KYOCERA

2024-2026 | Catalog

Cutting Tools



KYOCERA UNIMERCO

KEEPS YOU AHEAD

ADVANCING YOUR PRODUCTIVITY

Kyocera is the global and comprehensive cutting tool manufacturer who provides innovative materials and tool designs as well as proposes solutions for technological improvements.

Kyocera contributes to global manufacturing with innovative and efficient cutting tools, advanced tooling and technology solutions.

Kyocera's management aims to be focused on the user's perspective and we promise to be a comprehensive value-added manufacturer.

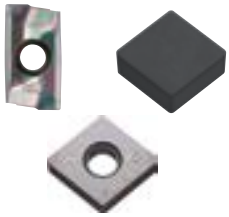
ADVANCING PRODUCTIVITY

PSC



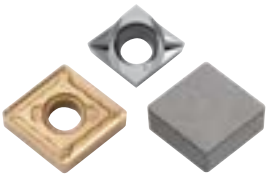
PSC type toolholders

A



Insert grades

B



Turning indexable inserts

C



CBN & PCD tools

D



External

E



Small tools

F



Boring

G



Grooving

H



Cut-off

J



Threading

K



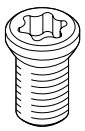
Drilling

M



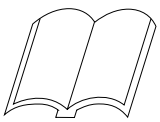
Milling

P



Spare parts

R



Technical information

T



Index

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ADVANCING PRODUCTIVITY

KYOCERA

CONTENTS | 2024-2026

Introduction	2-4
Polygon shank toolholders (PSC holder)	5-15
Insert grades	A1-A22
Turning	
Inserts	B1-B124
CBN & PCD tools	C1-C64
External	D1-D70
Small tools	E1-E68
Boring	F1-F160
Grooving	G1-G150
Cut-off	H1-H74
Threading	J1-J66
Drilling	K1-K96
Milling	M1-M300
Spare parts	P1-P38
Technical information	R1-R56
Index	T1-T20

A B C D E F G H J K M P R T

OPTIMIZE
YOUR PRODUCTION

Highly flexible toolmanagement solutions and powerful hydro chuck toolholders: See on last pages of the catalogue.



1. Introduction

Kyocera has put" a "caution" or a "warning" label on the package of the cutting tool products, but it is not on the tool itself.
Before using and handling any cutting tool products and cutting tool materials, be sure to read this guideline so they are used correctly.
Also, as part of your safety education, please make sure to familiarize all of your actual operators with the contents of this guideline.

2. Basic information for cutting tool materials

2.1 Technical terms

Cutting tool material:	Terminology for cutting tool materials, such as cemented carbide, coated carbide, cermet, coated cermet, ceramics, CBN and PCD
Carbide material:	Cemented varbide with WC (Tungsten carbide) as the main component

2.2 Physical properties

Appearance:	Depends on materials. (e.g. gray, black, gold, etc.)
Smell:	None
Hardness:	Carbide / Cermet 5 ~ 30 GPaHV, Ceramic 10 ~ 40 GPaHV CBN 20 ~ 50 GPaHV, PCD 80 ~ 120 GPaHV
Sp. Gr.:	Carbide 9 ~ 16, Cermet 5 ~ 9, Ceramic 2 ~ 7, CBN / PCD 3 ~ 5

2.3 Composition

Carbide, Nitride, Carbon-nitride and Oxide with W, Ti, Al, Si, Ta, B, etc. and additionally, metals such as Co, Ni, Cr, Mo are included in some cutting materials.

3. Notes for handling cutting tool materials

- These cutting tool materials are very hard, but also brittle. Therefore, they may brake by shock or excessive clamp force.
- Carbide base material, in particular, can be very heavy. Handle with care when transferring and storing large size products or large quantities as heavy load.
- Carbide base material has a different rate of thermal expansion to that of normal metals. When brazing the cutting tool material, use the proper temperature to prevent the tool from breaking.

4. Notes for cutting tools

- The cutting edge is very sharp; wear gloves when handling or installing tools to prevent injury.
- When cutting, cutting tools may brake due to shock, excessive tool wear or improper conditions. It is essential to wear protective clothing such as safe guards, safety eyeglasses, and gloves to prevent injury.
- Depending on workpiece material and cutting conditions, sparks or fire may occur. Use protective material such as safe guards, safety eyeglasses and gloves.
- When cutting, flying chips or metal pieces may be dangerous. Use protective materials such as safe guards and safety eyeglasses to prevent injury.

Precaution for using cutting tools

Target products	Precariousness	Countermeasures
General cutting tools	Direct touch to a sharp cutting edge may cause injury.	When you set up tools to the machine or take tools out of the case, please wear protective gloves.
	Misuse or inappropriate working conditions may cause tool breakage or dispersion of broken pieces.	• Please use safety items, such as safety glasses and protective gloves. • Please use in the range of our recommended cutting condition. See our catalog or instruction manuals.
	Excessive impact or heavy wear will increase cutting force and may cause tool breakage and dispersion of broken pieces.	• Please use safety items, such as safety glasses and protective gloves. • Early exchanging tools is prefereable.
	Dispersion of heated or prolonged chips may cause injury or burn.	• Please use safety items, such as safety glasses and protective gloves. • For chips removal, please stop the machine beforehand and use safety items, such as safety glasses and protective gloves.
	Tools and materials reach high temperatures during cutting operation. Direct touch to the tools and materials shortly after cutting may cause burn.	Please prepare safety items, such as safety glasses and protective gloves.
	Sparks, generation of heat or chips in high temperature during operation may cause fire.	• Please do not operate around Hazardous zone, in which there is some possibility of fire or explosion. • In case of using oil-coolant, please make sure there is sufficient fire-protection equipment.
	Lack of dynamic balance during high-speed revolutions leads to vibrations which can make the tool break.	• Please use safety items, such as safety glasses and protective gloves. • Please conduct test-operation before cutting, and confirm that there is no vibration or unusual sound.
	Direct touch to burrs which were generated on the rough surface of the workpiece may cause injury.	Do not touch workpiece with bare hand.
Indexable cutting tools	If the inserts or other tool parts are not installed properly, they can fall down or break which may cause injuries.	• Please clean up insert pockets or clamping parts before setting insert. • Please set up inserts with supplied wrench only, and confirm that the inserts or parts are clamped completely. Never use inserts or parts other than those prescribed.
	If inserts are clamped too tightly by supplementary tools like pipe etc, inserts or body may brake.	Do not use aids such as pipes. Please set up using supplied wrench only.
	When tools are used in high-speed revolution, inserts or parts may burst out of the body due to centrifugal force. When handling, please pay special attention to safety.	Please use in the range of our recommended cutting conditions. See our catalog or instruction manuals.
Milling cutters and other milling tools	Since milling cutters have sharp edges, direct contact with bare hands may cause injury.	Please use safety items, such as safety glasses and protective gloves.
	If a cutter lacks balance, the tool can start to vibrate. The dispersion of broken pieces can cause injuries.	• Please use in the range of our recommended cutting condition. • Accuracy and balance of machine spindle should be checked and adjusted regularly to prevent wear of the bearings due to eccentric rotation.
Drilling	When drilling a through-bore, it is possible that a disc is created during the drilling procedure that can fly out of the workpiece at a high speed. This is very dangerous since the disc has sharp edges.	Please use safety items, such as safety glasses and protective gloves. Also attach a cover on a chuck part.
Brazed tools	Dispersion or falling down of broken inserts may cause injury.	• Please check that the cutting inserts are brazed firmly before use. • Please do not use brazed tools in the condition that requires high cutting temperature.
Others	If brazing is carried out many times, the strength of carbide insert is deteriorated and can break easily during cutting.	Please do not use tools that have been brazed several times. The quality of the tool deteriorates.
	The tools can only be used for the appropriate application. It may damage tools and machines.	Please follow our recommended usage for the tools.

Preface

Thank you very much for using "**2024-2026 Kyocera Cutting Tools**".
This general catalog is as of **October, 2024**.

The availability of products will be shown as follows:

●	Standard item	□	Check availability
R	Right-hand only	MTO	Made to order
L	Left-hand only	None	No Stock

The specifications of products in this catalog may be changed due to research / development / modification without prior notice.
Also conventional products might be integrated or centralized due to new material or new product development.

Kyocera Cutting Tools will continue to improve product quality and safety.
For safety data sheet (SDS) of each insert grade, please refer to our machine tool homepage:
https://www.kyocera-unimerco.com/en-global/support/safety-data-sheets

Packaging units

Toolholder body / Parts

Type	Pieces/box	Remarks
Toolholder	1 piece/box	
Milling	1 piece/box	
Parts	1 piece/box	Light weight parts (Clamp screws) are in a plastic bag

Inserts

Type	Pieces/box	Remarks
Twin bars	5 pieces/box	TWB / TWBT / TWFG / TWFGT insert
System tip-bars	5 pieces/box	VNB / VNBT / VNFG / VNG / VNT insert
EZ bars	1 piece/box	
CBN inserts	1 piece/box	Insert grades: KBN···
PCD inserts	1 piece/box	Insert grades: KPD···
Threading inserts	5 pieces/box	Insert grades: PR1215 / PR1515 / PR1535 / PR1115 / GW15 only
GC inserts	5 pieces/box	Inserts for SIGC
DA…M-GM type insert	1 piece/box	Inserts for MagicDrill DRA
DC…M-SC type insert	1 piece/box	Inserts for MagicDrill DRC
SEEN-W inserts	5 pieces/box	Insert grades: TN100M / KW10 only
SNEU-W Inserts	5 pieces/box	MB45 insert with wiper edge
PNEG-W inserts	5 pieces/box	MFK insert with wiper edge
PNEU-W inserts	5 pieces/box	MFPN insert with wiper edge
RDFG type insert	2 pieces/box	MRF / MRFW ball end mill insert
RBG Type insert	1 piece/box	
Other than above inserts	10 pieces/box	



PSC HOLDER



ENHANCED STABILITY AND PRECISION FOR MAXIMUM MACHINING PERFORMANCE

- Turning
- Grooving
- High feed milling



ISO Turning toolholder

Polygon taper shank with high rigidity and high precision

PSC shank tools

JIS B 6066-1: Dual contact between polygon taper shank and the main spindle face

SO26623-1: Polygonal taper interface with flange contact surface



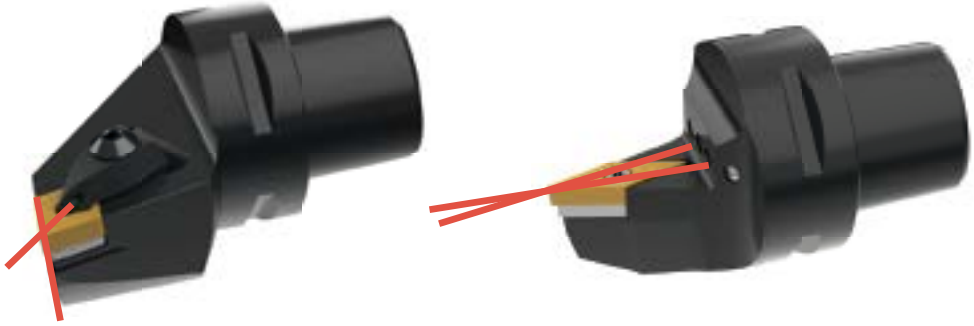
1 High rigidity

Polygon taper design and dual contact between the taper and the flange face for high rigidity

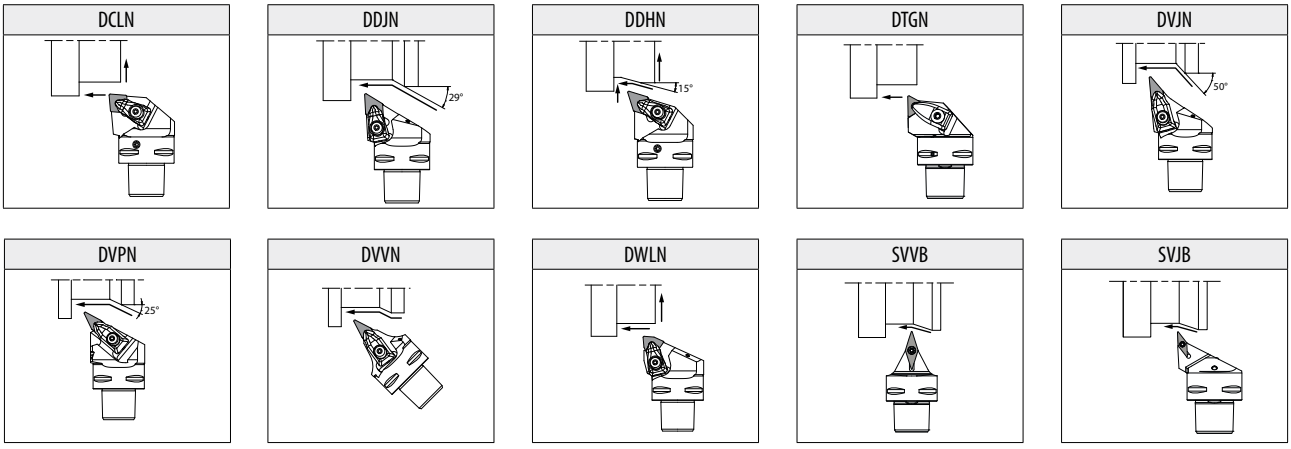
Even distribution of force between 3 faces enhances rigidity and centering

2 Effective cooling

Unique internal coolant design



3 Lineup

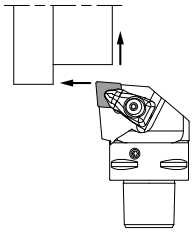


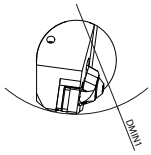
Turning toolholder PSC

DCLN$^{R}/_{L}$ -12

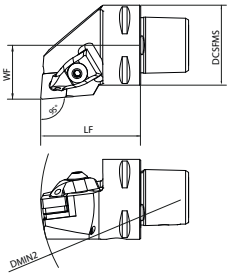


Image: C4-DCLNR-27050-12-DC-KUA





Right-hand shown



Applicable inserts	
CN☐A CN☐G CN☐M	1204...

Toolholder dimensions

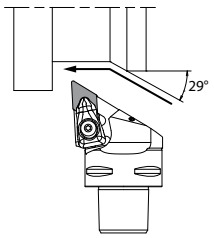
Description	Availability		Size	Dimensions (mm)					RE	Spare parts			
	R	L		DCSFMS	LF	WF	DMIN1	DMIN2		Clamp	Clamp Screw	Shim	Shim screw
C4-DCLN$^{R}/_{L}$-27050-12-DC-KUA	●	●	C4	40	50	27	110	150	0.8	KSPK$^{R}/_{L}$	KVPA.0620.DC	KPPPC.12	KVPP.0512.KG
C5-DCLN$^{R}/_{L}$-35060-12-DC-KUA	●	●	C5	50	60	35	115	175					
C6-DCLN$^{R}/_{L}$-45065-12-DC-KUA	●	●	C6	63	65	45	110	200					

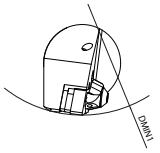
● : Available

DDJN$^{R}/_{L}$ -15

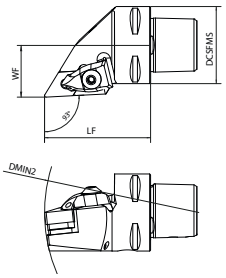


Image: C4-DDJNR-27055-15-DC-KUA





Right-hand shown



Applicable inserts	
DN☐A DN☐G DN☐M	1506...

Toolholder dimensions

Description	Availability		Size	Dimensions (mm)					RE	Spare parts			
	R	L		DCSFMS	LF	WF	DMIN1	DMIN2		Clamp	Clamp Screw	Shim	Shim screw
C4-DDJN$^{R}/_{L}$-27055-15-DC-KUA	●	●	C4	40	55	27	140	170	0.8	KSPK$^{R}/_{L}$	KVPA.0620.DC	KPPPD.15	KVPP.0512.KG
C5-DDJN$^{R}/_{L}$-35060-15-DC-KUA	●	●	C5	50	60	35	120	160					
C6-DDJN$^{R}/_{L}$-45065-15-DC-KUA	●	●	C6	63	65	45	110	190					

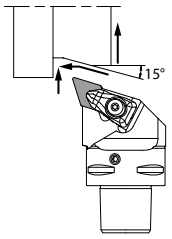
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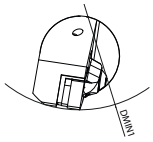
Turning toolholder PSC

DDHN$^{R}/_{L}$ -15

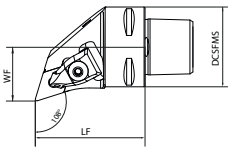


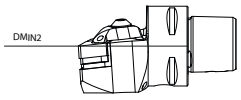
Image: C4-DDHNR-27055-15-DC-KUA





Right-hand shown





Applicable inserts	
DN☐A DN☐G DN☐M	1506...

Toolholder dimensions

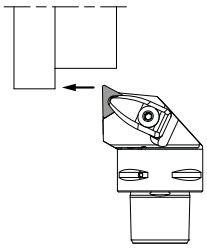
Description	Availability		Size	Dimensions (mm)					RE	Spare parts			
	R	L		DCSFMS	LF	WF	DMIN1	DMIN2		Clamp	Clamp Screw	Shim	Shim screw
C4-DDHN$^{R}/_{L}$-27055-15-DC-KUA	●	●	C4	40	55	27	125	300	0.8	KSPK$^{R}/_{L}$	KVPA.0620.DC	KPPPD.15	KVPP.0512.KG
C5-DDHN$^{R}/_{L}$-35060-15-DC-KUA	●	●	C5	50	60	35	110	165					
C6-DDHN$^{R}/_{L}$-45065-15-DC-KUA	●	●	C6	63	65	45	110	210					

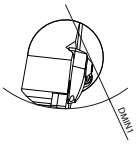
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DTGN$^{R}/_{L}$ -16

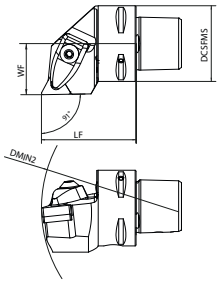


Image: C4-DTGNR-27050-16-DC-KUA





Right-hand shown



Applicable inserts	
TN☐A TN☐G TN☐M	1604...

Toolholder dimensions

Description	Availability		Size	Dimensions (mm)					RE	Spare parts			
	R	L		DCSFMS	LF	WF	DMIN1	DMIN2		Clamp	Clamp Screw	Shim	Shim screw
C4-DTGN$^{R}/_{L}$-27050-16-DC-KUA	●	●	C4	40	50	27	115	140	0.8	KSPD$^{R}/_{L}$	KVPA.0620.DC	KPPPT.16	KVPP.0512.RGT
C5-DTGN$^{R}/_{L}$-35060-16-DC-KUA	●	●	C5	50	60	35	110	165					
C6-DTGN$^{R}/_{L}$-45065-16-DC-KUA	●	●	C6	63	65	45	110	190					

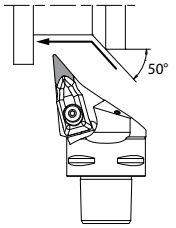
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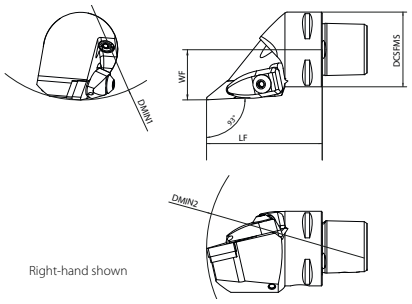
Turning toolholder PSC

DVJN$^{R}/_{L}$ -16



Image: C4-DVJNR-27062-16-DC-KUA





Right-hand shown

Applicable inserts	
VN□A VN□G VN□M	1604...

Toolholder dimensions

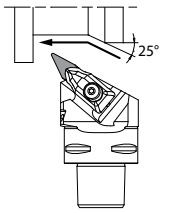
Description	Availability		Size	Dimensions (mm)					RE	Spare parts			
	R	L		DCSFMS	LF	WF	DMIN1	DMIN2		Clamp	Clamp Screw	Shim	Shim screw
C4-DVJN$^{R}/_{L}$-27062-16-DC-KUA	●	●	C4	40	62	27	145	140	0.8	KSPD$^{R}/_{L}$	KVPA.0620.DC	KPPPV.16	KVPP.0512.RG
C5-DVJN$^{R}/_{L}$-35060-16-DC-KUA	●	●	C5	50	65	35	115	165					
C6-DVJN$^{R}/_{L}$-45065-16-DC-KUA	●	●	C6	63	65	45	110	190					

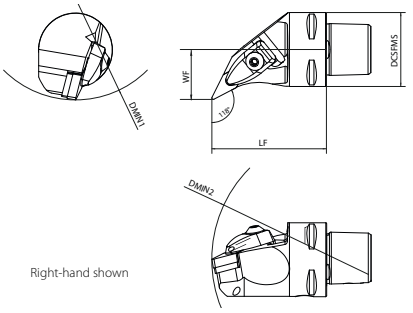
●: Available

DVPN$^{R}/_{L}$ -16



Image: C4-DVPNR-27062-16-DC-KUA





Right-hand shown

Applicable inserts	
VN□A VN□G VN□M	1604...

Toolholder dimensions

Description	Availability		Size	Dimensions (mm)					RE	Spare parts			
	R	L		DCSFMS	LF	WF	DMIN1	DMIN2		Clamp	Clamp Screw	Shim	Shim screw
C4-DVPN$^{R}/_{L}$-27062-16-DC-KUA	●	●	C4	40	62	27	110	140	0.8	KSPD$^{R}/_{L}$	KVPA.0620.DC	KPPPV.16	KVPP.0512.RG
C5-DVPN$^{R}/_{L}$-35060-16-DC-KUA	●	●	C5	50	65	35	110	165					
C6-DVPN$^{R}/_{L}$-45065-16-DC-KUA	●	●	C6	63	65	45	110	190					

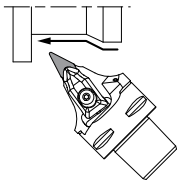
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Turning toolholder PSC

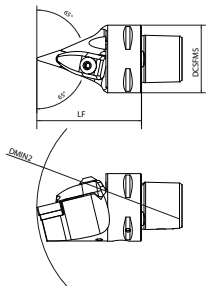
DVVNN -16



Image: C4-DVVNN-00062-16-DC-KUA







Right-hand shown

Applicable inserts	
VN☐A VN☐G VN☐M	1604...

Toolholder dimensions

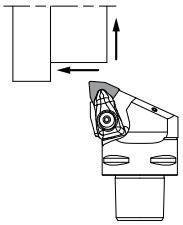
Description	Availability			Size	Dimensions (mm)					RE	Spare parts			
	R	N	L		DCSFMS	LF	WF	DMIN1	DMIN2		Clamp	Clamp Screw	Shim	Shim screw
C4-DVVNN-00062-16-DC-KUA		●		C4	40	62	0	-	140	0.8	KSPDR	KVPA.0620.DC	KPPPV.16	KVPP.0512.RG
C5-DVVNN-00065-16-DC-KUA		●		C5	50	65	0	-	170		KSPDL			
C6-DVVNN-00065-16-DC-KUA		●		C6	63	65	0	-	190		KSPDR			

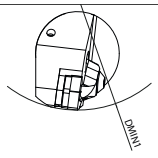
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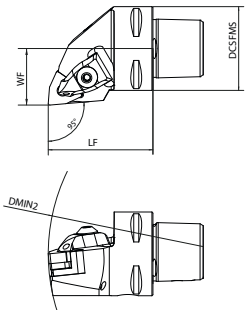
DWLN$^{R}/_{L}$ -08



Image: C4-DWLNR-27050-08-DC-KUA







Right-hand shown

Applicable inserts	
WN☐A WN☐G WN☐M	0804...

Toolholder dimensions

Description	Availability		Size	Dimensions (mm)					RE	Spare parts			
	R	L		DCSFMS	LF	WF	DMIN1	DMIN2		Clamp	Clamp Screw	Shim	Shim screw
C4-DWLN$^{R}/_{L}$-27050-08-DC-KUA	●	●	C4	40	50	27	120	190	0.8	KSPK$^{R}/_{L}$	KVPA.0620.DC	KPPPT.16	KVPP.0512.RGT
C5-DWLN$^{R}/_{L}$-35060-08-DC-KUA	●	●	C5	50	60	35	120	170					
C6-DWLN$^{R}/_{L}$-45065-08-DC-KUA	●	●	C6	63	65	45	110	195					

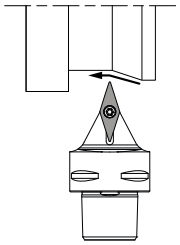
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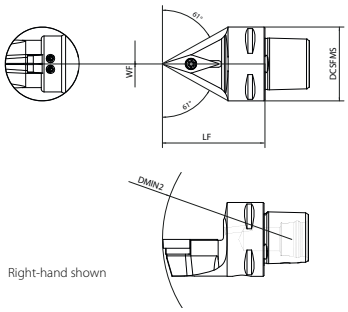
Turning toolholder PSC

SVVBN -16



Image: C4-DVPNR-27062-16-DC-KUA





Right-hand shown

Applicable inserts	
VB☐A VB☐G VB☐M	1604...

Toolholder dimensions

Description	Availability			Size	Dimensions (mm)					RE	Spare parts			
	R	N	L		DCSFMS	LF	WF	DMIN1	DMIN2		TORX screw	TORX key	Shim	Shim screw
C4-SVVBN-00055-16DC-KUA		●		C4	40	62	0	-	140	0.4	KVPT.3514	KKLJ.T15	KPPPV.16	KVPP.3511
C5-SVVBN-00060-16DC-KUA		●		C5	50	65	0	-	165					
C6-SVVBN-00065-16DC-KUA		●		C6	63	65	0	-	190					

● : Available

SVJB$^{R}/_{L}$ -11 / 16



Image: C4-DVPNR-27062-16-DC-KUA

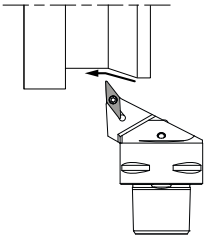
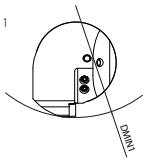
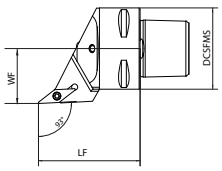


Fig. 1





Right-hand shown

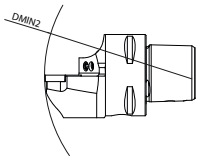
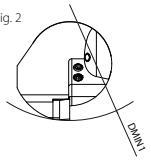
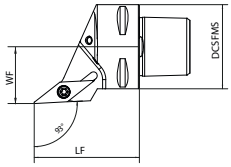
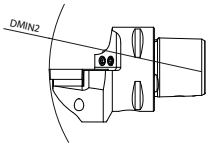


Fig. 2







Right-hand shown

Applicable inserts	
VB☐A VB☐G VB☐M	1103...

Applicable inserts	
VB☐A VB☐G VB☐M	1604...

Toolholder dimensions

Description	Availability			Size	Dimensions (mm)					Drawing	RE	Spare parts			
	R	N	L		DCSFMS	LF	WF	DMIN1	DMIN2			TORX screw	TORX key	Shim	Shim screw
C4-SVJB$^{R}/_{L}$-27050-11-DC-KUA	●		●	C4	40	50	27	185	140	Fig. 1	0.4	KVPT.2506	KT08	-	-
C5-SVJB$^{R}/_{L}$-35060-11-DC-KUA	●		●	C5	50	60	35	125	165						
C6-SVJB$^{R}/_{L}$-45065-11-DC-KUA	●		●	C6	63	65	45	110	190						
C4-SVJB$^{R}/_{L}$-27050-16-DC-KUA	●		●	C4	C4	40	50	27	115	Fig. 2		KVPT.3514	KKLJ.T15	KPPVV.16	KVPP.3508
C5-SVJB$^{R}/_{L}$-35060-16-DC-KUA	●		●	C5	C5	50	60	35	170						KVPP.3511
C6-SVJB$^{R}/_{L}$-45065-16-DC-KUA	●		●	C6	C6	63	65	45	115						

● : Available

KGD

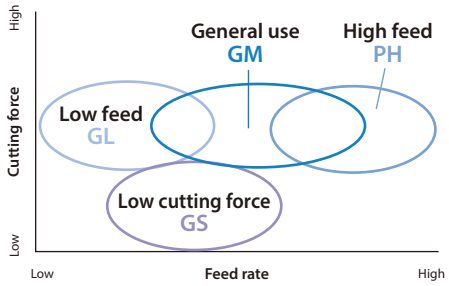


Good chip control
MEGACOAT coating technology for long tool life and high efficiency machining

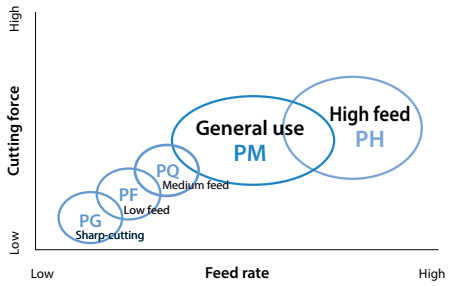
1 Wide range of chipbreakers

Application maps

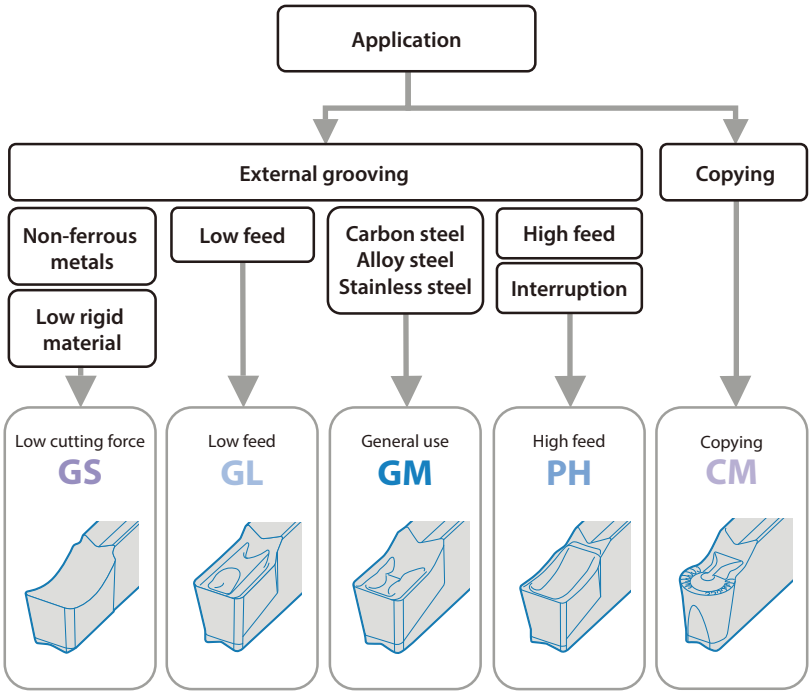
External grooving and traversing



Cut-Off



Chipbreaker selection (external)



Comparison of chip control (In-house evaluation)
Cutting conditions: Vc = 150 m/min, f = 0.15 mm/rev Workpiece : 15CrMo4

Better chip control than competitors
Reduces damage of cutting edge caused by crushing chips

GM chipbreaker



Competitor A



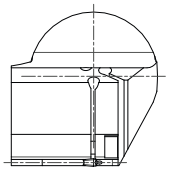
Competitor B

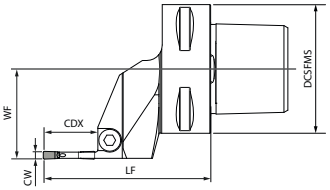


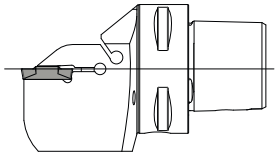
For more information, see the brochure about KGD

KGD-PSC (Grooving/Cut-off toolholder)









Right-hand shown

Toolholder dimensions

Groove width CW (mm)	Available grooving depth (mm)	Description	Availability		Size	Dimensions (mm)					Width W (mm)		Spare part Clamp bolt	Applicable inserts
			R	L		DCSFMS	LF	WF	CDX	Top coolant	MIN	MAX		
2	17	KUA-KPC4-KGD$^{R}_{L}$ -2T17	●	●	C4	40	60	27	17	●	2.0	3.0	HH5X16	GDM type GDG type
		KUA-KPC5-KGD$^{R}_{L}$ -2T17	●	●	C5	50	60	35	17	●				
3	20	KUA-KPC4-KGD$^{R}_{L}$ -3T20	●	●	C4	40	65	27	20	●	3.0	4.0		
		KUA-KPC5-KGD$^{R}_{L}$ -3T20	●	●	C5	50	65	35	20	●				
		KUA-KPC6-KGD$^{R}_{L}$ -3T20	●	●	C6	60	65	45	20	●				
4	25	KUA-KPC4-KGDR -4T25	●		C4	40	70	27	25	●	4.0	5.0		
		KUA-KPC5-KGDR -4T25	●		C5	50	70	35	25	●				
		KUA-KPC6-KGDR -4T25	●		C6	60	70	45	25	●				
5	25	KUA-KPC4-KGDR -5T25	●		C4	40	70	27	25	●	5.0	6.0		
		KUA-KPC5-KGDR -5T25	●		C5	50	70	35	25	●				
		KUA-KPC6-KGDR -5T25	●		C6	60	70	45	25	●				

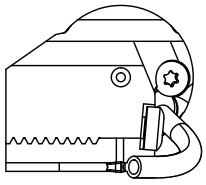
The recommended clamping torque is 6.5 Nm and the maximum coolant supply pressure is 80 bar.
CDX dimension shows available grooving depth (When CDX dimension is 20 mm or more, maximum grooving depth with 2 corners is 18 mm).

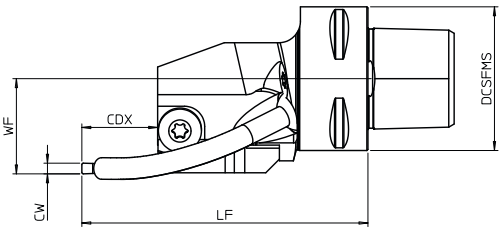
●: Available

KGD-PSC Blade type

Toolholder: Right-hand







Toolholder dimensions

Groove width CW (mm)	Available grooving depth (mm)	Blade description	Toolholder description	Availability		Size	Dimensions (mm)			
				R	L		DCSFMS	LF	WF	Coolant
2	17	KGD$^{R}_{L}$-2T17-C	KUA-KPC4-KGD$^{R}_{L}$-BL-CT	●	●	C4	40	77	27	●
3	10	KGD$^{R}_{L}$-3T10-C		●	●	C4		70		●
3	20	KGD$^{R}_{L}$-3T20-C		●	●	C4		80		●
4	10	KGD$^{R}_{L}$-4T10-C		●	●	C4		70		●
4	20	KGD$^{R}_{L}$-4T20-C		●	●	C4		80		●
4	25	KGD$^{R}_{L}$-4T25-C		●	●	C4		85		●
5	10	KGD$^{R}_{L}$-5T10-C		●	●	C4		70		●
5	25	KGD$^{R}_{L}$-5T25-C		●	●	C4		85		●

●: Available

Cutter for high feed machining

MFH

The MFH series is a highly efficiency high feed cutter with convex cutting edge design to reduce chatter for increased chip evacuation. Large line-up from Ø8 to 160 mm to cover a wide application range for multiple metal working processes.

MFH Boost



Fig. 1

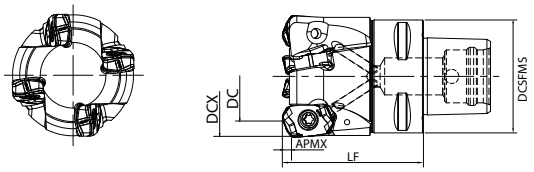


Fig. 2

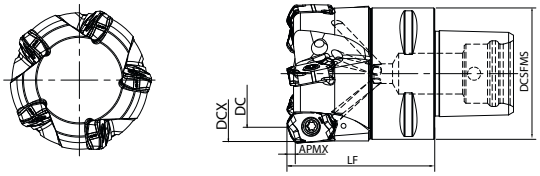


Fig. 3

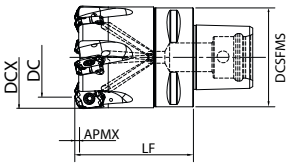
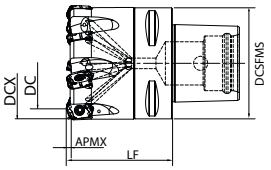


Fig. 4

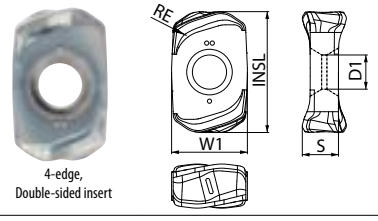


Toolholder dimensions

Description	Availability	No. of inserts	Size	Dimensions (mm)					Drawing	A.R.	Coolant hole
				DCX	DC	DCSFMS	LF	APMX			
MFH 36-04-4T-C3-KUA	●	4	C3	ø36	ø25	ø32	40	2.5	Fig. 1	−10°	Yes
MFH 44-04-5T-C4-KUA	●	5	C4	ø44	ø33	ø40	45		Fig. 2		
MFH 54-04-6T-C5-KUA	●	6	C5	ø54	ø43	ø50	60		Fig. 3		
MFH 66-04-7T-C6-KUA	●	7	C6	ø66	ø55	ø63			Fig. 4		

● : Available

Applicable inserts

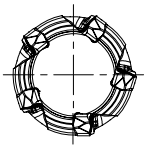
Shape	Description	Dimensions (mm)					MEGACOAT NANO			CVD Coating	MEGACOAT NANO EX		
		W1	S	D1	INSL	RE	PR1510	PR1525	PR1535	CA6535	PR1810	PR1825	PR1835
 4-edge, Double-sided insert	LOMU 040410ER-GM	9.1	4.4	4.1	14.5	1.0	●	●	●	●	●	●	●

● : Available

MFH Mini



Fig. 1



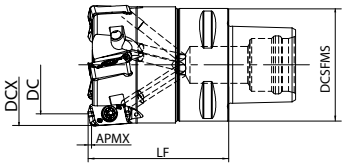
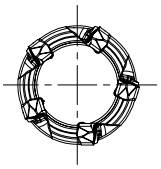
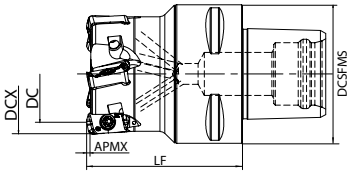


Fig. 2



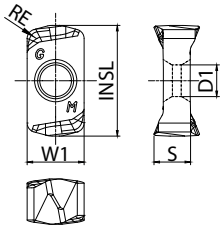
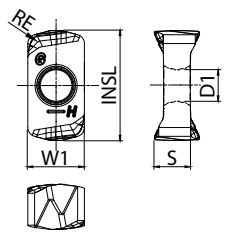


Toolholder dimensions

Description	Availability	No. of inserts	Size	Dimensions (mm)					Drawing	A.R.	Coolant hole
				DCX	DC	DCSFMS	LF	APMX			
MFH 36-03-5T-C3-KUA	●	5	C3	ø36	ø28	ø32	40	1	Fig. 1	−10°	Yes
MFH 36-03-5T-C4-KUA	●	5	C4			ø40	45		Fig. 2		
MFH 42-03-6T-C4-KUA	●	6	C4	ø42	ø34	ø40	45		-		
MFH 42-03-6T-C5-KUA	●	6	C5			ø50	50				
MFH 52-03-8T-C5-KUA	●	8	C5	ø52	ø44	ø50	55				
MFH 52-03-8T-C6-KUA	●	8	C6			ø63	60				
MFH 66-03-10T-C5-KUA	●	10	C5	ø66	ø58	ø50	55				
MFH 66-03-10T-C6-KUA	●	10	C6			ø63	60				

● : Available

Applicable inserts

Insert		Description	Dimensions (mm)					MEGACOAT NANO			MEGACOAT HARD	CVD coated carbide	MEGACOAT NANO EX		
			W1	S	D1	INSL	RE	PR1510	PR1525	PR1535	PR015S	CA6535	PR1810	PR1825	PR1835
 General purpose		LOGU030310ER-GM	6.2	3.96	3.45	11.9	1.0	●	●	●	–	●	●	●	●
 Tough edge		LOGU030310ER-GH	6.2	3.96	3.45	11.9	1.0	●	●	●	●	–	●	●	●

● : Available

A

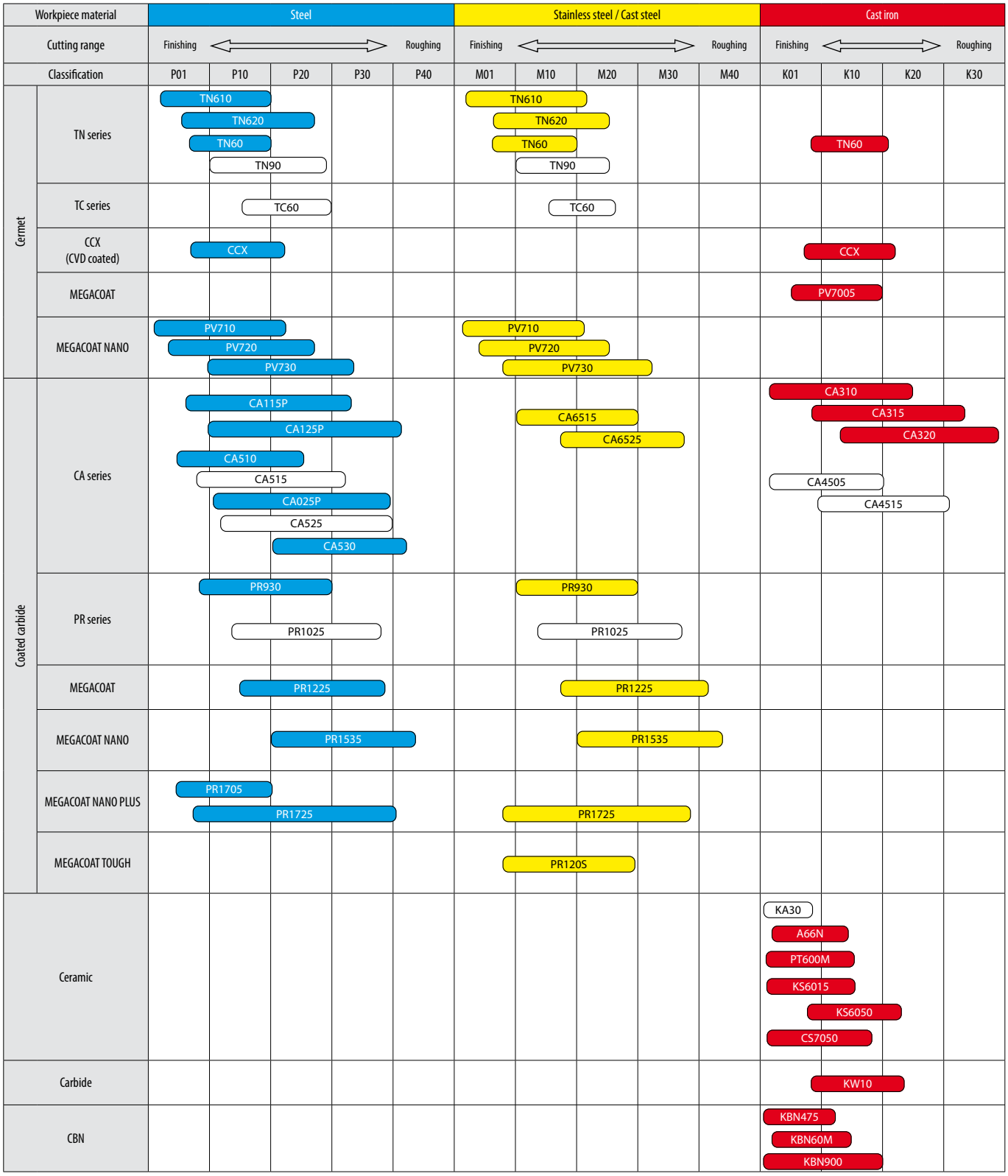


Summary of insert grades	A2-A5
Turning	A2
Small parts machining	A3
Grooving / Cut-Off / Threading	A4
Drilling	A5
Milling	A5

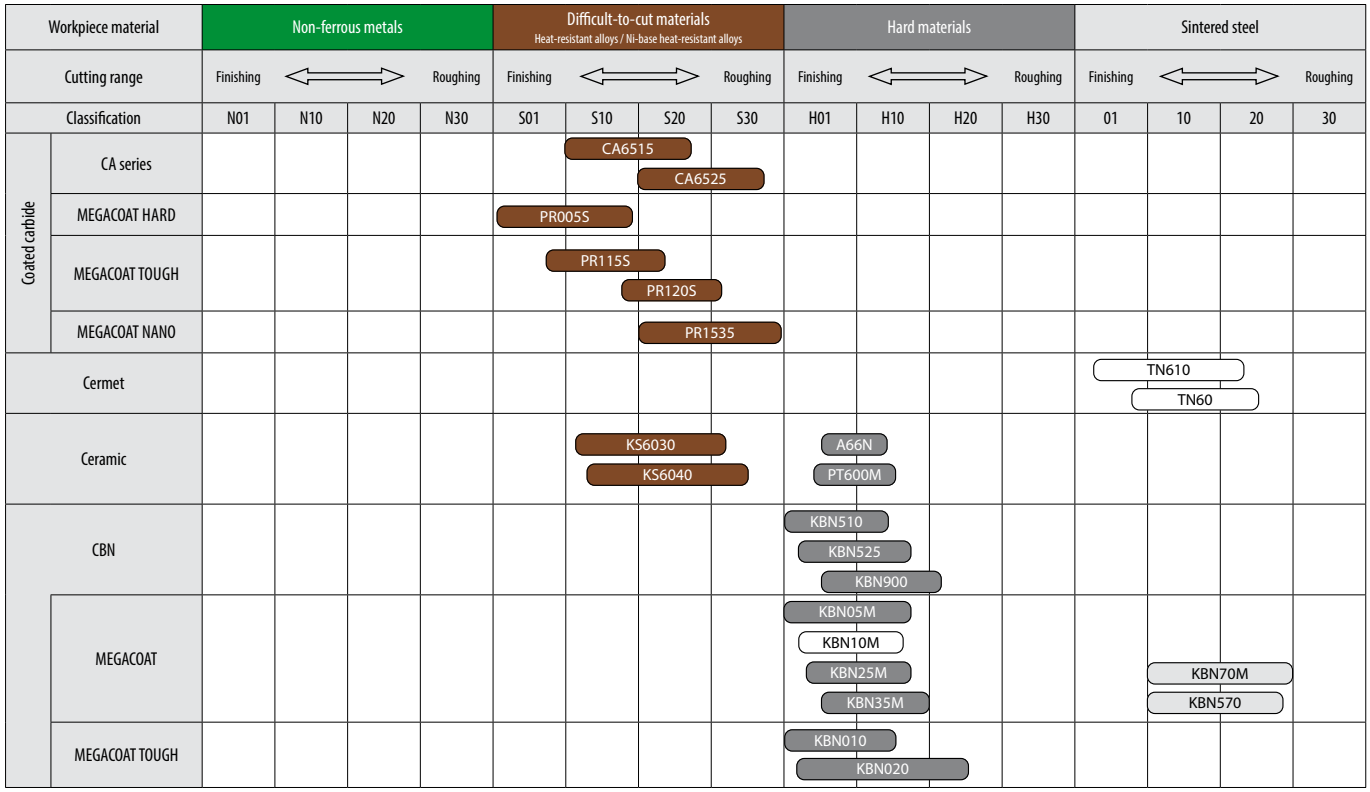
Insert grades	A6-A21
Cermet	A6
PVD coated cermet	A6
CVD coated carbide (Turning)	A8
PVD coated carbide (Turning)	A10
PVD / CVD coated carbide (Milling / Drilling)	A12
Carbide	A14
DLC coated carbide	A14
Ceramic	A15
CBN (Cubic boron nitride)	A16
PCD (Polycrystalline diamond)	A17
Honeycomb structure CBN	A18
Insert material selection table	A19
Grade properties	A20

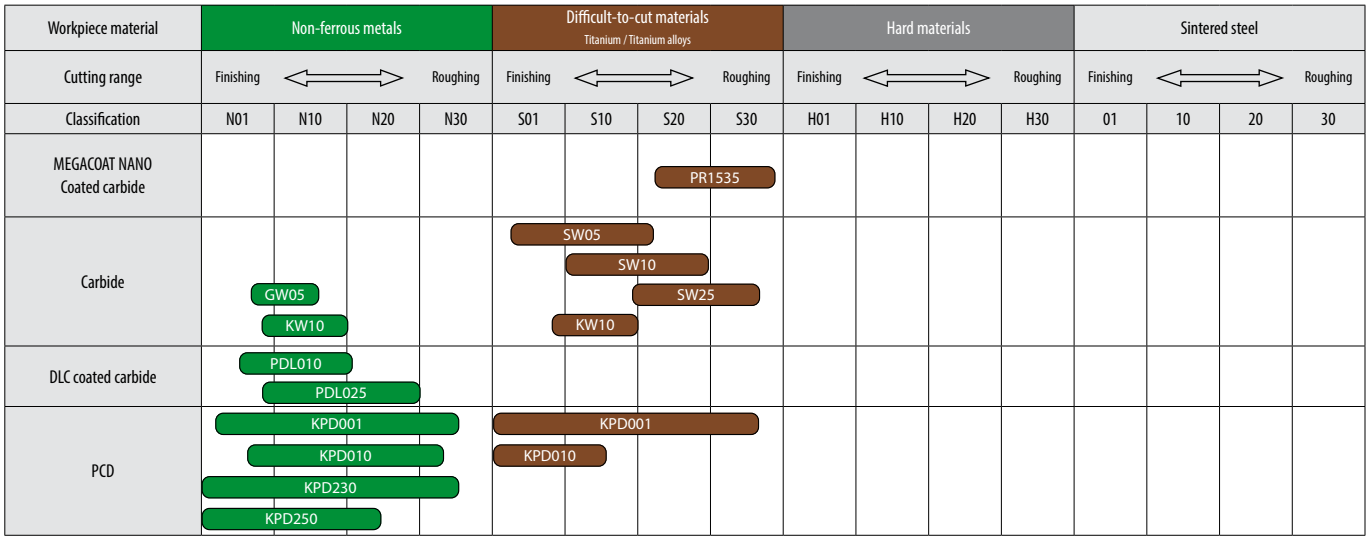
Kyocera promotes research and development to help improve customers' productivity and profitability. Kyocera provides high-quality inserts in various grades including cermet, coated carbide, coated super micro grain carbide, carbide, ceramic, PCD and CBN.

Turning

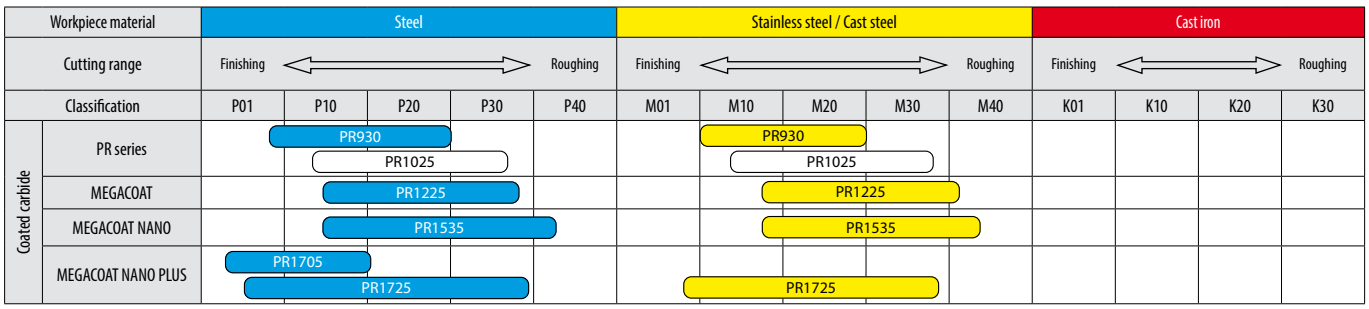


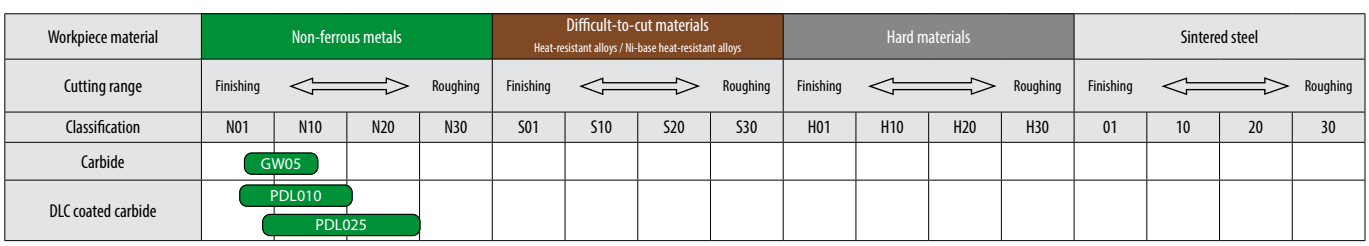
Turning





Small parts machining

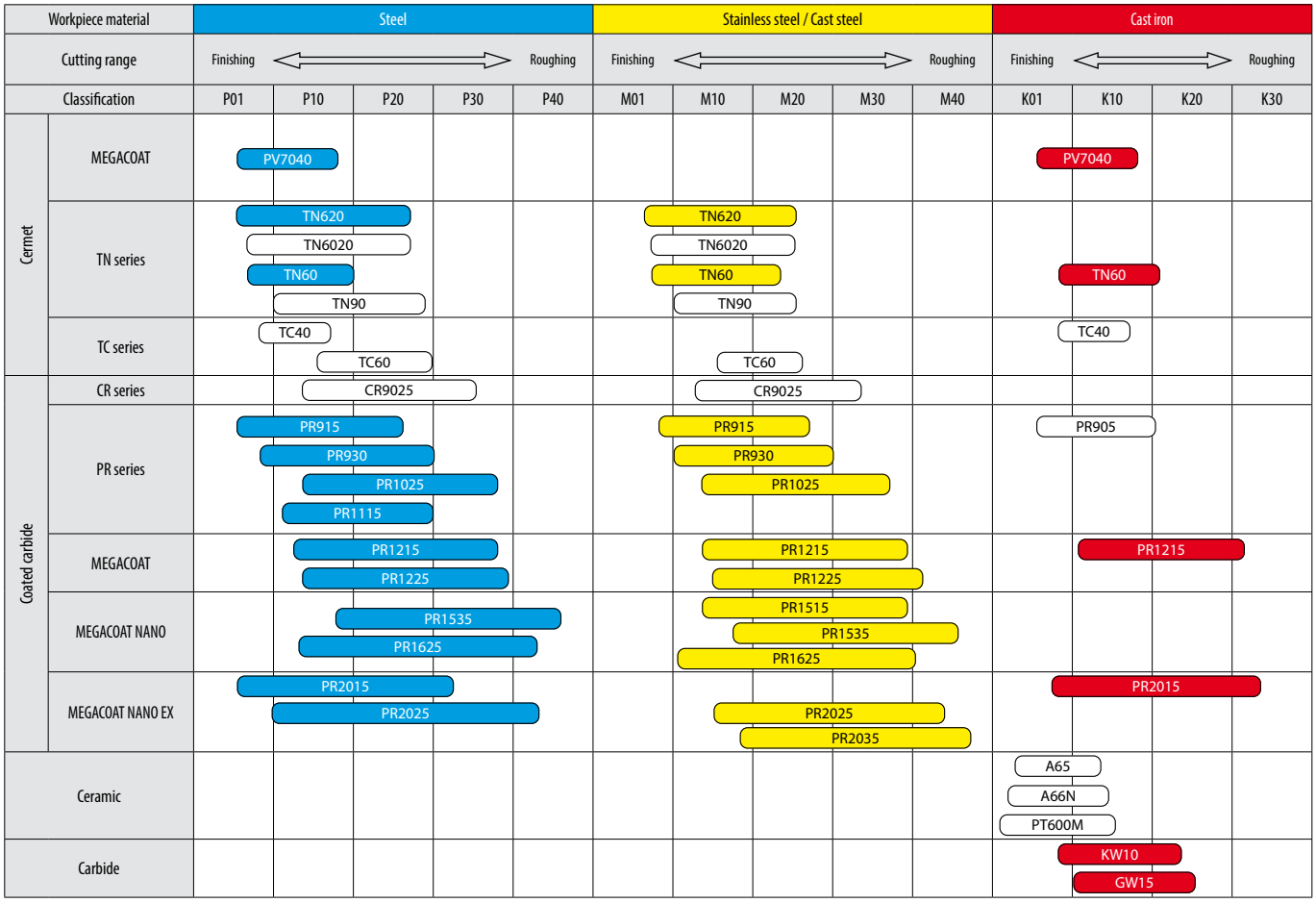


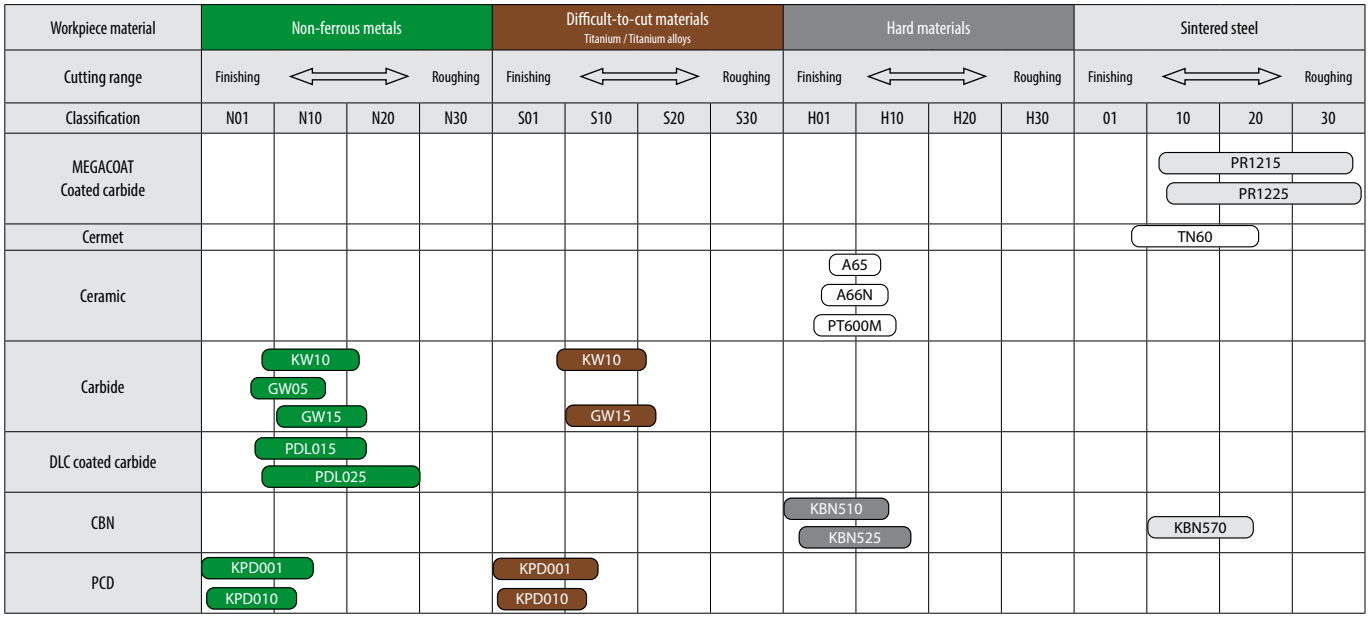


A

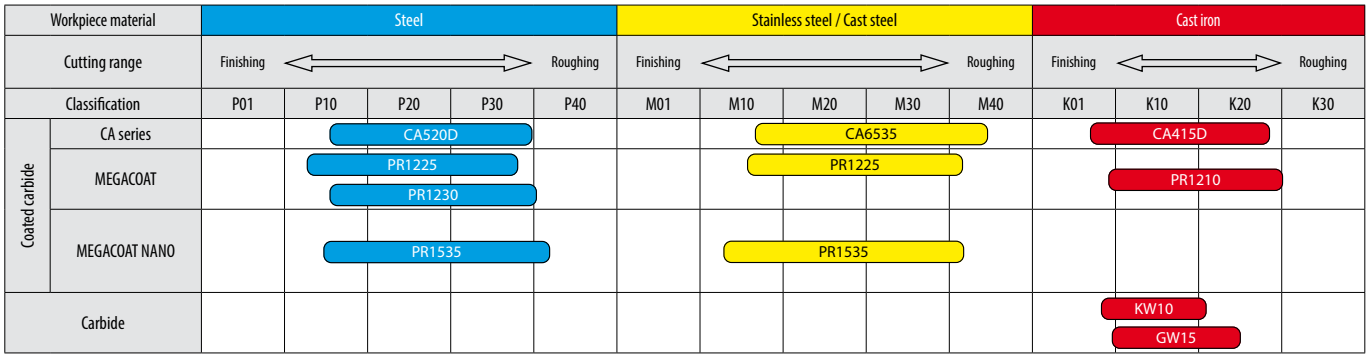
Insert grades

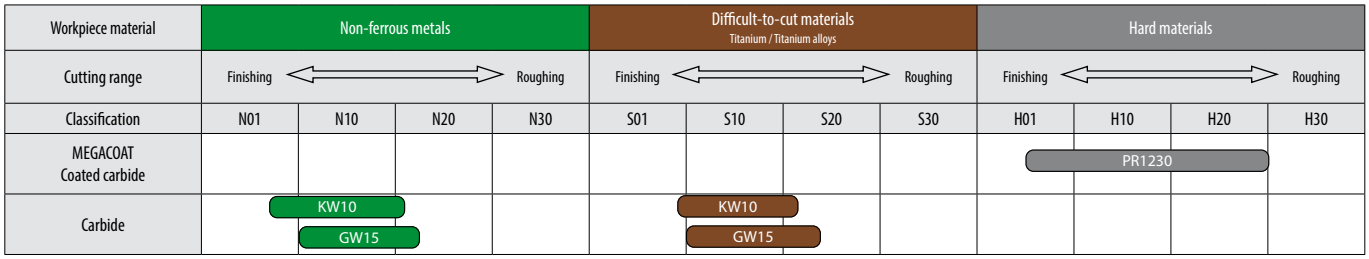
Grooving / Cut-Off / Threading



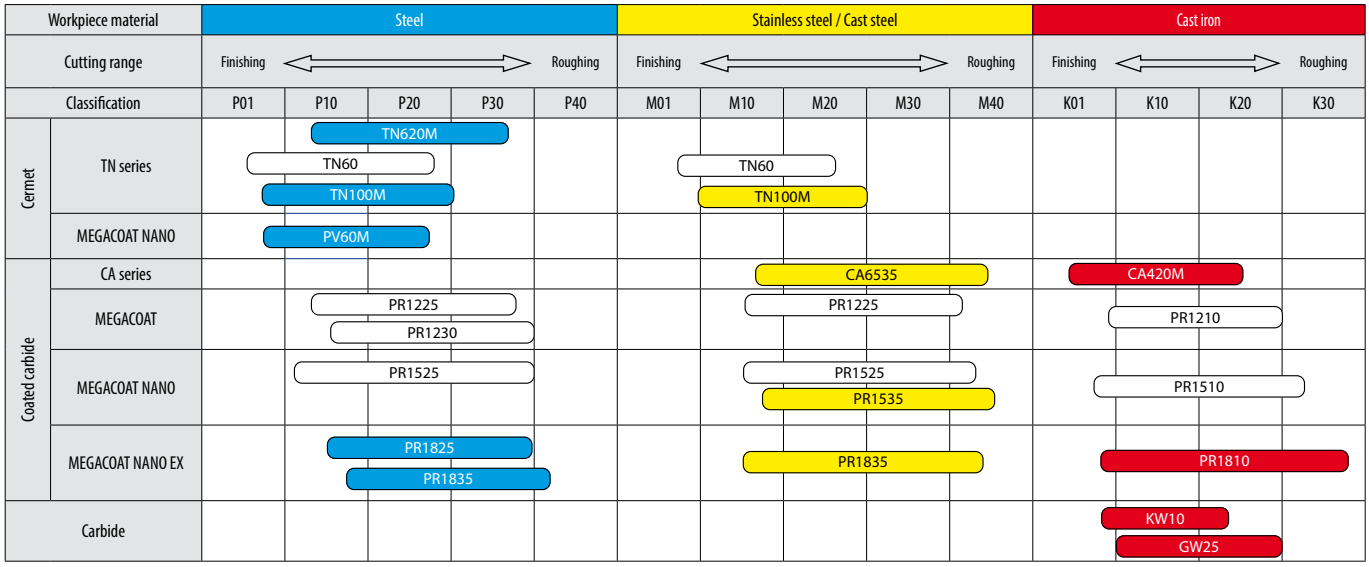


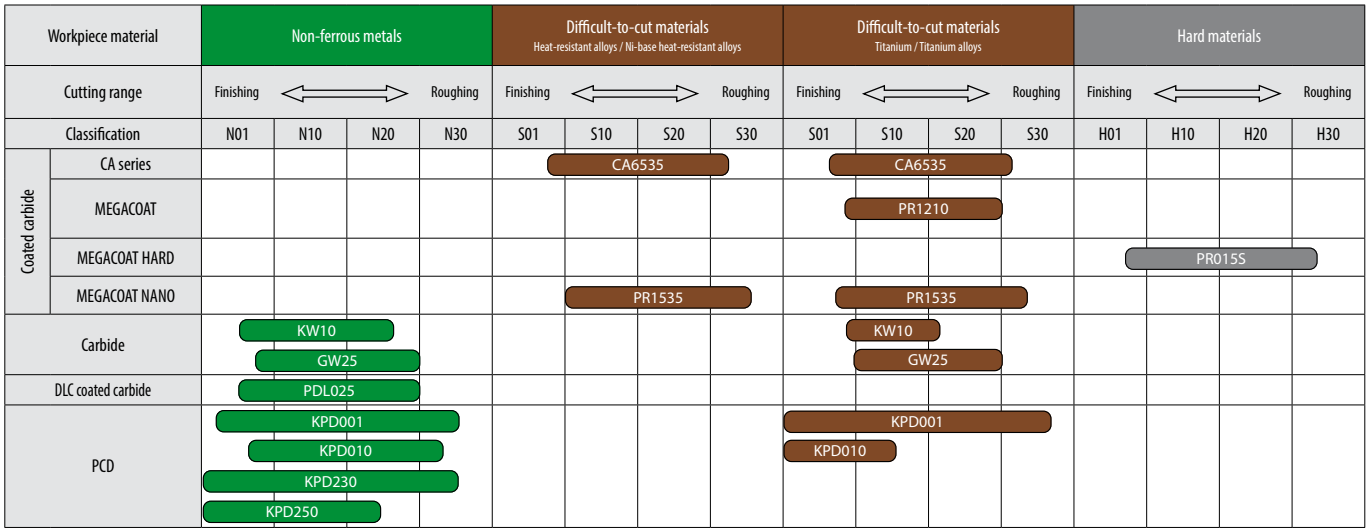
Drilling





Milling





Cermet

Cermet

KYOCERA is known as one of the leading manufacturer of cermets. Cermets combine toughness with superior wear resistance, and provide longer tool life and excellent surface finishes. Typical materials used in cermets are TiC, TiN, TiCN and NbC.



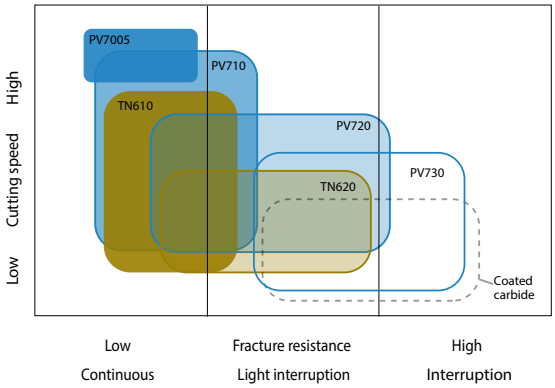
PVD coated cermet (MEGACOAT / MEGACOAT NANO Cermet)

PVD coated cermet is coated on cermet substrate with a thin layer of high wear resistance and high adhesion resistance by PVD (Physical Vapor Deposition) technology. Generally because of the low processing temperature of PVD compared with CVD, PVD coated cermet features less deterioration and more bending strength.

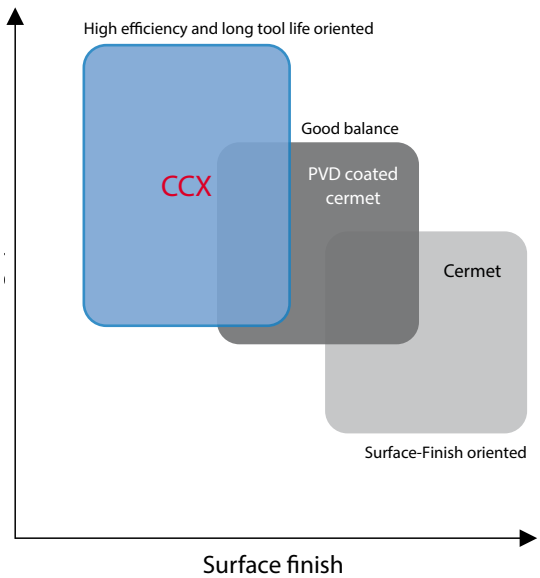
Features of cermet and PVD coated cermet

Classification	Grade		Color	Main component (Coated composition)	Advantages and applications
P Steel	Cermet	TN610	Gray	TiCN	• High wear resistant cermet due to three types of special reinforcement technology • Application: Cermet for steel machining, long tool life in high speed and continuous
		TN620		TiCN	• Three types of special reinforcement technology realized the superior fracture resistance and wear resistance • Application: Stable machining of steel
		TN60		TiCN+NbC	• Application: Machining of steel, continuous to interruption
		TN6020		TiCN	• Application : Uncoated cermet for grooving of steel
		TN620M		TiCN	• Tough cermet for milling with excellent balance of wear resistance and toughness • Application : Millig of steel with high quality surface finish and long tool life
		TN100M		TiCN+NbC	• Tough cermet with improved oxidation resistance and thermal shock resistance • Application: Milling of steel at high speed
		TC40		TiC+TiN	• Good balance of wear resistance and toughness • Application: Grooving and threading of steel
	CVD Coated Cermet	CCX	Gold	TiCN ($TiCN+Al_2O_3+Tin$)	• Specialized high-strength micro grain cermet base material with superior wear-resistant thick CVD coating • Excellent wear resistance leads long tool life in high speed machining • Application : High speed finishing to light interrupted machining of steel
	MEGACOAT NANO Cermet	PV710	Gold	TiCN (MEGACOAT NANO)	• Superior wear and adhesion resistant MEGACOAT NANO on the high wear resistant cermet • Application: Long tool life and stability in high speed continuous machining of steel, excellent surface
		PV720		TiCN (MEGACOAT NANO)	• Superior wear and adhesion resistant MEGACOAT NANO on the special reinforcement cermet • Application: First choice PVD coated cermet for steel machining, high efficient machining and high quality surface finish
		PV60M	Gold	TiCN+NbC (MEGACOAT NANO)	· Improved stable grade for milling by MEGACOAT NANO coating technology · Application: Milling of steel with high quality surface finish and stable machining
	MEGACOAT Cermet	PV7040	Blackish Red	TiC+TiN (MEGACOAT)	• MEGACOAT Cermet for Grooving • Application: Excellent surface finish and longer tool life in steel grooving
K Cast iron		PV7005		TiC+TiN MEGACOAT	• Heat-resistant MEGACOAT on cermet with excellent wear resistance • Application: High speed finishing of gray and nodular cast iron

Application map



Properties of PVD coating



Uncoated CERMET

TN610/TN620

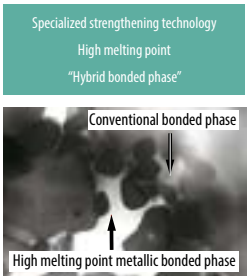
MEGACOAT NANO CERMET

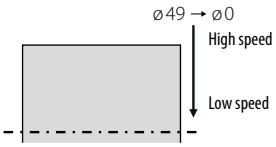
PV710/PV720/PV730

Special reinforcement technology (hybrid technology) Superior surface finish and machining stability.

1 Excellent surface finish

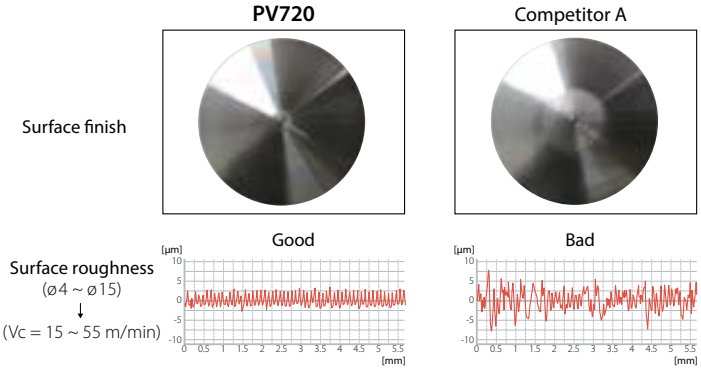
- **Combining the conventional cermet bonded phase (nickel, cobalt) and the special high melting point metallic bonded phase**
- **Provides high adhesion resistance to eliminate galling of the workpiece**





Surface finish comparison (In-house evaluation)

Cutting conditions: Vc = 180 ~ 0 m/min (Constant rotational speed), ap = 0.5 mm, f = 0.1 mm/rev, wet, CNMG120404 type, workpiece: C10



CVD coated cermet for finishing

CCX

Excellent high speed finishing leads to greater productivity. Applicable to a wide range of cutting conditions from general to high speed machining. Maintains long tool life in soft steel, general steel and cast iron machining

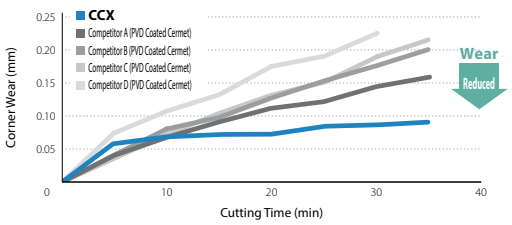
1 Superior wear resistance to PVD coated cermets

2 Unique cermet base material with thick CVD coating

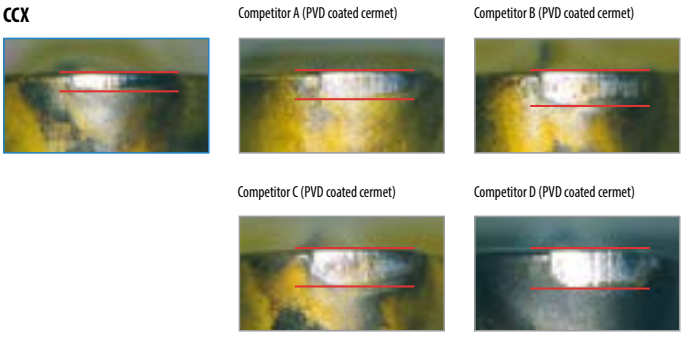
Alloy Steel - 34CrMo4 **High speed comparison: Vc = 400 m/min**

CCX provided better tool life than competitor's PVD cermets by greatly reducing the amount of wear

Wear resistance comparison (Internal evaluation)



Cutting edge (After machining 35 min)



* Picture shows 30 min after machining due to a large amount of wear

Cutting conditions: Vc = 400 m/min, ap = 0.3 mm, f = 0.12 mm/rev, Wet, CNMG120408 type, external turning

CVD coated carbide (Turning)

CVD coated carbide

Using chemical vapor deposition coating technology, CVD coated carbide grades provide stable, efficient machining at high speeds or for heavy interrupted applications.



Features

- Applicable from low to high speed machining and from finishing to roughing
- Stable machining is achieved due to the superior toughness and crack resistance
- Cutting times are reduced due to good chip control from effective chipbreakers

Features of CVD coated carbide

Classification	Grade	Color	Coated composition	Advantages and applications
P Steel	CA115P	Black and gold	TiCN+Al_2O_3+TiN	• Thick CVD coating with superior wear and fracture resistance using special carbide substrate with high hardness and thermal deformation and crystal forming technology. • Application: Continuous to light interrupted machining of steel
	CA125P		TiCN+Al_2O_3+TiN	• Thick CVD coating with superior wear and fracture resistance using special carbide substrate with high hardness and thermal deformation and crystal forming technology. • Application: First choice for general machining of steel
	CA510	Gold	TiCN+Al_2O_3+TiN	• Special substrate with thermal deformation resistance along with a thick and tough coating layer providing high wear resistance • Application: High speed and high efficiency steel machining
	CA515		TiCN+Al_2O_3+TiN	• Improved wear resistance and stability due to special substrate with heat deformation resistance and hard and tough coating layer with reinforced interface • Application: Light interrupted machining of steel
	CA025P		TiCN+Al_2O_3+TiN	• CVD coating with improved wear resistance. Adopted base material, excellent chipping resistance, resistance to wear and resistance to improve chip performance • Application: Continuous to interrupted machining of steel
	CA525		TiCN+Al_2O_3+TiN	• Stable and long tool life machining due to special substrate with heat deformation resistance and tougher coating layer and reinforced interface • Application: Interrupted to general machining of steel
	CA530		TiCN+Al_2O_3+TiN	• Special tough substrate and tough coating layer providing high stability and wear resistance • Application: General to heavy interrupted machining (stability oriented)
	CR9025		TiCN+TiN	• Improved toughness and stability due to specialized carbide substrate with plastic deformation resistance • Application: Cut-off, grooving and multi-function machining of steel
M Stainless steel	CA6515		TiCN+Al_2O_3+TiN	• Specialized carbide substrate for machining stainless steel, excellent wear resistance • Application: Continuous machining of stainless steel
	CA6525		TiCN+Al_2O_3+TiN	• Specialized carbide substrate for machining stainless steel, excellent notching resistance and toughness • Application: First choice for general machining of stainless steel, from finishing to roughing, continuous to interruption
K Cast iron	CA310	Rose Gold	TiCN+Al_2O_3+Ti base	• Grade for high-speed continuous machining and improved tool life through the deposition of a thickened Al_2O_3 coating layer • Application : For finishing to roughing of gray cast iron
	CA315		TiCN+Al_2O_3+Ti base	• Both high abrasion resistance and stability are compatible, high efficiency and long life performance are demonstrated. Can be adapted to both continuous machining and interrupted machining. • Application: Compatible with a wide machining area for cast iron and gray cast iron. First recommendation for cast iron
	CA320		TiCN+Al_2O_3+Ti base	• Improved stability with CVD layer structure with high adhesion • Application : Heavily interrupted or High-speed machining for Nodular Cast Iron. The 1st Recommendation for the FCD500 or higher application
	CA4505	Blackish gray	TiCN+Al_2O_3	• Stable, longer tool life due to improved bonding strength of coating layers and special treatment of the surface of the top coating layer • Application: For gray cast iron and nodular cast iron at high speed in continuous to light interrupted machining
	CA4515		TiCN+Al_2O_3	• Stable, longer tool life due to improved bonding strength of coating layers and special treatment of the surface of the top coating layer • Application: First choice for gray cast iron and nodular cast iron in light to heavy interrupted machining

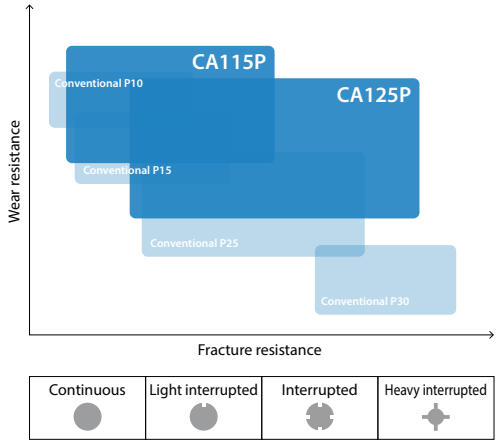
New CVD coated carbide grade for steel

CA115P/CA125P

The new standard for steel machining. Longer tool life in a wide range of machining environments.

1 Extended tool life in a wide variety of applications

Application map



CA115P

Continuous-light interrupted machining of steel
For high-efficient machining
with wear and chipping resistance

CA125P

Continuous-heavy interrupted steel machining
First recommendation for steel machining
High versatility

2 Newly developed proprietary coating and carbide substrate with superior wear and fracture resistance.

Optimized coating properties on rake and flank faces provides wear resistance and fracture resistance
The industry's most uniform alumina film* reduces crater wear
*March 2023, by Kyocera research

Flank face Improved wear resistance

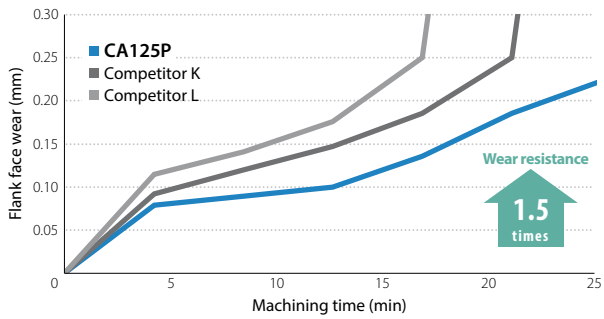
- High hardness surface layer suppresses abrasion
- Uniform alumina layer reduces wear
- Easy to see edge defects with golden surface

Rake face Suppresses crater wear and fracturing

- New surface treatment technology improves fracture resistance
- Highly uniform alumina layer reduces wear

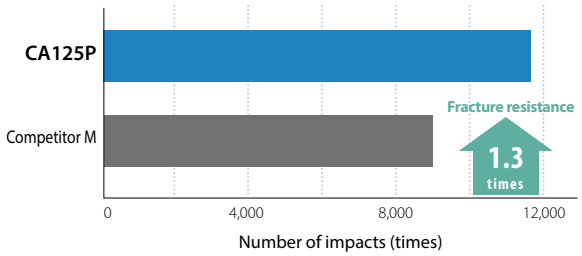


Wear resistance comparison (Internal evaluation)



Cutting Conditions : Vc = 300 m/min, ap = 1.5 mm, f = 0.3 mm/rev, Wet
Workpiece material : 34CrMo4

Fracture resistance comparison (Internal evaluation) Interrupted machining n = 3 mean



Cutting Conditions : Vc = 300 m/min, ap = 1.5 mm, f = 0.35 mm/rev, Wet
Workpiece material : C45 (4 grooves)

PVD coated carbide (Turning)

PVD coated carbide (MEGACOAT / MEGACOAT NANO)

Using a physical vapor deposition coating technology, generally because of the low processing temperature of PVD compared with CVD, PVD coated carbide features less deterioration and more bending strength. PVD coated carbide grades are coated on a very tough carbide substrate and suitable for turning.



PVD coated super micro-grain carbide

- Smooth fine surface of PVD coated carbide provides good surface finish and high precision machining
- Stable machining with excellent toughness

Features of PVD coated carbide

Classification	Grade	Color	Coated composition	Advantages and applications
P Steel	PR915 Super micro-grain	Bluish violet	TiAlN	• Application: Stable and reliable high precision machining of steel
	PR930 Super micro-grain	Reddish gray	TiCN	• Application: Low machining speed, precise machining with sharp edge
	PR1025			• Application: General machining of steel and stainless steel, stable and longer tool life
	PR1115	Purple red	TiAlN	• Superior oxidation resistance with well balanced wear resistance and toughness • Application: Machining of steel and stainless steel, for grooving, cut-off and threading
	PR1215	Blackish red	MEGACOAT	• Superior wear and oxidation-resistant MEGACOAT on micro-grain carbide substrate • Application: Superior adhesion resistance and longer tool life for steel and stainless steel machining
	PR1625	Reddish green	MEGACOAT NANO	• Adopted special nano multi-layer coating "MEGACOAT NANO" excellent in wear resistance and lubricity • Stable processing with steel and stainless steel grooving - Long tool life
	PR1705	Silver	MEGACOAT NANO PLUS	• High-hardness ultrafine particle carbide substrates with special multilayer nano coating MEGACOAT NANO PLUS offer excellent wear resistance and high precision machining. • Application: For free-cutting steel turning. Long tool life with excellent wear resistance and high-precision machining.
	PR1725			• New coating technology "MEGACOAT NANO PLUS" with superior wear resistance and adhesion resistance • Application : General grade for steel and stainless steel machining provides stablity and longer tool life
	PR2025	Dark blackish red	MEGACOAT NANO EX	• Nano layer coating "MEGACOAT NANO EX" with superior wear- and fracture resistance • Application: 1st recommendation for grooving and cut-off of steel. Excellent balance between wear and fracture resistance.
M Stainless steel	PR1225	Blackish red	MEGACOAT	• Superior wear and oxidation-resistant MEGACOAT on micro-grain carbide substrate • Application: Light interrupted to interrupted machining of stainless steel
	PR1515	Reddish green	MEGACOAT NANO	• Improved wear resistance and stability by using fine granite carbide base metal and special nano multi-layer coating "MEGACOAT NANO" • Application: For thread cutting of stainless steel
	PR1535			• Nano thin multi-layer coating "MEGACOAT NANO" improved wear resistance and stability • Application: Medium to roughing of stainless steel and heat-resistant alloys, cut-off of stainless steel
	PR2035	Dark blackish red	MEGACOAT NANO EX	• Nano layer coating "MEGACOAT NANO EX" with superior wear- and fracture resistance • Application: 1st recommendation for grooving and cut-off of stainless steel. Excellent fracture resistance.
K Cast iron	PR905	Bluish violet	TiAlN	• Smooth fine surface PVD coated hard carbide with plastic deformation resistance • Application: Suitable for machining gray and nodular cast iron
	PR2015	Dark blackish red	MEGACOAT NANO EX	• Nano layer coating "MEGACOAT NANO EX" with superior wear- and fracture resistance • Application: 1st recommendation for grooving and cut-off of cast iron. Excellent wear resistance and applicable for high speed machining.
S Heat-resistant alloys	PR005S	Grey black	MEGACOAT HARD	• Superior high temperature properties of special carbide substrate and excellent heat-resistance of MEGACOAT HARD enables high wear resistance • Application: Finish processing of heat-resistant alloys, also for high speed machining
	PR115S	Dark grey black	MEGACOAT TOUGH	• Special carbide substrate with excellent heat resistance and "MEGACOAT TOUGH" with excellent adhesion enables high wear resistance. • Application: Continuous finishing of heat-resistant alloys
	PR120S			• Special carbide substrate with excellent heat resistance and stability and "MEGACOAT TOUGH" with excellent adhesion for improved wear resistance and stability. • Application: Continuous finishing of stainless steel, continuous to light-interrupted machining of heat-resistant alloy

PVD coated carbide for small parts machining

PR1725

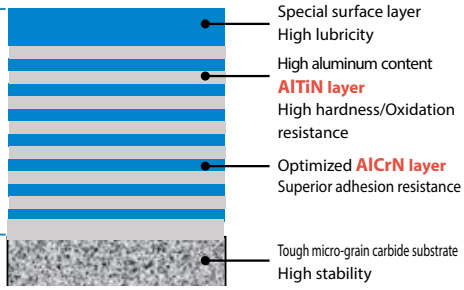
1st recommendation for steel machining
Excellent surface finish and long tool life
Great performance in small parts machining applications



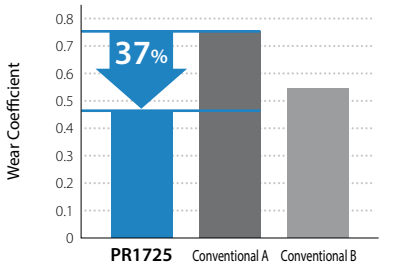
MEGACOAT NANO PLUS

AlTiN/AlCrN Nano laminated film with superior wear resistance and adhesion resistance. Excellent surface finish and long tool life

Reduces cracking
Reduces abnormal damages such as chipping because of increased lamination layer with a thinner gap than conventional coatings



Wear coefficient comparison (Internal evaluation)



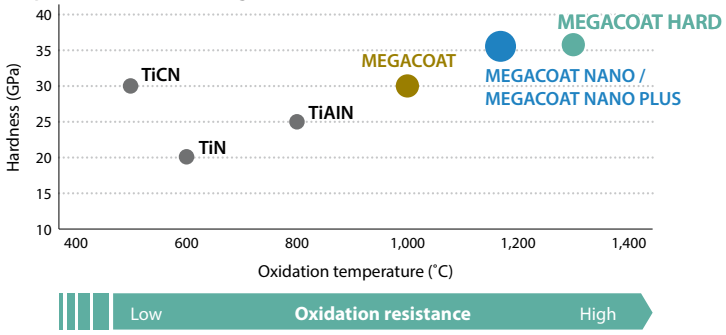
Superior wear and chipping resistance
High hardness with nano laminated film layer properties
Internal stress optimization reduces chipping

Excellent surface finish
Special surface layer with great lubricity reduces adhesion

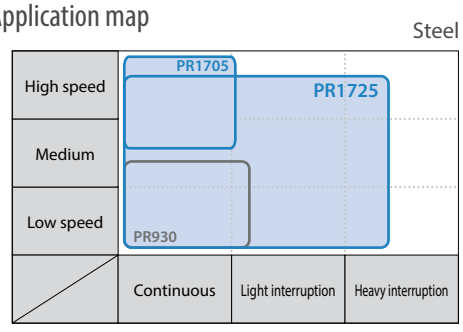
Applicable to various workpiece materials
Excellent oxidation resistance. Superior high temperature properties maintains good performance in steel, stainless steel and free-cutting steel

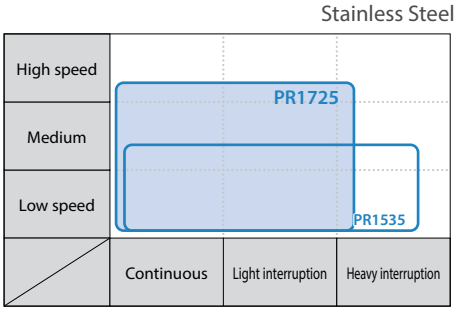
High machining stability
Tough micro-grain carbide substrate provides stable machining

Properties of PVD coating



Application map





PVD / CVD coated carbide (Milling / Drilling)

PVD coated carbide (MEGACOAT / MEGACOAT NANO)

PVD coated carbide grades for milling and drilling are coated on a very tough carbide substrate. Because of the low processing temperature of PVD compared with CVD, it features less deterioration and more bending strength.





CVD coated carbide

CVD coated carbide grades provide stable, efficient machining at high speeds or for heavy interrupted applications. Ti-base (TiN, TiCN) coating with superior hardness and wear resistance or ceramic-base (Al_2O_3) coating with high-thermal stability is applied on a tough carbide substrate. Superior fracture resistance and wear resistance.

Features of PVD / CVD coated carbide

Classification	Grade	Color	Coated composition	Advantages and applications
P Steel	PR1230	Blackish red	MEGACOAT	• Superior wear and oxidation-resistant MEGACOAT on a special tough carbide substrate • Application: Stable and high feed milling and drilling of steel
	PR1525	Reddish green	MEGACOAT NANO	• New coating technology (MEGACOAT NANO) is applied. Nano thin multi-layer coating performs superior wear resistance and high oxidation resistance • Application: Stable and longer tool life for milling of steel and stainless steel
	PR1825	Light reddish green	MEGACOAT NANO EX	• "MEGACOAT NANO EX" with excellent wear, oxidation and chipping resistance • Application: Stable machining of steel and stainless steel with extended tool life
	CA520D	Gold	TiCN+Al_2O_3+TiN (CVD)	• Improved abrasion resistance and fracture resistance by improving high toughness • Combination of high toughness substrate, toughened coating and enhanced interface allow both wear and fracture resistance • Application: Drilling of steel - first recommended grade (for high speed machining)
M Stainless steel	PR1225	Blackish red	MEGACOAT	• Superior wear and oxidation-resistant MEGACOAT on micro-grain carbide substrate • Application: General machining and high feed milling and drilling of steel and stainless steel
	PR1835	Light reddish green	MEGACOAT NANO EX	• "MEGACOAT NANO EX" with excellent wear, oxidation and chipping resistance • Application: Milling of steel and stainless steel achieves stable long tool life of heavy interrupted and high-load machining
K Cast iron	PR1210	Blackish red	MEGACOAT	• Superior wear and oxidation-resistant MEGACOAT coated on special carbide substrate • Application: Highly efficient stable milling and drilling of gray and nodular cast iron
	PR1510	Reddish green	MEGACOAT NANO	• New coating technology (MEGACOAT NANO) is applied. Nano thin multi-layer coating performs superior wear resistance and high oxidation resistance • Application: Highly fracture resistance and wear resistance for gray and nodular cast iron
	PR1810	Light reddish green	MEGACOAT NANO EX	• "MEGACOAT NANO EX" with excellent wear, oxidation and chipping resistance • Application: High efficiency stable milling of gray and nodular cast iron
	CA415D	Gold	TiCN+Al_2O_3+TiN	• Special carbide substrate for cast iron, toughened coating and enhanced interface allow both wear and fracture resistance • Application: Drilling of cast iron - 1st recommended material for high speed processing
	CA420M		TiCN+Al_2O_3+TiN (CVD)	• Kyocera's unique crystal control technology and advanced layer adhesion CVD coating with superior wear resistance and toughness • Application: Milling of gray and nodular cast iron
S Heat-resistant alloys Titanium alloys	PR1535	Reddish green	MEGACOAT NANO	• Nano thin multi-layer coating (MEGACOAT NANO) improved wear resistance and stability • Application: For milling of Ni-base heat-resistant alloys, titanium alloys and precipitation hardened stainless steel
S Heat-resistant alloys	CA6535	Gold	TiCN+Al_2O_3+TiN (CVD)	• High heat-resistance and wear resistance with CVD coating • Application: For milling of Ni-base heat-resistant alloys and martensitic stainless steel
H Hard material	PR015S	Blackish Gray	MEGACOAT HARD	•Substrate with improved thermal properties reduces sudden fracture and decrease edge wear. MEGACOAT HARD coating technology delivers the high hardness and superior wear resistance •Excellent wear and chipping resistance maintains stable machining for high hard materials •Application : Difficult-to-cut materials and high hard (less than 60HRC) machining

Next-generation PVD coating for milling

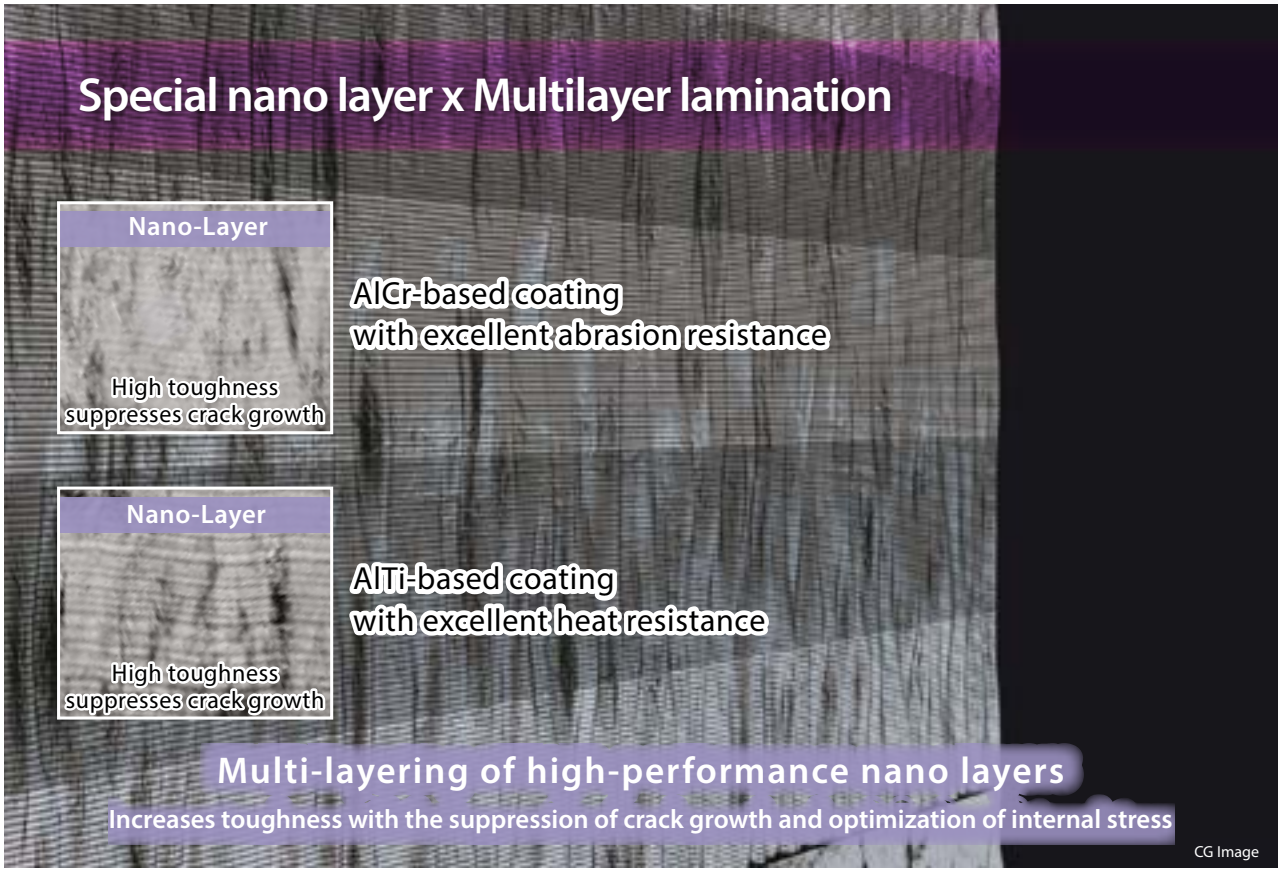
PR18 Series

Double lamination technology with special nano layer
MEGACOAT NANO EX provides longer tool life
Features 3 grades: PR1825/PR1835/PR1810. Available for various machining environments

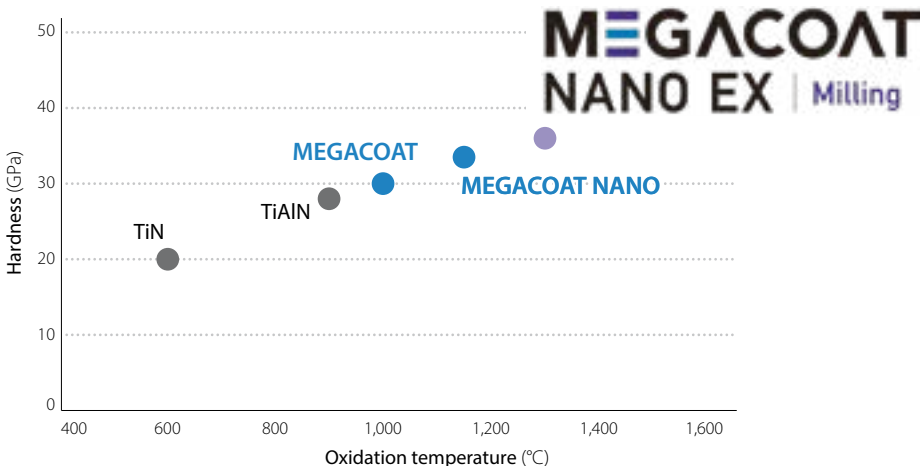
MEGACOAT NANO EX | Milling

Double lamination technology maintains longer tool life

Multi-layer structure with two unique nano layers
Superior abrasion resistance and fracture resistance



Coating characteristics (Internal evaluation)



Carbide

Carbide

Uncoated tungsten carbide grade is used in a variety of applications due to its superior mechanical properties.



Features

- KW10: Suitable for machining cast iron with high hardness and toughness
- GW05, GW15, GW25: Suitable for machining cast iron, non-ferrous metals and non-metals
- SW series: Suitable for machining of titanium and titanium alloy

Features of carbide

Classification	Grade	Color	Main component	Advantages and applications
N Non-ferrous metals	KW10	Gray	WC+Co	• ISO identification symbol K carbide (K10 relevant) • Application: Machining cast iron, non-ferrous materials and non-metals
	GW05			• ISO identification symbol K carbide (K05 relevant) • Application : Excellent wear resistance for machining of cast iron and non-ferrous metal
	GW15			• ISO identification symbol K carbide (K10 relevant), tough micro-grain carbide • Application: Machining cast iron, non-ferrous materials and non-metals
	GW25			• ISO identification symbol K carbide (K30 relevant) • Application: Milling operations of aluminum
S Heat-resistant alloys Titanium alloys	SW05			• ISO identification symbol K carbide (K05 relevant) • Application: Titanium alloys for continuous machining and finishing
	SW10 (Made to order)			• ISO identification symbol K carbide (K10 relevant) • Application: Titanium alloys for continuous and light interrupted machining
	SW25 (Made to order)			• ISO identification symbol K carbide (K25 relevant) • Application: Titanium alloys for interrupted and light interrupted machining

DLC coated carbide

DLC coated carbide

DLC (Diamond-Like Carbon) Coated carbide is coated on carbide substrate with a thin layer of amorphous carbon.



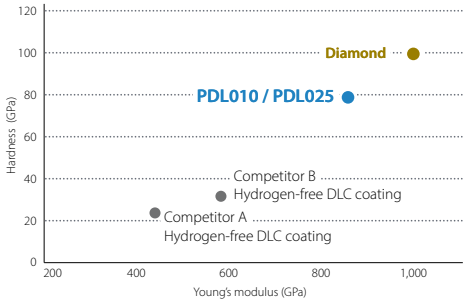
Features

- High Hardness with Kyocera's proprietary hydrogen-free DLC coating
- Exellent surface finish achieved through anti-adhesion performance

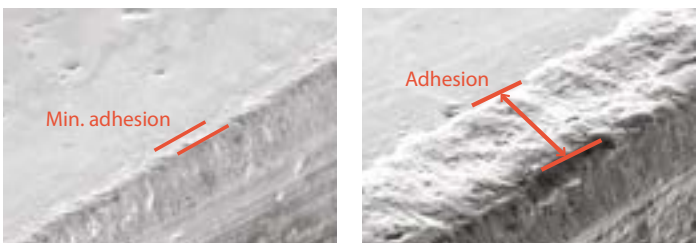
Features of DLC coated carbide

Classification	Grade	Color	Coated composition	Advantages and applications
N Non-ferrous metals	PDL010	Rainbow color	C	• DLC coating of original technology has high hardness, excellent adhesion resistance and film peeling resistance • Application: Excellent finished surface processing and long service life of aluminum alloy
	PDL015			• High Hardness with Kyocera's Proprietary Hydrogen-free DLC Coating • Application: Grooving of aluminum alloys
	PDL025			• High Hardness with Kyocera's Proprietary Hydrogen-free DLC Coating • Application: Long tool life and stable machining of aluminum alloys

Coating properties



Adhesion resistance comparison



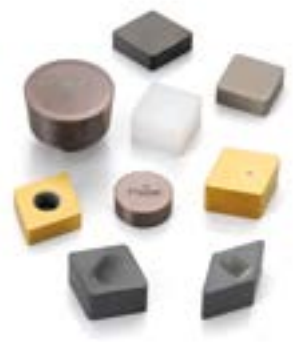
PDL025 Competitor A

Cutting conditions: Vc = 800 m/min, fz = 0.1 mm/t, ap × ae = 3×5 mm
Dry, cutter dia. ø 25 mm, workpiece material: A5052 cutting length: 57 m
(Internal evaluation)

Ceramic

Ceramic

Ceramics inserts are capable of machining at high speeds. Recommended for hard turning of hardened steel or rough to finish turning of cast iron and heat-resistant alloys.



Features

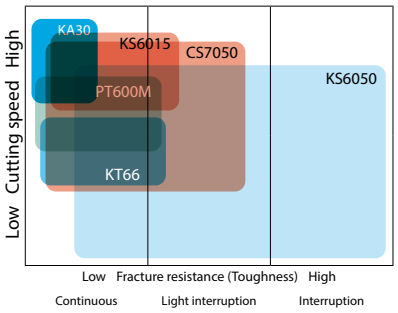
- Excellent wear resistance enables high speeds machining of cast iron
- Ceramic maintains good surface finishes due to the low affinity to workpiece materials
- Silicon nitride ceramic can machine cast iron with coolant due to its superior thermal shock resistance

Features of ceramic

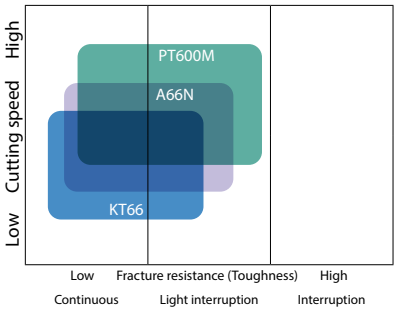
Classification	Grade	Color	Main component (Coated composition)	Coating layer	Hardness of substrate (GPa)	Fracture toughness ($MPa \cdot m^{1/2}$)	Transverse strength (MPa)	Advantages and applications
K Cast iron	KA30	White	Al_2O_3	-	17.5	4.0	750	• Aluminum oxide ceramic (Al_2O_3) • Application: Finishing of cast iron at high cutting speeds without coolant
	KS6015	Gray	Si_3N_4		15.2	7.8	1,000	• Silicon nitride ceramic with superior wear resistance reduces heat at the cutting edge. • Application : Roughing and high speed machining of cast iron (with or without coolant)
	KS6050	Gray	Si_3N_4		15.6	8.0	1,200	• Silicon nitride ceramic (Si_3N_4) • Application: Roughing and interrupted machining of cast iron. Focusing on stability. (with or without coolant)
	CS7050	Grayish white	Si_3N_4 (Special Al_2O_3 COAT)	Thin coating				• Silicon nitride ceramic (Si_3N_4) + CVD Coating (Special Al_2O_3 COAT) • Application: Finishing and continuous machining, and high speed and high efficient machining. (with or without coolant)
K Cast iron H Hard material	KT66	Black	Al_2O_3+TiC	-	20.1	4.1	980	• Aluminum oxide and titanium carbide ceramic (Al_2O_3+TiC) • Application: Semi-roughing to finishing of cast iron, and hard materials
	A66N	Gold	Al_2O_3+TiC (TiN COAT)	Thin coating				• TiN PVD coated aluminum oxide and titanium carbide ceramic (TiN coated Al_2O_3+TiN) • Application: Semi-roughing to finishing of hard materials
	PT600M	Blackish red	Al_2O_3+TiC (MEGACOAT)					• Heat-resistant MEGACOAT on aluminum oxide and titanium carbide ceramic (MEGACOAT Al_2O_3+TiC) • Application: Semi-roughing to finishing of cast iron, hard materials and hardened roll materials
S Heat-resistant alloys	KS6030	Gray	SiAlON	-	15.2	6.0	600	• SiAlON Ceramic with superior wear resistance and high resistance against boundary wear • Application: Finishing to medium machining of heat-resistant alloys
	KS6040	Brown			16.7	7.0	900	• High stability SiAlON ceramic with wear resistance and fracture resistance • Application: Roughing of heat-resistant alloys

Application map

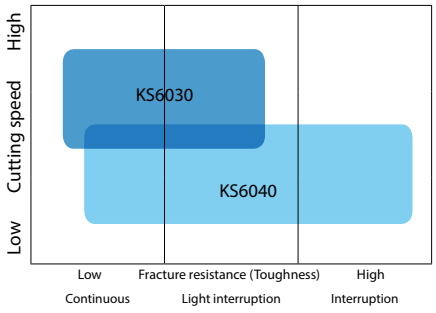
Cast iron



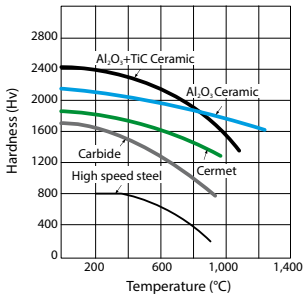
Hard materials



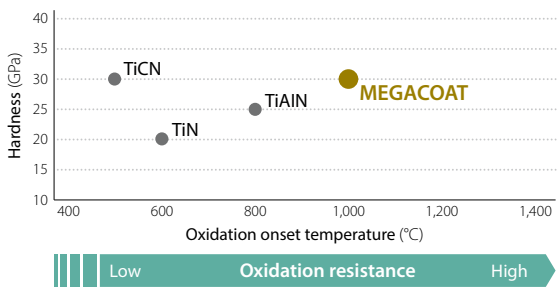
Heat-resistant alloys



High-Temperature hardness



Properties of PVD coating



CBN (Cubic boron nitride)

CBN

CBN (Cubic Boron Nitride) is second only to diamond in hardness, and is a synthetically produced material with high thermal conductivity.



Features

- Superior wear resistance when machining hard materials
- Suitable for high speed machining of hard materials, sintered steel and cast iron
- High thermal conductivity provides stable machining

Features of CBN

Classification	Grade	Color	Ave. grain size (μm)	Hardness of substrate (GPa)	Transverse strength (MPa)	Advantages and Applications
H Hard materials	KBN510	Black	2	28	1,000	• Excellent wear resistance and crack resistance, non-coated CBN • Application: Finishing and continuous machining of hardened die steel
	KBN525		1 and under	25	1,250	• Application: General purpose for hardened steel
	KBN05M (MEGACOAT)	Blackish red	0.5-1.5	27	1,000	• Heat-resistant MEGACOAT on highly heat-resistant CBN substrate • Application: High speed finishing of hardened steel
	KBN10M (MEGACOAT)		2	28		• Application: High speed finishing of hardened die steel
	KBN25M (MEGACOAT)		1 and under	25	1,250	• Heat-resistant MEGACOAT on micro-grain CBN with heat-resistant binder phase • Application: Stable machining of hardened steel at high cutting speeds
	KBN010 (MEGACOAT TOUGH)		0.5-1.5	27	1,000	• Chipping resistant "MEGACOAT TOUGH" on heat resistant CBN substrate • Application: High speed finishing of hardened steel
	KBN020 (MEGACOAT TOUGH)		3	31-32	1,300	• High toughness CBN coated with high wear resistance enables machining in a wide range of cutting areas • Application: Continuous to interrupted maching of hardened steel
Sintered steel	KBN570	Black	2-4	34	1,350	• High content CBN • Application: Processing of sintered steel (burr suppression)
	KBN70M (MEGACOAT)	Blackish red				• Heat-resistant MEGACOAT on CBN rich substrate • Application: Stable machining of sintered steel (ferrous sintered alloys)
K Cast iron	KBN475	Black	2	39	1,400	• Excellent wear resistance due to high CBN content and special binder • Application: High speed machining of gray cast iron
	KBN60M (MEGACOAT)	Blackish red	0.5-6	33	1,250	• Heat-resistant MEGACOAT on CBN rich substrate with hard binder phase • Application: High speed finishing of gray cast iron
	KBN900 (TiN COAT)	Gold	9	31	630	• TiN coated solid CBN • Application: Heavy duty, interrupted machining and finishing of hardened steel, hardened roll steel and cast iron

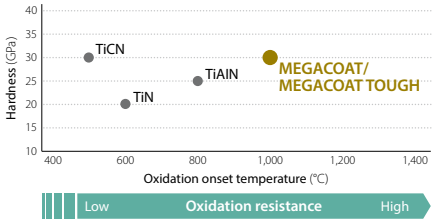
For KBN35M, see page A18.

Advantages of MEGACOAT TOUGH

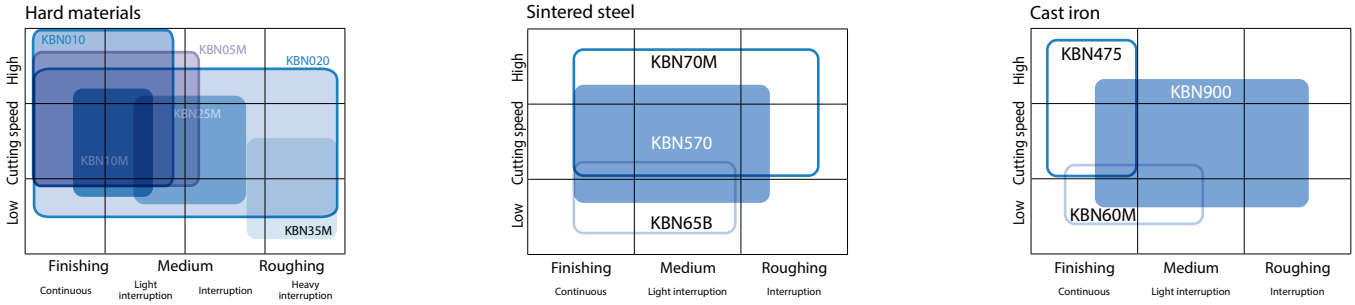
An adhesion layer is laminated between the high wear resistance layer and the CBN. Reduces layer peeling to achieve long tool life and stable machining.

MEGACOAT TOUGH CBN

Properties of PVD coating



Application map



PCD (Polycrystalline diamond)

PCD

PCD is a synthetic diamond sintered under high temperatures and pressures.



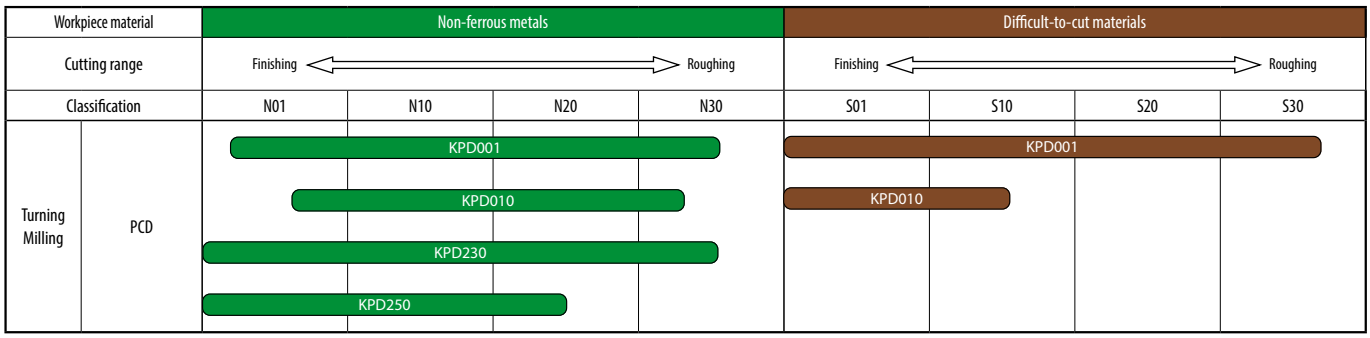
Features

- Applicable for milling of non-ferrous metals and non-metals
- No edge build-up provides high precision machining
- Diversified applications for machining of non-ferrous metals and non-metals
- Finished surface will be rainbow colored (A mirror-like finished surface will not be obtained)

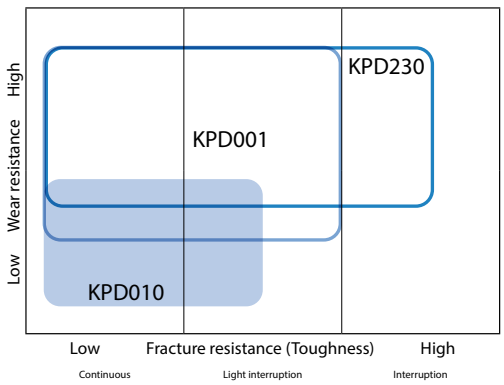
Features of PCD

Classification	Grade	Ave. grain size (µm)	Advantages and applications
N Non-ferrous metals	KPD001	0.5	• Super Micro-Grain PCD features cutting edge strength, wear resistance, fracture resistance, good edge-sharpening performance and longer, stable tool life • Application: High speed machining of aluminum alloys, brass, non-ferrous metals and non-metals including plastics, and carbide.
	KPD010	10	• Good wear resistance and toughness, good grindability • Application: High speed machining of aluminum alloys, brass, non-ferrous metals and non-metals including plastics, and carbide.
	KPD230	2-30	• Superior abrasive wear resistance and toughness due to high density PCD with mixed rough and fine grains • Application: High speed machining of aluminum alloys, brass, non-ferrous metals and non-metals including plastics.
	KPD250 (Made to order)	25	• Superior wear resistance due to rough grain PCD (25µm) • Application: High speed machining of high silicon aluminum alloy and machining of carbide

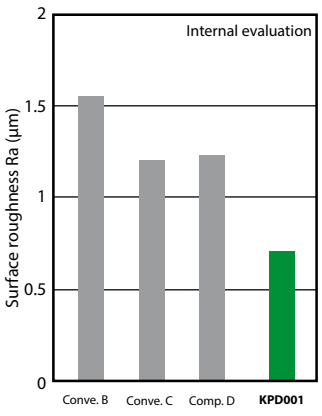
Applications



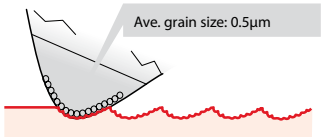
Application map



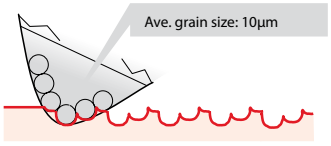
Surface finish roughness comparison of aluminum machining



Excellent surface finish provided by super micro-grain KPD001



Surface finish of conventional PCD

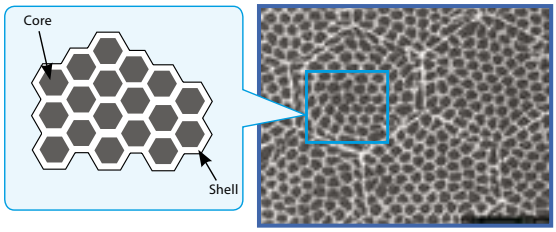


(Grain size affects surface finish quality)

Honeycomb structure CBN

Honeycomb structure CBN

Honeycomb structure is the high structural controlled composite material consisting of a hard and superior wear-resistance core (gray portion) and a tough shell (white portion).



Features

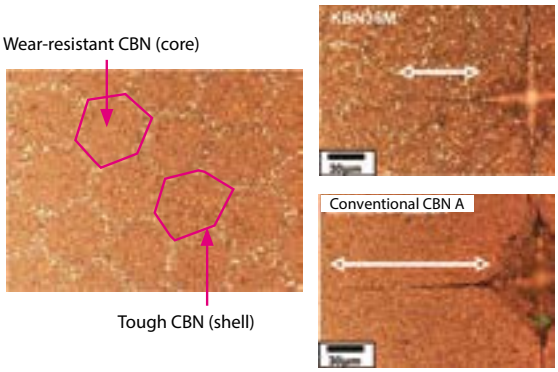
- Honeycomb structure CBN combine a hard, wear-resistant core and a tough shell into one insert.
- The tough shell stops cracks that form in the core.
- CBN is suitable for interrupted machining of exceptionally hard material

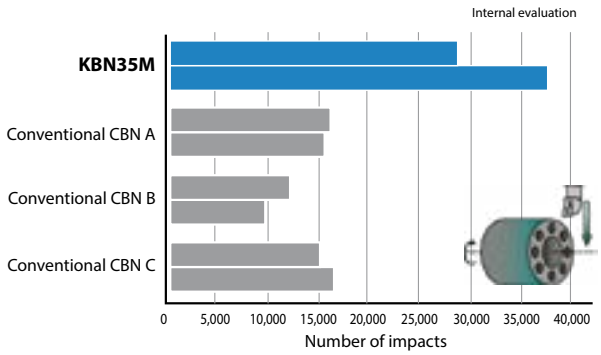
Features of honeycomb structure CBN

Classification	Grade	Color	Main component	Advantages and applications
H Hard materials	KBN35M (MEGACOAT)	Blackish red	CBN	• Honeycomb structure CBN composite material consisting of wear resistant CBN (core) and tough CBN (shell) • Heat-resistant MEGACOAT on tough Honeycomb structure CBN • Application: Stable machining of hardened steel at interrupted machining

KBN35M (MEGACOAT honeycomb structure CBN)

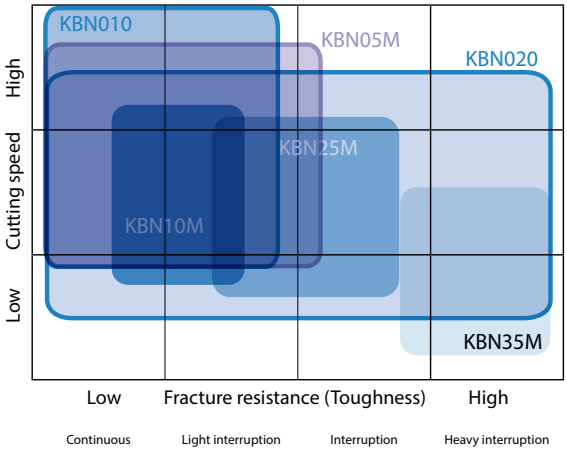
Tough CBN (shell) prevents crack growth





Application map

Hard materials



Insert material selection table

Applications		Cutting range	Steel	Stainless steel	Gray cast iron	Nodular cast iron	Non-ferrous metals	Heat-resistant alloys	Titanium alloys	Hard materials	Sintered steel
Turning		Finishing ↕ Roughing	TN610 CCX TN620 TN60 PV710 PV720 PV730 CA510 CA115P CA125P CA530	TN610 TN620 TN60 PV720 CA6515 CA6525 PR1535	KBN475 KBN60M KA30 PV7005 CA5505 CA310 CA315	TN60 PV7005 CA5505 CA310 CA315 CA320	KPD001 KPD010 PDL010 PDL025 KW10	KS6040 KW10 CA6515 CA6525 PR005S PR115S PR120S PR1535	KPD001 KPD010 SW05 SW10 SW25	KT66 A66N PT600M KBN010 KBN05M KBN020 KBN25M KBN35M KBN900	TN610 TN60 KBN570 KBN70M
Small tools		Finishing ↕ Roughing	TN610 TN620 PV710 PV720 PR1705 PR1725 PR930 PR1025 PR1535	TN610 TN620 PV720 PR1725 PR930 PR1025 PR1225 PR1535	CA310 CA315 KW10	CA310 CA315 CA320 KW10	KPD001 KPD010 PDL010 PDL025 GW05 KW10	CA6515 PR1125 PR1225 PR1535	KPD001 KPD010 KW10 PR1535	KBN010 KBN05M KBN020 KBN25M	TN610 TN60 KBN570 KBN70M
Boring		Large ↕ Small (Bore dia.)	TN610 TN620 PV710 PV720 PV730 CA115P CA125P CA530 PR1705 PR1725 PR1025 PR930 PR1535	TN60 CA6515 CA6525 PR1725 PR1025 PR1225 PR930 PR1535	KBN475 KBN60M PV7005 CA310 CA315 KW10	PV7005 CA310 CA315 CA320 KW10	KPD001 KPD010 PDL010 PDL025 GW05 KW10	CA6515 CA6525 PR1125 PR1225 PR1535	KPD001 KPD010 KW10 SW05 PR1535	PT600M KBN010 KBN05M KBN020 KBN25M	TN610 TN60 KBN570 KBN70M
Cut-Off		Large ↕ Small (Cutting dia.)	CR9025 PR930 PR915 PR1215 PR1225 PR1535	CR9025 PR930 PR915 PR1215 PR1225 PR1535	KW10 PR1215	KW10 PR1215	PDL025 KW10	KW10 PR1225 PR660	KW10	-	-
Cut-Off		Depends on the workpiece material	PR1025 PR2025 PR1535	PR1025 PR1535 PR2035	KW10 PR2015	KW10 PR2015	PDL025 KW10	KW10 PR1025 PR1225	KW10	-	-
Grooving		Glossy finish ↕ Stable	TC40N TN620 TN90 PV7040 PR930 PR1115 PR2015 PR1225 PR2025	TC40N TN620 TN90 PV7040 PR930 PR1115 PR2015 PR1225 PR2025	KW10 GW15 PR905 PR2015 PR1215	KW10 GW15 PR905 PR2015 PR1215	KPD001 PDL025 KW10 GW15	PR915 KW10 PR1215 PR1225 PR1535	KPD001 KW10 PR1535	KBN510 KBN525 PT600M	TC40N KBN570
Threading		Glossy finish ↕ Stable	TC60M PR1215 PR1115 PR930	TC60M PR1515 PR1115 PR930	KW10 GW15	KW10 GW15	KW10 GW15	KW10 GW15	KW10 GW15	-	PR1515 PR1115
Drilling		Wear resistance ↕ Toughness	CA520D PR1225 PR1230 PR1535	PR1225 PR1535	CA415D PR1210 KW10	PR1210 KW10	KW10 GW15	PR1225 KW10 GW15	KW10	-	-
Milling		Finishing ↕ Roughing	TN100M TN620M PV60M PR1825 PR1835	CA6535 PR1525 PR1835 PR1535	PR1510 PR1810 KW10	PR1510 PR1810 KW10	KPD230 KPD001 KPD010 PDL025 KW10 GW25	CA6535 PR1225 PR1535	KPD230 KPD001 KW10 PR905 PR1535	PR015S	-

Highlighted materials are recommended choice.

Grade properties

Cermet

Grade	Color	Main component	Coating layer	Ratio	Hardness of substrate		Fracture toughness ($MPa•m^{1/2}$)	Transverse strength (MPa)
					(HV)	(GPa)		
TN610	Gray	TiCN	-	6.6	1,750	17.2	6.0	2,100
TN620				6.9	1,550	15.2	9.0	2,500
TN620M				6.9	1,550	15.2	9.0	2,500
TN6020				6.4	1,500	14.7	10.0	2,500
TN60		TiCN+NbC		6.6	1,600	15.7	9.0	1,760
TN90				6.4	1,450	14.2	10.0	1,960
TN100M				6.7	1,520	14.9	10.5	1,860
TC40		TiC+TiN		6.0	1,650	16.2	9.0	1,570
TC60		NbC		8.1	1,500	14.7	10.5	1,670

CVD coated cermet

Grade	Color	Coated composition	Coating layer	Ratio	Hardness of substrate		Fracture toughness ($MPa•m^{1/2}$)	Transverse strength (MPa)
					(HV)	(GPa)		
CCX	Gold	TiCN+Al_2O_3+TiN	Thin coating	7.0	1,500	14.7	10.0	2,600

PVD coated cermet

Grade	Color	Coated composition	Coating layer	Ratio	Hardness of substrate		Fracture toughness ($MPa•m^{1/2}$)	Transverse strength (MPa)
					(HV)	(GPa)		
PV710	Gold	MEGACOAT NANO	Thin coating	6.6	1,750	17.2	6.0	2,100
PV720				6.9	1,550	15.2	9.0	2,500
PV730				7.0	1,550	14.2	10.0	2,500
PV7005	Blackish red	MEGACOAT		6.0	1,650	16.2	8.5	1,470
PV7040				6.0	1,650	16.2	9.0	1,570
PV60M	Gold	MEGACOAT NANO		6.6	1,600	15.7	9.0	1,760

CVD coated carbide

Grade	Color	Coated composition	Coating layer	Ratio	Hardness of substrate		Fracture toughness ($MPa•m^{1/2}$)	Transverse strength (MPa)
					(HV)	(GPa)		
CA025P	Gold	TiCN+Al_2O_3+TiN	Thick coating	14.2	1,400	13.7	13.5	2,800
CA115P	Black and gold	TiCN+Al_2O_3+TiN		13.9	1,440	14.1	13.0	2,250
CA125P				13.8	1,400	13.7	14.5	2,300
CA310	Rose Gold	TiCN+Al_2O_3+Ti base		15.0	1,570	15.4	12.0	2,780
CA315				15.0	1,570	15.4	12.0	2,780
CA320				15.0	1,570	15.4	12.0	2,780
CA415D	Gold	TiCN+Al_2O_3+TiN		15.0	1,570	15.4	12.0	2,780
CA420M				14.5	1,600	15.8	13.0	3,400
CA4505	Blackish gray	TiCN+Al_2O_3		15.0	1,790	17.5	9.5	2,350
CA4515				15.0	1,570	15.4	12.0	2,780
CA510	Gold	TiCN+Al_2O_3+TiN		14.5	1,470	14.4	11.5	2,500
CA515				14.4	1,440	14.1	12.5	2,650
CA520D				14.7	1,370	13.4	16.0	3,100
CA525				14.2	1,360	13.3	13.5	2,750
CA530				13.9	1,340	13.1	14.5	2,850
CA6515			Thin coating	14.7	1,530	15.0	12.0	2,780
CA6525				14.7	1,370	13.4	16.0	3,100
CA6535				14.3	1,320	12.9	16.0	3,700
CR9025		TiCN+TiN	Thick coating	14.5	1,400	13.7	12.0	2,780

Grade properties

PVD coated carbide

Grade	Color	Coated composition	Coating layer	Ratio	Hardness of substrate		Fracture toughness ($MPa•m^{1/2}$)	Transverse strength (MPa)
					(HV)	(GPa)		
PR005S	Gray black	MEGACOAT HARD	Thin coating	15.0	1,750	17.2	8.0	2,000
PR015S				14.9	1,680	16.5	9.0	2,400
PR115S	Dark grey black	MEGACOAT TOUGH		14.9	1,680	16.5	9.0	2,400
PR120S				14.6	1,500	14.7	14.0	2,700
PR905	Bluish violet	TiAlN		14.8	1,720	16.8	9.0	2,450
PR915				14.1	1,700	16.7	11.0	4,140
PR930	Reddish gray	TiCN		14.1	1,700	16.7	11.0	4,140
PR1025				14.5	1,600	15.8	13.0	3,400
PR1115	Purple red	TiAlN		14.7	1,700	16.7	11.0	3,000
PR1210	Blackish red	MEGACOAT		14.8	1,720	16.8	9.0	2,450
PR1215				14.7	1,700	16.7	11.0	3,000
PR1225				14.5	1,600	15.8	13.0	3,400
PR1230				13.7	1,450	14.2	13.0	2,250
PR1510	Reddish green	MEGACOAT NANO		14.8	1,720	16.8	9.0	2,450
PR1515				14,7	1,700	16.7	11.0	3,000
PR1525				14.5	1,600	15.8	13.0	3,400
PR1535				14.3	1,320	12.9	16.0	3,700
PR1625				14,5	1,600	15.8	13.0	3,400
PR1705	Silver	MEGACOAT NANO PLUS		14.9	1,800	17.6	10.0	3,300
PR1725				14.5	1,600	15.8	13.0	3,400
PR1810	Light reddish green	MEGACOAT NANO EX		14.9	1,680	16.5	9.0	2,400
PR1825				14.5	1,600	15.8	13.0	3,400
PR1835				14.3	1,320	12.9	16.0	3,700
PR2015	Dark blackish red			14.7	1,700	16.7	11.0	3,000
PR2025				14.5	1,600	15.8	13.0	3,400
PR2035				14.3	1,320	12.9	16.0	3,700

Carbide

Grade	Color	Main component	Coating layer	Ratio	Hardness of substrate		Fracture toughness ($MPa•m^{1/2}$)	Transverse strength (MPa)
					(HV)	(GPa)		
KW10	Gray	WC+Co	-	15.0	1,650	16.2	10.0	1,470
GW05				14.9	1,800	17.6	10.0	3,300
GW15				14.7	1,700	16.7	11.0	3,000
GW25				14.5	1,600	15.8	13.0	3,400
SW05				15.0	1,790	17.5	9.5	2,350
SW10				14.8	1,720	16.8	9.0	2,450
SW25				14.7	1,370	13.4	16.0	3,100

DLC coated carbide

Grade	Color	Coated composition	Coating layer	Ratio	Hardness of substrate		Fracture toughness ($MPa•m^{1/2}$)	Transverse strength (MPa)
					(HV)	(GPa)		
PDL010	Rainbow color	C	Thin coating	15.0	1,650	16.2	10.0	1,470
PDL015				14.7	1,700	16.7	11.0	3,000
PDL025				14.5	1,600	15.8	13.0	3,400

Turning indexable inserts

B



Introduction		B2
Negative type chipbreaker		B4
Positive type chipbreaker		B12
Page Guide		B15
Cermet / coated carbide / carbide lineup		B16
Negative inserts	80° Rhombic	B16
	55° Rhombic	B24
	Round	B32
	90° Square	B33
	60° Triangle	B38
	35° Rhombic	B46
	80° Trigon	B49
	Small double sided tools	B54
	Small double sided tools	B55
	Small double sided tools	B56
Positive inserts	80° Rhombic	B58
	55° Rhombic	B68
	70° Rhombic	B80
	Round	B81
	90° Square	B82
	60° Triangle	B84
	35° Rhombic	B97
	80° Trigon	B105
	25° Rhombic	B108
Bearing machining	Round / SNMF Type	B109
Inserts for back turning	TKFB	B110
	TKF-GTP	B111
	ABS / ABW	B112
Ceramic lineup		B113
Negative inserts	80° Rhombic	B113
	55° Rhombic	B114
	75° Rhombic	B115
	Round	B116
	90° Square	B117
	60° Triangle	B118
	35° Rhombic	B119
Positive inserts	Round	B120
	Square	B121
	Triangle	B122
	Inserts for high hardened roll	B123
	Grooving inserts	B124

B

Turning indexable inserts

Turning indexable inserts identification system

Symbol	Shape
H	Hexagon
O	Octagon
P	Pentagon
S	Square
T	Triangle
C	80° Rhombic
D	55° Rhombic
E	75° Rhombic
F	50° Rhombic
M	86° Rhombic
V	35° Rhombic
W	80° Trigon
L	Rectangle
A	85° Parallelogram
B	82° Parallelogram
K	55° Parallelogram
R	Round

Shown angle stands for acute angle for rhombic and parallelogram inserts.

«1» Shape symbol

Symbol	Relief angle
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°

«2» Relief angle symbol

Symbol class	Tolerance (mm)		
	Corner height	Thickness	I.C. size
A	±0.005	±0.025	±0.025
F			±0.013
C	±0.013		±0.025
H			±0.013
E	±0.025		±0.025
G		±0.13	
J	±0.005	±0.025	±0.05 - ±0.15
K*	±0.013		
L*	±0.025		
M*	±0.08 - ±0.18	±0.13	
N*		±0.025	
U*	±0.13 - ±0.38	±0.13	±0.08 - ±0.25

* Insert's periphery is as fired.
Tolerance difference is depending on insert size.

«3» Tolerance symbol

Symbol	Hole	Hole shape	Chipbreaker	Shape
N	No	-	No	
R			Single sided	
F			Double sided	
A	Yes	With hole	No	
M			Single sided	
G			Double sided	
W		With hole and one countersink 40° - 60°	No	
T			Single sided	
Q		With hole and two countersink 40° - 60°	No	
U			Double sided	
B		With hole and one countersink 70° - 90°	No	
H			Single sided	
C		With hole and two countersink 70° - 90°	No	
J			Double sided	
X	-	-	-	-

«4» Hole / Chipbreaker symbol

ISO metric

C	N	M	G	12	04	08	PG
1	2	3	4	5	6	7	8

ANSI inch

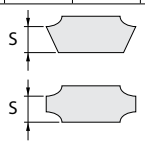
C	N	M	G	4	3	2	PG
1	2	3	4	5	6	7	8

«5» Edge length symbol (ISO)							I.C. size (mm)	«5» I.C. size (ANSI)	
C	D	R	S	T	V	W		IC size (inch)	Symbol
03	04		03	06			3.97	5/32	12
04	05		04	08	08		4.76	3/16	15
		05					5		
05	06		05	09		03	5.56	7/32	18
		06					6		
06	07		06	11	11	04	6.35	1/4	2
08	09		07	13		05	7.94	5/16	25
		08					8		
09	11	09	09	16	16	06	9.525	3/8	3
	12	10					10		
		12					12		
12	15	12	12	22	22	08	12.7	1/2	4
16	19	15	15	27	27	10	15.875	5/8	5
		16					16		
19	23	19	19	33	33	13	19.05	3/4	6
		20					20		
22	27		22	38			22.225	7/8	7
		25					25		
25	31	25	25	44	44	17	25.4	1	8
32	38	31	31	54	54	21	31.75	1-1/4	10
		32					32		

· Expressed as edge length for ISO.
· ANSI expresses the inscribed circle diameter in inches.

«6» Thickness symbol

ISO		ANSI	
Thickness (mm)	Symbol	Thickness (inch)	Symbol
1.59	01	1/16	1
1.98	T1	5/64	12
2.38	02	3/32	15
2.78	T2	-	-
3.18	03	1/8	2
3.97	T3	5/32	25
4.76	04	3/16	3
5.56	05	7/32	35
6.35	06	1/4	4
7.94	07	5/16	5
9.525	09	3/8	6



Thickness displayed as the distance between bottom surface and highest point on cutting edge.

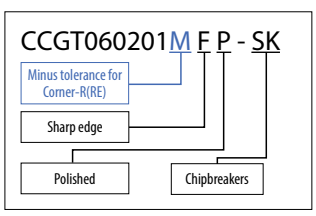
«7» Corner-R (RE) symbol

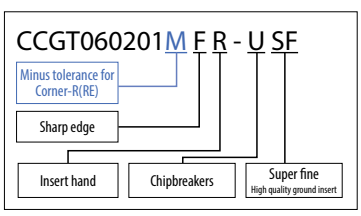
ISO		ANSI	
Corner-R(RE) (mm)	Symbol	Corner-R(RE) (inch)	Symbol
Sharp corner	00	.000	00
0.03	003	.001	01
0.05	005	.002	013
0.1	01	.004	02
0.2	02	.008	05
0.4	04	1/64	1
0.8	08	1/32	2
1.2	12	3/64	3
1.6	16	1/16	4
2.0	20	5/64	5
2.4	24	3/32	6
2.8	28	7/64	7
3.2	32	1/8	8
Round insert	00 (inch) or M0 (metric)	Round insert	0

«8» Manufacturer's option

Hand symbol, chipbreaker symbol, etc.

Positive inserts identification system





When a minus tolerance is specified for the corner-R(RE)

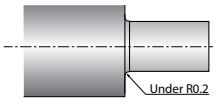


Fig. 1 Example of a specified corner-R in the drawing

If a minus tolerance is specified for the corner-R as shown in the figure, using an insert with corner-R(RE) = 0.2 mm may result in larger radius than specified.

Use an insert the corner of which R(RE) has a minus tolerance.

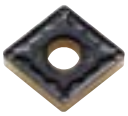
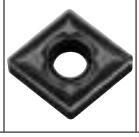
Insert colour

Red colour = New grade

Cermet

Grades	Cermet									CVD coated cermet	MEGACOAT NANO cermet				MEGACOAT cermet	
	TN610	TN620	TN620M	TN6020	TN60	TN90	TN100M	TC40N	TC60M	CCX	PV710	PV720	PV730	PV60M	PV7005	PV7040
Insert colour																

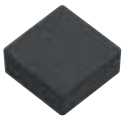
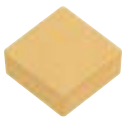
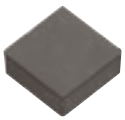
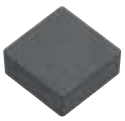
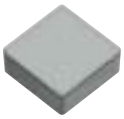
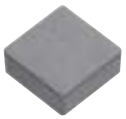
CVD coated carbide

Grades	CVD coated carbide												
	CA115P	CA125P	CA310	CA315	CA320	CA415D	CA520D	CA420M	CA45 series	CA025P	CA5 series	CA65 series	CR9025
Insert colour													

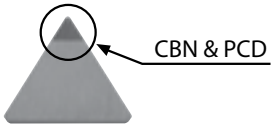
PVD coated carbide

Grades	MEGACOAT NANO					MEGACOAT NANO PLUS		MEGACOAT NANO EX			MEGACOAT HARD				MEGACOAT				PVD coated carbide				
	PR1510	PR1515	PR1525	PR1535	PR1625	PR1705	PR1725	PR1810	PR1825	PR1835	PR005S	PR015S	PR115S	PR120S	PR1210	PR1215	PR1225	PR1230	PR905	PR915	PR930	PR1025	PR1115
Insert colour																							

Ceramic

Grades	Aluminum oxide ceramic			PVD coated ceramic	MEGACOAT ceramic	Silicon nitride ceramic		CVD coated silicon nitride ceramic	SiAlON ceramic	
	KA30	A65	KT66	A66N	PT600M	KS6015	KS6050	CS7050	KS6030	KS6040
Insert colour										

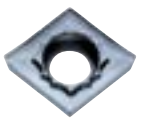
CBN & PCD

Grades	CBN				PCD			MEGACOAT TOUGH CBN / MEGACOAT CBN			PVD coated CBN
	KBN475	KBN510	KBN525	KBN570	KPD001	KPD010	KPD230	KBN010	KBN020	KBN..M	KBN900
Insert colour	 CBN & PCD										

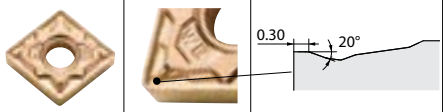
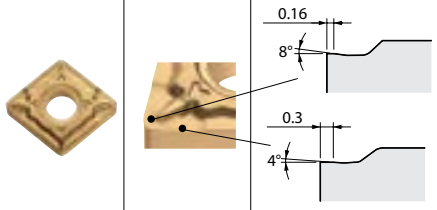
DLC coated carbide

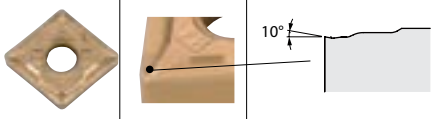
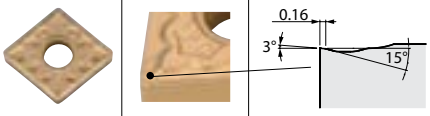
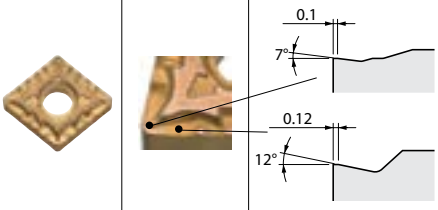
Grades	DLC coated carbide		
	PDL010	PDL015	PDL025
Insert colour			

Uncoated carbide

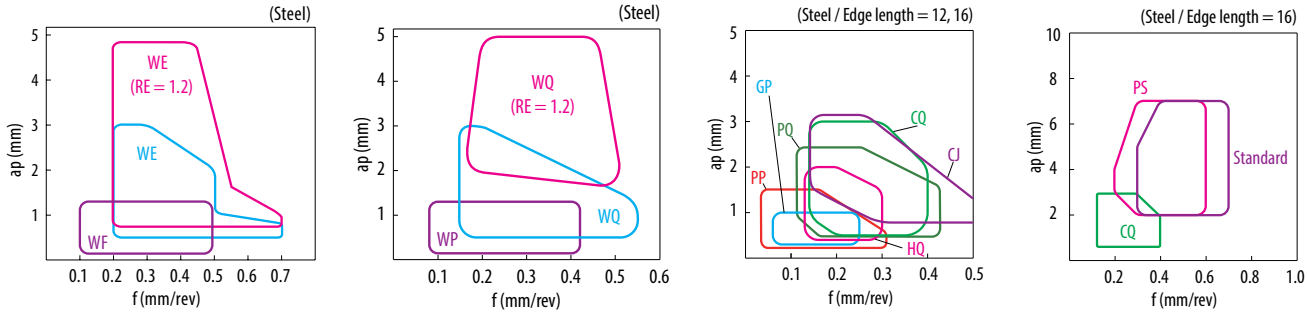
Grades	Carbide				
	GW05	GW15	GW25	KW10	SW05
Insert colour					

Steel (Molded chipbreaker)

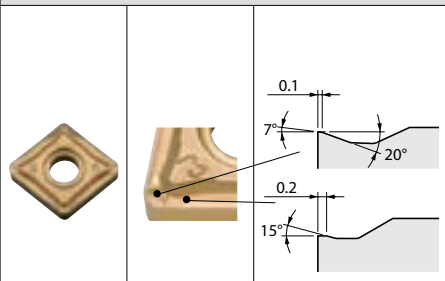
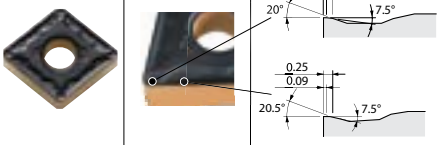
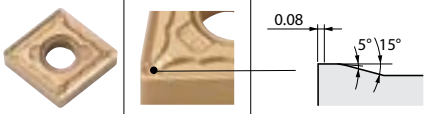
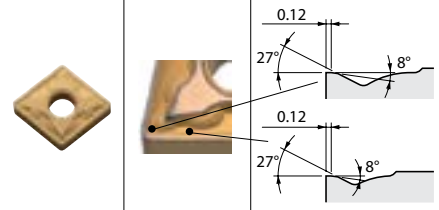
Cutting range	Name	Design	Advantages
Finishing	WF		• **Wiper insert** • Good chip control in finishing operations • Excellent surface roughness by controlling adhesion • Less cutting force due to sharp cutting edge
Finishing	WP		• **Wiper insert** • Good chip control at small machining
Finishing - Medium	WE		• **Wiper insert** • Good surface finish at high feed machining • High productivity with smooth chip control in a wide range of applications
Finishing - Medium	WQ		• **Wiper insert** • Double feed rate possible while maintaining a smooth finish • High efficiency and good chip control

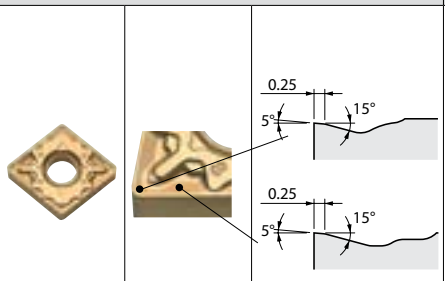
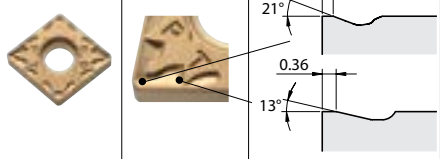
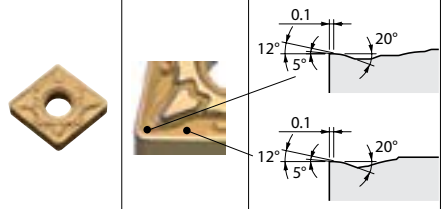
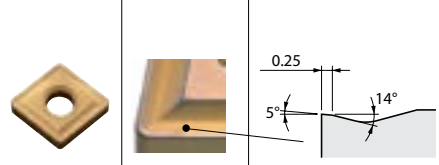
Cutting range	Name	Design	Advantages
Finishing	PP		• 3-step dot structure realizes stable chip control at a wide range of feed rate • Less cutting force due to sharp cutting edge and smooth rake face
Finishing - Medium	PQ		• Stable chip control in a wide feed rate range by breaking chips effectively • Well-balanced edge sharpness and toughness
Finishing	GP		• Finishing to light machining • Good chip control
Finishing - Medium	HQ		• Sharp cutting performance with 3-D rake angle and double projection design
Finishing - Medium	CQ		• Good chip control for varied ap such as copying • Applicable to up facing

Applicable chipbreaker range (ap indicates radius)

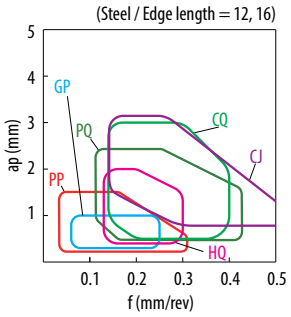


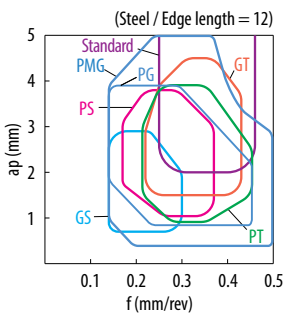
Steel (Molded chipbreaker)

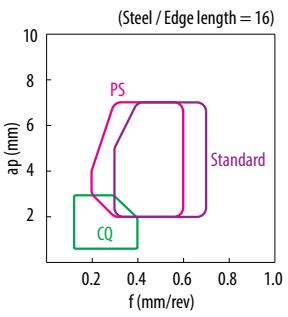
Cutting range	Name	Design	Advantages
Finishing - Medium / up facing	CJ		• Improved chip curling at small machining and high feed rate machining • Improved chip evacuation at copying and up facing
Medium - Roughing	PMG		• 1st Recommendation for medium-roughing process • Good chip control in a wide range of machining areas • Reduced crater wear leads to longer tool life
Medium - Roughing	PG		• Stable machining with good balance of edge sharpness and strength • Prevent chip clogging at high feed rate • Good chip control at low feed rate • Stable machining with wide chip control range
Medium - Roughing	GS		• Strong edge chipbreaker • Stable for continuous machining and light interrupted machining

Cutting range	Name	Design	Advantages
Medium - Roughing	PS		• General purpose chipbreaker • More stable due to large contact surface
Medium - Roughing / High feed rate	PT		• Low cutting force at high feed machining • Land support structure
Medium - Roughing / High feed rate	GT		• Strong edge chipbreaker • Wide land design and smooth chip control even at high feed rate machining
Roughing	Standard (without indication)		• Low cutting force and applicable to large ap roughing

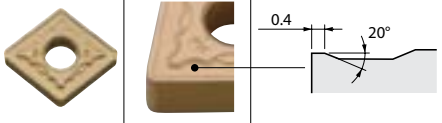
Applicable chipbreaker range (ap indicates radius)

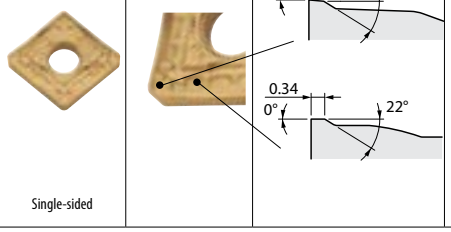




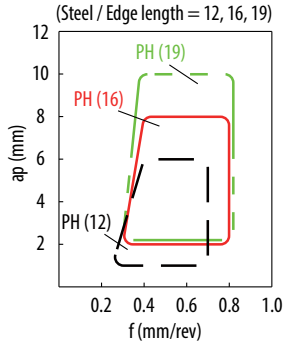


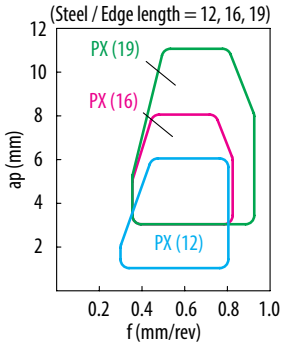
Steel (Molded chipbreaker)

Cutting range	Name	Design	Advantages
Roughing	PH		• Suitable for heavy interrupted machining and for workpieces with scale due to strong cutting edge

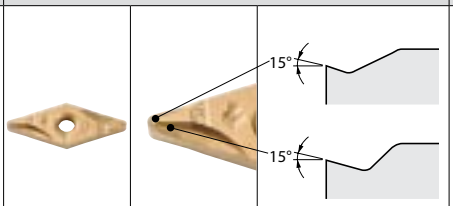
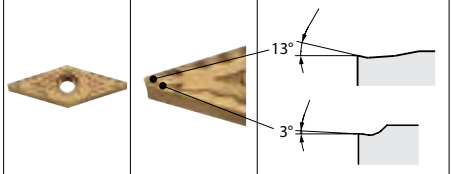
Cutting range	Name	Design	Advantages
Roughing (high feed rate)	PX	 Single-sided	• Roughing and high feed rate operation • Low cutting force chipbreaker

Applicable chipbreaker range (ap indicates radius)

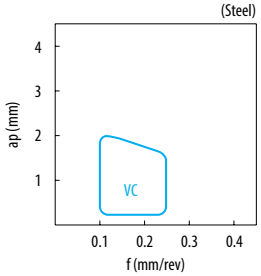


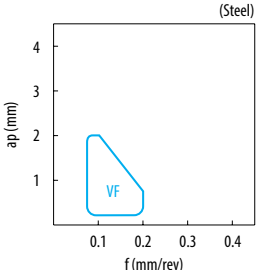


Steel (copying / undercutting , varied ap)

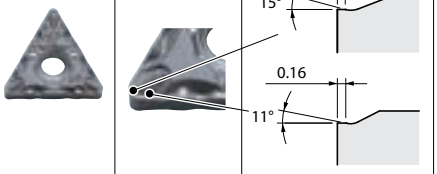
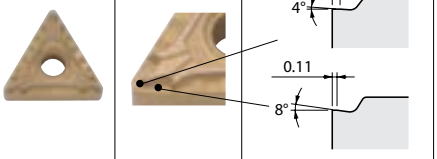
Cutting range	Name	Design	Advantages
Finishing - Medium	VC		• Handed chipbreaker for copying • Good chip control at varied ap because of the large space on the main cutting edge side
Finishing - Medium	VF		• Good chip control at varied ap such as copying and undercutting

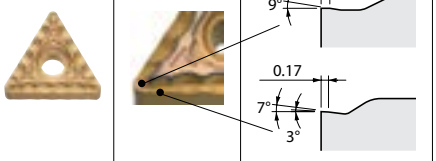
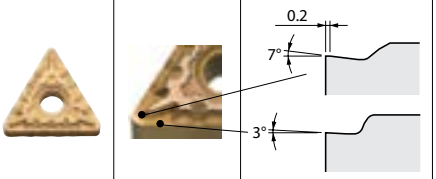
Applicable chipbreaker range (ap indicates radius)



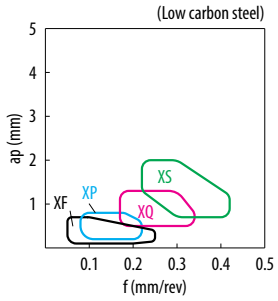


Low carbon steel (pipe / rolled plate / rolled steel)

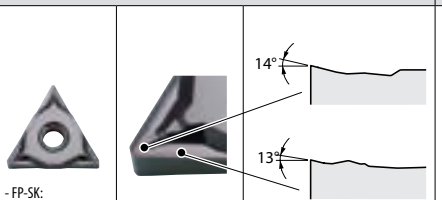
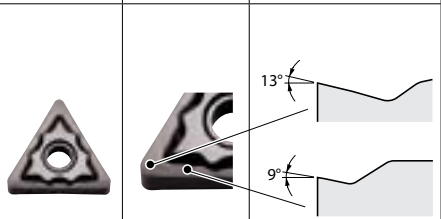
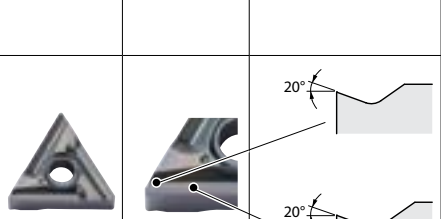
Cutting range	Name	Design	Advantages
Finishing	XF		• Excellent chip control at high speed and small ap machining of low carbon steel
Finishing	XP		• Short chips due to sharp cutting and special design

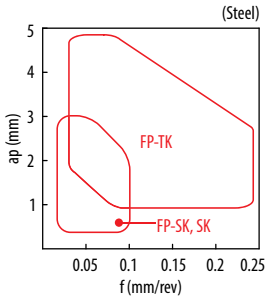
Cutting range	Name	Design	Advantages
Medium	XQ		• Consistent chip breaking due to moderate rake face and special design
Roughing	XS		• Consistent chip breaking due to special rake face and rake angle design

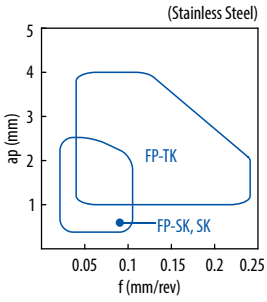
Applicable chipbreaker range (ap indicates radius)

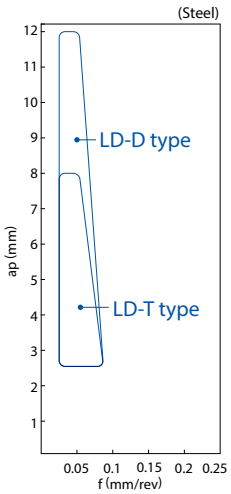


Steel / Stainless steel (for automatic lathe)

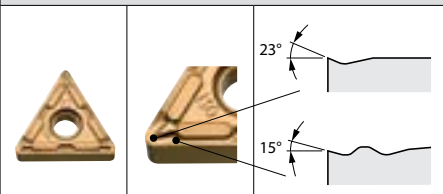
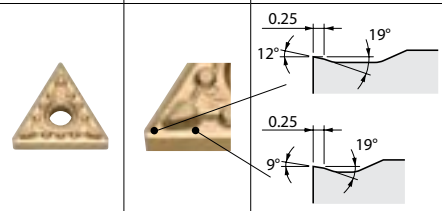
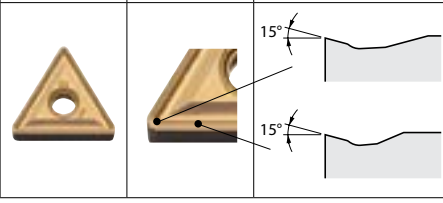
Cutting range	Name	Design	Advantages
Finishing - Medium	SK	 - FP-SK: Polished sharp edge -SK: Honed	• Machining in automatic lathes • Sharp cutting performance equivalent to positive inserts • 2-step dot design provides reliable chip control at various ap
Medium - Roughing	FP-TK		• Good in automatic lathes (When machining workpieces of medium to large diameter) • Superior cutting performance achieved by sharp edge and polished surface • Smooth chipbreaker geometry improves chip flow with less adhesion ·Large curled chips
Large ap	LD		• Available for greater depths of cut than many conventional chipbreakers • Achieves high-precision machining in a single pass • Chipbreaker shape optimized for various depths of cut • Stable chip control in a wide range of machining applications

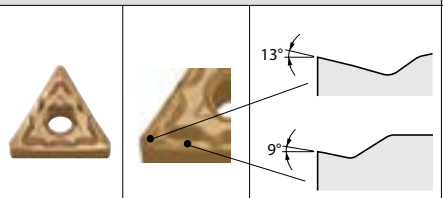
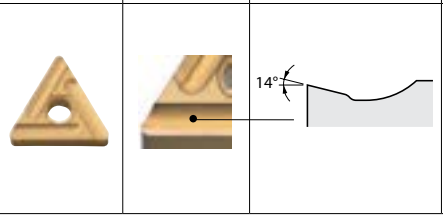




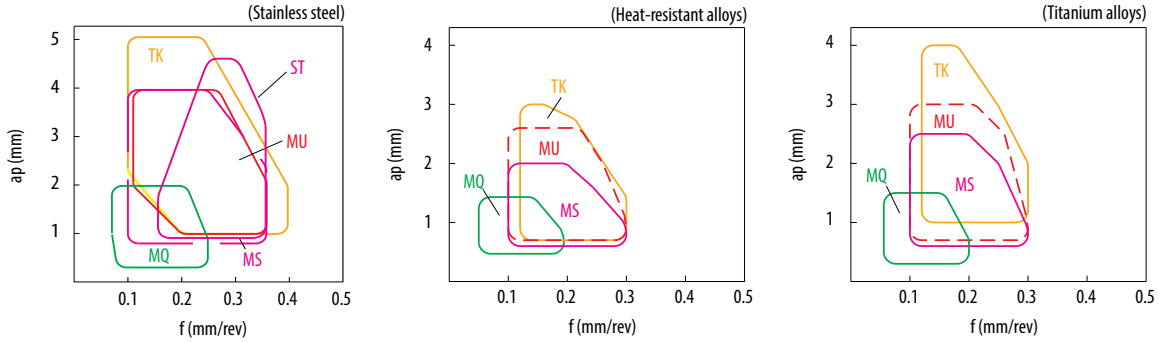


Stainless steel / Heat-resistant alloys / Titanium alloy

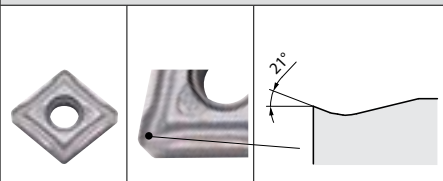
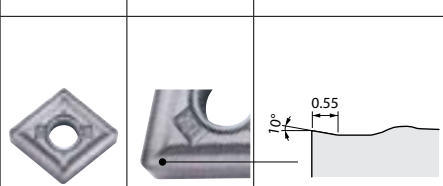
Cutting range	Name	Design	Advantages
Finishing	MQ		• Large rake angle • Low cutting force and good chip control
Medium - Roughing	MS		• Superior cutting edge sharpness and strength achieved by a positive land • Extra strength of cutting edge inhibits damage from wall shouldering
Medium - Roughing	MU		• Large rake angle reduces cutting force • Less burring achieved by diminishing damage from notching

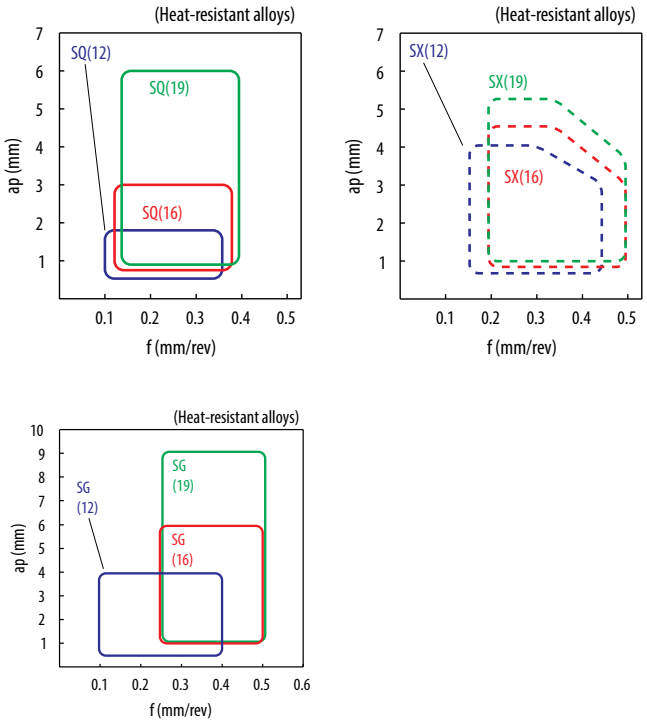
Cutting range	Name	Design	Advantages
Medium - Roughing	TK		• Smooth chipbreaker geometry improves chip flow with less adhesion • Large curled chips
Medium - Roughing	ST		• Less cutting force due to large rake angle • Less notching by special design

Applicable chipbreaker range (ap indicates radius)

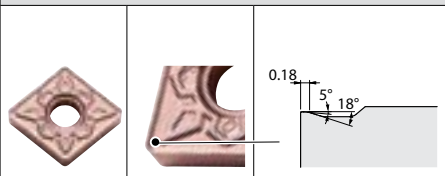
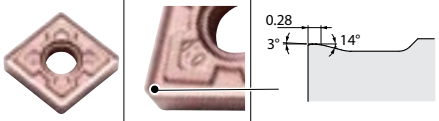
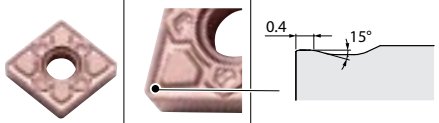


Heat-resistant alloys

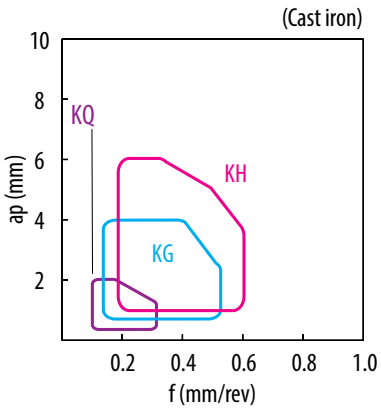
Cutting range	Name	Design	Advantages
Finishing - Medium	SQ		• Effective for burr suppression and reducing notching by slant cutting edge (inclined in (-) direction)
Roughing	SG		• Well-balanced edge strength • Cutting force reduction for stable machining at high-load cutting • Shallow and gently curved breaker controls chips smoothly
Roughing	SX		• Slant cutting edge reduces cutting force • Less burring achieved by unique cutting edge design



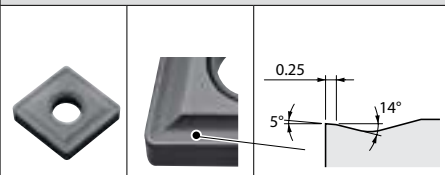
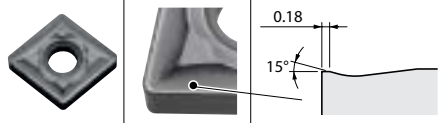
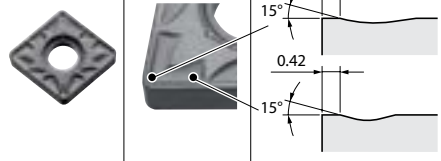
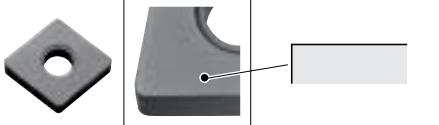
Cast iron (K series)

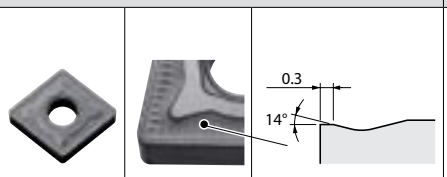
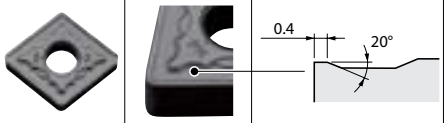
Cutting range	Name	Design	Advantages
Sharp cutting oriented	KQ		• Sharp cutting chipbreaker • Edge geometry is suitable for workpieces that require sharpness such as thin-walled
Roughing	KG		• Excellent balance of sharpness and strength • Realized stability at continuous machining
Roughing	KH		• Good for heavily interrupted machining • Strong edge chipbreaker • Improved locating / seating in the toolholder pocket, high reliability achieved

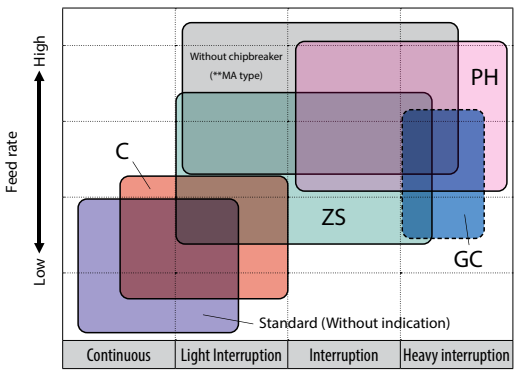
Applicable chipbreaker range (ap indicates radius)



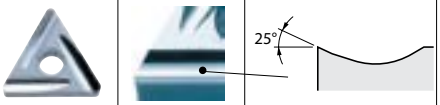
Cast iron

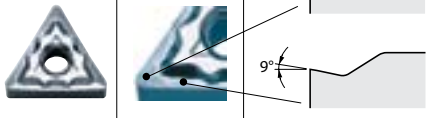
Cutting range	Name	Design	Advantages
Sharp cutting oriented	Standard (Without Indication)		• Standard type for continuous to light interrupted cut (Low cutting force)
	C		• High feed rate chipbreaker for continuous to light interrupted cut
	ZS		• Standard type for light interrupted to interrupted cut (Stability oriented)
	Without chipbreaker		• High feed rate chipbreaker for light interrupted to interrupted cut

Cutting range	Name	Design	Advantages
Stability oriented	GC		• For heavy interrupted cut (Tough edge chipbreaker)
	PH		• For roughing • Suitable for heavy interrupted cut and for workpieces with scale due to strong cutting edge

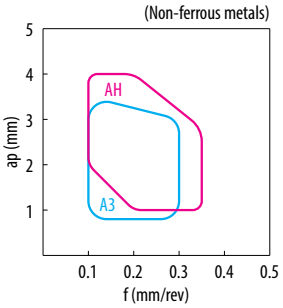


Non-ferrous metals

Cutting range	Name	Design	Advantages
Finishing - Medium	A3		• Large rake angle and smooth surface •Good chip control and less adhesion

Cutting range	Name	Design	Advantages
Medium - Roughing	AH	 G class: Sharp edge M class: Horned edge prep.	• Polished chipbreaker • Smooth chip control and less adhesion

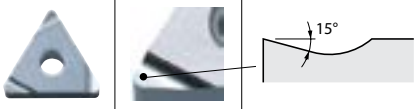
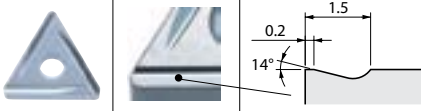
Applicable chipbreaker range (ap indicates radius)

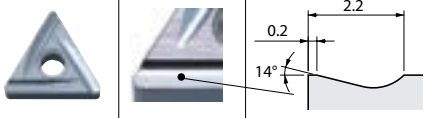
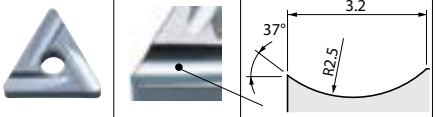


A3 chipbreaker	
	ap = 2 mm f = 0.2 mm/rev
	ap = 2 mm f = 0.3 mm/rev

AH chipbreaker	
	ap = 2 mm f = 0.2 mm/rev
	ap = 2 mm f = 0.3 mm/rev

Steel (Ground chipbreaker)

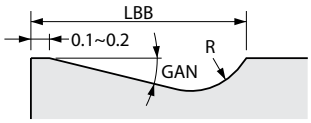
Cutting range	Name	Design	Advantages
Finishing	S		• Sharp edge and less cutting force • Good chip control and smooth chip evacuation
Finishing - Medium	B		• Suitable for general purpose machining at feed rate 0.15 to 0.25mm/rev

Cutting range	Name	Design	Advantages
Medium - Roughing	C		• Suitable for general purpose machining at feed rate 0.20 to 0.35 mm/rev
Medium - Roughing / Low cutting force	25R		• Applicable to sticky material such as low carbon steel • Large rake angle and suitable for stainless steel

Effectiveness of ground chipbreaker

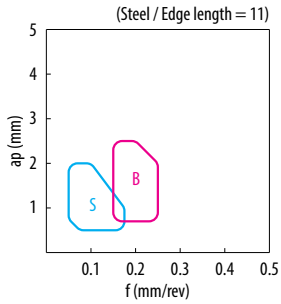
1. Lower cutting force and improve edge
2. Improved adhesion resistance
3. Improved dimension accuracy and finishing surface accuracy
4. Controlled chip evacuation direction

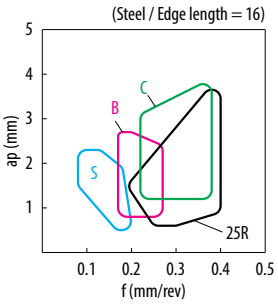
Specification of B, C and parallel ground chipbreaker

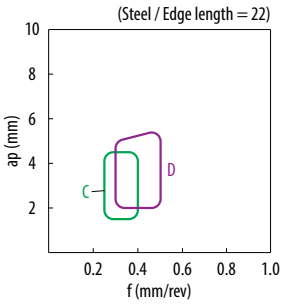


Insert type	Size	Chipbreaker name	LBB	GAN	R
CNGG	09,12	Without indication (Similar to C)	2.2	14°	1.0
WNGG	06	Without indication (Similar to C)	2.2	14°	1.0
TNGG	11,16	B	1.5	14°	0.5
	16,22	C	2.2	14°	1.0
DNGG	11,15	Without indication (Similar to C)	2.5	14°	2.0
VNGG	16	Without indication (Similar to B)	1.5	14°	0.5
SNGG	09,12	B	1.5	14°	0.5
	12	C	2.2	14°	1.0

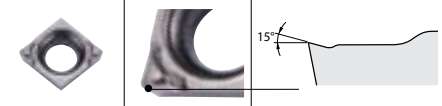
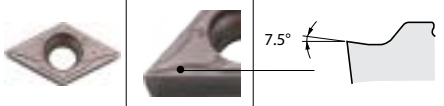
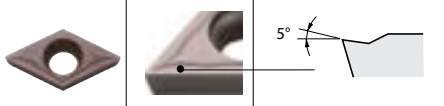
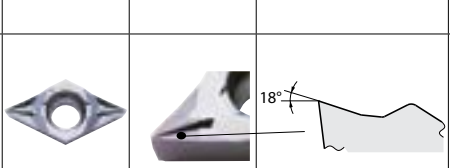
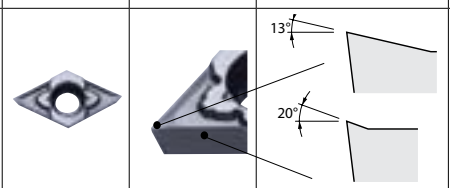
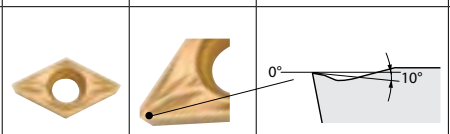
Applicable chipbreaker range (ap indicates radius)

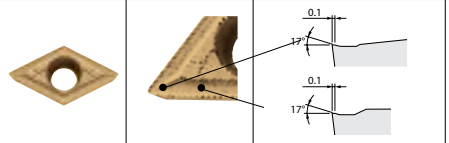
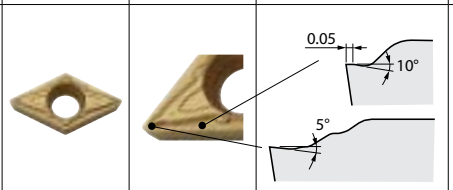
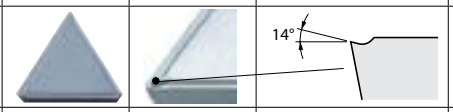
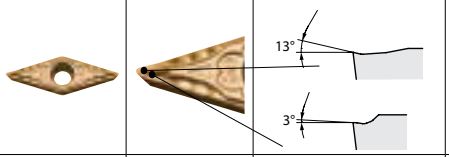
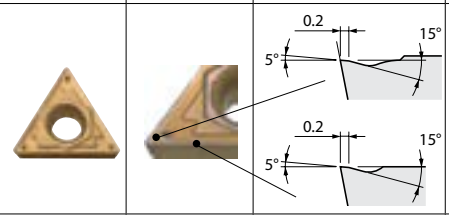
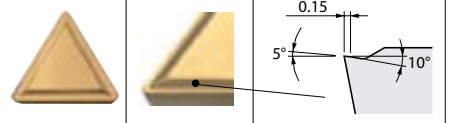
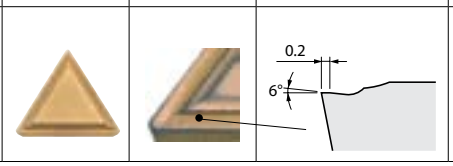




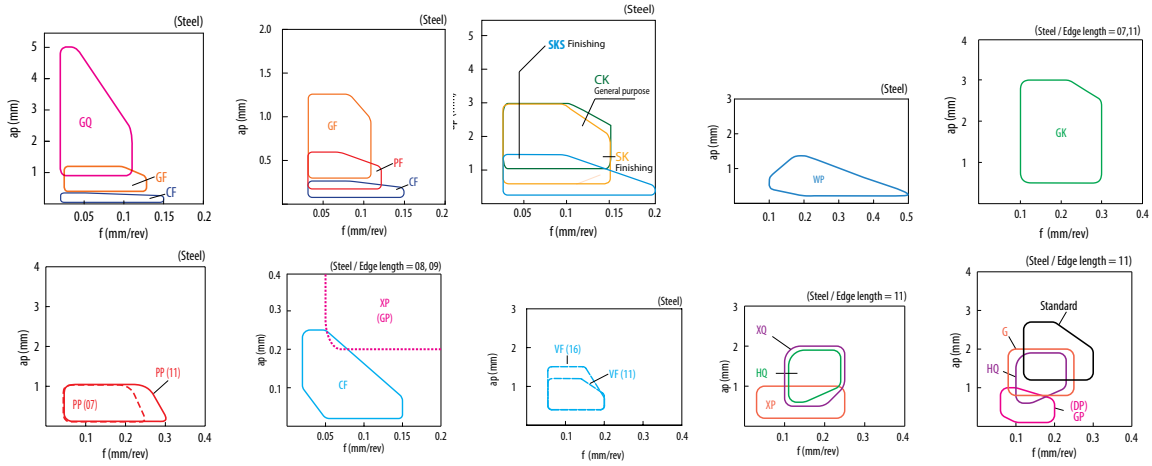


Steel (Molded chipbreaker)

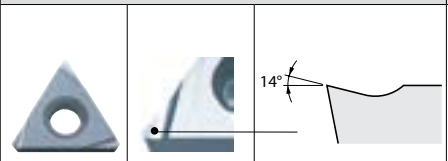
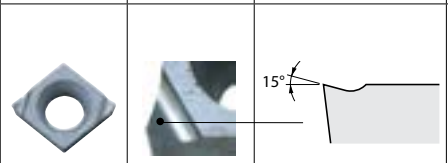
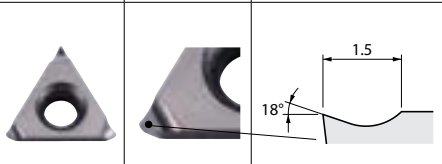
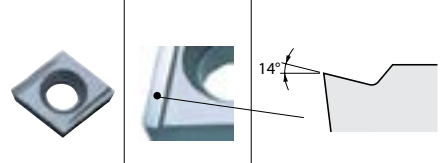
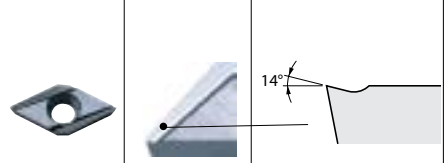
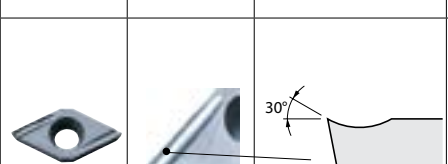
Cutting range	Name	Design	Advantages
Minute ap	CF		• Available for minute ap (0.02 to 0.2 mm) finishing
Finishing	PF		• Chipbreaker for finishing boring available from ap 0.15~0.6 mm
Finishing	GF		• Chips fragmented in small pieces in machining of small ap
Finishing - Medium	GQ		• Wide range of conditions by using the optimum chipbreaker width according to the cutting depth
Finishing	SKS		·Chipbreaker for finishing available from 0.2~1.5mm ·Rake face, bottom face and chipbreaker face provide stable chip control.
Finishing	SK		• Sharp cutting performance due to large rake angle • Large dot to the corner edge improved chip control in a wide feed rate range
Finishing	CK		• Good cutting performance • Applicable without hand for two direction machining on automatic lathe
Finishing	WP		• **Wiper insert** • Good surface finish and good chip control at high feeds • Reduces surface finish galling

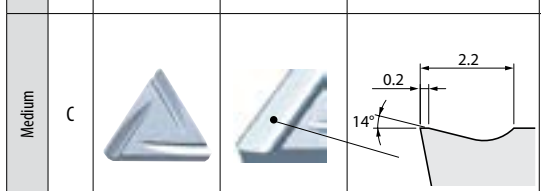
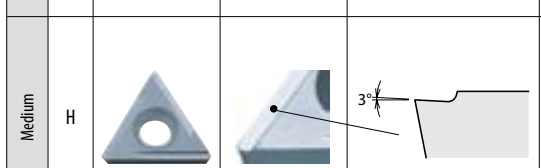
Cutting range	Name	Design	Advantages
Finishing - Medium	GK		• Good chip evacuation at wide range by breaker dot and wide chip pocket
Finishing	PP		• **1st. recommendation** • Stable chip control in a wide feed rate range •Stable tool life due to special edge design with sharpness and improved strength
Finishing	DP		• Consistent chip breaking performance for finishing
Finishing	GP		• Good chip control
Finishing	VF		• Good chip control for varied ap such as copying and undercutting
Finishing - Medium	HQ		• General purpose chipbreaker for medium machining
Medium	G		• Chipbreaker for short chips
Medium	Standard (without indication)		• Strong edge chipbreaker

Applicable chipbreaker range (ap indicates radius)

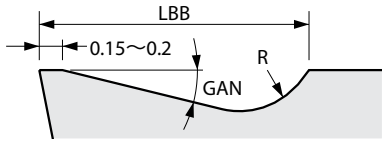


Steel (Ground chipbreaker)

Cutting range	Name	Design	Advantages
Finishing	Lead (Without Indication)		• Good chip control at finishing to light machining with low cutting force
Finishing	F		• Good chip control at finishing to light machining with low cutting force
Finishing	P		• Flows chips towards the inlet of hole • Sharp edge
Medium	Y		• Sharp cutting performance and good surface finish
Low Feed	J		• Slant chipbreaker width and chip control at various ap • Applicable to automatic lathes
Low Feed	U		• Good chip control at low feed rate and varied ap with low cutting force

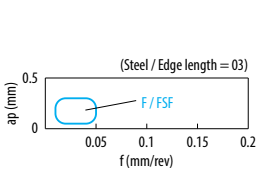
Cutting range	Name	Design	Advantages
Finishing	A		• Large rake angle and low cutting force • Narrow chipbreaker width and consistent chip control
Finishing - Medium	B		• General purpose chipbreaker for medium machining • Good balance between chip control and sharp cutting
Medium	C		• Applicable to high load machining • Good chip flow and less resistance
Medium	H		• Sharp cutting performance and small curled chips

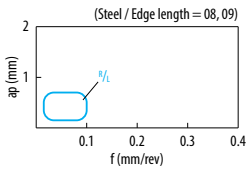
Specification of A, B, C and parallel ground chipbreaker

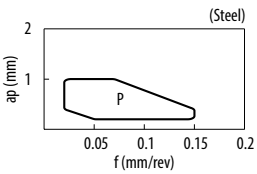


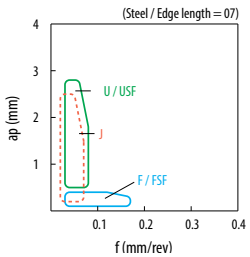
Insert type	Size	Chipbreaker name	LBB	GAN	R
TPGR	11	A	1.0	17°	0.5
	11,16	B	1.5	14°	0.5
	16	C	2.2	14°	1.0
SPGR	09	Without indication (Similar to B)	1.5	14°	0.5
	12	Without indication (Similar to C)	2.2	14°	1.0

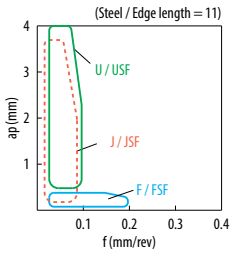
Applicable chipbreaker range (ap indicates radius)

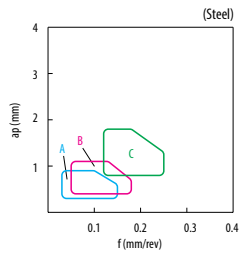


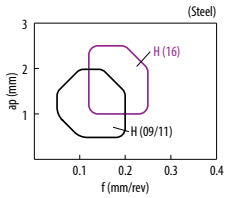




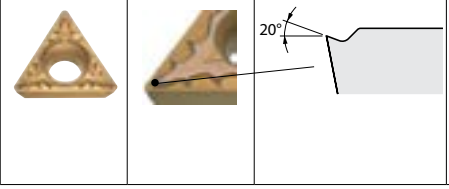


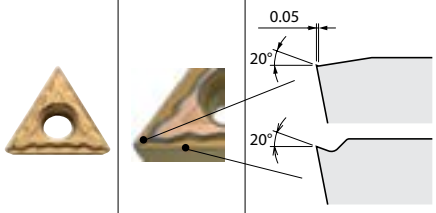




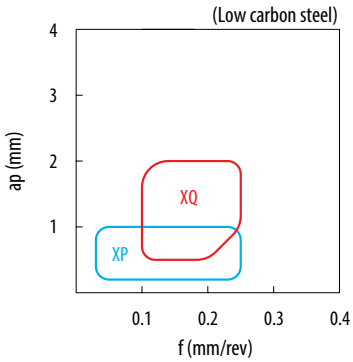


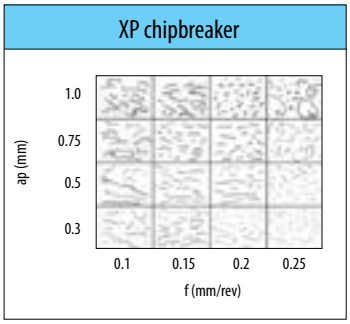
Low carbon steel (pipe / rolled plate / rolled steel)

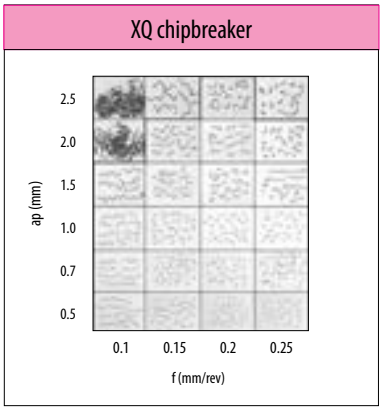
Cutting range	Name	Design	Advantages
Finishing	XP		• Consistent chip breaking performance even for low carbon steel and sticky material

Cutting range	Name	Design	Advantages
Finishing - Medium	XQ		• Wide chip control range and sharp cutting performance • Suitable for low carbon steel and sticky material

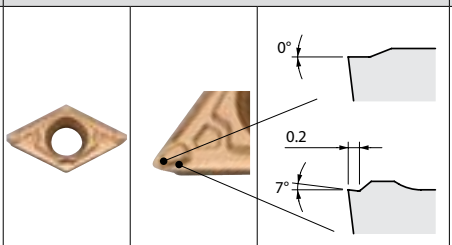
Applicable chipbreaker range (ap indicates radius)



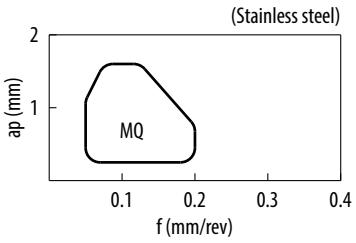




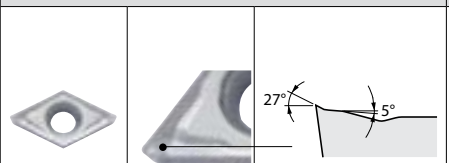
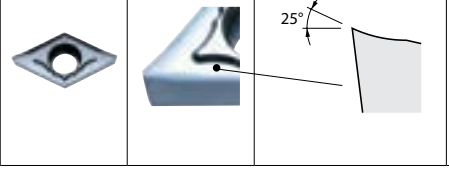
Stainless steel

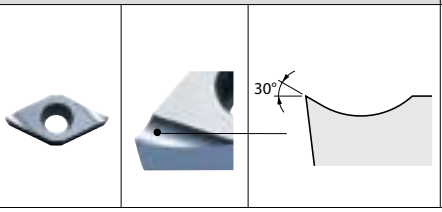
Cutting range	Name	Design	Advantages
Finishing	MQ		• Good chip evacuation at internal turning • Small curled chips • Prevents chip entanglement with toolholder and stabilizes surface roughness

Applicable chipbreaker range (ap indicates radius)

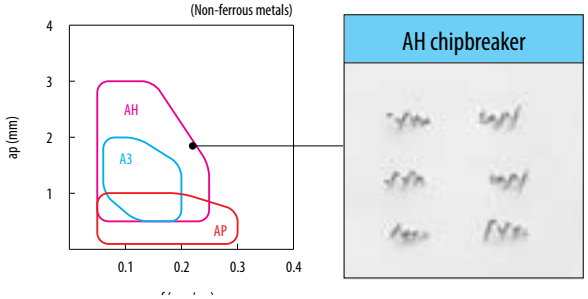


Non-ferrous metals

Cutting range	Name	Design	Advantages
Finishing	AP		• Curved edge and shape of chipbreaker lead good chip control • Sharp cutting edge provides excellent surface finish • Polished chipbreaker
Finishing - Medium	AH		• Positive chip groove and good chip control with low cutting force • Polished surface reduces adhesion

Cutting range	Name	Design	Advantages
Finishing - Medium	A3		• Large rake angle, smooth chip flow and less adhesion • Superior cutting performance achieved by sharp edge

Applicable chipbreaker range (ap indicates radius)

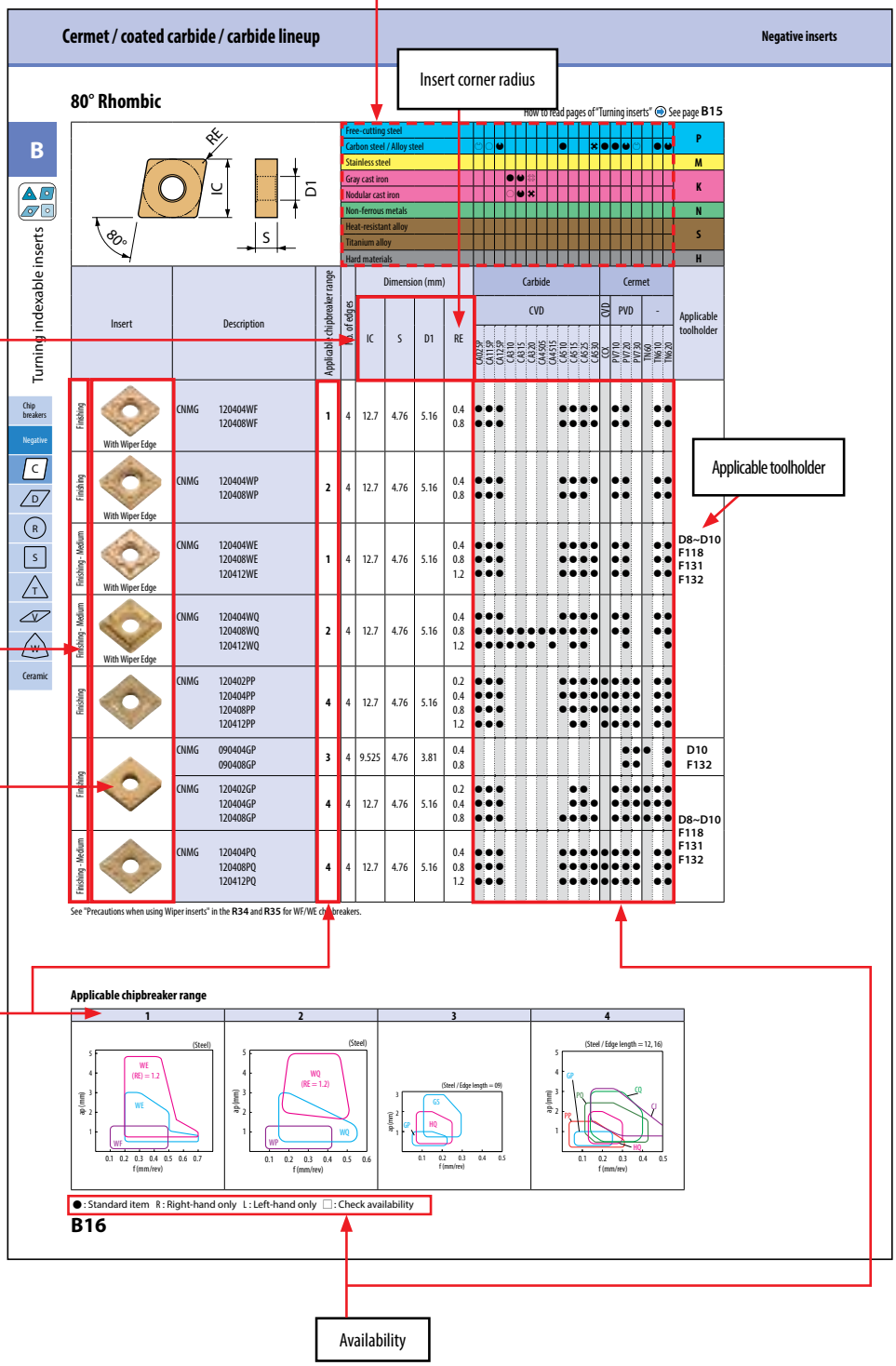


How to read pages of turning inserts

· Ref. to below for page contents of "Turning Inserts"
· Some contents are same in Chapter C

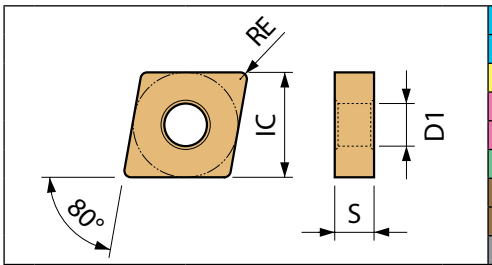
Classification of usage
**: Interruption / 1st Choice
**: Interruption / 2nd Choice
**: Light interruption / 1st Choice
**: Light interruption / 2nd Choice
**: Continuous / 1st Choice
**: Continuous / 2nd Choice
(In case hardness is 45HRC or under)

Recommended grades for each applications and workpiece materials are shown here.



80° Rhombic

How to read pages of "Turning inserts" See page B15

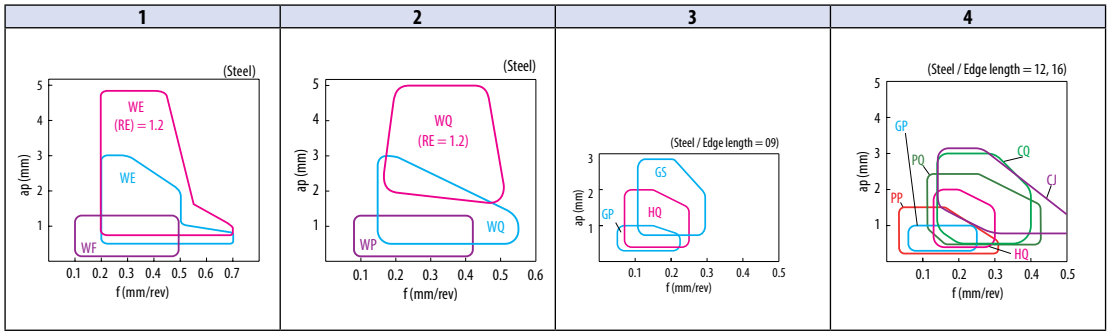


	P	M	K	K	N	S	S	S	H
	Free-cutting steel	Carbon steel / Alloy steel	Stainless steel	Gray cast iron	Nodular cast iron	Non-ferrous metals	Heat-resistant alloy	Titanium alloy	Hard materials

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Carbide CVD CA025P	CA115P	CA125P	CA310	CA315	CA320	CA4505	CA4515	CA510	CA515	CA525	CA530	Cermet CVD CCX	PVD PV710	PV720	PV730	- TN60	TN610	TN620	Applicable toolholder
Finishing	 With Wiper Edge	CNMG	120404WF 120408WF	1	4	12.7	4.76	5.16	0.4 0.8	● ●	●	●						●	●	●	●		●	●			●	●	
Finishing	 With Wiper Edge	CNMG	120404WP 120408WP	2	4	12.7	4.76	5.16	0.4 0.8	● ●	●	●						●	●	●	●		●	●			●	●	
Finishing - Medium	 With Wiper Edge	CNMG	120404WE 120408WE 120412WE	1	4	12.7	4.76	5.16	0.4 0.8 1.2	● ● ●	●	●						●	●	●	●		●	●			●	●	D8~D10 F118 F131 F132
Finishing - Medium	 With Wiper Edge	CNMG	120404WQ 120408WQ 120412WQ	2	4	12.7	4.76	5.16	0.4 0.8 1.2	● ● ●	●	●	●	●	●	●	●	●	●	●	●		●	●			●	●	
Finishing		CNMG	120402PP 120404PP 120408PP 120412PP	4	4	12.7	4.76	5.16	0.2 0.4 0.8 1.2	● ● ● ●	●	●						●	●	●	●	●	●	●	●			●	●	
Finishing		CNMG	090404GP 090408GP	3	4	9.525	4.76	3.81	0.4 0.8														●	●	●			●	D10 F132
		CNMG	120402GP 120404GP 120408GP	4	4	12.7	4.76	5.16	0.2 0.4 0.8	● ● ●	●	●						●	●				●	●	●	●	●	●	D8~D10 F118 F131 F132
Finishing - Medium		CNMG	120404PQ 120408PQ 120412PQ	4	4	12.7	4.76	5.16	0.4 0.8 1.2	● ● ●	●	●						●	●	●	●	●	●	●	●			●	●	

See "Precautions when using Wiper inserts" in the **R34** and **R35** for WF/WE chipbreakers.

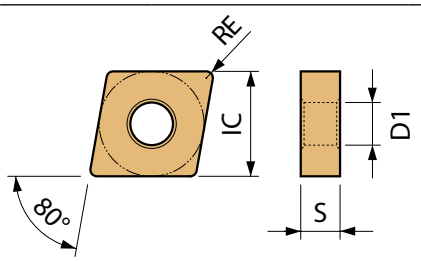
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

80° Rhombic

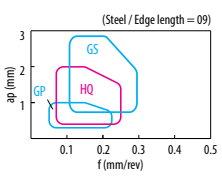
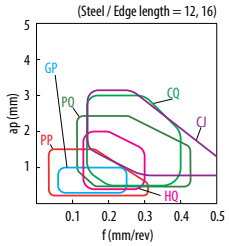
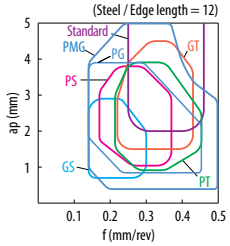
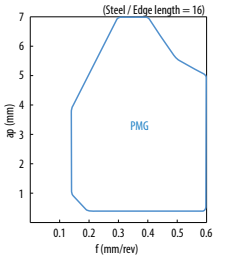
How to read pages of "Turning inserts" See page B15



Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert		Description	Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Carbide CVD CA025P	CA115P	CA125P	CA510	CA515	CA525	CA530	CA6515	CA6525	Carbide PVD CVD PR1535	Cermet CVD CCX	Cermet PVD PV710	PV720	PV730	Cermet - TN60	TN610	TN620	Applicable toolholder
Finishing - Medium		CNMG 090404HQ 090408HQ	1	4	9.525	4.76	3.81	0.4 0.8	● ●	●	●		●	●	●				●		●	●	●		●	D10 F132
		CNMG 120404HQ 120408HQ 120412HQ	2	4	12.7	4.76	5.16	0.4 0.8 1.2	● ● ●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	D8~D10 F118 F131 F132
Finishing - Medium	Up facing	CNMG 120404CQ 120408CQ 120412CQ	2	4	12.7	4.76	5.16	0.4 0.8 1.2	● ● ●	●	●	●	●	●	●					●	●	●			●	●	
		CNMG 160608CQ 160612CQ	2	4	15.875	6.35	6.35	0.8 1.2	● ●	●	●	●	●	●	●												D10
Finishing - Medium	Up facing	CNMG 120408CJ 120412CJ	2	4	12.7	4.76	5.16	0.8 1.2	● ●	●	●	●	●	●	●												D8~D10 F118 F131 F132
		CNMG 160612CJ 160616CJ	2	4	15.875	6.35	6.35	1.2 1.6	● ●	●	●		●		●												D10
Medium - Roughing		CNMG 120404PMG 120408PMG 120412PMG 120416PMG	3	4	12.7	4.76	5.16	0.4 0.8 1.2 1.6		●	●																D8~D10 F118 F131 F132
		CNMG 160608PMG 160612PMG 160616PMG	4	4	15.875	6.35	6.35	0.8 1.2 1.6		●	●																D10
Medium - Roughing		CNMG 090404GS 090408GS	1	4	9.525	4.76	3.81	0.4 0.8	● ●	●	●		●	●	●						●	●			●	●	D10 F132
		CNMG 120404GS 120408GS 120412GS	3	4	12.7	4.76	5.16	0.4 0.8 1.2	● ● ●			●	●	●	●						●	●			●	●	D8~D10 F118 F131 F132

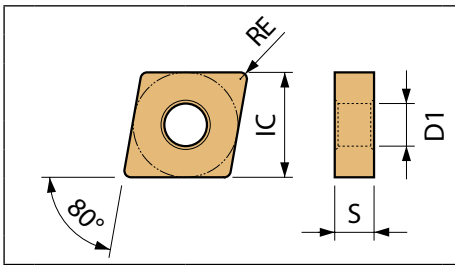
Applicable chipbreaker range

1	2	3	4
			

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

80° Rhombic

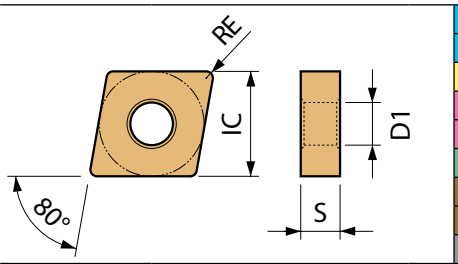
How to read pages of "Turning inserts" See page B15



| | | |

80° Rhombic

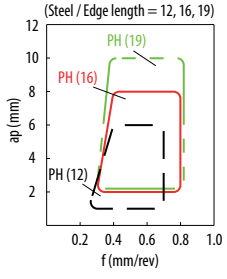
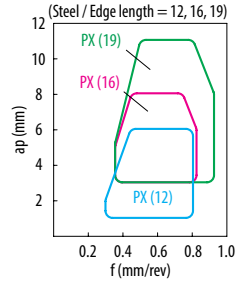
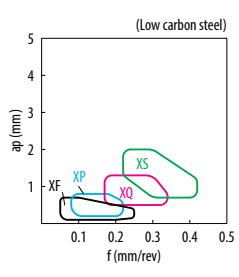
How to read pages of "Turning inserts" See page B15



Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert		Description	Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Carbide CVD CA025P	CA115P	CA125P	CA310	CA315	CA320	CA4505	CA4515	CA510	CA515	CA525	CA530	Cermet CVD CCX	PVD PV710	PV720	PV730	- TN60	TN610	TN620	Applicable toolholder
Roughing		CNMG 120408PH 120412PH 120416PH	1	4	12.7	4.76	5.16	0.8 1.2 1.6	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ○	● ● ●	● ● ●	● ● ●	● ● ●								D8~D10 F118, F131 F132
Roughing		CNMG 160608PH 160612PH 160616PH	1	4	15.875	6.35	6.35	0.8 1.2 1.6	● ● ●	● ● ●	● ● ●			● ● ●	● ● ●	● ● ○	● ● ●	● ● ●	● ● ●	● ● ●								
Roughing		CNMG 190608PH 190612PH 190616PH 190624PH	1	4	19.05	6.35	7.94	0.8 1.2 1.6 2.4	● ● ● ●	● ● ● ●	● ● ● ●						● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●								D10
Roughing	High feed / Single-sided	CNMM 120408PX 120412PX 120416PX	2	2	12.7	4.76	5.16	0.8 1.2 1.6	● ● ●	● ● ●	● ● ●						● ● ●	● ● ●	● ● ●	● ● ●								D8~D10 F118 F131 F132
Roughing		CNMM 160608PX 160612PX 160616PX	2	2	15.875	6.35	6.35	0.8 1.2 1.6	● ● ●	● ● ●	● ● ●							● ● ●	● ● ●	● ● ●								D10
Roughing		CNMM 190608PX 190612PX 190616PX 190624PX	2	2	19.05	6.35	7.94	0.8 1.2 1.6 2.4	● ● ● ●	● ● ● ●	● ● ● ●							● ● ● ●	● ● ● ●	● ● ● ●								
Low carbon steel	Finishing / Minute ap	CNMG 120404XF 120408XF	3	4	12.7	4.76	5.16	0.4 0.8													● ●	● ●	● ●	● ●	● ●	● ●		D8~D10 F118 F131 F132
Low carbon steel	Finishing	CNMG 120404XP 120408XP	3	4	12.7	4.76	5.16	0.4 0.8	● ●	● ●	● ●						● ●	● ●			● ●	● ●	● ●	● ●	● ●	● ●	● ●	
Low carbon steel	Medium	CNMG 120404XQ 120408XQ	3	4	12.7	4.76	5.16	0.4 0.8	● ●	● ●	● ●						● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●	

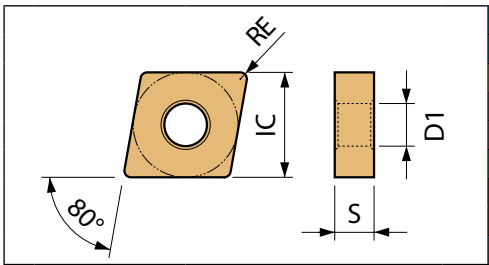
Applicable chipbreaker range

1	2	3
		

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

80° Rhombic

How to read pages of "Turning inserts" See page B15

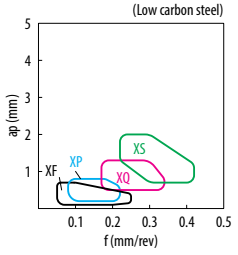
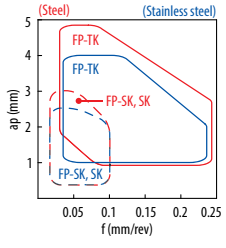
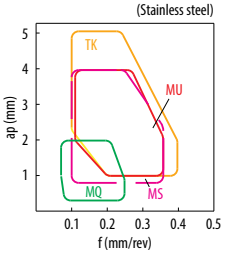
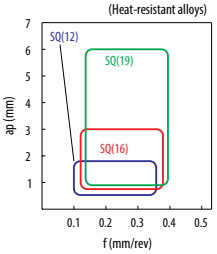


Free-cutting steel		P
Carbon steel / Alloy steel	○ ○ ● ● ✖ ○ ○ ● ● ● ● ●	P
Stainless steel	● ● ○ ○ ○ ● ○	M
Gray cast iron		K
Nodular cast iron		K
Non-ferrous metals		N
Heat-resistant alloy	○ ○ ● ○ ● ✖	S
Titanium alloy	● ○	S
Hard materials		H

	Insert	Description	Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Carbide CVD CA025P	CA115P	CA125P	CA510	CA515	CA525	CA530	CA6515	CA6525	Carbide PVD PR005S	PR115S	PR120S	PR1225	PR1535	PR1725	Carbide - SW05	Cermet PVD PV710	PV720	PV730	Cermet - TN60	TN610	TN620	Applicable toolholder
Low carbon steel	Roughing	CNMG 120408XS	1	4	12.7	4.76	5.16	0.8	●	●	●	●	●	●	●										●	●	●	●	●	●	D8~D10 F118 F131 F132
Finishing - Medium	Polished / Sharp edge	CNGG 120402MFP-SK CNGG 120404MFP-SK	2	4	12.7	4.76	5.16	< 0.2 < 0.4											●	●	●	●	●				●				D8~D10 E63 F118 F131 F132
Medium - Roughing	Polished / Sharp Edge	CNGG 120404FP-TK CNGG 120408FP-TK	2	4	12.7	4.76	5.16	0.4 0.8													●	●	●								
Stainless steel / Heat-resistant alloys	Medium - Roughing / Sharp edge	CNGG 120404TK CNGG 120408TK	3	4	12.7	4.76	5.16	0.4 0.8																●							D8~D10 F118 F131 F132
	Medium - Roughing	CNMG 120404TK CNMG 120408TK	3	4	12.7	4.76	5.16	0.4 0.8								●	●	●	●	●		●									
	Finishing - Medium	CNMG 120404MQ CNMG 120408MQ	3	4	12.7	4.76	5.16	0.4 0.8								●	●	●	●	●		●		●							
Heat-resistant alloys	Finishing - Medium	CNMG 120404SQ CNMG 120408SQ CNMG 120412SQ	4	4	12.7	4.76	5.16	0.4 0.8 1.2										●	●	●											
		CNMG 160612SQ CNMG 160616SQ	4	4	15.875	6.35	6.35	1.2 1.6										●	●	●										D10
		CNMG 190612SQ CNMG 190616SQ	4	4	19.05	6.35	7.94	1.2 1.6										●	●	●											

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

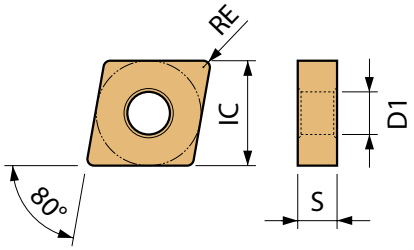
Applicable chipbreaker range

1	2	3	4
		Heat-Resistant Alloys Titanium Alloys See page B8 	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

80° Rhombic

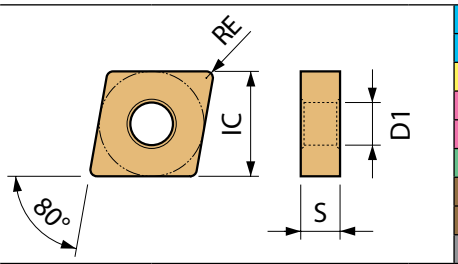
How to read pages of "Turning inserts" See page B15



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80° Rhombic

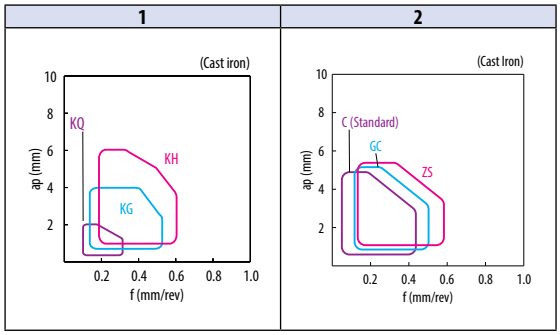
How to read pages of "Turning inserts" See page B15



Free-cutting steel		P
Carbon steel / Alloy steel		
Stainless steel		M
Gray cast iron	● ● ❄ ❄ ● ●	K
Nodular cast iron	○ ● ✖ ○ ○	
Non-ferrous metals		N
Heat-resistant alloy		S
Titanium alloy		
Hard materials		H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Carbide CVD CA310	CA315	CA320	CA4505	CA4515	- KW10	Cermet CVD CCX	PVD PV7005	Applicable toolholder
Cast iron	 Sharp cutting oriented	CNMG	120404KQ 120408KQ 120412KQ	1	4	12.7	4.76	5.16	0.4 0.8 1.2	● ● ●	● ● ●	● ● ●						D8~D10 F118 F131 F132
Cast iron	 Roughing	CNMG	120404KG 120408KG 120412KG	1	4	12.7	4.76	5.16	0.4 0.8 1.2	● ● ●	● ● ●	● ● ●						
Cast iron	 Roughing	CNMG	120408KH 120412KH 120416KH	1	4	12.7	4.76	5.16	0.8 1.2 1.6	● ● ●	● ● ●	● ● ●						
Cast iron	 Roughing	CNMG	120404C 120408C 120412C 120416C	2	4	12.7	4.76	5.16	0.4 0.8 1.2 1.6	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●				
		CNMG	160612C	2	4	15.875	6.35	6.35	1.2	●	●	●		●				D10
Cast iron	 Roughing	CNMG	120408ZS 120412ZS	2	4	12.7	4.76	5.16	0.8 1.2	● ●	● ●	● ●	● ●	● ●				D8~D10 F118 F131 F132
Cast iron	 Roughing	CNMG	120408GC 120412GC	2	4	12.7	4.76	5.16	0.8 1.2	● ●	● ●	● ●	● ●	● ●				
Cast iron	 Without chipbreaker	CNGA	120404 120408	-	4	12.7	4.76	5.16	0.4 0.8						● ●		● ●	
		CNMA	120404 120408 120412 120416	-	4	12.7	4.76	5.16	0.4 0.8 1.2 1.6	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ●	● ● ●	● ● ●	

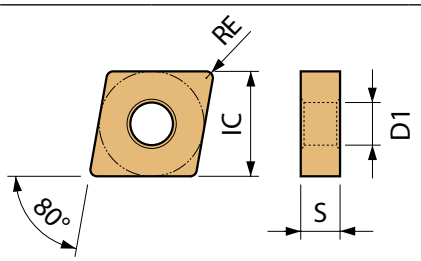
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

80° Rhombic

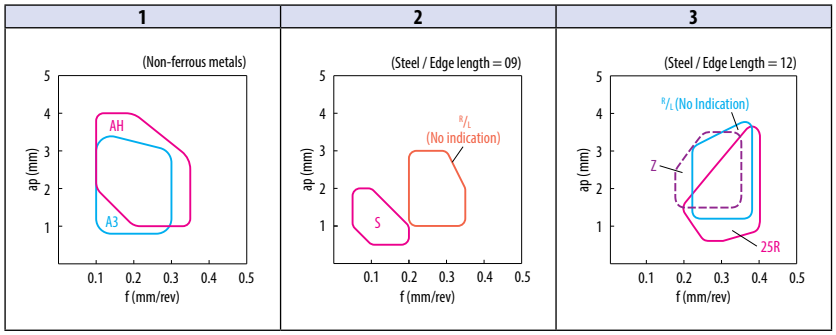
How to read pages of "Turning inserts" See page B15



Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Carbide DLC PDL010	Carbide DLC PDL025	Carbide - KW10	Cermet PVD PV710	Cermet PVD PV720	Cermet PVD PV730	Cermet - TN60	Cermet - TN610	Cermet - TN620	Applicable toolholder
Non-ferrous metals	Finishing - Medium / Sharp edge	CNGG	120404R-A3	1	4	12.7	4.76	5.16	0.4	●	●	●							D8~D10 F118 F131 F132
			120404L-A3						0.4	●	●	●							
			120408R-A3						0.8	●	●	●							
			120408L-A3						0.8	●	●	●							
Non-ferrous metals	Finishing - Medium / Sharp edge	CNGG	120404AH	1	4	12.7	4.76	5.16	0.4	●	●	●							
			120408AH						0.8	●	●	●							
Non-ferrous metals	Medium - Roughing	CNMG	120404AH	1	4	12.7	4.76	5.16	0.4	●	●	●							
			120408AH						0.8	●	●	●							
Finishing	Sharp edge / Surface finish oriented	CNGG	090402R-S	2	4	9.525	4.76	3.81	0.2				●	●		●	●	●	D10 F132
			090402L-S						0.2				●	●		●	●	●	
			090404R-S						0.4				●	●		●	●	●	
			090404L-S						0.4			●	●	●		●	●	●	
			090408R-S						0.8				●				●		
			090408L-S						0.8				●				●		
Medium		CNGG	090404L	2	4	9.525	4.76	3.81	0.4			●							
			090408L						0.8			●							
Medium		CNGG	120404R	3	4	12.7	4.76	5.16	0.4				●	●	●	●	●	●	
			120404L						0.4				●	●	●	●	●	●	
			120408R						0.8				●	●	●	●	●	●	
			120408L						0.8				●	●	●		●	●	
Medium - Roughing	Low cutting force	CNGG	120404R-25R	3	4	12.7	4.76	5.16	0.4				●	●		●	●	●	D8~D10 F118 F131 F132
			120404L-25R						0.4				●	●		●	●	●	
			120408R-25R						0.8				●	●			●	●	
			120408L-25R						0.8				●	●			●	●	
Medium - Roughing		CNGG	120404Z	3	4	12.7	4.76	5.16	0.4							●			

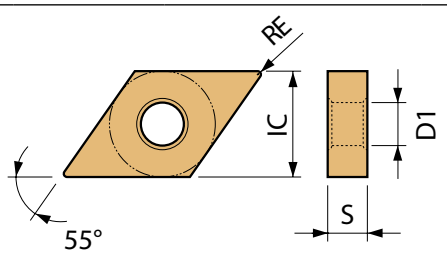
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

55° Rhombic

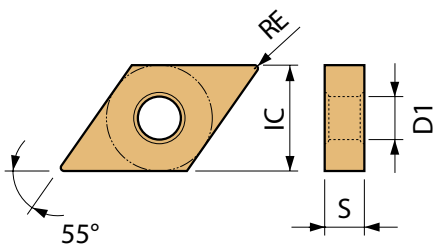
How to read pages of "Turning inserts" See page B15



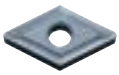
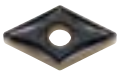
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55° Rhombic

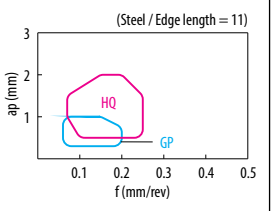
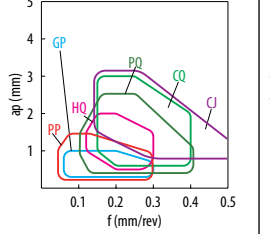
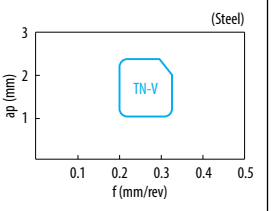
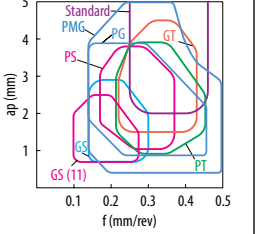
How to read pages of "Turning inserts" See page B15



Workpiece	
Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Carbide CVD CA025P	CA115P	CA125P	CA510	CA515	CA525	CA530	CA6515	CA6525	Carbide PVD PR1535	Cermet CVD CCX	Cermet PVD PV710	PV720	PV730	Cermet - TN60	TN610	TN620	Applicable toolholder
Finishing - Medium		DNMG	110402HQ 110404HQ	1	4	9.525	4.76	3.81	0.2 0.4	● ●	● ●	● ●		●	●	●				●		●	●			●	D16 F120, F134
		DNMG	150404HQ 150408HQ 150412HQ	2	4	12.7	4.76	5.16	0.4 0.8 1.2	● ● ●	● ● ●	● ● ●	● ●	● ●	● ●	● ●	● ●	● ●	●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	D13~D17 F120, F136 F138~F140
		DNMG	150604HQ 150608HQ 150612HQ	2	4	12.7	6.35	5.16	0.4 0.8 1.2	● ● ●	● ● ●	● ● ●	● ●	● ●	● ●	● ●	● ●	● ●	●	● ● ●	● ● ●			● ● ●			D13~D17
Finishing - Medium	 Up facing	DNMG	150404CQ 150408CQ 150412CQ	2	4	12.7	4.76	5.16	0.4 0.8 1.2	● ● ●	● ● ●	● ● ●	● ●	● ●	● ●	● ●					● ● ●	● ● ●	● ● ●		● ● ●	● ● ●	D13~D17 F120, F136 F138~F140
		DNMG	150604CQ 150608CQ 150612CQ	2	4	12.7	6.35	5.16	0.4 0.8 1.2	● ● ●	● ● ●	● ● ●	● ●	● ●	● ●	● ●					●				●		D13~D17
Finishing - Medium	 Up facing	DNMG	150408CJ 150412CJ	2	4	12.7	4.76	5.16	0.8 1.2	● ●	● ●	● ●		● ●	● ●												D13~D17 F120, F136 F138~F140
		DNMG	150608CJ 150612CJ	2	4	12.7	6.35	5.16	0.8 1.2	● ●	● ●	● ●	● ●	● ●	● ●												D13~D17
Medium		DNMG	150404TN-V 150408TN-V	3	4	12.7	4.76	5.16	0.4 0.8															● ●			D13~D17 F120, F136 F138~F140
Medium - Roughing		DNMG	150404PMG 150408PMG 150412PMG 150416PMG	4	4	12.7	4.76	5.16	0.4 0.8 1.2 1.6		● ● ● ●	● ● ● ●														D13~D17 F120, F136 F138~F140
		DNMG	150604PMG 150608PMG 150612PMG 150616PMG	4	4	12.7	6.35	5.16	0.4 0.8 1.2 1.6		● ● ● ●	● ● ● ●														D13~D17
Medium - Roughing		DNMG	110404GS 110408GS	4	4	9.525	4.76	3.81	0.4 0.8	● ●	● ●	● ●		● ●	● ●	● ●					● ●	● ●	● ●	● ●		● ●	D16 F120, F134
		DNMG	150404GS 150408GS 150412GS	4	4	12.7	4.76	5.16	0.4 0.8 1.2	● ● ●				● ● ●	● ● ●	● ● ●					● ●	● ●				● ●	D13~D17 F120, F136 F138~F140
		DNMG	150604GS 150608GS	4	4	12.7	6.35	5.16	0.4 0.8	● ●					● ●												D13~D17

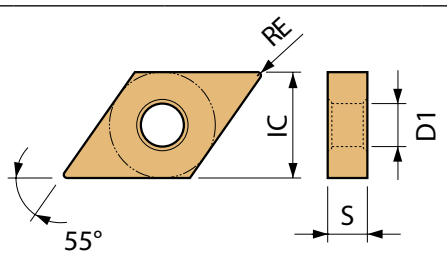
Applicable chipbreaker range

1	2	3	4
			

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

55° Rhombic

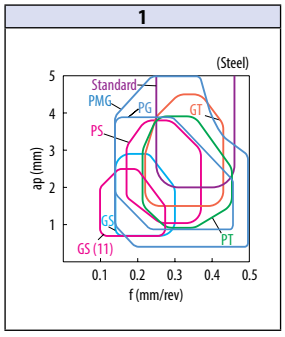
How to read pages of "Turning inserts" See page B15



Free-cutting steel		P
Carbon steel / Alloy steel		P
Stainless steel		M
Gray cast iron		K
Nodular cast iron		K
Non-ferrous metals		N
Heat-resistant alloy		S
Titanium alloy		S
Hard materials		H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm)				Carbide									Cermet				Applicable toolholder
						IC	S	D1	RE	CVD								PVD	PVD		-		
										CA025P	CA115P	CA125P	CA510	CA515	CA525	CA530	CA6515	CA6525	PR1535	PV710	PV720	PV730	TN610	TN620	
Medium - Roughing		DNMG	150404PG 150408PG 150412PG 150416PG	1	4	12.7	4.76	5.16	0.4 0.8 1.2 1.6	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●			● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	D13~D17 F120, F136 F138~F140
		DNMG	150604PG 150608PG 150612PG 150616PG	1	4	12.7	6.35	5.16	0.4 0.8 1.2 1.6	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●			● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	D13~D17
Medium - Roughing		DNMG	150404PS 150408PS 150412PS	1	4	12.7	4.76	5.16	0.4 0.8 1.2	● ● ●		● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●			● ●		● ●	● ●	D13~D17 F120, F136 F138~F140
		DNMG	150604PS 150608PS 150612PS 150616PS	1	4	12.7	6.35	5.16	0.4 0.8 1.2 1.6	● ● ● ●		● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●								D13~D17
Medium - Roughing	 High feed	DNMG	150408PT 150412PT	1	4	12.7	4.76	5.16	0.8 1.2	● ●		● ●	● ●	● ●	● ●	● ●	● ●								D13~D17 F120, F136 F138~F140
		DNMG	150608PT 150612PT	1	4	12.7	6.35	5.16	0.8 1.2	● ●		● ●	● ●	● ●	● ●	● ●	● ●								D13~D17
Medium - Roughing	 High feed	DNMG	150408GT 150412GT	1	4	12.7	4.76	5.16	0.8 1.2	● ●			● ●	● ●	● ●										D13~D17 F120, F136 F138~F140
		DNMG	150608GT 150612GT	1	4	12.7	6.35	5.16	0.8 1.2	● ●			● ●	● ●	● ●										D13~D17

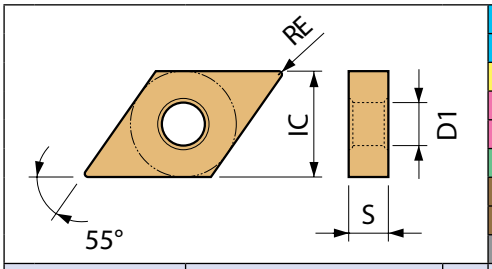
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

55° Rhombic

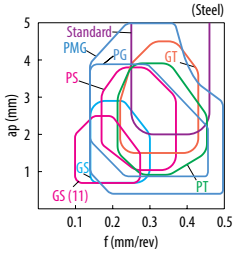
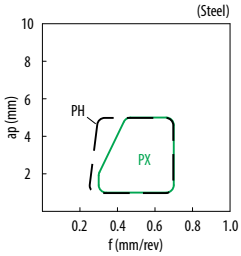
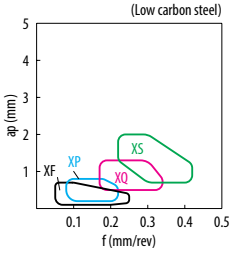
How to read pages of "Turning inserts" See page B15



Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Carbide CVD CA025P	CA115P	CA125P	CA310	CA315	CA320	CA4505	CA4515	CA510	CA515	CA525	CA530	Cermet CVD CCX	PVD PV7005	PV710	PV720	PV730	- TN60	TN610	TN620	Applicable toolholder
Roughing		DNMG	150404 150408 150412	1	4	12.7	4.76	5.16	0.4 0.8 1.2	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●		● ● ●	● ● ●	● ● ●		● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	D13~D17 F120, F136 F138~F140
		DNMG	150604 150608 150612	1	4	12.7	6.35	5.16	0.4 0.8 1.2	 ● ●	 ● ●	 ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	 ● ●	 ● ●	 ● ●	 ● ●									D13~D17
Roughing		DNMG	150408PH 150412PH 150416PH	2	4	12.7	4.76	5.16	0.8 1.2 1.6	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●										D13~D17 F120, F136 F138~F140
		DNMG	150608PH 150612PH 150616PH	2	4	12.7	6.35	5.16	0.8 1.2 1.6	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	 	● 	● ● ●	● ● ●	● ● ●										D13~D17
Roughing	High feed / Single-sided	DNMM	150408PX 150412PX 150416PX	2	2	12.7	4.76	5.16	0.8 1.2 1.6	● ● ●	● ● ●	● ● ●	 	 	 	 	 	 	● 	● ●										D13~D17 F120, F136 F138~F140
		DNMM	150608PX 150612PX 150616PX	2	2	12.7	6.35	5.16	0.8 1.2 1.6	● ● ●	● ● ●	● ● ●	 	 	 	 	 	 	● ● ●	● ● ●										D13~D17
Low carbon steel	Finishing / Minute ap	DNMG	150404XF 150408XF	3	4	12.7	4.76	5.16	0.4 0.8	 	 	 	 	 	 	 	 	 	 	 	● ●	● ●	● ●	● ●	 	 	● ●	● ●	D13~D17 F120, F136 F138~F140
		DNMG	150404XP 150408XP	3	4	12.7	4.76	5.16	0.4 0.8	● ● ●	● ● ●	● ● ●	 	 	 	 	 	● ● ●	● ● ●	● ● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●	
Low carbon steel	Finishing	DNMG	150604XP 150608XP	3	4	12.7	6.35	5.16	0.4 0.8	 	 	 	 	 	 	 	 	 	 	 	● ●	● ●	 	 	 	 	● ●	 	D13~D17
Low carbon steel	Medium	DNMG	150404XQ 150408XQ	3	4	12.7	4.76	5.16	0.4 0.8	● ● ●	● ● ●	● ● ●	 	 	 	 	 	● ● ●	● ● ●	● ● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●	D13~D17 F120, F136 F138~F140
Low carbon steel	Roughing	DNMG	150408XS	3	4	12.7	4.76	5.16	0.8	● ● ●	● ● ●	● ● ●	 	 	 	 	 	● ● ●	● ● ●	● ● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●	

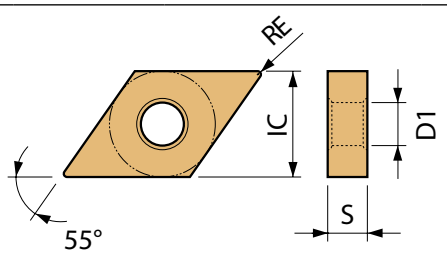
Applicable chipbreaker range

1	2	3
		

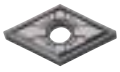
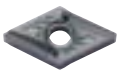
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

55° Rhombic

How to read pages of "Turning inserts" See page B15

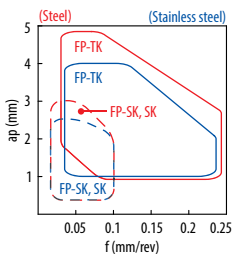
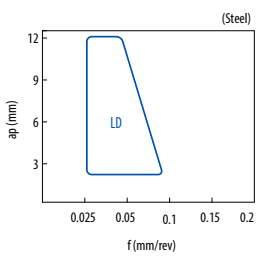
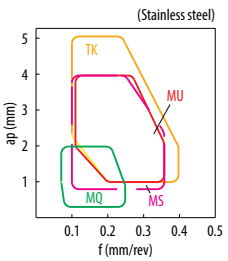


Free-cutting steel																			P
Carbon steel / Alloy steel																			P
Stainless steel	●	●			○	○	○	●	○										M
Gray cast iron																			K
Nodular cast iron																			K
Non-ferrous metals																			N
Heat-resistant alloy	○	○	●	○	●		✖												S
Titanium alloy							●		○										S
Hard materials																			H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Carbide CVD CA6515	CA6525	PVD PR0055	PR1155	PR1205	PR1225	PR1535	PR1725	- SW05	Cermet PVD PV730	Applicable toolholder
Finishing - Medium	 Polished / Sharp edge	DNGG	150402MFP-SK 150404MFP-SK	1	4	12.7	4.76	5.16	< 0.2 < 0.4				● ●	● ●	● ●	● ●	● ●		● ●	D13~D17 F120, F136 F138~F140
Large ap		DNMG	150402R-LD 150404R-LD	2	4	12.7	4.76	5.16	0.2 0.4						● ●	● ●				
Medium - Roughing	 Polished / Sharp edge	DNGG	150404FP-TK 150408FP-TK	1	4	12.7	4.76	5.16	0.4 0.8						● ●	● ●	● ●			
Stainless steel / Heat-resistant alloys	 Medium - Roughing / Sharp edge	DNGG	150404TK 150408TK	3	4	12.7	4.76	5.16	0.4 0.8									● ●		
	 Medium - Roughing	DNMG	150404TK 150408TK	3	4	12.7	4.76	5.16	0.4 0.8	● ●	● ●					● ●				
		DNMG	150604TK 150608TK	3	4	12.7	6.35	5.16	0.4 0.8	● ●	● ●					● ●				D13~D17
	 Finishing - Medium	DNMG	150404MQ 150408MQ	3	4	12.7	4.76	5.16	0.4 0.8	● ●	● ●	● ●	● ●	● ●		● ●		● ●		D13~D17 F120, F136 F138~F140
		DNMG	150604MQ 150608MQ	3	4	12.7	6.35	5.16	0.4 0.8	● ●	● ●	● ●	● ●	● ●		● ●		● ●		D13~D17

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

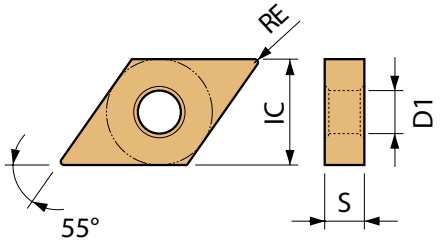
Applicable chipbreaker range

1	2	3
		Heat-Resistant Alloys Titanium Alloys See page B8 

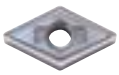
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

55° Rhombic

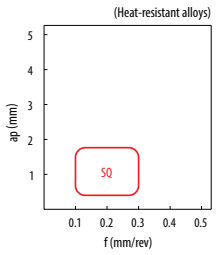
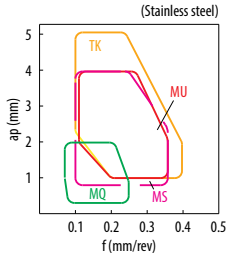
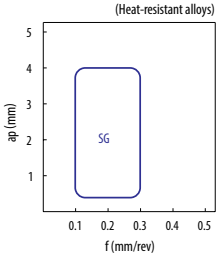
How to read pages of "Turning inserts" See page B15



Free-cutting steel																			P
Carbon steel / Alloy steel																			P
Stainless steel	●	◕			○	◔	◕												M
Gray cast iron																			K
Nodular cast iron																			K
Non-ferrous metals																			N
Heat-resistant alloy	○	◔	●	○	◕	✖													S
Titanium alloy						◕	◔												S
Hard materials																			H

	Insert	Description	Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Carbide CVD CA6515	CVD CA6525	PVD PR0055	PVD PR1155	PVD PR1205	PVD PR1535	- SW05	Applicable toolholder
Heat-resistant alloys	 Finishing - Medium	DNMG 150404SQ 150408SQ 150412SQ	1	4	12.7	4.76	5.16	0.4 0.8 1.2			● ● ●	● ● ●	● ● ●			D13~D17 F120, F136 F138~F140
		DNMG 150604SQ 150608SQ 150612SQ	1	4	12.7	6.35	5.16	0.4 0.8 1.2			● ● ●	● ● ●	● ● ●			D13~D17
Stainless steel / Heat-resistant alloys	 Medium - Roughing	DNMG 150404MS 150408MS 150412MS	2	4	12.7	4.76	5.16	0.4 0.8 1.2	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	D13~D17 F120, F136 F138~F140
		DNMG 150604MS 150608MS 150612MS	2	4	12.7	6.35	5.16	0.4 0.8 1.2	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●		D13~D17
	 Medium - Roughing	DNMG 150404MU 150408MU	2	4	12.7	4.76	5.16	0.4 0.8	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	D13~D17 F120, F136 F138~F140
		DNMG 150604MU 150608MU	2	4	12.7	6.35	5.16	0.4 0.8	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	D13~D17
Heat-resistant alloys	 Roughing	DNMG 150408SG 150412SG	3	4	12.7	4.76	5.16	0.8 1.2			● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	D13~D17 F120, F136 F138~F140
		DNMG 150608SG 150612SG	3	4	12.7	6.35	5.16	0.8 1.2			● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	D13~D17

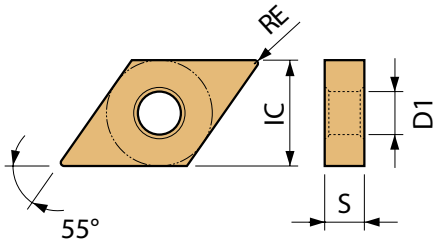
Applicable chipbreaker range

1	2	3
	Heat-Resistant Alloys Titanium Alloys See page B8 	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

55° Rhombic

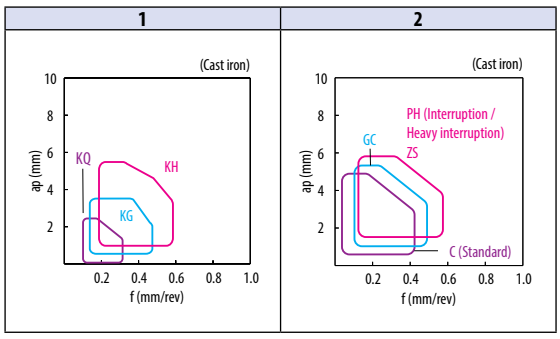
How to read pages of "Turning inserts" See page B15



Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Carbide CVD CA310	CA315	CA320	CA4505	CA4515	Applicable toolholder
Cast iron	 Sharp cutting oriented	DNMG	150404KQ 150408KQ	1	4	12.7	4.76	5.16	0.4 0.8	● ●	● ●	● ●			D13~D17 F120, F136 F138~F140
		DNMG	150604KQ 150608KQ	1	4	12.7	6.35	5.16	0.4 0.8	● ●	● ●	● ●			D13~D17
Cast iron	 Roughing	DNMG	150404KG 150408KG 150412KG	1	4	12.7	4.76	5.16	0.4 0.8 1.2	● ● ●	● ● ●	● ● ●			D13~D17 F120, F136 F138~F140
		DNMG	150604KG 150608KG 150612KG	1	4	12.7	6.35	5.16	0.4 0.8 1.2	● ● ●	● ● ●	● ● ●			D13~D17
Cast iron	 Roughing	DNMG	150408KH 150412KH	1	4	12.7	4.76	5.16	0.8 1.2	● ●	● ●	● ●			D13~D17 F120, F136 F138~F140
		DNMG	150608KH 150612KH	1	4	12.7	6.35	5.16	0.8 1.2	● ●	● ●	● ●			D13~D17
Cast iron	 Roughing	DNMG	150404C 150408C 150412C	2	4	12.7	4.76	5.16	0.4 0.8 1.2	● ● ●	● ● ●	● ● ●		● ● ●	D13~D17 F120, F136 F138~F140
		DNMG	150604C 150608C 150612C	2	4	12.7	6.35	5.16	0.4 0.8 1.2	● ● ●	● ● ●	● ● ●		● ●	D13~D17
Cast iron	 Roughing	DNMG	150408ZS 150412ZS	2	4	12.7	4.76	5.16	0.8 1.2	● ●	● ●	● ●	● ●	● ●	D13~D17 F120, F136 F138~F140
		DNMG	150608ZS 150612ZS	2	4	12.7	6.35	5.16	0.8 1.2	● ●	● ●	● ●	● ●	● ●	D13~D17
Cast iron	 Roughing	DNMG	150408GC 150412GC	2	4	12.7	4.76	5.16	0.8 1.2	● ●	● ●	● ●		● ●	D13~D17 F120, F136 F138~F140
		DNMG	150608GC 150612GC	2	4	12.7	6.35	5.16	0.8 1.2	● ●	● ●	● ●		●	D13~D17

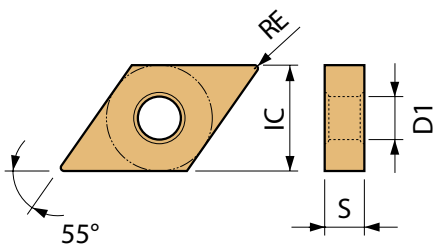
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

55° Rhombic

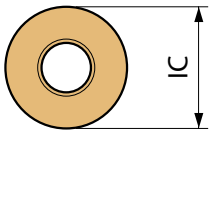
How to read pages of "Turning inserts" See page B15

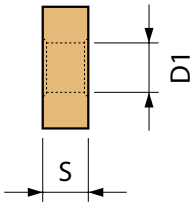


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Round

How to read pages of "Turning inserts" See page B15

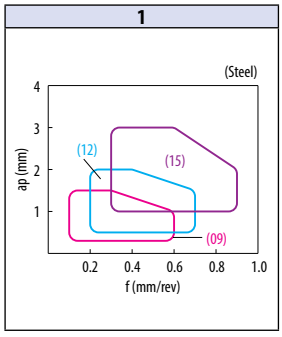




Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert		Description	Applicable chipbreaker range	Dimension (mm)			Carbide								Cermet				Applicable toolholder
				IC	S	D1	CVD								PVD		-		
							CA025P	CA115P	CA125P	CA310	CA315	CA320	CA515	CA525	CA530	PV7005	PV720	TN60	TN620	
Medium - Roughing		RNMG 090300	1	9.525	3.18	3.81	●	●	●				●	●			●	●	●	D42
		RNMG 120400	1	12.7	4.76	5.16	●	●	●	●	●	●	●	●	●	●	●	●	●	
		RNMG 150600	1	15.875	6.35	6.35	●	●	●	●	●	●		●						-

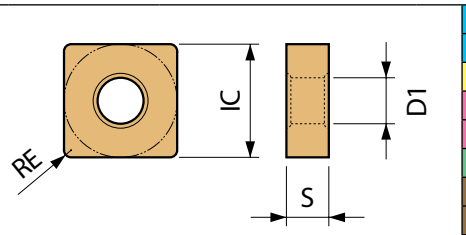
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

90° Square

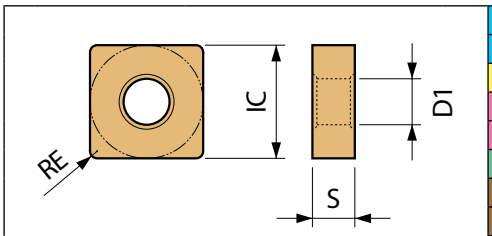
How to read pages of "Turning inserts" See page B15



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90° Square

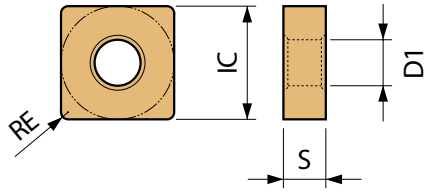
How to read pages of "Turning inserts" See page B15



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90° Square

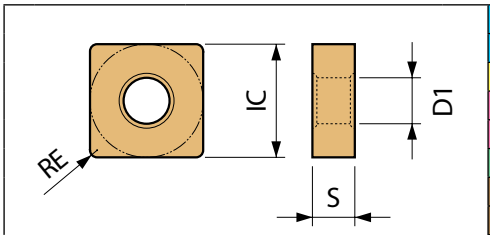
How to read pages of "Turning inserts" See page B15



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90° Square

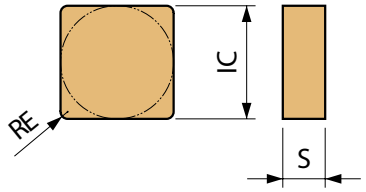
How to read pages of "Turning inserts" See page B15



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90° Square

How to read pages of "Turning inserts" See page B15



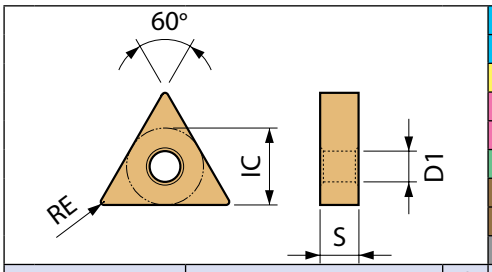
Workpiece		
Free-cutting steel		P
Carbon steel / Alloy steel		P
Stainless steel		M
Gray cast iron	● ● ❄	K
Nodular cast iron	○ ● ✖	K
Non-ferrous metals		N
Heat-resistant alloy		S
Titanium alloy		S
Hard materials		H

Insert		Description	Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	RE	Carbide CVD CA310	CA315	CA320	Applicable toolholder
Cast iron	 Without chipbreaker	SNMN 120408 120412	-	8	12.7	4.76	0.8 1.2	● ●	● ●	● ●	D52~D54 D63 D64

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

60° Triangle

How to read pages of "Turning inserts" See page B15

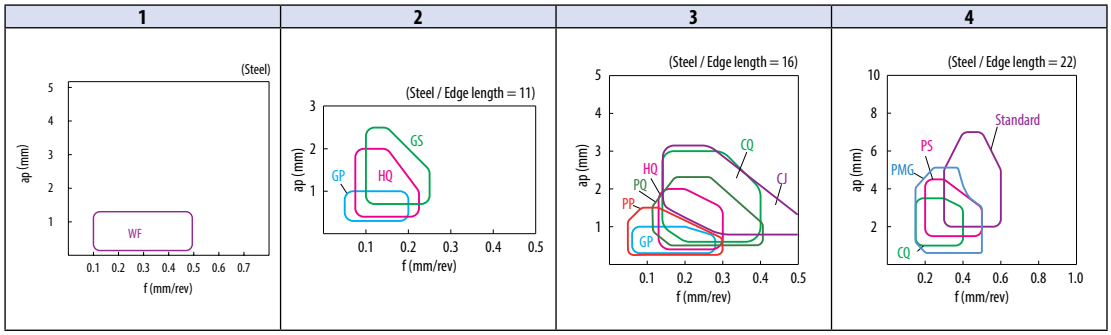


Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Carbide CVD CA025P	CA115P	CA125P	CA510	CA515	CA525	CA530	CA6515	CA6525	PVD CVD PR1535	Cermet CVD CCX	PVD PV710	PV720	PV730	- TN60	TN610	TN620	Applicable toolholder
Finishing	 With Wiper Edge	TNMX	160404WF	1	6	9.525	4.76	3.81	0.4	●	●	●	●	●	●	●					●	●			●	●	D22~D25
			160408WF						0.8	●	●	●	●	●	●	●					●	●			●	●	F122
			160412WF						1.2	●	●	●	●	●	●	●					●	●			●	●	F143
Finishing		TNMG	160402PP	3	6	9.525	4.76	3.81	0.2	●	●	●	●	●	●	●				●	●	●	●			●	●	D22~D25
			160404PP						0.4	●	●	●	●	●	●	●				●	●	●	●			●	●	D27, D28
			160408PP						0.8	●	●	●	●	●	●	●				●	●	●	●			●	●	F122
			160412PP						1.2	●	●	●			●	●				●	●	●	●			●	●	F143 F144
Finishing		TNMG	110404GP	2	6	6.35	4.76	2.26	0.4												●	●	●			●	D24, D25
			110408GP						0.8												●	●	●			●	F144
		TNMG	160402GP	3	6	9.525	4.76	3.81	0.2	●	●	●	●	●	●	●				●	●	●	●	●	●	●	D22~D25
			160404GP						0.4	●	●	●	●	●	●	●				●	●	●	●	●	●	●	D27, D28
			160408GP						0.8	●	●	●	●	●	●	●				●	●	●	●	●	●	●	F122
Finishing - Medium		TNMG	160404PQ	3	6	9.525	4.76	3.81	0.4	●	●	●	●	●	●	●				●	●	●	●			●	●	F143
			160408PQ						0.8	●	●	●	●	●	●	●				●	●	●	●			●	●	F144
			160412PQ						1.2	●	●	●			●	●				●	●	●	●			●	●	
Finishing - Medium		TNMG	110404HQ	2	6	6.35	4.76	2.26	0.4	●	●	●			●	●				●		●	●	●		●	D24, D25
			110408HQ						0.8	●	●	●	●	●	●	●				●		●	●	●		●	F144
		TNMG	160404HQ	3	6	9.525	4.76	3.81	0.4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	D22~D25
			160408HQ						0.8	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	D27, D28
			160412HQ						1.2	●	●	●	●	●	●	●				●		●	●	●		●	F122
Finishing - Medium	 Up facing	TNMG	160404CQ	3	6	9.525	4.76	3.81	0.4	●	●	●	●	●	●	●				●	●	●	●	●	●	●	F143
			160408CQ						0.8	●	●	●	●	●	●	●				●	●	●	●	●	●	●	F144
			160412CQ						1.2	●	●	●	●	●	●	●						●	●	●		●	
		TNMG	220408CQ	4	6	12.7	4.76	5.16	0.8	●	●	●	●	●	●	●											D24, D25
			220412CQ						1.2	●	●	●			●	●											F143

See "Precautions when using Wiper inserts" in the **R34** and **R35** for WF chipbreaker.

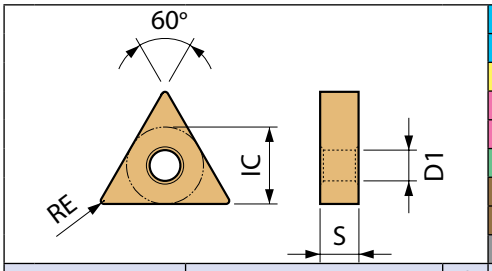
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

60° Triangle

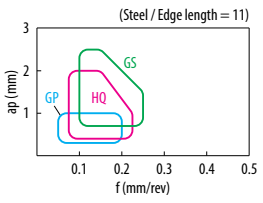
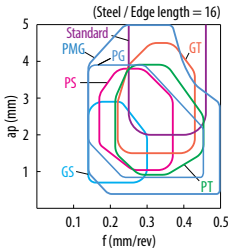
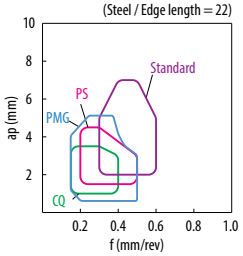
How to read pages of "Turning inserts" See page B15



Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert		Description	Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Carbide CVD CA025P	CA115P	CA125P	CA510	CA515	CA525	CA530	CA6515	CA6525	Carbide PVD PR1535	Cermet PVD PV710	PV720	PV730	Cermet - TN60	TN610	TN620	Applicable toolholder
Medium - Roughing		TNMG 160404PMG 160408PMG 160412PMG	2	6	9.525	4.76	3.81	0.4 0.8 1.2	● ● ●	● ● ●															D22~D25 D27, D28 F122,F143 F144
		TNMG 220404PMG 220408PMG 220412PMG 220416PMG	3	6	12.7	4.76	5.16	0.4 0.8 1.2 1.6	● ● ● ●	● ● ● ●															D24, D25 F143
Medium - Roughing		TNMG 110404GS 110408GS	1	6	6.35	4.76	2.26	0.4 0.8	● ●	● ●	● ●		● ●						● ●	● ●	●			●	D24, D25 F144
		TNMG 160404GS 160408GS	2	6	9.525	4.76	3.81	0.4 0.8	● ●			● ●	● ●	● ●	● ●				● ●	● ●				●	
Medium - Roughing		TNMG 160404PG 160408PG 160412PG	2	6	9.525	4.76	3.81	0.4 0.8 1.2	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●			● ● ●	● ● ●	● ● ●	● ● ●		● ● ●	● ● ●	D22~D25 D27, D28 F122 F143 F144
Medium - Roughing		TNMG 160404PS 160408PS 160412PS	2	6	9.525	4.76	3.81	0.4 0.8 1.2	● ● ●			● ● ●	● ● ●	● ● ●	● ● ●	● ● ●			● ● ●	● ● ●				●	
		TNMG 220404PS 220408PS 220412PS 220416PS	3	6	12.7	4.76	5.16	0.4 0.8 1.2 1.6	● ● ● ●			● ● ● ●	● ● ● ●	● ● ● ●	● ● ●	● ● ●									D24, D25 F143
Medium - Roughing	 High feed	TNMG 160408PT 160412PT	2	6	9.525	4.76	3.81	0.8 1.2	● ●			● ●	● ●	● ●	● ●	● ●									D22~D25 D27, D28 F122 F143 F144
Medium - Roughing	 High feed	TNMG 160408GT 160412GT	2	6	9.525	4.76	3.81	0.8 1.2	● ●			● ●	● ●	● ●	● ●										

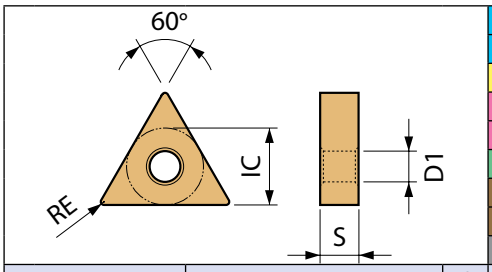
Applicable chipbreaker range

1	2	3
		

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

60° Triangle

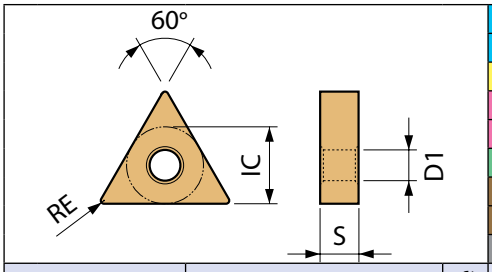
How to read pages of "Turning inserts" See page B15

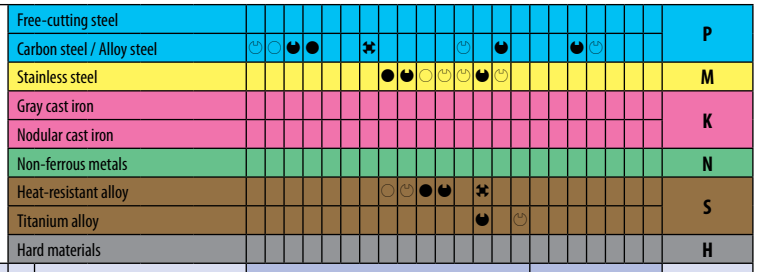


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60° Triangle

How to read pages of "Turning inserts" See page B15



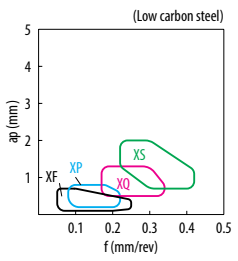


Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Carbide CVD CA025P	CA115P	CA125P	CA510	CA515	CA525	CA530	CA6515	CA6525	Carbide PVD PR115S	PR120S	PR1225	PR1535	PR1725	Carbide - SW05	Cermet CVD CCX	Cermet PVD PV710	PV720	PV730	Cermet - TN60	TN610	TN620	Applicable toolholder
Low carbon steel	 Finishing	TNMG	160404XP 160408XP	1	6	9.525	4.76	3.81	0.4 0.8	● ●	●	●		●	●										● ●	●	●		●	●	
Low carbon steel	 Medium	TNMG	160404XQ 160408XQ	1	6	9.525	4.76	3.81	0.4 0.8	● ●	●	●		●	●	●									● ●	●	●		●	●		D22~D25 D27, D28 F122 F143 F144
Low carbon steel	 Roughing	TNMG	160408XS	1	6	9.525	4.76	3.81	0.8	●	●	●		●	●	●											●	●	●		●	
Finishing - Medium	 Polished / Sharp edge	TNGG	160401MFP-SK 160402MFP-SK 160404MFP-SK	2	6	9.525	4.76	3.81	< 0.1 < 0.2 < 0.4										● ● ●	● ● ●	● ● ●	● ● ●	● ● ●				● ● ●					
Finishing - Medium		TNGG	160402M-SK 160404M-SK	2	6	9.525	4.76	3.81	< 0.2 < 0.4																		● ●	●	●			D22~D25 D27, D28 E64 F122 F143 F144
Large ap		TNMG	160402R-LD 160404R-LD	3	6	9.525	4.76	3.81	0.2 0.4													● ●	●									
Medium - Roughing	 Polished / Sharp edge	TNGG	160404FP-TK 160408FP-TK	2	6	9.525	4.76	3.81	0.4 0.8												● ●	● ●	● ●									
Stainless steel / Heat-resistant alloys	 Medium - Roughing / Sharp edge	TNGG	160404TK 160408TK	4	6	9.525	4.76	3.81	0.4 0.8															● ●								D22~D25 D27, D28 F122 F143 F144
Stainless steel / Heat-resistant alloys		TNMG	160404TK 160408TK	4	6	9.525	4.76	3.81	0.4 0.8								● ●	● ●				● ●										

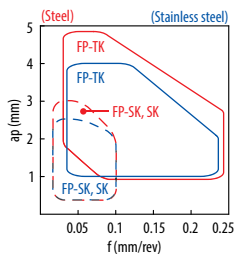
Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

Applicable chipbreaker range

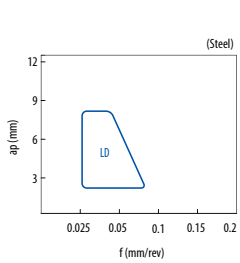
1



2

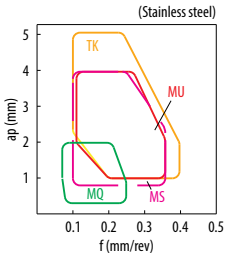


3



4

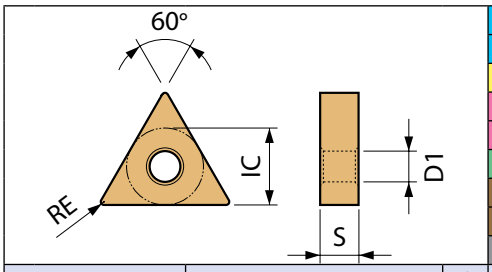
Heat-Resistant Alloys
Titanium Alloys
See page B8



● : Standard item R : Right-hand only L : Left-hand only ☐ : Check availability

60° Triangle

How to read pages of "Turning inserts" See page B15

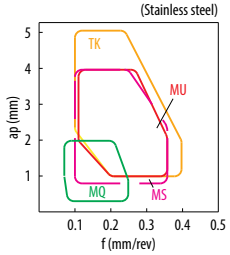


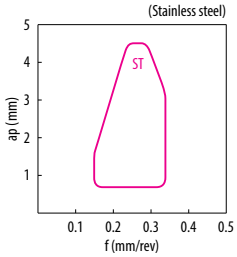
Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

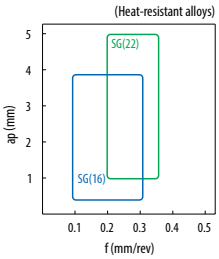
Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Carbide CVD CA025P	CA115P	CA125P	CA310	CA315	CA320	CA510	CA515	CA525	CA530	CA6515	CA6525	Carbide PVD PR005S	PR1155	PR1205	PR1535	Carbide - SW05	Cermet PVD PV710	PV720	Cermet - TN60	TN610	TN620	Applicable toolholder
Stainless steel / Heat-resistant alloys	Finishing - Medium	TNMG	160404MQ 160408MQ	1	6	9.525	4.76	3.81	0.4 0.8											●● ●●	●● ●●	● ●	● ●	● ●	● ●	● ●							
	Medium - Roughing	TNMG	160404MS 160408MS 160412MS	1	6	9.525	4.76	3.81	0.4 0.8 1.2											●● ●● ●●	●● ●● ●●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●							D22~D25 D27, D28 F122 F143 F144
	Medium - Roughing	TNMG	160404MU 160408MU	1	6	9.525	4.76	3.81	0.4 0.8											●● ●●	●● ●●	● ●	● ●	● ●	● ●	● ●							
Stainless steel	Medium - Roughing	TNMG	160404R-ST 160404L-ST 160408R-ST 160408L-ST	2	6	9.525	4.76	3.81	0.4 0.4 0.8 0.8	● ● ● ●	● ● ● ●	● ● ● ●				● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●			● ● ● ●			● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	D22~D25 D27, D28 F122 F143 F144
Heat-resistant alloys	Roughing	TNMG	160408SG 160412SG	3	6	9.525	4.76	3.81	0.8 1.2													●● ●●	●● ●●	●● ●●	●● ●●	● ●							
	Roughing	TNMG	220408SG 220412SG	3	6	12.7	4.76	5.16	0.8 1.2													●● ●●	●● ●●	●● ●●	●● ●●	● ●							D24, D25 F143
Cast iron	Sharp cutting oriented	TNMG	160404KQ 160408KQ	4	6	9.525	4.76	3.81	0.4 0.8				● ●	● ●	● ●																	
Cast iron	Roughing	TNMG	160404KG 160408KG 160412KG	4	6	9.525	4.76	3.81	0.4 0.8 1.2				● ● ●	● ● ●	● ● ●																	D22~D25 D27, D28 F122 F143 F144
Cast iron	Roughing	TNMG	160408KH 160412KH 160416KH	4	6	9.525	4.76	3.81	0.8 1.2 1.6				● ● ●	● ● ●	● ● ●																	

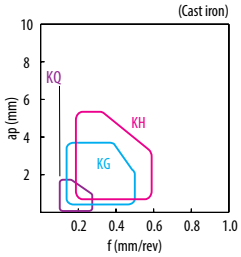
Applicable chipbreaker range

1	2	3	4
Heat-Resistant Alloys Titanium Alloys See page B8	(Stainless steel)	(Stainless steel)	(Heat-resistant alloys)	(Cast iron)





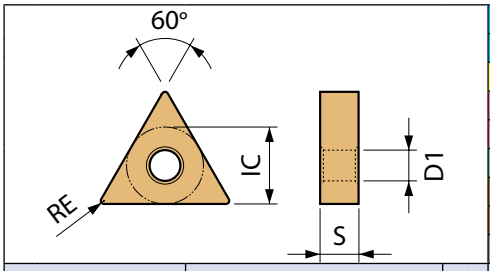




● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

60° Triangle

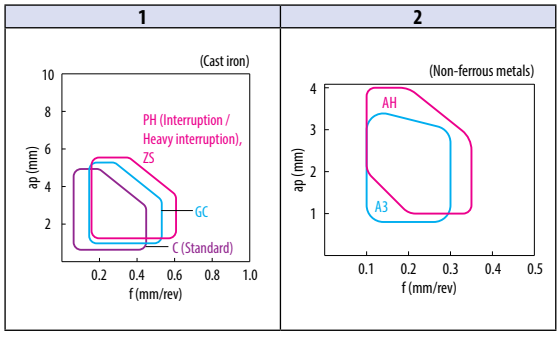
How to read pages of "Turning inserts" See page B15



Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Carbide CVD CA310	CA315	CA320	CA4505	CA4515	DLC PDL010	PDL025	- KW10	Cermet CVD CCX	PVD PV7005	PV7020	- TN60	TN620	Applicable toolholder
Cast iron	Roughing	TNMG	160404C 160408C 160412C	1	6	9.525	4.76	3.81	0.4 0.8 1.2	● ● ●	● ● ●	● ● ●	 ● ●	● ● ●									
Cast iron	Roughing	TNMG	160408ZS 160412ZS	1	6	9.525	4.76	3.81	0.8 1.2	● ●	● ●	● ●	● ●	● ●									D22~D25 D27, D28 F122 F143 F144
Cast iron	Roughing	TNMG	160408GC 160412GC	1	6	9.525	4.76	3.81	0.8 1.2	● ●	● ●	● ●	● 	● 									
Cast iron	Without chipbreaker	TNGA	110304	-	6	6.35	3.18	2.26	0.4								●						D24 D25
		TNGA	160404 160408	-	6	9.525	4.76	3.81	0.4 0.8								● ●		● ●				
		TNMA	160404 160408 160412 160416 160420	-	6	9.525	4.76	3.81	0.4 0.8 1.2 1.6 2	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ●				● ●	● ●	● ●	● ●	● ●	
Non-ferrous metals	Finishing - Medium / Sharp edge	TNGG	160404R-A3 160404L-A3 160408R-A3 160408L-A3	2	6	9.525	4.76	3.81	0.4 0.4 0.8 0.8						● ● ● ●	● ● ● ●	● ● ● ●						D22~D25 D27, D28 F122 F143 F144
Non-ferrous metals	Medium - Roughing / Sharp edge	TNGG	160404AH 160408AH	2	6	9.525	4.76	3.81	0.4 0.8						● ●	● ●	● ●						
Non-ferrous metals	Medium - Roughing	TNMG	160404AH 160408AH	2	6	9.525	4.76	3.81	0.4 0.8						● ●	● ●	● ●						

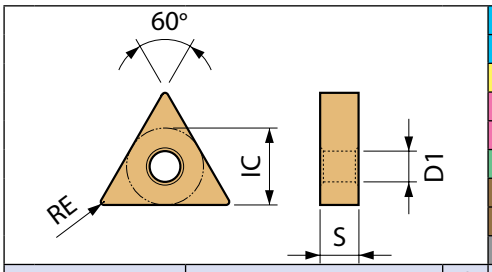
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

60° Triangle

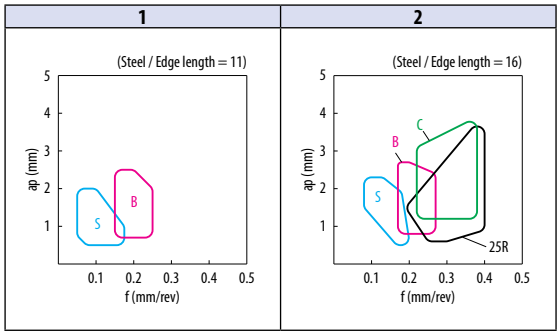
How to read pages of "Turning inserts" See page B15



Workpiece														
Free-cutting steel														P
Carbon steel / Alloy steel		●	◔		●	●	◔		●	●				P
Stainless steel	●	◔	◔											M
Gray cast iron				●	●									K
Nodular cast iron					○									K
Non-ferrous metals				✖										N
Heat-resistant alloy	●													S
Titanium alloy	●													S
Hard materials														H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm)				Carbide				Cermet						Applicable toolholder
						IC	S	D1	RE	PVD			-	PVD				-		
										PR1535	PR1725	PR930	KW10	PV7005	PV710	PV720	PV730	TN60	TN610	TN620
Finishing	Precision / Sharp edge	TNEG	160402R-SSF	2	6	9.525	4.76	3.81	0.2			●			●	●	●		●	●	D22~D25 D27, D28 F122 F143 F144
			160402L-SSF						0.2			●			●	●	●		●	●	
			160404R-SSF						0.4			●			●	●	●		●	●	
			160404L-SSF						0.4			●			●	●	●		●	●	
Finishing	Sharp edge / Surface finish oriented	TNGG	110402R-S	1	6	6.35	4.76	2.26	0.2				●					●			D24 D25 F144
			110402L-S						0.2				●					●			
			110404R-S						0.4									●			
			110404L-S						0.4									●			
			110408R-S						0.8									●			
			110408L-S						0.8									●			
		TNGG	160401R-S	2	6	9.525	4.76	3.81	0.1							●	●			●	D22~D25 D27, D28 F122 F143 F144
			160401L-S						0.1							●	●			●	
			160402R-S						0.2	●	●	●		●	●	●	●	●	●	●	
			160402L-S						0.2	●	●	●		●	●	●	●	●	●	●	
			160404R-S						0.4	●	●	●		●	●	●	●	●	●	●	
			160404L-S						0.4	●	●	●		●	●	●	●	●	●	●	
			160408R-S						0.8	●	●	●			●	●	●	●	●	●	
			160408L-S						0.8	●	●	●			●	●	●	●	●	●	
Finishing - Medium		TNGG	110302R-B	1	6	6.35	3.18	2.26	0.2				●		●	●		●	●	●	D24 D25
			110302L-B						0.2				●		●	●		●	●	●	
			110304R-B						0.4				●		●	●		●	●	●	
			110304L-B						0.4				●		●	●		●	●	●	
		TNGG	160304R-B	2	6	9.525	3.18	3.81	0.4									●			-
		TNGG	160402R-B	2	6	9.525	4.76	3.81	0.2			●	●		●	●	●	●	●	●	D22~D25 D27, D28 F122 F143 F144
			160402L-B						0.2			●	●		●	●	●	●	●	●	
			160404R-B						0.4			●		●	●	●	●	●	●	●	
			160404L-B						0.4			●		●	●	●	●	●	●	●	
			160408R-B						0.8						●	●	●	●	●	●	
			160408L-B						0.8						●	●	●	●	●	●	

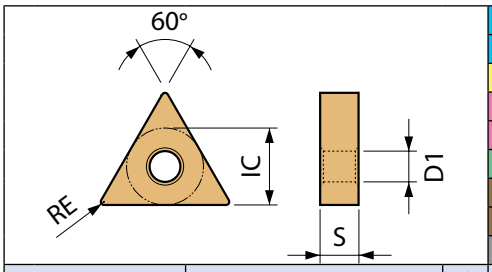
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

60° Triangle

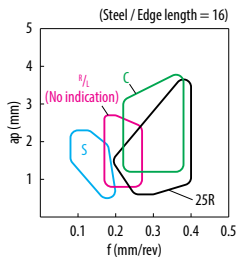
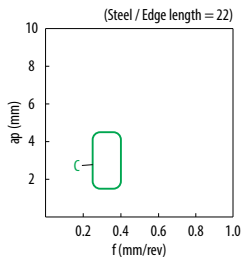
How to read pages of "Turning inserts" See page B15



Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Carbide PVD PR1535	Carbide PVD PR930	Carbide - KW10	Cermet PVD PV7005	Cermet PVD PV710	Cermet PVD PV720	Cermet PVD PV730	Cermet - TN60	Cermet - TN610	Cermet - TN620	Applicable toolholder
Medium - Roughing		TNGG	160402R-C	1	6	9.525	4.76	3.81	0.2						●	●			●	D22~D25 D27, D28 F122 F143 F144
			160402L-C						0.2						●	●			●	
			160404R-C						0.4			●	●	●	●	●	●	●	●	
			160404L-C						0.4			●	●	●	●	●	●	●	●	
			160408R-C						0.8			●	●	●	●	●	●	●	●	
			160408L-C						0.8			●	●	●	●	●	●	●	●	
			160412R-C						1.2				●	●	●	●	●	●	●	
			160412L-C						1.2				●	●	●	●	●	●	●	
		TNGG	220404R-C	2	6	12.7	4.76	5.16	0.4						●		●		●	D24 D25 F143
			220404L-C						0.4						●		●		●	
			220408R-C						0.8						●		●		●	
			220408L-C						0.8						●		●		●	
		TNMG	160404R-C	1	6	9.525	4.76	3.81	0.4					●	●	●	●	●	●	D22~D25 D27, D28 F122 F143 F144
			160404L-C						0.4					●	●	●	●	●	●	
			160408R-C						0.8					●	●	●	●	●	●	
			160408L-C						0.8					●	●	●	●	●	●	
			160412R-C						1.2								●			
Medium - Roughing		TNGG	110402R	1	6	6.35	4.76	2.26	0.2								●			D24 D25 F144
			110404R						0.4								●			
			110404L						0.4								●			
			110408R						0.8								●			
Medium - Roughing	 Low cutting force	TNGG	160404R-25R	1	6	9.525	4.76	3.81	0.4	●	●	●		●	●	●	●	●	●	D22~D25 D27, D28 F122 F143 F144
			160404L-25R						0.4	●	●	●		●	●	●	●	●	●	
			160408R-25R						0.8	●	●	●		●	●	●	●	●	●	
			160408L-25R						0.8	●	●	●		●	●	●	●	●	●	

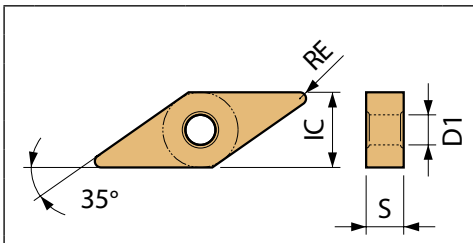
Applicable chipbreaker range

1	2
	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

35° Rhombic

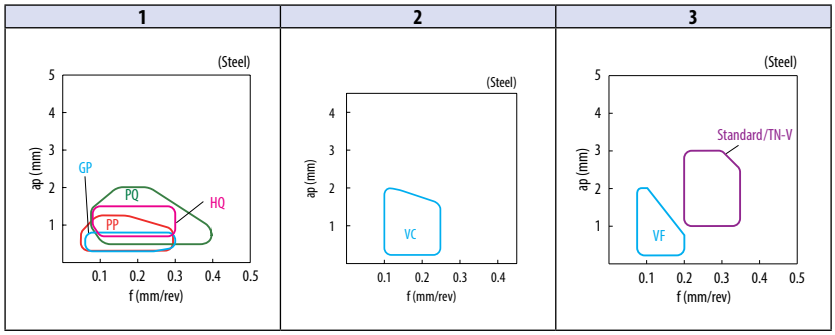
How to read pages of "Turning inserts" See page B15



Free-cutting steel		P
Carbon steel / Alloy steel	◔ ○ ● ● ✖ ● ● ● ● ◔ ● ●	P
Stainless steel	● ●	M
Gray cast iron	● ● ◎ ● ●	K
Nodular cast iron	○ ● ✖ ○ ○	K
Non-ferrous metals		N
Heat-resistant alloy	○ ◔	S
Titanium alloy		S
Hard materials		H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Carbide CVD CA025P	CA115P	CA125P	CA310	CA315	CA320	CA4505	CA4515	CA510	CA515	CA525	CA530	CA6515	CA6525	Cermet CVD CCX	PVD PV7005	PV710	PV720	PV730	- TN60	TN610	TN620	Applicable toolholder
Finishing		VNMG	160402PP	1	4	9.525	4.76	3.81	0.2	●	●	●						●	●	●	●			●		●	●			●	●	
			160404PP						0.4	●	●	●						●	●	●	●			●		●	●			●	●	
			160408PP						0.8	●	●	●						●	●	●	●			●		●	●			●	●	
			160412PP						1.2	●	●	●								●				●		●	●			●	●	
Finishing		VNMG	160402GP	1	4	9.525	4.76	3.81	0.2	●	●	●							●	●	●				●		●	●			●	●	
			160404GP						0.4	●	●	●						●	●	●	●			●		●	●			●	●	
			160408GP						0.8	●	●	●						●	●	●	●			●		●	●			●	●	
Finishing - Medium		VNMG	160404R-VC	2	4	9.525	4.76	3.81	0.4	●	●	●						●	●	●	●			●		●	●			●	●	
			160404L-VC						0.4	●	●	●						●	●	●	●			●		●	●			●	●	
			160408R-VC						0.8	●	●	●						●	●	●	●			●		●	●			●	●	
			160408L-VC						0.8	●	●	●						●	●	●	●			●		●	●			●	●	
			160412R-VC						1.2	●	●	●						●	●	●	●			●		●	●			●	●	
			160412L-VC						1.2	●	●	●						●	●	●	●			●		●	●			●	●	
Finishing - Medium		VNMG	160404VF	3	4	9.525	4.76	3.81	0.4	●	●	●						●	●	●	●			●		●	●			●	●	
			160408VF						0.8	●	●	●						●	●	●	●			●		●	●			●	●	
			160412VF						1.2	●	●	●								●	●						●	●			●	D30~D39
Finishing - Medium		VNMG	160404PQ	1	4	9.525	4.76	3.81	0.4	●	●	●						●	●	●	●			●		●	●			●	●	
			160408PQ						0.8	●	●	●						●	●	●	●			●		●	●			●	●	
			160412PQ						1.2	●	●	●						●	●	●	●			●		●	●			●	●	
Finishing - Medium		VNMG	160404HQ	1	4	9.525	4.76	3.81	0.4	●	●	●						●	●	●	●			●		●	●		●	●	●	
			160408HQ						0.8	●	●	●						●	●	●	●			●		●	●		●	●	●	
			160412HQ						1.2	●	●	●						●	●	●	●			●		●	●			●	●	
Medium		VNMG	160404TN-V	3	4	9.525	4.76	3.81	0.4																				●			
			160408TN-V						0.8																				●			
Roughing		VNMG	160404	3	4	9.525	4.76	3.81	0.4	●	●	●	●	●	●	●	●	●	●	●	●	●	●			●	●	●	●	●	●	
			160408						0.8	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	

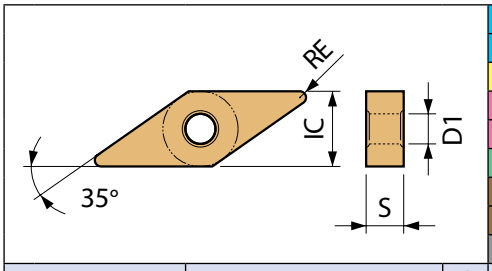
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

35° Rhombic

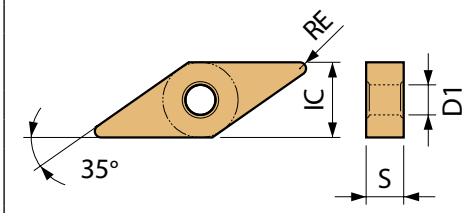
How to read pages of "Turning inserts" See page B15



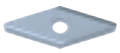
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35° Rhombic

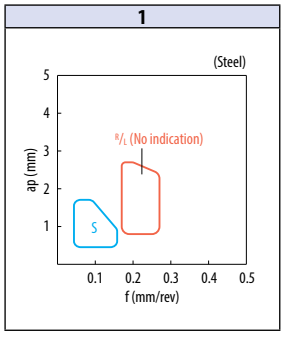
How to read pages of "Turning inserts" See page B15



Free-cutting steel												P
Carbon steel / Alloy steel		○			●	◓	○		●	◓		P
Stainless steel	◓	○										M
Gray cast iron			❄	●								K
Nodular cast iron				○								K
Non-ferrous metals			✖									N
Heat-resistant alloy	◓											S
Titanium alloy	◓		❄									S
Hard materials												H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm)				Carbide			Cermet						Applicable toolholder
						IC	S	D1	RE	PVD		-	PVD			-			
										PR1535	PR930	KW10	PV7005	PV710	PV720	PV730	TN60	TN610	TN620	
Cast iron	 Without chipbreaker	VNGA	160404	-	4	9.525	4.76	3.81	0.4			●	●							D30~D39
			160408						0.8			●	●							
Finishing	 Sharp edge / Surface finish oriented	VNGG	160402R-S	1	4	9.525	4.76	3.81	0.2	●					●	●			●	
			160402L-S						0.2	●					●	●			●	
			160404R-S						0.4	●					●	●			●	
			160404L-S						0.4	●					●	●			●	
Medium		VNGG	160402R	1	4	9.525	4.76	3.81	0.2		●			●	●	●		●	●	
			160402L						0.2					●	●	●		●	●	
			160404R						0.4		●	●		●	●	●		●	●	
			160404L						0.4		●	●		●	●	●		●	●	
			160408R						0.8		●	●		●	●	●	●	●	●	
			160408L						0.8			●		●	●	●		●	●	

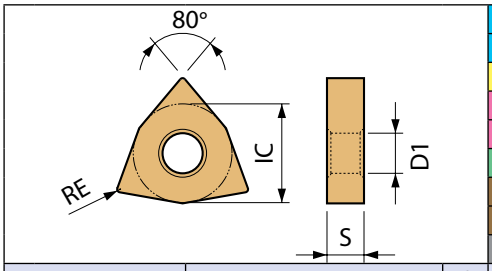
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

80° Trigon

How to read pages of "Turning inserts" See page B15

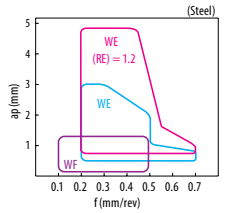
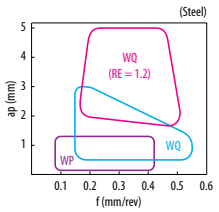
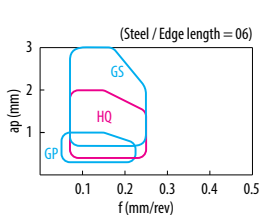
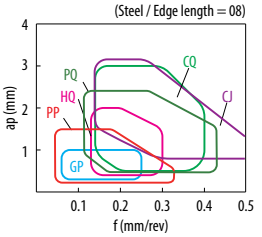


Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert		Description	Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Carbide CVD CA025P	CA115P	CA125P	CA510	CA515	CA525	CA530	Cermet CVD COX	PVD PV710	PV720	PV730	- TN60	TN610	TN620	Applicable toolholder
Finishing	With Wiper Edge	WNMG 080404WF 080408WF	1	6	12.7	4.76	5.16	0.4 0.8	● ●	● ●	● ●	● ●	● ●	● ●	● ●		● ●	● ●			● ●	● ●	
Finishing	With Wiper Edge	WNMG 080404WP 080408WP	2	6	12.7	4.76	5.16	0.4 0.8	● ●	● ●	● ●	● ●	● ●	● ●			● ●	● ●			● ●	● ●	
Finishing - Medium	With Wiper Edge	WNMG 080404WE 080408WE 080412WE	1	6	12.7	4.76	5.16	0.4 0.8 1.2	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●		● ● ●	● ● ●			● ● ●	● ● ●	D43~D46 F146 F148 F149
Finishing - Medium	With Wiper Edge	WNMG 080404WQ 080408WQ 080412WQ	2	6	12.7	4.76	5.16	0.4 0.8 1.2	● ● ●	● ● ●	● ● ●		● ● ●	● ● ●	● ● ●		● ● ●	● ● ●			● ● ●	● ● ●	
Finishing		WNMG 080402PP 080404PP 080408PP 080412PP	4	6	12.7	4.76	5.16	0.2 0.4 0.8 1.2	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●			● ● ● ●	● ● ● ●	
Finishing		WNMG 060404GP 060408GP	3	6	9.525	4.76	3.81	0.4 0.8										● ●	● ●	●		● ●	D45 F146
Finishing		WNMG 080404GP 080408GP	4	6	12.7	4.76	5.16	0.4 0.8									● ●	● ●	● ●	● ●		● ●	D43~D46 F146 F148 F149
Finishing - Medium		WNMG 080404PQ 080408PQ 080412PQ	4	6	12.7	4.76	5.16	0.4 0.8 1.2	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●			● ● ●	● ● ●	

See "Precautions when using Wiper inserts" in the **R34** and **R35** for WF / WE chipbreakers.

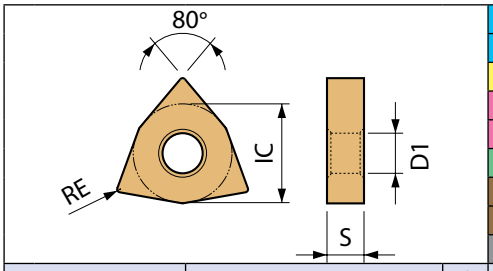
Applicable chipbreaker range

1	2	3	4
			

●: Standard item R: Right-hand only L: Left-hand only □: Check availability

80° Trigon

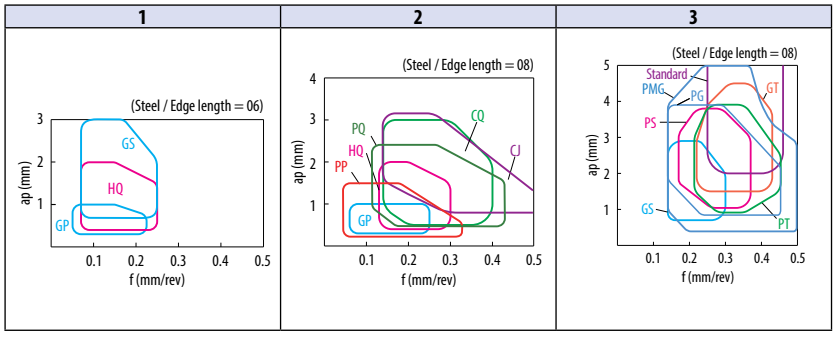
How to read pages of "Turning inserts" See page B15



Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert		Description	Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Carbide CVD CA025P	CA115P	CA125P	CA510	CA515	CA525	CA530	CA6515	CA6525	PVD CVD PR1535	Cermet CVD CCX	PVD PV710	PV720	PV730	- TN60	TN610	TN620	Applicable toolholder
Finishing - Medium		WNMG 06T304HQ 06T308HQ	1	6	9.525	3.97	3.81	0.4 0.8	● ●	● ●	● ●			● ●	● ●						● ●	● ●	● ●		● ●	-
		WNMG 060404HQ 060408HQ	1	6	9.525	4.76	3.81	0.4 0.8	● ●	● ●	● ●	● ●	● ●	● ●	● ●				● ●		● ●	● ●	● ●		● ●	D45 F146
		WNMG 080404HQ 080408HQ 080412HQ	2	6	12.7	4.76	5.16	0.4 0.8 1.2	● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●	
Finishing - Medium	Up facing	WNMG 080404CQ 080408CQ 080412CQ	2	6	12.7	4.76	5.16	0.4 0.8 1.2	● ●	● ●	● ●	● ●	● ●	● ●	● ●					● ●	● ●	● ●		● ●	● ●	D43~D46 F146 F148 F149
Finishing - Medium	Up facing	WNMG 080408CJ 080412CJ	2	6	12.7	4.76	5.16	0.8 1.2	● ●	● ●	● ●			● ●	● ●	● ●										
Medium - Roughing		WNMG 080404PMG 080408PMG 080412PMG 080416PMG	3	6	12.7	4.76	5.16	0.4 0.8 1.2 1.6		● ●	● ●															
Medium - Roughing		WNMG 060404GS 060408GS	1	6	9.525	4.76	3.81	0.4 0.8	● ●	● ●	● ●		● ●	● ●	● ●						● ●	● ●	● ●		● ●	D45 F146
		WNMG 080404GS 080408GS 080412GS	3	6	12.7	4.76	5.16	0.4 0.8 1.2	●			● ●	● ●	● ●	● ●						● ●	● ●			● ●	
Medium - Roughing		WNMG 080404PG 080408PG 080412PG 080416PG	3	6	12.7	4.76	5.16	0.4 0.8 1.2 1.6	● ●	● ●	● ●	● ●	● ●	● ●	● ●			● ●		● ●	● ●	● ●		● ●	● ●	D43~D46 F146 F148 F149
Medium - Roughing		WNMG 080404PS 080408PS 080412PS 080416PS	3	6	12.7	4.76	5.16	0.4 0.8 1.2 1.6	●			● ● ●	● ● ●	● ● ●	● ● ●	● ●					● ●	● ●			● ●	

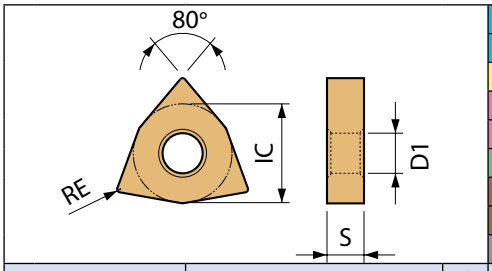
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

80° Trigon

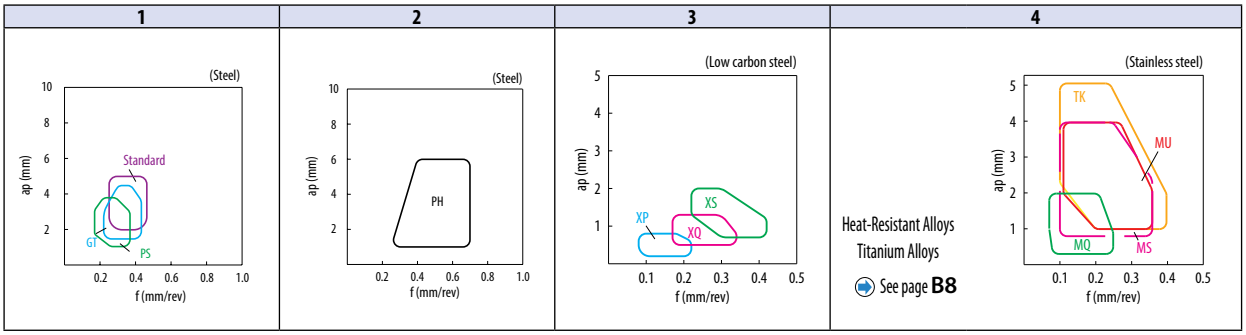
How to read pages of "Turning inserts" See page B15



Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Carbide CVD CA025P	CA115P	CA125P	CA310	CA315	CA320	CA4505	CA4515	CA510	CA515	CA525	CA530	CA6515	CA6525	Carbide PVD PR1535	SW05	Cermet CVD CCX	Cermet PVD PV7005	PV710	PV720	PV730	Cermet - TN60	TN610	TN620	Applicable toolholder
Medium - Roughing	High feed	WNMG	080408PT 080412PT	B50 3	6	12.7	4.76	5.16	0.8 1.2	● ●								●●●●● ●●●●●					●											
Medium - Roughing	High feed	WNMG	080408GT 080412GT	1	6	12.7	4.76	5.16	0.8 1.2	● ●								●●●● ●●●●															
Roughing		WNMG	080404 080408 080412	1	6	12.7	4.76	5.16	0.4 0.8 1.2	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	●● ●● ●●	●● ●● ●●	● ● ●	● ● ●	●● ●● ●●	●● ●● ●●	● ● ●		● ● ●	●● ●● ●●	●● ●● ●●	● ● ●	● ● ●	●● ●● ●●	● ● ●	● ● ●	● ● ●	
Roughing		WNMG	080408PH 080412PH	2	6	12.7	4.76	5.16	0.8 1.2	● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●	●● ●●	●● ●●	●● ●●	●● ●●													
Low carbon steel	Finishing	WNMG	080404XP 080408XP	3	6	12.7	4.76	5.16	0.4 0.8	● ●	● ●	● ●						●● ●●	●● ●●	●● ●●					● ●		●● ●●	●● ●●	●● ●●		●● ●●	●● ●●	D43~D46 F146 F148 F149
Low carbon steel	Medium	WNMG	080404XQ 080408XQ	3	6	12.7	4.76	5.16	0.4 0.8	● ●	● ●	● ●						●● ●●	●● ●●	●● ●●					● ●		●● ●●	●● ●●	●● ●●		●● ●●	●● ●●	
Low carbon steel	Roughing	WNMG	080408XS	3	6	12.7	4.76	5.16	0.8	●	●	●						●●	●●	●●								●●			●		
Stainless steel / Heat-resistant alloys	Medium - Roughing / Sharp edge	WNGG	080404TK 080408TK	4	6	12.7	4.76	5.16	0.4 0.8															● ●									
	Medium - Roughing	WNMG	080404TK 080408TK	4	6	12.7	4.76	5.16	0.4 0.8												●● ●●	●● ●●	●● ●●											

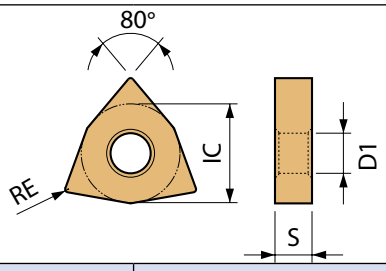
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

80° Trigon

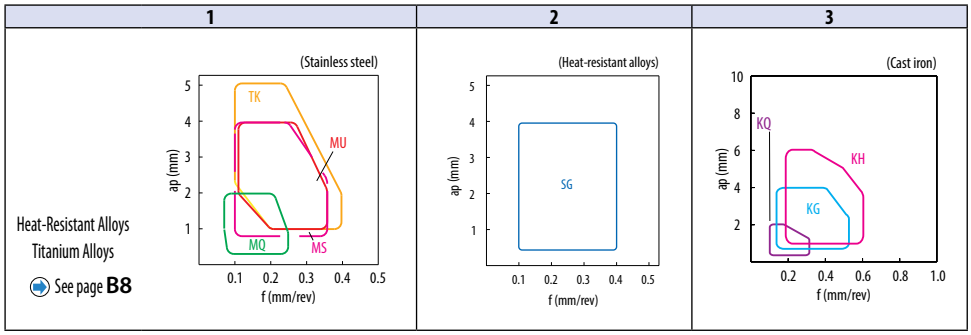
How to read pages of "Turning inserts" See page B15



Free-cutting steel	P
Carbon steel / Alloy steel	
Stainless steel	M
Gray cast iron	K
Nodular cast iron	
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	
Hard materials	H

Insert		Description	Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Carbide CVD CA310	CA315	CA320	CA6515	CA6525	PVD PR0055	PR1155	PR1205	PR1535	- SW05	Applicable toolholder
Stainless steel / Heat-resistant alloys	 Finishing - Medium	WNMG 080404MQ 080408MQ	1	6	12.7	4.76	5.16	0.4 0.8				● ●	●	● ●	●	● ●	● ●	●	D43~D46 F146 F148 F149
	 Medium - Roughing	WNMG 060404MS 060408MS	1	6	9.525	4.76	5.16	0.4 0.8				● ●							
		WNMG 080404MS 080408MS 080412MS	1	6	12.7	4.76	5.16	0.4 0.8 1.2				● ● ●	●	● ● ●	●	● ● ●	● ● ●	●	
	 Medium - Roughing	WNMG 080404MU 080408MU	1	6	12.7	4.76	5.16	0.4 0.8				● ●	●	● ●	●	● ●	● ●	●	
Heat-resistant alloys	 Roughing	WNMG 080408SG 080412SG	2	6	12.7	4.76	5.16	0.8 1.2						● ●	●	● ●	● ●	●	
Cast iron	 Sharp cutting oriented	WNMG 080404KQ 080408KQ 080412KQ	3	6	12.7	4.76	5.16	0.4 0.8 1.2	● ● ●	●	●								
Cast iron	 Roughing	WNMG 080404KG 080408KG 080412KG	3	6	12.7	4.76	5.16	0.4 0.8 1.2	● ● ●	●	●								
Cast iron	 Roughing	WNMG 080408KH 080412KH 080416KH	3	6	12.7	4.76	5.16	0.8 1.2 1.6	● ● ●	●	●								

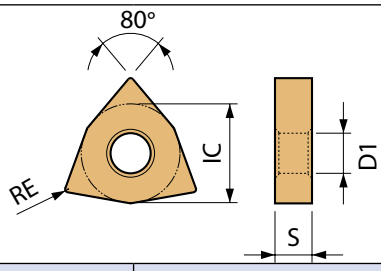
Applicable chipbreaker range



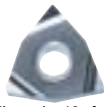
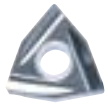
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

80° Trigon

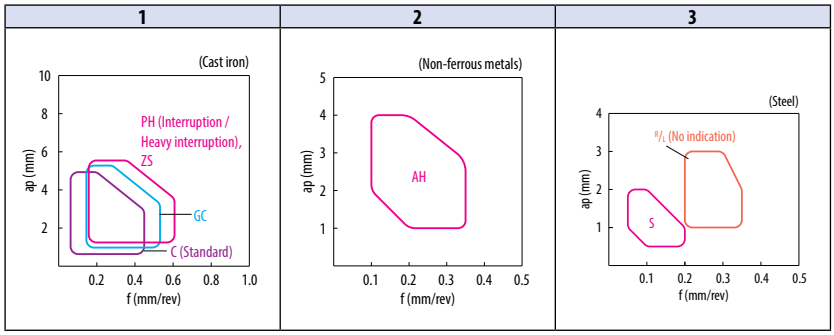
How to read pages of "Turning inserts" See page B15



Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Carbide CVD CA310	CA315	CA320	CA4505	CA4515	DLC PDL010	PDL025	- KW10	Cermet CVD CCX	- TN60	Applicable toolholder
Cast iron	 Roughing	WNMG	080404C 080408C 080412C	1	6	12.7	4.76	5.16	0.4 0.8 1.2	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●						D43~D46 F146 F148 F149
Cast iron	 Roughing	WNMG	080408ZS 080412ZS	1	6	12.7	4.76	5.16	0.8 1.2	● ●	● ●	● ●	● ●	● ●						
Cast iron	 Roughing	WNMG	080408GC 080412GC	1	6	12.7	4.76	5.16	0.8 1.2	● ●	● ●	● ●	● ●	● ●						
Cast iron	 Without chipbreaker	WNMA	080408 080412	-	6	12.7	4.76	5.16	0.8 1.2	● ●	● ●	● ●		● ●				●		
Non-ferrous metals	 Medium - Roughing / Sharp edge	WNGG	080404AH 080408AH	2	6	12.7	4.76	5.16	0.4 0.8						● ●	● ●	● ●			
Finishing	 Sharp edge / Surface finish oriented	WNGG	060402R-S 060402L-S 060404R-S 060404L-S	3	6	9.525	4.76	3.81	0.2 0.2 0.4 0.4								● ● ● ●		● ● ● ●	D45 F146
Medium		WNGG	060404R 060404L	3	6	9.525	4.76	3.81	0.4								● ●		● ●	

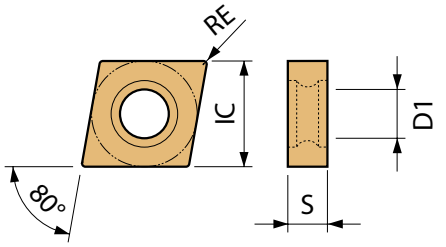
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Small double sided tools

How to read pages of "Turning inserts" See page B15

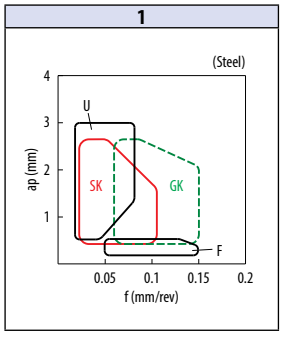


Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Carbide PVD PR1225	PR1535	PR1705	PR1725	Applicable toolholder
Finishing - Medium	 Polished / Sharp edge	CNGU	070301MFP-SK 070302MFP-SK	1	4	7.5	3.18	3.6	< 0.1 < 0.2	● ●	●		● ●	E60
Medium - Roughing	 With honing	CNMU	070302E-GK 070304E-GK	1	4	7.5	3.18	3.6	0.2 0.4	● ●	●		● ●	
Finishing	 Sharp edge	CNGU	0703005MFR-F 070301MFR-F 070302MFR-F 070304MFR-F	1	4	7.5	3.18	3.6	< 0.05 < 0.1 < 0.2 < 0.4	 ● 	 ● ● ●	● ● ● ●	 ● ● ●	
Low feed	 Sharp edge	CNGU	0703005MFR-U 070301MFR-U 070302MFR-U 070304MFR-U	1	4	7.5	3.18	3.6	< 0.05 < 0.1 < 0.2 < 0.4	● ● ● 	 ● ● ●	● ● ● ●	 ● ● ●	

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

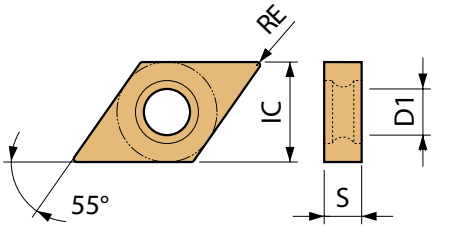
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Small double sided tools

How to read pages of "Turning inserts" See page B15

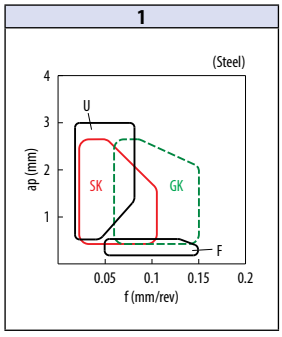


Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert		Description	Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Carbide PVD PR1225	PR1535	PR1705	PR1725	Applicable toolholder
Finishing - Medium	 Polished / Sharp edge	DNGU 080301MFP-SK 080302MFP-SK 080304MFP-SK	1	4	7	3.18	3.6	< 0.1 < 0.2 < 0.4	● ● ●	● ● ●		● ● ●	E61
Medium - Roughing	 With honing	DNMU 080302E-GK 080304E-GK	1	4	7	3.18	3.6	0.2 0.4	● ●	● ●		● ●	
Finishing	 Sharp edge	DNGU 080301MFR-F 080302MFR-F 080304MFR-F	1	4	7	3.18	3.6	< 0.1 < 0.2 < 0.4	 ● 	● ● ●	● ● ●	● ● ●	
Low feed	 Sharp edge	DNGU 080301MFR-U 080302MFR-U 080304MFR-U	1	4	7	3.18	3.6	< 0.1 < 0.2 < 0.4	 ● ●	● ● ●	● ● ●	● ● ●	
Low feed	 With honing	DNGU 080301MER-U 080302MER-U 080304MER-U	1	4	7	3.18	3.6	< 0.1 < 0.2 < 0.4		● ● ●	● ● ●	

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

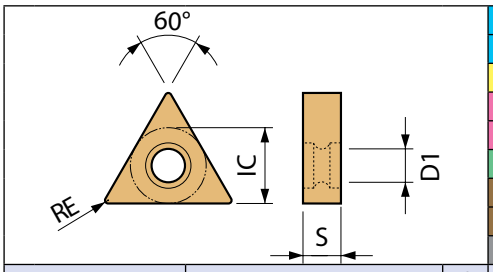
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Small double sided tools

How to read pages of "Turning inserts" See page B15



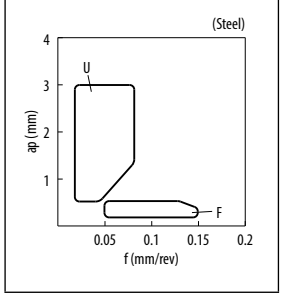
Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert		Description	Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Carbide PVD PR1225	PR1535	PR1705	PR1725	Applicable toolholder
Finishing	 Sharp edge	TNGU 0903005MFR-F 090301MFR-F 090302MFR-F 090304MFR-F	1	6	5.56	3.18	3	< 0.05 < 0.1 < 0.2 < 0.4	● ● ● ●	 ● ● ●	 ● ● ●	 ● ● ●	E62
Low feed	 Sharp edge	TNGU 090301MFR-U 090302MFR-U 090304MFR-U	1	6	5.56	3.18	3	< 0.1 < 0.2 < 0.4	 ● ●	● ● ●	 ● ●	● ● ●	
Low feed	 With honing	TNGU 090304MER-U	1	6	5.56	3.18	3	< 0.4			●	●	

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

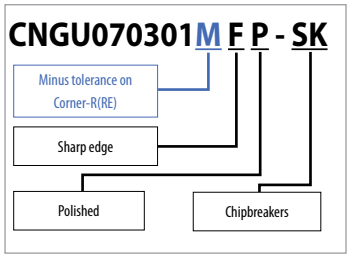
Applicable chipbreaker range

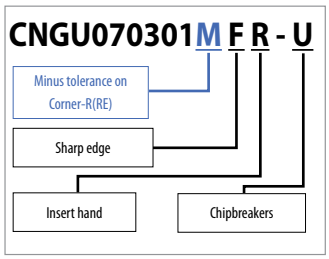
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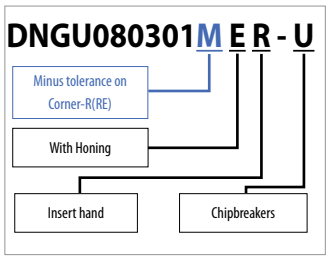


● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Small double sided tools identification system







When a minus tolerance is specified for the corner-R(RE)

If a minus tolerance is specified for the corner-R(RE) as shown in the Fig. 1, using an insert with corner-R(RE)=0.2 mm may result in larger radius than specified.
Use an insert the corner of which R(RE) has a minus tolerance.

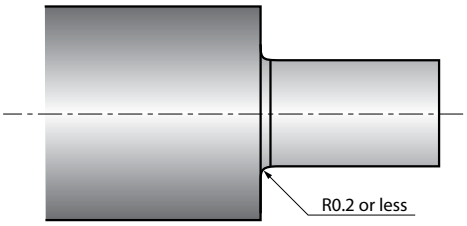
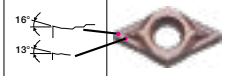
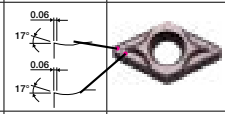
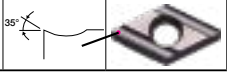


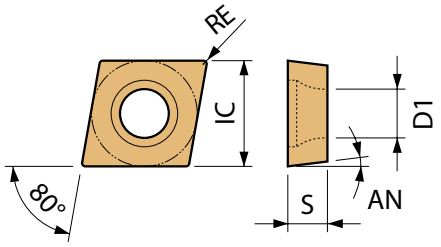
Fig. 1 Example of a specified corner-R in the drawing

Chipbreaker selection (Negative inserts)

Cutting range	Name	Cross-section	Advantages
Finishing - Medium	SK		A low cutting force chipbreaker designed for chip control in steel and stainless steel. Cutting performance is similar to comparable sized positive inserts.
Medium - Roughing	GK		Good chip evacuation at wide range by breaker dot and wide chip pocket.
Finishing	F		Good chip control at finishing with low cutting force.
Low feed	U		Good chip control at low feed rate and varied ap with low cutting force.

80° Rhombic

How to read pages of "Turning inserts" See page B15

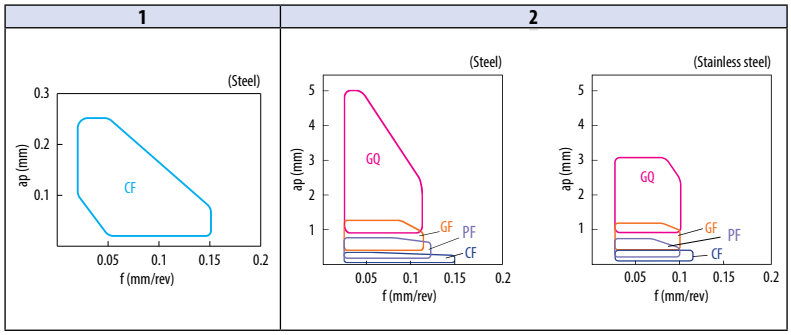


Free-cutting steel							●											P
Carbon steel / Alloy steel						○				●								P
Stainless steel					○	●		○										M
Gray cast iron																		K
Nodular cast iron																		K
Non-ferrous metals	●	●																N
Heat-resistant alloy						●												S
Titanium alloy						●												S
Hard materials																		H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide DLC PDL010	DLC PDL025	PVD PR1225	PVD PR1535	PVD PR1705	PVD PR1725	Applicable toolholder
Minute ap	 Polished / Sharp edge	CCGT	030101MP-CF 030102MP-CF	1	2	3.5	1.4	2	< 0.1 < 0.2	7	● ●	● ●	● ●	● ●	● ●	● ●	F31 F32 F60 F62
		CCGT	040101MP-CF 040102MP-CF	1	2	4.3	1.8	2.4	< 0.1 < 0.2	7	● ●	● ●	● ●	● ●	● ●	● ●	
Finishing	 Polished / Sharp edge	CCGT	030101MFP-PF 030102MFP-PF	2	2	3.5	1.4	2	< 0.1 < 0.2	7			● ●		● ●		
		CCGT	040101MFP-PF 040102MFP-PF	2	2	4.3	1.8	2.4	< 0.1 < 0.2	7			● ●		● ●		
		CCGT	060201MFP-PF 060202MFP-PF 060204MFP-PF	2	2	6.35	2.38	3	< 0.1 < 0.2 < 0.4	7			● ●		● ●		E26, E28 E54 F31, F32 F60~F62 F124
Finishing	 Polished / Sharp edge	CCGT	060201MFP-GF 060202MFP-GF 060204MFP-GF	2	2	6.35	2.38	3	< 0.1 < 0.2 < 0.4	7			● ●	● ●	● ●	● ●	
		CCGT	09T301MFP-GF 09T302MFP-GF 09T304MFP-GF	2	2	9.525	3.97	4.7	< 0.1 < 0.2 < 0.4	7			● ●	● ●	● ●	● ●	E26~E28 E54 F60~F62 F124

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

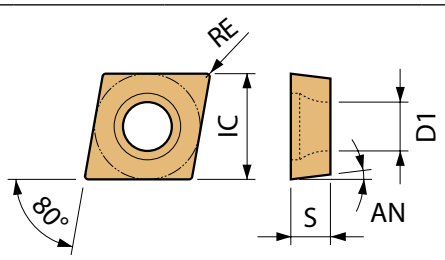
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

80° Rhombic

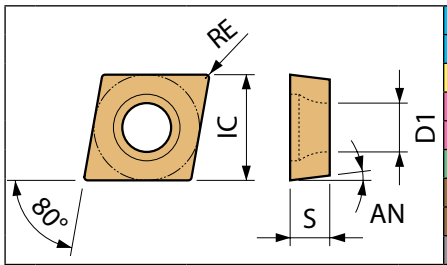
How to read pages of "Turning inserts" See page B15

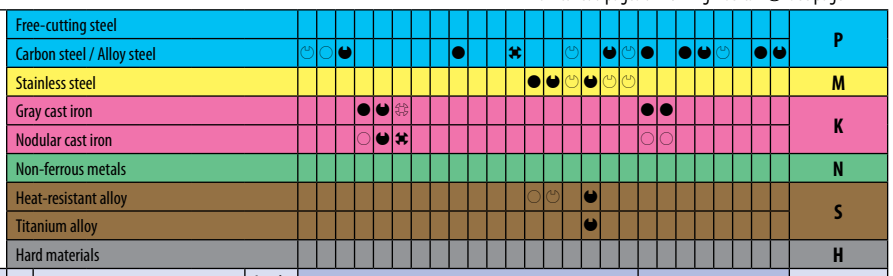


| | | |

80° Rhombic

How to read pages of "Turning inserts" See page B15

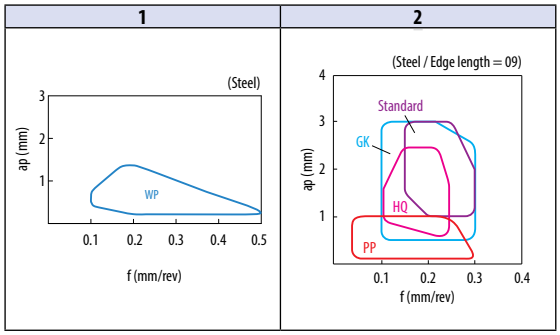




Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide CVD CA025P	CA115P	CA125P	CA310	CA315	CA320	CA4505	CA4515	CA510	CA515	CA525	CA530	CA6515	CA6525	Carbide PVD PR1225	PR1535	PR1725	PB930	Cermet CVD CCX	Cermet PVD PV7005	PV710	PV720	PV730	Cermet - TN60	TN610	TN620	Applicable toolholder
Finishing	With Wiper Edge	CCMT	060202WP 060204WP 060208WP	1	2	6.35	2.38	3	0.2 0.4 0.8	7	● ● ●	● ● ●	● ● ●						● ● ●	● ● ●	● ● ●	● ● ●			● ● ●		● ●				● ● ●	● ● ●			● ● ●	● ● ●	E26, E28, E54 F31, F32 F60~F62, F124
		CCMT	09T302WP 09T304WP 09T308WP	1	2	9.525	3.97	4.7	0.2 0.4 0.8	7	● ● ●	● ● ●	● ● ●						● ● ●	● ● ●	● ● ●	● ● ●			● ● ●		● ●				● ● ●	● ● ●			● ● ●	● ● ●	E26~E28, E54 F60~F62 F124
Finishing		CCMT	060202PP 060204PP	2	2	6.35	2.38	3	0.2 0.4	7	● ● ●	● ● ●	● ● ●						● ● ●	● ● ●	● ● ●				● ● ●	● ● ●	● ● ●		● ●		● ● ●	● ● ●			● ● ●	● ● ●	E26, E28, E54 F31, F32 F60~F62, F124
		CCMT	09T302PP 09T304PP 09T308PP	2	2	9.525	3.97	4.7	0.2 0.4 0.8	7	● ● ●	● ● ●	● ● ●						● ● ●	● ● ●	● ● ●	● ● ●			● ● ●	● ● ●	● ● ●		● ●		● ● ●	● ● ●			● ● ●	● ● ●	E26~E28, E54 F60~F62 F124
Finishing - Medium		CCMT	060202GK 060204GK	2	2	6.35	2.38	2.8	0.2 0.4	7	● ● ●	● ● ●	● ● ●	● ●	● ●	● ●		● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●		● ● ●	● ● ●	● ● ●	● ●		● ● ●	● ● ●			● ● ●	● ● ●	E26, E28, E54 F31, F32 F60~F62, F124
		CCMT	09T302GK 09T304GK	2	2	9.525	3.97	4.4	0.2 0.4	7	● ● ●	● ● ●	● ● ●	● ●	● ●	● ●		● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●		● ● ●	● ● ●	● ● ●	● ●		● ● ●	● ● ●			● ● ●	● ● ●	E26~E28, E54 F60~F62 F124
		CCMT	120404GK 120408GK 120412GK	2	2	12.7	4.76	5.5	0.4 0.8 1.2	7	● ● ●	● ● ●	● ● ●	● ●	● ●	● ●		● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●		● ● ●	● ● ●	● ● ●	● ●		● ● ●	● ● ●			● ● ●	● ● ●	E28
Finishing - Medium		CCMT	060202HQ 060204HQ	2	2	6.35	2.38	2.8	0.2 0.4	7	● ● ●	● ● ●	● ● ●						● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●		● ● ●	● ● ●	● ● ●	● ●		● ● ●	● ● ●		● ●	● ● ●	● ● ●	E26, E28, E54 F31, F32 F60~F62, F124
		CCMT	09T302HQ 09T304HQ 09T308HQ	2	2	9.525	3.97	4.4	0.2 0.4 0.8	7	● ● ●	● ● ●	● ● ●						● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●		● ● ●	● ● ●	● ● ●	● ●		● ● ●	● ● ●		● ●	● ● ●	● ● ●	E26~E28, E54 F60~F62 F124
Medium		CCGT	060201 060202 060204	2	2	6.35	2.38	2.8	0.1 0.2 0.4	7																	● ● ●				● ● ●	● ● ●		● ●	● ● ●	● ● ●	E26, E28, E54 F31, F32 F60~F62, F124
		CCGT	09T301 09T302 09T304	2	2	9.525	3.97	4.4	0.1 0.2 0.4	7																	● ● ●				● ● ●	● ● ●		● ●	● ● ●	● ● ●	E26~E28, E54 F60~F62 F124
		CCMT	09T308	2	2	9.525	3.97	4.4	0.8	7	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

See "Precautions when using Wiper inserts" in the **R36** and **R37** for WP chipbreaker.

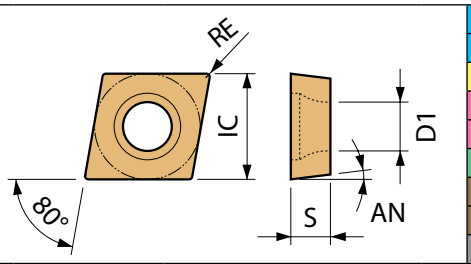
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

80° Rhombic

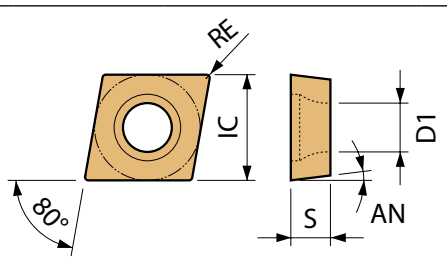
How to read pages of "Turning inserts" See page B15



| | | |

80° Rhombic

How to read pages of "Turning inserts" See page B15

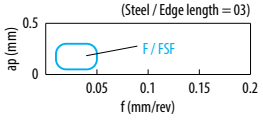
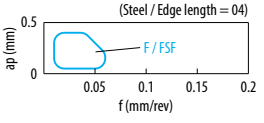


Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide DLC PDL010	DLC PDL025	PVD PR1225	PVD PR1535	PVD PR1705	PVD PR1725	- PR930	- KW10	Cermet PVD PV710	PVD PV720	PVD PV730	- TN60	- TN610	- TN620	Applicable toolholder
Finishing	 Sharp edge	CCET	0301005MR-F	1	2	3.5	1.4	1.9	< 0.05	7			●		●										F31 F32 F60 F62
			0301005ML-F						< 0.05			●	●		●									
			030101MR-F						< 0.1				●		●			●			●			
			030101ML-F						< 0.1		●	●	●		●			●	●	●	●	●	●	
			030102MR-F						< 0.2				●		●			●			●			
			030102ML-F						< 0.2		●	●	●	●	●			●	●	●	●	●	●	
			030104MR-F						< 0.4				●		●			●			●			
			030104ML-F						< 0.4		●	●	●	●	●			●	●	●	●	●	●	
		CCET	040101MR-F	2	2	4.3	1.8	2.3	< 0.1	7			●		●			●			●			
			040101ML-F						< 0.1		●	●	●		●			●	●	●	●	●	●	
			040102MR-F						< 0.2				●	●	●			●			●			
			040102ML-F						< 0.2		●	●	●	●	●			●	●	●	●	●	●	
			040104MR-F						< 0.4				●		●			●			●			
			040104ML-F						< 0.4		●	●	●	●	●			●	●	●	●	●	●	
Finishing	 Sharp edge	CCGT	0301003L-F	1	2	3.5	1.4	1.9	0.03	7							●								
			030101R-F						0.1								●	●						
			030101L-F						0.1								●	●				●		
			030102R-F						0.2								●	●						
			030102L-F						0.2								●	●						
			030104R-F						0.4								●	●				●		
			030104L-F						0.4								●	●						
		CCGT	0401003L-F	2	2	4.3	1.8	2.3	0.03	7							●								
			040101R-F						0.1								●	●						
			040101L-F						0.1								●	●				●		
			040102R-F						0.2								●	●				●		
			040102L-F						0.2								●	●				●		
			040104R-F						0.4								●	●				●		
			040104L-F						0.4								●	●				●		
		CCGT	0301005ML-F	1	2	3.5	1.4	1.9	< 0.05	7			●												
			030101MR-F						< 0.1				●												
			030101ML-F						< 0.1				●												
			030102MR-F						< 0.2				●												
			030102ML-F						< 0.2				●												
			030104MR-F						< 0.4				●												
			030104ML-F						< 0.4				●												
		CCGT	0401005ML-F	2	2	4.3	1.8	2.3	< 0.05	7			●												
			040101ML-F						< 0.1				●												
			040102MR-F						< 0.2				●												
			040102ML-F						< 0.2				●												
			040104MR-F						< 0.4				●												
			040104ML-F						< 0.4				●												

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

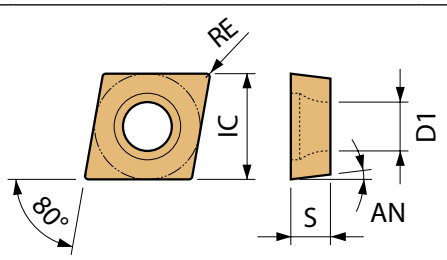
Applicable chipbreaker range

1	2
	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

80° Rhombic

How to read pages of "Turning inserts" See page B15

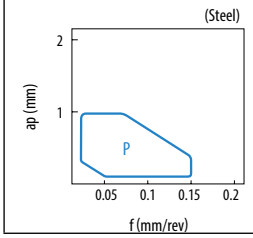
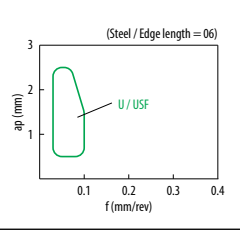
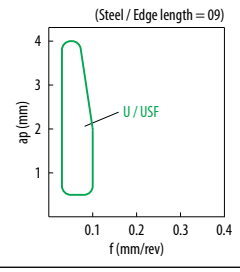


Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide DLC PDL010	DLC PDL025	PVD PR1225	PVD PR1535	PVD PR1705	PVD PR1725	PVD PR930	Cermet PVD PV710	PVD PV720	PVD PV730	- TN60	- TN610	- TN620	Applicable toolholder
Finishing	 Sharp edge	CCET	09T301MR-P	1	2	9.525	3.97	4.4	< 0.1	7			●		●								E26~E28 E54 F60~F62 F124
			09T301ML-P						< 0.1				●		●								
			09T302MR-P						< 0.2				●		●								
			09T302ML-P						< 0.2				●		●								
			09T304MR-P						< 0.4				●		●								
			09T304ML-P						< 0.4				●		●								
Low feed	 Precision / Sharp edge	CCET	0602003FR-USF	2	2	6.35	2.38	2.8	0.03	7							●						E26, E28 E54 F31, F32 F60~F62 F124
			0602003FL-USF						0.03								●						
			060201FR-USF						0.1								●						
			060201FL-USF						0.1								●						
			060202FR-USF						0.2								●				●		
			060202FL-USF						0.2								●				●		
		CCET	09T3003FR-USF	3	2	9.525	3.97	4.4	0.03	7							●				●		E26~E28 E54 F60~F62 F124
			09T301FR-USF						0.1								●						
			09T301FL-USF						0.1								●						
			09T302FR-USF						0.2								●				●		
			09T302FL-USF						0.2								●				●		
		CCET	0602005MFR-USF	2	2	6.35	2.38	2.8	< 0.05	7			●										E26, E28 E54 F31, F32 F60~F62 F124
			0602005MFL-USF						< 0.05				●										
			060201MFR-USF						< 0.1				●										
			060201MFL-USF						< 0.1				●										
			060202MFR-USF						< 0.2				●										
			060202MFL-USF						< 0.2				●										
		CCET	09T3005MFR-USF	3	2	9.525	3.97	4.4	< 0.05	7			●										E26~E28 E54 F60~F62 F124
			09T3005MFL-USF						< 0.05				●										
			09T301MFR-USF						< 0.1				●										
			09T301MFL-USF						< 0.1				●										
			09T302MFR-USF						< 0.2				●										
			09T302MFL-USF						< 0.2				●										
Low feed	 Sharp edge	CCET	0602005MFR-U	2	2	6.35	2.38	2.8	< 0.05	7		●		●	●	●							E26, E28 E54 F31, F32 F60~F62 F124
			0602005MFL-U						< 0.05			●		●		●							
			060201MFR-U						< 0.1		●	●		●	●	●		●	●	●		●	●	
			060201MFL-U						< 0.1		●	●		●		●		●	●	●		●	●	
			060202MFR-U						< 0.2		●	●		●	●	●		●	●	●		●	●	
			060202MFL-U						< 0.2		●	●		●	●	●		●	●	●		●	●	
		CCET	09T3005MFR-U	3	2	9.525	3.97	4.4	< 0.05	7		●		●	●	●							E26~E28 E54 F60~F62 F124
			09T3005MFL-U						< 0.05			●		●		●							
			09T301MFR-U						< 0.1		●	●		●	●	●		●	●	●		●	●	
			09T301MFL-U						< 0.1		●	●		●	●	●		●	●	●		●	●	
			09T302MFR-U						< 0.2		●	●		●	●	●		●	●	●		●	●	
			09T302MFL-U						< 0.2		●	●		●	●	●		●	●	●		●	●	
			09T304MFR-U						< 0.4		●	●		●		●								
			09T304MFL-U						< 0.4		●	●		●		●								

Applicable chipbreaker range

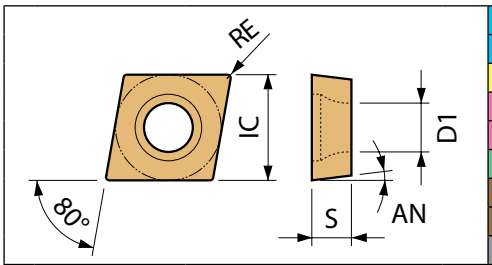
Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

1	2	3
		

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

80° Rhombic

How to read pages of "Turning inserts" See page B15

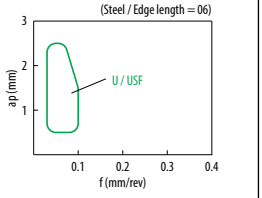
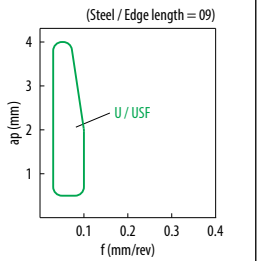


Free-cutting steel																P
Carbon steel / Alloy steel																P
Stainless steel																M
Gray cast iron																K
Nodular cast iron																K
Non-ferrous metals																N
Heat-resistant alloy																S
Titanium alloy																S
Hard materials																H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm)				Angle (°)	Carbide			Cermet	Applicable toolholder
						IC	S	D1	RE	AN	PVD	-	-		
											PR1225	PR930	KW10	TN60	
Low feed	 Sharp edge	CCGT	0602003FR-U	1	2	6.35	2.38	2.8	0.03	7		●	●		E26, E28 E54 F31, F32 F60~F62 F124
			0602003FL-U						0.03			●	●		
			060201FR-U						0.1			●	●	●	
			060201FL-U						0.1			●	●	●	
			060202FR-U						0.2			●	●	●	
			060202FL-U						0.2			●	●	●	
		CCGT	09T3003FR-U	2	2	9.525	3.97	4.4	0.03	7			●	●	E26~E28 E54 F60~F62 F124
			09T3003FL-U						0.03				●		
			09T301FR-U						0.1			●	●	●	
			09T301FL-U						0.1			●	●	●	
			09T302FR-U						0.2			●	●	●	
			09T302FL-U						0.2			●	●	●	
		CCGT	0602005MFR-U	1	2	6.35	2.38	2.8	< 0.05	7	●				E26, E28 E54 F31, F32 F60~F62 F124
			0602005MFL-U						< 0.05		●				
			060201MFR-U						< 0.1		●				
			060201MFL-U						< 0.1		●				
			060202MFR-U						< 0.2		●				
			060202MFL-U						< 0.2		●				
			060204MFR-U						< 0.4		●				
			060204MFL-U						< 0.4		●				
		CCGT	09T3005MFR-U	2	2	9.525	3.97	4.4	< 0.05	7	●				E26~E28 E54 F60~F62 F124
			09T3005MFL-U						< 0.05		●				
			09T301MFR-U						< 0.1		●				
			09T301MFL-U						< 0.1		●				
			09T302MFR-U						< 0.2		●				
			09T302MFL-U						< 0.2		●				
			09T304MFR-U						< 0.4		●				
			09T304MFL-U						< 0.4		●				

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

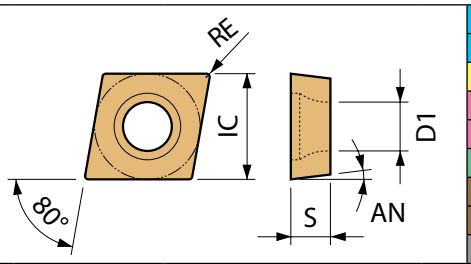
Applicable chipbreaker range

1	2
	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

80° Rhombic

How to read pages of "Turning inserts" See page B15

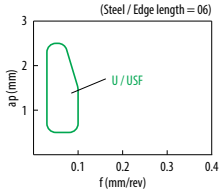
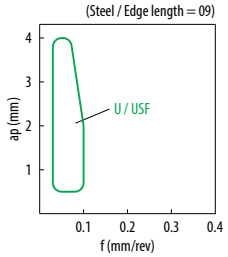
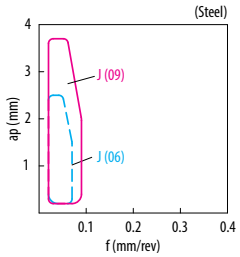


Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide PVD PR1225	PR1535	PR1725	PR930	Cermet PVD PV710	PV720	PV730	- TN60	TN610	TN620	Applicable toolholder
Low feed	 With honing	CCGT	060201ER-U	1	2	6.35	2.38	2.8	0.1	7				●	●				●		E26, E28 E54 F31, F32 F60~F62 F124
			060201EL-U						0.1					●	●	●	●	●	●	●	
			060202ER-U						0.2					●	●	●	●		●	●	
			060202EL-U						0.2					●	●	●	●		●	●	
			060204ER-U						0.4					●	●	●	●	●	●	●	
			060204EL-U						0.4					●	●	●	●	●	●	●	
		CCGT	09T301ER-U	2	2	9.525	3.97	4.4	0.1	7				●	●	●	●	●	●	●	E26~E28 E54 F60~F62 F124
			09T301EL-U						0.1					●	●	●	●	●	●	●	
			09T302ER-U						0.2					●	●	●	●	●	●	●	
			09T302EL-U						0.2					●	●	●	●	●	●	●	
			09T304ER-U						0.4					●	●	●	●	●	●	●	
			09T304EL-U						0.4					●	●	●	●	●	●	●	
		CCGT	060202MER-U	1	2	6.35	2.38	2.8	< 0.2	7			●								E26, E28 E54 F31, F32 F60~F62 F124
			060202MEL-U						< 0.2				●								
			060204MER-U						< 0.4				●								
			060204MEL-U						< 0.4				●								
		CCGT	09T301MER-U	2	2	9.525	3.97	4.4	< 0.1	7			●								E26~E28 E54 F60~F62 F124
			09T302MER-U						< 0.2				●								
			09T302MEL-U						< 0.2				●								
			09T304MER-U						< 0.4				●								
			09T304MEL-U						< 0.4				●								
Low feed	 Sharp edge	CCET	0602005MFR-J	3	2	6.35	2.38	2.8	< 0.05	7		●	●								E26, E28 E54 F31, F32 F60~F62 F124
			060201MFR-J						< 0.1		●	●	●								
			060201MFL-J						< 0.1			●	●								
			060202MFR-J						< 0.2		●	●	●								
			060202MFL-J						< 0.2			●	●								
		CCET	09T301MFR-J	3	2	9.525	3.97	4.4	< 0.1	7	●	●	●								E26~E28 E54 F60~F62 F124
			09T301MFL-J						< 0.1			●	●								
			09T302MFR-J						< 0.2		●	●	●								
			09T302MFL-J						< 0.2		●	●	●								
			09T304MFR-J						< 0.4		●	●	●								
			09T304MFL-J						< 0.4			●	●								

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

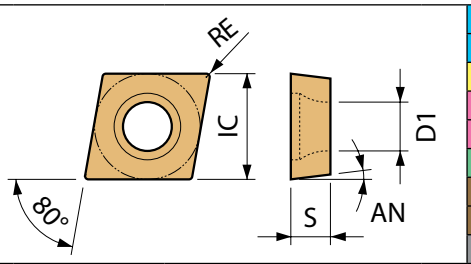
Applicable chipbreaker range

1	2	3
		

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

80° Rhombic

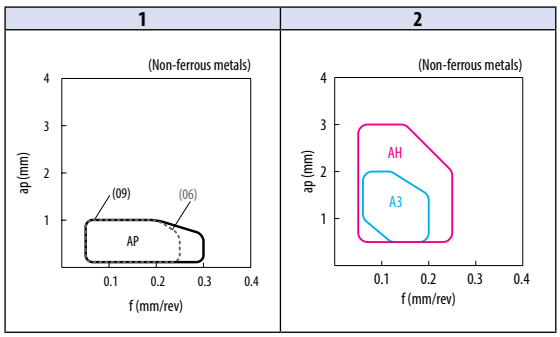
How to read pages of "Turning inserts" See page B15



Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide DLC PDL010	Carbide DLC PDL025	Carbide - KW10	Applicable toolholder
Non-ferrous metals	 Finishing / Sharp edge	CCGT	060202AP 060204AP	1	2	6.35	2.38	3	0.2 0.4	7	● ●		● ●	E26, E28, E54 F31, F32 F60~F62, F124
		CCGT	09T302AP 09T304AP 09T308AP	1	2	9.525	3.97	4.7	0.2 0.4 0.8	7	● ● ●		● ● ●	E26~E28 E54 F60~F62 F124
Non-ferrous metals	 Finishing - Medium / Sharp edge	CCGT	09T302R-A3 09T302L-A3 09T304R-A3 09T304L-A3 09T308R-A3 09T308L-A3	2	2	9.525	3.97	4.4	0.2 0.2 0.4 0.4 0.8 0.8	7	●● ●● ●● ●● ●● ●●	● ● ● ● ● ●	● ● ● ● ● ●	E26~E28 E54 F60~F62 F124
		CCGT	120402R-A3 120402L-A3 120404R-A3 120404L-A3 120408R-A3 120408L-A3	2	2	12.7	4.76	5.5	0.2 0.2 0.4 0.4 0.8 0.8	7	● ● ● ● ● ●	● ● ● ● ● ●	● ● ● ● ● ●	E28
Non-ferrous metals	 Finishing - Medium / Sharp edge	CCGT	09T304AH 09T308AH	2	2	9.525	3.97	4.4	0.4 0.8	7	●● ●●	● ●	● ●	E26~E28 E54 F60~F62 F124
Cast iron	 Without chipbreaker	CCGW	060201 060202	-	2	6.35	2.38	2.8	0.1 0.2	7			● ●	E26, E28, E54 F31, F32 F60~F62, F124
		CCGW	09T300 09T301 09T302 09T304	-	2	9.525	3.97	4.4	0 0.1 0.2 0.4	7			● ● ● ●	E26~E28 E54 F60~F62 F124

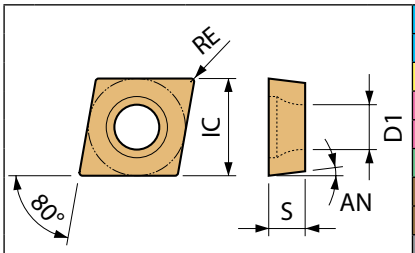
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

80° Rhombic

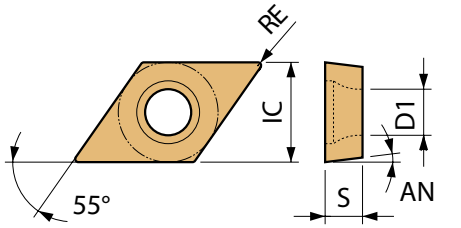
How to read pages of "Turning inserts" See page B15



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55° Rhombic

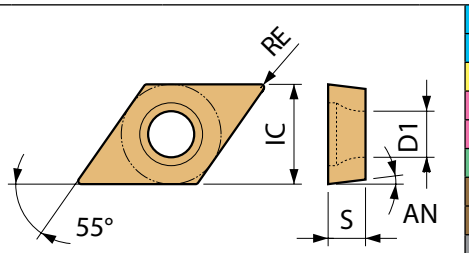
How to read pages of "Turning inserts" See page B15

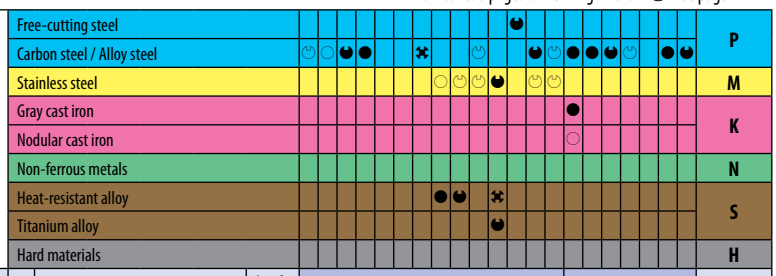


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55° Rhombic

How to read pages of "Turning inserts" See page B15



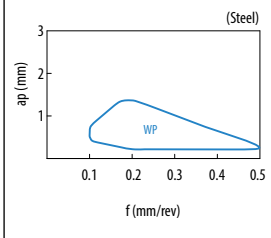
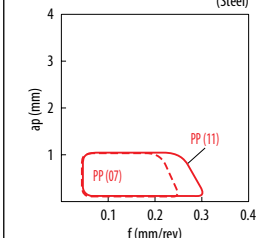
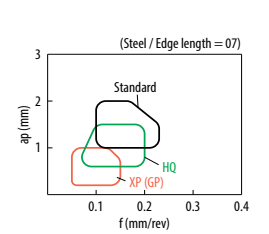
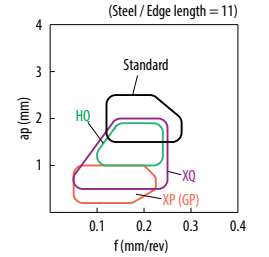


Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide CVD CA025P	CA115P	CA125P	CA510	CA515	CA525	CA530	Carbide PVD PR115S	PR120S	PR122S	PR153S	PR170S	PR172S	PR930	Cermet CVD CCX	Cermet PVD PV710	PV720	PV730	Cermet - TN60	TN610	TN620	Applicable toolholder
Finishing - Medium	 Polished / Sharp edge	DCGT	070201MFP-GQ 070202MFP-GQ 070204MFP-GQ	B681	2	6.35	2.38	3	< 0.1 < 0.2 < 0.4	7								● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●								*1
		DCGT	11T301MFP-GQ 11T302MFP-GQ 11T304MFP-GQ	B681	2	9.525	3.97	4.7	< 0.1 < 0.2 < 0.4	7								● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●								*2
Finishing	 With Wiper Edge	DCMX	070202WP 070204WP 070208WP	1	2	6.35	2.38	3	0.2 0.4 0.8	7	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●						● ● ●								*3
		DCMX	11T302WP 11T304WP 11T308WP	1	2	9.525	3.97	4.7	0.2 0.4 0.8	7	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●		● ●				● ● ●								*4
Finishing	 With Wiper Edge	DCMX	070204R-WP 070204L-WP	1	2	6.35	2.38	3	0.4	7													● ●				● ●				*3
		DCMX	11T304R-WP 11T304L-WP	1	2	9.525	3.97	4.7	0.4	7													● ●				● ●				*4
Finishing		DCMT	070202PP 070204PP	2	2	6.35	2.38	3	0.2 0.4	7	● ●	● ●	● ●	● ●	● ●	● ●	● ●			● ●			● ●		● ●	● ●	● ●	● ●		● ●	● ●	*1
		DCMT	11T302PP 11T304PP 11T308PP	2	2	9.525	3.97	4.7	0.2 0.4 0.8	7	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●			● ● ●			● ● ●		● ● ●	● ● ●	● ● ●	● ● ●		● ● ●	● ● ●	*2
Finishing		DCMT	070202GP 070204GP	3	2	6.35	2.38	2.8	0.2 0.4	7	● ●	● ●	● ●		● ●	● ●				● ●			● ●		● ●	● ●	● ●	● ●		● ●	● ●	*1
		DCMT	11T304GP 11T308GP	4	2	9.525	3.97	4.4	0.4 0.8	7	● ●	● ●	● ●		● ●	● ●	● ●			● ●			● ●		● ●	● ●	● ●	● ●	● ●	● ●	● ●	*2

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).
See "Precautions when using Wiper inserts" in the **R36** and **R37** for WP chipbreaker.

*1 : DC..07type **E29, E31, E34 E35, E55, E56, F66~F68, F70~F72, F74~F76, F125**
*2 : DC..11type **E23, E29~E32, E34, E35, E55, E56, F66~F68, F70~F72, F74~F76, F125**
*3 : DC..07type WP **E29, E31, E55, F66~F68, F74~F76, F125**
*4 : DC..11type WP **E23, E29~E32, E55, F66~F68, F74~F76, F125**

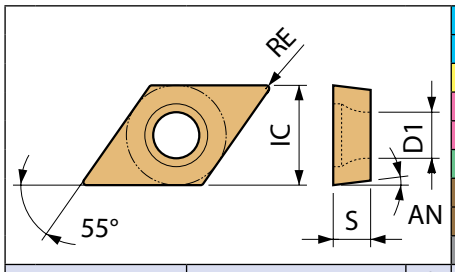
Applicable chipbreaker range

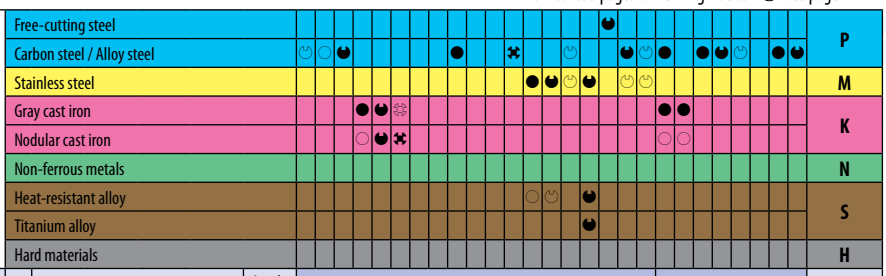
1	2	3	4
			

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

55° Rhombic

How to read pages of "Turning inserts" See page B15





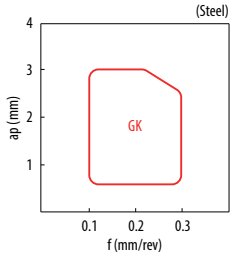
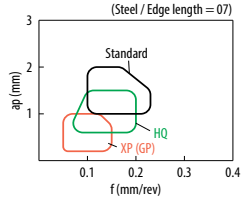
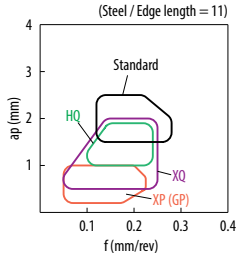
Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide CVD CA025P	CA115P	CA125P	CA310	CA315	CA320	CA4505	CA4515	CA510	CA515	CA525	CA530	CA6515	CA6525	Carbide PVD PR1225	PR1535	PR1705	PR1725	PR930	Cermet CVD CCX	Cermet PVD PV7005	PV710	PV720	PV730	Cermet - TN60	TN610	TN620	Applicable toolholder
Finishing - Medium		DCMT	070202GK	1	2	6.35	2.38	2.8	0.2	7	●	●	●							●	●	●	●	●		●		●	●	●	●			●	●	*1
			070204GK						0.4		●	●	●	●	●	●	●			●	●	●	●	●		●		●	●	●	●			●	●	
			070208GK						0.8		●	●	●	●	●	●				●	●	●	●	●		●		●	●	●	●			●	●	
		DCMT	11T302GK	1	2	9.525	3.97	4.4	0.2	7	●	●	●							●	●	●	●	●		●		●	●	●	●			●	●	*2
			11T304GK						0.4		●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●	●	●			●	●	
			11T308GK						0.8		●	●	●	●	●	●		●	●	●	●	●	●	●		●		●	●	●	●			●	●	
Finishing - Medium		DCMT	070202HQ	2	2	6.35	2.38	2.8	0.2	7	●	●	●							●	●	●				●		●	●	●	●			●	●	*1
			070204HQ						0.4		●	●	●						●	●	●	●	●	●		●		●	●	●	●			●	●	
			070208HQ						0.8		●	●	●						●	●	●	●	●	●		●		●	●	●	●			●	●	
		DCMT	11T302HQ	3	2	9.525	3.97	4.4	0.2	7	●	●	●						●	●	●	●	●	●		●		●	●	●	●			●	●	*2
			11T304HQ						0.4		●	●	●						●	●	●	●	●	●		●		●	●	●	●			●	●	
			11T308HQ						0.8		●	●	●						●	●	●	●	●	●		●		●	●	●	●			●	●	
Medium		DCGT	070201	2	2	6.35	2.38	2.8	0.1	7																●						●	●	●	●	*1
			070202						0.2																	●						●	●	●	●	
			070204						0.4																	●						●	●	●	●	
		DCGT	11T301	3	2	9.525	3.97	4.4	0.1	7																●						●	●	●	●	*2
			11T302						0.2																	●						●	●	●	●	
			11T304						0.4																	●						●	●	●	●	
		DCMT	11T308	3	2	9.525	3.97	4.4	0.8	7				●	●	●		●													●	●	●	●	●	●	●	
		DCGT	0702005M	2	2	6.35	2.38	2.8	< 0.05	7																●										*1
			070201M						< 0.1																	●										
			070202M						< 0.2																	●										
			070204M						< 0.4																	●										
		DCGT	11T3005M	3	2	9.525	3.97	4.4	< 0.05	7																●										*2
			11T301M						< 0.1																	●										
			11T302M						< 0.2																	●										
			11T304M						< 0.4																	●										
Medium	 Sharp edge	DCGT	0702005MF	2	2	6.35	2.38	2.8	< 0.05	7															●	●		●									*1
			070201MF						< 0.1																●	●	●	●									
			070202MF						< 0.2																●	●	●	●									
			070204MF						< 0.4																●	●	●	●									
		DCGT	11T3005MF	3	2	9.525	3.97	4.4	< 0.05	7															●	●		●									*2
			11T301MF						< 0.1																●	●	●	●									
			11T302MF						< 0.2																●	●	●	●									
			11T304MF						< 0.4																●	●	●	●									

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

*1 : DC..07type **E29, E31, E34 E35, E55, E56, F66~F68, F70~F72, F74~F76, F125**

*2 : DC..11type **E23, E29~E32, E34, E35, E55, E56, F66~F68, F70~F72, F74~F76, F125**

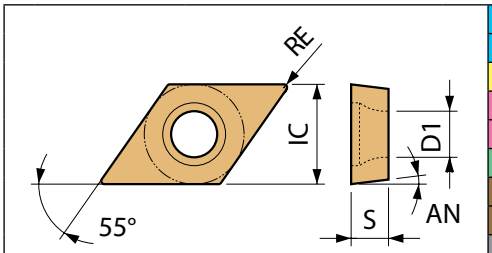
Applicable chipbreaker range

1	2	3
		

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

55° Rhombic

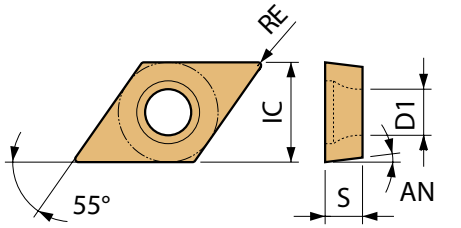
How to read pages of "Turning inserts" See page B15



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55° Rhombic

How to read pages of "Turning inserts" See page B15

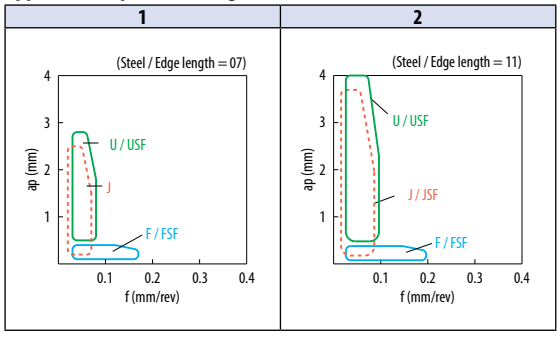


Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide DLC PDL010	DLC PDL025	PVD PR1225	PVD PR1535	PVD PR1705	PVD PR1725	PVD PR930	Cermet PVD PV710	PVD PV720	PVD PV730	- TN60	- TN610	- TN620	Applicable toolholder
Finishing	Precision / Sharp edge	DCET	0702003R-FSF	1	2	6.35	2.38	2.8	0.03	7							●				●			*1
			0702003L-FSF						0.03								●				●			
			070201R-FSF						0.1								●							
			070201L-FSF						0.1								●							
			070202R-FSF						0.2								●				●			
			070202L-FSF						0.2								●				●			
			070204R-FSF						0.4								●				●			
			070204L-FSF						0.4								●				●			
		DCET	11T3003R-FSF	2	2	9.525	3.97	4.4	0.03	7							●							*2
			11T301R-FSF						0.1								●				●			
			11T301L-FSF						0.1								●							
			11T302R-FSF						0.2								●				●			
			11T302L-FSF						0.2								●				●			
			11T304R-FSF						0.4								●				●			
			11T304L-FSF						0.4								●				●			
		DCET	0702005MR-FSF	1	2	6.35	2.38	2.8	< 0.05	7			●											*1
			0702005ML-FSF						< 0.05				●											
			070201MR-FSF						< 0.1				●											
			070201ML-FSF						< 0.1				●											
			070202MR-FSF						< 0.2				●											
			070202ML-FSF						< 0.2				●											
			070204MR-FSF						< 0.4				●											
		DCET	11T3005MR-FSF	2	2	9.525	3.97	4.4	< 0.05	7			●											*2
			11T301MR-FSF						< 0.1				●											
			11T302MR-FSF						< 0.2				●											
			11T302ML-FSF						< 0.2				●											
			11T304MR-FSF						< 0.4				●											
Finishing	Sharp edge	DCET	0702005MR-F	1	2	6.35	2.38	2.8	< 0.05	7		●		●	●	●								*1
			0702005ML-F						< 0.05						●									
			070201MR-F						< 0.1		●	●		●		●		●	●	●		●	●	
			070201ML-F						< 0.1		●	●		●		●		●	●	●		●	●	
			070202MR-F						< 0.2		●	●		●		●		●	●	●		●	●	
			070202ML-F						< 0.2		●	●		●		●		●	●	●		●	●	
			070204MR-F						< 0.4		●	●		●		●		●	●	●		●	●	
			070204ML-F						< 0.4		●	●		●		●		●	●	●		●	●	
		DCET	11T3005MR-F	2	2	9.525	3.97	4.4	< 0.05	7	●	●		●		●								*2
			11T301MR-F						< 0.1		●	●		●		●		●	●	●		●	●	
			11T301ML-F						< 0.1		●	●		●		●		●	●	●		●	●	
			11T302MR-F						< 0.2		●	●		●	●	●		●	●	●		●	●	
			11T302ML-F						< 0.2		●	●		●	●	●		●	●	●		●	●	
			11T304MR-F						< 0.4		●	●		●	●	●		●	●	●		●	●	
			11T304ML-F						< 0.4		●	●		●	●	●		●	●	●		●	●	

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

Applicable chipbreaker range

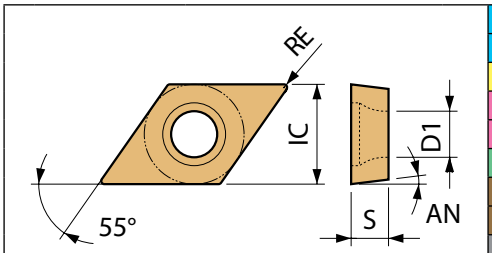


*1 : DC..07type **E29, E31, E34 E35, E55, E56, F66~F68, F70~F72, F74~F76, F125**
*2 : DC..11type **E23, E29~E32, E34, E35, E55, E56, F66~F68, F70~F72, F74~F76, F125**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

55° Rhombic

How to read pages of "Turning inserts" See page B15



Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

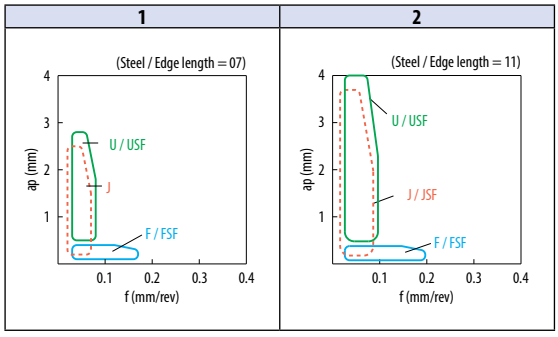
Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide PVD PR1225	PVD PR930	- KW10	Cermet - TN60	Applicable toolholder
Finishing	Sharp edge	DCGT	0702003R-F	1	2	6.35	2.38	2.8	0.03	7			●		*1
			0702003L-F						0.03				●		
			070201R-F						0.1			●	●		
			070201L-F						0.1			●	●		
			070202R-F						0.2			●	●	●	
			070202L-F						0.2			●	●	●	
			070204R-F						0.4			●	●	●	
			070204L-F						0.4			●	●	●	
		DCGT	11T3003R-F	2	2	9.525	3.97	4.4	0.03	7		●	●		*2
			11T3003L-F						0.03			●			
			11T301R-F						0.1			●	●	●	
			11T301L-F						0.1			●	●		
			11T302R-F						0.2			●	●	●	
			11T302L-F						0.2			●	●	●	
			11T304R-F						0.4			●	●	●	
			11T304L-F						0.4			●	●	●	
		DCGT	0702005MR-F	1	2	6.35	2.38	2.8	< 0.05	7	●				*1
			0702005ML-F						< 0.05		●				
			070201MR-F						< 0.1		●				
			070201ML-F						< 0.1		●				
			070202MR-F						< 0.2		●				
			070202ML-F						< 0.2		●				
			070204MR-F						< 0.4		●				
			070204ML-F						< 0.4		●				
		DCGT	11T3005MR-F	2	2	9.525	3.97	4.4	< 0.05	7	●				*2
			11T301MR-F						< 0.1		●				
			11T301ML-F						< 0.1		●				
			11T302MR-F						< 0.2		●				
			11T302ML-F						< 0.2		●				
			11T304MR-F						< 0.4		●				
			11T304ML-F						< 0.4		●				

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

*1 : DC..07type **E29, E31, E34 E35, E55, E56, F66~F68, F70~F72, F74~F76, F125**

*2 : DC..11type **E23, E29~E32, E34, E35, E55, E56, F66~F68, F70~F72, F74~F76, F125**

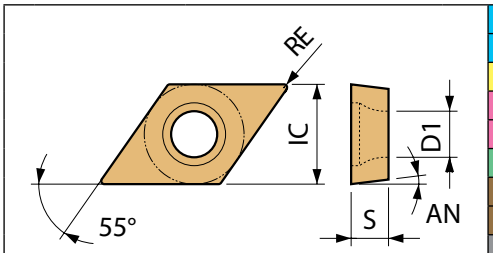
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

55° Rhombic

How to read pages of "Turning inserts" See page B15



Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

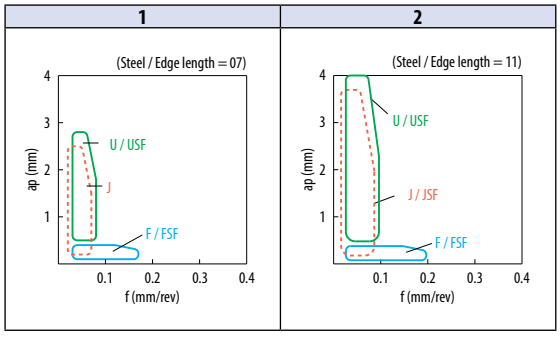
Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide DLC PDL010	DLC PDL025	PVD PR1225	PVD PR1535	PVD PR1705	PVD PR1725	PVD PR930	Cermet PVD PV710	PVD PV720	PVD PV730	- TN60	- TN610	- TN620	Applicable toolholder
Low feed	Precision / Sharp edge	DCET	0702003FR-USF	1	2	6.35	2.38	2.8	0.03	7							●							*1
			0702003FL-USF						0.03								●							
			070201FR-USF						0.1								●							
			070201FL-USF						0.1								●							
			070202FR-USF						0.2								●				●			
			070202FL-USF						0.2								●				●			
		DCET	11T3003FR-USF	2	2	9.525	3.97	4.4	0.03	7							●							*2
			11T3003FL-USF						0.03								●							
			11T301FR-USF						0.1								●				●			
			11T301FL-USF						0.1								●				●			
			11T302FR-USF						0.2								●				●			
			11T302FL-USF						0.2								●				●			
		DCET	0702005MFR-USF	1	2	6.35	2.38	2.8	< 0.05	7			●											*1
			070201MFR-USF						< 0.1				●											
			070202MFR-USF						< 0.2				●											
			070202MFL-USF						< 0.2				●											
		DCET	11T3005MFR-USF	2	2	9.525	3.97	4.4	< 0.05	7			●											*2
			11T301MFR-USF						< 0.1				●											
			11T301MFL-USF						< 0.1				●											
			11T302MFR-USF						< 0.2				●											
			11T302MFL-USF						< 0.2				●											
Low feed	Sharp edge	DCET	0702003FR-U	1	2	6.35	2.38	2.8	0.03	7						●								*1
		DCET	0702005MFR-U	1	2	6.35	2.38	2.8	< 0.05	7		●		●		●						●		
			070201MFR-U						< 0.1		●	●		●	●	●		●				●		
			070201MFL-U						< 0.1		●	●		●		●		●				●		
			070202MFR-U						< 0.2		●	●		●	●	●		●	●	●		●	●	
			070202MFL-U						< 0.2		●	●		●		●		●	●	●		●	●	
		DCET	11T3005MFR-U	2	2	9.525	3.97	4.4	< 0.05	7		●		●	●	●								*2
			11T301MFR-U						< 0.1		●	●		●	●	●		●				●		
			11T301MFL-U						< 0.1		●	●		●		●		●				●		
			11T302MFR-U						< 0.2		●	●		●	●	●		●	●	●		●	●	
			11T302MFL-U						< 0.2		●	●		●	●	●		●	●	●		●	●	
			11T304MFR-U						< 0.4		●	●		●	●	●								

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

*1 : DC..07type **E29, E31, E34 E35, E55, E56, F66~F68, F70~F72, F74~F76, F125**

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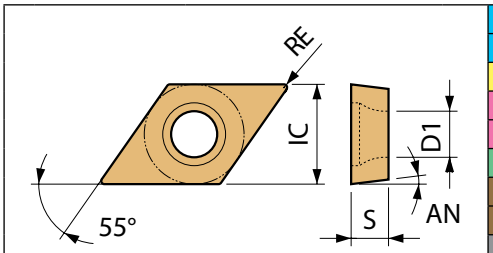
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

55° Rhombic

How to read pages of "Turning inserts" See page B15



Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

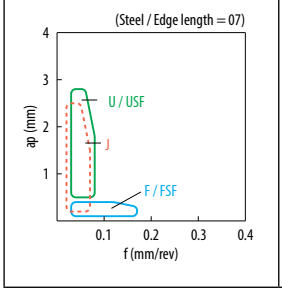
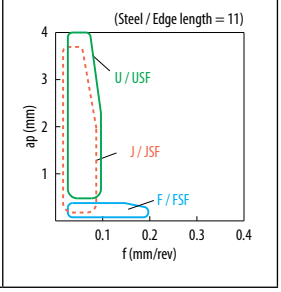
Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide PVD PR1225	PVD PR930	- KW10	Cermet - TN60	Applicable toolholder
Low feed	Sharp edge	DCGT	0702003FR-U	1	2	6.35	2.38	2.8	0.03	7		●	●		*1
			0702003FL-U						0.03			●			
			070201FR-U						0.1			●	●	●	
			070201FL-U						0.1			●	●	●	
			070202FR-U						0.2			●		●	
			070202FL-U						0.2			●		●	
		DCGT	11T3003FR-U	2	2	9.525	3.97	4.4	0.03	7		●	●	●	*2
			11T3003FL-U						0.03			●		●	
			11T301FR-U						0.1			●	●	●	
			11T301FL-U						0.1			●	●	●	
			11T302FR-U						0.2			●	●	●	
			11T302FL-U						0.2			●	●	●	
		DCGT	0702005MFR-U	1	2	6.35	2.38	2.8	< 0.05	7	●				*1
			0702005MFL-U						< 0.05		●				
			070201MFR-U						< 0.1		●				
			070201MFL-U						< 0.1		●				
			070202MFR-U						< 0.2		●				
			070202MFL-U						< 0.2		●				
			070204MFR-U						< 0.4		●				
			070204MFL-U						< 0.4		●				
		DCGT	11T3005MFR-U	2	2	9.525	3.97	4.4	< 0.05	7	●				*2
			11T301MFR-U						< 0.1		●				
			11T301MFL-U						< 0.1		●				
			11T302MFR-U						< 0.2		●				
			11T302MFL-U						< 0.2		●				
			11T304MFR-U						< 0.4		●				
			11T304MFL-U						< 0.4		●				

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

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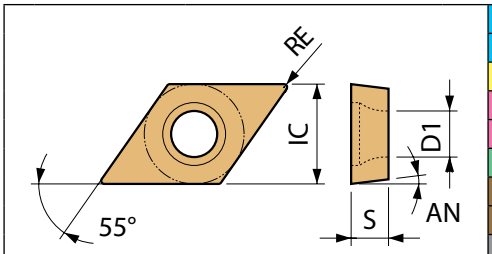
Applicable chipbreaker range

1	2
	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

55° Rhombic

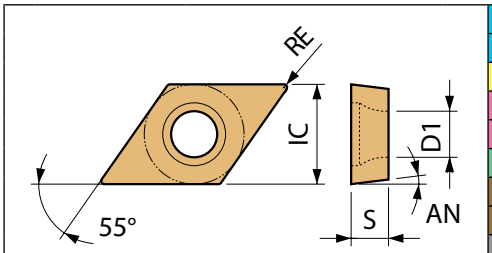
How to read pages of "Turning inserts" See page B15



| | | |

55° Rhombic

How to read pages of "Turning inserts" See page B15



Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

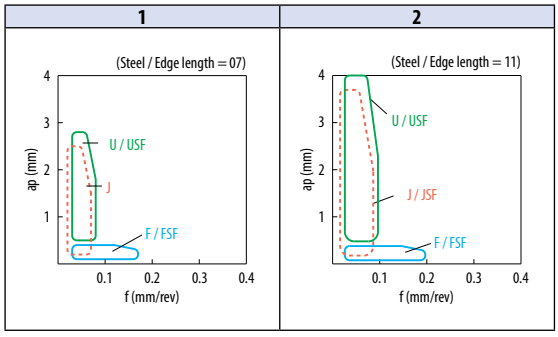
Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide PVD PR1225	PR1535	PR1705	PR1725	PR930	Carbide - KW10	Cermet PVD PV710	PV720	PV730	Cermet - TN60	TN610	TN620	Applicable toolholder
Low feed	Sharp edge	DCET	0702005MFR-J	1	2	6.35	2.38	2.8	< 0.05	7	●	●		●									*1
			070201MFR-J						< 0.1		●	●		●									
			070201MFL-J						< 0.1			●		●									
			070202MFR-J						< 0.2		●	●		●									
			070202MFL-J						< 0.2		●	●		●									
		DCET	11T3005MFR-J	2	2	9.525	3.97	4.4	< 0.05	7		●		●									*2
			11T301MFR-J						< 0.1			●	●	●			●				●		
			11T301MFL-J						< 0.1			●		●			●				●		
			11T302MFR-J						< 0.2			●	●	●			●				●		
			11T302MFL-J						< 0.2			●		●			●				●		
			11T304MFR-J						< 0.4			●	●	●									
			11T304MFL-J						< 0.4				●										
Low feed	Sharp edge	DCGT	11T301FR-J	2	2	9.525	3.97	4.4	0.1	7					●	●				●			
			11T301FL-J						0.1						●								
			11T302FR-J						0.2						●	●				●			
			11T302FL-J						0.2						●	●				●			
		DCGT	11T3005MFR-J	2	2	9.525	3.97	4.4	< 0.05	7	●												
			11T301MFR-J						< 0.1		●												
			11T301MFL-J						< 0.1		●												
			11T302MFR-J						< 0.2		●												
			11T302MFL-J						< 0.2		●												
			11T304MFR-J						< 0.4		●												
			11T304MFL-J						< 0.4		●												
Low feed	With honing	DCGT	11T3003ER-J	2	2	9.525	3.97	4.4	0.03	7					●								
			11T301ER-J						0.1						●	●	●	●	●		●	●	
			11T301EL-J						0.1								●				●		
			11T302ER-J						0.2						●	●	●	●	●	●	●	●	
			11T302EL-J						0.2						●		●				●		
			11T304ER-J						0.4						●	●	●	●	●	●	●	●	
			11T304EL-J						0.4						●	●	●	●	●	●	●	●	
		DCGT	11T3005MER-J	2	2	9.525	3.97	4.4	< 0.05	7				●									
			11T301MER-J						< 0.1					●									
			11T302MER-J						< 0.2					●									
			11T304MER-J						< 0.4					●									
			11T304MEL-J						< 0.4					●									

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

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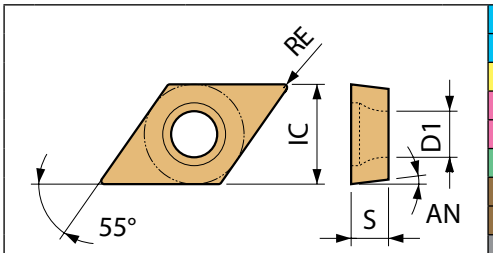
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

55° Rhombic

How to read pages of "Turning inserts" See page B15

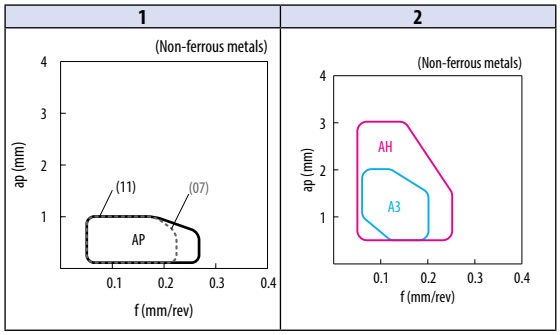


Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide DLC PDL010	DLC PDL025	- KW10	Applicable toolholder
Non-ferrous metals	 Finishing / Sharp edge	DCGT	070202AP 070204AP	1	2	6.35	2.38	2.8	0.2 0.4	7	● ●		● ●	*1
		DCGT	11T302AP 11T304AP 11T308AP	1	2	9.525	3.97	4.4	0.2 0.4 0.8	7	● ● ●		● ● ●	*2
Non-ferrous metals	 Finishing - Medium / Sharp edge	DCGT	11T302R-A3 11T302L-A3 11T304R-A3 11T304L-A3 11T308R-A3 11T308L-A3	2	2	9.525	3.97	4.4	0.2 0.2 0.4 0.4 0.8 0.8	7	● ● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	
Non-ferrous metals	 Finishing - Medium / Sharp edge	DCGT	11T304AH 11T308AH	2	2	9.525	3.97	4.4	0.4 0.8	7	● ●	● ●	● ●	
Cast iron	 Without chipbreaker	DCGW	070201 070202	-	2	6.35	2.38	2.8	0.1 0.2	7			● ●	*1
		DCGW	11T301 11T302 11T304	-	2	9.525	3.97	4.4	0.1 0.2 0.4	7			● ● ●	*2

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*2 : DC..11type **E23, E29~E32, E34, E35, E55, E56, F66~F68, F70~F72, F74~F76, F125**

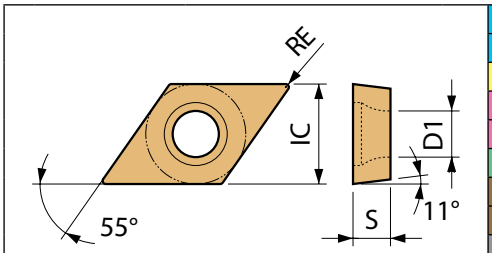
Applicable chipbreaker range



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55° Rhombic

How to read pages of "Turning inserts" See page B15

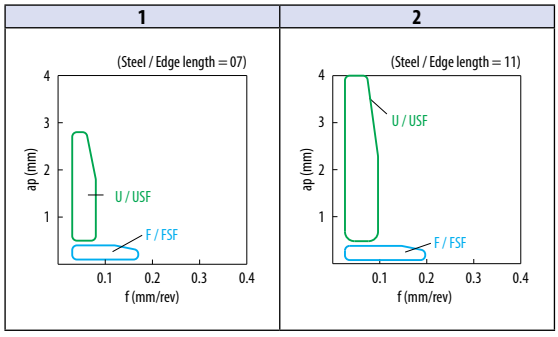


Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide PVD PR1725	Carbide PVD PR930	Cermet - TN60	Applicable toolholder
Finishing	Precision / Sharp edge	DPET	0702003R-FSF	1	2	6.35	2.38	2.8	0.03	11		●		E37
			070201R-FSF						0.1			●		
			070202R-FSF						0.2			●		
			070202L-FSF						0.2			●		
		DPET	11T3003R-FSF	2	2	9.525	3.97	4.4	0.03	11		●		
			11T301R-FSF						0.1			●		
			11T302R-FSF						0.2			●	●	
			11T302L-FSF						0.2			●	●	
		DPET	070202MR-FSF	1	2	6.35	2.38	2.8	< 0.2	11	●			
			070202ML-FSF								●			
		DPET	11T3005MR-FSF	2	2	9.525	3.97	4.4	< 0.05	11	●			
			11T301MR-FSF						< 0.1		●			
			11T302MR-FSF						< 0.2		●			
Low feed	Precision / Sharp edge	DPET	0702003FR-USF	1	2	6.35	2.38	2.8	0.03	11		●		
			070201FR-USF						0.1			●		
			070201FL-USF						0.1			●		
			070202FR-USF						0.2			●		
			070202FL-USF						0.2			●		
		DPET	11T3003FR-USF	2	2	9.525	3.97	4.4	0.03	11		●		
			11T301FR-USF						0.1			●		
			11T301FL-USF						0.1			●		
			11T302FR-USF						0.2			●	●	
			11T302FL-USF						0.2			●	●	
		DPET	0702005MFR-USF	1	2	6.35	2.38	2.8	< 0.05	11	●			
			070201MFR-USF						< 0.1		●			
			070202MFR-USF						< 0.2		●			
		DPET	11T3005MFR-USF	2	2	9.525	3.97	4.4	< 0.05	11	●			
			11T301MFR-USF						< 0.1		●			
			11T302MFR-USF						< 0.2		●			

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

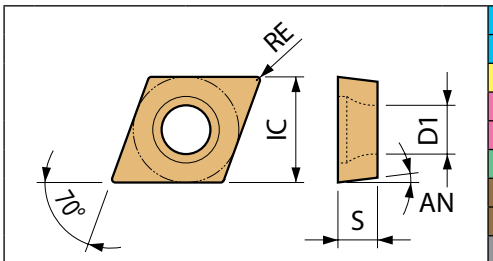
Applicable chipbreaker range



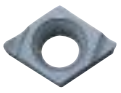
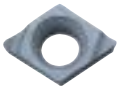
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

70° Rhombic

How to read pages of "Turning inserts" See page B15

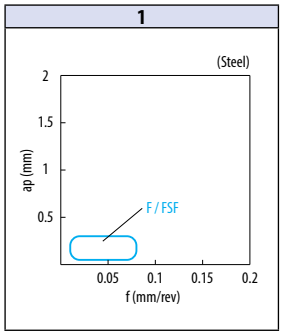


Free-cutting steel																P
Carbon steel / Alloy steel						●	○	○								P
Stainless steel					●	○	○									M
Gray cast iron																K
Nodular cast iron																K
Non-ferrous metals								●								N
Heat-resistant alloy					●											S
Titanium alloy					●			○								S
Hard materials																H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm)				Angle (°)	Carbide				Cermet	Applicable toolholder
						IC	S	D1	RE	AN	PVD		-		-	
											PR1535	PR1725	PP930	KW10	TN60	
Finishing	 Precision / Sharp edge	JCET	030102L-FSF	1	2	3.5	1.4	1.9	0.2	7			●			F78 F79
Finishing		JCET	030101MR-FSF	1	2	3.5	1.4	1.9	< 0.1	7		●				
			030101ML-FSF									●				
Finishing	 Sharp edge	JCET	030102MR-F	1	2	3.5	1.4	1.9	< 0.2	7	●	●				
			030102ML-F						< 0.2		●	●				
			030104MR-F						< 0.4		●	●				
			030104ML-F						< 0.4		●	●				
Finishing	 Sharp edge	JCGT	030101R-F	1	2	3.5	1.4	1.9	0.1	7			●			
			030101L-F						0.1				●	●	●	
			030102R-F						0.2				●	●	●	
			030102L-F						0.2				●	●	●	
			030104R-F						0.4				●			
			030104L-F						0.4				●		●	

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

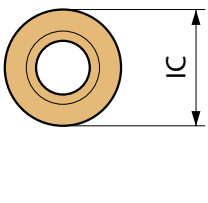
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Round

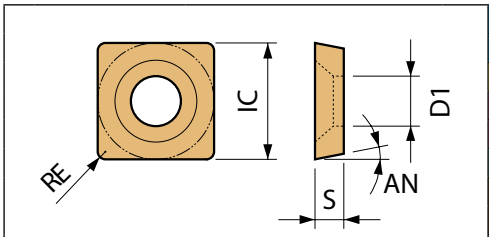
How to read pages of "Turning inserts" See page B15



| | | |

90° Square

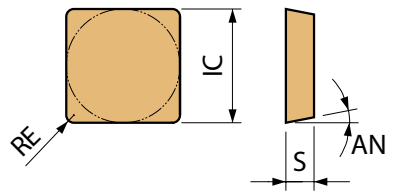
How to read pages of "Turning inserts" See page B15



| | | |

90° Square

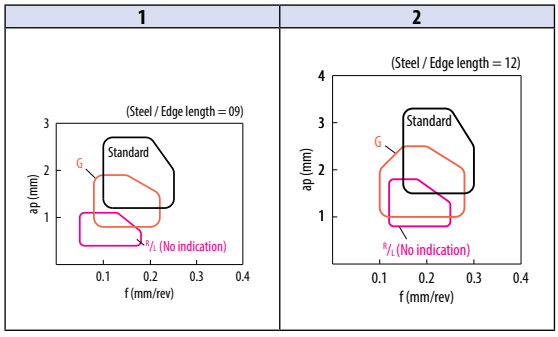
How to read pages of "Turning inserts" See page B15



Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	RE	Angle (°) AN	Carbide CVD CA025P	CA115P	CA125P	CA310	CA315	CA320	CA4515	CA515	CA525	CA530	CA6525	Carbide PVD PR1535	KW10	Cermet CVD CCX	Cermet PVD PV7005	PV7010	PV7020	PV7030	Cermet - TN60	TN610	TN620	Applicable toolholder
Medium		SPMR	090304G 090308G	1	4	9.525	3.18	0.4 0.8	11											● ●	●				● ●	●	●	● ●		
Medium		SPMR	120304G 120308G	2	4	12.7	3.18	0.4 0.8	11											● ●	●				● ●	●	●	● ●		
Medium		SPMR	090304 090308	1	4	9.525	3.18	0.4 0.8	11	● ●	●	●				●	●		●	● ●	●									
Medium		SPMR	120304 120308	2	4	12.7	3.18	0.4 0.8	11	● ●	●	●				●	●	●	●	● ●	●									
Finishing		SPGR	090304R 090304L 090308R 090308L	1	4	9.525	3.18	0.4 0.4 0.8 0.8	11															● ●	●	●	● ●	●	●	● ●	F112
Finishing		SPGR	120304R 120304L 120308R 120308L	2	4	12.7	3.18	0.4 0.4 0.8 0.8	11															● ●	●	●	● ●	●	●	● ●	
Cast iron	Without chipbreaker	SPGN	090304 090308	-	4	9.525	3.18	0.4 0.8	11													● ●								
Cast iron		SPGN	120304 120308	-	4	12.7	3.18	0.4 0.8	11													● ●	●							
Cast iron		SPMN	120304 120308 120312	-	4	12.7	3.18	0.4 0.8 1.2	11				● ●	●	●	●						● ●			● ●		●	● ●	●	
Cast iron		SPMN	120408 120412	-	4	12.7	4.76	0.8 1.2	11				● ●	●	●	●														

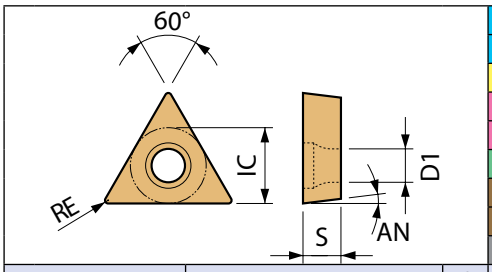
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

60° Triangle

How to read pages of "Turning inserts" See page B15

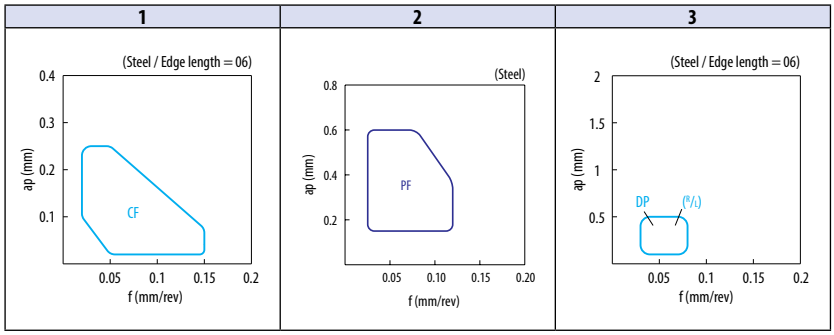


Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide CVD CA025P	CA115P	CA125P	CA510	CA515	CA525	CA530	Carbide PVD PR1225	PR1535	PR1705	PR1725	PR930	Carbide - KW10	Cermet CVD CCX	Cermet PVD PV710	PV720	PV730	Cermet - TN60	TN610	TN620	Applicable toolholder
Minute ap	 Sharp edge	TBGT	060102CF	1	3	3.97	1.59	2.3	0.2	5												●									
Minute ap	 Polished / Sharp edge	TBGT	060101MP-CF 060102MP-CF	1	3	3.97	1.59	2.3	< 0.1 < 0.2	5								● ●	● ●	● ●	● ●										
Finishing	 Polished / Sharp edge	TBGT	060101MFP-PF 060102MFP-PF 060104MFP-PF	2	3	3.97	1.59	2.3	< 0.1 < 0.2 < 0.4	5									● ● ●	● ● ●										
Finishing		TBMT	060102DP 060104DP	3	3	3.97	1.59	2.3	0.2 0.4	5	● ●	● ●	● ●	● ●	● ●	● ●	● ●							● ●	● ●	● ●	● ●	● ●	● ●	F33, F34 F80~F82 F86, F87
Finishing		TBET	0601005MR 0601005ML 060101MR 060101ML 060102MR 060102ML 060104MR 060104ML	3	3	3.97	1.59	2.4	< 0.05 < 0.05 < 0.1 < 0.1 < 0.2 < 0.2 < 0.4 < 0.4	5								● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ●											
Finishing		TBGT	060101R 060101L 060102R 060102L 060104R 060104L	3	3	3.97	1.59	2.4	0.1 0.1 0.2 0.2 0.4 0.4	5											● ● ● ● ● ●			● ● ● ● ● ●	● ● ● ● ● ●	● ● ● ● ● ●	● ● ● ● ● ●	● ● ● ● ● ●	● ● ● ● ● ●	
Cast iron	 Without chipbreaker	TBGW	060102 060104	-	3	3.97	1.59	2.4	0.2 0.4	5											● ●						●			

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

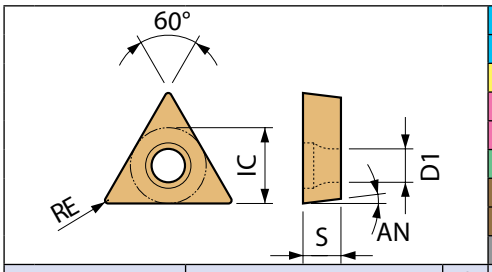
Applicable chipbreaker range

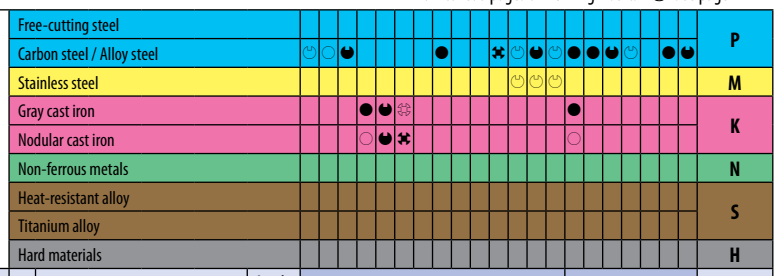


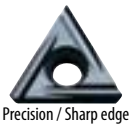
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

60° Triangle

How to read pages of "Turning inserts" See page B15

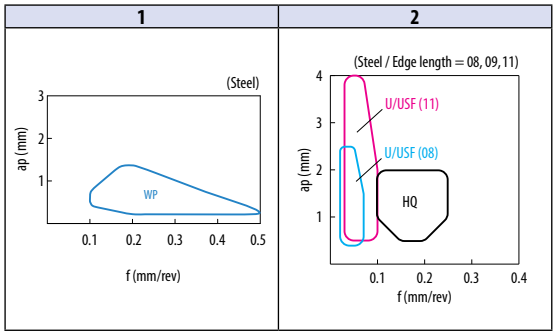




Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide CVD CA025P	CA115P	CA125P	CA310	CA315	CA320	CA4515	CA510	CA515	CA525	CA530	Carbide PVD PR1225	PR1725	PR930	Cermet CVD CCX	Cermet PVD PV710	PV720	PV730	Cermet - TN60	TN610	TN620	Applicable toolholder
Finishing	 With Wiper Edge	TCMX	090204WP	1	3	5.56	2.38	2.5	0.4	7	●	●	●					●	●	●	●	●	●			●	●			●	●	F88 F89
		TCMX	110204WP	1	3	6.35	2.38	2.8	0.4	7	●	●	●					●	●	●	●	●	●			●	●			●	●	
Finishing - Medium		TCMT	090202HQ	2	3	5.56	2.38	2.5	0.2	7															●	●	●	●	●	●	●	
			090204HQ						0.4																●	●	●	●	●	●	●	
		TCMT	110202HQ	2	3	6.35	2.38	2.8	0.2	7															●	●	●	●	●	●	●	
			110204HQ						0.4		●	●	●	●	●	●	●	●	●	●	●				●	●	●	●	●	●	●	
			110208HQ						0.8		●	●	●	●	●	●			●	●	●				●	●	●	●	●	●	●	
		TCMT	16T304HQ	2	3	9.525	3.97	4.4	0.4	7															●		●	●			●	-
			16T308HQ						0.8					●	●	●	●								●		●	●			●	
			16T312HQ						1.2					●	●	●	●								●							
Low feed	 Precision / Sharp edge	TCET	080201FR-USF	2	3	4.76	2.38	2.5	0.1	7													●									
			080202FR-USF						0.2														●									
		TCET	1103003FL-USF	2	3	6.35	3.18	2.8	0.03	7													●								E38
			110301FR-USF						0.1														●									
			110301FL-USF						0.1														●									
			110302FR-USF						0.2														●									
			110302FL-USF						0.2														●									
		TCET	1103005MFR-USF	2	3	6.35	3.18	2.8	< 0.05	7													●									
			110301MFR-USF						< 0.1														●									
			110302MFR-USF						< 0.2														●									

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).
See "Precautions when using Wiper inserts" in the **R36** and **R37** for WP chipbreaker.

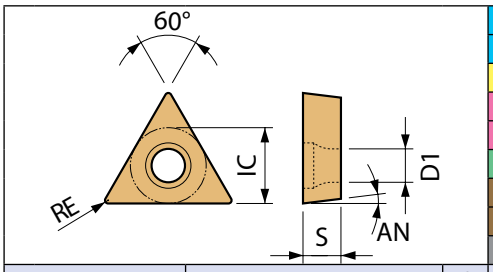
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

60° Triangle

How to read pages of "Turning inserts" See page B15



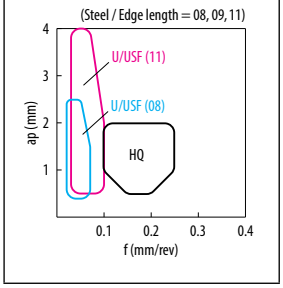
Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide PVD PR1225	PR1725	- PP930	KW10	Cermet - TN60	Applicable toolholder
Low feed	 Sharp edge	TCGT	080201FR-U	1	3	4.76	2.38	2.5	0.1	7			●		●	E38
			080202FR-U						0.2				●	●	●	
			080202FL-U						0.2				●	●	●	
		TCGT	1103003FR-U	1	3	6.35	3.18	2.8	0.03	7			●	●		
			110301FR-U						0.1				●	●	●	
			110301FL-U						0.1					●		
			110302FR-U						0.2				●	●	●	
			110302FL-U						0.2				●	●	●	
		TCGT	080201MFR-U	1	3	4.76	2.38	2.5	< 0.1	7	●					
			080202MFR-U						< 0.2		●					
			080202MFL-U						< 0.2		●					
		TCGT	1103005MFR-U	1	3	6.35	3.18	2.8	< 0.05	7	●					
			1103005MFL-U						< 0.05		●					
			110301MFR-U						< 0.1		●					
			110301MFL-U						< 0.1		●					
			110302MFR-U						< 0.2		●					
			110302MFL-U						< 0.2		●					
			110304MFR-U						< 0.4		●					
			110304MFL-U						< 0.4		●					
Low feed	 With honing	TCGT	080202ER-U	1	3	4.76	2.38	2.5	0.2	7			●		●	
			080202EL-U										●		●	
		TCGT	110301ER-U	1	3	6.35	3.18	2.8	0.1	7					●	
			110302ER-U						0.2				●		●	
			110302EL-U						0.2				●		●	
			110304ER-U						0.4				●		●	
			110304EL-U						0.4				●		●	
		TCGT	080202MER-U	1	3	4.76	2.38	2.5	< 0.2	7		●				
		TCGT	110302MER-U	1	3	6.35	3.18	2.8	< 0.2	7		●				
			110302MEL-U						< 0.2			●				
			110304MER-U						< 0.4			●				

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

Applicable chipbreaker range

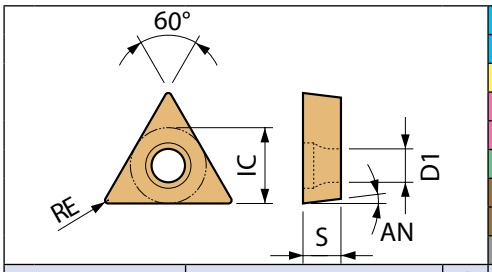
1



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

60° Triangle

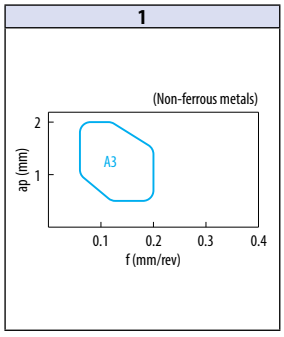
How to read pages of "Turning inserts" See page B15



											Carbide			
											DLC		-	
	Insert		Description	Applicable chipbreaker range	No. of edges	IC	S	D1	RE	AN	PDL010	PDL025	KW10	Applicable toolholder
Non-ferrous metals	 Finishing - Medium / Sharp edge	TCGT	110302R-A3	1	3	6.35	3.18	2.8	0.2	7	●	●	●	E38
			110302L-A3						0.2		●	●	●	
			110304R-A3						0.4		●	●	●	
			110304L-A3						0.4		●	●	●	
			110308R-A3						0.8		●	●		
			110308L-A3						0.8		●	●		
Cast iron	 Without chipbreaker	TCGW	080201	-	3	4.76	2.38	2.5	0.1	7			●	
			080202						0.2				●	
		TCGW	110301	-	3	6.35	3.18	2.8	0.1	7			●	
			110302						0.2				●	
			110304						0.4				●	

	Free-cutting steel	Carbon steel / Alloy steel	Stainless steel	Gray cast iron	Nodular cast iron	Non-ferrous metals	Heat-resistant alloy	Titanium alloy	Hard materials	
TCGT	●	●	●	○	○	●	○	○	○	P / M / K / N / S / H
TCGW	●	●	●	○	○	●	○	○	○	P / M / K / N / S / H

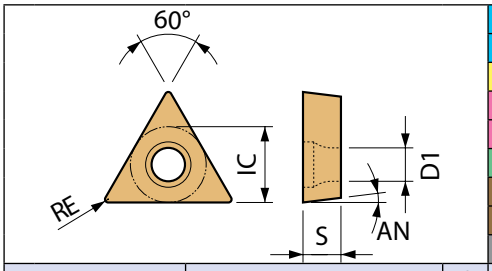
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

60° Triangle

How to read pages of "Turning inserts" See page B15

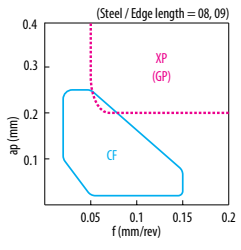
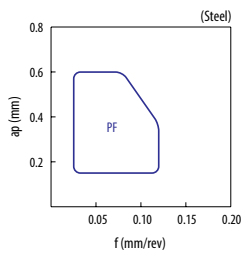
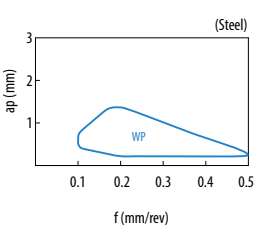
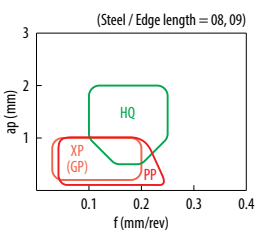
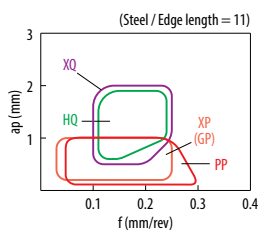


Free-cutting steel		P
Carbon steel / Alloy steel		P
Stainless steel		M
Gray cast iron		K
Nodular cast iron		K
Non-ferrous metals		N
Heat-resistant alloy		S
Titanium alloy		S
Hard materials		H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide CVD CA025P	CA115P	CA125P	CA510	CA515	CA525	CA530	Carbide PVD PR1225	PR1535	PR1705	PR1725	PR930	Cermet CVD CCX	Cermet PVD PV710	PV720	PV730	- TN610	TN620	Applicable toolholder
Minute ap	 Sharp edge	TPGT	080202CF	1	3	4.76	2.38	2.3	0.2	11												●						E39 F80~F82 F86
		TPGT	090202CF	1	3	5.56	2.38	2.8	0.2	11												●						F33, F34 F80~F82 F86
Minute ap	 Polished / Sharp edge	TPGT	080201MP-CF 080202MP-CF	1	3	4.76	2.38	2.3	< 0.1 < 0.2	11								● ● ●	● ● ●	● ● ●	● ● ●								E39 F80~F82 F86
		TPGT	090201MP-CF 090202MP-CF	1	3	5.56	2.38	2.8	< 0.1 < 0.2	11								● ● ●	● ● ●	● ● ●	● ● ●								
Finishing	 Polished / Sharp edge	TPGT	090201MFP-PF 090202MFP-PF 090204MFP-PF	2	3	5.56	2.38	2.8	< 0.1 < 0.2 < 0.4	11									● ● ●	● ● ●	● ● ●								F33, F34 F80~F82 F86
Finishing	 With Wiper Edge	TPMX	090202WP 090204WP 090208WP	3	3	5.56	2.38	2.8	0.2 0.4 0.8	11	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●			● ● ●	● ● ●			● ● ●	● ● ●		● ● ●	● ● ●	F33, F34 F80~F82
		TPMX	110302WP 110304WP 110308WP	3	3	6.35	3.18	3.3	0.2 0.4 0.8	11	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●			● ● ●	● ● ●			● ● ●	● ● ●		● ● ●	● ● ●	
Finishing	 With Wiper Edge	TPMX	110304R-WP 110304L-WP	3	3	6.35	3.18	3.3	0.4	11										● ●	● ●				● ●			● ●	F80~F82 F126
Finishing		TPMT	090202PP 090204PP	4	3	5.56	2.38	2.8	0.2 0.4	11	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	F33, F34 F80~F82 F86
		TPMT	110302PP 110304PP 110308PP	5	3	6.35	3.18	3.3	0.2 0.4 0.8	11	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	E39 F80~F82 F84, F85 F126

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).
See "Precautions when using Wiper inserts" in the **R36** and **R37** for WP chipbreaker.

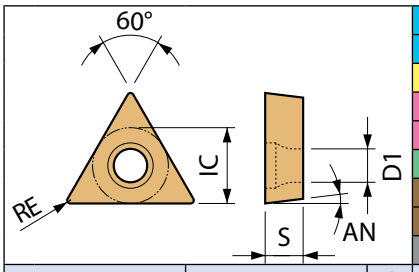
Applicable chipbreaker range

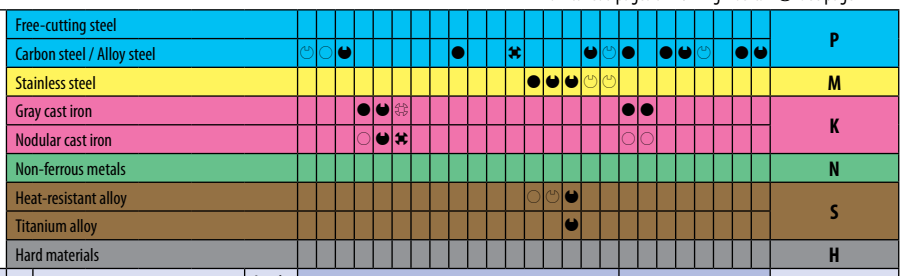
1	2	3	4	5
				

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

60° Triangle

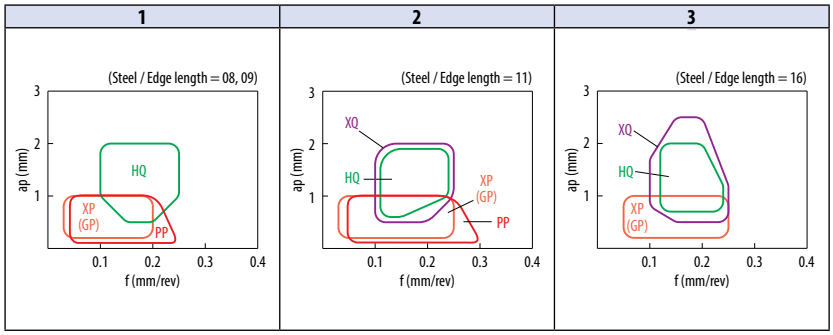
How to read pages of "Turning inserts" See page B15





	Insert	Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide CVD CA025P	CA115P	CA125P	CA310	CA315	CA320	CA4505	CA4515	CA510	CA515	CA525	CA530	CA6515	CA6525	Carbide PVD PR1535	PR1725	PR930	Cermet CVD CCX	Cermet PVD PV7005	PV710	PV720	PV730	Cermet - TN60	TN610	TN620	Applicable toolholder
Finishing		TPMT	090202GP 090204GP	1	3	5.56	2.38	2.8	0.2 0.4	11	● ●	●	●							●	●				●	●			●	●			●	●	F33, F34 F80~F82 F86
		TPMT	110304GP 110308GP	2	3	6.35	3.18	3.3	0.4 0.8	11	● ●	●	●							●	●				●	●			●	●			●	●		E39 F80~F82 F84, F85, F126
		TPMT	160304GP	3	3	9.525	3.18	4.7	0.4	11	●	●	●							●	●				●	●			●	●			●	●		F80~F82 F84, F126
Finishing - Medium		TPMT	090202HQ 090204HQ	1	3	5.56	2.38	2.8	0.2 0.4	11	● ●	●	●							●	●				●	●	●	●	●	●			●	●		F33, F34 F80~F82 F86
		TPMT	110302HQ 110304HQ 110308HQ	2	3	6.35	3.18	3.3	0.2 0.4 0.8	11	● ● ●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	E39 F80~F82 F84, F85, F126
		TPMT	160302HQ 160304HQ 160308HQ	3	3	9.525	3.18	4.7	0.2 0.4 0.8	11	● ● ●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	F80~F82 F84, F126
Low carbon steel	 Finishing	TPMT	090204XP	1	3	5.56	2.38	2.8	0.4	11	● ●	●	●							●	●				●	●			●	●			●	●		F33, F34 F80~F82 F86
		TPMT	110304XP 110308XP	2	3	6.35	3.18	3.3	0.4 0.8	11	● ●	●	●							●	●	●			●	●	●		●	●			●	●		E39 F80~F82 F84, F85, F126
		TPMT	160304XP 160308XP	3	3	9.525	3.18	4.7	0.4 0.8	11	● ●	●	●							●	●	●			●	●	●		●	●			●	●		F80~F82 F84, F126
Low carbon steel	 Finishing - Medium	TPMT	110304XQ 110308XQ	2	3	6.35	3.18	3.3	0.4 0.8	11	● ●	●	●							●	●	●						●	●	●			●	●		E39 F80~F82 F84, F85, F126
		TPMT	160304XQ 160308XQ	3	3	9.525	3.18	4.7 4.4	0.4 0.8	11	● ●	●	●							●	●	●						●	●	●			●	●		F80~F82 F84, F126

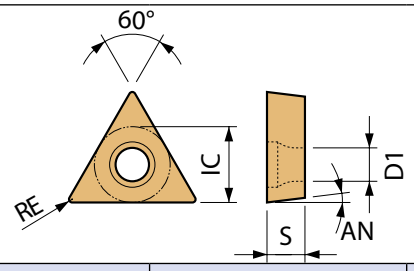
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

60° Triangle

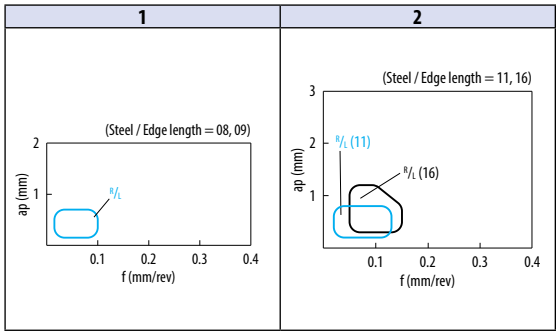
How to read pages of "Turning inserts" See page B15



Free-cutting steel	●																					P
Carbon steel / Alloy steel			●	○			●	●	○			●	●									P
Stainless steel	●		○	○																		M
Gray cast iron				○	●																	K
Nodular cast iron					○																	K
Non-ferrous metals					●																	N
Heat-resistant alloy	●																					S
Titanium alloy	●				○																	S
Hard materials																						H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide PVD PR1535	PR1705	PR1725	PR930	Carbide - KW10	Cermet PVD PV7005	PV710	PV720	PV730	Cermet - TN60	TN610	TN620	Applicable toolholder
Finishing		TPGH	080201R	1	3	4.76	2.38	2.3	0.1	11	●		●									E39 F80~F82 F86
			080201L						0.1		●		●	●	●				●			
			080202R						0.2		●	●	●	●	●			●	●	●		●	
			080202L						0.2		●	●	●	●	●		●	●	●	●	●	●	
			080204R						0.4		●	●	●	●	●			●	●			●	
			080204L						0.4		●	●	●	●	●	●	●	●	●	●	●	●	
		TPGH	090201R	1	3	5.56	2.38	3.2	0.1	11	●		●	●	●							F33, F34 F80~F82 F86
			090201L						0.1		●		●	●	●					●		
			090202R						0.2		●	●	●	●	●			●	●	●		●	
			090202L						0.2		●	●	●	●	●	●	●	●	●	●	●	●	
			090204R						0.4		●	●	●	●	●	●		●	●	●		●	
			090204L						0.4		●	●	●	●	●	●	●	●	●	●	●	●	
		TPGH	110202R	2	3	6.35	2.38	3.7	0.2	11	●		●	●								F84 F85
			110202L						0.2		●	●	●	●	●		●	●	●	●	●	●	
			110204R						0.4		●		●	●	●					●		
			110204L						0.4		●	●	●	●	●		●	●	●	●	●	●	
		TPGH	110302R	2	3	6.35	3.18	3.3	0.2	11	●	●	●	●	●			●	●	●		●	E39 F80~F82 F84, F85 F126
			110302L						0.2		●	●	●	●	●	●	●	●	●	●	●	●	
			110304R						0.4		●	●	●	●	●	●		●	●	●		●	
			110304L						0.4		●	●	●	●	●	●	●	●	●	●	●	●	
			110308R						0.8		●		●	●	●		●	●	●	●	●	●	
			110308L						0.8		●	●	●	●	●		●	●	●	●	●	●	
		TPGH	160302R	2	3	9.525	3.18	4.7	0.2	11	●		●	●	●		●	●	●	●	●	F80~F82 F84 F126
			160302L						0.2		●	●	●	●	●		●	●	●		●	●	
			160304R						0.4		●	●	●	●	●		●	●	●	●	●	●	
			160304L						0.4		●	●	●	●	●	●	●	●	●	●	●	●	
			160308R						0.8		●		●				●						
			160308L						0.8		●	●	●	●	●		●	●	●	●	●	●	

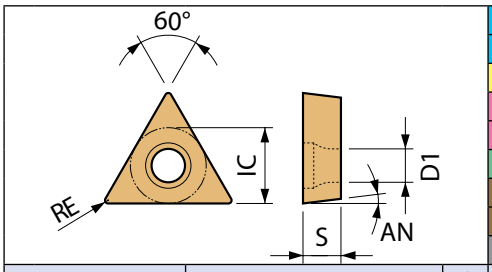
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

60° Triangle

How to read pages of "Turning inserts" See page B15

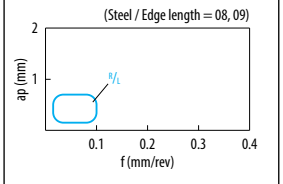
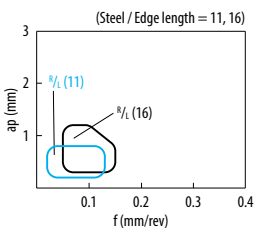


Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert	Description	Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide PVD PR1705	PR1725	Applicable toolholder
Finishing	TPGH 080201ML	1	3	4.76	2.38	2.3	< 0.1	11		●	
	TPGH 080202MR	1	3	4.76	2.38	2.3	< 0.2	11	●	●	E39
	TPGH 080202ML	1	3	4.76	2.38	2.3	< 0.2	11	●	●	F80~F82
	TPGH 080204MR	1	3	4.76	2.38	2.3	< 0.4	11	●	●	F86
	TPGH 080204ML	1	3	4.76	2.38	2.3	< 0.4	11	●	●	
	TPGH 090201ML	1	3	5.56	2.38	3.2	< 0.1	11		●	
	TPGH 090202MR	1	3	5.56	2.38	3.2	< 0.2	11		●	F33, F34
	TPGH 090202ML	1	3	5.56	2.38	3.2	< 0.2	11	●	●	F80~F82
	TPGH 090204MR	1	3	5.56	2.38	3.2	< 0.4	11	●	●	F86
	TPGH 090204ML	1	3	5.56	2.38	3.2	< 0.4	11	●	●	
	TPGH 110202ML	2	3	6.35	2.38	3.7	< 0.2	11	●		F84
	TPGH 110204ML	2	3	6.35	2.38	3.7	< 0.4	11		●	F85
	TPGH 110302MR	2	3	6.35	3.18	3.3	< 0.2	11	●	●	
	TPGH 110302ML	2	3	6.35	3.18	3.3	< 0.2	11	●	●	E39
	TPGH 110304MR	2	3	6.35	3.18	3.3	< 0.4	11	●	●	F80~F82
	TPGH 110304ML	2	3	6.35	3.18	3.3	< 0.4	11	●	●	F84, F85
	TPGH 110308ML	2	3	6.35	3.18	3.3	< 0.8	11	●	●	F126
	TPGH 160302ML	2	3	9.525	3.18	4.7	< 0.2	11		●	
	TPGH 160304MR	2	3	9.525	3.18	4.7	< 0.4	11		●	F80~F82
	TPGH 160304ML	2	3	9.525	3.18	4.7	< 0.4	11	●	●	F84
	TPGH 160308ML	2	3	9.525	3.18	4.7	< 0.8	11		●	F126

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

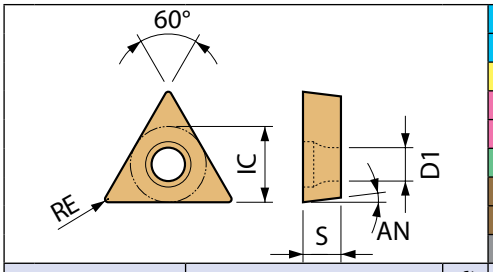
Applicable chipbreaker range

1	2
	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

60° Triangle

How to read pages of "Turning inserts" See page B15

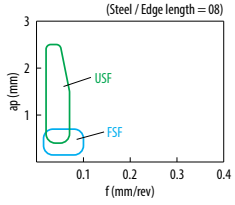
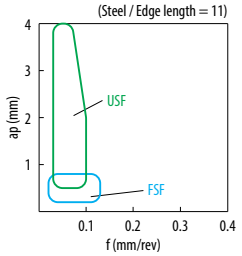
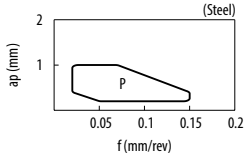


Free-cutting steel															P
Carbon steel / Alloy steel											●	◔	◔		P
Stainless steel										●	◔	◔			M
Gray cast iron															K
Nodular cast iron															K
Non-ferrous metals															N
Heat-resistant alloy										●					S
Titanium alloy										●					S
Hard materials															H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide PVD PR1535	PR1725	PR930	Carbide - TN60	Cermet	Applicable toolholder
Finishing	Precision / Sharp edge	TPET	0802003L-FSF	1	3	4.76	2.38	2.3	0.03	11			●			E39 F80~F82 F86
			080201R-FSF						0.1				●			
			080201L-FSF						0.1				●			
			080202R-FSF						0.2				●			
			080202L-FSF						0.2				●	●		
		TPET	1103003R-FSF	2	3	6.35	3.18	3.3	0.03	11			●			E39 F80~F82 F84, F85 F126
			1103003L-FSF						0.03				●			
			1103005L-FSF						0.05			●				
			110301R-FSF						0.1			●	●			
			110301L-FSF						0.1			●	●	●		
			110302R-FSF						0.2			●	●	●		
			110302L-FSF						0.2			●	●	●		
		TPET	080202ML-FSF	1	3	4.76	2.38	2.3	< 0.2	11		●				E39 F80~F82, F86
		TPET	1103005ML-FSF	2	3	6.35	3.18	3.3	< 0.05	11		●				E39 F80~F82 F84, F85 F126
			110301MR-FSF						< 0.1			●				
			110301ML-FSF						< 0.1			●				
			110302MR-FSF						< 0.2			●				
			110302ML-FSF						< 0.2			●				
Finishing	Sharp edge	TPEH	080201MR-P	3	3	4.76	2.38	2.3	< 0.1	11	●	●				E39 F80~F82 F86
			080201ML-P						< 0.1		●	●				
			080202MR-P						< 0.2		●	●				
			080202ML-P						< 0.2		●	●				
			080204MR-P						< 0.4		●	●				
			080204ML-P						< 0.4		●	●				
		TPEH	090201MR-P	3	3	5.56	2.38	3.2	< 0.1	11	●	●				F33, F34 F80~F82 F86
			090201ML-P						< 0.1		●	●				
			090202MR-P						< 0.2		●	●				
			090202ML-P						< 0.2		●	●				
			090204MR-P						< 0.4		●	●				
			090204ML-P						< 0.4		●	●				
		TPEH	110301MR-P	3	3	6.35	3.18	3.3	< 0.1	11	●	●				E39 F80~F82 F84, F85 F126
			110301ML-P						< 0.1		●	●				
			110302MR-P						< 0.2		●	●				
			110302ML-P						< 0.2		●	●				
			110304MR-P						< 0.4		●	●				
			110304ML-P						< 0.4		●	●				

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

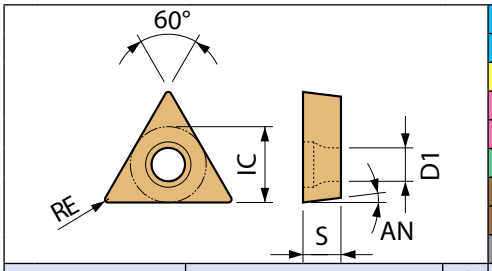
Applicable chipbreaker range

1	2	3
		

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

60° Triangle

How to read pages of "Turning inserts" See page B15

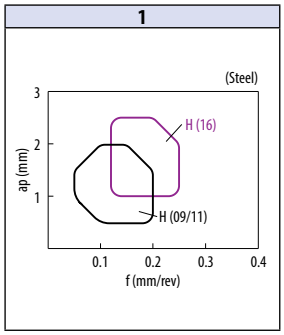


Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert	Description	Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide PVD PR1535	PR1725	PP930	Carbide - KW10	Cermet PVD PV710	PV720	PV730	Cermet - TN60	TN610	TN620	Applicable toolholder
Medium	TPGH 090201L-H	1	3	5.56	2.38	3.2	0.1	11	●	●									F33, F34
	TPGH 090202L-H	1	3	5.56	2.38	3.2	0.2	11	●	●									F80~F82
	TPGH 090204L-H	1	3	5.56	2.38	3.2	0.4	11	●	●									F86
	TPGH 110302R-H	1	3	6.35	3.18	3.3	0.2	11	●	●	●					●			
	TPGH 110302L-H	1	3	6.35	3.18	3.3	0.2	11	●	●	●	●	●	●	●	●	●	●	E39
	TPGH 110304R-H	1	3	6.35	3.18	3.3	0.4	11	●	●	●	●		●	●	●		●	F80~F82
	TPGH 110304L-H	1	3	6.35	3.18	3.3	0.4	11	●	●	●	●	●	●	●	●	●	●	F84, F85
	TPGH 110308R-H	1	3	6.35	3.18	3.3	0.8	11	●	●	●					●			F126
	TPGH 110308L-H	1	3	6.35	3.18	3.3	0.8	11	●	●	●	●	●	●	●	●	●	●	
	TPGH 160304R-H	1	3	9.525	3.18	4.7	0.4	11	●	●	●					●			
	TPGH 160304L-H	1	3	9.525	3.18	4.7	0.4	11	●	●	●	●	●	●	●	●	●	●	F80~F82
	TPGH 160308R-H	1	3	9.525	3.18	4.7	0.8	11	●	●	●								F84
	TPGH 160308L-H	1	3	9.525	3.18	4.7	0.8	11	●	●	●					●			F126
	TPGT 160402L-H	1	3	9.525	4.76	4.5	0.2	11					●	●	●	●	●	●	
	TPGT 160404L-H	1	3	9.525	4.76	4.5	0.4	11					●	●	●	●	●	●	-
	TPGT 160408L-H	1	3	9.525	4.76	4.5	0.8	11								●			
	TPGH 110302ML-H	1	3	6.35	3.18	3.3	< 0.2	11		●									E39
	TPGH 110304ML-H	1	3	6.35	3.18	3.3	< 0.4	11		●									F80~F82
																			F84, F85
																			F126
	TPGH 160304ML-H	1	3	9.525	3.18	4.7	< 0.4	11		●									F80~F82
																			F84
																			F126

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

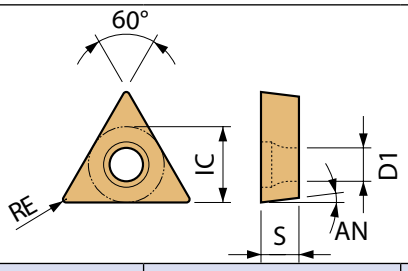
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

60° Triangle

How to read pages of "Turning inserts" See page B15

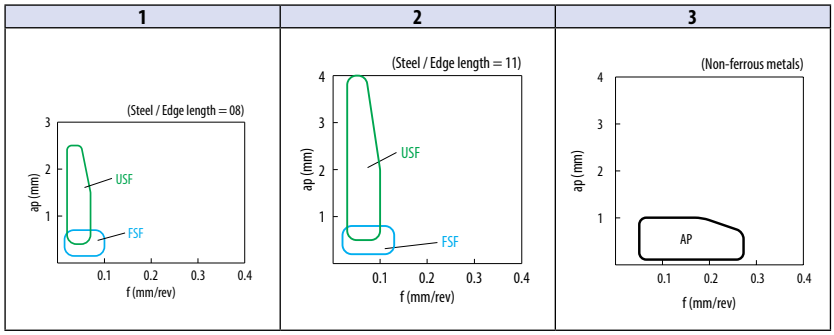


Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide DLC PDL010	Carbide PVD PR1725	Carbide PVD PP930	Carbide - KW10	Cermet PVD PV7005	Cermet PVD PV710	Cermet PVD PV720	Cermet PVD PV730	Cermet - TN60	Cermet - TN610	Cermet - TN620	Applicable toolholder
Low feed	Precision / Sharp edge	TPET	080201FL-USF	1	3	4.76	2.38	2.3	0.1	11			●									E39
		TPET	080202FR-USF	1	3	4.76	2.38	2.3	0.2	11		●	●						●			F80~F82
		TPET	080202FL-USF	1	3	4.76	2.38	2.3	0.2	11		●	●						●			F86
		TPET	110301FR-USF	2	3	6.35	3.18	3.3	0.1	11			●									E39
		TPET	110301FL-USF	2	3	6.35	3.18	3.3	0.1	11		●	●						●			F80~F82
		TPET	110302FR-USF	2	3	6.35	3.18	3.3	0.2	11		●	●						●			F84, F85, F126
		TPET	110302FL-USF	2	3	6.35	3.18	3.3	0.2	11		●	●						●			
		TPET	080202MFR-USF	1	3	4.76	2.38	2.3	< 0.2	11		●										E39
		TPET	080202MFL-USF	1	3	4.76	2.38	2.3	< 0.2	11		●										F80~F82
		TPET	110301MFL-USF	2	3	6.35	3.18	3.3	< 0.1	11		●										F86
		TPET	110302MFR-USF	2	3	6.35	3.18	3.3	< 0.2	11		●										E39
		TPET	110302MFL-USF	2	3	6.35	3.18	3.3	< 0.2	11		●										F80~F82
Non-ferrous metals	Finishing / Sharp edge	TPGT	090202AP	3	3	5.56	2.38	2.8	0.2	11	●			●								F84, F85, F126
		TPGT	090204AP	3	3	5.56	2.38	2.8	0.4	11	●			●								F33, F34
		TPGT	090208AP	3	3	5.56	2.38	2.8	0.8	11	●			●								F80~F82
		TPGT	110302AP	3	3	6.35	3.18	3.3	0.2	11	●			●								F86
		TPGT	110304AP	3	3	6.35	3.18	3.3	0.4	11	●			●								E39
		TPGT	110308AP	3	3	6.35	3.18	3.3	0.8	11	●			●								F80~F82
Cast iron	Without chipbreaker	TPGB	080202	-	3	4.76	2.38	2.3	0.2	11				●					●			F84, F85, F126
		TPGB	080204	-	3	4.76	2.38	2.3	0.4	11				●	●		●	●	●		●	F86
		TPGB	080208	-	3	4.76	2.38	2.3	0.8	11				●					●			
		TPGB	090202	-	3	5.56	2.38	3.2	0.2	11				●					●			F33, F34
		TPGB	090204	-	3	5.56	2.38	3.2	0.4	11				●	●		●	●	●		●	F80~F82
		TPGB	1102005	-	3	6.35	2.38	3.7	0.05	11				●					●			F86
		TPGB	110201	-	3	6.35	2.38	3.7	0.1	11				●					●			
		TPGB	110202	-	3	6.35	2.38	3.7	0.2	11				●					●			F84
		TPGB	110204	-	3	6.35	2.38	3.7	0.4	11				●		●	●	●	●	●	●	F85
		TPGB	1103005	-	3	6.35	3.18	3.3	0.05	11				●					●			
		TPGB	110301	-	3	6.35	3.18	3.3	0.1	11				●					●			
		TPGB	110302	-	3	6.35	3.18	3.3	0.2	11				●		●	●	●	●	●	●	E39
		TPGB	110304	-	3	6.35	3.18	3.3	0.4	11				●	●	●	●	●	●	●	●	F80~F82
		TPGB	110308	-	3	6.35	3.18	3.3	0.8	11				●	●	●	●	●	●	●	●	F84, F85, F126
		TPGB	160304	-	3	9.525	3.18	4.7	0.4	11				●	●	●	●	●	●	●	●	F80~F82
		TPGB	160308	-	3	9.525	3.18	4.7	0.8	11				●		●	●	●	●	●	●	F84, F126

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

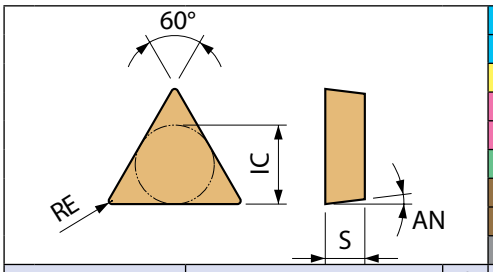
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

60° Triangle

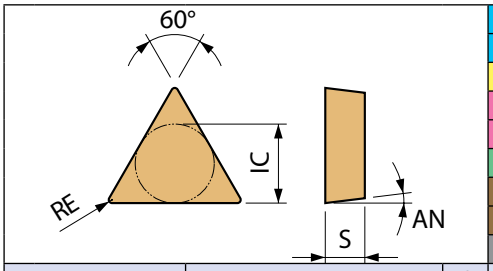
How to read pages of "Turning inserts" See page B15



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60° Triangle

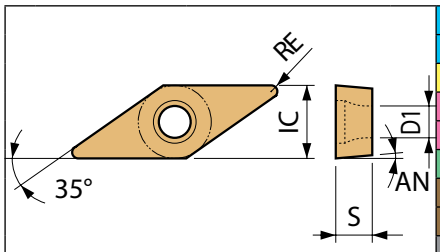
How to read pages of "Turning inserts" See page B15



| | | |

35° Rhombic

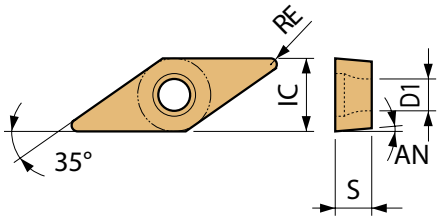
How to read pages of "Turning inserts" See page B15



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35° Rhombic

How to read pages of "Turning inserts" See page B15



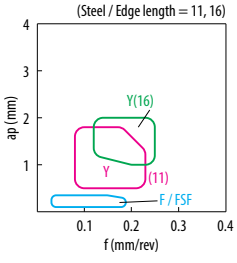
Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide PVD PR1225	PR1535	PR1705	PR1725	PR930	Carbide - KW10	Cermet PVD PV710	PV720	PV730	Cermet - TN60	TN610	TN620	Applicable toolholder
Finishing	Precision / Sharp edge	VBET	1103003R-FSF	1	2	6.35	3.18	2.8	0.03	5					●					●			E40~E43 E58 F90, F91 F94~F99 F127
			1103003L-FSF						0.03						●								
			110301R-FSF						0.1						●					●			
			110301L-FSF						0.1						●					●			
			110302R-FSF						0.2						●					●			
			110302L-FSF						0.2						●					●			
		VBET	1103005MR-FSF	1	2	6.35	3.18	2.8	< 0.05	5	●												
			1103005ML-FSF						< 0.05		●												
			110301MR-FSF						< 0.1		●												
			110301ML-FSF						< 0.1		●												
			110302MR-FSF						< 0.2		●												
			110302ML-FSF						< 0.2		●												
Finishing	Sharp edge	VBET	1103005MR-F	1	2	6.35	3.18	2.8	< 0.05	5		●		●									
			1103005ML-F						< 0.05			●		●									
			110301MR-F						< 0.1			●	●	●				●	●			●	
			110301ML-F						< 0.1			●		●				●	●			●	
			110302MR-F						< 0.2			●	●	●			●	●	●		●	●	
			110302ML-F						< 0.2			●	●	●			●	●	●		●	●	
Finishing	Sharp edge	VBGT	1103003R-F	1	2	6.35	3.18	2.8	0.03	5					●	●							
			1103003L-F						0.03						●								
			110301R-F						0.1						●	●		●	●			●	
			110301L-F						0.1						●	●							
			110302R-F						0.2						●	●		●	●	●		●	
			110302L-F						0.2						●	●				●			
		VBGT	1103005MR-F	1	2	6.35	3.18	2.8	< 0.05	5	●												
			1103005ML-F						< 0.05		●												
			110301MR-F						< 0.1		●												
			110301ML-F						< 0.1		●												
			110302MR-F						< 0.2		●												
			110302ML-F						< 0.2		●												

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

Applicable chipbreaker range

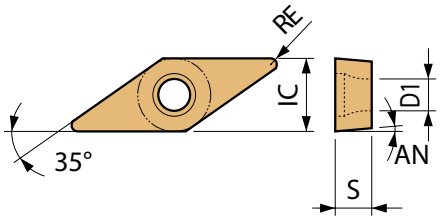
1



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

35° Rhombic

How to read pages of "Turning inserts" See page B15



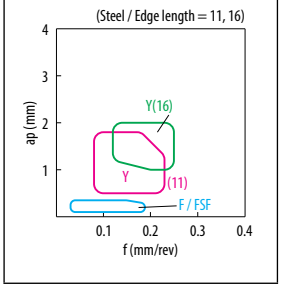
Free-cutting steel			●																			P
Carbon steel / Alloy steel	◌			●	◌		●	●	◌			●	●									P
Stainless steel	◌	●		◌	◌																	M
Gray cast iron					◌																	K
Nodular cast iron																						K
Non-ferrous metals						●																N
Heat-resistant alloy		●																				S
Titanium alloy		●				◌																S
Hard materials																						H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide PVD PR1225	PR1535	PR1705	PR1725	PR930	Carbide - KW10	Cermet PVD PV710	PV720	PV730	Cermet - TN60	TN610	TN620	Applicable toolholder
Finishing - Medium	Sharp edge	VBET	1103005MR-Y	1	2	6.35	3.18	2.8	< 0.05	5		●		●									E40~E43 E58 F90, F91 F94~F99 F127
			1103005ML-Y						< 0.05			●		●									
			110301MR-Y						< 0.1			●		●									
			110301ML-Y						< 0.1			●		●									
			110302MR-Y						< 0.2			●		●			●	●	●		●	●	
			110302ML-Y						< 0.2			●		●			●	●	●		●	●	
			110304MR-Y						< 0.4			●		●			●	●	●		●	●	
			110304ML-Y						< 0.4			●		●			●	●	●		●	●	
Finishing - Medium	Sharp edge	VBGT	1103003R-Y	1	2	6.35	3.18	2.8	0.03	5					●	●							
			1103003L-Y						0.03						●								
			110301R-Y						0.1						●	●		●	●			●	
			110301L-Y						0.1						●	●				●			
			110302R-Y						0.2						●	●		●	●	●		●	
			110302L-Y						0.2						●	●		●	●	●		●	
			110304R-Y						0.4						●	●		●	●	●		●	
			110304L-Y						0.4						●	●		●	●	●		●	
			110308R-Y						0.8						●	●							
			110308L-Y						0.8						●	●				●			
		VBGT	160402R-Y	1	2	9.525	4.76	4.4	0.2	5					●	●	●	●	●	●	●	●	E41~E43 E90, F91 F94~F99 F127
			160402L-Y						0.2						●	●	●	●	●	●	●	●	
			160404R-Y						0.4						●	●	●	●	●	●	●	●	
			160404L-Y						0.4						●	●	●	●	●	●	●	●	
			160408R-Y						0.8						●	●							
			160408L-Y						0.8						●	●							
		VBGT	1103005MR-Y	1	2	6.35	3.18	2.8	< 0.05	5	●		●										E40~E43 E58 F90, F91 F94~F99 F127
			1103005ML-Y						< 0.05		●												
			110301MR-Y						< 0.1		●		●										
			110301ML-Y						< 0.1		●												
			110302MR-Y						< 0.2		●		●										
			110302ML-Y						< 0.2		●		●										
			110304MR-Y						< 0.4		●		●										
			110304ML-Y						< 0.4		●		●										
			110308MR-Y						< 0.8		●												
			110308ML-Y						< 0.8		●												
		VBGT	160402MR-Y	1	2	9.525	4.76	4.4	< 0.2	5	●		●										E41~E43 E90, F91 F94~F99 F127
			160402ML-Y						< 0.2		●												
			160404MR-Y						< 0.4		●		●										
			160404ML-Y						< 0.4		●												
			160408MR-Y						< 0.8		●												
			160408ML-Y						< 0.8		●												

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

Applicable chipbreaker range

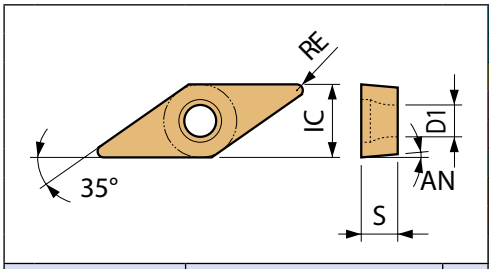
1



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

35° Rhombic

How to read pages of "Turning inserts" See page B15

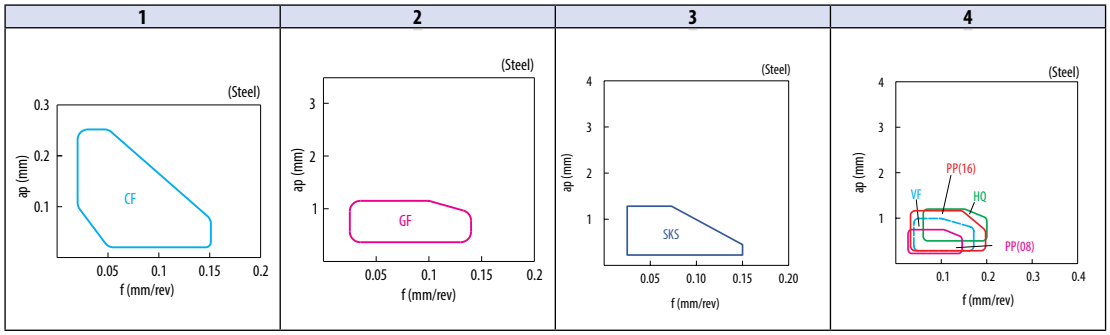


Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide CVD CA025P	CA115P	CA125P	CA510	CA515	CA525	CA530	CA6515	CA6525	Carbide PVD PR1155	PR1205	PR1225	PR1535	PR1705	PR1725	PR930	Cermet CVD CCX	Cermet PVD PV710	PV720	PV730	Cermet - TN60	TN610	TN620	Applicable toolholder
Minute ap	Polished / Sharp edge	VCGT	110301MP-CF 110302MP-CF	1	2	6.35	3.18	2.8	< 0.1 < 0.2	7													● ●	● ●										
Finishing	Polished / Sharp edge	VCGT	110301MFP-GF 110302MFP-GF	2	2	6.35	3.18	2.8	< 0.1 < 0.2	7													●●● ●●●											E44~E46 E59
Finishing	Polished / Sharp Edge	VCGT	110301MFP-SKS 110302MFP-SKS 110304MFP-SKS	3	2	6.35	3.18	2.8	< 0.1 < 0.2 < 0.4	7										●● ●● ●●			●●● ●●● ●●●	●●● ●●● ●●●										
Finishing	Polished / Sharp Edge	VCGT	130301MFP-SK 130302MFP-SK	-	2	7.94	3.18	3.4	< 0.1 < 0.2	7													● ●	● ●										-
Finishing		VCMT	080202PP 080204PP	4	2	4.76	2.38	2.3	0.2 0.4	7	●● ●●	●● ●●	●● ●●	●● ●●	●● ●●	●● ●●	●● ●●					●● ●●		● ●		●●●● ●●●●			●● ●●					E59 F90, F91 F94~F99
Finishing		VCMT	160404PP 160408PP	4	2	9.525	4.76	4.4	0.4 0.8	7	●● ●●	●● ●●	●● ●●	●● ●●	●● ●●	●● ●●	●● ●●					●● ●●		● ●		●●●● ●●●●			●● ●●					-
Finishing		VCMT	080202VF 080204VF	4	2	4.76	2.38	2.3	0.2 0.4	7	●● ●●	●● ●●	● ●	●● ●●	●● ●●	●● ●●	●● ●●					● ●		●● ●●		●●●● ●●●●			●● ●●					E59 F90, F91 F94~F99
Finishing - Medium		VCMT	080202HQ 080204HQ	4	2	4.76	2.38	2.3	0.2 0.4	7	●● ●●	●● ●●	●● ●●	●● ●●	●● ●●	●● ●●	●● ●●	●● ●●	●● ●●			●● ●●		●● ●●		●●●● ●●●●			●● ●●		●● ●●		●● ●●	

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

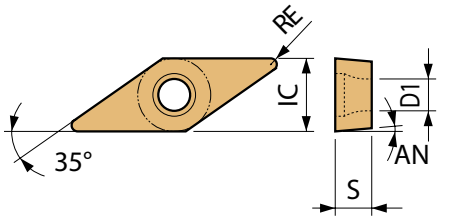
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

35° Rhombic

How to read pages of "Turning inserts" See page B15

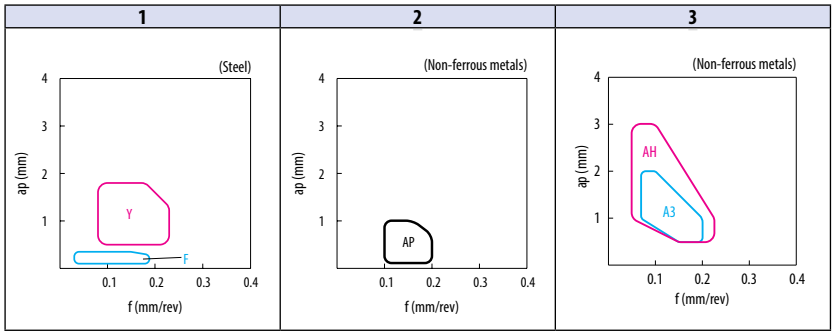


	P	M	K	N	S	H
Free-cutting steel						
Carbon steel / Alloy steel	●					
Stainless steel	●	○				
Gray cast iron			○			
Nodular cast iron						
Non-ferrous metals	●	●		●		
Heat-resistant alloy	●					
Titanium alloy	●		○			
Hard materials						

	Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide DLC PDL010	DLC PDL025	PVD PR1535	PVD PR1725	- KW10	Applicable toolholder
Finishing		VCET	110301MR-F		1	2	6.35	3.18	2.8	< 0.1	7			●	●		E44~E46 E59
			110301ML-F							< 0.1				●	●		
			110302MR-F							< 0.2				●	●		
			110302ML-F							< 0.2				●	●		
			110304MR-F							< 0.4				●	●		
			110304ML-F							< 0.4				●	●		
Finishing - Medium	 Sharp edge	VCET	1103005MR-Y		1	2	6.35	3.18	2.8	< 0.05	7			●	●		
			1103005ML-Y							< 0.05				●	●		
			110301MR-Y							< 0.1				●	●		
			110301ML-Y							< 0.1				●	●		
			110302MR-Y							< 0.2				●	●		
			110302ML-Y							< 0.2				●	●		
			110304MR-Y							< 0.4				●	●		
			110304ML-Y							< 0.4				●	●		
Non-ferrous metals	 Finishing / Sharp edge	VCGT	160404AP		2	2	9.525	4.76	4.4	0.4	7	●				●	
Non-ferrous metals	 Finishing - Medium / Sharp edge	VCGT	160404R-A3		3	2	9.525	4.76	4.4	0.4	7	●	●			●	E41~E43 F90, F91 F94~F99 F127
			160404L-A3							0.4		●	●			●	
			160408R-A3							0.8		●	●			●	
			160408L-A3							0.8		●	●			●	
Non-ferrous metals	 Finishing - Medium / Sharp edge	VCGT	160404AH		3	2	9.525	4.76	4.4	0.4	7	●	●			●	

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

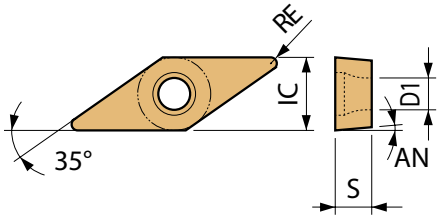
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

35° Rhombic

How to read pages of "Turning inserts" See page B15

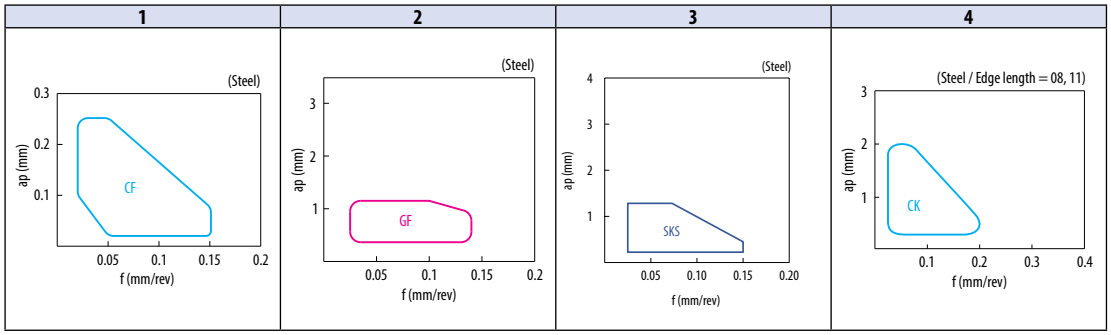


Free-cutting steel	●	P
Carbon steel / Alloy steel	●	P
Stainless steel	○ ◒ ◒ ● ◒ ◒	M
Gray cast iron	◒	K
Nodular cast iron	◒	K
Non-ferrous metals	● ●	N
Heat-resistant alloy	● ● ✖	S
Titanium alloy	●	S
Hard materials		H

Insert		Description	Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide DLC PDL010	PDL025	PVD PR1155	PR1205	PR1225	PR1535	PR1705	PR1725	PR930	Applicable toolholder
Minute ap	Sharp edge	VPGT 110302CF	1	2	6.35	3.18	2.8	0.2	11									●	
Minute ap	Polished / Sharp Edge	VPGT 110301MP-CF 110302MP-CF	1	2	6.35	3.18	2.8	< 0.1 < 0.2	11	● ●	● ●		● ●	● ●	● ●	● ●			E24 E47~E49
Finishing	Polished / Sharp edge	VPGT 110301MFP-GF 110302MFP-GF	2	2	6.35	3.18	3	< 0.1 < 0.2	11				● ●	● ●	● ●	● ●			
Finishing	Polished / Sharp Edge	VPGT 110301MFP-SKS 110302MFP-SKS 110304MFP-SKS	3	2	6.35	3.18	3	< 0.1 < 0.2 < 0.4				● ● ●	● ●	● ●	● ●	● ●			
Finishing		VPGT 080201CK 080202CK	4	2	4.76	2.38	2.3	0.1 0.2	11									● ●	E48, E49 F90, F91
		VPGT 110301CK 110302CK	4	2	6.35	3.18	2.8	0.1 0.2	11									● ●	E24 E47~E49
Finishing		VPGT 080201MP-CK 080202MP-CK	4	2	4.76	2.38	2.3	< 0.1 < 0.2	11	● ●	● ●		● ●	● ●	● ●	● ●			E48, E49 F90, F91
	Polished / Sharp edge	VPGT 110301MP-CK 110302MP-CK	4	2	6.35	3.18	2.8	< 0.1 < 0.2	11	● ●	● ●		● ●	● ●	● ●	● ●			E24 E47~E49

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

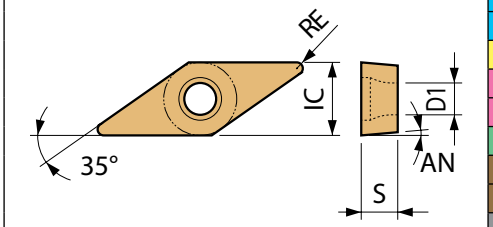
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

35° Rhombic

How to read pages of "Turning inserts" See page B15

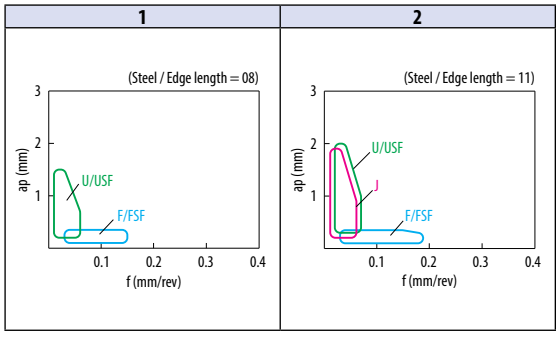


Free-cutting steel																	P
Carbon steel / Alloy steel																	P
Stainless steel																	M
Gray cast iron																	K
Nodular cast iron																	K
Non-ferrous metals																	N
Heat-resistant alloy																	S
Titanium alloy																	S
Hard materials																	H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide PVD PR1225	PR1535	PR1725	Cermet - PR930	TN60	Applicable toolholder
Finishing	Precision / Sharp edge	VPET	080201R-FSF	1	2	4.76	2.38	2.3	0.1	11				●	●	E48, E49 F90, F91
			080201L-FSF						0.1					●	●	
			080202R-FSF						0.2					●	●	
			080202L-FSF						0.2					●	●	
		VPET	1103003R-FSF	2	2	6.35	3.18	2.8	0.03	11				●		E24 E47~E49
			110301R-FSF						0.1					●	●	
			110301L-FSF						0.1					●	●	
			110302R-FSF						0.2					●	●	
			110302L-FSF						0.2					●	●	
		VPET	080201MR-FSF	1	2	4.76	2.38	2.3	< 0.1	11	●					E48, E49 F90, F91
			080201ML-FSF						< 0.1		●					
			080202MR-FSF						< 0.2		●					
			080202ML-FSF						< 0.2		●					
		VPET	1103005MR-FSF	2	2	6.35	3.18	2.8	< 0.05	11	●					E24 E47~E49
			110301MR-FSF						< 0.1		●					
			110301ML-FSF						< 0.1		●					
			110302MR-FSF						< 0.2		●					
			110302ML-FSF						< 0.2		●					
Finishing	Sharp edge	VPET	080201MR-F	1	2	4.76	2.38	2.3	< 0.1	11		●	●			E48, E49 F90, F91
			080201ML-F						< 0.1			●	●			
			080202MR-F						< 0.2			●	●			
			080202ML-F						< 0.2			●	●			
		VPET	1103005MR-F	2	2	6.35	3.18	2.8	< 0.05	11		●	●			E24 E47~E49
			110301MR-F						< 0.1			●	●			
			110302MR-F						< 0.2			●	●			
			110302ML-F						< 0.2			●	●			

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

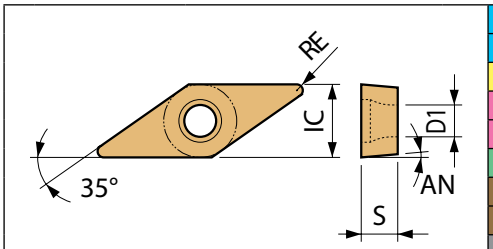
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

35° Rhombic

How to read pages of "Turning inserts" See page B15

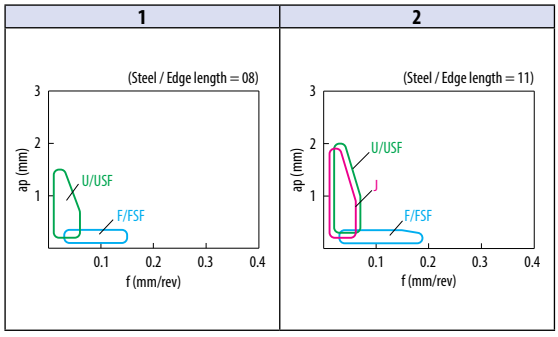


Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide PVD PR1225	PR1535	PR1725	PR930	Carbide - TN60	Cermet	Applicable toolholder
Low feed	 Precision / Sharp edge	VPET	080201FR-USF	1	2	4.76	2.38	2.3	0.1	11				●			E48, E49 F90, F91
			080201FL-USF						0.1					●			
			080202FR-USF						0.2					●		●	
			080202FL-USF						0.2					●			
		VPET	1103003FR-USF	2	2	6.35	3.18	2.8	0.03	11				●			E24 E47~E49
			1103003FL-USF						0.03					●			
			110301FR-USF						0.1					●		●	
			110301FL-USF						0.1					●			
			110302FR-USF						0.2					●			
			110302FL-USF						0.2					●			
		VPET	080201MFR-USF	1	2	4.76	2.38	2.3	< 0.1	11	●						E48, E49 F90, F91
			080202MFR-USF						< 0.2		●						
			080202MFL-USF						< 0.2		●						
		VPET	1103005MFR-USF	2	2	6.35	3.18	2.8	< 0.05	11	●						E24 E47~E49
			110301MFR-USF						< 0.1		●						
			110301MFL-USF						< 0.1		●						
			110302MFR-USF						< 0.2		●						
Low feed	 Sharp edge	VPET	080201MFR-U	1	2	4.76	2.38	2.3	< 0.1	11		●	●				E48, E49 F90, F91
			080201MFL-U						< 0.1			●	●				
			080202MFR-U						< 0.2			●	●				
			080202MFL-U						< 0.2			●	●				
		VPET	1103005MFR-U	2	2	6.35	3.18	2.8	< 0.05	11		●	●				E24 E47~E49
			1103005MFL-U						< 0.05			●	●				
			110301MFR-U						< 0.1			●	●				
			110301MFL-U						< 0.1			●	●				
			110302MFR-U						< 0.2			●	●				
			110302MFL-U						< 0.2			●	●				
Low feed	 Sharp edge	VPET	1103005MFR-J	2	2	6.35	3.18	2.8	< 0.05	11	●	●	●				E24 E47~E49
			110301MFR-J						< 0.1		●	●	●				
			110301MFL-J						< 0.1			●	●				
			110302MFR-J						< 0.2		●	●	●				
			110302MFL-J						< 0.2			●	●				

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

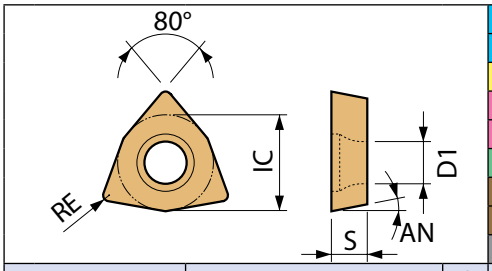
Applicable chipbreaker range

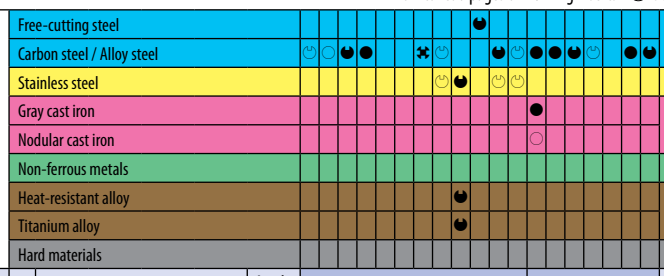


● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

80° Trigon

How to read pages of "Turning inserts" See page B15

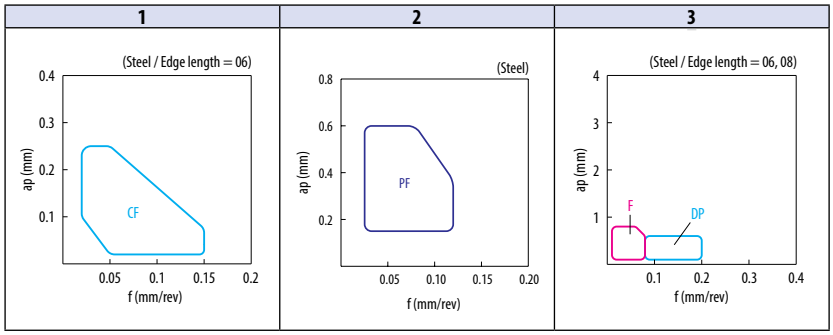




Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide CVD CA025P	CA115P	CA125P	CA510	CA515	CA525	CA530	Carbide PVD PR1225	PR1535	PR1705	PR1725	PR930	Cermet CVD CCX	Cermet PVD PV710	PV720	PV730	Cermet - TN60	TN610	TN620	Applicable toolholder
Minute ap	 Polished / Sharp edge	WBGT	060101MPR-CF	1	3	3.97	1.59	2.4	< 0.1	5								●	●		●									
			060101MPL-CF						< 0.1									●	●		●									
			060102MPR-CF						< 0.2								●	●			●									
			060102MPL-CF						< 0.2								●	●	●	●										
Finishing	 Polished / Sharp edge	WBGT	060101MFPR-PF	2	3	3.97	1.59	2.4	< 0.1	5									●		●									
			060101MFPL-PF						< 0.1										●		●									
			060102MFPR-PF						< 0.2										●		●									
			060102MFPL-PF						< 0.2										●		●									
		WBGT	080201MFPR-PF	2	3	4.76	2.38	2.3	< 0.1	5									●		●									
			080201MFPL-PF						< 0.1										●		●									
			080202MFPR-PF						< 0.2										●		●									
			080202MFPL-PF						< 0.2										●		●									
Finishing		WBMT	060102R-DP	3	3	3.97	1.59	2.3	0.2	5									●		●	●	●		●	●		●	●	F36 F100~F102
			060102L-DP						0.2		●	●	●	●	●	●			●		●	●	●	●	●	●	●	●	●	
			060104R-DP						0.4										●		●	●	●		●	●		●	●	
			060104L-DP						0.4		●	●	●			●	●		●		●	●	●	●	●	●	●	●	●	
		WBMT	080202R-DP	3	3	4.76	2.38	2.3	0.2	5									●		●	●	●		●	●			●	
			080202L-DP						0.2		●	●	●			●	●		●		●	●	●	●	●	●	●	●	●	
			080204R-DP						0.4										●		●	●	●		●	●			●	
			080204L-DP						0.4		●	●	●	●	●	●	●		●		●	●	●	●	●	●	●	●	●	
Finishing	 Sharp edge	WBET	0601005ML-F	3	3	3.97	1.59	2.3	< 0.05	5									●		●									
			060101MR-F						< 0.1										●		●									
			060101ML-F						< 0.1										●	●	●									
			060102MR-F						< 0.2										●		●			●				●		
			060102ML-F						< 0.2										●	●	●			●	●	●		●	●	
			060104MR-F						< 0.4										●		●			●				●		
			060104ML-F						< 0.4										●	●	●			●	●	●		●	●	
		WBET	080201MR-F	3	3	4.76	2.38	2.3	< 0.1	5														●				●	
			080201ML-F						< 0.1										●		●			●				●		
			080202MR-F						< 0.2															●				●	
			080202ML-F						< 0.2										●	●	●			●	●	●		●	●	
			080204MR-F						< 0.4										●		●			●				●		
			080204ML-F						< 0.4										●	●	●			●	●	●		●	●	

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

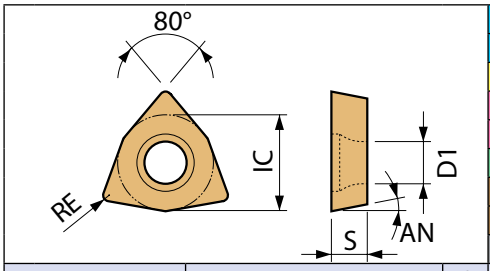
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

80° Trigon

How to read pages of "Turning inserts" See page B15

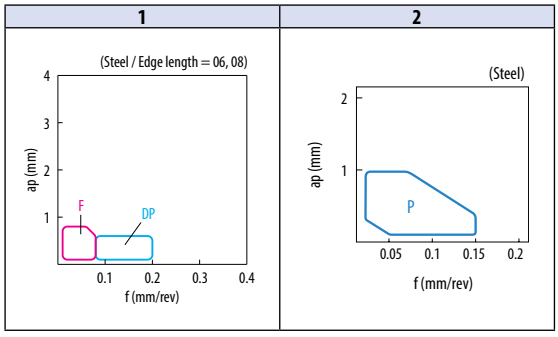


Free-cutting steel																P
Carbon steel / Alloy steel					●	○	○									P
Stainless steel			●	○	○	○										M
Gray cast iron							○									K
Nodular cast iron																K
Non-ferrous metals							●									N
Heat-resistant alloy			●													S
Titanium alloy			●				○									S
Hard materials																H

Insert		Description		Applicable chipbreaker range	No. of edges	Dimension (mm)				Angle (°)	Carbide			Cermet	Applicable toolholder
						IC	S	D1	RE	AN	PVD		-	-	
											PR1535	PR1725	PP930	KW10	TN60	
Finishing	 Sharp edge	WBGT	0601003L-F	1	3	3.97	1.59	2.3	0.03	5			●		F36 F100~F102
			060101R-F						0.1				●		
			060101L-F						0.1				●	●	●
			060102R-F						0.2				●	●	●
			060102L-F						0.2				●	●	●
			060104R-F						0.4				●	●	●
			060104L-F						0.4				●	●	●
		WBGT	080201L-F	1	3	4.76	2.38	2.3	0.1	5			●		●
			080202R-F						0.2				●	●	●
			080202L-F						0.2				●	●	●
			080204R-F						0.4				●	●	●
			080204L-F						0.4				●	●	●
Finishing	 Sharp edge	WBET	080201MR-P	2	3	4.76	2.38	2.3	< 0.1	5	●	●			
			080201ML-P						< 0.1		●	●			
			080202MR-P						< 0.2		●	●			
			080202ML-P						< 0.2		●	●			
			080204MR-P						< 0.4		●	●			
			080204ML-P						< 0.4		●	●			
Cast iron	 Without chipbreaker	WBGW	060102L	-	3	3.97	1.59	2.3	0.2	5				●	
		WBGW	080202L	-	3	4.76	2.38	2.3	0.2	5				●	

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

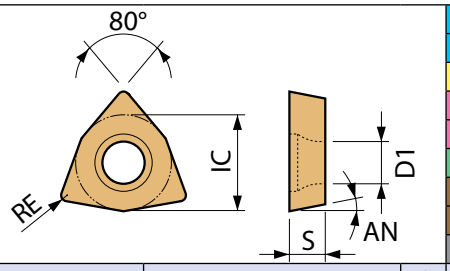
Applicable chipbreaker range

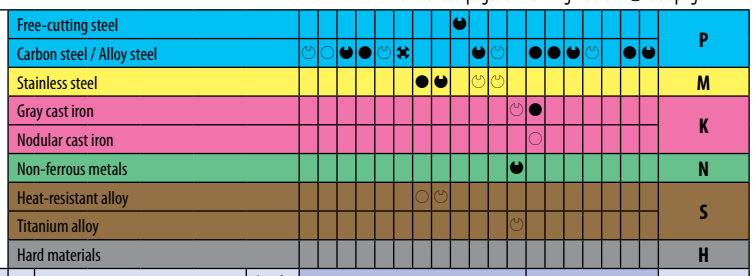


● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

80° Trigon

How to read pages of "Turning inserts" See page B15

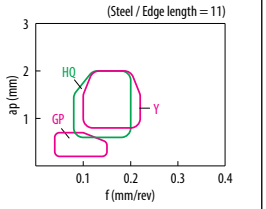
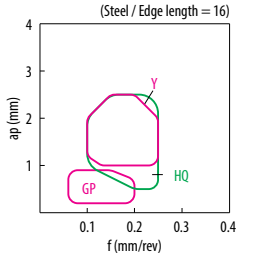




	Insert	Description		Applicable chipbreaker range	No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide: CVD CA025P	CA115P	CA125P	CA515	CA525	CA530	CA6515	CA6525	Carbide: PVD PR1705	PR1725	PR930	Carbide: - KW10	Cermet: CVD CCX	Cermet: PVD PV710	PV720	PV730	Cermet: - TN60	TN610	TN620	Applicable toolholder
Finishing		WPMT	110204GP	1	3	6.35	2.38	2.8	0.4	11	●	●	●	●					●	●				●	●			●	
		WPMT	160304GP	2	3	9.525	3.18	4.4	0.4	11	●	●	●	●	●				●					●	●			●	
Finishing - Medium		WPMT	110202HQ	1	3	6.35	2.38	2.8	0.2	11	●	●	●	●	●				●	●			●	●	●	●		●	
			110204HQ						0.4		●	●	●	●	●	●	●		●	●			●	●	●	●	●	●	
		WPMT	160304HQ	2	3	9.525	3.18	4.4	0.4	11	●	●	●	●	●		●	●	●	●			●	●	●	●	●	●	
			160308HQ						0.8		●	●	●	●	●	●	●	●	●	●			●	●	●	●	●	●	
Finishing - Medium		WPGT	110202L-Y	1	3	6.35	2.38	2.8	0.2	11										●	●						●		F100~F102
			110204R-Y						0.4											●									
			110204L-Y						0.4											●	●						●		
		WPGT	160304R-Y	2	3	9.525	3.18	4.4	0.4	11																	●		
			160304L-Y						0.4											●	●						●		
			160308L-Y						0.8											●	●								
		WPGT	110204MR-Y	1	3	6.35	2.38	2.8	< 0.4	11									●										
			110204ML-Y																●	●									
Cast iron	 Without chipbreaker	WPGW	110202	-	3	6.35	2.38	2.8	0.2	11												●							
			110204						0.4													●							
		WPGW	160304	-	3	9.525	3.18	4.4	0.4	11												●							
			160308						0.8													●							

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

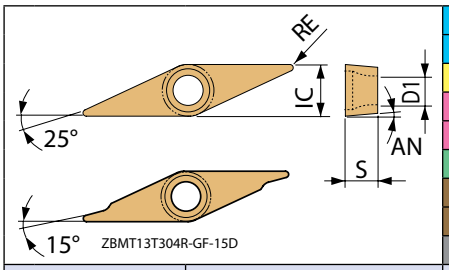
Applicable chipbreaker range

1	2
	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

25° Rhombic

How to read pages of "Turning inserts" See page B15



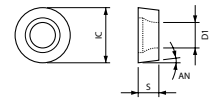
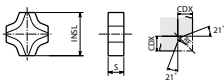
Free-cutting steel															P
Carbon steel / Alloy steel							●	●	○	●					P
Stainless steel						●	○								M
Gray cast iron															K
Nodular cast iron															K
Non-ferrous metals															N
Heat-resistant alloy						●									S
Titanium alloy						●									S
Hard materials															H

Insert		Description		No. of edges	Dimension (mm)				Angle (°)	Carbide		Cermet			Applicable toolholder
					IC	S	D1	RE	AN	PVD		PVD		-	
										PR1535	PR1725	PV720	PV730	TN620	
Finishing		ZBMT	13T302GF	2	6.35	3.97	3.7	0.2	5	●	●				E52, E53 F106~F110
			13T304GF					0.4		●	●	●	●	●	
			13T308GF					0.8		●	●	●	●	●	
Finishing		ZBMT	13T304R-GF-15D	2	6.35	3.97	3.7	0.4	5	●	●				

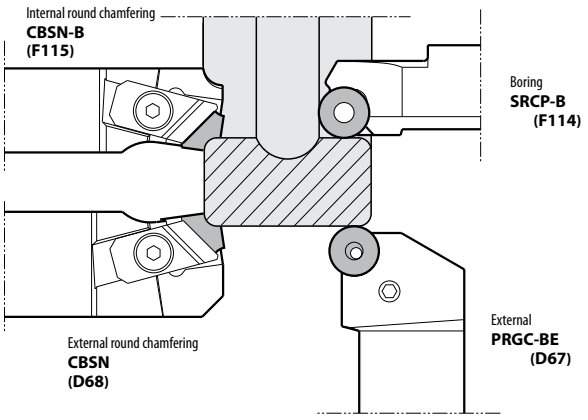
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Round / SNMF Type

How to read pages of "Turning inserts" See page B15

													Free-cutting steel / Carbon steel / Alloy steel: P; Stainless steel: M; Gray cast iron / Nodular cast iron: K; Non-ferrous metals: N; Heat-resistant alloy / Titanium alloy: S; Hard materials: H
Insert		Description		No. of edges	Dimension (mm) CDX	INSL	IC	S	D1	RE	Angle (°) AN	Cermet -	Cermet TN90	Applicable toolholder
	 External / Boring / Facing	RCMT	1204M0-BB	-	-	-	12	4.76	4.2	-	7	●		D67
		RCMT	1606M0-BB	-	-	-	16	6.35	5.5	-	7	●		
		RPMT	1203M0-BB	-	-	-	12	3.18	4.4	-	11	●		F114
		RPMT	1604M0-BB	-	-	-	16	4.76	5.5	-	11	●		
	 Round Chamfering	SNMF	120406-21	8	1.5	12.7	-	4.76	-	0.6	-	●		D68 F115
			120410-21		3					1		●		
			120416-21		3.1					1.6		●		
			120421-21		3.2					2.1		●		
			120426-21		3.3					2.6		●		

Tooling for Bearing machining

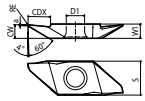
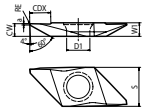
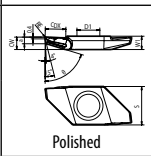
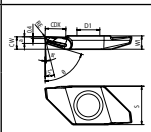


● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

TKFB

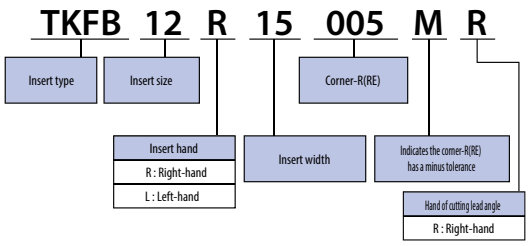
How to read pages of "Turning inserts" See page B15

Free-cutting steel	P
Carbon steel / Alloy steel	P
Stainless steel	M
Gray cast iron	K
Nodular cast iron	K
Non-ferrous metals	N
Heat-resistant alloy	S
Titanium alloy	S
Hard materials	H

Insert	Description	No. of edges	Dimension (mm) CW	CDX	S	D1	RE	W1	a	Angle (°) θ	Carbide PVD PR1225	PR1535	PR1725	- KW10	Applicable toolholder
 	TKFB 12R15005M TKFB 12R28005M TKFB 12R28010M	2	1.5 2.8 2.8	2.6 4.6 4.6	8.7	5.2	< 0.05 < 0.05 < 0.1	3	0.25 0.3 0.3	-	● ● ●	● ● ●	● ● ●	● ● ●	E15 E16
	TKFB 16R38005M TKFB 16R38010M	2	3.8	6.3	9.5	5.2	< 0.05 < 0.1	4	0.3	-	● ●	● ●	● ●	● ●	
 	TKFB 12L28005MR TKFB 12L28010MR	2	2.8	4.6	8.7	5.2	< 0.05 < 0.1	3	0.3	-	● ●	● ●			
	TKFB 16L38005MR TKFB 16L38010MR	2	3.8	6.3	9.5	5.2	< 0.05 < 0.1	4	0.3	-	● ●	● ●			
  Polished	TKFB 12R28005P-GQ TKFB 12R28015P-GQ	2	2.8	4.6	8.7	5.2	0.05 0.15	3	1.5	74	● ●	● ●	● ●		
	TKFB 16R38005P-GQ TKFB 16R38015P-GQ	2	3.8	6.3	9.5	5.2	0.05 0.15	4	1.8	72	● ●	● ●	● ●		
 	TKFB 12R28005-GQ TKFB 12R28015-GQ	2	2.8	4.6	8.7	5.2	0.05 0.15	3	1.5	74	● ●	● ●	● ●		
	TKFB 16R38005-GQ TKFB 16R38015-GQ	2	3.8	6.3	9.5	5.2	0.05 0.15	4	1.8	72	● ●	● ●	● ●		

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

Inserts identification system (Ref. to Tables 1 and 2)



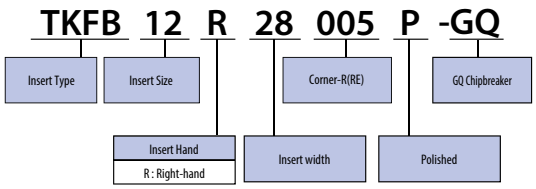


Table 1

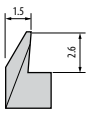
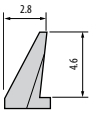
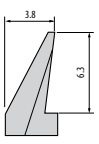
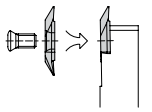
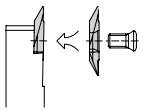
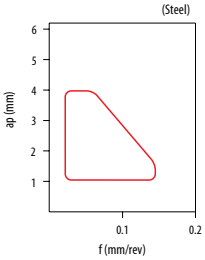
Small machining	General purpose	Large machining
		
TKFB12R15..	TKFB12R28..	TKFB16R38..

Table 2

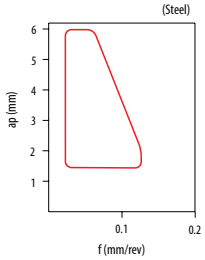
Toolholder	Right-hand	Toolholder	Left-hand
Insert	Right-hand	Insert	Left-hand
Lead angle	Right-hand	Lead angle	Right-hand
			

Applicable chipbreaker range

TKFB12R28...GQ



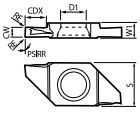
TKFB16R38...GQ



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

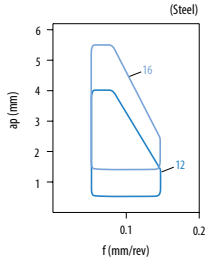
TKF-GTP

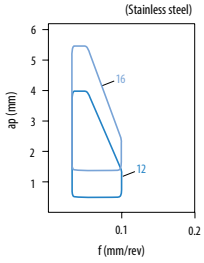
How to read pages of "Turning inserts" See page B15

Insert		Description		No. of edges	Dimension (mm) CW	CDX	S	D1	RE	W1	Angle (°) PSIRR	Carbide PVD PR1535	Carbide PVD PR1725	Applicable toolholder
	 Plunge and turn	TKF	12R200-GTP	2	2	4.3	8.7	5.2	0.08	3	0	●	●	E15 E16
		TKF	16R300-GTP	2	3	5.8	9.5	5.2	0.08	4	0	●	●	

Free-cutting steel		P
Carbon steel / Alloy steel	○	●
Stainless steel	●	○
Gray cast iron		K
Nodular cast iron		
Non-ferrous metals		N
Heat-resistant alloy	●	○ S
Titanium alloy	●	
Hard materials		H

Applicable chipbreaker range



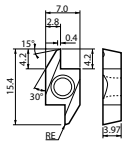
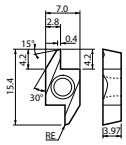
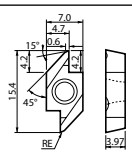
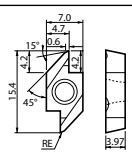
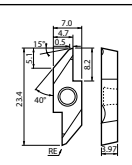
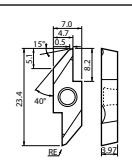


● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

ABS / ABW

How to read pages of "Turning inserts" See page B15

Free-cutting steel	●	P
Carbon steel / Alloy steel	○ ● ○	P
Stainless steel	● ○ ○	M
Gray cast iron	●	K
Nodular cast iron	○	K
Non-ferrous metals	●	N
Heat-resistant alloy	● ○	S
Titanium alloy	●	S
Hard materials		H

Insert	Description	No. of edges	Dimension (mm) RE	Carbide PVD PR1225	Carbide PVD PR1705	Carbide PVD PR1725	Carbide - PR930	Carbide - KW10	Cermet - TC60	Applicable toolholder
 	ABS 15R4005M ABS 15R4015M	2	< 0.05 < 0.15	● ●	● ●	● ●				E20
 	ABS 15R4005 ABS 15R4015	2	0.05 0.15				● ●	● ●	● ●	E20
 	ABW 15R4005M ABW 15R4015M	2	< 0.05 < 0.15	● ●	● ●	● ●				E21
 	ABW 15R4005 ABW 15R4015	2	0.05 0.15				● ●	● ●	● ●	E21
 	ABW 23R5005M ABW 23R5015M	2	< 0.05 < 0.15	● ●		● ●				E22
 	ABW 23R5005 ABW 23R5015	2	0.05 0.15				● ●	● ●	● ●	E22

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

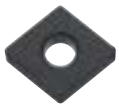
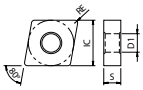
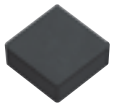
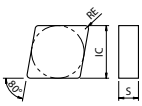
80° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
S	Chamfered and R-honed	S01525	0.15mm × 25° chamfered and R-honed
T	Chamfered	T02025	0.20mm × 25° chamfered

Gray cast iron (with scale)	○					●		✖	K
Gray cast iron (without scale)	●		○	○	●			○	
Nodular cast iron (with scale)	○								
Nodular cast iron (without scale)	○								
Heat-resistant alloy							✖		S
Hard materials		○	●						H

Insert		Description		Edge preparation type	No. of edges	Dimension (mm) IC	S	D1	RE	Ceramic CVD CS7050	PVD A66N	PVD PT600M	- A65	- KA30	- KS6015	- KS6040	- KS6050	Applicable toolholder
		CNGA	120412S01025	S01025	4	12.7	4.76	5.16	1.2					●				D8~D10 F118 F131 F132
		CNGA	120404S01525 120408S01525 120412S01525	S01525	4	12.7	4.76	5.16	0.4 0.8 1.2		● ● ●							
		CNGA	120404S02025 120408S02025 120412S02025	S02025	4	12.7	4.76	5.16	0.4 0.8 1.2			● ● ●						
		CNGA	120404T02025 120408T02025 120412T02025	T02025	4	12.7	4.76	5.16	0.4 0.8 1.2	 ● ●		● ● ●	 ● ●	 ● ●	 ● ●		 ● ●	
		CNGA	120404S03030 120408S03030 120412S03030	S03030	4	12.7	4.76	5.16	0.4 0.8 1.2		● ● ●							
		CNMA	120408S03030 120412S03030	S03030	4	12.7	4.76	5.16	0.8 1.2		● ●							
		CNGN	120408T01020	T01020	4	12.7	4.76	-	0.8							●		D49
		CNGN	120412S01025	S01025	4	12.7	4.76	-	1.2					●				
		CNGN	120408T02025 120412T02025 120416T02025	T02025	4	12.7	4.76	-	0.8 1.2 1.6			● ●			● ●	 ●		
		CNGN	120708S01525 120712S01525	S01525	4	12.7	7.94	-	0.8 1.2		● ●							
		CNGN	120704T02025 120708T02025 120712T02025 120716T02025	T02025	4	12.7	7.94	-	0.4 0.8 1.2 1.6				● ● ● ●					
		CNGN	160712T02025 160716T02025	T02025	4	15.875	7.94	-	1.2 1.6				● ●					
		CNMN	120708T02025	T02025	4	12.7	7.94	-	0.8				●					

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

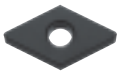
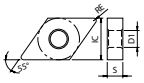
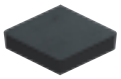
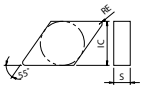
55° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
S	Chamfered and R-honed	S01525	0.15mm × 25° chamfered and R-honed
T	Chamfered	T02025	0.20mm × 25° chamfered

				K
Gray cast iron (with scale)				
Gray cast iron (without scale)		○	○	
Nodular cast iron (with scale)				
Nodular cast iron (without scale)				
Heat-resistant alloy				S
Hard materials	○	●		H

Insert		Description	Edge preparation type	No. of edges	Dimension (mm) IC	S	D1	RE	Ceramic PVD A66N	PVD PT600M	- A65	Applicable toolholder
		DNGA 150404S01525	S01525	4	12.7	4.76	5.16	0.4	●			D13~D17 F120, F136 F138~F140
		DNGA 150408S01525						0.8	●			
		DNGA 150404S02025	S02025	4	12.7	4.76	5.16	0.4		●		
		DNGA 150408S02025						0.8		●		
		DNGA 150404T02025	T02025	4	12.7	4.76	5.16	0.4		●		
		DNGA 150408T02025						0.8		●	●	
		DNGA 150412T02025						1.2		●		
		DNGA 150408S03030	S03030	4	12.7	4.76	5.16	0.8	●			
		DNGA 150604T02025	T02025	4	12.7	6.35	5.16	0.4		●		D13~D17
		DNGA 150608T02025						0.8		●		
		DNGA 150612T02025						1.2		●		
		DNGN 150704S01525	S01525	4	12.7	7.94	-	0.4	●			D50
		DNGN 150708S01525						0.8	●			
		DNGN 150712S01525						1.2	●			
		DNGN 150708S02025	S02025	4	12.7	7.94	-	0.8		●		
		DNGN 150704T02025	T02025	4	12.7	7.94	-	0.4			●	
		DNGN 150708T02025						0.8			●	
		DNGN 150712T02025						1.2			●	
		DNGN 150716T02025						1.6			●	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

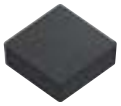
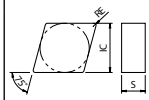
75° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
S	Chamfered and R-honed	S01525	0.15mm × 25° chamfered and R-honed
T	Chamfered	T02025	0.20mm × 25° chamfered

Gray cast iron (with scale)			K
Gray cast iron (without scale)		○	
Nodular cast iron (with scale)			
Nodular cast iron (without scale)			
Heat-resistant alloy			S
Hard materials	○		H

Insert		Description		Edge preparation type	No. of edges	Dimension (mm) IC	S	RE	Ceramic PVD A66N	Ceramic - A65	Applicable toolholder
		ENGN	130708S01525	S01525	4	12.7	7.94	0.8	●		D51 F151
		ENGN	130704T02025	T02025	4	12.7	7.94	0.4		●	
			130708T02025					0.8		●	
			130712T02025					1.2		●	
			130716T02025					1.6		●	
			130720T02025					2		●	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

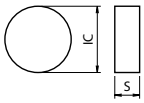
Round

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
E	R-honed	E005	R0.05mm honed
K	Double chamfered	K15015	1.5mm × 15° chamfered
S	Chamfered and R-honed	S01525	0.15mm × 25° chamfered and R-honed
T	Chamfered	T02025	0.20mm × 25° chamfered

Gray cast iron (with scale)				●			✖	K
Gray cast iron (without scale)		↻	↻				↻	
Nodular cast iron (with scale)								
Nodular cast iron (without scale)								
Heat-resistant alloy					●	✖		S
Hard materials	○	●						H

Insert	Description		Edge preparation type	Dimension (mm)		Ceramic						Applicable toolholder
				IC	S	PVD		-				
						A66N	PT600M	A65	KS6015	KS6030	KS6040	KS6050	
 	RNGN	090300T01020	T01020	9.525	3.18					●			D61
	RNGN	090400S01525	S01525	9.525	4.76	●							
	RNGN	090400S02025	S02025	9.525	4.76		●						
	RNGN	090400T02025	T02025	9.525	4.76		●	●					
	RNGN	120400E003	E003	12.7	4.76					●			D58 D61
	RNGN	120400T01020	T01020	12.7	4.76					●			
	RNGN	120400S01525	S01525	12.7	4.76	●							
	RNGN	120400S02025	S02025	12.7	4.76		●						
	RNGN	120400T02025	T02025	12.7	4.76		●	●	●			●	
	RNGN	120700E003	E003	12.7	7.94					●			
	RNGN	120700E005	E005	12.7	7.94						●		
	RNGN	120700T01020	T01020	12.7	7.94					●	●		
	RNGN	120700K15015	K15015	12.7	7.94		●						
	RNGN	120700S01525	S01525	12.7	7.94	●							
	RNGN	120700S02025	S02025	12.7	7.94		●						
	RNGN	120700T02025	T02025	12.7	7.94		●	●	●			●	
	RNGN	150700S01525	S01525	15.875	7.94	●							D58
	RNGN	150700S02025	S02025	15.875	7.94		●						
	RNGN	150700T02025	T02025	15.875	7.94			●					
	RNGN	190700E003	E003	19.05	7.94					●			-
	RNGN	190700T01020	T01020	19.05	7.94					●	●		
	RNGN	250700E003	E003	25.4	7.94					●			-

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

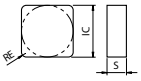
90° Square

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
S	Chamfered and R-honed	S01525	0.15mm × 25° chamfered and R-honed
T	Chamfered	T02025	0.20mm × 25° chamfered

Gray cast iron (with scale)	○					●		✖	K
Gray cast iron (without scale)	●		○	○	●			○	
Nodular cast iron (with scale)	○								
Nodular cast iron (without scale)	○								
Heat-resistant alloy							✖		S
Hard materials		○	●						H

Insert		Description		Edge preparation type	No. of edges	Dimension (mm)				Ceramic							Applicable toolholder
						IC	S	D1	RE	CVD	PVD		-				
										CS7050	A66N	PT600M	A65	KA30	KS6015	KS6040	KS6050
		SNGA	120408S01525	S01525	8	12.7	4.76	5.16	0.8		●						D19~D21 F142
			120412S01525						1.2		●						
		SNGA	120408S02025	S02025	8	12.7	4.76	5.16	0.8			●					
			120412S02025						1.2			●					
		SNGA	120408T02025	T02025	8	12.7	4.76	5.16	0.8			●	●		●		●
			120412T02025						1.2			●	●		●		●
			120416T02025						1.6	●		●			●		●
		SNMA	120408S03030	S03030	8	12.7	4.76	5.16	0.8		●						
		SNGN	120412T01020	T01020	8	12.7	4.76	-	1.2							●	
		SNGN	120408S01025	S01025	8	12.7	4.76	-	0.8					●			
			120412S01025						1.2					●			
			120416S01025						1.6					●			
			120420S01025						2					●			
		SNGN	120408S01525	S01525	8	12.7	4.76	-	0.8		●						
			120412S01525						1.2		●						
			120416S01525						1.6		●						
		SNGN	120408S02025	S02025	8	12.7	4.76	-	0.8			●					
			120412S02025						1.2			●					
			120416S02025						1.6			●					
		SNGN	120404T02025	T02025	8	12.7	4.76	-	0.4			●	●				D52~D54 D63 D64
			120408T02025						0.8			●	●		●		
			120412T02025						1.2	●		●	●		●		●
			120416T02025						1.6			●			●		●
			120420T02025						2				●		●		●
		SNGN	120704S01525	S01525	8	12.7	7.94	-	0.4		●						
			120708S01525						0.8		●						
			120712S01525						1.2		●						
			120716S01525						1.6		●						
			120720S01525						2		●						
		SNGN	120708S02025	S02025	8	12.7	7.94	-	0.8			●					
			120712S02025						1.2			●					
			120716S02025						1.6			●					
			120720S02025						2			●					
		SNGN	120704T02025	T02025	8	12.7	7.94	-	0.4				●				
			120708T02025						0.8			●					
			120712T02025						1.2			●	●				
			120716T02025						1.6			●	●		●		●
			120720T02025						2			●					
		SNMN	120716T02025	T02025	8	12.7	7.94	-	1.6				●				
		SNGN	150712T02025	T02025	8	15.875	7.94	-	1.2				●				D52 D53

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

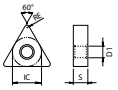
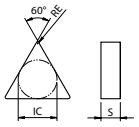
60° Triangle

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
S	Chamfered and R-honed	S01525	0.15mm × 25° chamfered and R-honed
T	Chamfered	T02025	0.20mm × 25° chamfered

Gray cast iron (with scale)						●	✖	K
Gray cast iron (without scale)		↻	↻	●		↻		
Nodular cast iron (with scale)								
Nodular cast iron (without scale)								
Heat-resistant alloy								S
Hard materials	○	●						H

Insert		Description		Edge preparation type	No. of edges	Dimension (mm) IC	S	D1	RE	Ceramic PVD A66N	PVD PT600M	- A65	- KA30	- KS6015	- KS6050	Applicable toolholder
		TNGA	160408T00520	T00520	6	9.525	4.76	3.81	0.8				●			D22~D25 D27 D28 F122 F143 F144
		TNGA	160408S01525 160412S01525	S01525	6	9.525	4.76	3.81	0.8 1.2	● ●						
		TNGA	160404S02025 160408S02025 160412S02025	S02025	6	9.525	4.76	3.81	0.4 0.8 1.2		● ● ●					
		TNGA	160404T02025 160408T02025 160412T02025	T02025	6	9.525	4.76	3.81	0.4 0.8 1.2		● ● ●	●	● ● ●	● ●	● ●	
		TNGA	160408S03030	S03030	6	9.525	4.76	3.81	0.8	●						
		TNGN	110304T00520 110308T00520 110312T00520	T00520	6	6.35	3.18	-	0.4 0.8 1.2		● ●	● ● ●				D66 F152
		TNGN	160404T00520 160408T00520 160412T00520	T00520	6	9.525	4.76	-	0.4 0.8 1.2			● ●	 ●			D56
		TNGN	160404S01025 160408S01025 160412S01025	S01025	6	9.525	4.76	-	0.4 0.8 1.2				● ● ●			
		TNGN	160404S01525 160408S01525 160412S01525	S01525	6	9.525	4.76	-	0.4 0.8 1.2	● ● ●						
		TNGN	160404S02025 160408S02025 160412S02025	S02025	6	9.525	4.76	-	0.4 0.8 1.2		● ●					
		TNGN	160404T02025 160408T02025 160412T02025	T02025	6	9.525	4.76	-	0.4 0.8 1.2			● ● ●	 ● ●	● ●	●	
		TNGN	160704T02025 160708T02025 160712T02025	T02025	6	9.525	7.94	-	0.4 0.8 1.2			● ● ●				

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

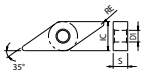
35° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
S	Chamfered and R-honed	S01525	0.15mm × 25° chamfered and R-honed
T	Chamfered	T02025	0.20mm × 25° chamfered

Gray cast iron (with scale)				K
Gray cast iron (without scale)		○	○	
Nodular cast iron (with scale)				
Nodular cast iron (without scale)				
Heat-resistant alloy				S
Hard materials	○	●		H

Insert		Description	Edge preparation type	No. of edges	Dimension (mm) IC	S	D1	RE	Ceramic PVD A66N	PVD PT600M	- A65	Applicable toolholder
		VNGA 160404S01525	S01525	4	9.525	4.76	3.81	0.4	●			D30~D39
		VNGA 160408S01525						0.8	●			
		VNGA 160404S02025	S02025	4	9.525	4.76	3.81	0.4		●		
		VNGA 160408S02025						0.8		●		
		VNGA 160404T02025	T02025	4	9.525	4.76	3.81	0.4		●	●	
		VNGA 160408T02025						0.8		●	●	
		VNGA 160412T02025						1.2		●		

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

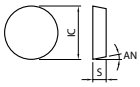
Round

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
E	R-honed	E003	R0.03mm honed
T	Chamfered	T01020	0.10mm × 20° chamfered

Gray cast iron (with scale)		K
Gray cast iron (without scale)		
Nodular cast iron (with scale)		
Nodular cast iron (without scale)		
Heat-resistant alloy	●	S
Hard materials		H

Insert		Description	Edge preparation type	Dimension (mm) IC	Dimension (mm) S	Angle (°) AN	Ceramic - KS6030	Applicable toolholder
		RPGN 090300E003	E003	9.525	3.18	11	●	-
		RPGN 090300T01020	T01020	9.525	3.18	11	●	
		RPGN 120400E003	E003	12.7	4.76	11	●	
		RPGN 120400T01020	T01020	12.7	4.76	11	●	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Square

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
S	Chamfered and R-honed	S00820	0.08mm × 20° chamfered and R-honed
T	Chamfered	T00820	0.08mm × 20° chamfered

			K
Gray cast iron (with scale)			
Gray cast iron (without scale)		○	
Nodular cast iron (with scale)			
Nodular cast iron (without scale)			
Heat-resistant alloy			S
Hard materials	○		H

Insert		Description	Edge preparation type	No. of edges	Dimension (mm) IC	S	RE	Angle (°) AN	Ceramic PVD A66N	Ceramic - A65S	Applicable toolholder
		SPGN 090308S00820	S00820	4	9.525	3.18	0.8	11	●		F112
		SPGN 090308T00820	T00820	4	9.525	3.18	0.8	11		●	
		SPGN 120308S00820	S00820	4	12.7	3.18	0.8	11	●		
		SPGN 120308T00820 120312T00820	T00820	4	12.7	3.18	0.8 1.2	11		● ●	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

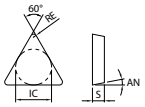
Triangle

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
S	Chamfered and R-honed	S00820	0.08mm × 20° chamfered and R-honed
T	Chamfered	T00820	0.08mm × 20° chamfered

				K
Gray cast iron (with scale)				
Gray cast iron (without scale)		○	○	
Nodular cast iron (with scale)				
Nodular cast iron (without scale)				
Heat-resistant alloy				S
Hard materials	○	●		H

Insert	Description	Edge preparation type	No. of edges	Dimension (mm) IC	S	RE	AN	Angle (°)	Ceramic PVD A66N	PVD PT600M	Ceramic - A65	Applicable toolholder
 	TBGN 060104S00820 060108S00820	S00820	3	3.97	1.59	0.4 0.8	5		● ●	● ●		-
	TPGN 090204T00820 090208T00820	T00820	3	5.56	2.38	0.4 0.8	11			● ●		F113
	TPGN 110304S00820 110308S00820	S00820	3	6.35	3.18	0.4 0.8	11		● ●	● ●		
	TPGN 110304T00820 110308T00820	T00820	3	6.35	3.18	0.4 0.8	11			● ●	● ●	
	TPGN 160304S00820 160308S00820 160312S00820	S00820	3	9.525	3.18	0.4 0.8 1.2	11		● ● ●	● ●		
	TPGN 160304T00820 160308T00820	T00820	3	9.525	3.18	0.4 0.8	11			● ●	● ●	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

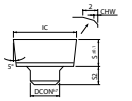
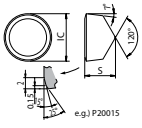
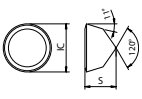
Inserts for high hardened roll

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
E	R-honed	E005	R0.05mm honed
K	Double chamfered	K20003	2.0mm × 3° chamfered
P	Double chamfered and R-honed	P20015	2.0mm × 15° chamfered and R-honed
S	Chamfered and R-honed	S01020	0.10mm × 20° chamfered and R-honed
T	Chamfered	T01020	0.10mm × 20° chamfered

Gray cast iron (with scale)	✖			K
Gray cast iron (without scale)				
Nodular cast iron (with scale)				
Nodular cast iron (without scale)				
Heat-resistant alloy		●	✖	S
Hard materials	●			H

Insert		Description		Edge preparation type	Dimension (mm)					Ceramic			Applicable toolholder
					IC	DCON	S	S2	CHW	PVD	-		
										PT600M	KS6030	KS6040	
		RBG	16K20003	K20003	16	8	8	5	0.2	●			-
		RCGX	060600E005	E005	6.35	-	6.35	-	-			●	-
		RCGX	060600T01020	T01020	6.35	-	6.35	-	-		●	●	
		RCGX	090700T01020	T01020	9.525	-	8	-	-		●	●	
		RCGX	090700P20015	P20015	9.525	-	8	-	-	●			
		RCGX	120700E003	E003	12.7	-	8	-	-		●		
		RCGX	120700T01020	T01020	12.7	-	8	-	-		●		
		RCGX	120700P20015	P20015	12.7	-	8	-	-	●			
		RPGX	060600E003	E003	6.35	-	6.35	-	-		●		-
		RPGX	060600T01020	T01020	6.35	-	6.35	-	-		●		
		RPGX	090700E003	E003	9.525	-	8	-	-		●		
		RPGX	090700T01020	T01020	9.525	-	8	-	-		●		
		RPGX	120700E003	E003	12.7	-	8	-	-		●		

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

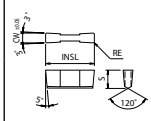
Grooving inserts

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

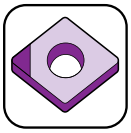
Symbol	Specification	Example	
S	Chamfered and R-honed	S01020	0.10mm × 20° chamfered and R-honed
T	Chamfered	T01020	0.10mm × 20° chamfered

Gray cast iron (with scale)				K
Gray cast iron (without scale)		●	○	
Nodular cast iron (with scale)				
Nodular cast iron (without scale)				
Heat-resistant alloy				S
Hard materials	○	●		H

Insert	Description	Edge preparation type	No. of edges	Dimension (mm) CW	S	RE	INSL	Tolerance (mm) CW min.	CW max.	Ceramic PVD A66N	PVD PT600M	- A65	Applicable toolholder
 	GH 4020-05	S01020 T01020	2	4	7.5	0.5	20	-0.05	+0.05	●		●	G62 G63 G93
	GH 5020-05	S01020 T01020	2	5	7.5	0.5	20	-0.05	+0.05	●		●	
	GH 6020-05	T01020	2	6	7.5	0.5	20	-0.05	+0.05			●	
	GH 7020-05	T01020	2	7	7.5	0.5	20	-0.05	+0.05			●	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

C



CBN Lineup		C2
Negative inserts	80° Rhombic	C8
	55° Rhombic	C10
	90° Square	C12
	60° Triangle	C13
	35° Rhombic	C14
	80° Trigon	C15
	80° Rhombic / Solid	C16
	Round / Solid	C17
	90° Square / Solid	C18
	60° Triangle / Solid	C19
Positive inserts	80° Rhombic	C20
	55° Rhombic	C22
	60° Triangle	C23
	35° Rhombic	C26
	80° Trigon	C28
Grooving inserts	GBA	C29
	GDGS	C30
	GMN	C31
Solid bar	EZB-NB	C32

PCD Lineup		C33
Negative inserts	80° Rhombic	C34
	55° Rhombic	C35
	60° Triangle	C36
	35° Rhombic	C37
	80° Trigon	C38
Positive inserts	80° Rhombic	C39
	55° Rhombic	C42
	90° Square	C43
	60° Triangle	C44
	35° Rhombic	C49
	80° Trigon	C51
	25° Rhombic	C53
Grooving inserts	GBA	C54
	GV/GVF	C55
	GDGS	C56
	GMN	C57
	GMGW	C58
	TKF	C59
Solid bar	EZB-NB	C60
	VNBR-NB	C61
	VNGR-NB	C62
Milling inserts	Available inserts	C64

Identification system (Turning insert / CBN)

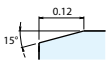
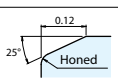
C	N	G	A	12	04	04	S01225	ME

Turning Indexable Inserts Identification System" See B2

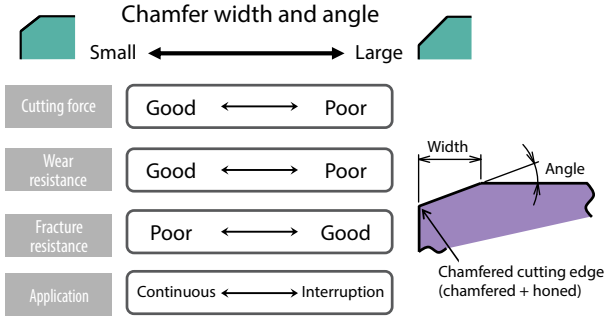
Insert type	Description	Edge preperation	Manufacture's option	Edge length	Number of edges	Re-grinding
Negative	CNGA120404MEF	F	MEF	Short (Small edge)	2	Not recommended
	CNGA120404ME4	S01225	ME4		4 (Multi edge double-sided)	
	CNGA120404S01225ME		ME		2	
	CNGA120404S00545MEP	S00545	MEP		2	
	CNGA120404S01225SE	S01225	SE		1	
	CNMN120404S02020	S02020	Without indication (Only KBN900)	Long	Multi edge	Possible
Positive	CCMW09T304MEF	F	MEF	Short (Small edge)	2	Not recommended
	CCMW09T304T00815ME	T00815	ME		2	
	CCMW09T304S01225MES	S01225	MES		2	
	CCMW09T304T00815SE	T00815	SE		1	

About re-grinding
- Re-grinding is possible for inserts without any indication in manufacturer's option. Regrinding can not be available depending on the edge condition.
- Re-grinding is not recommended for inserts with manufacturer's symbol like "ME" or "SE"

Edge preparation identification system

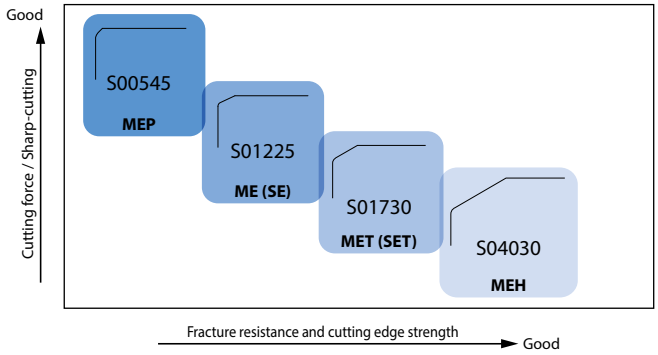
Edge preperation				
Symbol	Cutting edge spec.	Example		Shape
F	Sharp edge	F	Sharp edge	
E	Honed cutting edge	E008	R0.08 mm honed cutting edge	
T	Chamfered cutting edge	T01215	0.12 mm x 15° chamfered cutting edge	
S	Chamfered and honed cutting edge	S01225	0.12 mm x 25° chamfered and honed cutting edge	

Features of chamfer width and angle



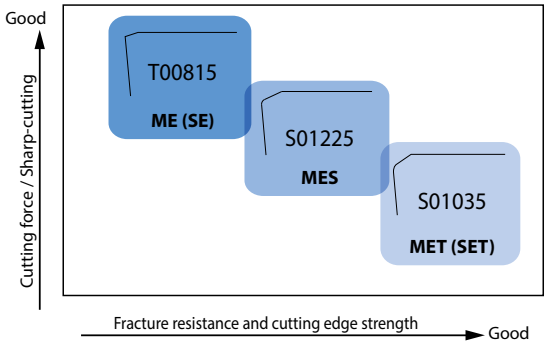
Standard cutting edge preperation

Negative type (machining of hard materials)



Manufacture's option	Edge preperation		Application and features
MEP	S00545	0.05 mm × 45°+ Honed cutting edge	High speed, continuous cut. Excellent crater wear resistance.
ME	S01225	0.12 mm × 25°+ Honed cutting edge	General purpose.
MET	S01730	0.17 mm × 30°+ Honed cutting edge	Superior fracture resistance.
MEH	S04030	0.40 mm × 30°+ Honed cutting edge	Interrupted high feed machining. Prevention of flaking.

Positive type (machining of hard materials)

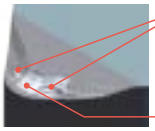
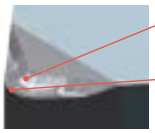
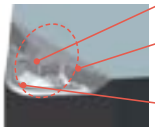


Manufacture's option	Edge preperation		Application and features
ME	T00815	0.08 mm × 15°	Chamfered type. Sharp-cutting oriented, less burring.
MES	S01225	0.12 mm × 25°+ Honed cutting edge	General purpose.
MET	S01035	0.10 mm × 35°+ Honed cutting edge	Interrupted machining. Stable machining oriented.

CBN inserts for machining hardened material

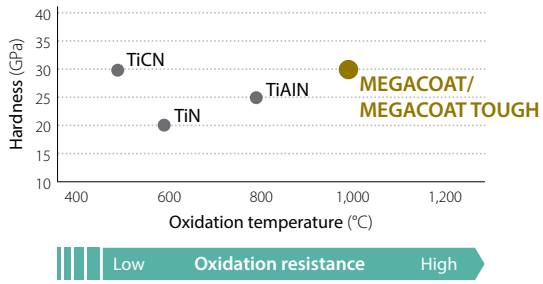
H chipbreaker series

Unique molded chipbreaker provides excellent chip control when machining hardened material. 3 Chipbreaker styles for a wide range of machining applications.

Chipbreaker	Application	Recommended cutting range
HH (1st Recommendation)  Twin Dots: Breaks chips into small pieces. Wide Bump: Provides stable chip curls	Hardened steel finishing 55HRC or more	Small D.O.C. ap = 0.1 ~ 0.3 mm
HL  Wide Bump; Rake Surface: Stable chip control for softer interior of hard materials	Hardened steel finishing 55HRC or less	
HD  Wide Bump; Multi-step Structure: Good for a wide range of conditions; Rake Surface: Stable chip control for softer interior of hard materials	Removing carburized layer From carburized layer to unhardened layer	Large D.O.C. ap = 0.3 ~ 0.7 mm

MEGACOAT CBN

Properties of PVD coating



Advantages of MEGACOAT

Long tool life and stable machining due to superior heat-resistance and hardness.

Stability improvement through prevention of crater wear (oxidation, diffusional wear).

High thermal stability and surface smoothness provide excellent surface finish.

New coated CBN for machining hardened material

KBN010/KBN020

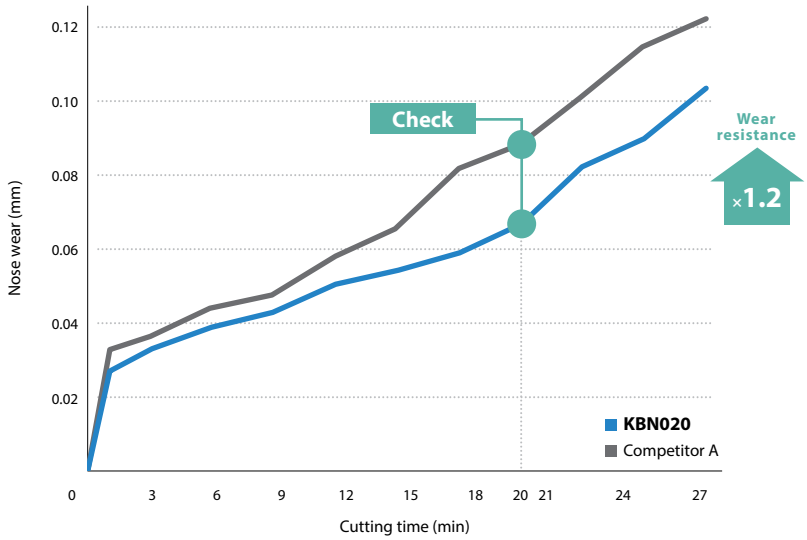
Long tool life and stable machining results with wear resistance and fracture resistance.
Supports a wide range of applications and reduces the cost of machining hardened materials.

1 Combination of new coating technology and high content CBN provides exceptional wear resistance and fracture resistance

Wear resistance

New coating "MEGACOAT TOUGH" suppresses layer peeling.
Excellent wear resistance

Wear Resistance Comparison (Internal evaluation)

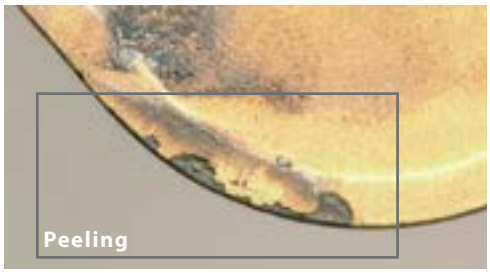


Cutting conditions: Vc = 150 m/min, ap = 0.2 mm, f = 0.1 mm/rev, Wet
Workpiece material: 15CrMo4 60HRC

KBN020



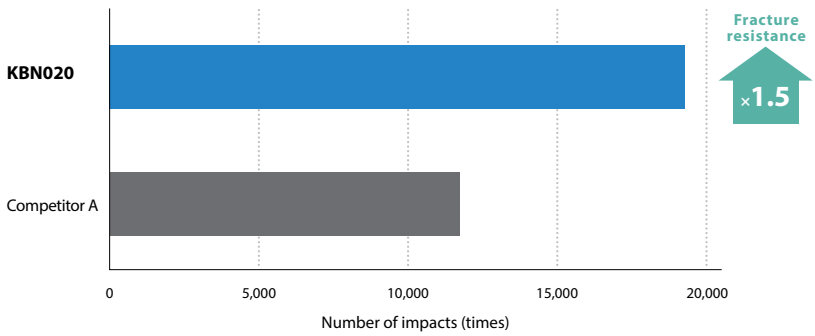
Competitor A



Fracture resistance

KBN010 : Mixed structure of micro grain CBN and coarse grain CBN
KBN020 : High content CBN and high purity TiN binder improves strength of CBN.
Excellent fracture resistance

Continuous to interrupted machining comparison (Internal evaluation)



Cutting conditions: Vc = 150 m/min, ap = 0.2 mm, f = 0.2 mm/rev, Dry
Workpiece material: 15CrMo4 60HRC

2 Newly developed coating "MEGACOAT TOUGH"

Features

An adhesion layer is laminated between
the high wear resistance layer and the CBN.
Reduces layer peeling to achieve long tool life and stable machining.

MEGACOAT TOUGH CBN

High wear resistance layer with TiAlN + Oxidation resistance components.
Suppresses oxidation/diffusional wear

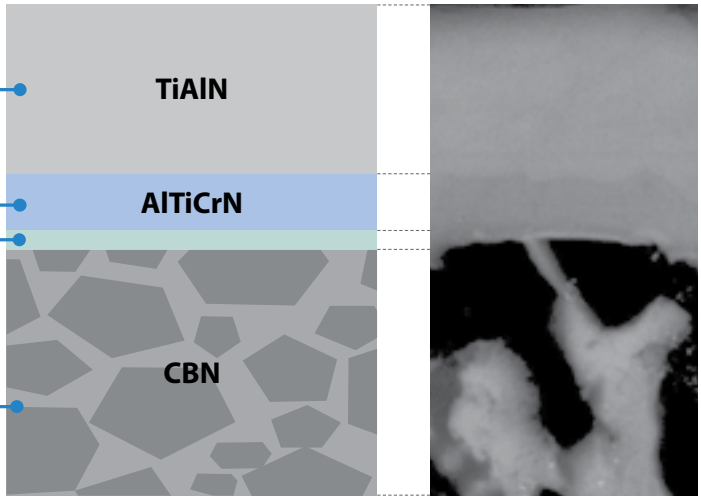
Check New technology

Interlayer for stress relief
High adhesion layer

Two layers dedicated to CBN.
Improved adhesion between CBN and high wear resistant layer.
Suppressed layer peeling.

Check

High content CBN
KBN010 : Mixed structure of micro grain CBN and coarse grain CBN
Improved wear resistance in high speed machining
KBN020 : High content CBN with high purity TiN binder
Improved heat resistance and toughness



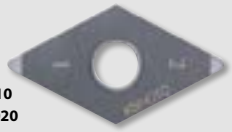
Layer image

Solution for Automotive parts

CVT shaft

Workpiece
17Cr3

Insert 1st recommendation : KBN010
2nd recommendation : KBN020
DNGA150404S01225ME



Applications
External finishing

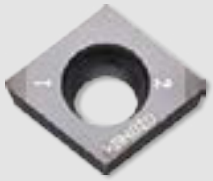


(Image)

Sun gear

Workpiece
C45 (Carburizing and quenching)

Insert 1st recommendation : KBN020
CCMW09T308S01035MET



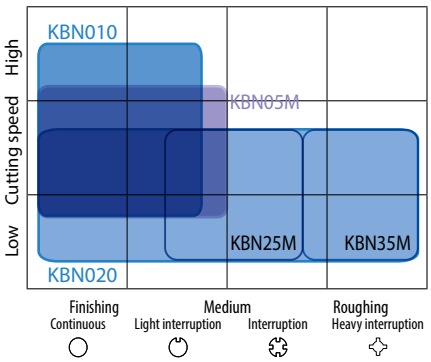
Applications
Boring finishing for spline part (Interruption)



(Image)

Application map

Hard materials



KBN010 : High wear resistance for continuous,high-speed nishing
KBN020 : 1st recommended grade for a wide range of application from continuous (high speed finishing) to interrupted machining.
KBN05M : Applicable for continuous (high speed finishing) to interrupted machining. With chipbreaker Inserts are available.
KBN25M : General machining.
KBN35M : Honeycomb structure CBN (Superior fracture resistance in heavy interrupted machining).

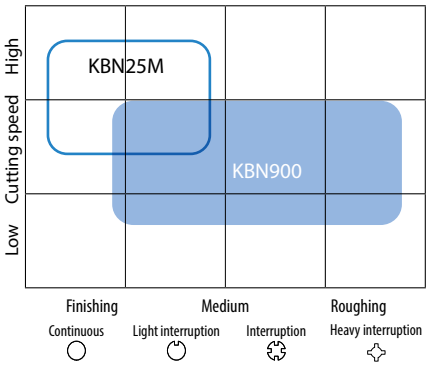
Coolant for KBN010/KBN020

Application	Wet	Dry
Continuous	✓	⊘
Interruption	Partially*	✓

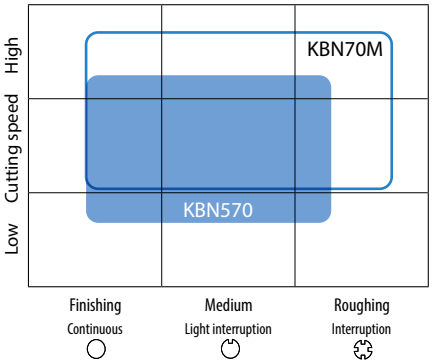
✓ Recommended ⊘ Not Recommended

*Use KBN05M when using coolant.

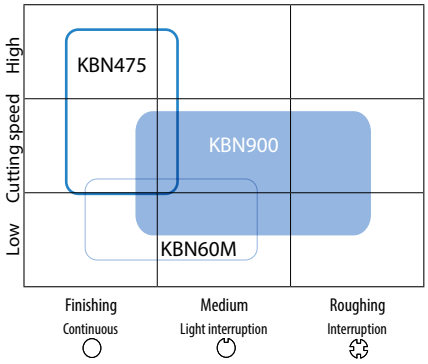
Roll materials (Chilled cast iron)



Sintered steel



Cast iron



Recommended cutting conditions

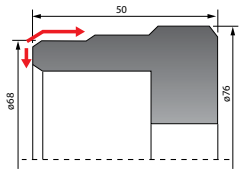
Workpiece material	Hardness	Applications		Recommended insert grade	Cutting conditions		
					Vc: (m/min)	ap: (mm)	f: (mm/rev)
Hardened steel	Over 55HRC	High speed finishing	Continuous	KBN010	80 - **180** - 230	0.05 - **0.2** - 0.35	0.05 - **0.15** - 0.3
		General finishing	Continuous ~ Interruption	KBN020	80 - **150** - 200	0.05 - **0.2** - 0.5	0.05 - **0.2** - 0.45
		HH chipbreaker for hardened steel finishing	Continuous ~ Interruption	KBN05M	100 - **150** - 200	0.1 - **0.2** - 0.3	0.1 - **0.15** - 0.25
		High efficient stable machining	Light interruption ~ Interruption	KBN020	80 - **150** - 200	0.05 - **0.2** - 0.5	0.05 - **0.2** - 0.45
		Interruption (Small ap)	Interruption ~ Heavy interruption	KBN020	80 - **130** - 180	0.05 - **0.2** - 0.5	0.05 - **0.2** - 0.4
		Heavy machining	Continuous ~ Interruption	KBN900	70 - **90** - 110	0.5 - **1.0** - 2.0	0.05 - **0.1** - 0.2
	Under 55HRC	HL chipbreaker for hardened steel finishing	Continuous ~ Interruption	KBN05M	100 - **150** - 200	0.1 - **0.2** - 0.3	0.1 - **0.15** - 0.25
		Finishing	Continuous	*PT600M	60 - **80** - 120	0.2 - **0.5** - 0.7	0.05 - **0.1** - 0.15
	Removing the carburized layer	HD chipbreaker	Continuous ~ Interruption	KBN05M	100 - **150** - 200	0.3 - **0.5** - 0.7	0.1 - **0.15** - 0.25
Gray cast iron	Under 250HB	Finishing	Continuous ~ Light interruption	KBN475	400 - **800** - 1,200	0.05 - **0.2** - 0.5	0.1 - **0.2** - 0.3
		Finishing	Continuous ~ Light interruption	KBN60M	300 - **500** - 700	0.05 - **0.2** - 0.5	0.1 - **0.2** - 0.3
		High efficient finishing	Continuous~Light interruption	KBN900	500 - **900** - 1,200	0.1 - **0.5** - 1.0	0.05 - **0.1** - 0.2
		Heavy machining	Continuous ~ interruption	KBN900	500 - **700** - 900	0.5 - **1.5** - 3.0	0.1 - **0.3** - 0.5
Roll materials (Chilled cast iron)	Over 55HRC	Finishing	Continuous ~ interruption	KBN25M	80 - **120** - 160	0.05 - **0.3** - 0.5	0.05 - **0.08** - 0.1
		Heavy machining	Continuous ~ interruption	KBN900	70 - **90** - 110	0.3 - **0.7** - 1.0	0.05 - **0.1** - 0.15
Sintered steel	-	Finishing	Continuous ~ Light interruption	KBN570	50 - **150** - 250	0.05 - **0.15** - 0.25	0.03 - **0.1** - 0.2
	-	Finishing	Continuous ~ Interruption	KBN70M	100 - **200** - 250	0.05 - **0.2** - 0.3	0.05 - **0.15** - 0.25

*PT600M: MEGACOAT on Al_2O_3+TiC ceramic

Case studies

20Cr4 (58HRC)

- Gear
- External , facing & chamfering
- Vc = 130 m/min
- ap = 0.6 mm
- f = 0.12 mm/rev
- Wet
- CNGA120408S01225ME (KBN05M)



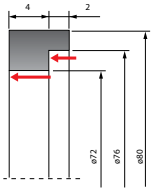
KBN05M	300 pcs/edge
Competitor C	200 pcs/edge

- KBN05M achieved 1.5 times longer tool life than competitor C.
- Its longer tool life contributes to cost-cutting.

Evaluation by the user

15CrMo (55HRC)

- Stator
- Boring
- Vc = 170 m/min
- ap = 0.4 mm
- f = 0.1 mm/rev
- Wet
- CNGA120408S01225ME (KBN05M)



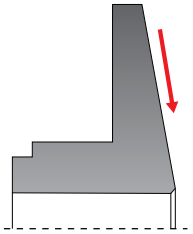
KBN05M	600 pcs/edge
Competitor D	300 pcs/edge

- KBN05M achieved twise longer tool life than competitor D.
- Its longer tool life contributes to cost-cutting.

Evaluation by the user

20Cr4 (58HRC)

- Pulley
- Facing (Continuous)
- Vc = 120 m/min
- ap = 0.15 ~ 0.2 mm
- f = 0.24 mm/rev
- Wet
- DNGA120408S00545MEP (KBN05M)



KBN05M-MEP (Edge preperation: 0.05 × 45˚)	150 pcs/edge
KBN05M-ME (Edge preperation: 0.12 × 25˚)	100 pcs/edge
Competitor E	100 pcs/edge

- Tool life of KBN05M-ME type (Edge prep.: 0.12 × 25° chamfered + R honed) is same as comp. E's.
- KBN05M-MEP (Edge prep.: 0.05 × 45° chamfered + R honed) type achieved 1.5 times longer tool life, preventing crater wear.

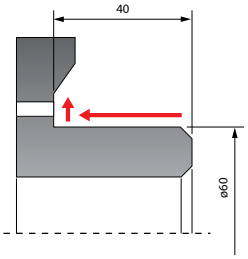


KBN05M-MEP　KBN05M-ME　Competitor E

Evaluation by the user

Chromium steel (61~65HRC)

- Gear
- External & facing (Interrupted)
- Vc = 120 m/min
- ap = 0.15 mm
- f = 0.1~0.15 mm/rev (External)
- Wet
- CNGA120408S04030MEH (KBN05M)



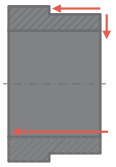
KBN05M-MEH (Edge preperation: 0.40 × 30˚)	150 pcs/edge
Competitor F	100 pcs/edge

- Compared to competitor F, KBN05M-MEH type (Edge prep.: 0.40 × 30° chamfered + R honed) achieved 1.5 times longer tool life.
- No chipping in interrupted machining, and improved productivity. Competitor F's cutting edge got many chipping.
- Feed rate could be increased from 0.15 to 0.25 mm/rev in facing.
- Achieved cycle time and cost reduction.

Evaluation by the user

Chromium Molybdenum Hardened Steel (55 ~ 62HRC)

- Pinion
- Vc = 130 m/min
- ap = 0.05 mm
- f = 0.08 mm/rev
- Dry
- CNGM120408ME-HH (KBN05M)



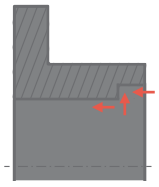
KBN05M HH Chipbreaker	70 pcs/edge
Competitor G	30 pcs/edge

The HH chipbreaker maintained 2.3 times longer tool life than Competitor F.
The molded chipbreaker provided stable chip control.

Evaluation by the user

17Cr3 (59HRC)

- Clutch
- Vc = 100 m/min
- ap = 0.15 mm
- f = 0.10 mm/rev
- Wet
- WNGA080408S01225ME (KBN020)



KBN020	650 pcs/edge
Competitor H	400 pcs/edge

KBN020 can be stable machining and long tool life.

Evaluation by the user

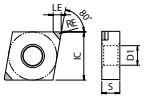
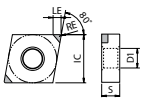
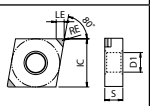
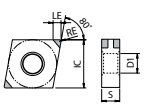
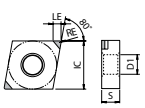
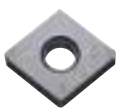
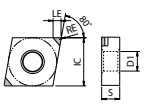
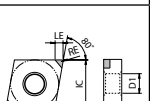
80° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
F	Sharp edge	F	Sharp edge
E	R-honed	E008	R0.08mm honed
T	Chamfered	T01215	0.12mm × 15° chamfered
S	Chamfered and R-honed	S01225	0.12mm × 25° chamfered and R-honed

Gray cast iron (with scale)													K
Gray cast iron (without scale)							◕		●				
Nodular cast iron (with scale)													
Hard materials (Roughing)						✖							H
Hard materials (Finishing)	●	◕	○	◡						○	◡		
Hard materials (Chip control)													
Sintered steel								✖				◕	-

Insert	Description	Edge preparation type	No. of edges	Dimension (mm)					CBN										Applicable toolholder
									PVD							-			
				IC	S	D1	RE	LE	KBN010	KBN020	KBN05M	KBN10M	KBN25M	KBN35M	KBN60M	KBN70M	KBN475	KBN510	KBN525	KBN570	
  With Wiper Edge	CNGA 120404S01215MEW	S01215	2	12.7	4.76	5.16	0.4	2.6	●	●	●		●						●		D8~D10 F118 F131 F132
	CNGA 120408S01215MEW						0.8	2.5	●	●	●	●	●	●				●	●		
	CNGA 120412S01215MEW						1.2	2.5	●	●	●	●	●								
  Finishing	CNGA 120404S00545MEP	S00545	2	12.7	4.76	5.16	0.4	2.6			●										
	CNGA 120408S00545MEP						0.8	2.6			●										
	CNGA 120412S00545MEP						1.2	2.5			●										
	CNGA 120416S00545MEP						1.6	3.4			●										
	CNGA 120420S00545MEP						2	3.4			●										
	CNGA 120424S00545MEP						2.4	3.3			●										
  Sharp edge	CNGA 120404MEF	F	2	12.7	4.76	5.16	0.4	2.6									●			●	
	CNGA 120408MEF						0.8	2.6									●			●	
	CNGA 120412MEF						1.2	2.5									●				
  Double-sided	CNGA 120404ME4	S01225	4	12.7	4.76	5.16	0.4	2.6			●										
	CNGA 120408ME4						0.8	2.6			●										
	CNGA 120412ME4						1.2	2.5			●										
	CNGA 120404T01215ME	T01215	2	12.7	4.76	5.16	0.4	2.6								●	●				
	CNGA 120408T01215ME						0.8	2.6								●	●				
	CNGA 120412T01215ME						1.2	2.5								●	●				
 	CNGA 120402S01225ME	S01225	2	12.7	4.76	5.16	0.2	2.6	●	●	●		●		●				●		
	CNGA 120404S01225ME						0.4	2.6	●	●	●	●	●	●	●		●	●	●		
	CNGA 120408S01225ME						0.8	2.6	●	●	●	●	●	●	●		●	●	●		
	CNGA 120412S01225ME						1.2	2.5	●	●	●	●	●	●	●		●		●		
	CNGA 120416S01225ME						1.6	3.4	●	●	●										
	CNGA 120420S01225ME						2	3.4	●	●	●										
	CNGA 120424S01225ME						2.4	3.3			●										
  Tough	CNGA 120404S01730MET	S01730	2	12.7	4.76	5.16	0.4	2.6	●	●	●		●	●					●		
	CNGA 120408S01730MET						0.8	2.6	●	●	●		●	●					●		
	CNGA 120412S01730MET						1.2	2.5	●	●	●		●	●							
	CNGA 120416S01730MET						1.6	3.4	●	●	●										
	CNGA 120420S01730MET						2	3.4			●										
	CNGA 120424S01730MET						2.4	3.3			●										
  Interruption	CNGA 120404S04030MEH	S04030	2	12.7	4.76	5.16	0.4	2.6			●										
	CNGA 120408S04030MEH						0.8	2.6	●	●	●										
	CNGA 120412S04030MEH						1.2	2.5	●	●	●										
	CNGA 120416S04030MEH						1.6	3.4			●										
	CNGA 120420S04030MEH						2	3.4			●										
	CNGA 120424S04030MEH						2.4	3.3			●										

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

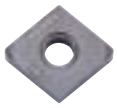
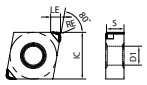
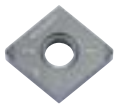
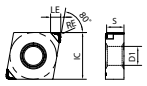
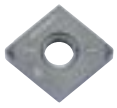
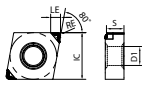
80° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
F	Sharp edge	F	Sharp edge
E	R-honed	E008	R0.08mm honed
T	Chamfered	T01215	0.12mm × 15° chamfered
S	Chamfered and R-honed	S01225	0.12mm × 25° chamfered and R-honed

Gray cast iron (with scale)		K
Gray cast iron (without scale)		
Nodular cast iron (with scale)		
Hard materials (Roughing)		H
Hard materials (Finishing)	●	
Hard materials (Chip control)	●	
Sintered steel		-

Insert		Description	Edge preparation type	No. of edges	Dimension (mm) IC	S	D1	RE	LE	CBN KBN05M	PVD	Applicable toolholder
	 Hardened steel Finishing (55HRC or more)	CNGM 120404ME-HH	E	2	12.7	4.76	5.16	0.4	2.6	●		D8~D10 F118 F131 F132
		CNGM 120408ME-HH						0.8	2.6	●		
		CNGM 120412ME-HH						1.2	2.5	●		
	 Hardened steel Finishing (55HRC or less)	CNGM 120404ME-HL	E	2	12.7	4.76	5.16	0.4	2.6	●		
		CNGM 120408ME-HL						0.8	2.6	●		
		CNGM 120412ME-HL						1.2	2.5	●		
	 Removing the Carburized Layer	CNGM 120404ME-HD	S01235	2	12.7	4.76	5.16	0.4	2.6	●		
		CNGM 120408ME-HD						0.8	2.6	●		
		CNGM 120412ME-HD						1.2	2.5	●		

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

55° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
F	Sharp edge	F	Sharp edge
E	R-honed	E008	R0.08mm honed
T	Chamfered	T01215	0.12mm × 15° chamfered
S	Chamfered and R-honed	S01225	0.12mm × 25° chamfered and R-honed

Gray cast iron (with scale)														K
Gray cast iron (without scale)							●		●					
Nodular cast iron (with scale)														
Hard materials (Roughing)						✖								H
Hard materials (Finishing)	●	●	○	◡						○	◡			
Hard materials (Chip control)														
Sintered steel								✖					●	-

Insert		Description		Edge preparation type	No. of edges	Dimension (mm)					CBN									Applicable toolholder
						IC	S	D1	RE	LE	PVD							-			
											KBN010	KBN020	KBN05M	KBN10M	KBN25M	KBN35M	KBN60M	KBN70M	KBN475	KBN510	KBN525	KBN570	
	Finishing	DNGA	150404S00545MEP	S00545	2	12.7	4.76	5.16	0.4	2.6			●										D13~D17 F120, F136 F138~F140
			150408S00545MEP						0.8	2.2			●										
			150412S00545MEP						1.2	1.9			●										
			150416S00545MEP						1.6	3.8			●										
			150420S00545MEP						2	3.5			●										
			150424S00545MEP						2.4	3.1			●										
	Sharp edge	DNGA	150404MEF	F	2	12.7	4.76	5.16	0.4	2.6									●			●	
			150408MEF						0.8	2.2									●			●	
			150412MEF						1.2	1.9									●				
	Double-sided	DNGA	150404ME4	S01225	4	12.7	4.76	5.16	0.4	2.6			●										
			150408ME4						0.8	2.2			●										
			150412ME4						1.2	1.9			●										
		DNGA	150404T01215ME	T01215	2	12.7	4.76	5.16	0.4	2.6								●	●				
			150408T01215ME						0.8	2.2								●	●				
			150412T01215ME						1.2	1.9									●				
		DNGA	150604T01215ME	T01215	2	12.7	6.35	5.16	0.4	2.6								●					D13~D17
		DNGA	150401S01225ME	S01225	2	12.7	4.76	5.16	0.1	2.8	●	●	●		●								D13~D17 F120, F136 F138~F140
			150402S01225ME						0.2	2.7	●	●	●		●					●	●		
			150404S01225ME						0.4	2.6	●	●	●	●	●	●	●		●	●	●		
			150408S01225ME						0.8	2.2	●	●	●		●	●	●		●	●	●		
			150412S01225ME						1.2	1.9	●	●	●		●				●				
			150416S01225ME						1.6	3.8	●	●	●										
			150420S01225ME						2	3.5			●										
			150424S01225ME						2.4	3.1			●										
		DNGA	150604S01225ME	S01225	2	12.7	6.35	5.16	0.4	2.6	●	●	●		●						●		D13~D17
			150608S01225ME						0.8	2.2	●	●	●		●	●	●				●		
			150612S01225ME						1.2	1.9			●			●							
	Tough	DNGA	150404S01730MET	S01730	2	12.7	4.76	5.16	0.4	2.6	●	●	●		●	●					●		D13~D17 F120, F136 F138~F140
			150408S01730MET						0.8	2.2	●	●	●		●	●					●		
			150412S01730MET						1.2	1.9	●	●	●		●						●		
			150416S01730MET						1.6	3.8	●	●	●										
			150420S01730MET						2	3.5			●										
			150424S01730MET						2.4	3.1			●										
		DNGA	150604S01730MET	S01730	2	12.7	6.35	5.16	0.4	2.6	●	●	●	●	●	●							D13~D17
			150608S01730MET						0.8	1.9	●	●	●	●	●	●					●		
			150612S01730MET						1.2	1.9			●										
	Interruption	DNGA	150404S04030MEH	S04030	2	12.7	4.76	5.16	0.4	2.6	●	●	●										D13~D17 F120, F136 F138~F140
			150408S04030MEH						0.8	2.2	●	●	●										
			150412S04030MEH						1.2	1.9	●	●	●										
			150416S04030MEH						1.6	3.8			●										
			150420S04030MEH						2	3.5			●										
			150424S04030MEH						2.4	3.1			●										

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

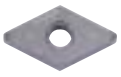
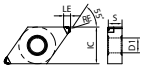
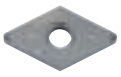
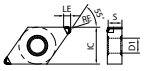
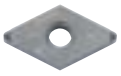
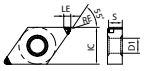
55° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
F	Sharp edge	F	Sharp edge
E	R-honed	E008	R0.08mm honed
T	Chamfered	T01215	0.12mm × 15° chamfered
S	Chamfered and R-honed	S01225	0.12mm × 25° chamfered and R-honed

Gray cast iron (with scale)		K
Gray cast iron (without scale)		
Nodular cast iron (with scale)		
Hard materials (Roughing)		H
Hard materials (Finishing)	●	
Hard materials (Chip control)	●	
Sintered steel		-

Insert		Description	Edge preparation type	No. of edges	Dimension (mm) IC	S	D1	RE	LE	CBN KBN05M	PVD	Applicable toolholder
	 Hardened steel Finishing (55HRC or more)	DNGM 150404ME-HH	E	2	12.7	4.76	5.16	0.4	2.6	●		D13~D17 F120, F136 F138~F140
		DNGM 150408ME-HH						0.8	2.2	●		
		DNGM 150412ME-HH						1.2	1.9	●		
	 Hardened steel Finishing (55HRC or less)	DNGM 150404ME-HL	E	2	12.7	4.76	5.16	0.4	2.6	●		
		DNGM 150408ME-HL						0.8	2.2	●		
		DNGM 150412ME-HL						1.2	1.9	●		
	 Removing the Carburized Layer	DNGM 150404ME-HD	S01235	2	12.7	4.76	5.16	0.4	2.6	●		
		DNGM 150408ME-HD						0.8	2.2	●		
		DNGM 150412ME-HD						1.2	1.9	●		

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

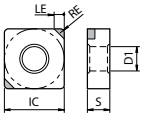
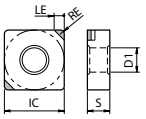
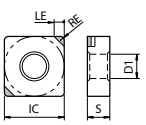
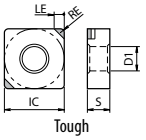
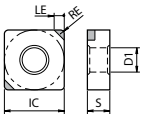
90° Square

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
F	Sharp edge	F	Sharp edge
E	R-honed	E008	R0.08mm honed
T	Chamfered	T01215	0.12mm × 15° chamfered
S	Chamfered and R-honed	S01225	0.12mm × 25° chamfered and R-honed

Gray cast iron (with scale)	K
Gray cast iron (without scale)	K
Nodular cast iron (with scale)	K
Hard materials (Roughing)	H
Hard materials (Finishing)	H
Hard materials (Chip control)	H
Sintered steel	-

Insert		Description		Edge preparation type	No. of edges	Dimension (mm) IC	S	D1	RE	LE	CBN PVD KBN010	KBN020	KBN05M	KBN25M	KBN35M	CBN - KBN475	KBN525	Applicable toolholder
	 Finishing	SNGA	120408S00545MEP 120412S00545MEP	S00545	2	12.7	4.76	5.16	0.8 1.2	1.8 2.2			● ●					D19~D21 F142
	 Sharp edge	SNGA	120408MEF 120412MEF	F	2	12.7	4.76	5.16	0.8 1.2	1.8 2.2						● ●		
		SNGA	120408T01215ME 120412T01215ME	T01215	2	12.7	4.76	5.16	0.8 1.2	1.8						● ●		
		SNGA	120404S01225ME 120408S01225ME 120412S01225ME	S01225	2	12.7	4.76	5.16	0.4 0.8 1.2	1.8	● ●	● ●	● ●	● ●		● ● ●	●	
	 Tough	SNGA	120404S01730MET 120408S01730MET 120412S01730MET	S01730	2	12.7	4.76	5.16	0.4 0.8 1.2	1.8 1.8 2.2	● ●	● ●	● ●	● ●	● ●			
	 Interruption	SNGA	120408S04030MEH 120412S04030MEH	S04030	2	12.7	4.76	5.16	0.8 1.2	1.8 2.2			● ●					

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

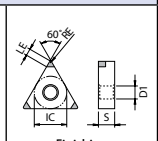
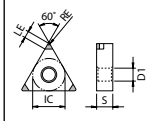
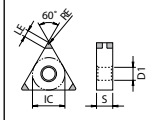
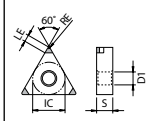
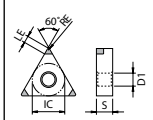
60° Triangle

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
F	Sharp edge	F	Sharp edge
E	R-honed	E008	R0.08mm honed
T	Chamfered	T01215	0.12mm × 15° chamfered
S	Chamfered and R-honed	S01225	0.12mm × 25° chamfered and R-honed

Gray cast iron (with scale)													K
Gray cast iron (without scale)							◕		●				K
Nodular cast iron (with scale)													K
Hard materials (Roughing)						✖							H
Hard materials (Finishing)	●	◕	○	◡						○	◡		H
Hard materials (Chip control)													H
Sintered steel								✖				◕	-

Insert		Description		Edge preparation type	No. of edges	Dimension (mm)					CBN									Applicable toolholder
						IC	S	D1	RE	LE	PVD							-			
											KBN010	KBN020	KBN05M	KBN10M	KBN25M	KBN35M	KBN60M	KBN70M	KBN475	KBN510	KBN525	KBN570	
	 Finishing	TNGA	160404S00545MEP 160408S00545MEP 160412S00545MEP	S00545	3	9.525	4.76	3.81	0.4 0.8 1.2	2.7 2.4 2.1			● ● ●										
	 Sharp edge	TNGA	160404MEF 160408MEF 160412MEF	F	3	9.525	4.76	3.81	0.4 0.8 1.2	2.7 2.4 2.1									● ● ●			● ●	
	 Double-sided	TNGA	160404ME6 160408ME6 160412ME6	S01225	6	9.525	4.76	3.81	0.4 0.8 1.2	2.7 2.4 2.1			● ● ●										
		TNGA	160404T01215ME 160408T01215ME 160412T01215ME	T01215	3	9.525	4.76	3.81	0.4 0.8 1.2	2.7 2.4 2.1								● ● ●	● ● ●					D22~D25 D27, D28 F122 F143 F144
		TNGA	160401S01225ME 160402S01225ME 160404S01225ME 160408S01225ME 160412S01225ME	S01225	3	9.525	4.76	3.81	0.1 0.2 0.4 0.8 1.2	2.9 2.8 2.7 2.4 2.1	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●		● ● ●	● ● ●	● ● ●		
	 Tough	TNGA	160404S01730MET 160408S01730MET 160412S01730MET	S01730	3	9.525	4.76	3.81	0.4 0.8 1.2	2.7 2.4 2.1	● ● ●	● ● ●	● ● ●		● ● ●	● ● ●					● ● ●		
	 Interruption	TNGA	160404S04030MEH 160408S04030MEH 160412S04030MEH	S04030	3	9.525	4.76	3.81	0.4 0.8 1.2	2.7 2.4 2.1	● ●	● ●	● ● ●										

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

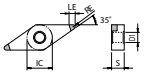
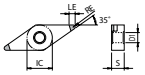
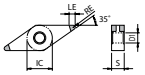
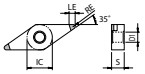
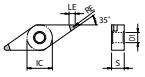
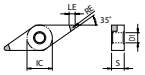
35° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
F	Sharp edge	F	Sharp edge
E	R-honed	E008	R0.08mm honed
T	Chamfered	T01215	0.12mm × 15° chamfered
S	Chamfered and R-honed	S01225	0.12mm × 25° chamfered and R-honed

Gray cast iron (with scale)													K
Gray cast iron (without scale)							●		●				
Nodular cast iron (with scale)													
Hard materials (Roughing)						✖							H
Hard materials (Finishing)	●	◕	○	◡						○	◡		
Hard materials (Chip control)													
Sintered steel								✖				◕	-

Insert		Description		Edge preparation type	No. of edges	Dimension (mm)					CBN									Applicable toolholder
						IC	S	D1	RE	LE	PVD							-			
											KBN010	KBN020	KBN05M	KBN10M	KBN25M	KBN35M	KBN60M	KBN70M	KBN475	KBN510	KBN525	KBN570	
	 Finishing	VNGA	160404S00545MEP 160408S00545MEP	S00545	2	9.525	4.76	3.81	0.4 0.8	2 1.8			● ●										D30~D39
	 Sharp edge	VNGA	160404MEF 160408MEF	F	2	9.525	4.76	3.81	0.4 0.8	2 1.8									● ●			●	
	 Double-sided	VNGA	160404ME4 160408ME4	S01225	4	9.525	4.76	3.81	0.4 0.8	2 1.8			● ●										
		VNGA	160404T01215ME 160408T01215ME	T01215	2	9.525	4.76	3.81	0.4 0.8	2 1.8								●	● ●				
		VNGA	160401S01225ME 160402S01225ME 160404S01225ME 160408S01225ME	S01225	2	9.525	4.76	3.81	0.1 0.2 0.4 0.8	2.6 2.3 2 1.8	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●		● ● ●	● ● ●	● ● ●		
	 Tough	VNGA	160404S01730MET 160408S01730MET	S01730	2	9.525	4.76	3.81	0.4 0.8	2 1.8	● ●	● ●	● ●		● ●	● ●					● ●		
	 Interruption	VNGA	160404S04030MEH 160408S04030MEH	S04030	2	9.525	4.76	3.81	0.4 0.8	2 1.8			● ●										

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

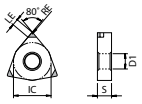
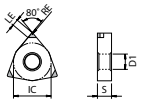
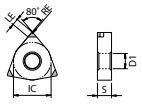
80° Trigon

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
F	Sharp edge	F	Sharp edge
E	R-honed	E008	R0.08mm honed
T	Chamfered	T01215	0.12mm × 15° chamfered
S	Chamfered and R-honed	S01225	0.12mm × 25° chamfered and R-honed

Gray cast iron (with scale)										K
Gray cast iron (without scale)							◕	●		
Nodular cast iron (with scale)										
Hard materials (Roughing)					✖				H	
Hard materials (Finishing)	●	◕	○	◔				◔		
Hard materials (Chip control)										
Sintered steel										-

Insert		Description	Edge preparation type	No. of edges	Dimension (mm)					CBN								Applicable toolholder
					IC	S	D1	RE	LE	PVD					-			
										KBN010	KBN020	KBN05M	KBN25M	KBN35M	KBN60M	KBN475	KBN525	
	 Sharp edge	WNGA 080404MEF 080408MEF	F	3	12.7	4.76	5.16	0.4 0.8	2 2.6							● ●		D43~D46 F146 F148 F149
		WNGA 080404T01215ME 080408T01215ME	T01215	3	12.7	4.76	5.16	0.4 0.8	2 2.6							● ●		
		WNGA 080404S01225ME 080408S01225ME 080412S01225ME	S01225	3	12.7	4.76	5.16	0.4 0.8 1.2	2 2.6 2.5	● ●	● ●	● ● ●	● ●	● ●	● ●	● ● ●	● ● ●	
	 Tough	WNGA 080404S01730MET 080408S01730MET 080412S01730MET	S01730	3	12.7	4.76	5.16	0.4 0.8 1.2	2 2.6 2.5	● ●	● ●		● ●	● ● ●				

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

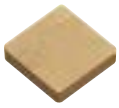
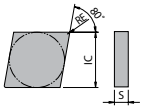
80° Rhombic / Solid

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
F	Sharp edge	F	Sharp edge
E	R-honed	E008	R0.08mm honed
T	Chamfered	T01215	0.12mm × 15° chamfered
S	Chamfered and R-honed	S01225	0.12mm × 25° chamfered and R-honed

Gray cast iron (with scale)	✖	K
Gray cast iron (without scale)	✖	
Nodular cast iron (with scale)		
Hard materials (Roughing)		H
Hard materials (Finishing)	●	
Hard materials (Chip control)		
Sintered steel		-

Insert		Description	Edge preparation type	No. of edges	Dimension (mm) IC	S	RE	CBN KBN900	PVD	Applicable toolholder
		CNMN 090308S02020 090312S02020	S02020	4	9.525	3.18	0.8 1.2	● ●		D60
		CNMN 120412S02020 120416S02020	S02020	4	12.7	4.76	1.2 1.6	● ●		D49

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

Round / Solid

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
F	Sharp edge	F	Sharp edge
E	R-honed	E008	R0.08mm honed
T	Chamfered	T01215	0.12mm × 15° chamfered
S	Chamfered and R-honed	S01225	0.12mm × 25° chamfered and R-honed

Gray cast iron (with scale)	✖	K
Gray cast iron (without scale)	✖	
Nodular cast iron (with scale)		
Hard materials (Roughing)		H
Hard materials (Finishing)	●	
Hard materials (Chip control)		
Sintered steel		-

Insert		Description	Edge preparation type	Dimension (mm) IC	Dimension (mm) S	CBN	PVD	KBN900	Applicable toolholder
		RNMN 090300S02020	S02020	9.525	3.18	●			D61
		RNMN 120300S02020	S02020	12.7	3.18	●			D61
		RNMN 120400S02020	S02020	12.7	4.76	●			D58, D61

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

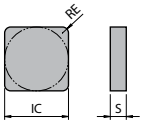
90° Square / Solid

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
F	Sharp edge	F	Sharp edge
E	R-honed	E008	R0.08mm honed
T	Chamfered	T01215	0.12mm × 15° chamfered
S	Chamfered and R-honed	S01225	0.12mm × 25° chamfered and R-honed

Gray cast iron (with scale)	✖	K
Gray cast iron (without scale)	✖	
Nodular cast iron (with scale)		
Hard materials (Roughing)		H
Hard materials (Finishing)	●	
Hard materials (Chip control)		
Sintered steel		-

Insert		Description	Edge preparation type	No. of edges	Dimension (mm) IC	S	RE	CBN KBN900	PVD	Applicable toolholder
		SNMN 090308S02020	S02020	8	9.525	3.18	0.8	●		D63, D64
		SNMN 090312S02020					1.2	●		
		SNMN 120308S02020	S02020	8	12.7	3.18	0.8	●		D63, D64
		SNMN 120312S02020					1.2	●		
		SNMN 120412S02020	S02020	8	12.7	4.76	1.2	●		D52~D54 D63, D64
		SNMN 120416S02020					1.6	●		
		SNMN 120420S02020					2	●		

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

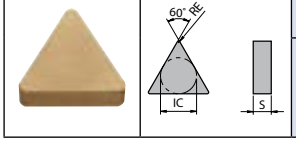
60° Triangle / Solid

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
F	Sharp edge	F	Sharp edge
E	R-honed	E008	R0.08mm honed
T	Chamfered	T01215	0.12mm × 15° chamfered
S	Chamfered and R-honed	S01225	0.12mm × 25° chamfered and R-honed

Gray cast iron (with scale)	✖	K
Gray cast iron (without scale)	✖	
Nodular cast iron (with scale)		
Hard materials (Roughing)		H
Hard materials (Finishing)	●	
Hard materials (Chip control)		
Sintered steel		-

Insert	Description	Edge preparation type	No. of edges	Dimension (mm) IC	S	RE	CBN	PVD	KBN900	Applicable toolholder
	TNMN 110308S02020	S02020	6	6.35	3.18	0.8	●			D66, F152
	TNMN 160408S02020 160412S02020	S02020	6	9.525	4.76	0.8 1.2	● ●			D56

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

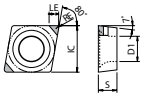
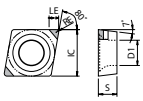
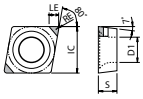
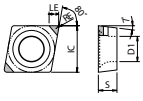
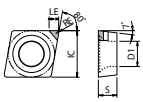
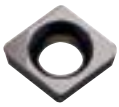
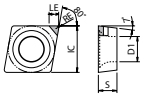
80° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
F	Sharp edge	F	Sharp edge
E	R-honed	E008	R0.08mm honed
T	Chamfered	T01215	0.12mm × 15° chamfered
S	Chamfered and R-honed	S01225	0.12mm × 25° chamfered and R-honed

Gray cast iron (with scale)	K
Gray cast iron (without scale)	K
Nodular cast iron (with scale)	K
Hard materials (Roughing)	H
Hard materials (Finishing)	H
Hard materials (Chip control)	H
Sintered steel	-

Insert		Description		Edge preparation type	No. of edges	Dimension (mm)					CBN										Applicable toolholder
											PVD							-			
						IC	S	D1	RE	LE	KBN010	KBN020	KBN05M	KBN10M	KBN25M	KBN35M	KBN60M	KBN70M	KBN475	KBN510	KBN525	KBN570	
	 Sharp edge	CCMW	09T304MEF 09T308MEF	F	2	9.525	3.97	4.4	0.4 0.8	1.9 1.8									● ●			●	E26~E28 E54 F60~F62 F124
		CCMW	060202T00815ME 060204T00815ME 060208T00815ME	T00815	2	6.35	2.38	2.8	0.2 0.4 0.8	2 1.9 1.8	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ●		● ●	● ●	● ●		E26, E28, E54 F31, F32 F60~F62, F124
		CCMW	09T302T00815ME 09T304T00815ME 09T308T00815ME	T00815	2	9.525	3.97	4.4	0.2 0.4 0.8	2 1.9 1.8	● ● ●	● ● ●	● ● ●		● ● ●	● ● ●	● ● ●	●	● ●		● ●	●	E26~E28, E54 F60~F62 F124
	 General purpose	CCMW	060204S01225MES 060208S01225MES	S01225	2	6.35	2.38	2.8	0.4 0.8	1.9 1.8	● ●	● ●	● ●										E26, E28, E54 F31, F32 F60~F62, F124
		CCMW	09T304S01225MES 09T308S01225MES	S01225	2	9.525	3.97	4.4	0.4 0.8	1.9 1.8	● ●	● ●	● ●						● ●				E26~E28, E54 F60~F62 F124
	 Tough	CCMW	09T304S01035MET 09T308S01035MET	S01035	2	9.525	3.97	4.4	0.4 0.8	1.9 1.8	● ●	● ●	● ●	● ●	● ●	● ●					●		E26~E28 E54 F60~F62 F124
		CCMW	030102T00815SE 030104T00815SE	T00815	1	3.5	1.4	1.9	0.2 0.4	1.4				● ●	● ●					● ●	● ●		F31 F32 F60 F62
		CCMW	040102T00815SE 040104T00815SE	T00815	1	4.3	1.8	2.3	0.2 0.4	1.4				● ●	● ●					● ●	● ●		
		CCMW	060202T00815SE 060204T00815SE	T00815	1	6.35	2.38	2.8	0.2 0.4	2 1.9					● ●					● ●	● ●		E26, E28, E54 F31, F32 F60~F62, F124
		CCMW	09T302T00815SE 09T304T00815SE	T00815	1	9.525	3.97	4.4	0.2 0.4	2 1.9										● ●	● ●		E26~E28, E54 F60~F62 F124
	 Tough	CCMW	030102S01035SET 030104S01035SET	S01035	1	3.5	1.4	1.9	0.2 0.4	1.4				● ●	● ●						●	F31 F32 F60 F62
		CCMW	040102S01035SET 040104S01035SET	S01035	1	4.3	1.8	2.3	0.2 0.4	1.4				● ●	● ●						●	
		CCMW	060204S01035SET	S01035	1	6.35	2.38	2.8	0.4	1.9											●	E26, E28, E54 F31, F32 F60~F62, F124
		CCMW	09T304S01035SET	S01035	1	9.525	3.97	4.4	0.4	1.9											●	E26~E28, E54 F60~F62 F124

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

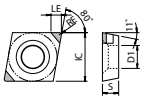
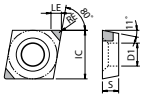
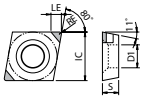
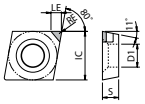
80° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
F	Sharp edge	F	Sharp edge
E	R-honed	E008	R0.08mm honed
T	Chamfered	T01215	0.12mm × 15° chamfered
S	Chamfered and R-honed	S01225	0.12mm × 25° chamfered and R-honed

Gray cast iron (with scale)												K
Gray cast iron (without scale)								◕	●			
Nodular cast iron (with scale)												
Hard materials (Roughing)						✖						H
Hard materials (Finishing)	●	◕	○		◡					○	◡	
Hard materials (Chip control)												
Sintered steel												-

Insert		Description		Edge preparation type	No. of edges	Dimension (mm)					CBN									Applicable toolholder
											PVD						-			
						IC	S	D1	RE	LE	KBN010	KBN020	KBN05M	KBN10M	KBN25M	KBN35M	KBN60M	KBN475	KBN510	KBN525	
		CPGB	080204T00815ME	T00815	2	7.94	2.38	3.5	0.4	1.9	●	●	●		●			●		●	F64 F65
		CPGB	090302T00815ME 090304T00815ME 090308T00815ME	T00815	2	9.525	3.18	4.5	0.2 0.4 0.8	1.9 1.9 2.5	● ●	● ●	● ●		● ●		● ●	● ●	●	● ●	
	 General purpose	CPGB	090304S01225MES 090308S01225MES	S01225	2	9.525	3.18	4.5	0.4 0.8	1.9 2.5	● ●	● ●	● ●								
	 Tough	CPGB	080204S01035MET 080208S01035MET	S01035	2	7.94	2.38	3.5	0.4 0.8	1.9 2.2	● ●	● ●			● ●					●	
		CPGB	090304S01035MET 090308S01035MET	S01035	2	9.525	3.18	4.5	0.4 0.8	1.9 2.5	● ●	● ●	● ●	●	● ●	● ●				●	
		CPGB	080202T00815SE 080204T00815SE	T00815	1	7.94	2.38	3.5	0.2 0.4	1.9								● ●	● ●	● ●	
		CPGB	090302T00815SE 090304T00815SE	T00815	1	9.525	3.18	4.5	0.2 0.4	1.9								● ●	● ●	● ●	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

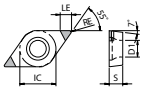
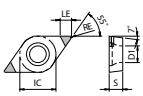
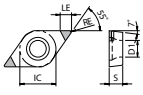
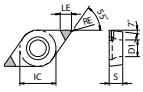
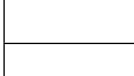
55° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
F	Sharp edge	F	Sharp edge
E	R-honed	E008	R0.08mm honed
T	Chamfered	T01215	0.12mm × 15° chamfered
S	Chamfered and R-honed	S01225	0.12mm × 25° chamfered and R-honed

Gray cast iron (with scale)														K
Gray cast iron (without scale)							●		●					
Nodular cast iron (with scale)														
Hard materials (Roughing)						✖								H
Hard materials (Finishing)	●	●	○		◡						○	◡		
Hard materials (Chip control)														
Sintered steel								✖					●	-

Insert		Description		Edge preparation type	No. of edges	Dimension (mm)					CBN									Applicable toolholder
											PVD							-			
						IC	S	D1	RE	LE	KBN010	KBN020	KBN05M	KBN10M	KBN25M	KBN35M	KBN60M	KBN70M	KBN475	KBN510	KBN525	KBN570	
	 Sharp edge	DCMW	11T304MEF 11T308MEF	F	2	9.525	3.97	4.4	0.4 0.8	1.7 1.9									● ●			● ●	E23, E29~E32, E34 E35, E55, E56 F66~F68 F70~F72 F74~F76, F125
		DCMW	070202T00815ME 070204T00815ME 070208T00815ME	T00815	2	6.35	2.38	2.8	0.2 0.4 0.8	1.9 1.7 1.9	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●		● ●	● ●	● ● ●		E29, E31, E34 E35, E55, E56 F66~F68 F70~F72 F74~F76, F125
		DCMW	11T302T00815ME 11T304T00815ME 11T308T00815ME 11T312T00815ME	T00815	2	9.525	3.97	4.4	0.2 0.4 0.8 1.2	1.9 1.7 1.9 1.9	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ●	● ● ●	● ● ●	● ● ●		E23, E29~E32, E34 E35, E55, E56 F66~F68 F70~F72 F74~F76, F125
	 General purpose	DCMW	11T302S01225MES 11T304S01225MES 11T308S01225MES	S01225	2	9.525	3.97	4.4	0.2 0.4 0.8	1.9 1.7 1.9	● ● ●	● ● ●	● ● ●						● ●				E23, E29~E32, E34 E35, E55, E56 F66~F68 F70~F72 F74~F76, F125
	 Tough	DCMW	070202S01035MET 070204S01035MET 070208S01035MET	S01035	2	6.35	2.38	2.8	0.2 0.4 0.8	1.9 1.7 1.9	● ● ●	● ● ●			● ● ●	● ● ●							E29, E31, E34 E35, E55, E56 F66~F68 F70~F72 F74~F76, F125
		DCMW	11T302S01035MET 11T304S01035MET 11T308S01035MET 11T312S01035MET	S01035	2	9.525	3.97	4.4	0.2 0.4 0.8 1.2	1.9 1.7 1.9 1.9	● ● ● ●	● ● ● ●	● ● ●	● ● ● ●	● ● ● ●	● ● ● ●					● ● ●		E23, E29~E32, E34 E35, E55, E56 F66~F68 F70~F72 F74~F76, F125
		DCMW	070202T00815SE 070204T00815SE	T00815	1	6.35	2.38	2.8	0.2 0.4	1.9 1.7					● ●				● ●	● ●		E29, E31, E34 E35, E55, E56 F66~F68 F70~F72 F74~F76, F125
		DCMW	11T302T00815SE 11T304T00815SE	T00815	1	9.525	3.97	4.4	0.2 0.4	1.9 1.7									● ●	● ●	● ●		E23, E29~E32, E34 E35, E55, E56 F66~F68 F70~F72 F74~F76, F125
	Tough	DCMW	070204S01035SET	S01035	1	6.35	2.38	2.8	0.4	1.7											●		E29, E31, E34 E35, E55, E56 F66~F68 F70~F72 F74~F76, F125
		DCMW	11T302S01035SET 11T304S01035SET	S01035	1	9.525	3.97	4.4	0.2 0.4	1.9 1.7											● ●		E23, E29~E32, E34 E35, E55, E56 F66~F68 F70~F72 F74~F76, F125

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

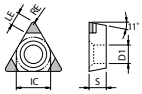
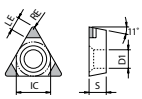
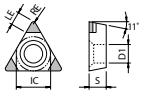
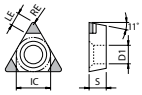
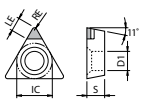
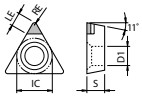
60° Triangle

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
F	Sharp edge	F	Sharp edge
E	R-honed	E008	R0.08mm honed
T	Chamfered	T01215	0.12mm × 15° chamfered
S	Chamfered and R-honed	S01225	0.12mm × 25° chamfered and R-honed

Gray cast iron (with scale)	K
Gray cast iron (without scale)	K
Nodular cast iron (with scale)	K
Hard materials (Roughing)	H
Hard materials (Finishing)	H
Hard materials (Chip control)	H
Sintered steel	-

Insert		Description		Edge preparation type	No. of edges	Dimension (mm)					CBN									Applicable toolholder
											PVD						-			
						IC	S	D1	RE	LE	KBN010	KBN020	KBN05M	KBN10M	KBN25M	KBN35M	KBN60M	KBN475	KBN510	KBN525	KBN570	
	 Sharp edge	TPGB	110304MEF 110308MEF	F	3	6.35	3.18	3.3	0.4 0.8	2.1 1.8								● ●			● ●	E39 F80~F82 F84, F85
		TPGB	110302T00815ME 110304T00815ME 110308T00815ME	T00815	3	6.35	3.18	3.3	0.2 0.4 0.8	2.3 2.1 1.8	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	E39 F80~F82 F84, F85
		TPGB	160304T00815ME 160308T00815ME	T00815	3	9.525	3.18	4.5	0.4 0.8	1.8 1.5			● ●		● ●		● ●	● ●				F80~F82 F84
	 General purpose	TPGB	110304S01225MES 110308S01225MES	S01225	3	6.35	3.18	3.3	0.4 0.8	2.1 1.8	● ●	● ●	● ●					● ●				E39 F80~F82 F84, F85
	 Tough	TPGB	110302S01035MET 110304S01035MET 110308S01035MET	S01035	3	6.35	3.18	3.3	0.2 0.4 0.8	2.3 2.1 1.8	● ● ●	● ● ●		● ● ●	● ● ●	● ●						E39 F80~F82 F84, F85
		TPGB	160304S01035MET 160308S01035MET	S01035	3	9.525	3.18	4.5	0.4 0.8	1.8 1.5	● ●	● ●			● ●					● ●		F80~F82 F84
		TPGB	080202T00815SE 080204T00815SE	T00815	1	4.76	2.38	2.5	0.2 0.4	1.8 1.6					● ●				● ●	● ●		E39 F80~F82, F86
		TPGB	090202T00815SE 090204T00815SE	T00815	1	5.56	2.38	3	0.2 0.4	1.8 1.6					● ●	● ●			● ●	● ●		F33, F34 F80~F82, F86
		TPGB	110302T00815SE 110304T00815SE 110308T00815SE	T00815	1	6.35	3.18	3.3	0.2 0.4 0.8	1.9 1.8 1.5					● ●				● ●	● ● ●		E39 F80~F82 F84, F85
		TPGB	160302T00815SE 160304T00815SE	T00815	1	9.525	3.18	4.5	0.2 0.4	1.9 1.8									● ●	● ●		F80~F82 F84
	 Tough	TPGB	080202S01035SET 080204S01035SET	S01035	1	4.76	2.38	2.5	0.2 0.4	1.8 1.6					● ●					● ●		E39 F80~F82, F86
		TPGB	090202S01035SET 090204S01035SET	S01035	1	5.56	2.38	3	0.2 0.4	1.8 1.6					● ●					● ●		F33, F34 F80~F82, F86
		TPGB	110304S01035SET 110308S01035SET	S01035	1	6.35	3.18	3.3	0.4 0.8	1.8 1.5										● ●		E39, F80~F82 F84, F85
		TPGB	160304S01035SET	S01035	1	9.525	3.18	4.5	0.4	1.8										●		F80~F82 F84

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

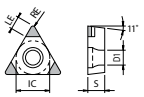
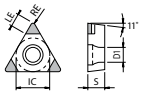
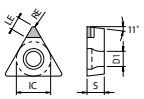
60° Triangle

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
F	Sharp edge	F	Sharp edge
E	R-honed	E008	R0.08mm honed
T	Chamfered	T01215	0.12mm × 15° chamfered
S	Chamfered and R-honed	S01225	0.12mm × 25° chamfered and R-honed

Gray cast iron (with scale)							K
Gray cast iron (without scale)							
Nodular cast iron (with scale)							
Hard materials (Roughing)							H
Hard materials (Finishing)	●	●		○	○		
Hard materials (Chip control)							
Sintered steel							-

Insert		Description		Edge preparation type	No. of edges	Dimension (mm)					CBN					Applicable toolholder
						IC	S	D1	RE	LE	PVD				-	
											KBN010	KBN020	KBN10M	KBN25M	KBN525	
		TPGW	160404T00815ME 160408T00815ME	T00815	3	9.525	4.76	4.4	0.4 0.8	1.8 1.5			● ●	●		-
	 Tough	TPGW	160404S01035MET 160408S01035MET	S01035	3	9.525	4.76	4.4	0.4 0.8	1.8 1.5	● ●	● ●		● ●		
		TPGW	160404T00815SE	T00815	1	9.525	4.76	4.4	0.4	1.8					●	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

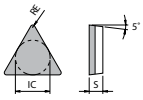
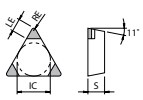
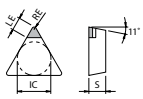
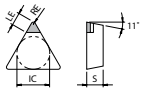
60° Triangle

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
F	Sharp edge	F	Sharp edge
E	R-honed	E008	R0.08mm honed
T	Chamfered	T01215	0.12mm × 15° chamfered
S	Chamfered and R-honed	S01225	0.12mm × 25° chamfered and R-honed

Gray cast iron (with scale)				K
Gray cast iron (without scale)				
Nodular cast iron (with scale)				
Hard materials (Roughing)				H
Hard materials (Finishing)		○	◔	
Hard materials (Chip control)				
Sintered steel				-

Insert	Description		Edge preparation type	No. of edges	Dimension (mm) IC	S	RE	LE	CBN PVD KBN10M	CBN - KBN510	CBN - KBN525	Applicable toolholder
  CBN surface type	TBGN	060102T00815	T00815	3	3.97	1.59	0.2	-			●	-
		060104T00815					0.4			●	●	
		060108T00815					0.8		●	●		
 	TPGN	110304T00815ME	T00815	3	6.35	3.18	0.4	2.5			●	F113
 	TPGN	110304T00815SE	T00815	1	6.35	3.18	0.4	2.5			●	
	TPGN	160302T00815SE	T00815	1	9.525	3.18	0.2	2.6			●	
		160304T00815SE					0.4	2.4		●	●	
		160308T00815SE					0.8	2.1			●	
  Tough	TPGN	110304S01035SET	S01035	1	6.35	3.18	0.4	2.5			●	
	TPGN	160304S01035SET	S01035	1	9.525	3.18	0.4	2.4			●	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

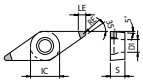
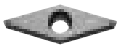
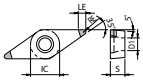
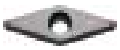
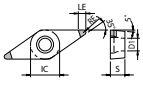
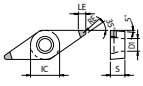
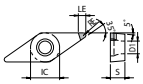
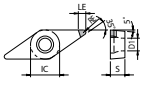
35° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
F	Sharp edge	F	Sharp edge
E	R-honed	E008	R0.08mm honed
T	Chamfered	T01215	0.12mm × 15° chamfered
S	Chamfered and R-honed	S01225	0.12mm × 25° chamfered and R-honed

Gray cast iron (with scale)															K
Gray cast iron (without scale)							◕		●						
Nodular cast iron (with scale)															
Hard materials (Roughing)						✖									H
Hard materials (Finishing)	●	◕	○		◡							○	◡		
Hard materials (Chip control)															
Sintered steel								✖						◕	-

Insert		Description		Edge preparation type	No. of edges	Dimension (mm)					CBN										Applicable toolholder
											PVD							-			
						IC	S	D1	RE	LE	KBN010	KBN020	KBN05M	KBN10M	KBN25M	KBN35M	KBN60M	KBN70M	KBN475	KBN510	KBN525	KBN570	
	 Sharp edge	VBGW	110304MEF 110308MEF	F	2	6.35	3.18	2.8	0.4 0.8	2 1.7									● ●			● ●	E40~E43, E58 F90, F91 F94~F99
		VBGW	160404MEF 160408MEF	F	2	9.525	4.76	4.4	0.4 0.8	2 1.7									● ●			●	E41~E43 F90, F91 F94~F99
		VBGW	110302T00815ME 110304T00815ME 110308T00815ME	T00815	2	6.35	3.18	2.8	0.2 0.4 0.8	2.4 2 1.7	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●			●	● ● ●	● ● ●	● ● ●		E40~E43, E58 F90, F91 F94~F99
		VBGW	160402T00815ME 160404T00815ME 160408T00815ME	T00815	2	9.525	4.76	4.4	0.2 0.4 0.8	2.4 2 1.7	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ●	●		● ● ●	● ● ●		E41~E43 F90, F91 F94~F99
	 General purpose	VBGW	110304S01225MES 110308S01225MES	S01225	2	6.35	3.18	2.8	0.4 0.8	2 1.7	● ●	● ●	● ●						● ●				E40~E43, E58 F90, F91 F94~F99
		VBGW	160404S01225MES 160408S01225MES	S01225	2	9.525	4.76	4.4	0.4 0.8	2 1.7	● ●	● ●	● ●						● ●				E41~E43 F90, F91 F94~F99
	 Tough	VBGW	110302S01035MET 110304S01035MET 110308S01035MET	S01035	2	6.35	3.18	2.8	0.2 0.4 0.8	2.4 2 1.7	● ● ●	● ● ●		● ● ●	● ● ●	● ●						●	E40~E43, E58 F90, F91 F94~F99
		VBGW	160402S01035MET 160404S01035MET 160408S01035MET	S01035	2	9.525	4.76	4.4	0.2 0.4 0.8	2.4 2 1.7	● ● ●	● ● ●	● ●	● ● ●	● ● ●	● ●						●	E41~E43 F90, F91 F94~F99
		VBGW	110302T00815SE 110304T00815SE	T00815	1	6.35	3.18	2.8	0.2 0.4	2.8 2.4				● ●	● ●					● ●	● ●	E40~E43, E58 F90, F91 F94~F99
		VBGW	160402T00815SE 160404T00815SE 160408T00815SE	T00815	1	9.525	4.76	4.4	0.2 0.4 0.8	2.4 2 1.7				●					● ●	● ●	● ●	E41~E43 F90, F91 F94~F99
	 Tough	VBGW	110304S01035SET 110308S01035SET	S01035	1	6.35	3.18	2.8	0.4 0.8	2 1.7					●						●	E40~E43, E58 F90, F91 F94~F99
		VBGW	160404S01035SET 160408S01035SET	S01035	1	9.525	4.76	4.4	0.4 0.8	2 1.7											● ●	E41~E43 F90, F91 F94~F99

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

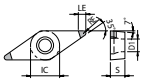
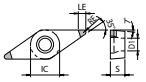
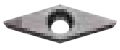
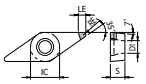
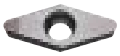
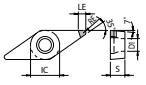
35° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
F	Sharp edge	F	Sharp edge
E	R-honed	E008	R0.08mm honed
T	Chamfered	T01215	0.12mm × 15° chamfered
S	Chamfered and R-honed	S01225	0.12mm × 25° chamfered and R-honed

Gray cast iron (with scale)	K
Gray cast iron (without scale)	K
Nodular cast iron (with scale)	K
Hard materials (Roughing)	H
Hard materials (Finishing)	H
Hard materials (Chip control)	H
Sintered steel	-

Insert		Description		Edge preparation type	No. of edges	Dimension (mm)					CBN								Applicable toolholder
						IC	S	D1	RE	LE	PVD					-			
											KBN010	KBN020	KBN05M	KBN10M	KBN25M	KBN60M	KBN475	KBN510	KBN525	
		VCGW	080202T00815ME 080204T00815ME 080208T00815ME	T00815	2	4.76	2.38	2.3	0.2 0.4 0.8	2 2 1.7	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ●	● ● ●	● ● ●	● ● ●	E59 F90, F91 F94~F99
	 Tough	VCGW	080202S01035MET 080204S01035MET 080208S01035MET	S01035	2	4.76	2.38	2.3	0.2 0.4 0.8	2 2 1.7	● ● ●	● ● ●		● ● ●						
		VCGW	080202T00815SE 080204T00815SE	T00815	1	4.76	2.38	2.3	0.2 0.4	2.4 2				● ●			● ●	● ●	● ●	
	 Tough	VCGW	080204S01035SET 080208S01035SET	S01035	1	4.76	2.38	2.3	0.4 0.8	2 1.8								● ●		

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

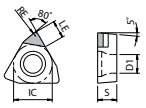
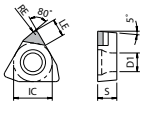
80° Trigon

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
F	Sharp edge	F	Sharp edge
E	R-honed	E008	R0.08mm honed
T	Chamfered	T01215	0.12mm × 15° chamfered
S	Chamfered and R-honed	S01225	0.12mm × 25° chamfered and R-honed

Gray cast iron (with scale)					K
Gray cast iron (without scale)					
Nodular cast iron (with scale)					
Hard materials (Roughing)					H
Hard materials (Finishing)	○	●	○	◔	
Hard materials (Chip control)					
Sintered steel					-

Insert		Description	Edge preparation type	No. of edges	Dimension (mm) IC	S	D1	RE	LE	CBN PVD KBN10M	CBN PVD KBN25M	CBN - KBN510	CBN - KBN525	Applicable toolholder
		WBGW 060102T00815L-SE 060104T00815L-SE	T00815	1	3.97	1.59	2.3	0.2 0.4	1.9	● ●	● ●	● ●	● ●	F36 F100~F102
		WBGW 080202T00815L-SE 080204T00815L-SE	T00815	1	4.76	2.38	2.3	0.2 0.4	2.3	● ●	● ●	 ●	● ●	
	 Tough	WBGW 060102S01035LSET 060104S01035LSET	S01035	1	3.97	1.59	2.3	0.2 0.4	1.9	 ●	 ●	 	 ●	
		WBGW 080202S01035LSET 080204S01035LSET	S01035	1	4.76	2.38	2.3	0.2 0.4	2.3	 ●	 ●	 	 ●	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

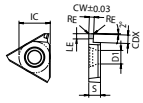
GBA

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
F	Sharp edge	F	Sharp edge
E	R-honed	E008	R0.08mm honed
T	Chamfered	T01215	0.12mm × 15° chamfered
S	Chamfered and R-honed	S01225	0.12mm × 25° chamfered and R-honed

Gray cast iron (with scale)			K
Gray cast iron (without scale)			
Nodular cast iron (with scale)			
Hard materials (Roughing)			H
Hard materials (Finishing)	○	●	
Hard materials (Chip control)			
Sintered steel			-

Insert		Description	Edge preparation type	No. of edges	Dimension (mm) CW	CDX	IC	S	D1	RE	LE	Tolerance (mm) CW min.	CW max.	CBN - KBN510	CBN - KBN525	Applicable toolholder
	 External / Internal Grooving	GBA43R 125-020	E008	1	1.25	2	12.7	4.76	5.5	0.2	1.9	- 0.03	+0.03	●	●	G13~G17 G89
		GBA43R 150-020			1.5	3.5								●	●	
		GBA43R 200-020			2	3.5								●	●	
		GBA43R 250-020			2.5	4								●	●	
		GBA43R 300-020			3	4								●	●	
		GBA43L 125-020			1.25	2						- 0.03	+0.03		●	
		GBA43L 150-020			1.5	3.5								●	●	
		GBA43L 200-020			2	3.5								●	●	
		GBA43L 250-020			2.5	4									●	
		GBA43L 300-020			3	4									●	

Right-hand shown
CDX shows available grooving depth.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

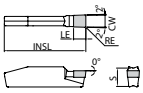
GDGS

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
F	Sharp edge	F	Sharp edge
E	R-honed	E008	R0.08mm honed
T	Chamfered	T01215	0.12mm × 15° chamfered
S	Chamfered and R-honed	S01225	0.12mm × 25° chamfered and R-honed

Gray cast iron (with scale)			K
Gray cast iron (without scale)			
Nodular cast iron (with scale)			
Hard materials (Roughing)			H
Hard materials (Finishing)	●		
Hard materials (Chip control)			
Sintered steel		●	-

Insert		Description	Edge preparation type	No. of edges	Dimension (mm)					Tolerance (mm)		CBN		Applicable toolholder
					CW	S	RE	INSL	LE	CW min.	CW max.	PVD KBN05M	- KBN570	
	 External Grooving	GDGS 2020N-020NB	E008	1	2	4.3	0.2	20	2.9	- 0.03	+ 0.03	●		G34~G43
			E002										●	
		GDGS 3020N-040NB	E008	1	3	4.3	0.4	20	2.9	- 0.03	+ 0.03	●		
			E002										●	
		GDGS 4020N-040NB	E008	1	4	4.3	0.4	20	2.9	- 0.03	+ 0.03	●		
			E002										●	
		GDGS 5020N-040NB	E008	1	5	4.3	0.4	20	2.9	- 0.03	+ 0.03	●		G34 G40~G43
			E002										●	
		GDGS 6020N-040NB	E008	1	6	4.3	0.4	20	2.9	- 0.03	+ 0.03	●		

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

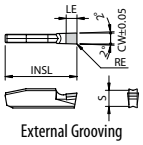
GMN

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
F	Sharp edge	F	Sharp edge
E	R-honed	E008	R0.08mm honed
T	Chamfered	T01215	0.12mm × 15° chamfered
S	Chamfered and R-honed	S01225	0.12mm × 25° chamfered and R-honed

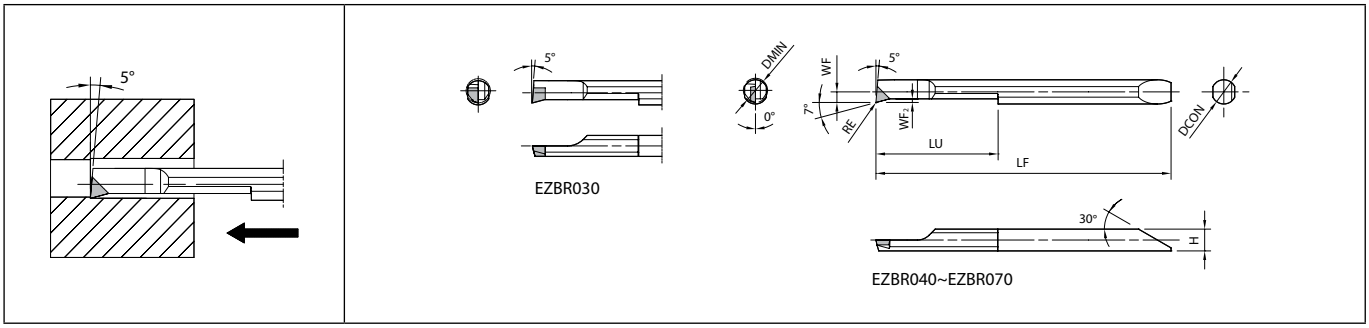
Gray cast iron (with scale)			K
Gray cast iron (without scale)			
Nodular cast iron (with scale)			
Hard materials (Roughing)			H
Hard materials (Finishing)	○	●	
Hard materials (Chip control)			
Sintered steel			-

Insert		Description	Edge preparation type	No. of edges	Dimension (mm)					Tolerance (mm)		CBN		Applicable toolholder
					CW	S	RE	INSL	LE	CW min.	CW max.	- KBN510	KBN525	
	 External Grooving	GMN 2	E008	1	2	4.3	0.2	20	2.9	- 0.05	+ 0.05	●	●	G55 G57
		GMN 3	E008	1	3	4.3	0.4	20	2.9	- 0.05	+ 0.05	●	●	G55~G58
		GMN 4	E008	1	4	4.3	0.4	20	2.9	- 0.05	+ 0.05	●	●	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

EZB-NB (Boring)



Right-hand shown

Dimensions

How to read pages of "Turning inserts" See page B15

Cutting edge preparation

Symbol	Specification	Example	
F	Sharp edge	F	Sharp edge
E	R-honed	E008	R0.08mm honed
T	Chamfered	T01215	0.12mm × 15° chamfered
S	Chamfered and R-honed	S01225	0.12mm × 25° chamfered and R-honed

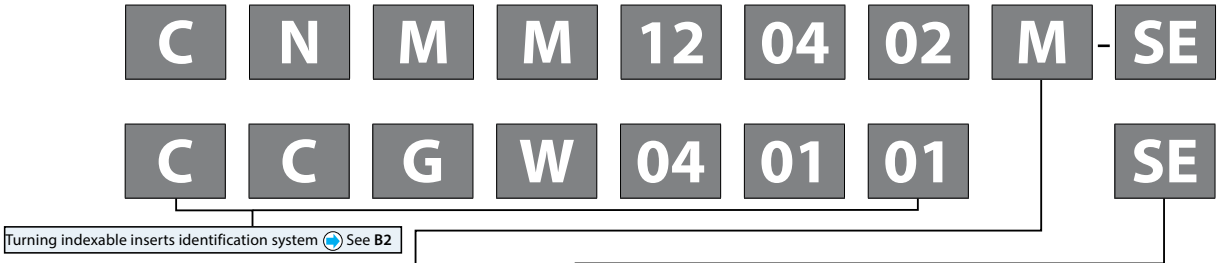
Gray cast iron (with scale)		K
Gray cast iron (without scale)		
Nodular cast iron (with scale)		
Hard materials (Roughing)		H
Hard materials (Finishing)	●	
Hard materials (Chip control)		
Sintered steel		-

Description		Edge preparation type	No. of edges	Dimension (mm)								Tolerance (mm)		CBN	PVD	KBN05M	Applicable sleeve F38~F43
				DMIN	DCON	H	LF	LU	WF	WF_2	RE	RE min.	RE max.				
EZBR	030030-003NB	T00815	1	3	3	2.6	38.8	13	1.25	0.3	0.035	-0.015	+0.015	●			EZH030...
EZBR	040040-003NB	T00815	1	4	4	3.6	48.8	20	1.75	0.5	0.035	-0.015	+0.015	●			EZH040...
EZBR	050050-003NB	T00815	1	5	5	4.6	58.1	25	2.25	0.5	0.035	-0.015	+0.015	●			EZH050...
EZBR	060060-003NB	T00815	1	6	6	5.6	66.1	30	2.75	0.5	0.035	-0.015	+0.015	●			EZH060...
EZBR	070070-003NB	T00815	1	7	7	6.6	74.1	35	3.25	0.5	0.035	-0.015	+0.015	●			EZH070...

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

Identification system (Turning insert / PCD)

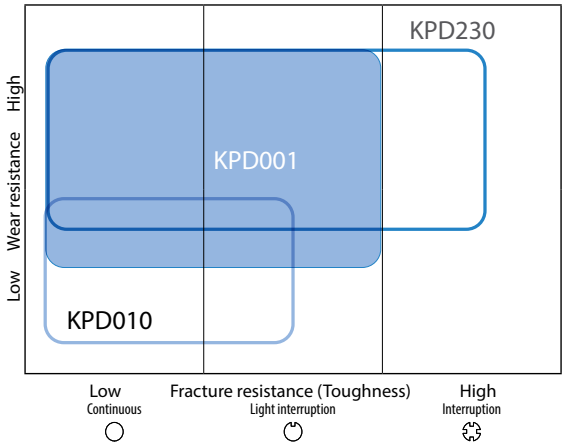


Insert type	Description	Manufacture´s option 1	Manufacture´s option 2	Series name	Edge length	Number of edges	Re-grinding
Negative	CNMM120402M-SE	M (Indicates the tool is for negative inserts/toolholders)	SE	Small edge	Short (Small edge)	1	Not recommended
	CNMM120402M-NE		NE	New value edge	Long (85% length compared with no Indication`s cutting edge)	1	Possible
	CNMM120402M		Without indication	-	Long	1	
Positive	CCGW040101SE	-	SE	Small edge	Short (Small edge)	1	Not recommended
	CCGW040101NE		NE	New value edge	Long (85% length compared with no Indication`s cutting edge)	1	Possible
	CCGW040101		Without indication	-	Long	1	

• No edge preparation symbols for PCD inserts. Most of the PCD inserts' edge prep. are sharp edge.
• "M" in manufacturer's option 1 indicates the inserts are applicable to negative toolholders.

About re-grinding:
• Re-grinding is possible with the inserts with "NE" and no symbol in manufacturer's option 2.
• Re-grinding can not be available depending on the edge condition.
• Re-grinding is not recommended for inserts with "SE" in manufacturer's option 2.

Application map



Grades	Applications	Features
KPD001 Average grain size under 0.5 µm	• High speed machining of non-ferrous metals and brass • High speed machining of plastics • Machining of carbide	• The world highest level micro-grain diamond • High edge strength, and superior to wear resistance, fracture resistance and edge sharpening performance
KPD010 Average grain size 10 µm	• High speed machining of non-ferrous metals and brass • High speed machining of plastics • Machining of carbide	• Good balance of wear resistance and flexural strength • General purpose
KPD230 Mixture of fine grain with average grain size 2~30 µm and coarse grain	• High speed machining of non-ferrous metals and brass • High speed machining of plastics	• High density PCD with mixture of coarse and fine grains features excellent abrasive wear resistance and fracture resistance
KPD250 Average grain size 25 µm Made to order	• High speed machining of high silicon aluminium alloy • Machining of carbide	• Coarse grain PCD Ave. grain size 25 µm • Superior to wear resistance

Recommended cutting conditions

Workpiece material	Insert grades		Cutting conditions				Remarks
	KPD001	KPD010	Vc (m/min)	ap (mm) Small edge and positive inserts	ap (mm) Negative inserts	f (mm/rev)	
Aluminum alloys Zinc alloys	●	○	300 ~ 1,500	~1.0	~2.0	0.03 ~ 0.5	Both: Dry and coolant
Copper, Brass, Bronze	●	○	300 ~ 1,000	~1.0	~2.0	0.03 ~ 0.5	
Magnesium alloys	●	○	400 ~ 1,200	~1.0	~2.0	0.03 ~ 0.5	
Carbide	●	○	10 ~ 30	~0.3	~0.3	0.03 ~ 0.1	
Titanium alloys	●	○	100 ~ 200	~1.0	~2.0	0.05 ~ 0.2	Coolant
Glass fiber reinforced plastics Carbon fiber	●	○	100 ~ 600	~1.0	~2.0	0.05 ~ 0.5	Dry
Silica filling plastic Particle board	●	○	400 ~ 800	~1.0	~2.0	0.05 ~ 0.5	

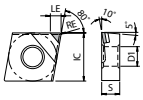
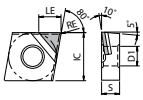
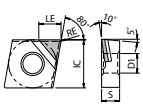
●: 1st Recommendation ○: 2nd Recommendation

80° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation		
PCD all items	F	Sharp edge

Non-ferrous metals (with interruption)	◕	N
Non-ferrous metals (without interruption)	●	
Titanium alloys (with interruption)	◕	S
Titanium alloys (without interruption)	●	

Insert		Description	Edge preparation type	No. of edges	Dimension (mm) IC	S	D1	RE	LE	PCD - KPD001	PCD - KPD010	Applicable toolholder
	 Small Edge	CNMM 120402M-SE CNMM 120404M-SE CNMM 120408M-SE	F	1	12.7	4.76	5.16	0.2 0.4 0.8	2.8 2.8 2.7	● ● ●	● ● ●	D8~D10 F118 F131 F132
	 New Value Edge	CNMM 120402M-NE CNMM 120404M-NE CNMM 120408M-NE	F	1	12.7	4.76	5.16	0.2 0.4 0.8	5.1 5 4.9	● ● ●		
		CNMM 120402M CNMM 120404M CNMM 120408M CNMM 120412M	F	1	12.7	4.76	5.16	0.2 0.4 0.8 1.2	5.8 5.8 5.7 5.6	● ● ● ●	● ● ● ●	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

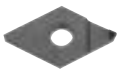
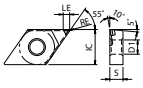
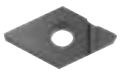
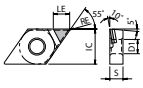
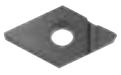
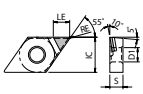
CBN & PCD Inserts are sold in 1 piece boxes

55° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation		
PCD all items	F	Sharp edge

Non-ferrous metals (with interruption)	●	N
Non-ferrous metals (without interruption)	●	
Titanium alloys (with interruption)	●	S
Titanium alloys (without interruption)	●	

Insert		Description	Edge preparation type	No. of edges	Dimension (mm) IC	S	D1	RE	LE	PCD - KPD001	PCD - KPD010	Applicable toolholder
	 Small Edge	DNMM 150402M-SE	F	1	12.7	4.76	5.16	0.2	2.8	●	●	D13~D17 F120, F136 F138~F140
		DNMM 150404M-SE						0.4	2.6	●	●	
		DNMM 150408M-SE						0.8	2.2	●	●	
	 New Value Edge	DNMM 150402M-NE	F	1	12.7	4.76	5.16	0.2	5.2	●		
		DNMM 150404M-NE						0.4	5	●		
		DNMM 150408M-NE						0.8	4.6	●		
		DNMM 150402M	F	1	12.7	4.76	5.16	0.2	5.9	●	●	
		DNMM 150404M						0.4	5.8	●	●	
		DNMM 150408M						0.8	5.4	●	●	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

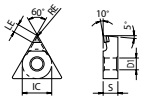
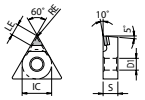
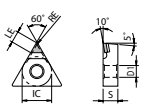
CBN & PCD Inserts are sold in 1 piece boxes

60° Triangle

How to read pages of "Turning inserts" See page B15

Cutting edge preparation		
PCD all items	F	Sharp edge

Non-ferrous metals (with interruption)	◕	N
Non-ferrous metals (without interruption)	●	
Titanium alloys (with interruption)	◕	S
Titanium alloys (without interruption)	●	

Insert		Description	Edge preparation type	No. of edges	Dimension (mm) IC	S	D1	RE	LE	PCD - KPD001	PCD - KPD010	Applicable toolholder
	 Small Edge	TNMM 160402M-SE 160404M-SE 160408M-SE	F	1	9.525	4.76	3.81	0.2 0.4 0.8	2.7 2.6 2.3	● ● ●	● ● ●	D22~D25 D27, D28 F122 F143 F144
	 New Value Edge	TNMM 160402M-NE 160404M-NE 160408M-NE	F	1	9.525	4.76	3.81	0.2 0.4 0.8	3.2 3.1 2.8	● ● ●		
		TNMM 160402M 160404M 160408M 160412M	F	1	9.525	4.76	3.81	0.2 0.4 0.8 1.2	3.8 3.6 3.3 3	● ● ● 	● ● ● ●	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

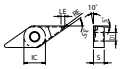
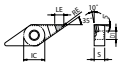
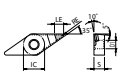
CBN & PCD Inserts are sold in 1 piece boxes

35° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation		
PCD all items	F	Sharp edge

Non-ferrous metals (with interruption)	◕	N
Non-ferrous metals (without interruption)	●	
Titanium alloys (with interruption)	◕	S
Titanium alloys (without interruption)	●	

Insert		Description	Edge preparation type	No. of edges	Dimension (mm) IC	S	D1	RE	LE	PCD KPD001	PCD KPD010	Applicable toolholder
	 Small Edge	VNMM 160402M-SE 160404M-SE 160408M-SE	F	1	9.525	4.76	3.81	0.2 0.4 0.8	2.9 2.5 1.6	● ● ●	● ● ●	D30~D39
	 New Value Edge	VNMM 160402M-NE 160404M-NE 160408M-NE	F	1	9.525	4.76	3.81	0.2 0.4 0.8	4.7 4.2 3.4	● ● ●		
		VNMM 160402M 160404M 160408M	F	1	9.525	4.76	3.81	0.2 0.4 0.8	5.3 4.8 4	● ● ●	● ● 	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

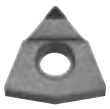
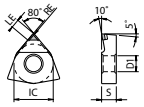
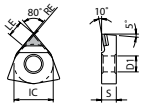
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80° Trigon

How to read pages of "Turning inserts" See page B15

Cutting edge preparation		
PCD all items	F	Sharp edge

Non-ferrous metals (with interruption)	◕	N
Non-ferrous metals (without interruption)	●	
Titanium alloys (with interruption)	◕	S
Titanium alloys (without interruption)	●	

Insert		Description	Edge preparation type	No. of edges	Dimension (mm) IC	S	D1	RE	LE	PCD - KPD001	PCD - KPD010	Applicable toolholder
	 Small Edge	WNMM 080402M-SE 080404M-SE 080408M-SE	F	1	12.7	4.76	5.16	0.2 0.4 0.8	2.8 2.8 2.7	● ●	 ● ●	D43~D46 F146 F148 F149
	 New Value Edge	WNMM 080402M-NE 080404M-NE	F	1	12.7	4.76	5.16	0.2 0.4	5	● ●		

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

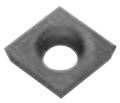
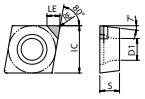
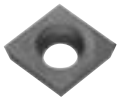
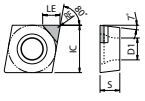
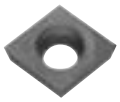
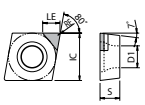
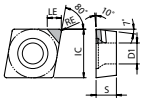
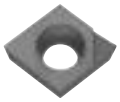
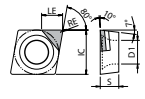
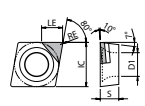
CBN & PCD Inserts are sold in 1 piece boxes

80° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation		
PCD all items	F	Sharp edge

Non-ferrous metals (with interruption)	◕	N
Non-ferrous metals (without interruption)	●	
Titanium alloys (with interruption)	◕	S
Titanium alloys (without interruption)	●	

Insert		Description	Edge preparation type	No. of edges	Dimension (mm) IC	S	D1	RE	LE	PCD - KPD001	PCD - KPD010	Applicable toolholder
	 Small Edge	CCGW 040101SE 040102SE 040104SE	F	1	4.3	1.8	2.3	0.1 0.2 0.4	1.3	● ● ●		F31, F32 F60, F62
		CCGW 060201SE 060202SE 060204SE	F	1	6.35	2.38	2.8	0.1 0.2 0.4	2.3	● ● ●		E26, E28, E54 F31, F32 F60~F62, F124
		CCGW 09T302SE 09T304SE 09T308SE	F	1	9.525	3.97	4.4	0.2 0.4 0.8	2.7	● ● ●		E26~E28, E54 F60~F62 F124
	 New Value Edge	CCGW 040101NE 040102NE	F	1	4.3	1.8	2.3	0.1 0.2	1.7 1.6	● ●		F31, F32 F60, F62
		CCGW 060201NE 060202NE 060204NE	F	1	6.35	2.38	2.8	0.1 0.2 0.4	3.1 3 3	● ● ●		E26, E28, E54 F31, F32 F60~F62, F124
		CCGW 09T301NE 09T302NE 09T304NE 09T308NE	F	1	9.525	3.97	4.4	0.1 0.2 0.4 0.8	3.4 3.4 3.4 3.3	● ● ● ●		E26~E28, E54 F60~F62 F124
		CCGW 040101 040102 040104	F	1	4.3	1.8	2.3	0.1 0.2 0.4	1.9	● ● ●	 ● ●	F31, F32 F60, F62
		CCGW 060201 060202 060204	F	1	6.35	2.38	2.8	0.1 0.2 0.4	3.5	 	● ● ●	E26, E28, E54 F31, F32 F60~F62, F124
		CCGW 09T301 09T302 09T304 09T308	F	1	9.525	3.97	4.4	0.1 0.2 0.4 0.8	3.8 3.8 3.7 3.6	● ● ● 	 ● ● ●	E26~E28, E54 F60~F62 F124
	 Small Edge	CCMT 060202SE 060204SE	F	1	6.35	2.38	2.8	0.2 0.4	2.2	● ●		E26, E28, E54 F31, F32 F60~F62, F124
		CCMT 09T301SE 09T302SE 09T304SE 09T308SE	F	1	9.525	3.97	4.4	0.1 0.2 0.4 0.8	2.7	● ● ● ●		E26~E28, E54 F60~F62 F124
	 New Value Edge	CCMT 060201NE 060202NE 060204NE	F	1	6.35	2.38	2.8	0.1 0.2 0.4	2.8	● ● ●		E26, E28, E54 F31, F32 F60~F62, F124
		CCMT 09T301NE 09T302NE 09T304NE 09T308NE	F	1	9.525	3.97	4.4	0.1 0.2 0.4 0.8	3.4 3.4 3.4 3.3	● ● ● ●		E26~E28, E54 F60~F62 F124
		CCMT 060201 060202 060204	F	1	6.35	2.38	2.8	0.1 0.2 0.4	3.3 3.3 3.2	● ● ●	● ● ●	E26, E28, E54 F31, F32 F60~F62, F124
		CCMT 09T301 09T302 09T304 09T308	F	1	9.525	3.97	4.4	0.1 0.2 0.4 0.8	3.9 3.9 3.9 3.8	● ● ● 	● ● ● ●	E26~E28, E54 F60~F62 F124

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

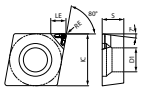
CBN & PCD Inserts are sold in 1 piece boxes

80° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation		
PCD all items	F	Sharp edge

Non-ferrous metals (with interruption)	●	N
Non-ferrous metals (without interruption)	●	
Titanium alloys (with interruption)	●	S
Titanium alloys (without interruption)	●	

Insert		Description	Edge preparation type	No. of edges	Dimension (mm) IC	S	D1	RE	LE	PCD -	PCD KPD001	Applicable toolholder
	 Chip Control	CCMT 09T302APD 09T304APD 09T308APD	F	1	9.525	3.97	4.4	0.2 0.4 0.8	2.7	●	●	E26~E28, E54 F60~F62 F124

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

80° Rhombic

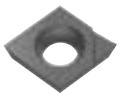
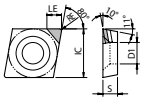
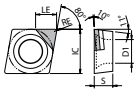
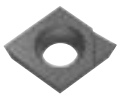
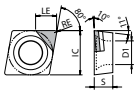
How to read pages of "Turning inserts" See page B15

Cutting edge preparation		
PCD all items	F	Sharp edge

Non-ferrous metals (with interruption)	◕
Non-ferrous metals (without interruption)	●
Titanium alloys (with interruption)	◕
Titanium alloys (without interruption)	●

N

S

Insert		Description	Edge preparation type	No. of edges	Dimension (mm) IC	S	D1	RE	LE	PCD KPD001	PCD KPD010	Applicable toolholder
	 Small Edge	CPMH 090302SE	F	1	9.525	3.18	4.5	0.2	2.7	●		F64 F65
		CPMH 090304SE	F	1	9.525	3.18	4.5	0.4	2.7	●		
		CPMH 080202NE	F	1	7.94	2.38	3.5	0.2	3.2	●		
		CPMH 080204NE	F	1	7.94	2.38	3.5	0.4	3.2	●		
	 New Value Edge	CPMH 090301NE	F	1	9.525	3.18	4.5	0.1	3.4	●		
		CPMH 090302NE	F	1	9.525	3.18	4.5	0.2	3.4	●		
		CPMH 090304NE	F	1	9.525	3.18	4.5	0.4	3.4	●		
		CPMH 090308NE	F	1	9.525	3.18	4.5	0.8	3.3	●		
		CPMH 080201	F	1	7.94	2.38	3.5	0.1		●		
		CPMH 080202	F	1	7.94	2.38	3.5	0.2	3.7	●	●	
		CPMH 080204	F	1	7.94	2.38	3.5	0.4		●	●	
		CPMH 090301	F	1	9.525	3.18	4.5	0.1	4		●	
		CPMH 090302	F	1	9.525	3.18	4.5	0.2	3.9	●	●	
		CPMH 090304	F	1	9.525	3.18	4.5	0.4	3.9	●	●	
		CPMH 090308	F	1	9.525	3.18	4.5	0.8	3.8		●	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

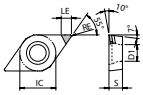
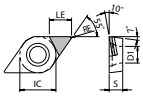
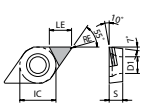
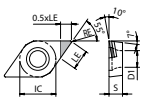
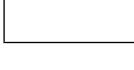
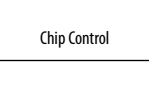
CBN & PCD Inserts are sold in 1 piece boxes

55° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation		
PCD all items	F	Sharp edge

Non-ferrous metals (with interruption)	◕	N
Non-ferrous metals (without interruption)	●	
Titanium alloys (with interruption)	◕	S
Titanium alloys (without interruption)	●	

Insert		Description	Edge preparation type	No. of edges	Dimension (mm) IC	S	D1	RE	LE	PCD - KPD001	PCD - KPD010	Applicable toolholder
	 Small Edge	DCMT 070201SE 070202SE 070204SE	F	1	6.35	2.38	2.8	0.1 0.2 0.4	2.7	● ● ●		E29, E31, E34 E35, E55, E56 F66~F68 F70~F72 F74~F76, F125
		DCMT 11T301SE 11T302SE 11T304SE 11T308SE	F	1	9.525	3.97	4.4	0.1 0.2 0.4 0.8	2.7	● ● ● ●		E23, E29~E32, E34 E35, E55, E56 F66~F68 F70~F72 F74~F76, F125
	 New Value Edge	DCMT 070201NE 070202NE 070204NE	F	1	6.35	2.38	2.8	0.1 0.2 0.4	3.4 3.4 3.2	● ● ●		E29, E31, E34 E35, E55, E56 F66~F68 F70~F72 F74~F76, F125
		DCMT 11T301NE 11T302NE 11T304NE 11T308NE	F	1	9.525	3.97	4.4	0.1 0.2 0.4 0.8	3.4 3.3 3.2 2.8	● ● ● ●		E23, E29~E32, E34 E35, E55, E56 F66~F68 F70~F72 F74~F76, F125
		DCMT 070201 070202 070204	F	1	6.35	2.38	2.8	0.1 0.2 0.4	4 3.9 3.7	● ● ● ● ● ●		E29, E31, E34 E35, E55, E56 F66~F68 F70~F72 F74~F76, F125
		DCMT 11T301 11T302 11T304 11T308	F	1	9.525	3.97	4.4	0.1 0.2 0.4 0.8	4 3.9 3.7 3.3	● ● ● ● ● ● ● ●		E23, E29~E32, E34 E35, E55, E56 F66~F68 F70~F72 F74~F76, F125
	 New Value Edge	DCMT 070202R-NE 070202L-NE 070204R-NE 070204L-NE	F	1	6.35	2.38	2.8	0.2 0.2 0.4 0.4	3.3 3.3 3.2 3.2	● ● ● ●		E29, E31, E34 E35, E55, E56 F66~F68 F70~F72 F74~F76, F125
		DCMT 11T302R-NE 11T302L-NE 11T304R-NE 11T304L-NE	F	1	9.525	3.97	4.4	0.2 0.2 0.4 0.4	3.3 3.3 3.2 3.2	● ● ● ●		E23, E29~E32, E34 E35, E55, E56 F66~F68 F70~F72 F74~F76, F125
	 Chip Control	DCMT 11T302APD 11T304APD 11T308APD	F	1	9.525	3.97	4.4	0.2 0.4 0.8	2.7	● ● ●		E23, E29~E32, E34 E35, E55, E56 F66~F68 F70~F72 F74~F76, F125

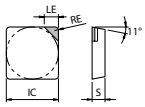
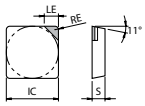
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

90° Square

How to read pages of "Turning inserts" See page B15

Cutting edge preparation			Non-ferrous metals (with interruption)	●	N
PCD all items	F	Sharp edge	Non-ferrous metals (without interruption)	●	
			Titanium alloys (with interruption)	●	S
			Titanium alloys (without interruption)	●	

Insert		Description	Edge preparation type	No. of edges	Dimension (mm) IC	S	RE	LE	PCD - KPD001	PCD - KPD010	Applicable toolholder
	 New Value Edge	SPGN 120304NE	F	1	12.7	3.18	0.4	3.6	●		F112
		SPGN 120304	F	1	12.7	3.18	0.4	4.2		●	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

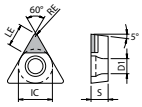
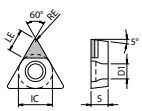
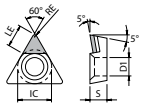
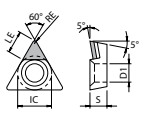
CBN & PCD Inserts are sold in 1 piece boxes

60° Triangle

How to read pages of "Turning inserts" See page B15

Cutting edge preparation		
PCD all items	F	Sharp edge

Non-ferrous metals (with interruption)	◕	N
Non-ferrous metals (without interruption)	●	N
Titanium alloys (with interruption)	◕	S
Titanium alloys (without interruption)	●	S

Insert		Description	Edge preparation type	No. of edges	Dimension (mm) IC	S	D1	RE	LE	PCD - KPD001	PCD - KPD010	Applicable toolholder
	 New Value Edge	TBGW 060102NE	F	1	3.97	1.59	2.4	0.2	2.1	●		F33, F34 F80~F82 F86, F87
		TBGW 060104NE						0.4	1.9	●		
		TBGW 060102	F	1	3.97	1.59	2.4	0.2	2.4	●		
		TBGW 060104						0.4	2.2	●		
	 New Value Edge	TBMT 060101NE	F	1	3.97	1.59	2.4	0.1	2.2	●		
		TBMT 060102NE						0.2	2.1	●		
		TBMT 060104NE						0.4	2	●		
		TBMT 060108NE						0.8	1.7	●		
		TBMT 060102	F	1	3.97	1.59	2.4	0.2	2.5	●	●	
		TBMT 060104						0.4	2.3		●	
		TBMT 060108						0.8	2	●		

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

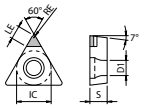
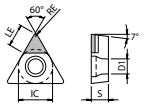
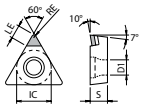
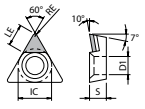
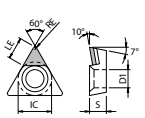
CBN & PCD Inserts are sold in 1 piece boxes

60° Triangle

How to read pages of "Turning inserts" See page B15

Cutting edge preparation		
PCD all items	F	Sharp edge

Non-ferrous metals (with interruption)	●	N
Non-ferrous metals (without interruption)	●	
Titanium alloys (with interruption)	●	S
Titanium alloys (without interruption)	●	

Insert		Description	Edge preparation type	No. of edges	Dimension (mm) IC	S	D1	RE	LE	PCD KPD001	PCD KPD010	Applicable toolholder
	 Small Edge	TCGW 110302SE	F	1	6.35	3.18	2.8	0.2	2.5		●	E38
		TCGW 110304SE	F	1	6.35	3.18	2.8	0.4	2.4		●	
	 New Value Edge	TCGW 110302NE	F	1	6.35	3.18	2.8	0.2	3.3	●		
		TCGW 110304NE	F	1	6.35	3.18	2.8	0.4	3.2	●		
	 Small Edge	TCMT 110301SE	F	1	6.35	3.18	2.8	0.1	2.6		●	
		TCMT 110302SE	F	1	6.35	3.18	2.8	0.2	2.5		●	
		TCMT 110304SE	F	1	6.35	3.18	2.8	0.4	2.4		●	
	 New Value Edge	TCMT 080202NE	F	1	4.76	2.38	2.5	0.2	2.1	●		
		TCMT 110302NE	F	1	6.35	3.18	2.8	0.2	3.4	●		
		TCMT 080202	F	1	4.76	2.38	2.5	0.2	2.4		●	
		TCMT 080204	F	1	4.76	2.38	2.5	0.4	2.2		●	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

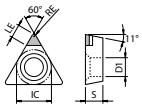
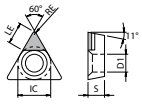
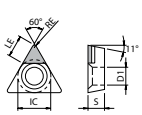
CBN & PCD Inserts are sold in 1 piece boxes

60° Triangle

How to read pages of "Turning inserts" See page B15

Cutting edge preparation		
PCD all items	F	Sharp edge

Non-ferrous metals (with interruption)	◕	N
Non-ferrous metals (without interruption)	●	N
Titanium alloys (with interruption)	◕	S
Titanium alloys (without interruption)	●	S

Insert		Description	Edge preparation type	No. of edges	Dimension (mm) IC	S	D1	RE	LE	PCD - KPD001	PCD - KPD010	Applicable toolholder
	 Small Edge	TPGB 090202SE	F	1	5.56	2.38	3.2	0.2	2.1	●		F33, F34 F80~F82, F86
		TPGB 090204SE						0.4		●		
		TPGB 090208SE						0.8		●		
		TPGB 110301SE	F	1	6.35	3.18	3.3	0.1	2.7	●	●	E39
		TPGB 110302SE						0.2	2.6	●	●	F80~F82
		TPGB 110304SE						0.4	2.5	●	●	F84, F85
		TPGB 160302SE	F	1	9.525	3.18	4.7	0.2	2.6	●	●	F80~F82
		TPGB 160304SE						0.4	2.4	●	●	F84
	 New Value Edge	TPGB 080202NE	F	1	4.76	2.38	2.3	0.2	2.2	●		E39
		TPGB 080204NE						0.4	2.1	●		F80~F82, F86
		TPGB 080208NE						0.8	1.8	●		
		TPGB 090202NE	F	1	5.56	2.38	3.2	0.2	2.7	●		F33, F34
		TPGB 090204NE						0.4	2.6	●		F80~F82, F86
		TPGB 110302NE	F	1	6.35	3.18	3.3	0.2	3.4	●		E39
		TPGB 110304NE						0.4	3.3	●		F80~F82
		TPGB 110308NE						0.8	3	●		F84, F85
		TPGB 160304NE	F	1	9.525	3.18	4.7	0.4	3.2	●		F80~F82
		TPGB 160308NE						0.8	2.9	●		F84
		TPGB 080202	F	1	4.76	2.38	2.3	0.2	2.6	●	●	E39
		TPGB 080204						0.4	2.4	●	●	F80~F82, F86
		TPGB 090202	F	1	5.56	2.38	3.2	0.2	3.2	●		F33, F34
		TPGB 090204						0.4	3	●	●	F80~F82, F86
		TPGB 110302	F	1	6.35	3.18	3.3	0.2	3.9	●	●	E39
		TPGB 110304						0.4	3.7	●	●	F80~F82
		TPGB 110308						0.8	3.4		●	F84, F85

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

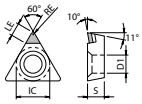
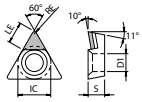
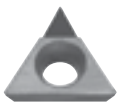
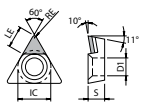
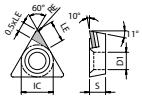
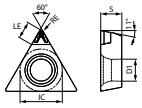
CBN & PCD Inserts are sold in 1 piece boxes

60° Triangle

How to read pages of "Turning inserts" See page B15

Cutting edge preparation		
PCD all items	F	Sharp edge

Non-ferrous metals (with interruption)	◕	N
Non-ferrous metals (without interruption)	●	
Titanium alloys (with interruption)	◕	S
Titanium alloys (without interruption)	●	

Insert		Description	Edge preparation type	No. of edges	Dimension (mm) IC	S	D1	RE	LE	PCD KPD001	PCD KPD010	Applicable toolholder
	 Small Edge	TPMH 080202SE	F	1	4.76	2.38	2.3	0.2	2	●		E39
		080204SE						0.4	1.8	●		F80~F82, F86
		TPMH 090202SE	F	1	5.56	2.38	3.2	0.2	2.4	●		F33, F34
		090204SE						0.4	2.2	●		F80~F82, F86
		TPMH 110301SE	F	1	6.35	3.18	3.3	0.1	2.7		●	E39
		110302SE						0.2	2.6	●	●	F80~F82
		110304SE						0.4	2.5	●	●	F84, F85
		TPMH 160302SE	F	1	9.525	3.18	4.7	0.2	2.6	●		F80~F82
		160304SE						0.4	2.4	●	●	F84
	 New Value Edge	TPMH 080201NE	F	1	4.76	2.38	2.3	0.1	2.3	●		E39
		080202NE						0.2	2.2	●		F80~F82, F86
		080204NE						0.4	2.1	●		
		TPMH 090201NE	F	1	5.56	2.38	3.2	0.1	2.7	●		F33, F34
		090202NE						0.2	2.6	●		F80~F82, F86
		090204NE						0.4	2.5	●		
		090208NE						0.8	2.2	●		
		TPMH 110301NE	F	1	6.35	3.18	3.3	0.1	3.4	●		E39
		110302NE						0.2	3.3	●		F80~F82
		110304NE						0.4	3.2	●		F84, F85
		110308NE						0.8	2.9	●		
		TPMH 160304NE	F	1	9.525	3.18	4.7	0.4	3.3	●		F80~F82
		160308NE						0.8	3	●		F84
		TPMH 080202	F	1	4.76	2.38	2.3	0.2	2.5	●	●	E39
		080204						0.4	2.3	●	●	F80~F82, F86
		TPMH 090201	F	1	5.56	2.38	3.2	0.1	3	●		F33, F34
		090202						0.2	2.9	●	●	F80~F82, F86
		090204						0.4	2.8	●	●	
		TPMH 110301	F	1	6.35	3.18	3.3	0.1	3.9	●	●	E39
		110302						0.2	3.9	●	●	F80~F82
		110304						0.4	3.7	●	●	F84, F85
		110308						0.8	3.4		●	
		TPMH 160302	F	1	9.525	3.18	4.7	0.2	4	●	●	F80~F82
		160304						0.4	3.8	●	●	F84
		160308						0.8	3.6		●	
	 New Value Edge	TPMH 110302L-NE	F	1	6.35	3.18	3.3	0.2	3.8	●		E39
		110304L-NE						0.4	3.6	●		F80~F82
												F84, F85
	 Chip Control	TPMT 110302APD	F	1	6.35	3.18	3.3	0.2	2.6	●		E39
		110304APD						0.4	2.5	●		F80~F82
		110308APD						0.8	2.5	●		F84, F85

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

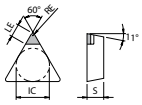
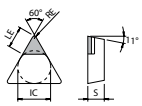
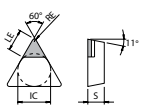
CBN & PCD Inserts are sold in 1 piece boxes

60° Triangle

How to read pages of "Turning inserts" See page B15

Cutting edge preparation		
PCD all items	F	Sharp edge

Non-ferrous metals (with interruption)	●	N
Non-ferrous metals (without interruption)	●	
Titanium alloys (with interruption)	●	S
Titanium alloys (without interruption)	●	

Insert		Description	Edge preparation type	No. of edges	Dimension (mm) IC	S	RE	LE	PCD - KPD001	PCD - KPD010	Applicable toolholder
	 Small Edge	TPGN 110301SE	F	1	6.35	3.18	0.1	2.6	●		F113
		TPGN 110302SE	F	1	6.35	3.18	0.2	2.5	●	●	
		TPGN 110304SE	F	1	6.35	3.18	0.4	2.4	●	●	
		TPGN 160301SE	F	1	9.525	3.18	0.1	2.6		●	
		TPGN 160302SE	F	1	9.525	3.18	0.2	2.6	●	●	
		TPGN 160304SE	F	1	9.525	3.18	0.4	2.4	●	●	
	 New Value Edge	TPGN 160304NE	F	1	9.525	3.18	0.4	3.2	●		
		TPGN 160308NE	F	1	9.525	3.18	0.8	2.9	●		
		TPGN 110302	F	1	6.35	3.18	0.2	3.9	●	●	
		TPGN 110304	F	1	6.35	3.18	0.4	3.7	●	●	
		TPGN 160304	F	1	9.525	3.18	0.4	3.7	●	●	
		TPGN 160308	F	1	9.525	3.18	0.8	3.4		●	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

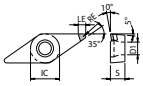
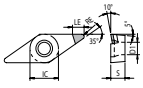
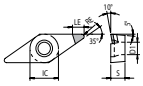
CBN & PCD Inserts are sold in 1 piece boxes

35° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation		
PCD all items	F	Sharp edge

Non-ferrous metals (with interruption)	●	N
Non-ferrous metals (without interruption)	●	
Titanium alloys (with interruption)	●	S
Titanium alloys (without interruption)	●	

Insert		Description	Edge preparation type	No. of edges	Dimension (mm) IC	S	D1	RE	LE	PCD KPD001	PCD KPD010	Applicable toolholder
	 Small Edge	VBMT 110301SE	F	1	6.35	3.18	2.8	0.1	2.5	●		E40~E43 E58 F90, F91 F94~F99
		VBMT 110302SE						0.2	2.3	●		
		VBMT 110304SE						0.4	1.9	●		
		VBMT 110308SE						0.8	1.9	●		
		VBMT 160401SE	F	1	9.525	4.76	4.4	0.1	2.7	●		E41~E43 F90, F91 F94~F99
		VBMT 160402SE						0.2	2.5	●		
		VBMT 160404SE						0.4	2.1	●		
		VBMT 160408SE						0.8	2	●		
	 New Value Edge	VBMT 110301NE	F	1	6.35	3.18	2.8	0.1	2.6	●		E40~E43 E58 F90, F91 F94~F99
		VBMT 110302NE						0.2	2.4	●		
		VBMT 110304NE						0.4	2	●		
		VBMT 110308NE						0.8	3.1	●		
		VBMT 160401NE	F	1	9.525	4.76	4.4	0.1	2.8	●		E41~E43 F90, F91 F94~F99
		VBMT 160402NE						0.2	2.6	●		
		VBMT 160404NE						0.4	2.2	●		
		VBMT 160408NE						0.8	3	●		
		VBMT 110301	F	1	6.35	3.18	2.8	0.1	3	●	●	E40~E43 E58 F90, F91 F94~F99
		VBMT 110302						0.2	2.8	●	●	
		VBMT 110304						0.4	2.4	●	●	
		VBMT 110308						0.8	3.5	●	●	
		VBMT 160401	F	1	9.525	4.76	4.4	0.1	3.2	●		E41~E43 F90, F91 F94~F99
		VBMT 160402						0.2	3	●	●	
		VBMT 160404						0.4	2.6	●	●	
		VBMT 160408						0.8	3.5	●	●	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

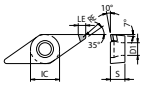
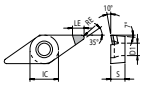
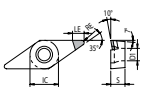
CBN & PCD Inserts are sold in 1 piece boxes

35° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation		
PCD all items	F	Sharp edge

Non-ferrous metals (with interruption)	◕	N
Non-ferrous metals (without interruption)	●	
Titanium alloys (with interruption)	◕	S
Titanium alloys (without interruption)	●	

Insert		Description	Edge preparation type	No. of edges	Dimension (mm) IC	S	D1	RE	LE	PCD - KPD001	PCD - KPD010	Applicable toolholder
	 Small Edge	VCMT 080202SE 080204SE 080208SE	F	1	4.76	2.38	2.3	0.2 0.4 0.8	1.4	● ● ●		E59 F90, F91 F94~F99
	 New Value Edge	VCMT 080201NE 080202NE 080204NE 080208NE	F	1	4.76	2.38	2.3	0.1 0.2 0.4 0.8	1.7 1.7 1.8 1.9	● ● ● ●		
		VCMT 080201 080202 080204 080208	F	1	4.76	2.38	2.3	0.1 0.2 0.4 0.8	2 2 2.1 2.2	 ● ● ●	● ● ● ●	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

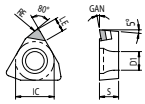
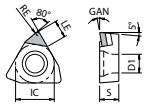
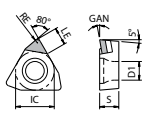
CBN & PCD Inserts are sold in 1 piece boxes

80° Trigon

How to read pages of "Turning inserts" See page B15

Cutting edge preparation		
PCD all items	F	Sharp edge

Non-ferrous metals (with interruption)	◕	N
Non-ferrous metals (without interruption)	●	
Titanium alloys (with interruption)	◕	S
Titanium alloys (without interruption)	●	

Insert		Description	Edge preparation type	No. of edges	Dimension (mm) IC	S	D1	RE	LE	PCD KPD001	PCD KPD010	Applicable toolholder
	 Small Edge	WBMT 060102L-SE	F	1	3.97	1.59	2.3	0.2	1.3	●		F36 F100~F102
		WBMT 080202L-SE	F	1	4.76	2.38	2.3	0.2	1.6	●		
	 New Value Edge	WBMT 060101L-NE 060102L-NE 060104L-NE	F	1	3.97	1.59	2.3	0.1 0.2 0.4	1.7 1.6 1.6	● ● ●		
		WBMT 080202L-NE 080204L-NE	F	1	4.76	2.38	2.3	0.2 0.4	2.1	● ●		
		WBMT 060101L 060102L 060104L	F	1	3.97	1.59	2.3	0.1 0.2 0.4	1.9	● ● ●	 ● ●	
		WBMT 080202L 080204L	F	1	4.76	2.38	2.3	0.2 0.4	2.4 2.3	● ●	● ●	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

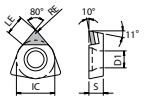
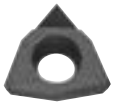
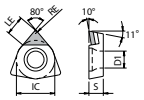
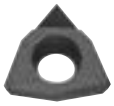
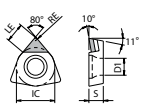
CBN & PCD Inserts are sold in 1 piece boxes

80° Trigon

How to read pages of "Turning inserts" See page B15

Cutting edge preparation		
PCD all items	F	Sharp edge

Non-ferrous metals (with interruption)	◕	N
Non-ferrous metals (without interruption)	●	
Titanium alloys (with interruption)	◕	S
Titanium alloys (without interruption)	●	

Insert		Description	Edge preparation type	No. of edges	Dimension (mm) IC	S	D1	RE	LE	PCD - KPD001	PCD - KPD010	Applicable toolholder
	 Small Edge	WPMT 110202SE	F	1	6.35	2.38	2.8	0.2	2.1	●		F100~F102
	 New Value Edge	WPMT 110202NE	F	1	6.35	2.38	2.8	0.2	2.7	●		
		WPMT 110202	F	1	6.35	2.38	2.8	0.2	3.1		●	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

25° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation			Non-ferrous metals (with interruption)	●	N
PCD all items	F	Sharp edge	Non-ferrous metals (without interruption)	●	
			Titanium alloys (with interruption)	●	S
			Titanium alloys (without interruption)	●	

Insert		Description	Edge preparation type	No. of edges	Dimension (mm)				Angle (°)	PCD	Applicable toolholder
					IC	S	D1	RE	AN	- / KPD001	
	 New Value Edge	ZBMT 13T301NE 13T302NE 13T304NE	F	1	6.35	3.97	3.7	0.1 0.2 0.4	5	● ● ●	E52, E53 F106~F110

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

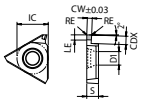
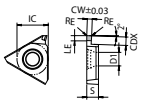
CBN & PCD Inserts are sold in 1 piece boxes

GBA

How to read pages of "Turning inserts" See page B15

Cutting edge preparation		
PCD all items	F	Sharp edge

Non-ferrous metals (with interruption)	●	N
Non-ferrous metals (without interruption)	●	N
Titanium alloys (with interruption)	●	S
Titanium alloys (without interruption)	●	S

Insert		Description	Edge preparation type	No. of edges	Dimension (mm) CW	CDX	IC	S	D1	RE	LE	Tolerance (mm) CW min.	CW max.	PCD - KPD001	PCD - KPD010	Applicable toolholder
	 1-edge	GBA32R 125-010 150-010 200-010	F	1	1.25 1.5 2	2 2 2.5	9.525	3.18	4.4	0.1	1.7	- 0.03	+ 0.03	● ● ●	● ● 	G13~G17 G89
	 1-edge	GBA43R 125-010 150-010 200-010 250-010 300-010	F	1	1.25 1.5 2 2.5 3	2 3.5 3.5 4 4	12.7	4.76	5.5	0.1	1.9	- 0.03	+0.03	 ● ● ● ●	● ● ● ● ●	
		GBA43L 125-010 150-010 200-010 250-010 300-010			1.25 1.5 2 2.5 3	2 3.5 3.5 4 4								● ● ● ● ●	● ● ● ● 	

CDX shows available grooving depth.
Right-hand shown

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

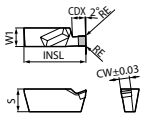
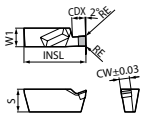
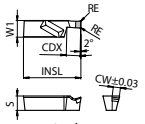
CBN & PCD Inserts are sold in 1 piece boxes

GV/GVF

How to read pages of "Turning inserts" See page B15

Cutting edge preparation		
PCD all items	F	Sharp edge

Non-ferrous metals (with interruption)	●	N
Non-ferrous metals (without interruption)	●	
Titanium alloys (with interruption)	●	S
Titanium alloys (without interruption)	●	

Insert		Description		Edge preparation type	No. of edges	Dimension (mm)						Tolerance (mm)		PCD	Applicable toolholder
						CW	CDX	S	RE	INSL	W1	CW min.	CW max.	- / KPD010	
		GVR	145-020A 200-020A	F	1	1.45 2	2.3	5	0.2	12	4	- 0.03	+0.03	● ●	G86~G88
		GVR	200-020B 250-020B	F	1	2 2.5	3.2	5.5	0.2	15	4.5	- 0.03	+0.03	● ●	
		GVFR	250-020B 300-020B 400-020B	F	1	2.5 3 4	4.8 4.8 5.3	5	0.2	20	5.8	- 0.03	+0.03	● ● MTO	G127~G130 G133
		GVFL	250-020B 300-020B 400-020B			2.5 3 4	4.8 4.8 5.3							● ● MTO	
		GVFR	350-040C	F	1	3.5	6.8	7	0.4	27	7	- 0.03	+ 0.03	MTO	

CDX shows available grooving depth.
Right-hand shown

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

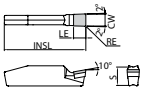
CBN & PCD Inserts are sold in 1 piece boxes

GDGS

How to read pages of "Turning inserts" See page B15

Cutting edge preparation		
PCD all items	F	Sharp edge

Non-ferrous metals (with interruption)	●	N
Non-ferrous metals (without interruption)	●	
Titanium alloys (with interruption)	●	S
Titanium alloys (without interruption)	●	

Insert		Description	Edge preparation type	No. of edges	Dimension (mm)					Tolerance (mm)		PCD	Applicable toolholder
					CW	S	RE	INSL	LE	CW min.	CW max.	- / KPD001	
		GDGS 2020N-020NB	F	1	2	4.3	0.2	20	2.9	- 0.03	+ 0.03	●	G34~G42
		GDGS 3020N-020NB	F	1	3	4.3	0.2	20	2.9	- 0.03	+ 0.03	●	
		GDGS 4020N-020NB	F	1	4	4.3	0.2	20	2.9	- 0.03	+ 0.03	●	
		GDGS 5020N-020NB	F	1	5	4.3	0.2	20	2.9	- 0.03	+ 0.03	●	G34 G40~G42
		GDGS 6020N-020NB	F	1	6	4.3	0.2	20	2.9	- 0.03	+ 0.03	●	

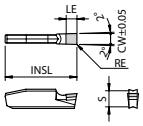
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

GMN

How to read pages of "Turning inserts" See page B15

Cutting edge preparation			Non-ferrous metals (with interruption)	●		N
PCD all items	F	Sharp edge	Non-ferrous metals (without interruption)	●		
			Titanium alloys (with interruption)	●		S
			Titanium alloys (without interruption)	●		

Insert		Description	Edge preparation type	No. of edges	Dimension (mm)					Tolerance (mm)		PCD		Applicable toolholder
					CW	S	RE	INSL	LE	CW min.	CW max.	- KPD001	- KPD010	
		GMN 2	F	1	2	4.3	0.2	20	2.9	- 0.05	+ 0.05	●	●	G55 G57
		GMN 3	F	1	3	4.3	0.2	20	2.9	- 0.05	+ 0.05	●	●	G55~G58
		GMN 4	F	1	4	4.3	0.2	20	2.9	- 0.05	+ 0.05	●	●	
		GMN 5	F	1	5	4.3	0.2	20	2.9	- 0.05	+ 0.05	●	●	
		GMN 6	F	1	6	4.3	0.2	20	2.9	- 0.05	+ 0.05		●	G56 G57

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

GMGW

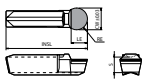
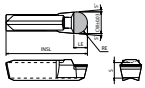
How to read pages of "Turning inserts" See page B15

Cutting edge preparation	
GMGW	R-honed

Non-ferrous metals (with interruption)	●
Non-ferrous metals (without interruption)	●
Titanium alloys (with interruption)	●
Titanium alloys (without interruption)	●

N

S

Insert		Description	Edge preparation type	No. of edges	Dimension (mm)					Tolerance (mm)		PCD	Applicable toolholder
					CW	S	RE	INSL	LE	CW min.	CW max.	KPD001	
		GMGW 6030-30R	F	1	6	5.5	3	30	4.5	- 0.03	+0.03	●	G67
		GMGW 8030-40R	F	1	8	5.5	4	30	6	- 0.03	+0.03	●	
		GMGW 8030-40R-HR	F	1	8	5.5	4	30	5	- 0.03	+ 0.03	●	

GMGW inserts are exclusively used for KGMW toolholder. It cannot be used for other toolholder because of its different installation angle.
GMGW inserts Edge Preparation : R-honed Cutting Edge.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

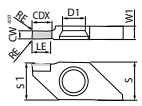
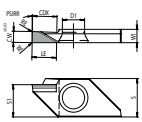
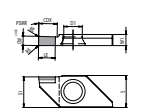
CBN & PCD Inserts are sold in 1 piece boxes

TKF

How to read pages of "Turning inserts" See page B15

Cutting edge preparation		
PCD all items	F	Sharp edge

Non-ferrous metals (with interruption)	●	N
Non-ferrous metals (without interruption)	●	
Titanium alloys (with interruption)	●	S
Titanium alloys (without interruption)	●	

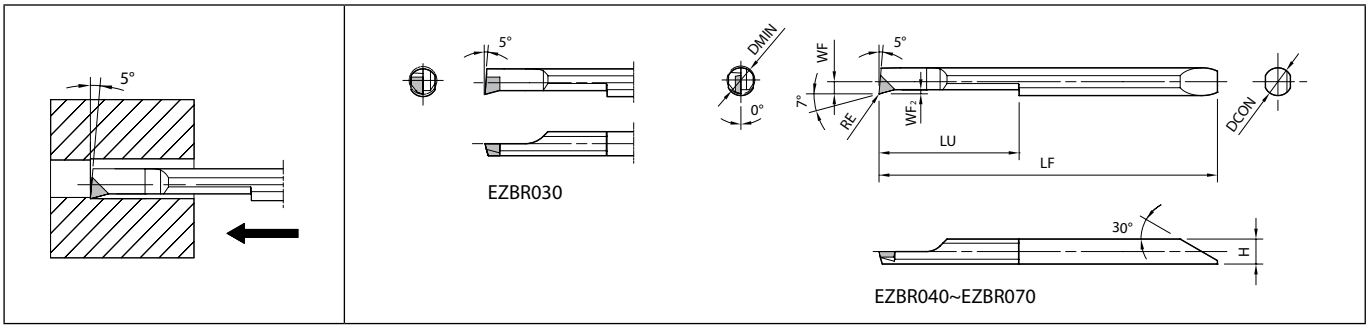
Insert		Description	Edge preparation type	No. of edges	Dimension (mm) CW	CDX	S	S1	D1	RE	LE	W1	Angle (°) PSIR R/L	Tolerance (mm) CW min.	CW max.	RE (+/-) min.	RE (+/-) max.	PCD -	PCD KPD001	Applicable toolholder
		TKF12R 200-AGT TKF12R 250-AGT	F	1	2 2.5	4.8	8.7	8.3	5	0.1	4.2	3	0	-0.03	+0.03	-0.05	0	● ●		E15 E16
		TKF12R 200-AS TKF12L 200-AS TKF12R 250-AS	F	1	2 2 2.5	5	8.7	7.3	5	0.1	5.3	3	0	-0.03	+0.03	-0.05	0	● ● ●		
		TKF16R 250-AS TKF16L 250-AS	F	1	2.5	8	9.5	8	5	0.1	6.3	4	0	-0.03	+0.03	-0.05	0	● ●		
		TKF12R 150-NB TKF12R 200-NB TKF12R 250-NB	F	1	1.5 2 2.5	3.5 4 4	8.7	8.3	5	0.1	2 3 3	3	0	-0.03	+0.03	-0.05	0	● ● ●		

Right-hand shown

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

EZB-NB (Boring)



Right-hand shown

Dimensions

How to read pages of "Turning inserts" See page B15

Cutting edge preparation					
PCD all items	F	Sharp edge	Non-ferrous metals (with interruption)	●	N
			Non-ferrous metals (without interruption)	●	
			Titanium alloys (with interruption)	●	S
			Titanium alloys (without interruption)	●	

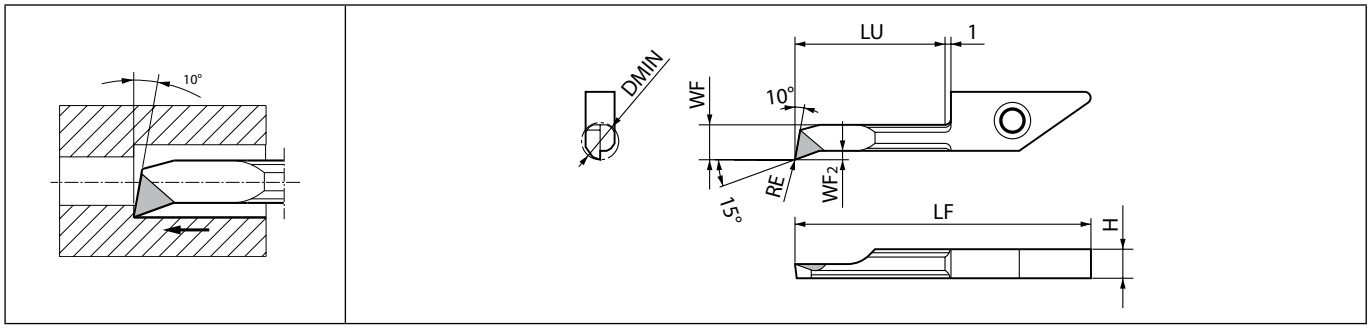
Description	No. of edges	Dimension (mm)								Tolerance (mm)		PCD	Applicable sleeve
		DMIN	DCON	H	LF	LU	WF	WF_2	RE	RE min.	RE max.	KPD001	
EZBR 040040-003NB	1	4	4	3.6	48.8	20	1.75	0.5	0.035	- 0.015	+ 0.015	●	EZH040...
EZBR 050050-003NB	1	5	5	4.6	58.1	25	2.25	0.5	0.035	- 0.015	+ 0.015	●	EZH050...
EZBR 060060-003NB	1	6	6	5.6	66.1	30	2.75	0.5	0.035	- 0.015	+ 0.015	●	EZH060...
EZBR 070070-003NB	1	7	7	6.6	74.1	35	3.25	0.5	0.035	- 0.015	+ 0.015	●	EZH070...

Applicable sleeve: F39, F41, F43

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

VNB-NB (Boring)



Right-hand shown

Dimensions

How to read pages of "Turning inserts" See page B15

Cutting edge preparation		
PCD all items	F	Sharp edge

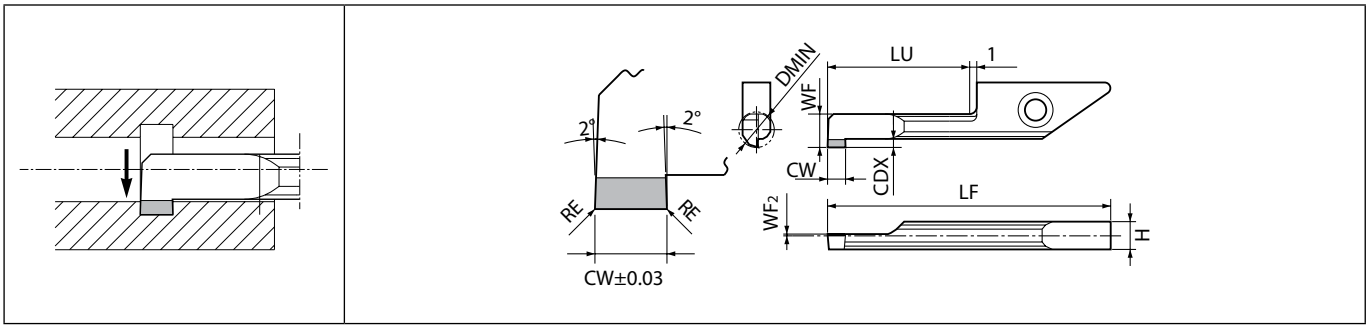
Non-ferrous metals (with interruption)	●	N
Non-ferrous metals (without interruption)	●	
Titanium alloys (with interruption)	●	S
Titanium alloys (without interruption)	●	

Description	No. of edges	Dimension (mm)							PCD		Applicable toolholder
		DMIN	H	LF	LU	WF	WF_2	RE	-	KPD001	
VNBR 0411-02NB	1	4	3.66	30.8	11	3.5	0.5	0.2		●	F48~F51
VNBR 0420-02NB				39.8	20					●	
VNBR 0511-02NB	1	5	3.9	30.8	11	4.5	0.7	0.2		●	
VNBR 0520-02NB				39.8	20					●	
VNBR 0620-02NB	1	6	3.9	39.8	20	5.3	1	0.2		●	
VNBR 0630-02NB				49.8	30					●	
VNBR 0720-02NB	1	7	3.9	39.8	20	6.2	1	0.2		●	
VNBR 0730-02NB				49.8	30					●	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

VNG



Right-hand shown

Dimensions

How to read pages of "Turning inserts" See page B15

Cutting edge preparation			Non-ferrous metals (with interruption)	●	N
PCD all items	F	Sharp edge	Non-ferrous metals (without interruption)	●	
			Titanium alloys (with interruption)	●	S
			Titanium alloys (without interruption)	●	

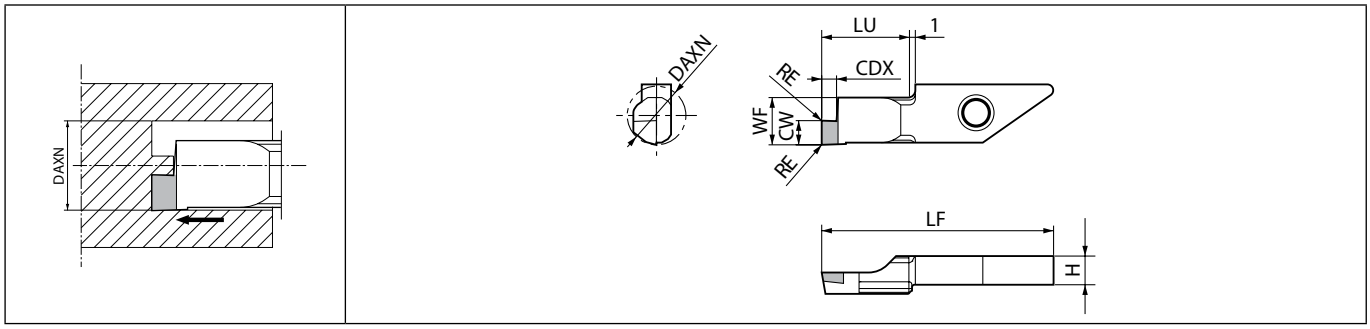
Description	No. of edges	Dimension (mm)									Tolerance (mm)		PCD	Applicable toolholder
		DMIN	CW	CDX	H	LF	LU	WF	WF_2	RE	CW min.	CW max.	- / KPD001	
VNGR 0410-11NB	1	4	1	0.8	3.9	30.8	11	3.5	0.1	0.05	-0.03	+0.03	MTO	F48~F51
VNGR 0420-11NB			2										MTO	
VNGR 0510-11NB	1	5	1	1	3.9	30.8	11	4.4	0.1	0.05	-0.03	+0.03	MTO	
VNGR 0520-11NB			2										MTO	
VNGR 0720-20NB	1	7	2	2	3.9	39.8	20	6.2	0.3	0.05	-0.03	+0.03	MTO	

CDX shows available grooving depth.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

CBN & PCD Inserts are sold in 1 piece boxes

VNFG



Right-hand shown

Dimensions

How to read pages of "Turning inserts" See page **B15**

Cutting edge preparation					
PCD all items	F	Sharp edge	Non-ferrous metals (with interruption)	●	N
			Non-ferrous metals (without interruption)	●	
			Titanium alloys (with interruption)	●	S
			Titanium alloys (without interruption)	●	

Description	No. of edges	External dia. of the groove (mm)		Dimension (mm)							PCD	Applicable toolholder
		DAXN (min.)	DAXX (max.)	CW	CDX	H	LF	LU	WF	RE	- / KPD001	
VNFGR 0830-10NB	1	8 (0)	∞ (∞)	3	3	3.9	29.6	10	7.3	0.05	MTO	**F48 F50 F51**

CDX shows available grooving depth.
External dia. of the groove DAXN (0) means that you can make the initial groove within DAXN ~ DAXX and then widen it to the center.

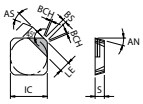
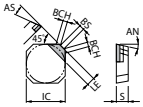
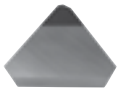
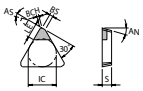
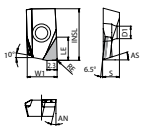
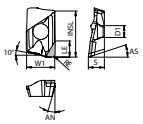
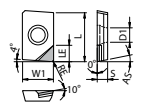
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

CBN & PCD Inserts are sold in 1 piece boxes

Available inserts

Cutting edge preparation		
PCD all items	F	Sharp edge

Non-ferrous metals (with interruption)	●	N
Non-ferrous metals (without interruption)	●	N
Titanium alloys (with interruption)	●	S
Titanium alloys (without interruption)	●	S

Insert		Description		No. of edges	Dimension (mm) IC	S	D1	RE	INSL	LE	BCH	BS	W1	Angle (°) AN	AS	PCD - KPD001	KPD010	KPD230	Applicable toolholder
		SDKN	1203AUFN-NE	1	12.7	3.18	-	-	-	3.1	0.5	1.2	-	15	23	●			-
		SEEN	1203AFFN 1203AFFN-NE	1	12.7	3.18	-	-	-	3.5 3	0.5	1.4	-	20	25	● ●	●		-
		TEEN	1603PTFR 1603PTFR-NE	1	9.525	3.18	-	-	-	4.7 4.1	0.6	1.4	-	20	22	● ●			-
		BDGT	11T302FR 11T304FR 11T308FR	1	-	3.8	2.8	0.2 0.4 0.8	11.5	3.8	-	-	6.7	13	18	● ● ●		● ● ●	M86, M87 M89, M90
		BDGT	11T302FR-LE 11T304FR-LE 11T308FR-LE	1	-	3.8	2.8	0.2 0.4 0.8	11.5	5.2	-	-	6.7	13	18	● ● ●		● ● ●	
		BDMT	11T302FR 11T304FR	1	-	3.8	2.8	0.2 0.4	11	3.6	-	-	6.7	13	18	● ●		● ●	
		BDMT	170402FR 170404FR	1	-	4.9	4.4	0.2 0.4	17	4.4	-	-	9.6	13	18	● ●		● ●	M88~M90
		NDCW	150302FRX 150302FRX-NE	1	-	3.18	4.4	0.2	15	5.7 5.1	-	-	9.525	-	15	● ●	●		M171

Handed insert shows Right-hand

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

D

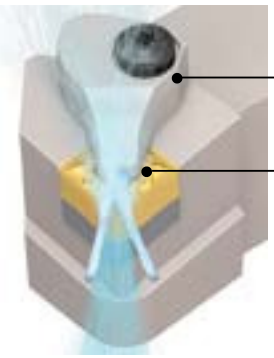


Introduction		**D2**
Toolholders for general purpose		**D8**
CN insert	DCLN/DCLN-JCT/PCLN	D8
DN insert	DDJN/DDJN-JCT/DDHN	D13
	PDJN/PDHN	D16
SN insert	DSBN/PSBN	D19
	PSKN/PSSN/PSDN	D20
TN insert	DTGN/PTGN/PTFN	D22
	WTJN/WTKN/WTEN	D27
VN insert	DVLN/DVLN-JCT/DVPN/DVPN-JCT/DVVN/DVVN-JCT	D30
	MVLN/MVVN	D36
	PVLN/PVPN/PVVN	D38
RC insert	PRGC/PRXC	D40
RN insert	PRGN	D42
WN Insert	DWLN/DWLN-JCT/PWLN/WWLN	D43
Toolholders for ceramic inserts		**D48**
CN insert	CCLN	D49
DN insert	CDJN	D50
EN insert	CELN	D51
SN insert	CSRN/CS-N/CSKN/CSYN/CSSN/CSDN	D52
TN insert	CTJN/CTUN	D56
RN insert	CRSN/CRDN	D58
Toolholders for solid CBN inserts		**D60**
CNMN insert	CCRN-A/CCLN-A	D60
RNMN insert	CRSN-A/CRDN-A	D61
SNMN insert	CSRN-A/CSKN-A/CSSN-A/CSDN-A	D63
TNMN insert	CTJN-A	D66
Toolholders for bearing machining		**D67**
RCMT insert	PRGC-BE	D67
SNMF insert	CBSN	D68
Recommended cutting conditions		**D69**

Great for high pressure coolant

Double clamp-JCT

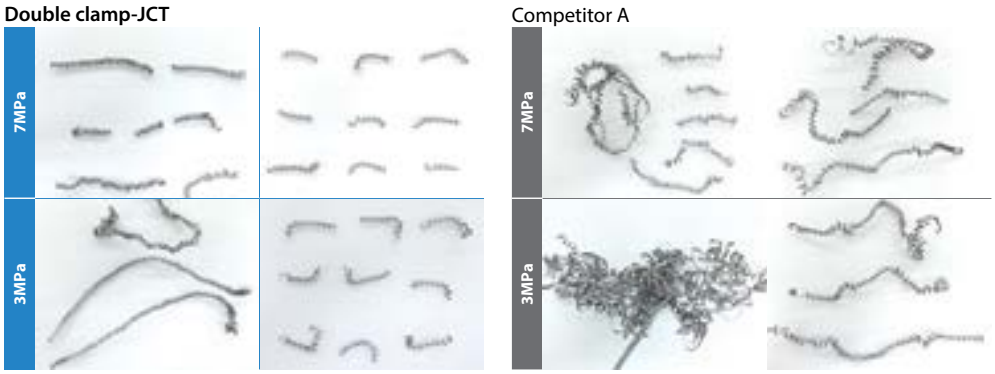
1 Superior chip control performance



Double clamp — **Firm insert clamp and easy to use in single operations**
High-density coolant supply close to the cutting edge

Unique nozzle shape — **Provides coolant to a wide area of the insert surface**

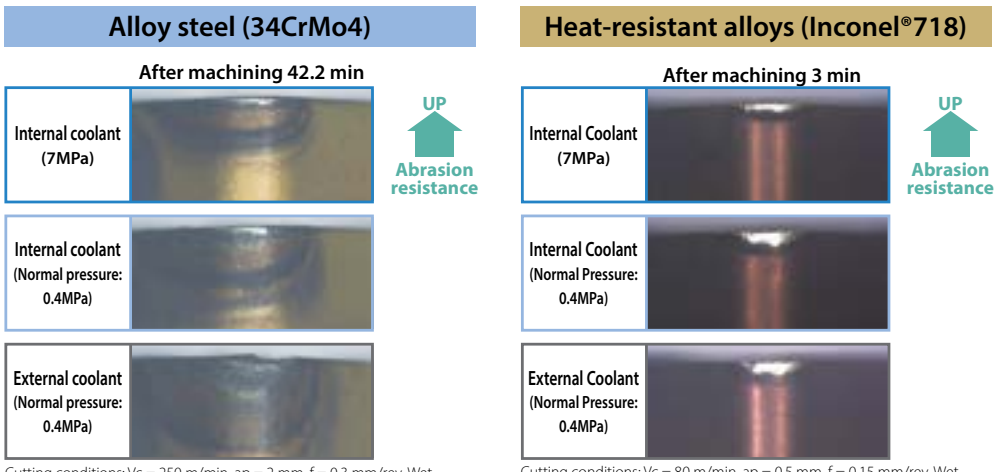
Chip control comparison (Internal evaluation)



Cutting conditions: Vc = 150 m/min, ap = 0.5 mm, Wet, CNMG120408 type Workpiece material: 15CrMo4 External turning

2 Longer tool life and high speed machining

Coolant is also directed from two directions towards the flank face of the insert to ensure even cooling action
Longer tool life and high-speed machining with improved wear resistance



Cutting conditions: Vc = 250 m/min, ap = 2 mm, f = 0.3 mm/rev, Wet
CNMG120408 type External turning

Cutting conditions: Vc = 80 m/min, ap = 0.5 mm, f = 0.15 mm/rev, Wet
CNMG120408 type External turning

Using internal coolant improves wear-resistance in alloy steel and heat-resistant alloys
High-pressure coolant is more effective

External turning toolholders identification system (Square shank)

Clamping system	
A	Back clamp
C	Top clamp
D	Double clamp
M	Multi lock
P	Pin lock or lever lock
S	Screw clamp
W	Wedge lock

Insert shape	
C	80° Rhombic
D	55° Rhombic
R	Round
S	90° Square
T	60° Triangle
V	35° Rhombic
W	80° Trigon

Hand of tool	
R	Right-hand
L	Left-hand
N	Neutral

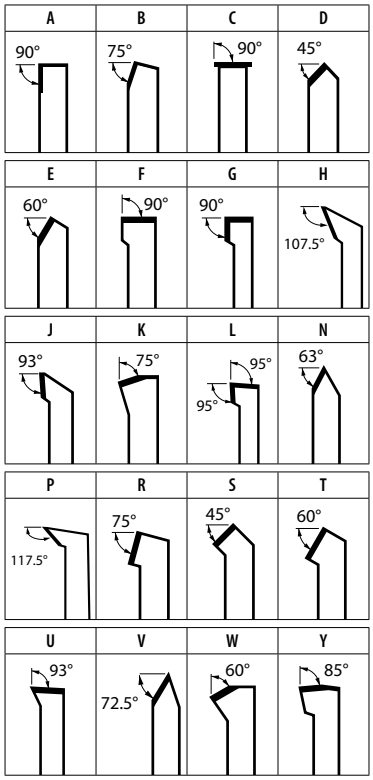
Shank height
Shank height (mm)

Shank width
Shank width (mm)

Manufacturer´s option
Optional mark or number

D	C	L	N	R	20	20	K	–	12	

Cutting edge angle



Insert relief angle



B	5° Positive
C	7° Positive
D	15° Positive
E	20° Positive
N	0° Negative
P	11° Positive

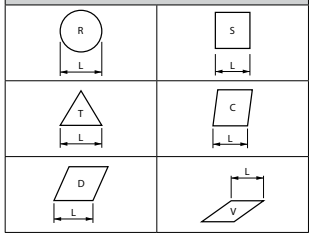
Toolholder length



(mm)

A	32	J	110	R	200
B	40	JX	120	S	250
C	50	K	125	T	300
D	60	L	140	U	350
E	70	M	150	V	400
F	80	N	160	W	450
G	90	P	170	Y	500
H	100	Q	180	X	Special

Insert size



- Specification may change without any prior notice.
- Due to the installation size contrains on the machine, the toolholder length of some products may not match with the symbol.

External Turning Toolholders

Applicable Insert Shape	CN..	WN..	TN..	DN..	RC..		RN..	VN..
Applications	External / Facing		External / Facing / Copying					External / Facing / Copying / Undercutting
Cutting Edge Angle	95°		105°	107.5°	Special			117.5°
Lever Lock (Pin Lock)	PCLN	PWLN		PDHN	PRGC	PRXC	PRGN	PVPN (Pin Lock)
See Page	**D10**	**D45**		**D17**	**D40**	**D40**	**D42**	**D38**
Wedge Lock Multi Lock		WWLN	WTKN-N					
See Page		**D46**	**D27**					
Double Clamp (Coolant-through holders)	DCLN (-JCT)	DWLN (-JCT)		DDHN				DVPN (-JCT)
See Page	**D8 / D9**	**D43 / D44**		**D15**				**D32 / D33**

Toolholders for Ceramic Tools

Applications	External / Facing			External / Copying		External / Chamfering	External / Facing / Chamfering	
Cutting Edge Angle	95°	97.5°	Special	93°	Special	45°	45°	
Top Clamp	CCLN	CELN	CRSN	CDJN	CRDN	CSDN	CSSN	
See Page	**D49**	**D51**	**D58**	**D50**	**D58**	**D54**	**D54**	

Toolholders for Solid CBN Tools

Applications	External / Facing		External / Copying	External / Chamfering	External / Facing / Chamfering	External		
Cutting Edge Angle	95°	Special	Special	45°	45°	75°		93°
Top Clamp	CCLN-A	CRSN-A	CRDN-A	CSDN-A	CSSN-A	CCRN-A	CSRN-A	CTJN-A
See Page	**D60**	**D61**	**D61**	**D64**	**D64**	**D60**	**D63**	**D66**

VN..		DN.. TN..	SN..	TN..	SN..	SN..	TN..	SN..	TN..
External / Copying			External / Chamfering		External / Facing / Chamfering	External		Facing	
72.5°	95°	93°	45°	60°	45°	75°	91°	15°	-1°
PVVN (Pin Lock)	PVLN (Pin Lock)	PDJN	PSDN		PSSN	PSBN	PTGN	PSKN	PTFN
D39	**D38**	**D16**	**D21**		**D20**	**D19**	**D24**	**D20**	**D25**
MVVN	MVLN	WTJN-N		WTEN-N					
D37	**D36**	**D27**		**D28**					
DVVN (-JCT)	DVLN (-JCT)	DDJN (-JCT)				DSBN	DTGN (-JCT)		
D34 / D35	**D30 / D31**	**D13 / D14**				**D19**	**D22 / D23**		

External			Facing		
75°	85°	93°	5°	15°	-3°
CSRN	CS-N	CTJN	CSYN	CSKN	CTUN
D52	**D52**	**D56**	**D53**	**D53**	**D56**

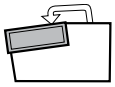
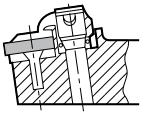
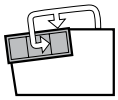
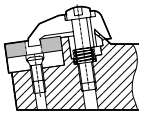
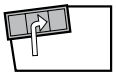
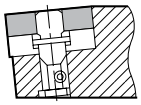
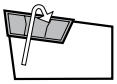
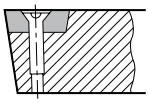
Toolholders for Bearing Machining

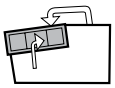
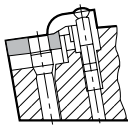
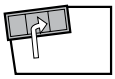
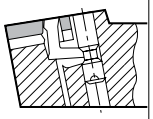
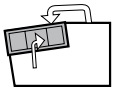
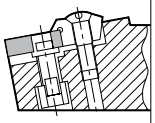
Facing
15°
CSKN-A
D63

Applications	External
Cutting Edge Angle	Special
Lever Lock	PRGC-BE
See Page	**D67**

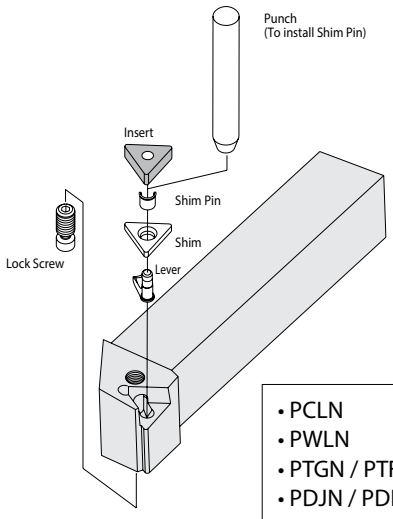
Applications	Round Chamfering
Cutting Edge Angle	Special
Top Clamp	CBSN
See Page	**D68**

Clamping systems

Series	Design		Features
Top clamp (C)			• Rigid clamping • Negative Insert: Medium to heavy machining (Mainly for ceramic insert)
Double clamp (D)			• Firmly clamp the insert in two directions with one action.
Pin lock (P)			• Easy insert replacement
Screw clamp (S)			• Simple mechanism • Fewer parts • Finishing to medium machining

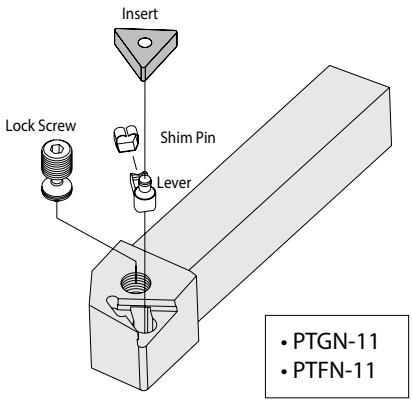
Series	Design		Features
Multi lock (M)			• Combination of top clamp and pin lock • Rigid clamping • Heavy machining
Lever lock (P)			• Easy insert replacement • General use
Wedge lock (W)			• Rigid clamping • Heavy machining

Lever lock



With shim

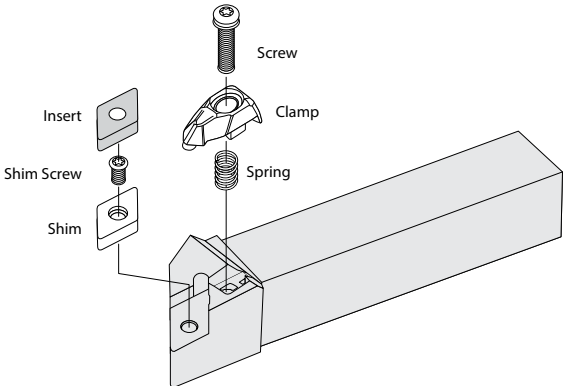
- PCLN
- PWLN
- PTGN / PTFN / PTLN
- PDJN / PDHN
- PSBN / PSKN / PSSN / PSDN
- PRGN
- PRGC / PRXC



Without shim

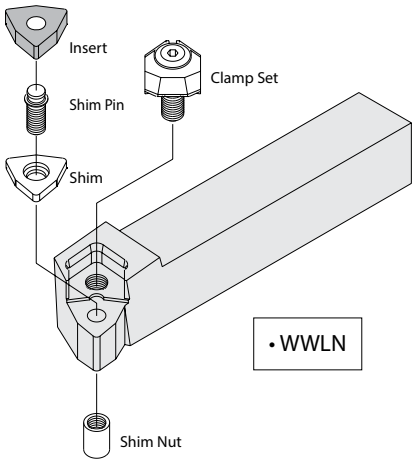
- PTGN-11
- PTFN-11

Double clamp

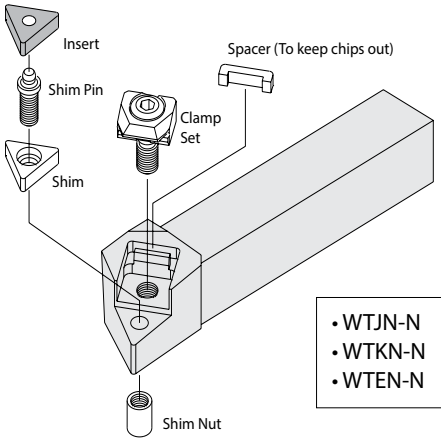


- DCLN
- DDJN / DDHN
- DSBN
- DTGN
- DVLN / DVPN / DVVN
- DWLN

Wedge lock

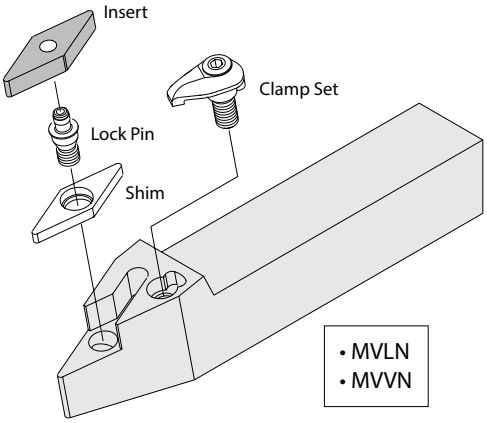


- WWLN



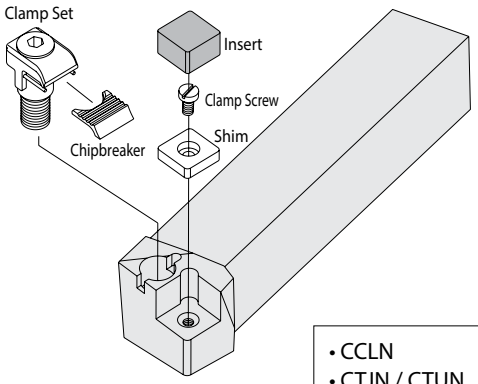
- WTJN-N
- WTKN-N
- WTEN-N

Multi lock



- MVLN
- MVVN

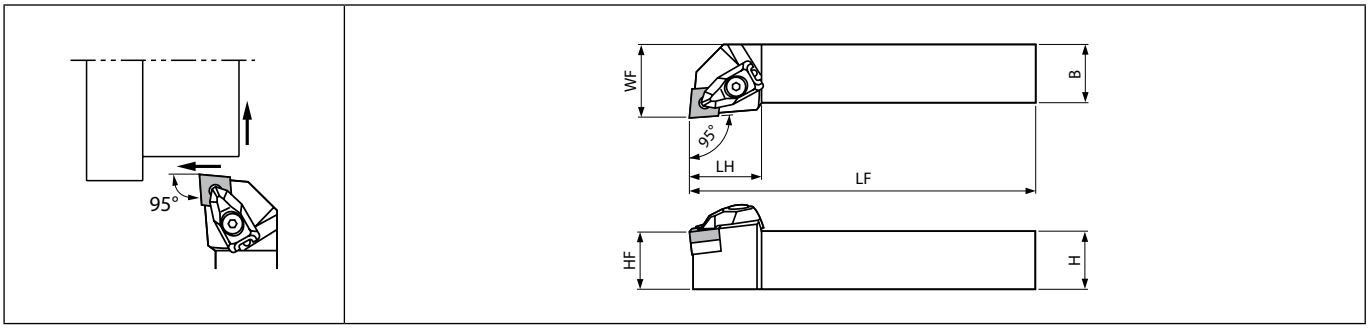
Top clamp



- CCLN
- CTJN / CTUN
- CDHN / CDJN
- CELN
- CSRN / CS-N / CSKN
- CSYN / CSSN / CSDN
- *CRSN / *CRDN

*Chipbreaker is not included

DCLN (External turning / External facing)



Right-hand shown

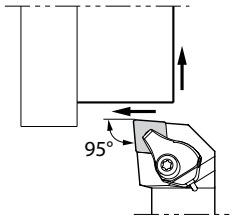
Toolholder dimensions

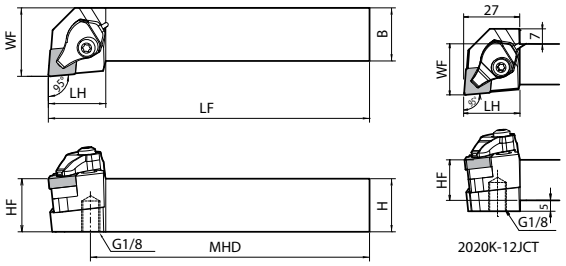
Description	Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts							Applicable inserts
												Clamp	Screw (for clamp)	Spring	Wrench (for clamp)	Shim	Screw (for shim)	Wrench* (for shim)	
	R	L	H	B	LH	HF	LF	WF											
DCLN[R/L] 2020K-12	●	●	20	20	33	20	125	25	0.8	-6	-6	CP-3D	CS-3D	SP-3D	LW-3	DC-44 (DC-44-C*)	SB-4085TR	FT-15	CN□A1204... CN□G1204... CN□M1204...
2525M-12	●	●	25	25	32	25	150	32											

When using inserts whose corner-R(RE) is greater than 1.6 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.
When using the inserts with SX chipbreaker, prepare a shim (-C type) separately.
Wrench (FT-15) is sold separately.
Recommended tightening torque : 3.9N·m

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DCLN-JCT (External turning / External facing, Coolant-through holders)





Right-hand shown | with coolant supply | Applicable pressure : ~30MPa

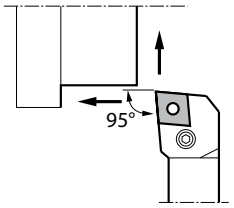
Toolholder dimensions

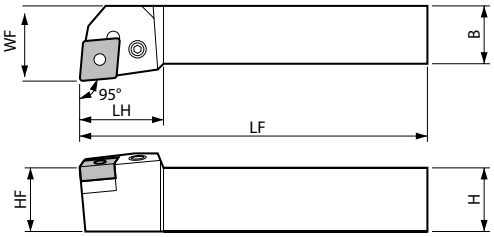
Description	Availability		Dimension (mm)							Standard corner-R(RE)	Coolant hole	Side rake angle (°)	Inclination angle (°)	Spare parts							Applicable inserts
														Clamp	Pipe connection	Screw (for clamp)	Screw (for shim)	Shim	Spring	Wrench	
	R	L	H	B	LH	MHD	HF	LF	WF												
DCLN[R/L] 2020K-12JCT	●	●	20	20	27	109	20	125	25	0.8	Yes	-6	-6	CP-3D-[R/L]-JCT	FP-12	CS-3D-TR	SB-4085TR	DC-44 (DC-44-C*)	SP-3D	FT-15	CN□A1204... CN□G1204... CN□M1204...
2525M-12JCT	●	●	25	25		134	25	150	32												

When using inserts whose corner-R(RE) is greater than 1.6 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.
When using the inserts with SX chipbreaker, prepare a shim (-C type) separately.
Clamp : CP-3D-R-JCT for Right-hand Toolholder, CP-3D-L-JCT for Left-hand Toolholder.
Please see page **D12** for piping parts of coolant-through holders.
Only the O-ring (SS-035) included with the pipe connection can be ordered.
Recommended tightening torque : 3.9N·m

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

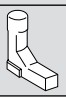
PCLN (External turning / External facing)





Right-hand shown

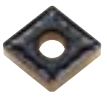
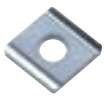
Toolholder dimensions

Description	Availability R	Availability L	Dimension (mm) H	B	LH	HF	LF	WF	Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts: Lever	Lock screw	Punch	Shim pin	Shim	Wrench	Wrench	Applicable inserts
																			
PCLN□/L 1616H-09	●	●	16	16	22	16	100	20	0.8	-6	-6	LL-1N	LS-1N	PC-1	LSP-1	LC-32N	-	FH-2.5	CN□G0904...
2020K-09	●	●	20	20		20	125	25											
2525M-09	●	●	25	25		25	150	32											
PCLN□/L 2020H-12	●		20	20	27	20	100	25	0.8	-6	-6	LL-2N	LS-2N	PC-2	LSP-2	LC-42N (LC-42N-C*) (LC-42N-20*)	LW-3	-	CN□A1204... CN□G1204... CN□M1204...
2020K-12	●	●					125												
2525M-12	●	●	25	25		25	150	32											
3225P-12	●	●	32			32	170												
PCLN□/L 2525M-16	●	●	25	25	32	25	150	32	0.8	-6	-6	LL-5N	LS-4N	-	LSP-3	LC-53N (LC-53N-C*)	LW-3	-	CNMG1606... CNMM1606...
3232P-16	●	●	32	32		32	170	40											
PCLN□/L 3232P-19	●	●	32	32	40	32	170	40	1.6	-6	-6	LL-6	LS-5	-	LSP-4	LC-63 (LC-63-C*)	LW-4	-	CNMG1906... CNMM1906...

When using inserts whose corner-R(RE) is greater than 1.6 mm, please purchase a shim and use it in order to prevent workpiece and shim from interfering each other.
When using the inserts with SX chipbreaker, prepare a shim (-C type) separately.

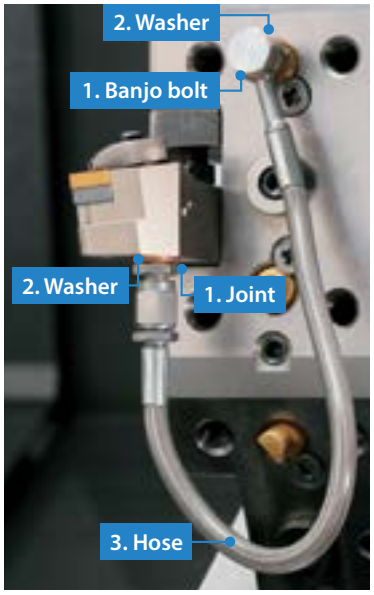
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts

Applications	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Finishing	Finishing	Finishing - Medium	Finishing - Medium
Insert								
Chipbreaker type	WF	WP	WE	WQ	PP	GP	PQ	HQ
Page	B16	B16	B16	B16	B16	B16	B16	B17
Applications	Finishing - Medium	Finishing - Medium	Medium	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing
Insert								
Chipbreaker type	CQ	CJ	TN-V	PMG	GS	PG	PS	PT
Page	B17	B17	B17	B17	B17	B18	B18	B18
Applications	Medium - Roughing	Roughing	Roughing	Roughing	Finishing	Medium	Medium - Roughing	Medium - Roughing
Insert								
Chipbreaker type	GT	STD	PH	PX	R/L-S	R/L	R/L-25R	Z
Page	B18	B18	B19	B19	B23	B23	B23	B23
Applications	Low carbon steel	Low carbon steel	Low carbon steel	Low carbon steel	Finishing - Medium	Medium - Roughing	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys
Insert								
Chipbreaker type	XF	XP	XQ	XS	SK	FP-TK	TK	MQ
Page	B19	B19	B19	B20	B20	B20	B20	B20
Applications	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron
Insert								
Chipbreaker type	MS	MU	KQ	KG	KH	C	ZS	GC
Page	B21	B21	B22	B22	B22	B22	B22	B22
Applications	Cast iron	Cast iron / Hard materials	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Heat-resistant alloys	Heat-resistant alloys	Heat-resistant alloys
Insert								
Chipbreaker type	No CB	Ceramic	R/L-A3	AH	PCD	SQ	SG	R/L-SX
Page	B22	B113	B23	B23	C34	B20	B21	B21
Applications	Hard materials / Cast iron	Hard materials	Hard materials	Hard materials				
Insert								
Chipbreaker type	CBN	HH	HL	HD				
Page	C8	C9	C9	C9				

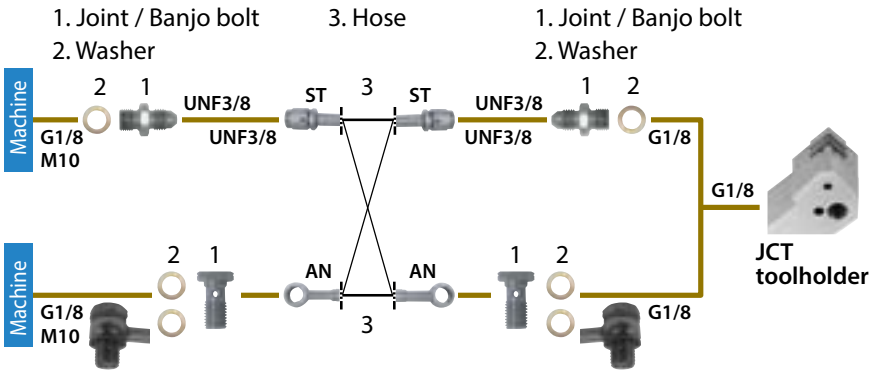
Recommended cutting conditions D69~D70

Easy connection with high pressure hose and joint



- **Even without a high pressure pump, internal coolant can be used at a normal pressure**
- **Banjo bolt available for angled hose connection. Can be used in a variety of machines**

Piping installation guide

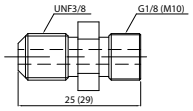
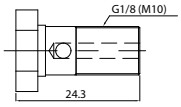


Piping parts

Optional piping parts available (sold separately)
Choose from parts below to match your machine specifications
1. Joint / Banjo bolt × 2 2. Washer × 2-4 3. Hose × 1

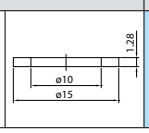
1. Joint / Banjo bolt

Applicable pressure: ~ 30 MPa

Shape		Description	Availability	Thread standard Thread connection to the machine
		J-G1/8-UNF3/8	●	G1/8
		J-M10X1.5-UNF3/8	●	M10X1.5
Banjo bolt (For the angle hose) 		BB-G1/8	●	G1/8
		BB-M10X1.5	●	M10X1.5

2. Washer

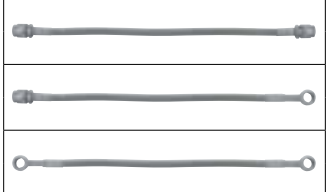
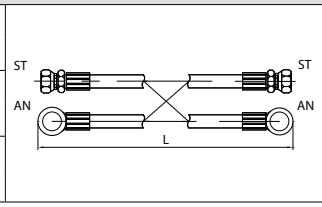
Applicable pressure: ~ 30 MPa

Shape		Description	Availability
		WS-10	●

* Use 2 washers for a banjo bolt

3. Hose

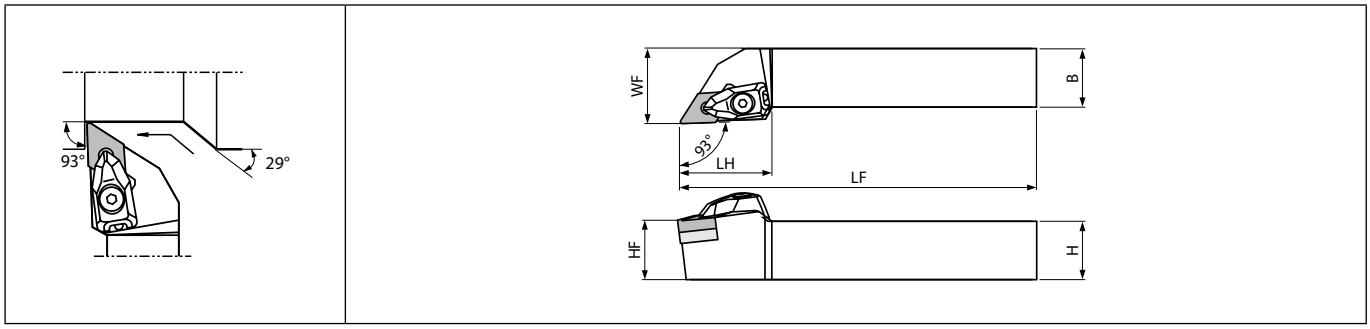
Applicable pressure: ~ 30 MPa

Shape		Description	Availability	Thread standard		Dimensions (mm) L
		HS-ST-ST-200	●	UNF3/8	UNF3/8	200
		HS-ST-ST-250	●			250
		HS-ST-AN-200	●	UNF3/8	– Banjo bolt	200
		HS-ST-AN-250	●			250
		HS-AN-AN-200	●	– Banjo bolt	– Banjo bolt	200
		HS-AN-AN-250	●			250

Precautions
1. Make sure machine door is completely closed before use of these parts.
2. Use appropriate seal for the male thread of the piping parts and make sure the connection is secure. Use plugs to seal off unused coolant holes.
3. Connect and fasten the coolant hose firmly.
4. The use of copper washers may cause leakage but will have no effect on the performance.
5. Commercial piping parts can be used if the thread standards are same. Check the applicable pressure before use.
6. Regularly changing the coolant filter is recommended.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DDJN (External turning / External copying)



Right-hand shown

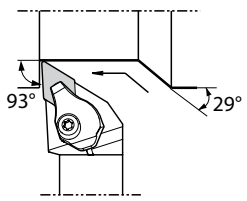
Toolholder dimensions

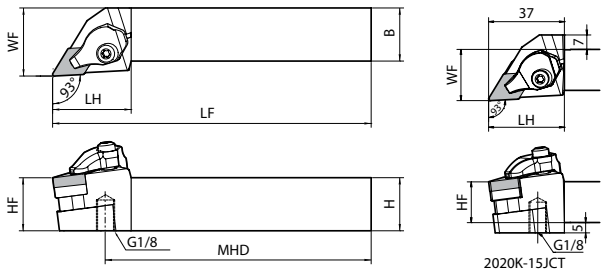
Description		Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts							Applicable inserts
													Clamp	Screw (for clamp)	Spring	Wrench (for clamp)	Shim	Screw (for shim)	Wrench* (for shim)	
		R	L	H	B	LH	HF	LF	WF											
DDJN□/L	2020K-1504	●	●	20	20	39	20	125	25	0.8	-6	-6	CP-3D	CS-3D	SP-3D	LW-3	DD-44 (DD-43*)	SB-4085TR	FT-15	DN□A1504... DN□G1504... DN□M1504... DN□X1504...
	2525M-1504	●	●	25	25		25	150	32											
	2020K-1506	●	●	20	20	39	20	125	25	0.8	-6	-6					DD-43 (DD-44*)			DN□A1506... DN□G1506... DN□M1506... DN□X1506...
	2525M-1506	●	●	25	25		25	150	32											

Shims indicated * are not included with the toolholder. To change insert thickness, please purchase it separately.
When using inserts whose corner-R(RE) is greater than 1.6 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.
When using the insert with WF chipbreaker, tool edge offset or program corrections are required on **R34** and **R35**.
Wrench (FT-15) is sold separately.
Recommended tightening torque : 3.9N·m

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

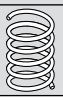
DDJN-JCT (External turning / External copying, Coolant-through holders)





Right-hand shown | with coolant supply | Applicable pressure : ~30MPa

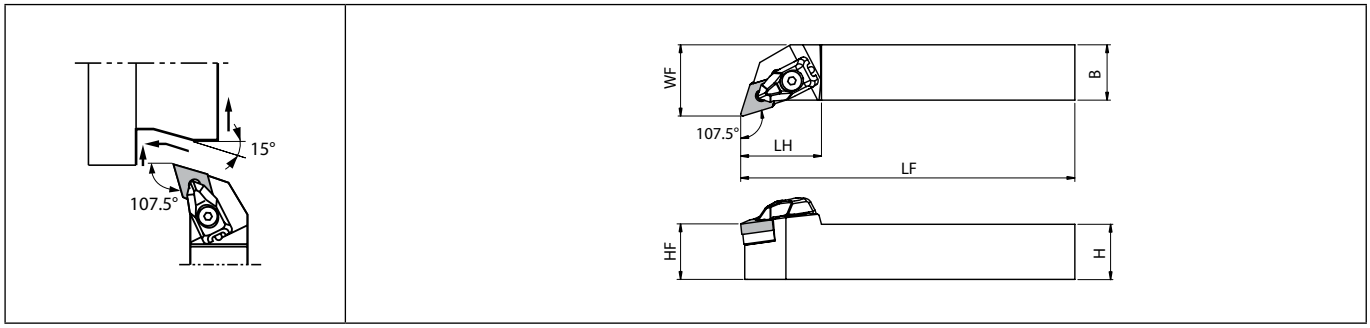
Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Coolant hole	Side rake angle (°)	Inclination angle (°)	Spare parts							Applicable inserts
														Clamp	Pipe connection	Screw (for clamp)	Screw	Shim	Spring	Wrench	
	R	L	H	B	LH	MHD	HF	LF	WF												
DDJN[R/L] 2020K-15JCT	●	●	20	20	37	101	20	125	25	0.8	Yes	-6	-7	CP-4D-[R/L]-JCT	FP-12	CS-3D-TR	SB-4085TR	DD-44 (DD-43*)	SP-3D	FT-15	DN□A1504... DN□G1504... DN□M1504... DN□X1504...
2525M-15JCT	●	●	25	25		126	25	150	32												

Shims indicated * are not included with the toolholder. To change insert thickness, please purchase it separately.
When using inserts whose corner-R(RE) is greater than 1.6 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.
When using the insert with WF chipbreaker, tool edge offset or program corrections are required on **R34** and **R35**.
Please see page **D12** for piping parts of coolant-through holders.
Clamp : CP-4D-R-JCT for Right-hand Toolholder, CP-4D-L-JCT for Left-hand Toolholder.
Only the O-ring (SS-035) included with the pipe connection can be ordered.
Recommended tightening torque : 3.9N·m

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DDHN (External turning / External facing / External copying)



Right-hand shown

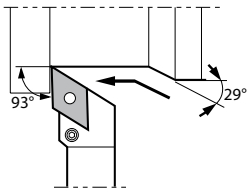
Toolholder dimensions

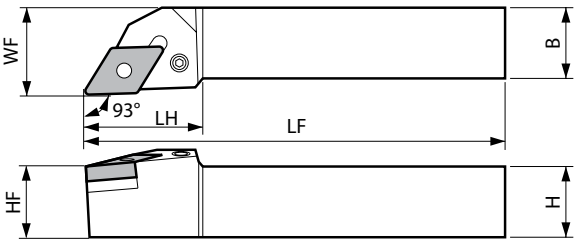
Description	Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts							Applicable inserts
												Clamp	Screw (for clamp)	Spring	Wrench (for clamp)	Shim	Screw (for shim)	Wrench* (for shim)	
	R	L	H	B	LH	HF	LF	WF											
DDHN R/L 2020K-1504	●	●	20	20	37	20	125	25	0.8	-6	-6	CP-3D	CS-3D	SP-3D	LW-3	DD-44 (DD-43*)	SB-4085TR	FT-15	DN□A1504... DN□G1504... DN□M1504...
2525M-1504	●	●	25	25		25	150	32											
2020K-1506	●	●	20	20	37	20	125	25	0.8	-6	-6					DD-43 (DD-44*)			DN□A1506... DN□G1506... DN□M1506...
2525M-1506	●	●	25	25		25	150	32											

Shims indicated * are not included with the toolholder. To change insert thickness, please purchase it separately.
When using inserts whose corner-R(RE) is greater than 1.6 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.
Wrench (FT-15) is sold separately.
The insert with WF chipbreaker is not applicable for DDHN type toolholder.
Recommended tightening torque : 3.9N·m

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

PDJN (External turning / External copying)





Right-hand shown

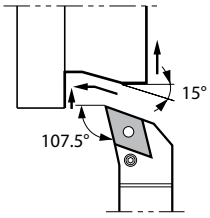
Toolholder dimensions

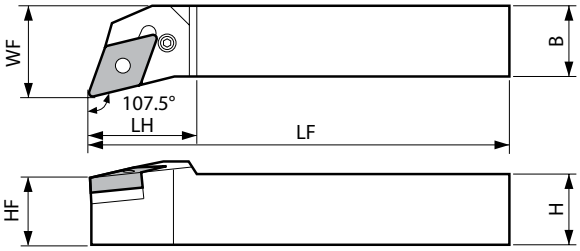
Description		Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts							Applicable inserts
													Lever	Lock screw	Punch	Shim pin	Shim	Wrench	Wrench	
		R	L	H	B	LH	HF	LF	WF											
PDJN$^{R}_{L}$	1616H-11	●	●	16	16	28	16	100	20	0.4	-6	-7	LL-1DN	LS-1N	PC-1	LSP-1	LD-32N	-	FH-2.5	DN□G1104...
	2020K-11	●	●	20	20		20	125	25											
	2525M-11	●	●	25	25		25	150	32											
PDJN$^{R}_{L}$	2020K-15	●	●	20	20	36	20	125	25	0.8	-6	-7	LL-3N	LS-2N	PC-2	LSP-2	LD-42 (LD-42-20*)	LW-3	-	DN□A1504... DN□G1504... DN□M1504... DNMX1504...
	2525M-15	●	●	25	25		25	150	32											
	3225P-15	●	●	32			32	170												
	2525M-15U	●	●	25	25	34	25	150	32				LL-4N	LS-3			LD-42 (LD-42-20*) (LD-43**) (LD-43-20**)			DN□A1506... DN□G1506... DN□M1506... DNMX1506...
	3232P-15U	●	●	32	32	36	32	170	40											

When using inserts whose corner-R(RE) is greater than 1.6 mm, please purchase a shim* and use it in order to prevent workpiece and shim from interfering each other.
Shim : PDJN$^{R}_{L}$-15U . . . LD-42 is attached to PDJN$^{R}_{L}$-15U. When using DN□□1504 type insert, please purchase LD-43 (or LD-43-20 when using inserts whose corner-R(RE) is greater than 1.6mm) separately.
When using the insert with WF chipbreaker, tool edge offset or program corrections are required on **R34** and **R35**.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

PDHN (External turning / External facing / External copying)





Right-hand shown

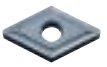
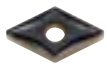
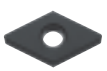
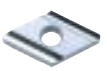
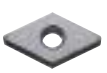
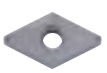
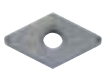
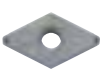
Toolholder dimensions

Description	Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts
												Lever	Lock screw	Punch	Shim pin	Shim	Wrench	
	R	L	H	B	LH	HF	LF	WF										
PDHN R/L 2020K-15	●	●	20	20	35	20	125	25	0.8	-6	-6	LL-4N	LS-3	PC-2	LSP-2	LD-43 (LD-43-20*) (LD-42**) (LD-42-20**)	LW-3	DN□A1504... DN□G1504... DN□M1504...
2525M-15	●	●	25	25	34	25	150	32										

When using inserts whose corner-R(RE) is greater than 1.6 mm, please purchase a shim* and use it in order to prevent workpiece and shim from interfering each other.
Shim : PDHN . . .LD-43 is attached to PDHN. When using DN□□1506 type Insert, please purchase LD-42 (or LD-42-20 when using inserts whose corner-R(RE) is greater than 1.6mm) separately.
The insert with WF chipbreaker is not applicable for PDHN type toolholder.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

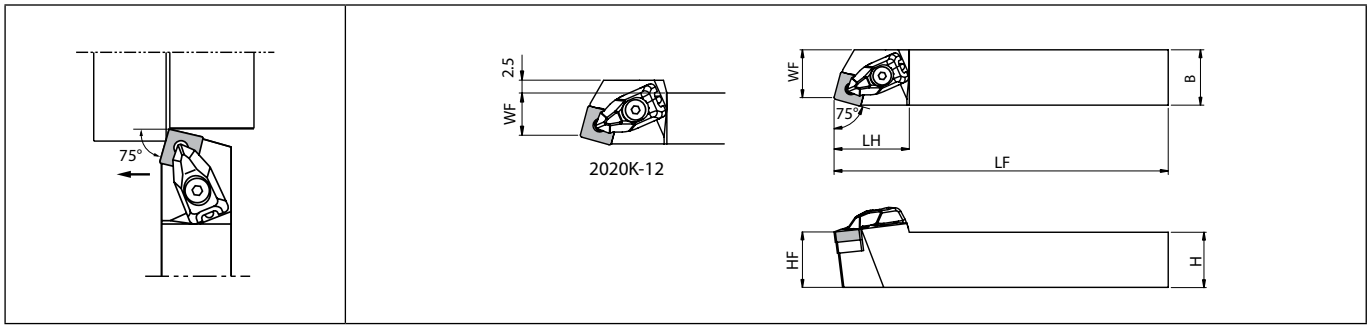
Applicable inserts (DDJN / DDJN-JCT / DDHN / PDJN / PDHN)

Applications	Finishing	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Finishing - Medium	Finishing - Medium	Medium
Insert								
Chipbreaker type	WF*	PP	GP	PQ	HQ	CQ	CJ	TN-V
Page	B24	B24	B24	B24	B25	B25	B25	B25
Applications	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Roughing	Roughing
Insert								
Chipbreaker type	PMG	GS	PG	PS	PT	GT	STD	PH
Page	B25	B25	B26	B26	B26	B26	B27	B27
Applications	Roughing	Finishing	Medium	Low carbon steel	Low carbon steel	Low carbon steel	Low carbon steel	Finishing - Medium
Insert								
Chipbreaker type	PX	R/L-S	R/L	XF	XP	XQ	XS	SK
Page	B27	B31	B31	B27	B27	B27	B27	B28
Applications	Large ap	Medium - Roughing	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Cast iron	Cast iron
Insert								
Chipbreaker type	R-LD	FP-TK	TK	MQ	MS	MU	KQ	KG
Page	B28	B28	B28	B28	B29	B29	B30	B30
Applications	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron / Hard materials	Non-ferrous metals	Non-ferrous metals
Insert								
Chipbreaker type	KH	C	ZS	GC	No CB	Ceramic	R/L-A3	AH
Page	B30	B30	B30	B30	B31	B114	B31	B31
Applications	Non-ferrous metals	Heat-resistant alloys	Heat-resistant alloys	Hard materials / Cast iron	Hard materials	Hard materials	Hard materials	
Insert								
Chipbreaker type	PCD	SQ	SG	CBN	HH	HL	HD	
Page	C35	B29	B29	C10	C11	C11	C11	

When using the insert with WF chipbreaker, tool edge offset or program corrections are required on **R34** and **R35**.
The insert with WF chipbreaker is not applicable for DDHN type and PDHN type toolholder.

Recommended cutting conditions **D69~D70**

DSBN (External turning)



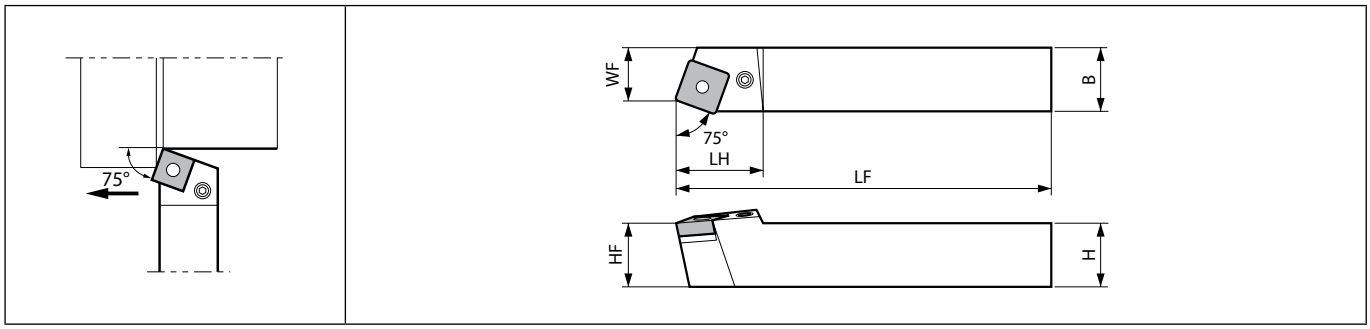
Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts							Applicable inserts
												Clamp	Screw (for clamp)	Spring	Wrench (for clamp)	Shim	Screw (for shim)	Wrench* (for shim)	
	R	L	H	B	LH	HF	LF	WF											
DSBN R/L 2020K-12	●	●	20	20	34	20	125	17	0.8	-4	-7	CP-3D	CS-3D	SP-3D	LW-3	DS-44	SB-4085TR	FT-15	SN□A1204... SN□G1204... SN□M1204...
2525M-12	●	●	25	25		25	150	22											

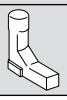
Wrench (FT-15) is sold separately.
When using inserts whose corner-R(RE) is greater than 1.6 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.
Recommended tightening torque : 3.9N·m

PSBN (External turning)



Right-hand shown

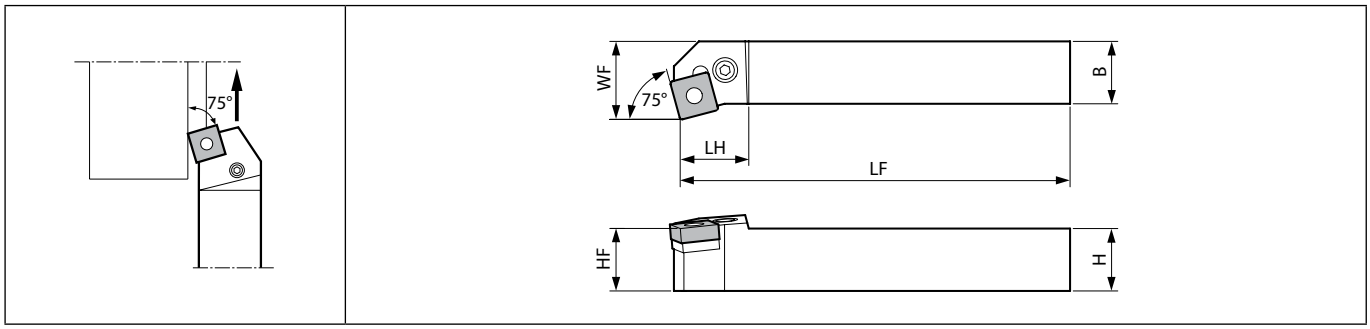
Toolholder dimensions

Description	Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts
												Lever	Lock screw	Punch	Shim pin	Shim	Wrench	
	R	L	H	B	LH	HF	LF	WF										
PSBN R/L 2020K-12	●	●	20	20	27	20	125	17	0.8	-4	-7	LL-2N	LS-2N	PC-2	LSP-2	LS-42	LW-3	SN□A1204... SN□G1204... SN□M1204...
2525M-12	●	●	25	25	24	25	150	22										

When using inserts whose corner-R(RE) is greater than 1.6 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

PSKN (External facing)



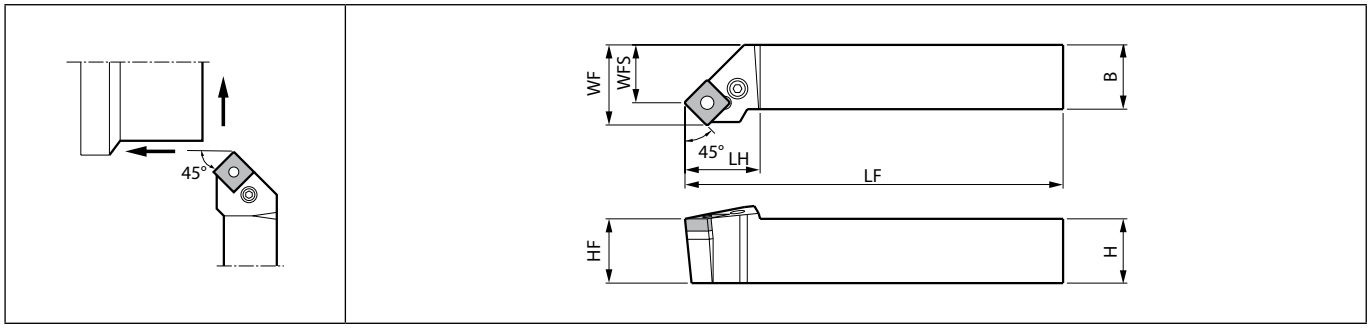
Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts
												Lever	Lock screw	Punch	Shim pin	Shim	Wrench	
	R	L	H	B	LH	HF	LF	WF										
PSKN$^{R}_{L}$ 2020K-12	●	●	20	20	22.5	20	125	25	0.8	-4	-7	LL-2N	LS-2N	PC-2	LSP-2	LS-42	LW-3	SN□A1204... SN□G1204... SN□M1204...
2525M-12	●	●	25	25		25	150	32										

When using inserts whose corner-R(RE) is greater than 1.6 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.
PSKN$^{R}_{L}$: Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

PSSN (External turning / External facing / External chamfering)



Right-hand shown

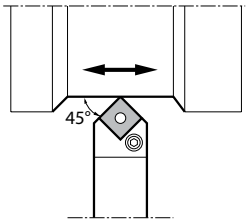
Toolholder dimensions

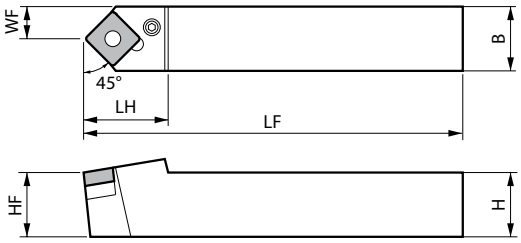
Description	Availability		Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts							Applicable inserts
													Lever	Lock screw	Punch	Shim pin	Shim	Wrench	Wrench	
	R	L	H	B	LH	HF	LF	WF	WFS											
PSSN$^{R}_{L}$ 1616H-09	●	●	16	16	22	16	100	20	13.6	0.8	-8	0	LL-1N	LS-1N	PC-1	LSP-1	LS-32	-	FH-2.5	SN□G0903...
PSSN$^{R}_{L}$ 2020K-12	●	●	20	20	29	20	125	25	16.4	0.8	-8	0	LL-2N	LS-2N	PC-2	LSP-2	LS-42	LW-3	-	SN□A1204... SN□G1204...
2525M-12	●	●	25	25		25	150	32	23.4											SN□M1204...

When using inserts whose corner-R(RE) is greater than 1.6 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.
PSSN$^{R}_{L}$: When using handed inserts,For External Turning, Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.
For Facing, Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

PSDN (External turning / External chamfering)





Toolholder dimensions

Description	Availability	Dimension (mm)						Standard corner-R(RE)	Back rake angle (°)	Spare parts							Applicable inserts
										Lever	Lock screw	Punch	Shim pin	Shim	Wrench	Wrench	
	N	H	B	LH	HF	LF	WF										
PSDNN 1616H-09	●	16	16	21	16	100	8	0.8	-8.5	LL-1N	LS-1N	PC-1	LSP-1	LS-32	-	FH-2.5	SN□G0903...
PSDNN 2020K-12	●	20	20	30	20	125	10	0.8	-8.5	LL-2N	LS-2N	PC-2	LSP-2	LS-42	LW-3	-	SN□A1204... SN□G1204... SN□M1204...
2525M-12	●	25	25		25	150	12.5										

When using inserts whose corner-R(RE) is greater than 1.6 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.

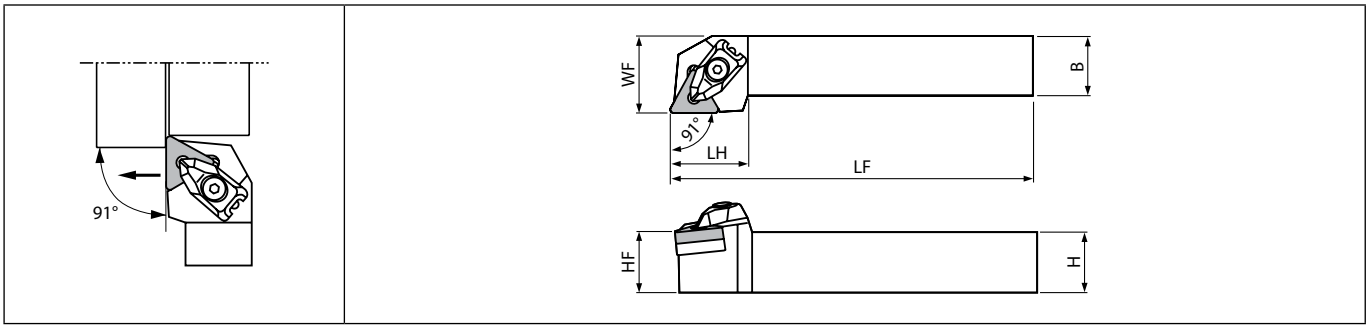
Applicable inserts (DSBN / PSBN / PSKN / PSSN / PSDN)

Applications	Finishing - Medium	Finishing - Medium	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Roughing	Roughing
Insert								
Chipbreaker type	PQ	HQ	PMG	PG	PS	PT	STD	PH
Page	B33	B33	B33	B33	B33	B33	B33	B34
Applications	Roughing	Finishing - Medium	Medium - Roughing	Medium - Roughing	Low carbon steel	Low carbon steel	Low carbon steel	Stainless steel / Heat-resistant alloys
Insert								
Chipbreaker type	PX	R/L-B	R/L-C	R/L-25R	XP	XQ	XS	MQ
Page	B34	B36	B36	B36	B34	B34	B34	B35
Applications	Stainless steel / Heat-resistant alloys	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron / Hard materials
Insert								
Chipbreaker type	MS	KG	KH	C	ZS	GC	No CB	Ceramic
Page	B35	B35	B35	B35	B36	B36	B36	B117
Applications	Heat-resistant alloys	Hard materials / Cast iron						
Insert								
Chipbreaker type	SG	CBN						
Page	B35	C12						

Recommended cutting conditions D69~D70

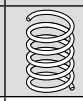
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DTGN (External turning)



Right-hand shown

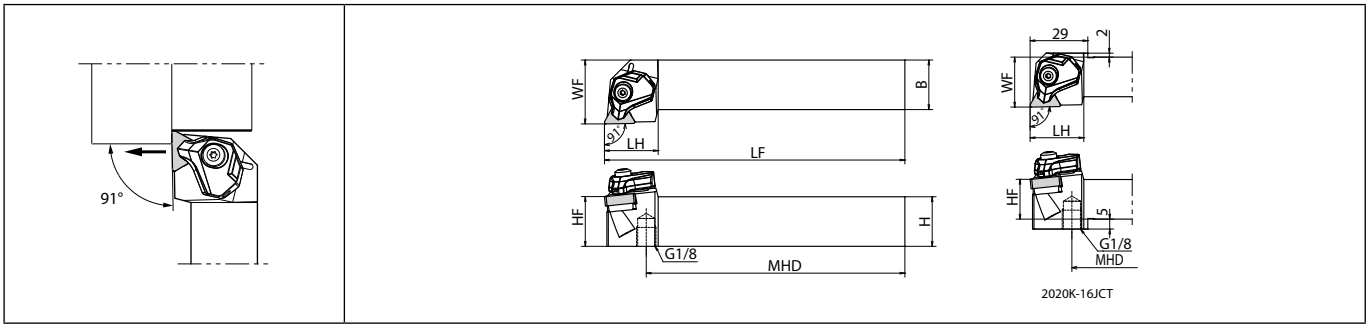
Toolholder dimensions

Description	Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts							Applicable inserts
												Clamp	Screw (for clamp)	Screw	Shim	Spring	Wrench	Wrench*	
	R	L	H	B	LH	HF	LF	WF											
DTGN□ 2020K-16	●	●	20	20	25	20	125	25	0.8	-6	-6	CP-2D	CS-2D	SB-3080TR	DT-32	SP-2D	LW-2.5	FT-10	TN□A1604... TN□G1604... TN□M1604... TN□X1604...
2525M-16	●	●	25	25		25	150	32											

When using inserts whose corner-R(RE) is greater than 1.6 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.
When using the insert with WF chipbreaker, tool edge offset or program corrections are required on **R34** and **R35**.
Wrench (FT-10) is sold separately.
Recommended tightening torque : 1.7N·m

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

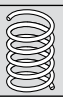
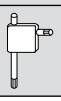
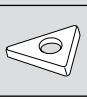
DTGN-JCT (External turning, Coolant-through holders)



Right-hand shown | with coolant supply | Applicable pressure : ~30MPa

Toolholder dimensions

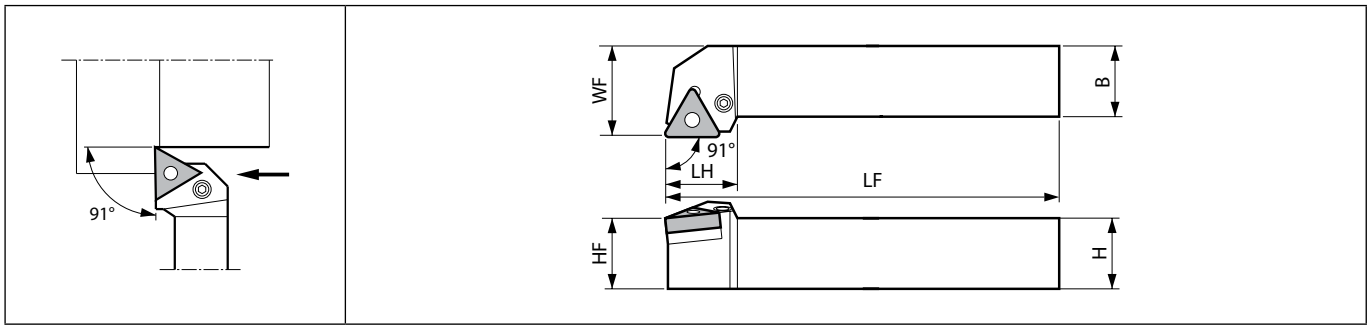
Description		Availability		Dimension (mm)							Standard corner-R(RE)	Coolant hole	Side rake angle (°)	Inclination angle (°)	Applicable inserts
		R	L	H	B	LH	MHD	HF	LF	WF					
DTGN$^{R}_{L}$	2020K-16JCT	●	●	20	20	27	104	20	125	25	0.8	Yes	-6	-6	TN□A1604... TN□G1604... TN□M1604... TNMX1604...
	2525M-16JCT	●	●	25	25		129	25	150	32					

Description		Spare parts							
		Clamp	Screw (for clamp)	Spring	Wrench (for clamp)	Shim	Screw (for shim)	Wrench* (for shim)	Pipe connection
									
DTGN$^{R}_{L}$	2020K-16JCT 2525M-16JCT	CP-2D-$^{R}_{L}$-JCT	CS-3D-TR	SP-3D	FT-15	DT-32	SB-3080TR	FT-10	FP-12

When using inserts whose corner-R(RE) is greater than 1.6 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.
When using the insert with WF chipbreaker, tool edge offset or program corrections are required on **R34** and **R35**.
Wrench (FT-10) is sold separately.
Please see page **D12** for piping parts of coolant-through holders.
Only the O-ring (SS-035) included with the pipe connection can be ordered.
Recommended tightening torque : 3.9N·m

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

PTGN (External turning)



Right-hand shown

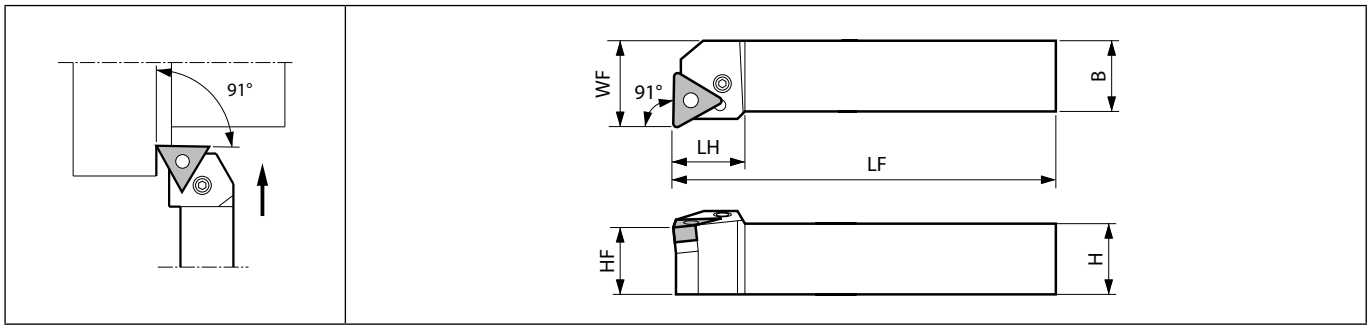
Toolholder dimensions

Description	Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts								Applicable inserts
												Lever	Lock screw	Punch	Shim pin	Shim pin	Shim	Wrench	Wrench	
	R	L	H	B	LH	HF	LF	WF												
PTGN□/L 1212F-11	●	●	12	12	18	12	80	16	0.8	-6	-6	LL-03N	LS-03N	-	-	P-03	-	-	FH-2	TNGG/A1103...
1616H-11	●		16	16	22	16	100	20				LL-03TN	LS-03SN			P-03S			FH-2.5	TNGG1104... TNMG1104...
2020K-11	●	●	20	20		20	125	25												
2525M-11	●	●	25	25		25	150	32												
PTGN□/L 1616H-16	●	●	16	16	24	16	100	20	0.8	-6	-6	LL-1N	LS-1N	PC-1	LSP-1	-	LT-32N (LT-32N-20*)	-	FH-2.5	TN□A1604... TN□G1604... TN□M1604... TNMX1604...
2020H-16	●		20	20		20		25												
2020K-16	●	●					125													
2525M-16	●	●	25	25		25	150	32												
PTGN□/L 2525M-22	●	●	25	25	29	25	150	32	0.8	-6	-6	LL-2N	LS-2N	PC-2	LSP-2	-	LT-42N (LT-42N-20*)	LW-3	-	TN□G2204... TN□M2204...

When using inserts whose corner-R(RE) is greater than 1.6 mm, please purchase a shim* and use it in order to prevent workpiece and shim from interfering each other.
When using the insert with WF chipbreaker, tool edge offset or program corrections are required on **R34** and **R35**.
PTGN□/L1212F-11 : TNGA1103 and TNGG1103 type Inserts are applicable.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

PTFN (External facing)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts								Applicable inserts
												Lever	Lock screw	Punch	Shim pin	Shim pin	Shim	Wrench	Wrench	
	R	L	H	B	LH	HF	LF	WF												
PTFN R/L 1212F-11	●	●	12	12	15	12	80	16	0.8	-6	-6	LL-03N	LS-03N	-	-	P-03	-	-	FH-2	TN□□1103...
1616H-11	●	●	16	16	22.5	16	100	20				LL-03TN	LS-03SN			P-03S			FH-2.5	TN□□1104...
2020K-11	●		20	20		20	125	25												
2525M-11	●	●	25	25		25	150	32												
PTFN R/L 2020K-16	●	●	20	20	22	20	125	25	0.8	-6	-6	LL-1N	LS-1N	PC-1	LSP-1	-	LT-32N (LT-32N-20*)	-	FH-2.5	TN□A1604... TN□G1604... TN□M1604... TNMX1604...
2525M-16	●	●	25	25	23	25	150	32												
PTFN R/L 2525M-22	●	●	25	25	28	25	150	32	0.8	-6	-6	LL-2N	LS-2N	PC-2	LSP-2	-	LT-42N (LT-42N-20*)	LW-3	-	TN□G2204... TN□M2204...

When using inserts whose corner-R(RE) is greater than 1.6 mm, please purchase a shim* and use it in order to prevent workpiece and shim from interfering each other.
When using the insert with WF chipbreaker, tool edge offset or program corrections are required on **R34** and **R35**.
PTFN R/L 1212F-11 : TNGA1103 and TNGG1103 type inserts are applicable.
PTFN R/L : Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

D

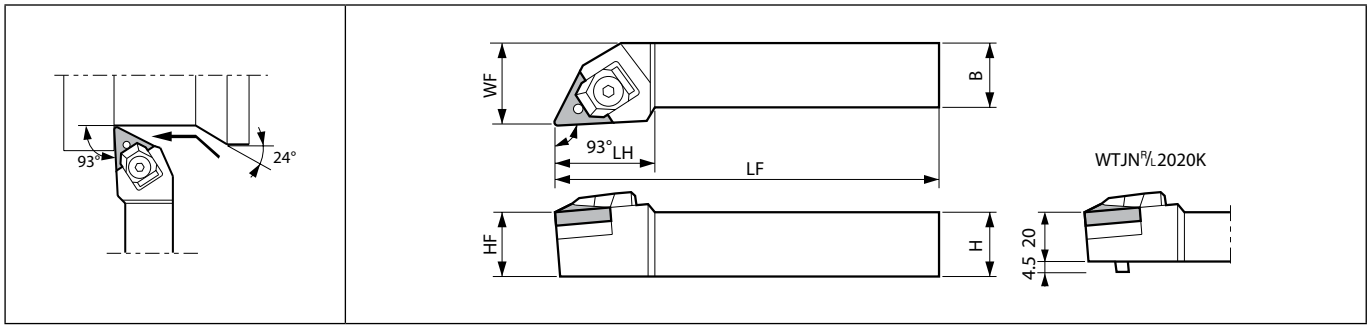
External turning

Applicable inserts (DTGN / DTGN-JCT / PTGN / PTFN)

Applications	Finishing	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Finishing - Medium	Medium - Roughing	Medium - Roughing
Insert								
Chipbreaker type	WF	PP	GP	PQ	HQ	CQ	PMG	GS
Page	B38	B38	B38	B38	B38	B38	B39	B39
Applications	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Roughing	Roughing	Roughing	Finishing
Insert								
Chipbreaker type	PG	PS	PT	GT	STD	PH	PX	R/L-SSF
Page	B39	B39	B39	B39	B40	B40	B40	B44
Applications	Finishing	Finishing - Medium	Medium - Roughing	Medium - Roughing	Medium - Roughing	Low carbon steel	Low carbon steel	Low carbon steel
Insert								
Chipbreaker type	R/L-S	R/L-B	R/L-C	R/L	R/L-25R	XF	XP	XQ
Page	B44	B44	B45	B45	B45	B40	B41	B41
Applications	Low carbon steel	Finishing - Medium	Large ap	Medium - Roughing	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys
Insert								
Chipbreaker type	XS	SK	R-LD	FP-TK	TK	MQ	MS	MU
Page	B41	B41	B41	B41	B41	B42	B42	B42
Applications	Stainless steel	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron
Insert								
Chipbreaker type	R/L-ST	KQ	KG	KH	C	ZS	GC	No CB
Page	B42	B42	B42	B42	B43	B43	B43	B43
Applications	Cast iron / Hard materials	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Heat-resistant alloys	Hard materials / Cast iron		
Insert								
Chipbreaker type	Ceramic	R/L-A3	AH	PCD	SG	CBN		
Page	B118	B43	B43	C36	B42	C13		

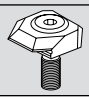
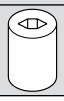
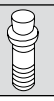
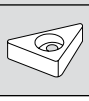
Recommended cutting conditions ➡ D69~D70

WTJN (External turning / External copying)



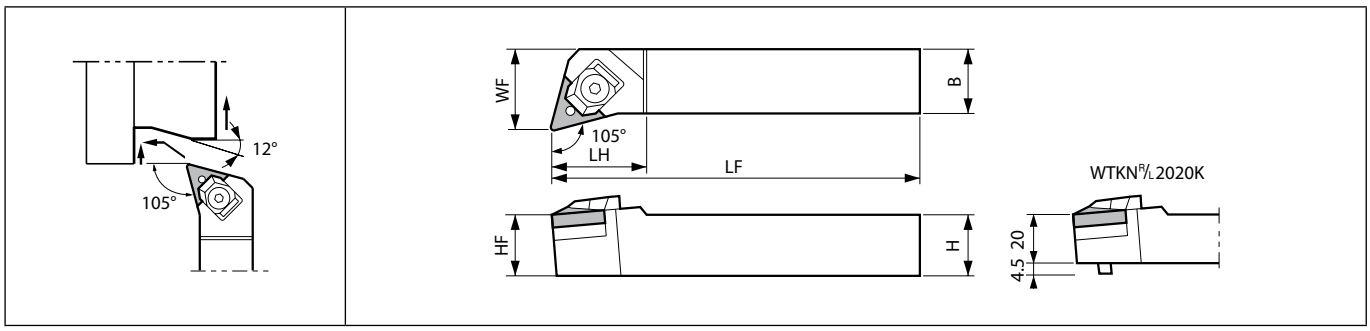
Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts
												Clamp set	Nut	Shim pin	Shim	Spacer	Wrench	
	R	L	H	B	LH	HF	LF	WF										
WTJN R/L 2020K-16N	●	●	20	20	32	20	125	25	0.8	-6	-6	WCS-1N	WN-1	WP-1S	WTN-33 (WTN-33-20*)	WSP-1	LW-3	TN□A1604... TN□G1604... TN□M1604...
2525M-16N	●	●	25	25		25	150	32										

When using inserts whose corner-R(RE) is greater than 1.6 mm, please purchase a shim* and use it in order to prevent workpiece and shim from interfering each other.
In wedge lock, use of ceramic insert other than silicon nitride insert is not recommended due to strong restrain force.

WTKN (External turning / External facing / External copying)



Right-hand shown

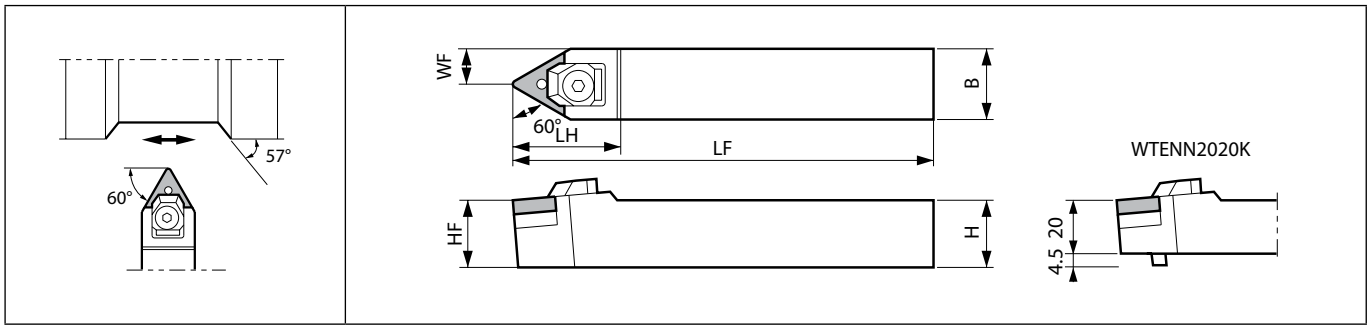
Toolholder dimensions

Description	Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts
												Clamp set	Nut	Shim pin	Shim	Spacer	Wrench	
	R	L	H	B	LH	HF	LF	WF										
WTKN R/L 2020K-16N	●	●	20	20	32	20	125	25	0.8	-6	-6	WCS-1N	WN-1	WP-1S	WTN-33 (WTN-33-20*)	WSP-1	LW-3	TN□A1604... TN□G1604... TN□M1604...
2525M-16N	●	●	25	25		25	150	32										

When using inserts whose corner-R(RE) is greater than 1.6 mm, please purchase a shim* and use it in order to prevent workpiece and shim from interfering each other.
In wedge lock, use of ceramic insert other than silicon nitride insert is not recommended due to strong restrain force.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

WTEN (External turning / External chamfering)



Toolholder dimensions

Description		Availability	Dimension (mm)							Standard corner-R(RE)	Back rake angle (°)	Spare parts						Applicable inserts
												Clamp set	Nut	Shim pin	Shim	Spacer	Wrench	
		N	H	B	LH	HF	LF	WF										
WTENN	2020K-16N	●	20	20	32	20	125	10	0.8	-8.5	WCS-1N	WN-1	WP-1S	WTN-33 (WTN-33-20*)	WSP-1	LW-3	TN□A1604... TN□G1604... TN□M1604...
	2525M-16N	●	25	25		25	150	12.5										

When using inserts whose corner-R(RE) is greater than 1.6 mm, please purchase a shim* and use it in order to prevent workpiece and shim from interfering each other.
In wedge lock, use of ceramic insert other than silicon nitride insert is not recommended due to strong restrain force.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts (WTJN / WTKN / WTEN)

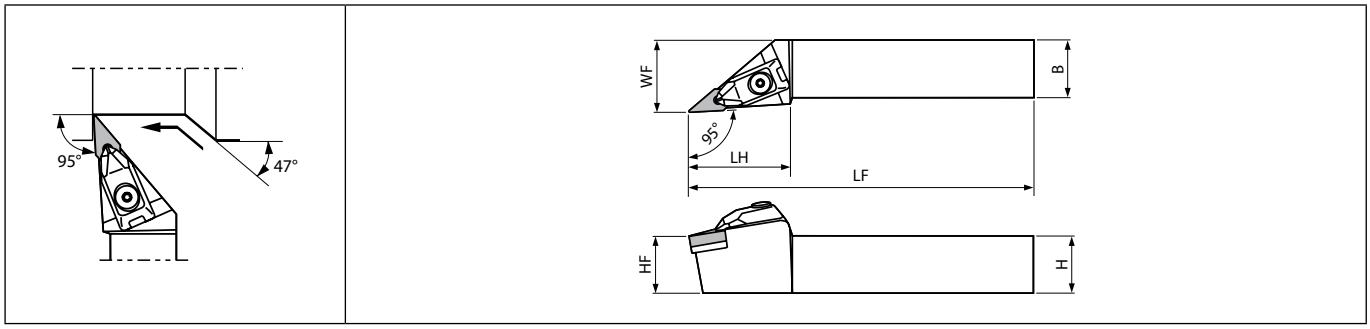
Applications	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Finishing - Medium	Medium - Roughing	Medium - Roughing	Medium - Roughing
Insert								
Chipbreaker type	PP	GP	PQ	HQ	CQ	PMG	GS	PG
Page	B38	B38	B38	B38	B38	B39	B39	B39
Applications	Medium - Roughing	Medium - Roughing	Medium - Roughing	Roughing	Roughing	Roughing	Finishing	Finishing
Insert								
Chipbreaker type	PS	PT	GT	STD	PH	PX	R/L-SSF	R/L-S
Page	B39	B39	B39	B40	B40	B40	B44	B44
Applications	Finishing - Medium	Medium - Roughing	Medium - Roughing	Low carbon steel	Low carbon steel	Low carbon steel	Low carbon steel	Finishing - Medium
Insert								
Chipbreaker type	R/L-B	R/L-C	R/L-25R	XF	XP	XQ	XS	SK
Page	B44	B45	B45	B40	B41	B41	B41	B41
Applications	Large ap	Medium - Roughing	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel	Cast iron
Insert								
Chipbreaker type	R-LD	FP-TK	TK	MQ	MS	MU	R/L-ST	KQ
Page	B41	B41	B41	B42	B42	B42	B42	B42
Applications	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Non-ferrous metals	Non-ferrous metals
Insert								
Chipbreaker type	KG	KH	C	ZS	GC	No CB	R/L-A3	AH
Page	B42	B42	B43	B43	B43	B43	B43	B43
Applications	Non-ferrous metals	Heat-resistant alloys	Hard materials / Cast iron					
Insert								
Chipbreaker type	PCD	SG	CBN					
Page	C36	B42	C13					

Recommended cutting conditions D69~D70

D

External turning

DVLN (External turning / External copying)



Right-hand shown

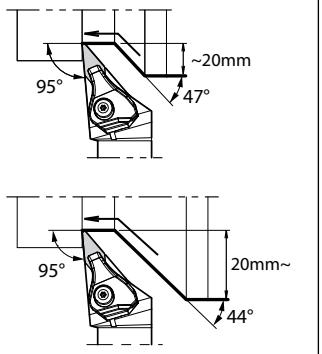
Toolholder dimensions

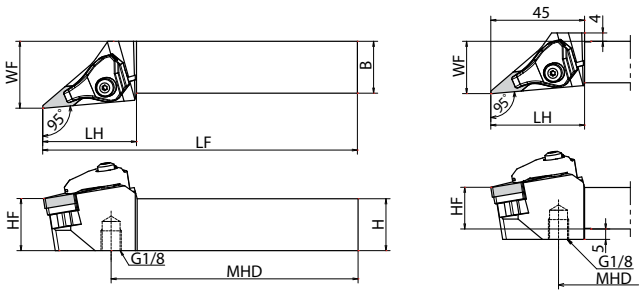
Description	Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts							Applicable inserts
												Clamp	Screw (for clamp)	Spring	Wrench (for clamp)	Shim	Screw (for shim)	Wrench* (for shim)	
	R	L	H	B	LH	HF	LF	WF											
DVLN R/L 2020K-16	●	●	20	20	45	20	125	25	0.8	-6	-9	CP-5D	CS-5D	SP-5D	LW-3	DV-33	SB-4085TR	FT-15	VN□A1604... VN□G1604... VN□M1604...
2525M-16	●	●	25	25		25	150	32											

When using inserts whose corner-R(RE) is greater than 1.2 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.
Wrench (FT-15) is sold separately.
Recommended tightening torque : 3.0N·m

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DVLN-JCT (External turning / External copying, Coolant-through holders)

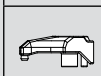
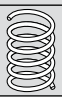




Right-hand shown | with coolant supply | Applicable pressure : ~30MPa

Toolholder dimensions

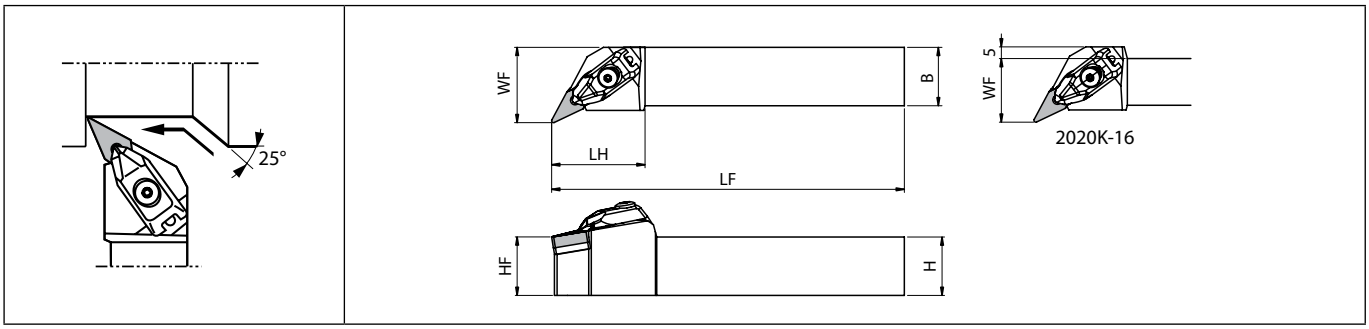
Description		Availability		Dimension (mm)							Standard corner-R(RE)	Coolant hole	Side rake angle (°)	Inclination angle (°)	Applicable inserts
		R	L	H	B	LH	MHD	HF	LF	WF					
DVLNR	2020K-16JCT	●		20	20	45	92.5	20	125	25	0.8	Yes	-6	-9	VN□A1604... VN□G1604... VN□M1604...
DVLNL	2020K-16JCT		●				88.5								
DVLNR	2525M-16JCT	●		25	25		117.5	25	150	32					
DVLNL	2525M-16JCT		●				113.5								

Description		Spare parts						
		Clamp	Pipe connection	Screw (for clamp)	Screw	Shim	Spring	Wrench
								
DVLN[R/L]	2020K-16JCT 2525M-16JCT	CP-5D-JCT	FP-12	CS-3D-TR	SB-4085TR	DV-33	SP-3D	FT-15

When using inserts whose corner-R(RE) is greater than 1.2 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.
The washer may protrude from the holder. To prevent interference, additional modifications to the washer may be required.
Only the O-ring (SS-035) included with the pipe connection can be ordered.
Please see page **D12** for piping parts of coolant-through holders.
Recommended tightening torque : 3.9N·m

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DVPN (External turning / External facing / External copying / Undercutting)



Right-hand shown

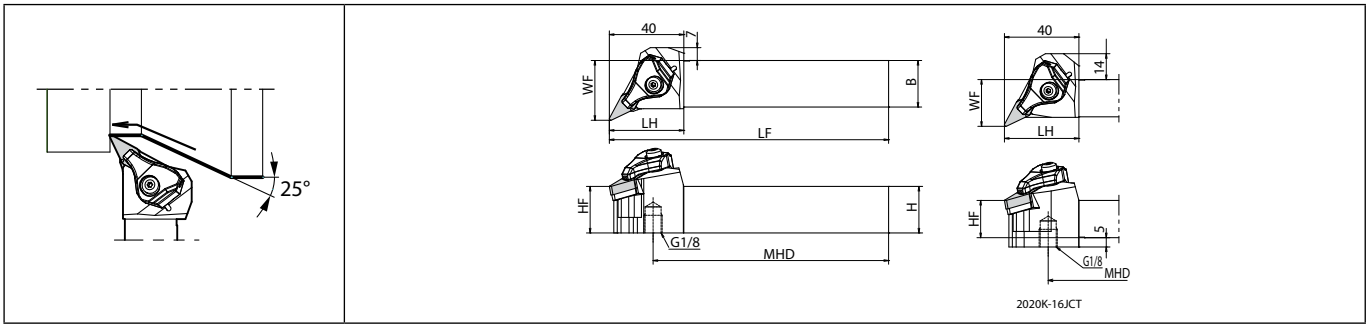
Toolholder dimensions

Description	Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts							Applicable inserts
												Clamp	Screw (for clamp)	Spring	Wrench (for clamp)	Shim	Screw (for shim)	Wrench* (for shim)	
	R	L	H	B	LH	HF	LF	WF											
DVPN R/L 2020K-16	●	●	20	20	40	20	125	27	0.8	-13	-10	CP-5D	CS-5D	SP-5D	LW-3	DV-33	SB-4085TR	FT-15	VN□A1604... VN□G1604... VN□M1604...
2525M-16	●	●	25	25		25	150	32											

When using inserts whose corner-R(RE) is greater than 1.2 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.
Wrench (FT-15) is sold separately.
Recommended tightening torque : 3.0N·m

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

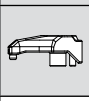
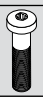
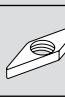
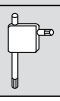
DVPN-JCT (External turning / External facing / External copying / Undercutting, Coolant-through holders)



Right-hand shown | with coolant supply | Applicable pressure : ~30MPa

Toolholder dimensions

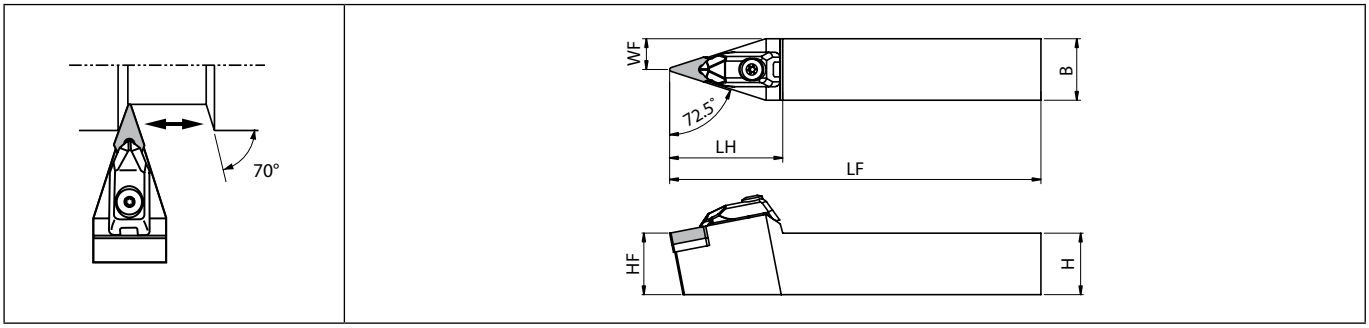
Description		Availability R	Availability L	H	B	LH	MHD	HF	LF	WF	Standard corner-R(RE)	Coolant hole	Side rake angle (°)	Inclination angle (°)	Applicable inserts
DVPNR	2020K-16JCT	●		20	20	40	101.5	20	125	25	0.8	Yes	-13	-10	VN□A1604... VN□G1604... VN□M1604...
DVPNL	2020K-16JCT		●				93.5								
DVPNR	2525M-16JCT	●		25	25		126.5	25	150	32					
DVPNL	2525M-16JCT		●				118.5								

Description		Spare parts: Clamp	Pipe connection	Screw (for clamp)	Screw	Shim	Spring	Wrench
								
DVPN R/L	2020K-16JCT 2525M-16JCT	CP-5D-JCT	FP-12	CS-3D-TR	SB-4085TR	DV-33	SP-3D	FT-15

When using inserts whose corner-R(RE) is greater than 1.2 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.
The washer may protrude from the holder. To prevent interference, additional modifications to the washer may be required.
Only the O-ring (SS-035) included with the pipe connection can be ordered.
Please see page **D12** for piping parts of coolant-through holders.
Recommended tightening torque : 3.9N·m

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DVVN (External turning / External copying)



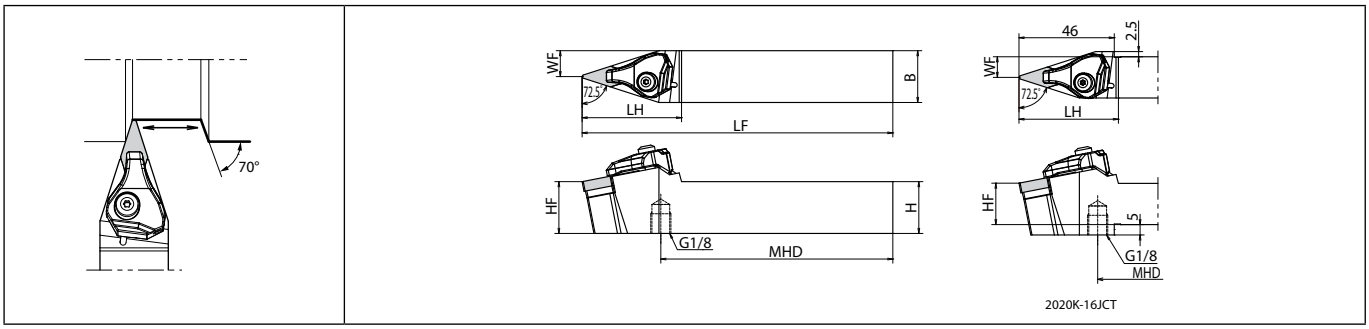
Toolholder dimensions

Description	Availability	Dimension (mm)						Standard corner-R(RE)	Back rake angle (°)	Spare parts							Applicable inserts
										Clamp	Screw (for clamp)	Spring	Wrench (for clamp)	Shim	Screw (for shim)	Wrench* (for shim)	
	N	H	B	LH	HF	LF	WF										
DVVNN 2020K-16	●	20	20	46	20	125	10	0.8	-11	CP-5D	CS-5D	SP-5D	LW-3	DV-33	SB-4085TR	FT-15	VN□A1604... VN□G1604... VN□M1604...
2525M-16	●	25	25		25	150	12.5										

When using inserts whose corner-R(RE) is greater than 1.2 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.
Wrench (FT-15) is sold separately.
Recommended tightening torque : 3.0N·m

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

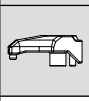
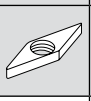
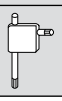
DVVN-JCT (External turning / External copying, Coolant-through holders)



with coolant supply | Applicable pressure : ~30MPa

Toolholder dimensions

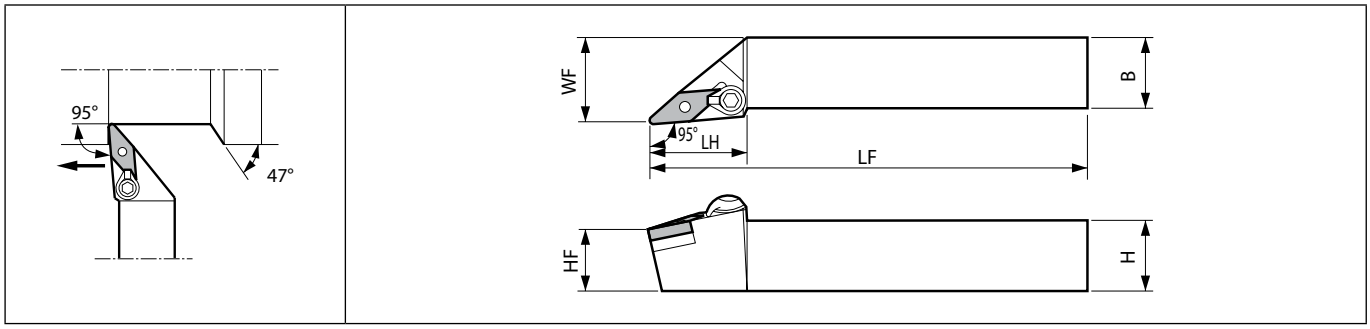
Description		Availability	Dimension (mm)							Standard corner-R(RE)	Coolant hole	Back rake angle (°)	Applicable inserts
		N	H	B	LH	MHD	HF	LF	WF				
DVVNN	2020K-16JCT	●	20	20	48	87	20	125	10	0.8	Yes	-11	VN□A1604... VN□G1604... VN□M1604...
	2525M-16JCT	●	25	25		112	25	150	12.5				

Description		Spare parts						
		Clamp	Pipe connection	Screw (for clamp)	Screw	Shim	Spring	Wrench
								
DVVNN	2020K-16JCT 2525M-16JCT	CP-5D-JCT	FP-12	CS-3D-TR	SB-4085TR	DV-33	SP-3D	FT-15

When using inserts whose corner-R(RE) is greater than 1.2 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.
The washer may protrude from the holder. To prevent interference, additional modifications to the washer may be required.
Only the O-ring (SS-035) included with the pipe connection can be ordered.
Please see page **D12** for piping parts of coolant-through holders.
Recommended tightening torque : 3.9N·m

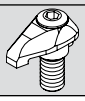
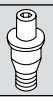
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MVLN (External turning / External copying)



Right-hand shown

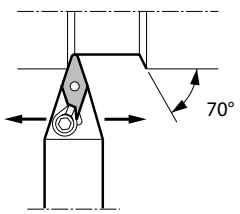
Toolholder dimensions

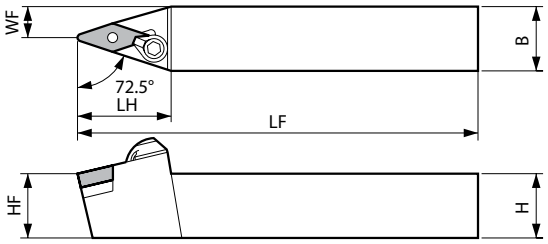
Description		Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts					Applicable inserts
													Clamp set	Wrench (for clamp set)	Lock pin	Shim	Wrench (for lock pin)	
		R	L	H	B	LH	HF	LF	WF									
MVLN$^{R/L}$	2020K-16	●	●	20	20	38	20	125	25	0.8	-6	-9	CPS-5$^{R/L}$	FH-2.5	TS-3S	MVN-32	FH-2	VN□A1604... VN□G1604... VN□M1604...
	2525M-16	●	●	25	25		25	150	32									

When using inserts whose corner-R(RE) is greater than 1.2 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.
Clamp set : CPS-5R for Right-hand Toolholder, CPS-5L for Left-hand Toolholder.
Clamp set : CPS-5R has Right-hand thread.
When clamping the insert, turn the screw in the arrow direction (clockwise).
When removing the insert, turn the screw away from the arrow (counterclockwise).
Clamp set : CPS-5L has Left-hand thread.
When clamping the insert, turn the screw in the arrow direction (counterclockwise).
When removing the insert, turn the screw away from the arrow (clockwise).

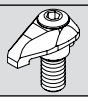
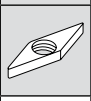
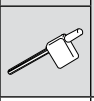
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MVVN (External turning / External copying)





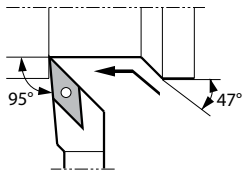
Toolholder dimensions

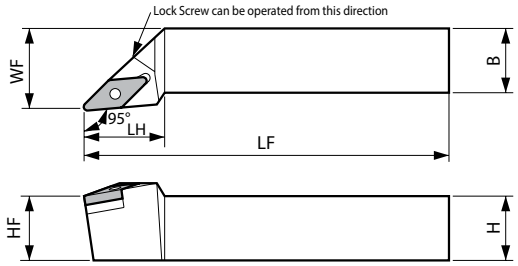
Description		Availability	Dimension (mm)						Standard corner-R(RE)	Back rake angle (°)	Spare parts					Applicable inserts
											Clamp set	Wrench (for clamp set)	Lock pin	Shim	Wrench (for lock pin)	
		N	H	B	LH	HF	LF	WF								
MVVNN	2020K-16	●	20	20	39	20	125	10	0.8	-11	CPS-5R	FH-2.5	TS-3S	MVN-32	FH-2	VN□A1604... VN□G1604... VN□M1604...
	2525M-16	●	25	25		25	150	12.5								

When using inserts whose corner-R(RE) is greater than 1.2 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.
Clamp set : CPS-5R has Right-hand thread.
When clamping the insert, turn the screw in the arrow direction (clockwise).
When removing the insert, turn the screw away from the arrow (counterclockwise).

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

PVLN (External turning / External copying)





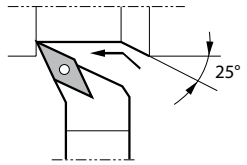
Right-hand shown

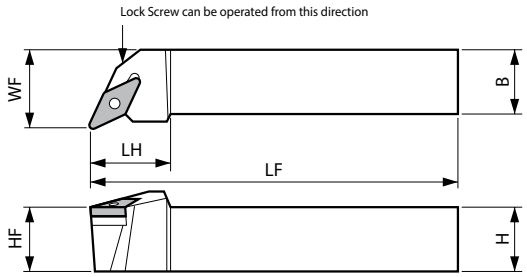
Toolholder dimensions

Description	Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts				Applicable inserts
												Lock pin	Lock screw	Shim	Wrench	
	R	L	H	B	LH	HF	LF	WF								
PVLN R/L 2525M-16Q	●	●	25	25	37	25	150	32	0.8	-6	-9	LP-6S	LS-15	KVN-32	LW-3	VN□A1604... VN□G1604... VN□M1604...

When using inserts whose corner-R(RE) is greater than 1.2 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.

PVPN (External turning / External facing / External copying / Undercutting)





Right-hand shown

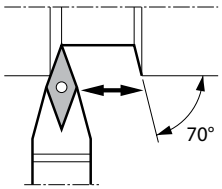
Toolholder dimensions

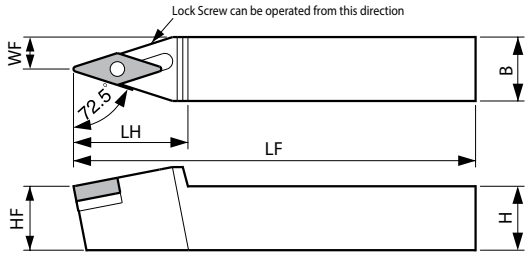
Description	Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts				Applicable inserts
												Lock pin	Lock screw	Shim	Wrench	
	R	L	H	B	LH	HF	LF	WF								
PVPN R/L 2020K-16Q	●	●	20	20	30	20	125	25	0.8	-13	-10	LP-2S	LS-11	KVN-32	LW-3	VN□A1604... VN□G1604... VN□M1604...
2525M-16Q	●	●	25	25		25	150	32				LP-6S				

When using inserts whose corner-R(RE) is greater than 1.2 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.

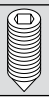
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

PVVN (External turning / External copying)



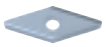


Toolholder dimensions

Description		Availability	Dimension (mm)						Standard corner-R(RE)	Back rake angle (°)	Spare parts				Applicable inserts
											Lock pin	Lock screw	Shim	Wrench	
		N	H	B	LH	HF	LF	WF							
PVVNN	2020K-16Q	●	20	20	35	20	125	10	0.8	-11	LP-2S	LS-15	KVN-32	LW-3	VN□A1604... VN□G1604... VN□M1604...
	2525M-16Q	●	25	25	40	25	150	12.5			LP-6S				

When using inserts whose corner-R(RE) is greater than 1.2 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.

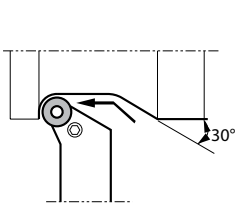
Applicable inserts

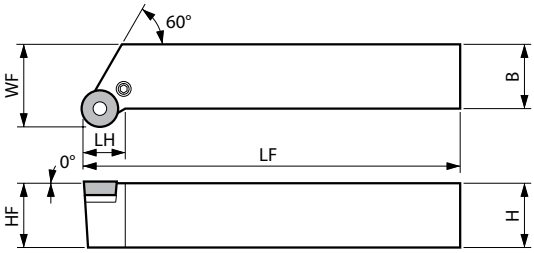
Applications	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Finishing - Medium	Finishing - Medium	Medium	Roughing
Insert								
Chipbreaker type	**PP**	**GP**	**R/L-VC**	**VF**	**PQ**	**HQ**	**TN-V**	**STD**
Page	**B46**	**B46**	**B46**	**B46**	**B46**	**B46**	**B46**	**B46**
Applications	Finishing - Medium	Finishing	Medium	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Cast iron	Cast iron
Insert								
Chipbreaker type	**SK**	**R/L-S**	**R/L**	**MQ**	**MS**	**MU**	**KG**	**KH**
Page	**B47**	**B48**	**B48**	**B47**	**B47**	**B47**	**B47**	**B47**
Applications	Cast iron	Cast iron / Hard materials	Non-ferrous metals	Heat-resistant alloys	Hard materials / Cast iron			
Insert								
Chipbreaker type	**No CB**	**Ceramic**	**PCD**	**SG**	**CBN**			
Page	**B48**	**B119**	**C37**	**B47**	**C14**			

Recommended cutting conditions ➡ **D69~D70**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

PRGC (External turning / External facing / External copying)



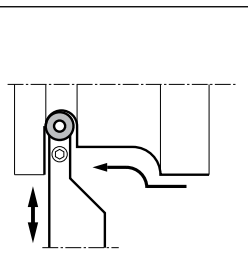


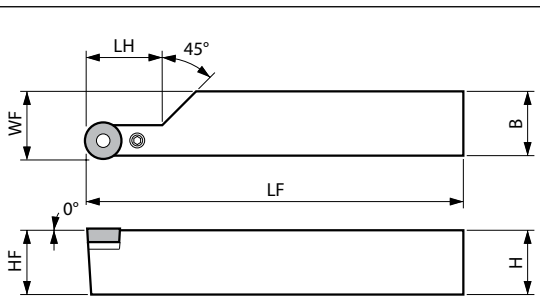
Right-hand shown

Toolholder dimensions

Description		Availability		Dimension (mm)						Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts
		R	L	H	B	LH	HF	LF	WF			Lever	Lock screw	Punch	Shim pin	Shim	Wrench	
PRGC□/L	2020K-10	●	●	20	20	15	20	125	25	0	0	LL-05C	LS-05	PC-1	LSP-1	LR-10C	FH-2	RC□X1003M0
	2525M-10	●	●	25	25		25	150	32									
PRGC□/L	2020K-12	●	●	20	20	14	20	125	25	0	0	LL-1CN	LS-1N	PC-1	LSP-1	LR-12C	FH-2.5	RCMX1204M0
	2525M-12	●	●	25	25	17	25	150	32									

PRXC (External turning / External facing / External copying)





Right-hand shown

Toolholder dimensions

Description		Availability		Dimension (mm)						Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts
		R	L	H	B	LH	HF	LF	WF			Lever	Lock screw	Punch	Shim pin	Shim	Wrench	
PRXC□/L	2020K-10	●	●	20	20	25	20	125	20.5	0	0	LL-05C	LS-05	PC-1	LSP-1	LR-10C	FH-2	RC□X1003M0
	2525M-10	●	●	25	25	30	25	150	25.5									
	2525Q-10	●	●					180										
PRXC□/L	2525M-12	●	●	25	25	30	25	150	25.7	0	0	LL-1CN	LS-1N	PC-1	LSP-1	LR-12C	FH-2.5	RCMX1204M0

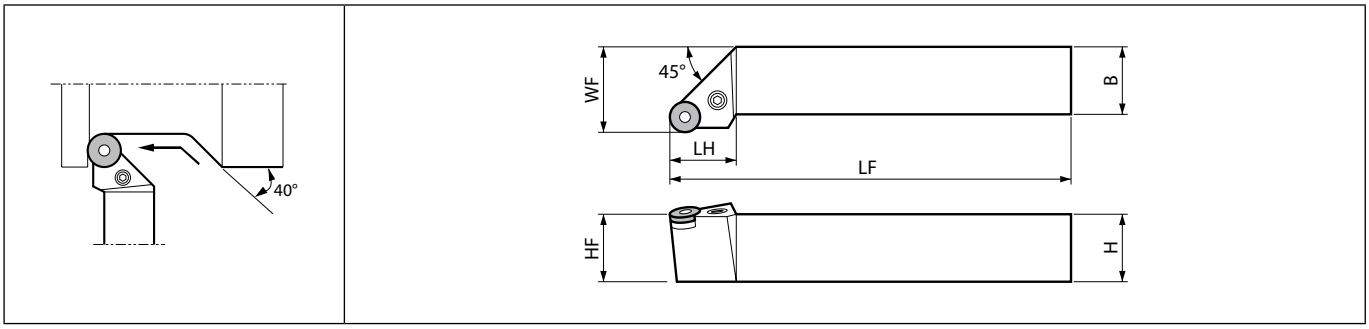
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts

Applications	Medium	Non-ferrous metals
Insert		
Chipbreaker type	STD	AQ
Page	B81	B81

Recommended cutting conditions D69~D70

PRGN (External turning / External facing / External copying)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)						Side rake angle (°)	Inclination angle (°)	Spare parts							Applicable inserts
											Lever	Lock screw	Punch	Shim pin	Shim	Wrench	Wrench	
	R	L	H	B	LH	HF	LF	WF										
PRGN[R/L] 2020K-09	●	●	20	20	19	20	125	25	-6	-6	LL-1N	LS-1N	PC-1	LSP-1	LR-80	-	FH-2.5	RNMG090300
PRGN[R/L] 2525M-12	●	●	25	25	26	25	150	32	-6	-6	LL-2N	LS-2N	PC-2	LSP-2	LR-81	LW-3	-	RNMG120400

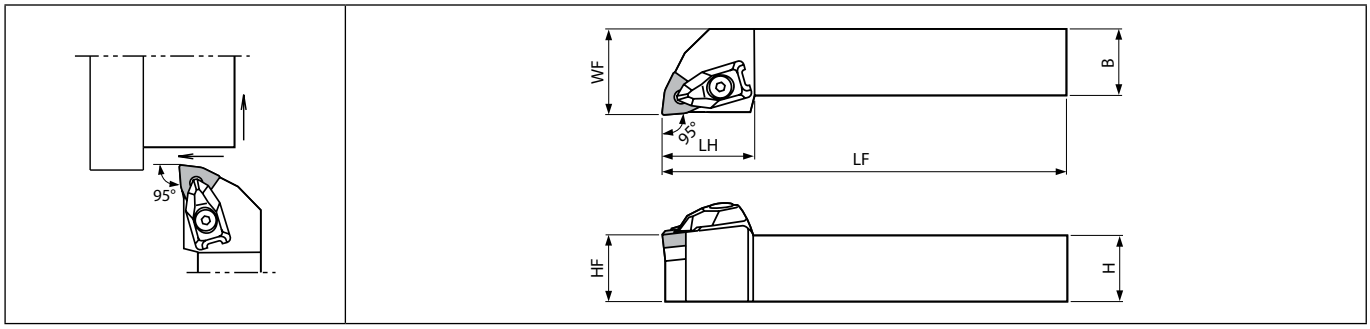
Applicable inserts

Applications	Medium - Roughing
Insert	
Chipbreaker type	STD
Page	B32

Recommended cutting conditions D69~D70

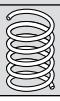
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DWLN (External turning / External facing)



Right-hand shown

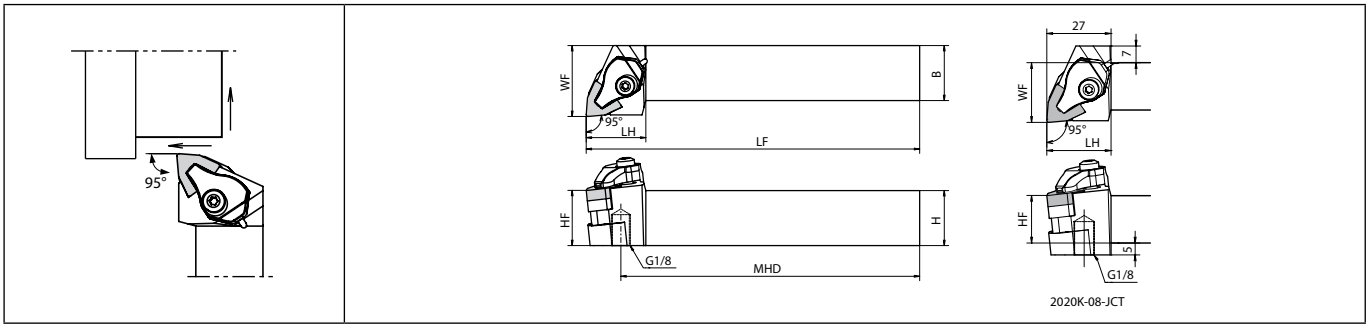
Toolholder dimensions

Description	Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts							Applicable inserts
												Clamp	Screw (for clamp)	Spring	Wrench (for clamp)	Shim	Screw (for shim)	Wrench* (for shim)	
	R	L	H	B	LH	HF	LF	WF											
DWLN$^{R}_{L}$ 2020K-08	●	●	20	20	34	20	125	25	0.8	-6	-6	CP-3D	CS-3D	SP-3D	LW-3	DW-44	SB-4085TR	FT-15	WN□A0804... WN□G0804... WN□M0804...
2525M-08	●	●	25	25		25	150	32											

Wrench (FT-15) is sold separately.
Recommended tightening torque : 3.9N·m

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

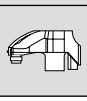
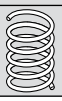
DWLN-JCT (External turning / External facing, Coolant-through holders)



Right-hand shown | with coolant supply | Applicable pressure : ~30MPa

Toolholder dimensions

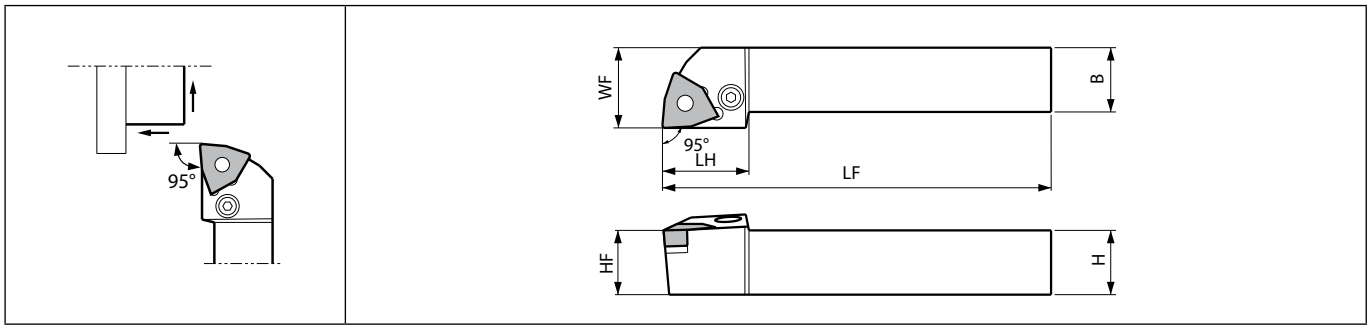
Description		Availability		Dimension (mm)							Standard corner-R(RE)	Coolant hole	Side rake angle (°)	Inclination angle (°)	Applicable inserts
		R	L	H	B	LH	MHD	HF	LF	WF					
DWLN$^{R}_{L}$	2020K-08JCT	●	●	20	20	27	109	20	125	25	0.8	Yes	-6	-6	WN□A0804... WN□G0804... WN□M0804...
	2525M-08JCT	●	●	25	25		134	25	150	32					

Description	Spare parts						
	Clamp	Pipe connection	Screw (for clamp)	Screw	Shim	Spring	Wrench
							
DWLN$^{R}_{L}$ 2020K-08JCT 2525M-08JCT	CP-3D-$^{R}_{L}$-JCT	FP-12	CS-3D-TR	SB-4085TR	DW-44	SP-3D	FT-15

Clamp : CP-3D-R-JCT for Right-hand Toolholder, CP-3D-L-JCT for Left-hand Toolholder.
Please see page **D12** for piping parts of coolant-through holders.
Only the O-ring (SS-035) included with the pipe connection can be ordered.
Recommended tightening torque : 3.9N·m

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

PWLN (External turning / External facing)



Right-hand shown

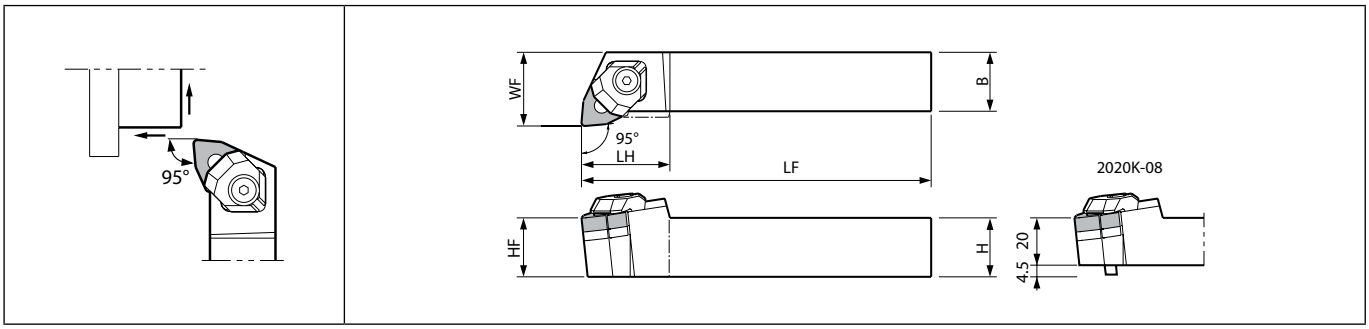
Toolholder dimensions

Description	Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts							Applicable inserts
												Lever	Lock screw	Punch	Shim pin	Shim	Wrench	Wrench	
	R	L	H	B	LH	HF	LF	WF											
PWLN[R/L] 1616H-06	●	●	16	16	22	16	100	20	0.8	-6	-6	LL-1N	LS-1N	PC-1	LSP-1	LW-32N	-	FH-2.5	WN□G0604...
2020K-06	●	●	20	20		20	125	25											
2525M-06	●	●	25	25		25	150	32											
PWLN[R/L] 2020K-08	●	●	20	20	26	20	125	25	0.8	-6	-6	LL-2N	LS-2N	PC-2	LSP-2	LW-42N	LW-3	-	WN□A0804... WN□G0804... WN□M0804...
2525M-08	●	●	25	25		25	150	32											

When using inserts whose corner-R(RE) is greater than 1.6 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.

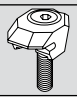
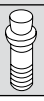
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

WWLN (External turning / External facing)



Right-hand shown

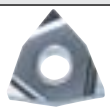
Toolholder dimensions

Description	Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts					Applicable inserts
												Clamp set	Nut	Shim pin	Shim	Wrench	
	R	L	H	B	LH	HF	LF	WF									
WWLN[R/L] 2020K-08	●	●	20	20	30	20	125	25	1.2	-6	-6	WCS-8	WN-1	WP5X15	WWN-42	LW-3	WN□A0804... WN□G0804...
2525M-08	●	●	25	25		25	150	32									WN□M0804...

In wedge lock, use of ceramic insert other than silicon nitride insert is not recommended due to strong restrain force.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts (DWLN / DWLN-JCT / PWLN / WWLN)

Applications	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Finishing	Finishing	Finishing - Medium	Finishing - Medium
Insert								
Chipbreaker type	WF	WP	WE	WQ	PP	GP	PQ	HQ
Page	B49	B49	B49	B49	B49	B49	B49	B50
Applications	Finishing - Medium	Finishing - Medium	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing
Insert								
Chipbreaker type	CQ	CJ	PMG	GS	PG	PS	PT	GT
Page	B50	B50	B50	B50	B50	B50	B51	B51
Applications	Roughing	Roughing	Finishing	Medium	Low carbon steel	Low carbon steel	Low carbon steel	Stainless steel / Heat-resistant alloys
Insert								
Chipbreaker type	STD	PH	R/L-S	R/L	XP	XQ	XS	TK
Page	B51	B51	B53	B53	B51	B51	B51	B51
Applications	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron
Insert								
Chipbreaker type	MQ	MS	MU	KQ	KG	KH	C	ZS
Page	B52	B52	B52	B52	B52	B52	B53	B53
Applications	Cast iron	Cast iron	Non-ferrous metals	Non-ferrous metals	Heat-resistant alloys	Hard materials / Cast iron		
Insert								
Chipbreaker type	GC	No CB	AH	PCD	SG	CBN		
Page	B53	B53	B53	C38	B52	C15		

In wedge lock, use of ceramic insert other than silicon nitride insert is not recommended due to strong restrain force.

Recommended cutting conditions ➔ **D69~D70**

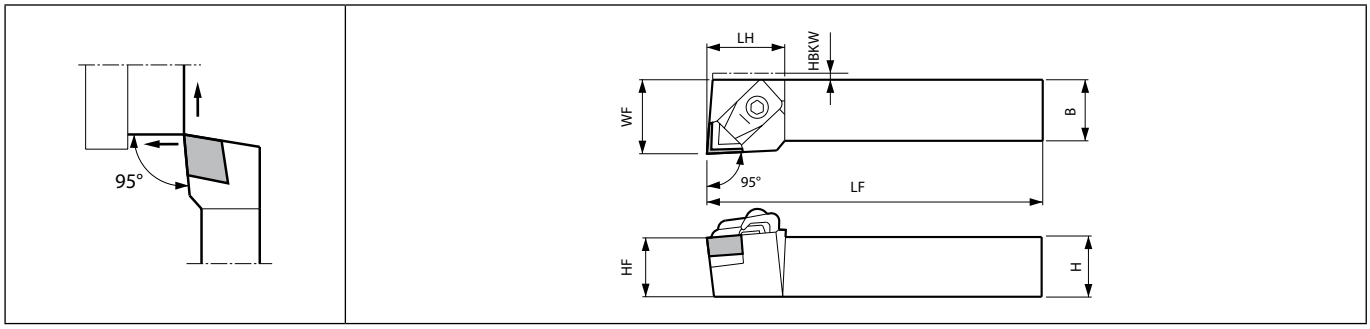
Selection guide for ceramic inserts

Select the suitable ceramic insert and specifications from the table below:

Insert shape	Corner-R (RE)	f (mm/rev) 0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.60	ap (mm)
RN	-											0.3~4
SN	2.0											0.3~4
	1.6											
EN	1.2											
CN	0.8											
	0.4											
TN	1.6											0.3~2
	1.2											
DN	0.8											
Chamfer		0.05mm x 20°		(0.1~0.2)mm x (20°~ 25°)				0.3mm x 30°				-
Insert thickness		7.94mm										

(GG25, Cutting edge angle: 0°~15°)

CCLN (External turning / External facing)



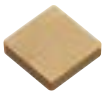
Right-hand shown

Toolholder dimensions

Description		Availability		Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts					Applicable inserts
														Chipbreaker	Clamp set	Shim screw	Shim	Wrench	
		R	L	H	B	LH	HF	HBKW	LF	WF									
CCLNR/L	2020K-12	●	●	20	20	32	20	5	125	27	0.8	-6	-6	CB-16	CE-010	M3X8 (M3X12*)	SP-441 (SP-443*)	LW-4	CN□N1207... (CN□N1204...*)
	2525M-12	●	●	25	25		25	-	150	32									
CCLNR/L	3225P-16	●	●	32	25	35	32	-	170	32	0.8	-6	-6	CB-17	CE-220	M4X10	SP-454	LW-4	CNGN1607...

Shims indicated * are not included with the toolholder. When using CN□N1204 type insert, please purchase shim (SP-443) and screw (M3X12) separately.

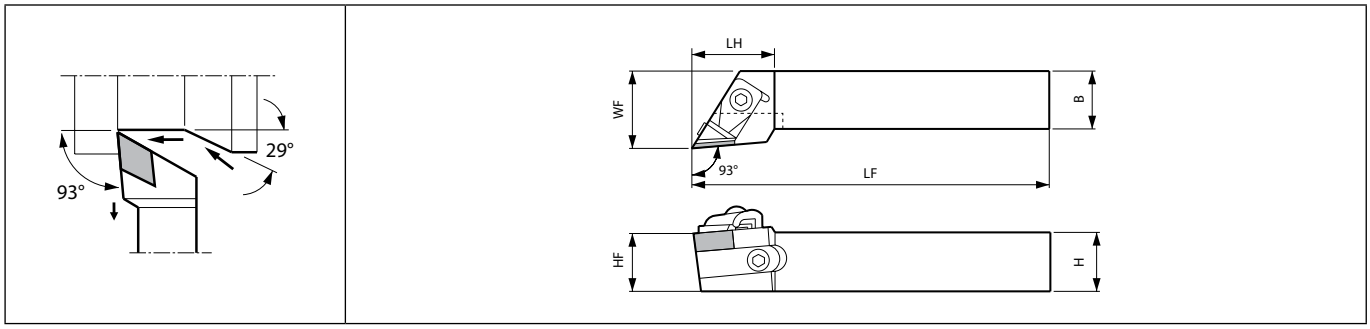
Applicable inserts

Applications	Cast iron / Hard materials	Hard materials / Cast iron
Insert		
Type	Ceramic	CBN
Page	B113	C16

Recommended cutting conditions D69~D70

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CDJN (External turning / External copying / Back turning)



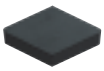
Right-hand shown

Toolholder dimensions

Description		Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts					Applicable inserts
													Chipbreaker	Clamp bolt	Clamp set	Shim	Wrench	
		R	L	H	B	LH	HF	LF	WF									
CDJN$^{R/L}$	2525M-15	●	●	25	25	32	25	150	32	0.8	-5	-8	CB-14/15	HH5X16	CE-010	556C$^{R/L}$	LW-4	DNGN1507...
	3225P-15	●	●	32			32	170										

Chipbreaker : CB-14 for Right-hand Toolholder, CB-15 for Left-hand Toolholder.
Shim : 556CR for Right-hand Toolholder, 556CL for Left-hand Toolholder.

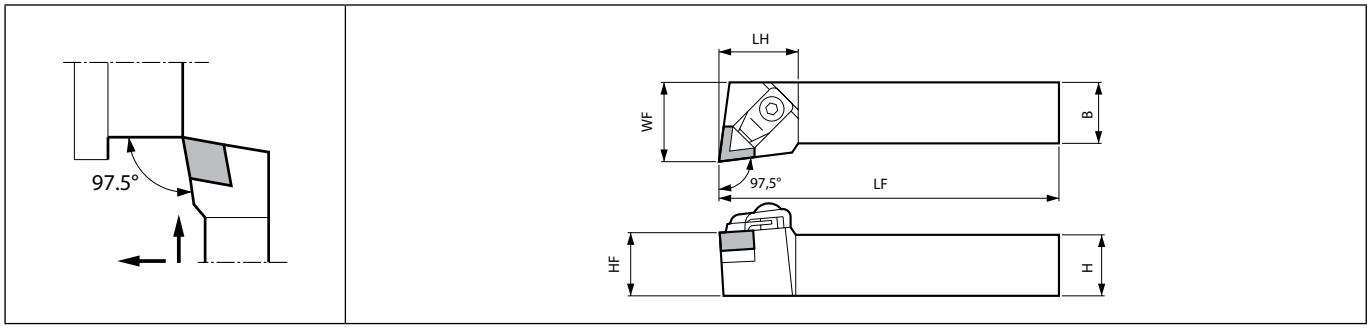
Applicable inserts

Applications	Cast iron / Hard materials
Insert	
Type	Ceramic
Page	B114

Recommended cutting conditions D69~D70

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CELN (External turning / External facing)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts					Applicable inserts
												Chipbreaker	Clamp set	Shim screw	Shim	Wrench	
	R	L	H	B	LH	HF	LF	WF									
CELNR/L 2525M-13	●	●	25	25	32	25	150	32	0.8	-6	-6	CB-16	CE-010	M3X8	SP-342	LW-4	ENGN1307...

Applicable inserts

Applications	Cast iron / Hard materials
Insert	
Type	Ceramic
Page	B115

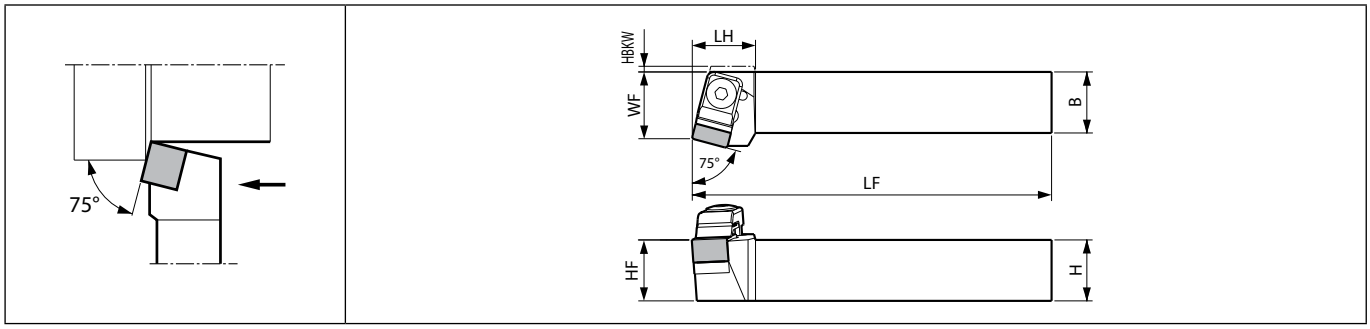
Recommended cutting conditions D69~D70

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

D

External turning

CSRN (External turning)



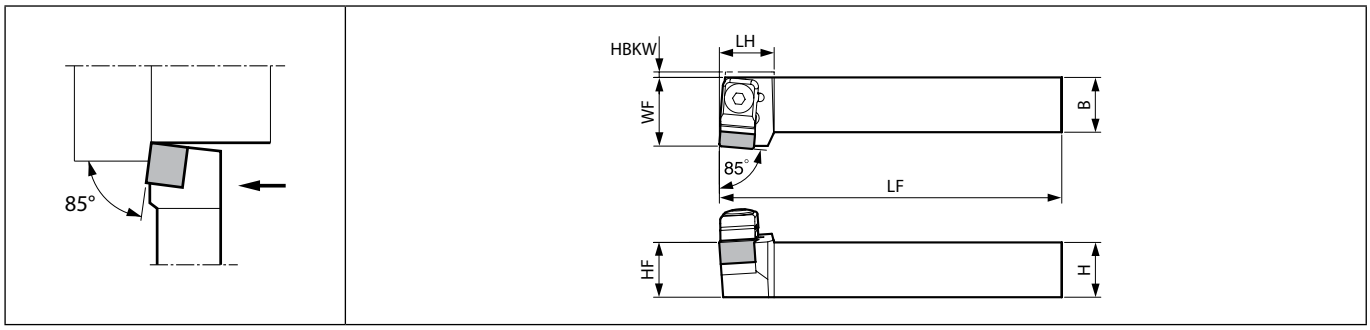
Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts
													Chipbreaker	Clamp set	Clamp set	Shim screw	Shim	Wrench	
	R	L	H	B	LH	HF	HBKW	LF	WF										
CSRN R/L 2020K-12	●	●	20	20	22	20	2	125	22	0.8	-6	-4	CB-11	CE-020	-	M3X8 (M3X12*)	SP-141 (SP-143*)	LW-4	SN□N1207... (SN□N1204...*)
2525M-12	●	●	25	25		25	-	150	27										
3225P-12	●	●	32			32		170											
CSRN R/L 3225P-15	●		32	25	30	32	-	170	32.4	1.2	-6	-4	CB-51	-	CE-220	M4X10	SP-162	LW-4	SNGN1507...
4040R-15	●	●	40	40		40		200	43										

Shims indicated * are not included with the toolholder. When using SN□N1204 type insert, please purchase shim (SP-143) and screw (M3X12) separately.

CS-N (External turning)



Right-hand shown

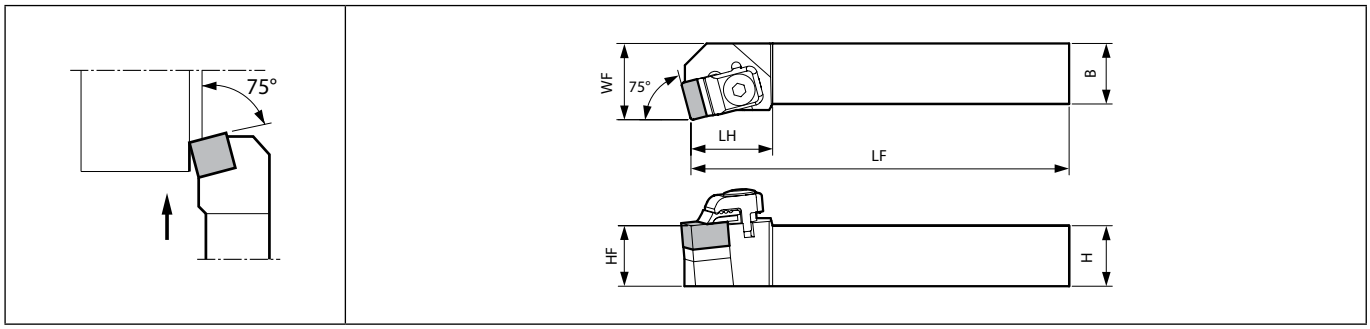
Toolholder dimensions

Description	Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts					Applicable inserts
												Chipbreaker	Clamp set	Shim screw	Shim	Wrench	
	R	L	H	B	LH	HF	LF	WF									
CS-N R/L 2525M-12	●	●	25	25	20	25	150	32	0.8	-6	-4	CB-11	CE-020	M3X8 (M3X12*)	SP-141 (SP-143*)	LW-4	SN□N1207... (SN□N1204...*)

Shims indicated * are not included with the toolholder. When using SN□N1204 type insert, please purchase shim (SP-143) and screw (M3X12) separately.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CSKN (External facing)



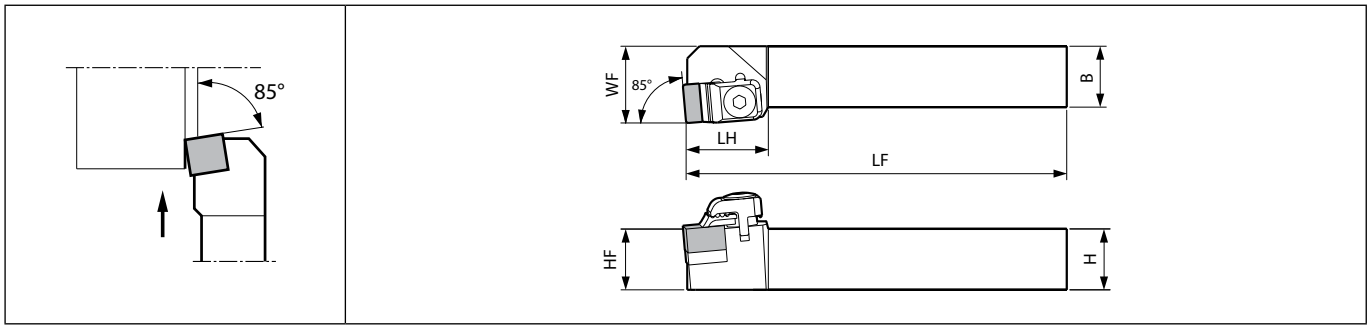
Right-hand shown

Toolholder dimensions

Description	Availability R	Availability L	Dimension (mm) H	B	LH	HF	LF	WF	Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts: Chipbreaker	Clamp set	Clamp set	Shim screw	Shim	Wrench	Applicable inserts
CSKN R/L 2020K-12	●		20	20	27	20	125	25	0.8	-6	-4	CB-11	CE-020	-	M3X8 (M3X12*)	SP-141 (SP-143*)	LW-4	SN□N1207... (SN□N1204...*)
2525M-12	●	●	25	25		25	150	32										
CSKNR 3225P-15	●		32	25	37	32	170	32	1.2	-6	-4	CB-51	-	CE-220	M4X10	SP-162	LW-4	SNGN1507...

Shims indicated * are not included with the toolholder. When using SN□N1204 type insert, please purchase shim (SP-143) and screw (M3X12) separately.

CSYN (External facing)



Right-hand shown

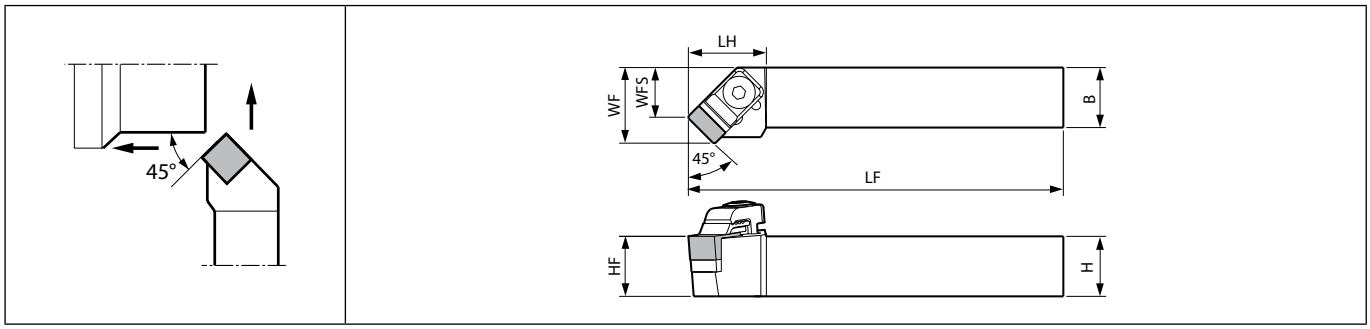
Toolholder dimensions

Description	Availability R	Availability L	Dimension (mm) H	B	LH	HF	LF	WF	Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts: Chipbreaker	Clamp set	Shim screw	Shim	Wrench	Applicable inserts
CSYN R/L 2525M-12	●	●	25	25	27	25	150	32	0.8	-6	-4	CB-11	CE-020	M3X8 (M3X12*)	SP-141 (SP-143*)	LW-4	SN□N1207... (SN□N1204...*)

Shims indicated * are not included with the toolholder. When using SN□N1204 type insert, please purchase shim (SP-143) and screw (M3X12) separately.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CSSN (External turning / External facing / Chamfering)



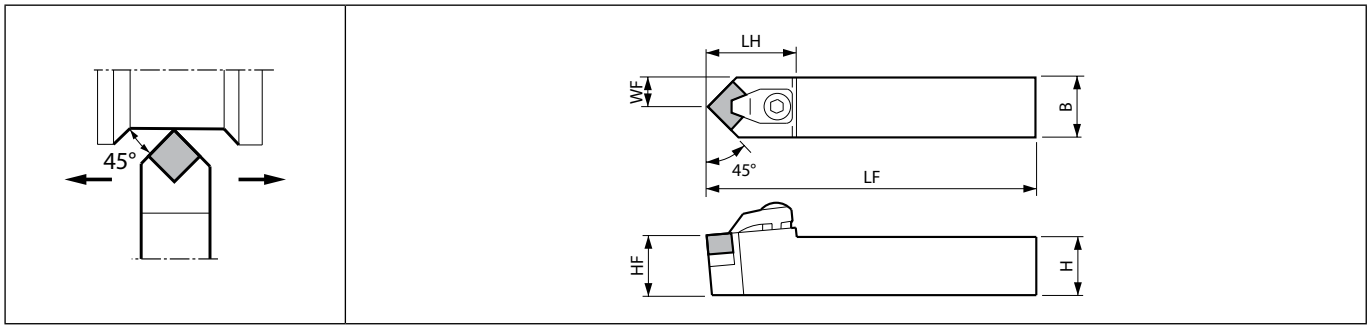
Right-hand shown

Toolholder dimensions

Description		Availability R	Availability L	Dimension (mm) H	B	LH	HF	LF	WF	WFS	Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts: Chipbreaker	Clamp set	Shim screw	Shim	Wrench	Applicable inserts
CSSNR/L	2020K-12	●		20	20	26	20	125	25	16	0.8	-6	0	CB-11	CE-020	M3X8 (M3X12*)	SP-141 (SP-143*)	LW-4	SN□N1207... (SN□N1204...*)
	2525M-12	●	●	25	25		25	150	32	23									

Shims indicated * are not included with the toolholder. When using SN□N1204 type insert, please purchase shim (SP-143) and screw (M3X12) separately.

CSDN (External turning / Chamfering)



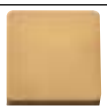
Toolholder dimensions

Description		Availability N	Dimension (mm) H	B	LH	HF	LF	WF	Standard corner-R(RE)	Back rake angle (°)	Spare parts: Clamp set	Shim screw	Shim	Wrench	Applicable inserts
CSDNN	2020K-12	●	20	20	32	20	125	10	0.8	-8.5	CE-040	M3X8 (M3X12*)	SP-141 (SP-143*)	LW-4	SN□N1207... (SN□N1204...*)
	2525M-12	●	25	25		25	150	12.5							
	3225P-12	●	32			32	170								

Shims indicated * are not included with the toolholder. When using SN□N1204 type insert, please purchase shim (SP-143) and screw (M3X12) separately.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts

Applications	Cast iron / Hard materials	Cast iron	Hard materials / Cast iron
Type	Ceramic	Coated carbide	CBN
Insert / Toolholder			
CSRN R/L ...-12	SNGN1207..(SNGN1204..) SNMN1207..	(SNMN1204..)	(SNMN1204..)
CSRN R/L ...-15	SNGN1507..	-	-
CS-N R/L ...-12	SNGN1207..(SNGN1204..) SNMN1207..	(SNMN1204..)	(SNMN1204..)
CSKN R/L ...-12	SNGN1207..(SNGN1204..) SNMN1207..	(SNMN1204..)	(SNMN1204..)
CSKN R/L ...-15	SNGN1507..	-	-
CSYN R/L ...-12	SNGN1207..(SNGN1204..) SNMN1207..	(SNMN1204..)	(SNMN1204..)
CSSN R/L ...-12	SNGN1207..(SNGN1204..) SNMN1207..	(SNMN1204..)	(SNMN1204..)
CSDNN ...-12	SNGN1207..(SNGN1204..) SNMN1207..	(SNMN1204..)	(SNMN1204..)
Page	B117	B37	C18

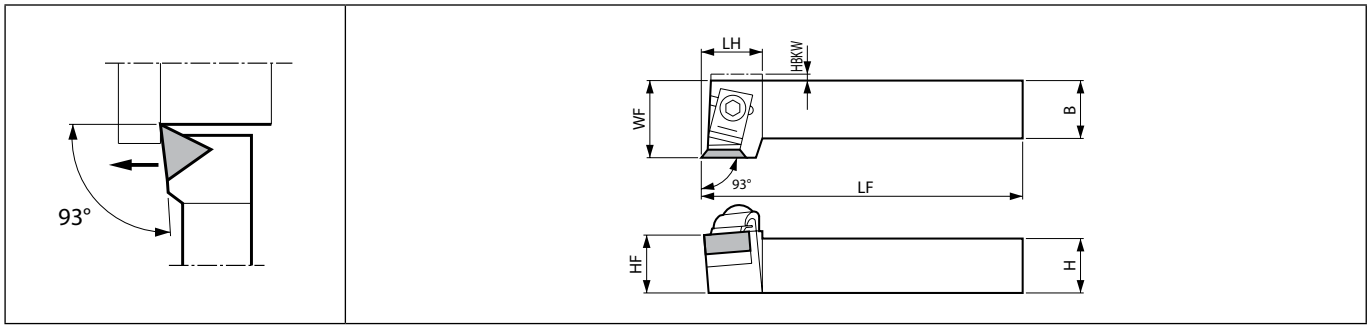
Recommended cutting conditions D69~D70

Spare parts (When using as toolholder for CBN tools (KBN900), please purchase separately.)

Applications	Hard materials / Cast iron	Spare parts		
Type	CBN	Clamp set	Shim	Shim screw
Insert / Toolholder				
CSRN R/L ...-12	(SNMN1204..)	CE-030A	SP-143	M3X12
CSRN R/L ...-15	-	-	-	-
CS-N R/L ...-12	(SNMN1204..)	CE-030A	SP-143	M3X12
CSKN R/L ...-12	(SNMN1204..)	CE-030A	SP-143	M3X12
CSKN R/L ...-15	-	-	-	-
CSYN R/L ...-12	(SNMN1204..)	CE-030A	SP-143	M3X12
CSSN R/L ...-12	(SNMN1204..)	CE-030A	SP-143	M3X12
CSDNN ...-12	(SNMN1204..)	*-	SP-143	M3X12

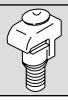
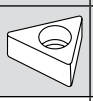
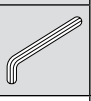
* CSDNN...-12 : Clamp set CE-040 is used continuously.

CTJN (External turning)



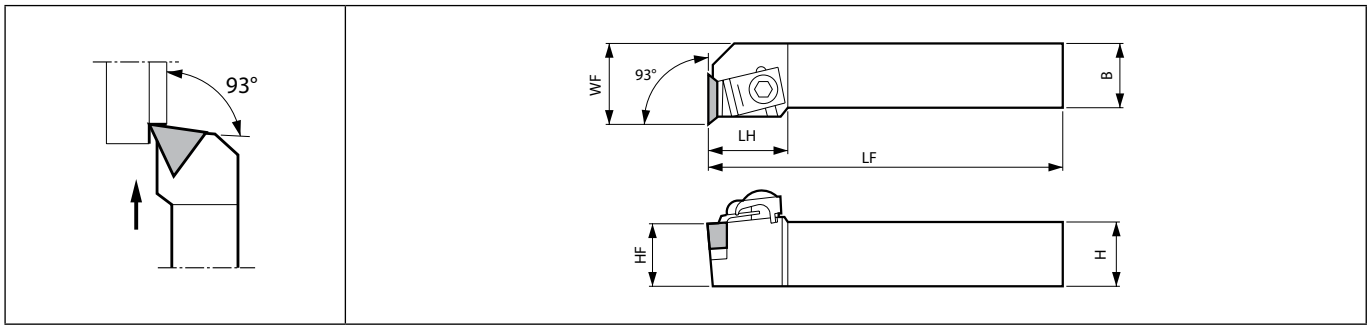
Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts					Applicable inserts
													Chipbreaker	Clamp set	Shim screw	Shim	Wrench	
	R	L	H	B	LH	HF	HBKW	LF	WF									
CTJNR/L 2020K-16	●	●	20	20	21	20	2	125	25	0.8	-6	-4	CB-12/13	CE-020	M3X8 (M3X12*)	SP-221 (SP-223*)	LW-4	TNGN1607... (TN□N1604...*)
2525M-16	●	●	25	25		25	-	150	32									

Chipbreaker : CB-12 for Right-hand Toolholder, CB-13 for Left-hand Toolholder.
Shims indicated * are not included with the toolholder. When using TN□N1604 type insert, please purchase shim (SP-223) and screw (M3X12) separately.

CTUN (External facing)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts					Applicable inserts
												Chipbreaker	Clamp set	Shim screw	Shim	Wrench	
	R	L	H	B	LH	HF	LF	WF									
CTUNR/L 2525M-16	●	●	25	25	27	25	150	32	0.8	-6	-4	CB-13/12	CE-020	M3X8 (M3X12*)	SP-221 (SP-223*)	LW-4	TNGN1607... (TN□N1604...*)

Chipbreaker : CB-13 for Right-hand Toolholder, CB-12 for Left-hand Toolholder.
Shims indicated * are not included with the toolholder. When using TN□N1604 type insert, please purchase shim (SP-223) and screw (M3X12) separately.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts (CTJN / CTUN)

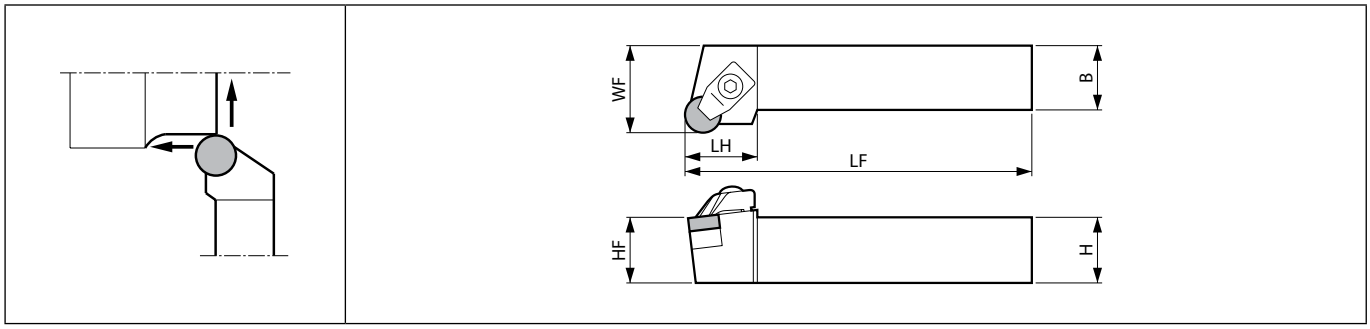
Applications	Cast iron / Hard materials	Hard materials / Cast iron
Insert		
Type	Ceramic	CBN
Page	B118	C19

Recommended cutting conditions D69~D70

D

External turning

CRSN (External turning / External facing)



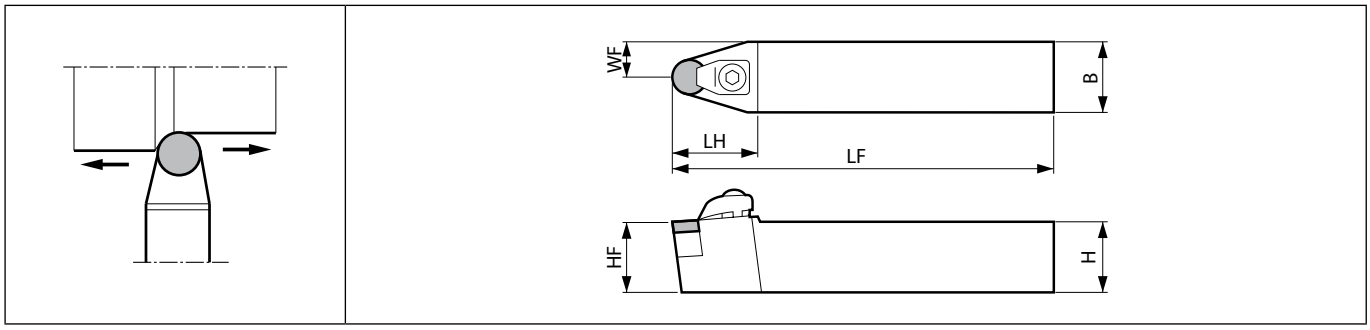
Right-hand shown

Toolholder dimensions

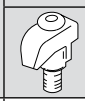
Description		Availability		Dimension (mm)						Side rake angle (°)	Inclination angle (°)	Spare parts				Applicable inserts
												Clamp set	Shim screw	Shim	Wrench	
		R	L	H	B	LH	HF	LF	WF							
CRSN□□	2020K-12	●	●	20	20	26	20	125	25	-6	-6	CE-030	M3X8 (M3X12*)	SP-841 (SP-843*)	LW-4	RNGN1207... (RN□N1204...*)
	2525M-12	●	●	25	25		25	150	32							
	3225P-12	●	●	32			32	170								

Shims indicated * are not included with the toolholder. When using RN□N1204 type insert, please purchase shim (SP-843) and screw (M3X12) separately.

CRDN (External turning / External copying)



Toolholder dimensions

Description		Availability	Dimension (mm)						Back rake angle (°)	Spare parts				Applicable inserts
										Clamp set	Shim screw	Shim	Wrench	
		N	H	B	LH	HF	LF	WF						
CRDNN	2020K-12	●	20	20	28	20	125	10	-8.5	CE-030	M3X8 (M3X12*)	SP-841 (SP-843*)	LW-4	RNGN1207... (RN□N1204...*)
	2525M-12	●	25	25		25	150	12.5						
	3225P-12	●	32			32	170							
CRDNN	3232P-15	●	32	32	35	32	170	16	-8.5	CE-040	M4X10	SP-861	LW-4	RNGN1507...
	4040R-15	●	40	40		40	200	20						

Shims indicated * are not included with the toolholder. When using RN□N1204 type insert, please purchase shim (SP-843) and screw (M3X12) separately.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts

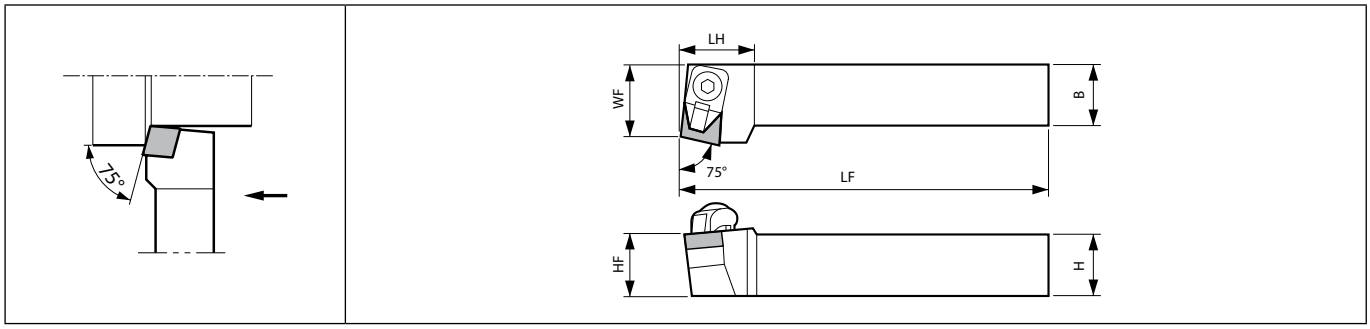
Applications	Cast iron / Hard materials	Hard materials / Cast iron
Type	Ceramic	CBN
Insert / Toolholder		
CRSN R/L ...-12	RNGN120700 (RNGN120400)	(RNMN120400)
CRDNN ...-12	RNGN120700 (RNGN120400)	(RNMN120400)
CRDNN ...-15	RNGN150700	-
Page	B116	C17

Recommended cutting conditions ➔ **D69~D70**

Spare parts (When using as toolholder for CBN tools (KBN900), please purchase separately.)

Applications	Hard materials / Cast iron	Spare parts		
Type	CBN	Clamp set	Shim	Shim screw
Insert / Toolholder				
CRSN R/L ...-12	(RNMN120400)	CE-030A	SP-843	M3X12
CRDNN ...-12	(RNMN120400)	CE-030A	SP-843	M3X12
CRDNN ...-15	-	-	-	-

CCRN-A (External turning)

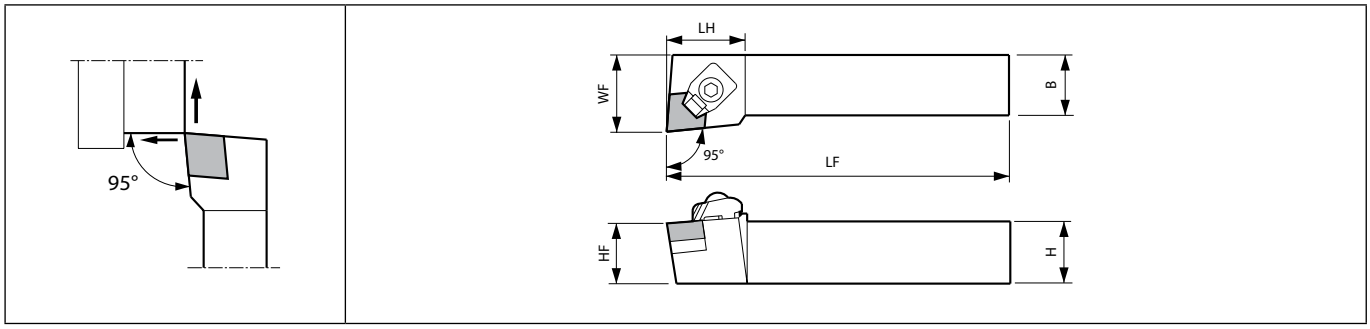


Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts				Applicable inserts
	R	L	H	B	LH	HF	LF	WF				Clamp set	Shim screw	Shim	Wrench	
CCRN R/L 2525M-09A	●		25	25	27	25	150	27	0.8	-6	-6	CE-030A	HH3X12	SP-429	LW-4	CNMN0903...

CCLN-A (External turning / External facing)



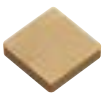
Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts				Applicable inserts
	R	L	H	B	LH	HF	LF	WF				Clamp set	Shim screw	Shim	Wrench	
CCLN R/L 2525M-09A	●	●	25	25	28	25	150	32	0.8	-5	-5	CE-030A	HH3X12	SP-429	LW-4	CNMN0903...

For CNMN1204 Insert toolholder, see page **D49**

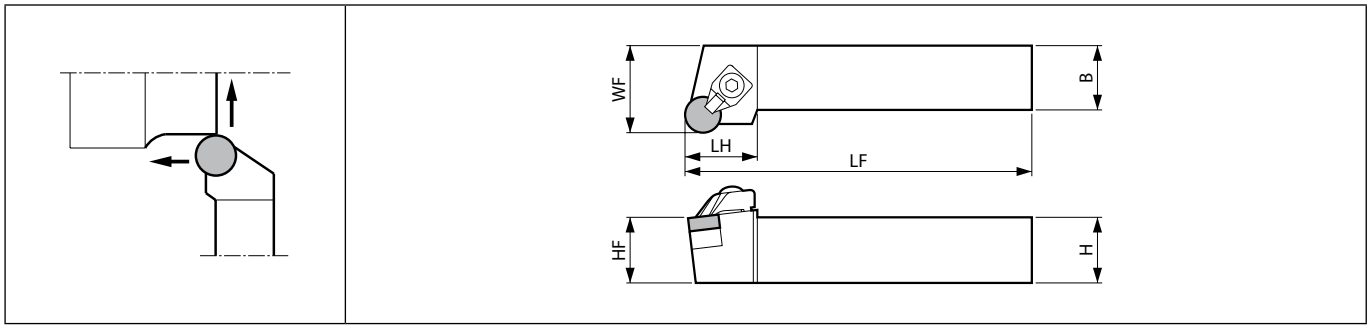
Applicable inserts

Applications	Hard materials / Cast iron
Insert	
Type	CBN
Page	C16

Recommended cutting conditions **D69~D70**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CRSN-A (External turning / External facing)



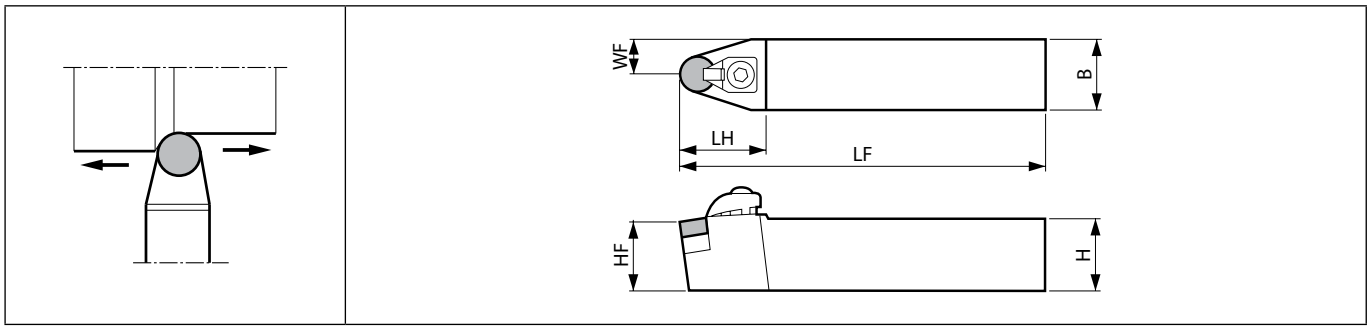
Right-hand shown

Toolholder dimensions

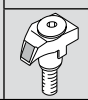
Description		Availability		Dimension (mm)						Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts
												Clamp set	Shim screw	Shim screw	Shim	Shim	Wrench	
		R	L	H	B	LH	HF	LF	WF									
CRSN□	2525M-09A	●	●	25	25	26	25	150	32	-6	-6	CE-030A	-	HH3X12	SP-829 (SP-826*)	-	LW-4	RNMN0903... (RNGN0904...*)
	3225P-09A	●	●	32			32	170										
CRSN□	2525M-12A	●	●	25	25	26	25	150	32	-6	-6	CE-030A	BH3X12	-	-	SP-849 (SP-843**) (SP-841***)	LW-4	RNMN1203... (RN□N1204...**) (RNGN1207...***)
	3225P-12A	●	●	32			32	170										

When using RNGN0904 type insert, please purchase shim (SP-826) separately.
When using RN□N1204 type insert, please purchase shim (SP-843) separately.
When using RNGN1207 type insert, please purchase shim (SP-841) separately.

CRDN-A (External turning / External copying)



Toolholder dimensions

Description		Availability	Dimension (mm)						Back rake angle (°)	Spare parts						Applicable inserts
										Clamp set	Shim screw	Shim screw	Shim	Shim	Wrench	
		N	H	B	LH	HF	LF	WF								
CRDNN	2525M-09A	●	25	25	29	25	150	12.5	-8.5	CE-030A	-	HH3X12	SP-829 (SP-826*)	-	LW-4	RNMN0903... (RNGN0904...*)
	3225P-09A	●	32			32	170									
CRDNN	2525M-12A	●	25	25	28	25	150	12.5	-8.5	CE-030A	BH3X12	-	-	SP-849 (SP-843**) (SP-841***)	LW-4	RNMN1203... (RN□N1204...**) (RNGN1207...***)
	3225P-12A	●	32			32	170									

When using RNGN0904 type insert, please purchase shim (SP-826) separately.
When using RN□N1204 type insert, please purchase shim (SP-843) separately.
When using RNGN1207 type insert, please purchase shim (SP-841) separately.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts

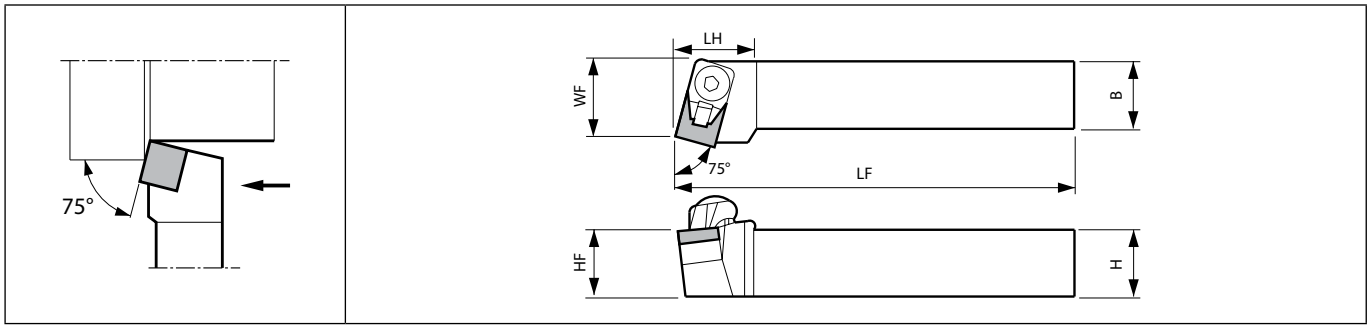
Applications	Hard materials / Cast iron	Cast iron / Hard materials
Type	CBN	Ceramic
Insert / Toolholder		
CRSN R/L ...-09A	RNMN090300	(RNGN090400)
CRSN R/L ...-12A	RNMN120300 (RNMN120400)	(RNGN120400) (RNGN120700)
CRDNN ...-09A	RNMN090300	(RNGN090400)
CRDNN ...-12A	RNMN120300 (RNMN120400)	(RNGN120400) (RNGN120700)
Page	C17	B116

Recommended cutting conditions ➡ D69~D70

Spare parts (When using as toolholder for Ceramic tools, please purchase separately.)

Applications	Cast iron / Hard materials	Spare parts	
Type	Ceramic	Shim	Shim screw
Insert / Toolholder			
CRSN R/L ...-09A	(RNGN090400)	SP-826	-
CRSN R/L ...-12A	(RNGN120400)	SP-843	M3X12
	(RNGN120700)	SP-841	M3X8
CRDNN ...-09A	(RNGN090400)	SP-826	-
CRDNN ...-12A	(RNGN120400)	SP-843	M3X12
	(RNGN120700)	SP-841	M3X8

CSRN-A (External turning)



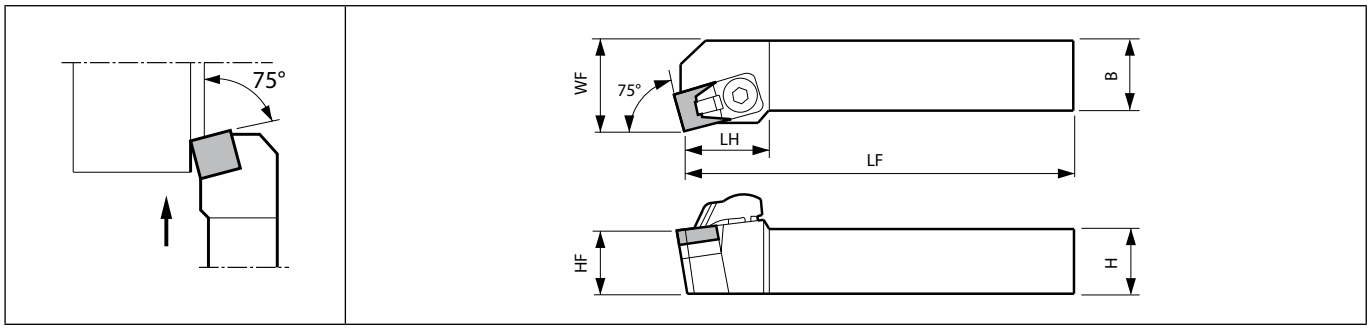
Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts				Applicable inserts
												Clamp set	Shim screw	Shim	Wrench	
	R	L	H	B	LH	HF	LF	WF								
CSRN□ 2525M-12A	●	●	25	25	22	25	150	27	0.8	-6	-4	CE-030A	BH3X12	SP-148 (SP-143*)	LW-4	SNMN1203... (SN□N1204...)

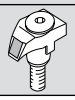
When using SN□N1204 type insert, please purchase shim (SP-143) separately.

CSKN-A (External facing)



Right-hand shown

Toolholder dimensions

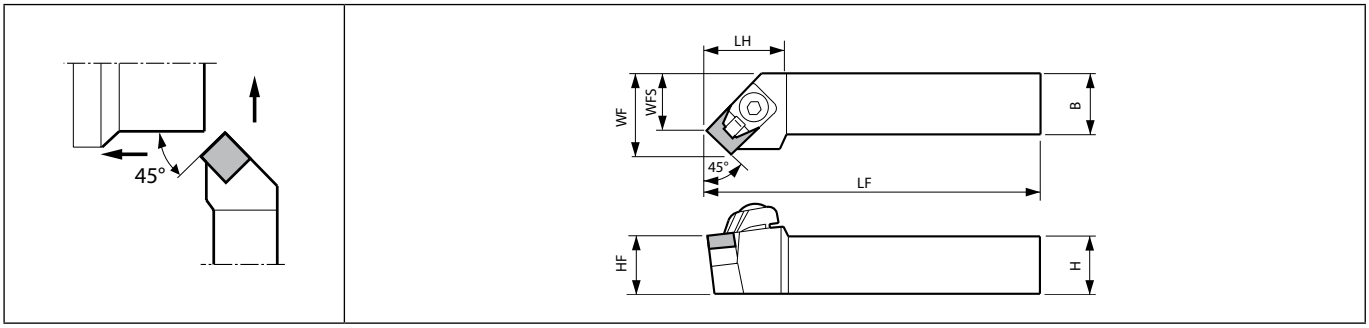
Description	Availability	Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts				Applicable inserts
											Clamp set	Shim screw	Shim	Wrench	
	R	H	B	LH	HF	LF	WF								
CSKNR 2525M-09A	●	25	25	27	25	150	32	0.8	-6	-4	CE-030A	HH3X12	SP-129	LW-4	SNMN0903...

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

D

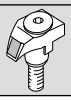
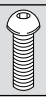
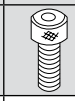
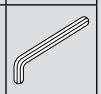
External turning

CSSN-A (External turning / External facing / Chamfering)



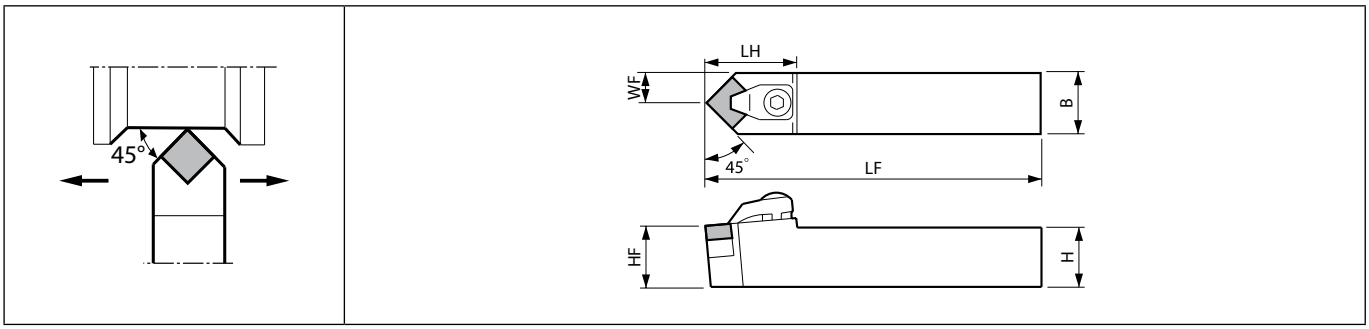
Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts
													Clamp set	Shim screw	Shim screw	Shim	Shim	Wrench	
	R	L	H	B	LH	HF	LF	WF	WFS										
CSSN□ 2525M-09A	●	●	25	25	26	25	150	32	25	0.8	-6	0	CE-030A	-	HH3X12	SP-129	-	LW-4	SNMN0903...
CSSN□ 2525M-12A	●	●	25	25	26	25	150	32	23	0.8	-6	0	CE-030A	BH3X12	-	-	SP-148 (SP-143*) (SP-141*)	LW-4	SNMN1203... (SN□N1204...*) (SN□N1207...*)

When using SN□N1204 type insert, please purchase shim (SP-143) separately. When using SN□N1207 type insert, please purchase shim (SP-141) separately.

CSDN-A (External turning / Chamfering)



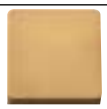
Toolholder dimensions

Description	Availability	Dimension (mm)						Standard corner-R(RE)	Back rake angle (°)	Spare parts						Applicable inserts
										Clamp set	Shim screw	Shim screw	Shim	Shim	Wrench	
	N	H	B	LH	HF	LF	WF									
CSDNN 2525M-09A	●	25	25	32	25	150	12.5	0.8	-8.5	CE-040	-	HH3X12	SP-129	-	LW-4	SNMN0903...
CSDNN 2525M-12A	●	25	25	32	25	150	12.5	0.8	-8.5	CE-040	BH3X12	-	-	SP-148 (SP-143*) (SP-141*)	LW-4	SNMN1203... (SN□N1204...*) (SN□N1207...*)

When using SN□N1204 type insert, please purchase shim (SP-143) separately. When using SN□N1207 type insert, please purchase shim (SP-141) separately.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts

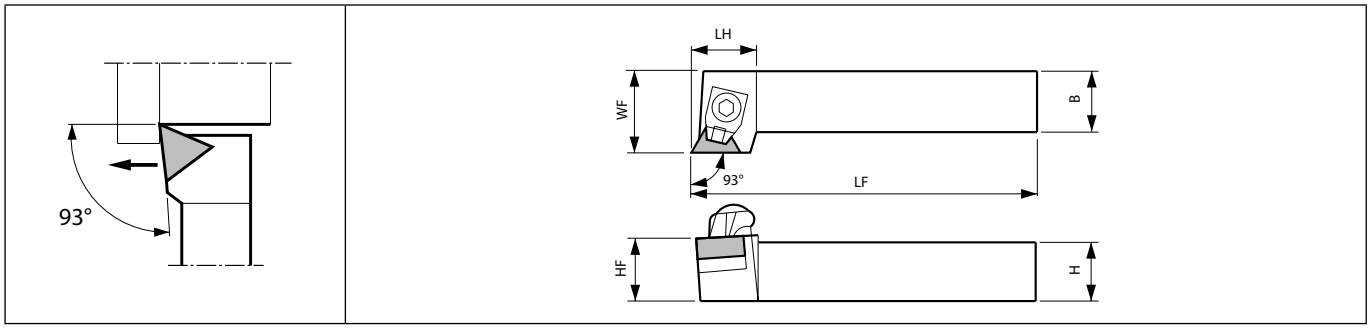
Applications	Hard materials / Cast iron	Cast iron	Cast iron / Hard materials
Type	CBN	Coated carbide	Ceramic
Insert / Toolholder			
CSRN R/L ...-12A	SNMN1203.. (SNMN1204..)	(SNMN1204..)	(SNGN1204..)(SNMN1204..) (SNGN1207..)(SNMN1207..)
CSKN R/L ...-09A	SNMN0903..	-	-
CSSN R/L ...-09A	SNMN0903..	-	-
CSSN R/L ...-12A	SNMN1203.. (SNMN1204..)	(SNMN1204..)	(SNGN1204..)(SNMN1204..) (SNGN1207..)(SNMN1207..)
CSDNN ...-09A	SNMN0903..	-	-
CSDNN ...-12A	SNMN1203.. (SNMN1204..)	(SNMN1204..)	(SNGN1204..)(SNMN1204..) (SNGN1207..)(SNMN1207..)
Page	C18	B37	B117

Recommended cutting conditions ➡ D69~D70

Spare parts (When using as toolholder for Ceramic tools, please purchase separately.)

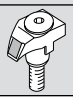
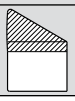
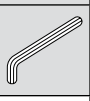
Applications	Cast iron / Hard materials	Spare parts			
Type	Ceramic	Chipbreaker	Clamp set	Shim	Shim screw
Insert / Toolholder					
CSRN R/L ...-12A	(SNGN1204..)(SNMN1204..)	CB-11	CE-020	SP-143	M3X12
	(SNGN1207..)(SNMN1207..)			SP-141	M3X8
CSKN R/L ...-09A	-	-	-	-	-
CSSN R/L ...-09A	-	-	-	-	-
CSSN R/L ...-12A	(SNGN1204..)(SNMN1204..)	CB-11	CE-020	SP-143	M3X12
	(SNGN1207..)(SNMN1207..)			SP-141	M3X8
CSDNN ...-09A	-	-	-	-	-
CSDNN ...-12A	(SNGN1204..)(SNMN1204..)	-	-	SP-143	M3X12
	(SNGN1207..)(SNMN1207..)			SP-141	M3X8

CTJN-A (External turning)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts				Applicable inserts
												Clamp set	Shim screw	Shim	Wrench	
	R	L	H	B	LH	HF	LF	WF								
CTJN□2525M-11A	●	●	25	25	22	25	150	32	0.8	-6	-4	CE-030A	HH3X12	SP-219	LW-4	TN□N1103...

For TNMN1604 Insert toolholder, see page **D56**.

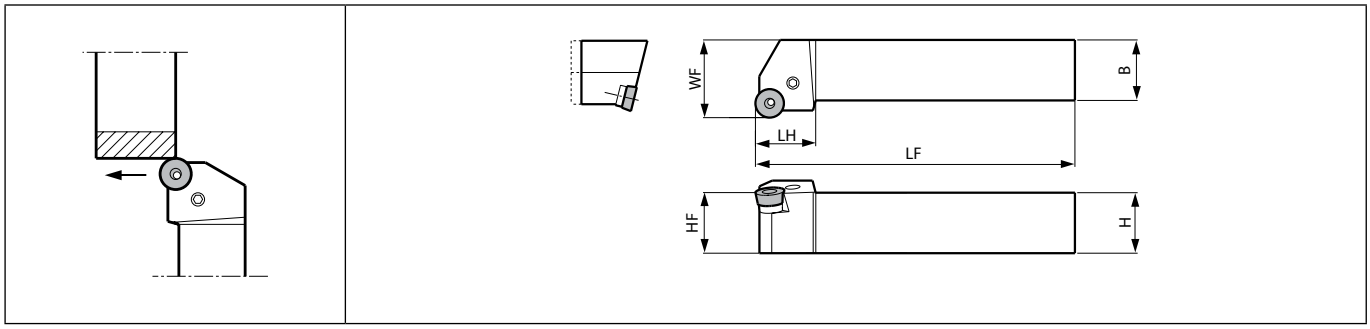
Applicable inserts

Applications	Hard materials / Cast iron	Cast iron / Hard materials
Insert		
Type	CBN	Ceramic
Page	C19	B118

Recommended cutting conditions **D69~D70**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

PRGC-BE (External turning)



Right-hand shown

Toolholder dimensions

Description	Availability	Dimension (mm)						Spare parts						Applicable inserts
								Lever	Lock screw	Punch	Shim pin	Shim	Wrench	
	R	H	B	LH	HF	LF	WF							
PRGCR 2525M-12BE	●	25	25	25	25	150	32	LL-1CN	LS-1N	PC-1	LSP-1	LR-12C	FH-2.5	RCMT1204M0-BB

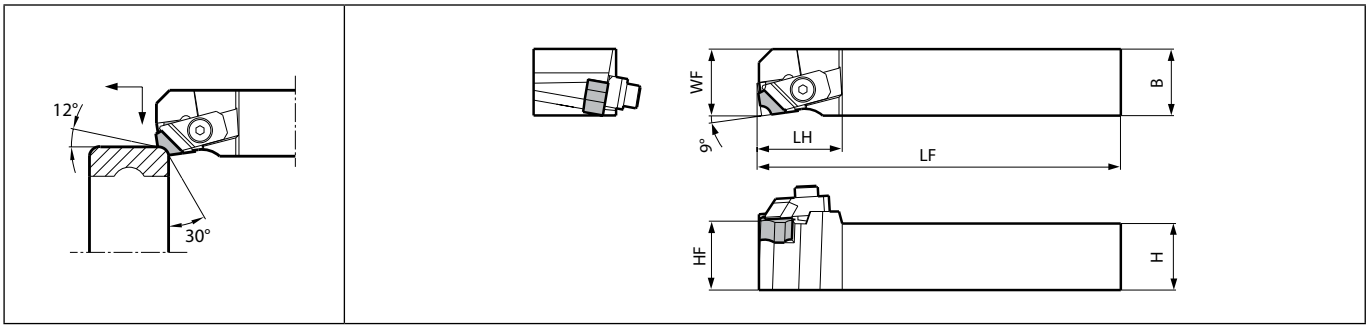
Applicable inserts

Applications	Finishing
Insert	
Chipbreaker type	BB
Page	B109

Recommended cutting conditions ➡ D69~D70

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBSN (External round chamfering)



Right-hand shown

Toolholder dimensions

Description		Availability		Dimension (mm)						Spare parts				Applicable inserts
		R	L	H	B	LH	HF	LF	WF	Clamp set	Shim screw	Shim	Wrench	
CBSN R/L	2020K-12	●	●	20	20	32	20	125	20	CP-RC R/L	SP3X8	SP-RC	LW-5	SNMF1204..-21
	2525M-12	●	●	25	25		25	150	25					

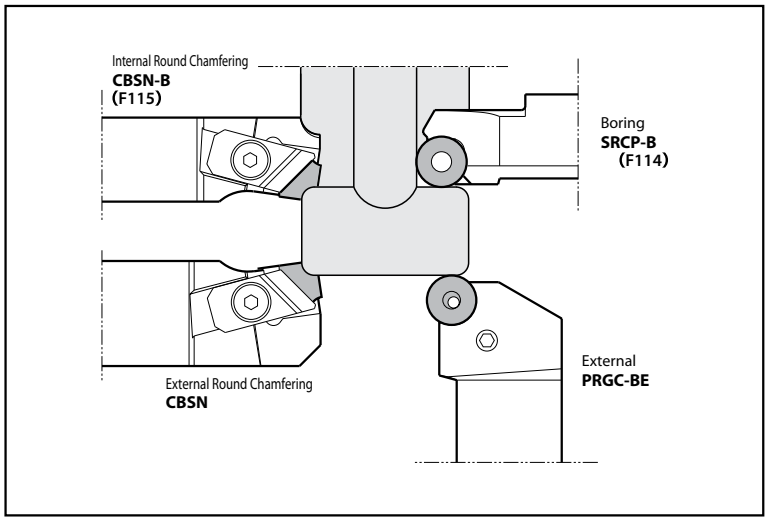
Clamp set : CP-RCR for Right-hand Toolholder, CP-RCL for Left-hand Toolholder.

Applicable inserts

Applications	Finishing
Insert	
Chipbreaker type	21
Page	B109

Recommended cutting conditions D69~D70

Tooling for bearing machining



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

External turning - Negative insert

ap indicates radius

ISO Classification	Workpiece material	Hardness	Cutting range	Applications	Recommended chipbreaker	Recommended insert grade	Corner-R(RE)	Lower Limit - Recommendation - Upper Limit		
								Vc (m/min)	ap (mm)	f (mm/rev)
P	Low carbon steel Low carbon alloy	HB ≤ 300	Finishing (High Speed Machining)	Continuous	XP	CCX	0.8	300 - **600** - 800	0.2 - **0.5** - 0.7	0.07 - **0.12** - 0.2
			Finishing (Small ap)	Continuous Interruption	XF	PV710 PV720	0.4 0.8	250 - **350** - 520 240 - **320** - 480	0.05 - **0.12** - 0.6 0.05 - **0.15** - 0.6	0.03 - **0.1** - 0.22 0.04 - **0.12** - 0.25
			Finishing (Gloss Oriented)	Continuous Interruption	XP	TN610 TN620	0.4 0.8	250 - **320** - 400 240 - **310** - 370	0.2 - **0.5** - 0.7 0.2 - **0.5** - 0.7	0.07 - **0.12** - 0.2 0.07 - **0.12** - 0.2
			Finishing (Tool Life Oriented)	Continuous Interruption	XP	PV710 PV720	0.4 0.8	250 - **300** - 370 240 - **290** - 340	0.2 - **0.5** - 0.7 0.2 - **0.5** - 0.7	0.07 - **0.12** - 0.2 0.07 - **0.12** - 0.2
			Finishing - Medium (Gloss Oriented)	Continuous Interruption	XQ	TN610 TN620	0.4 0.8	250 - **320** - 400 240 - **280** - 340	0.5 - **1.0** - 1.5 0.5 - **1.0** - 1.5	0.17 - **0.25** - 0.3 0.17 - **0.25** - 0.3
			Finishing - Medium (Tool Life Oriented)	Continuous Interruption	XQ	PV710 PV720	0.8 0.8	250 - **300** - 370 240 - **280** - 340	0.5 - **1.0** - 1.5 0.5 - **1.0** - 1.5	0.17 - **0.25** - 0.3 0.17 - **0.25** - 0.3
			Medium - Roughing	Continuous Interruption	XS	PV720 CA125P	0.8 0.8	220 - **260** - 320 160 - **210** - 260	0.8 - **1.5** - 2.0 0.8 - **1.5** - 2.0	0.25 - **0.3** - 0.4 0.25 - **0.3** - 0.4
			Roughing	Continuous Interruption	PMG	CA115P CA125P	0.8 1.2	180 - **220** - 260 150 - **200** - 240	1.0 - **2.5** - 3.5 1.0 - **2.5** - 3.5	0.2 - **0.3** - 0.4 0.2 - **0.3** - 0.4
			Roughing High Feed Rate	Continuous Interruption	PH	CA115P CA125P	1.2 1.6	150 - **200** - 240 120 - **180** - 220	2.0 - **5.0** - 8.0 2.0 - **5.0** - 8.0	0.4 - **0.6** - 0.8 0.3 - **0.5** - 0.7
			Roughing (Low Cutting Force)	Continuous Interruption	PX (Single-sided)	CA115P CA125P	1.2 1.6	150 - **200** - 240 120 - **180** - 220	2.0 - **5.0** - 8.0 2.0 - **5.0** - 8.0	0.4 - **0.6** - 0.8 0.3 - **0.5** - 0.7
	Medium carbon steel Medium carbon alloy	HB ≤ 300	Finishing (Time Oriented)	Continuous Interruption	WF (Wiper)	PV710 CA125P	0.8 0.8	200 - **250** - 320 160 - **220** - 280	0.3 - **0.5** - 1.0 0.3 - **0.5** - 1.0	0.2 - **0.3** - 0.4 0.2 - **0.3** - 0.4
			Finishing - Medium (Time Oriented)	Continuous Interruption	WE (Wiper)	PV710 CA125P	0.8 0.8	180 - **220** - 280 130 - **180** - 240	1.0 - **2.0** - 3.0 1.0 - **2.0** - 3.0	0.2 - **0.3** - 0.4 0.2 - **0.3** - 0.4
			Finishing (High Speed Machining)	Continuous	PP	CCX	0.8	200 - **300** - 450	0.2 - **0.5** - 1.5	0.04 - **0.16** - 0.28
			Finishing (Gloss Oriented)	Continuous Interruption	PP	TN610	0.4 0.8	200 - **250** - 320 180 - **230** - 300	0.2 - **0.5** - 1.5 0.2 - **0.5** - 1.5	0.04 - **0.16** - 0.28 0.05 - **0.2** - 0.35
			Finishing (Tool Life Oriented)	Continuous Interruption	PP	PV710 PV720	0.4 0.8	200 - **250** - 320 200 - **240** - 290	0.2 - **0.5** - 1.5 0.2 - **0.5** - 1.5	0.04 - **0.16** - 0.28 0.05 - **0.2** - 0.35
			Finishing - Medium (Gloss Oriented)	Continuous Interruption	PQ	TN610 TN620	0.8 1.2	180 - **230** - 300 160 - **220** - 260	0.5 - **1.5** - 2.5 0.5 - **1.5** - 2.5	0.1 - **0.2** - 0.3 0.1 - **0.17** - 0.25
			Finishing - Medium (Tool Life Oriented)	Continuous Interruption	PQ	PV710 CA125P	0.8 0.8	160 - **210** - 280 140 - **200** - 240	0.5 - **1.5** - 2.5 0.5 - **1.5** - 2.5	0.1 - **0.2** - 0.3 0.1 - **0.17** - 0.25
			Medium - Roughing	Continuous Interruption	PMG	CA115P CA125P	0.8 1.2	150 - **200** - 240 120 - **160** - 200	1.0 - **2.5** - 3.5 1.0 - **2.5** - 3.5	0.2 - **0.3** - 0.4 0.2 - **0.3** - 0.4
			Roughing High Feed Rate	Continuous Interruption	PH	CA115P CA125P	1.2 1.6	120 - **180** - 230 100 - **150** - 200	2.0 - **5.0** - 8.0 2.0 - **5.0** - 8.0	0.4 - **0.6** - 0.8 0.3 - **0.5** - 0.7
			Roughing (Low Cutting Force)	Continuous Interruption	PX (Single-sided)	CA115P CA125P	1.2 1.6	120 - **180** - 230 100 - **150** - 200	2.0 - **5.0** - 8.0 2.0 - **5.0** - 8.0	0.4 - **0.6** - 0.8 0.3 - **0.5** - 0.7
	High carbon alloy	HB ≤ 280	Finishing (High Speed Machining)	Continuous	PP	CCX	0.8	200 - **300** - 400	0.2 - **0.5** - 1.5	0.04 - **0.16** - 0.28
			Finishing (Gloss Oriented)	Continuous Interruption	PP	TN610 TN620	0.4 0.8	150 - **200** - 280 140 - **180** - 240	0.2 - **0.5** - 1.5 0.2 - **0.5** - 1.5	0.04 - **0.16** - 0.28 0.05 - **0.2** - 0.35
			Finishing (Tool Life Oriented)	Continuous Interruption	PP	PV710 CA125P	0.4 0.8	120 - **180** - 260 100 - **150** - 200	0.2 - **0.5** - 1.5 0.2 - **0.5** - 1.5	0.04 - **0.16** - 0.28 0.05 - **0.2** - 0.35
			Finishing - Medium	Continuous Interruption	PQ	CA115P CA125P	0.8 0.8	120 - **160** - 220 100 - **140** - 180	0.5 - **1.5** - 2.5 0.5 - **1.5** - 2.5	0.15 - **0.25** - 0.3 0.15 - **0.2** - 0.25
			Medium - Roughing	Continuous Interruption	PMG	CA115P CA125P	0.8 0.8	120 - **150** - 200 100 - **130** - 180	1.0 - **2.0** - 3.0 1.0 - **2.0** - 3.0	0.2 - **0.3** - 0.5 0.15 - **0.2** - 0.3
			Roughing High Feed Rate	Continuous Interruption	PH	CA115P CA125P	1.2 1.6	100 - **140** - 180 80 - **120** - 160	2.0 - **5.0** - 8.0 2.0 - **5.0** - 8.0	0.4 - **0.6** - 0.8 0.3 - **0.5** - 0.7
			Roughing (Low Cutting Force)	Continuous Interruption	PX (Single-sided)	CA115P CA125P	1.2 1.6	100 - **140** - 180 80 - **120** - 160	2.0 - **5.0** - 8.0 2.0 - **5.0** - 8.0	0.4 - **0.6** - 0.8 0.3 - **0.5** - 0.7

External turning - Negative insert

ap indicates radius

ISO Classification	Workpiece material	Hardness	Cutting range	Applications	Recommended chipbreaker	Recommended insert grade	Corner-R(RE)	Lower limit - Recommendation - Upper limit		
								Vc (m/min)	ap (mm)	f (mm/rev)
M	Stainless steel (Austenitic related)	HB ≤ 220	Finishing (Gloss Oriented)	Continuous	PQ	TN620	0.8	120 - **160** - 200	0.5 - **1.0** - 1.5	0.08 - **0.15** - 0.2
				Interruption			0.8	100 - **120** - 150	0.5 - **1.0** - 1.5	0.05 - **0.1** - 0.15
			Finishing	Continuous	MQ	CA6515	0.4	120 - **180** - 240	0.5 - **1.0** - 1.5	0.08 - **0.15** - 0.2
				Interruption		CA6525	0.8	100 - **160** - 220	0.5 - **1.0** - 1.5	0.05 - **0.1** - 0.15
			Medium - Roughing (Chip Control Oriented)	Continuous	MS	CA6515	0.4	120 - **160** - 200	1.0 - **2.0** - 3.0	0.1 - **0.2** - 0.3
				Interruption		CA6525	0.8	80 - **140** - 180	1.0 - **2.0** - 3.0	0.2 - **0.3** - 0.4
			Medium - Roughing (Sharpness Oriented)	Continuous	MU	CA6515	0.4	120 - **160** - 200	1.0 - **2.0** - 3.0	0.15 - **0.25** - 0.35
				Interruption		CA6525	0.8	80 - **140** - 180	1.0 - **2.0** - 3.0	0.15 - **0.25** - 0.3
			Roughing	Continuous	Standard	CA6515	0.8	100 - **140** - 180	1.0 - **2.0** - 4.0	0.2 - **0.3** - 0.4
				Interruption		CA6525	1.2	80 - **120** - 150	1.0 - **2.0** - 4.0	0.2 - **0.3** - 0.4
	Stainless steel (Precipitation hardening)	HB ≤ 300	Finishing (Gloss Oriented)	Continuous	PQ	TN620	0.8	100 - **120** - 150	0.5 - **1.0** - 1.5	0.05 - **0.1** - 0.15
				Interruption			0.8	80 - **100** - 120	0.5 - **1.0** - 1.5	0.05 - **0.08** - 0.1
			Finishing	Continuous	MQ	CA6515	0.4	100 - **120** - 150	0.5 - **1.0** - 1.5	0.08 - **0.15** - 0.2
				Interruption		CA6525	0.8	80 - **100** - 120	0.5 - **1.0** - 1.5	0.05 - **0.1** - 0.15
			Medium - Roughing (Chip Control Oriented)	Continuous	MS	CA6515	0.4	100 - **120** - 150	1.0 - **1.5** - 2.0	0.1 - **0.15** - 0.25
				Interruption		CA6525	0.8	80 - **100** - 120	1.0 - **2.0** - 3.0	0.1 - **0.15** - 0.2
			Medium - Roughing (Sharpness Oriented)	Continuous	MU	CA6515	0.4	100 - **120** - 150	1.0 - **1.5** - 2.0	0.1 - **0.15** - 0.25
				Interruption		CA6525	0.8	80 - **100** - 120	1.0 - **2.0** - 3.0	0.1 - **0.15** - 0.2
			Roughing	Continuous	Standard	CA6515	0.8	80 - **100** - 120	1.0 - **2.0** - 3.0	0.2 - **0.3** - 0.4
				Interruption		CA6525	1.2	60 - **80** - 100	1.0 - **2.0** - 4.0	0.2 - **0.3** - 0.4
K	Gray cast iron	HB ≤ 250	High Speed Machining	Continuous	Without chipbreaker	KBN475	0.8	400 - **800** - 1200	0.05 - **0.2** - 0.5	0.1 - **0.2** - 0.3
				Continuous		KBN900	1.2	500 - **900** - 1200	0.1 - **0.5** - 1.0	0.05 - **0.1** - 0.2
				Interruption		KBN900	1.2	500 - **700** - 900	0.5 - **1.0** - 1.5	0.05 - **0.1** - 0.2
			Finishing (Gloss Oriented)	Continuous	Standard	PV7005	0.8	300 - **350** - 400	0.5 - **1.0** - 1.5	0.1 - **0.2** - 0.3
				Interruption		PV720	0.8	150 - **200** - 300	0.5 - **1.0** - 1.5	0.08 - **0.15** - 0.2
			Finishing (Ceramic)	Continuous	Without chipbreaker	KA30	1.2	300 - **500** - 700	0.3 - **0.5** - 1.0	0.1 - **0.2** - 0.3
				Continuous		PT600M	0.8	300 - **450** - 600	0.3 - **0.5** - 1.0	0.1 - **0.2** - 0.3
			Medium (Ceramic)	Continuous		CS7050	1.2	300 - **450** - 550	1.0 - **2.0** - 3.0	0.15 - **0.25** - 0.35
				Interruption		KS6050	1.2	250 - **400** - 500	1.0 - **2.0** - 3.0	0.15 - **0.2** - 0.3
			Medium	Continuous	KH	CA310	0.8	200 - **250** - 300	0.5 - **2.0** - 2.5	0.1 - **0.2** - 0.3
				Interruption		CA315	1.2	150 - **200** - 250	0.5 - **2.0** - 2.5	0.08 - **0.15** - 0.2
			Roughing	Continuous	KH	CA310	0.8	200 - **250** - 300	1.0 - **2.0** - 4.0	0.2 - **0.3** - 0.4
				Interruption		CA315	1.2	150 - **200** - 250	1.0 - **2.0** - 4.0	0.2 - **0.3** - 0.4
	Nodular cast iron	HB ≤ 270	High Speed Machining	Continuous	Without chipbreaker	KBN60M	0.4	200 - **300** - 400	0.1 - **0.3** - 0.5	0.1 - **0.15** - 0.2
				Continuous		PT600M	0.8	200 - **250** - 350	0.1 - **0.5** - 1.0	0.1 - **0.2** - 0.4
			Finishing (Gloss Oriented)	Continuous	Standard	PV7005	0.8	150 - **250** - 300	0.5 - **1.0** - 1.5	0.1 - **0.2** - 0.3
				Interruption		PV720	0.8	120 - **200** - 250	0.5 - **1.0** - 1.5	0.08 - **0.15** - 0.2
			Medium	Continuous	KG	CA310	0.8	150 - **200** - 250	0.5 - **2.0** - 2.5	0.1 - **0.2** - 0.3
				Interruption		CA315	1.2	120 - **180** - 220	0.5 - **2.0** - 2.5	0.08 - **0.15** - 0.2
			Roughing	Continuous	KG	CA315	0.8	150 - **200** - 250	1.0 - **2.0** - 4.0	0.2 - **0.3** - 0.4
				Interruption	KH	CA320	1.2	120 - **180** - 220	1.0 - **2.0** - 4.0	0.2 - **0.3** - 0.4
N	Non-ferrous metals Copper alloy Aluminum Aluminum alloys	HB ≤ 100	High Speed Machining (Rainbow Surface Gross)	Continuous	Without chipbreaker	KPD001	0.4	300 - **800** - 2000	0.05 - **0.5** - 1.0	0.05 - **0.1** - 0.15
			Finishing (Long Tool Life)	Continuous	A3	PDL025	0.4	400 - **500** - 700	0.5 - **1.0** - 2.0	0.1 - **0.2** - 0.25
				Interruption			0.8	400 - **500** - 700	0.5 - **1.0** - 2.0	0.1 - **0.2** - 0.25
			Finishing	Continuous	A3	KW10	0.8	400 - **500** - 700	0.5 - **1.0** - 2.0	0.1 - **0.2** - 0.25
				Interruption			0.8	400 - **500** - 700	0.5 - **1.0** - 2.0	0.1 - **0.2** - 0.25
			Medium	Continuous	AH	KW10	0.8	200 - **300** - 500	1.0 - **2.0** - 3.5	0.1 - **0.3** - 0.4
				Interruption			0.8	200 - **300** - 500	1.0 - **2.0** - 3.5	0.1 - **0.3** - 0.4
S	Titanium alloys	HB ≤ 400	Precision Finishing (Rainbow Surface Gross)	Continuous	Without chipbreaker	KPD001	0.4	100 - **150** - 180	0.05 - **0.3** - 0.5	0.03 - **0.1** - 0.15
				Interruption			0.4	70 - **120** - 150	0.05 - **0.3** - 0.5	0.03 - **0.07** - 0.1
			Finishing	Continuous	MQ	SW05	0.4	40 - **70** - 100	0.2 - **0.5** - 1.0	0.05 - **0.2** - 0.3
				Interruption			0.4	40 - **70** - 100	0.2 - **0.5** - 1.0	0.05 - **0.15** - 0.2
			Medium	Continuous	MU	SW05	0.8	40 - **60** - 80	0.5 - **1.0** - 3.0	0.1 - **0.25** - 0.35
				Interruption			0.8	40 - **60** - 80	0.5 - **1.0** - 3.0	0.1 - **0.2** - 0.3
	Heat-resistant alloys	HB ≤ 350	Finishing	Continuous	MQ	PR005S	0.4	30 - **55** - 90	0.2 - **0.3** - 1.0	0.05 - **0.08** - 0.15
				Interruption		PR120S	0.8	25 - **45** - 70	0.2 - **0.5** - 1.0	0.05 - **0.1** - 0.2
			Medium	Continuous	SQ	PR005S	0.8	30 - **55** - 90	0.3 - **0.5** - 1.5	0.1 - **0.17** - 0.35
				Interruption		PR120S	0.8	25 - **45** - 70	0.3 - **0.5** - 1.5	0.1 - **0.17** - 0.35
			Roughing	Continuous	SX	PR005S	-	30 - **55** - 90	0.5 - **2.0** - 4.0	0.15 - **0.3** - 0.45
				Interruption		PR120S		25 - **45** - 70	0.5 - **2.0** - 4.0	0.15 - **0.3** - 0.45
H	Hardened steel Hard materials	40-50 HRC	Finishing	Continuous	PQ	CA115P	0.8	60 - **100** - 120	0.1 - **0.3** - 0.5	0.05 - **0.08** - 0.1
				Interruption	Standard		0.8	30 - **50** - 70	0.1 - **0.3** - 0.5	0.05 - **0.08** - 0.1
		40~50 HRC	Finishing	Continuous	Without chipbreaker	PT600M	0.8	60 - **80** - 100	0.2 - **0.5** - 0.7	0.05 - **0.1** - 0.15
		50~65 HRC		Continuous			1.2	30 - **40** - 60	0.2 - **0.5** - 0.7	0.05 - **0.1** - 0.15
		50~68 HRC	Finishing	Continuous	ME	KBN010	0.8	100 - **150** - 200	0.05 - **0.3** - 0.5	0.05 - **0.08** - 0.1
				Interruption	MET	KBN020	1.2	90 - **140** - 180	0.05 - **0.3** - 0.5	0.05 - **0.08** - 0.1
			Medium	Continuous	Without chipbreaker	KBN900	1.2	80 - **100** - 120	0.5 - **1.0** - 2.0	0.05 - **0.1** - 0.2
				Interruption			Radius	70 - **90** - 110	0.3 - **0.7** - 1.0	0.05 - **0.1** - 0.15

E

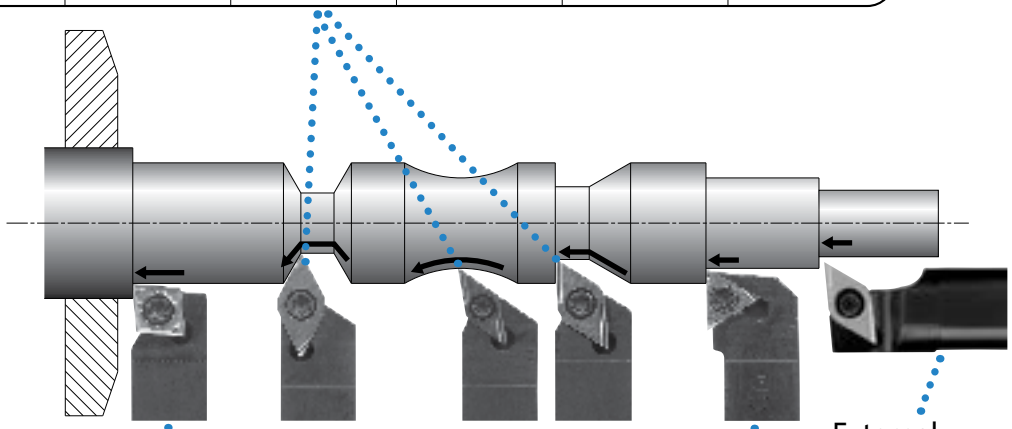


Introduction		**E2**
Toolholders for back turning		**E12**
TKFB insert	TKF	E14
	KTKF / KTKF Goose-neck holder	E15
ABS15 insert	AABS-40F/SABS-40F	E20
ABW15 insert	AABW-40F/SABW-40F	E21
ABW23 insert	AABW-50F/SABW-50F	E22
Goose-neck toolholders		**E23**
DC insert	SDJC	E23
VP insert	SVLP	E24
External toolholders		**E26**
CC insert	ACLC-FF	E26
	SCLC-FF/SCLC-FFJCTM	E27
	SCLC	E28
DC insert	ADJC-FF	E29
	SDJC-FFJCTM	E30
	SDJC	E31
	SDJC-FF-Y	E32
	SDLC-FF	E34
	SDNC-F	E35
	SDNC	E36
DP insert	SDLP-FF	E37
TC/TP insert	STGC	E38
	STGP	E39
VB/VC insert	AVJB-FF/SVJB-FF/SVJB-FFJCTM/SVJB/SVPB/SVVB	E40
	SVJC-FF/SVLC-FF	E44
	SVPC-FF/SVVC	E45
VP insert	SVJP-FF/SVJP-FFJCTM/SVLP-FF/SVPP-FF	E47
ZB insert	SZLB/SZPB/SZVBN	E52
External sleeve holder		**E54**
CC insert	S...SCLC	E54
DC insert	S...SDUC/S...SDLC	E55
VB/VC insert	S...SVUB/S...SVUC	E58
Toolholders for small double sided tooling		**E60**
CN insert	SCLN-FF (without offset)	E60
DN insert	SDLN-FF (without offset)	E61
TN insert	STLN-FF (without offset)	E62
Toolholders for double sided tooling for automatic lathes		**E63**
CN insert	PCLN-FF (without offset)	E63
TN insert	PTLN-FF (without offset)	E64
Recommended cutting conditions		**E65**

Summary of External turning

External / Copying

ADJC-FF	SDJC-FF(JCTM) SDJC-FF-Y	SDJC	SDLC-FF SDLP-FF	SDLN-FF	SDNC-F	SDNC
Back clamp Without offset	Screw clamp Without offset	Screw clamp	Screw clamp Without offset	Screw clamp Without offset	Screw clamp	Screw clamp
E29	E29, E30, E32	E31	E34, E37	E61	E35	E35



External / Facing

ACLC-FF	SCLC-FF(JCTM)	SCLC	SCLN-FF
Back clamp Without offset	Screw clamp Without offset	Screw clamp	Screw clamp Without offset
E26	E26, E27	E28	E60

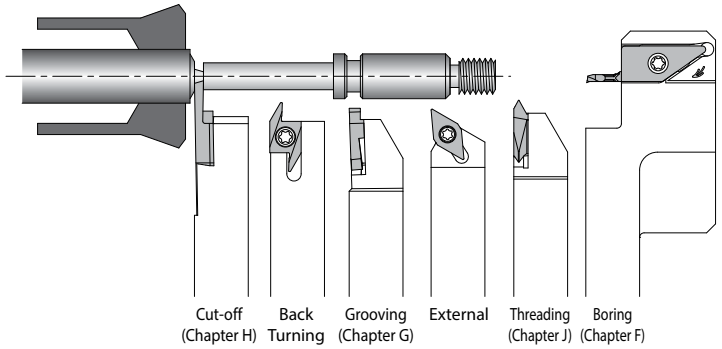
External

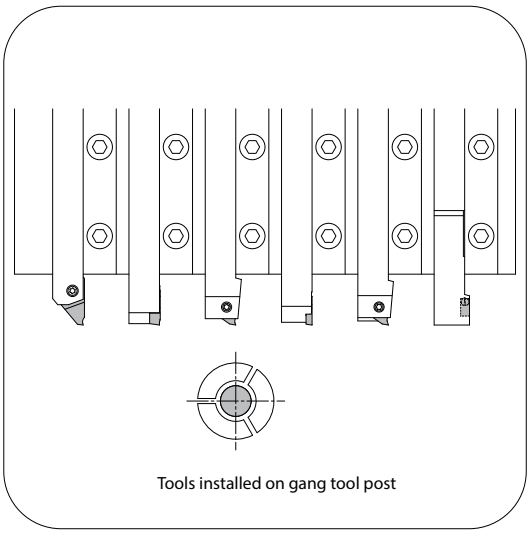
STGC(P)	STLN-FF
Screw clamp	Screw clamp Without offset
E38, E39	E62

External Sleeve holder

S-SDLC
Screw clamp Shank dia. ø12~ø25.4
E56

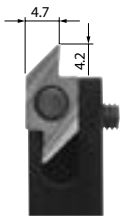
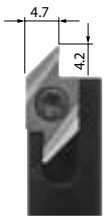
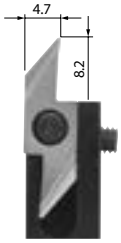
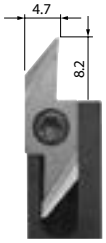
Tooling example (1) CNC Automatic lathe (Gang type)

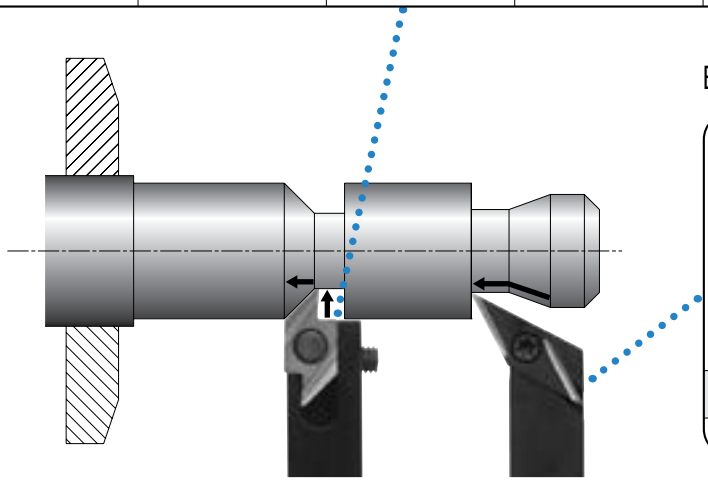




Tools installed on gang tool post

Back turning

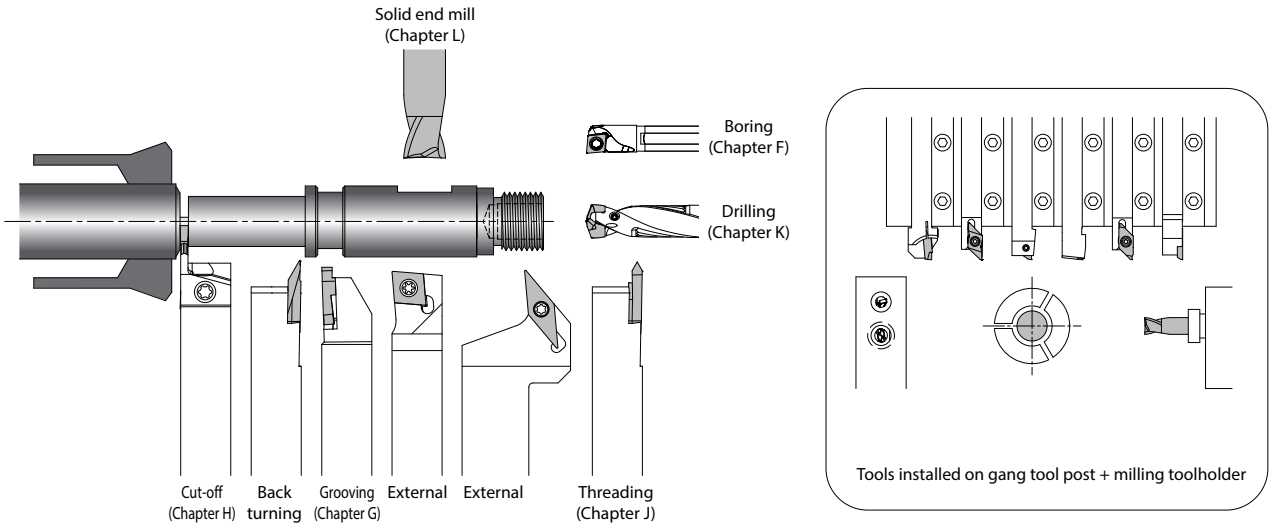
						
AABS-40F	SABS-40F	AABW-40F	SABW-40F	AABW-50F	SABW-50F	KTKF
Back clamp Edge width : 2.8 ap : ~4.0	Screw clamp Edge width : 2.8 ap : ~4.0	Back clamp Edge width : 4.7 ap : ~4.0	Screw clamp Edge width : 4.7 ap : ~4.0	Back clamp Edge width : 4.7 ap : ~5.0	Screw clamp Edge width : 4.7 ap : ~5.0	Screw clamp Edge width : 1.5~3.8 Max. ap : 1.8~5.5
E20	E20	E21	E21	E22	E22	E15, E16



External / Facing / Copying / Undercutting

	
SVPB	SVPP-FF
Screw clamp	Screw clamp Without offset
E42	E49

Tooling example (2) CNC Automatic lathe (Gang type)



How to use goose-neck holder for swiss tool automatic lathe (Gang type tool post)

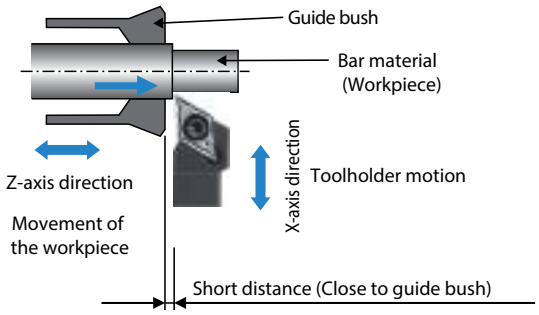


Swiss tool automatic lathe (Guide bush system)

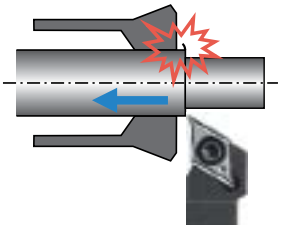
Goose-neck holder is applicable to automatic lathes whose toolholder does not move to longitudinal direction (Z-axis direction).

In case of machining with the conventional toolholder

Goose-neck holder is applicable to automatic lathe that toolholder does not move to longitudinal direction (Z-axis direction)

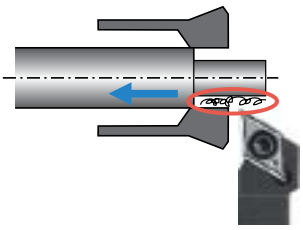


Problems of machining with the conventional toolholder

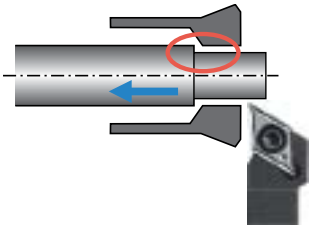


Case 1
During multiple passes, when bar material returns into guide bush, the burr contacts and breaks guide bush.

Case 2
The workpiece burr contacts the guide bush and causes dimensional variation.



Case 3
During multiple passes, when bar material returns into guide bush, the chips contacts and breaks guide bush.

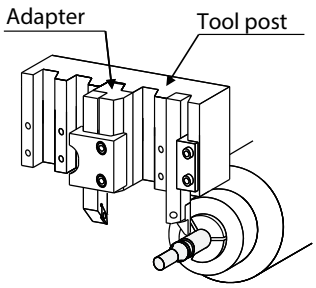


Case 4
Bar material deviation from the guide bush disables machining.

Problems of toolholder Installation

When using a conventional toolholder

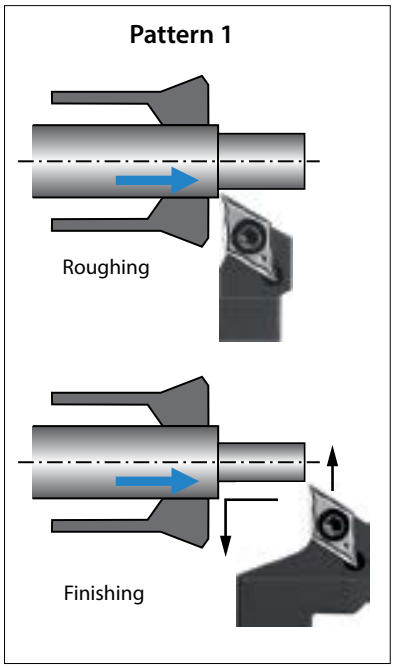
1. Additional space is required for an adapter.
2. Toolholder's handling is difficult due to limited space.
3. Necessary to buy an adapter.
4. An adapter may interfere with the next tool post.



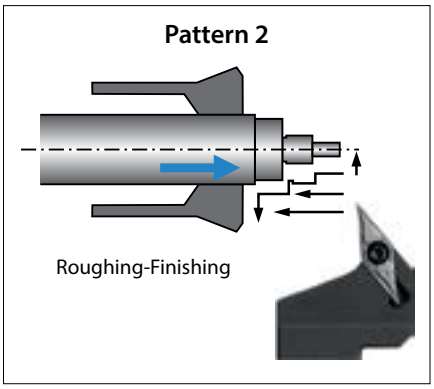
Advantages of goose-neck holder

When using goose-neck holder

1. Machining precision improves by additional finishing process.
2. Chips do not come into the guide bush.
3. Better chip control due to large chip evacuation space.

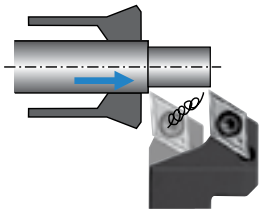


Available for machining after roughing without returning bar material into guide bush, preventing damages and improving precision.

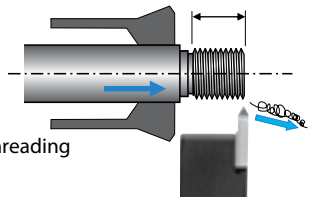


Available for roughing and finishing with one Goose-neck holder.

For better chip control



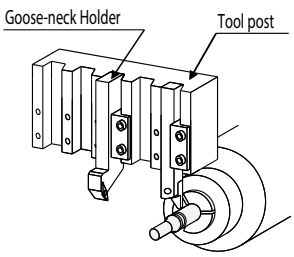
Optimum cutting edge position and large space for efficient chip evacuation.



With conventional threading toolholders, chip biting into guide bush can cause damages on threads.

Advantages of Toolholder installation - When using a goose-neck holder

1. Maximum number of toolholders can be attached.
2. No interference with next tool post.



Summary of External turning

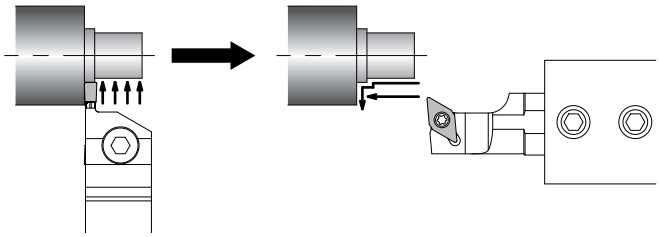
External sleeve holder

			
S-SCLC	S-SDUC	S-SDLC	S-SVUB(C)
Screw clamp Shank dia. ø12~ø25.4	Screw clamp Shank dia. ø14~ø25.4	Screw clamp Shank dia. ø12~ø25.4	Screw clamp Shank dia. ø12~ø25.4
E54	E55	E56	E58, E59



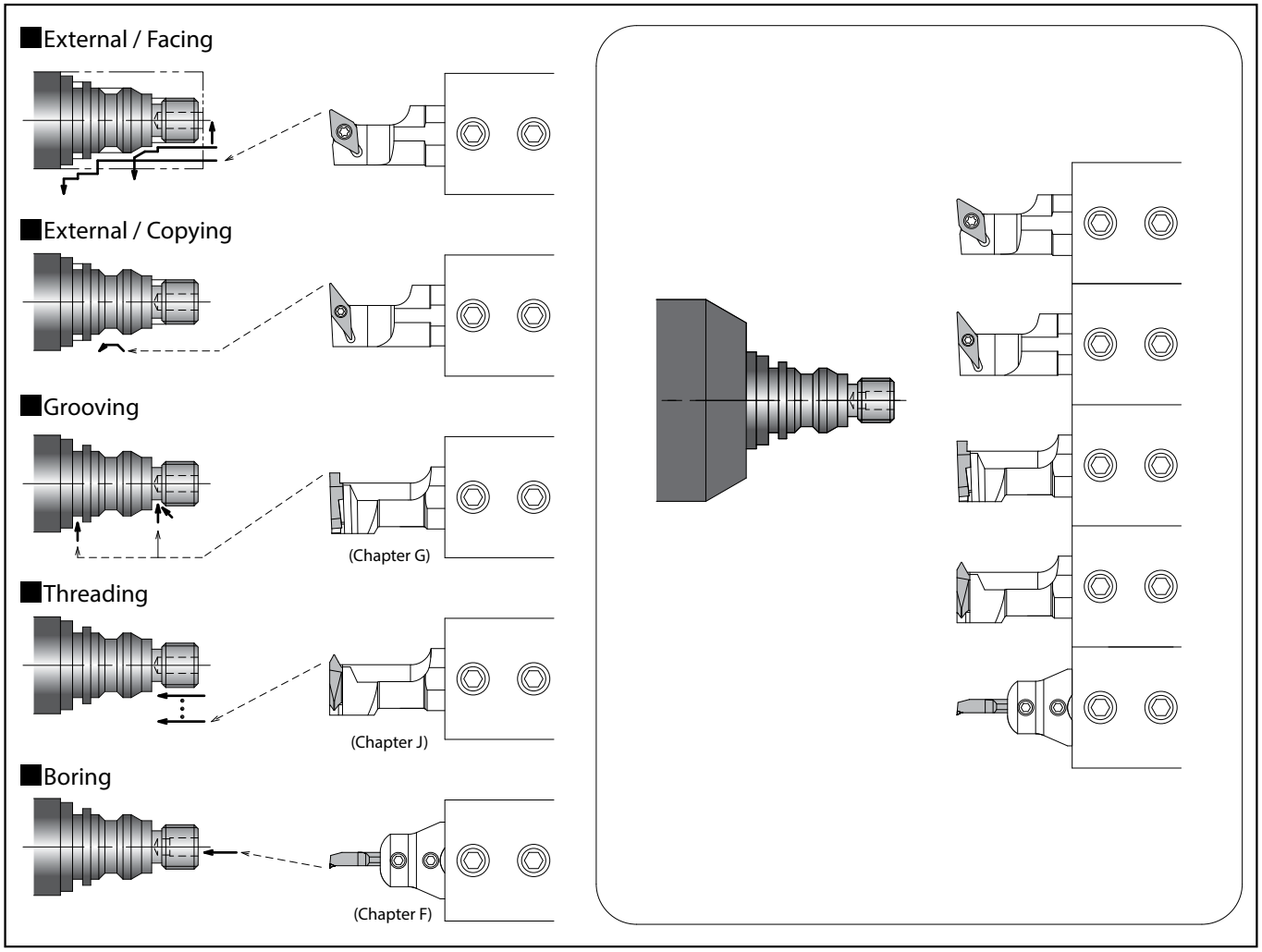
For tooling layout and automatic lathe list by manufacturer, See page R46~R54

● Finishing by sleeve holder



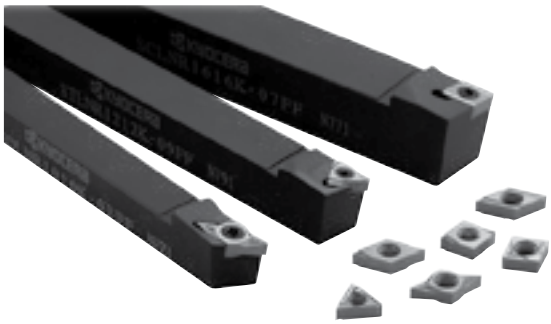
1) Roughing by grooving toolholder
2) Finishing by sleeve holder improves chip control and reduces cutting time

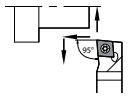
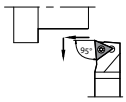
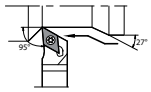
Tooling example (3) CNC automatic lathe (Opposed gang type)



For tooling layout and automatic lathe list by manufacturer, See page R46~R54

Toolholders for small double sided tooling (Screw clamp)

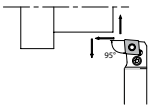
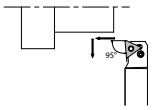


Applications	External / Facing	External / Up Facing	External / Copying
Cutting edge angle	95°	95°	95°
Screw clamp (Without offset)	 SCLN	 STLN	 SDLN
See page	E60	E62	E61

Newly designed negative inserts (double-sided) enable high productivity and stability by economical doubled insert edge numbers
Sharp cutting equivalent to positive inserts (single-sided)

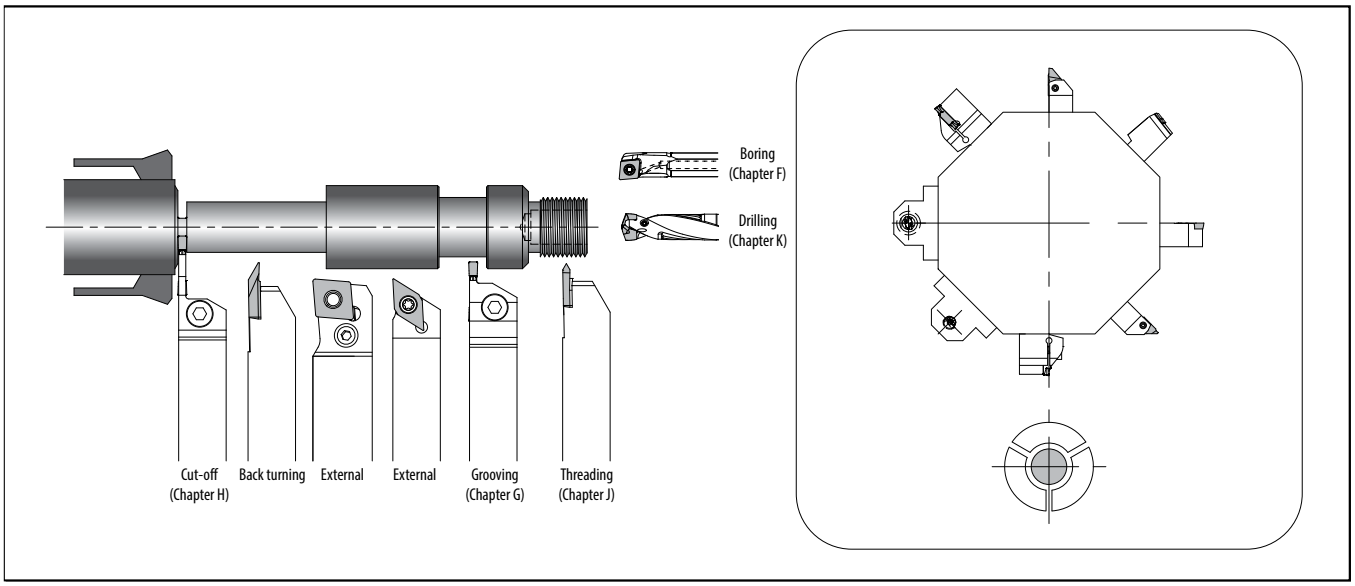
Toolholder for double sided tooling for automatic lathe
(Lever Lock, Without Offset)



Applications	External / Facing	External / Up Facing
Cutting edge angle	95°	95°
Lever lock (Without offset)	 PCLN-FF	 PTLN-FF
See page	E63	E64

The lever lock type is available for small parts machining for external machining

Tooling example (4)



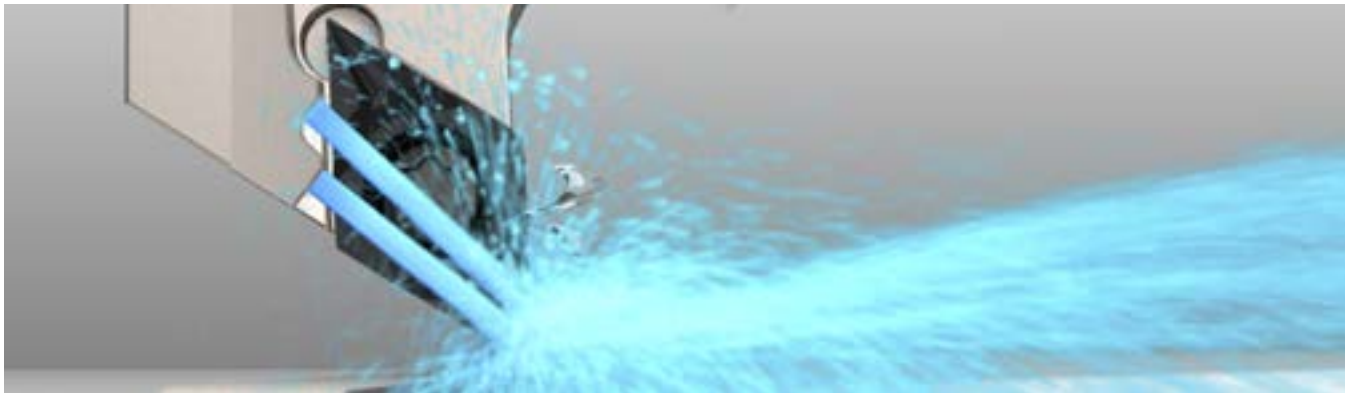
For tooling layout and automatic lathe list by manufacturer, See page R46~R54

JCTM Series direct coolant holder for small parts machining

JCTM Series

Applicable to different supply styles.
Supports internal coolant with/without piping system.
Lineup of turning, grooving (KGBF), and cut-off (KGZ/KGD/KTKF) holders

1 Using internal coolant to enhance tool performance



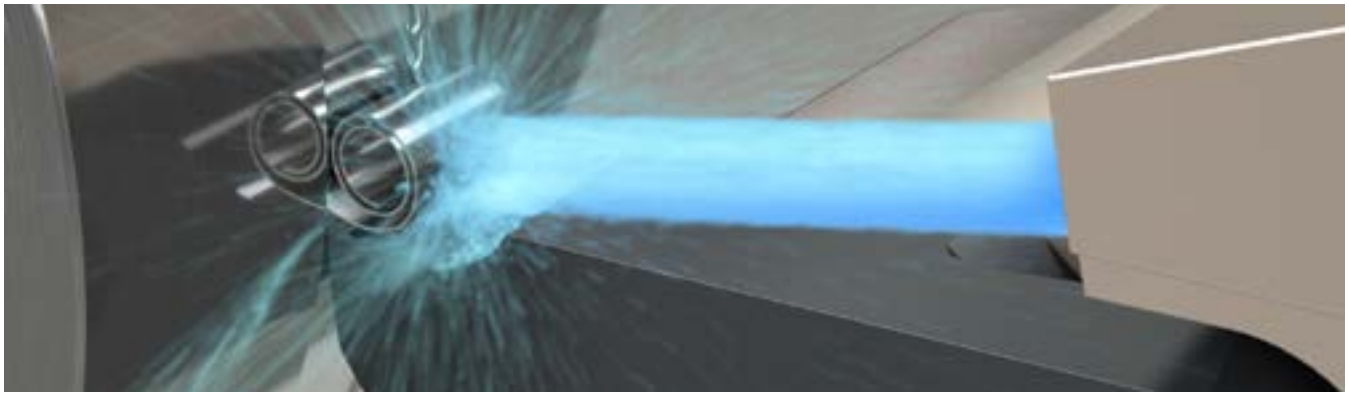
CG Image

Challenges

- Difficulty in automatic operation due to sudden chip entanglement
- Insert change is not enough to extend tool life

Solution

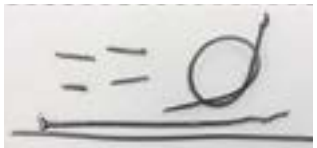
- The JCTM series is compatible with internal coolant supply system in a wide range of machines and also works under normal pressure
- Reduces down time by improving chip control and reduces cost by extending tool life



CG Image

Switching to internal coolant toolholder reduces chip entanglement

Internal coolant (2.5 MPa)



External coolant



Pin Alloy tool steel (SKS93, JIS)
Vc = 180 m/min, ap = 1.4 mm
f = 0.13 mm/rev, wet
SDJC / DCMT11T304 type (User evaluation)

2 Applicable to different supply styles. Supports internal coolant with/without piping system

Internal coolant without piping

NEW

*When the tool turret supports direct coolant

Coolant is supplied directly from tool turret into the holder. No need for piping just by installing tools

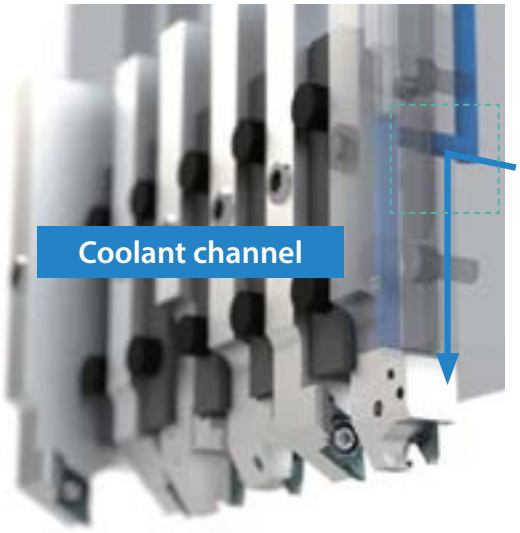
Applicable to wide range of machines

The tool turret is optional. Please contact our company sales representative for details.

CITIZEN MACHINERY CO., LTD. (L20, D25, M32)
STAR MICRONICS CO., LTD. (SB-R series, SR series, SV series)
TSUGAMI CORPORATION (S205/206-Ⅱ □16 type, S205A/206A-Ⅱ □16 type)

Compatible with various machine including the above. Toolholders can be customized as well.

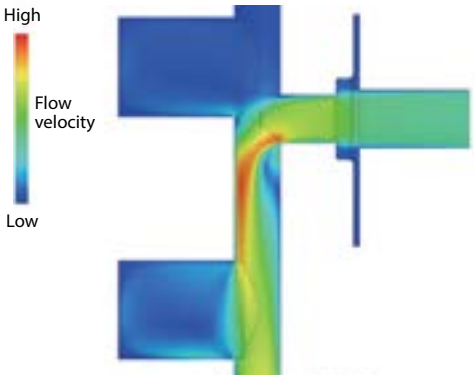
(Random order)
Based on Kyocera survey in January 2021



Point

Appropriate hole design to reduce energy loss based on deep analysis

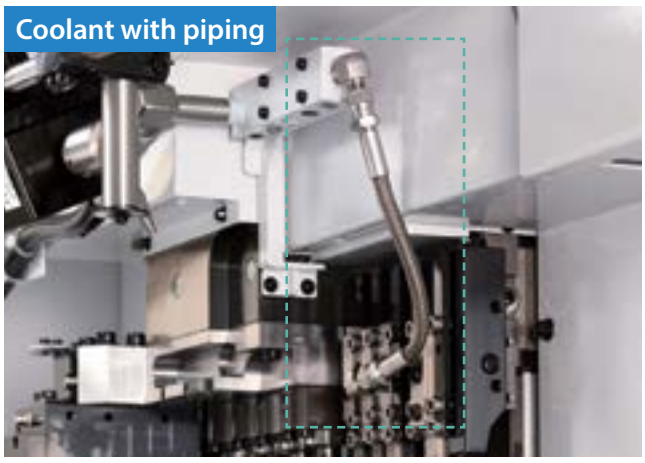
Analysis image (Internal evaluation)



Internal coolant with piping

Compatible with internal coolant on any machine with standard piping parts

Commercial piping parts are available when using at normal pressure



3 Large lineup for various tooling operations

Turning Screw clamp - JCTM

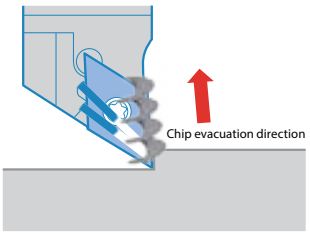


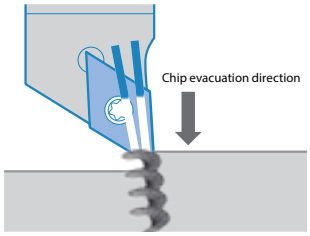
● **Double coolant holes**
Provide coolant toward the rake face of the insert
(V Type □12: Single hole)

● **Lineup**
SCLC-JCTM / SDJC-JCTM
SVJB-JCTM / SVJP-JCTM

Coolant supply structure comparison (Internal evaluation) (Image)

Screw clamp- JCTM	Competitor A
Discharges coolant toward the rake surface of insert	Discharges coolant down onto the chip forcing the chip into the part





Chip control performance	✓ Provides stable chip curls	**Chip control performance**	Chip becomes unstable
Cooling effect	✓ The cutting edge stays cool	**Cooling effect**	Chip can prevent coolant supply to edges

External grooving KGBF-JCTM



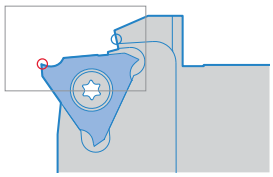
● **Provides coolant toward the rake surface of insert**

● **Specification**
Edge width: 0.25 -3 mm
Ground chipbreaker/3D GL chipbreaker
Maximum groove depth: 3 mm

Coolant discharging comparison (Internal evaluation)

Small chips and better cooling of the insert leads to longer tool life.

○ Cutting edge
○ Coolant hole

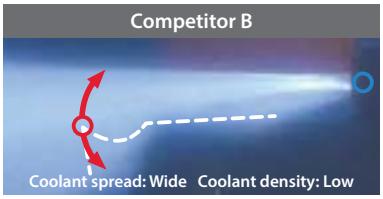


KGBF-JCTM



(Without insert)

Competitor B



(Without insert)

Square shank identification system (small tools)

Clamping system	
A	Back clamp
C	Top clamp
P	Lever lock
S	Screw clamp

Insert shape	
C	80° Rhombic
D	55° Rhombic
S	90° Square
T	60° Triangle
V	35° Rhombic

Hand of tool	
R	Right-hand
L	Left-hand
N	Neutral

Shank height
Shank height (mm)

Shank width
Shank width (mm)

Manufacturer´s option
Optional mark or number
e.g. : FF = Without offset

S C L C R 12 12 JX – 09 FF

Cutting edge angle

A	B	D	F
90°	75°	45°	90°

G	J	K	L
90°	93°	75°	95°

N	P	S	T
63°	117.5°	45°	60°

V
72.5°

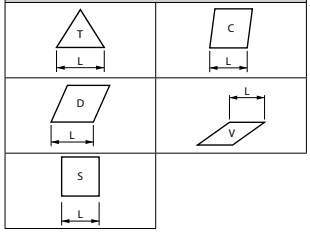
Insert relief angle

B	5° Positive
C	7° Positive
N	0° Negative
P	11° Positive

Toolholder length

F	80 (85)
H	100
JX	120
K	125
M	150

Insert size



• Some back turning toolholders are Kyocera's original products, therefore their descriptions are not accordant with international standards.

External sleeve holder identification system

Shank	
S	Steel

Toolholder length	
F	80 (85)
G	90
H	100
K	125 (120)

Clamping system	
S	Screw clamp

Insert shape	
C	80° Rhombic
D	55° Rhombic
V	35° Rhombic

Hand of tool	
L	Left-hand

S 20 K – S C L C L 09

Shank diameter

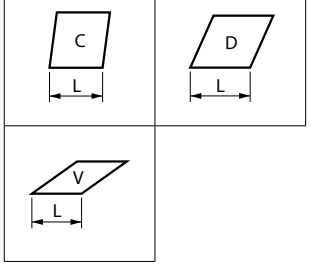
Cutting edge angle

L	95°
U	93°

Insert relief angle

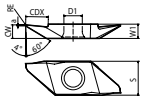
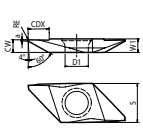
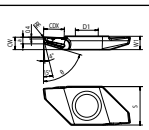
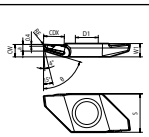
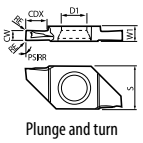
B	5° Positive
C	7° Positive

Insert size



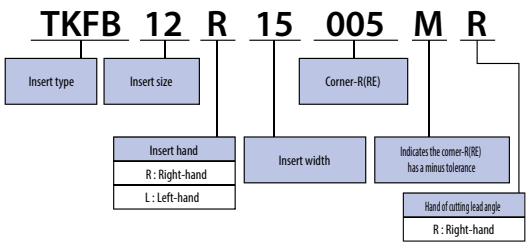
• Specification may change without any prior notice.
• Due to the installation size constrains on the machine, the toolholder length of some products may not match with the symbol.

TKF / TKFB

						Carbon steel / Alloy steel													P
						Stainless steel													M
						Gray cast iron													K
						Non-ferrous metals													N
Insert		Description			No. of edges	Dimension (mm)							Angle (°)		Carbide			Applicable toolholder ➔ E15, E16
						CW	CDX	S	D1	RE	W1	a	PSIR°/L	θ	PVD		-	
															PR1225	PR1535	PR1725	KW10	
		TKFB	12R15005M 12R28005M 12R28010M		2	1.5 2.8 2.8	2.6 4.6 4.6	8.7	5.2	< 0.05 < 0.05 < 0.1	3	0.25 0.3 0.3	-	-	● ● ●	● ● ●	● ● ●	● ● ●	KTKFR...-12 KTKFR...-12-Y
		TKFB	16R38005M 16R38010M		2	3.8	6.3	9.5	5.2	< 0.05 < 0.1	4	0.3	-	-	● ●	● ●	● ●	● ●	KTKFR...-16
		TKFB	12L28005MR 12L28010MR		2	2.8	4.6	8.7	5.2	< 0.05 < 0.1	3	0.3	-	-	● ●	● ●			KTKFL...-12
		TKFB	16L38005MR 16L38010MR		2	3.8	6.3	9.5	5.2	< 0.05 < 0.1	4	0.3	-	-	● ●	● ●			KTKFL...-16
	 Polished	TKFB	12R28005P-GQ 12R28015P-GQ		2	2.8	4.6	8.7	5.2	0.05 0.15	3	1.5	-	74	● ●	● ●	● ●		KTKFR...-12 KTKFR...-12-Y
		TKFB	16R38005P-GQ 16R38015P-GQ		2	3.8	6.3	9.5	5.2	0.05 0.15	4	1.8	-	72	● ●	● ●	● ●		KTKFR...-16
		TKFB	12R28005-GQ 12R28015-GQ		2	2.8	4.6	8.7	5.2	0.05 0.15	3	1.5	-	74	● ●	● ●	● ●		KTKFR...-12 KTKFR...-12-Y
		TKFB	16R38005-GQ 16R38015-GQ		2	3.8	6.3	9.5	5.2	0.05 0.15	4	1.8	-	72	● ●	● ●	● ●		KTKFR...-16
	 Plunge and turn	TKF	12R200-GTP		2	2	4.3	8.7	5	0.08	3	-	0	-		●	●		KTKFR...-12 KTKFR...-12-Y
		TKF	16R300-GTP		2	3	5.8	9.5	5	0.08	4	-	0	-		●	●		KTKFR...-16

Recommended cutting conditions ➔ E67

Inserts identification system (Ref. to Tables 1 and 2)



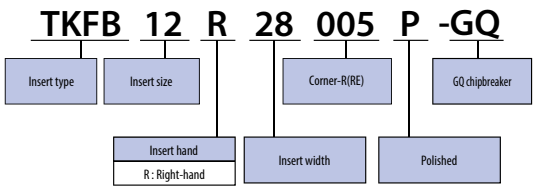


Table 1

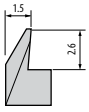
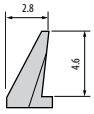
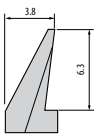
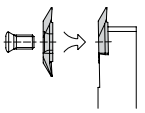
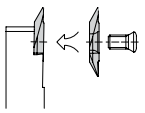
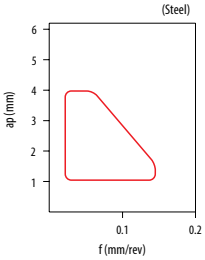
Small machining	General purpose	Large machining
		
TKFB12R15..	TKFB12R28..	TKFB16R38..

Table 2

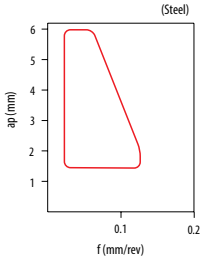
Toolholder	Right-hand	Toolholder	Left-hand
Insert	Right-hand	Insert	Left-hand
Lead angle	Right-hand	Lead angle	Right-hand
			

Applicable chipbreaker range

TKFB12R28...GQ



TKFB16R38...GQ



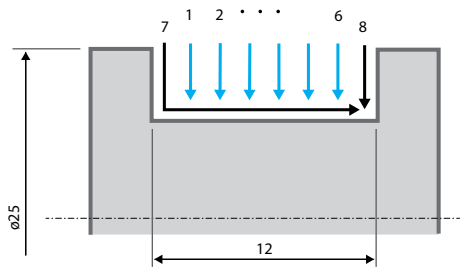
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GTP chipbreaker - Grooving and Turning available

Cutting time comparison (Internal evaluation)

Competitor A

Multiple grooves and a finishing pass
Workpiece material : C45(ø25)

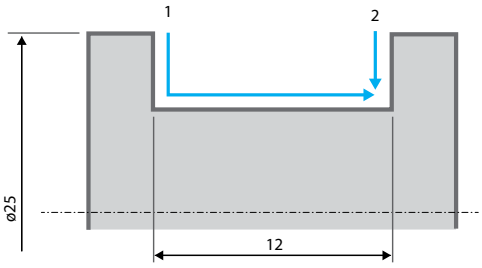


Cutting conditions: Multiple grooves
Vc=100m/min
ap=3.5mm, f=0.10mm/rev

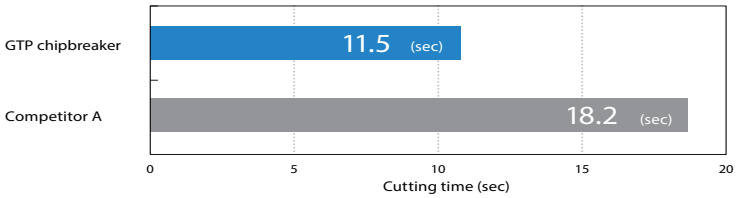
Cutting conditions: Finishing
Vc=100m/min
ap=0.5mm, f=0.05mm/rev

TKF12R200-GTP

Grooving and Turning
Workpiece material : C45(ø25)



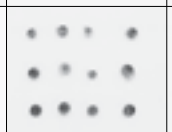
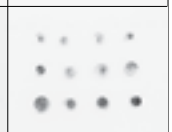
Cutting conditions: Grooving and Turning
Vc=100m/min
ap=4mm, f=0.05mm/rev



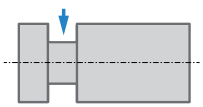
GTP chipbreaker required fewer machining paths than competitor

40%
Cutting time reduction

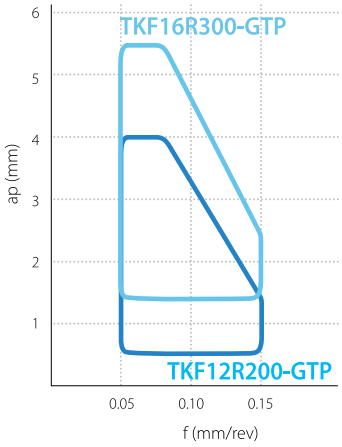
Chip control comparison (Internal evaluation)
Grooving

f (mm/rev)	0.05	0.07	0.10
TKF12R 200-GTP			
Competitor B			

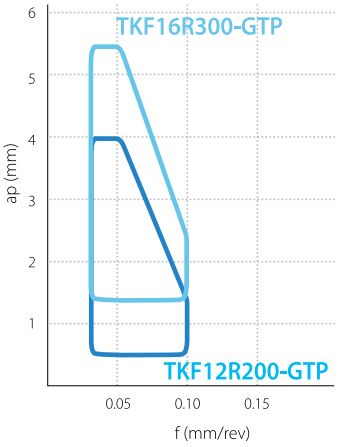
Cutting conditions : Vc=100m/min, ap=4mm, Wet
Workpiece material : C45 (ø25)



Recommended chipbreaker range (Steel)

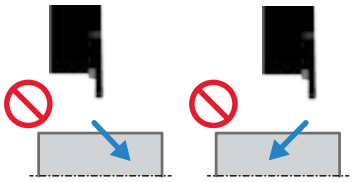


Recommended chipbreaker range (Stainless steel)



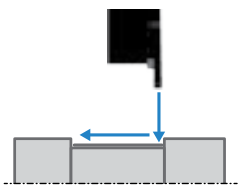
Caution for machining

Ramping

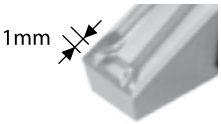


Ramping is not recommended if the workpiece is not pre-machined as shown in the right gures

Back turning

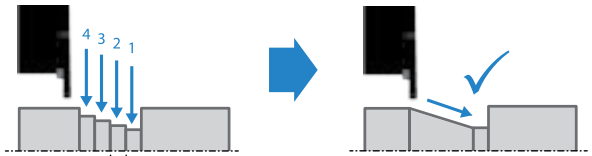


When back turning is used for nishing, make sure that the side cutting edge (back) of the tool is within 1mm

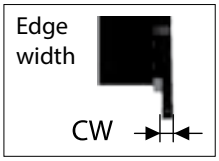


Tips for ramping

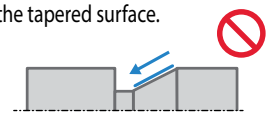
Step grooving is required before ramping. (Refer to the gure below)



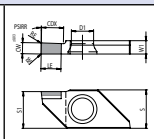
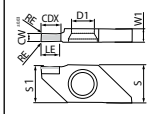
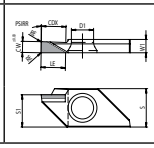
*The width of the groove must be smaller than the edge width to overlap the previous groove



Back turning is not recommended on the tapered surface.



TKF

Insert		Description	No. of edges	Dimension (mm) CW	CDX	S	S1	D1	RE	LE	W1	Angle (°) PSIR$^{R}_{L}$	Tolerance CW min.	CW max.	RE (+/-) min.	RE (+/-) max.	PCD -	PCD KPD001	Applicable toolholder ➔ E15, E16
Carbon steel / Alloy steel																	●		P
Stainless steel																	●		M
Gray cast iron																	●		K
Non-ferrous metals																	●		N
		TKF12R 150-NB 200-NB 250-NB	1	1.5 2 2.5	3.5 4 4	8.7	8.3	5	0.1	2 3 3	3	0	-0.03	+0.03	-0.05	0	● ● ●		KTKFR...-12 KTKFR...-12-Y
		TKF12R 200-AGT 250-AGT	1	2 2.5	4.8	8.7	8.3	5	0.1	4.2	3	0	-0.03	+0.03	-0.05	0	● ●		
		TKF12R 200-AS 250-AS TKF12L 200-AS	1	2 2.5 2	5	8.7	7.3	5	0.1	5.3	3	0	-0.03	+0.03	-0.05	0	● ● ●		KTKF$^{R}_{L}$...-12 KTKFR...-12-Y
		TKF16R 250-AS TKF16L 250-AS	1	2.5	8	9.5	8	5	0.1	6.3	4	0	-0.03	+0.03	-0.05	0	● ●		KTKF$^{R}_{L}$...-16

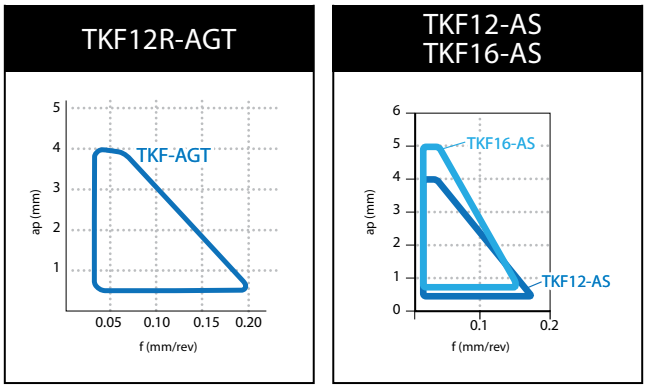
Recommended cutting conditions ➔ E67

Inserts identification system

TKF	12	R	200	-	AGT
TKF	12	L	200	-	AS

- Insert type
- Insert size
- Insert hand: R : Right-hand; L : Left-hand
- Width (Edge width)
- Name of chipbreaker: AGT : AGT chipbreaker; AS : AS chipbreaker; GTP : GTP chipbreaker; NB : Without chipbreaker

Applicable range



* PCD Inserts for turning and grooving

* Not recommended for cut-off

Note 1) The cutting edge of the TKF-AS / -ASR will be 1 mm lower than the center line when attached to the KTKF toolholder (Ref. to Fig. 2).
Adjust the height by making NC lathe parameter settings or inserting a plate.
2) If the 1 mm adjustment is not possible, use the TKF..-AGT/TKF..-NB. (Ref. to Fig. 3)

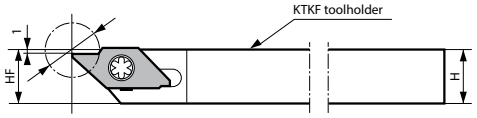


Fig. 2 When a TKF-AS / -ASR insert is attached(The cutting edge is 1mm lower than the center line)

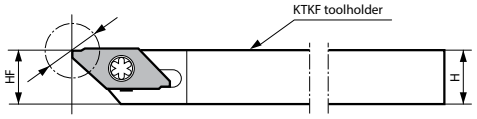
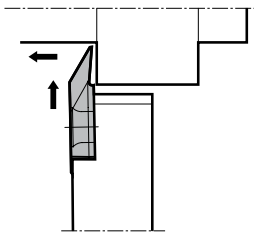


Fig. 3 When a TKF-NB insert is attached

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

KTKF (Back turning)



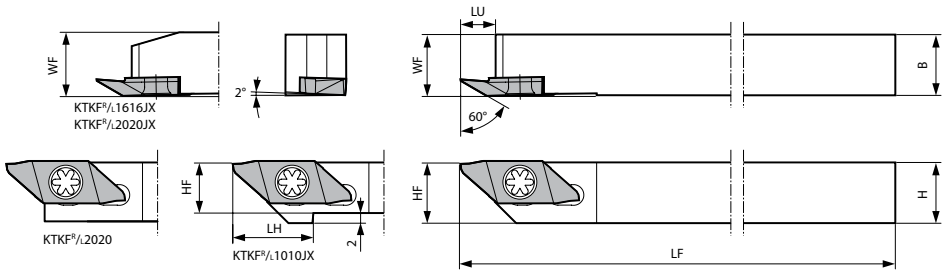


Fig. 1

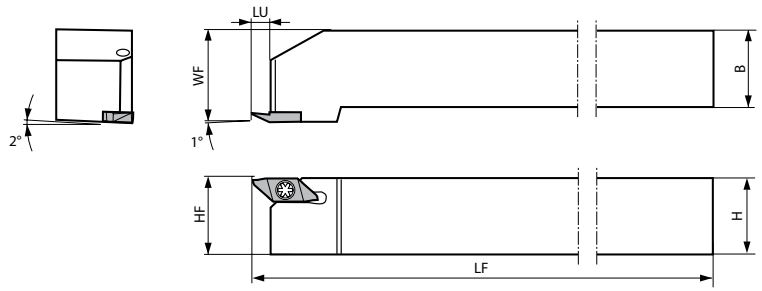


Fig. 2

Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

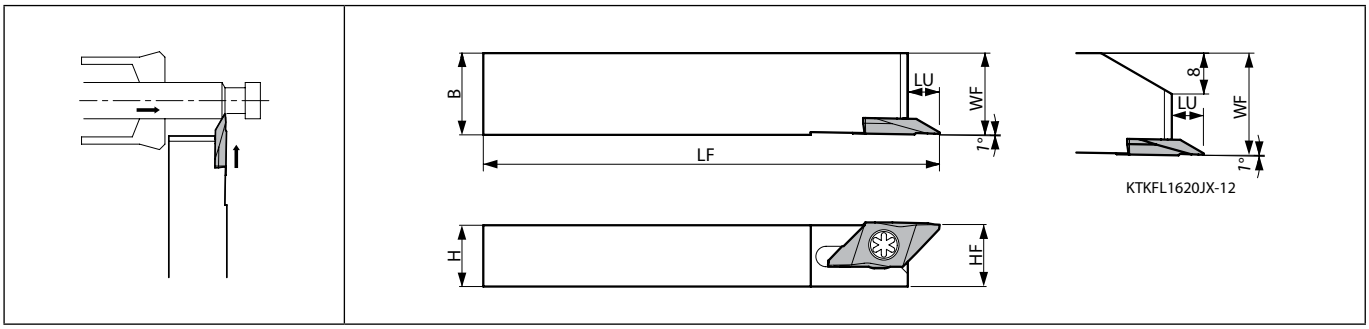
Toolholder dimensions

Description		Availability R	Availability L	Dimension (mm) H	B	LH	HF	LF	LU	WF	Fig.	Spare parts Screw	Spare parts Wrench	Applicable inserts E12, E14
KTKF R/L	1010JX-12	●	●	10	10	15	10	120	6	10	1	SB-4590TRWN	FT-10	TKF12 R/L... TKFB12 R/L...
	1212F-12	●	●	12	12	-	12	85		12	1			
	1212JX-12	●	●					120						
	1616JX-12	●	●	16	16		16	120		16	1			
	2020JX-12	●	●	20	20		20	120		20	1			
	2525M-12	●		25	25		25	150		30	2			
KTKF R/L	1010JX-16	●	●	10	10	20	10	120	8	10	1	SB-4590TRWN	FT-10	TKF16 R/L... TKFB16 R/L...
	1212F-16	●	●	12	12	-	12	85		12	1			
	1212JX-16	●	●					120						
	1616JX-16	●	●	16	16		16	120		16	1			
	2020JX-16	●	●	20	20		20	120		20	1			
	2525M-16	●		25	25		25	150		30	2			

LU shows the distance from the toolholder to the cutting edge.
See Page **H15** for internal coolant type (coolant-through holders)

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KTKF (Back turning , Goose-neck holder)



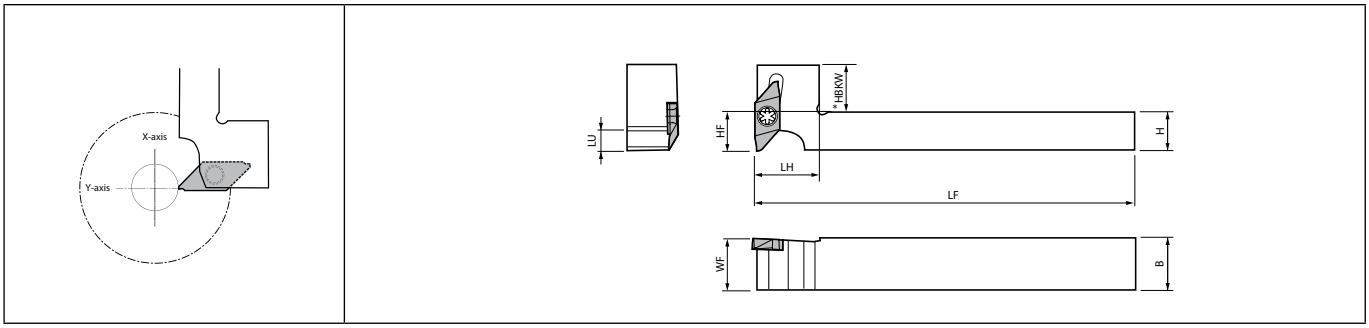
Left-hand shown | Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description		Availability	Dimension (mm)							Spare parts		Applicable inserts E12, E14
			L	H	B	HF	LF	LU	WF	Screw	Wrench	
KTKFL	1216JX-12	●	12	16	12	120	6	16	SB-4590TRWN	FT-10	TKF12L... TKFB12L...
	1620JX-12	●	16	20	16			20			

LU shows the distance from the toolholder to the cutting edge.

KTKF-Y (Back turning , Y-axis toolholder)



Right-hand shown | Right-hand Insert for Right-hand Toolholder.

Toolholder dimensions

Description		Availability	Dimension (mm)									Spare parts		Applicable inserts E12, E14
			R	H	B	LH	HF	HBKW	LF	LU	WF	Screw	Wrench	
KTKFR	1216JX-12-Y	●	12	16	20	12	15	120	6	16	SB-4590TRWN	FT-10	TKF12R... TKFB12R...
	1616JX-12-Y	●	16		25	16	11						

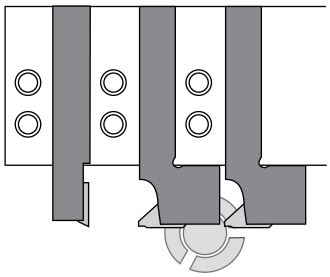
LU shows the distance from the toolholder to the cutting edge.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

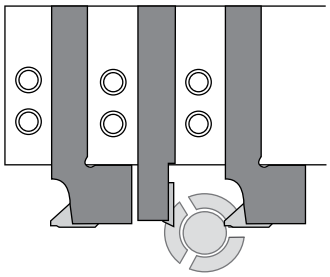
Precautions for using Y-axis toolholder

Do not use Y-axis toolholders side by side to prevent interference. (Only two Y-axis holder can be used at the same time)

With interference

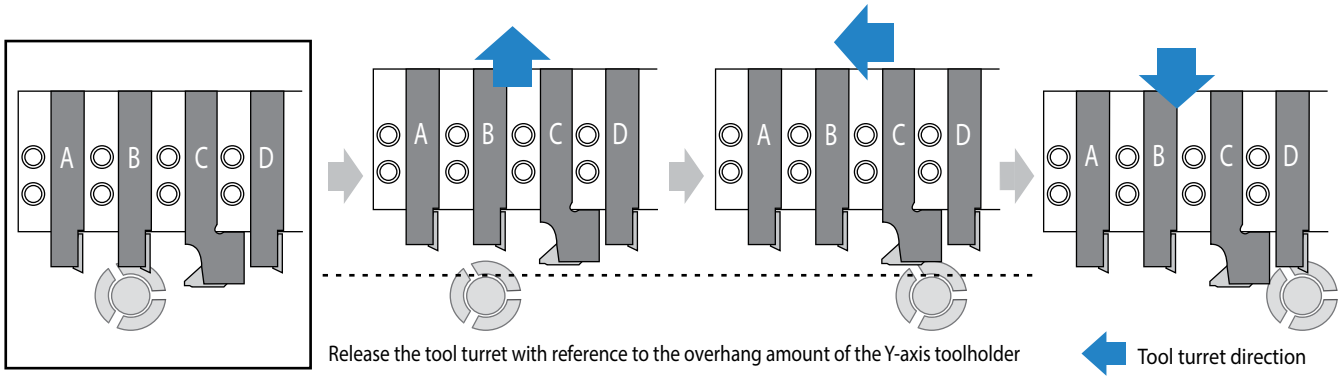


Without interference



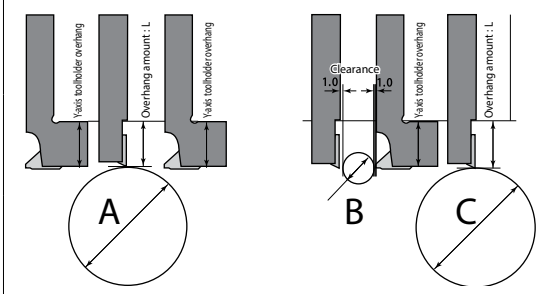
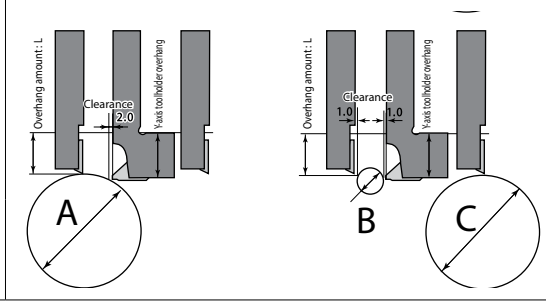
Standard toolholders may be mounted between two Y-axis toolholders

When changing the tool, set the retracted position with reference to the cutting edge of the Y-axis holder. (When exchanging from tool B to D)



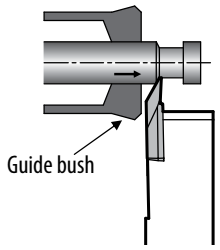
Note that using other toolholders together will result in dierent outside diameters

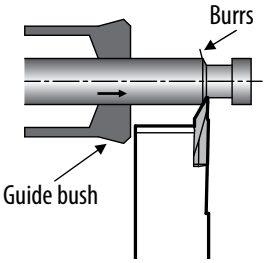
(Unit : mm)

Y-axis toolholder overhang	Examples	Available outside cutting diameter (ø) \ Overhang amount L	20	22	25
20		A	Without restriction	Without restriction	Without restriction
		B	13.0	13.0	13.0
		C	Without restriction	Without restriction	Without restriction
25		A	38.0	58.0	Without restriction
		B	14.9	13.6	13.0
		C	45.0	60.0	Without restriction

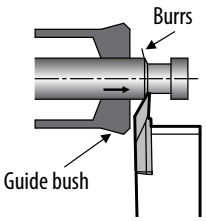
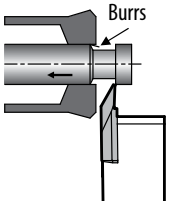
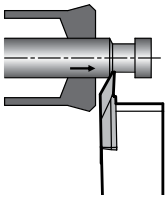
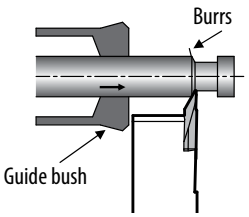
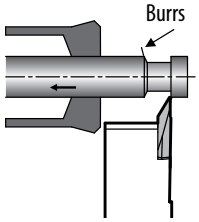
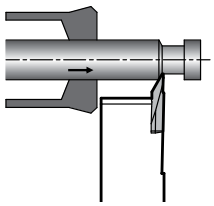
Toolholders for back turning - TKFB insert

How to select back turning toolholder hand

Right-hand		• Machining near the guide bush is possible • Narrow cutting edge width of TKFB12R15005M • Optimum for small parts and high precision machining

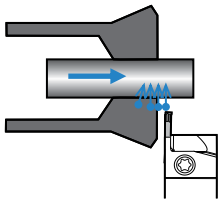
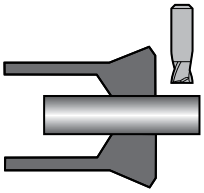
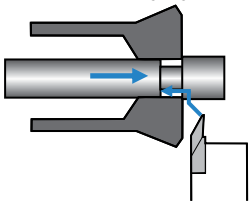
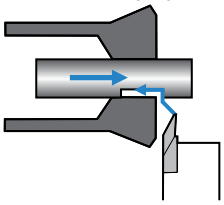
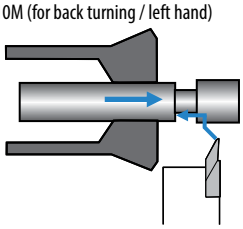
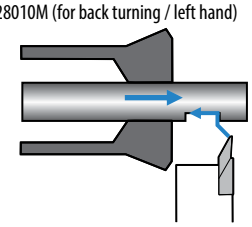
Left-hand	The workpiece burr does not contact the guide bush.
	 
		• Machining with a distance from guide bush
		• Good chip control due to large space between the guide bush and the tool.
		• Excellent chip control in roughing and finishing (plural passes)
		  • Stable accuracy of external diameter dimension:
		  • When burrs occur, if a left-hand toolholder is used, it is not necessary to return workpiece into guide bush in finishing.
		  • Also, left-hand toolholders prevent guide bush wear caused by chip biting.

Workpiece movement and tool hand selection - in roughing and finishing

	Roughing	Workpiece position after roughing	Finishing
Right-hand			
Left-hand			

* Good dimension accuracy: If a left-hand toolholder is used, burrs on workpiece generated in roughing do not damage the guide bush in finishing.

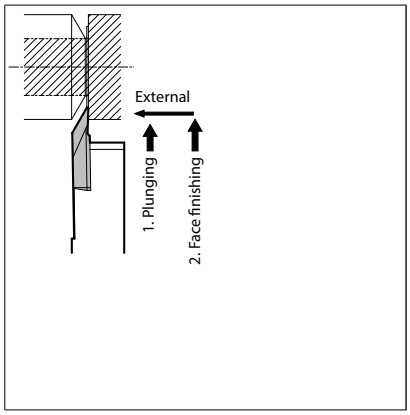
Chip control improvement in back turning

	Chip control improvement by tool pass changes - 1	Chip control improvement by tool pass changes - 2
Roughing	Roughing with grooving tools 1. GMM2420-020MW (Grooving) 	Pre-Stage machining is processed with solid end mill 1. Solid end mill 
Finishing (Countermeasures 1) Use right-hand toolholder	When using TKFB12R28010M (for back turning / right hand)  Advantages: • Good surface roughness Disadvantages: • If a machining pass is long, the guide bush can not support the workpiece.	When using TKFB12R28010M (for back turning / right hand)  Advantages: 1. Minimal deflection in long machining passes 2. Chips are broken into small pieces, though the workpiece material is sticky Disadvantages: • The pre-stage machining may cause fractures, because of interrupted machining
Finishing (Countermeasures 2) Use left-hand toolholder	When using TKFB12L28010M (for back turning / left hand)  Advantages: 1. Good surface roughness 2. High precision machining if the machined portion does not contact the guide bush. Disadvantages: • If a machining pass is long, the guide bush can not support the workpiece.	When using TKFB12L28010M (for back turning / left hand)  Advantages: 1. Minimal deflection in long machining passes 2. Chips are broken into small pieces, though the workpiece material is sticky. 3. High precision machining if the machined portion does not contact the guide bush. Disadvantages: • The pre-stage machining may cause fractures, because of interrupted machining.

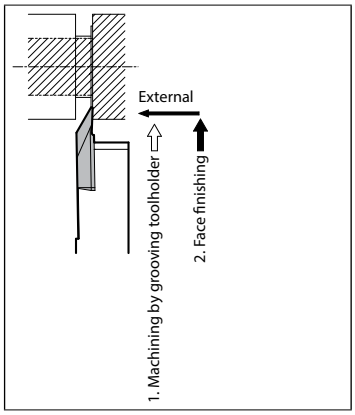
Countermeasure against peeled surface in face back turning

When peeled surface occurs on the workpiece face, please apply the countermeasures below.

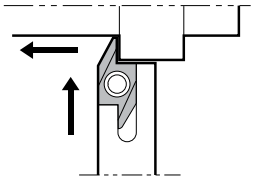
Countermeasures 1 Face finishing

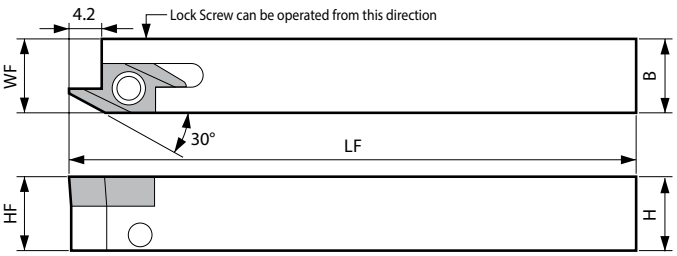


Countermeasures 2 Face finishing after grooving



AABS-40F (Back turning / Edge width : 2.8mm, Max. depth : 4mm)

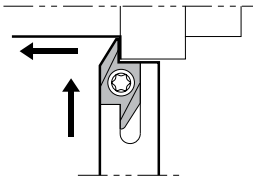


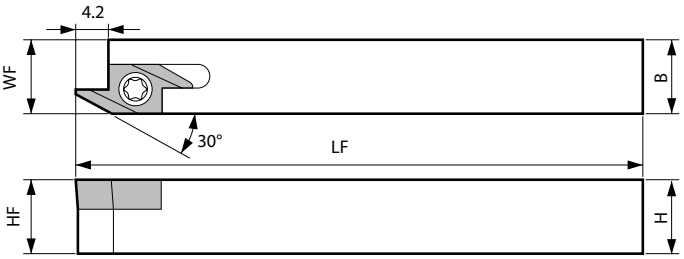


Toolholder dimensions

Description		Availability	Dimension (mm)					Standard corner-R(RE)	Spare parts			Applicable inserts ➡ B112
			Anchor pin	Lock screw	Wrench							
		R	H	B	HF	LF	WF					
AABSR	1010JX-40F	●	10	10	10		10.2		LPA-11			
	1212JX-40F	●	12	12	12	120	12.2	0.15	LPA-13	HSB4X8R	FH-2	ABS15R40...
	1616JX-40F	●	16	16	16		16.2		LPA-17			

SABS-40F (Back turning / Edge width : 2.8mm, Max. depth : 4mm)



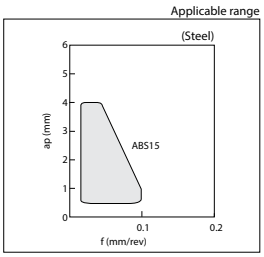


Toolholder dimensions

Description		Availability	Dimension (mm)					Standard corner-R(RE)	Spare parts		Applicable inserts ➡ B112
			Screw	Wrench							
		R	H	B	HF	LF	WF				
SABSR	1010JX-40F	●	10	10	10	120	10.2				
	1212F-40F	●	12	12	12	85	12.2				
	1212JX-40F	●				120		0.15	SB-3080TR	FT-10	ABS15R40...
	1616JX-40F	●	16	16	16		16.2				
	2020K-40F	●	20	20	20	125	20.2				

Applicable inserts

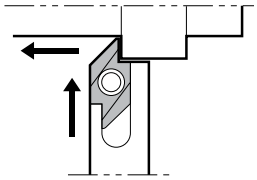
Applications	Back turning
Insert	
Type	ABS15
Page	B112

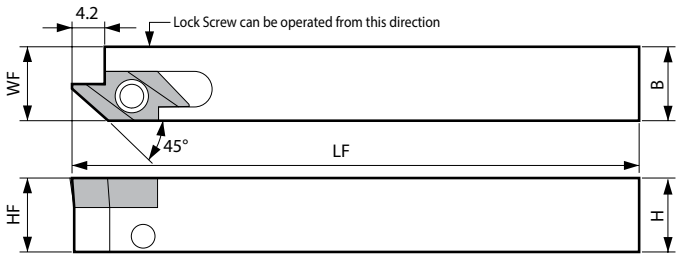


Recommended cutting conditions ➡ E67

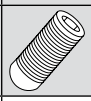
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

AABW-40F (Back turning / Edge width : 4.7mm, Max. depth : 4mm)

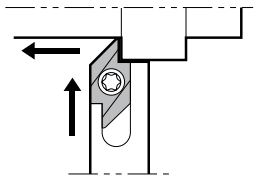


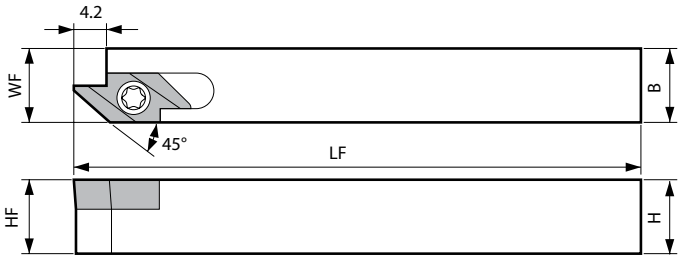


Toolholder dimensions

Description		Availability	Dimension (mm)					Standard corner-R(RE)	Spare parts			Applicable inserts B112
									Anchor pin	Lock screw	Wrench	
		R	H	B	HF	LF	WF					
AABWR	1010JX-40F	●	10	10	10		10.2		LPA-11			
	1212JX-40F	●	12	12	12	120	12.2	0.15	LPA-13	HSB4X8R	FH-2	ABW15R40...
	1616JX-40F	●	16	16	16		16.2		LPA-17			

SABW-40F (Back turning / Edge width : 4.7mm, Max. depth : 4mm)



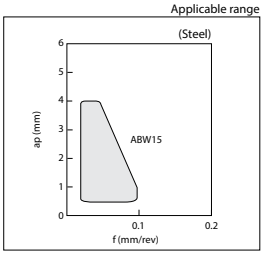


Toolholder dimensions

Description		Availability	Dimension (mm)					Standard corner-R(RE)	Spare parts		Applicable inserts B112
									Screw	Wrench	
		R	H	B	HF	LF	WF				
SABWR	1010JX-40F	●	10	10	10		10.2				
	1212JX-40F	●	12	12	12	120	12.2	0.15	SB-3080TR	FT-10	ABW15R40...
	1616JX-40F	●	16	16	16		16.2				
	2020K-40F	●	20	20	20	125	20.2				

Applicable inserts

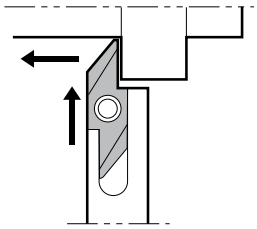
Applications	Back turning
Insert	
Type	ABW15
Page	B112

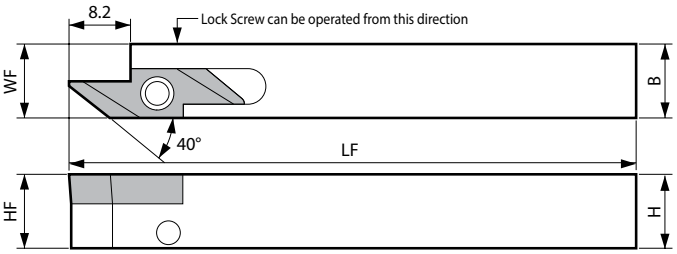


Recommended cutting conditions E67

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

AABW-50F (Back turning / Edge width : 4.7mm, Max. depth : 5mm)

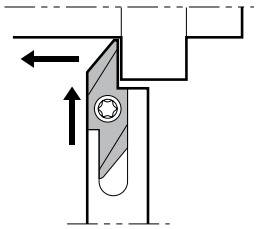


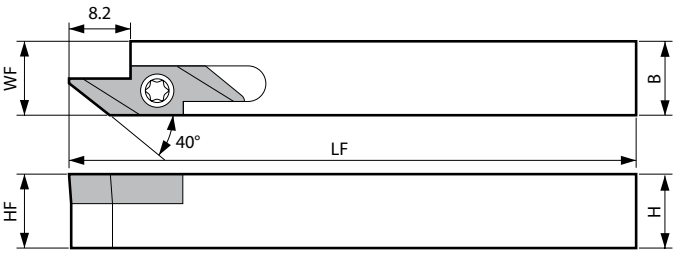


Toolholder dimensions

Description		Availability	Dimension (mm)					Standard corner-R(RE)	Spare parts			Applicable inserts ➡ B112
		R	H	B	HF	LF	WF		Anchor pin	Lock screw	Wrench	
AABWR	1010JX-50F	●	10	10	10		10.2		LPA-11			
	1212JX-50F	●	12	12	12	120	12.2	0.15	LPA-13	HSB4X8R	FH-2	ABW23R50...
	1616JX-50F	●	16	16	16		16.2		LPA-17			

SABW-50F (Back turning / Edge width : 4.7mm, Max. depth : 5mm)



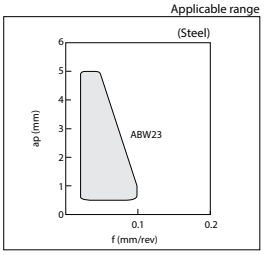


Toolholder dimensions

Description		Availability	Dimension (mm)					Standard corner-R(RE)	Spare parts		Applicable inserts ➡ B112
		R	H	B	HF	LF	WF		Screw	Wrench	
SABWR	1010JX-50F	●	10	10	10		10.2				
	1212JX-50F	●	12	12	12	120	12.2	0.15	SB-3080TR	FT-10	ABW23R50...
	1616JX-50F	●	16	16	16		16.2				
	2020K-50F	●	20	20	20	125	20.2				

Applicable inserts

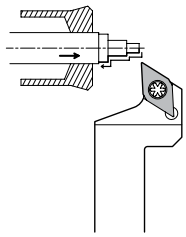
Applications	Back turning
Insert	
Type	ABW23
Page	B112

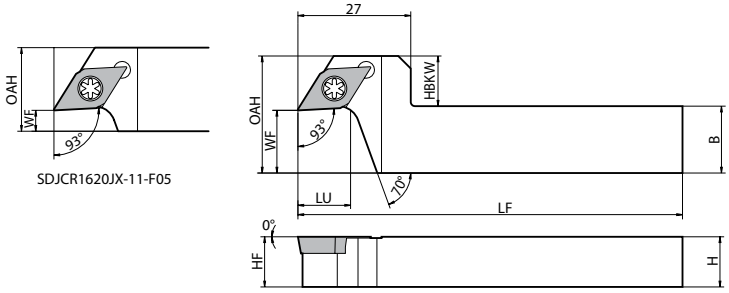


Recommended cutting conditions ➡ E67

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SDJC (External turning / External copying)





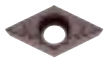
Right-hand shown

Toolholder dimensions

Description		Availability	Dimension (mm)								Standard corner-R(RE)	Spare parts		Applicable inserts
												Screw	Wrench	
		R	H	B	OAH	HF	HBKW	LF	LU	WF				
SDJCR	1216JX-11-F05	●	12	16	18	12	2	120	12.6	5	0.2	SB-4085TR	FT-15	DC□T11T3... DC□W11T3... DC□X11T3...
	1216JX-11-F15	●			28		12			15				
	1620JX-11-F05	●	16	20	20	16	-			5				
	1620JX-11-F15	●			28		8			15				

For WP chipbreaker, cutting edge offsets or program corrections are required on **R36** and **R37**.

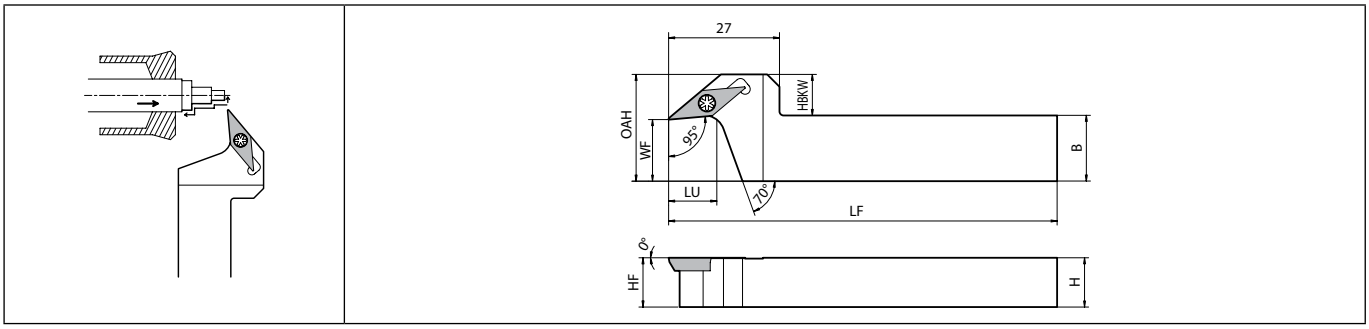
Applicable inserts

Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing
Insert								
Chipbreaker type	**CF**	**GF**	**SKS**	**SK**	**CK**	**GQ**	**WP**	**R/L-WP**
Page	**B68**	**B68**	**B68**	**B68**	**B68**	**B69**	**B69**	**B69**
Applications	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Medium	Medium	Finishing	Finishing
Insert								
Chipbreaker type	**PP**	**GP**	**GK**	**HQ**	**STD**	**MF**	**R/L-F**	**R/L-FSF**
Page	**B69**	**B69**	**B70**	**B70**	**B70**	**B70**	**B72, B73**	**B72**
Applications	Low feed	Low feed	Low feed	Low feed	Low carbon steel	Low carbon steel	Stainless steel / Heat-resistant alloys	Cast iron
Insert								
Chipbreaker type	**R/L-U**	**R/L-USF**	**R/L-J**	**R/L-JSF**	**XP**	**XQ**	**MQ**	**No CB**
Page	**B74~B76**	**B74**	**B77**	**B76**	**B71**	**B71**	**B71**	**B78**
Applications	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Hard materials		
Insert								
Chipbreaker type	**AP**	**R/L-A3**	**AH**	**PCD**	**APD**	**CBN**		
Page	**B78**	**B78**	**B78**	**C42**	**C42**	**C22**		

Recommended cutting conditions ➡ **E65, E66**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SVLP (External turning / External copying)

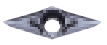


Right-hand shown

Toolholder dimensions

Description		Availability	Dimension (mm)								Standard corner-R(RE)	Spare parts		Applicable inserts
												Screw	Wrench	
		R	H	B	OAH	HF	HBKW	LF	LU	WF				
SVLPR	1216JX-11-F15	●	12	16	26	12	10	120	12	15	0.2	SB-2570TR	FT-8	VP□T1103...
	1620JX-11-F15	●	16	20		16	6							

Applicable inserts

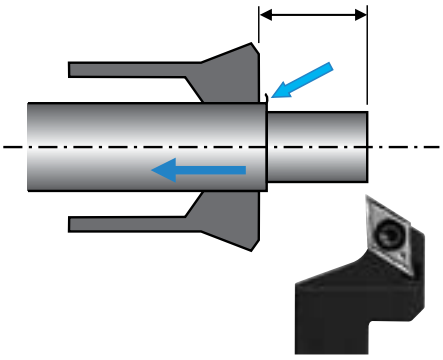
Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Finishing	Low feed	Low feed
Insert								
Chipbreaker type	CF	GF	SKS	CK	R/L-F	R/L-FSF	R/L-U	R/L-USF
Page	B102	B102	B102	B102	B103	B103	B104	B104

Applications	Low feed
Insert	
Chipbreaker type	R/L-J
Page	B104

Recommended cutting conditions E65, E66

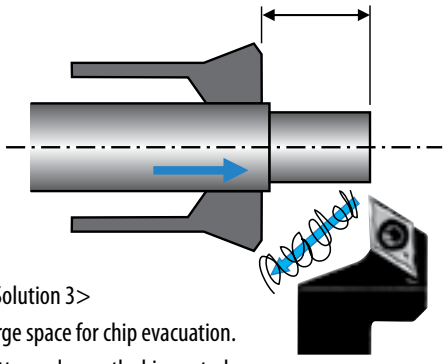
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Goose-neck holder is available for multiple passes at roughing and finishing



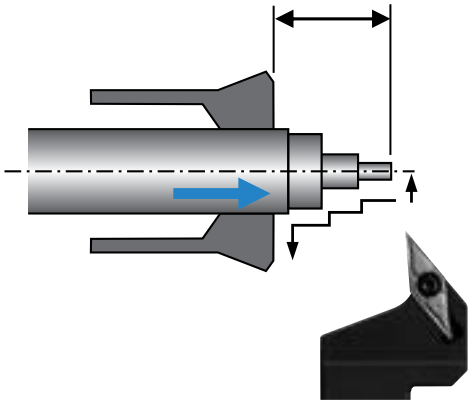
<Solution 1>
The workpiece burr does not contact the guide bush and no breakage will be caused.

<Solution 2>
Longitudinal dimension will be stable. External diameter will be stable owing to multiple pass machining (roughing and finishing).



<Solution 3>
Large space for chip evacuation.
Better and smooth chip control.

One toolholder for complex shape workpiece

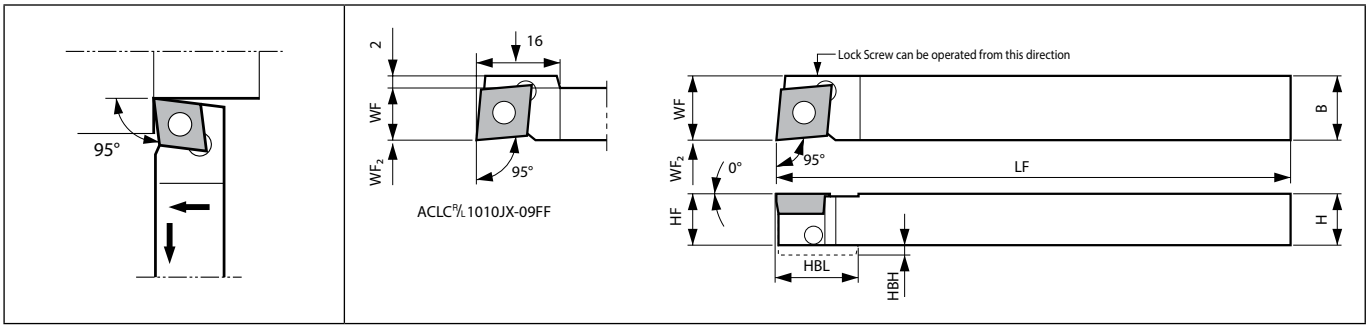


Complex shape workpiece can be processed with one toolholder.
It can be used for undercutting and external / face finishing.

E

Small tools

ACLC-FF (External turning / External facing , Back clamp, Without offset)



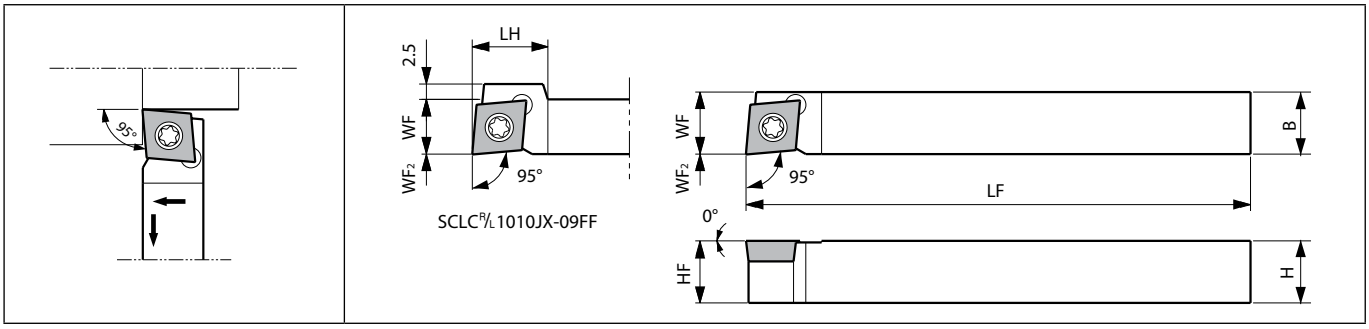
Right-hand shown

Toolholder dimensions

Description		Availability		Dimension (mm)								Standard corner-R(RE)	Spare parts			Applicable inserts
													Anchor pin	Lock screw	Wrench	
		R	L	H	B	HF	HBH	HBL	LF	WF	WF2					
ACLCR/L	1010JX-06FF	●	●	10	10	10	-	-	120	10	0	0.2	LPF-11	HSB4X8R/L	FH-2	CC□T0602... CC□W0602...
ACLCR/L	1010JX-09FF	●	●	10	10	10	2	16	120	10	0	0.2	LPF-13	HSB4X8R/L	FH-2	CC□T09T3... CC□W09T3...
	1212JX-09FF	●	●	12	12	12	-	-		12						
	1616JX-09FF	●	●	16	16	16				16			LPF-17			

Lock screw : HSB4X8R for Right-hand Toolholder, HSB4X8L for Left-hand Toolholder.

SCLC-FF (External turning / External facing , Screw clamp, Without offset)



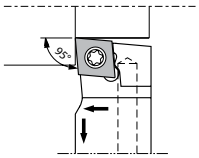
Right-hand shown

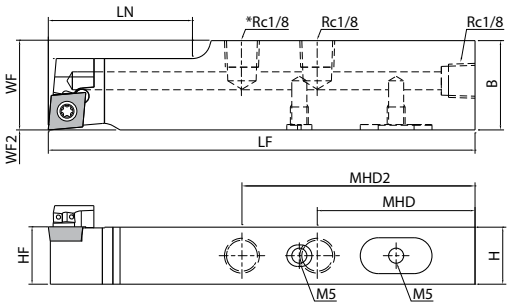
Toolholder dimensions

Description		Availability		Dimension (mm)							Standard corner-R(RE)	Spare parts			Applicable inserts
												Screw	Wrench	Wrench	
		R	L	H	B	LH	HF	LF	WF	WF2					
SCLCR/L	0808F-06FF	●	●	8	8	-	8	85	8	0	0.2	SB-2570TR	-	FT-8	CC□T0602... CC□W0602...
	1010JX-06FF	●	●	10	10		10	120	10						
SCLCR/L	1010JX-09FF	●	●	10	10	15	10	120	10	0	0.2	SB-4085TR	FT-15	-	CC□T09T3... CC□W09T3...
	1212F-09FF	●	●	12	12	-	12	85	12						
	1212JX-09FF	●	●					120							
	1616JX-09FF	●	●	16	16		16		16						
	2020JX-09FF	●	●	20	20		20		20						

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

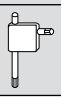
SCLC-FFJCTM (External turning / External facing , Screw clamp, Without offset, Coolant-though holder)





Right-hand shown | SCLCR12…: 2-Rc1/8

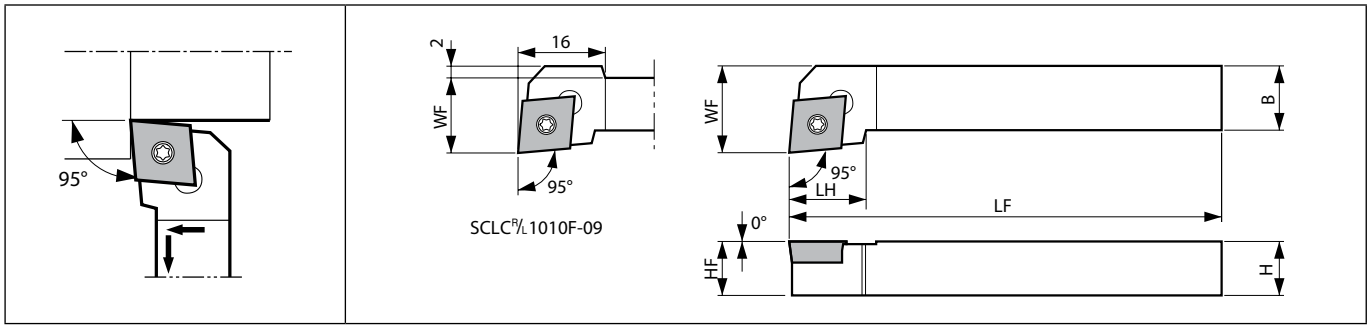
Toolholder dimensions

Description		Availability	Dimension (mm)									Standard corner-R(RE)	Coolant hole	Spare parts				Applicable inserts
														Plug	Plug	Screw	Wrench	
		R	H	B	MHD	MHD2	HF	LF	LN	WF	WF_2							
SCLCR	1218JX-09FFJCTM	●	12	18	54	-	12	120	28	18	0	0.2	Yes	GP-1	HS5X4LP	SB-4085TR	FT-15	CC□T09T3... CC□W09T3...
	1625JX-09FFJCTM	●	16	25	44	65	16		40	25								
	2025JX-09FFJCTM	●	20				20								-			

Please see page **H16** and **H17** for piping parts of coolant-through holders.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SCLC (External turning / External facing , Screw clamp)

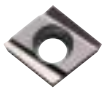
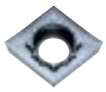


Right-hand shown

Toolholder dimensions

Description		Availability		Dimension (mm)						Standard corner-R(RE)	Spare parts				Applicable inserts
											Screw	Wrench	Wrench	Wrench	
		R	L	H	B	LH	HF	LF	WF						
SCLCR/L	1010F-06	●	●	10	10	9	10	80	12	0.2	SB-2570TR	-	FT-8	-	CC□T0602... CC□W0602...
SCLCR/L	1010F-09	●	●	10	10	14	10	80	14	0.2	SB-4085TR	FT-15	-	-	CC□T09T3... CC□W09T3...
	1212H-09	●	●	12	12		12	100	16						
	1616H-09	●	●	16	16	15	16		20						
	2020K-09	●	●	20	20	20	20	125	25						
	2525M-09	●	●	25	25	22	25	150	32						
SCLCR/L	1616H-12	●	●	16	16	20	16	100	20	0.4	SB-5090TR	-	-	LTW-20	CC□T1204...
	2020K-12	●	●	20	20	22	20	125	25						
	2525M-12	●	●	25	25		25	150	32						

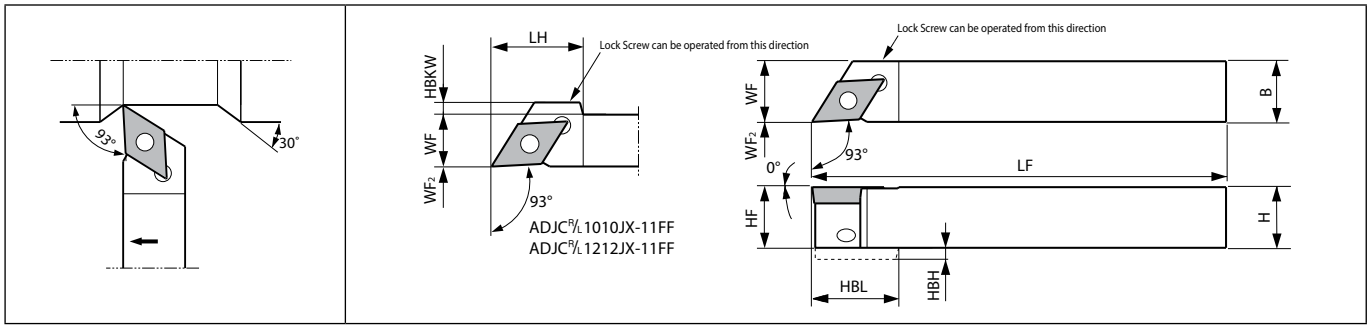
Applicable inserts (ACLC-FF / SCLC-FF / SCLC-FFJCTM / SCLC)

Applications	Finishing	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing
Insert								
Chipbreaker type	PF	GF	SKS	SK	CK	GQ	WP	PP
Page	B58	B58	B59	B59	B59	B59	B60	B60
Applications	Finishing - Medium	Finishing - Medium	Medium	Medium	Low feed	Low feed	Stainless steel / Heat-resistant alloys	Cast iron
Insert								
Chipbreaker type	GK	HQ	STD	MF	R/L-U	R/L-J	MQ	No CB
Page	B60	B60	B60	B61	B63~B65	B65	B61	B66
Applications	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Hard materials		
Insert								
Chipbreaker type	AP	R/L-A3	AH	PCD	APD	CBN		
Page	B66	B66	B66	C39	C40	C20		

Recommended cutting conditions E65, E66

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

ADJC-FF (External turning / External copying , Back clamp, Without offset)



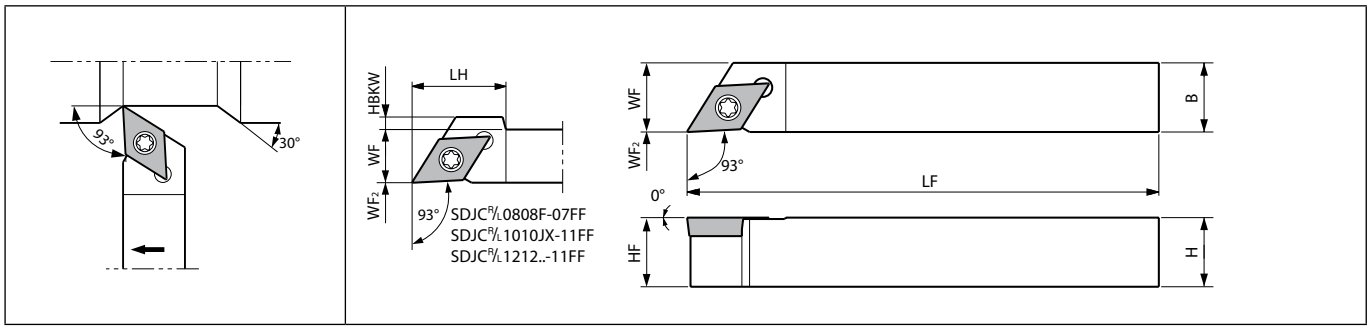
Right-hand shown

Toolholder dimensions

Description		Availability R	Availability L	Dimension (mm) H	B	LH	HF	HBH	HBKW	HBL	LF	WF	WF2	Standard corner-R(RE)	Spare parts: Anchor pin	Spare parts: Lock screw	Spare parts: Wrench	Applicable inserts
ADJCR/L	1010JX-07FF	●	●	10	10	-	10	-	-	-	120	10	0	0.2	LPF-11	HSB4X8R/L	FH-2	DC□T0702... DC□W0702... DC□X0702...
ADJCR/L	1010JX-11FF	●	●	10	10	20	10	2	3	20	120	10	0	0.2	LPF-13	HSB4X8R/L	FH-2	DC□T11T3... DC□W11T3... DC□X11T3...
	1212JX-11FF	●	●	12	12		12	-	1	-		12						
	1616JX-11FF	●	●	16	16	-	16		-			16			LPF-17			

Lock screw : HSB4X8R for Right-hand Toolholder, HSB4X8L for Left-hand Toolholder.
For WP chipbreaker, cutting edge offsets or program corrections are required on **R36** and **R37**.

SDJC-FF (External turning / External copying, Screw clamp, Without offset)



Right-hand shown

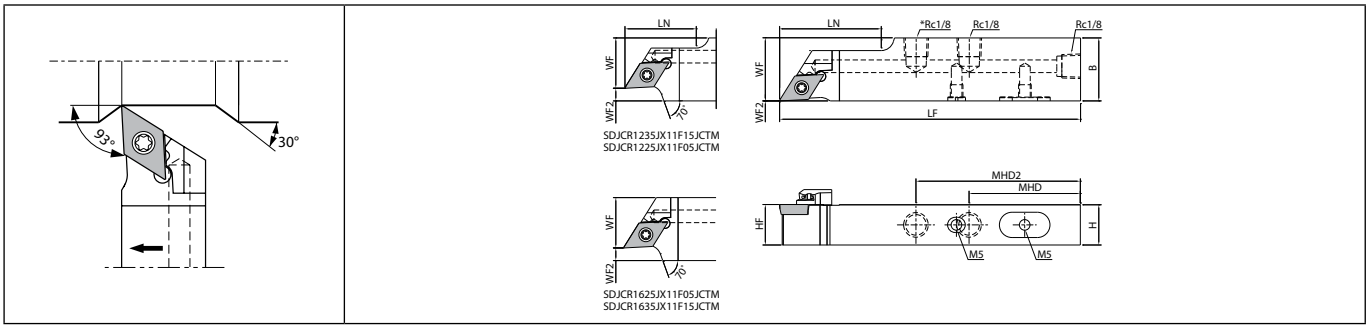
Toolholder dimensions

Description		Availability R	Availability L	Dimension (mm) H	B	LH	HF	HBKW	LF	WF	WF2	Standard corner-R(RE)	Spare parts: Screw	Spare parts: Wrench	Spare parts: Wrench	Applicable inserts
SDJCR/L	0808F-07FF	●	●	8	8	14	8	0.5	85	8	0	0.2	SB-2570TR	-	FT-8	DC□T0702... DC□W0702... DC□X0702...
	1010JX-07FF	●	●	10	10	-	10	-	120	10						
SDJCR/L	1010JX-11FF	●	●	10	10	20	10	3	120	10	0	0.2	SB-4085TR	FT-15	-	DC□T11T3... DC□W11T3... DC□X11T3...
	1212F-11FF	●	●	12	12		12	1	85	12						
	1212JX-11FF	●	●													
	1616JX-11FF	●	●	16	16	-	16	-	120	16						
	2020JX-11FF	●	●	20	20		20			20						

For WP chipbreaker, cutting edge offsets or program corrections are required on **R36** and **R37**.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SDJC-FFJCTM (External turning / External copying, Screw clamp, Without offset, Coolant-though holder)



Right-hand shown | SDJCR12… :2-Rc1/8

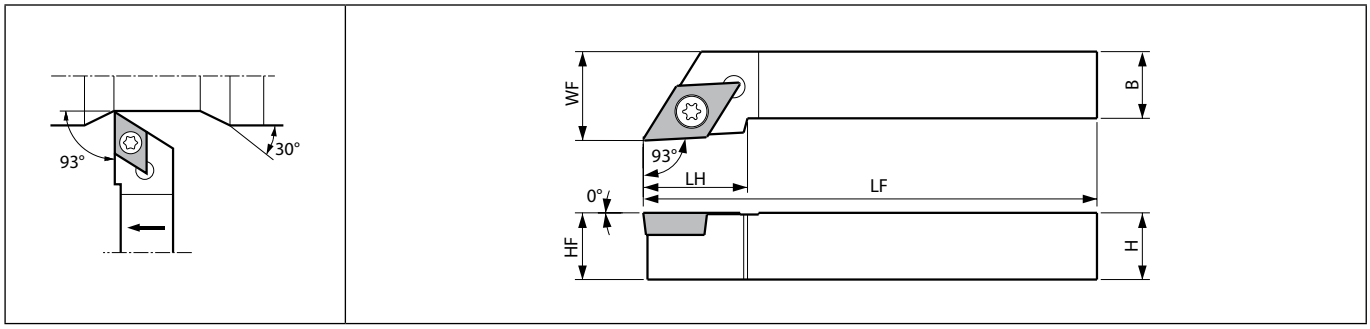
Toolholder dimensions

Description		Availability	Dimension (mm)									Standard corner-R(RE)	Coolant hole	Spare parts				Applicable inserts
														Plug	Plug	Screw	Wrench	
		R	H	B	MHD	MHD2	HF	LF	LN	WF	WF_2							
SDJCR	1218JX-11FFJCTM	●	12	18	54	-	12	120	28	18	0	0.2	Yes	GP-1	HS5X4LP	SB-4085TR	FT-15	DC□T11T3... DC□W11T3... DC□X11T3...
	1625JX-11FFJCTM	●	16	25	44	65	16		40	25								
	2025JX-11FFJCTM	●	20				20								-			
SDJCR	1225JX11F05JCTM	●	12	25	54	-	12	120	28	20	5	0.2	Yes	GP-1	HS5X4LP	SB-4085TR	FT-15	DC□T11T3... DC□W11T3... DC□X11T3...
	1235JX11F15JCTM	●		35							15							
	1625JX11F05JCTM	●	16	25	44	65	16		-		5							
	1635JX11F15JCTM	●		35							15							

Please see page **H16** and **H17** for piping parts of coolant-through holders.
For WP chipbreaker, cutting edge offsets or program corrections are required on **R36** and **R37**.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SDJC (External turning / External copying , Screw clamp)



Right-hand shown

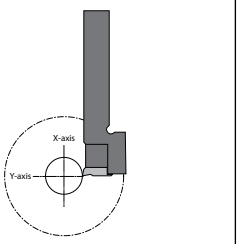
Toolholder dimensions

Description		Availability R	Availability L	Dimension (mm) H	B	LH	HF	LF	WF	Standard corner-R(RE)	Spare parts Screw	Wrench	Wrench	Applicable inserts
SDJC□/L	1010F-07	●	●	10	10	12	10	80	12	0.2	SB-2570TR	-	FT-8	DC□T0702... DC□W0702... DC□X0702...
SDJC□/L	1010F-11	●	●	10	10	18	10	80	12	0.2	SB-4085TR	FT-15	-	DC□T11T3... DC□W11T3... DC□X11T3...
	1212H-11	●	●	12	12		12	100	16					
	1616H-11	●	●	16	16		16		20					
	2020K-11	●	●	20	20		20	125	25					
	2525M-11	●	●	25	25	23	25	150	32					

For WP chipbreaker, cutting edge offsets or program corrections are required on **R36** and **R37**.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SDJC-FF-Y (External turning / External copying , Y-axis toolholder)



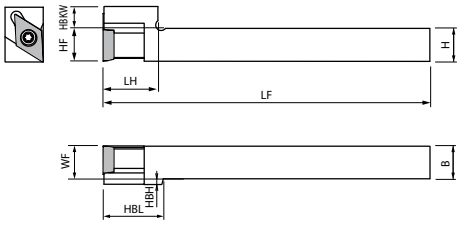


Fig. 1

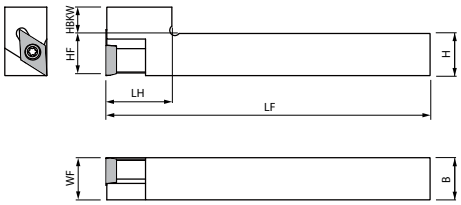


Fig. 2

Right-hand shown | Right-hand Insert for Right-hand Toolholder.

Toolholder dimensions

Description		Availability	Dimension (mm)									Fig.	Coolant hole	Spare parts		Applicable inserts
														Screw	Wrench	
		R	H	B	LH	HF	HBH	HBKW	HBL	LF	WF					
SDJCR	1212JX-11FF-Y	●	12	12	20	12	2	8	22	120	12	1	No	SB-4085TR	FT-15	DC□T11T3... DC□W11T3... DC□X11T3...
	1616JX-11FF-Y	●	16	16	25	16	-	10	-		16	2				

For WP chipbreaker, cutting edge offsets or program corrections are required on **R36** and **R37**.

Applicable inserts (ADJC-FF / SDJC-FF / SDJC-FFJCTM / SDJC / SDJC-FF-Y)

Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing
Insert								
Chipbreaker type	**CF**	**GF**	**SKS**	**SK**	**CK**	**GQ**	**WP**	**R/L-WP**
Page	**B68**	**B68**	**B68**	**B68**	**B68**	**B69**	**B69**	**B69**
Applications	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Medium	Medium	Finishing	Finishing
Insert								
Chipbreaker type	**PP**	**GP**	**GK**	**HQ**	**STD**	**MF**	**R/L-F**	**R/L-FSF**
Page	**B69**	**B69**	**B70**	**B70**	**B70**	**B70**	**B72, B73**	**B72**
Applications	Low feed	Low feed	Low feed	Low feed	Low carbon steel	Low carbon steel	Stainless steel / Heat-resistant alloys	Cast iron
Insert								
Chipbreaker type	**R/L-U**	**R/L-USF**	**R/L-J**	**R/L-JSF**	**XP**	**XQ**	**MQ**	**No CB**
Page	**B74~B76**	**B74**	**B77**	**B76**	**B71**	**B71**	**B71**	**B78**
Applications	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Hard materials		
Insert								
Chipbreaker type	**AP**	**R/L-A3**	**AH**	**PCD**	**APD**	**CBN**		
Page	**B78**	**B78**	**B78**	**C42**	**C42**	**C22**		

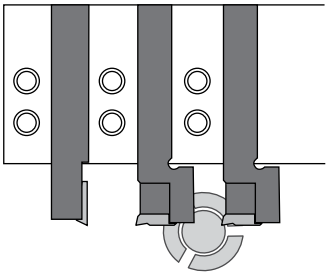
Recommended cutting conditions ➡ **E65, E66**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

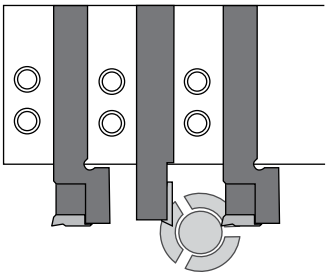
Precautions for using Y-axis toolholder

Do not use Y-axis toolholders side by side to prevent interference. (Only two Y-axis holder can be used at the same time)

With interference

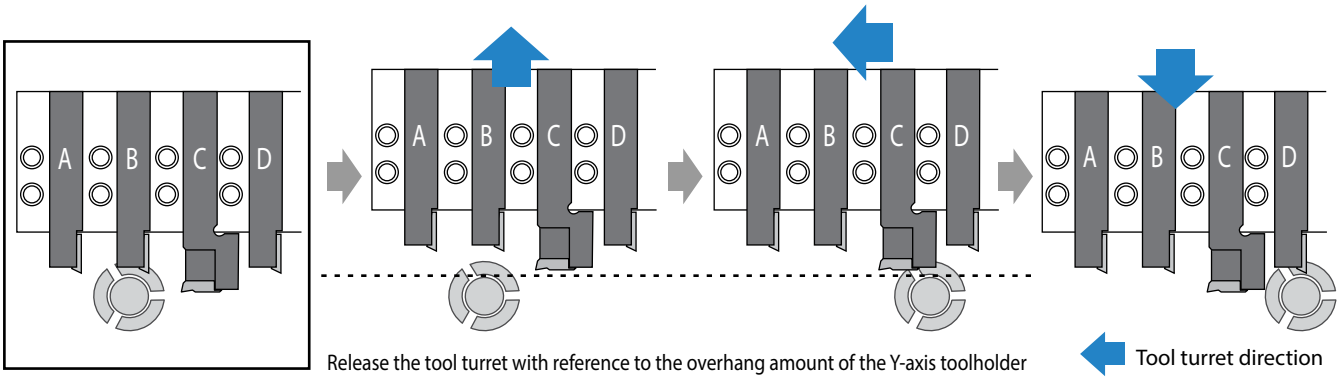


Without interference



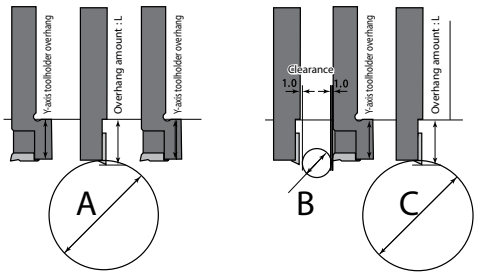
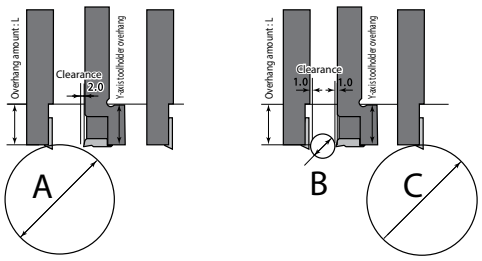
Standard toolholders may be mounted between two Y-axis toolholders

When changing the tool, set the retracted position with reference to the cutting edge of the Y-axis holder. (When exchanging from tool B to D)



Note that using other toolholders together will result in dierent outside diameters

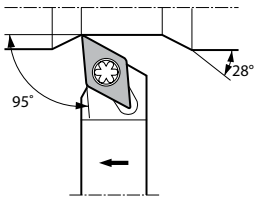
(Unit : mm)

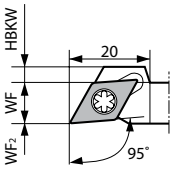
Y-axis toolholder overhang	Examples	Available outside cutting diameter (ø) \ Overhang amount L	20	22	25
20		A	Without restriction	Without restriction	Without restriction
		B	13.0	13.0	13.0
		C	Without restriction	Without restriction	Without restriction
25		A	38.0	58.0	Without restriction
		B	14.9	13.6	13.0
		C	45.0	60.0	Without restriction

E

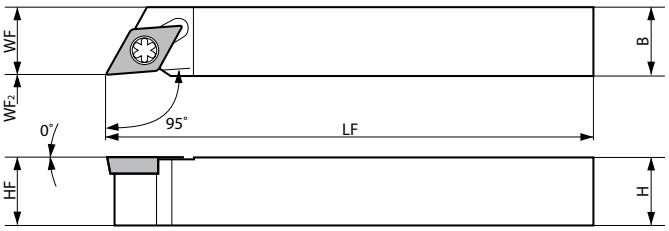
Small tools

SDLC-FF (External turning / External copying, Screw clamp, Without offset)





SDLC R/L 1010..-11FF
SDLC R/L 1212..-11FF

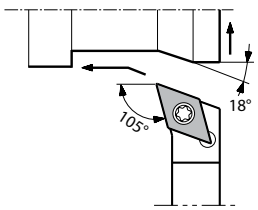


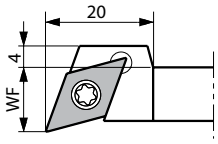
Right-hand shown

Toolholder dimensions

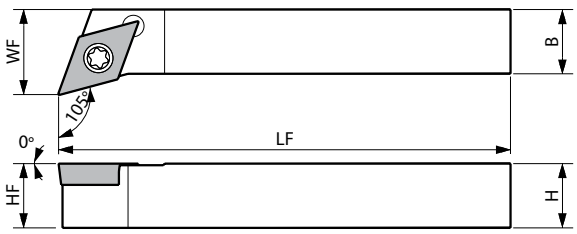
Description		Availability R	Availability L	Dimension (mm) H	B	HF	HBKW	LF	WF	WF2	Standard corner-R(RE)	Spare parts Screw	Spare parts Wrench	Spare parts Wrench	Applicable inserts
SDLC R/L	1010JX-07FF	●	●	10	10	10	-	120	10	0	0.2	SB-2570TR	-	FT-8	DC□T0702... DC□W0702...
	1212F-07FF	●	●	12	12	12	-	85	12	0	0.2	SB-2570TR	-	FT-8	DC□T0702... DC□W0702...
	1212JX-07FF	●	●	12	12	12	-	120	12	0	0.2	SB-2570TR	-	FT-8	DC□T0702... DC□W0702...
	1616JX-07FF	●	●	16	16	16	-	120	16	0	0.2	SB-2570TR	-	FT-8	DC□T0702... DC□W0702...
SDLC R/L	1010F-11FF	●		10	10	10	4	80	10	0	0.2	SB-4085TR	FT-15	-	DC□T11T3... DC□W11T3...
	1010JX-11FF	●	●	10	10	10	4	120	10	0	0.2	SB-4085TR	FT-15	-	DC□T11T3... DC□W11T3...
	1212F-11FF	●		12	12	12	2	85	12	0	0.2	SB-4085TR	FT-15	-	DC□T11T3... DC□W11T3...
	1212JX-11FF	●	●	12	12	12	2	120	12	0	0.2	SB-4085TR	FT-15	-	DC□T11T3... DC□W11T3...
	1616H-11FF	●		16	16	16	-	100	16	0	0.2	SB-4085TR	FT-15	-	DC□T11T3... DC□W11T3...
	1616JX-11FF	●	●	16	16	16	-	120	16	0	0.2	SB-4085TR	FT-15	-	DC□T11T3... DC□W11T3...

SDXC (External turning / External facing / External copying)





SDXC R/L 1010JX-11



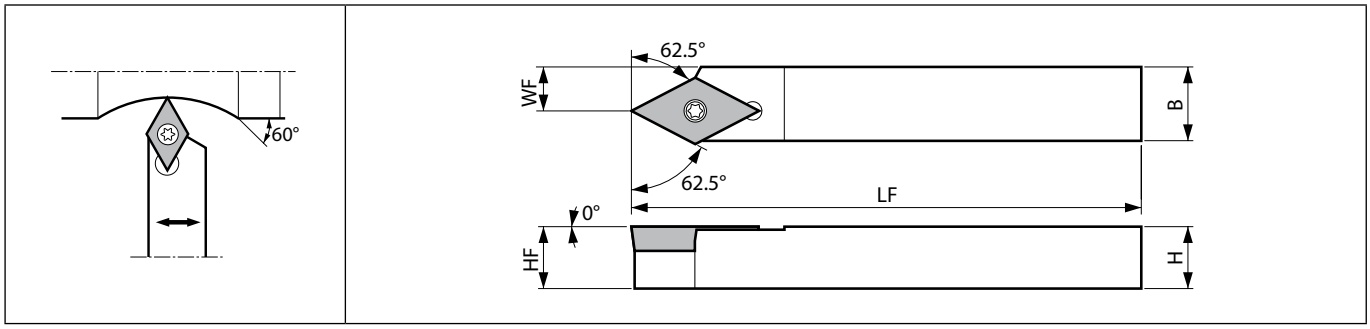
Right-hand shown

Toolholder dimensions

Description		Availability R	Availability L	Dimension (mm) H	B	HF	LF	WF	Standard corner-R(RE)	Spare parts Screw	Spare parts Wrench	Spare parts Wrench	Applicable inserts
SDXC R/L	1010JX-07	●	●	10	10	10	120	12	0.2	SB-2570TR	-	FT-8	DC□T0702... DC□W0702...
SDXC R/L	1010JX-11	●	●	10	10	10	120	12	0.2	SB-4085TR	FT-15	-	DC□T11T3... DC□W11T3...
	1212JX-11	●	●	12	12	12	120	16	0.2	SB-4085TR	FT-15	-	DC□T11T3... DC□W11T3...
	1616JX-11	●	●	16	16	16	120	20	0.2	SB-4085TR	FT-15	-	DC□T11T3... DC□W11T3...

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SDNC-F (External turning / External copying)

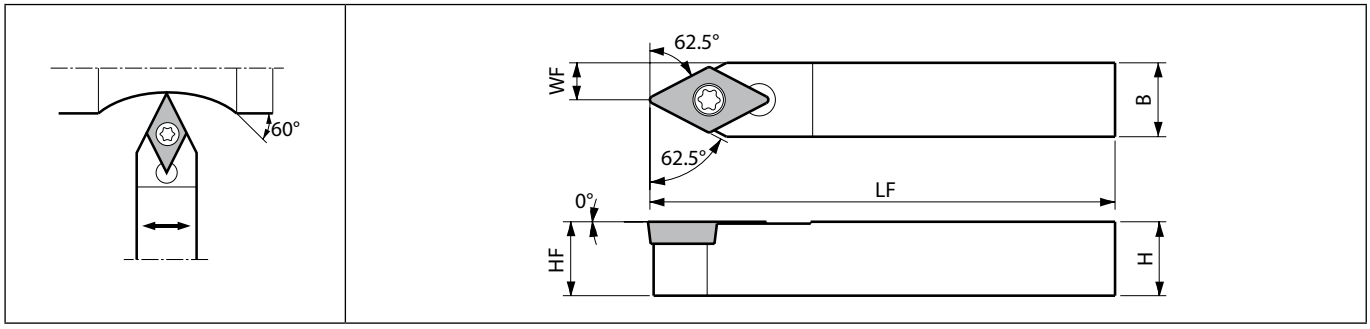


Right-hand shown

Toolholder dimensions

Description		Availability		Dimension (mm)					Standard corner-R(RE)	Spare parts		Applicable inserts
										Screw	Wrench	
		R	L	H	B	HF	LF	WF				
SDNCR	1010JX-07F	●		10	10	10	120	7	0.2	SB-2570TR	FT-8	DC□T0702... DC□W0702...

SDNC (External turning / External copying)



Toolholder dimensions

Description		Availability	Dimension (mm)					Standard corner-R(RE)	Spare parts			Applicable inserts
									Screw	Wrench	Wrench	
		N	H	B	HF	LF	WF					
SDNCN	0808F-07	●	8	8	8	85	4	0.2	SB-2570TR	-	FT-8	DC□T0702... DC□W0702...
	1010JX-07	●	10	10	10	120	5					
	1212JX-07	●	12	12	12		6					
SDNCN	1010F-11	●	10	10	10	80	5	0.2	SB-4085TR	FT-15	-	DC□T11T3... DC□W11T3...
	1010JX-11	●				120						
	1212F-11	●	12	12	12	85	6					
	1212JX-11	●				120						
	1616H-11	●	16	16	16	100	8					
	1616JX-11	●				120						

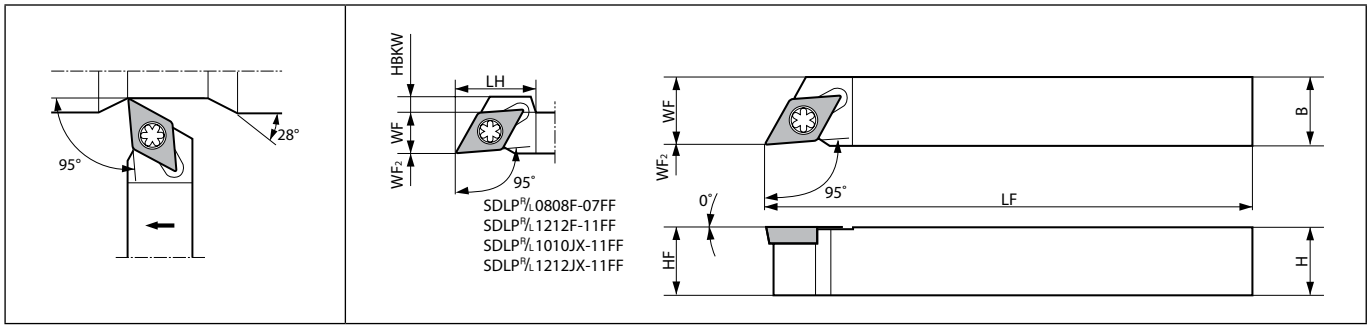
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts (SDLC-FF / SDXC / SDNC-F / SDNC)

Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing
Insert								
Chipbreaker type	CF	GF	SKS	SK	CK	GQ	PP	GP
Page	B68	B68	B68	B68	B68	B69	B69	B69
Applications	Finishing - Medium	Finishing - Medium	Medium	Medium	Finishing	Finishing	Low feed	Low feed
Insert								
Chipbreaker type	GK	HQ	STD	MF	R/L-F	R/L-FSF	R/L-U	R/L-USF
Page	B70	B70	B70	B70	B72, B73	B72	B74~B76	B74
Applications	Low feed	Low feed	Low carbon steel	Low carbon steel	Stainless steel / Heat-resistant alloys	Cast iron	Non-ferrous metals	Non-ferrous metals
Insert								
Chipbreaker type	R/L-J	R/L-JSF	XP	XQ	MQ	No CB	AP	R/L-A3
Page	B77	B76	B71	B71	B71	B78	B78	B78
Applications	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Hard materials				
Insert								
Chipbreaker type	AH	PCD	APD	CBN				
Page	B78	C42	C42	C22				

Recommended cutting conditions ➔ **E65, E66**

SDLP-FF (External turning / External copying, Screw clamp, Without offset)



Right-hand shown

Toolholder dimensions

Description		Availability		Dimension (mm)							Standard corner-R(RE)	Spare parts			Applicable inserts
		R	L	H	B	LH	HF	HBKW	LF	WF	WF_2		Screw	Wrench	Wrench	
																
SDLP R/L	0808F-07FF	●	●	8	8	14	8	0.5	85	8	0	0.2	SB-2570TR	-	FT-8	DPET0702...
	1010JX-07FF	●	●	10	10	-	10	-	120	10						
SDLP R/L	1010JX-11FF	●	●	10	10	20	10	4		10						
	1212JX-11FF	●	●	12	12		12	2	120	12	0	0.2	SB-4085TR	FT-15	-	DPET11T3...
	1616JX-11FF	●	●	16	16	-	16	-		16						

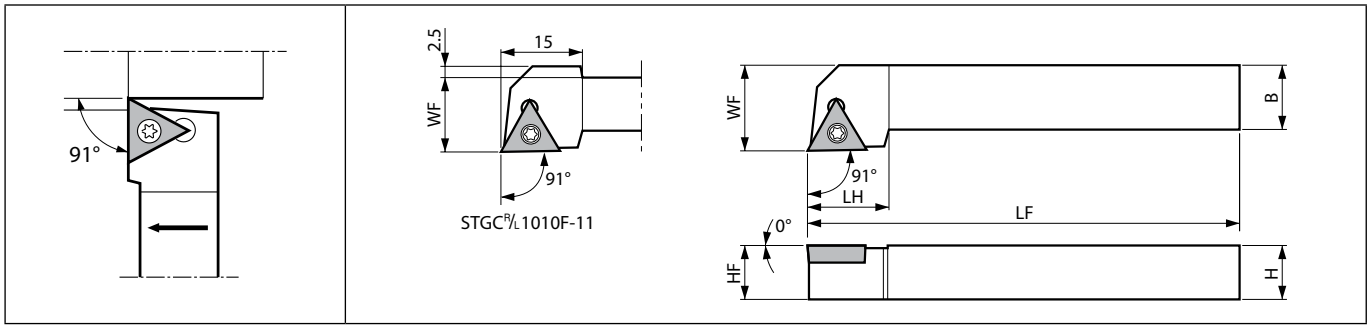
Applicable inserts

Applications	Finishing	Low feed
Insert		
Chipbreaker type	R/L-**FSF**	R/L-**USF**
Page	**B79**	**B79**

Recommended cutting conditions **E65, E66**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

STGC (External turning)



Right-hand shown

Toolholder dimensions

Description		Availability R	Availability L	Dimension (mm) H	B	LH	HF	LF	WF	Standard corner-R(RE)	Spare parts: Screw	Spare parts: Wrench	Applicable inserts
STGCR/L	0808E-08	●		8	8	12	8	70	10	0.2	SB-2050TR	FT-6	TC□T0802... TC□W0802...
	1010F-08	●	●	10	10		10	80	12				
STGCR/L	1010F-11	●	●	10	10	15	10	80	14	0.4	SB-2570TR	FT-8	TC□T1103... TC□W1103...
	1212H-11	●	●	12	12		12	100	16				
	1616H-11	●	●	16	16		16		20				
	2020K-11	●	●	20	20		20	125	25				
	2525M-11	●	●	25	25	20	25	150	32				

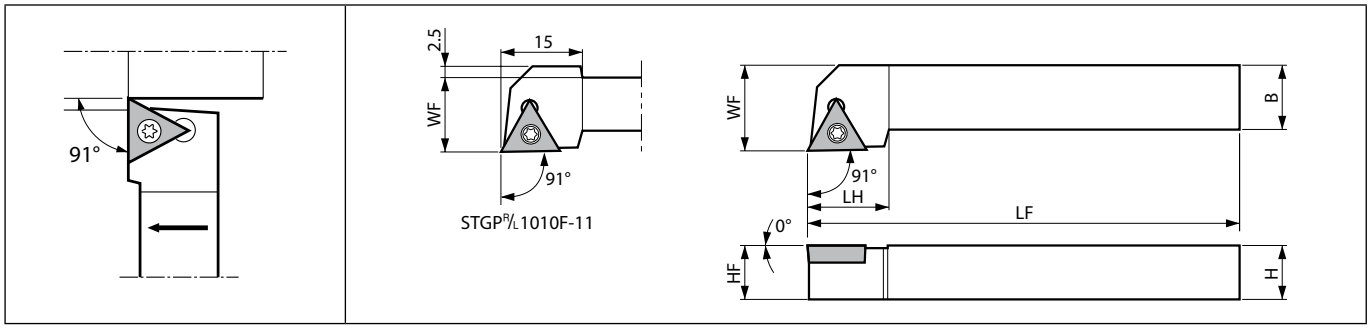
Applicable inserts

Applications	Low feed	Low feed	Cast iron	Non-ferrous metals	Non-ferrous metals
Insert					
Chipbreaker type	R/L-**U**	R/L-**USF**	**No CB**	R/L-**A3**	**PCD**
Page	**B86**	**B85**	**B87**	**B87**	**C45**

Recommended cutting conditions ⊕ **E65, E66**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

STGP (External turning)



Right-hand shown

Toolholder dimensions

Description		Availability R	Availability L	Dimension (mm) H	B	LH	HF	LF	WF	Standard corner-R(RE)	Spare parts: Screw	Spare parts: Wrench	Applicable inserts
STGPR	0808E-08	●		8	8	12	8	70	10	0.2	SB-2050TR	FT-6	TP□B0802... , TP□H0802... TP□T0802...
STGPR/L	1010F-11	●	●	10	10	15	10	80	14	0.2	SB-3080TR	FT-10	TP□B1103... TP□H1103... TP□T1103...
	1212H-11	●	●	12	12		12	100	16				
	1616H-11	●	●	16	16		16		20				

Applicable inserts

Applications	Minute ap	Finishing	Finishing	Finishing - Medium	Finishing	Finishing	Low feed	Medium
Insert								
Chipbreaker type	CF	PP	GP	HQ	R/L	R/L-FSF	R/L-USF	R/L-H
Page	B88	B88	B89	B89	B90, B91	B92	B94	B93
Applications	Low carbon steel	Low carbon steel	Cast iron	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Hard materials	
Insert								
Chipbreaker type	XP	XQ	No CB	AP	PCD	APD	CBN	
Page	B89	B89	B94	B94	C46, C47	C47	C23	

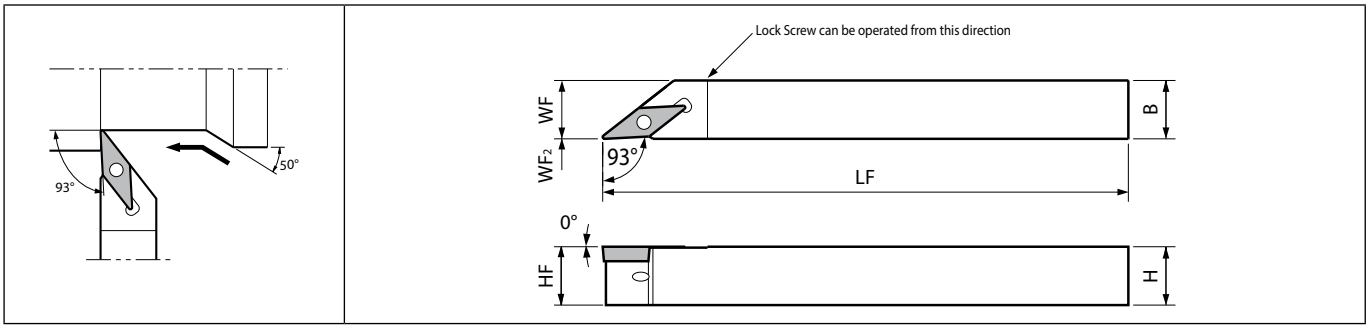
Recommended cutting conditions ➔ E65, E66

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

E

Small tools

AVJB-FF (External turning / External copying , Back clamp, Without offset)



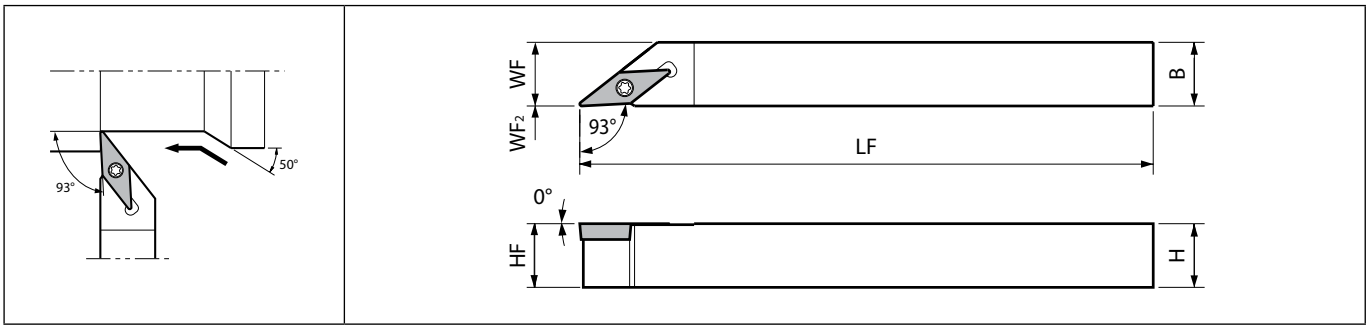
Right-hand shown

Toolholder dimensions

Description		Availability		Dimension (mm)						Standard corner-R(RE)	Spare parts			Applicable inserts
		R	L	H	B	HF	LF	WF	WF_2		Anchor pin	Lock screw	Wrench	
AVJB R/L	1010JX-11FF	●	●	10	10	10	120	10	0	0.4	LPF-11	HSB4X8 R/L	FH-2	VB□T1103... VB□W1103...
	1212JX-11FF	●	●	12	12	12		12			LPF-1113			
	1616JX-11FF	●	●	16	16	16		16			LPF-1117			

Lock screw : HSB4X8R for Right-hand Toolholder, HSB4X8L for Left-hand Toolholder.

SVJB-FF (External turning / External copying, Screw clamp, Without offset)



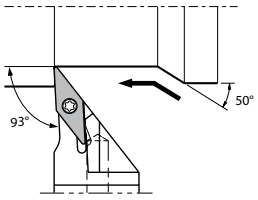
Right-hand shown

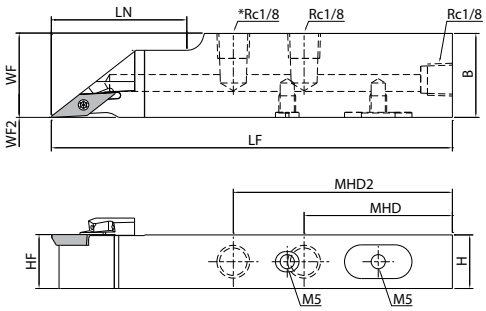
Toolholder dimensions

Description		Availability		Dimension (mm)						Standard corner-R(RE)	Spare parts		Applicable inserts
		R	L	H	B	HF	LF	WF	WF_2		Screw	Wrench	
SVJB R/L	1010JX-11FF	●	●	10	10	10	120	10	0	0.4	SB-2570TR	FT-8	VB□T1103... VB□W1103...
	1212JX-11FF	●	●	12	12	12		12					
	1616JX-11FF	●	●	16	16	16		16					
	2020JX-11FF	●	●	20	20	20		20					

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SVJB-FFJCTM (External turning / External copying, Screw clamp, Without offset, Coolant-though holder)





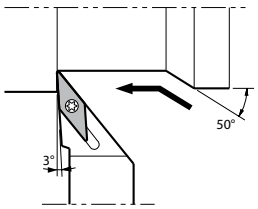
Right-hand shown | SVJBR12…: 2-Rc1/8

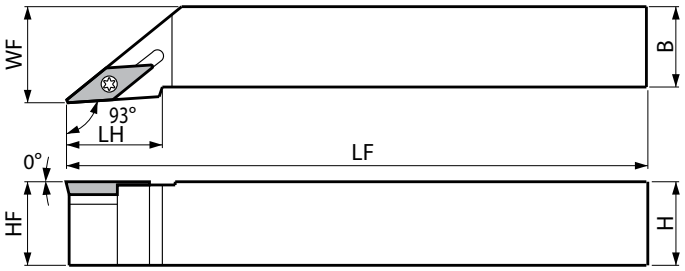
Toolholder dimensions

Description		Availability	Dimension (mm)									Standard corner-R(RE)	Coolant hole	Spare parts				Applicable inserts
														Plug	Plug	Screw	Wrench	
		R	H	B	MHD	MHD2	HF	LF	LN	WF	WF_2							
SVJBR	1218JX-11FFJCTM	●	12	18	54	-	12	120	28	18	0	0.4	Yes	GP-1	HS5X4LP	SB-2570TR	FT-8	VB□T1103... VB□W1103...
	1625JX-11FFJCTM	●	16	25	44	65	16		40	25								
	2025JX-11FFJCTM	●	20				20								-			

Please see page **H16** and **H17** for piping parts of coolant-through holders.

SVJB (External turning / External copying, Screw clamp)





Right-hand shown

Toolholder dimensions

Description		Availability		Dimension (mm)						Standard corner-R(RE)	Spare parts						Applicable inserts
											Screw	Wrench	Wrench	Shim screw	Shim	Wrench	
		R	L	H	B	LH	HF	LF	WF								
SVJB[R/L]	2020K-11	●	●	20	20	30	20	125	25	0.4	SB-2570TR	-	FT-8	-	-	-	VB□T1103... VB□W1103...
	2525M-11	●	●	25	25	35	25	150	32								
SVJB[R/L]	2020K-16N	●	●	20	20	30	20	125	25	0.8	SB-40125TRN	FT-15	-	SS-4N	SVN-32N (SVN-32S*)	LW-4	VB□T1604..., VB□W1604... VC□T1604...
	2525M-16N	●	●	25	25		25	150	32								

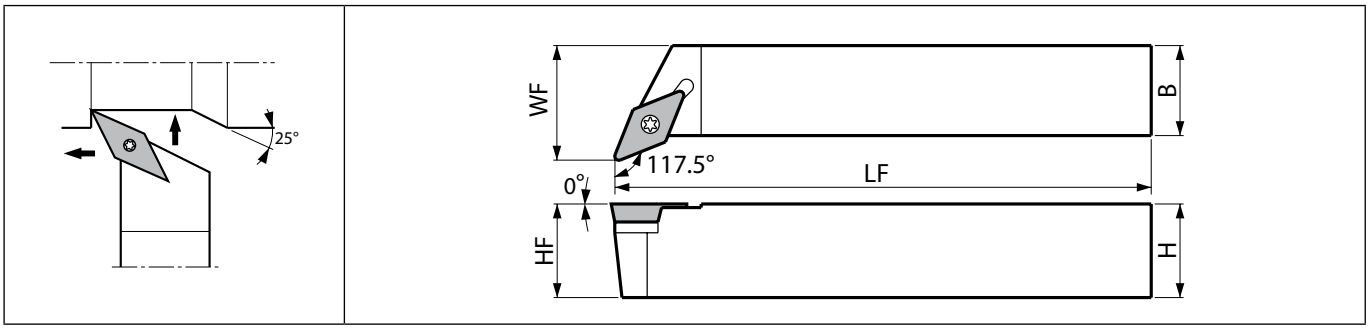
When using inserts whose corner-R(RE) is 0.2 or 0.4mm, shim (SVN-32S) is recommended (sold separately).

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

E

Small tools

SVPB (External turning / External facing / External copying / Undercutting, Screw clamp)



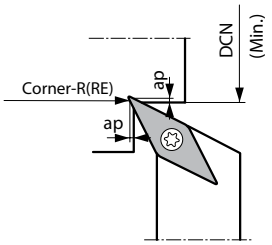
Right-hand shown

Toolholder dimensions

Description		Availability R	Availability L	Dimension (mm) H	B	HF	LF	WF	Standard corner-R(RE)	Spare parts: Screw	Wrench	Wrench	Shim screw	Shim	Wrench	Applicable inserts
SVPB R/L	1010JX-11	●	●	10	10	10		14.5								
	1212JX-11	●	●	12	12	12	120	16.5								
	1616JX-11	●	●	16	16	16		20.5	0.4	SB-2570TR	-	FT-8	-	-	-	VB□T1103... VB□W1103...
	2020K-11	●	●	20	20	20	125	25								
	2525M-11	●	●	25	25	25	150	32								
SVPB R/L	2020K-16N	●	●	20	20	20	125	25	0.8	SB-40125TRN	FT-15	-	SS-4N	SVN-32N (SVN-32S*)	LW-4	VB□T1604..., VB□W1604... VC□T1604...
	2525M-16N	●	●	25	25	25	150	32								

When using inserts whose corner-R(RE) is 0.2 or 0.4mm, shim (SVN-32S) is recommended (sold separately).

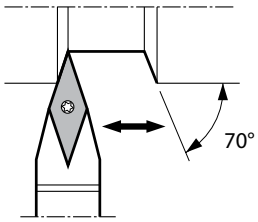
Undercutting diameter of SVPB

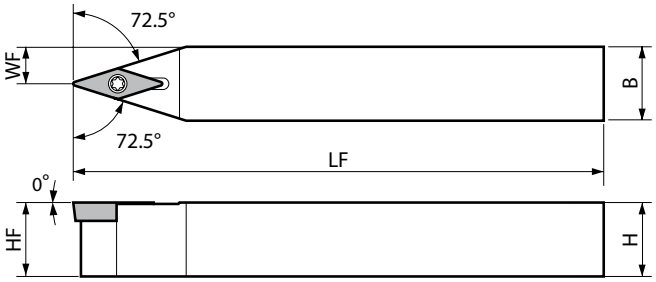


Corner-R (RE)	ap (mm)	DCN (Min.)
0.4	0.5	ø25
	1	ø30
0.8	0.5	ø45
	1	ø55

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SVVB (External turning / External copying)





Toolholder dimensions

Description		Availability	Dimension (mm)					Standard corner-R(RE)	Spare parts						Applicable inserts
									Screw	Wrench	Wrench	Shim screw	Shim	Wrench	
		N	H	B	HF	LF	WF								
SVVBN	1010F-11	●	10	10	10	80	5	0.4	SB-2570TR	-	FT-8	-	-	-	VB□T1103... VB□W1103...
	1010JX-11	●				120									
	1212F-11	●	12	12	12	85	6								
	1212JX-11	●				120									
	1616H-11	●	16	16	16	100	8								
	1616JX-11	●				120									
	2020K-11	●	20	20	20	125	10								
	2525M-11	●	25	25	25	150	12.5								
SVVBN	2020K-16N	●	20	20	20	125	10	0.8	SB-40125TRN	FT-15	-	SS-4N	SVN-32N (SVN-32S*)	LW-4	VB□T1604..., VB□W1604... VC□T1604...
	2525M-16N	●	25	25	25	150	12.5								

When using inserts whose corner-R(RE) is 0.2 or 0.4mm, shim (SVN-32S) is recommended (sold separately).

Applicable inserts (AVJB-FF / SVJB-FF / SVJB-FFJCTM / SVJB / SVPB / SVVB)

Applications	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing	Finishing - Medium	Non-ferrous metals
Insert								
Chipbreaker type	PP	GP	VF	HQ	P/L-F	P/L-FSF	P/L-Y	PCD
Page	B97	B97	B97	B97	B98	B98	B99	C49

Applications	Hard materials
Insert	
Chipbreaker type	CBN
Page	C26

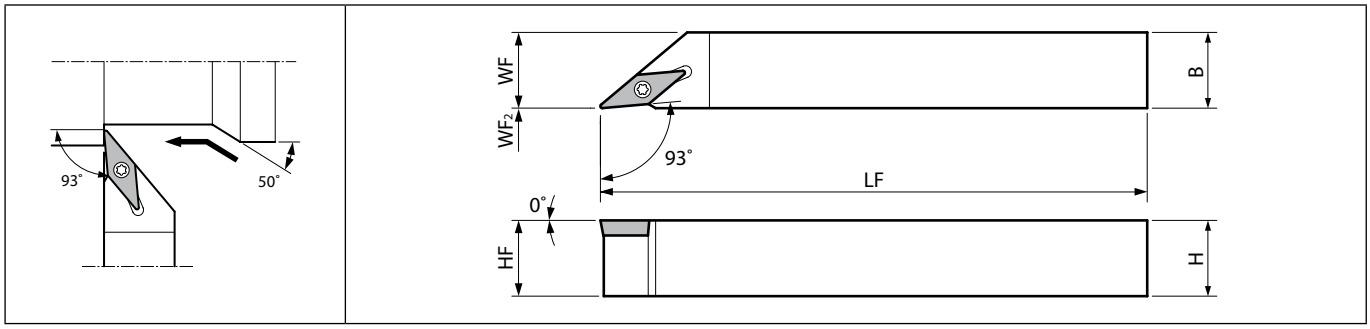
Recommended cutting conditions ⇒ E65, E66

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

E

Small tools

SVJC-FF (External turning / External copying, Screw clamp, Without offset)

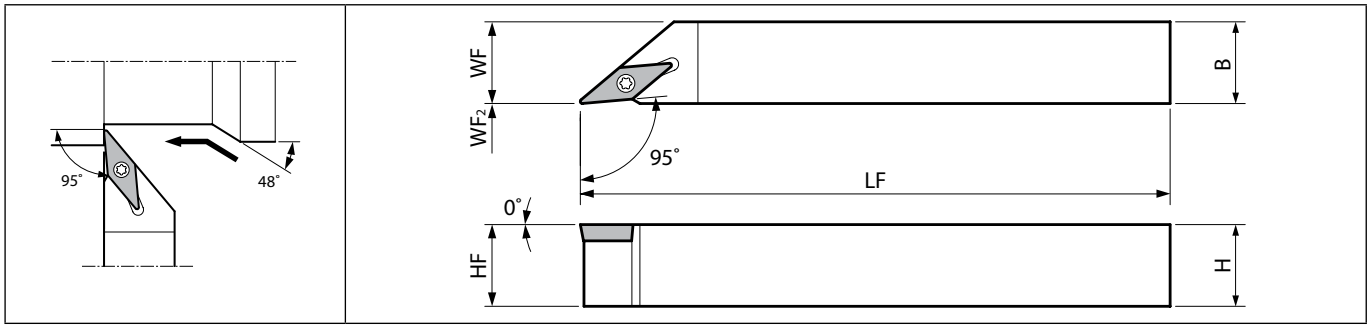


Right-hand shown

Toolholder dimensions

Description		Availability R	Availability L	Dimension (mm) H	B	HF	LF	WF	WF2	Standard corner-R(RE)	Spare parts Screw	Spare parts Wrench	Applicable inserts
SVJCR/L	1010JX-11FF	●	●	10	10	10	120	10	0	0.2	SB-2570TR	FT-8	VC□T1103...
	1212F-11FF	●	●	12	12	12	85	12					
	1212JX-11FF	●	●				120						
	1616JX-11FF	●	●	16	16	16		16					
	2020JX-11FF	●	●	20	20	20		20					

SVLC-FF (External turning / External copying, Screw clamp, Without offset)



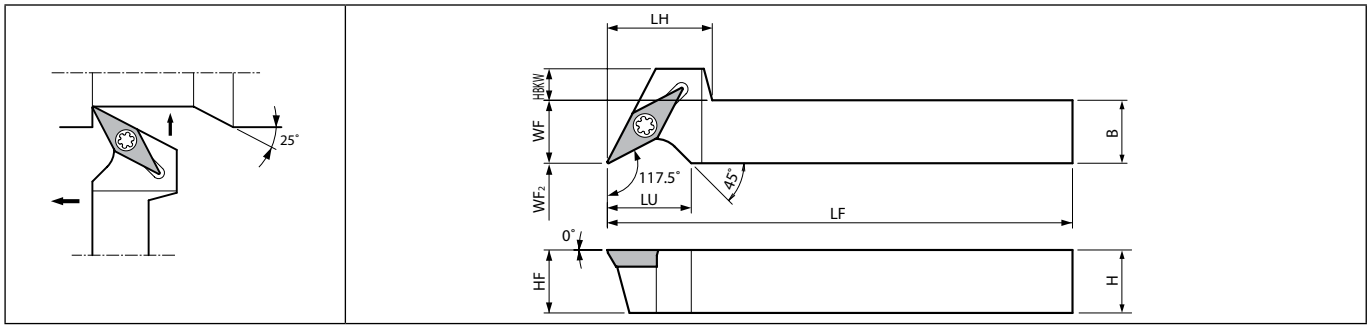
Right-hand shown

Toolholder dimensions

Description		Availability R	Availability L	Dimension (mm) H	B	HF	LF	WF	WF2	Standard corner-R(RE)	Spare parts Screw	Spare parts Wrench	Applicable inserts
SVLCR/L	1212F-11FF	●	●	12	12	12	85	12	0	0.2	SB-2570TR	FT-8	VC□T1103...
	1212JX-11FF	●	●				120						
	1616JX-11FF	●	●	16	16	16		16					

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SVPC-FF (External turning / External facing / External copying / Undercutting, Screw clamp, Without offset)

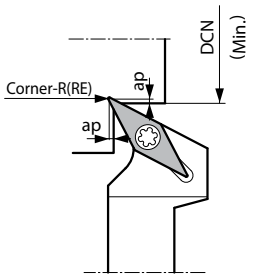


Right-hand shown

Toolholder dimensions

Description		Availability	Dimension (mm)									Standard corner-R(RE)	Spare parts		Applicable inserts
													Screw	Wrench	
		R	H	B	LH	HF	HBKW	LF	LU	WF	WF_2				
SVPCR	1010JX-11FF	●	10	10	20	10	8	120	16	10	0	0.2	SB-2570TR	FT-8	VC□T1103...
	1212F-11FF	●	12	12		12	6	85		12					
	1212JX-11FF	●						120							
	1616JX-11FF	●	16	16		16	2		20	16					

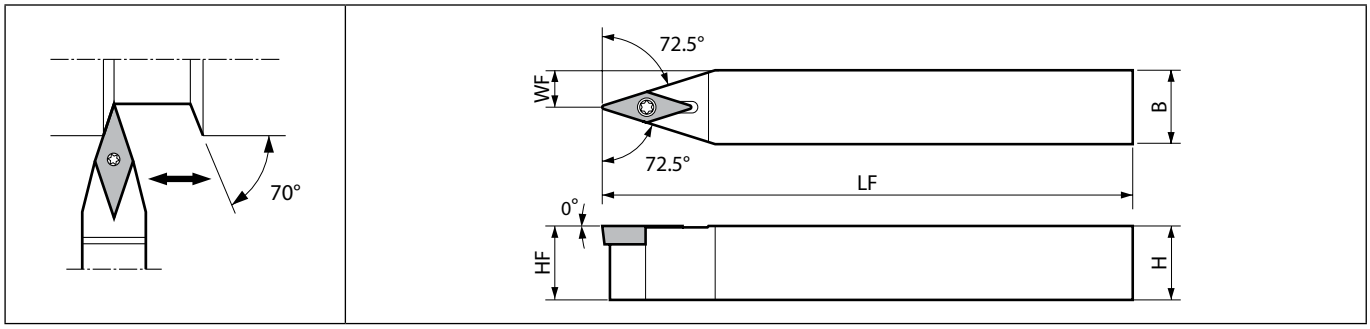
Undercutting diameter of SVPC-FF



Corner-R (RE)	ap (mm)	DCN (Min.)
0.2	0.5	ø20
	0.7	ø25

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SVVC (External turning / External copying)



Toolholder dimensions

Description		Availability	Dimension (mm)					Standard corner-R(RE)	Spare parts		Applicable inserts
									Screw	Wrench	
		N	H	B	HF	LF	WF				
SVVCN	1010JX-11	●	10	10	10	120	5	0.2	SB-2570TR	FT-8	VC□T1103...
	1212JX-11	●	12	12	12		6				
	1616JX-11	●	16	16	16		8				

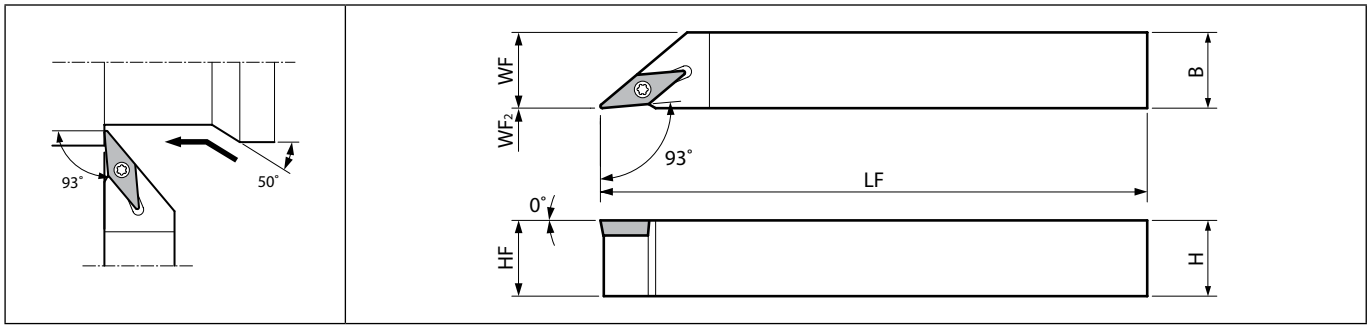
Applicable inserts (SVJC-FF / SVLC-FF / SVPC-FF / SVVC)

Applications	Minute ap	Finishing	Finishing	Finishing	Finishing - Medium
Insert					
Chipbreaker type	**CF**	**GF**	**SKS**	R/L-**F**	R/L-**Y**
Page	**B100**	**B100**	**B100**	**B101**	**B101**

Recommended cutting conditions ➡ **E65, E66**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SVJP-FF (External turning / External copying, Screw clamp, Without offset)

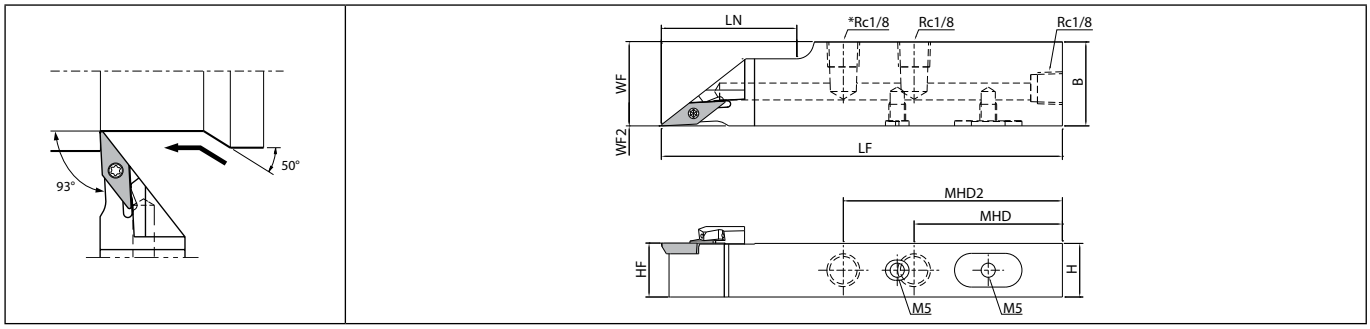


Right-hand shown

Toolholder dimensions

Description		Availability		Dimension (mm)						Standard corner-R(RE)	Spare parts		Applicable inserts
		R	L	H	B	HF	LF	WF	WF_2		Screw	Wrench	
SVJP R/L	1212F-11FF	●	●	12	12	12	85	12	0	0.2	SB-2570TR	FT-8	VP□T1103...
	1212JX-11FF	●	●				120						
	1616JX-11FF	●	●	16	16	16		16					
	2020JX-11FF	●	●	20	20	20		20					

SVJP-FFJCTM (External turning / External copying, Screw clamp, Without offset, Coolant-though holder)



Right-hand shown | SVJPR12…: 2-Rc1/8

Toolholder dimensions

Description		Availability	Dimension (mm)									Standard corner-R(RE)	Coolant hole	Spare parts				Applicable inserts
		R	H	B	MHD	MHD2	HF	LF	LN	WF	WF_2			Plug	Plug	Screw	Wrench	
SVJPR	1218JX-11FFJCTM	●	12	18	54	-	12	120	28	18	0	0.2	Yes	GP-1	HS5X4LP	SB-2570TR	FT-8	VP□T1103...
	1625JX-11FFJCTM	●	16	25	44	65	16		40	25								
	2025JX-11FFJCTM	●	20				20								-			

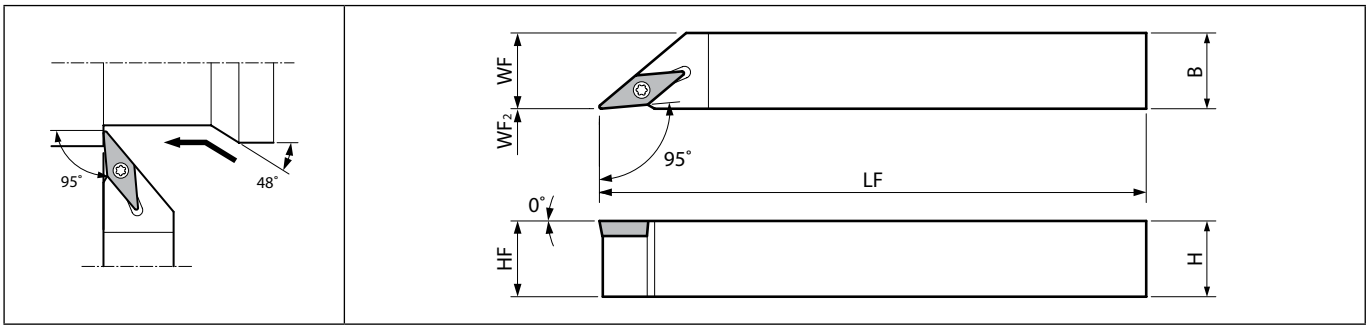
Please see page **H16** and **H17** for piping parts of coolant-through holders.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

E

Small tools

SVLP-FF (External turning / External copying, Screw clamp, Without offset)



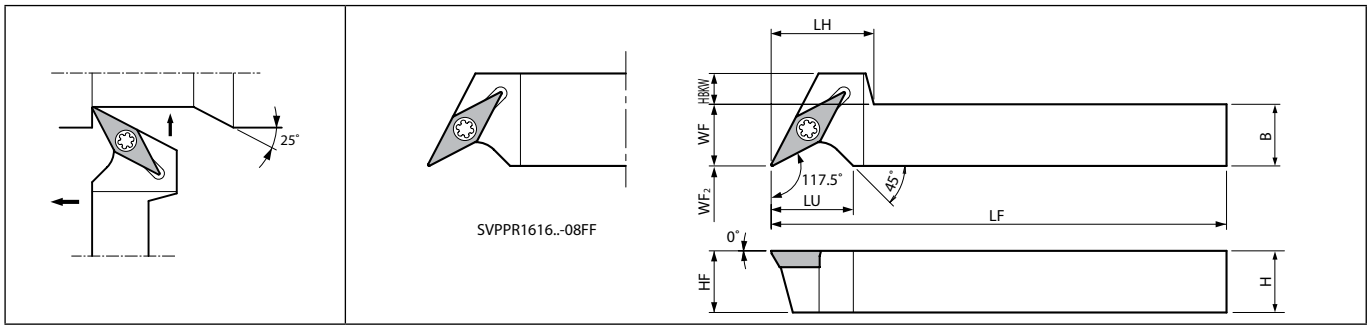
Right-hand shown

Toolholder dimensions

Description		Availability		Dimension (mm)						Standard corner-R(RE)	Spare parts		Applicable inserts
											Screw	Wrench	
		R	L	H	B	HF	LF	WF	WF_2				
SVLP R/L	1010JX-08FF	●	●	10	10	10	120	10	0	0.1	SB-2050TR	FT-6	VP□T0802...
	1212F-08FF	●	●	12	12	12	85	12					
	1212JX-08FF	●	●				120						
	1616JX-08FF	●	●	16	16	16		16					
SVLP R/L	1212F-11FF	●	●	12	12	12	85	12	0	0.2	SB-2570TR	FT-8	VP□T1103...
	1212JX-11FF	●	●				120						
	1616JX-11FF	●	●	16	16	16		16					

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SVPP-FF (External turning / External facing / External copying / Undercutting, Screw clamp, Without offset)

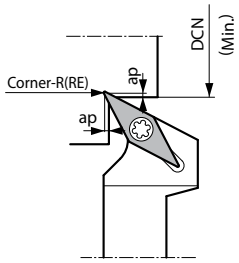


Right-hand shown

Toolholder dimensions

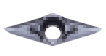
Description		Availability	Dimension (mm)									Standard corner-R(RE)	Spare parts		Applicable inserts
													Screw	Wrench	
		R	H	B	LH	HF	HBKW	LF	LU	WF	WF_2				
SVPPR	1010JX-08FF	●	10	10	16	10	4	120	12	10	0	0.1	SB-2050TR	FT-6	VP□T0802...
	1212F-08FF	●	12	12		12	2	85		12					
	1212JX-08FF	●						120							
	1616JX-08FF	●	16	16	-	16	-			16					
SVPPR	1010JX-11FF	●	10	10	20	10	8	120	16	10	0	0.2	SB-2570TR	FT-8	VP□T1103...
	1212F-11FF	●	12	12		12	6	85		12					
	1212JX-11FF	●						120							
	1616JX-11FF	●	16	16		16	2			16					

Undercutting diameter of SVPP-FF



Corner-R (RE)	ap (mm)	DCN (Min.)
0.2	0.5	ø20
	1	ø25

Applicable inserts (SVJP-FF / SVJP-FFJCTM / SVLP-FF / SVPP-FF)

Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Finishing	Low feed	Low feed
Insert								
Chipbreaker type	CF	SKS	CK	GF	R/L-F	R/L-FSF	R/L-U	R/L-USF
Page	B102	B102	B102	B102	B103	B103	B104	B104

Applications	Low feed
Insert	
Chipbreaker type	R/L-J
Page	B104

Recommended cutting conditions ➡ E65, E66

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

E

Small tools

25° Insert profiling tools

ZBMT Series

Unique clamping structure and a wide lineup of external toolholders and boring bars. High precision and stable machining in a wide range of applications including copying, undercutting, tapering, V-slotting, spherical machining, and more.

1 Newly developed unique-clamping mechanism achieves a higher rigidity

Side lock mechanism

Unique design holds insert at 2 points
Safe even for insert with small tip angle that is difficult to mount

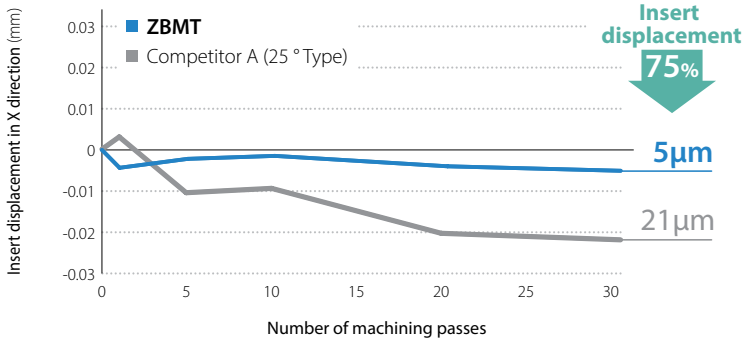


Indentations for screw clamp are designed into the insert's body

Uses a large screw size (M4)



Insert displacement during facing comparison (Internal evaluation)



Cutting conditions : Vc = 230 m/min, ap = 0.3 mm, f = 0.15 mm/rev, Wet Workpiece material 34CrMo4

*The above figures are not guaranteed. It depends on cutting conditions.

Check

By controlling insert displacement,

– Machining precision is stabilized and long tool life is enable

– Reduces defect rate due to sudden dimensional deviation

Provides high quality and stable machining in various machining applications

Excellent performance in various machining applications including copying, undercutting, tapering, V-slotting, spherical machining, etc.



Shaft copying



Internal undercutting



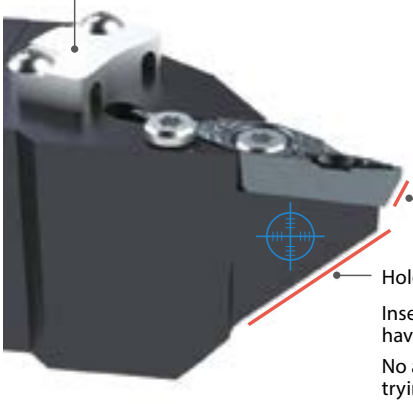
End face tapering

CG images

2 Unique holder design to meet customers' needs

Both boring bars and external toolholders are compatible with internal coolant.

Uses a clamp with a small thickness that does not prevent chip flow



Unique double coolant hole design

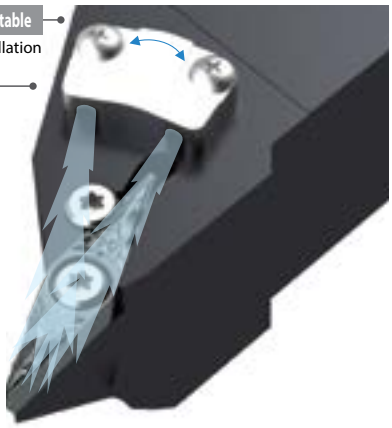
Supplies coolant directly to the cutting edge and provides improved chip evacuation and long tool life (Coolant discharge direction: Fine adjustment possible)

*Though coolant stream hits side clamp screw, machining performance is not affected

*Pressure resistance: ~ 3 MPa

Fine tuned and adjustable

± 4 ° Adjustable oscillation



Easy to use for facing

Insert corner : 2-Step Positive Type (20°)

Holder: Tapered shape

Inserts and toolholders have a unique end shape

No additional machining is required when trying to avoid interference with workpiece.

Effective for facing applications

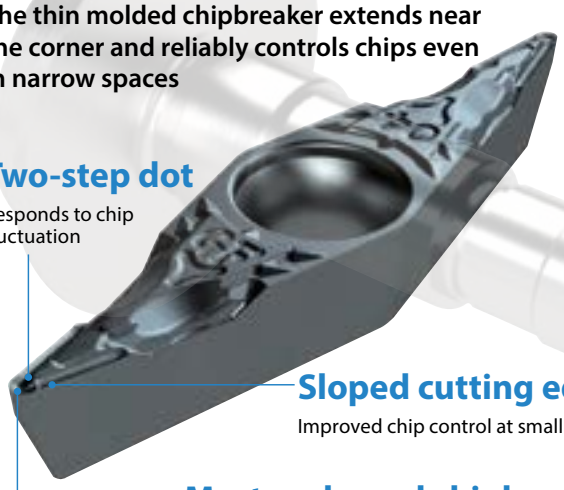


3 New GF chipbreaker for ZBMT reduces chip control issues at minute D.O.C.

GF chipbreaker

Solving chip control issues leads to high-quality surface finishes

The thin molded chipbreaker extends near the corner and reliably controls chips even in narrow spaces



Two-step dot

Responds to chip fluctuation

Sloped cutting edge

Improved chip control at small D.O.C.

Mortar-shaped chipbreaker

Low resistance and excellent chip control even in ductile workpieces

Chip control comparison

(Internal evaluation)



GF chipbreaker

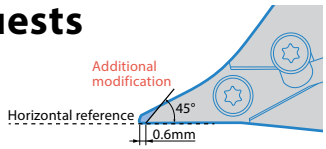


Competitor A (25 ° Type)

Cutting conditions : Vc = 230 m/min, f = 0.15 mm/rev, ap = 0.2 - 0.5 mm, Wet Workpiece material 34CrMo4 Facing

15° Inserts are also available upon customer requests

To avoid holder interference, additional modifications is required as shown in the figure on the right. Also, as shown in the figure below, special order for holders may be required depending on machining application.

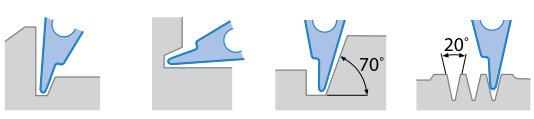


Examples

When using the toolholder in reverse mounting position

When using the toolholder in normal mounting position

* Holder: Special order specification

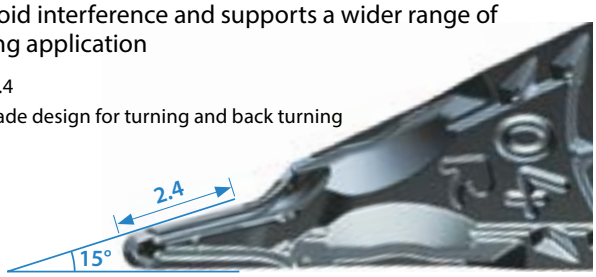


15 ° inserts are developed relative to 25 ° inserts

Helps avoid interference and supports a wider range of machining application

Corner-R 0.4

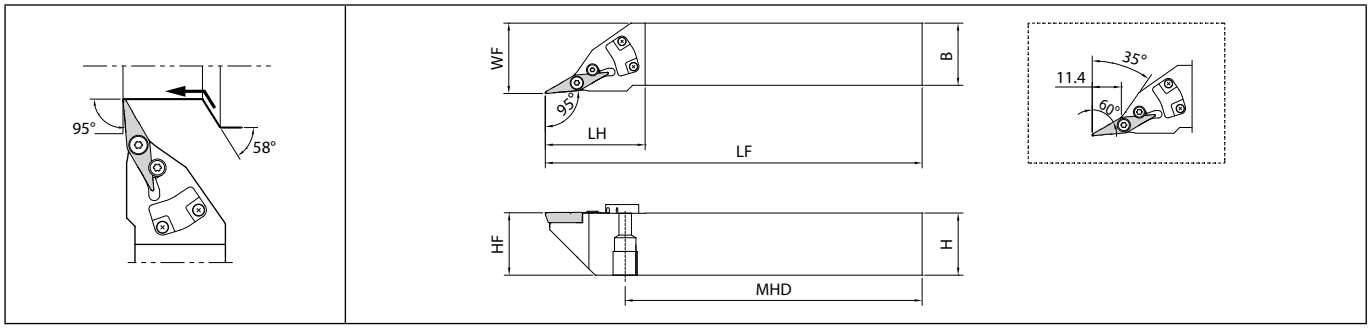
Double-blade design for turning and back turning



E

Small tools

SZLB (External turning / External copying, Screw clamp, Coolant-though holder)



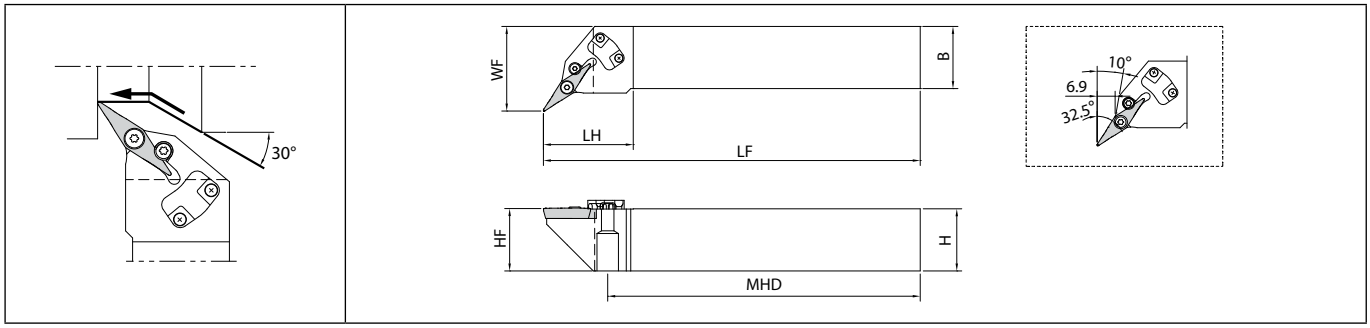
Right-hand shown | ZBMT13T304R-GF-15D is applicable to Right-hand Toolholder. | Applicable pressure : ~3MPa

Toolholder dimensions

Description		Availability		Dimension (mm)							Standard corner-R(RE)	Coolant hole	Spare parts				Applicable inserts
		R	L	H	B	LH	MHD	HF	LF	WF			Clamper screw	Clamper	Screw	Wrench	
SZLB R/L	2020K-13C	●	●	20	20	40	92.6	20	125	23	0.4	Yes	BH2X6	ZCP-13	SB-3079TR	FT-8	ZBMT13T3...
	2525M-13C	●	●	25	25		118	25	150	28.2							

Please see page **D12** for piping parts of coolant-through holders.

SZPB (External turning / External facing / External copying / Undercutting, Screw clamp, Coolant-though holder)



Right-hand shown | Applicable pressure : ~3MPa

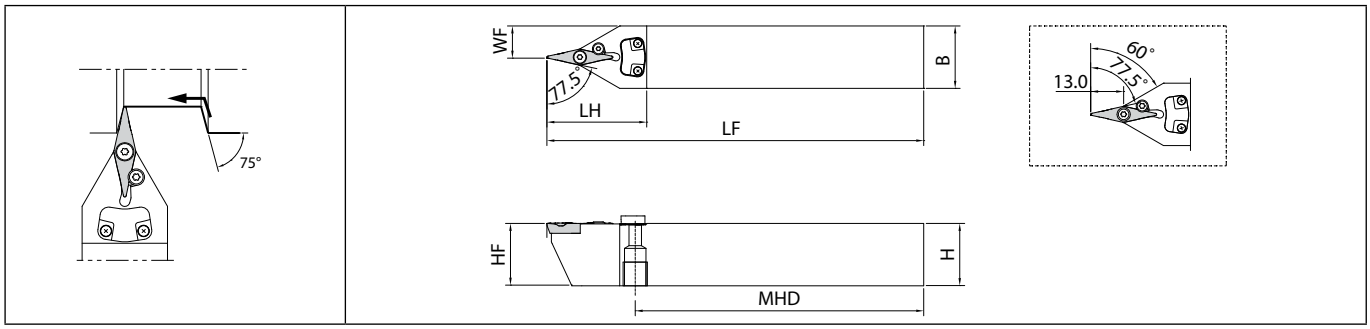
Toolholder dimensions

Description		Availability		Dimension (mm)							Standard corner-R(RE)	Coolant hole	Spare parts				Applicable inserts
		R	L	H	B	LH	MHD	HF	LF	WF			Clamper screw	Clamper	Screw	Wrench	
SZPB R/L	2020K-13C	●	●	20	20	37	95	20	125	27.2	0.4	Yes	BH2X6	ZCP-13	SB-3079TR	FT-8	ZBMT13T3...
	2525M-13C	●	●	25	25	36	124.2	25	150	33.9							

Please see page **D12** for piping parts of coolant-through holders.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SZVB (External turning / External copying, Screw clamp, Coolant-though holder)



Applicable pressure : ~3MPa

Toolholder dimensions

Description		Availability	Dimension (mm)							Standard corner-R(RE)	Coolant hole	Spare parts				Applicable inserts
												Clamper screw	Clamper	Screw	Wrench	
		N	H	B	LH	MHD	HF	LF	WF							
SZVBN	2020K-13C	●	20	20	40	89.6	20	125	10	0.4	Yes	BH2X6	ZCP-13	SB-3079TR	FT-8	ZBMT13T3...
	2525M-13C	●	25	25		114.6	25	150	12.5							

Please see page **D12** for piping parts of coolant-through holders.

Applicable inserts

Applications	Finishing	Finishing	Non-ferrous metals
Insert			
Chipbreaker type	**GF**	**R-GF-15D**	**NE**
Page	**B108**	**B108**	**C53**

R-GF-15D inserts are only for the right-hand toolholders of SZLB.

Recommended cutting conditions **E68**

Instructions

When mounting the insert (Tightening torque: 1.2 N·m)

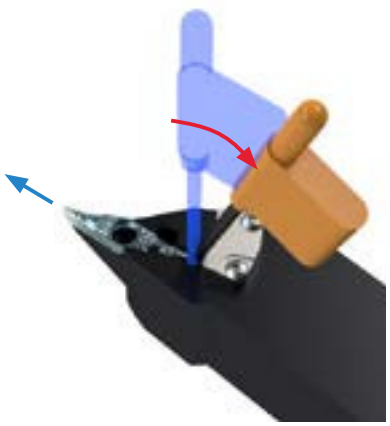


1. Tighten the main screw with the insert pressed against the contact surface with fingertips.



2. Tighten the side screw to complete the installation.

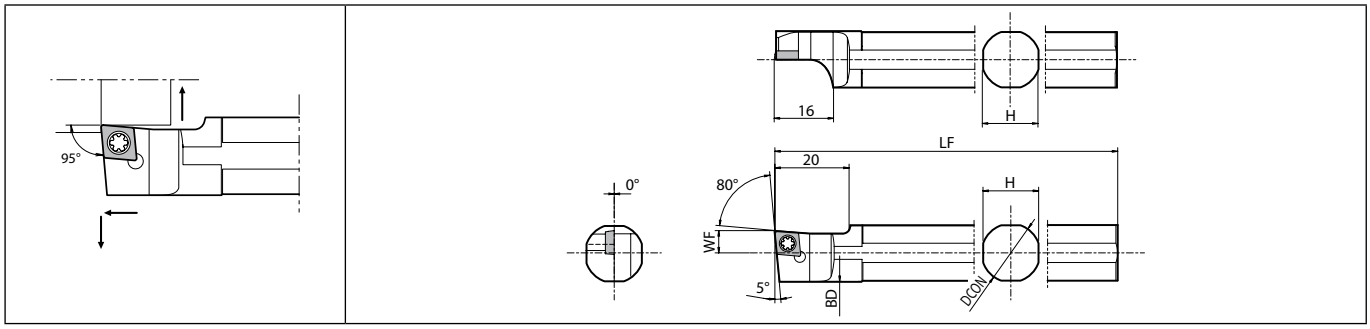
When removing the insert



Remove the two screws and put the wrench into the gap at the back end of the insert. It can be easily removed by pushing out the insert as shown above.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-SCLC (External turning / External facing)

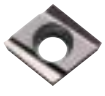
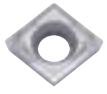


Left-hand shown | Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description		Availability	Dimension (mm)					Standard corner-R(RE)	Spare parts			Applicable inserts
									Screw	Wrench	Wrench	
		L	DCON	H	BD	LF	WF					
S12F-	SCLCL06	●	12	11	13.4	80	6	0.4	SB-2560TR	-	FT-8	CC□T0602... CC□W0602...
S14H-	SCLCL06	●	14	13		100						
S15F-	SCLCL06	●	15.875	15	15.4	85			SB-2570TR			
S16F-	SCLCL06	●	16									
S19G-	SCLCL06	●	19.05	17	18.4	90						
S19K-	SCLCL06	●				120						
S20G-	SCLCL06	●	20	18	19.4	90						
S20K-	SCLCL06	●				120						
S19G-	SCLCL09	●	19.05	17	18.4	90	10	0.4	SB-4065TR	FT-15	-	CC□T09T3... CC□W09T3...
S19K-	SCLCL09	●				120						
S20G-	SCLCL09	●	20	18	19.4	90						
S20K-	SCLCL09	●				120						
S25.0H-	SCLCL09	●	25	23	24.4	100						
S25K-	SCLCL09	●	25.4		24.8	120						

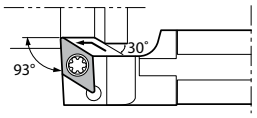
Applicable inserts

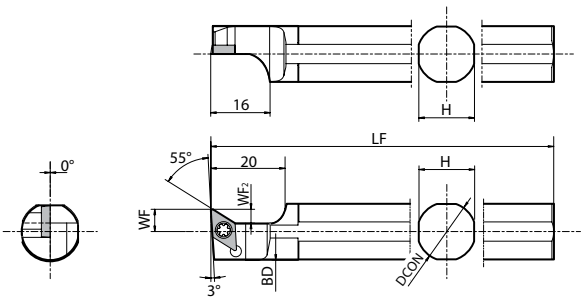
Applications	Finishing	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing
Insert								
Chipbreaker type	PF	GF	SKS	SK	CK	GQ	WP	PP
Page	B58	B58	B59	B59	B59	B59	B60	B60
Applications	Finishing - Medium	Finishing - Medium	Medium	Medium	Low feed	Low feed	Stainless steel / Heat-resistant alloys	Cast iron
Insert								
Chipbreaker type	GK	HQ	STD	MF	R-U	R-J	MQ	No CB
Page	B60	B60	B60	B61	B63~B65	B65	B61	B66
Applications	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Hard materials		
Insert								
Chipbreaker type	AP	R-A3	AH	PCD	APD	CBN		
Page	B66	B66	B66	C39	C40	C20		

Recommended cutting conditions E65, E66

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-SDUC (External turning / External copying)





Left-hand shown | Right-hand Insert for Left-hand Toolholder.

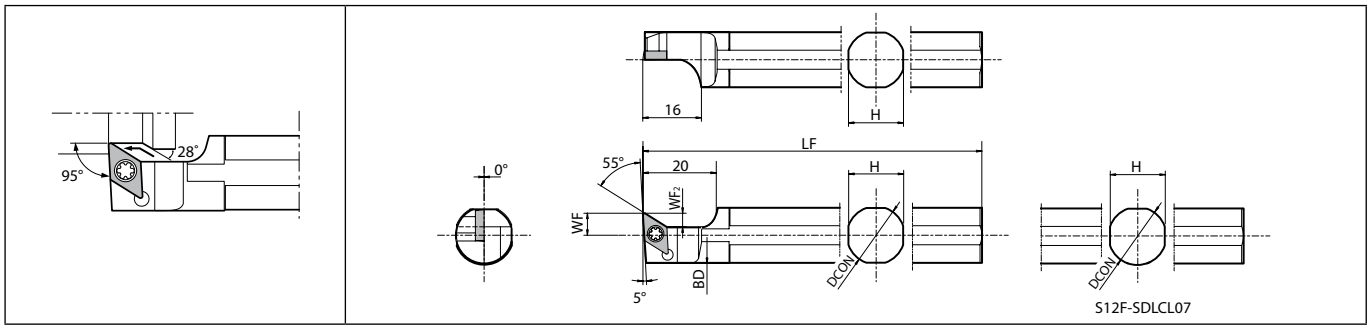
Toolholder dimensions

Description		Availability	Dimension (mm)						Standard corner-R(RE)	Spare parts			Applicable inserts
										Screw	Wrench	Wrench	
		L	DCON	H	BD	LF	WF	WF_2					
S14H-	SDUCL07	●	14	13	13.4	100	6	3.8	0.4	SB-2560TR	-	FT-8	DC□T0702... DC□W0702... DC□X0702...
S15F-	SDUCL07	●	15.875	15	15.4	85							
S19G-	SDUCL07	●	19.05	17	18.4	90							
S19K-	SDUCL07	●				120							
S20G-	SDUCL07	●	20	18	19.4	90							
S20K-	SDUCL07	●				120							
S19G-	SDUCL11	●	19.05	17	18.4	90	10	5.8	0.4	SB-4085TR	FT-15	-	DC□T11T3... DC□W11T3... DC□X11T3...
S19K-	SDUCL11	●				120							
S20G-	SDUCL11	●	20	18	19.4	90							
S20K-	SDUCL11	●				120							
S22K-	SDUCL11	●	22	20	21.4								
S25.0H-	SDUCL11	●	25	23	24.4	100							
S25K-	SDUCL11	●	25.4		24.8	120							

For WP chipbreaker, cutting edge offsets or program corrections are required on **R36** and **R37**.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-SDLC (External turning / External copying)



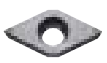
Left-hand shown | Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability	Dimension (mm)						Standard corner-R(RE)	Spare parts			Applicable inserts
									Screw	Wrench	Wrench	
	L	DCON	H	BD	LF	WF	WF_2					
S12F- SDLCL07	●	12	11	13.4	80	6	3.8	0.4	SB-2560TR	-	FT-8	DC□T0702... DC□W0702...
S14H- SDLCL07	●	14	13		100							
S15F- SDLCL07	●	15.875	15	15.4	85							
S16F- SDLCL07	●	16										
S19G- SDLCL07	●	19.05	17	18.4	90							
S19K- SDLCL07	●				120							
S20G- SDLCL07	●	20	18	19.4	90							
S20K- SDLCL07	●				120							
S19G- SDLCL11	●	19.05	17	18.4	90	10	5.8	0.4	SB-4085TR	FT-15	-	DC□T11T3... DC□W11T3...
S19K- SDLCL11	●				120							
S20G- SDLCL11	●	20	18	19.4	90							
S20K- SDLCL11	●				120							
S22K- SDLCL11	●	22	20	21.4								
S25.0H- SDLCL11	●	25	23	24.4	100							
S25K- SDLCL11	●	25.4		24.8	120							

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts (S-SDUC / S-SDLC)

Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing
Insert								
Chipbreaker type	CF	GF	SKS	SK	CK	GQ	WP*	R-WP*
Page	B68	B68	B68	B68	B68	B69	B69	B69
Applications	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Medium	Medium	Finishing	Finishing
Insert								
Chipbreaker type	PP	GP	GK	HQ	STD	MF	R-F	R-FSF
Page	B69	B69	B70	B70	B70	B70	B72, B73	B72
Applications	Low feed	Low feed	Low feed	Low feed	Low carbon steel	Low carbon steel	Stainless steel / Heat-resistant alloys	Cast iron
Insert								
Chipbreaker type	R-U	R-USF	R-J	R-JSF	XP	XQ	MQ	No CB
Page	B74~B76	B74	B77	B76	B71	B71	B71	B78
Applications	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Hard materials		
Insert								
Chipbreaker type	AP	R-A3	AH	PCD	APD	CBN		
Page	B78	B78	B78	C42	C42	C22		

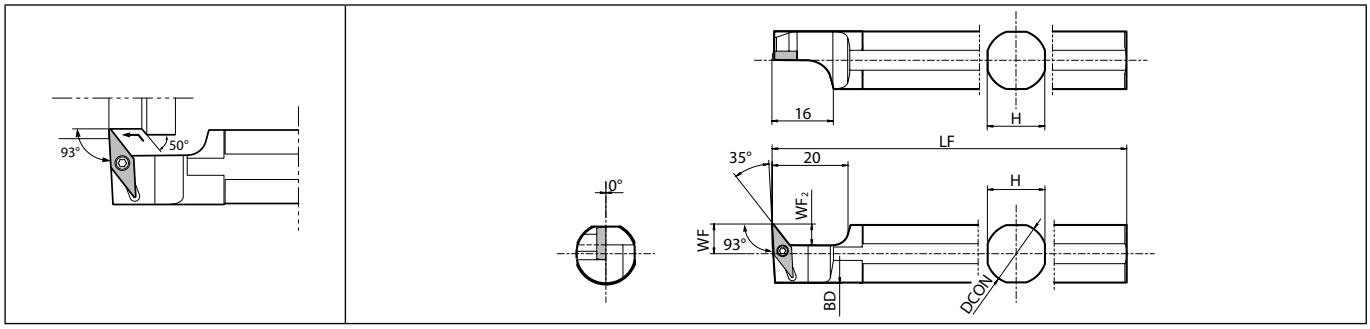
For WP chipbreaker, cutting edge offsets or program corrections are required on **R36** and **R37**. **(S-SDLC cannot be used)**

Recommended cutting conditions ➡ **E65, E66**

E

Small tools

S-SVUB (External turning / External copying)



Left-hand shown | Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description		Availability	Dimension (mm)						Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts
			L	DCON	H	BD	LF	WF	WF_2			Screw	Wrench	
S19G-	SVUBL11	●	19.05	19.05	17	18.4	90	10.5	8	0.4	No	SB-2570TR	FT-8	VB□T1103... VB□W1103...
S19K-	SVUBL11	●					120							
S20G-	SVUBL11	●	20	20	18	19.4	90							
S20K-	SVUBL11	●					120							
S25.0H-	SVUBL11	●	25	23		24.4	100							
S25K-	SVUBL11	●	25.4			24.8	120							

Applicable inserts

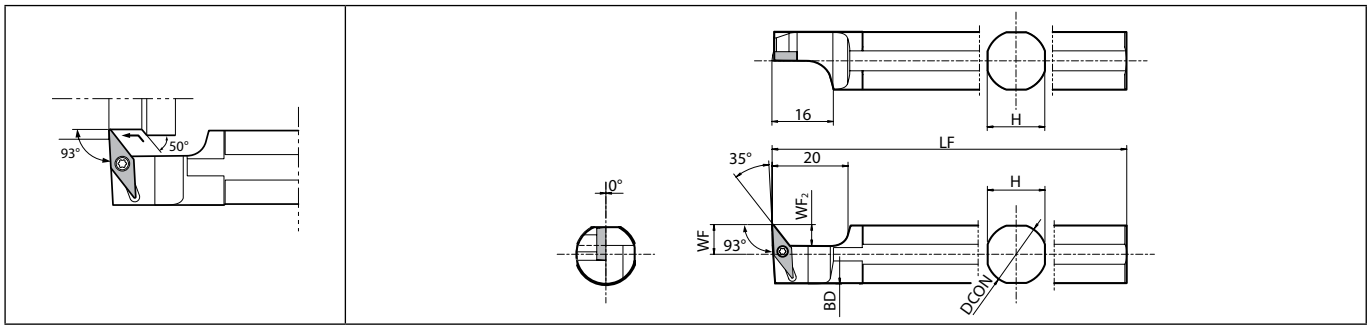
Applications	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing	Finishing - Medium	Non-ferrous metals
Insert								
Chipbreaker type	PP	GP	VF	HQ	R-F	R-FSF	R-Y	PCD
Page	B97	B97	B97	B97	B98	B98	B99	C49

Applications	Hard materials
Insert	
Chipbreaker type	CBN
Page	C26

Recommended cutting conditions ➔ **E65, E66**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-SVUC (External turning / External copying)



Left-hand shown | Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description		Availability	Dimension (mm)						Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts
			L	DCON	H	BD	LF	WF	WF_2			Screw	Wrench	
S12F-	SVUCL08	●	12	11	13.4	13.4	80	7.5	5.5	0.4	No	SB-2050TR	FT-6	VC□T0802... VC□W0802...
S14H-	SVUCL08	●	14	13			100							
S15F-	SVUCL08	●	15.875	15	15.4	15.4	85	8						
S16F-	SVUCL08	●	16											
S19G-	SVUCL11	●	19.05	17	18.4	18.4	90	10.5	8	0.2	No	SB-2570TR	FT-8	VC□T1103...
S19K-	SVUCL11	●					120							
S20G-	SVUCL11	●	20	18	19.4	19.4	90							
S20K-	SVUCL11	●					120							
S25.0H-	SVUCL11	●	25	23	24.4	24.4	100							
S25K-	SVUCL11	●	25.4			24.8	120							

Applicable inserts

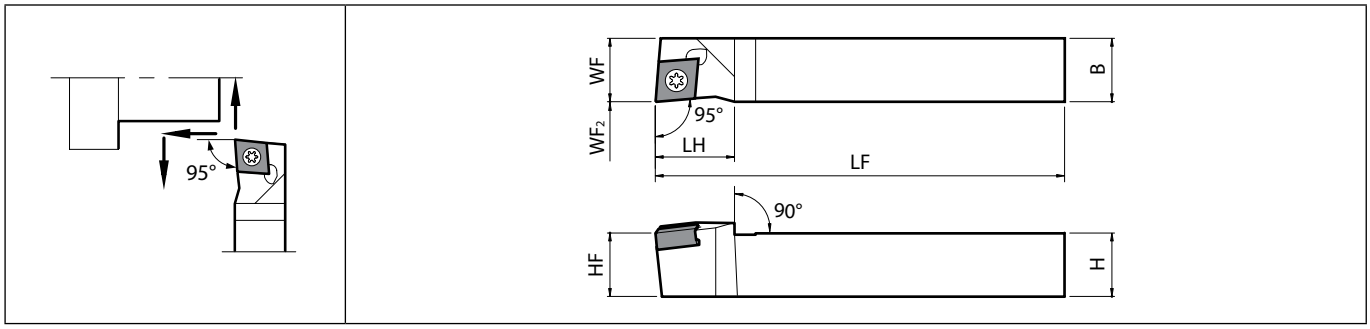
Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing - Medium
Insert								
Chipbreaker type	CF	GF	SKS	PP	VF	HQ	R-F	R-Y
Page	B100	B100	B100	B100	B100	B100	B101	B101

Applications	Non-ferrous metals	Hard materials
Insert		
Chipbreaker type	PCD	CBN
Page	C50	C27

Recommended cutting conditions ➔ E65, E66

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SCLN-FF (External turning / External facing, Screw clamp, Without offset)

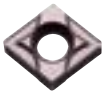
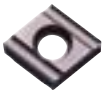


Right-hand shown

Toolholder dimensions

Description		Availability	Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts		Applicable inserts
			R	H	B	LH	HF	LF	WF	WF_2				Screw	Wrench	
SCLNR	1010K-07FF	●		10	10		10	120	10							
	1212F-07FF	●		12	12	15	12	85	12	0	0.2	-6	-6	SB-3080TR	LTW-10SS	CN□U0703...
	1212K-07FF	●						120								
	1616K-07FF	●		16	16		16		16							

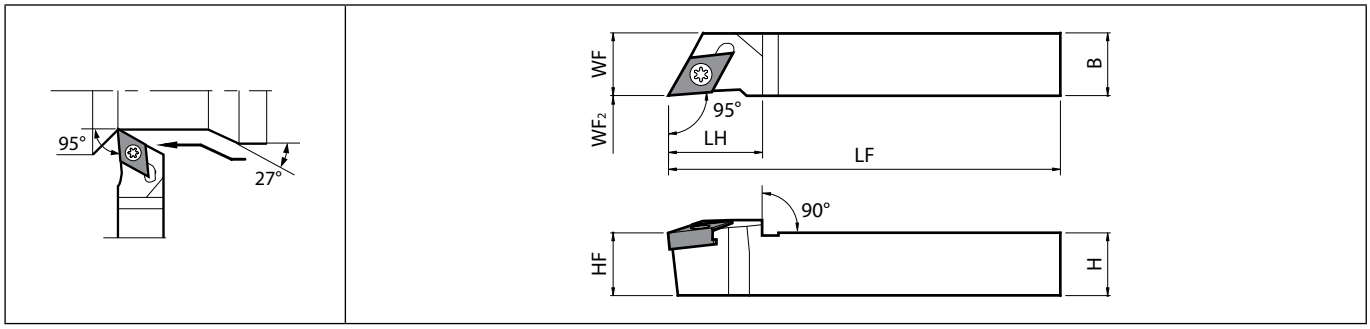
Applicable inserts

Applications	Finishing - Medium	Medium - Roughing	Finishing	Low feed
Insert				
Chipbreaker type	SK	GK	R-F	R-U
Page	B54	B54	B54	B54

Recommended cutting conditions E62

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SDLN-FF (External turning / External copying, Screw clamp, Without offset)



Right-hand shown

Toolholder dimensions

Description		Availability	Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts		Applicable inserts
			R	H	B	LH	HF	LF	WF	WF_2				Screw	Wrench	
SDLNR	1010K-08FF	●		10	10		10	120	10							
	1212F-08FF	●		12	12		12	85	12							
	1212K-08FF	●				18		120		0	0.2	-6	-7	SB-3080TR	LTW-10SS	DN□U0803...
	1616K-08FF	●		16	16		16		16							

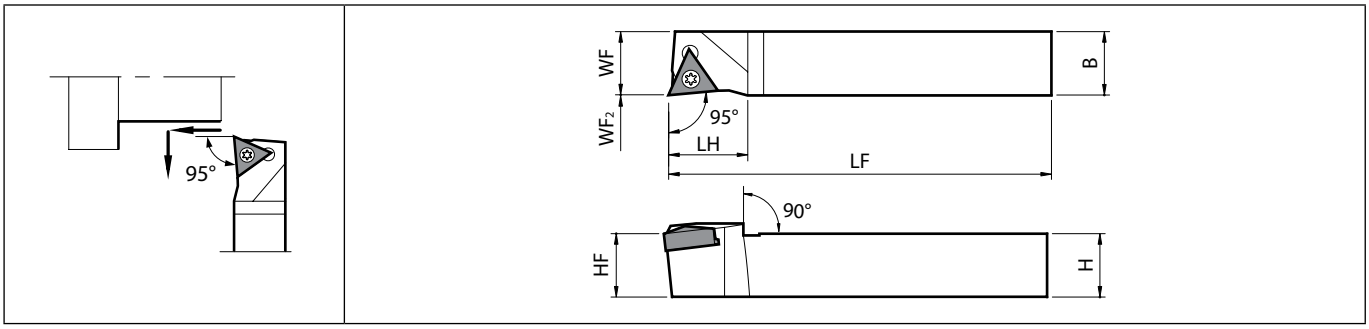
Applicable inserts

Applications	Finishing - Medium	Medium - Roughing	Finishing	Low feed
Insert				
Chipbreaker type	SK	GK	R-F	R-U
Page	B55	B55	B55	B55

Recommended cutting conditions E62

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

STLN-FF (External turning, Screw clamp, Without offset)



Right-hand shown

Toolholder dimensions

Description		Availability	Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts		Applicable inserts
			R	H	B	LH	HF	LF	WF	WF_2				Screw	Wrench	
STLNR	1010K-09FF	●	10	10	15	10	120	10	0	0.2	-6	-7	SB-2570TR	LTW-8SS	TNGU0903...
	1212F-09FF	●	12	12		12	85	12							
	1212K-09FF	●					120								
	1616K-09FF	●	16	16		16		16							

Applicable inserts

Applications	Finishing	Low feed
Insert		
Chipbreaker type	R-F	R-U
Page	B56	B56

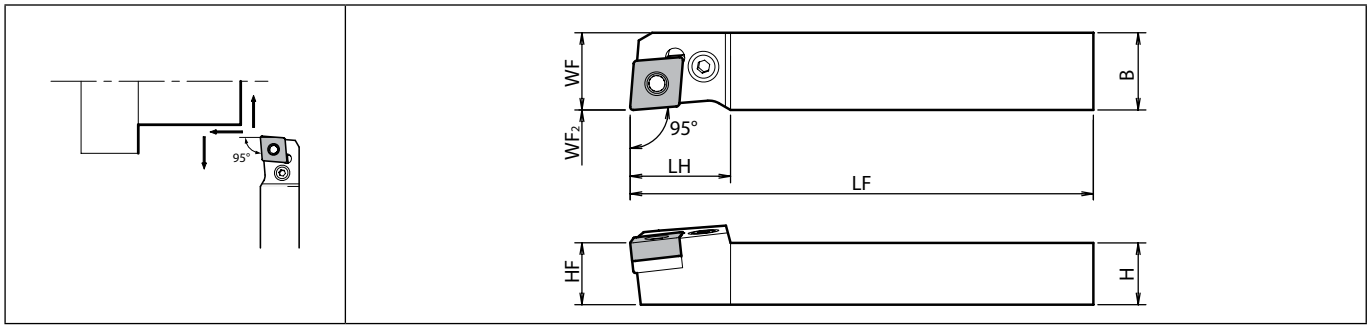
Recommended cutting conditions

Workpiece material	PR1225	PR1535	PR1705	PR1725
Free-cutting steel	-	-	● Vc = 100 m/min 60 ~ 150	◌ Vc = 100 m/min 60 ~ 150
Carbon steel / Alloy steel	◌ Vc = 100 m/min 60 ~ 150	◌ Vc = 100 m/min 60 ~ 150	◌ Vc = 130 m/min 60 ~ 220	● Vc = 130 m/min 60 ~ 200
Stainless steel	◌ Vc = 80 m/min 50 ~ 150	● Vc = 100 m/min 60 ~ 180	-	◌ Vc = 100 m/min 80 ~ 150

● : Continuous to light interruption: 1st recommendation
◌ : Continuous to light interruption: 2nd recommendation

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

PCLN-FF (External turning / External facing, Without offset)



Right-hand shown

Toolholder dimensions

Description		Availability	Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts
													Lever	Lock screw	Punch	Shim pin	Shim	Wrench	
		R	H	B	LH	HF	LF	WF	WF_2										
PCLNR	1620JX-12FF	●	16	20	26	16	120	20	0	0.8	-6	-6	LL-2N	LS-2N	PC-2	LSP-2	LC-42N	LW-3	CN□G1204...
	2020JX-12FF	●	20			20													

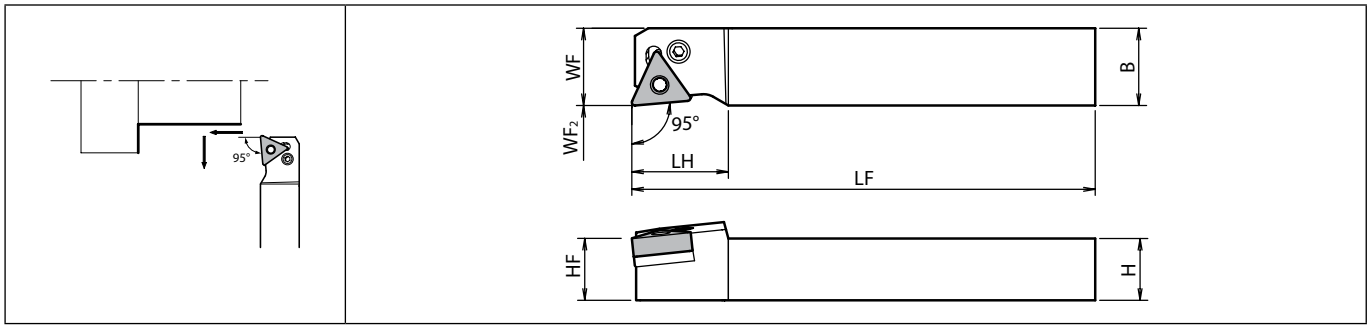
Applicable inserts

Applications	Finishing - Medium	Medium - Roughing
Insert		
Chipbreaker type	**SK**	**FP-TK**
Page	**B20**	**B20**

Recommended cutting conditions **E62**

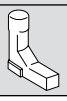
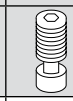
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

PTLN-FF (External turning, Without offset)



Right-hand shown

Toolholder dimensions

Description		Availability	Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts
													Lever	Lock screw	Punch	Shim pin	Shim	Wrench	
		R	H	B	LH	HF	LF	WF	WF_2										
PTLNR	1620JX-16FF	●	16	20	24	16	120	20	0	0.8	-6	-6	LL-1N	LS-1N	PC-1	LSP-1	LT-32N *LT-32N-20	FH-2.5	TN□G1604...
	2020JX-16FF	●	20			20													

When using inserts whose corner-R(RE) is greater than 1.6 mm, please purchase a shim* and use it in order to prevent workpiece and shim from interfering each other.

Applicable inserts

Applications	Finishing - Medium	Medium - Roughing	Large ap
Insert			
Chipbreaker type	SK	FP-TK	R-LD
Page	B41	B41	B41

Recommended cutting conditions E62

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

External turning (positive insert) - cutting diameter under ø16mm

ISO classification	Workpiece material	Hardness	Cutting range	Applications	Chipbreaker	Insert grade	Corner-R (RE)	Lower limit - **Recommendation** - Upper limit		
								Vc (m/min)	ap (mm)	f (mm/rev)
P *	Low carbon steel Low carbon alloy	HB ≤ 300	Precision finishing	Continuous	F	PR1725	0.05	100 - **150** - 200	0.05 - **0.07** - 0.15	0.03 - **0.05** - 0.1
				Interruption		PR1725	0.2	80 - **120** - 160	0.05 - **0.1** - 0.2	0.03 - **0.1** - 0.15
			Precision finishing Molded chipbreaker	Continuous	CF	PR1725	0.2	100 - **150** - 200	0.02 - **0.05** - 0.1	0.02 - **0.05** - 0.12
			Finishing	Continuous	SKS	PR1725	0.2	100 - **140** - 180	0.2 - **0.5** - 1.0	0.05 - **0.1** - 0.2
				Interruption		PR1725	0.4	80 - **120** - 160	0.2 - **0.5** - 1.0	0.05 - **0.1** - 0.2
			Finishing-Medium	Continuous	SK	PR1725	0.2	80 - **120** - 160	0.8 - **3.0** - 5.0	0.03 - **0.05** - 0.1
				Interruption		PR1725	0.4	60 - **100** - 140	0.8 - **2.0** - 3.0	0.03 - **0.05** - 0.1
			Low feed & Large ap	Continuous	J, U	PR1725	0.2	80 - **100** - 140	0.5 - **2.0** - 3.5	0.02 - **0.05** - 0.1
	Medium carbon steel Medium carbon alloy	HB ≤ 330	Precision finishing	Continuous	F	PR1725	0.05	100 - **150** - 200	0.05 - **0.07** - 0.15	0.03 - **0.05** - 0.1
				Interruption		PR1725	0.2	80 - **120** - 160	0.05 - **0.1** - 0.2	0.03 - **0.1** - 0.15
			Precision finishing Molded chipbreaker	Continuous	CF	PR1725	0.2	100 - **150** - 200	0.02 - **0.05** - 0.1	0.02 - **0.05** - 0.12
			Finishing	Continuous	SKS	PR1725	0.2	100 - **140** - 180	0.2 - **0.5** - 1.0	0.05 - **0.1** - 0.2
				Interruption		PR1725	0.4	80 - **120** - 160	0.2 - **0.5** - 1.0	0.05 - **0.1** - 0.2
			Finishing-Medium	Continuous	SK	PR1725	0.2	80 - **120** - 160	0.8 - **3.0** - 5.0	0.03 - **0.05** - 0.1
				Interruption		PR1725	0.4	60 - **100** - 140	0.8 - **2.0** - 3.0	0.03 - **0.05** - 0.1
			Low feed & Large ap	Continuous	J, U	PR1725	0.2	80 - **100** - 140	0.5 - **2.0** - 3.5	0.02 - **0.05** - 0.1
	High carbon alloy	HB ≤ 280	Precision finishing	Continuous	F	PR1725	0.05	100 - **150** - 200	0.05 - **0.07** - 0.15	0.03 - **0.05** - 0.1
				Interruption		PR1725	0.2	80 - **120** - 160	0.05 - **0.1** - 0.2	0.03 - **0.1** - 0.15
			Precision finishing Molded chipbreaker	Continuous	CF	PR1725	0.2	100 - **150** - 200	0.02 - **0.05** - 0.1	0.02 - **0.05** - 0.12
			Finishing	Continuous	SKS	PR1725	0.2	100 - **140** - 180	0.2 - **0.5** - 1.0	0.05 - **0.1** - 0.2
				Interruption		PR1725	0.4	80 - **120** - 160	0.2 - **0.5** - 1.0	0.05 - **0.1** - 0.2
			Finishing-Medium	Continuous	SK	PR1725	0.2	80 - **120** - 160	0.3 - **1.5** - 3.0	0.03 - **0.05** - 0.1
				Interruption		PR1725	0.4	60 - **100** - 140	0.3 - **1.0** - 2.0	0.03 - **0.05** - 0.1
			Low feed & Large ap	Continuous	J, U	PR1725	0.2	80 - **100** - 140	0.5 - **2.0** - 3.5	0.02 - **0.05** - 0.1
M	Stainless steel (Austenitic related)	HB ≤ 220	Finishing	Continuous	SKS	PR1725	0.2	80 - **100** - 120	0.1 - **0.3** - 0.5	0.03 - **0.05** - 0.1
				Interruption		PR1535	0.4	60 - **80** - 100	0.3 - **0.5** - 1.0	0.05 - **0.1** - 0.15
			Medium	Continuous	SK	PR1725	0.2	80 - **100** - 120	0.5 - **1.5** - 3.0	0.03 - **0.08** - 0.12
				Interruption		PR1535	0.4	60 - **80** - 100	0.5 - **1.0** - 2.0	0.05 - **0.1** - 0.15
	Stainless steel (Precipitation hardening)	HB ≤ 300	Finishing	Continuous	SKS	PR1725	0.2	40 - **60** - 80	0.1 - **0.3** - 0.5	0.03 - **0.05** - 0.1
				Interruption		PR1535	0.4	30 - **50** - 70	0.3 - **0.5** - 1.0	0.05 - **0.1** - 0.15
			Medium	Continuous	SK	PR1725	0.2	40 - **60** - 80	0.5 - **1.0** - 2.0	0.03 - **0.08** - 0.12
				Interruption		PR1535	0.4	30 - **50** - 70	0.5 - **1.0** - 1.5	0.05 - **0.1** - 0.15

* For machining free-cutting steels, such as SUM, etc. use PR1705 at Vc = 200 m/min or less.
For ap and f, refer to specs for low carbon steels.

External turning (positive insert) - cutting diameter under ø16mm

ISO classification	Workpiece material	Hardness	Cutting range	Applications	Chipbreaker	Insert grade	Corner-R (RE)	Lower limit - **Recommendation** - Upper limit		
								Vc (m/min)	ap (mm)	f (mm/rev)
K	Gray cast iron	HB ≤ 250	Finishing	Continuous	Standard	CA310	0.4	100 - **120** - 150	0.2 - **0.5** - 1.0	0.1 - **0.15** - 0.2
				Interruption		CA315	0.4	80 - **100** - 120	0.2 - **0.5** - 1.0	0.05 - **0.1** - 0.15
			Medium	Continuous	Standard	CA310	0.4	100 - **120** - 150	0.5 - **1.0** - 2.0	0.1 - **0.15** - 0.2
				Interruption		CA315	0.8	80 - **100** - 120	0.5 - **1.0** - 2.0	0.05 - **0.1** - 0.15
	Nodular cast iron	HB ≤ 270	Finishing	Continuous	Standard	CA310	0.4	80 - **100** - 120	0.2 - **0.5** - 1.0	0.1 - **0.15** - 0.2
				Interruption		CA315	0.4	60 - **80** - 100	0.2 - **0.5** - 1.0	0.05 - **0.1** - 0.15
			Medium	Continuous	Standard	CA310	0.4	80 - **100** - 120	0.5 - **1.0** - 2.0	0.1 - **0.15** - 0.2
				Interruption		CA315	0.8	60 - **80** - 100	0.5 - **1.0** - 2.0	0.05 - **0.1** - 0.15
N	Non-ferrous metals Copper alloy Aluminum Aluminum alloys (Si10% or less) etc.	HB ≤ 100	High speed machining (Rainbow surface gloss)	Continuous	Without chipbreaker	KPD001	0.2	150 - **250** - 350	0.05 - **0.1** - 0.3	0.05 - **0.1** - 0.15
			Finishing (Long tool life)	Continuous	F	PDL025	0.2	100 - **150** - 200	0.05 - **0.3** - 0.5	0.02 - **0.07** - 0.1
				Interruption		PDL025	0.4	100 - **150** - 200	0.05 - **0.3** - 0.5	0.02 - **0.07** - 0.1
			Finishing	Continuous	F	KW10	0.2	100 - **150** - 200	0.05 - **0.3** - 0.5	0.02 - **0.07** - 0.1
				Interruption		KW10	0.4	100 - **150** - 200	0.05 - **0.3** - 0.5	0.02 - **0.07** - 0.1
			Medium	Continuous	U	KW10	0.2	100 - **150** - 200	0.2 - **0.5** - 1.5	0.03 - **0.1** - 0.2
				Interruption		KW10	0.4	100 - **150** - 200	0.2 - **0.5** - 1.5	0.03 - **0.1** - 0.2
S	Titanium alloys	HB ≤ 400	Precision finishing (Rainbow surface gloss)	Continuous	Without chipbreaker	KPD001	0.2	100 - **120** - 150	0.05 - **0.1** - 0.3	0.03 - **0.07** - 0.1
				Interruption		KPD001	0.4	70 - **100** - 120	0.05 - **0.1** - 0.3	0.03 - **0.07** - 0.1
			Medium	Continuous	F, U	KW10	0.4	30 - **50** - 70	0.1 - **0.5** - 1.0	0.03 - **0.1** - 0.2
				Interruption		KW10	0.4	30 - **50** - 70	0.1 - **0.5** - 1.0	0.03 - **0.1** - 0.2
	Heat-resistant alloys	HB ≤ 350	Finishing	Continuous	F, U	KW10	0.4	10 - **30** - 50	0.1 - **0.3** - 0.5	0.03 - **0.05** - 0.1
				Interruption	Without chipbreaker	KW10	0.8	10 - **30** - 50	0.2 - **0.5** - 0.7	0.03 - **0.05** - 0.1
			Finishing	Continuous	MQ	PR1535	0.4	40 - **60** - 80	0.1 - **0.3** - 0.5	0.03 - **0.05** - 0.1
				Interruption		PR1535	0.8	40 - **60** - 80	0.1 - **0.3** - 0.5	0.03 - **0.05** - 0.1
H	Hardened steel Hard materials	40 ~ 50 HRC	Finishing	Continuous	GK	PR1725	0.2	40 - **60** - 80	0.1 - **0.3** - 0.5	0.02 - **0.07** - 0.1
				Interruption		PR1725	0.4	40 - **60** - 80	0.1 - **0.3** - 0.5	0.02 - **0.07** - 0.1
		50 ~ 68 HRC	Finishing	Continuous	ME	KBN010	0.2	80 - **120** - 150	0.1 - **0.3** - 0.5	0.02 - **0.07** - 0.1
				Interruption	MET	KBN020	0.4	60 - **100** - 120	0.1 - **0.3** - 0.5	0.02 - **0.07** - 0.1

Back Turning - cutting diameter under ø16mm

KTKF

Workpiece material		MEGACOAT NANO PLUS PR1725		MEGACOAT NANO PR1535		MEGACOAT PR1225		Remarks
		Grooving	Turning	Grooving	Turning	Grooving	Turning	
Carbon steel / Alloy steel	Vc (m/min)	★60 ~ 200		☆60 ~ 150		☆60 ~ 150		Coolant
	f (mm/rev)	0.01 ~ 0.03	0.02 ~ 0.15	0.01 ~ 0.03	0.02 ~ 0.15	0.01 ~ 0.03	0.02 ~ 0.15	
Stainless steel	Vc (m/min)	☆60 ~ 150		★60 ~ 130		☆60 ~ 130		
	f (mm/rev)	0.01 ~ 0.02	0.02 ~ 0.1	0.01 ~ 0.02	0.02 ~ 0.1	0.01 ~ 0.02	0.02 ~ 0.1	

Workpiece material		Carbide KW10		PCD KPD001		Remarks
		Grooving	Turning	Grooving	Turning	
Cast iron	Vc (m/min)	50 ~ 100		-		Coolant
	f (mm/rev)	0.01 ~ 0.02	0.02 ~ 0.15	-		
Aluminum	Vc (m/min)	200 ~ 450		200 ~ 500		
	f (mm/rev)	0.01 ~ 0.03	0.02 ~ 0.15	0.01 ~ 0.03	0.02 ~ 0.12	
Brass	Vc (m/min)	100 ~ 200		100 ~ 350		
	f (mm/rev)	0.01 ~ 0.05	0.02 ~ 0.2	0.01 ~ 0.05	0.02 ~ 0.15	

KTKF (GTP chipbreaker)

Workpiece material		MEGACOAT NANO PLUS PR1725		MEGACOAT NANO PR1535		Remarks
		Grooving	Turning	Grooving	Turning	
Carbon steel / Alloy steel	Vc (m/min)	★60 ~ 200		☆60 ~ 150		Coolant
	f (mm/rev)	0.03~0.07	0.05~0.15	0.03~0.07	0.05~0.15	
Stainless steel	Vc (m/min)	☆60 ~ 150		★60 ~ 130		
	f (mm/rev)	0.02~0.05	0.03~0.10	0.02~0.05	0.03~0.10	

KTKF (GQ chipbreaker)

Workpiece material		MEGACOAT NANO PLUS PR1725		MEGACOAT NANO PR1535		MEGACOAT PR1225		Remarks
		Grooving	Turning	Grooving	Turning	Grooving	Turning	
Carbon steel / Alloy steel	Vc (m/min)	★60 ~ 200		☆60 ~ 150		☆60 ~ 150		Coolant
	f (mm/rev)	0.01 ~ 0.04	0.02 ~ 0.15	0.01 ~ 0.04	0.02 ~ 0.15	0.01 ~ 0.04	0.02 ~ 0.15	
Stainless steel	Vc (m/min)	☆60 ~ 150		★60 ~ 130		☆60 ~ 130		
	f (mm/rev)	0.01 ~ 0.03	0.02 ~ 0.1	0.01 ~ 0.03	0.02 ~ 0.1	0.01 ~ 0.03	0.02 ~ 0.1	

KTKF (AGT chipbreaker)

Workpiece material		PCD KPD001		Remarks
		Grooving	Turning	
Aluminum alloy	Vc (m/min)	200 ~ 500		Coolant
	f (mm/rev)	0.03 ~ 0.15	0.03 ~ 0.20	
Brass	Vc (m/min)	100 ~ 350		
	f (mm/rev)	0.03 ~ 0.15	0.03 ~ 0.20	

ABS15, ABW15, ABW23

Workpiece material		MEGACOAT NANO PLUS PR1725		PR1705		MEGACOAT PR1225		PVD coated carbide PR930		Remarks
		Grooving	Turning	Grooving	Turning	Grooving	Turning	Grooving	Turning	
Carbon steel / Alloy steel	Vc (m/min)	★60 ~ 180		☆80 ~ 200		☆60 ~ 150		☆80 ~ 100		Coolant
	f (mm/rev)	0.02	0.02 ~ 0.07	0.02	0.02 ~ 0.07	0.02	0.02 ~ 0.07	0.02	0.02 ~ 0.07	
Stainless steel	Vc (m/min)	☆30 ~ 130		☆40 ~ 150		★40 ~ 120		☆30 ~ 50		
	f (mm/rev)	0.02	0.02 ~ 0.05	0.02	0.02 ~ 0.05	0.02	0.02 ~ 0.05	0.02	0.02 ~ 0.05	

Workpiece material		Carbide KW10		Remarks
		Grooving	Turning	
Aluminum	Vc (m/min)	150 ~ 200		Coolant
	f (mm/rev)	0.02	0.02 ~ 0.10	
Brass	Vc (m/min)	100 ~ 160		
	f (mm/rev)	0.03	0.02 ~ 0.15	

★: 1st recommendation
☆: 2nd recommendation

ZBMT

Workpiece material	Insert tip angle	Corner-R (RE)	Insert grade	Vc (m/min)	ap (mm)	f (mm/rev)
Carbon steel / Alloy steel	25°	0.2	PR1725	60 - **150** - 200	0.2 - **0.3** - 1.5	0.05 - **0.10** - 0.15
			PR1535	60 - **120** - 180	0.2 - **0.3** - 1.5	0.05 - **0.10** - 0.15
		0.4 / 0.8	PR1725	60 - **150** - 200	0.2 - **0.3** - 2.0	0.05 - **0.15** - 0.25
			PR1535	60 - **120** - 180	0.2 - **0.3** - 2.0	0.05 - **0.15** - 0.25
	15°	0.4	PR1725	60 - **150** - 200	0.2 - **0.3** - 1.0	0.05 - **0.10** - 0.15
			PR1535	60 - **120** - 180	0.2 - **0.3** - 1.0	0.05 - **0.10** - 0.15
Stainless steel	25°	0.2	PR1725	60 - **150** - 180	0.2 - **0.3** - 1.0	0.05 - **0.10** - 0.15
			PR1535	60 - **120** - 150	0.2 - **0.3** - 1.0	0.05 - **0.10** - 0.15
		0.4 / 0.8	PR1725	60 - **150** - 180	0.2 - **0.3** - 1.0	0.05 - **0.15** - 0.25
			PR1535	60 - **120** - 150	0.2 - **0.3** - 1.0	0.05 - **0.15** - 0.25
	15°	0.4	PR1725	60 - **150** - 180	0.2 - **0.3** - 1.0	0.05 - **0.10** - 0.15
			PR1535	60 - **120** - 150	0.2 - **0.3** - 1.0	0.05 - **0.10** - 0.15
Cast iron	25°	0.2	PR1725	60 - **150** - 180	0.2 - **0.3** - 1.5	0.05 - **0.10** - 0.15
		0.4 / 0.8	PR1725	60 - **150** - 180	0.2 - **0.3** - 2.0	0.05 - **0.15** - 0.25
	15°	0.4	PR1725	60 - **150** - 180	0.2 - **0.3** - 1.0	0.05 - **0.10** - 0.15

When using machining at ap 1.5 mm or more, reduce the feed by about 50%.

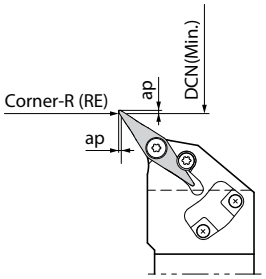
Boring/Facing available cutting diameter and maximum D.O.C.



Standard corner-R (RE) 0.4

Cutting Dia.	Depth (mm)
ø30	0.5
ø50	1.5
ø65	3.0
ø80	6.0
ø100	10.0
ø150	14.0

SZPB type cutting diameter for undercutting



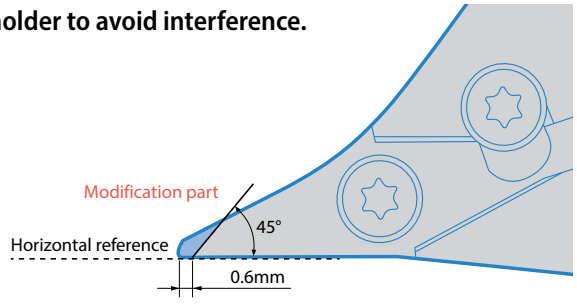
Corner-R (RE)	ap (mm)	DCN (Min.)
0.2	0.5	ø30
	1	ø35
0.4	0.5	ø30
	1	ø35
0.8	0.5	ø110
	1	ø150

How to modify toolholder when using 15 ° insert

When using 15 ° insert, additional modification is required for the holder to avoid interference.

Recommended additional modification

- Set the edge of insert bearing surface at the end of the holder at horizontal reference shown below.
- Modify the holder to 0.6 mm from the tip at an angle of not less than 45 degrees from the horizontal.



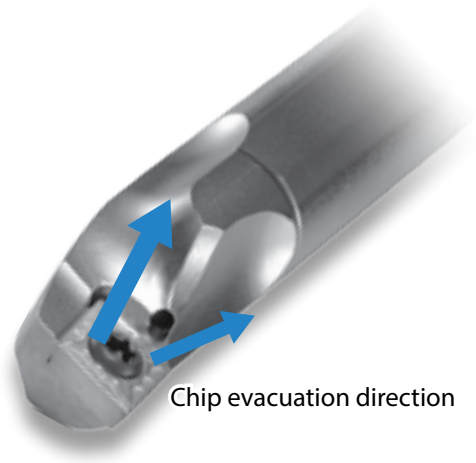
F



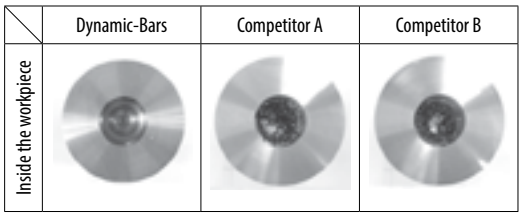
Introduction		**F2**
Solid tip bars for micro boring		**F16**
EZ Bars		F16
EZ Bar PLUS		F31
System Tip-Bars		F44
Twin-Bars		F56
Dynamic-Bars		**F60**
CC insert		F60
CP insert		F64
DC insert		F66
JC insert		F78
TB/TP insert		F80
TC insert		F88
VB/VC/VP insert		F90
WB/WP insert		F100
ZB insert		F106
Borings bars (screw clamp / top clamp)		**F111**
SP insert	S-SSKP/S-CSKP	F111
TP insert	S-CTUP	F113
Bearing machining		**F114**
RPMT insert	SRCP-B	F114
SNMF insert	CBSN-B	F115
KAV		**F116**
CN insert	KAVH-PCLN	F118
DN insert	KAVH-PDUN	F120
TN insert	KAVH-PTFN	F122
CC insert	KAVH-SCLC	F124
DC insert	KAVH-SDUC	F125
TP insert	KAVH-STLP	F126
VB insert	KAVH-SVUB	F127
Shank for KAV		F128
Boring bars for negative type inserts		**F131**
CN insert		F131
DN insert		F134
SN insert		F142
TN insert		F143
WN insert		F146
Boring bars for ceramic inserts		**F151**
EN insert	S- CELN	F151
Boring bars for CBN inserts		**F152**
TN insert	S-CTUN-A	F152
Sleeves / Coolant joint		**F153**
Recommended cutting conditions		**F158**

Dynamic-Bars

The Dynamic-Bars achieves superior chip evacuation

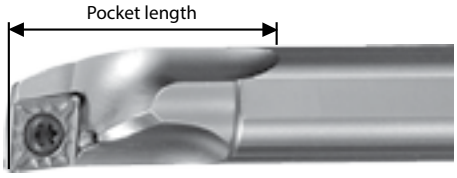


Superior chip evacuation (External coolant)



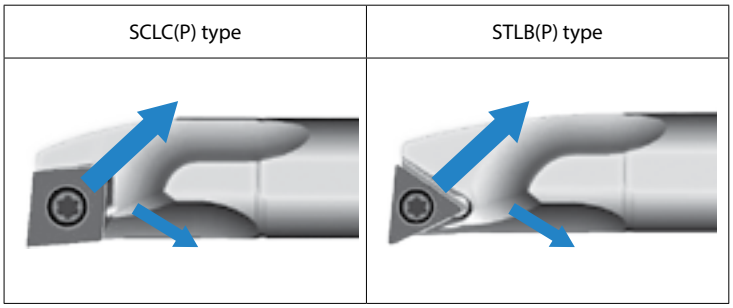
In the products of competitor A and B chips remain inside the workpiece, but chips from the Dynamic-Bars are all evacuated from the workpiece.

Comparison of pocket length



Description	Pocket length (mm)	
	Dynamic-Bars	Competitor A
A16-SCLPR09-18 type	37	29
A20-SCLCR09-22 type	48	32

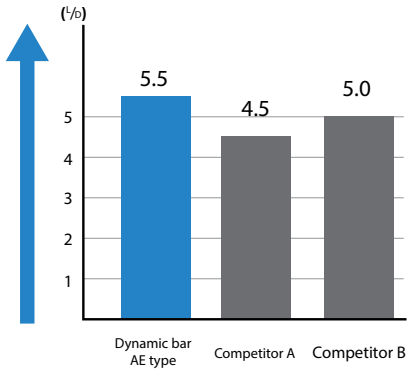
Chip evacuation direction



Better evacuation by backward chip flow

High rigidity and chattering resistance are ensured by using a special alloy and with help of stress analysis technology.

Comparison of vibration tendency

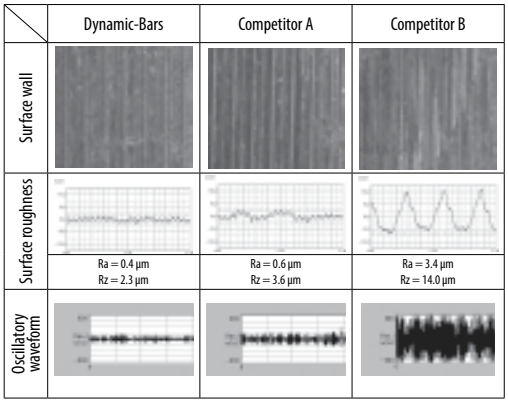


Maximum toolholder overhang length (L/D)

Cutting conditions	
15CrMo4	f = 0.1 mm/rev
Vc = 150 m/min	S16-SCLPR09 type
ap = 0.5 mm	CPMH090304L-Y

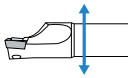
Comparison of surface finish

Vibration of the Dynamic-Bars was minimal even at high cutting speeds, enabling stable machining.



Cutting conditions
15CrMo4
Vc=210m/min
ap=0.5mm
f=0.1mm/rev
A16Q-SCLPR09-18 type
CPMT090304XP (PV7020)
L/D=4
External coolant

Direction of vibration measurement



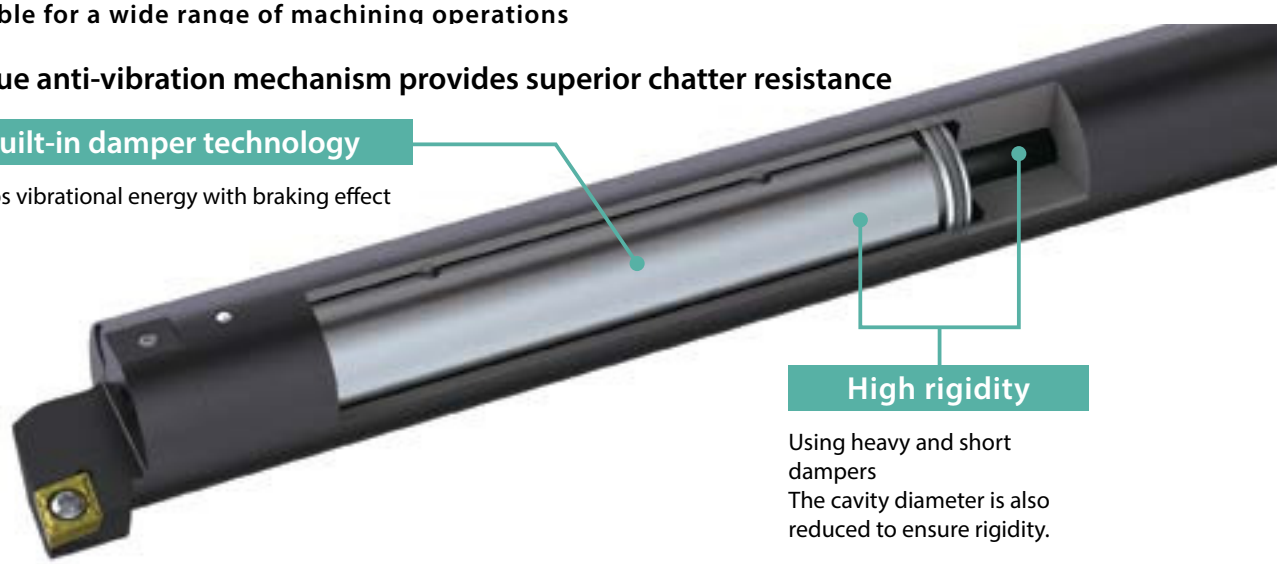
Interchangeable head boring bars with anti-vibration dampener system, KAV series

"Max L/D = 10" Solves deep-boring challenges
Excellent anti-chatter performance due to unique anti-vibration design and available for a wide range of machining operations

Unique anti-vibration mechanism provides superior chatter resistance

Built-in damper technology

Absorbs vibrational energy with braking effect



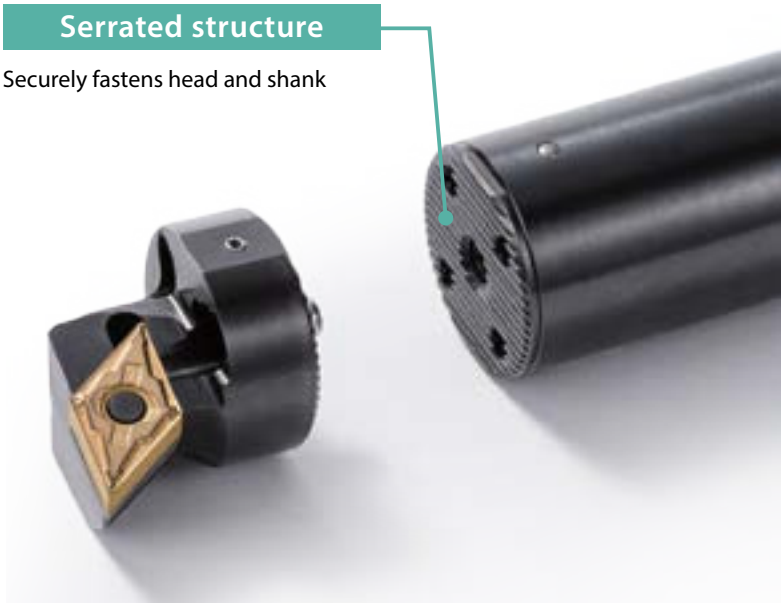
High rigidity

Using heavy and short dampers
The cavity diameter is also reduced to ensure rigidity.

Interchangeable heads for a variety of machining applications
Strong fastening with serrated joint structure

Serrated structure

Securely fastens head and shank



Shank lineup

Shank diameters, from 16mm to 40mm with L/D = 7 and 10, are available
Carbide reinforced style also available

Shank diameter	Available overhang length range	Type
ø16 ø20		Steel Carbide reinforcement
ø25 ø32 ø40		Steel Steel

Head lineup

Shank diameter	Positive type (Screw clamp)				Negative type (Lever lock)		
	SCLC	SDUC	STLP	SVUB	PCLN	PDUN	PTFN
ø16	●	●	●				
ø20	●	●	●	●			
ø25	●	●	●	●			
ø32	●	●	●	●	●	●	●
ø40	●	●	●	●	●	●	●

Double clamp boring bars for negative inserts

Stable machining is realized in double clamp and direction adjustment mechanism coolant hole.

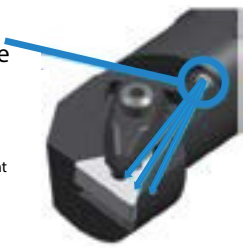
Improved clamping rigidity

Firmly clamp the insert in two directions with one action. Along with improving the accuracy of the insert position, long tool life can be achieved.



Direction adjustment mechanism coolant hole

Discharge direction of coolant is adjustment flexible focusing on coolant to edge reliably builds up
Not applicable to high-pressure coolant



Nozzle setting

Wrench etc. that enters 2.5 or less holes are used, and adjust.



Small internal machining

EZ Bar series

Selecting the proper tool in a simple step. Easy adjustment and high precision
Four chipbreakers for a wide range of machining applications

1 Large tooling lineup. Select the proper tool in a simple step

Internal turning

Supports wide range of internal machining applications

Boring	EZB

Chipbreakers

H



Tough edge (General purpose)

1st Recommendation / General purpose Extended reach type available

PR1725

G



Chip control oriented

Excellent chip control performance

PR1725

F



Low cutting force

Finishing / Sharpness oriented

PR1725

NB



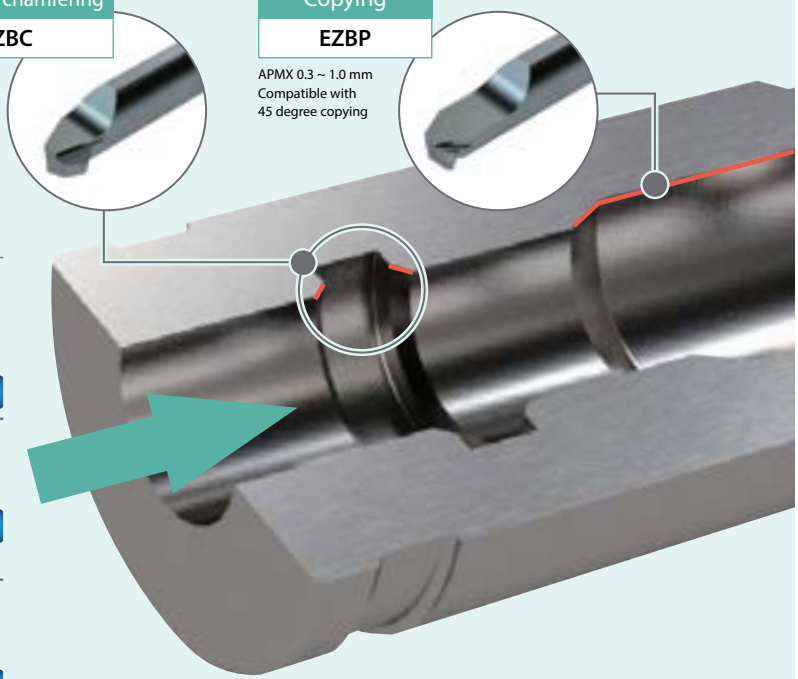
Without chipbreaker

GW05 insert grade for aluminum machining available

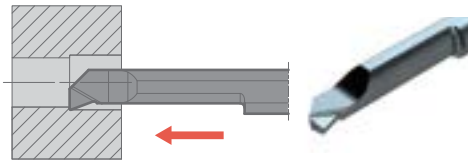
45 degree chamfering	EZBC

Copying	EZBP

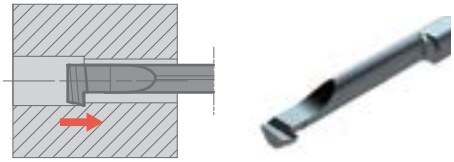
APMX 0.3 ~ 1.0 mm
Compatible with 45 degree copying



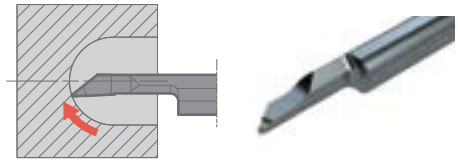
90 degree lead angle	EZBF



Back boring	EZBT



Internal facing • Internal profiling	EZVB



2 Easy adjustment and high precision

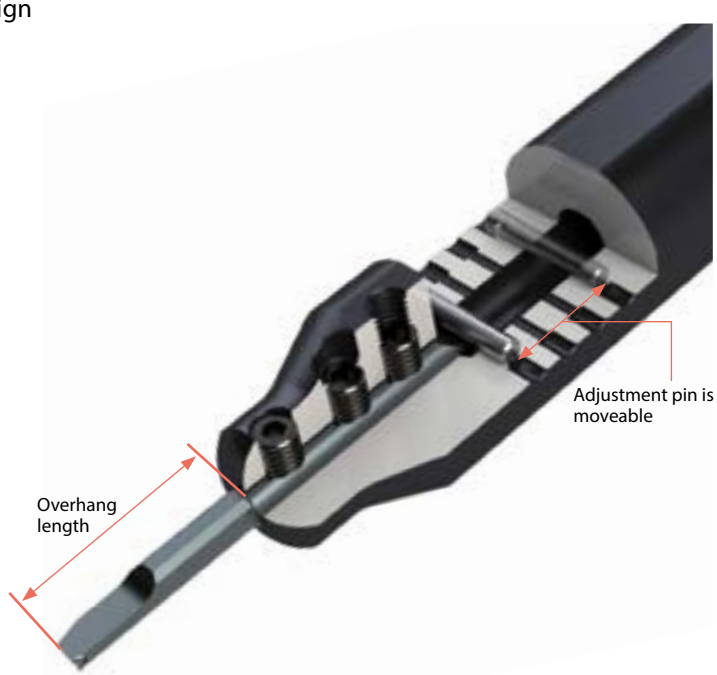
For CT sleeves with coolant holes and HP sleeves with positioning function, the overhang length can be set by moving adjustment pins

Check

Smooth coolant flow due to special head design

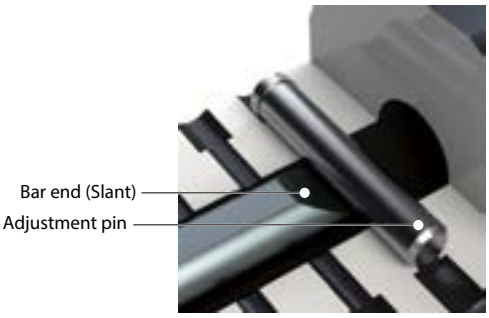


Coolant-through : EZH-CT



Check

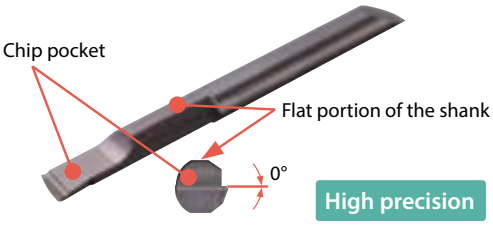
High precision design by contacting the bar end (Slant) with the adjustment pin



With EZ Adjust Structure : EZH-CT, EZH-HP

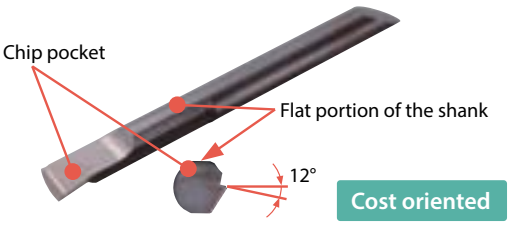
3 Select the HP bar for high presision and the ST bar for cost reduction for boring (tolerances are different)

HP (EZB-HP)



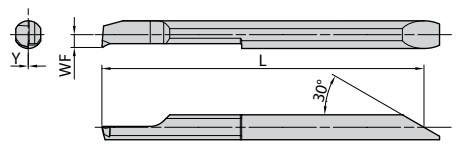
High precision

ST (EZB-ST)



Cost oriented

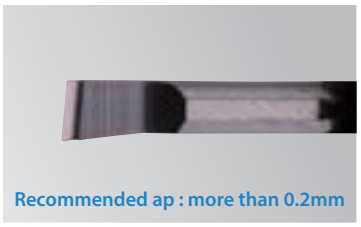
Bar tolerance



Bar tolerance	Offset (WF)	Longitudinal direction (L)	Cutting edge height (Y)	Min. bore dia.
HP	± 0.025 mm	± 0.05 mm	+ 0.05 mm / 0 mm	Same as shank dia.
ST	± 0.06 mm	± 0.1 mm	+ 0.06 mm / 0 mm	Different from shank dia.

4 4 chipbreakers and new PVD coating PR 1725 for a wide range of machining processes

H chipbreaker (without lead angle)
1st recommendation / General purpose



PR1725 Available

GW05 insert grade for aluminum machining available

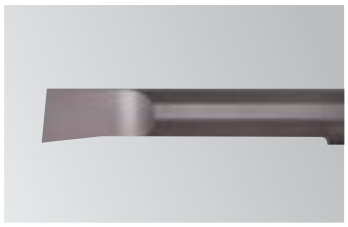
Left-hand available (HP type)

F chipbreaker (with lead angle)
Finishing / Sharpness oriented



PR1725 Available

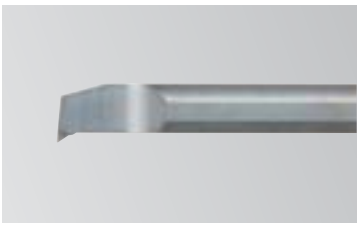
NB chipbreaker (without chipbreaker)
Non-ferrous metal machining



PCD.CBN inserts available

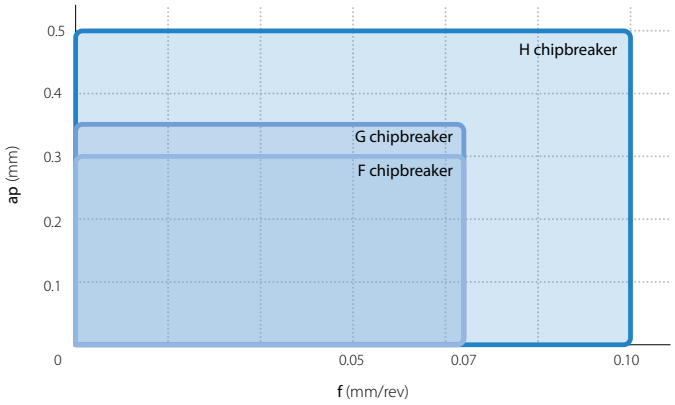
GW05 insert grade for aluminum machining available

G chipbreaker (with lead angle)
Chip control oriented



PR1725 Available

Applicable chipbreaker range

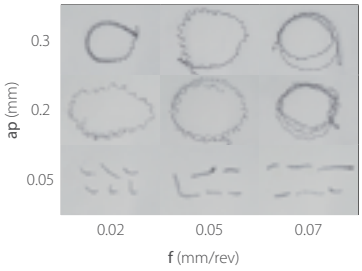


Check Cutting performance comparison

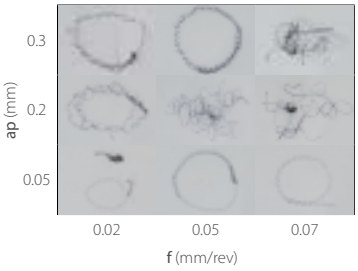
Chip control comparison

Stable chip curls and good chip breaking

G chipbreaker



Competitor (with lead angle)

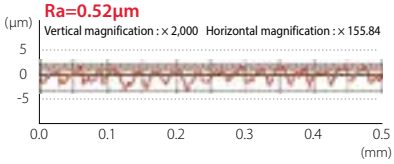


Cutting conditions: Vc = 80 m/min, Wet Workpiece material: C45 (Internal evaluation)

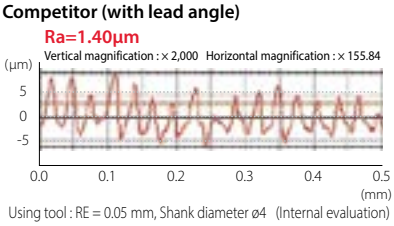
Surface finish comparison

Excellent surface finish

G chipbreaker



Competitor (with lead angle)



Using tool : RE = 0.05 mm, Shank diameter ø4 (Internal evaluation)

Sleeve

Point Large tooling lineup that can be customized for your machining demands

How to select sleeves

Select between three types of sleeves

EZH-CT
With EZ adjust structure
Coolant-through



EZH-HP
With EZ adjust structure



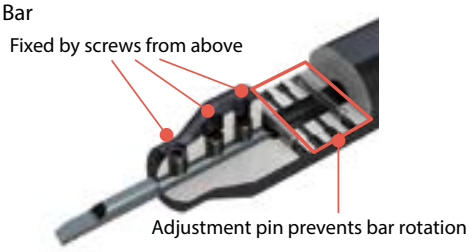
EZH-ST
Without EZ adjust structure



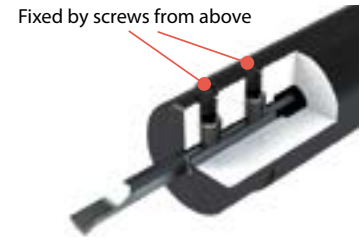
Point The EZ Bar prevents deviation with high-rigidity clamping

The adjustment pin prevents the bar from rotating during machining

EZ Bar

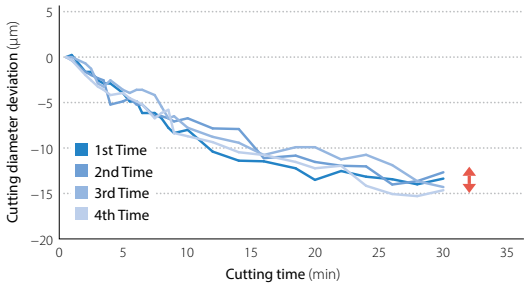


Competitor

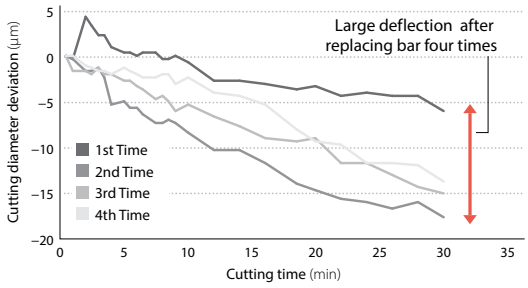


Cutting diameter deviation comparison (Internal evaluation)

EZ Bar



Competitor A



Cutting conditions : Vc = 66 m/min, ap = 0.1 mm, f = 0.02 mm/rev, Wet (Oil-based) Workpiece material : SK4

EZ Bar PLUS

High precision solid bar with convenience of indexable inserts reduce machining costs



Indexable EZ Bar
Minimum bore diameter 5 mm

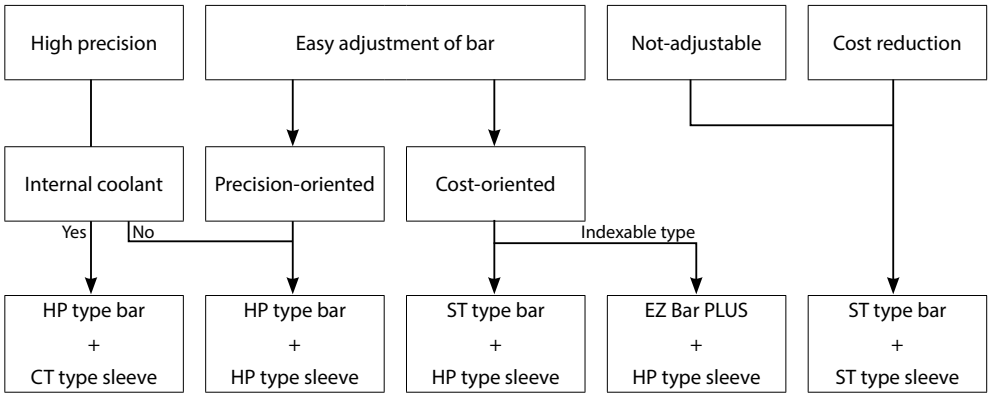
Point Minimum bore diameter 5 mm

Carbide or steel bars can be selected depending on the machining purpose

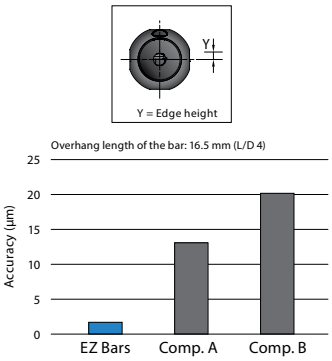
Point Reduces installing times by 1/3

The EZ adjust structure features much lower mounting times compared to conventional boring bars

How to select bars and sleeves for each application



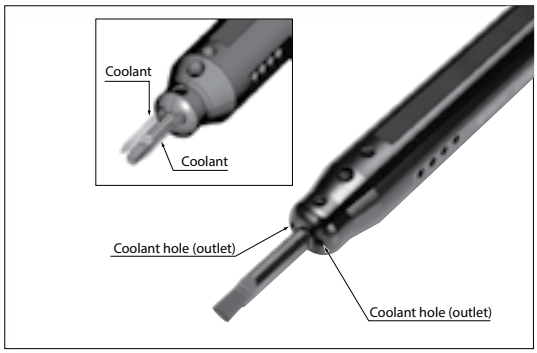
Excellent repeat accuracy by the combination of HP bar + CT / HP sleeve



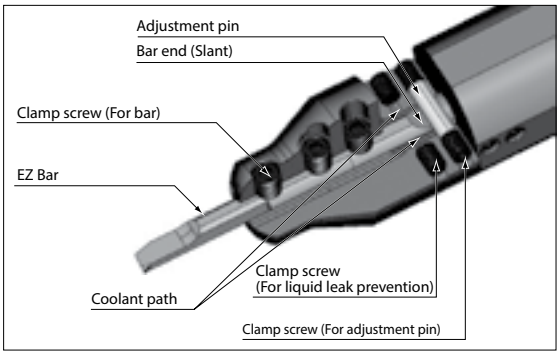
EZH-CT type sleeve (high precision / with coolant hole)

Kyocera's unique EZ adjust structure and internal coolant system improve dimensional accuracy and surface

Coolant discharge system of EZH-CT



Structure of EZH-CT



How to mount EZ Bars (EZH-CT sleeve)

How to use adjustment pin and prevent liquid leak (Fig. 1)

- Put the adjustment pin into the hole according to the overhang length. Push it into the sleeve, using the wrench (LW-1.5).
- Tighten the clamp screw for the adjustment pin "HS3x3P" or "HS3x4P" using the wrench "LW-1.5" from the both sides of the sleeve.
- Put the clamp screws "HS3x3P" or "HS3x4P" into the holes for liquid leak prevention, using the wrench "LW-1.5" and fix them from the both sides of the sleeve.

How to fix bar (Fig. 2)

- With the chip pocket upward, set the bar into the sleeve. Press the slant of the end of the bar with the adjustment pin. Make sure that the bar does not move (Fig. 3)
- Tighten the clamp screw with wrench (LW-2) and fix the bar. Use LW-1.5 if shank dia. is 3 mm or less

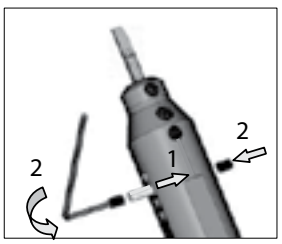


Fig. 1: How to use adjustment pin

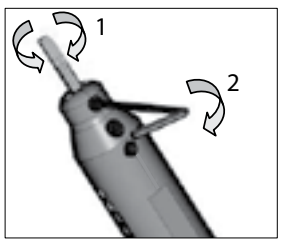


Fig. 2: How to fix bar

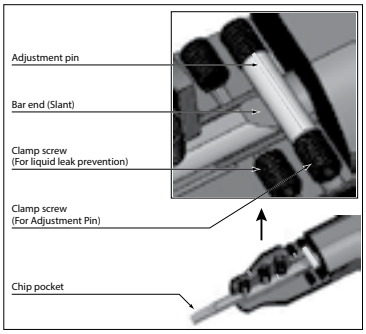
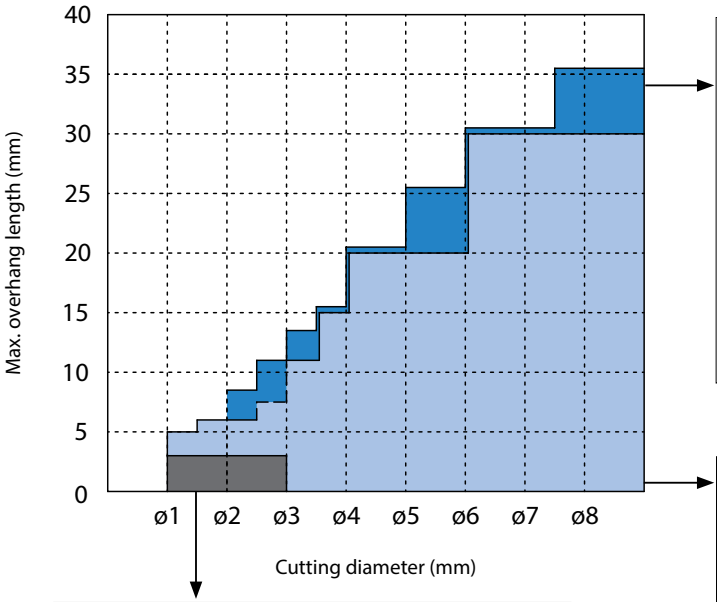


Fig. 3: Fixed bar

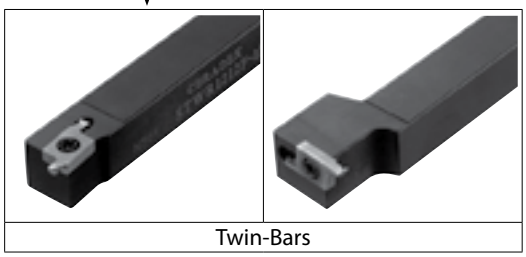
Guide for usage (Adjustable overhang type)

Solid tip-bars type: Min. bore diameter ø1~

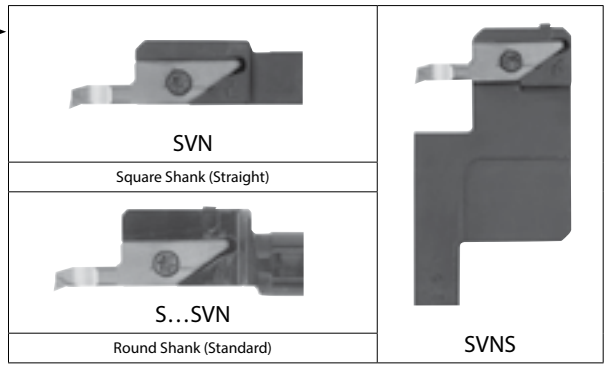


Easy adjustment and high precision - EZ Bars





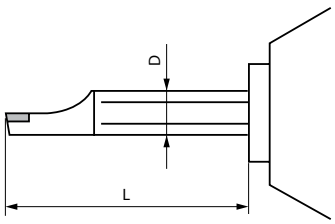
Twin-Bars



System tip-bars

Guide line for overhang length of boring bar - Workpiece material: C45

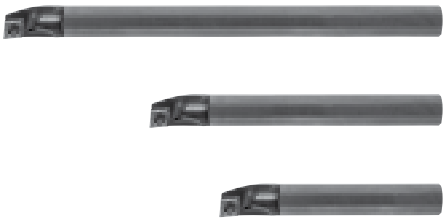
Overhang Length (L / D)	Shank Material
3	Steel
4	Steel (Dynamic-Bars)
5	Excellent
5.5	Excellent (Dynamic-Bars)
7	Carbide
7~10	KAV (with anti-vibration dampener system)



Carbide shank boring bar

Short shank series

Short shank types with length of 1/2 and 2/3 of standard type are available. (-1/2 or -2/3 is shown at the end of the description). When installing on machines, no additional machining (to change toolholder length) is required.



Boring bar identification system (round shank)

Shank type	
S	Steel
A	Steel (with coolant)
C	Carbide
E	Carbide (with coolant)

Bar length			
F	80	Q	180
G	90	R	200
H	100	S	250
J	110	T	300
K	125	U	350
L	140	V	400
M	150	W	450
N	160	Y	500
P	170	X	Special

Clamping system	
C	Top clamp
M	Multi lock
P	Lock pin or lever lock
S	Screw clamp
W	Wedge lock

Insert shape	
C	80° Rhombic
D	55° Rhombic
J	70° Rhombic
R	Round
S	90° Square
T	60° Triangle
V	35° Rhombic
W	80° Trigon

Hand of tool	
R	Right-hand
L	Left-hand

Manufacturer`s option (optional mark or number)	
A(N)	Dynamic-Bars
AE	Excellent bar which is Dynamic-Bars type
E	Excellent bar

S 12 M – S C L P R 09 – 16

Shank diameter

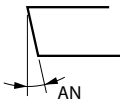
Cutting edge angle

F	K	L	P
90°	75°	95°	117.5°

Q	S	U	W
107.5°	45°	93°	60°

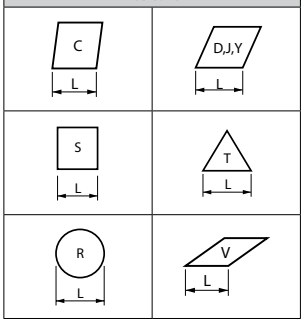
Y	X	Z
85°	110°	93°(95°)

Insert relief angle



B	5° Positive
C	7° Positive
D	15° Positive
E	20° Positive
N	0° Negative
P	11° Positive

Insert size



Minimum bore diameter

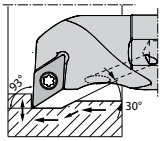
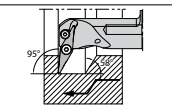
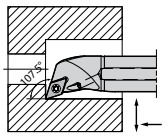
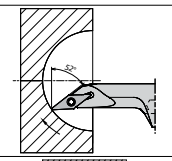
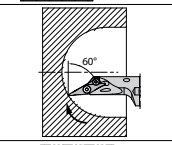
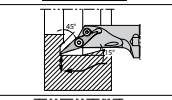
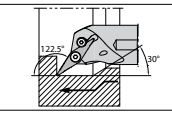
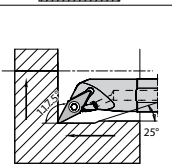
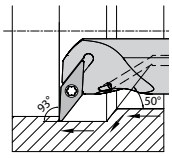
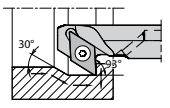
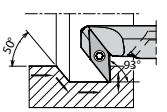
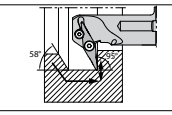
Solid Tip-Bars for Micro Boring

Applications	Solid Tip-Bars type	Shape	Shank type / Max. Overhang Length (L/D)	Min. Bore Dia. DMIN 1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	See Page for Toolholders	Summary
Boring	EZB-HP EZ Bars ⇒ F16~F19		Solid L/D=~5			●	●	●	●	●	●	●		●		●		●	F38~F43	
	EZB-HP-LT EZ Bars (Long Type) ⇒ F17		Solid			●	●	●	●	●		●		●						
	EZB-ST EZ Bars ⇒ F20, F21		Solid L/D=~5			●	●	●	●	●	●		●		●		●			
	EZB-NB EZ Bars (PR1225 / GW05) ⇒ F22		Solid L/D=~5			●	●	●	●	●	●		●		●		●			
	CBN EZB-NB EZ Bars PCD ⇒ F22		Solid L/D=~5					●		●		●		●		●				
	TWB Twin-Bars ⇒ F56		Solid	●	●	●	●	●											F56, F57	
	TWBT Twin-Bars ⇒ F58		Solid	●	●	●	●	●											F59	
	VNB-S System Tip-Bars ⇒ F44		Solid	●	●	●	●	●	●	●									F48~F51	
	VNB System Tip-Bars ⇒ F45, F46		Solid			●		●		●		●		●		●				
	VNBX-S System Tip-Bars ⇒ F52		Solid	●	●	●		●	●	●									F53~F55	
90° Lead Angle	EZBF EZ Bars ⇒ F24		Solid					●		●		●		●					F38~F43	
Copying	EZBP EZ Bars ⇒ F26		Solid			●		●		●		●		●					F38~F43	
	EZVB EZ Bars ⇒ F28		Solid						●		●		●		●				F38~F43	
Back Boring	EZBT EZ Bars ⇒ F30		Solid							●		●							F39 F41 F43	
	VNBT System Tip-Bars ⇒ F47		Solid							●		●							F48~F51	
45° Chamfering	EZBC EZ Bars ⇒ F27		Solid									●		●		●			F39 F41 F43	

Dynamic-Bars / EZ Bar PLUS

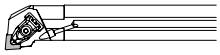
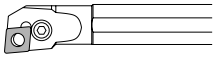
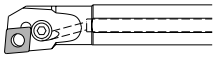
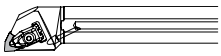
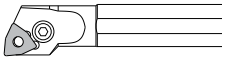
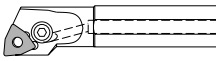
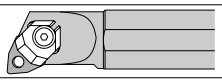
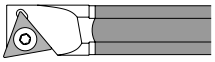
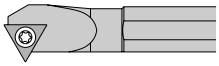
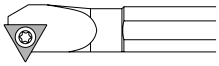
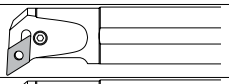
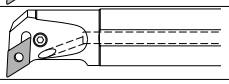
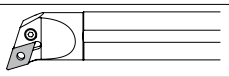
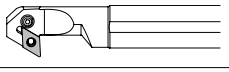
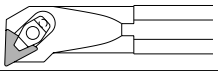
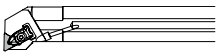
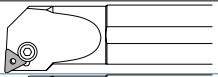
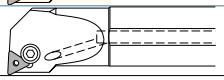
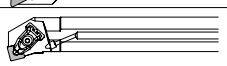
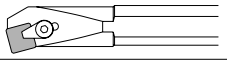
Applications	Shape	Boring bar type	Shank type Max. Overhang Length (L/D)	Coolant hole Yes	Coolant hole No	Min. Bore Dia. DMIN 5	6	7	8	10	12	13	14	16	18	20	22	23	25	26	27	30	31	32	34	40	50	See Page for Toolholders
Boring / Internal Facing		A…SCLC-AE	Excellent L/D=~5.5	●						●	●		●		●		●				●							F60 F61 F62
		S…SCLC-AE	Excellent L/D=~5.5		○	●	●	●	●																			
		S…SCLC-A	Steel L/D=~4		○					●	●		●		●		●				●							
		C…SCLC-AN	Carbide L/D=~7		○	●	●	●	●																			
		E…SCLC-A(N)	Carbide L/D=~7	●						●	●		●		●		●				●							
		A…SCLP-AE	Excellent L/D=~5.5	●							●		●	●	●		●				●							F64 F65
		S…SCLP-A	Steel L/D=~4		○						●		●	●	●		●				●							
		E…SCLP-A(N)	Carbide L/D=~7	●							●		●	●	●		●				●							
	EZ Bar PLUS	S…SCLC-EZP	Steel L/D=~3		○	●	●	●	●	●																	F31
		C…SCLC-EZP	Carbide L/D=~5		○	●	●	●	●	●																	F32
		A…STLP-AE	Excellent L/D=~5.5	●						●	●		●	●	●		●		●		●							F80 F81 F82
		S…STLB-AE			○				●																			
		S…STLB(P)-A	Steel L/D=~4		○				●	●	●		●	●	●		●				●							
		E…STLP-A(N)	Carbide	●						●	●		●	●	●		●		●		●							
		C…STLB-AN	L/D=~7		○				●																			
		A…STLC-AE	Excellent L/D=~5.5	●						●	●		●		●		●											F88 F89
		S…STLC-A	Steel L/D=~4		○					●	●		●		●		●											
	EZ Bar PLUS	S…STLB(P)-EZP	Steel L/D=~3		○				●	●																	F33
		C…STLB(P)-EZP	Carbide L/D=~5		○				●	●																	F34
Boring		S…SWUB-AE	Excellent L/D=~5.5		○		●	●	●																			F100 F101 F102
		A…SWUB(P)-AE	Excellent L/D=~5.5	●						●	●		●		●		●											
		S…SWUB(P)-A	Steel L/D=~4		○		●	●	●	●	●		●		●		●											
		C…SWUB-AN	Carbide L/D=~7		○		●	●	●																			
		E…SWUB(P)-A(N)	Carbide L/D=~7	●						●	●		●		●		●											
	EZ Bar PLUS	S…SWUB-EZP	Steel L/D=~3		○		●	●	●																		F36
		C…SWUB-EZP	Carbide L/D=~5		○		●	●	●																		

Dynamic-Bars

Applications	Shape	Boring bar type	Shank type Max. Overhang Length (L/D)	Coolant hole Yes	Coolant hole No	Min. Bore Dia. DMIN 5	6	7	8	10	12	13	14	16	18	20	22	23	25	26	27	30	31	32	34	40	50	See Page for Toolholders
Copying		A…SDUC-AE	Excellent L/D=~5.5	●									●	●		●		●			●			●				F66 F67 F68
		S…SDUC-A	Steel L/D=~4		○								●	●		●		●			●			●				
		E…SDUC-A	Carbide L/D=~7	●									●	●		●		●			●			●				
		A…SZLB-AE	Excellent L/D=~5.5	●																		●			●	●		F109
		A…SDQC-AE	Excellent L/D=~5.5	●							●		●			●			●			●						F70 F71 F72
		S…SDQC-A	Steel L/D=~4		○						●		●			●			●			●						
		E…SDQC-A	Carbide L/D=~7	●							●		●			●			●			●						
		A…SVJB(C)-AE	Excellent L/D=~5.5	●										●		●			●			●				●	●	F90 F91
		A…SVJP-AE		●										●														
		S…SVJB(C)-A	Steel L/D=~4		○									●		●			●			●				●	●	
		S…SVJP-A			○									●														
		A…SZJB-AE	Excellent L/D=~5.5	●																	● 28	●				●		F106
		A…SZXB-AE	Excellent L/D=~5.5	●															●			●				●		F107
		A…SZQB-AE	Excellent L/D=~5.5	●																	●			●		●		F108
		A…SVPC(B)-AE	Excellent L/D=~5.5	●									●		●		●			●			●			●		F94 F95
		S…SVPC(B)-A	Steel L/D=~4		○								●		●		●			●			●			●		
		E…SVPC(B)-A	Carbide L/D=~7	●									●		●		●			●			●					
		A…SVUB(C)-AE	Excellent L/D=~5.5	●										●		●			●						●	●		F96 F97
		S…SVUB(C)-A	Steel L/D=~4		○									●		●			●						●	●		
		E…SVUB(C)-A	Carbide L/D=~7	●											●				●			● 29			●			
Back copying		A…SDZC-AE	Excellent L/D=~5.5	●									●	●		●		●			●			●				F74 F75 F76
		S…SDZC-A	Steel L/D=~4		○								●	●		●		●			●			●				
		E…SDZC-A	Carbide L/D=~7	●									●	●		●		●			●							
		A…SVZB(C)-AE	Excellent L/D=~5.5	●										●		●			●						●	●		F98 F99
		S…SVZB(C)-A	Steel L/D=~4		○									●		●			●						●	●		
		A…SZZB-AE	Excellent L/D=~5.5	●																		●			●	●		F110

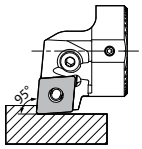
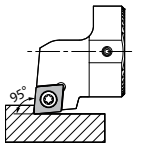
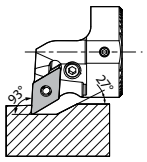
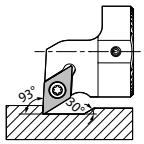
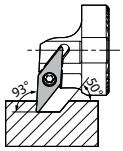
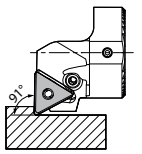
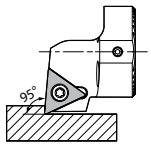
For Min. Bore Dia. DMIN, the figure under ● may be applied depending on the toolholder type.

Boring bars

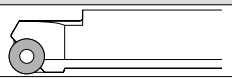
Applications	Boring bar type	Shape	Shank type Max. Overhang Length (L/D)	Coolant hole Yes	Coolant hole No	Insert type	Min. Bore Dia. DMIN 5	6	7	8	10	12	14	16	18	20	25	30	32	40	50	63	See Page for Toolholders
Boring / Internal Facing	A…DCLN12		Steel L/D=~3	●		Negative													●	●	●		F131
	S…PCLN○○		Steel L/D=~3		○	Negative										●	● 27		●	●	●		F132
	A…PCLN09		Steel L/D=~3	●		Negative										●	● 27		●				
	A…DWLN08		Steel L/D=~3	●		Negative													●	●	●		F148
	S…PWLN○○		Steel L/D=~3		○	Negative										●	● 27		●	●	●		F146
	A…PWLN06		Steel L/D=~3	●		Negative										●	● 27		●				F146
	S…WWLN08-E		Excellent L/D=~5		○	Negative											● 28		● 34	●			F149
	C…STXP(B)		Carbide L/D=~7		○	Positive			● 7.5	● 9	● 11												F86
	C…SJLC		Carbide L/D=~7		○	Positive	● 5.5																F78
Copying	S…STWP-E		Excellent L/D=~5		○	Positive						●		●		●	●		●				F84 F85
	S…STWP		Steel L/D=~3		○	Positive						●		●		●	●						
	A…DDUN15		Steel L/D=~3	●		Negative														●	●	●	F136
	S…PDUN11		Steel L/D=~3		○	Negative											● 27		●	●			F134
	A…PDUN11		Steel L/D=~3	●		Negative											● 27		●	●			
	S…PDUN15		Steel L/D=~3		○	Negative													●	● 44	● 54		F138
	S…PDQN15		Steel L/D=~3		○	Negative													●	● 44	● 54		F139
Back copying	C…STZB		Carbide L/D=~7		○	Positive				● 8.5													F87
	C…SJZC		Carbide L/D=~7		○	Positive		● 6.5															F79
	S…PDZN15		Steel L/D=~3		○	Negative													●	● 44	● 54		F140
Boring	S…CTUP		Steel L/D=~3		○	Positive								●		●	● 27		● 34	● 43	●		F113
	A…DTFN○○		Steel L/D=~3	●		Negative													●	●	●		F143
	S…PTUN○○		Steel L/D=~3		○	Negative										●	●	●	●	●	●		F144
	A…PTUN11		Steel L/D=~3	●		Negative										●	●		●				
	A…DSKN12		Steel L/D=~3	●		Negative													●	●	●		F142
	S…SSKP		Steel L/D=~3		○	Positive										●							F111 F112
	S…CSKP		Steel L/D=~3		○	Positive										●	● 27		● 34				

For Min. Bore Dia. DMIN, the figure under ● may be applied depending on the toolholder type.

KAV series Interchangeable head boring bars with anti-vibration dampener system

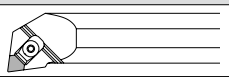
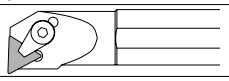
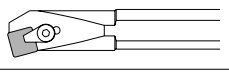
Applications	Boring bar type	Shape	Shank type Max. Overhang Length (L/D)	Coolant hole Yes	Coolant hole No	Insert type	Min. Bore Dia. DMIN 7	8	10	12	14	16	18	20	25	30	32	40	43	50	63	See Page for Toolholders
Boring / Internal facing	KAVH-PCLN		Anti-vibration Dampener System L/D=~10	●		Negative												●		●		F118
Boring / Internal facing	KAVH-SCLC		Anti-vibration Dampener System L/D=~10	●		Positive								●	●		●	●		●		F124
Copying	KAVH-PDUN		Anti-vibration Dampener System L/D=~10	●		Negative												●		●		F120
Copying	KAVH-SDUC		Anti-vibration Dampener System L/D=~10	●		Positive								●	●		●	●		●		F125
Copying	KAVH-SVUB		Anti-vibration Dampener System L/D=~10	●		Positive									●		●	●		●		F127
Boring	KAVH-PTFN		Anti-vibration Dampener System L/D=~10	●		Negative												●		●		F122
Boring	KAVH-STLP		Anti-vibration Dampener System L/D=~10	●		Positive								●	●		●	●		●		F126

Boring Toolholders for Bearing Machining (Square shank)

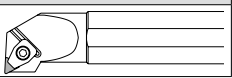
Applications	Boring bar type	Shape	Min. Bore Dia. DMIN 20	25	30	32	40	50	See Page for Toolholders
Boring	SRCP-B		●			●			F114

Applications	Boring bar type	Shape	Min. Bore Dia. DMIN 20	25	30	32	40	50	See Page for Toolholders
Round-Chamfering	CBSN-B		●						F115

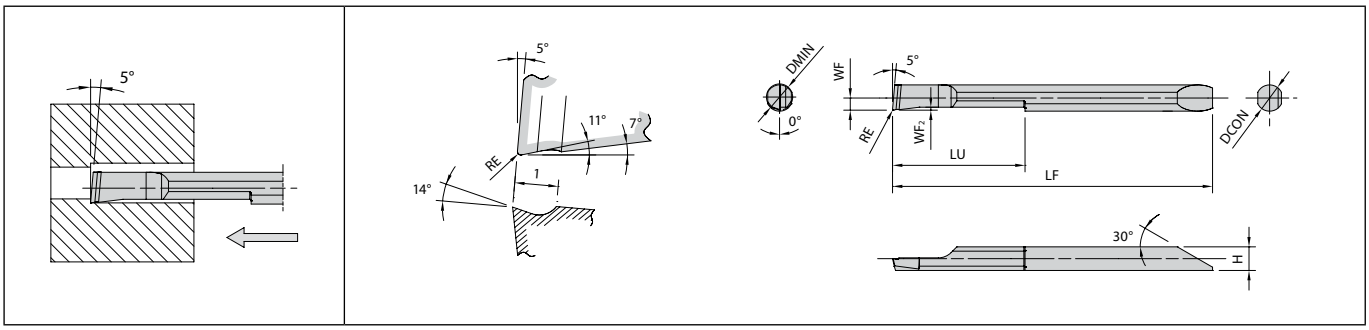
Boring Bars for Ceramic / Solid CBN Tools (L/D=~3)

Applications	Boring bar type	Shape	Min. Bore Dia. DMIN 16	18	20	25	30	32	40	50	See Page for Toolholders
Boring / Internal facing	S-CELN									●	F151
Boring	S-CTUP		●		●	● 27		● 34	● 43	●	F113
Boring	S-CSKP				●	● 27		● 34			F112

For Min. Bore Dia. øA, the figure under ● may be applied depending on the toolholder type.

Applications	Boring bar type	Shape	Min. Bore Dia. DMIN 20	25	30	32	40	50	See Page for Toolholders
Boring	S-CTUN-A				●				F152

EZB-HP (H chipbreaker) (Boring)



Right-hand shown | Without lead angle | Tough edge (General purpose)

F

Boring

Solid
Positive
KAV
Negative

Dimensions

Description		No. of edges	Dimension (mm)								Tolerance (mm)		Carbide				Applicable sleeve ➡ F38~F43
													PVD			-	
			DMIN	DCON	H	LF	LU	WF	WF_2	RE	RE min.	RE max.	PR1225		PR1725	GW05	
													R	L	R	R	
EZB R/L	020020HP-008H	1	2	2	1.8	32	8	0.85	0.25	0.08	-0.015	+0.015	●	●	●	●	EZH020...
EZB R/L	025025HP-008H	1	2.5	2.5	2.3	35	10.5	1.1	0.25	0.08	-0.015	+0.015	●	●	●	●	EZH025...
	025025HP-015H									0.15	-0.02	+0.02	●		●		
EZB R/L	030030HP-008H	1	3	3	2.7	38.9	13	1.35	0.3	0.08	-0.015	+0.015	●	●	●	●	EZH030...
	030030HP-015H									0.15	-0.02	+0.02	●		●		
EZB R/L	035035HP-008H	1	3.5	3.5	3.2	41.9	15	1.6	0.4	0.08	-0.015	+0.015	●	●	●	●	EZH035...
	035035HP-015H									0.15	-0.02	+0.02	●		●		
EZB R/L	040040HP-008H	1	4	4	3.6	48.8	20	1.85	0.4	0.08	-0.015	+0.015	●	●	●	●	EZH040...
	040040HP-015H									0.15	-0.02	+0.02	●		●		
EZB R/L	045045HP-008H	1	4.5	4.5	4.1	51.1	22.5	2.1	0.5	0.08	-0.015	+0.015	●	●	●	●	EZH045...
	045045HP-015H									0.15	-0.02	+0.02	●		●		
EZB R/L	050050HP-008H	1	5	5	4.6	58.1	25	2.35	0.5	0.08	-0.015	+0.015	●	●	●	●	EZH050...
	050050HP-015H									0.15	-0.02	+0.02	●		●		
EZB R/L	060060HP-008H	1	6	6	5.6	66.1	30	2.85	0.6	0.08	-0.015	+0.015	●	●	●	●	EZH060...
	060060HP-015H									0.15	-0.02	+0.02	●		●		
EZB R/L	070070HP-008H	1	7	7	6.3	73.8	35	3.3	0.7	0.08	-0.015	+0.015	●	●	●	●	EZH070...
	070070HP-015H									0.15	-0.02	+0.02	●		●		
EZB R/L	080080HP-008H	1	8	8	7.2	84.8	40	3.75	0.8	0.08	-0.015	+0.015	●	●	●	●	EZH080...
	080080HP-015H									0.15	-0.02	+0.02	●		●		

Tolerance : Offset ±0.025 mm (of the reference pin), overall length ±0.05 mm, edge height +0.05/0 mm

Recommended cutting conditions ➡ F23

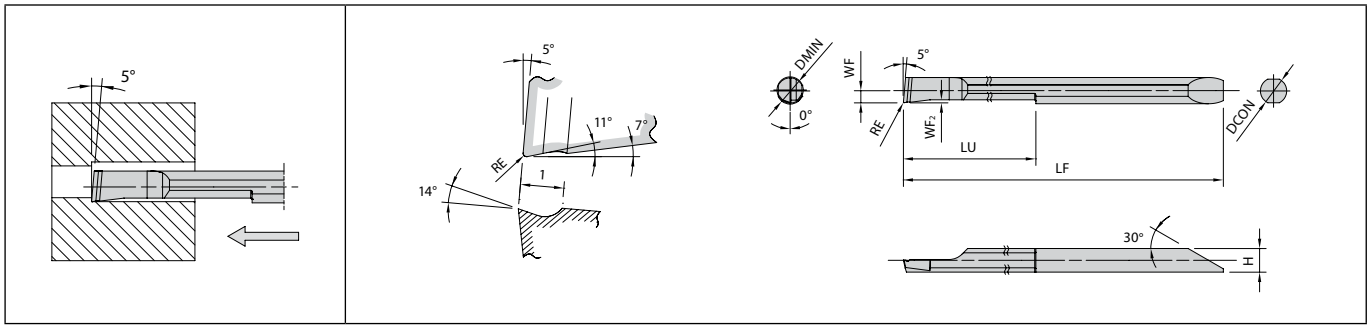
EZ Bars Identification System

EZ	B	R	020	020	HP	-	008	H
Symbol of EZ Bars	Applications	Insert Hand	Min. Bore Dia.	Shank Dia.	Symbol of Precision		Corner-R(RE)	Name of Chipbreaker
	B : Boring Bars	R : Right-hand L : Left-hand	020 : 2mm 025 : 2.5mm ⋮	020 : 2mm 025 : 2.5mm ⋮	HP : High Precision ST : Standard		008 : 0.08mm 015 : 0.15mm ⋮	H : Without lead angle G : With lead angle F : With lead angle NB : Without chipbreaker

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

EZ bars are sold in 1 piece boxes

EZB-HP-LT (H chipbreaker) (Boring)



Right-hand shown | Without lead angle | Tough edge (General purpose)

F

Boring

Dimensions

Description		No. of edges	Dimension (mm)								Overhang length (mm)				Tolerance (mm)		Carbide	Applicable sleeve ➔ F38~F43
			DMIN	DCON	H	LF	LU	WF	WF_2	RE	#1	#2	#3	#4	RE min.	RE max.	PVD PR1225 R	
EZBR	020020HP-008H-LT	1	2	2	1.8	36	12	0.85	0.25	0.08	12.5	8.5	-	-	-0.015	+0.015	●	EZH020...
	025025HP-008H-LT	1	2.5	2.5	2.3	39.5	15	1.1			15.5	11.5	-	-			●	EZH025...
	030030HP-008H-LT	1	3	3	2.7	47.9	18	1.35	0.3		*22.5*	18.5	14.5	-			●	EZH030...
	035035HP-008H-LT	1	3.5	3.5	3.2	51.9	21	1.6	0.4		*25.5*	21.5	17.5	-			●	EZH035...
	040040HP-008H-LT	1	4	4	3.6	60.8	28	1.85			*32.5*	28.5	24.5	20.5			●	EZH040...
	050050HP-008H-LT	1	5	5	4.6	73.1	35	2.35	0.5		*40.5*	35.5	30.5	25.5			●	EZH050...
	060060HP-008H-LT	1	6	6	5.6	83.1	42	2.85	0.6		*47.5*	42.5	37.5	32.5			●	EZH060...

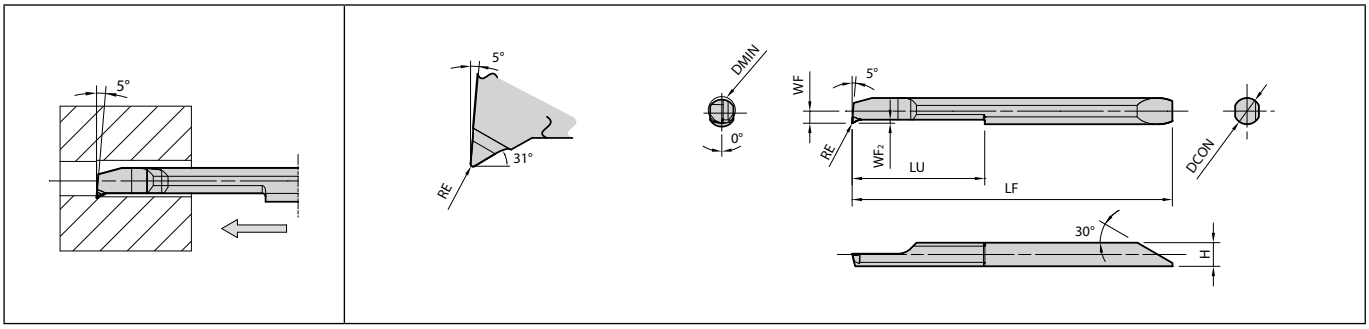
Tolerance : Offset ±0.025 mm (of the reference pin), overall length ±0.05 mm, edge height +0.05/0 mm
EZBR..H-LT : Inserts need to be modified for overhang length #1 in italics (DCON = 3 - 6 mm).

Recommended cutting conditions ➔ F23

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

EZ bars are sold in 1 piece boxes

EZB-HP (G chipbreaker) (Boring)



Right-hand shown | With lead angle | Chip control oriented

Dimensions

Description		No. of edges	Dimension (mm)								Tolerance (mm)		Carbide	Applicable sleeve ➡ F38~F43
			DMIN	DCON	H	LF	LU	WF	WF_2	RE	RE min.	RE max.	PVD PR1725 R	
EZBR	020020HP-005G	1	2	2	1.65	31.8	8	0.55	0.25	0.05	-0.01	+0.01	●	EZH020...
EZBR	025025HP-005G	1	2.5	2.5	2.15	34.8	10.5	0.8	0.3	0.05	-0.01	+0.01	●	EZH025...
	025025HP-015G									0.15	-0.02	+0.02	●	
EZBR	030030HP-005G	1	3	3	2.5	38.7	13	1.05	0.4	0.05	-0.01	+0.01	●	EZH030...
	030030HP-015G									0.15	-0.02	+0.02	●	
EZBR	035035HP-005G	1	3.5	3.5	3	41.7	15	1.3	0.5	0.05	-0.01	+0.01	●	EZH035...
	035035HP-015G									0.15	-0.02	+0.02	●	
EZBR	040040HP-005G	1	4	4	3.45	48.7	20	1.55	0.5	0.05	-0.01	+0.01	●	EZH040...
	040040HP-015G									0.15	-0.02	+0.02	●	
EZBR	045045HP-005G	1	4.5	4.5	3.95	50.9	22.5	1.8	0.7	0.05	-0.01	+0.01	●	EZH045...
	045045HP-015G									0.15	-0.02	+0.02	●	
EZBR	050050HP-005G	1	5	5	4.3	57.8	25	2.05	0.7	0.05	-0.01	+0.01	●	EZH050...
	050050HP-015G									0.15	-0.02	+0.02	●	
EZBR	060060HP-005G	1	6	6	5.15	65.7	30	2.55	0.9	0.05	-0.01	+0.01	●	EZH060...
	060060HP-015G									0.15	-0.02	+0.02	●	
EZBR	070070HP-005G	1	7	7	6.15	73.7	35	3.05	1	0.05	-0.01	+0.01	●	EZH070...
	070070HP-015G									0.15	-0.02	+0.02	●	
EZBR	080080HP-005G	1	8	8	7.1	84.8	40	3.55	1	0.05	-0.01	+0.01	●	EZH080...
	080080HP-015G									0.15	-0.02	+0.02	●	

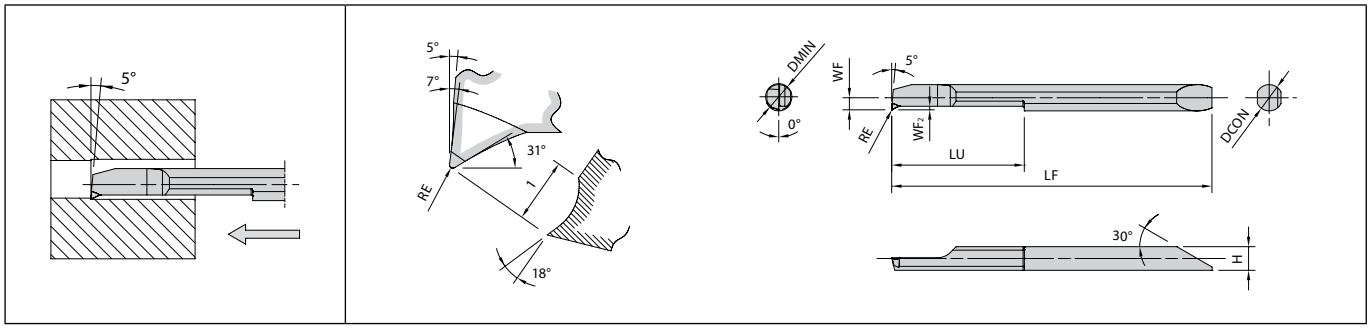
Tolerance : Offset ±0.025 mm (of the reference pin), overall length ±0.05 mm, edge height +0.05/0 mm

Recommended cutting conditions ➡ F23

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

EZ bars are sold in 1 piece boxes

EZB-HP (F chipbreaker) (Boring)



Right-hand shown | With lead angle | Sharp cutting (For finishing)

F

Boring

Dimensions

Description		No. of edges	Dimension (mm)								Tolerance (mm)		Carbide		Applicable sleeve ➡ F38~F43
			DMIN	DCON	H	LF	LU	WF	WF_2	RE	RE min.	RE max.	PVD		
													PR1225	PR1725	
													R	R	
EZBR	020020HP-005F	1	2	2	1.8	32	8	0.85	0.25	0.05	-0.01	+0.01	●	●	EZH020...
EZBR	025025HP-005F	1	2.5	2.5	2.3	35	10.5	1.1	0.3	0.05	-0.01	+0.01	●	●	EZH025...
	025025HP-015F									0.15	-0.02	+0.02	●	●	
EZBR	030030HP-005F	1	3	3	2.7	38.9	13	1.35	0.4	0.05	-0.01	+0.01	●	●	EZH030...
	030030HP-015F									0.15	-0.02	+0.02	●	●	
EZBR	035035HP-005F	1	3.5	3.5	3.2	41.9	15	1.6	0.5	0.05	-0.01	+0.01	●	●	EZH035...
	035035HP-015F									0.15	-0.02	+0.02	●	●	
EZBR	040040HP-005F	1	4	4	3.6	48.8	20	1.85	0.5	0.05	-0.01	+0.01	●	●	EZH040...
	040040HP-015F									0.15	-0.02	+0.02	●	●	
EZBR	045045HP-005F	1	4.5	4.5	4.1	51.1	22.5	2.1	0.7	0.05	-0.01	+0.01	●	●	EZH045...
	045045HP-015F									0.15	-0.02	+0.02	●	●	
EZBR	050050HP-005F	1	5	5	4.6	58.1	25	2.35	0.7	0.05	-0.01	+0.01	●	●	EZH050...
	050050HP-015F									0.15	-0.02	+0.02	●	●	
EZBR	060060HP-005F	1	6	6	5.6	66.1	30	2.85	0.9	0.05	-0.01	+0.01	●	●	EZH060...
	060060HP-015F									0.15	-0.02	+0.02	●	●	
EZBR	070070HP-005F	1	7	7	6.3	73.8	35	3.3	1	0.05	-0.01	+0.01	●	●	EZH070...
	070070HP-015F									0.15	-0.02	+0.02	●	●	
EZBR	080080HP-005F	1	8	8	7.2	84.8	40	3.75	1	0.05	-0.01	+0.01	●	●	EZH080...
	080080HP-015F									0.15	-0.02	+0.02	●	●	

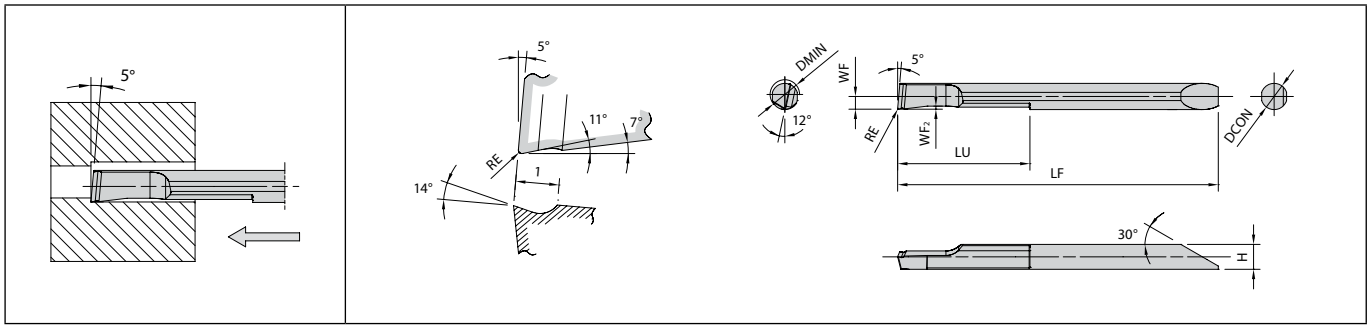
Tolerance : Offset ±0.025 mm (of the reference pin), overall length ±0.05 mm, edge height +0.05/0 mm

Recommended cutting conditions ➡ F23

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

EZ bars are sold in 1 piece boxes

EZB-ST (H chipbreaker) (Boring)



Right-hand shown | Without lead angle | Tough edge (General purpose)

F

Boring

Solid
Positive
KAV
Negative

Dimensions

Description		No. of edges	Dimension (mm)								Tolerance (mm)		Carbide		Applicable sleeve ➡ F38~F43
			DMIN	DCON	H	LF	LU	WF	WF_2	RE	RE min.	RE max.	PVD		
													PR1225	PR1725	
													R	R	
EZBR	020017ST-008H	1	2	1.7	1.5	27.3	7	0.79	0.19	0.08	-0.015	+0.015	●	●	EZH017...
EZBR	025020ST-008H	1	2.5	2	1.82	32	8	0.94	0.16	0.08	-0.015	+0.015	●	●	EZH020...
	025020ST-015H									0.15	-0.02	+0.02	●	●	
EZBR	030025ST-008H	1	3	2.5	2.3	35	10.5	1.19	0.15	0.08	-0.015	+0.015	●	●	EZH025...
	030025ST-015H									0.15	-0.02	+0.02	●	●	
EZBR	035030ST-008H	1	3.5	3	2.8	39	13	1.44	0.18	0.08	-0.015	+0.015	●	●	EZH030...
	035030ST-015H									0.15	-0.02	+0.02	●	●	
EZBR	040035ST-008H	1	4	3.5	3.3	42	15	1.69	0.24	0.08	-0.015	+0.015	●	●	EZH035...
	040035ST-015H									0.15	-0.02	+0.02	●	●	
EZBR	045040ST-008H	1	4.5	4	3.8	49	20	1.94	0.27	0.08	-0.015	+0.015	●	●	EZH040...
	045040ST-015H									0.15	-0.02	+0.02	●	●	
EZBR	055050ST-008H	1	5.5	5	4.8	58.2	25	2.44	0.33	0.08	-0.015	+0.015	●	●	EZH050...
	055050ST-015H									0.15	-0.02	+0.02	●	●	
EZBR	065060ST-008H	1	6.5	6	5.8	66.2	30	2.94	0.38	0.08	-0.015	+0.015	●	●	EZH060...
	065060ST-015H									0.15	-0.02	+0.02	●	●	
EZBR	075070ST-008H	1	7.5	7	6.8	74.2	35	3.44	0.44	0.08	-0.015	+0.015	●	●	EZH070...
	075070ST-015H									0.15	-0.02	+0.02	●	●	

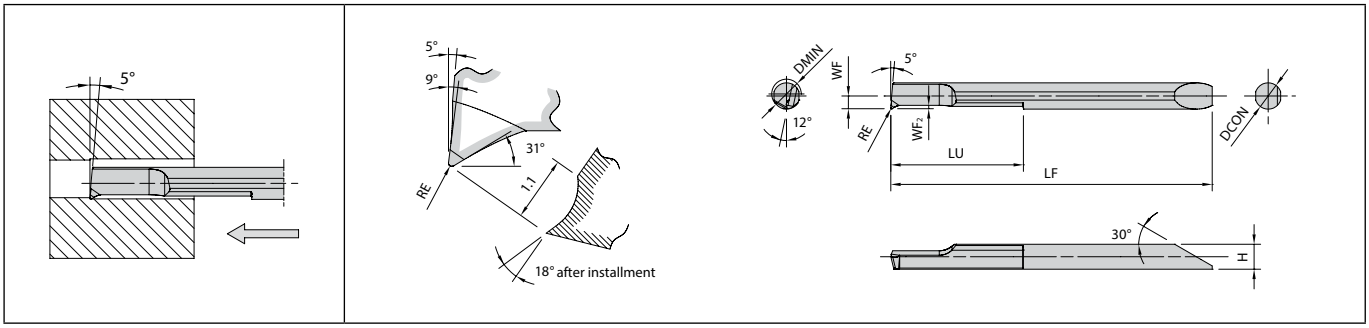
Tolerance : Offset ±0.06 mm , overall length ±0.1 mm, edge height +0.06/0 mm

Recommended cutting conditions ➡ F23

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

EZ bars are sold in 1 piece boxes

EZB-ST (F chipbreaker) (Boring)



Right-hand shown | With lead angle | Sharp cutting (For finishing)

F

Boring

Dimensions

Description		No. of edges	Dimension (mm)								Tolerance (mm)		Carbide		Applicable sleeve ➡ F38~F43
			DMIN	DCON	H	LF	LU	WF	WF_2	RE	RE min.	RE max.	PVD PR1225 R	PVD PR1725 R	
EZBR	020017ST-005F	1	2	1.7	1.5	27.3	7	0.79	0.2	0.05	-0.01	+0.01	●	●	EZH017...
EZBR	025020ST-005F	1	2.5	2	1.82	32	8	0.94	0.16	0.05	-0.01	+0.01	●	●	EZH020...
	025020ST-015F									0.15	-0.02	+0.02	●	●	
EZBR	030025ST-005F	1	3	2.5	2.3	35	10.5	1.19	0.2	0.05	-0.01	+0.01	●	●	EZH025...
	030025ST-015F									0.15	-0.02	+0.02	●	●	
EZBR	035030ST-005F	1	3.5	3	2.8	39	13	1.44	0.26	0.05	-0.01	+0.01	●	●	EZH030...
	035030ST-015F									0.15	-0.02	+0.02	●	●	
EZBR	040035ST-005F	1	4	3.5	3.3	42	15	1.69	0.33	0.05	-0.01	+0.01	●	●	EZH035...
	040035ST-015F									0.15	-0.02	+0.02	●	●	
EZBR	045040ST-005F	1	4.5	4	3.8	49	20	1.94	0.31	0.05	-0.01	+0.01	●	●	EZH040...
	045040ST-015F									0.15	-0.02	+0.02	●	●	
EZBR	055050ST-005F	1	5.5	5	4.8	58.2	25	2.44	0.45	0.05	-0.01	+0.01	●	●	EZH050...
	055050ST-015F									0.15	-0.02	+0.02	●	●	
EZBR	065060ST-005F	1	6.5	6	5.8	66.2	30	2.94	0.59	0.05	-0.01	+0.01	●	●	EZH060...
	065060ST-015F									0.15	-0.02	+0.02	●	●	
EZBR	075070ST-005F	1	7.5	7	6.8	74.2	35	3.44	0.65	0.05	-0.01	+0.01	●	●	EZH070...
	075070ST-015F									0.15	-0.02	+0.02	●	●	

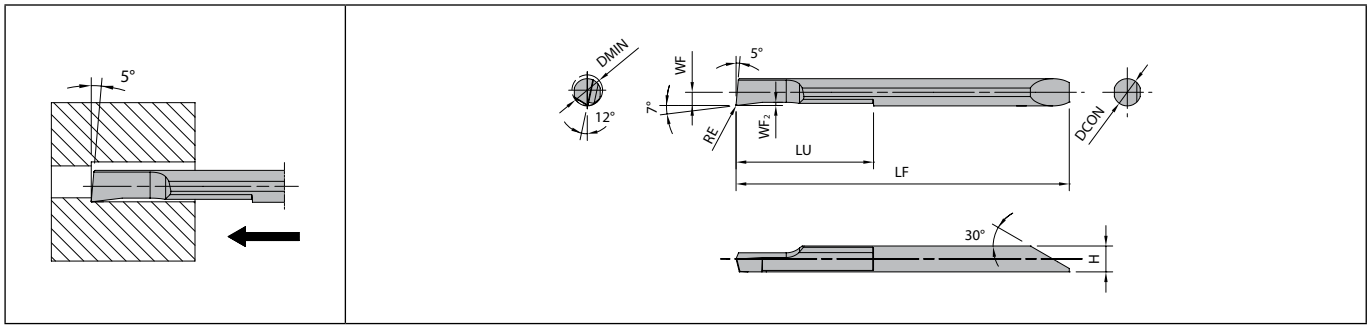
Tolerance : Offset ±0.06 mm , overall length ±0.1 mm, edge height +0.06/0 mm

Recommended cutting conditions ➡ F23

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

EZ bars are sold in 1 piece boxes

EZB-NB (Boring)



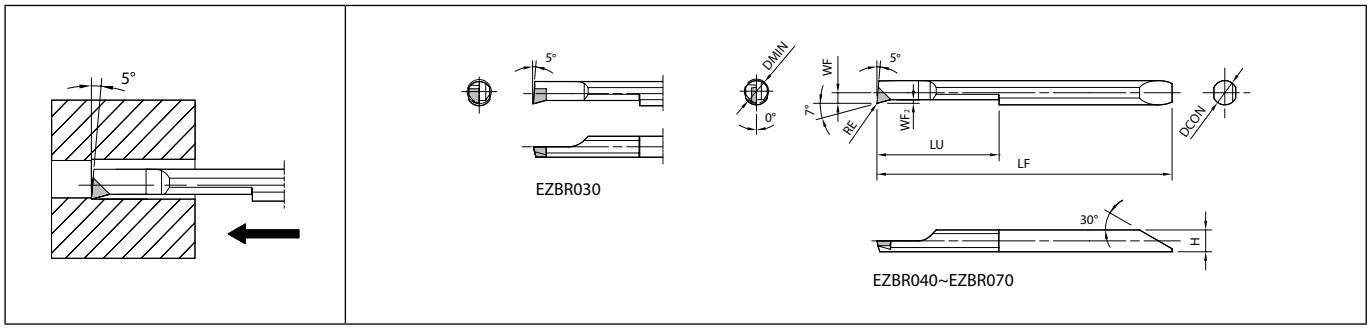
Right-hand shown

Dimensions

Description		No. of edges	Dimension (mm)								Tolerance (mm)		Carbide		Applicable sleeve ➡ F38~F43
			DMIN	DCON	H	LF	LU	WF	WF_2	RE	RE min.	RE max.	PVD	-	
													PR1225	GW05	
													R	R	
EZBR	020017-005NB	1	2	1.7	1.5	27.3	7	0.79	0.2	0.05	-0.015	+0.015	●	●	EZH017...
EZBR	025020-005NB	1	2.5	2	1.82	32	8	0.94	0.16	0.05	-0.015	+0.015	●	●	EZH020...
EZBR	030025-005NB	1	3	2.5	2.3	35	10.5	1.19	0.16	0.05	-0.015	+0.015	●	●	EZH025...
EZBR	035030-005NB	1	3.5	3	2.8	39	13	1.44	0.19	0.05	-0.015	+0.015	●	●	EZH030...
EZBR	040035-005NB	1	4	3.5	3.3	42	15	1.69	0.25	0.05	-0.015	+0.015	●	●	EZH035...
EZBR	045040-005NB	1	4.5	4	3.8	49	20	1.94	0.28	0.05	-0.015	+0.015	●	●	EZH040...
EZBR	055050-005NB	1	5.5	5	4.8	58.2	25	2.44	0.33	0.05	-0.015	+0.015	●	●	EZH050...
EZBR	065060-005NB	1	6.5	6	5.8	66.2	30	2.94	0.39	0.05	-0.015	+0.015	●	●	EZH060...
EZBR	075070-005NB	1	7.5	7	6.8	74.2	35	3.44	0.45	0.05	-0.015	+0.015	●	●	EZH070...

Recommended cutting conditions ➡ F23

EZB-NB (Boring)



Right-hand shown

Dimensions

Description		No. of edges	Dimension (mm)								Tolerance (mm)		CBN	PCD	Applicable sleeve ➡ F38~F43
			DMIN	DCON	H	LF	LU	WF	WF_2	RE	RE min.	RE max.	PVD	-	
													KBN05M	KPD001	
													R	R	
EZBR	030030-003NB	1	3	3	2.6	38.8	13	1.25	0.3	0.035	-0.015	+0.015	●		EZH030...
EZBR	040040-003NB	1	4	4	3.6	48.8	20	1.75	0.5	0.035	-0.015	+0.015	●	●	EZH040...
EZBR	050050-003NB	1	5	5	4.6	58.1	25	2.25	0.5	0.035	-0.015	+0.015	●	●	EZH050...
EZBR	060060-003NB	1	6	6	5.6	66.1	30	2.75	0.5	0.035	-0.015	+0.015	●	●	EZH060...
EZBR	070070-003NB	1	7	7	6.6	74.1	35	3.25	0.5	0.035	-0.015	+0.015	●	●	EZH070...

KBN05M edge preparation : T00815 (0.08mm x 15° Chamfered cutting edge)
KPD001 edge preparation : F (Sharp edge)

Recommended cutting conditions ➡ F23

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

EZ bars are sold in 1 piece boxes

Recommended cutting conditions

H chipbreaker (EZB-HP··H type / EZB-ST··H type)

Workpiece material	Insert grades Vc: m/min			EZB020/025		EZB030/035		EZB040/045		EZB050/055/ 060/065/070/075/080		Remarks
	MEGACOAT NANO PLUS	MEGACOAT	Carbide	ap (mm), f (mm/rev)								
	PR1725	PR1225	GW05	ap	f	ap	f	ap	f	ap	f	
Carbon steel / Alloy steel	30~120	30~100	-	~0.3	~0.03	~0.4	~0.04	~0.45	~0.07	~0.5	~0.1	Coolant
Stainless steel	30~100	30~80	-	~0.2	~0.02	~0.3	~0.03	~0.35	~0.05	~0.4	~0.07	
Non-ferrous metals	-	-	~100	~0.3	~0.05	~0.4	~0.06	~0.45	~0.1	~0.5	~0.15	

H chipbreaker (EZB-HP··H-LT type (Long type))

Workpiece material	Insert grades Vc: m/min	EZB020/025/030/035		EZB040/050/060		Remarks
	MEGACOAT	ap (mm), f (mm/rev)				
	PR1225	ap	f	ap	f	
Carbon steel / Alloy steel	30~60	~0.3	~0.05	~0.4	~0.1	Coolant
Stainless steel	20~40	~0.25	~0.05	~0.3	~0.07	

G chipbreaker

Workpiece material	Insert grades Vc: m/min	EZB020/025		EZB030/035		EZB040/045/050/060/070/080		Remarks
	MEGACOAT NANO PLUS	ap (mm), f (mm/rev)						
	PR1725	ap	f	ap	f	ap	f	
Carbon steel / Alloy steel	30~120	~0.25	~0.03	~0.3	~0.05	~0.35	~0.07	Coolant
Stainless steel	30~100	~0.2	~0.02	~0.25	~0.03	~0.3	~0.05	

F chipbreaker (EZB-HP··F type / EZB-ST··F type)

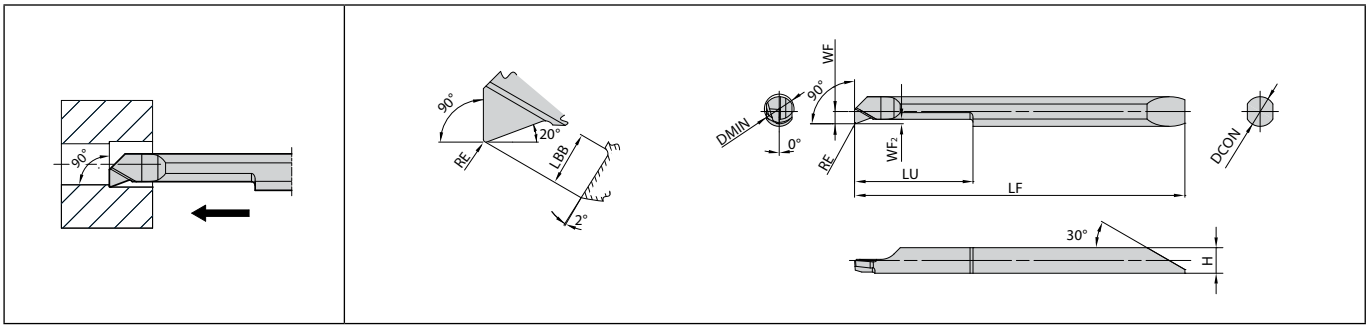
Workpiece material	Insert grades Vc: m/min		EZB020/025		EZB030/035		EZB040/045		EZB050/055/060/ 065/070/075/080		Remarks
	MEGACOAT NANO PLUS	MEGACOAT	ap (mm), f (mm/rev)								
	PR1725	PR1225	ap	f	ap	f	ap	f	ap	f	
Carbon steel / Alloy steel	30~120	30~100	~0.2	~0.03	~0.2	~0.05	~0.3	~0.07	~0.3	~0.07	Coolant
Stainless steel	30~100	30~80	~0.2	~0.02	~0.2	~0.03	~0.25	~0.05	~0.25	~0.05	

NB (Without chipbreaker)

Workpiece material	Insert grades Vc: m/min		EZB020/025		EZB030/035		EZB040/045		EZB055/ 065/075		Remarks
	MEGACOAT	Carbide	ap (mm), f (mm/rev)								
	PR1225	GW05	ap	f	ap	f	ap	f	ap	f	
Carbon steel / Alloy steel	30~100	-	~0.3	~0.03	~0.4	~0.04	~0.45	~0.07	~0.5	~0.1	Coolant
Stainless steel	30~80	-	~0.2	~0.02	~0.3	~0.03	~0.35	~0.05	~0.4	~0.07	
Non-ferrous metals	-	~100	~0.3	~0.05	~0.4	~0.06	~0.45	~0.07	~0.5	~0.1	

Workpiece material	Insert grades Vc: m/min		EZB030		EZB040/045		EZB050/060/070		Remarks
	MEGACOAT CBN	PCD	ap (mm), f (mm/rev)						
	KBN05M	KPD001	ap	f	ap	f	ap	f	
Non-ferrous metals	-	~300	-	-	~0.45	~0.1	~0.5	~0.15	Coolant
Hard materials	~100	-	~0.07	~0.03	~0.10	~0.05	~0.15	~0.07	

EZBF (Boring, 90° Lead angle)



Right-hand shown

Dimensions

Description	No. of edges	Dimension (mm)									Tolerance (mm)		Carbide	Applicable sleeve ➡ F38~F43
		DMIN	DCON	H	LBB	LF	LU	WF	WF_2	RE	RE min.	RE max.	PVD PR1225 R	
EZBFR 030030-008	1	3	3	2.5	1.5	37.7	12	1.2	0.45	0.08	-0.015	+0.015	●	EZH030...
EZBFR 040040-008	1	4	4	3.45	2	44.6	16	1.65	0.55	0.08	-0.015	+0.015	●	EZH040...
EZBFR 050050-015	1	5	5	4.3	2.4	52.7	20	2.15	0.7	0.15	-0.02	+0.02	●	EZH050...
EZBFR 060060-015	1	6	6	5.15	2.8	59.6	24	2.55	0.85	0.15	-0.02	+0.02	●	EZH060...

Recommended cutting conditions

Workpiece Material	Insert Grades (Cutting Speed Vc : m/min)	EZBFR030030-008		EZBFR040040-008		EZBFR050050/ 060060-015		Remarks
	MEGACOAT	ap (mm), f (mm/rev)						
	PR1225	ap	f	ap	f	ap	f	
Carbon steel / Alloy steel	30~100	~0.2	~0.05	~0.3	~0.05	~0.5	~0.05	Coolant
Stainless steel	30~80	~0.2	~0.05	~0.3	~0.05	~0.5	~0.05	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

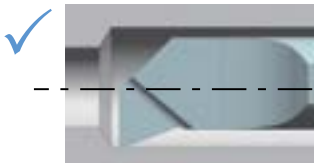
EZ bars are sold in 1 piece boxes

Precautions

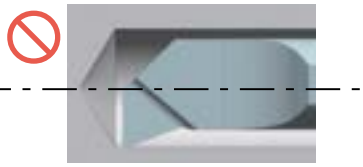
✓ Recommended ⃠ Not Recommended

1. Machining in blind hole is not recommended

Stepped hole



Blind hole



2. If front cutting edge exceeds beyond workpiece center line, fracturing may occur

Fracturing May Occur

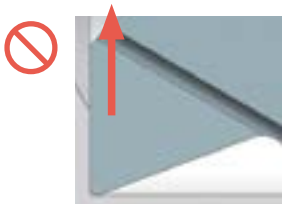


Min boring diameter of ø 4 : 1.9 mm front cutting edge length

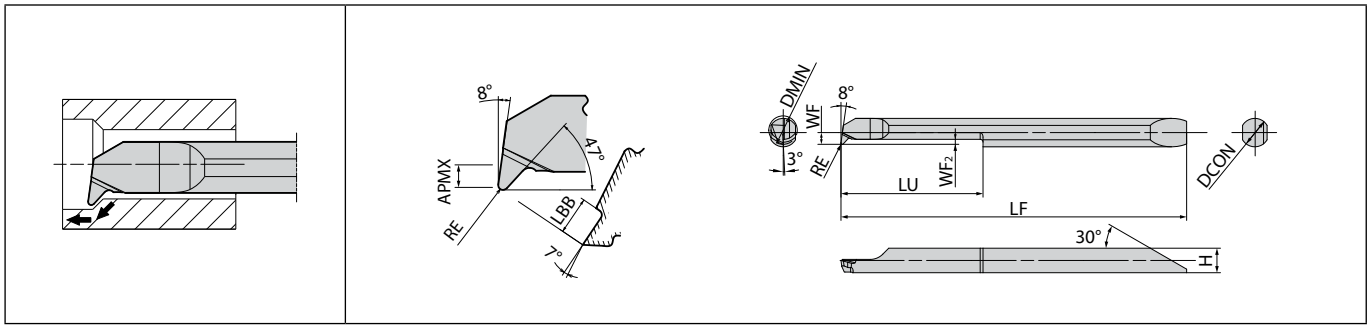
Off-center Boring

3. Up facing is not recommended

Fracturing May Occur



EZBP (Internal copying)



Right-hand shown

Dimensions

Description		No. of edges	Dimension (mm)										Tolerance (mm)		Carbide	Applicable sleeve ⇨ F38~F43
			DMIN	DCON	H	LBB	LF	LU	WF	WF_2	APMX	RE	RE min.	RE max.	PVD PR1225 R	
EZBPR	020020-005-08	1	2	2	1.65	1	31.8	8	0.55	0.35	0.3	0.05	-0.01	+0.01	●	EZH020...
	020020-005-10						33.8	10							●	
	020020-005-12						35.8	12							●	
EZBPR	030030-005-12	1	3	3	2.5	1.2	37.7	12	1.05	0.45	0.4	0.05	-0.01	+0.01	●	EZH030...
	030030-005-15						40.7	15							●	
EZBPR	040040-015	1	4	4	3.45	1.5	48.7	20	1.65	0.65	0.6	0.15	-0.02	+0.02	●	EZH040...
EZBPR	050050-015	1	5	5	4.3	2.2	57.8	25	2	1.1	0.8	0.15	-0.02	+0.02	●	EZH050...
EZBPR	060060-015	1	6	6	5.15	2.5	65.7	30	2.45	1.35	1	0.15	-0.02	+0.02	●	EZH060...

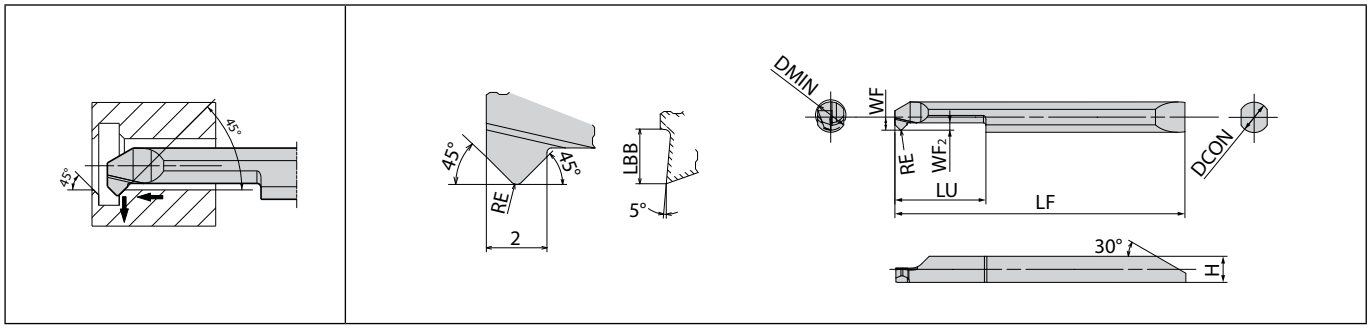
Recommended cutting conditions

Workpiece Material	Insert Grades (Cutting Speed Vc : m/min)	EZBPR020		EZBPR030		EZBPR040		EZBPR050		EZBPR060		Remarks
	MEGACOAT	ap (mm), f (mm/rev)										
	PR1225	ap	f	ap	f	ap	f	ap	f	ap	f	
Carbon steel / Alloy steel	30~100	~0.3	~0.05	~0.4	~0.05	~0.6	~0.05	~0.8	~0.05	~1.0	~0.05	Coolant
Stainless steel	30~80	~0.3	~0.05	~0.4	~0.05	~0.6	~0.05	~0.8	~0.05	~1.0	~0.05	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

EZ bars are sold in 1 piece boxes

EZBC (Internal chamfering)



Right-hand shown

Dimensions

Description	No. of edges	Dimension (mm)									Tolerance (mm)		Carbide	Applicable sleeve ➔ F39 F41 F43
		DMIN	DCON	H	LBB	LF	LU	WF	WF_2	RE	RE min.	RE max.	PVD / PR1225 / R	
EZBCR 050050-020-15	1	5	5	4.3	1.8	47.8	15	2.15	1.2	0.2	-0.02	+0.02	●	EZH050...
EZBCR 050050-020-20						52.8	20						●	
EZBCR 060060-020-18	1	6	6	5.15	2.5	53.7	18	2.65	1.9	0.2	-0.02	+0.02	●	EZH060...
EZBCR 060060-020-24						59.7	24						●	
EZBCR 070070-020-21	1	7	7	6.2	3.1	59.7	21	3	2.5	0.2	-0.02	+0.02	●	EZH070...
EZBCR 070070-020-42						80.7	42						●	

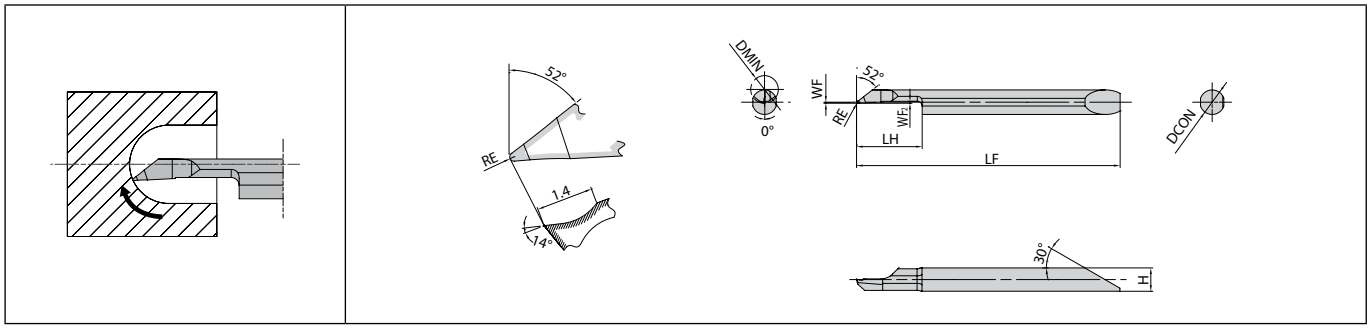
Recommended cutting conditions

Workpiece Material	Insert Grades (Cutting Speed Vc : m/min)	EZBCR050		EZBCR060		EZBCR070		Remarks
	MEGACOAT	ap (mm), f (mm/rev)						
	PR1225	ap	f	ap	f	ap	f	
Carbon steel / Alloy steel	30~100	~0.7	~0.06	~0.7	~0.06	~0.7	~0.06	Coolant
Stainless steel	30~80	~0.7	~0.06	~0.7	~0.06	~0.7	~0.06	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

EZ bars are sold in 1 piece boxes

EZVB (Boring / Internal facing / Internal copying)



Right-hand shown

Dimensions

Description	No. of edges	Dimension (mm)									Tolerance (mm)		Carbide	Applicable sleeve ➡ F38~F43
		DMIN	DCON	H	LH	H	LF	WF	WF_2	RE	RE min.	RE max.	PVD PR1225 R	
EZVBR 035030-010	1	3.5	3	2.8	8	2.8	38	0.17	0.22	0.1	-0.015	+0.015	●	EZH030...
EZVBR 045040-010	1	4.5	4	3.8	10	3.8	43		0.26				●	EZH040...
EZVBR 055050-010	1	5.5	5	4.8	12	4.8	50.2		0.29				●	EZH050...
EZVBR 065060-010	1	6.5	6	5.8	14	5.8	55.2		0.32				●	EZH060...

Recommended cutting conditions

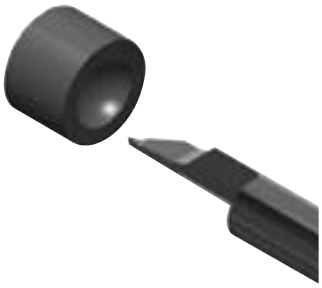
Workpiece material	Insert grades Vc: m/min	EZVBR035		EZVBR045		EZVBR055/065		Remarks
	MEGACOAT	ap (mm), f (mm/rev)						
	PR1225	ap	f	ap	f	ap	f	
Carbon steel / Alloy steel	30~100	~0.05	~0.04	~0.07	~0.07	~0.1	~0.07	Coolant
Stainless steel	30~80	~0.03	~0.03	~0.05	~0.05	~0.07	~0.05	

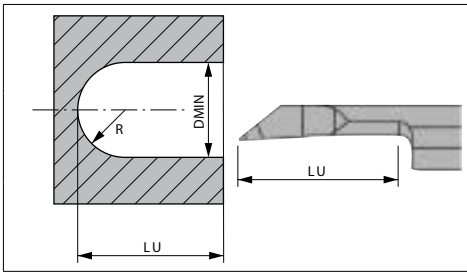
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

EZ bars are sold in 1 piece boxes

Application of EZVB

1. Application range



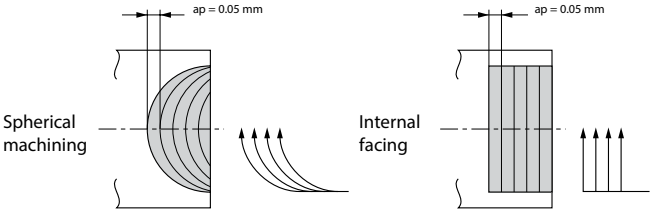


(mm)

Description	DMIN	R	LU
EZVBR 035030-010	3.5	1.75	8
EZVBR 045040-010	4.5	2.25	10
EZVBR 055050-010	5.5	2.75	12
EZVBR 065060-010	6.5	3.25	14

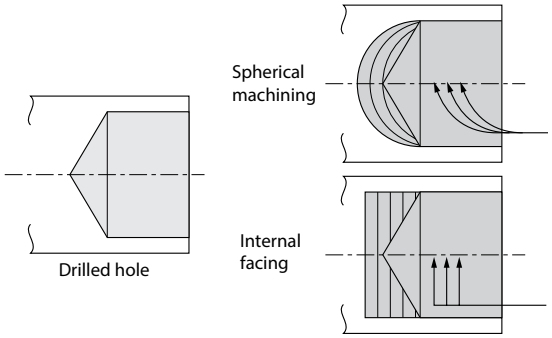
2. Application

Case with no existing hole



Note: f shall be under 0.03 mm/rev at internal facing.

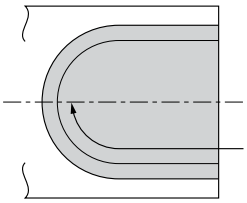
Case with drilled hole



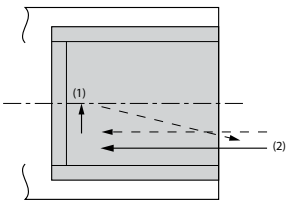
Note: f shall be under 0.03 mm/rev at internal facing.

Finishing

Spherical machining

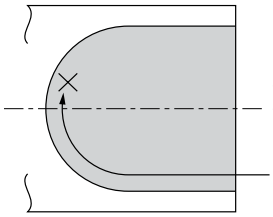


Internal facing

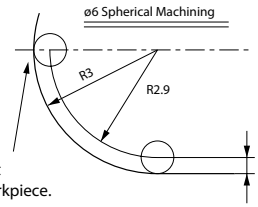


Machining process
1. Finish the internal face first.
2. Next, finish the internal diameter.

3. Caution

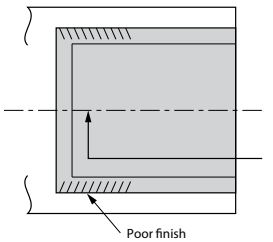


When machining past the center of the workpiece, insert may break.



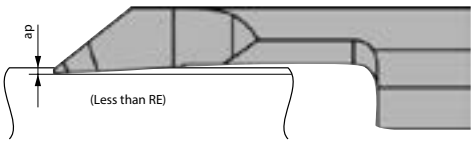
Fix the insert edge at the center of the workpiece.

Adjust the machining program to radius minus the value of RE.



This type of machining is possible, but the chips might scratch the surface.

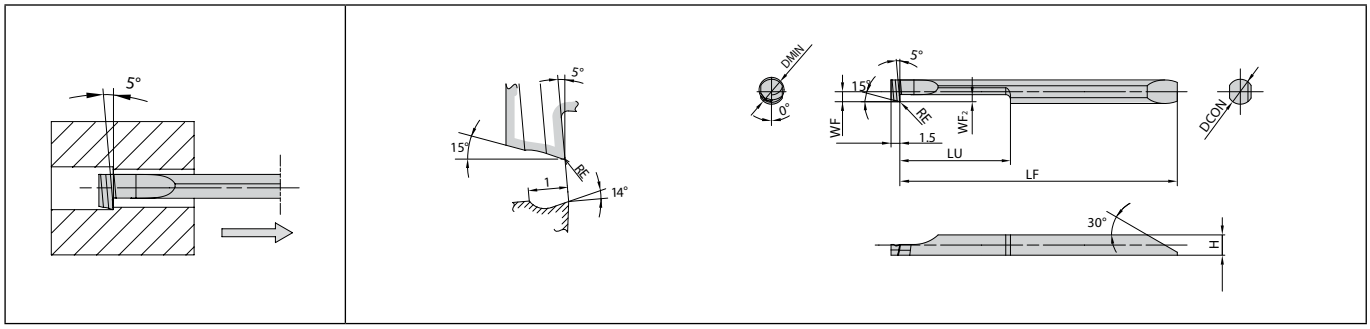
For internal profiling, ap should be less than the value of RE.



(Burrs may occur, if ap is bigger than RE)

F
Boring

EZBT (Back boring)



Right-hand shown

Dimensions

Description	No. of edges	Dimension (mm)								Tolerance (mm)		Carbide		Applicable sleeve F39 F41 F43
		DMIN	DCON	H	LF	LU	WF	WF_2	RE	RE min.	RE max.	PVD PR1225 R	- GW05 R	
EZBTR 040040-005	1	4	4	3.45	47.2	18.5	1.7	1.2	0.05	-0.02	0	●	●	EZH040...
EZBTR 050050-005	1	5	5	4.3	57.2	23.5	2.15	1.5				●	●	EZH050...

Recommended cutting conditions

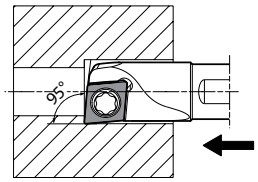
Workpiece Material	Insert Grades (Cutting Speed Vc: m/min)		EZBTR040040-005		EZBTR050050-005		Remarks
	MEGACOAT	Carbide	ap (mm), f (mm/rev)				
	PR1225	GW05	ap	f	ap	f	
Carbon steel / Alloy steel	★ 30-100	–	~0.45	~0.07	~0.5	~0.1	Coolant
Stainless steel	★ 30-80	–	~0.45	~0.05	~0.5	~0.07	
Non-Ferrous metals	–	★ 30-100	~0.45	~0.1	~0.5	~0.15	

★ : 1st Recommendation

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

EZ bars are sold in 1 piece boxes

S-SCLC-EZP Steel shank bar (Boring)



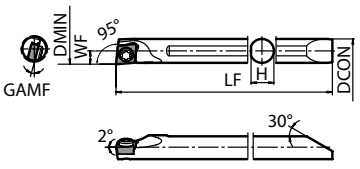


Fig. 1

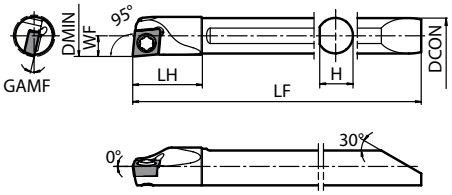


Fig. 2

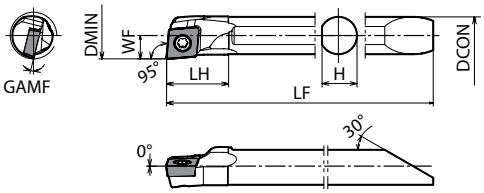


Fig. 3

Right-hand shown | Left-hand Insert for Right-hand Toolholder. | Max. Overhang Length L/D=~3

F

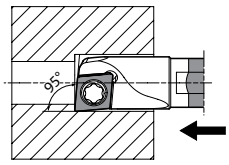
Boring

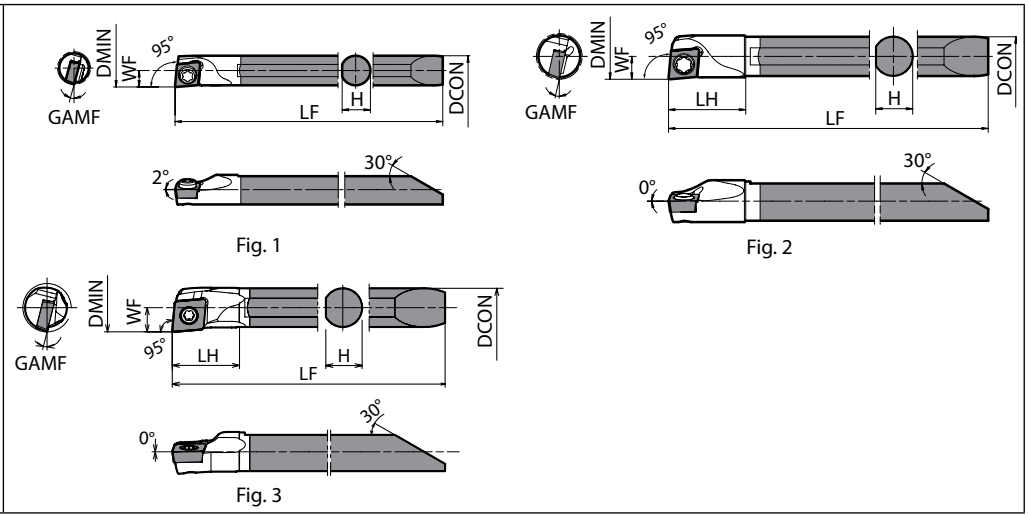
Toolholder dimensions

Description		Availability	Dimension (mm)						GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts		Applicable inserts	Applicable sleeves ➡ F39 F41 F43
		R	DMIN	DCON	H	LH	LF	WF					Screw	Wrench		
																
S045X-	SCLCR03-050EZP	●	5	4.5	4.3	-	42.4	2.5	15	0.2	No	1	SB-1635TR	FT-6	CC□T0301... CC□W0301...	EZH045...
S050X-	SCLCR03-060EZP	●	6	5	4.7	9	48.4	3	13			2				EZH050...
S060X-	SCLCR04-070EZP	●	7	6	5.7	10	54.4	3.5	13	0.2	No	2	SB-2035TR	FT-6	CC□T0401... CC□W0401...	EZH060...
S070X-	SCLCR04-080EZP	●	8	7	6.7	10.3	60.4	4	11							EZH070...
S080X-	SCLCR06-100EZP	●	10	8	7.5	13.3	69.5	5	14	0.4	No	3	SB-2545TR	FT-8	CC□T0602... CC□W0602...	EZH080...

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

C-SCLC-EZP Carbide shank bar (Boring)



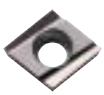


Right-hand shown | Left-hand Insert for Right-hand Toolholder. | Max. Overhang Length L/D=~5

Toolholder dimensions

Description		Availability	Dimension (mm)						GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts		Applicable inserts	Applicable sleeves ➡ F39 F41 F43
		R	DMIN	DCON	H	LH	LF	WF					Screw	Wrench		
C045X-	SCLCR03-050EZP	●	5	4.5	4.3	-	51.4	2.5	15	0.2	No	1	SB-1635TR	FT-6	CC□T0301... CC□W0301...	EZH045...
C050X	SCLCR03-060EZP	●	6	5	4.7	9	58.4	3	13			2				EZH050...
C060X-	SCLCR04-070EZP	●	7	6	5.7	10	66.4	3.5	13	0.2	No	2	SB-2035TR	FT-6	CC□T0401... CC□W0401...	EZH060...
C070X	SCLCR04-080EZP	●	8	7	6.7	10.3	74.4	4	11							EZH070...
C080X-	SCLCR06-100EZP	●	10	8	7.5	13.3	85.5	5	14	0.4	No	3	SB-2545TR	FT-8	CC□T0602... CC□W0602...	EZH080...

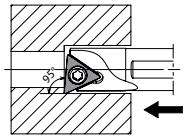
Applicable inserts (S-SCLC-EZP / C- SCLC-EZP)

Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing
Insert								
Chipbreaker type	CF	PF	GF	SKS	SK	CK	GQ	WP
Page	B58	B58	B58	B59	B59	B59	B59	B60
Applications	Finishing	Finishing - Medium	Finishing - Medium	Medium	Medium	Finishing	Finishing	Low feed
Insert								
Chipbreaker type	PP	GK	HQ	STD	MF	L-F	L-FSF	L-U
Page	B60	B60	B60	B60	B61	B62	B61	B63~B65
Applications	Low feed	Low feed	Cast iron	Non-Ferrous metals	Non-Ferrous metals	Hard materials		
Insert								
Chipbreaker type	L-USF	L-J	No CB	AP	PCD	CBN		
Page	B63	B65	B66	B66	C39	C20		

Recommended cutting conditions ➡ **F158, F159**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-STLB(P)-EZP Steel shank bar (Boring)



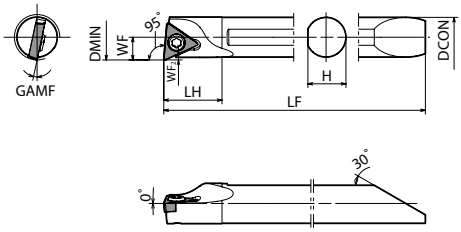


Fig. 1

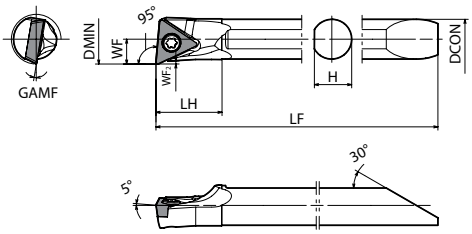


Fig. 2

Right-hand shown | Left-hand Insert for Right-hand Toolholder. | Max. Overhang Length L/D=~3

F

Boring

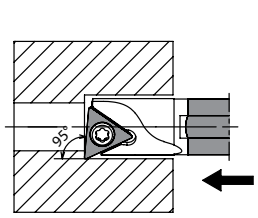
Toolholder dimensions

Description	Availability	Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts		Applicable inserts	Applicable sleeves ➡ F39 F41 F43
													Screw	Wrench		
	R	DMIN	DCON	H	LH	LF	WF	WF_2								
S070X- STLBR06-080EZP	●	8	7	6.7	10.3	60.4	4	0.4	12	0.2	No	1	SB-2035TR	FT-6	TB□T0601... TB□W0601...	EZH070...
S080X- STLPR09-100EZP	●	10	8	7.5	13.3	69.5	5	0.5	10	0.4	No	2	SB-2545TR	FT-8	TP□B0902... TP□H0902... TP□T0902... TP□X0902...	EZH080...

TB□□060108.. type inserts can not be used.
Use Right-handed P chipbreaker
For WP chipbreaker, cutting edge offsets or program corrections are required on **R36** and **R37**.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

C-STLB(P)-EZP Carbide shank bar (Boring)



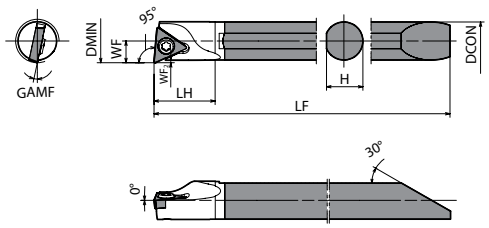


Fig. 1

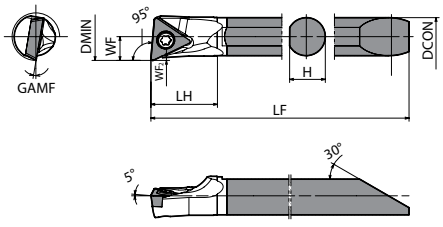


Fig. 2

Right-hand shown | Left-hand Insert for Right-hand Toolholder. | Max. Overhang Length L/D=~5

F

Boring

Solid

Positive

KAV

Negative

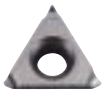
Toolholder dimensions

Description		Availability	Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts		Applicable inserts	Applicable sleeves ➡ F39 F41 F43
														Screw	Wrench		
		R	DMIN	DCON	H	LH	LF	WF	WF_2								
C070X-	STLBR06-080EZP	●	8	7	6.7	11	74.4	4	0.4	12	0.2	No	1	SB-2035TR	FT-6	TB□T0601... TB□W0601...	EZH070...
C080X-	STLPR09-100EZP	●	10	8	7.5	14	85.5	5	0.5	10	0.4	No	2	SB-2545TR	FT-8	TP□B0902... TP□H0902... TP□T0902... TP□X0902...	EZH080...

TB□□060108.. type inserts can not be used.
Use Right-handed P chipbreaker
For WP chipbreaker, cutting edge offsets or program corrections are required on **R36** and **R37**.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

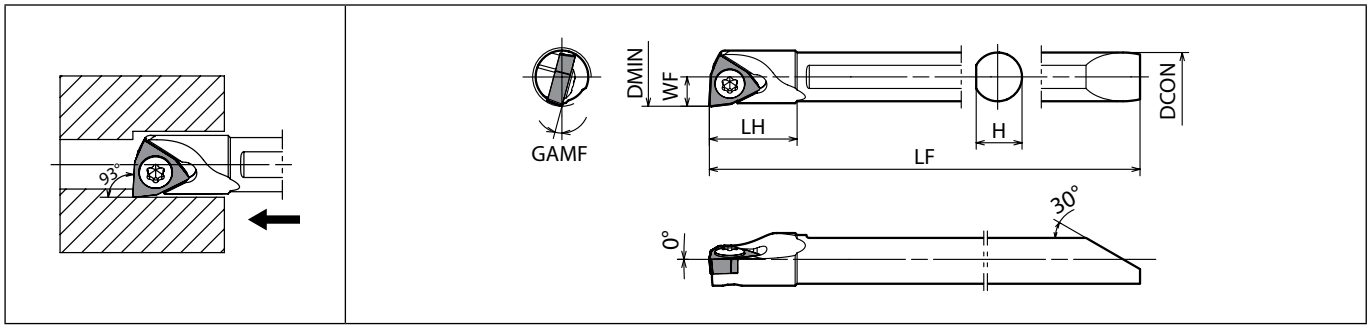
Applicable inserts (S-STLB(P)-EZP / C-STLB(P)-EZP)

Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Finishing	Finishing	Finishing - Medium
Insert								
Chipbreaker type	CF	PF	WP	PP	R-P	GP	DP	HQ
Page	B84, B88	B84, B88	B88	B88	B92	B89	B84	B89

Applications	Finishing	Medium	Low carbon steel	Cast iron	Non-Ferrous metals	Non-Ferrous metals	Hard materials
Insert							
Chipbreaker type	L	L-H	XP	No CB	AP	PCD	CBN
Page	B84, B90, B91	B93	B89	B84, B94	B94	C44, C46,C47	C23

Recommended cutting conditions F158, F159

S-SWUB-EZP Steel shank bar (Boring)

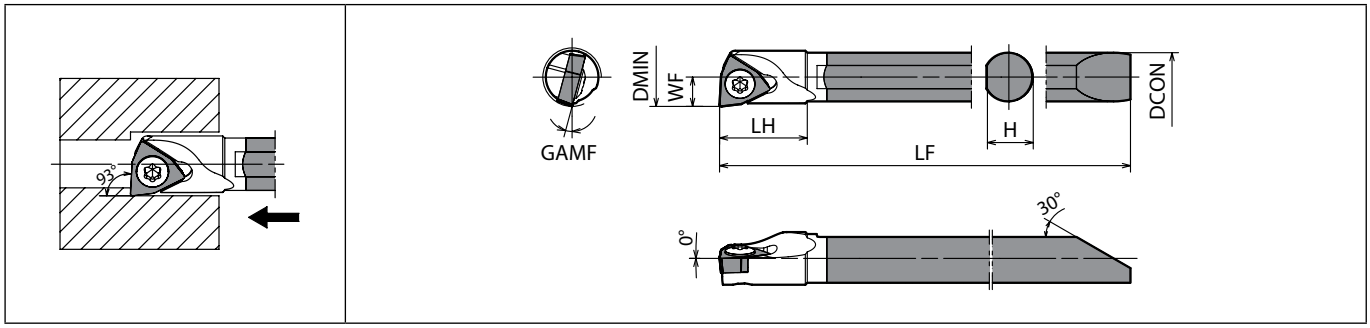


Right-hand shown | Left-hand Insert for Right-hand Toolholder. | Max. Overhang Length L/D=~3

Toolholder dimensions

Description		Availability	Dimension (mm)						GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts	Applicable sleeves ➡ F39 F41 F43
												Screw	Wrench		
		R	DMIN	DCON	H	LH	LF	WF							
S050X-	SWUBR06-060EZP	●	6	5	4.7	9	48.4	3	15	0.2	No	SB-2035TR	FT-6	WB□T0601... WB□W0601...	EZH050...
S060X-	SWUBR06-070EZP	●	7	6	5.7	10	54.4	3.5	13						EZH060...
S070X-	SWUBR08-080EZP	●	8	7	6.7	10.3	60.4	4	15	0.2	No	SB-2035TR	FT-6	WB□T0802... WB□W0802...	EZH070...

C-SWUB-EZP Carbide shank bar (Boring)



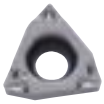
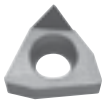
Right-hand shown | Left-hand Insert for Right-hand Toolholder. | Max. Overhang Length L/D=~5

Toolholder dimensions

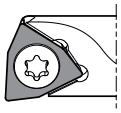
Description		Availability	Dimension (mm)						GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts	Applicable sleeves ➡ F39 F41 F43
												Screw	Wrench		
		R	DMIN	DCON	H	LH	LF	WF							
C050X-	SWUBR06-060EZP	●	6	5	4.7	9	58.4	3	15	0.2	No	SB-2035TR	FT-6	WB□T0601... WB□W0601...	EZH050...
C060X-	SWUBR06-070EZP	●	7	6	5.7	10	66.4	3.5	13						EZH060...
C070X-	SWUBR08-080EZP	●	8	7	6.7	11	74.4	4	15	0.2	No	SB-2035TR	FT-6	WB□T0802... WB□W0802...	EZH070...

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts (S-SWUB-EZP / C-SWUB-EZP)

Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Cast iron	Non-Ferrous metals	Hard materials
Insert								
Chipbreaker type	L-CF	L-PF	L-DP	L-P	L-F	No CB	PCD	CBN
Page	B105	B105	B105	B106	B106	B106	C51	C28

Recommended cutting conditions **F158, F159**



····SWUBR06···· Insert mounting side

Right-hand shown

How to mount EZ Bars

How to use adjustment pin (Fig. 1)

1. Put the adjustment pin into the hole.
2. Push it into the sleeve, using the wrench (LW-1.5).
3. Tightening the clamp screw (HS3X4P) with wrench (LW-1.5) to fix the adjustment pin.

How to fix bar (Fig. 2)

1. With the chip pocket upward, set the bar into the sleeve. Press the slant of the end of the bar with the adjustment pin. Make sure that the bar does not move (Fig. 3)
2. Tighten the clamp screw with wrench (LW-2) and fix the bar. Use LW-1.5 if shank dia.is 3 mm or less.

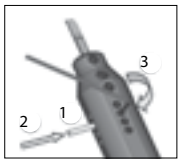


Fig. 5
How to use adjustment pin

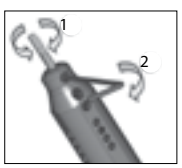


Fig. 6
How to fix bar

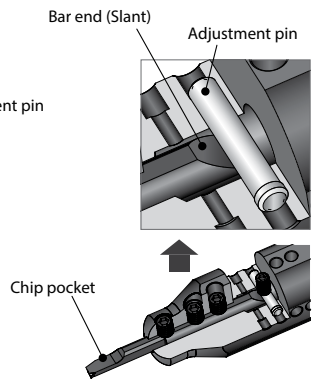


Fig. 7: Fixed bar

EZH-CT (Adjustable with coolant hole)

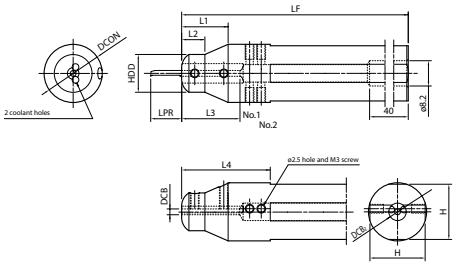


Fig. 1

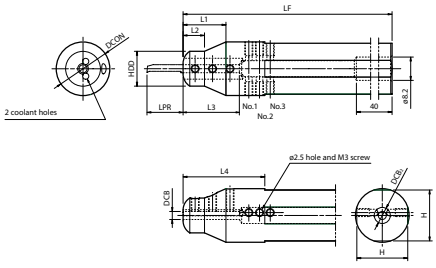


Fig. 2

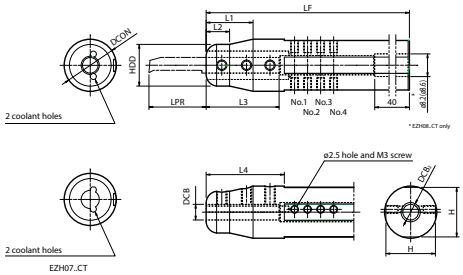


Fig. 3

Sleeve dimensions

Description		Availability	Dimension (mm)													Fig.	Applicable EZ bars F16~F26, F28 G70 J40
			DCB	DCB2	DCON	H	HDD	LF	L1	L2	L3	L4	LPR				
													No.1	No.2	No.3		
EZH	01719CT-120	●	1.7	6	19.05	18	13	120	16	8	16	30.5	7.5	3.5	-	1	EZBR...017...
	01720CT-120	●			20	19											
	01722CT-135	●			22	21		135				41.5					
	01725.0CT-135	●			25	24											
	01725.4CT-120	●			25.4	24.4		120				30.5					
EZH	02019CT-120	●	2	6	19.05	18	13	120	16	8	20	30.5	8.5	4.5	-	1	EZB[R/L]...020... EZBPR...020...
	02020CT-120	●			20	19											
	02022CT-135	●			22	21		135				41.5					
	02025.0CT-135	●			25	24											
	02025.4CT-120	●			25.4	24.4		120				30.5					
EZH	02519CT-120	●	2.5	6	19.05	18	13	120	16	8	20	30.5	11	7	-	1	EZB[R/L]...025... EZTR...025...
	02520CT-120	●			20	19											
	02522CT-135	●			22	21		135				41.5					
	02525.0CT-135	●			25	24											
	02525.4CT-120	●			25.4	24.4		120				30.5					
EZH	03019CT-120	●	3	6	19.05	18	13	120	16	8	21	30.5	13.5	9.5	5.5	2	EZB[R/L]...030... EZBFR...030... EZBPR...030... EZVBR...030... EZGR...030... EZTR...030...
	03020CT-120	●			20	19											
	03022CT-135	●			22	21		135				41.5					
	03025.0CT-135	●			25	24											
	03025.4CT-120	●			25.4	24.4		120				30.5					
EZH	03519CT-120	●	3.5	6	19.05	18	13	120	16	8	21	31.1	15.5	11.5	7.5	2	EZB[R/L]...035... EZTR...035...
	03520CT-120	●			20	19											
	03522CT-135	●			22	21		135				41.5					
	03525.0CT-135	●			25	24											
	03525.4CT-120	●			25.4	24.4		120				31.1					

L3 shows DCB length.
LPR shows overhang length of the EZB Bar when attached to sleeve.
Choose sleeves (DCB) to meet with DCON dimension of bar.
A hole on the rear end of sleeve is prepared hole for Rc1/8 threading. Please modify by additional processing if necessary. The body hardness is 42HRC.
For how to fix EZ Bars (EZH-CT sleeve), please refer to **F8**.

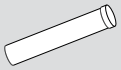
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

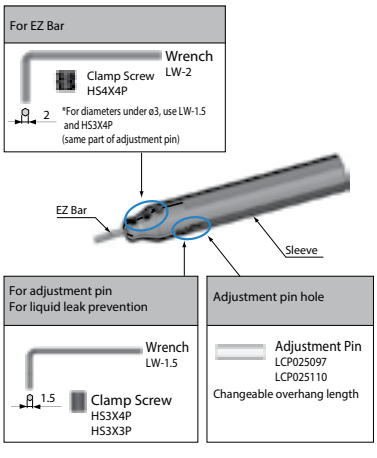
Sleeve dimensions

Description		Availability	Dimension (mm)														Fig.	Applicable EZ bars F16~F36 G70, G102 J40
			DCB	DCB2	DCON	H	HDD	LF	L1	L2	L3	L4	LPR No.1	LPR No.2	LPR No.3	LPR No.4		
EZH	04019CT-120	●	4	6	19.05	18	13	120	16	8	22	32.7	20.5	16.5	12.5	8.5	3	EZB$^{R/L}$...040..., EZBFR...040... EZBPR...040..., EZVBR...040... EZBTR...040..., EZG$^{R/L}$...040... EZFG$^{R/L}$...040..., EZTR...040...
	04020CT-120	●			20	19												
	04022CT-135	●			22	21		135				41.5						
	04025.0CT-135	●			25	24						32.7						
	04025.4CT-120	●			25.4	24.4		120										
EZH	04519CT-120	●	4.5	6	19.05	18	16	120	18	9	23	30	23 (14)	18.5 (9.5)	14 (-)	9.5 (-)	3	EZB$^{R/L}$...045... _045X...-050EZP
	04520CT-120	●			20	19												
	04522CT-135	●			22	21		135				44						
	04525.0CT-135	●			25	24						30						
	04525.4CT-120	●			25.4	24.4		120										
EZH	05019CT-120	●	5	6	19.05	18	16	120	18	9	26	30	25.5 (15.5)	20.5 (10.5)	15.5 (-)	10.5 (-)	3	EZB$^{R/L}$...050..., EZBFR...050... EZBPR...050..., EZBCR...050... EZVBR...050..., EZBTR...050... _050X...-060EZP, EZG$^{R/L}$...050... EZFG$^{R/L}$...050..., EZTR...050...
	05020CT-120	●			20	19												
	05022CT-135	●			22	21		135				44						
	05025.0CT-135	●			25	24						30						
	05025.4CT-120	●			25.4	24.4		120										
EZH	06019CT-120	●	6	7.4	19.05	18	16	120	18	9	28	30	30.5 (18.5)	25.5 (13.5)	20.5 (-)	15.5 (-)	3	EZB$^{R/L}$...060..., EZBFR...060... EZBPR...060..., EZBCR...060... EZVBR...060..., _060X...-070EZP EZG$^{R/L}$...060..., EZTR...060...
	06020CT-120	●			20	19												
	06022CT-135	●			22	21		135				41.5						
	06025.0CT-135	●			25	24						30						
	06025.4CT-120	●			25.4	24.4		120										
EZH	07019CT-120	●	7	7.4	19.05	18	16	120	18	9	29	30	35.5 (21.5)	30.5 (16.5)	25.5 (11.5)	20.5 (-)	3	EZB$^{R/L}$...070..., EZBCR...070... _070X...-080EZP, EZG$^{R/L}$...070... EZFG$^{R/L}$...070..., EZTR...070...
	07020CT-120	●			20	19												
	07022CT-135	●			22	21		135				44						
	07025.0CT-135	●			25	24						30						
	07025.4CT-120	●			25.4	24.4		120										
EZH	08019CT-120	●	8	8.6	19.05	18	16	120	18	9	33	34	40.5 (24.5)	35.5 (19.5)	30.5 (14.5)	25.5 (-)	3	EZB$^{R/L}$...080... _080X...-100EZP
	08020CT-120	●			20	19												
	08022CT-135	●			22	21		135				44						
	08025.0CT-135	●			25	24						34						
	08025.4CT-120	●			25.4	24.4		120										

L3 shows DCB length.
LPR shows overhang length of the EZB Bar when attached to sleeve. ( ) value indicates the overhang length when installed the steel boring bar (EZ Bar PLUS).
Choose sleeves (DCB) to meet with DCON dimension of bar.
A hole on the rear end of sleeve is prepared hole for Rc1/8 threading. Please modify by additional processing if necessary. The body hardness is 42HRC.
For how to fix EZ Bars (EZH-CT sleeve), please refer to **F8**.

Spare parts description (for EZH-CT Sleeves)

Description		Spare parts				
		Adjustment pin	Clamp screw (for adjustment pin)	Wrench	Clamp screw (for bar)	Wrench
						
EZH	017...CT-.. 020...CT-.. 025...CT-.. 030...CT-..	LCP025097	HS3X4P (for adjustment pin and liquid leak prevention)	LW-1.5 Tightening torque 1N·m	HS3X4P	LW-1.5 Tightening torque 1N·m
EZH	035...CT-.. 040...CT-.. 045...CT-.. 050...CT-.. 060...CT-.. 070...CT-..	LCP025097	HS3X4P (for adjustment pin and liquid leak prevention)	LW-1.5 Tightening torque 1N·m	HS4X4P (for bar)	LW-2 Tightening torque 2N·m
	080...CT-..	LCP025110	HS3X3P (for adjustment pin and liquid leak prevention)			



1) If shank dia. is ø2.5mm or less, use clamp screw (HS3X4P)

For adjustment pin	2 pcs
For liquid leak prevention	2 pcs
For EZ Bar	2 pcs

2) If shank dia. is ø3mm, use clamp screw (HS3X4P)

For adjustment pin	2 pcs
For liquid leak prevention	4 pcs
For EZ Bar	3 pcs

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

EZH-HP (Adjustable)

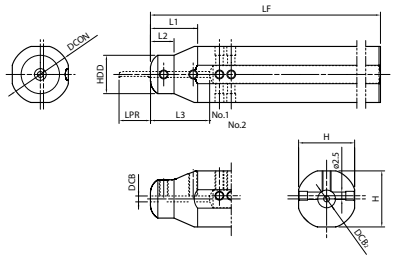


Fig. 1

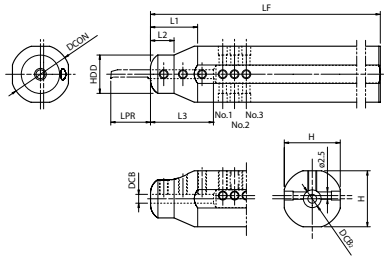


Fig. 2

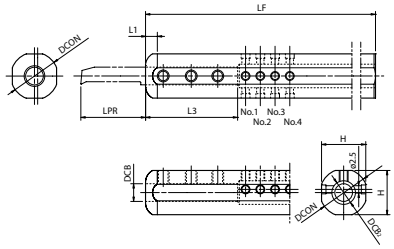


Fig. 3

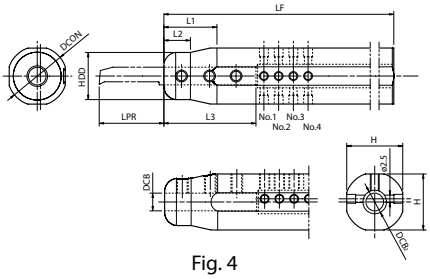


Fig. 4

F

Boring

Solid
Positive
KAV
Negative

Sleeve dimensions

Description		Availability	Dimension (mm)													Fig.	Applicable EZ bars
			DCB	DCB2	DCON	H	HDD	LF	L1	L2	L3	LPR No.1	LPR No.2	LPR No.3	LPR No.4		F16~F26, F28 G70 J40
EZH	01716HP-100	●	1.7	6	16	15	13	100	16	8	16	7.5	3.5	-	-	1	EZBR...017...
	01719HP-120	●			19.05	18		120									
	01720HP-120	●			20	19											
	01722HP-135	●			22	21		135									
	01725.0HP-135	●			25	24											
	01725.4HP-120	●			25.4	24.4		120									
EZH	02016HP-100	●	2	6	16	15	13	100	16	8	20	8.5	4.5	-	-	1	EZB[R/L]...020... EZBPR...020...
	02019HP-120	●			19.05	18		120									
	02020HP-120	●			20	19											
	02022HP-135	●			22	21		135									
	02025.0HP-135	●			25	24											
	02025.4HP-120	●			25.4	24.4		120									
EZH	02516HP-100	●	2.5	6	16	15	13	100	16	8	20	11	7	-	-	1	EZB[R/L]...025... EZTR...025...
	02519HP-120	●			19.05	18		120									
	02520HP-120	●			20	19											
	02522HP-135	●			22	21		135									
	02525.0HP-135	●			25	24											
	02525.4HP-120	●			25.4	24.4		120									
EZH	03016HP-100	●	3	6	16	15	13	100	16	8	21	13.5	9.5	5.5	-	2	EZB[R/L]...030... EZBFR...030... EZBPR...030... EZVBR...030... EZGR...030... EZTR...030...
	03019HP-120	●			19.05	18		120									
	03020HP-120	●			20	19											
	03022HP-135	●			22	21		135									
	03025.0HP-135	●			25	24											
	03025.4HP-120	●			25.4	24.4		120									
EZH	03516HP-100	●	3.5	6	16	15	13	100	16	8	22	15.5	11.5	7.5	-	2	EZB[R/L]...035... EZTR...035...
	03519HP-120	●			19.05	18		120									
	03520HP-120	●			20	19											
	03522HP-135	●			22	21		135									
	03525.0HP-135	●			25	24											
	03525.4HP-120	●			25.4	24.4		120									

L3 shows DCB length.
LPR shows overhang length of the EZB Bar when attached to sleeve.
Choose sleeves (DCB) to meet with DCON dimension of bar.
For how to fix EZ Bars (EZH-HP sleeve), please refer to **F37**.

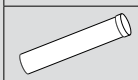
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Sleeve dimensions

Description		Availability	Dimension (mm)													Fig.	Applicable EZ bars F16~F36 G70, G102 J40
			DCB	DCB2	DCON	H	HDD	LF	L1	L2	L3	LPR No.1	LPR No.2	LPR No.3	LPR No.4		
EZH	04016HP-100	●	4	6	16	15	13	100	16	8	24	20.5	16.5	12.5	8.5	4	EZB$^{R}_{L}$...040..., EZBFR...040... EZBPR...040..., EZVBR...040... EZBTR...040..., EZG$^{R}_{L}$...040... EZFG$^{R}_{L}$...040..., EZTR...040...
	04019HP-120	●			19.05	18		120									
	04020HP-120	●			20	19											
	04022HP-135	●			22	21		135									
	04025.0HP-135	●			25	24											
	04025.4HP-120	●			25.4	24.4		120									
EZH	04516HP-100	●	4.5	6	16	15	16	100	4	-	25.3	23 (14)	18.5 (9.5)	14 (-)	9.5 (-)	3	EZB$^{R}_{L}$...045... _045X...-050EZP
	04519HP-120	●			19.05	18		120	18	9						4	
	04520HP-120	●			20	19											
	04522HP-135	●			22	21		135									
	04525.0HP-135	●			25	24											
	04525.4HP-120	●			25.4	24.4		120									
EZH	05016HP-100	●	5	6	16	15	16	100	4	-	29	25.5 (15.5)	20.5 (10.5)	15.5 (-)	10.5 (-)	3	EZB$^{R}_{L}$...050..., EZBFR...050... EZBPR...050..., EZBCR...050... EZVBR...050..., EZBTR...050... _050X...-060EZP, EZG$^{R}_{L}$...050... EZFG$^{R}_{L}$...050..., EZTR...050...
	05019HP-120	●			19.05	18		120	18	9						4	
	05020HP-120	●			20	19											
	05022HP-135	●			22	21		135									
	05025.0HP-135	●			25	24											
	05025.4HP-120	●			25.4	24.4		120									
EZH	06016HP-100	●	6	8	16	15	16	100	4	-	31	30.5 (18.5)	25.5 (13.5)	20.5 (-)	15.5 (-)	3	EZB$^{R}_{L}$...060..., EZBFR...060... EZBPR...060..., EZBCR...060... EZVBR...060..., _060X...-070EZP EZG$^{R}_{L}$...060..., EZTR...060...
	06019HP-120	●			19.05	18		120	18	9						4	
	06020HP-120	●			20	19											
	06022HP-135	●			22	21		135									
	06025.0HP-135	●			25	24											
	06025.4HP-120	●			25.4	24.4		120									
EZH	07016HP-100	●	7	8	16	15	16	100	4	-	33	35.5 (21.5)	30.5 (16.5)	25.5 (11.5)	20.5 (-)	3	EZB$^{R}_{L}$...070..., EZBCR...070... _070X...-080EZP, EZG$^{R}_{L}$...070... EZFG$^{R}_{L}$...070..., EZTR...070...
	07019HP-120	●			19.05	18		120	18	9						4	
	07020HP-120	●			20	19											
	07022HP-135	●			22	21		135									
	07025.0HP-135	●			25	24											
	07025.4HP-120	●			25.4	24.4		120									
EZH	08019HP-120	●	8	8.4	19.05	18	16	120	18	9	37	40.5 (24.5)	35.5 (19.5)	30.5 (14.5)	25.5 (-)	4	EZB$^{R}_{L}$...080... _080X...-100EZP
	08020HP-120	●			20	19											
	08022HP-135	●			22	21		135									
	08025.0HP-135	●			25	24											
	08025.4HP-120	●			25.4	24.4		120									

L3 shows DCB length.
LPR shows overhang length of the EZB Bar when attached to sleeve. ( ) value indicates the overhang length when installed the steel boring bar (EZ Bar PLUS).
Choose sleeves (DCB) to meet with DCON dimension of bar.
For how to fix EZ Bars (EZH-HP sleeve), please refer to **F37**.

Spare parts description (for EZH-HP Sleeves)

Description		Spare parts: Adjustment pin	Clamp screw (for Adjustment Pin)	Wrench	Clamp screw (for Bar)	Wrench	Applicable EZ Bars EZ Bar PLUS
							
EZH	017...HP-..	LCP025140	HS3X4P (for both adjustment pin and bar)	LW-1.5 Tightening torque 1N·m	HS3X4P	LW-1.5 Tightening torque 1N·m	EZBR...017...
	020...HP-..						EZB$^{R}_{L}$...020... EZ_R...020-...
	025...HP-..						EZB$^{R}_{L}$...025... EZ_R...025-...
	030...HP-..						EZB$^{R}_{L}$...030... EZ_R...030-...
EZH	035...HP-..	LCP025140	HS3X4P	LW-1.5 Tightening torque 1N·m	HS4X4P	LW-2 Tightening torque 2N·m	EZB$^{R}_{L}$...035... EZ_R...035-...
	040...HP-..						EZB$^{R}_{L}$...040... EZ_$^{R}_{L}$...040-...
	045...HP-..						EZB$^{R}_{L}$...045... _045X-...-050EZP
	050...HP-..						EZB$^{R}_{L}$...050... EZ_$^{R}_{L}$...050-... _050X-...-060EZP
	060...HP-..						EZB$^{R}_{L}$...060... EZ_$^{R}_{L}$...060-... _060X-...-070EZP
	070...HP-..						EZB$^{R}_{L}$...070... EZ_$^{R}_{L}$...070-... _070X-...-080EZP
	080...HP-..						EZB$^{R}_{L}$...080... _080X-...-100EZP

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

EZH-ST (Not-adjustable)

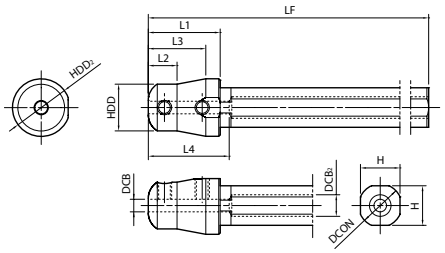


Fig. 1

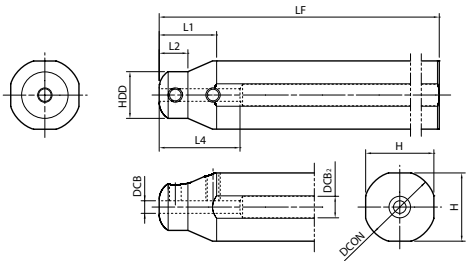


Fig. 2

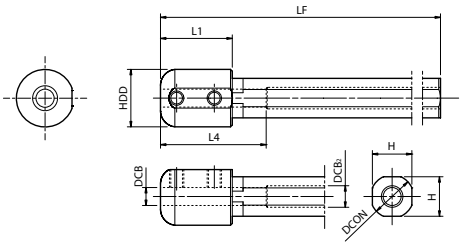


Fig. 3

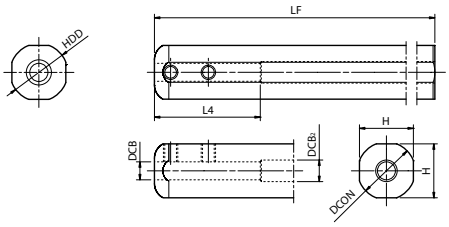


Fig. 4

Sleeve dimensions

Description		Availability	Dimension (mm)											Fig.	Applicable EZ bars F16~F26, F28 G70 J40
			DCB	DCB2	DCON	H	HDD	HDD2	LF	L1	L2	L3	L4		
EZH	01712ST-80	●			12	11		16	80	20		16		1	
	01716ST-100	●			16	15			100						
	01719ST-120	●			19.05	18			120						
	01720ST-120	●	1.7	6	20	19	13	-		16	8	-	16	2	EZBR...017...
	01722ST-135	●			22	21			135						
	01725.0ST-135	●			25	24									
	01725.4ST-120	●			25.4	24.4			120						
EZH	02012ST-80	●			12	11		16	80	20		16		1	
	02016ST-100	●			16	15			100						
	02019ST-120	●			19.05	18			120						
	02020ST-120	●	2	6	20	19	13	-		16	8	-	20	2	EZB$^{R}_{L}$...020... EZBPR...020...
	02022ST-135	●			22	21			135						
	02025.0ST-135	●			25	24									
	02025.4ST-120	●			25.4	24.4			120						
EZH	02512ST-80	●			12	11		16	80	20		16		1	
	02516ST-100	●			16	15			100						
	02519ST-120	●			19.05	18			120						
	02520ST-120	●	2.5	6	20	19	13	-		16	8	-	20	2	EZB$^{R}_{L}$...025... EZTR...025...
	02522ST-135	●			22	21			135						
	02525.0ST-135	●			25	24									
	02525.4ST-120	●			25.4	24.4			120						
EZH	03012ST-80	●			12	11		16	80	20		16		1	
	03016ST-100	●			16	15			100						
	03019ST-120	●			19.05	18			120						
	03020ST-120	●	3	6	20	19	13	-		16	8	-	21	2	EZB$^{R}_{L}$...030... EZBFR...030... EZBPR...030... EZVBR...030... EZGR...030... EZTR...030...
	03022ST-135	●			22	21			135						
	03025.0ST-135	●			25	24									
	03025.4ST-120	●			25.4	24.4			120						

L4 shows DCB length.
Choose sleeves (DCB) to meet with DCON dimension of bar.
Adjustment pin cannot be installed to EZH-ST sleeves. To adjust overhang of the bar, please use EZH-CT / HP sleeves.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Sleeve dimensions

Description		Availability	Dimension (mm)											Fig.	Applicable EZ bars F16~F36 G70, G102 J40
			DCB	DCB2	DCON	H	HDD	HDD2	LF	L1	L2	L3	L4		
EZH	03512ST-80	●	3.5	6	12	11	13	16	80	20	8	16	22	1	EZB$^{R/L}$...035... EZTR...035...
	03516ST-100	●			16	15		-	100	16		-		2	
	03519ST-120	●			19.05	18			120						
	03520ST-120	●			20	19									
	03522ST-135	●			22	21			135						
	03525.0ST-135	●			25	24									
	03525.4ST-120	●			25.4	24.4			120						
EZH	04012ST-80	●	4	6	12	11	13	16	80	20	8	16	24	1	EZB$^{R/L}$...040..., EZBFR...040... EZBPR...040..., EZVBR...040... EZBTR...040..., EZG$^{R/L}$...040... EZFG$^{R/L}$...040..., EZTR...040...
	04016ST-100	●			16	15		-	100	16		-		2	
	04019ST-120	●			19.05	18			120						
	04020ST-120	●			20	19									
	04022ST-135	●			22	21			135						
	04025.0ST-135	●			25	24									
	04025.4ST-120	●			25.4	24.4			120						
EZH	05012ST-80	●	5	6	12	11	16	-	80	20	-	-	29	3	EZB$^{R/L}$...050..., EZBFR...050... EZBPR...050..., EZBCR...050... EZVBR...050..., EZBTR...050... _050X...-060EZP, EZG$^{R/L}$...050... EZFG$^{R/L}$...050..., EZTR...050...
	05016ST-100	●			16	15			100	-				4	
	05019ST-120	●			19.05	18			120	18	9			2	
	05020ST-120	●			20	19									
	05022ST-135	●			22	21			135						
	05025.0ST-135	●			25	24									
	05025.4ST-120	●			25.4	24.4			120						
EZH	06012ST-80	●	6	8	12	11	16	-	80	20	-	-	31	3	EZB$^{R/L}$...060..., EZBFR...060... EZBPR...060..., EZBCR...060... EZVBR...060..., _060X...-070EZP EZG$^{R/L}$...060..., EZTR...060...
	06016ST-100	●			16	15			100	-				4	
	06019ST-120	●			19.05	18			120	18	9			2	
	06020ST-120	●			20	19									
	06022ST-135	●			22	21			135						
	06025.0ST-135	●			25	24									
	06025.4ST-120	●			25.4	24.4			120						
EZH	07012ST-80	●	7	8	12	11	16	-	80	20	-	-	33	3	EZB$^{R/L}$...070..., EZBCR...070... _070X...-080EZP, EZG$^{R/L}$...070... EZFG$^{R/L}$...070..., EZTR...070...
	07016ST-100	●			16	15			100	-				4	
	07019ST-120	●			19.05	18			120	18	9			2	
	07020ST-120	●			20	19									
	07022ST-135	●			22	21			135						
	07025.0ST-135	●			25	24									
	07025.4ST-120	●			25.4	24.4			120						
EZH	08016ST-100	●	8	8.4	16	15	16	-	100	-	-	-	37	4	EZB$^{R/L}$...080... _080X...-100EZP
	08019ST-120	●			19.05	18			120	18	9			2	
	08020ST-120	●			20	19									
	08022ST-135	●			22	21			135						
	08025.0ST-135	●			25	24									
	08025.4ST-120	●			25.4	24.4			120						

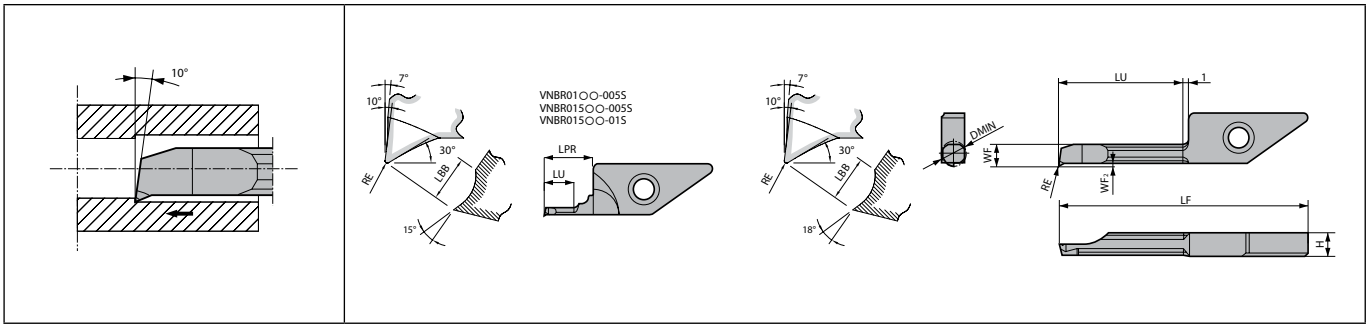
L4 shows DCB length.
Choose sleeves (DCB) to meet with DCON dimension of bar.
Adjustment pin cannot be installed to EZH-ST sleeves. To adjust overhang of the bar, please use EZH-CT / HP sleeves.

Spare parts description (for EZH-ST Sleeves)

Description		Spare parts		Applicable EZ Bars		EZ Bar PLUS
		Clamp screw	Wrench	EZB-HP EZB-HP-LT EZB-ST EZB-NB	EZBT / EZBF EZBP / EZBC EZVB / EZG EZFG / EZT	S/C-SCLC S/C-STLB(P) S/C-SWUB
						
EZH	017...ST-..	HS3X4P	LW-1.5 Tightening torque 1N-m	EZBR…017…	-	-
	020...ST-..			EZB$^{R/L}$…020…	EZ_R…020-…	-
	025...ST-..			EZB$^{R/L}$…025…	EZTR…025-…	-
	030...ST-..			EZB$^{R/L}$…030…	EZ_R…030-…	-
EZH	035...ST-..	HS4X4P	LW-2 Tightening torque 2N-m	EZB$^{R/L}$…035…	EZTR…035-…	-
	040...ST-..			EZB$^{R/L}$…040…	EZ_$^{R/L}$…040-…	-
	050...ST-..			EZB$^{R/L}$…050…	EZ_$^{R/L}$…050-…	_050X-…-060EZP
	060...ST-..			EZB$^{R/L}$…060…	EZ_$^{R/L}$…060-…	_060X-…-070EZP
	070...ST-..			EZB$^{R/L}$…070…	EZ_$^{R/L}$…070-…	_070X-…-080EZP
	080...ST-..			EZB$^{R/L}$…080…	-	_080X-…-100EZP

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

VNB-S (Boring)



Right-hand shown

Dimensions

Description	No. of edges	Dimension (mm)									Tolerance (mm)		Carbide		Applicable toolholder ➡ F48~F51
		DMIN	H	LPR	LBB	LF	LU	WF	WF_2	RE	RE min.	RE max.	PVD PR1225	PVD PR930	
VNBR 0103-005S	1	1	3.9	7	0.7	26.5	3	0.85	0.2	0.05	- 0.02	0	●	●	SVNR...-12N S...-SVNR12N S...-SVNR12SN
VNBR 0105-005S	1	1	3.9	7	0.7	26.5	5	0.85	0.2	0.05	- 0.02	0	●	●	
VNBR 01503-005S	1	1.5	3.9	7	0.7	26.5	3	1.3	0.2	0.05	- 0.02	0	●	●	
01503-01S							3			0.1	- 0.03		●	●	
01505-005S							5			0.05	- 0.02		●	●	
01505-01S							5			0.1	- 0.03		●	●	
VNBR 0206-005S	1	2	3.9	-	0.8	26.5	6	1.8	0.25	0.05	- 0.02	0	●	●	SVNR...-12N, SVNSR-12-06N S...-SVNR12N, S...-SVNR12SN
0206-01S										0.1	- 0.03		●	●	
VNBR 025075-005S	1	2.5	3.9	-	0.8	28.1	7.5	2.1	0.4	0.05	- 0.02	0	●	●	SVNR...-12NS..., -SVNR12N S...-SVNR12SN
025075-01S										0.1	- 0.03		●	●	
VNBR 0311-005S	1	3	3.9	-	0.8	30.8	11	2.6	0.4	0.05	- 0.02	0	●	●	SVNR...-12N, SVNSR-12-11N S...-SVNR12N, S...-SVNR12SN
0311-01S										0.1	- 0.03		●	●	
VNBR 03515-005S	1	3.5	3.9	-	0.8	34.8	15	3	0.5	0.05	- 0.02	0	●	●	SVNR...-12NS..., -SVNR12N S...-SVNR12SN
03515-01S										0.1	- 0.03		●	●	
VNBR 0411-005S	1	4	3.66	-	0.8	30.8	11	3.5	0.5	0.05	- 0.02	0	●	●	SVNR...-12N, SVNSR-12-11N S...-SVNR12N, S...-SVNR12SN
0411-01S										0.1	- 0.03		●	●	
0411-02S										0.2	- 0.04		●	●	
VNBR 0420-005S	1	4	3.66	-	0.8	39.8	20	3.5	0.5	0.05	- 0.02	0	●	●	SVNR...-12N, SVNSR-12-20N S...-SVNR12N, S...-SVNR12SN
0420-01S										0.1	- 0.03		●	●	
0420-02S										0.2	- 0.04		●	●	

Recommended cutting conditions (VNB-S)

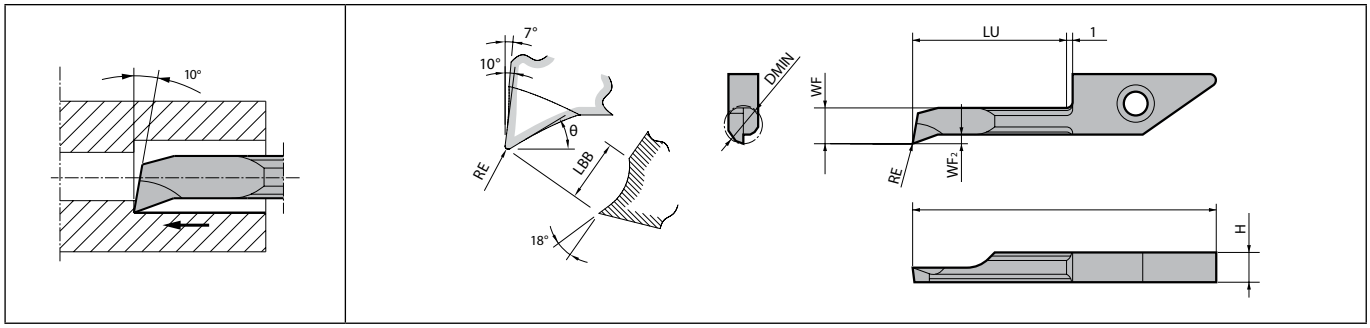
Workpiece material	Insert grades (Vc: m/min)		VNB01-S VNB015-S		VNB02-S ~ VNB04-S		Remarks
	MEGACOAT	PVD coated carbide					
	PR1225	PR930	ap (mm), f (mm/rev)				
			ap	f	ap	f	
Carbon steel / Alloy steel	★ 30~120	☆ 30~100	~0.1	~0.01	~0.2	~0.03	Coolant
Stainless steel	★ 30~100	☆ 30~80	~0.1	~0.01	~0.2	~0.02	

★1st recommendation ☆2nd recommendation

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

System tip-bars are 5 piece boxes

VNB (Boring)



Right-hand shown

Dimensions

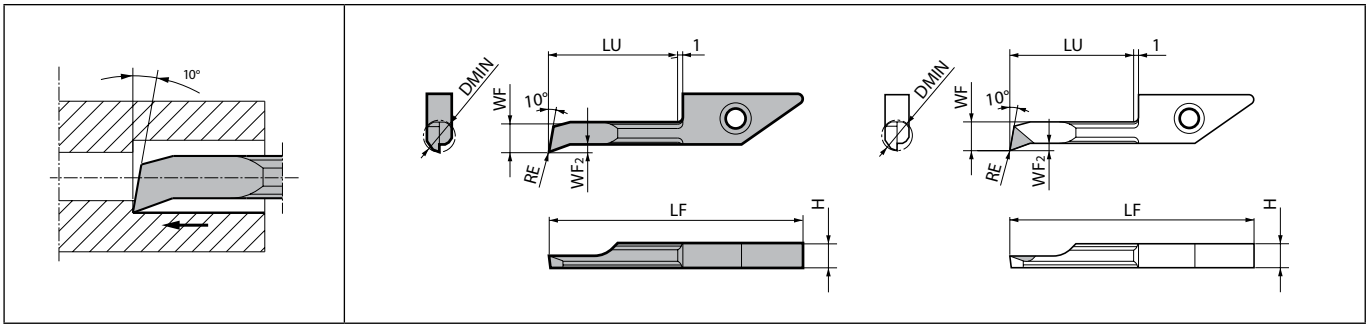
Description	No. of edges	Dimension (mm)								Angle	Carbide			Applicable toolholder F48~F51
		DMIN	H	LBB	LF	LU	WF	WF_2	RE	θ (°)	PVD		-	
											PR1225	PR930	KW10	
VNBR 0206-003	1	2	3.9	1.2	26.5	6	1.8	0.25	0.03	24	●	●	●	SVNR...-12N, SVNSR-12-06N
VNBR 0206-01									0.1		●	●	●	S...-SVNR12N, S...-SVNR12SN
VNBR 0206-02									0.2		●	●	●	
VNBR 0311-003	1	3	3.9	1.8	30.8	11	2.6	0.4	0.03	24	●	●	●	SVNR...-12N, SVNSR-12-11N
VNBR 0311-01									0.1		●	●	●	S...-SVNR12N, S...-SVNR12SN
VNBR 0311-02									0.2		●	●	●	
VNBR 0411-003	1	4	3.66	2.7	30.8	11	3.5	0.5	0.03	23	●	●	●	SVNR...-12N, SVNSR-12-11N
VNBR 0411-01									0.1		●	●	●	S...-SVNR12N, S...-SVNR12SN
VNBR 0411-02									0.2		●	●	●	
VNBR 0420-003	1	4	3.66	2.7	39.8	20	3.5	0.5	0.03	23	●	●	●	SVNR...-12N, SVNSR-12-20N
VNBR 0420-01									0.1		●	●	●	S...-SVNR12N, S...-SVNR12SN
VNBR 0420-02									0.2		●	●	●	
VNBR 0511-003	1	5	3.9	3	30.8	11	4.5	0.7	0.03	23	●	●	●	SVNR...-12N, SVNSR-12-11N
VNBR 0511-01									0.1		●	●	●	S...-SVNR12N, S...-SVNR12SN
VNBR 0511-02									0.2		●	●	●	
VNBR 0520-003	1	5	3.9	3	39.8	20	4.5	0.7	0.03	23	●	●	●	SVNR...-12N, SVNSR-12-20N
VNBR 0520-01									0.1		●	●	●	S...-SVNR12N, S...-SVNR12SN
VNBR 0520-02									0.2		●	●	●	
VNBR 0620-003	1	6	3.9	3	39.8	20	5.3	1	0.03	24	●	●	●	SVNR...-12N, SVNSR-12-20N
VNBR 0620-01									0.1		●	●	●	S...-SVNR12N, S...-SVNR12SN
VNBR 0620-02									0.2		●	●	●	
VNBR 0630-003	1	6	3.9	3	49.8	30	5.3	1	0.03	24	●	●	●	SVNR...-12N
VNBR 0630-01									0.1		●	●		S...-SVNR12N
VNBR 0630-02									0.2		●	●	●	S...-SVNR12SN
VNBR 0720-003	1	7	3.9	3	39.8	20	6.2	1	0.03	24		●	●	SVNR...-12N, SVNSR-12-20N
VNBR 0720-01									0.1			●	●	S...-SVNR12N, S...-SVNR12SN
VNBR 0720-02									0.2		●	●	●	
VNBR 0730-003	1	7	3.9	3	49.8	30	6.2	1	0.03	24		●	●	SVNR...-12N
VNBR 0730-01									0.1			●		S...-SVNR12N
VNBR 0730-02									0.2		●	●	●	S...-SVNR12SN

Recommended cutting conditions F47

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

System tip-bars are sold in 5 piece boxes

VNB-NB (Boring)



Right-hand shown

Dimensions

Description	No. of edges	Dimension (mm)							Angle	Carbide		PCD	Applicable toolholder ➡ F48~F51
		DMIN	H	LF	LU	WF	WF_2	RE	θ (°)	PVD PR930	- KW10	- KPD001	
VNBR 0206-003NB 0206-02NB	1	2	3.9	26.5	6	1.8	0.25	0.03 0.2	15	● ●	● ●		SVNR...-12N, SVNSR-12-06N S...-SVNR12N, S...-SVNR12SN
VNBR 0311-003NB 0311-02NB	1	3	3.9	30.8	11	2.6	0.4	0.03 0.2	15	● ●	● ●		SVNR...-12N, SVNSR-12-11N S...-SVNR12N, S...-SVNR12SN
VNBR 0411-003NB 0411-02NB	1	4	3.66	30.8	11	3.5	0.5	0.03 0.2	15	● ●	● ●	 ●	SVNR...-12N, SVNSR-12-11N S...-SVNR12N, S...-SVNR12SN
VNBR 0420-003NB 0420-02NB	1	4	3.66	39.8	20	3.5	0.5	0.03 0.2	15	● ●	● ●	 ●	SVNR...-12N, SVNSR-12-20N S...-SVNR12N, S...-SVNR12SN
VNBR 0511-003NB 0511-02NB	1	5	3.9	30.8	11	4.5	0.7	0.03 0.2	15	● ●	● ●	 ●	SVNR...-12N, SVNSR-12-11N S...-SVNR12N, S...-SVNR12SN
VNBR 0520-003NB 0520-02NB	1	5	3.9	39.8	20	4.5	0.7	0.03 0.2	15	● ●	● ●	 ●	SVNR...-12N, SVNSR-12-20N S...-SVNR12N, S...-SVNR12SN
VNBR 0620-003NB 0620-02NB	1	6	3.9	39.8	20	5.3	1	0.03 0.2	15	● ●	● ●	 ●	SVNR...-12N, SVNSR-12-20N S...-SVNR12N, S...-SVNR12SN
VNBR 0630-003NB 0630-02NB	1	6	3.9	49.8	30	5.3	1	0.03 0.2	15	● ●	● ●	 ●	SVNR...-12N, S...-SVNR12N S...-SVNR12SN
VNBR 0720-003NB 0720-02NB	1	7	3.9	39.8	20	6.2	1	0.03 0.2	15	● ●	● ●	 ●	SVNR...-12N, SVNSR-12-20N S...-SVNR12N, S...-SVNR12SN
VNBR 0730-003NB 0730-02NB	1	7	3.9	49.8	30	6.2	1	0.03 0.2	15	● ●	● ●	 ●	SVNR...-12N, S...-SVNR12N S...-SVNR12SN

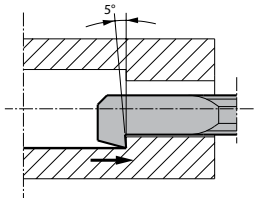
Recommended cutting conditions ➡ F47

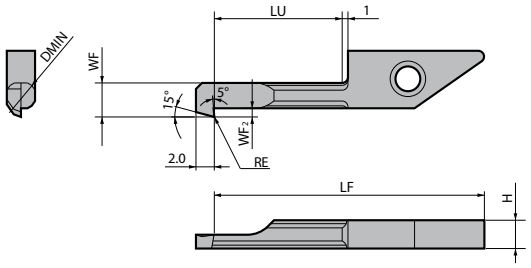
System tip-bars are sold in 5 piece boxes

CBN & PCD Inserts are sold in 1 piece boxes

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

VNBT (Back boring)





Right-hand shown

Dimensions

Description	No. of edges	Dimension (mm)							Carbide			Applicable toolholder F48~F51
		DMIN	H	LF	LU	WF	WF_2	RE	PVD		-	
									PR1225	PR930	KW10	
VNBTR 0411-003	1	4	3.66	28.8	9	3.6	1	0.03		●	●	SVNR...-12N, SVNSR-12-11N
VNBTR 0411-01								0.1	●	●	●	S...-SVNR12N, S...-SVNR12SN
VNBTR 0420-003	1	4	3.66	37.8	18	3.6	1	0.03		●		SVNR...-12N, SVNSR-12-20N
VNBTR 0420-01								0.1	●	●		S...-SVNR12N, S...-SVNR12SN
VNBTR 0511-003	1	5	3.9	28.8	9	4.6	1.3	0.03		●	●	SVNR...-12N, SVNSR-12-11N
VNBTR 0511-01								0.1	●	●	●	S...-SVNR12N, S...-SVNR12SN
VNBTR 0520-003	1	5	3.9	37.8	18	4.6	1.3	0.03		●		SVNR...-12N, SVNSR-12-20N
VNBTR 0520-01								0.1	●	●		S...-SVNR12N, S...-SVNR12SN

Recommended cutting conditions F47

Recommended cutting conditions (VNB / VNB-NB / VNBT)

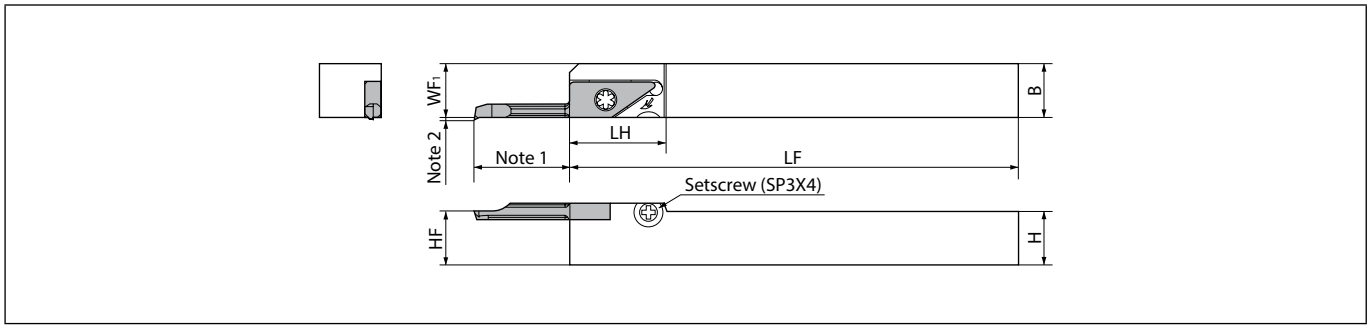
Workpiece material	Insert grades (Vc: m/min)					VNB02		VNB03		VNB04 VNBT04		VNB05 VNB06 VNB07 VNBT05		Remarks
	MEGACOAT	PVD coated carbide	Carbide	PCD										
	PR1225	PR930	KW10	KPD001	KPD010	ap (mm), f (mm/rev)								
						ap	f	ap	f	ap	f	ap	f	
Carbon steel / Alloy steel	★ 30~120	☆ 30~100				~0.3	~0.03	~0.4	~0.04	~0.45	~0.07	~0.5	~0.1	Coolant
Stainless steel	★ 30~100	☆ 30~80				~0.3	~0.02	~0.4	~0.03	~0.45	~0.05	~0.5	~0.07	
Non-ferrous metals			☆ ~100	★ ~300	☆ ~300	~0.3	~0.05	~0.4	~0.06	~0.45	~0.1	~0.5	~0.15	

★1st recommendation ☆2nd recommendation

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

System tip-bars are sold in 5 piece boxes

SVN-N (without side stopper)



Right-hand shown | Right-hand Insert for Right-hand Toolholder.
Note 1 & Note 2 (WF_2) : For insert dimensions, see page (**F44~F47**)

Toolholder dimensions

Description		Availability	Dimension (mm)						Spare parts			Applicable inserts
									Screw	Set screw	Wrench	**F44~F47** **G72, G73** **G104** **J44**
		R	H	B	LH	HF	LF	WF_1				
SVNR	1010H-12N	●	10	10	22	10	100	10	SB-3080TR	SP3X4	FT-10	VNBR...-... VNBTR...-... VNGR...-... VNFGR...-... VNTR...-..
	1212K-12N	●	12	12		12	125	12				
	1616K-12N	●	16	16		16		16				
	2020K-12N	●	20	20		20		20				
	2525M-12N	●	25	25		25	150	25				

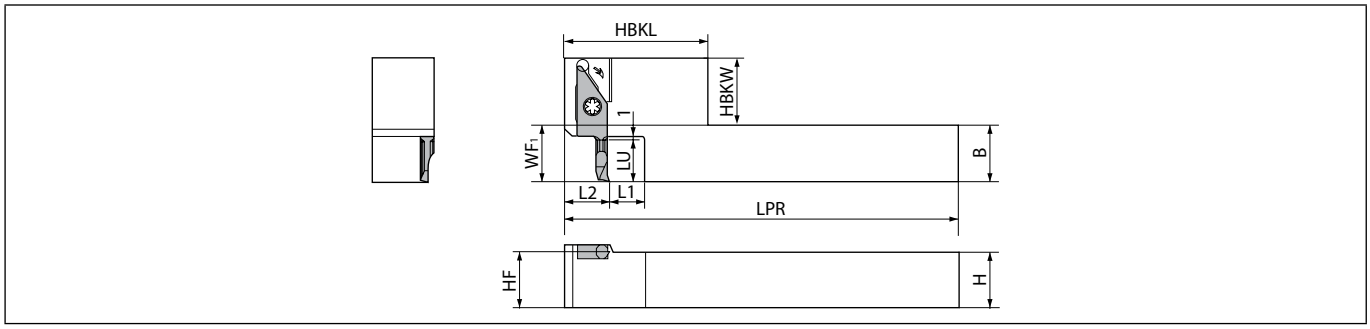
SVN-N (without side stopper) retains high index accuracy by easy restraint.
SVN-N (without side stopper) has a setscrew SP3X4. Changing the setscrew SP3X4 to a screw HS3X4 (sold separately) enables the toolholder to be used as a binding effect toolholder similar to the side stopper toolholder.

Spare parts (Optional)

Screw (Side stopper)	Wrench
	
HS3X4	LW-1.5

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SVNS-N (without side stopper / without setscrew)



Right-hand shown | Right-hand Insert for Right-hand Toolholder.

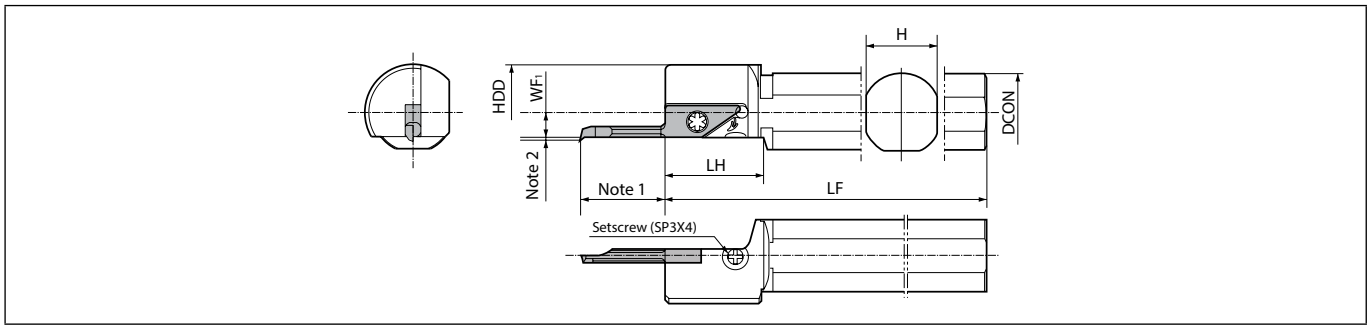
Toolholder dimensions

Description		Availability	Dimension (mm)										Spare parts		Applicable inserts
													Screw	Wrench	F44~F47 G72, G73 J44
		R	H	B	LPR	HF	HBKW	HBKL	LU	WF1	L1	L2			
SVNSR	1010K-12-06N	●	10	10	125	10	19	45	6	10	10	12	SB-3080TR	LTW-10S	VNBR..06...
	1212M-12-06N	●	12	12	150	12	17			12					
	1616M-12-06N	●	16	16		16	13			16	16				
SVNSR	1010K-12-11N	●	10	10	125	10	23	45	11	10	10	12	SB-3080TR	LTW-10S	VNBR..11-..., VNBTR..11-... VNGR...-11, VNTR...-11
	1212M-12-11N	●	12	12	150	12	21			12					
	1616M-12-11N	●	16	16		16	17			16	16				
SVNSR	1212M-12-20N	●	12	12	150	12	30	45	20	12	10	13	SB-3080TR	LTW-10S	VNBR..20-..., VNBTR20-... VNGR...-20
	1616M-12-20N	●	16	16		16	26			16	16				

All system Tip-Bars Inserts are used with a SVNSR-N Toolholders. However, when setting the cutting edge at the face level of the toolholder as shown in the figure, use the applicable inserts described above.
In these cases, the LU dimension of the toolholders corresponds to the LU dimension of the insert.

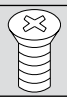
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-SVN-N (Round shank / Standard / without side stopper)



Right-hand shown | Right-hand Insert for Right-hand Toolholder.
Note 1 & Note 2 (WF_2) : For insert dimensions, see page (**F44~F47**)

Toolholder dimensions

Description		Availability	Dimension (mm)						Spare parts			Applicable inserts
									Screw	Set screw	Wrench	
		R	DCON	H	LH	HDD	LF	WF_1				**F44~F47** **G72, G73** **G104** **J44**
S12F-	SVNR12N	●	12	11	23	20	80	4	SB-3080TR	SP3X4	FT-10	VNBR...-... VNBTR...-... VNGR...-... VNFGR...-... VNTR...-..
S14G-	SVNR12N	●	14	13			90					
S16H-	SVNR12N	●	16	15		24	100	6				
S19H-	SVNR12N	●	19.05	17	24							
S19N-	SVNR12N	●					160					
S20H-	SVNR12N	●	20	18			100					
S25H-	SVNR12N	●	25.4	23		30						
S25Q-	SVNR12N	●					180					

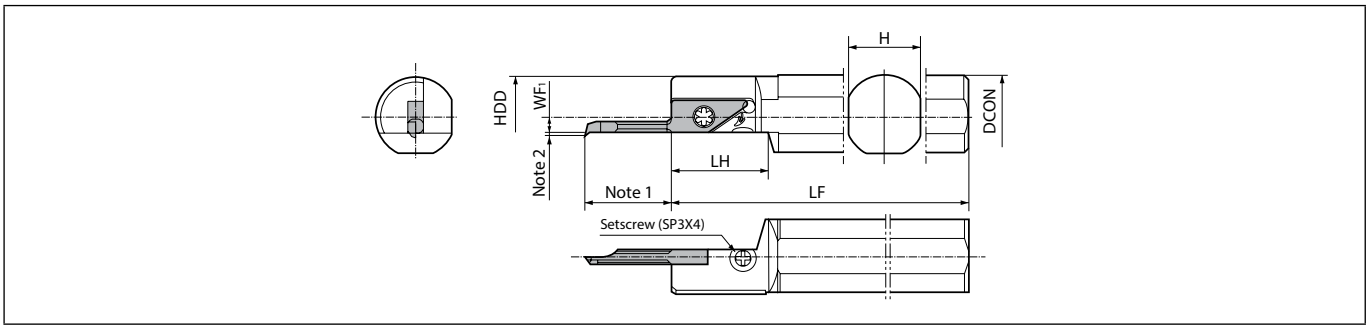
S-SVN-N (without side stopper) retains high index accuracy by easy restraint.
S-SVN-N (without side stopper) has a setscrew SP3X4. Changing the setscrew SP3X4 to a screw HS3X4 (sold separately) enables the toolholder to be used as a binding effect toolholder similar to the side stopper toolholder.

Spare parts (Optional)

Screw (Side stopper)	Wrench
	
HS3X4	LW-1.5

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-SVN-SN (Round shank / Straight / without side stopper)



Right-hand shown | Right-hand Insert for Right-hand Toolholder.
Note 1 & Note 2 (WF_2) : For insert dimensions, see page (**F44~F47**)

F

Boring

Toolholder dimensions

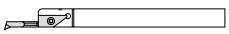
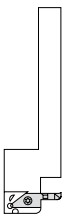
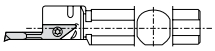
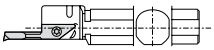
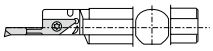
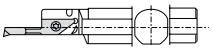
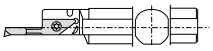
Description	Availability	Dimension (mm)						Spare parts			Applicable inserts
								Screw	Set screw	Wrench	**F44~F47** **G72, G73** **G104** **J44**
	R	DCON	H	LH	HDD	LF	WF_1				
S19H- SVNR12SN	●	19.05	17	23	18.5	100	4	SB-3080TR	SP3X4	FT-10	VNBR...-..., VNBTR...-... VNGR...-..., VNFGR...-... VNTR...-..
S20H- SVNR12SN	●	20	18		19.5						
S22K- SVNR12SN	●	22	20		21.5	125					
S25.0G- SVNR12SN	●	25	23		24.5	90					

Spare parts (Optional)

Screw (Side stopper)	Wrench
HS3X4	LW-1.5

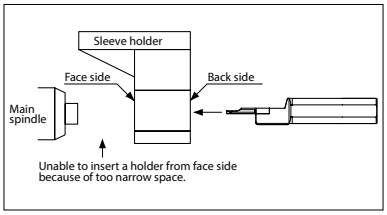
S-SVN-SN (without side stopper) retains high index accuracy by easy restraint.
S-SVN-SN (without side stopper) has a setscrew SP3X4. Changing the setscrew SP3X4 to a screw HS3X4 (sold separately) enables the toolholder to be used as a binding effect toolholder similar to the side stopper toolholder.

Selection of system tip-bars

Gang-Type (Horizontal)	Gang-Type	Gang-Type Front loading sleeve type	Gang-Type Back loading sleeve type
			
Square shank (Straight)	Square shank (L-shape)	Square shank	Square shank
		—	—
Round shank (Standard)		Round shank (Standard)	Round shank (Standard)
			—
Round shank (Straight)		Round shank (Straight)	Round shank (Straight)
			

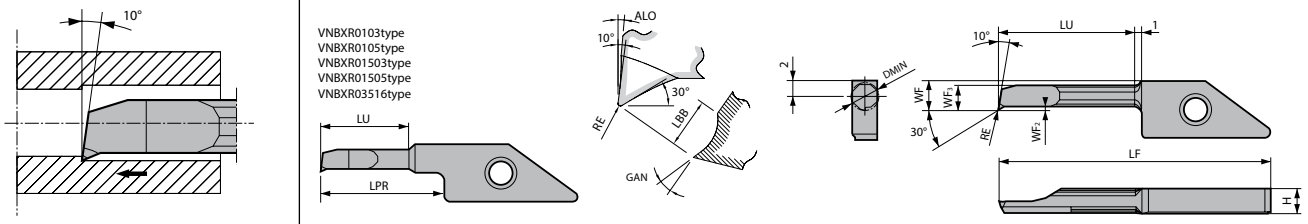
Q: There are standard types (head dia. is larger than shank) and straight types for round shanks. What is each one used for?

A: The straight type is used when it cannot be inserted from the face side of the sleeve holder and can be inserted only from the back side due to space limitation (Refer to fig. on the right). On the other hand, the standard type should be installed when it can be inserted from the face side, and the head end is used for positioning as stopper.



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

VNBX-S (Boring)



Right-hand shown

Dimensions

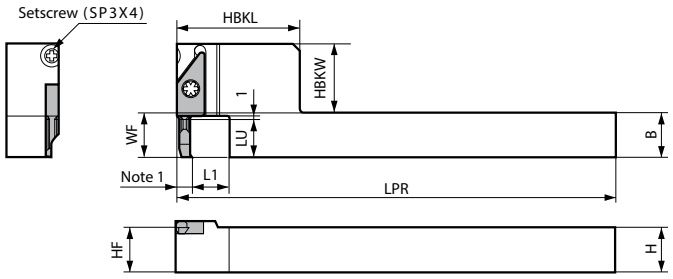
Description	No. of edges	Dimension (mm)										Angle (°)		Tolerance (mm)		Carbide	Applicable toolholder ➡ F53~F55
		DMIN	H	LPR	LBB	LF	LU	WF	WF_2	WF_3	RE	ALO	GAN	RE min.	RE max.	PVD PR930	
VNBXR 0103-005S	1	1	3.9	7	0.7	26.5	3	2.95	0.2	0.85	0.05	7	15	- 0.02	0	●	S...-SVNR12XN S...-SVNR12SXN
VNBXR 0105-005S	1	1	3.9	7	0.7	26.5	5	2.95	0.2	0.85	0.05	7	15	- 0.02	0	●	S...-SVNR12XN S...-SVNR12SXN
VNBXR 01503-005S 01503-01S 01505-005S 01505-01S	1	1.5	3.9	7	0.7	26.5	3 3 5 5	2.95	0.2	1.3	0.05 0.1 0.05 0.1	7	15	- 0.02 - 0.03 - 0.02 - 0.03	0	● ● ● ●	S...-SVNR12XN S...-SVNR12SXN
VNBXR 0206-005S 0206-01S	1	2	3.9	-	0.8	26.5	6	3	0.25	1.8	0.05 0.1	8	18	- 0.02 - 0.03	0	● ●	SVNSR...-12-06XN S...-SVNR12XN S...-SVNR12SXN
VNBXR 0311-005S 0311-01S	1	3	3.9	-	0.8	30.8	11	3.5	0.4	2.6	0.05 0.1	8	18	- 0.02 - 0.03	0	● ●	SVNSR...-12-11XN S...-SVNR12XN S...-SVNR12SXN
VNBXR 03511-005S 03511-01S 03516-005S 03516-01S	1	3.5	3.9	- - 21 21	0.8	30.8 30.8 39.8 39.8	11 11 16 16	3.75	0.45	3.1	0.05 0.1 0.05 0.1	8	18	- 0.02 - 0.03 - 0.02 - 0.03	0	● ● ● ●	SVNSR...-12-11XN, S...-SVNR12XN S...-SVNR12SXN S...-SVNR12XN S...-SVNR12SXN
VNBXR 0411-005S 0411-01S 0411-02S	1	4	3.66	-	0.8	30.8	11	4	0.5	3.5	0.05 0.1 0.2	8	18	- 0.02 - 0.03 - 0.04	0	● ● ●	SVNSR...-12-11XN S...-SVNR12XN S...-SVNR12SXN
VNBXR 0420-005S 0420-01S 0420-02S	1	4	3.66	-	0.8	39.8	20	4	0.5	3.5	0.05 0.1 0.2	8	18	- 0.02 - 0.03 - 0.04	0	● ● ●	SVNSR...-12-20XN S...-SVNR12XN S...-SVNR12SXN

Recommended cutting conditions ➡ F55

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

System tip-bars are sold in 5 piece boxes

SVNS-XN (without side stopper)



Right-hand shown | Right-hand Insert for Right-hand Toolholder.
Note 1 : The dimension of Note 1 is same size as the applicable insert (VNBX) WF dimension.

Toolholder dimensions

Description		Availability	Dimension (mm)									Spare parts			Applicable inserts F52
												Screw	Set screw	Wrench	
		R	H	B	LPR	L1	HF	HBKW	HBKL	LU	WF				
SVNSR	1010K-12-06XN	●	10	10	125	10	10	19	45	6	10	SB-3080TR	SP3X4	LTW-10S	VNBXR0206-...
	1212M-12-06XN	●	12	12	150		12	17			12				
	1616M-12-06XN	●	16	16		16	16	13			16				
SVNSR	1010K-12-11XN	●	10	10	125	10	10	23	45	11	10	SB-3080TR	SP3X4	LTW-10S	VNBXR...11-...
	1212M-12-11XN	●	12	12	150		12	21			12				
	1616M-12-11XN	●	16	16		16	16	17			16				
SVNSR	1212M-12-20XN	●	12	12	150	10	12	30	45	20	12	SB-3080TR	SP3X4	LTW-10S	VNBXR0420-...
	1616M-12-20XN	●	16	16		16	16	26			16				

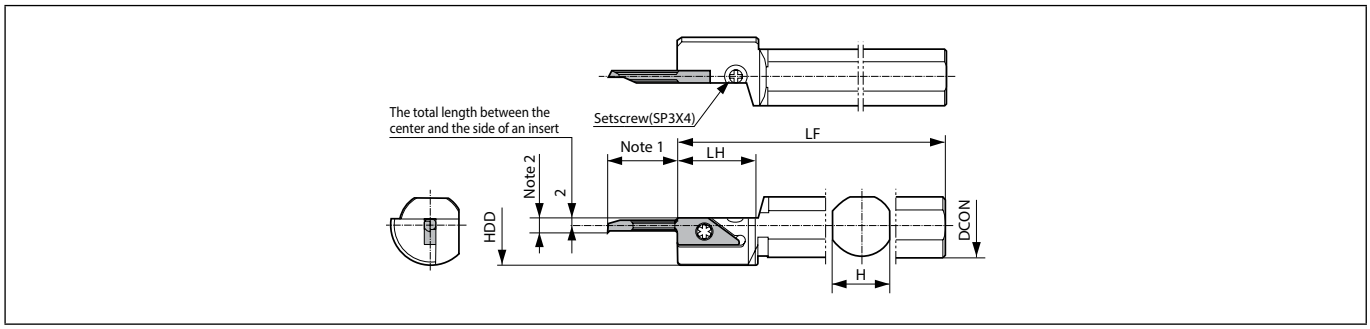
All VNBXR system Tip-Bars Inserts are used with a SVNS-XN Toolholder. However, when setting the cutting edge at the face level of the toolholder as shown in figure, use the applicable inserts described above.
SVNS-XN (without side stopper) retains high index accuracy by easy restraint.
SVNS-XN (without side stopper) has a setscrew SP3X4. Changing the setscrew SP3X4 to a screw HS3X4 (sold separately) enables the toolholder to be used as a binding effect toolholder similar to the side stopper toolholder.

Spare parts (Optional)

Screw (Side stopper)	Wrench
	
HS3X4	LW-1.5

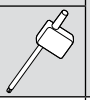
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-SVN-XN (Round shank / Standard / without side stopper)



Right-hand shown | Right-hand Insert for Right-hand Toolholder.
Note 1 : The dimension of Note 1 shows the applicable insert (VNBX) LU +1 mm.
Note 2 : The dimension of Note 2 is same size as the applicable insert (VNBX) WF dimension.

Toolholder dimensions

Description	Availability	Dimension (mm)					Spare parts			Applicable inserts F52
							Screw	Set screw	Wrench	
	R	DCON	H	LH	HDD	LF				
S12F- SVNR12XN	●	12	11	23	20	80	SB-3080TR	SP3X4	FT-10	VNBXR...
S14G- SVNR12XN	●	14	13			90				
S16H- SVNR12XN	●	16	15		24	100				
S19H- SVNR12XN	●	19.05	17	24						
S19N- SVNR12XN	●					160				
S20H- SVNR12XN	●	20	18			100				
S25H- SVNR12XN	●	25.4	23		30					
S25Q- SVNR12XN	●					180				

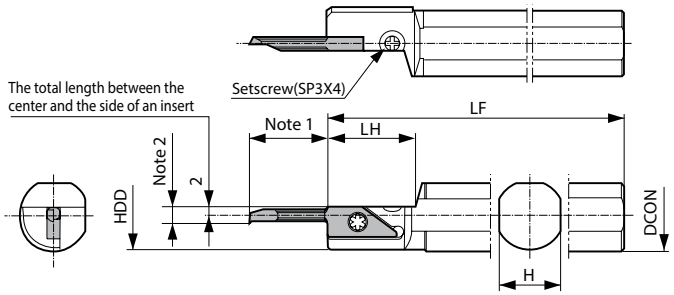
S-SVN-XN (without side stopper) retains high index accuracy by easy restraint.
S-SVN-XN (without side stopper) has a setscrew SP3X4. Changing the setscrew SP3X4 to a screw HS3X4 (sold separately) enables the toolholder to be used as a binding effect toolholder similar to the side stopper toolholder.

Spare parts (Optional)

Screw (Side stopper)	Wrench
	
HS3X4	LW-1.5

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-SVN-SXN (Round shank / Straight / without side stopper)



Right-hand shown | Right-hand Insert for Right-hand Toolholder.
Note 1 : The dimension of Note 1 shows the applicable insert (VNBX) LU +1 mm.
Note 2 : The dimension of Note 2 is same size as the applicable insert (VNBX) WF dimension.

Toolholder dimensions

Description		Availability	Dimension (mm)					Spare parts			Applicable inserts F52
								Screw	Set screw	Wrench	
		R	DCON	H	LH	HDD	LF				
S19H-	SVNR12SXN	●	19.05	17	23	18.5	100	SB-3080TR	SP3X4	FT-10	VNBXR...
S20H-	SVNR12SXN	●	20	18		19.5					
S22K-	SVNR12SXN	●	22	20		21.5	125				
S25.0G-	SVNR12SXN	●	25	23		24.5	90				

S-SVN-SXN (without side stopper) retains high index accuracy by easy restraint.
S-SVN-SXN (without side stopper) has a setscrew SP3X4. Changing the setscrew SP3X4 to a screw HS3X4 (sold separately) enables the toolholder to be used as a binding effect toolholder similar to the side stopper toolholder.

Spare parts (Optional)

Screw (Side stopper)	Wrench
HS3X4	LW-1.5

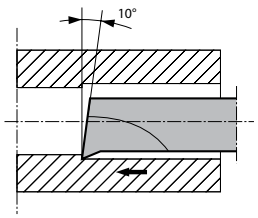
Recommended cutting conditions (VNBX-S)

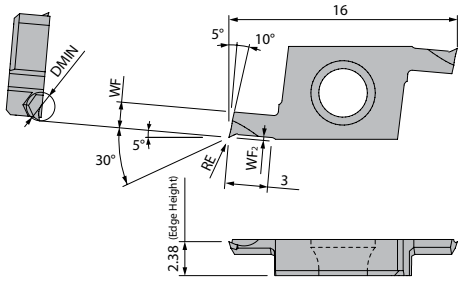
Workpiece material	Insert grades (Vc: m/min) PVD coated carbide PR930	VNBX01-S type VNBX015-S type		VNBX02-S type ~ VNBX04-S type		Remarks
		ap (mm), f (mm/rev)				
		ap	f	ap	f	
Carbon steel / Alloy steel	★ 30~100	~0.1	~0.01	~0.2	~0.03	Coolant
Stainless steel	★ 30~80	~0.1	~0.01	~0.2	~0.02	

★1st recommendation

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

TWB (Micro boring, Horizontal type)





Right-hand shown

Dimensions

Description	No. of edges	Dimension (mm)				Tolerance (mm)		Carbide		Applicable toolholder F56, F57
		DMIN	WF	WF_2	RE	RE min.	RE max.	PVD PR1025	PVD PR1535	
TWBR 01003-005	2	1	0.85	0.2	0.05	-0.02	0	●	●	STWR...-15 S..-STWR15
TWBR 01503-005	2	1.5	1.3	0.2	0.05	-0.02	0	●	●	
TWBR 01503-010					0.1	-0.03		●	●	
TWBR 02003-005	2	2	1.75	0.25	0.05	-0.02	0	●	●	
TWBR 02003-010					0.1	-0.03		●	●	
TWBR 02503-005	2	2.5	2.1	0.3	0.05	-0.02	0		●	
TWBR 02503-010					0.1	-0.03		●	●	
TWBR 03003-005	2	3	2.4	0.4	0.05	-0.02	0	●	●	
TWBR 03003-010					0.1	-0.03		●	●	

Recommended cutting conditions F59

STW (Micro boring, Square shank for horizontal type insert)



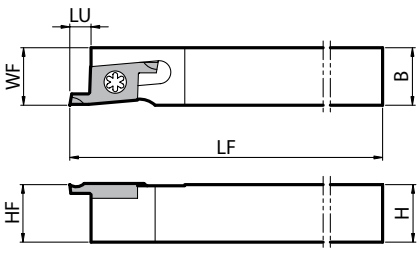


Fig. 1

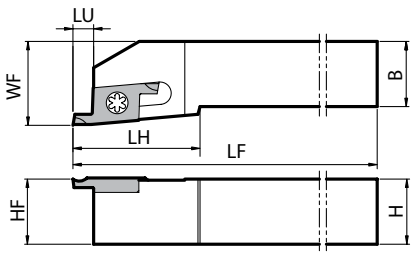


Fig. 2

Right-hand shown | Right-hand Insert for Right-hand Toolholder.
(For Left-hand toolholders for grooving, please see page **G106**.)

Toolholder dimensions

Description	Availability	Dimension (mm)								Coolant hole	Fig.	Spare parts Screw	Spare parts Wrench	Applicable inserts F56
	R	H	B	LH	HF	LF	LU	WF						
STWR 1212F-15	●	12	12	-	12	85	3	12		No	1	SB-3080TR	LTW-10S	TWBR...
1212K-15	●										1			
1616K-15	●	16	16		16	125		16			1			
2020K-15	●	20	20	25	20			25			2			
2525M-15	●	25	25		25	150		32			2			

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Twin-bars are sold in 5 piece boxes

S-STW (Micro boring, Round shank for horizontal type insert)



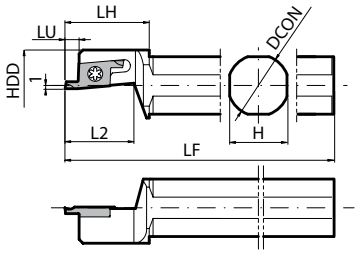


Fig. 1

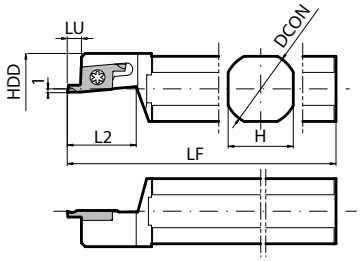


Fig. 2

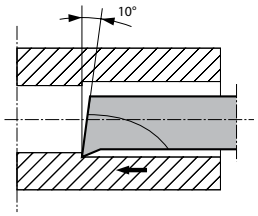
Right-hand shown | Right-hand Insert for Right-hand Toolholder.
(For Left-hand toolholders for grooving, please see page **G107**.)

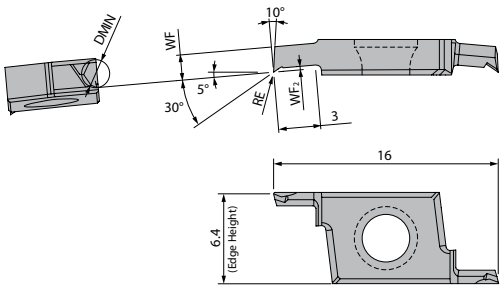
Toolholder dimensions

Description		Availability	Dimension (mm)							Coolant hole	Fig.	Spare parts		Applicable inserts ➡ **F56**
												Screw	Wrench	
		R	DCON	H	LH	HDD	L2	LF	LU					
S12F-	STWR15	●	12	11	22	20	18	80	3	No	1	SB-3080TR	LTW-10S	TWBR...
S14H-	STWR15	●	14	13				100			1			
S15F-	STWR15	●	15.875	15				85			1			
S16F-	STWR15	●	16								1			
S19G-	STWR15	●	19.05	17	-	18.5		90			2			
S19K-	STWR15	●						120			2			
S20G-	STWR15	●	20	18		19.5		90			2			
S20K-	STWR15	●						120			2			
S22K-	STWR15	●	22	20		21.5	22	125			2			
S25.0J-	STWR15	●	25	23		24.5		110			2			
S25K-	STWR15	●	25.4			25		120			2			

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

TWBT (Micro boring, Vertical type)





Right-hand shown

Dimensions

Description	No. of edges	Dimension (mm)				Tolerance (mm)		Carbide		Applicable toolholder F59
		DMIN	WF	WF_2	RE	RE min.	RE max.	PVD		
								PR1025	PR1535	
TWBTR 01003-005	2	1	0.85	0.2	0.05	-0.02	0	●	●	STWSR...-15T
TWBTR 01503-005	2	1.5	1.3	0.2	0.05	-0.02	0	●	●	
TWBTR 01503-010					0.1	-0.03		●	●	
TWBTR 02003-005	2	2	1.75	0.25	0.05	-0.02	0		●	
TWBTR 02003-010					0.1	-0.03		●	●	
TWBTR 02503-005	2	2.5	2.1	0.3	0.05	-0.02	0	●	●	
TWBTR 02503-010					0.1	-0.03		●	●	
TWBTR 03003-005	2	3	2.3	0.4	0.05	-0.02	0	●	●	
TWBTR 03003-010					0.1	-0.03		●	●	

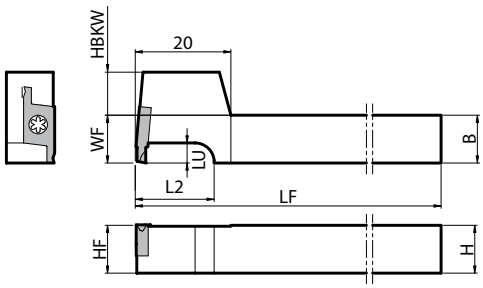
Recommended cutting conditions F59

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Twin-bars are sold in 5 piece boxes

STWS (Micro boring, Square shank for vertical type insert)





Right-hand shown

Toolholder dimensions

Description		Availability	Dimension (mm)								Spare parts		Applicable inserts F58
											Screw	Wrench	
		R	H	B	L2	HF	HBKW	LF	LU	WF			
STWSR	1010F-15T	●	10	10	16	10	9	85	3	10	SB-3080TR	LTW-10S	TWBTR...
	1010JX-15T	●						120					
	1212F-15T	●	12	12		12	7	85		12			
	1212JX-15T	●						120					
	1616JX-15T	●	16	16	20	16	3			16			

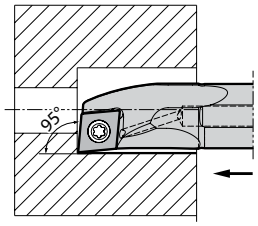
Recommended cutting conditions (TWB / TWBT)

Workpiece material	Insert grades Vc: m/min		TWBR01003 TWBR01503 TWBTR01003 TWBTR01503		TWBR02003 TWBR02503 TWBR03003 TWBTR02003 TWBTR02503 TWBTR03003		Remarks
	MEGACOAT NANO	PVD coated carbide	ap (mm), f (mm/rev)				
	PR1535	PR1025	ap	f	ap	f	
Carbon steel / Alloy steel	★ 30~100	☆ 30~100	~0.1	~0.01	~0.2	~0.03	Coolant
Stainless steel	★ 30~80	☆ 30~80	~0.1	~0.01	~0.2	~0.02	

★1st recommendation ☆2nd recommendation

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

A/S-SCLC-AE Excellent bar (Boring / Internal facing)



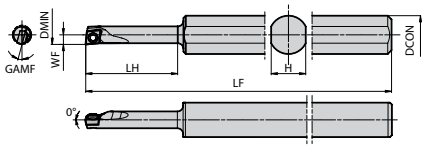


Fig. 1

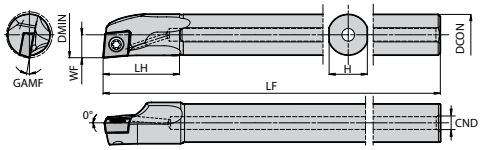


Fig. 2

Max. Overhang Length L/D=~5.5 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Boring

Solid
Positive
KAV
Negative

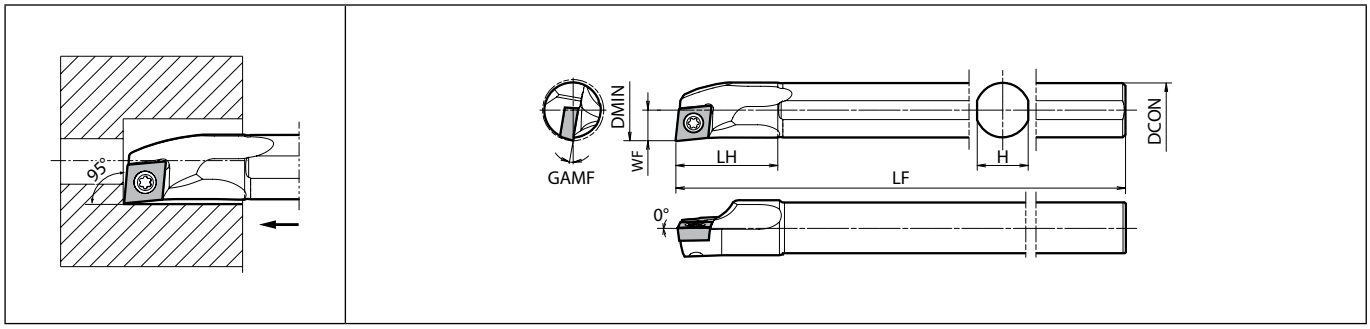
Toolholder dimensions

Description		Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts			Applicable inserts
															Screw	Wrench	Wrench	
		R	L	DMIN	DCON	CND	H	LH	LF	WF								
S10H-	SCLC$^{R}_{L}$03-05AE	●	●	5	10	-	9	24	100	2.5	15	0.2	No	1	SB-1635TR	-	FT-6	CC□T0301... CC□W0301...
	SCLC$^{R}_{L}$03-06AE	●	●	6				28		3	13							
S10H-	SCLC$^{R}_{L}$04-07AE	●	●	7	10	-	9	32	100	3.5	13	0.2	No	1	SB-2035TR	-	FT-6	CC□T0401... CC□W0401...
	SCLC$^{R}_{L}$04-08AE	●	●	8				37		4	11							
A08X-	SCLC$^{R}_{L}$06-10AE	●	●	10	8	2.5	7	16	120	5	14	0.4	Yes	2	SB-2545TR	-	FT-8	CC□T0602... CC□W0602...
A10L-	SCLC$^{R}_{L}$06-12AE	●	●	12	10	3	9	20	140	6	12							
A12M-	SCLC$^{R}_{L}$06-14AE	●	●	14	12	4	11	24	150	7	10							
A16Q-	SCLC$^{R}_{L}$09-18AE	●	●	18	16	5	15	30	180	9	10	0.4	Yes	2	SB-4065TR	FT-15	-	CC□T09T3... CC□W09T3...
A20R-	SCLC$^{R}_{L}$09-22AE	●	●	22	20		19	36	200	11	8							
A25S-	SCLC$^{R}_{L}$09-27AE	●	●	27	25		24	46	250	13.5	6							

When using P chipbreaker : Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-SCLC-A Steel shank bar (Boring / Internal facing)



Max. Overhang Length L/D=~4 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

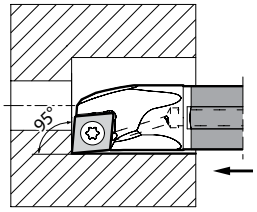
Toolholder dimensions

Description		Availability		Dimension (mm)						GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts			Applicable inserts
		R	L	DMIN	DCON	H	LH	LF	WF				Screw	Wrench	Wrench	
																
S08X-	SCLC$^{R}_{L}$06-10A	●	●	10	8	7	16	120	5	14	0.4	No	SB-2545TR	-	FT-8	CC□T0602... CC□W0602...
S10L-	SCLC$^{R}_{L}$06-12A	●	●	12	10	9	20	140	6	12						
S12M-	SCLC$^{R}_{L}$06-14A	●	●	14	12	11	24	150	7	10						
S16Q-	SCLC$^{R}_{L}$09-18A	●	●	18	16	15	30	180	9	10	0.4	No	SB-4065TR	FT-15	-	CC□T09T3... CC□W09T3...
S20R-	SCLC$^{R}_{L}$09-22A	●	●	22	20	19	36	200	11	8						
S25S-	SCLC$^{R}_{L}$09-27A	●	●	27	25	24	46	250	13.5	6						

When using P chipbreaker : Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

C/E-SCLC-A(N) Carbide shank bar (Boring / Internal facing)



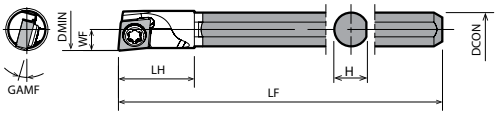


Fig. 1

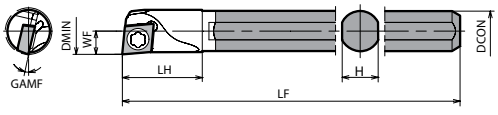


Fig. 2

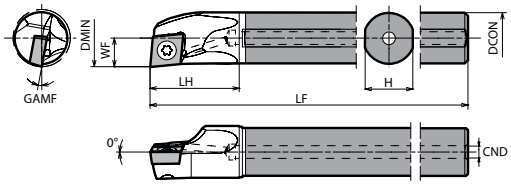


Fig. 3

Max. Overhang Length L/D=~7 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F
Boring
Solid
Positive
KAV
Negative

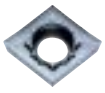
Toolholder dimensions

Description		Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts			Applicable inserts
															Screw	Wrench	Wrench	
		R	L	DMIN	DCON	CND	H	LH	LF	WF								
C04G-	SCLC□03-05AN	●	●	5	4	-	3.8	7	90	2.5	15	0.2	No	1	SB-1635TR	-	FT-6	CC□T0301... CC□W0301...
C05H-	SCLC□03-06AN	●	●	6	5	-	4.4	9	100	3	13	0.2	No	2	SB-1635TR	-	FT-6	CC□T0301... CC□W0301...
C06J-	SCLC□04-07AN	●	●	7	6	-	5.4	10	110	3.5	13	0.2	No	2	SB-2035TR	-	FT-6	CC□T0401... CC□W0401...
C07K-	SCLC□04-08AN	●	●	8	7	-	6.4	11	125	4	11							
E08L-	SCLC□06-10AN	●	●	10	8	3	7	14	140	5	14	0.4	Yes	3	SB-2545TR	-	FT-8	CC□T0602... CC□W0602...
	SCLCR06-10AN2/3	●							90									
E10N-	SCLC□06-12AN	●	●	12	10		9	18	160	6	12							
	SCLCR06-12AN2/3	●							105									
E12Q-	SCLC□06-14A	●	●	14	12	4	11	23	180	7	10							
	SCLCR06-14A-2/3	●							120									
E16X-	SCLC□09-18A	●	●	18	16	4	15	28	220	9	10	0.4	Yes	3	SB-4065TR	FT-15	-	CC□T09T3... CC□W09T3...
	SCLCR09-18A-2/3	●							145									
E20S-	SCLC□09-22A	●	●	22	20	6	19	32	250	11	8							
	SCLCR09-22A-2/3	●							165									
E25T-	SCLC□09-27A	●	●	27	25		24	38	300	13.5	6							
	SCLCR09-27A-2/3	●							200									

When using P chipbreaker : Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

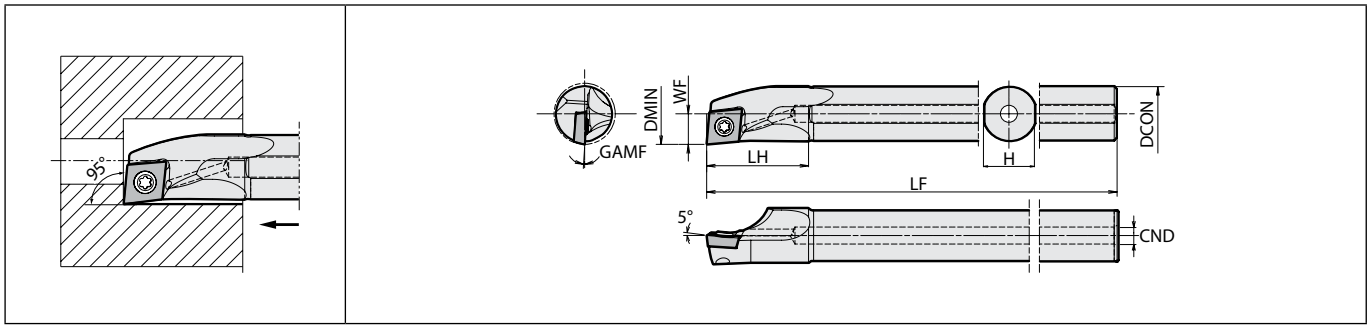
Applicable inserts (A/S-SCLC-AE / S-SCLC-A / C/E-SCLC-A(N))

Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing
Insert								
Chipbreaker type	CF	PF	GF	SKS	SK	CK	GQ	WP
Page	B58	B58	B58	B59	B59	B59	B59	B60
Applications	Finishing	Finishing - Medium	Finishing - Medium	Medium	Medium	Finishing	Finishing	Finishing
Insert								
Chipbreaker type	PP	GK	HQ	STD	MF	R/L-F	R/L-FSF	R/L-P
Page	B60	B60	B60	B60	B61	B62	B61	B63
Applications	Low feed	Low feed	Low feed	Stainless steel / Heat-resistant alloys	Cast iron	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals
Insert								
Chipbreaker type	R/L-U	R/L-USF	R/L-J	MQ	No CB	AP	R/L-A3	AH
Page	B63~B65	B63	B65	B61	B66	B66	B66	B66

Applications	Non-Ferrous metals	Non-Ferrous metals	Hard materials
Insert			
Chipbreaker type	PCD	APD	CBN
Page	C39	C40	C20

Recommended cutting conditions ➡ **F158, F159**
Applicable sleeves ➡ **F154~F157**

A-SCLP-AE Excellent bar (Boring / Internal facing)

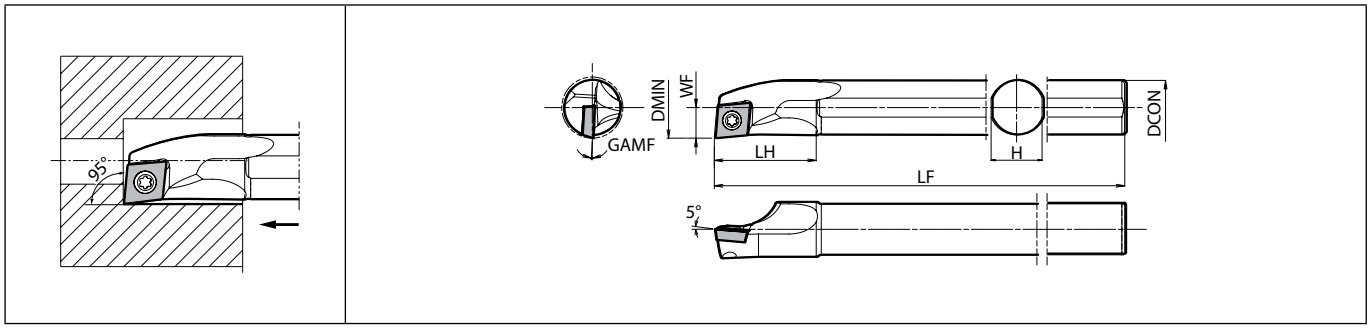


Max. Overhang Length L/D=~5.5 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description		Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts			Applicable inserts
		R	L	DMIN	DCON	CND	H	LH	LF	WF				Screw	Wrench	Wrench	
A10L-	SCLP□L08-12AE	●	●	12	10	3	9	20	140	6	5	0.4	Yes	SB-3060TR	-	FT-10	CP□B0802... CP□H0802... CP□T0802...
A12M-	SCLP□L08-14AE	●	●	14	12	4	11	24	150	7	4						
A12M-	SCLP□L09-16AE	●	●	16	12	4	11	24	150	8	4	0.4	Yes	SB-4065TR	FT-15	-	CP□B0903... CP□H0903... CP□T0903...
A16Q-	SCLP□L09-18AE	●	●	18	16	5	15	30	180	9	3.5						
A20R-	SCLP□L09-22AE	●	●	22	20		19	36	200	11	2						
A25S-	SCLP□L09-27AE	●	●	27	25		24	46	250	13.5	0						

S-SCLP-A Steel shank bar (Boring / Internal facing)



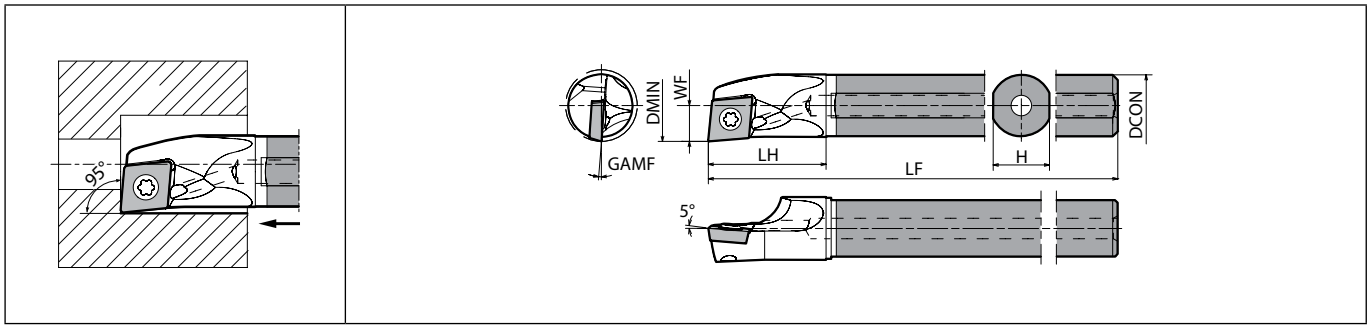
Max. Overhang Length L/D=~4 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description		Availability		Dimension (mm)						GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts			Applicable inserts
		R	L	DMIN	DCON	H	LH	LF	WF				Screw	Wrench	Wrench	
S10L-	SCLP□L08-12A	●	●	12	10	9	20	140	6	5	0.4	No	SB-3060TR	-	FT-10	CP□B0802... CP□H0802... CP□T0802...
S12M-	SCLP□L08-14A	●	●	14	12	11	24	150	7	4						
S12M-	SCLP□L09-16A	●	●	16	12	11	24	150	8	4	0.4	No	SB-4065TR	FT-15	-	CP□B0903... CP□H0903... CP□T0903...
S16Q-	SCLP□L09-18A	●	●	18	16	15	30	180	9	3.5						
S20R-	SCLP□L09-22A	●	●	22	20	19	36	200	11	2						
S25S-	SCLP□L09-27A	●	●	27	25	24	46	250	13.5	0						

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

E-SCLP-A(N) Carbide shank bar (Boring / Internal facing)



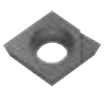
Max. Overhang Length L/D=~7 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description		Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts			Applicable inserts
														Screw	Wrench	Wrench	
		R	L	DMIN	DCON	CND	H	LH	LF	WF							
E10N-	SCLP$^{R}_{L}$08-12AN	●	●	12	10	3	9	18	160	6	5	0.4	Yes	SB-3060TR	-	FT-10	CP□B0802... CP□H0802... CP□T0802...
	SCLPR08-12AN2/3	●							105								
	SCLPR08-12AN1/2	●							80								
E12Q-	SCLP$^{R}_{L}$08-14A	●	●	14	12	4	11	23	180	7	4						
	SCLPR08-14A-2/3	●							120								
	SCLPR08-14A-1/2	●							90								
E12Q-	SCLP$^{R}_{L}$09-16A	●	●	16	12	4	11	23	180	8	5	0.4	Yes	SB-4065TR	FT-15	-	CP□B0903... CP□H0903... CP□T0903...
	SCLPR09-16A-2/3	●							120								
	SCLPR09-16A-1/2	●							90								
E16X-	SCLP$^{R}_{L}$09-18A	●	●	18	16		15	28	220	9	3.5						
	SCLPR09-18A-2/3	●							145								
	SCLPR09-18A-1/2	●							110								
E20S-	SCLP$^{R}_{L}$09-22A	●	●	22	20	6	19	32	250	11	2						
	SCLPR09-22A-2/3	●							165								
	SCLPR09-22A-1/2	●							125								
E25T-	SCLP$^{R}_{L}$09-27A	●	●	27	25		24	38	300	13.5	0						
	SCLPR09-27A-2/3	●							200								

Applicable inserts (A-SCLP-AE / S-SCLP-A / E-SCLP-A(N))

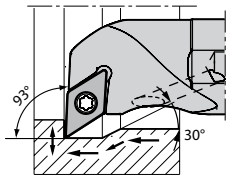
Applications	Finishing	Finishing	Finishing - Medium	Medium	Low carbon steel	Low carbon steel	Finishing - Medium	Cast iron
Insert								
Chipbreaker type	PP	GP	HQ	STD	XP	XQ	$^{F}_{L}$-Y	No CB
Page	B67	B67	B67	B67	B67	B67	B67	B67

Applications	Non-Ferrous metals	Hard materials
Insert		
Chipbreaker type	PCD	CBN
Page	C41	C21

Recommended cutting conditions F159
Applicable sleeves F155~F157

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

A-SDUC-AE Excellent bar (Internal copying)



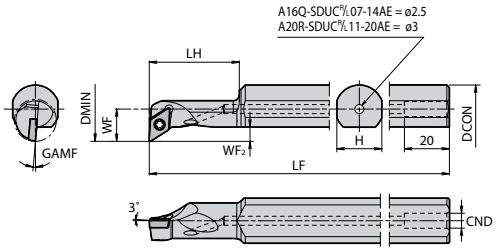


Fig. 1

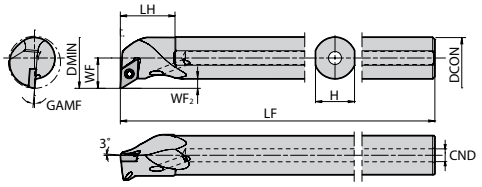


Fig. 2

Max. Overhang Length L/D=~5.5 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Boring

Solid

Positive

KAV

Negative

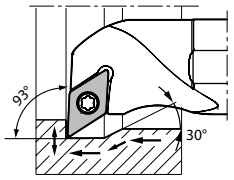
Toolholder dimensions

Description		Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts			Applicable inserts
																Screw	Wrench	Wrench	
		R	L	DMIN	DCON	CND	H	LH	LF	WF	WF_2								
A10L-	SDUC□07-14AE	●	●	14	10	3	9	19	140	8.7	3.3	5	0.4	Yes	2	SB-2560TR	-	FT-8	DC□T0702... DC□W0702... DC□X0702...
A12M-	SDUC□07-16AE	●	●	16	12	4	11	21	150	9.7					2				
A16Q-	SDUC□07-14AE	●	●	14	16	5	15	28	180	10.8	4.4				1				
	SDUC□07-20AE	●	●	20				21		11.7	3.3				2				
A16Q-	SDUC□11-23AE	●	●	23	16	5	15	21	180	14.5	6.1	5	0.4	Yes	2	SB-4065TR	FT-15	-	DC□T11T3... DC□W11T3... DC□X11T3...
A20R-	SDUC□11-20AE	●	●	20	20		19	48	200	15.6					1				
	SDUC□11-27AE	●	●	27				23		16.5					2				
A25S-	SDUC□11-32AE	●	●	32	25		24	24	250	19					2				

For WP chipbreaker, cutting edge offsets or program corrections are required on **R36** and **R37**.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-SDUC-A Steel shank bar (Internal copying)



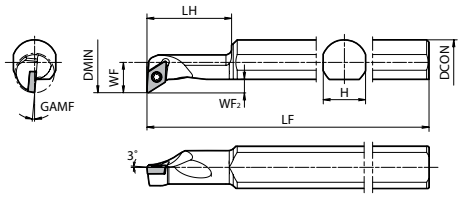


Fig. 1

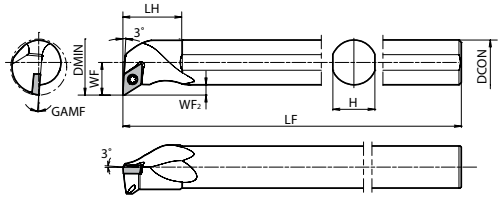


Fig. 2

Max. Overhang Length L/D=~4 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Boring

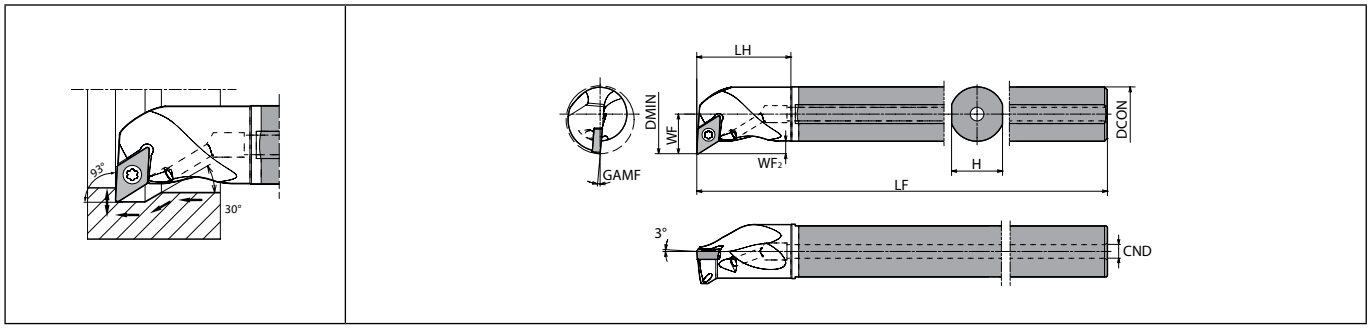
Toolholder dimensions

Description		Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts			Applicable inserts
															Screw	Wrench	Wrench	
		R	L	DMIN	DCON	H	LH	LF	WF	WF_2								
S10L-	SDUC$^{R}_{L}$07-14A	●	●	14	10	9	19	140	8.7	3.3	5	0.4	No	2	SB-2560TR	-	FT-8	DC□T0702... DC□W0702... DC□X0702...
S12M-	SDUC$^{R}_{L}$07-16A	●	●	16	12	11	21	150	9.7					2				
S16Q-	SDUC$^{R}_{L}$07-14A	●	●	14	16	15	28	180	10.8	4.4				1				
	SDUC$^{R}_{L}$07-20A	●	●	20			21		11.7	3.3				2				
S16Q-	SDUC$^{R}_{L}$11-23A	●	●	23	16	15	21	180	14.5	6.1	5	0.4	No	2	SB-4065TR	FT-15	-	DC□T11T3... DC□W11T3... DC□X11T3...
S20R-	SDUC$^{R}_{L}$11-20A	●	●	20	20	19	48	200	15.6					1				
	SDUC$^{R}_{L}$11-27A	●	●	27			23		16.5					2				
S25S-	SDUC$^{R}_{L}$11-32A	●	●	32	25	24	24	250	19					2				

For WP chipbreaker, cutting edge offsets or program corrections are required on **R36** and **R37**.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

E-SDUC-A Carbide shank bar (Internal copying)



Max. Overhang Length L/D=~7 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

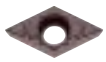
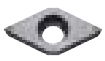
Toolholder dimensions

Description		Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts			Applicable inserts
															Screw	Wrench	Wrench	
		R	L	DMIN	DCON	CND	H	LH	LF	WF	WF2							
E10N-	SDUC[R/L]07-14A	●	●	14	10	3	9	20	160	8.7								
	SDUCR07-14A-2/3	●							105									
E12Q-	SDUC[R/L]07-16A	●	●	16	12	4	11	23	180	9.7	3.3	5	0.4	Yes	SB-2560TR	-	FT-8	DC□T0702... DC□W0702... DC□X0702...
	SDUCR07-16A-2/3	●							120									
E16X-	SDUC[R/L]07-20A	●	●	20	16		15	28	220	11.7								
	SDUCR07-20A-2/3	●							145									
E16X-	SDUC[R/L]11-23A	●	●	23	16	4	15	28	220	14.5								
	SDUCR11-23A-2/3	●							145									
E20S-	SDUC[R/L]11-27A	●	●	27	20	6	19	32	250	16.5	6.1	5	0.4	Yes	SB-4065TR	FT-15	-	DC□T11T3... DC□W11T3... DC□X11T3...
	SDUCR11-27A-2/3	●							165									
E25T-	SDUC[R/L]11-32A	●	●	32	25		24	38	300	19								
	SDUCR11-32A-2/3	●							200									

For WP chipbreaker, cutting edge offsets or program corrections are required on **R36** and **R37**.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

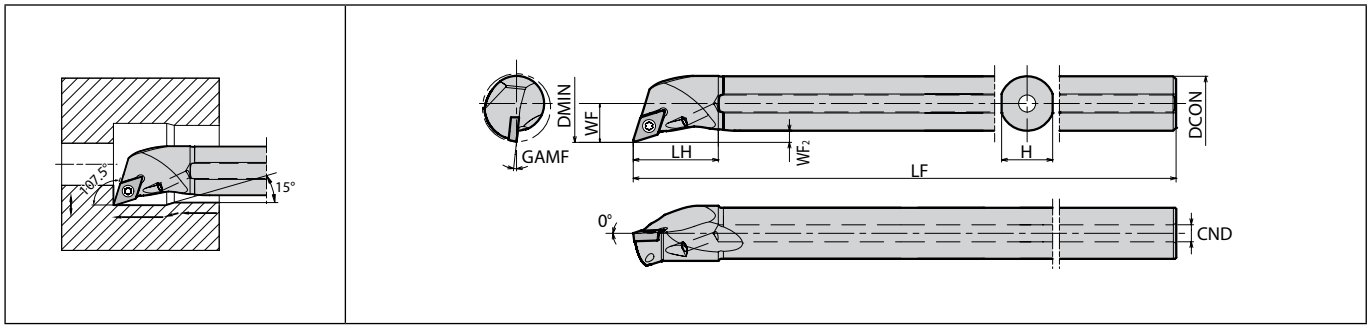
Applicable inserts (A-SDUC-AE / S-SDUC-A / E-SDUC-A)

Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing
Insert								
Chipbreaker type	CF	GF	SKS	SK	CK	GQ	WP	R/L-WP
Page	B68	B68	B68	B68	B68	B69	B69	B69
Applications	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Medium	Medium	Finishing	Finishing
Insert								
Chipbreaker type	PP	GP	GK	HQ	STD	MF	R/L-F	R/L-FSF
Page	B69	B69	B70	B70	B70	B70	B72, B73	B72
Applications	Low feed	Low feed	Low feed	Low feed	Low carbon steel	Low carbon steel	Stainless steel / Heat-resistant alloys	Cast iron
Insert								
Chipbreaker type	R/L-U	R/L-USF	R/L-J	R/L-JSF	XP	XQ	MQ	No CB
Page	B74~B76	B74	B77	B76	B71	B71	B71	B78
Applications	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Hard materials		
Insert								
Chipbreaker type	AP	R/L-A3	AH	PCD	APD	CBN		
Page	B78	B78	B78	C42	C42	C22		

Recommended cutting conditions ➡ F159
Applicable sleeves ➡ F155~F157

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

A-SDQC-AE Excellent bar (Internal copying)



Max. Overhang Length L/D=~5.5 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Boring

Solid

Positive

KAV

Negative

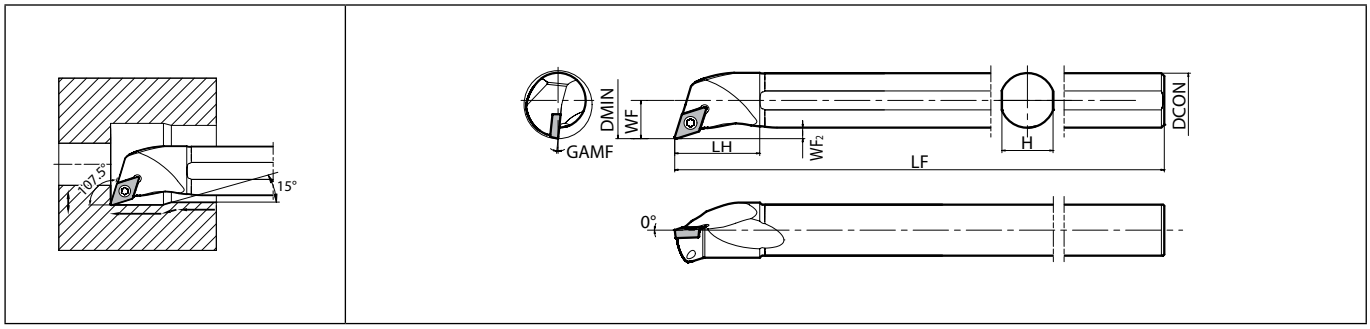
Toolholder dimensions

Description		Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts			Applicable inserts
															Screw	Wrench	Wrench	
		R	L	DMIN	DCON	CND	H	LH	LF	WF	WF_2							
A10L-	SDQC[R/L]07-13AE	●	●	13	10	3	9	19	140	7.5	2.1	10	0.4	Yes	SB-2560TR	-	FT-8	DC□T0702... DC□W0702...
A12M-	SDQC[R/L]07-16AE	●	●	16	12	4	11	22	150	9.25	2.6	8						
A16Q-	SDQC[R/L]07-20AE	●	●	20	16	5	15	25	180	11.3		6						
A20R-	SDQC[R/L]11-25AE	●	●	25	20	5	19	31	200	14.4	3.7	5	0.4	Yes	SB-4065TR	FT-15	-	DC□T11T3... DC□W11T3...
A25S-	SDQC[R/L]11-30AE	●	●	30	25		24	38	250	16.9		4						

WP chipbreaker (DCMX-WP : Wiper insert) is not applicable to A-SDQC-AE Toolholders.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-SDQC-A Steel shank bar (Internal copying)



Max. Overhang Length L/D=~4 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Boring

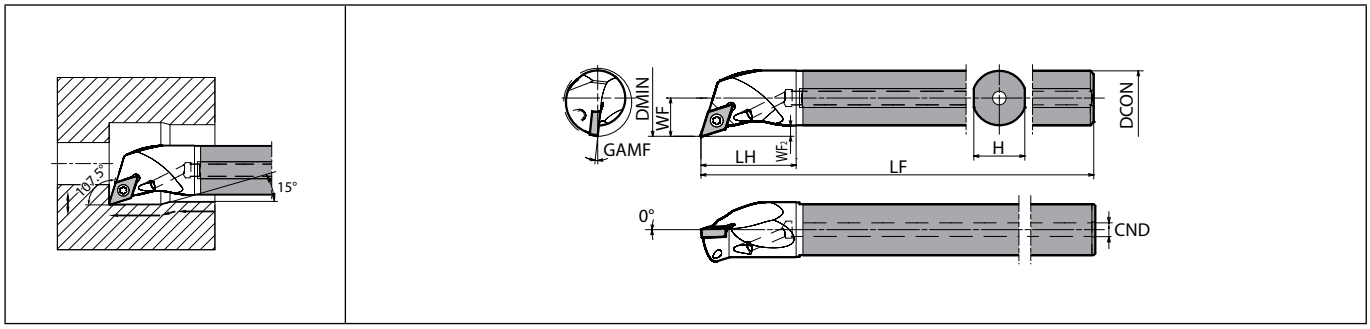
Toolholder dimensions

Description		Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts			Applicable inserts
		R	L	DMIN	DCON	H	LH	LF	WF	WF_2				Screw	Wrench	Wrench	
S10L-	SDQC[R/L]07-13A	●	●	13	10	9	19	140	7.5	2.1	10	0.4	No	SB-2560TR	-	FT-8	DC□T0702... DC□W0702...
S12M-	SDQC[R/L]07-16A	●	●	16	12	11	22	150	9.25	2.6	8						
S16Q-	SDQC[R/L]07-20A	●	●	20	16	15	25	180	11.3		6						
S20R-	SDQC[R/L]11-25A	●	●	25	20	19	31	200	14.4	3.7	5	0.4	No	SB-4065TR	FT-15	-	DC□T11T3... DC□W11T3...
S25S-	SDQC[R/L]11-30A	●	●	30	25	24	38	250	16.9		4						

WP chipbreaker (DCMX-WP : Wiper insert) is not applicable to S-SDQC-A Toolholders.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

E-SDQC-A Carbide shank bar (Internal copying)



Max. Overhang Length L/D=~7 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

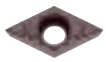
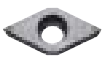
Toolholder dimensions

Description		Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts			Applicable inserts
															Screw	Wrench	Wrench	
		R	L	DMIN	DCON	CND	H	LH	LF	WF	WF_2							
E10N-	SDQC[R/L]07-13A	●	●	13	10	3	9	20	160	7.5	2.1	10	0.4	Yes	SB-2560TR	-	FT-8	DC□T0702... DC□W0702...
	SDQCR07-13A-2/3	●							105									
E12Q-	SDQC[R/L]07-16A	●	●	16	12	4	11	23	180	9.25	2.6	8						
	SDQCR07-16A-2/3	●							120									
E16X-	SDQC[R/L]07-20A	●	●	20	16		15	28	220	11.3		6						
	SDQCR07-20A-2/3	●							145									
E20S-	SDQC[R/L]11-25A	●	●	25	20	6	19	32	250	14.4	3.7	5	0.4	Yes	SB-4065TR	FT-15	-	DC□T11T3... DC□W11T3...
	SDQCR11-25A-2/3	●							165									
E25T-	SDQC[R/L]11-30A	●	●	30	25		24	38	300	16.9		4						
	SDQCR11-30A-2/3	●							200									

WP chipbreaker (DCMX-WP : Wiper insert) is not applicable to E-SDQC-A Toolholders.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts (A-SDQC-AE / S-SDQC-A / E-SDQC-A)

Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing
Insert								
Chipbreaker type	CF	GF	SKS	SK	CK	GQ	PP	GP
Page	B68	B68	B68	B68	B68	B69	B69	B69
Applications	Finishing - Medium	Finishing - Medium	Medium	Medium	Finishing	Finishing	Low feed	Low feed
Insert								
Chipbreaker type	GK	HQ	STD	MF	R/L-F	R/L-FSF	R/L-U	R/L-USF
Page	B70	B70	B70	B70	B72, B73	B72	B74~B76	B74
Applications	Low feed	Low feed	Low carbon steel	Low carbon steel	Stainless steel / Heat-resistant alloys	Cast iron	Non-Ferrous metals	Non-Ferrous metals
Insert								
Chipbreaker type	R/L-J	R/L-JSF	XP	XQ	MQ	No CB	AP	R/L-A3
Page	B77	B76	B71	B71	B71	B78	B78	B78
Applications	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Hard materials				
Insert								
Chipbreaker type	AH	PCD	APD	CBN				
Page	B78	C42	C42	C22				

Recommended cutting conditions ➡ F159
Applicable sleeves ➡ F155~F157

A-SDZC-AE Excellent bar (Back boring)

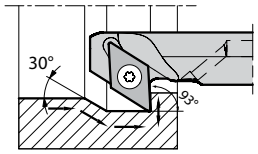


Fig. 1

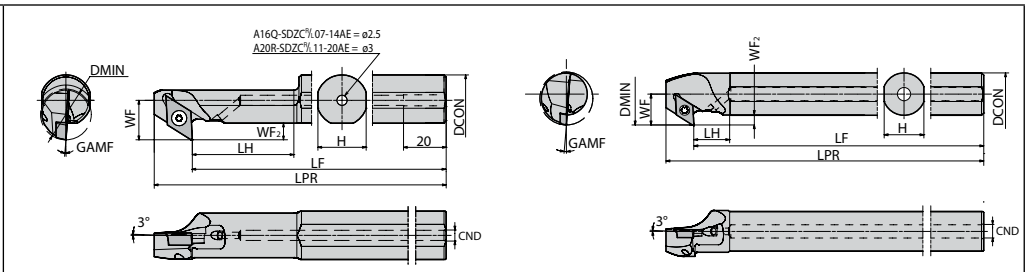


Fig. 2

Max. Overhang Length L/D=~5.5 | Right-hand shown
Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

F

Boring

Solid

Positive

KAV

Negative

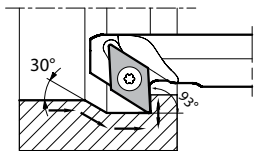
Toolholder dimensions

Description		Availability		Dimension (mm)									GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts			Applicable inserts
																	Screw	Wrench	Wrench	
		R	L	DMIN	DCON	CND	H	LH	LPR	LF	WF	WF2								
A10L-	SDZC□07-14AE	●	●	14	10	3	9	14	140	130.5	8.7	3.3	5	0.4	Yes	2	SB-2545TR	-	FT-8	DC□T0702... DC□W0702... DC□X0702...
A12M-	SDZC□07-16AE	●	●	16	12	4	11		150	139.5	9.7					2	SB-2560TR			
A16Q-	SDZC□07-14AE	●	●	14	16	5	15	30	180	170	10.8	4.4				1	SB-2545TR			
	SDZC□07-20AE	●	●	20				14		169.5	11.7	3.3				2	SB-2560TR			
A16Q-	SDZC□11-23AE	●	●	23	16	5	15	15	180	165	14.5	6.1	5	0.4	Yes	2	SB-4065TR	FT-15	-	DC□T11T3... DC□W11T3... DC□X11T3...
A20R-	SDZC□11-20AE	●	●	20	20		19	40	200	185	15.6					1				
	SDZC□11-27AE	●	●	27				15			16.5					2				
A25S-	SDZC□11-32AE	●	●	32	25		24		250	235	19					2				

For WP chipbreaker, cutting edge offsets or program corrections are required on **R36** and **R37**.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-SDZC-A Steel shank bar (Back boring)



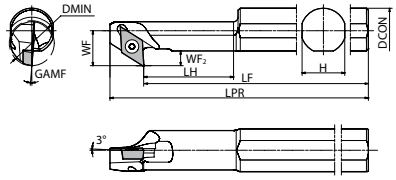


Fig. 1

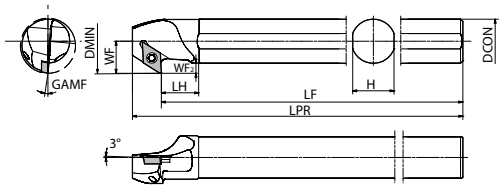


Fig. 2

Max. Overhang Length L/D=~4 | Right-hand shown
Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

F

Boring

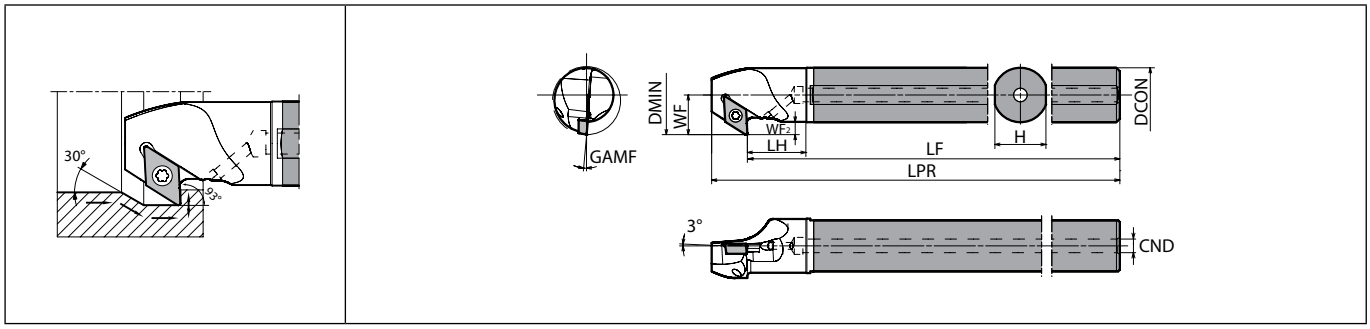
Toolholder dimensions

Description		Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts			Applicable inserts
																Screw	Wrench	Wrench	
		R	L	DMIN	DCON	H	LH	LPR	LF	WF	WF_2								
S10L-	SDZC□L07-14A	●	●	14	10	9	14	140	130.5	8.7	3.3	5	0.4	No	2	SB-2545TR	-	FT-8	DC□T0702... DC□W0702... DC□X0702...
S12M-	SDZC□L07-16A	●	●	16	12	11		150	139.5	9.7					2	SB-2560TR			
S16Q-	SDZC□L07-14A	●	●	14	16	15	30	180	170	10.8	4.4				1	SB-2545TR			
	SDZC□L07-20A	●	●	20			14		169.5	11.7	3.3				2	SB-2560TR			
S16Q-	SDZC□L11-23A	●	●	23	16	15	15	180	165	14.5	6.1	5	0.4	No	2	SB-4065TR	FT-15	-	DC□T11T3... DC□W11T3... DC□X11T3...
S20R-	SDZC□L11-20A	●	●	20	20	19	40	200	185	15.6					1				
	SDZC□L11-27A	●	●	27			15			16.5					2				
S25S-	SDZC□L11-32A	●	●	32	25	24		250	235	19					2				

For WP chipbreaker, cutting edge offsets or program corrections are required on **R36** and **R37**.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

E-SDZC-A Carbide shank bar (Back boring)



Max. Overhang Length L/D=~7 | Right-hand shown
Right-hand Insert for Right-hand Toolholder.

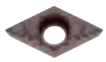
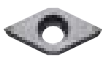
Toolholder dimensions

Description		Availability	Dimension (mm)									GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts			Applicable inserts
															Screw	Wrench	Wrench	
		R	DMIN	DCON	CND	H	LH	LPR	LF	WF	WF_2							
E10N-	SDZCR07-14A	●	14	10	3	9	10.5	160	150.5	8.7	3.3	5	0.4	Yes	SB-2545TR	-	FT-8	DC□T0702... DC□W0702... DC□X0702...
E12Q-	SDZCR07-16A	●	16	12	4	11	12.5	180	169.5	9.7					SB-2560TR			
E16X-	SDZCR07-20A	●	20	16		15	17.5	220	209.5	11.7								
E16X-	SDZCR11-23A	●	23	16	4	15	13	220	205	14.5	6.1	5	0.4	Yes	SB-4065TR	FT-15	-	DC□T11T3... DC□W11T3... DC□X11T3...
E20S-	SDZCR11-27A	●	27	20	6	19	17	250	235	16.5								

For WP chipbreaker, cutting edge offsets or program corrections are required on **R36** and **R37**.

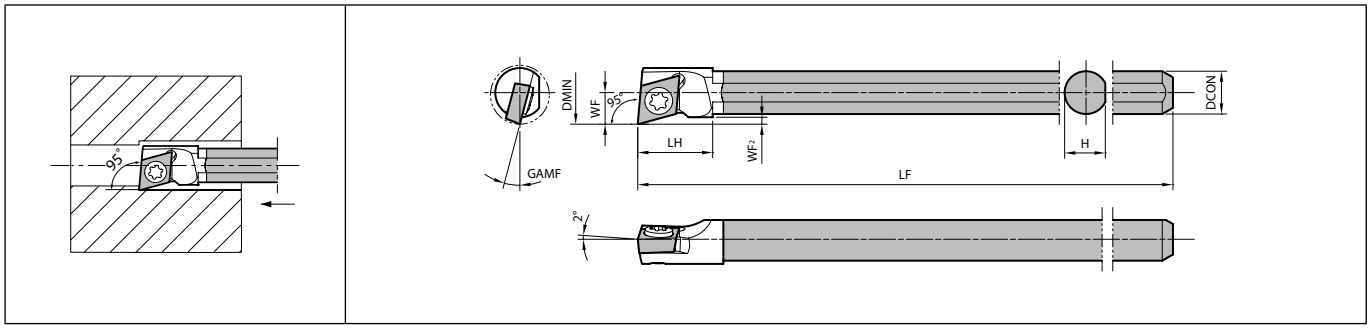
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts (A-SDZC-AE / S-SDZC-A / E-SDZC-A)

Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing
Insert								
Chipbreaker type	**CF**	**GF**	**SKS**	**SK**	**CK**	**GQ**	**WP**	**R/L-WP**
Page	**B68**	**B68**	**B68**	**B68**	**B68**	**B69**	**B69**	**B69**
Applications	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Medium	Medium	Finishing	Finishing
Insert								
Chipbreaker type	**PP**	**GP**	**GK**	**HQ**	**STD**	**MF**	**R/L-F**	**R/L-FSF**
Page	**B69**	**B69**	**B70**	**B70**	**B70**	**B70**	**B72, B73**	**B72**
Applications	Low feed	Low feed	Low feed	Low feed	Low carbon steel	Low carbon steel	Stainless steel / Heat-resistant alloys	Cast iron
Insert								
Chipbreaker type	**R/L-U**	**R/L-USF**	**R/L-J**	**R/L-JSF**	**XP**	**XQ**	**MQ**	**No CB**
Page	**B74~B76**	**B74**	**B77**	**B76**	**B71**	**B71**	**B71**	**B78**
Applications	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Hard materials		
Insert								
Chipbreaker type	**AP**	**R/L-A3**	**AH**	**PCD**	**APD**	**CBN**		
Page	**B78**	**B78**	**B78**	**C42**	**C42**	**C22**		

Recommended cutting conditions ➡ **F159**
Applicable sleeves ➡ **F155~F157**

C-SJLC Carbide shank bar (Boring / Internal facing)



Max. Overhang Length L/D=~7 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

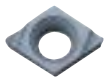
Boring

Solid
Positive
KAV
Negative

Toolholder dimensions

Description		Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts
		R	L	DMIN	DCON	H	LH	LF	WF	WF_2				Screw	Wrench	
C04X-	SJLC$^{R}_{L}$03-055	●	●	5.5	4	3.8	7	91	2.95	0.65	15	0.03	No	SB-1635TR	FT-6	JC□T0301...

Applicable inserts

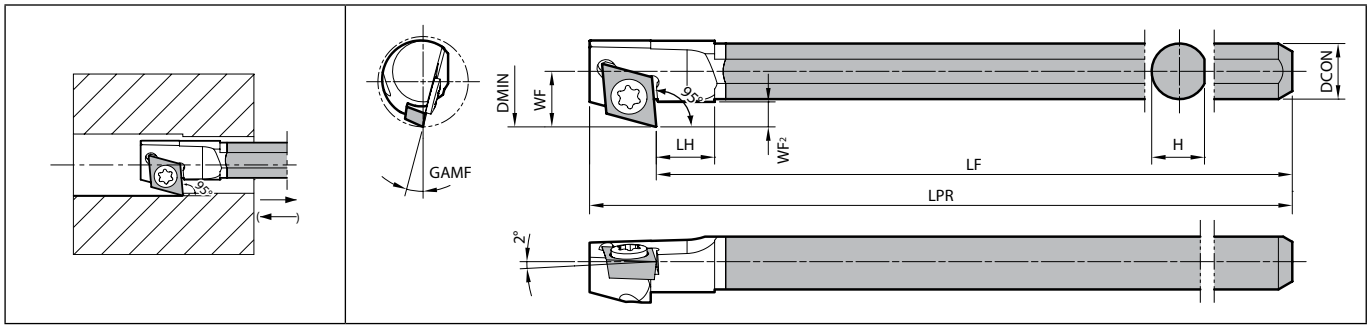
Applications	Finishing	Finishing
Insert		
Chipbreaker type	$^{R}_{L}$-**F**	$^{R}_{L}$-**FSF**
Page	**B80**	**B80**

Recommended cutting conditions **F158, F159**
Applicable sleeves **F154, F156, F157**

- Features of C-SJLC
  1. Specially designed for minimized bore dia.
  2. A relief angle of 15˚ ensures high flexibility of the tool pass during necking.
  3. Retaining front relief angle 5˚ and good surface roughness during internal facing.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

C-SJZC Carbide shank bar (Back boring)



Max. Overhang Length L/D=~7 | Right-hand shown
Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.
When using Right-hand Toolholder, use Right-hand insert if machining from back to front in this direction (→).
Use Left-hand insert if machining from front to back in this direction (←).

Toolholder dimensions

Description	Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts
														Screw	Wrench	
	R	L	DMIN	DCON	H	LH	LPR	LF	WF	WF_2						
C04X- SJZC[R/L]03-065	●	●	6.5	4	3.8	4	93	88.1	4	1.8	15	0.03	No	SB-1635TR	FT-6	JC□T0301...

Applicable inserts

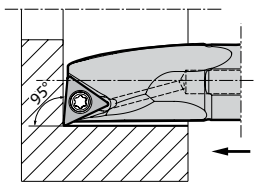
Applications	Finishing	Finishing
Insert		
Chipbreaker type	R/L-**F**	R/L-**FSF**
Page	**B80**	**B80**

Recommended cutting conditions **F158, F159**
Applicable sleeves **F154, F156, F157**

- Features of C-SJZC
  1. Back boring bars for workpiece that require high concentric circle accuracy and when a change of chuck is not possible.
  2. Available for back boring and necking.
  3. Despite the small size of minimum boring dia. as ø6.5, the edge gap is retained as large as 1.8 mm.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

A/S-STLB(P)-AE Excellent bar (Boring / Internal facing)



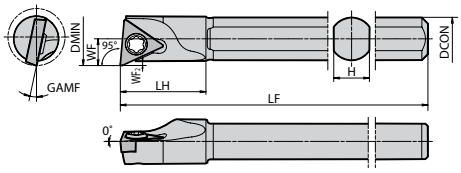


Fig. 1

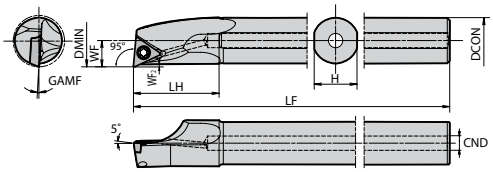


Fig. 2

Max. Overhang Length L/D=~5.5 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Boring

Solid
Positive
KAV
Negative

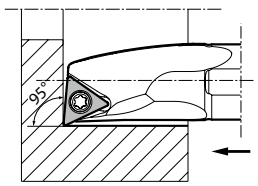
Toolholder dimensions

Description		Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts			Applicable inserts
																Screw	Wrench	Wrench	
		R	L	DMIN	DCON	CND	H	LH	LF	WF	WF_2								
S06H-	STLB□L06-08AE	●	●	8	6	-	5	12	100	3.8	0.5	12	0.2	No	1	SB-2035TR		FT-6	TB□T0601... TB□W0601...
A08X-	STLP□L08-10AE	●	●	10	8	2.5	7	16	120	5	0.5	10	0.4	Yes	2	SB-1TR	-	FT-6	TP□B0802... TP□H0802... TP□T0802...
A08X-	STLP□L09-10AE	●	●	10	8	2.5	7	16	120	5	0.5	10	0.4	Yes	2	SB-2545TR	-	FT-8	TP□B0902... TP□H0902... TP□T0902... TP□X0902...
A10L-	STLP□L09-12AE	●	●	12	10	3	9	20	140	6.2	0.9	8							
A12M-	STLP□L09-16AE	●	●	16	12	4	11	24	150	8	0.6	5							
A10L-	STLP□L11-12AE	●	●	12	10	3	9	20	140	6	0.7	10	0.4	Yes	2	SB-3060TR	-	FT-10	TP□B1103... TP□H1103... TP□T1103... TP□X1103...
A12M-	STLP□L11-14AE	●	●	14	12	4	11	24	150	7.2	0.8	7							
A16Q-	STLP□L11-18AE	●	●	18	16	5	15	30	180	9.2	0.7	3.5							
A20R-	STLP□L11-22AE	●	●	22	20		19	36	200	11.2		2							
A20R-	STLP□L16-25AE	●	●	25	20	5	19	36	200	13	0.7	0	0.4	Yes	2	SB-4065TR	FT-15	-	TP□B1603... TP□H1603... TP□T1603...
A25S-	STLP□L16-27AE	●	●	27	25		24	46	250	13.7									

For WP chipbreaker, cutting edge offsets or program corrections are required on **R36** and **R37**.
When using P chipbreaker : Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-STLB(P)-A Steel shank bar (Boring / Internal facing)



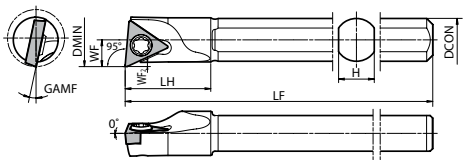


Fig. 1

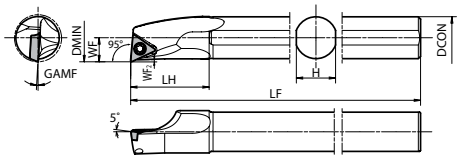


Fig. 2

Max. Overhang Length L/D=~4 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Boring

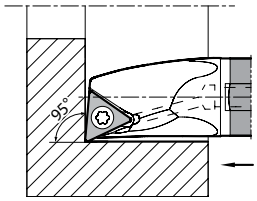
Toolholder dimensions

Description		Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts			Applicable inserts
															Screw	Wrench	Wrench	
		R	L	DMIN	DCON	H	LH	LF	WF	WF_2								
S06H-	STLB□L06-08A	●	●	8	6	5	12	100	3.8	0.5	12	0.2	No	1	SB-2035TR		FT-6	TB□T0601... TB□W0601...
S08X-	STLP□L08-10A	●	●	10	8	7	16	120	5	0.5	10	0.4	No	2	SB-1TR	-	FT-6	TP□B0802... TP□H0802... TP□T0802...
S08X-	STLP□L09-10A	●	●	10	8	7	16	120	5	0.5	10	0.4	No	2	SB-2545TR	-	FT-8	TP□B0902... TP□H0902... TP□T0902... TP□X0902...
S10L-	STLP□L09-12A	●	●	12	10	9	20	140	6.2	0.9	8							
S12M-	STLP□L09-16A	●	●	16	12	11	24	150	8	0.6	5							
S10L-	STLP□L11-12A	●	●	12	10	9	20	140	6	0.7	10	0.4	No	2	SB-3060TR	-	FT-10	TP□B1103... TP□H1103... TP□T1103... TP□X1103...
S12M-	STLP□L11-14A	●	●	14	12	11	24	150	7.2	0.8	7							
S16Q-	STLP□L11-18A	●	●	18	16	15	30	180	9.2	0.7	3.5							
S20R-	STLP□L11-22A	●	●	22	20	19	36	200	11.2		2							
S25S-	STLP□L16-27A	●	●	27	25	24	46	250	13.7	0.7	0	0.4	No	2	SB-4065TR	FT-15	-	TP□B1603... TP□H1603... TP□T1603...

For WP chipbreaker, cutting edge offsets or program corrections are required on **R36** and **R37**.
When using P chipbreaker : Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

C/E-STLB(P)-A(N) Carbide shank bar (Boring / Internal facing)



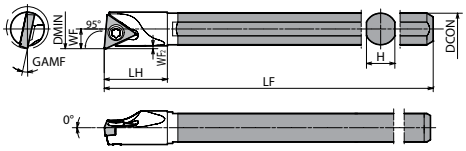


Fig. 1

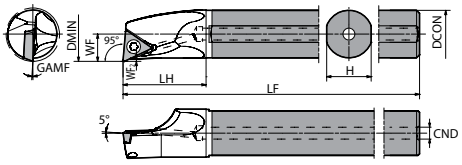


Fig. 2

Max. Overhang Length L/D=~7 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Boring

Solid
Positive
KAV
Negative

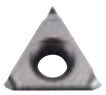
Toolholder dimensions

Description		Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts			Applicable inserts
																Screw	Wrench	Wrench	
		R	L	DMIN	DCON	CND	H	LH	LF	WF	WF_2								
C06J-	STLB$^{R}_{L}$06-08AN	●	●	8	6	-	5.4	10	110	3.8	0.5	12	0.2	No	1	SB-2035TR	-	FT-6	TB□T0601... TB□W0601...
E08L-	STLP$^{R}_{L}$08-10AN	●	●	10	8	3	7	14	140	5	0.5	10	0.4	Yes	2	SB-1TR	-	FT-6	TP□B0802... TP□H0802... TP□T0802...
E08L-	STLP$^{R}_{L}$09-10AN	●	●	10	8	3	7	14	140	5	0.5	10	0.4	Yes	2	SB-2545TR	-	FT-8	TP□B0902... TP□H0902... TP□T0902... TP□X0902...
E10N-	STLP$^{R}_{L}$09-12AN	●	●	12	10	3	9	18	160	6.2	0.9	8	0.4	Yes	2	SB-2545TR	-	FT-8	TP□B0902... TP□H0902... TP□T0902... TP□X0902...
	STLPR09-12AN2/3	●		12	10	3	9	18	105	6.2	0.9	8	0.4	Yes	2	SB-2545TR	-	FT-8	TP□B0902... TP□H0902... TP□T0902... TP□X0902...
	STLPR09-12AN1/2	●		12	10	3	9	18	80	6.2	0.9	8	0.4	Yes	2	SB-2545TR	-	FT-8	TP□B0902... TP□H0902... TP□T0902... TP□X0902...
E12Q-	STLP$^{R}_{L}$09-16A	●	●	16	12	4	11	23	180	8	0.6	5	0.4	Yes	2	SB-2545TR	-	FT-8	TP□B0902... TP□H0902... TP□T0902... TP□X0902...
	STLPR09-16A-2/3	●		16	12	4	11	23	120	8	0.6	5	0.4	Yes	2	SB-2545TR	-	FT-8	TP□B0902... TP□H0902... TP□T0902... TP□X0902...
	STLPR09-16A-1/2	●		16	12	4	11	23	90	8	0.6	5	0.4	Yes	2	SB-2545TR	-	FT-8	TP□B0902... TP□H0902... TP□T0902... TP□X0902...
E10N-	STLP$^{R}_{L}$11-12AN	●	●	12	10	3	9	18	160	6	0.7	10	0.4	Yes	2	SB-3060TR	-	FT-10	TP□B1103... TP□H1103... TP□T1103... TP□X1103...
	STLPR11-12AN2/3	●		12	10	3	9	18	105	6	0.7	10	0.4	Yes	2	SB-3060TR	-	FT-10	TP□B1103... TP□H1103... TP□T1103... TP□X1103...
	STLPR11-12AN1/2	●		12	10	3	9	18	80	6	0.7	10	0.4	Yes	2	SB-3060TR	-	FT-10	TP□B1103... TP□H1103... TP□T1103... TP□X1103...
E12Q-	STLP$^{R}_{L}$11-14A	●	●	14	12	4	11	23	180	7.2	0.8	7	0.4	Yes	2	SB-3060TR	-	FT-10	TP□B1103... TP□H1103... TP□T1103... TP□X1103...
	STLPR11-14A-2/3	●		14	12	4	11	23	120	7.2	0.8	7	0.4	Yes	2	SB-3060TR	-	FT-10	TP□B1103... TP□H1103... TP□T1103... TP□X1103...
	STLPR11-14A-1/2	●		14	12	4	11	23	90	7.2	0.8	7	0.4	Yes	2	SB-3060TR	-	FT-10	TP□B1103... TP□H1103... TP□T1103... TP□X1103...
E16X-	STLP$^{R}_{L}$11-18A	●	●	18	16	4	15	28	220	9.2	0.7	3.5	0.4	Yes	2	SB-3060TR	-	FT-10	TP□B1103... TP□H1103... TP□T1103... TP□X1103...
	STLPR11-18A-2/3	●		18	16	4	15	28	145	9.2	0.7	3.5	0.4	Yes	2	SB-3060TR	-	FT-10	TP□B1103... TP□H1103... TP□T1103... TP□X1103...
	STLPR11-18A-1/2	●		18	16	4	15	28	110	9.2	0.7	3.5	0.4	Yes	2	SB-3060TR	-	FT-10	TP□B1103... TP□H1103... TP□T1103... TP□X1103...
E20S-	STLP$^{R}_{L}$11-22A	●	●	22	20	6	19	32	250	11.2	0.7	2	0.4	Yes	2	SB-3060TR	-	FT-10	TP□B1103... TP□H1103... TP□T1103... TP□X1103...
	STLPR11-22A-2/3	●		22	20	6	19	32	165	11.2	0.7	2	0.4	Yes	2	SB-3060TR	-	FT-10	TP□B1103... TP□H1103... TP□T1103... TP□X1103...
	STLPR11-22A-1/2	●		22	20	6	19	32	125	11.2	0.7	2	0.4	Yes	2	SB-3060TR	-	FT-10	TP□B1103... TP□H1103... TP□T1103... TP□X1103...
E20S-	STLP$^{R}_{L}$16-25A	●	●	25	20	6	19	32	250	13	0.7	0	0.4	Yes	2	SB-4065TR	FT-15	-	TP□B1603... TP□H1603... TP□T1603...
	STLPR16-25A-2/3	●		25	20	6	19	32	165	13	0.7	0	0.4	Yes	2	SB-4065TR	FT-15	-	TP□B1603... TP□H1603... TP□T1603...
	STLPR16-25A-1/2	●		25	20	6	19	32	125	13	0.7	0	0.4	Yes	2	SB-4065TR	FT-15	-	TP□B1603... TP□H1603... TP□T1603...
E25T-	STLP$^{R}_{L}$16-27A	●	●	27	25	6	24	38	300	13.7	0.7	0	0.4	Yes	2	SB-4065TR	FT-15	-	TP□B1603... TP□H1603... TP□T1603...
	STLPR16-27A-2/3	●		27	25	6	24	38	200	13.7	0.7	0	0.4	Yes	2	SB-4065TR	FT-15	-	TP□B1603... TP□H1603... TP□T1603...

For WP chipbreaker, cutting edge offsets or program corrections are required on **R36** and **R37**.
When using P chipbreaker : Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

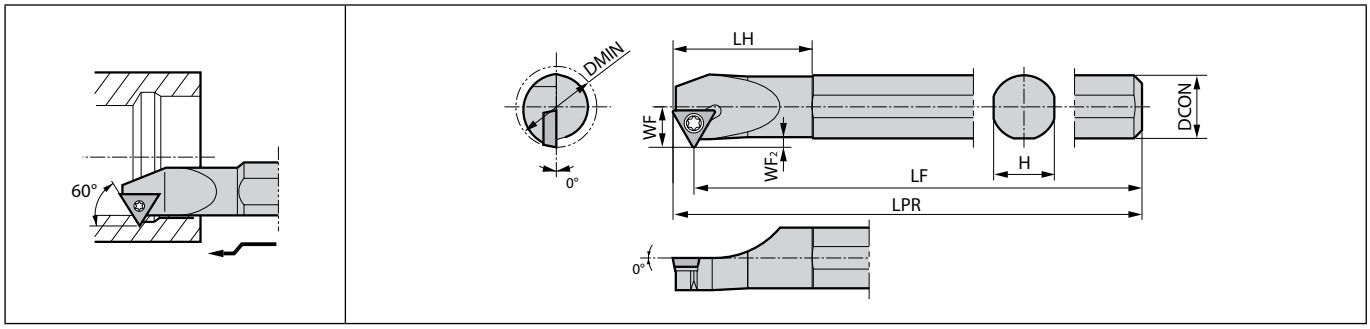
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts (A/S-STLB(P)-AE / S-STLB(P)-A / C/E-STLB(P)-A(N))

Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Finishing	Finishing	Finishing - Medium
Insert								
Chipbreaker type	CF	PF	WP	R/L-WP	PP	GP	DP	HQ
Page	B84, B88	B84, B88	B88	B88	B88	B89	B84	B89
Applications	Finishing	Finishing	Finishing	Medium	Low feed	Low carbon steel	Low carbon steel	Cast iron
Insert								
Chipbreaker type	R/L	R/L-FSF	R/L-P	R/L-H	R/L-USF	XP	XQ	No CB
Page	B84, B90, B91	B92	B92	B93	B94	B89	B89	B84, B94
Applications	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Hard materials				
Insert								
Chipbreaker type	AP	PCD	APD	CBN				
Page	B94	C44, C46, C47	C47	C23				

Recommended cutting conditions ➡ **F158, F159**
Applicable sleeves ➡ **F154~F157**

S-STWP-E Excellent bar (Internal copying)



Max. Overhang Length L/D=~5 | This toolholder is also available for threading. | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

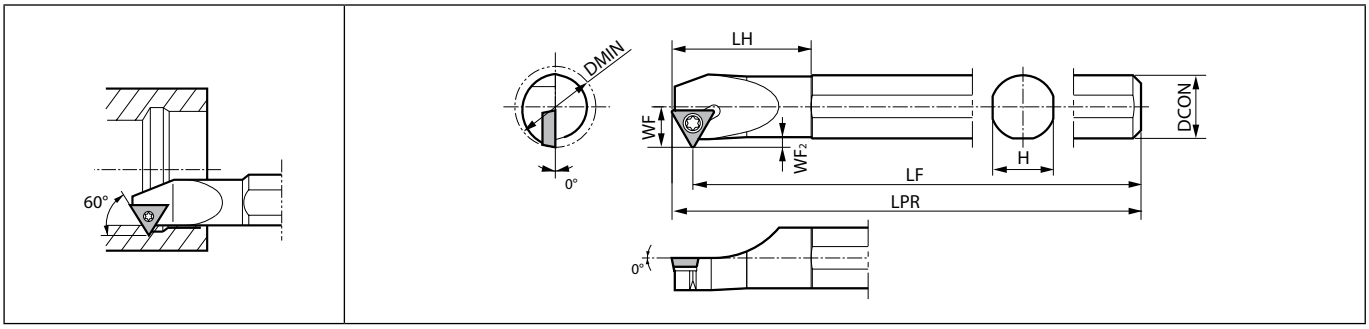
Toolholder dimensions

Description		Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts			Applicable inserts
															Screw	Wrench	Wrench	
		R	L	DMIN	DCON	H	LH	LPR	LF	WF	WF_2							
S10M-	STWP[R/L]11-12E	●	●	12	10	9.2	23	150	144.5	6	1	0	0.1	No	SB-3STR	-	FT-10	TP□B1102... TP□H1102...
S12M-	STWP[R/L]11-16E	●	●	16	12	11	30			8	1.5							TP□B1103... TP□H1103... TP□T1103...
S16R-	STWP[R/L]11-20E	●	●	20	16	15	35	200	194.5	10	2				SB-3TR			
S20X-	STWP[R/L]11-25E	●	●	25	20	19	40	220	214.5	12.5	2.5							
S20X-	STWP[R/L]16-25E	●	●	25	20	19	40	220	212.3	14	4	0	0.8	No	SB-4TR	FT-15	-	TP□B1603... TP□H1603... TP□T1603...
S25X-	STWP[R/L]16-32E	●	●	32	25	24	42	270	262.3	16.5								

WP chipbreaker (TPMX-WP : Wiper insert) is not applicable to S-STWP-E Toolholders.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-STWP Steel shank bar (Internal copying)



Max. Overhang Length L/D=~3 | This toolholder is also available for threading. | Right-hand shown
Left-hand Insert for Right-hand Toolholder.

Toolholder dimensions

Description		Availability	Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts
														Screw	Wrench	
		R	DMIN	DCON	H	LH	LPR	LF	WF	WF2						
S10M-	STWPR11-12	●	12	10	9.2	23	150	144.5	6	1	0	0.1	No	SB-3STR	FT-10	TP□B1102... TP□H1102...
S12M-	STWPR11-16	●	16	12	11	30			8	1.5						TP□B1103... TP□H1103... TP□T1103...
S16Q-	STWPR11-20	●	20	16	15	35	180	174.5	10	2				SB-3TR		
S20R-	STWPR11-25	●	25	20	19	40	200	194.5	12.5	2.5						

WP chipbreaker (TPMX-WP : Wiper insert) is not applicable to S-STWP Toolholders.

Applicable inserts (S-STWP-E / S-STWP)

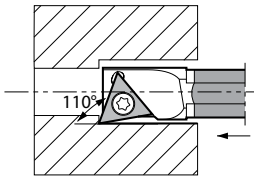
Applications	Finishing	Finishing	Finishing - Medium	Finishing	Finishing	Medium	Low feed	Low carbon steel
Insert								
Chipbreaker type	PP	GP	HQ	R/L	R/L-FSF	R/L-H	R/L-USF	XP
Page	B88	B89	B89	B90, B91	B92	B93	B94	B89

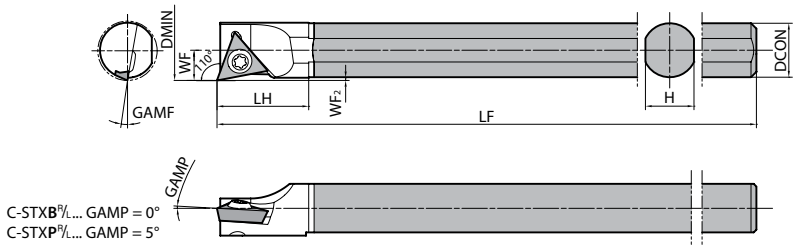
Applications	Low carbon steel	Cast iron	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Hard materials
Insert						
Chipbreaker type	XQ	No CB	AP	PCD	APD	CBN
Page	B89	B94	B94	C46, C47	C47	C23

Recommended cutting conditions F159
Applicable sleeves F155~F157

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

C-STXB(P) Carbide shank bar (Boring / Internal facing)





Max. Overhang Length L/D=~7 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description		Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts
		R	L	DMIN	DCON	H	LH	LF	WF	WF_2				Screw	Wrench	
C06J-	STXBR/L06-075	●	●	7.5	6	5.4	11	110	3.75	0.5	10	0.03	No	SB-1STR	FT-6	TB□T0601... TB□W0601...
C08X-	STXPR/L08-09	●	●	9	8	7	14	143	4.6	0.5	10	0.03	No	SB-1TR	FT-6	TP□B0802... TP□H0802... TP□T0802...
C10X-	STXPR/L09-11	●	●	11	10	9	17	164	5.6	0.5	10	0.03	No	SB-2TR	FT-8	TP□B0902... TP□H0902... TP□T0902...

WP chipbreaker (TPMX-WP : Wiper insert) is not applicable to C-STXP Toolholders.

Applicable inserts

Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing
Insert								
Chipbreaker type	**CF**	**PF**	**PP**	**GP**	**DP**	**HQ**	**R/L**	**R/L-FSF**
Page	**B84, B88**	**B84, B88**	**B88**	**B89**	**B84**	**B89**	**B84, B90, B91**	**B92**
Applications	Medium	Low feed	Low carbon steel	Cast iron	Non-Ferrous metals	Non-Ferrous metals	Hard materials	
Insert								
Chipbreaker type	**R/L-H**	**R/L-USF**	**XP**	**No CB**	**AP**	**PCD**	**CBN**	
Page	**B93**	**B94**	**B89**	**B84, B94**	**B94**	**C44, C46, C47**	**C23**	

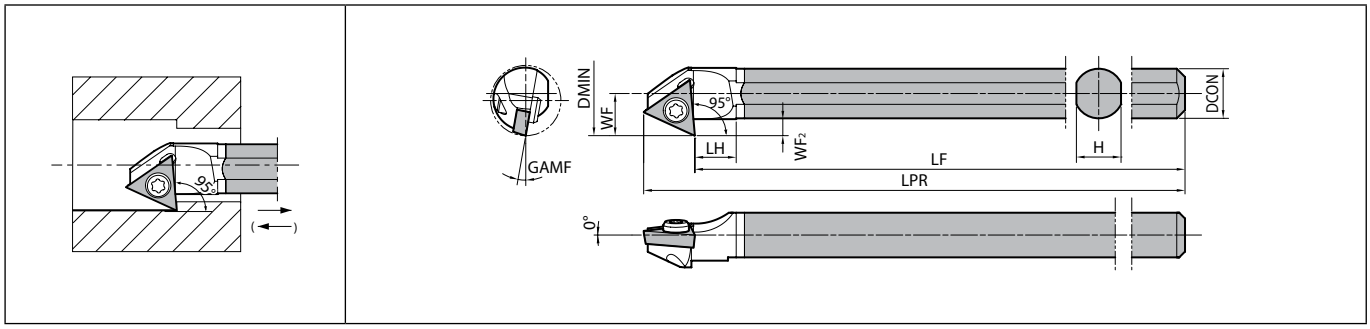
Recommended cutting conditions **F158, F159**
Applicable sleeves **F154, F155, F157**

C-STXP(B) Boring bar cutting conditions (Workpiece material : 34CrMo4)

Toolholder description	Insert description (Grades)	Vc (m/min)	ap (mm)	f (mm/rev)	Coolant
C06J-STXBR/L06-075	TBGT0601003L/R (PR930)	30~100	0.02~0.1	0.02~0.04	Yes
C08X-STXPR/L08-09	TPGH080201L/R (PR930)	30~100	0.05~0.15	0.03~0.08	Yes
C10X-STXPR/L09-11	TPGH090201L/R (PR930)	30~100	0.05~0.15	0.03~0.08	Yes

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

C-STZB Carbide shank bar (Back boring)



Max. Overhang Length L/D=~7 | Right-hand shown
Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.
When using Right-hand Toolholder, use Right-hand insert if machining from back to front in this direction (→).
Use Left-hand insert if machining from front to back in this direction (←).

F

Boring

Toolholder dimensions

Description	Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts
														Screw	Wrench	
	R	L	DMIN	DCON	H	LH	LPR	LF	WF	WF_2						
C06J- STZB□/L06-085	●	●	8.5	6	5.4	5	110	104.3	5.1	1.8	10	0.03	No	SB-1STR	FT-6	TB□T0601... TB□W0601...

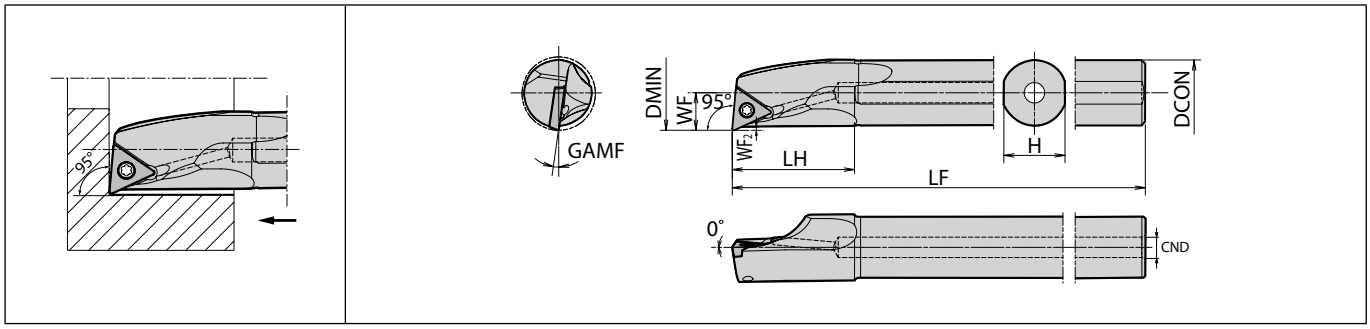
Applicable inserts

Applications	Minute ap	Finishing	Finishing	Finishing	Cast iron	Non-Ferrous metals
Insert						
Chipbreaker type	CF	PF	DP	R/L	No CB	PCD
Page	B84	B84	B84	B84	B84	C44

Recommended cutting conditions **F158, F159**
Applicable sleeves **F154, F157**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

A-STLC-AE Excellent bar (Boring / Internal facing)



Max. Overhang Length L/D=~5.5 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Boring

Solid
Positive
KAV
Negative

Toolholder dimensions

Description		Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts
															Screw	Wrench	
		R	L	DMIN	DCON	CND	H	LH	LF	WF	WF_2						
A08X-	STLC[R/L]09-10AE	●	●	10	8	2.5	7	16	120	5	0.5	14	0.4	Yes	SB-2250TR	FT-7	TCMT0902... TCMX0902...
A10L-	STLC[R/L]09-12AE	●	●	12	10	3	9	20	140	6.2	0.9	12					
A10L-	STLC[R/L]11-12AE	●	●	12	10	3	9	20	140	6.2	0.9	12	0.4	Yes	SB-2560TR	FT-8	TCMT1102... TCMX1102...
A12M-	STLC[R/L]11-14AE	●	●	14	12	4	11	24	150	7.2		10					
A16Q-	STLC[R/L]11-18AE	●	●	18	16	5	15	30	180	9.2	0.7	8					
A20R-	STLC[R/L]11-22AE	●	●	22	20		19	36	200	11.2		6					

For WP chipbreaker, cutting edge offsets or program corrections are required on **R36** and **R37**.

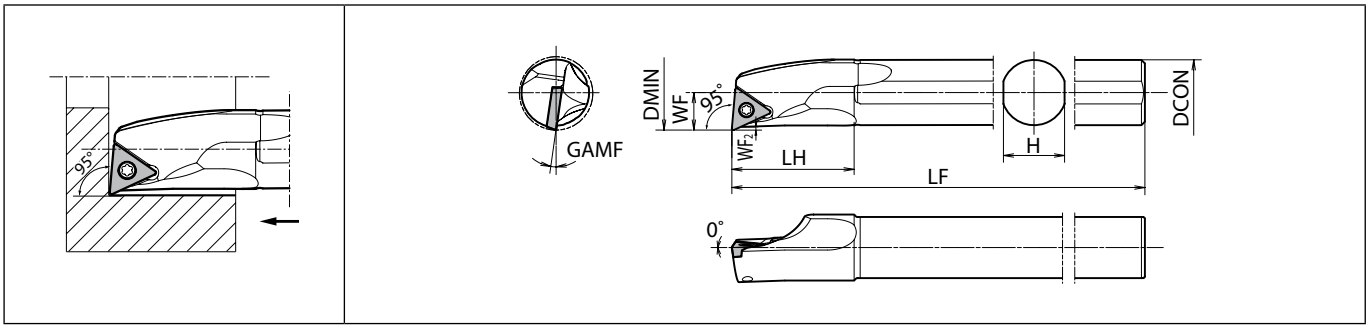
Applicable inserts

Applications	Finishing	Finishing - Medium
Insert		
Chipbreaker type	**WP**	**HQ**
Page	**B85**	**B85**

Recommended cutting conditions **F158, F159**
Applicable sleeves **F154~F157**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-STLC-A Steel shank bar (Boring / Internal facing)



Max. Overhang Length L/D=~4 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description		Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts
		R	L	DMIN	DCON	H	LH	LF	WF	WF_2				Screw	Wrench	
S08X-	STLC[R/L]09-10A	●	●	10	8	7	16	120	5	0.5	14	0.4	No	SB-2250TR	FT-7	TCMT0902... TCMX0902...
S10L-	STLC[R/L]09-12A	●	●	12	10	9	20	140	6.2	0.9	12					
S10L-	STLC[R/L]11-12A	●	●	12	10	9	20	140	6.2	0.9	12	0.4	No	SB-2560TR	FT-8	TCMT1102... TCMX1102...
S12M-	STLC[R/L]11-14A	●	●	14	12	11	24	150	7.2		10					
S16Q-	STLC[R/L]11-18A	●	●	18	16	15	30	180	9.2	0.7	8					
S20R-	STLC[R/L]11-22A	●	●	22	20	19	36	200	11.2		6					

For WP chipbreaker, cutting edge offsets or program corrections are required on **R36** and **R37**.

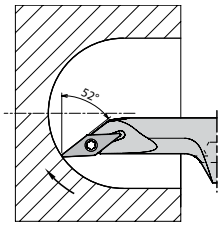
Applicable inserts

Applications	Finishing	Finishing - Medium
Insert		
Chipbreaker type	**WP**	**HQ**
Page	**B85**	**B85**

Recommended cutting conditions **F158, F159**
Applicable sleeves **F154~F157**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

A-SVJP(C)(B)-AE Excellent bar (Spherical machining / Internal facing / Internal copying)



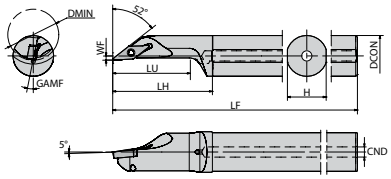


Fig. 1

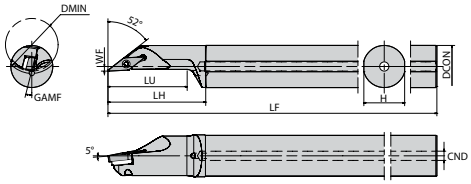


Fig. 2

Max. Overhang Length L/D=~5.5 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Boring

Solid

Positive

KAV

Negative

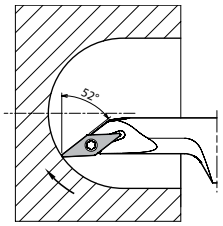
Toolholder dimensions

Description	Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts						Applicable inserts
															Screw	Wrench	Wrench	Shim	Shim screw	Wrench	
	R	L	DMIN	DCON	CND	H	LH	LF	LU	WF											
A12M- SVJP[R/L]08-16AE	●	●	16	12	4	11	33	150	26	2	5	0.2	Yes	1	SB-2050TR	-	FT-6	-	-	-	VP□T0802...
A12M- SVJC[R/L]08-16AE	●	●	16	12	4	11	33	150	26	2	5	0.4	Yes	1	SB-2050TR	-	FT-6	-	-	-	VC□T0802... VC□W0802...
A16Q- SVJC[R/L]08-20AE	●	●	20	16		15	43	180	36												
A20R- SVJB[R/L]11-25AE	●	●	25	20	5	19	48	200	37.5	2	5	0.4	Yes	1	SB-2570TR	-	FT-8	-	-	-	VB□T1103... VB□W1103...
A25S- SVJB[R/L]11-30AE	●	●	30	25	7	24	58	250	45	3.5											
A32S- SVJB[R/L]16-40AE	●	●	40	32	7	31	74	250	60	3.5	8	0.4	Yes	2	SB-40125TRN	FT-15	-	SVN-32N (SVN-32S*)	SS-4N	LW-4	VB□T1604... VB□W1604... VC□T1604...
A40T- SVJB[R/L]16-50AE	●	●	50	40	9	39	91	300	75	4.5	7										

Use of VB□T1103..-Y / VB□T1604..-Y with A-SVJB-AE is not recommended.
When using inserts whose corner-R(RE) is 0.2 or 0.4mm, shim (SVN-32S) is recommended (sold separately).

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-SVJP(C)(B)-A Steel shank bar (Spherical machining / Internal facing / Internal copying)



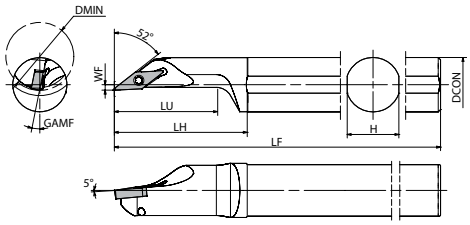


Fig. 1

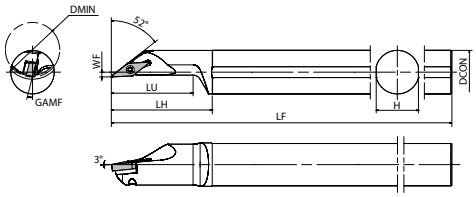


Fig. 2

Max. Overhang Length L/D=~4 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

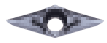
Toolholder dimensions

Description		Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts						Applicable inserts
															Screw	Wrench	Wrench	Shim	Shim screw	Wrench	
		R	L	DMIN	DCON	H	LH	LF	LU	WF											
S12M-	SVJP[R/L]08-16A	●	●	16	12	11	33	150	26	2	5	0.2	No	1	SB-2050TR	-	FT-6	-	-	-	VP□T0802...
S12M-	SVJC[R/L]08-16A	●	●	16	12	11	33	150	26	2	5	0.4	No	1	SB-2050TR	-	FT-6	-	-	-	VC□T0802... VC□W0802...
S16Q-	SVJC[R/L]08-20A	●	●	20	16	15	43	180	36												
S20R-	SVJB[R/L]11-25A	●	●	25	20	19	48	200	37.5	2	5	0.4	No	1	SB-2570TR	-	FT-8	-	-	-	VB□T1103... VB□W1103...
S25S-	SVJB[R/L]11-30A	●	●	30	25	24	58	250	45	3.5											
S32S-	SVJB[R/L]16-40A	●	●	40	32	31	74	250	60	3.5	8	0.4	No	2	SB-40125TRN	FT-15	-	SVN-32N (SVN-32S*)	SS-4N	LW-4	VB□T1604... VB□W1604... VC□T1604...
S40T-	SVJB[R/L]16-50A	●	●	50	40	39	91	300	75	4.5	7										

Use of VB□T1103..-Y / VB□T1604..-Y with S-SVJB-A is not recommended.
When using inserts whose corner-R(RE) is 0.2 or 0.4mm, shim (SVN-32S) is recommended (sold separately).

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts (A-SVJP(C)(B)-AE / S-SVJP(C)(B)-A)

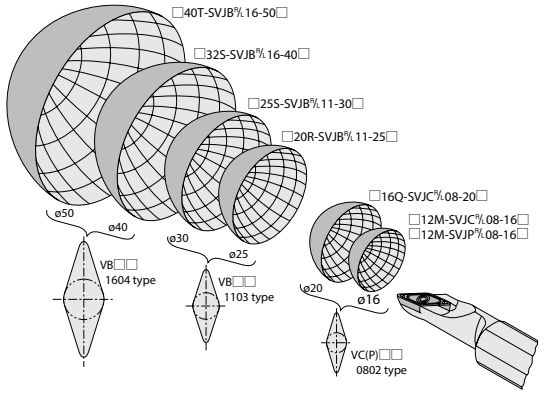
Applications	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing	Low feed
Insert								
Chipbreaker type	**CK**	**VF**	**PP**	**GP**	**HQ**	**R/L-F**	**R/L-FSF**	**R/L-U**
Page	**B102**	**B97, B100**	**B97, B100**	**B97**	**B97, B100**	**B98, B103**	**B98, B103**	**B104**

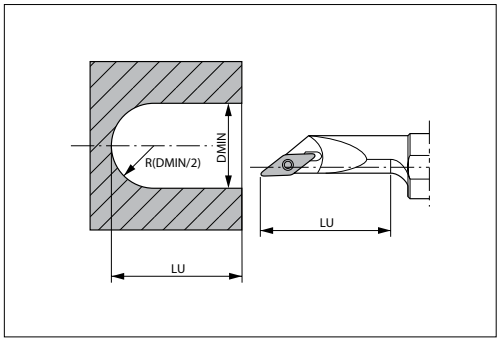
Applications	Low feed	Finishing - Medium	Non-Ferrous metals	Hard materials
Insert				
Chipbreaker type	**R/L-USF**	**R/L-Y**	**PCD**	**CBN**
Page	**B104**	**B99**	**C49, C50**	**C26, C27**

Recommended cutting conditions ➡ **F159**
Applicable sleeves ➡ **F155~F157**

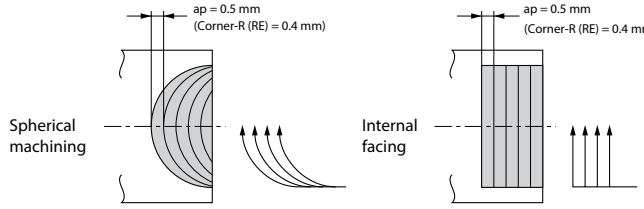
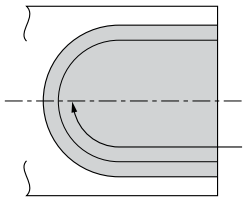
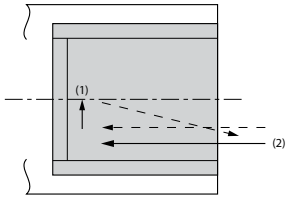
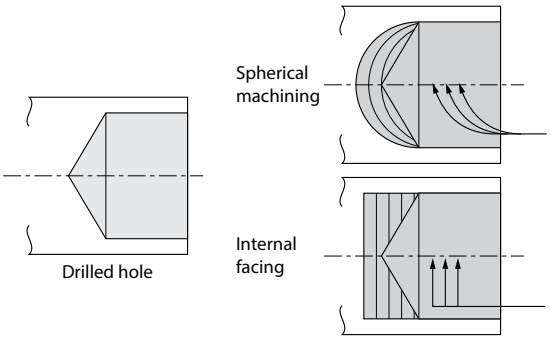
Application of □-SVJP(C)(B)-□ / A-SZJB-AE

1. Application range

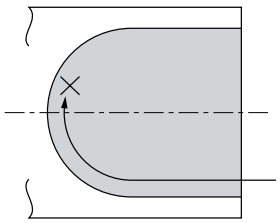




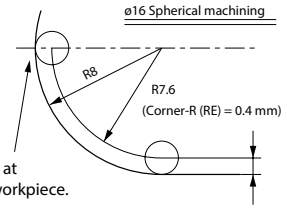
2. Application

Case with no existing hole	Finishing
 (Note) f shall be 0.05 mm/rev or less at internal facing.	Spherical machining 
Case with drilled hole	Internal facing  Machining process (1) Finish the internal face first. (2) Next, finish the internal diameter.
 (Note) f shall be 0.05mm/rev or less at internal facing.	

3. Caution

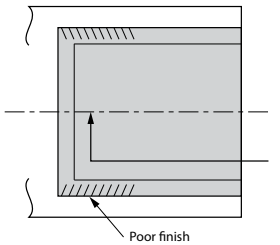


When machining past the center of the workpiece, insert may break.



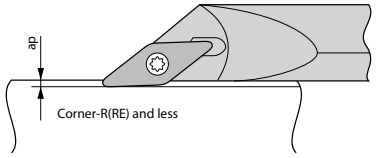
Fix the insert edge at the center of the workpiece.

Adjust the machining program to radius minus the value of corner-R (RE).



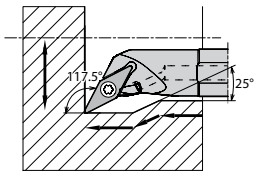
This type of machining is possible, but the chips might scratch the surface.

For internal profiling, ap should be the value of Corner-R(RE) and less.



[Burrs may occur, if ap is Corner-R (RE) and more]

A-SVPC(B)-AE Excellent bar (Internal copying / Undercutting)



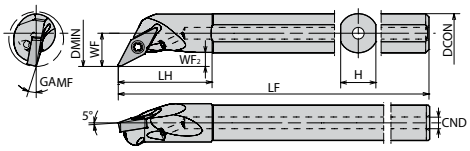


Fig. 1

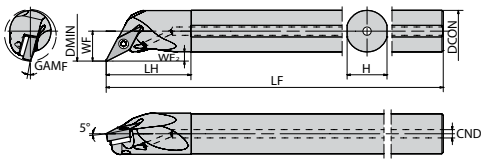


Fig. 2

Max. Overhang Length L/D=~5.5 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Boring

Solid

Positive

KAV

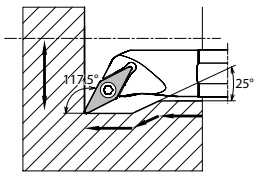
Negative

Toolholder dimensions

Description		Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts						Applicable inserts
																Screw	Wrench	Wrench	Shim	Shim screw	Wrench	
		R	L	DMIN	DCON	CND	H	LH	LF	WF	WF_2											
A10L-	SVPC[R/L]08-14AE	●	●	14	10	3	9	24	140	8.5	3	8	0.4	Yes	1	SB-2050TR	-	FT-6	-	-	-	VC□T0802... VC□W0802...
A12M-	SVPB[R/L]11-18AE	●	●	18	12	4	11	29	150	11	4.5	8	0.4	Yes	1	SB-2570TR	-	FT-8	-	-	-	VB□T1103... VB□W1103...
A16Q-	SVPB[R/L]11-22AE	●	●	22	16	5	15	35	180	13.5	5	5										
A20R-	SVPB[R/L]11-26AE	●	●	26	20		19	41	200	15.5												
A25S-	SVPB[R/L]16-31AE	●	●	31	25	5	24	51	250	18	5	13	0.4	Yes	2	SB-40125TRN	FT-15	-	SVN-32N (SVN-32S*)	SS-4N	LW-4	VB□T1604... VB□W1604... VC□T1604...
A32S-	SVPB[R/L]16-40AE	●	●	40	32		31	54		23	6.5	9										

When using inserts whose corner-R(RE) is 0.2 or 0.4mm, shim (SVN-32S) is recommended (sold separately).

S-SVPC(B)-A Steel shank bar (Internal copying / Undercutting)



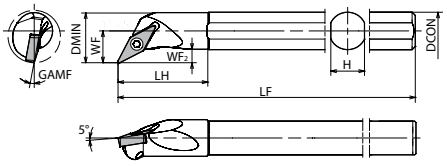


Fig. 1

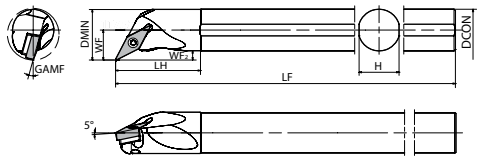


Fig. 2

Max. Overhang Length L/D=~4 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

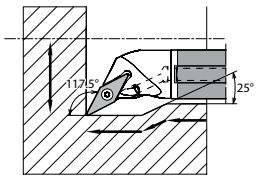
Toolholder dimensions

Description		Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole		Spare parts						Applicable inserts
																Screw	Wrench	Wrench	Shim	Shim screw	Wrench	
		R	L	DMIN	DCON	H	LH	LF	WF	WF_2												
S10L-	SVPC[R/L]08-14A	●	●	14	10	9	24	140	8.5	3	8	0.4	No	1		SB-2050TR	-	FT-6	-	-	-	VC□T0802... VC□W0802...
S12M-	SVPB[R/L]11-18A	●	●	18	12	11	29	150	11	4.5	8	0.4	No	1		SB-2570TR	-	FT-8	-	-	-	VB□T1103... VB□W1103...
S16Q-	SVPB[R/L]11-22A	●	●	22	16	15	35	180	13.5	5	5											
S20R-	SVPB[R/L]11-26A	●	●	26	20	19	41	200	15.5													
S25S-	SVPB[R/L]16-31A	●	●	31	25	24	51	250	18	5	13	0.4	No	2		SB-40125TRN	FT-15	-	SVN-32N (SVN-32S*)	SS-4N	LW-4	VB□T1604... VB□W1604... VC□T1604...
S32S-	SVPB[R/L]16-40A	●	●	40	32	31	54		23	6.5	9											

When using inserts whose corner-R(RE) is 0.2 or 0.4mm, shim (SVN-32S) is recommended (sold separately).

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

E-SVPC(B)-A Carbide shank bar (Internal copying / Undercutting)



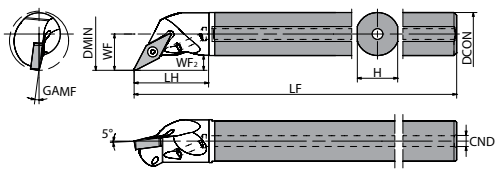


Fig. 1

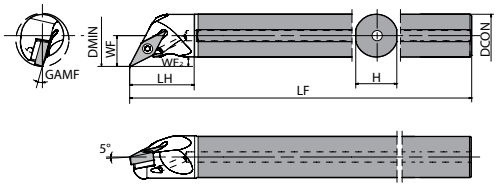


Fig. 2

Max. Overhang Length L/D=~7 | Right-hand shown | Left-hand Insert for Right-hand Toolholder.

Toolholder dimensions

Description		Availability	Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts						Applicable inserts
															Screw	Wrench	Wrench	Shim	Shim screw	Wrench	
		R	DMIN	DCON	CND	H	LH	LF	WF	WF_2											
E10N-	SVPCR08-14A	●	14	10	3	9	20	160	8.5	3	8	0.4	Yes	1	SB-2050TR	-	FT-6	-	-	-	VC□T0802... VC□W0802...
E12Q-	SVPBR11-18A	●	18	12	4	11	23	180	11	4.5	8	0.4	Yes	1	SB-2570TR	-	FT-8	-	-	-	VB□T1103... VB□W1103...
E16X-	SVPBR11-22A	●	22	16		15	28	220	13.5	5	5										
E20S-	SVPBR11-26A	●	26	20	6	19	32	250	15.5												
E25T-	SVPBR16-31A	●	31	25	6	24	38	300	18	5	13	0.4	Yes	2	SB-40125TRN	FT-15	-	SVN-32N (SVN-32S*)	SS-4N	LW-4	VB□T1604... VB□W1604... VC□T1604...

When using inserts whose corner-R(RE) is 0.2 or 0.4mm, shim (SVN-32S) is recommended (sold separately).

Applicable inserts (A-SVPC(B)-AE / S-SVPC(B)-A / E-SVPC(B)-A)

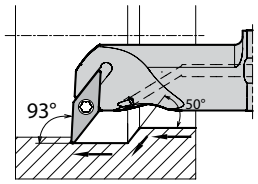
Applications	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing	Finishing - Medium	Non-Ferrous metals
Insert								
Chipbreaker type	VF	PP	GP	HQ	R/L-F	R/L-FSF	R/L-Y	PCD
Page	B97, B100	B97, B100	B97	B97, B100	B98	B98	B99	C49, C50

Applications	Hard materials
Insert	
Chipbreaker type	CBN
Page	C26, C27

Recommended cutting conditions ➡ F159
Applicable sleeves ➡ F155~F157

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

A-SVUC(B)-AE Excellent bar (Internal copying)



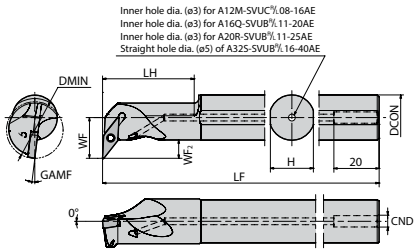


Fig. 1

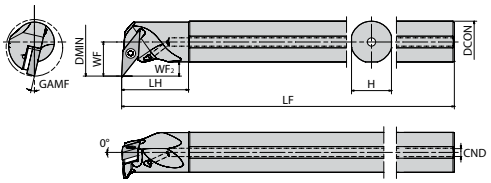


Fig. 2

Max. Overhang Length L/D=~5.5 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Boring

Solid

Positive

KAV

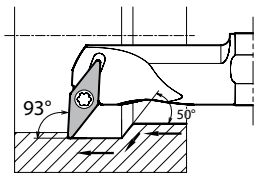
Negative

Toolholder dimensions

Description		Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts						Applicable inserts
																Screw	Wrench	Wrench	Shim	Shim screw	Wrench	
		R	L	DMIN	DCON	CND	H	LH	LF	WF	WF_2											
A12M-	SVUC□/L08-16AE	●	●	16	12	4	11	25.5	150	11.5	5.5	8	0.4	Yes	1	SB-2050TR		FT-6				VC□T0802... VC□W0802...
A16Q-	SVUB□/L11-20AE	●	●	20	16	5	15	32.5	180	16	8	8	0.4	Yes	1	SB-2570TR	-	FT-8	-	-	-	VB□T1103... VB□W1103...
A20R-	SVUB□/L11-25AE	●	●	25	20		19	40.5	200	18		7										
A25S-	SVUB□/L16-34AE	●	●	34	25	5	24	40	250	20.5	8.5	13	0.4	Yes	2	SB-40125TRN	FT-15	-	SVN-32N (SVN-32S*)	SS-4N	LW-4	VB□T1604... VB□W1604... VC□T1604...
A32S-	SVUB□/L16-40AE	●	●	40	32	5	31	84	250	28	12	9	0.4	Yes	1							

When using inserts whose corner-R(RE) is 0.2 or 0.4mm, shim (SVN-32S) is recommended (sold separately).

S-SVUC(B)-A Steel shank bar (Internal copying)



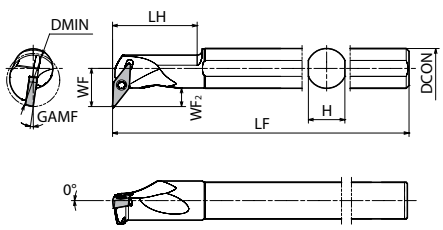


Fig. 1

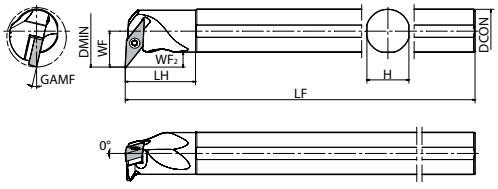


Fig. 2

Max. Overhang Length L/D=~4 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

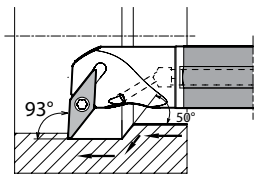
Toolholder dimensions

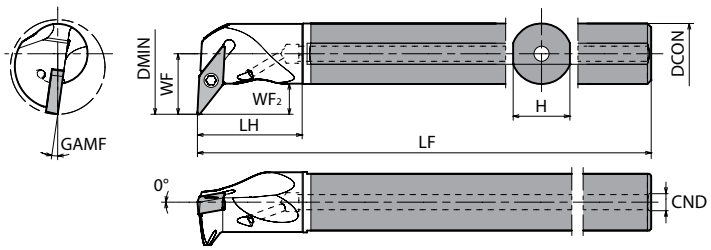
Description		Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts						Applicable inserts
															Screw	Wrench	Wrench	Shim	Shim screw	Wrench	
		R	L	DMIN	DCON	H	LH	LF	WF	WF_2											
S12M-	SVUC□/L08-16A	●	●	16	12	11	25.5	150	11.5	5.5	8	0.4	No	1	SB-2050TR	-	FT-6	-	-	-	VC□T0802... VC□W0802...
S16Q-	SVUB□/L11-20A	●	●	20	16	15	32.5	180	16	8	8	0.4	No	1	SB-2570TR	-	FT-8	-	-	-	VB□T1103... VB□W1103...
S20R-	SVUB□/L11-25A	●	●	25	20	19	40.5	200	18		7										
S25S-	SVUB□/L16-34A	●	●	34	25	24	40	250	20.5	8.5	13	0.4	No	2	SB-40125TRN	FT-15	-	SVN-32N (SVN-32S*)	SS-4N	LW-4	VB□T1604... VB□W1604... VC□T1604...
S32S-	SVUB□/L16-40A	●	●	40	32	31	84	250	28	12	9	0.4	No	1							

When using inserts whose corner-R(RE) is 0.2 or 0.4mm, shim (SVN-32S) is recommended (sold separately).

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

E-SVUC(B)-A Carbide shank bar (Internal copying)



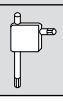
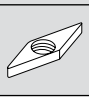


Max. Overhang Length L/D=~7 | Right-hand shown
Left-hand Insert for Right-hand Toolholder.

F

Boring

Toolholder dimensions

Description		Availability	Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts						Applicable inserts
														Screw	Wrench	Wrench	Shim	Shim screw	Wrench	
		R	DMIN	DCON	CND	H	LH	LF	WF	WF2										
E12Q-	SVUCR08-18A	●	18	12	4	11	23	180	11.5	5.5	8	0.4	Yes	SB-2050TR	-	FT-6	-	-	-	VC□T0802... VC□W0802...
E16X-	SVUBR11-25A	●	25	16	4	15	28	220	16	8	8	0.4	Yes	SB-2570TR	-	FT-8	-	-	-	VB□T1103...
E20S-	SVUBR11-29A	●	29	20	6	19	32	250	18		7									VB□W1103...
E25T-	SVUBR16-34A	●	34	25	6	24	38	300	21	8.5	13	0.4	Yes	SB-40125TRN	FT-15	-	SVN-32N (SVN-32S*)	SS-4N	LW-4	VB□T1604... VB□W1604... VC□T1604...

When using inserts whose corner-R(RE) is 0.2 or 0.4mm, shim (SVN-32S) is recommended (sold separately).

Applicable inserts (A-SVUC(B)-AE / S-SVUC(B)-A / E-SVUC(B)-A)

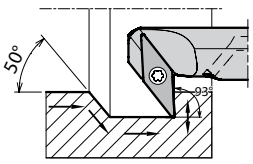
Applications	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing	Finishing - Medium	Non-Ferrous metals
Insert								
Chipbreaker type	VF	PP	GP	HQ	R/L-F	R/L-FSF	R/L-Y	PCD
Page	B97, B100	B97, B100	B97	B97, B100	B98	B98	B99	C49, C50

Applications	Hard materials
Insert	
Chipbreaker type	CBN
Page	C26, C27

Recommended cutting conditions ➡ F159
Applicable sleeves ➡ F155~F157

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

A-SVZC(B)-AE Excellent bar (Back boring)



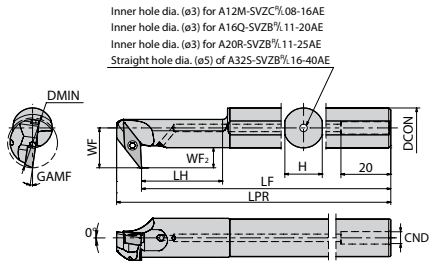


Fig. 1

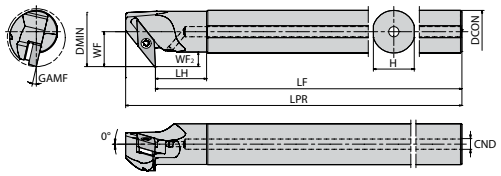


Fig. 2

Max. Overhang Length L/D=~5.5 | Right-hand shown
Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

F

Boring

Solid

Positive

KAV

Negative

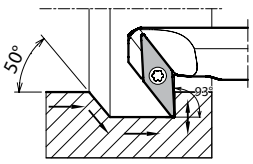
Toolholder dimensions

Description	Availability		Dimension (mm)									GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts						Applicable inserts
																Screw	Wrench	Wrench	Shim	Shim screw	Wrench	
	R	L	DMIN	DCON	CND	H	LH	LPR	LF	WF	WF2											
A12M- SVZC□08-16AE	●	●	16	12	4	11	25.5	150	142.5	11.5	5.5	8	0.4	Yes	1	SB-2050TR	-	FT-6	-	-	-	VC□T0802... VC□W0802...
A16Q- SVZB□11-20AE	●	●	20	16	5	15	32.5	180	170	16	8	8	0.4	Yes	1	SB-2570TR	-	FT-8	-	-	-	VB□T1103... VB□W1103...
A20R- SVZB□11-25AE	●	●	25	20		19	40.5	200	190	18		7										
A25S- SVZB□16-34AE	●	●	34	25	5	24	30	250	232.5	20.5	8.5	13	0.4	Yes	2	SB-40125TRN	FT-15	-	SVN-32N (SVN-32S*)	SS-4N	LW-4	VB□T1604... VB□W1604... VC□T1604...
A32S- SVZB□16-40AE	●	●	40	32	5	31	72.5	250	232.5	28	12	9	0.4	Yes	1							

When using inserts whose corner-R(RE) is 0.2 or 0.4mm, shim (SVN-32S) is recommended (sold separately).

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-SVZC(B)-A Steel shank bar (Back boring)



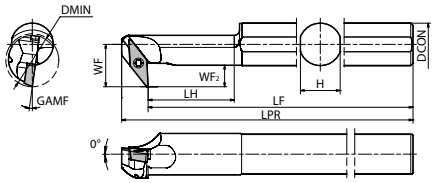


Fig. 1

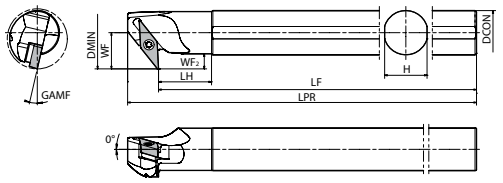


Fig. 2

Max. Overhang Length L/D=~4 | Right-hand shown
Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

F

Boring

Toolholder dimensions

Description		Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts						Applicable inserts
																Screw	Wrench	Wrench	Shim	Shim screw	Wrench	
		R	L	DMIN	DCON	H	LH	LPR	LF	WF	WF_2											
S12M-	SVZC$^{R}_{L}$08-16A	●	●	16	12	11	25.5	150	142.5	11.5	5.5	8	0.4	No	1	SB-2050TR	-	FT-6	-	-	-	VC□T0802... VC□W0802...
S16Q-	SVZB$^{R}_{L}$11-20A	●	●	20	16	15	32.5	180	170	16	8	8	0.4	No	1	SB-2570TR	-	FT-8	-	-	-	VB□T1103... VB□W1103...
S20R-	SVZB$^{R}_{L}$11-25A	●	●	25	20	19	40.5	200	190	18		7										
S25S-	SVZB$^{R}_{L}$16-34A	●	●	34	25	24	30	250	232.5	20.5	8.5	13	0.4	No	2	SB-40125TRN	FT-15	-	SVN-32N (SVN-32S*)	SS-4N	LW-4	VB□T1604... VB□W1604... VC□T1604...
S32S-	SVZB$^{R}_{L}$16-40A	●	●	40	32	31	72.5	250	232.5	28	12	9	0.4	No	1							

When using inserts whose corner-R(RE) is 0.2 or 0.4mm, shim (SVN-32S) is recommended (sold separately).

Applicable inserts (A-SVZC(B)-AE / S-SVZC(B)-A)

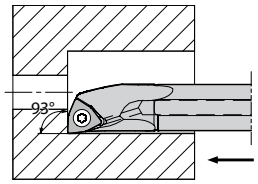
Applications	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing	Finishing - Medium	Non-Ferrous metals
Insert								
Chipbreaker type	VF	PP	GP	HQ	$^{R}_{L}$-F	$^{R}_{L}$-FSF	$^{R}_{L}$-Y	PCD
Page	B97, B100	B97, B100	B97	B97, B100	B98	B98	B99	C49, C50

Applications	Hard materials
Insert	
Chipbreaker type	CBN
Page	C26, C27

Recommended cutting conditions ➡ F159
Applicable sleeves ➡ F155~F157

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

A/S-SWUB(P)-AE Excellent bar (Boring)



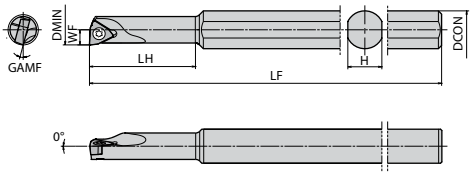


Fig. 1

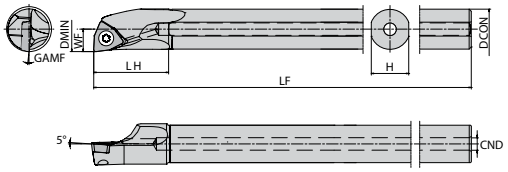


Fig. 2

Max. Overhang Length L/D=~5.5 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Boring

Solid

Positive

KAV

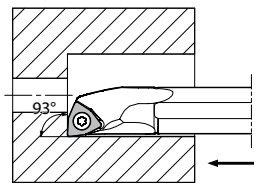
Negative

Toolholder dimensions

Description		Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts			Applicable inserts
															Screw	Wrench	Wrench	
		R	L	DMIN	DCON	CND	H	LH	LF	WF								
S10H-	SWUB$^{R}_{L}$06-06AE	●	●	6	10	-	9	21	100	3	15	0.2	No	1	SB-2035TR	-	FT-6	WB□T0601... WB□W0601...
	SWUB$^{R}_{L}$06-07AE	●	●	7				25		3.5	13							
S10H-	SWUB$^{R}_{L}$08-08AE	●	●	8	10	-	9	28	100	4	15	0.2	No	1	SB-2035TR	-	FT-6	WB□T0802... WB□W0802...
A08X-	SWUB$^{R}_{L}$08-10AE	●	●	10	8	2.5	7	16	120	5	13	0.2	Yes	2	SB-2050TR	-	FT-6	
A10L-	SWUB$^{R}_{L}$08-12AE	●	●	12	10	3	9	20	140	6	10							
A12M-	SWUP$^{R}_{L}$11-14AE	●	●	14	12	4	11	24	150	7	4	0.4	Yes	2	SB-2545TR	-	FT-8	WP□T1102... WP□W1102...
A16Q-	SWUP$^{R}_{L}$11-18AE	●	●	18	16	5	15	30	180	9	1							
A16Q-	SWUP$^{R}_{L}$16-18AE	●	●	18	16	5	15	30	180	9	3.5	0.8	Yes	2	SB-4065TR	FT-15	-	WP□T1603... WP□W1603...
A20R-	SWUP$^{R}_{L}$16-22AE	●	●	22	20		19	36	200	11	2							

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-SWUB(P)-A Steel shank bar (Boring)



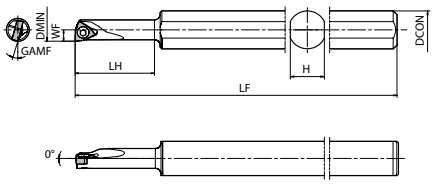


Fig. 1

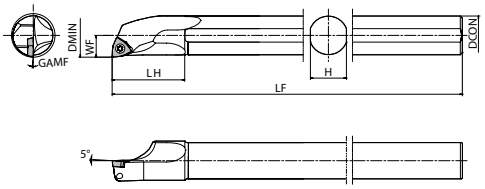


Fig. 2

Max. Overhang Length L/D=~4 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

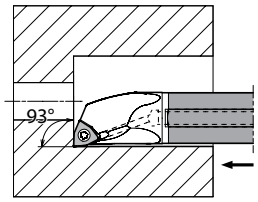
Boring

Toolholder dimensions

Description		Availability		Dimension (mm)						GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts			Applicable inserts
		R	L	DMIN	DCON	H	LH	LF	WF					Screw	Wrench	Wrench	
																	
S10H-	SWUB$^{R}_{L}$06-06A	●	●	6	10	9	21	100	3	15	0.2	No	1	SB-2035TR	-	FT-6	WB□T0601... WB□W0601...
	SWUB$^{R}_{L}$06-07A	●	●	7			25		3.5	13							
S10H-	SWUB$^{R}_{L}$08-08A	●	●	8	10	9	28	100	4	15	0.2	No	1	SB-2035TR	-	FT-6	WB□T0802... WB□W0802...
S08X-	SWUB$^{R}_{L}$08-10A	●	●	10	8	7	16	120	5	13	0.2	No	2	SB-2050TR			
S10L-	SWUB$^{R}_{L}$08-12A	●	●	12	10	9	20	140	6	10							
S12M-	SWUP$^{R}_{L}$11-14A	●	●	14	12	11	24	150	7	4	0.4	No	2	SB-2545TR	-	FT-8	WP□T1102... WP□W1102...
S16Q-	SWUP$^{R}_{L}$11-18A	●	●	18	16	15	30	180	9	1							
S16Q-	SWUP$^{R}_{L}$16-18A	●	●	18	16	15	30	180	9	3.5	0.8	No	2	SB-4065TR	FT-15	-	WP□T1603... WP□W1603...
S20R-	SWUP$^{R}_{L}$16-22A	●	●	22	20	19	36	200	11	2							

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

C/E-SWUB(P)-A(N) Carbide shank bar (Boring)



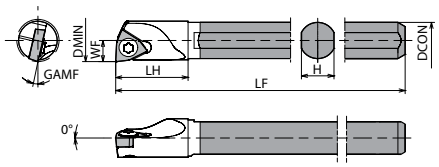


Fig. 1

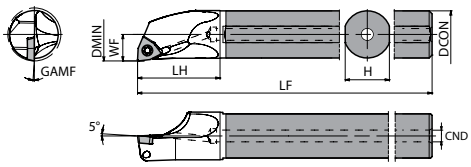


Fig. 2

Max. Overhang Length L/D=~7 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Boring

Solid

Positive

KAV

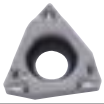
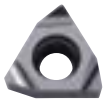
Negative

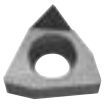
Toolholder dimensions

Description		Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts			Applicable inserts
															Screw	Wrench	Wrench	
		R	L	DMIN	DCON	CND	H	LH	LF	WF								
C05H-	SWUB$^{R}_{L}$06-06AN	●	●	6	5	-	4.4	9	100	3	15	0.2	No	1	SB-2035TR	-	FT-6	WB□T0601... WB□W0601...
C06J-	SWUB$^{R}_{L}$06-07AN	●	●	7	6	-	5.4	10	110	3.5	13							
C07K-	SWUB$^{R}_{L}$08-08AN	●	●	8	7	-	6.4	11	125	4	15	0.2	No	1	SB-2035TR	-	FT-6	WB□T0802... WB□W0802...
E08L-	SWUB$^{R}_{L}$08-10AN	●	●	10	8	3	7	14	140	5	13	0.2	Yes	2	SB-2050TR			
E10N-	SWUB$^{R}_{L}$08-12AN	●	●	12	10		9	18	160	6	10							
	SWUBR08-12AN2/3	●							105									
	SWUBR08-12AN1/2	●							80									
E12Q-	SWUP$^{R}_{L}$11-14A	●	●	14	12	4	11	23	180	7	4	0.4	Yes	2	SB-2545TR	-	FT-8	WP□T1102... WP□W1102...
	SWUPR11-14A-2/3	●							120									
	SWUPR11-14A-1/2	●							90									
E16X-	SWUP$^{R}_{L}$11-18A	●	●	18	16		15	28	220	9	1							
	SWUPR11-18A-2/3	●							145									
	SWUPR11-18A-1/2	●							110									
E16X-	SWUP$^{R}_{L}$16-18A	●	●	18	16	4	15	28	220	9	3.5	0.8	Yes	2	SB-4065TR	FT-15	-	WP□T1603... WP□W1603...
	SWUPR16-18A-2/3	●							145									
	SWUPR16-18A-1/2	●							110									
E20S-	SWUP$^{R}_{L}$16-22A	●	●	22	20	6	19	32	250	11	2							
	SWUPR16-22A-2/3	●							165									
	SWUPR16-22A-1/2	●							125									

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts

Applications	Minute ap	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing	Finishing - Medium
Insert								
Chipbreaker type	R/L-**CF**	R/L-**PF**	**GP**	R/L-**DP**	**HQ**	R/L-**F**	R/L-**P**	R/L-**Y**
Page	**B105**	**B105**	**B107**	**B105**	**B107**	**B105, B106**	**B106**	**B107**

Applications	Cast iron	Non-Ferrous metals	Hard materials
Insert			
Chipbreaker type	**No CB**	**PCD**	**CBN**
Page	**B107**	**C51, C52**	**C28**

Recommended cutting conditions **F158, F159**

25° insert profiling tools

ZBMT series

Unique clamping structure and a wide lineup of external toolholders and boring bars. High precision and stable machining in a wide range of applications including copying, undercutting, tapering, V-slotting, spherical machining, and more.

1 Newly developed unique-clamping mechanism achieves a higher rigidity

Side lock mechanism

Unique design holds insert at 2 points
Safe even for insert with small tip angle that is difficult to mount

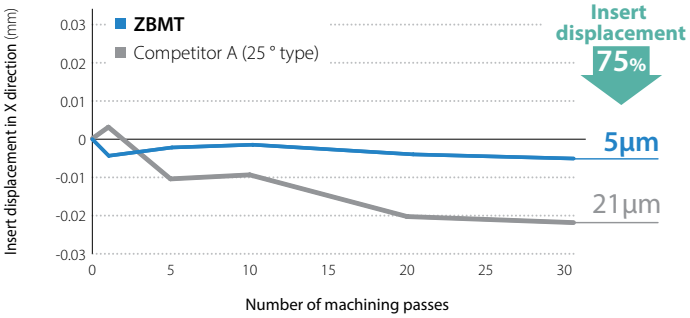


Indentations for screw clamp are designed into the insert's body

Uses a large screw size (M4)



Insert displacement during facing comparison (Internal evaluation)



Cutting conditions : Vc = 230 m/min, ap = 0.3 mm, f = 0.15 mm/rev, Wet Workpiece material 34CrMo4

*The above figures are not guaranteed. It depends on cutting conditions.

Check

By controlling insert displacement,

- Machining precision is stabilized and long tool life is enable
- Reduces defect rate due to sudden dimensional deviation

Provides high quality and stable machining in various machining applications

Excellent performance in various machining applications including copying, undercutting, tapering, V-slotting, spherical machining, etc.



Shaft copying



Internal undercutting



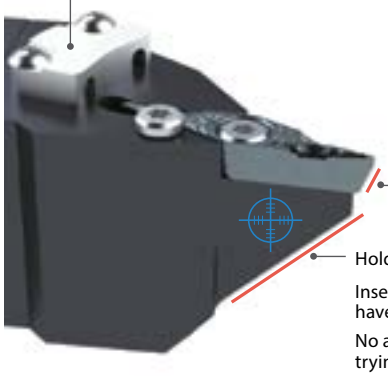
End face tapering

CG images

2 Unique holder design to meet customers' needs

Both boring bars and external toolholders are compatible with internal coolant.

Uses a clamp with a small thickness that does not prevent chip flow



Unique double coolant hole design

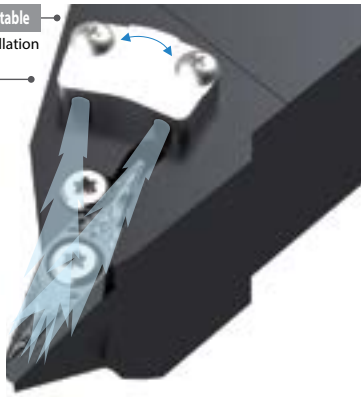
Supplies coolant directly to the cutting edge and provides improved chip evacuation and long tool life (Coolant discharge direction: Fine adjustment possible)

*Though coolant stream hits side clamp screw, machining performance is not affected

*Pressure resistance: ~ 3 MPa

Fine tuned and adjustable

± 4 ° Adjustable oscillation



Easy to use for facing

Insert corner : 2-step positive type (20°)

Holder: Tapered shape

Inserts and toolholders have a unique end shape

No additional machining is required when trying to avoid interference with workpiece.

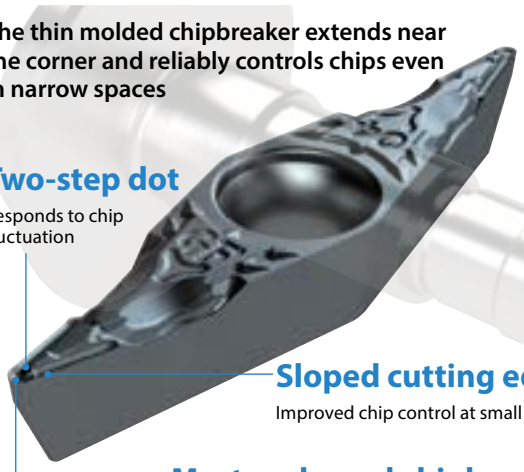
Effective for facing applications



3 New GF chipbreaker for ZBMT reduces chip control issues at minute D.O.C.

GF chipbreaker Solving chip control issues leads to high-quality surface finishes

The thin molded chipbreaker extends near the corner and reliably controls chips even in narrow spaces



Two-step dot

Responds to chip fluctuation

Sloped cutting edge

Improved chip control at small D.O.C.

Mortar-shaped chipbreaker

Low resistance and excellent chip control even in ductile workpieces

Chip control comparison

(Internal evaluation)



GF chipbreaker

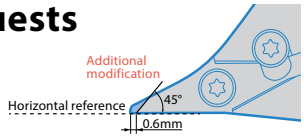


Competitor A (25 ° type)

Cutting conditions : Vc = 230 m/min, f = 0.15 mm/rev, ap = 0.2 - 0.5 mm, Wet Workpiece material 34CrMo4 Facing

15° Inserts are also available upon customer requests

To avoid holder interference, additional modifications is required as shown in the figure on the right. Also, as shown in the figure below, special order for holders may be required depending on machining application.

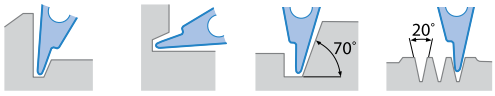


Examples

When using the toolholder in reverse mounting position

When using the toolholder in normal mounting position

* Holder: Special order specification

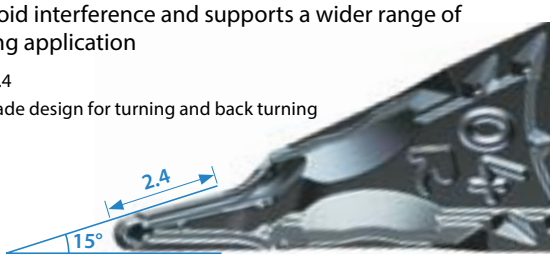


15 ° inserts are developed relative to 25 ° inserts

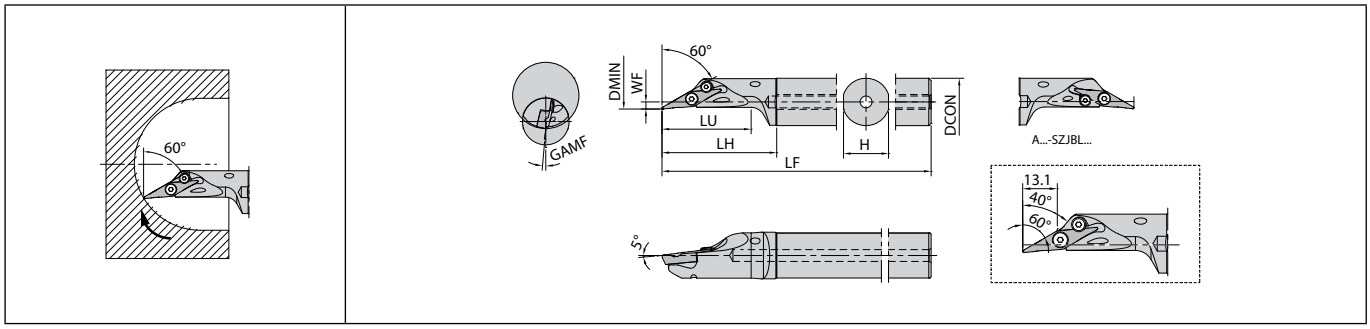
Helps avoid interference and supports a wider range of machining application

Corner-R 0.4

Double-blade design for turning and back turning



A-SZJB-AE Excellent bar (Spherical machining / Internal facing / Internal copying)



Max. Overhang Length L/D=~5.5 | Right-hand shown | ZBMT13T304R-GF-15D is applicable to Right-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts
														Screw	Wrench	
	R	L	DMIN	DCON	CND	H	LH	LF	LU	WF						
A20R- SZJB□13-28AE	●	●	28	20	5	19	48	250	37.5	3.5	5	0.4	Yes	SB-3079TR	FT-8	ZBMT13T3...
A25S- SZJB□13-30AE	●	●	30	25		24	58		47							
A32S- SZJB□13-40AE	●	●	40	32		31	72		61.5							

For application of A-SZJB-AE, please refer to **F93**.

Applicable inserts

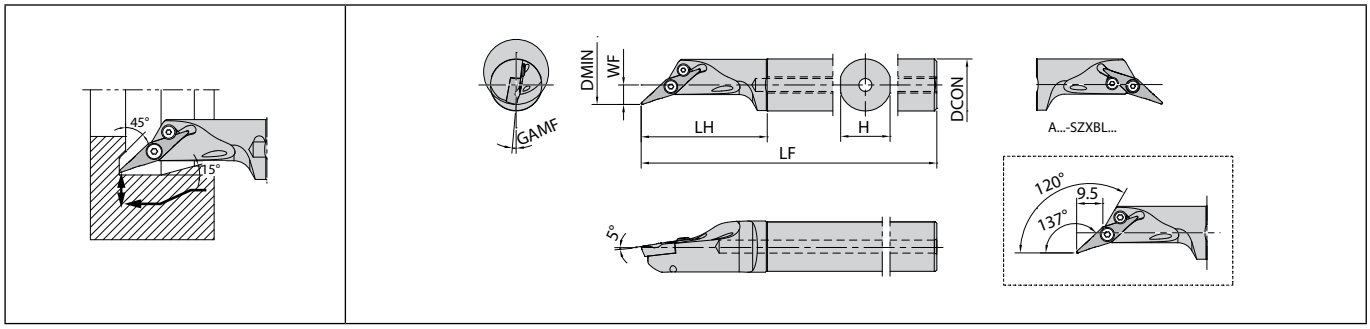
Applications	Finishing	Finishing	Non-ferrous metals
Insert			
Chipbreaker type	GF	R-GF-15D	NE
Page	B108	B108	C53

R-GF-15D inserts are only for the right-hand toolholders of A-SZJB-AE.

Recommended cutting conditions F159
Applicable sleeves F156

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

A-SZXB-AE Excellent bar (Internal facing / Internal copying / Undercutting)



Max. Overhang Length L/D=~5.5 | Right-hand shown

Toolholder dimensions

Description		Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts
															Screw	Wrench	
		R	L	DMIN	DCON	CND	H	LH	LF	LU	WF						
A20R-	SZXB[R/L]13-25AE	●	●	25	20	5	19	48	250	37.5	7.5	5	0.4	Yes	SB-3079TR	FT-8	ZBMT13T3...
A25S-	SZXB[R/L]13-30AE	●	●	30	25		24	58		45.2	7						
A32S-	SZXB[R/L]13-40AE	●	●	40	32		31	74		60.2							

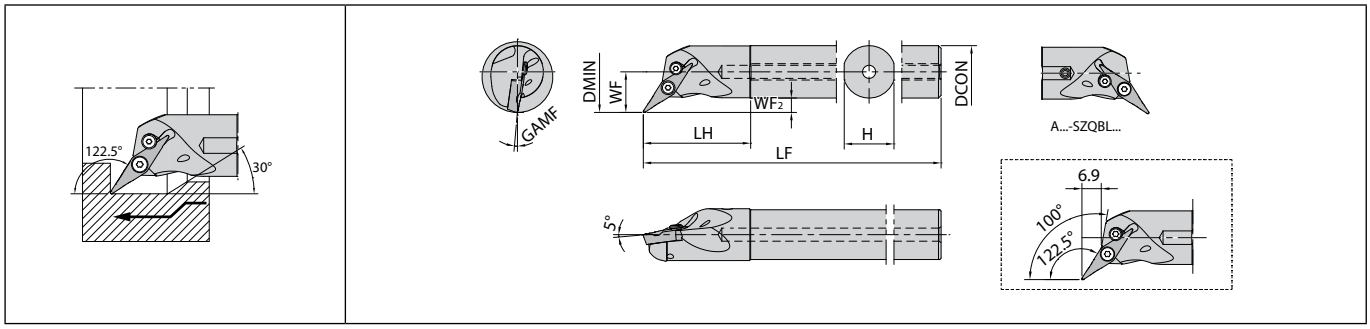
Applicable inserts

Applications	Finishing	Non-ferrous metals
Insert		
Chipbreaker type	GF	NE
Page	B108	C53

Recommended cutting conditions F159
Applicable sleeves F156

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

A-SZQB-AE Excellent bar (Internal copying / Undercutting)



Max. Overhang Length L/D=~5.5 | Right-hand shown

Toolholder dimensions

Description		Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts
		R	L	DMIN	DCON	CND	H	LH	LF	WF	WF_2				Screw	Wrench	
A20R-	SZQB[R/L]13-27AE	●	●	27	20	5	19	41	200	15.5	5.5	5	0.4	Yes	SB-3079TR	FT-8	ZBMT13T3...
A25S-	SZQB[R/L]13-32AE	●	●	32	25		24	51	250	18							
A32S-	SZQB[R/L]13-40AE	●	●	40	32		31	54		22.5	6.5						

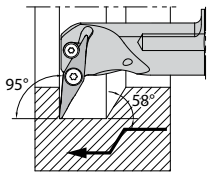
Applicable inserts

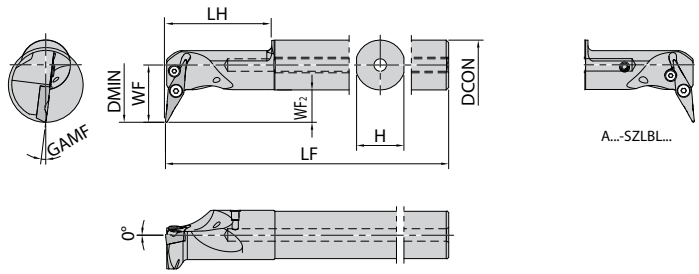
Applications	Finishing	Non-ferrous metals
Insert		
Chipbreaker type	GF	NE
Page	B108	C53

Recommended cutting conditions ➡ F159
Applicable sleeves ➡ F156

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

A-SZLB-AE Excellent bar (Internal copying)





Max. Overhang Length L/D=~5.5 | Right-hand shown | ZBMT13T304R-GF-15D is applicable to Left-hand Toolholder.

Toolholder dimensions

Description		Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts
		R	L	DMIN	DCON	CND	H	LH	LF	WF	WF_2				Screw	Wrench	
A20R-	SZLB□13-30AE	●	●	30	20	5	19	42	200	23	13	7	0.4	Yes	SB-3079TR	FT-8	ZBMT13T3...
A25S-	SZLB□13-34AE	●	●	34	25		24	64	250	25.5							
A32S-	SZLB□13-40AE	●	●	40	32		31	86		29							

Applicable inserts

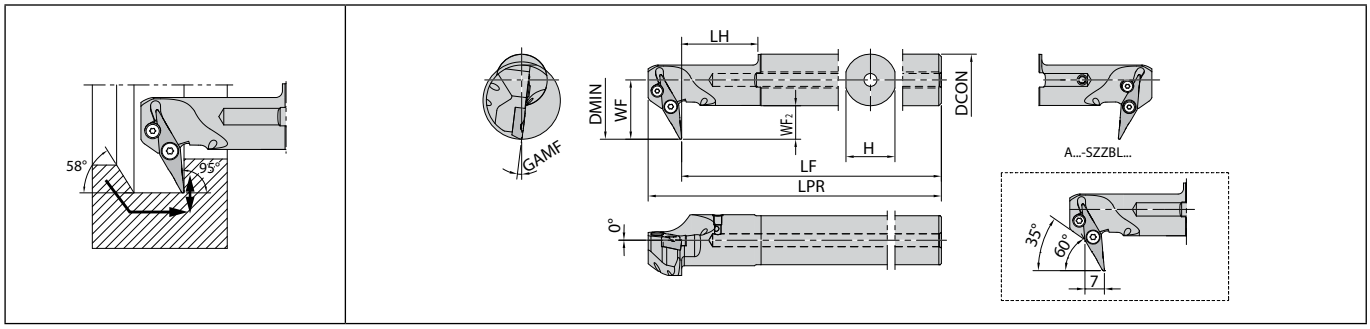
Applications	Finishing	Finishing	Non-ferrous metals
Insert			
Chipbreaker type	GF	R-GF-15D	NE
Page	B108	B108	C53

R-GF-15D inserts are only for the left-hand toolholders of A-SZLB-AE.

Recommended cutting conditions ➡ F159
Applicable sleeves ➡ F156

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

A-SZZB-AE Excellent bar (Back boring)



Max. Overhang Length L/D=~5.5 | Right-hand shown | ZBMT13T304R-GF-15D is applicable to Right-hand Toolholder.

F

Boring

Solid

Positive

KAV

Negative

Toolholder dimensions

Description	Availability		Dimension (mm)									GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts
	R	L	DMIN	DCON	CND	H	LH	LPR	LF	WF	WF_2				Screw	Wrench	
A20R- SZZB□/L13-30AE	●	●	30	20	5	19	42	200	187	23	13	7	0.4	Yes	SB-3079TR	FT-8	ZBMT13T3...
A25S- SZZB□/L13-34AE	●	●	34	25		24	58	250	237	25.5							
A32S- SZZB□/L13-40AE	●	●	40	32		31	74			29							

Applicable inserts

Applications	Finishing	Finishing	Non-ferrous metals
Insert			
Chipbreaker type	GF	R-GF-15D	NE
Page	B108	B108	C53

R-GF-15D inserts are only for the right-hand toolholders of A-SZZB-AE.

Recommended cutting conditions F159
Applicable sleeves F156

Instructions

When mounting the insert (Tightening torque: 1.2 N · m)

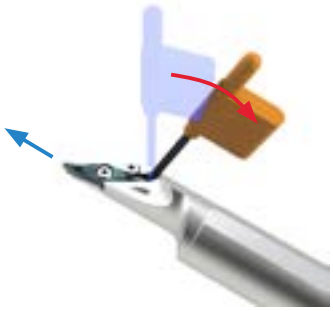


1. Tighten the main screw with the insert pressed against the contact surface with fingertips.



2. Tighten the side screw to complete the installation.

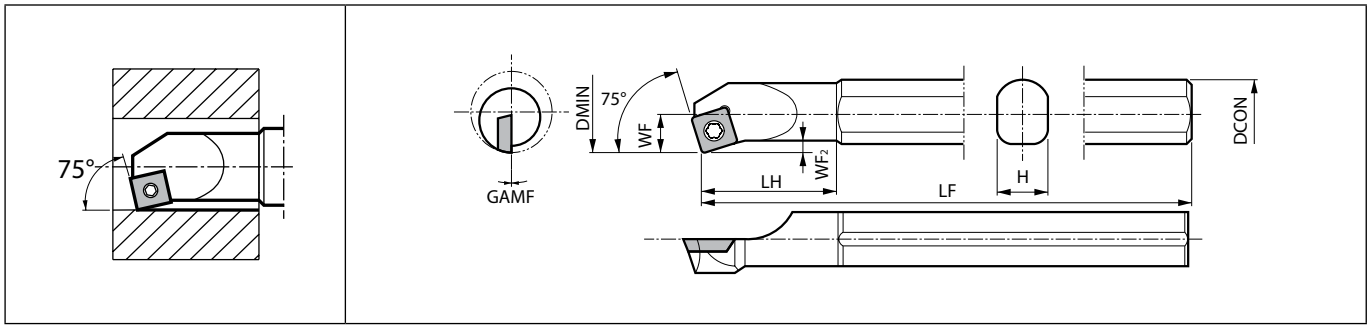
When removing the insert



Remove the two screws and put the wrench into the gap at the back end of the insert. It can be easily removed by pushing out the insert as shown above.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-SSKP Steel shank bar (Boring)



Max. Overhang Length L/D=~3 | Right-hand shown | Left-hand Insert for Right-hand Toolholder.

Toolholder dimensions

Description	Availability	Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts
												Screw	Wrench	
	R	DMIN	DCON	H	LH	LF	WF	WF_2						
S16Q- SSKPR09-20	●	20	16	14	30	180	10	2	-3	0.8	No	SB-4TR	FT-15	SPGH0903...

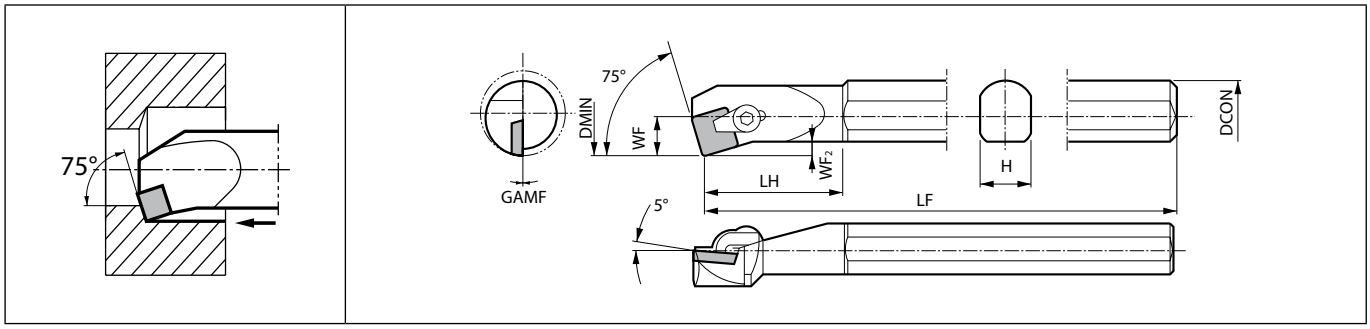
Applicable inserts

Applications	Finishing
Insert	
Chipbreaker type	**L**
Page	**B82**

Recommended cutting conditions **F159**
Applicable sleeves **F156, F157**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-CSKP Steel shank bar (Boring)



Max. Overhang Length L/D=~3 | Right-hand shown | Left-hand Insert for Right-hand Toolholder.

Toolholder dimensions

Description		Availability	Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts			Applicable inserts
		R	DMIN	DCON	H	LH	LF	WF	WF_2				Clamp set	Wrench	Wrench	
S16N-	CSKPR09-20	●	20	16	14	40	160	10	2	0	0.8	No	CPS-2	-	FH-2.5	SP□N0903... SP□R0903...
S20Q-	CSKPR09-27	●	27	20	18	45	180	13.5	3.5							
S25X-	CSKPR12-34	●	34	25	23	60	220	17	4.5	0	0.8	No	CPS-3	LW-3	-	SP□N1203... SP□R1203...

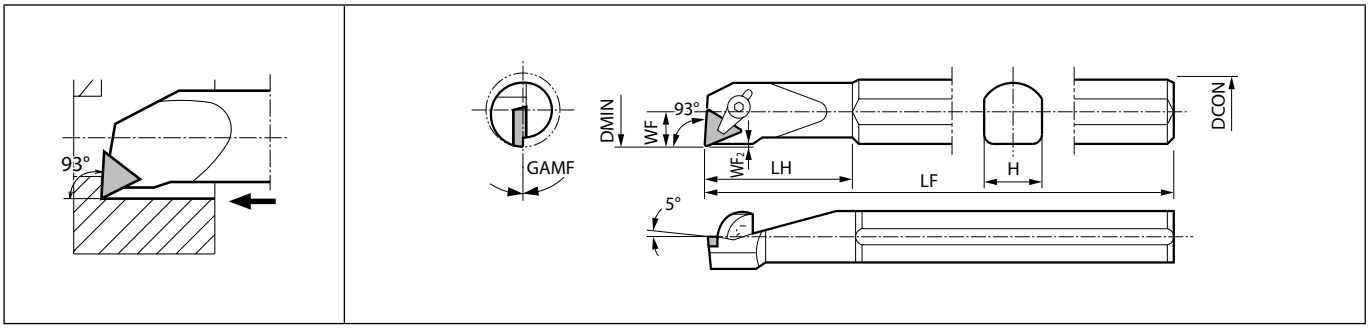
Applicable inserts

Applications	Medium	Medium	Finishing - Medium	Cast iron	Cast iron	Non-Ferrous metals
Insert						
Chipbreaker type	**G**	**STD**	**L**	**No CB**	**Ceramic**	**PCD**
Page	**B83**	**B83**	**B83**	**B83**	**B121**	**C43**

Recommended cutting conditions ➡ **F159**
Applicable sleeves ➡ **F156, F157**

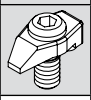
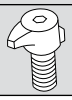
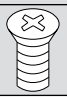
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-CTUP Steel shank bar (Boring)



Max. Overhang Length L/D=~3 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description		Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts						Applicable inserts
														Clamp set	Clamp set	Shim screw	Shim	Wrench	Wrench	
		R	L	DMIN	DCON	H	LH	LF	WF	WF_2										
S12L-	CTUPR09-16	●		16	12	11	32	140	8	0.5	0	0.4	No	CPS-1	-	-	-	-	FH-2	TP□N0902... TP□R0902...
S16N-	CTUP$^{R}_{L}$11-20	●	●	20	16	15	30	160	10	0.5	0	0.4	No	-	CPS-2	-	-	-	FH-2.5	TP□N1103... TP□R1103...
S20Q-	CTUP$^{R}_{L}$11-27	●	●	27	20	18	40	180	13.5	1.3										
S25X-	CTUP$^{R}_{L}$16-34	●	●	34	25	23	60	220	17	1	0	0.8	No	-	CPS-3	-	-	LW-3	-	TP□N1603... TP□R1603...
S32S-	CTUP$^{R}_{L}$16-43	●	●	43	32	30	70	250	21.5							SP3X10	KPT-32			
S40X-	CTUP$^{R}_{L}$16-50	●	●	50	40	37	80	315	25											

Applicable inserts

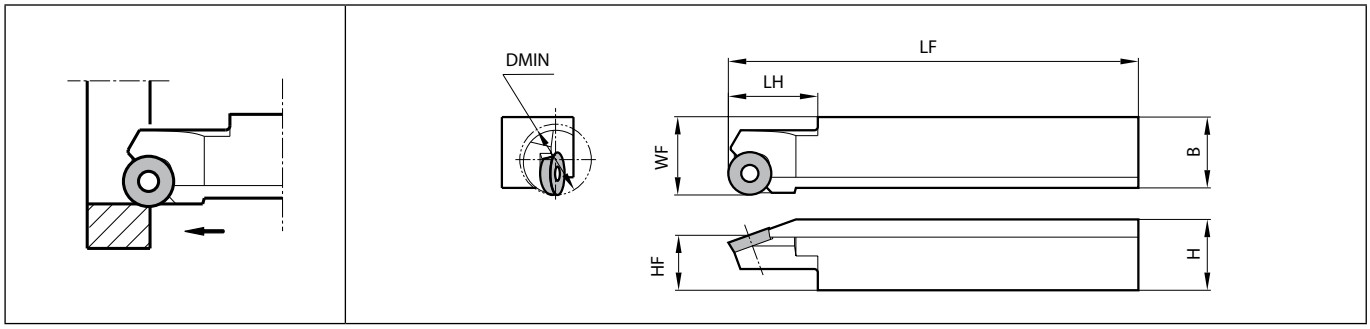
Applications	Finishing	Finishing	Finishing - Medium	Medium	Medium	Finishing	Finishing	Finishing - Medium
Insert								
Chipbreaker type	**DP**	**GP**	**HQ**	**G**	**STD**	**$^{R}_{L}$-F**	**$^{R}_{L}$-A**	**$^{R}_{L}$-B**
Page	**B95**	**B95**	**B95**	**B95**	**B95**	**B96**	**B96**	**B96**

Applications	Medium	Cast iron	Cast iron	Non-Ferrous metals	Hard materials
Insert					
Chipbreaker type	**$^{R}_{L}$-C**	**No CB**	**Ceramic**	**PCD**	**CBN**
Page	**B96**	**B96**	**B122**	**C48**	**C25**

Recommended cutting conditions ➔ **F159**
Applicable sleeves ➔ **F155~F157**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SRCP-B (Boring)



Right-hand shown

Toolholder dimensions

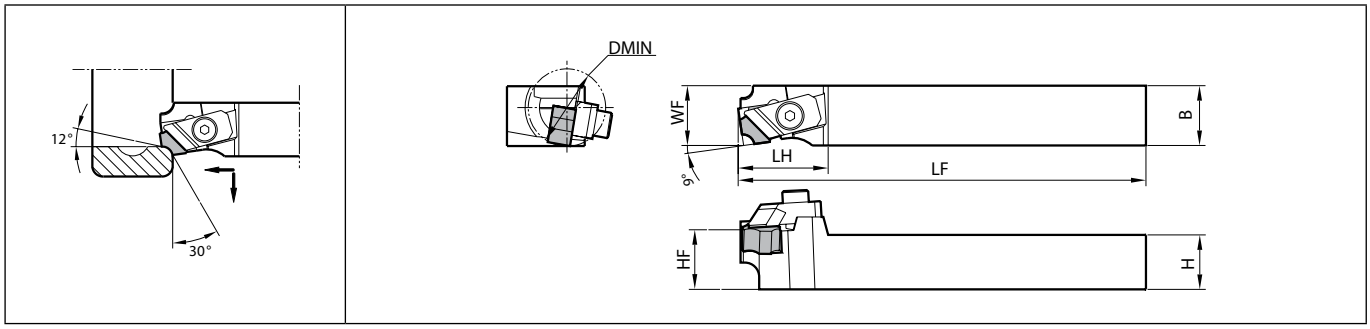
Description		Availability		Dimension (mm)							Spare parts			Applicable inserts
		R	L	DMIN	H	B	LH	HF	LF	WF	Screw	Wrench	Wrench	
SRCP R/L	2020B-12-A20	●	●	20	20	20	25	15.5	125	22	SB-4TR	FT-15	-	RPMT1203M0-BB
SRCPR	2525B-16-A32	●		32	25	25	31	20	150	27	SB-5090TR	-	LTW-20	RPMT1604M0-BB

Applicable inserts

Applications	Bearing machining
Insert	
Chipbreaker type	BB
Page	B109

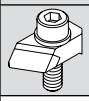
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBSN-B (Internal round chamfering)



Right-hand shown

Toolholder dimensions

Description		Availability	Dimension (mm)							Spare parts		Applicable inserts
										Clamp set (R)	Wrench	
		R	DMIN	H	B	LH	HF	LF	WF			
CBSNR	2020B-12-A20	●	20	20	20	32	21	125	20	CP-RCR	LW-5	SNMF1204..-21
	2525B-12-A20	●		25	25		26	150	25			

Applicable inserts

Applications	Bearing machining
Insert	
Chipbreaker type	21
Page	B109

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Interchangeable head boring bars with anti-vibration dampener system

KAV series

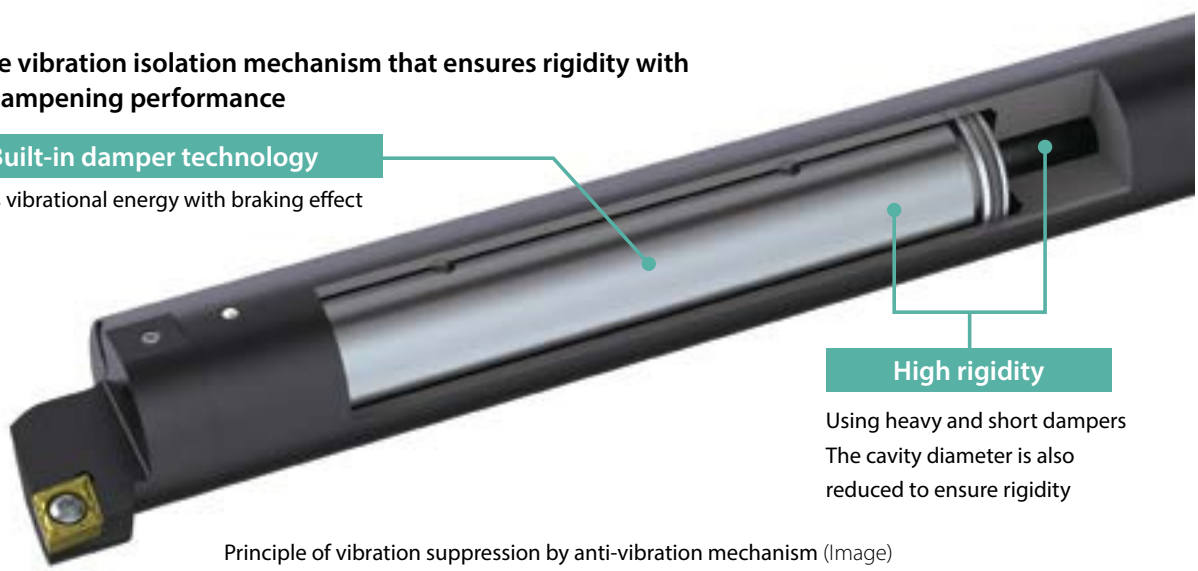
"Max L/D = 10" Solves deep-boring challenges
Excellent anti-chatter performance due to unique anti-vibration design and available for a wide range of machining operations

1 Unique anti-vibration mechanism provides superior chatter resistance

Unique vibration isolation mechanism that ensures rigidity with high dampening performance

Built-in damper technology

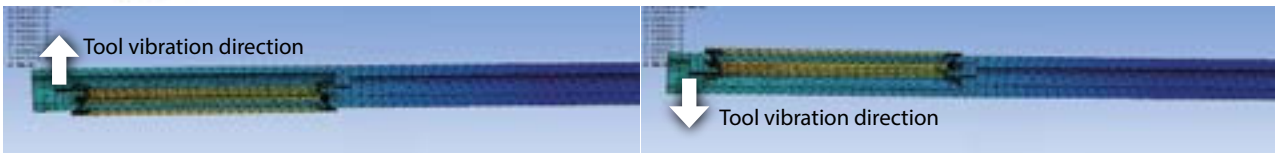
Absorbs vibrational energy with braking effect



High rigidity

Using heavy and short dampers
The cavity diameter is also reduced to ensure rigidity

Principle of vibration suppression by anti-vibration mechanism (Image)



The damper vibrates late against the shank. Effective for vibration damping

Available up to L/D = 10. Excellent anti-vibration performance over conventional carbide shanks

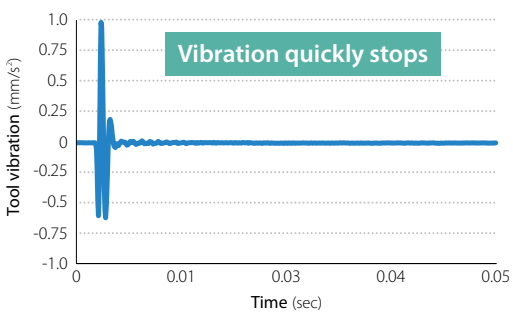
Hammering test (Internal evaluation)

Hammer impacts to the head of the tool
(ø20, Overhang length 10D)

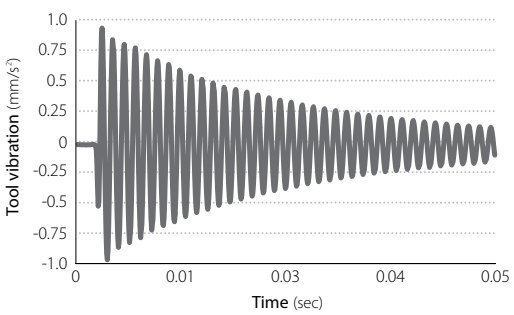


Vibration measurement direction

KAV (built-in anti-vibration mechanism)



Conventional carbide shank



2 Interchangeable heads for a variety of machining applications Strong fastening with serrated joint structure

Serrated structure

Securely fastens head and shank



Internal coolant recommended

Internal coolant recommended to prevent damage to anti-vibration mechanism

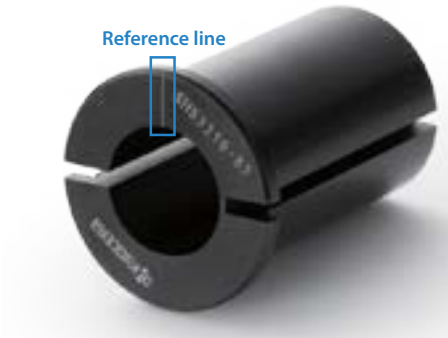
When using our plumbing parts:
Supports pressures up to 7 MPa
(some items are only recommended up to 1 MPa)

ø16 ~ ø25

ø32
ø40

Coolant pipe connections F129

3 Easy cutting edge adjustment with E-Sleeve Smooth machining setup



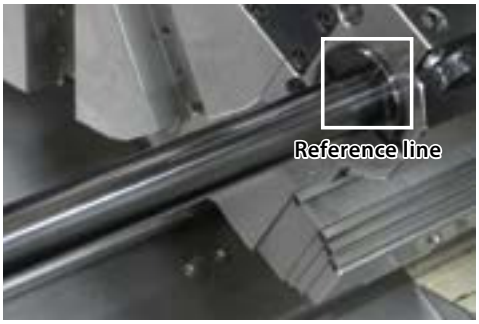
E-Sleeve (Sold separately)

Separated structure with printed reference lines
Easy adjustment reduces setup time

Adjusting the cutting edge position

Exclusive Sleeve (E-Sleeve)

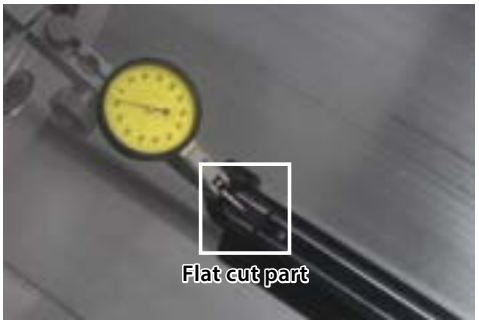
Adjusting the cutting edge position with a reference line



Adjusting the cutting edge position is easy by simply aligning the reference line between the shank and the sleeve.

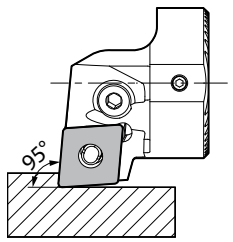
Conventional Sleeve

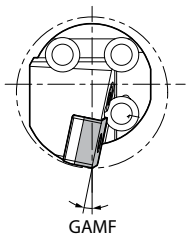
Adjusting the cutting edge position with the flat cut part of the head

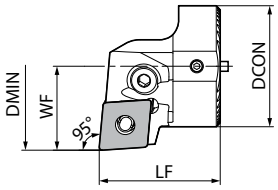


Adjust the flat cut part of the head by moving the tool while applying a dial gauge, etc.

KAVH-PCLN







GAMP = -6°

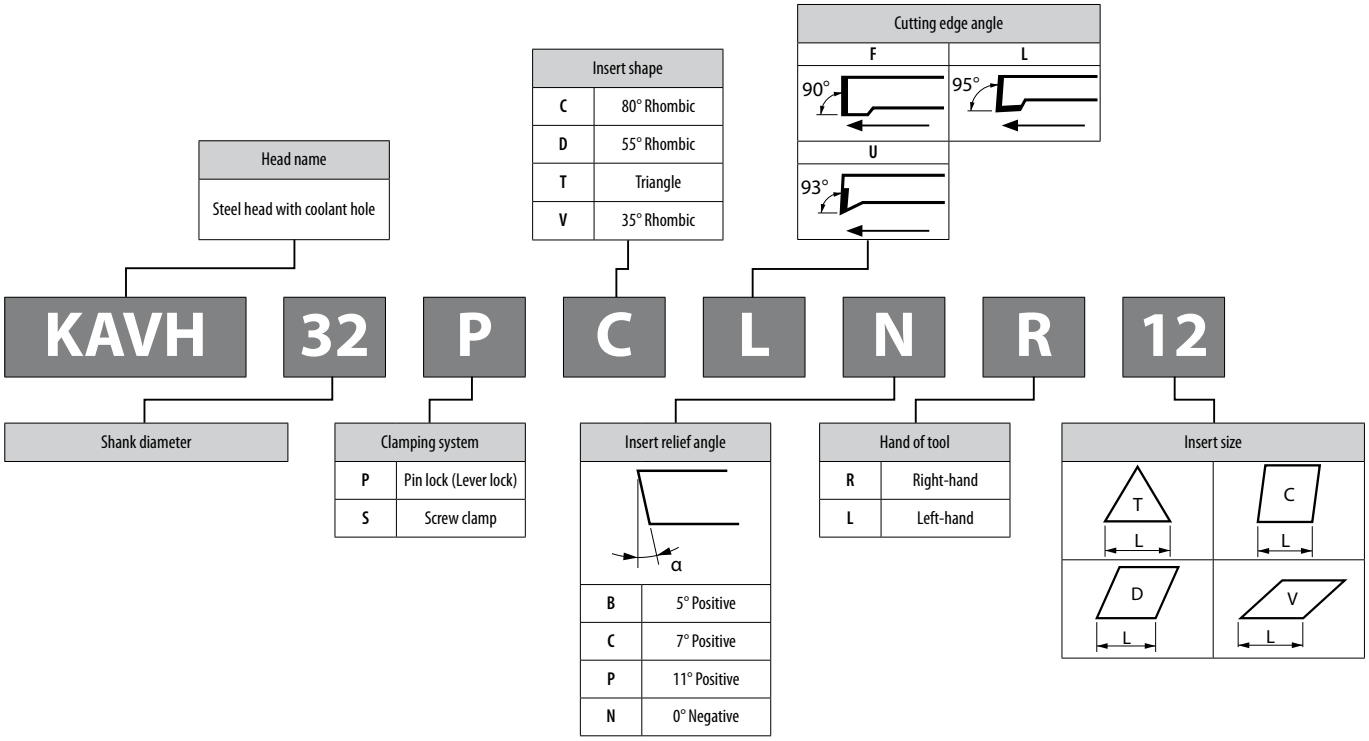
Right-hand shown | Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description		Availability		Dimension (mm)				Standard corner-R(RE)	GAMF (°)	Spare parts						Applicable shank	Applicable inserts
		R	L	DMIN	DCON	LF	WF			Lever	Lock screw	Punch	Shim pin	Shim	Wrench		
KAVH	32-PCLNR/L12	●	●	40	32	32	22.2	0.8	-11.5	LL-2N	LS-2N	PC-2	LSP-2	LC-42NR/L	LW-3	KAV-D32..	CN□A1204... CN□G1204... CN□M1204...
	40-PCLNR/L12	●	●	50	40		27		-10							KAV-D40...	

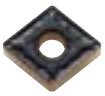
LC-42NR for Right-hand Toolholder, LC-42NL for Left-hand Toolholder.

KAV - Identification system for interchangeable heads



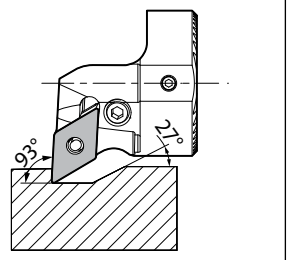
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

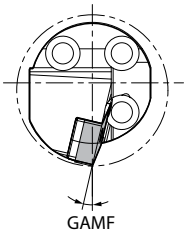
Applicable inserts

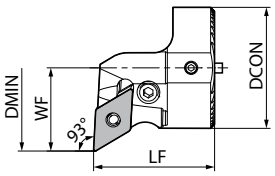
Applications	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Finishing	Finishing	Finishing - Medium	Finishing - Medium
Insert								
Chipbreaker type	WF	WP	WE	WQ	PP	GP	PQ	HQ
Page	B16	B16	B16	B16	B16	B16	B16	B17
Applications	Finishing - Medium	Finishing - Medium	Medium	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing
Insert								
Chipbreaker type	CQ	CJ	TN-V	PMG	GS	PG	PS	PT
Page	B17	B17	B17	B17	B17	B18	B18	B18
Applications	Medium - Roughing	Roughing	Roughing	Roughing	Medium	Medium - Roughing	Medium - Roughing	Low carbon steel
Insert								
Chipbreaker type	GT	STD	PH	PX	R/L	R/L-25R	Z	XF
Page	B18	B18	B19	B19	B23	B23	B23	B19
Applications	Low carbon steel	Low carbon steel	Low carbon steel	Finishing - Medium	Medium - Roughing	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys
Insert								
Chipbreaker type	XP	XQ	XS	SK	FP-TK	TK	MQ	MS
Page	B19	B19	B20	B20	B20	B20	B20	B21
Applications	Stainless steel / Heat-resistant alloys	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron
Insert								
Chipbreaker type	MU	KQ	KG	KH	C	ZS	GC	No CB
Page	B21	B22	B22	B22	B22	B22	B22	B22
Applications	Cast iron / Hard materials	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Heat-resistant alloys	Heat-resistant alloys	Hard materials	Hard materials
Insert								
Chipbreaker type	Ceramic	R/L-A3	AH	PCD	SQ	SG	HH	HL
Page	B113	B23	B23	C34	B20	B21	C9	C9
Applications	Hard materials	Hard materials / Cast iron						
Insert								
Chipbreaker type	HD	CBN						
Page	C9	C8						

Recommended cutting conditions F159

KAVH-PDUN







GAMP = -6°

Right-hand shown | Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

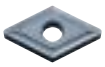
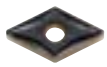
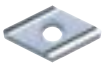
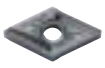
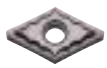
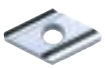
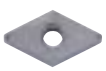
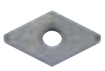
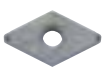
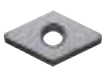
Description		Availability		Dimension (mm)				Standard corner-R(RE)	GAMF (°)	Spare parts						Applicable shank	Applicable inserts
										Lever	Lock screw	Punch	Shim pin	Shim	Wrench		
		R	L	DMIN	DCON	LF	WF										
KAVH	32-PDUN□11	●	●	40	32	32	22	0.4	-13	LL-1DN	LS-1SN	PC-1	LSP-1	LD-32N	FH-2.5	KAV-D32..	DN□G1104...

Description		Availability		Dimension (mm)				Standard corner-R(RE)	GAMF (°)						Applicable shank	Applicable inserts
										Lock pin	Screw	Shim	Wrench	Wrench		
		R	L	DMIN	DCON	LF	WF									
KAVH	32-PDUN□15	●	●	40	32	32	22	0.8	-12.5	PP-4	SB-2050TR	PD-42	LW-3	FT-6	KAV-D32..	DN□A1504... DN□G1504...
	40-PDUN□15	●	●	50	40		27								KAV-D40...	DN□M1504... DN□X1504...

When using inserts whose corner-R(RE) is greater than 1.6 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.
For WF chipbreaker, cutting edge offsets or program corrections are required on **R34** and **R35**.

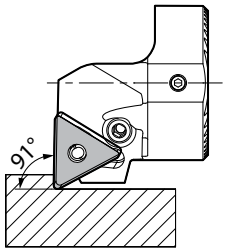
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

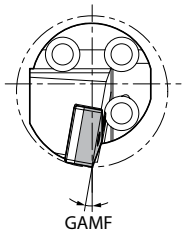
Applicable inserts

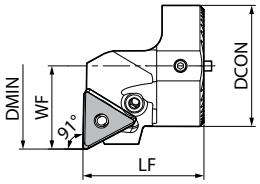
Applications	Finishing	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Finishing - Medium	Finishing - Medium	Medium
Insert								
Chipbreaker type	WF	PP	GP	PQ	HQ	CQ	CJ	TN-V
Page	B24	B24	B24	B24	B25	B25	B25	B25
Applications	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Roughing	Roughing
Insert								
Chipbreaker type	PMG	GS	PG	PS	PT	GT	STD	PH
Page	B25	B25	B26	B26	B26	B26	B27	B27
Applications	Roughing	Medium	Low carbon steel	Low carbon steel	Low carbon steel	Low carbon steel	Finishing - Medium	Large ap
Insert								
Chipbreaker type	PX	R/L	XF	XP	XQ	XS	SK	R-LD
Page	B27	B31	B27	B27	B27	B27	B28	B28
Applications	Medium - Roughing	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Cast iron	Cast iron	Cast iron
Insert								
Chipbreaker type	FP-TK	TK	MQ	MS	MU	KQ	KG	KH
Page	B28	B28	B28	B29	B29	B30	B30	B30
Applications	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron / Hard materials	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals
Insert								
Chipbreaker type	C	ZS	GC	No CB	Ceramic	R/L-A3	AH	PCD
Page	B30	B30	B30	B31	B114	B31	B31	C35
Applications	Heat-resistant alloys	Heat-resistant alloys	Hard materials	Hard materials	Hard materials	Hard materials / Cast iron		
Insert								
Chipbreaker type	SQ	SG	HH	HL	HD	CBN		
Page	B29	B29	C11	C11	C11	C10		

Recommended cutting conditions F159

KAVH-PTFN







GAMP = -6°

Right-hand shown | Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Boring

Solid
Positive
KAV
Negative

Toolholder dimensions

Description		Availability		Dimension (mm)				Standard corner-R(RE)	GAMF (°)	Spare parts						Applicable shank	Applicable inserts
										Lever	Lock screw	Punch	Shim pin	Shim	Wrench		
		R	L	DMIN	DCON	LF	WF										
KAVH	32-PTFN$^{R}_{L}$16	●	●	40	32	32	22	0.8	-10	LL-1N	LS-1N	PC-1	LSP-1	LT-32N (LT-32N-20*)	FH-2.5	KAV-D32..	TN□A1604... TN□G1604...
	40-PTFN$^{R}_{L}$16	●	●	50	40		27		-9							KAV-D40...	TN□M1604... TN□X1604...

When using inserts whose corner-R(RE) is greater than 1.2 mm, please purchase a shim* and use it in order to prevent workpiece and shim from interfering each other.
For WF chipbreaker, cutting edge offsets or program corrections are required on **R34** and **R35**.

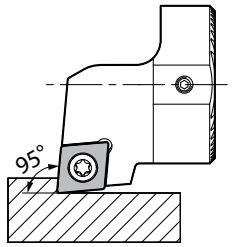
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

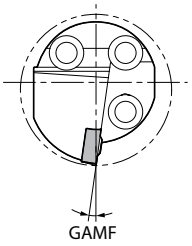
Applicable inserts

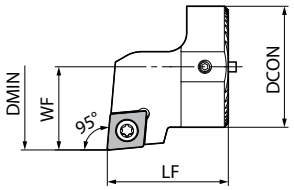
Applications	Finishing	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Finishing - Medium	Medium - Roughing	Medium - Roughing
Insert								
Chipbreaker type	WF	PP	GP	PQ	HQ	CQ	PMG	GS
Page	B38	B38	B38	B38	B38	B38	B39	B39
Applications	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Roughing	Roughing	Roughing	Finishing
Insert								
Chipbreaker type	PG	PS	PT	GT	STD	PH	PX	R/L-SSF
Page	B39	B39	B39	B39	B40	B40	B40	B44
Applications	Finishing - Medium	Medium - Roughing	Medium - Roughing	Low carbon steel	Low carbon steel	Low carbon steel	Low carbon steel	Finishing - Medium
Insert								
Chipbreaker type	R/L-B	R/L-C	R/L-25R	XF	XP	XQ	XS	SK
Page	B44	B45	B45	B40	B41	B41	B41	B41
Applications	Large ap	Medium - Roughing	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel	Cast iron
Insert								
Chipbreaker type	R-LD	FP-TK	TK	MQ	MS	MU	R/L-ST	KQ
Page	B41	B41	B41	B42	B42	B42	B42	B42
Applications	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron / Hard materials	Non-Ferrous metals
Insert								
Chipbreaker type	KG	KH	C	ZS	GC	No CB	Ceramic	R/L-A3
Page	B42	B42	B43	B43	B43	B43	B118	B43
Applications	Non-Ferrous metals	Non-Ferrous metals	Heat-resistant alloys	Hard materials / Cast iron				
Insert								
Chipbreaker type	AH	PCD	SG	CBN				
Page	B43	C36	B42	C13				

Recommended cutting conditions F159

KAVH-SCLC







GAMP = 0°

Right-hand shown | Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Boring

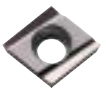
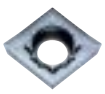
Solid
Positive
KAV
Negative

Toolholder dimensions

Description		Availability		Dimension (mm)				Standard corner-R(RE)	GAMF (°)	Spare parts			Applicable shank	Applicable inserts
										Screw	Wrench	Wrench		
		R	L	DMIN	DCON	LF	WF							
KAVH	16-SCLC$^{R}_{L}$06	●	●	20	16	20	11	0.4	-7	SB-2545TR	FT-8	-	KAV-D16.. / G16..	CC□T0602... CC□W0602...
KAVH	20-SCLC$^{R}_{L}$09	●	●	25	20	20	13	0.4	-8	SB-4065TR	-	FT-15	KAV-D20.. / G20..	CC□T09T3... CC□W09T3...
	25-SCLC$^{R}_{L}$09	●	●	32	25		17						KAV-D25..	
	32-SCLC$^{R}_{L}$09	●	●	40	32	32	22						KAV-D32..	
	40-SCLC$^{R}_{L}$09	●	●	50	40		27		-7				KAV-D40...	

When using P chipbreaker : Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

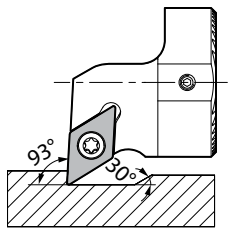
Applicable inserts

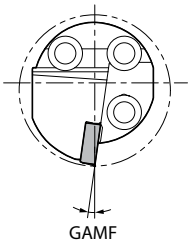
Applications	Finishing	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing
Insert								
Chipbreaker type	PF	GF	SKS	SK	CK	GQ	WP	PP
Page	B58	B58	B59	B59	B59	B59	B60	B60
Applications	Finishing - Medium	Finishing - Medium	Medium	Medium	Finishing	Low feed	Low feed	Low feed
Insert								
Chipbreaker type	GK	HQ	STD	MF	$^{R}_{L}$-P	$^{R}_{L}$-U	$^{R}_{L}$-USF	$^{R}_{L}$-J
Page	B60	B60	B60	B61	B63	B63~B65	B63	B65
Applications	Stainless steel / Heat-resistant alloys	Cast iron	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Hard materials
Insert								
Chipbreaker type	MQ	No CB	AP	$^{R}_{L}$-A3	AH	PCD	APD	CBN
Page	B61	B66	B66	B66	B66	C39	C40	C20

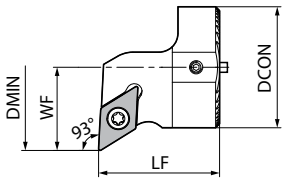
Recommended cutting conditions F159

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KAVH-SDUC







GAMP = 0°

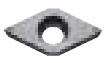
Right-hand shown | Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description		Availability		Dimension (mm)				Standard corner-R(RE)	GAMF (°)	Spare parts			Applicable shank	Applicable inserts
										Screw	Wrench	Wrench		
		R	L	DMIN	DCON	LF	WF							
KAVH	16-SDUC$^{R}_{L}$07	●	●	20	16	20	11	0.4	-7	SB-2545TR	FT-8	-	KAV-D16.. / G16..	DC□T0702... DC□W0702... DC□X0702...
KAVH	20-SDUC$^{R}_{L}$11	●	●	25	20	20	13	0.4	-9	SB-4065TR	-	FT-15	KAV-D20.. / G20..	DC□T11T3... DC□W11T3... DC□X11T3...
	25-SDUC$^{R}_{L}$11	●	●	32	25		17		-8				KAV-D25..	
	32-SDUC$^{R}_{L}$11	●	●	40	32	32	22						KAV-D32..	
	40-SDUC$^{R}_{L}$11	●	●	50	40		27		-7				KAV-D40...	

For WP chipbreaker, cutting edge offsets or program corrections are required on **R36** and **R37**.

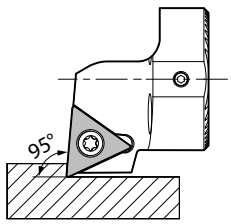
Applicable inserts

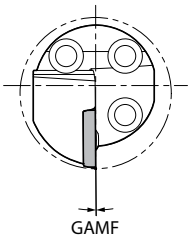
Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing
Insert								
Chipbreaker type	**CF**	**GF**	**SKS**	**SK**	**CK**	**GQ**	**WP**	$^{R}_{L}$**-WP**
Page	**B68**	**B68**	**B68**	**B68**	**B68**	**B69**	**B69**	**B69**
Applications	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Medium	Medium	Finishing	Finishing
Insert								
Chipbreaker type	**PP**	**GP**	**GK**	**HQ**	**STD**	**MF**	$^{R}_{L}$**-F**	$^{R}_{L}$**-FSF**
Page	**B69**	**B69**	**B70**	**B70**	**B70**	**B70**	**B72, B73**	**B72**
Applications	Low feed	Low feed	Low feed	Low feed	Low carbon steel	Low carbon steel	Stainless steel / Heat-resistant alloys	Cast iron
Insert								
Chipbreaker type	$^{R}_{L}$**-U**	$^{R}_{L}$**-USF**	$^{R}_{L}$**-J**	$^{R}_{L}$**-JSF**	**XP**	**XQ**	**MQ**	**No CB**
Page	**B74~B76**	**B74**	**B77**	**B76**	**B71**	**B71**	**B71**	**B78**
Applications	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Hard materials		
Insert								
Chipbreaker type	**AP**	$^{R}_{L}$**-A3**	**AH**	**PCD**	**APD**	**CBN**		
Page	**B78**	**B78**	**B78**	**C42**	**C42**	**C22**		

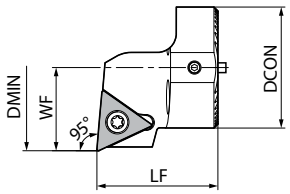
Recommended cutting conditions ➔ **F159**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KAVH-STLP







GAMP = 5°

Right-hand shown | Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Boring

Solid

Positive

KAV

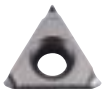
Negative

Toolholder dimensions

Description		Availability		Dimension (mm)				Standard corner-R(RE)	GAMF (°)	Spare parts			Applicable shank	Applicable inserts
										Screw	Wrench	Wrench		
		R	L	DMIN	DCON	LF	WF							
KAVH	16-STLP$^{R}_{L}$11	●	●	20	16	20	11	0.4	-3.5	SB-3060TR	FT-10	-	KAV-D16.. / G16..	TP□B1103... TP□H1103... TP□T1103... TP□X1103...
	20-STLP$^{R}_{L}$11	●	●	25	20		13		-2	SB-3080TR			KAV-D20.. / G20..	
	25-STLP$^{R}_{L}$11	●	●	32	25		17		0				KAV-D25..	
KAVH	32-STLP$^{R}_{L}$16	●	●	40	32	32	22	0.4	0	SB-4065TR	-	FT-15	KAV-D32..	TP□B1603... TP□H1603... TP□T1603...
	40-STLP$^{R}_{L}$16	●	●	50	40		27						KAV-D40...	

For WP chipbreaker, cutting edge offsets or program corrections are required on **R36** and **R37**.
When using P chipbreaker : Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

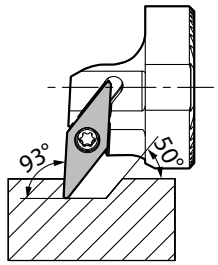
Applicable inserts

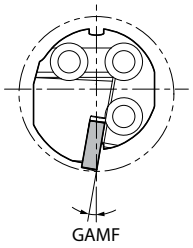
Applications	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing	Finishing
Insert								
Chipbreaker type	**WP**	$^{R}_{L}$**-WP**	**PP**	**GP**	**HQ**	**R/L**	$^{R}_{L}$**-FSF**	$^{R}_{L}$**-P**
Page	**B88**	**B88**	**B88**	**B89**	**B89**	**B90, B91**	**B92**	**B92**
Applications	Medium	Low feed	Low carbon steel	Low carbon steel	Cast iron	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals
Insert								
Chipbreaker type	$^{R}_{L}$**-H**	$^{R}_{L}$**-USF**	**XP**	**XQ**	**No CB**	**AP**	**PCD**	**APD**
Page	**B93**	**B94**	**B89**	**B89**	**B94**	**B94**	**C46, C47**	**C47**
Applications	Hard materials							
Insert								
Chipbreaker type	**CBN**							
Page	**C23**							

Recommended cutting conditions **F159**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KAVH-SVUB





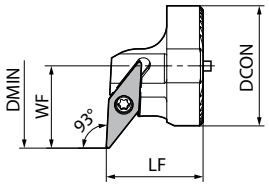
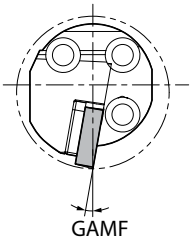


Fig. 1



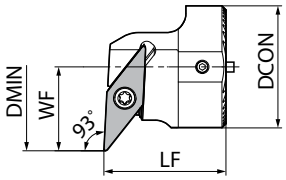
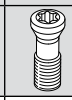
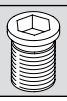
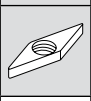
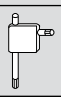
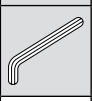


Fig. 2

GAMP = 0°

Right-hand shown | Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description		Availability		Dimension (mm)				Standard corner-R(RE)	GAMF (°)	Fig.	Spare parts							Applicable shank	Applicable inserts
											Screw	Screw	Shim screw	Shim	Wrench	Wrench	Wrench		
		R	L	DMIN	DCON	LF	WF												
KAVH	20-SVUB$^{R}_{L}$11	●	●	25	20	20	13	0.4	-10	1	SB-2570TR	-	-	-	FT-8	-	-	KAV-D20.. / G20..	VB□T1103...
	25-SVUB$^{R}_{L}$11	●	●	32	25		17											KAV-D25..	VB□W1103...
KAVH	32-SVUB$^{R}_{L}$16	●	●	40	32	32	22	0.4	-10	2	-	SB-40125TRN	SS-4N	SVN-32N (SVN-32S*)	-	FT-15	LW-4	KAV-D32..	VB□T1604... VB□W1604...
	40-SVUB$^{R}_{L}$16	●	●	50	40		27		-9									KAV-D40...	VC□T1604...

When using inserts whose corner-R(RE) is 0.2 or 0.4mm, shim (SVN-32S) is recommended (sold separately).

Applicable inserts

Applications	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing	Finishing - Medium	Non-Ferrous metals
Insert								
Chipbreaker type	VF	PP	GP	HQ	$^{R}_{L}$-F	$^{R}_{L}$-FSF	$^{R}_{L}$-Y	PCD
Page	B97	B97	B97	B97	B98	B98	B99	C49

Applications	Hard materials
Insert	
Chipbreaker type	CBN
Page	C26

Recommended cutting conditions F159

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Shank for KAV

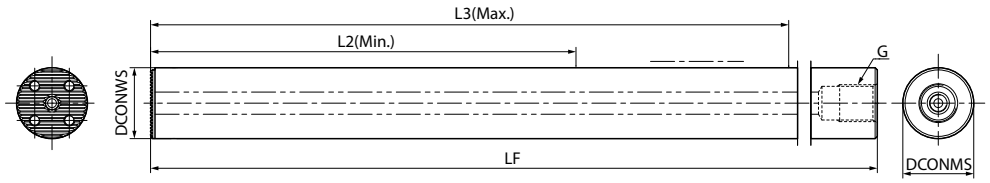


Fig. 1

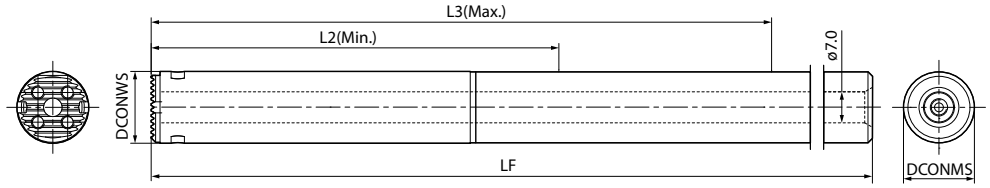


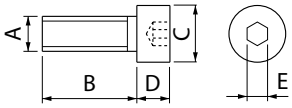
Fig. 2

Toolholder dimensions

Description			Availability	Dimension (mm) DCONWS	DCONMS	G	LF	L2 (Min.)	L3 (Max.)	Fig.	Spare parts: Head fastening bolts (3)	Wrench	O-ring
Standard	KAV-	D16-7D	●	16	16	G1/8	157.5	44	92	1	HH3X10S	LW-2.5	-
		D20-7D	●	20	20	G1/4	201.5	60	120		HH3.5X10S		
		D25-7D	●	25	25		256.5	80	155		HH4X12S	LW-3	
		D25-10D	●				331.5	155	230				
		D32-7D	●	32	32	G3/8	321.5	96	192		HH5X12	LW-4	GR-006-2
		D32-10D	●				417.5	192	288				
		D40-7D	●	40	40	G1/2	409.5	128	248		HH6X12	LW-5	
		D40-10D	●				529.5	248	368				
Carbide reinforced	KAV-	G16-10D	●	16.2	16	-	205.5	92	140	2	HH3X10S	LW-2.5	-
		G20-10D	●	20.2	20		261.5	120	180		HH3.5X10S		

When cutting the back end, consider the length of the shank grip in addition to the amount of overhang length F130

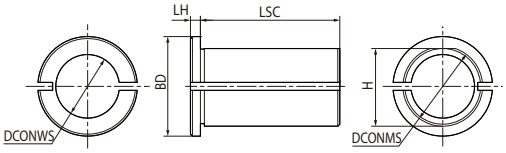
Head fastening bolt



Description	Dimension (mm) A	B	C	D	E	Tightening torque (N·m)
HH 3X10S	M3X0.5	10.0	5.0	3.0	2.5	2.2
HH 3.5X10S	M3.5X0.6	10.0	5.5	3.0	2.5	2.2
HH 4X12S	M4X0.7	12.0	7.0	4.0	3.0	3.0
HH 5X12	M5X0.8	12.0	8.5	5.0	4.0	5.0
HH 6X12	M6X1.0	12.0	10.0	6.0	5.0	8.5

Sleeve for KAV (E-Sleeve)





Sleeve dimensions

Description			Availability	Dimension (mm) DCONWS	DCONMS	BD	LH	LSC	H	Applicable shank
SHS	1640-75		●	16	40	50	5	70	39	KAV-D16-7D, KAV-G16-10D
	2040-75		●	20						KAV-D20-7D, KAV-G20-10D
	2540-75		●	25						KAV-D25-7D/10D
	3240-75		●	32						KAV-D32-7D/10D
SHS	2550-85		●	25	50	60	5	80	48.5	KAV-D25-7D/10D
	3250-85		●	32						KAV-D32-7D/10D
	4050-85		●	40						KAV-D40-7D/10D

Choose the sleeve DCONWS together with the shank DCONMS

●: Standard item R: Right-hand only L: Left-hand only □: Check availability

Internal coolant: Piping connections

❶ Screw standard for shank back end (pipe connection)

- The thread standard depends on the description. Please refer to the dimension chart "G" on page **F128** when using commercially available piping parts.
- When using our piping components, they must be converted to "**UNF3/8**" or "**G1/8**."
  Check the table below and select the required joint parts (sold separately).

●Steel shank (Pressure ~ 7MPa)

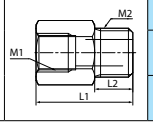
Type	Thread standards and conversion joints
ø16-7D	**G1/8**
ø20-7D ø25-7D/10D	**G1/8 ⇐ G1/4** J-ST-G1/4-G1/8
ø32-7D/10D	**G1/8 ⇐ G1/4 ⇐ G3/8** J-ST-G3/8-G1/4 J-ST-G1/4-G1/8
ø40-7D/10D	**G1/8 ⇐ G1/4 ⇐ G3/8 ⇐ G1/2** J-ST-G1/2-G3/8 J-ST-G3/8-G1/4 J-ST-G1/4-G1/8

If a leak occurs, use a commercially available washer.

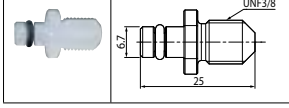
●Carbide reinforced shank (Pressure ~ 1MPa)

Type	Thread standards and conversion joints
ø16-10D ø20-10D	**UNF3/8 ⇐ ø7 Straight hole** *The shank side is not threaded.

Joint

Shape	Description	Availability	M1	M2	L1	L2
 	J-ST-G1/4-G1/8	●	G1/8	G1/4	27	12
	J-ST-G3/8-G1/4	●	G1/4	G3/8	33	13
	J-ST-G1/2-G3/8	●	G3/8	G1/2	37	17

Resin joint (with O-ring)

Shape	Description	Availability	Thread standard
	PR07-ST-UNF3/8	●	UNF3/8

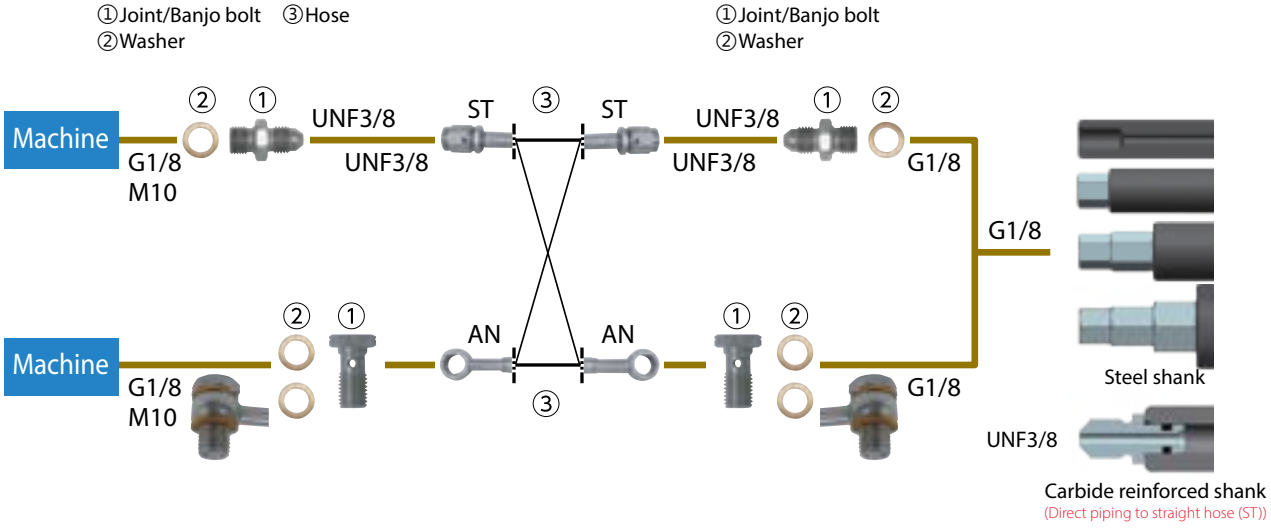
You can order only the included O-ring (**GR-004-2**).

❷ How to connect when using our plumbing parts

Easy to use with high pressure capable hoses and joints

- **Can be used as internal coolant at normal pressure without a high-pressure pump unit**
- **Banjo bolts for angle hoses available. Supports a wide variety of machines**

< Piping installation guide >



Optional piping parts available (Sold separately) D12

Precautions

About the dedicated E-Sleeve

The shank does not have a flat cut. In order to ensure vibration-proof performance, we recommend using a special sleeve (SHS ****-**) that is sold separately.

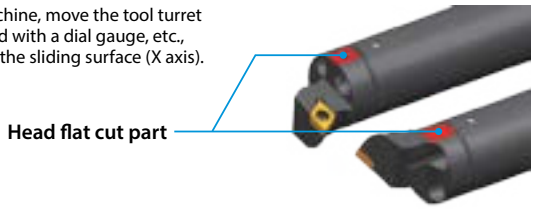


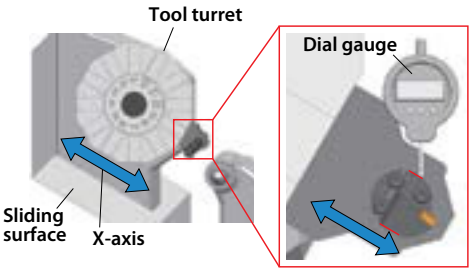
Use the entire sleeve to grasp the shank area.

How to adjust cutting edge position

When using a head flat cut part

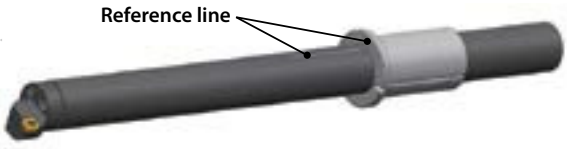
After attaching the tool to the machine, move the tool turret against the flat cut part of the head with a dial gauge, etc., and make sure that it is parallel to the sliding surface (X axis).





When using the reference lines of the shank/dedicated sleeve (E-Sleeve)

Align the reference lines printed on the shank and the dedicated sleeve (SHS ****-**).
It is possible to more easily adjust the cutting edge position than using the head flat cut part.



Recommendations for internal coolant

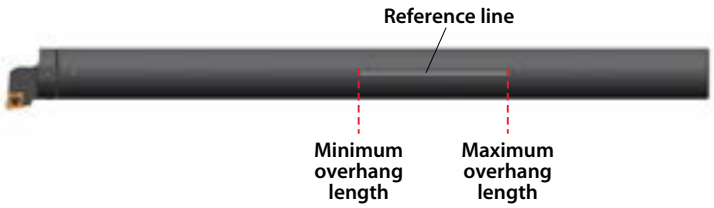
Under high temperatures, the anti-vibration mechanism may deteriorate or be damaged.
Please use with internal coolant.
The coolant pressure resistance of the shank is 7 MPa. However, when using coolant parts (PR07-ST-UNF 3/8) for internal coolant in the carbide reinforced shank (KAV-G ***), the coolant pressure is 1 MPa. Please be careful.



Available overhang length range

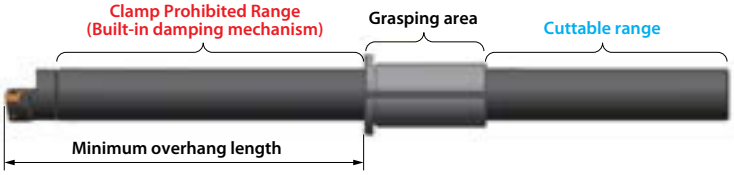
Available overhang length is set for this tool
To adjust the overhang length, please use the reference line printed on the shank.

Available overhang length range		
Description	Minimum overhang length	Maximum overhang length
KAV-***-10D	Shank diameter × 7	Shank diameter × 10
KAV-***-7D	Shank diameter × 4	Shank diameter × 7



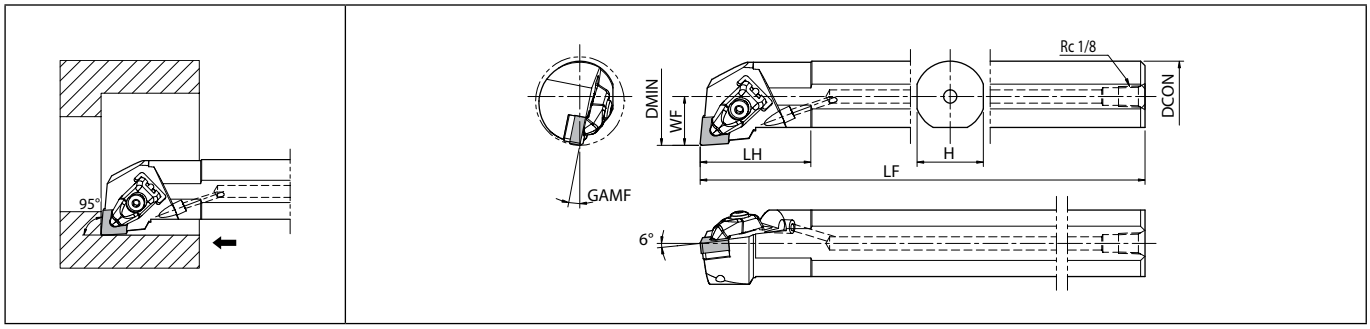
Shank cut

If the shank needs to be cut or modified, do so within the cutting range and do not clamp the built-in damping mechanism.



- Use the appropriate inserts and parts. Use of damaged parts may result in tool breakage and injury.
- Do not touch the cutting edge of the insert directly with your bare hands. There is a risk of injury.
- Make sure that there are no foreign materials such as chips in the insert seating area, serrated area, or shank grip area before mounting.
- Do not use the product under chattering conditions. This can lead to damage of the built-in damping mechanism.
- If tool falls or hits the part while machining, do not use it. The impact can cause tool damage and lead to large chattering.
- Avoid high humidity and store at room temperature (about 20°C).

A-DCLN (Boring / Internal facing)



Max. Overhang Length L/D=~3 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

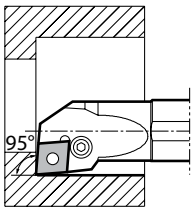
Toolholder dimensions

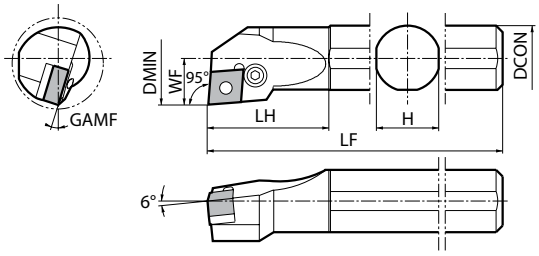
Description		Availability		Dimension (mm)						GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts								Applicable inserts
													Clamp	Screw (for clamp)	Spring	Wrench (for clamp)	Shim	Screw (for shim)	Wrench* (for shim)	Nozzle	
		R	L	DMIN	DCON	H	LH	LF	WF												
A25R-	DCLNR/L12-32	●	●	32	25	23	42	200	17	11	0.8	Yes	CP-3D	CS-3D	SP-3D	LW-3	DC-42	SB-4085TR	FT-15	DN10	CN□A1204...
A32S-	DCLNR/L12-40	●	●	40	32	30	50	250	22												CN□G1204...
A40T-	DCLNR/L12-50	●	●	50	40	37	60	300	27	14										DN20	CN□M1204...

Not applicable to high-pressure coolant
Wrench (FT-15) is sold separately.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

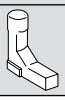
S-PCLN (Boring / Internal facing)





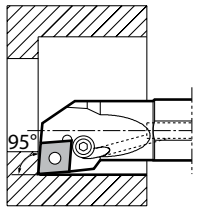
Max. Overhang Length L/D=~3 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

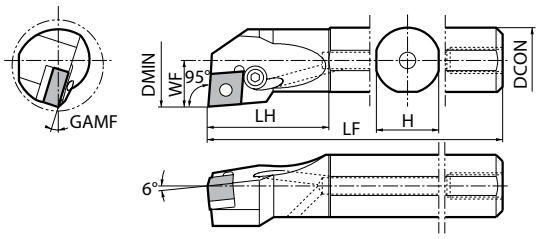
Toolholder dimensions

Description	Availability		Dimension (mm)						GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts								Applicable inserts
												Lever	Lock screw	Punch	Shim pin	Shim pin	Shim	Wrench	Wrench	
	R	L	DMIN	DCON	H	LH	LF	WF												
S16M- PCLN[R/L]09-20	●	●	20	16	15	34	150	11	16	0.8	No	LL-03SN	LS-03SN	-	-	P-03S	-	-	FH-2.5	CN□G0904...
S20Q- PCLN[R/L]09-27	●	●	27	20	19	37	180	14.2	17			LL-1N	LS-1SN	PC-1	LSP-1	-	LC-32N			
S25R- PCLN[R/L]09-32	●	●	32	25	24	42	200	15.7	15											
S25R- PCLN[R/L]12-32	●	●	32	25	24	42	200	16.3	16	0.8	No	LL-2N	LS-2N	PC-2	LSP-2	-	LC-42N[R/L]	LW-3	-	CN□A1204... CN□G1204... CN□M1204...
S32S- PCLN[R/L]12-40	●	●	40	32	30	50	250	21	10											
S40T- PCLN[R/L]12-50	●	●	50	40	37	60	300	25												

LC-42NR for Right-hand Toolholder, LC-42NL for Left-hand Toolholder.

A-PCLN (Boring / Internal facing)





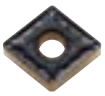
Max. Overhang Length L/D=~3 | Right-hand shown | Left-hand Insert for Right-hand Toolholder.

Toolholder dimensions

Description	Availability	Dimension (mm)						GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts							Applicable inserts
											Lever	Lock screw	Punch	Shim pin	Shim pin	Shim	Wrench	
	R	DMIN	DCON	H	LH	LF	WF											
A16M- PCLNR09-20	●	20	16	15	34	150	11	16	0.8	Yes	LL-03SN	LS-03SN	-	-	P-03S	-	FH-2.5	CN□G0904...
A20Q- PCLNR09-27	●	27	20	19	37	180	14.2	17			LL-1N	LS-1SN	PC-1	LSP-1	-	LC-32N		
A25R- PCLNR09-32	●	32	25	24	42	200	15.7	15										

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts (A-DCLN / S-PCLN / A-PCLN)

Applications	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Finishing	Finishing	Finishing - Medium	Finishing - Medium
Insert								
Chipbreaker type	WF	WP	WE	WQ	PP	GP	PQ	HQ
Page	B16	B16	B16	B16	B16	B16	B16	B17
Applications	Finishing - Medium	Finishing - Medium	Medium	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing
Insert								
Chipbreaker type	CQ	CJ	TN-V	PMG	GS	PG	PS	PT
Page	B17	B17	B17	B17	B17	B18	B18	B18
Applications	Medium - Roughing	Roughing	Roughing	Roughing	Finishing	Medium	Medium - Roughing	Medium - Roughing
Insert								
Chipbreaker type	GT	STD	PH	PX	R/L-S	R/L	R/L-25R	Z
Page	B18	B18	B19	B19	B23	B23	B23	B23
Applications	Low carbon steel	Low carbon steel	Low carbon steel	Low carbon steel	Finishing - Medium	Medium - Roughing	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys
Insert								
Chipbreaker type	XF	XP	XQ	XS	SK	FP-TK	TK	MQ
Page	B19	B19	B19	B20	B20	B20	B20	B20
Applications	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron
Insert								
Chipbreaker type	MS	MU	KQ	KG	KH	C	ZS	GC
Page	B21	B21	B22	B22	B22	B22	B22	B22
Applications	Cast iron	Cast iron / Hard materials	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Heat-resistant alloys	Heat-resistant alloys	Hard materials
Insert								
Chipbreaker type	No CB	Ceramic	R/L-A3	AH	PCD	SQ	SG	HH
Page	B22	B113	B23	B23	C34	B20	B21	C9
Applications	Hard materials	Hard materials	Hard materials / Cast iron					
Insert								
Chipbreaker type	HL	HD	CBN					
Page	C9	C9	C8					

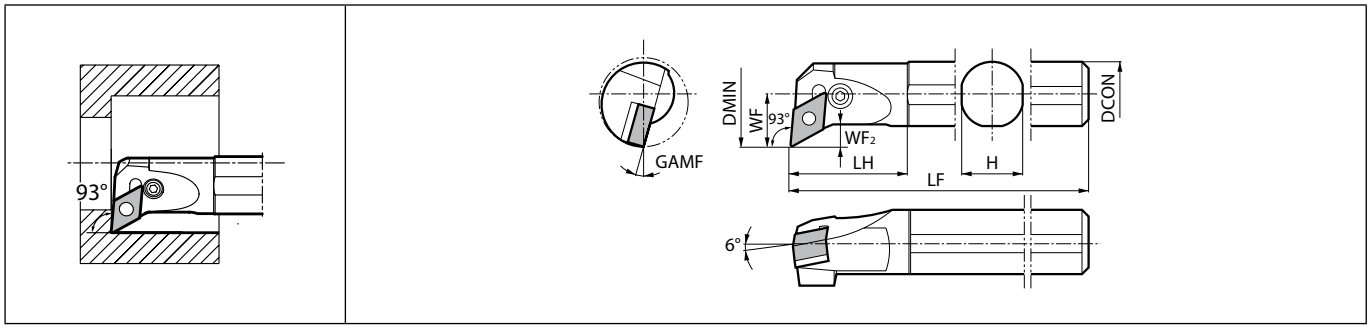
Recommended cutting conditions F159

Applicable Coolant Sleeve / Joint

Toolholder description	Applicable Coolant Sleeve	Applicable Coolant Joint
A16M -PCLN R/L 09-20	SHC1640-70, SHC1650-95	SJS-8
A20Q -PCLN R/L 09-27	SHC2040-70, SHC2050-95	
A25R -PCLN R/L 09-32	SHC2540-70, SHC2550-95	

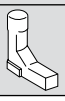
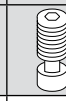
For Coolant Sleeve, Coolant Joint See Page F156, F157

S-PDUN11 (Boring / Internal facing)

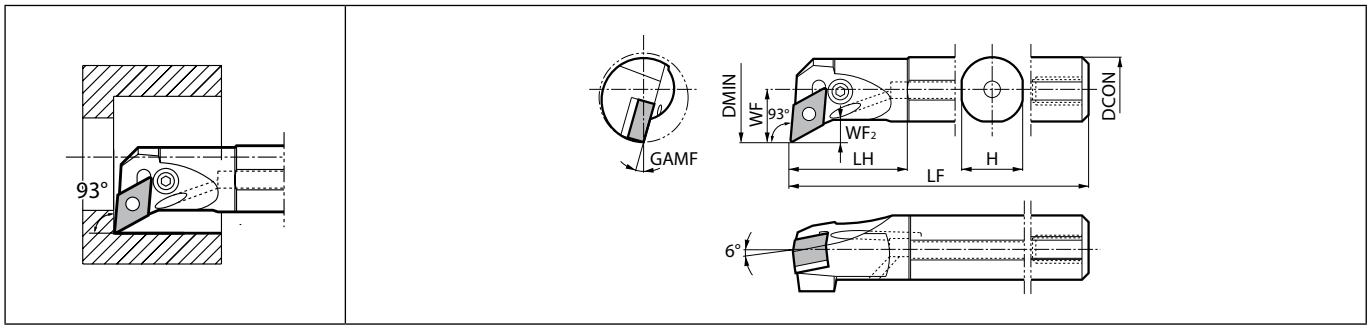


Max. Overhang Length L/D=~3 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description		Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts						Applicable inserts
														Lever	Lock screw	Punch	Shim pin	Shim	Wrench	
		R	L	DMIN	DCON	H	LH	LF	WF	WF2										
S20Q-	PDUN[R/L]11-27	●	●	27	20	19	35	180	16	7.6	17	0.4	No	LL-1DN	LS-1SN	PC-1	LSP-1	LD-32N	FH-2.5	DN□G1104...
S25R-	PDUN[R/L]11-32	●	●	32	25	24	40	200	17		15									
S32S-	PDUN[R/L]11-40	●	●	40	32	31	45	250	22	8.5	12									

A-PDUN11 (Boring / Internal facing)



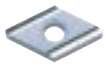
Max. Overhang Length L/D=~3 | Right-hand shown | Left-hand Insert for Right-hand Toolholder.

Toolholder dimensions

Description		Availability	Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts						Applicable inserts
													Lever	Lock screw	Punch	Shim pin	Shim	Wrench	
		R	DMIN	DCON	H	LH	LF	WF	WF2										
A20Q-	PDUNR11-27	●	27	20	19	35	180	16	7.6	17	0.4	Yes	LL-1DN	LS-1SN	PC-1	LSP-1	LD-32N	FH-2.5	DN□G1104...
A25R-	PDUNR11-32	●	32	25	24	40	200	17		15									
A32S-	PDUNR11-40	●	40	32	31	45	250	22	8.5	12									

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts (S-PDUN / A-PDUN)

Applications	Finishing	Finishing - Medium	Medium - Roughing	Finishing	Medium
Insert					
Chipbreaker type	GP	HQ	GS	F/L-S	R/L
Page	B24	B25	B25	B31	B31

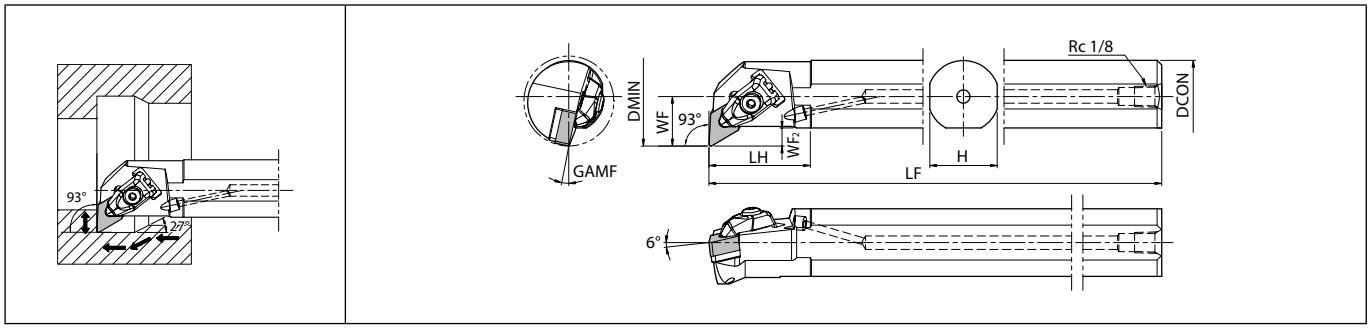
Recommended cutting conditions F159

Applicable Coolant Sleeve / Joint

Toolholder description	Applicable coolant sleeve	Applicable coolant joint
A20Q-PDUNR11-27	SHC2040-70, SHC2050-95	SJS-8
A25R-PDUNR11-32	SHC2540-70, SHC2550-95	
A32S-PDUNR11-40	-	

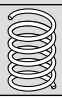
For coolant sleeve, coolant joint See page F156, F157

A-DDUN (Boring / Internal copying)



Max. Overhang Length L/D=~3 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

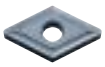
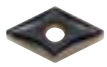
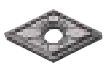
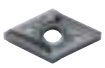
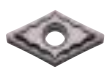
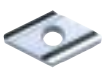
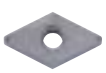
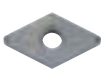
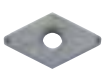
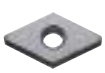
Toolholder dimensions

Description		Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts								Applicable inserts
														Clamp	Screw (for clamp)	Spring	Wrench (for clamp)	Shim	Screw (for shim)	Wrench* (for shim)	Nozzle	
		R	L	DMIN	DCON	H	LH	LF	WF	WF_2												
A32S-	DDUN☐15-40	●	●	40	32	30	45	250	22	8	12	0.8	Yes	CP-3D	CS-3D	SP-3D	LW-3	DD-42 (DD-42-16*)	SB-4085TR	FT-15	DN10	DN☐A1504... DN☐G1504... DN☐M1504... DN☐X1504...
A40T-	DDUN☐15-50	●	●	50	40	37	55	300	27	8.5												
A50U-	DDUN☐15-63	●	●	63	50	47	65	350	35	10.5											DN20	

When using inserts whose corner-R(RE) is greater than 1.6 mm, please purchase a shim* and use it in order to prevent workpiece and shim from interfering each other.
Not applicable to high-pressure coolant
When using the insert with WF chipbreaker, tool edge offset or program corrections are required on **R34** and **R35**.
Wrench (FT-15) is sold separately.

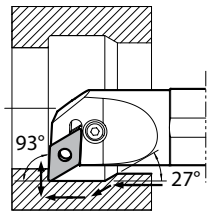
● : Standard item R : Right-hand only L : Left-hand only ☐ : Check availability

Applicable inserts

Applications	Finishing	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Finishing - Medium	Finishing - Medium	Medium
Insert								
Chipbreaker type	WF	PP	GP	PQ	HQ	CQ	CJ	TN-V
Page	B24	B24	B24	B24	B25	B25	B25	B25
Applications	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Roughing	Roughing
Insert								
Chipbreaker type	PMG	GS	PG	PS	PT	GT	STD	PH
Page	B25	B25	B26	B26	B26	B26	B27	B27
Applications	Roughing	Medium	Low carbon steel	Low carbon steel	Low carbon steel	Low carbon steel	Finishing - Medium	Large ap
Insert								
Chipbreaker type	PX	R/L	XF	XP	XQ	XS	SK	R-LD
Page	B27	B31	B27	B27	B27	B27	B28	B28
Applications	Medium - Roughing	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Cast iron	Cast iron	Cast iron
Insert								
Chipbreaker type	FP-TK	TK	MQ	MS	MU	KQ	KG	KH
Page	B28	B28	B28	B29	B29	B30	B30	B30
Applications	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron / Hard materials	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals
Insert								
Chipbreaker type	C	ZS	GC	No CB	Ceramic	R/L-A3	AH	PCD
Page	B30	B30	B30	B31	B114	B31	B31	C35
Applications	Heat-resistant alloys	Heat-resistant alloys	Hard materials	Hard materials	Hard materials	Hard materials / Cast iron		
Insert								
Chipbreaker type	SQ	SG	HH	HL	HD	CBN		
Page	B29	B29	C11	C11	C11	C10		

Recommended cutting conditions F159

S-PDUN15 (Internal copying)



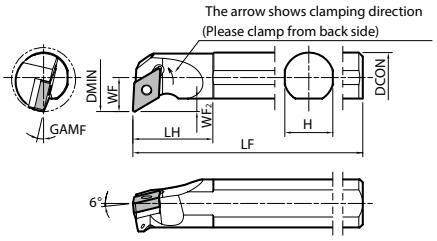


Fig. 1

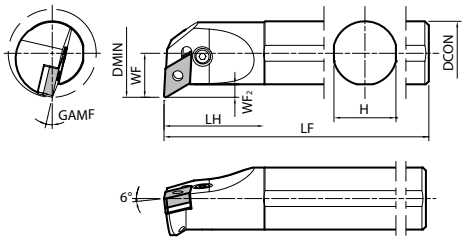


Fig. 2

Max. Overhang Length L/D=~3 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Boring

Solid
Positive
KAV
Negative

Toolholder dimensions

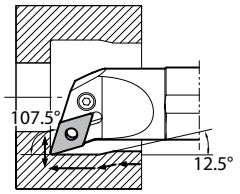
Description		Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Applicable inserts
		R	L	DMIN	DCON	H	LH	LF	WF	WF_2					
S25R-	PDUN[R/L]15-32	●	●	32	25	24	40	200	17	6.5	13	0.8	No	1	DN□A1504... DN□G1504... DN□M1504... DN□X1504...
S32S-	PDUN[R/L]15-44	●	●	44	32	31	50	250	22					2	
S40T-	PDUN[R/L]15-54	●	●	54	40	39	65	300	27	7.5	12				

Description		Spare parts									
		Lever	Lock pin	Lock screw	Wrench	Shim	Shim	Screw	Wrench	Shim pin	Punch
S25R-	PDUN[R/L]15-32	-	PP-4	-	LW-3	-	PD-42	SB-2050TR	FT-6	-	-
S32S-	PDUN[R/L]15-44	LL-3N	-	LS-2N		LD-42 (LD-42-20*)	-	-	-	LSP-2	PC-2
S40T-	PDUN[R/L]15-54										

When using the insert with WF chipbreaker, tool edge offset or program corrections are required on **R34** and **R35**.
When using inserts whose corner-R(RE) is greater than 1.6 mm for S25R-PDUN[R/L]15-32, use shim modified by additional processing in order to prevent workpiece and shim from interfering each other.
When using inserts whose corner-R(RE) is greater than 1.6 mm for S32S-PDUN[R/L]15-44 and S40T-PDUN[R/L]15-54, please purchase a shim with* mark and use it in order to prevent workpiece and shim from interfering each other.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-PDQN15 (Internal copying)



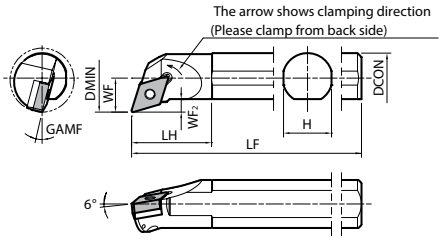


Fig. 1

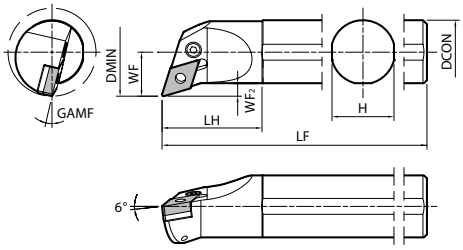


Fig. 2

Max. Overhang Length L/D=~3 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

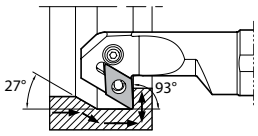
Description		Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Applicable inserts
		R	L	DMIN	DCON	H	LH	LF	WF	WF_2					
S25R-	PDQN$^{R/L}$15-32	●	●	32	25	24	40	200	17	6.5	13	0.8	No	1	DN□A1504...
S32S-	PDQN$^{R/L}$15-44	●	●	44	32	31	50	250	22					2	DN□G1504...
S40T-	PDQN$^{R/L}$15-54	●	●	54	40	39	65	300	27	7.5	12				DN□M1504...

Description		Spare parts									
		Lever	Lock pin	Lock screw	Wrench	Shim	Shim	Screw	Wrench	Shim pin	Punch
S25R-	PDQN$^{R/L}$15-32	-	PP-4	-	LW-3	-	PD-42	SB-2050TR	FT-6	-	-
S32S-	PDQN$^{R/L}$15-44	LL-3N	-	LS-2N		LD-42 (LD-42-20*)	-	-	-	LSP-2	PC-2
S40T-	PDQN$^{R/L}$15-54										

When using inserts whose corner-R(RE) is greater than 1.6 mm for S25R-PDQN$^{R/L}$15-32, use shim modified by additional processing in order to prevent workpiece and shim from interfering each other.
When using inserts whose corner-R(RE) is greater than 1.6 mm for S32S-PDQN$^{R/L}$15-44 and S40T-PDQN$^{R/L}$15-54, please purchase a shim with* mark and use it in order to prevent workpiece and shim from interfering each other.
WF chipbreaker can not be used for S-PDQN15 toolholder.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-PDZN15 (Back boring)



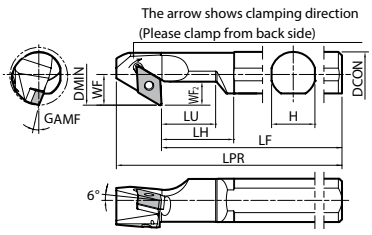


Fig. 1

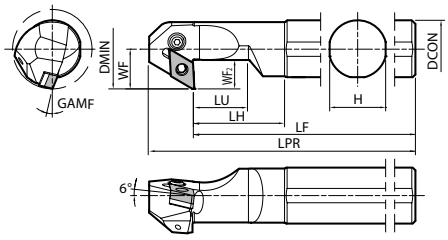


Fig. 2

Max. Overhang Length L/D=~3 | Right-hand shown
Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

F

Boring

Solid
Positive
KAV
Negative

Toolholder dimensions

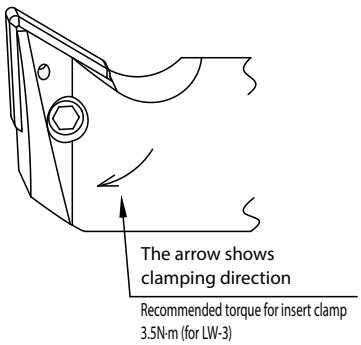
Description		Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Applicable inserts
		R	L	DMIN	DCON	H	LH	LPR	LU	WF	WF_2					
S25R-	PDZN[R/L]15-32	●	●	32	25	24	40	225	30	17	13	13	0.8	No	1	DN□A1504... DN□G1504... DN□M1504... DN□X1504...
S32S-	PDZN[R/L]15-44	●	●	44	32	31	50	275		22	16				2	
S40T-	PDZN[R/L]15-54	●	●	54	40	39	65	325	50	27		12				

Description		Spare parts									
		Lever	Lock pin	Lock screw	Wrench	Shim	Shim	Screw	Wrench	Shim pin	Punch
S25R-	PDZN[R/L]15-32	-	PP-4	-	LW-3	-	PD-42	SB-2050TR	FT-6	-	-
S32S-	PDZN[R/L]15-44	LL-3N	-	LS-2N		LD-42 (LD-42-20*)	-	-	-	LSP-2	PC-2
S40T-	PDZN[R/L]15-54										

When using the insert with WF chipbreaker, tool edge offset or program corrections are required on **R34** and **R35**.
When using inserts whose corner-R(RE) is greater than 1.6 mm for S25R-PDZN[R/L]15-32, use shim modified by additional processing in order to prevent workpiece and shim from interfering each other.
When using inserts whose corner-R(RE) is greater than 1.6 mm for S32S-PDZN[R/L]15-44 and S40T-PDZN[R/L]15-54, please purchase a shim with* mark and use it in order to prevent workpiece and shim from interfering each other.

How to change S25R-PD□N[R/L]15-32 inserts

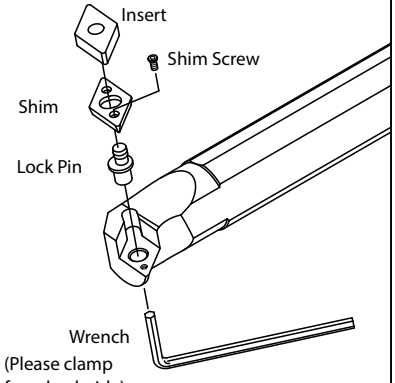
· Please replace S25R-PD□N[R/L]15-32 insert from the back side



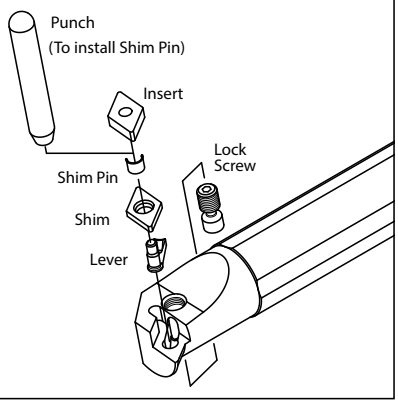
Back side of toolholder

How to assemble spare parts

· S25R-PD□N[R/L]15-32 (Pin Lock)

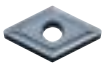
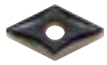
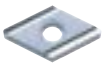
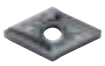
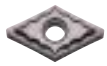
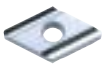
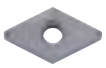
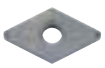
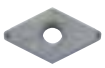
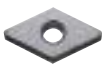


· S32S-PD□N[R/L]15-44 (Lever Lock)
· S40T-PD□N[R/L]15-54 (Lever Lock)



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

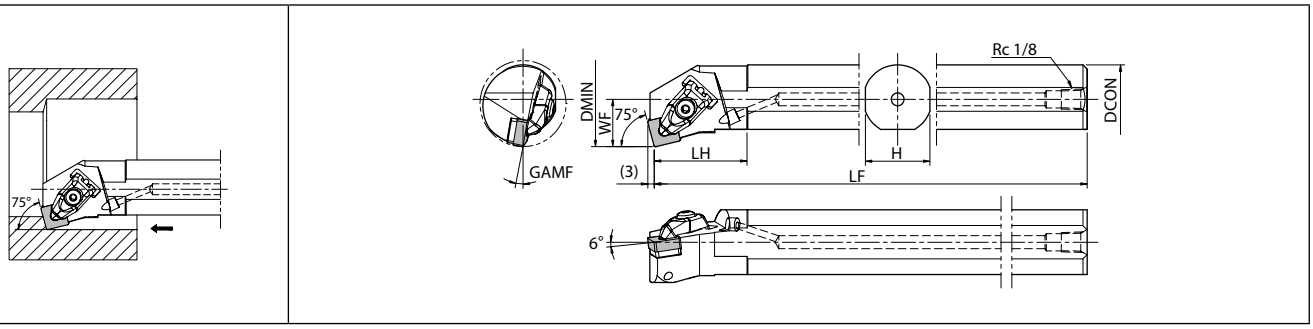
Applicable inserts (S-PDUN15 / S-PDQN15 / S-PDZN15)

Applications	Finishing	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Finishing - Medium	Finishing - Medium	Medium
Insert								
Chipbreaker type	WF*	PP	GP	PQ	HQ	CQ	CJ	TN-V
Page	B24	B24	B24	B24	B25	B25	B25	B25
Applications	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Roughing	Roughing
Insert								
Chipbreaker type	PMG	GS	PG	PS	PT	GT	STD	PH
Page	B25	B25	B26	B26	B26	B26	B27	B27
Applications	Roughing	Medium	Low carbon steel	Low carbon steel	Low carbon steel	Low carbon steel	Finishing - Medium	Large ap
Insert								
Chipbreaker type	PX	R/L	XF	XP	XQ	XS	SK	R-LD
Page	B27	B31	B27	B27	B27	B27	B28	B28
Applications	Medium - Roughing	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Cast iron	Cast iron	Cast iron
Insert								
Chipbreaker type	FP-TK	TK	MQ	MS	MU	KQ	KG	KH
Page	B28	B28	B28	B29	B29	B30	B30	B30
Applications	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron / Hard materials	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals
Insert								
Chipbreaker type	C	ZS	GC	No CB	Ceramic	R/L-A3	AH	PCD
Page	B30	B30	B30	B31	B114	B31	B31	C35
Applications	Heat-resistant alloys	Heat-resistant alloys	Hard materials	Hard materials	Hard materials	Hard materials / Cast iron		
Insert								
Chipbreaker type	SQ	SG	HH	HL	HD	CBN		
Page	B29	B29	C11	C11	C11	C10		

When using the insert with WF chipbreaker, tool edge offset or program corrections are required on **R34** and **R35**.
The insert with WF chipbreaker is not applicable for S-PDQN15 type toolholder.

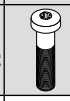
Recommended cutting conditions ➡ **F159**

A-DSKN (Boring)



Max. Overhang Length L/D=~3 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)						GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts								Applicable inserts
												Clamp	Screw (for clamp)	Spring	Wrench (for clamp)	Shim	Screw (for shim)	Wrench* (for shim)	Nozzle	
	R	L	DMIN	DCON	H	LH	LF	WF												
A25R- DSKN$^{R}_{L}$12-32	●	●	32	25	23	43	200	17	11	0.8	Yes	CP-3D	CS-3D	SP-3D	LW-3	DS-42	SB-4085TR	FT-15	DN10	SN□A1204... SN□G1204... SN□M1204...
A32S- DSKN$^{R}_{L}$12-40	●	●	40	32	30		250	22												
A40T- DSKN$^{R}_{L}$12-50	●	●	50	40	37	53	300	27											DN20	

Not applicable to high-pressure coolant
Wrench (FT-15) is sold separately.

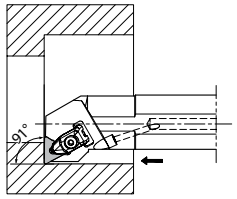
Applicable inserts

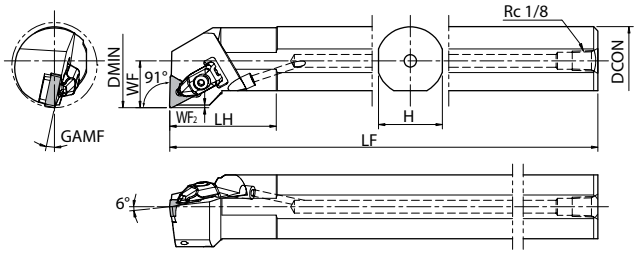
Applications	Finishing - Medium	Finishing - Medium	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Roughing	Roughing
Insert								
Chipbreaker type	PQ	HQ	PMG	PG	PS	PT	STD	PH
Page	B33	B33	B33	B33	B33	B33	B33	B34
Applications	Roughing	Medium - Roughing	Medium - Roughing	Low carbon steel	Low carbon steel	Low carbon steel	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys
Insert								
Chipbreaker type	PX	$^{R}_{L}$-C	$^{R}_{L}$-25R	XP	XQ	XS	MQ	MS
Page	B34	B36	B36	B34	B34	B34	B35	B35
Applications	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron / Hard materials	Heat-resistant alloys
Insert								
Chipbreaker type	KG	KH	C	ZS	GC	No CB	Ceramic	SG
Page	B35	B35	B35	B36	B36	B36	B117	B35
Applications	Hard materials / Cast iron							
Insert								
Chipbreaker type	CBN							
Page	C12							

Recommended cutting conditions F159

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

A-DTFN (Boring)

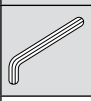
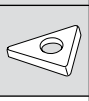
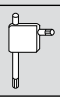
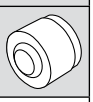




Max. Overhang Length L/D=~3 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

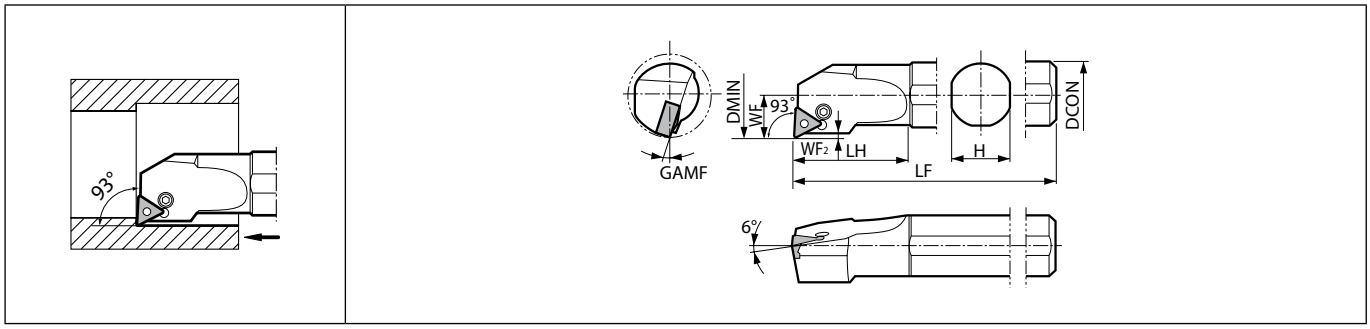
Description	Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Applicable inserts
	R	L	DMIN	DCON	H	LH	LF	WF	WF_2				
A25R- DTFN[R/L]16-32	●	●	32	25	23	42	200	17	0.8	12	0.8	Yes	TN□A1604... TN□G1604... TN□M1604... TN□X1604...
A32S- DTFN[R/L]16-40	●	●	40	32	30	50	250	22	1.2				
A40T- DTFN[R/L]22-50	●	●	50	40	37	60	300	27	1.5	12	0.8	Yes	TN□G2204... TN□M2204...

Description	Spare parts								
	Clamp	Screw (for clamp)	Spring	Wrench (for clamp)	Shim	Screw (for shim)	Wrench* (for shim)	Wrench* (for shim)	Nozzle
									
A25R- DTFN[R/L]16-32	CP-2D	CS-2D	SP-2D	LW-2.5	DT-32	SB-3080TR	FT-10	-	DN10
A32S- DTFN[R/L]16-40									
A40T- DTFN[R/L]22-50	CP-3D	CS-3D	SP-3D	LW-3	DT-42	SB-4085TR	-	FT-15	DN20

Not applicable to high-pressure coolant
When using the insert with WF chipbreaker, tool edge offset or program corrections are required on **R34** and **R35**.
Wrench (FT-10 or FT-15) is sold separately

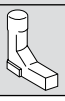
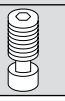
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-PTUN (Boring)



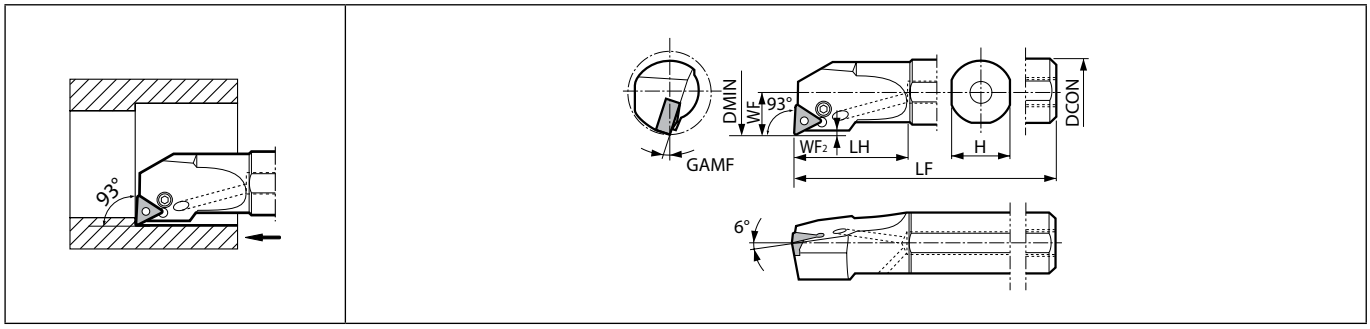
Max. Overhang Length L/D=~3 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description		Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts						Applicable inserts
														Lever	Lock screw	Punch	Shim	Shim pin	Shim pin	Wrench
		R	L	DMIN	DCON	H	LH	LF	WF	WF2											
S16M-	PTUN□/L11-20	●	●	20	16	15	34	150	11	0.3	18	0.8	No	LL-03TN	LS-03SN	-	-	-	P-03S	FH-2.5	TN□G1104...
S20Q-	PTUN□/L11-25	●	●	25	20	19	37	180	13.2	0.2	17									
S25R-	PTUN□/L11-32	●	●	32	25	24	42	200	15.7	0.3	16									
S16M-	PTUN□/L16-20	●	●	20	16	15	34	150	11	1.3	18	0.8	No	LL-03SN	LS-03SN	-	-	-	P-03S	FH-2.5	TN□A1604... TN□G1604... TN□M1604...
S20Q-	PTUN□/L16-25	●	●	25	20	19	37	180	13.2		17									
S25R-	PTUN□/L16-30	●	●	30	25	24	42	200	15.5		13									
S32S-	PTUN□/L16-40	●	●	40	32	30	50	250	22	0.7				LL-1N	LS-1N	PC-1	LT-32N (LT-32N-20*)	LSP-1	-	
S40T-	PTUN□/L16-50	●	●	50	40	37	60	300	27	0.6	11									

When using inserts whose corner-R(RE) is greater than 1.6 mm, please purchase a shim* and use it in order to prevent workpiece and shim from interfering each other.

A-PTUN (Boring)



Max. Overhang Length L/D=~3 | Right-hand shown
Left-hand Insert for Right-hand Toolholder.

Toolholder dimensions

Description		Availability	Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts				Applicable inserts
													Lever	Lock screw	Shim pin	Wrench	
		R	DMIN	DCON	H	LH	LF	WF	WF2								
A16M-	PTUNR11-20	●	20	16	15	34	150	11	0.3	18	0.8	Yes	LL-03TN	LS-03SN	P-03S	FH-2.5	TN□G1104...
A20Q-	PTUNR11-25	●	25	20	19	37	180	13.2	0.2	17							
A25R-	PTUNR11-32	●	32	25	24	42	200	15.7	0.3	16							

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts (A-DTFN / S-PTUN / A-PTUN)

Applications	Finishing	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Finishing - Medium	Medium - Roughing	Medium - Roughing
Insert								
Chipbreaker type	WF*	PP	GP	PQ	HQ	CQ	PMG	GS
Page	B38	B38	B38	B38	B38	B38	B39	B39
Applications	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Roughing	Roughing	Roughing	Finishing
Insert								
Chipbreaker type	PG	PS	PT	GT	STD	PH	PX	R/L-SSF
Page	B39	B39	B39	B39	B40	B40	B40	B44
Applications	Finishing	Finishing - Medium	Medium - Roughing	Medium - Roughing	Medium - Roughing	Low carbon steel	Low carbon steel	Low carbon steel
Insert								
Chipbreaker type	R/L-S	R/L-B	R/L-C	R/L	R/L-25R	XF	XP	XQ
Page	B44	B44	B45	B45	B45	B40	B41	B41
Applications	Low carbon steel	Finishing - Medium	Large ap	Medium - Roughing	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys
Insert								
Chipbreaker type	XS	SK	R-LD	FP-TK	TK	MQ	MS	MU
Page	B41	B41	B41	B41	B41	B42	B42	B42
Applications	Stainless steel	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron
Insert								
Chipbreaker type	R/L-ST	KQ	KG	KH	C	ZS	GC	No CB
Page	B42	B42	B42	B42	B43	B43	B43	B43
Applications	Cast iron / Hard materials	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Heat-resistant alloys	Hard materials / Cast iron		
Insert								
Chipbreaker type	Ceramic	R/L-A3	AH	PCD	SG	CBN		
Page	B118	B43	B43	C36	B42	C13		

When using the insert with WF chipbreaker, tool edge offset or program corrections are required on **R34** and **R35**.
The insert with WF chipbreaker is not applicable for S-PTUN type and A-PTUN type toolholder.

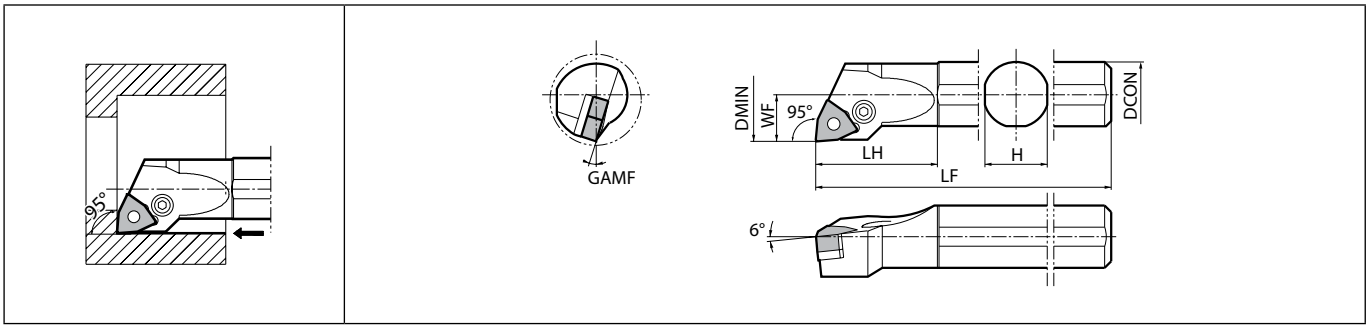
Recommended cutting conditions ⇨ **F159**

Applicable Coolant Sleeve / Joint

Toolholder description	Applicable coolant sleeve	Applicable coolant joint
A16M-PTUN R/L 11-20	SHC1640-70, SHC1650-95	SJS-8
A20Q-PTUN R/L 11-25	SHC2040-70, SHC2050-95	
A25R-PTUN R/L 11-32	SHC2540-70, SHC2550-95	

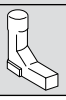
For coolant sleeve, coolant joint See page ⇨ **F156, F157**

S-PWLN (Boring / Internal facing)



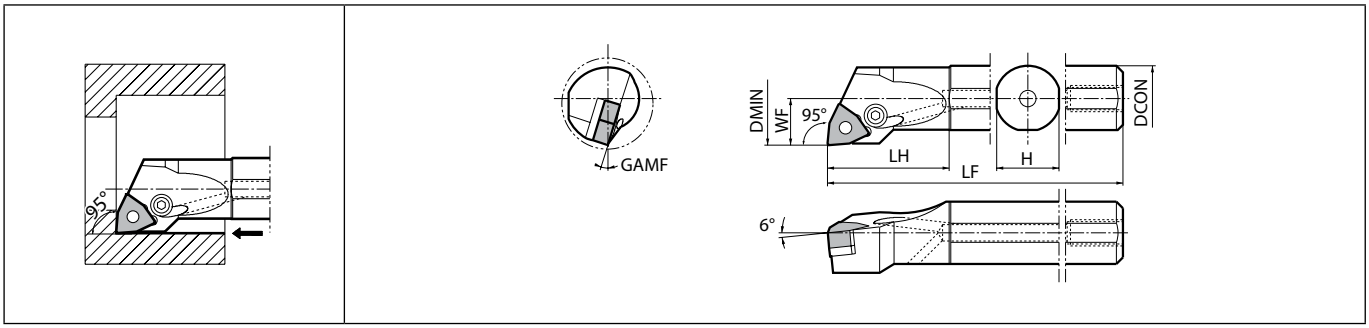
Max. Overhang Length L/D=~3 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)						GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts								Applicable inserts
												Lever	Lock screw	Punch	Shim	Shim pin	Shim pin	Wrench	Wrench	
	R	L	DMIN	DCON	H	LH	LF	WF												
S16M- PWLN□/L06-20	●	●	20	16	15	34	150	11	16	0.8	No	LL-03SN	LS-03SN	-	-	-	P-03S	-	FH-2.5	WN□G0604...
S20Q- PWLN□/L06-27	●	●	27	20	19	37	180	14.2	17			LL-1N	LS-1SN	PC-1	LW-32N	LSP-1	-			
S25R- PWLN□/L06-32	●	●	32	25	24	42	200	15.7	15											
S32S- PWLN□/L08-40	●	●	40	32	30	50	250	22	10	0.8	No	LL-2N	LS-2N	PC-2	LW-42N□/L	LSP-2	-	LW-3	-	WN□A0804... WN□G0804... WN□M0804...
S40T- PWLN□/L08-50	●	●	50	40	37	60	300	27												

Shim : LW-42NR for Right-hand Toolholder, LW-42NL for Left-hand Toolholder.

A-PWLN (Boring / Internal facing)



Max. Overhang Length L/D=~3 | Right-hand shown
Left-hand Insert for Right-hand Toolholder.

Toolholder dimensions

Description	Availability	Dimension (mm)						GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts							Applicable inserts
											Lever	Lock screw	Punch	Shim	Shim pin	Shim pin	Wrench	
	R	DMIN	DCON	H	LH	LF	WF											
A16M- PWLNR06-20	●	20	16	15	34	150	11	16	0.8	Yes	LL-03SN	LS-03SN	-	-	-	P-03S	FH-2.5	WN□G0604...
A20Q- PWLNR06-27	●	27	20	19	37	180	14.2	17			LL-1N	LS-1SN	PC-1	LW-32N	LSP-1	-		
A25R- PWLNR06-32	●	32	25	24	42	200	15.7	15										

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts (S-PWLN / A-PWLN)

Applications	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Finishing	Finishing	Finishing - Medium	Finishing - Medium
Insert								
Chipbreaker type	WF	WP	WE	WQ	PP	GP	PQ	HQ
Page	B49	B49	B49	B49	B49	B49	B49	B50
Applications	Finishing - Medium	Finishing - Medium	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing
Insert								
Chipbreaker type	CQ	CJ	PMG	GS	PG	PS	PT	GT
Page	B50	B50	B50	B50	B50	B50	B51	B51
Applications	Roughing	Roughing	Finishing	Medium	Low carbon steel	Low carbon steel	Low carbon steel	Stainless steel / Heat-resistant alloys
Insert								
Chipbreaker type	STD	PH	R/L-S	R/L	XP	XQ	XS	TK
Page	B51	B51	B53	B53	B51	B51	B51	B51
Applications	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron
Insert								
Chipbreaker type	MQ	MS	MU	KQ	KG	KH	C	ZS
Page	B52	B52	B52	B52	B52	B52	B53	B53
Applications	Cast iron	Cast iron	Non-Ferrous metals	Non-Ferrous metals	Heat-resistant alloys	Hard materials / Cast iron		
Insert								
Chipbreaker type	GC	No CB	AH	PCD	SG	CBN		
Page	B53	B53	B53	C38	B52	C15		

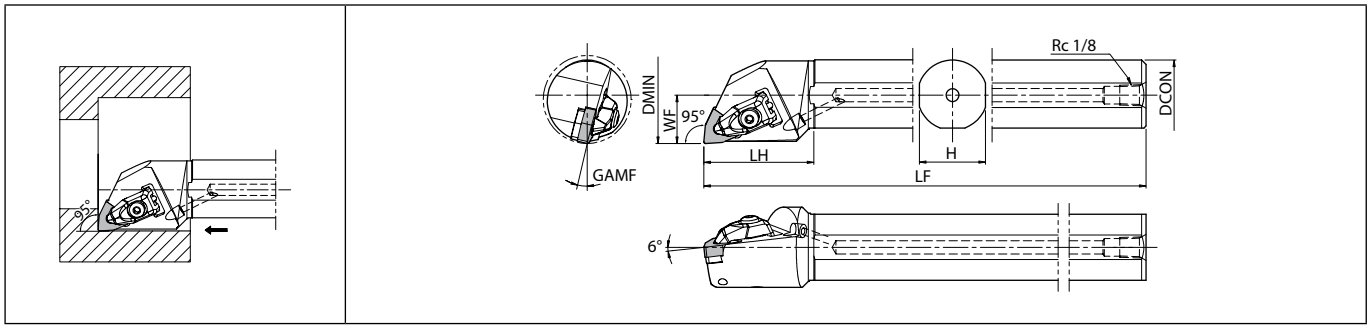
Recommended cutting conditions F159

Applicable Coolant Sleeve / Joint

Toolholder description	Applicable coolant sleeve	Applicable coolant joint
A16M-PWLNR06-20	SHC1640-70, SHC1650-95	SJS-8
A20M-PWLNR06-27	SHC2040-70, SHC2050-95	
A25R-PWLNR06-32	SHC2540-70, SHC2550-95	

For coolant sleeve, coolant joint See page F156, F157

A-DWLN (Boring / Internal facing)



Max. Overhang Length L/D=~3 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

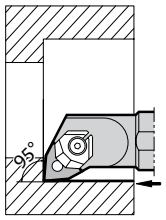
Description		Availability		Dimension (mm)						GAMF (°)	Standard corner-R(RE)	Coolant hole	Applicable inserts
		R	L	DMIN	DCON	H	LH	LF	WF				
A25R-	DWLN□/L08-32	●	●	32	25	23	50	200	17	13	0.8	Yes	WN□A0804... WN□G0804... WN□M0804...
A32S-	DWLN□/L08-40	●	●	40	32	30		250	22				
A40T-	DWLN□/L08-50	●	●	50	40	37	60	300	27				

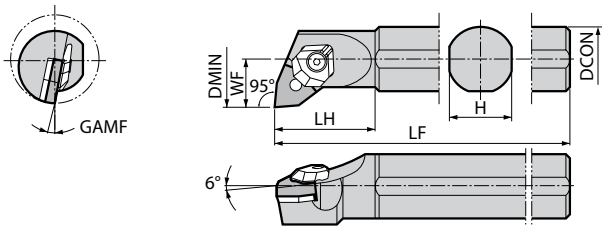
Description		Spare parts							
		Clamp	Screw (for clamp)	Spring	Wrench (for clamp)	Shim	Screw (for shim)	Wrench* (for shim)	Nozzle
									
A25R-	DWLN□/L08-32	CP-3D	CS-3D	SP-3D	LW-3	DW-42	SB-4085TR	FT-15	DN10
A32S-	DWLN□/L08-40								
A40T-	DWLN□/L08-50								DN20

Not applicable to high-pressure coolant
Wrench (FT-15) is sold separately.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

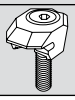
S-WWLN-E Excellent bar (Boring / Internal facing)





Max. Overhang Length L/D=~5 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description		Availability		Dimension (mm)						GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts					Applicable inserts
													Clamp set	Wrench	Shim	Shim pin	Wrench	
		R	L	DMIN	DCON	H	LH	LF	WF									
S25S-	WWLN[R/L]08-28E	●	●	28	25	24	36	250	14	13	1.2	No	WCS-8	LW-3	WWP-42 (WWP-42-16*)	WP5X11	LW-2	WN□A0804... WN□G0804... WN□M0804...
	WWLN[R/L]08-34E	●	●	34			40		17	11								
S32S-	WWLN[R/L]08-40E	●	●	40	32	30	50		20	10								

When using inserts whose corner-R(RE) is greater than 1.6 mm, please purchase a shim* and use it in order to prevent workpiece and shim from interfering each other.
In wedge lock, use of ceramic insert other than silicon nitride insert is not recommended due to strong restrain force.

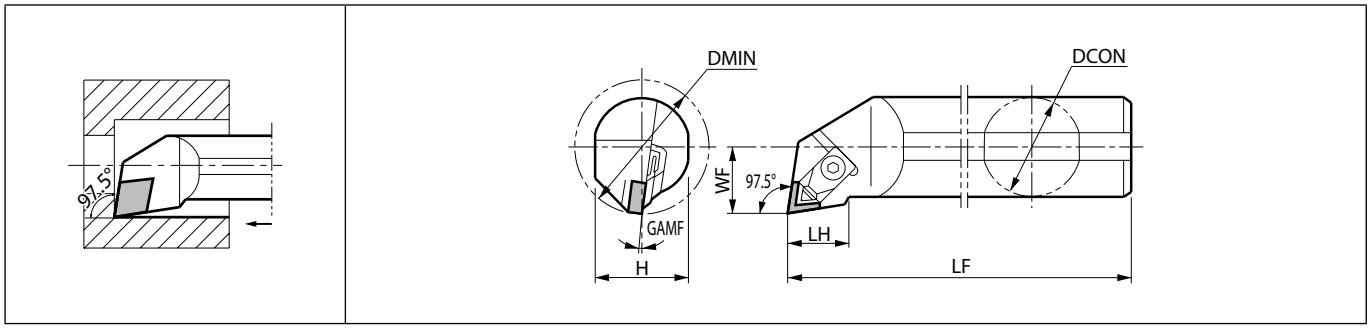
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts (A-DWLN / S-WWLN-E)

Applications	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Finishing	Finishing	Finishing - Medium	Finishing - Medium
Insert								
Chipbreaker type	WF	WP	WE	WQ	PP	GP	PQ	HQ
Page	B49	B49	B49	B49	B49	B49	B49	B50
Applications	Finishing - Medium	Finishing - Medium	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing
Insert								
Chipbreaker type	CQ	CJ	PMG	GS	PG	PS	PT	GT
Page	B50	B50	B50	B50	B50	B50	B51	B51
Applications	Roughing	Roughing	Low carbon steel	Low carbon steel	Low carbon steel	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys
Insert								
Chipbreaker type	STD	PH	XP	XQ	XS	TK	MQ	MS
Page	B51	B51	B51	B51	B51	B51	B52	B52
Applications	Stainless steel / Heat-resistant alloys	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron
Insert								
Chipbreaker type	MU	KQ	KG	KH	C	ZS	GC	No CB
Page	B52	B52	B52	B52	B53	B53	B53	B53
Applications	Non-Ferrous metals	Non-Ferrous metals	Heat-resistant alloys	Hard materials / Cast iron				
Insert								
Chipbreaker type	AH	PCD	SG	CBN				
Page	B53	C38	B52	C15				

Recommended cutting conditions F159

S-CELN (Boring / Internal facing)

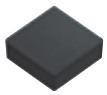


Max. Overhang Length L/D=~3 | Right-hand shown

Toolholder dimensions

Description		Availability	Dimension (mm)						GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts					Applicable inserts
												Chipbreaker	Clamp set	Wrench	Shim	Shim screw	
		R	DMIN	DCON	H	LH	LF	WF									
S40T-	CELNR13-50	●	50	40	37	32	300	27	12	0.8	No	CB-16	CE-010	LW-4	SP-341P	M3X8	ENGN1307...

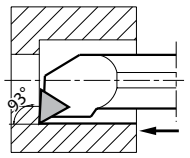
Applicable inserts

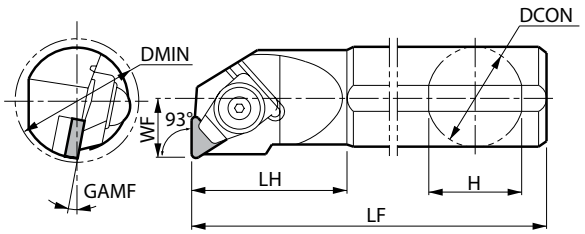
Applications	Cast iron / Hard materials
Insert	
Type	Ceramic
Page	B115

Recommended cutting conditions F159

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

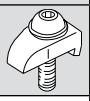
S-CTUN-A (Boring)





Right-hand shown

Toolholder dimensions

Description	Availability	Dimension (mm)						GAMF (°)	Standard corner-R(RE)	Spare parts				Applicable inserts
										Clamp set	Shim screw	Shim	Wrench	
	R	DMIN	DCON	H	LH	LF	WF							
S25X- CTUNR11-30A	●	30	25	24	40	220	15	10	0.8	CE-360S	BH3X6	SP-210A	LW-4	TN□N1103...

Applicable inserts

Applications	Hard materials / Cast iron	Cast iron / Hard materials
Insert		
Type	CBN	Ceramic
Page	C19	B118

Recommended cutting conditions F159

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

EZH sleeves

Sleeve description				Applicable inserts				Applicable machine manufacturer
EZH-CT (Adjustable overhang length with coolant hole)	EZH-HP (Adjustable overhang length)	EZH-ST	Sleeve shank dia. DCON (mm)	EZB	EZBT/EZBF EZBP/EZBC EZVB/EZG EZFG/EZT	EZ Bar PLUS	Shank dia. DCON (mm)	
-	-	EZH 01712ST-80	12	EZB_ ...017...	-	-	1.7	(General purpose)
		02012ST-80		EZB_ ...020...	EZ__ ...020...		2	
		02512ST-80		EZB_ ...025...	EZ__ ...025-...		2.5	
		03012ST-80		EZB_ ...030...	EZ__ ...030-...		3	
		03512ST-80		EZB_ ...035...	EZ__ ...035-...		3.5	
		04012ST-80		EZB_ ...040...	EZ__ ...040-...		4	
		05012ST-80		EZB_ ...050...	EZ__ ...050-...		5	
		06012ST-80		EZB_ ...060...	EZ__ ...060-...		6	
		07012ST-80		EZB_ ...070...	EZ__ ...070-...		7	
-	EZH 01716HP-100	EZH 01716ST-100	16	EZB_ ...017...	-	-	1.7	(General purpose)
	02016HP-100	02016ST-100		EZB_ ...020...	EZ__ ...020...		2	
	02516HP-100	02516ST-100		EZB_ ...025...	EZ__ ...025-...		2.5	
	03016HP-100	03016ST-100		EZB_ ...030...	EZ__ ...030-...		3	
	03516HP-100	03516ST-100		EZB_ ...035...	EZ__ ...035-...		3.5	
	04016HP-100	04016ST-100		EZB_ ...040...	EZ__ ...040-...		4	
	04516HP-100	-		EZB_ ...045...	-	_045X- ...-050EZP	4.5	
	05016HP-100	05016ST-100		EZB_ ...050...	EZ__ ...050-...	_050X- ...-060EZP	5	
	06016HP-100	06016ST-100		EZB_ ...060...	EZ__ ...060-...	_060X- ...-070EZP	6	
	07016HP-100	07016ST-100		EZB_ ...070...	EZ__ ...070-...	_070X- ...-080EZP	7	
	-	08016ST-100		EZB_ ...080...	-	_080X- ...-100EZP	8	
EZH 01719CT-120	EZH 01719HP-120	EZH 01719ST-120	19.05	EZB_ ...017...	-	-	1.7	Citizen Machinery
02019CT-120	02019HP-120	02019ST-120		EZB_ ...020...	EZ__ ...020...		2	
02519CT-120	02519HP-120	02519ST-120		EZB_ ...025...	EZ__ ...025-...		2.5	
03019CT-120	03019HP-120	03019ST-120		EZB_ ...030...	EZ__ ...030-...		3	
03519CT-120	03519HP-120	03519ST-120		EZB_ ...035...	EZ__ ...035-...		3.5	
04019CT-120	04019HP-120	04019ST-120		EZB_ ...040...	EZ__ ...040-...		4	
04519CT-120	04519HP-120	-		EZB_ ...045...	-	_045X- ...-050EZP	4.5	
05019CT-120	05019HP-120	05019ST-120		EZB_ ...050...	EZ__ ...050-...	_050X- ...-060EZP	5	
06019CT-120	06019HP-120	06019ST-120		EZB_ ...060...	EZ__ ...060-...	_060X- ...-070EZP	6	
07019CT-120	07019HP-120	07019ST-120		EZB_ ...070...	EZ__ ...070-...	_070X- ...-080EZP	7	
08019CT-120	08019HP-120	08019ST-120		EZB_ ...080...	-	_080X- ...-100EZP	8	
EZH 01720CT-120	EZH 01720HP-120	EZH 01720ST-120	20	EZB_ ...017...	-	-	1.7	Eguro Tsugami Citizen Machinery (General purpose)
02020CT-120	02020HP-120	02020ST-120		EZB_ ...020...	EZ__ ...020...		2	
02520CT-120	02520HP-120	02520ST-120		EZB_ ...025...	EZ__ ...025-...		2.5	
03020CT-120	03020HP-120	03020ST-120		EZB_ ...030...	EZ__ ...030-...		3	
03520CT-120	03520HP-120	03520ST-120		EZB_ ...035...	EZ__ ...035-...		3.5	
04020CT-120	04020HP-120	04020ST-120		EZB_ ...040...	EZ__ ...040-...		4	
04520CT-120	04520HP-120	-		EZB_ ...045...	-	_045X- ...-050EZP	4.5	
05020CT-120	05020HP-120	05020ST-120		EZB_ ...050...	EZ__ ...050-...	_050X- ...-060EZP	5	
06020CT-120	06020HP-120	06020ST-120		EZB_ ...060...	EZ__ ...060-...	_060X- ...-070EZP	6	
07020CT-120	07020HP-120	07020ST-120		EZB_ ...070...	EZ__ ...070-...	_070X- ...-080EZP	7	
08020CT-120	08020HP-120	08020ST-120		EZB_ ...080...	-	_080X- ...-100EZP	8	
EZH 01722CT-135	EZH 01722HP-135	EZH 01722ST-135	22	EZB_ ...017...	-	-	1.7	Star Micronics Nomura DS Tsugami
02022CT-135	02022HP-135	02022ST-135		EZB_ ...020...	EZ__ ...020...		2	
02522CT-135	02522HP-135	02522ST-135		EZB_ ...025...	EZ__ ...025-...		2.5	
03022CT-135	03022HP-135	03022ST-135		EZB_ ...030...	EZ__ ...030-...		3	
03522CT-135	03522HP-135	03522ST-135		EZB_ ...035...	EZ__ ...035-...		3.5	
04022CT-135	04022HP-135	04022ST-135		EZB_ ...040...	EZ__ ...040-...		4	
04522CT-135	04522HP-135	-		EZB_ ...045...	-	_045X- ...-050EZP	4.5	
05022CT-135	05022HP-135	05022ST-135		EZB_ ...050...	EZ__ ...050-...	_050X- ...-060EZP	5	
06022CT-135	06022HP-135	06022ST-135		EZB_ ...060...	EZ__ ...060-...	_060X- ...-070EZP	6	
07022CT-135	07022HP-135	07022ST-135		EZB_ ...070...	EZ__ ...070-...	_070X- ...-080EZP	7	
08022CT-135	08022HP-135	08022ST-135		EZB_ ...080...	-	_080X- ...-100EZP	8	
EZH 01725.0CT-135	EZH 01725.0HP-135	EZH 01725.0ST-135	25	EZB_ ...017...	-	-	1.7	Eguro Tsugami Citizen Machinery (General purpose)
02025.0CT-135	02025.0HP-135	02025.0ST-135		EZB_ ...020...	EZ__ ...020...		2	
02525.0CT-135	02525.0HP-135	02525.0ST-135		EZB_ ...025...	EZ__ ...025-...		2.5	
03025.0CT-135	03025.0HP-135	03025.0ST-135		EZB_ ...030...	EZ__ ...030-...		3	
03525.0CT-135	03525.0HP-135	03525.0ST-135		EZB_ ...035...	EZ__ ...035-...		3.5	
04025.0CT-135	04025.0HP-135	04025.0ST-135		EZB_ ...040...	EZ__ ...040-...		4	
04525.0CT-135	04525.0HP-135	-		EZB_ ...045...	-	_045X- ...-050EZP	4.5	
05025.0CT-135	05025.0HP-135	05025.0ST-135		EZB_ ...050...	EZ__ ...050-...	_050X- ...-060EZP	5	
06025.0CT-135	06025.0HP-135	06025.0ST-135		EZB_ ...060...	EZ__ ...060-...	_060X- ...-070EZP	6	
07025.0CT-135	07025.0HP-135	07025.0ST-135		EZB_ ...070...	EZ__ ...070-...	_070X- ...-080EZP	7	
08025.0CT-135	08025.0HP-135	08025.0ST-135		EZB_ ...080...	-	_080X- ...-100EZP	8	
EZH 01725.4CT-120	EZH 01725.4HP-120	EZH 01725.4ST-120	25.4	EZB_ ...017...	-	-	1.7	Citizen Machinery
02025.4CT-120	02025.4HP-120	02025.4ST-120		EZB_ ...020...	EZ__ ...020...		2	
02525.4CT-120	02525.4HP-120	02525.4ST-120		EZB_ ...025...	EZ__ ...025-...		2.5	
03025.4CT-120	03025.4HP-120	03025.4ST-120		EZB_ ...030...	EZ__ ...030-...		3	
03525.4CT-120	03525.4HP-120	03525.4ST-120		EZB_ ...035...	EZ__ ...035-...		3.5	
04025.4CT-120	04025.4HP-120	04025.4ST-120		EZB_ ...040...	EZ__ ...040-...		4	
04525.4CT-120	04525.4HP-120	-		EZB_ ...045...	-	_045X- ...-050EZP	4.5	
05025.4CT-120	05025.4HP-120	05025.4ST-120		EZB_ ...050...	EZ__ ...050-...	_050X- ...-060EZP	5	
06025.4CT-120	06025.4HP-120	06025.4ST-120		EZB_ ...060...	EZ__ ...060-...	_060X- ...-070EZP	6	
07025.4CT-120	07025.4HP-120	07025.4ST-120		EZB_ ...070...	EZ__ ...070-...	_070X- ...-080EZP	7	
08025.4CT-120	08025.4HP-120	08025.4ST-120		EZB_ ...080...	-	_080X- ...-100EZP	8	

· Choose sleeves (DCB) to meet with DCON dimension of bar.

· Adjustment Pin cannot be installed to EZH-ST sleeves. To adjust overhang of the bar, please use EZH-CT / HP sleeves.

· Machine manufacturers in random order.

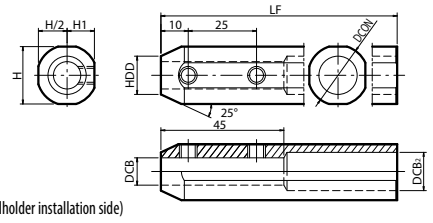
EZH sleeves and applicable inserts / toolholders

Shank size (Hole dia.: mm)		017 (1.7mm)	020 (2mm)	025 (2.5mm)	03 (3mm)	035 (3.5mm)
EZH-CT sleeve (Internal coolant) EZH-HP sleeve description (Adjustable overhang length)		EZH 01716HP-100	EZH 02016HP-100	EZH 02516HP-100	EZH 03016HP-100	EZH 03516HP-100
		01719CT/HP-120	02019CT/HP-120	02519CT/HP-120	03019CT/HP-120	03519CT/HP-120
		01720CT/HP-120	02020CT/HP-120	02520CT/HP-120	03020CT/HP-120	03520CT/HP-120
		01722CT/HP-135	02022CT/HP-135	02522CT/HP-135	03022CT/HP-135	03522CT/HP-135
		01725.0CT/HP-135	02025.0CT/HP-135	02525.0CT/HP-135	03025.0CT/HP-135	03525.0CT/HP-135
		01725.4CT/HP-120	02025.4CT/HP-120	02525.4CT/HP-120	03025.4CT/HP-120	03525.4CT/HP-120
EZH-ST sleeve description		EZH 01712ST-80	EZH 02012ST-80	EZH 02512ST-80	EZH 03012ST-80	EZH 03512ST-80
		01716ST-100	02016ST-100	02516ST-100	03016ST-100	03516ST-100
		01719ST-120	02019ST-120	02519ST-120	03019ST-120	03519ST-120
		01720ST-120	02020ST-120	02520ST-120	03020ST-120	03520ST-120
		01722ST-135	02022ST-135	02522ST-135	03022ST-135	03522ST-135
		01725.0ST-135	02025.0ST-135	02525.0ST-135	03025.0ST-135	03525.0ST-135
		01725.4ST-120	02025.4ST-120	02525.4ST-120	03025.4ST-120	03525.4ST-120
EZ Bars	Boring		EZB$^{R}/_{L}$ 020020HP-	EZB$^{R}/_{L}$ 025025HP-	EZB$^{R}/_{L}$ 030030HP-	EZB$^{R}/_{L}$ 035035HP-
		EZBR 020017ST-	EZBR 025020ST-	EZBR 030025ST-	EZBR 035030ST-	EZBR 040035ST-
		EZBR 020017-...NB	EZBR 025020-...NB	EZBR 030025-...NB	EZBR ...030-...NB	EZBR 040035-...NB
					EZBFR 030030-008	
			EZBPR 020020-		EZBPR 030030-	
					EZVBR 035030-	
	Internal grooving				EZGR 030030-	
	Face grooving					
	Internal threading			EZTR 030025-	EZTR 035030-	EZTR 040035-
EZ Bar PLUS						

Shank size (Hole dia.: mm)		04 (4mm)	045 (4.5mm)	05 (5mm)	06 (6mm)	07 (7mm)	08 (8mm)
EZH-CT sleeve (Internal coolant) EZH-HP sleeve description (Adjustable overhang length)		EZH 04016HP-100	EZH 04516HP-100	EZH 05016HP-100	EZH 06016HP-100	EZH 07016HP-100	
		04019CT/HP-120	04519CT/HP-120	05019CT/HP-120	06019CT/HP-120	07019CT/HP-120	EZH 08019CT/HP-120
		04020CT/HP-120	04520CT/HP-120	05020CT/HP-120	06020CT/HP-120	07020CT/HP-120	08020CT/HP120
		04022CT/HP-135	04522CT/HP-135	05022CT/HP-135	06022CT/HP-135	07022CT/HP-135	08022CT/HP-135
		04025.0CT/HP-135	04525.0CT/HP-135	05025.0CT/HP-135	06025.0CT/HP-135	07025.0CT/HP-135	08025.0CT/HP-135
		04025.4CT/HP-120	04525.4CT/HP-120	05025.4CT/HP-120	06025.4CT/HP-120	07025.4CT/HP-120	08025.4CT/HP-120
EZH-ST sleeve description		EZH 04012ST-80		EZH 05012ST-80	EZH 06012ST-80	EZH 07012ST-80	
		04016ST-100		05016ST-100	06016ST-100	07016ST-100	EZH 08016ST-100
		04019ST-120		05019ST-120	06019ST-120	07019ST-120	08019ST-120
		04020ST-120		05020ST-120	06020ST-120	07020ST-120	08020ST-120
		04022ST-135		05022ST-135	06022ST-135	07022ST-135	08022ST-135
		04025.0ST-135		05025.0ST-135	06025.0ST-135	07025.0ST-135	08025.0ST-135
		04025.4ST-120		05025.4ST-120	06025.4ST-120	07025.4ST-120	08025.4ST-120
EZ Bars	Boring	EZB$^{R}/_{L}$ 040040HP-	EZB$^{R}/_{L}$ 045045HP-	EZB$^{R}/_{L}$ 050050HP-	EZB$^{R}/_{L}$ 060060HP-	EZB$^{R}/_{L}$ 070070HP-	EZB$^{R}/_{L}$ 080080HP-
		EZBR 045040ST-		EZBR 055050ST-	EZBR 065060ST-	EZBR 075070ST-	
		EZBR ...040-...NB		EZBR ...050-...NB	EZBR ...060-...NB	EZBR ...070-...NB	
		EZBFR 040040-008		EZBFR 050050-015	EZBFR 060060-015		
		EZBPR 040040-015		EZBPR 050050-015	EZBPR 060060-015		
				EZBCR 050050-	EZBCR 060060-	EZBCR 070070-	
		EZVBR 045040-		EZVBR 055050-	EZVBR 065060-		
		EZBTR 040040-		EZBTR 050050-			
	Internal grooving	EZG$^{R}/_{L}$ 040040-		EZG$^{R}/_{L}$ 050050-	EZG$^{R}/_{L}$ 060060-	EZG$^{R}/_{L}$ ...070-...	
	Face grooving	EZFG$^{R}/_{L}$ 050040-		EZFG$^{R}/_{L}$ 060050-		EZFG$^{R}/_{L}$ 080070-	
	Internal threading	EZTR 050040-		EZTR 060050-	EZTR 070060-	EZTR 080070-	
EZ Bar PLUS			S/C045X-SCLCR03-050EZP	S/C050X-SCLCR03-060EZP	S/C060X-SCLCR04-070EZP	S/C070X-SCLCR04-080EZP	S/C080X-SCLCR06-100EZP
						S/C070X-STLBR06-080EZP	S/C080X-STLPR09-100EZP
				S/C050X-SWUBR06-060EZP	S/C060X-SWUBR06-070EZP	S/C070X-SWUBR08-080EZP	
Boring Bars		C04-....		C05-....	C06-....	C07-....	C/E08-....
					S06-....		A/S08-....

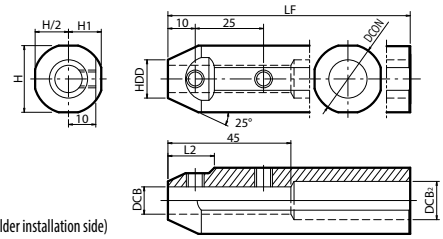
Note 1) When attaching boring bars to EZH-CT/HP sleeve (Adjustable overhang length), detach adjustable pin.
Overhang length of bar is not adjustable.

SHA sleeves (Applicable toolholders F157)



(Toolholder installation side)

Fig. 1



(Toolholder installation side)

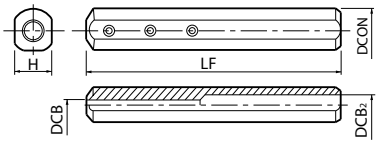
Fig. 2

Description		Availability	Dimension (mm)								Drawing	Spare parts		Applicable machine manufacturer
			DCB	DCON	HDD	DCB_2	H	H1	LF	L2		Screw	Wrench	
SHA	0820-120	●	8	20	14	12	19	9.25	120	-	Fig. 1	HS6X4P	LW-3	Eguro Tsugami Citizen Machinery
	1020-120	●	10											
SHA	0825.0-135	●	8	25	14	14	24	11.5	135	17	Fig. 2			
	1025.0-135	●	10											
	1225.0-135	●	12		16									
SHA	0819-120	●	8	19.05	14	12	18	8.75	120	-	Fig. 1	HS6X4P	LW-3	Citizen Machinery
	1019-120	●	10											
SHA	0820-120	●	8	20	14	12	19	9.25	120	-	Fig. 1			
	1020-120	●	10											
SHA	0825.4-120	●	8	25.4	14	14	24.4	12	120	17	Fig. 2			
	1025.4-120	●	10											
	1225.4-120	●	12		16									
SHA	0822-125	●	8	22	14	14	21	10	125	-	Fig. 1	HS6X4P	LW-3	Star Micronics Nomura DS
	1022-125	●	10											
	1222-125	●	12		16									
SHA	0823-120	●	8	23	14	14	22	10.5	120	16	Fig. 2	HS6X4P	LW-3	Nomura DS
	1023-120	●	10											
	1223-120	●	12		16									

* Length of DCB···45mm (All of SHA sleeves)
Choose sleeves (DCB) to meet with DCON dimension of toolholder.
Machine manufacturers in random order.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Sleeves for Boring bars

Shape	Description		Availability	Dimension (mm) DCON	DCB	DCB_2	H	LF	Spare parts Screw	Spare parts Wrench
 (Toolholder installation side)	SH	0416-100	●	16	4	5	14	100	HS4X4	LW-2
		0516-100	●		5	6				
		0616-100	●		6	7				
		0716-100	●		7	8				
	SH	0820-120	●	20	8	9	18	120	HS4X4	LW-2
		1020-120	●		10	11				
		1225-150	●	25	12	13	23	150	HS5X5	LW-2.5
		1632-180	●	32	16	18	30	180		
		2032-180	●		20	22				

Coolant sleeve dimensions

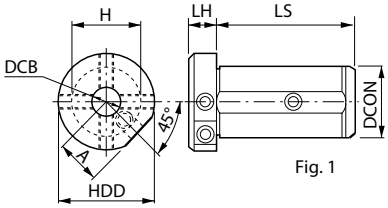


Fig. 1

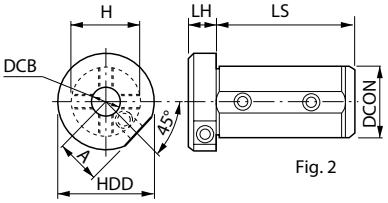


Fig. 2

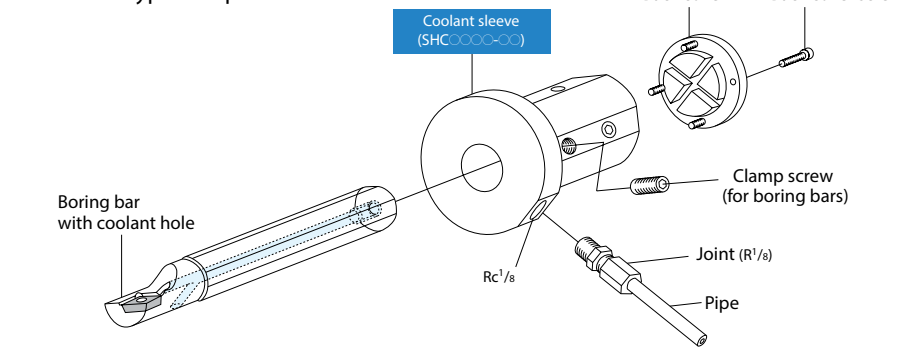
Accessories
Back cover / SHL-4···SHC○○40-70
SHL-5···SHC○○50-95
Back cover screw
Shank clamp screw

(Note) To stabilize the toolholder and to prevent coolant leaks, tighten all 4 screws of coolant sleeve securely.

Description		Availability	Dimension (mm) DCON	HDD	DCB	LS	LH	H	A	Drawing	Spare parts Front screw	Wrench	Back screw	Wrench	Back cover	Back cover screw	Wrench
SHC	0840-70	●	40	56	8	70	16	38	27	Fig. 1	HS6X22	LW-3	HS6X14	LW-3	SHL-4	HH3X6	LW-2.5
	1040-70	●			10												
	1240-70	●			12					Fig. 2	HS10X10	LW-5	HS10X10	LW-5			
	1640-70	●			16												
	2040-70	●			20					Fig. 1	HS10X10	LW-5	HS6X6	LW-3			
	2540-70	●			25												
SHC	0850-95	●	50	65	8	95	16	47	30.5	Fig. 1	HS6X22	LW-3	HS6X14	LW-3	SHL-5	HH3X12	LW-2.5
	1050-95	●			10												
	1250-95	●			12					Fig. 2	HS10X10	LW-5	HS10X10	LW-5			
	1650-95	●			16												
	2050-95	●			20												
	2550-95	●			25												

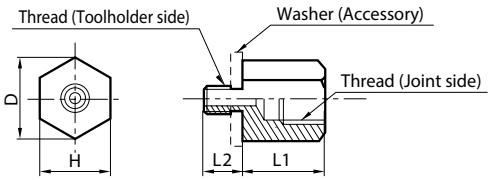
How to install

1. For turret type tool post



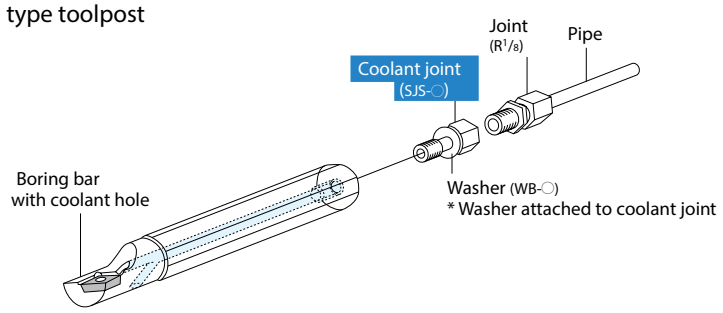
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Coolant joint dimensions *This Coolant joint is not applicable for Dynamic-Bars



Description	Availability	Dimension (mm) D	L1	L2	H	Thread (Toolholder side)	Thread (Joint side)	Spare parts Washer
SJS-5	●	15	15	7	13	M5XP0.8	Rc1/8 (PT1/8)	WB-5
SJS-6	●			9		M6XP1.0		WB-6
SJS-8	●			13		M8XP1.25		WB-8

2. For gang type toolpost



List of toolholders and applicable joints

Toolholder description	Applicable coolant joint
A08-...-○○E	SJS-5
A10-...-○○E	
A12-...-○○E	SJS-6
A16-...-○○E	SJS-8
A20-...-○○E	
A25-...-○○E	
E08-...-○○	SJS-5
E10-...-○○	
E12-...-○○	SJS-6
E16-...-○○	SJS-8
E20-...-○○	

*This Coolant Joint is not applicable for Dynamic-Bars

SHA / SH / SHC sleeves and applicable toolholders

Shank size (Hole dia.: mm)	04 (4mm)	05 (5mm)	06 (6mm)	07 (7mm)	08 (8mm)	10 (10mm)	12 (12mm)	16 (16mm)	20 (20mm)	25 (25mm)
Sleeve description	SH0416-100	SH0516-100	SH0616-100	SH0716-100	SH0820-120	SH1020-120	SH1225-150	SH1632-180	SH2032-180	
					SHA0819-120	SHA1019-120				
					SHA0820-120	SHA1020-120				
					SHA0822-125	SHA1022-125	SHA1222-125			
					SHA0823-120	SHA1023-120	SHA1223-120			
					SHA0825.0-135	SHA1025.0-135	SHA1225.0-135			
					SHA0825.4-120	SHA1025.4-120	SHA1225.4-120			
					SHC0840-70	SHC1040-70	SHC1240-70	SHC1640-70	SHC2040-70	SHC2540-70
					SHC0850-95	SHC1050-95	SHC1250-95	SHC1650-95	SHC2050-95	SHC2550-95
Boring Bar description					A08.-...	A10.-...	A12.-...	A16.-...	A20.-...	A25.-...
	C04.-...	C05.-...	C06.-...	C07.-...	C08.-...	C10.-...	C12.-...	C16.-...	C20.-...	C25.-...
					E08.-...	E10.-...	E12.-...	E16.-...	E20.-...	E25.-...
			S06.-...		S08.-...	S10.-...	S12.-...	S16.-...	S20.-...	S25.-...
Internal grooving toolholder description			SIGC^{R}/L0806-WH		SIGC^{R}/L1008-WH-L85	SIGCR1210-WH-L95	SIGC^{R}/L0812-EH	SIGC^{R}/L1016-EH		
					SIGCR1008-WH-L100	SIGC^{R}/L1210-WH-L110		SIGC^{R}/L1216-EH		
					SIGE^{R}/L0808A-EH	SIGE^{R}/L1010B-EH	SIGE^{R}/L1412C-EH	SIGE^{R}/L1616C-EH	SIGE^{R}/L2020D-EH	SIGE^{R}/L2525E-EH
						SIGE^{R}/L1210B-EH	SIGE^{R}/L1612C-EH			KIGBA^{R}/L3525-16
					SIGE^{R}/L0808A-WH	SIGE^{R}/L1010B-WH	SIGE^{R}/L1412C-WH	KGDI^{R}/L...16B-	KGDI^{R}/L2520B-	KGDI^{R}/L3225B-
						SIGE^{R}/L1210B-WH	SIGE^{R}/L1612C-WH			
					SIGER1008B-WH-90	SIGER1210B-WH-90	SIGER1412C-WH-90			
							GIV^{R}/L1412-1SE	GIV^{R}/L1216-1SS	GIV^{R}/L1420-1S	GIV^{R}/L2025-1B
							GIV^{R}/L1612-1AE	GIV^{R}/L2016-1BE	GIV^{R}/L1620-1A	GIV^{R}/L2025-2B
								GIV^{R}/L2016-2BE	GIV^{R}/L2520-1CE	GIV^{R}/L3225-1CE
								GIV^{R}/L1616-1AW	GIV^{R}/L2720-2CE	GIV^{R}/L3225-2CE
									GIV^{R}/L2020-1BW	GIV^{R}/L2525-1CW
									GIV^{R}/L2020-2BW	GIV^{R}/L2525-2CW
Internal threading toolholder description							SINR0612S-06E	SINR0816S-08E	SIN^{R}/L2420S-16	CIN^{R}/L3025S-16
								SIN^{R}/L1216S-11E	SINR2420S-22	CINR3025S-22
								SIN^{R}/L1516S-11		
								SIN^{R}/L1616S-16		
								SIN^{R}/L2016S-16		

* For SHA sleeves, please see page **F155**. For SH / SHC sleeves, please see page **F156**.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Boring: Positive insert (Cutting diameter under 10 mm)

ISO classification	Workpiece material	Hardness	Cutting range	Applications	Chipbreaker	Insert grades	Corner-R (RE)	Lower limit - **Recommendation** - Upper limit		
								Vc (m/min)	ap (mm)	f (mm/rev)
P *	Low-carbon steel Low-carbon alloy	HB ≤ 300	Finishing Solid type	Continuous Interruption	EZB-F EZB-H	PR1725	0.05 0.15	30 - **70** - 110 30 - **60** - 90	0.05 - **0.1** - 0.2 0.05 - **0.1** - 0.2	0.01 - **0.04** - 0.07 0.03 - **0.07** - 0.1
			Finishing	Continuous Interruption	F	PR1725	0.1 0.2	40 - **80** - 120 40 - **70** - 100	0.05 - **0.08** - 0.1 0.05 - **0.1** - 0.15	0.03 - **0.05** - 0.07 0.03 - **0.07** - 0.1
			Finishing-Medium	Continuous Interruption	CF	PR1725	0.1 0.2	40 - **80** - 120 40 - **70** - 100	0.05 - **0.15** - 0.25 0.05 - **0.15** - 0.25	0.03 - **0.05** - 0.07 0.03 - **0.07** - 0.1
	Medium-carbon steel Medium-carbon alloy	HB ≤ 300	Finishing Solid type	Continuous Interruption	EZB-F EZB-H	PR1725	0.05 0.15	30 - **70** - 110 30 - **60** - 90	0.05 - **0.1** - 0.2 0.05 - **0.1** - 0.2	0.01 - **0.04** - 0.07 0.03 - **0.07** - 0.1
			Finishing	Continuous Interruption	F	PR1725	0.1 0.2	40 - **80** - 120 40 - **70** - 120	0.05 - **0.08** - 0.1 0.05 - **0.1** - 0.15	0.03 - **0.05** - 0.07 0.03 - **0.07** - 0.1
			Finishing-Medium	Continuous Interruption	CF	PR1725	0.1 0.2	40 - **80** - 120 40 - **70** - 100	0.05 - **0.15** - 0.25 0.05 - **0.15** - 0.25	0.03 - **0.05** - 0.07 0.03 - **0.07** - 0.1
	High-carbon alloy	HB ≤ 280	Finishing Solid type	Continuous Interruption	EZB-F EZB-H	PR1725	0.05 0.15	30 - **70** - 110 30 - **60** - 90	0.05 - **0.1** - 0.2 0.05 - **0.1** - 0.2	0.01 - **0.04** - 0.07 0.03 - **0.07** - 0.1
			Finishing	Continuous Interruption	F	PR1725	0.1 0.2	40 - **80** - 120 40 - **70** - 100	0.05 - **0.08** - 0.1 0.05 - **0.1** - 0.15	0.03 - **0.05** - 0.07 0.03 - **0.07** - 0.1
			Finishing-Medium	Continuous Interruption	CF	PR1725	0.1 0.2	40 - **80** - 120 40 - **70** - 100	0.05 - **0.15** - 0.25 0.05 - **0.15** - 0.25	0.03 - **0.05** - 0.07 0.03 - **0.07** - 0.1
M	Stainless steel	HB ≤ 220	Finishing Solid type	Continuous Interruption	EZB-F EZB-H	PR1725	0.05 0.15	30 - **60** - 80 30 - **60** - 80	0.05 - **0.1** - 0.2 0.05 - **0.1** - 0.2	0.01 - **0.03** - 0.05 0.02 - **0.05** - 0.07
			Finishing	Continuous Interruption	F	PR1225 PR1535	0.1 0.2	30 - **60** - 80 30 - **60** - 80	0.05 - **0.08** - 0.1 0.05 - **0.1** - 0.15	0.03 - **0.05** - 0.07 0.03 - **0.07** - 0.1
			Finishing-Medium	Continuous Interruption	CF	PR1225 PR1535	0.1 0.2	30 - **60** - 80 30 - **60** - 80	0.05 - **0.15** - 0.25 0.05 - **0.15** - 0.25	0.03 - **0.05** - 0.07 0.03 - **0.07** - 0.1
	Stainless steel	HB ≤ 300	Finishing Solid type	Continuous Interruption	EZB-F EZB-H	PR1725	0.05 0.15	30 - **60** - 80 30 - **60** - 80	0.05 - **0.1** - 0.2 0.05 - **0.1** - 0.2	0.01 - **0.03** - 0.05 0.02 - **0.05** - 0.07
			Finishing	Continuous Interruption	F	PR1225 PR1535	0.1 0.2	30 - **60** - 80 30 - **60** - 80	0.05 - **0.08** - 0.1 0.05 - **0.1** - 0.15	0.03 - **0.05** - 0.07 0.03 - **0.07** - 0.1
			Finishing-Medium	Continuous Interruption	CF	PR1225 PR1535	0.1 0.2	30 - **60** - 80 30 - **60** - 80	0.05 - **0.15** - 0.25 0.05 - **0.15** - 0.25	0.03 - **0.05** - 0.07 0.03 - **0.07** - 0.1
K	Gray cast iron	HB ≤ 250	Finishing Solid type	Continuous Interruption	(VNB) (VNB-NB)	KW10	0.03 0.2	30 - **60** - 100 30 - **60** - 100	0.05 - **0.08** - 0.1 0.05 - **0.1** - 0.15	0.03 - **0.05** - 0.07 0.03 - **0.07** - 0.1
			Finishing	Continuous Interruption	F	KW10	0.1 0.2	30 - **60** - 100 30 - **60** - 80	0.05 - **0.08** - 0.1 0.05 - **0.1** - 0.15	0.03 - **0.05** - 0.07 0.03 - **0.07** - 0.1
			Finishing-Medium	Continuous Interruption	Without chipbreaker	KW10	0.2 0.4	30 - **60** - 100 30 - **60** - 80	0.1 - **0.2** - 0.3 0.1 - **0.2** - 0.3	0.03 - **0.05** - 0.07 0.03 - **0.07** - 0.1
	Nodular cast iron	HB ≤ 270	Finishing Solid type	Continuous Interruption	(VNB) (VNB-NB)	KW10	0.03 0.2	30 - **60** - 80 30 - **60** - 80	0.05 - **0.08** - 0.1 0.05 - **0.1** - 0.15	0.03 - **0.05** - 0.07 0.03 - **0.07** - 0.1
			Finishing	Continuous Interruption	F,U	KW10	0.1 0.2	30 - **60** - 80 30 - **60** - 80	0.05 - **0.08** - 0.1 0.05 - **0.1** - 0.15	0.03 - **0.05** - 0.07 0.03 - **0.07** - 0.1
			Finishing-Medium	Continuous Interruption	Without chipbreaker	KW10	0.2 0.4	30 - **60** - 100 30 - **60** - 80	0.1 - **0.2** - 0.3 0.1 - **0.2** - 0.3	0.03 - **0.05** - 0.07 0.03 - **0.07** - 0.1
N	Non-ferrous metals Copper alloy Aluminum Aluminum alloys	HB ≤ 100	High Speed Finishing Rainbow surface gloss	Continuous	Without chipbreaker	KPD001	0.05	150 - **200** - 300	0.05 - **0.1** - 0.3	0.05 - **0.1** - 0.15
			Finishing Long tool life	Continuous Interruption	F, U	PDL025	0.1 0.2	100 - **150** - 200 100 - **150** - 200	0.05 - **0.3** - 0.5 0.05 - **0.3** - 0.5	0.03 - **0.1** - 0.2 0.03 - **0.1** - 0.2
			Finishing	Continuous Interruption	F, U	KW10	0.1 0.2	100 - **150** - 200 100 - **150** - 200	0.05 - **0.3** - 0.5 0.05 - **0.3** - 0.5	0.03 - **0.1** - 0.2 0.03 - **0.1** - 0.2
S	Titanium alloys	HB ≤ 400	Precision Finishing Rainbow surface gloss	Continuous Interruption	Without chipbreaker	KPD001	0.1 0.2	100 - **120** - 150 70 - **100** - 120	0.05 - **0.1** - 0.3 0.05 - **0.1** - 0.3	0.03 - **0.07** - 0.1 0.03 - **0.07** - 0.1
			Finishing	Continuous Interruption	F, U	KW10	0.1 0.2	20 - **40** - 60 20 - **40** - 60	0.05 - **0.2** - 0.5 0.05 - **0.2** - 0.5	0.03 - **0.1** - 0.2 0.03 - **0.1** - 0.2
	Heat-resistant alloys	HB ≤ 350	Finishing Solid type	Continuous Interruption	(VNB)	KW10	0.2 0.2	10 - **30** - 50 10 - **30** - 50	0.05 - **0.1** - 0.3 0.05 - **0.1** - 0.3	0.03 - **0.05** - 0.1 0.03 - **0.05** - 0.08
			Finishing	Continuous Interruption	F,U	KW10	0.2 0.2	10 - **30** - 50 10 - **30** - 50	0.05 - **0.2** - 0.4 0.05 - **0.2** - 0.4	0.03 - **0.05** - 0.1 0.03 - **0.05** - 0.1
H	Hardened steel Hard materials	40~50 HRC	Finishing	Continuous Interruption	(VNB)	PR930	0.2 0.2	30 - **50** - 70 30 - **50** - 70	0.05 - **0.1** - 0.4 0.05 - **0.1** - 0.2	0.01 - **0.02** - 0.05 0.01 - **0.02** - 0.03
		45~68 HRC	Finishing	Continuous Interruption	ME MES	KBN010 KBN020	0.2 0.4	60 - **100** - 140 60 - **80** - 120	0.05 - **0.1** - 0.2 0.05 - **0.1** - 0.2	0.02 - **0.05** - 0.1 0.02 - **0.05** - 0.1

* Please use it with PR1725 set to Vc = 150 m/min or below, for machining of free-cutting steel such as small size SUM. For ap and f, refer to specs for low carbon steels.
• ap indicates radius

Boring: Positive insert (Cutting diameter over 10 mm)

ISO classification	Workpiece material	Hardness	Cutting range	Applications	Chipbreaker	Insert grades	Corner-R (RE)	Lower limit - **Recommendation** - Upper limit		
								Vc (m/min)	ap (mm)	f (mm/rev)
P*	Low-carbon steel Low-carbon alloy	HB ≤ 300	Precision finishing	Continuous Interruption	F, U	TN620 PR1725	0.1 0.2	250 - **300** - 350 120 - **170** - 220	0.05 - **0.3** - 0.5 0.05 - **0.3** - 0.5	0.03 - **0.1** - 0.15 0.03 - **0.1** - 0.15
			Finishing	Continuous Interruption	XP	PV710 CA125P	0.4 0.4	200 - **250** - 300 150 - **200** - 250	0.2 - **0.5** - 1.0 0.2 - **0.5** - 1.0	0.05 - **0.1** - 0.2 0.05 - **0.1** - 0.2
			Finishing-Medium	Continuous Interruption	XQ	PV710 CA125P	0.4 0.4	150 - **200** - 250 100 - **150** - 200	0.5 - **1.0** - 2.0 0.5 - **1.0** - 1.5	0.1 - **0.15** - 0.25 0.1 - **0.15** - 0.2
			Medium	Continuous Interruption	Standard	PV720 CA125P	0.8 0.8	100 - **150** - 200 80 - **120** - 150	1.0 - **1.5** - 2.5 1.0 - **1.5** - 2.0	0.1 - **0.15** - 0.3 0.1 - **0.15** - 0.2
	Medium-carbon steel Medium-carbon alloy	HB ≤ 300	Precision finishing	Continuous Interruption	F, U	TN620 PR1725	0.2 0.4	150 - **200** - 250 120 - **140** - 170	0.05 - **0.3** - 0.5 0.05 - **0.3** - 0.5	0.03 - **0.1** - 0.15 0.03 - **0.1** - 0.15
			Finishing	Continuous Interruption	PP	PV710 CA125P	0.4 0.4	150 - **200** - 250 120 - **180** - 200	0.2 - **0.5** - 1.0 0.2 - **0.5** - 1.0	0.05 - **0.1** - 0.2 0.05 - **0.1** - 0.2
			Finishing-Medium	Continuous Interruption	HQ	PV710 CA125P	0.4 0.4	120 - **180** - 220 100 - **150** - 200	0.5 - **1.0** - 2.0 0.5 - **1.0** - 1.5	0.1 - **0.15** - 0.25 0.1 - **0.15** - 0.2
			Medium	Continuous Interruption	Standard	PV720 CA125P	0.8 0.8	100 - **150** - 200 80 - **120** - 150	1.0 - **1.5** - 2.5 1.0 - **1.5** - 2.0	0.1 - **0.15** - 0.3 0.1 - **0.15** - 0.2
	High-carbon alloy	HB ≤ 280	Precision finishing	Continuous Interruption	F, U	TN620 PR1725	0.2 0.4	120 - **150** - 180 110 - **130** - 160	0.05 - **0.3** - 0.5 0.05 - **0.3** - 0.5	0.03 - **0.1** - 0.15 0.03 - **0.1** - 0.15
			Finishing	Continuous Interruption	PP	PV710 CA125P	0.4 0.4	120 - **150** - 180 100 - **120** - 150	0.2 - **0.5** - 1.0 0.2 - **0.5** - 1.0	0.05 - **0.1** - 0.2 0.05 - **0.1** - 0.2
			Finishing-Medium	Continuous Interruption	HQ	PV710 CA125P	0.4 0.4	120 - **150** - 180 100 - **120** - 150	0.5 - **1.0** - 2.0 0.5 - **1.0** - 1.5	0.1 - **0.15** - 0.25 0.1 - **0.15** - 0.2
			Medium	Continuous Interruption	Standard	CA515 CA125P	0.8 0.8	100 - **120** - 150 80 - **100** - 120	1.0 - **1.5** - 2.5 1.0 - **1.5** - 2.0	0.1 - **0.15** - 0.3 0.1 - **0.15** - 0.2
M	Stainless steel	HB ≤ 220	Finishing	Continuous Interruption	MQ	CA6525 PR1535	0.4 0.8	120 - **150** - 180 100 - **120** - 150	0.2 - **0.5** - 0.8 0.2 - **0.5** - 0.8	0.05 - **0.08** - 0.1 0.05 - **0.08** - 0.1
			Medium	Continuous Interruption	Standard	CA6525 PR1535	0.4 0.8	120 - **150** - 180 100 - **120** - 150	0.5 - **1.0** - 1.5 0.5 - **1.0** - 1.5	0.05 - **0.1** - 0.2 0.05 - **0.1** - 0.2
	Stainless steel	HB ≤ 300	Finishing	Continuous Interruption	MQ	CA6525 PR1535	0.4 0.8	80 - **100** - 120 60 - **80** - 100	0.2 - **0.7** - 1.0 0.2 - **0.7** - 1.0	0.05 - **0.1** - 0.15 0.05 - **0.1** - 0.15
			Medium	Continuous Interruption	Standard	CA6525 PR1535	0.4 0.8	80 - **100** - 120 60 - **80** - 100	0.5 - **1.0** - 1.5 0.5 - **1.0** - 1.5	0.05 - **0.1** - 0.2 0.05 - **0.1** - 0.2
K	Gray cast iron	HB ≤ 250	High speed finishing	Continuous Interruption	Without chipbreaker	KBN475 PT600M	0.4 0.8	400 - **500** - 600 200 - **250** - 350	0.05 - **0.2** - 0.5 0.2 - **0.5** - 1.0	0.05 - **0.1** - 0.15 0.05 - **0.1** - 0.15
			Finishing Gloss oriented	Continuous Interruption	Standard	PV7005 TN620	0.8 0.8	200 - **250** - 300 120 - **180** - 230	0.2 - **0.5** - 1.0 0.2 - **0.5** - 1.0	0.05 - **0.1** - 0.2 0.05 - **0.1** - 0.2
			Finishing	Continuous Interruption	Standard	CA310 CA315	0.4 0.8	150 - **180** - 200 100 - **150** - 180	0.2 - **0.5** - 1.0 0.2 - **0.5** - 1.0	0.05 - **0.1** - 0.2 0.05 - **0.1** - 0.2
			Medium	Continuous Interruption	Standard Without chipbreaker	CA310 CA315	0.8 0.8	100 - **150** - 200 80 - **120** - 150	0.5 - **1.0** - 2.0 0.5 - **1.0** - 2.0	0.1 - **0.15** - 0.2 0.05 - **0.1** - 0.15
	Nodular cast iron	HB ≤ 270	High speed finishing	Continuous Interruption	Without chipbreaker	KBN60M PT600M	0.4 0.8	200 - **300** - 400 150 - **200** - 250	0.05 - **0.2** - 0.5 0.2 - **0.5** - 1.0	0.03 - **0.05** - 0.1 0.05 - **0.1** - 0.15
			Finishing Gloss oriented	Continuous Interruption	Standard	PV7005 TN620	0.8 0.8	150 - **200** - 250 120 - **150** - 200	0.2 - **0.5** - 1.0 0.2 - **0.5** - 1.0	0.05 - **0.1** - 0.2 0.05 - **0.1** - 0.2
			Finishing	Continuous Interruption	Standard	CA310 CA315	0.4 0.8	120 - **150** - 180 100 - **120** - 150	0.2 - **0.5** - 1.0 0.2 - **0.5** - 1.0	0.05 - **0.1** - 0.2 0.05 - **0.1** - 0.2
			Medium	Continuous Interruption	Standard	CA315 CA320	0.8 0.8	100 - **120** - 150 80 - **100** - 120	0.5 - **1.0** - 2.0 0.5 - **1.0** - 2.0	0.05 - **0.1** - 0.2 0.05 - **0.1** - 0.15
N	Non-ferrous metals Copper alloy Aluminum Aluminum alloys	HB ≤ 100	High speed finishing Rainbow surface gloss	Continuous	Without chipbreaker	KPD001	0.2	200 - **400** -1,000	0.05 - **0.1** - 0.3	0.05 - **0.1** - 0.15
			Finishing Long tool life	Continuous Interruption	F, U	PDL025	0.4 0.4	100 - **200** - 400 100 - **200** - 400	0.05 - **0.5** - 1.0 0.05 - **0.5** - 1.0	0.03 - **0.1** - 0.2 0.03 - **0.1** - 0.2
			Finishing	Continuous Interruption	F, U	KW10	0.4 0.4	100 - **200** - 400 100 - **200** - 400	0.05 - **0.5** - 1.0 0.05 - **0.5** - 1.0	0.03 - **0.1** - 0.2 0.03 - **0.1** - 0.2
S	Titanium alloys	HB ≤ 400	Precision finishing Rainbow surface gloss	Continuous Interruption	Without chipbreaker	KPD001	0.2 0.4	100 - **120** - 150 70 - **100** - 120	0.05 - **0.1** - 0.3 0.05 - **0.1** - 0.3	0.03 - **0.07** - 0.1 0.03 - **0.07** - 0.1
			Finishing	Continuous Interruption	F, U	KW10	0.2 0.4	30 - **50** - 70 30 - **50** - 70	0.05 - **0.5** - 1.0 0.05 - **0.5** - 1.0	0.03 - **0.1** - 0.2 0.03 - **0.1** - 0.2
	Heat-resistant alloys	HB ≤ 350	Finishing	Continuous Interruption	F, U	KW10	0.4 0.4	10 - **30** - 50 10 - **30** - 50	0.05 - **0.5** - 1.0 0.05 - **0.5** - 1.0	0.03 - **0.1** - 0.2 0.03 - **0.1** - 0.2
			Finishing	Continuous Interruption	MQ	PR115S	0.4 0.8	40 - **60** - 80 40 - **60** - 80	0.1 - **0.3** - 0.5 0.1 - **0.3** - 0.5	0.03 - **0.05** - 0.1 0.03 - **0.05** - 0.1
H	Hardened steel Hard materials	40~50 HRC	Finishing	Continuous Interruption	HQ Standard	CA115P	0.8 0.8	60 - **80** - 100 30 - **50** - 70	0.05 - **0.3** - 0.5 0.05 - **0.3** - 0.5	0.05 - **0.08** - 0.1 0.05 - **0.08** - 0.1
		45~68 HRC	Finishing	Continuous Interruption	ME MET	KBN010 KBN020	0.4 0.8	100 - **140** - 180 90 - **120** - 160	0.1 - **0.2** - 0.3 0.1 - **0.2** - 0.3	0.02 - **0.07** - 0.1 0.02 - **0.07** - 0.1
			Medium	Continuous	Without chipbreaker Negative	KBN900	0.8	60 - **80** - 100	0.3 - **0.7** - 1.0	0.03 - **0.1** - 0.15

* When machining free-cutting steel such as SUM, please use PR1725 for Vc = 200 m/min or under or use PV720 / CA115P, etc.
• ap indicates radius

G



External grooving		**G2**
GBA type	KGBA/KGBAS/KGBA-JCT	G13
	KGB/KGBS	G16
GBF type	KGBF-F/KGBF-JCTM/KGBFS	G23
	S-KGBF	G26
GDM/GDMS/GDGS type	KGD (Integral type)	G34
	KGD (Integral type for automatic lathe)	G35
	KGD-JCT (Integral type)	G36
	KGD-JCTM (Integral type for automatic lathe)	G38
	KGD (Polygon taper shank)	G40
	KGD-S (0˚ separate type)	G41
GM/GMN/GMM/GMG/GMGA/FGG type	KGM/KGM-T/KGMM/KGMS	G55
	KGMU	G60
GH/GHU/GA type	KGH/KGHS/KGA	G62
GMGW type	KGMW	G67
Internal grooving		**G68**
EZG type	EZG	G70
VNG type	VNG	G72
GC type	SIGC	G76
GE/GER type	SIGE-EH / WH / WH-90	G81
GV type	GIV/GIV-E/GIV-W	G86
GBA type	KIGBA	G89
GDM/GDG type	KGDI	G91
GH/GHU type	KIGH	G93
GMM/GMG/GMGA type	KIGM-8/KIGMU-8	G95
GIA type	KGIA	G97
Face grooving		**G98**
EZFG type	EZFG	G102
VNFG type	VNFG	G104
TWFG/TWFGT small diameter face grooving (Twin-Bars)	TWFG	G106
	TWFGT	G108
GDFM/GDFMS type	KGDF 0°	G114
	KGDF-Z (Integral type)	G118
	KGDF 90°	G121
GVF type	GFV (A/B/C)	G127
	GIFV (A/B/C)	G133
FMM/FMN type	KFMS	G135
GMM/GMG/GMGA type	KFMS	G138
FTK type	KFTB-S	G140
Recommended cutting conditions		**G141**

KGD Grooving (External grooving & turning)

Integral type

Type	KGD
Edge width (mm)	2.0 ~ 8.0
Max. grooving depth (mm)	6 ~ 30
See Page	**G34**

Integral type (Coolant-through holders)

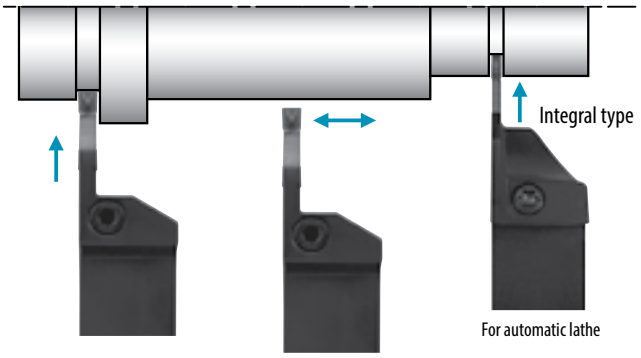
Type	KGD-JCT
Edge width (mm)	3.0 ~ 5.0
Max. grooving depth (mm)	6 ~ 25
See Page	**G36**

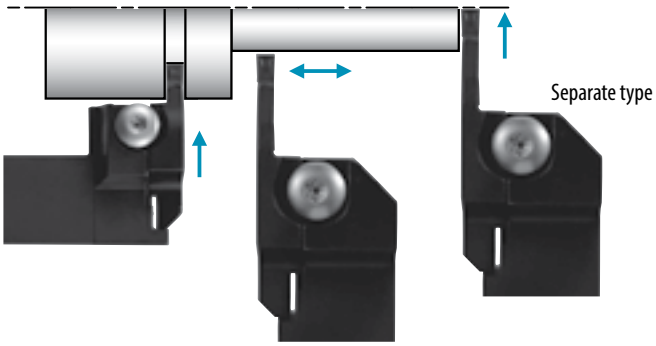
Integral type for automatic lathe

Type	KGD
Edge width (mm)	2.0 ~ 4.0
Max. grooving depth (mm)	10 ~ 25.5
See Page	**G35**

Integral type for automatic lathe (Coolant-through holders)

Type	KGD-JCTM
Edge width (mm)	2.0 ~ 4.0
Max. grooving depth (mm)	12 ~ 16
See Page	**G39**





Separate type

Type	*KGDS-S
Edge width (mm)	3.0
Max. grooving depth (mm)	10
See Page	**G42**

* The separate type toolholders can accept all the blades if their hand is matching.

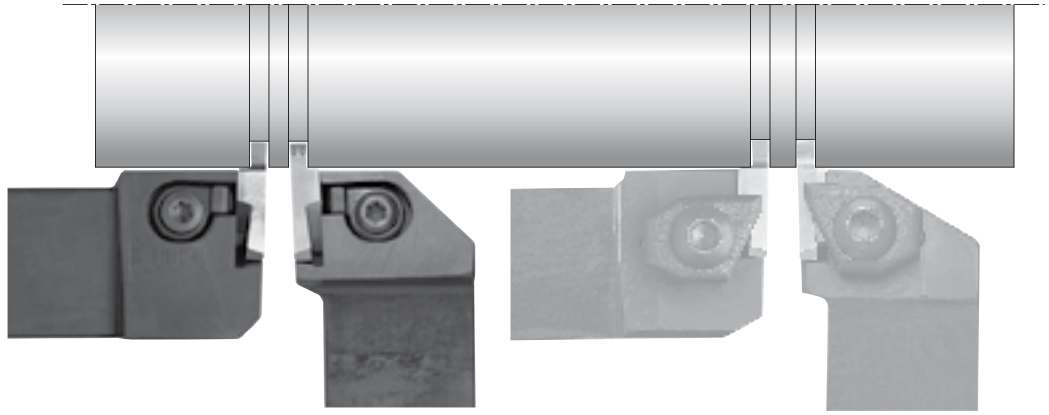
Separate type

Type	*KGD-S
Edge width (mm)	2.0 ~ 5.0
Max. grooving depth (mm)	10 ~ 25
See Page	**G41**

* The separate type toolholders can accept all the blades if their hand is matching.

Low cutting force GS	Low feed GL	General purpose GM	High feed PH	Copying CM	Non-ferrous Metals AM
					

Shallow grooving (Grooving depth: ~5 mm)



Type	KGBAS	KGBA (-JCT)	KGBS	KGB
Edge width (mm)	0.33 ~ 4.8	0.33 ~ 4.8	0.33 ~ 4.8	0.33 ~ 4.8
Max. grooving depth (mm)	0.8 ~ 5.0	0.8 ~ 5.0	0.8 ~ 5.0	0.8 ~ 5.0
See Page	**G14**	**G13,G15**	**G17**	**G16**



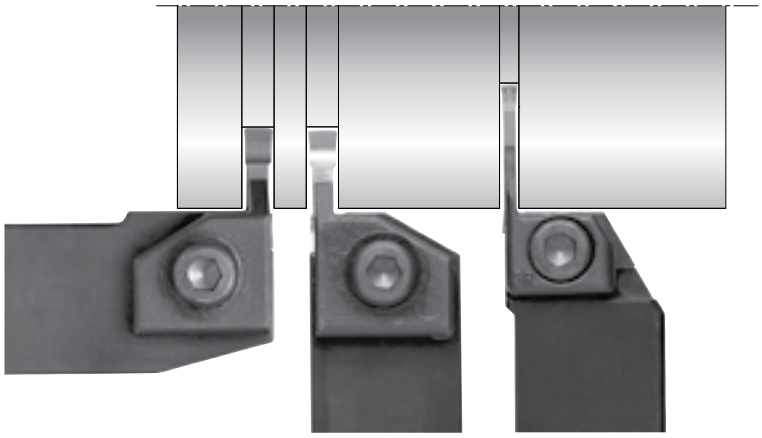
Ground chipbreaker | Ground chipbreaker Full-R | GM chipbreaker | MY chipbreaker

Edge shape	General (Square)	Full-R (Round)	GM chipbreaker	MY chipbreaker
				

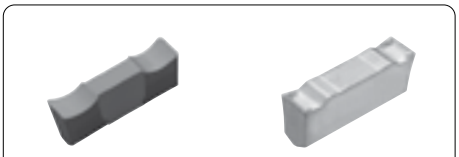
* These shallow groove types of the previous system will be switched to the system on the left.

KGBS ⟶ KGBAS
KGB ⟶ KGBA

Deep grooving (Grooving depth : ~25 mm)



Type	KGHS	KGH	KGA
Edge Width (mm)	4.0 ~ 8.0	4.0 ~ 12.0	3.0 ~ 5.0
Max. grooving depth (mm)	13	13 ~ 17	20 ~ 25
See Page	**G63**	**G62**	**G64**



Ground chipbreaker | Molded chipbreaker



Molded chipbreaker

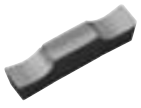
KGM Grooving (External grooving & turning)

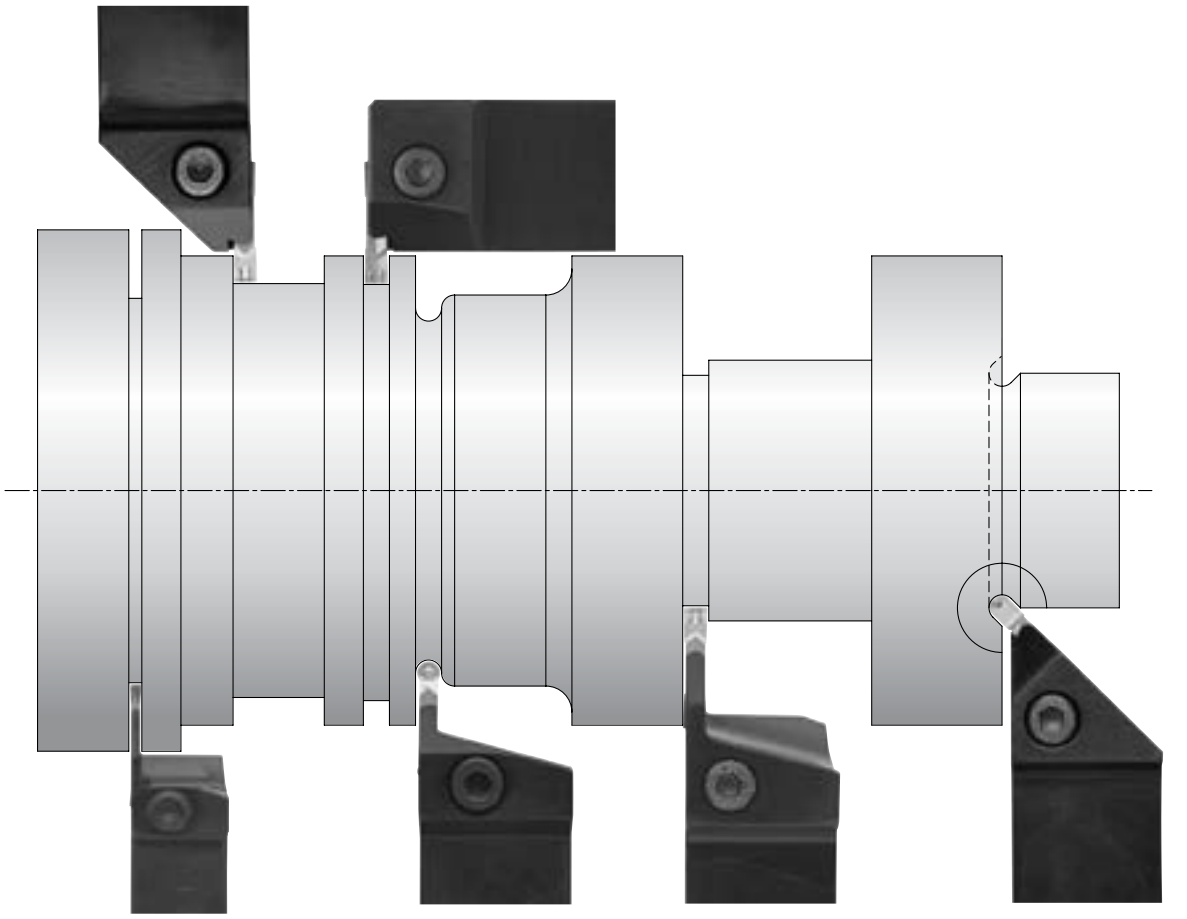
Type	KGMM
Edge width (mm)	3.0 ~ 5.0
Max. grooving depth (mm)	4.8
See Page	**G58**

KGMS
3.0 ~ 5.0
4.8
G58


Molded chipbreaker


Molded chipbreaker Full-R


Ground chipbreaker



Type	KGM
Edge width (mm)	1.5 ~ 4.0
Max. grooving depth (mm)	10 ~ 16
See Page	**G55**

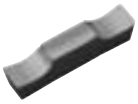
KGM
3.0 ~ 8.0
9 ~ 25
G56

KGM-T
2.0 ~ 6.0
17 ~ 30
G57

KGMU
3.0 ~ 5.0
3.5 ~ 4.5
G60


Molded chipbreaker


Molded chipbreaker Full-R


Ground chipbreaker


Deep grooving / Cut-off


Molded chipbreaker Full-R

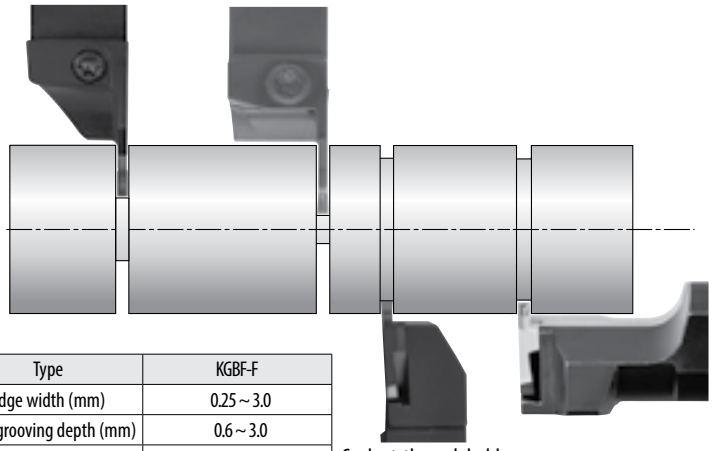
External grooving of precision parts for automatic lathe

Coolant-through holders

Type	KGD
Edge width (mm)	2.0 ~ 4.0
Max. grooving depth (mm)	10 ~ 25.5
See Page	**G35**

Type	KGD-JCTM
Edge width (mm)	2.0 ~ 4.0
Max. grooving depth (mm)	12 ~ 16
See Page	**G39**

Type	KGM
Edge width (mm)	1.5 ~ 4.0
Max. grooving depth (mm)	10 ~ 16
See Page	**G55**





Molded chipbreaker

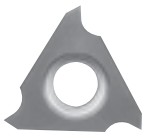


Ground chipbreaker

Type	KGBF-F
Edge width (mm)	0.25 ~ 3.0
Max. grooving depth (mm)	0.6 ~ 3.0
See Page	**G23**

Coolant-through holders

Type	KGBFS	KGBF-JCTM	S-KGBF
Edge width (mm)	0.25 ~ 3.0	0.25 ~ 3.0	0.25 ~ 3.0
Max. grooving depth (mm)	0.6 ~ 3.0	0.6 ~ 3.0	0.6 ~ 3.0
See Page	**G25**	**G24**	**G26**



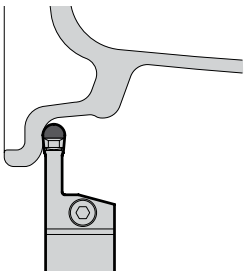
Ground chipbreaker



GL chipbreaker

For aluminum wheel external grooving

(External / Facing / Copying)



Type	KGMW
Edge width (mm)	6.0 ~ 8.0
Max. grooving depth (mm)	25
See Page	**G67**



1-edge
PCD

GBA32

| | | |

GBA32

| | | |

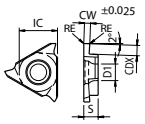
GBA43

| | | |

GBA43

| | | |

GBA43

													Carbon steel / Alloy steel			P
													Stainless steel			M
													Cast iron			K
													Non-ferrous metals			N
													Titanium alloy			S
													Hard materials (~ 40HRC)			H
													Hard materials (40HRC ~)			
Insert		Description		No. of edges	Dimension (mm)							Tolerance (mm)		Cermet		Applicable toolholder ⇒ G13~G17 G89
					CW	CDX	IC	S	D1	RE	LE	CW min.	CW max.	-	TN620	
	 Sharp edge	GBA43R	125-020F	3	1.25	2	12.7	4.76	5.5	0.2	-	- 0.025	+ 0.025	●		KGBAR...22-15 KGBAR...22-15JCT KGBASL...22-15 KIGBAL...22
			145-020F		1.45	2		4.76		0.2				●		
			150-020F		1.5	3.5		4.76		0.2				●		
			175-020F		1.75	3.5		4.76		0.2				●		
			185-020F		1.85	3.5		4.76		0.2				●		
			200-020F		2	3.5		4.76		0.2				●		
			230-020F		2.3	3.5		4.76		0.2				●		
			250-030F		2.5	4		4.76		0.3				●		*2
			265-030F		2.65	4		4.76		0.3				●		
			280-030F		2.8	4		4.76		0.3				●		
			300-030F		3	4		4.76		0.3				●		
			330-030F		3.3	4		4.76		0.3				●		
			350-030F		3.5	5		4.76		0.3				●		KGBAR...22-35 KGBAR...22-35JCT KGBASL...22-35 KIGBAL...22
			400-040F		4	5		4.76		0.4				●		
			430-040F		4.3	5		4.76		0.4				●		
			450-040F		4.5	5		4.76		0.4				●		
			480-040F		4.8	5		5		0.4				●		
		GBA43L	125-020F		1.25	2				0.2				●		KGBAL...22-15 KGBAL...22-15JCT KGBASR...22-15 KIGBAR...22
			145-020F		1.45	2				0.2				●		
			150-020F		1.5	3.5				0.2				●		
			175-020F		1.75	3.5				0.2				●		
			185-020F		1.85	3.5				0.2				●		
			200-020F		2	3.5				0.2				●		
			230-020F		2.3	3.5				0.2				●		
			250-030F		2.5	4		4.76		0.3				●		*4
			265-030F		2.65	4				0.3				●		
			280-030F		2.8	4				0.3				●		
			300-030F		3	4				0.3				●		
			330-030F		3.3	4				0.3				●		
			350-030F		3.5	5				0.3				●		*6
			400-040F		4	5				0.4				●		

Right-hand shown

CDX shows available grooving depth.

*2 : KGBAR...22-25, KGBAR...22-25T5, KGBAR...22-25JCT, KGBASL...22-25, KGBASL...22-25T5, KIGBAL...22

*4 : KGBAL...22-25, KGBAL...22-25T5, KGBAL...22-25JCT, KGBASR...22-25, KGBASR...22-25T5, KIGBAR...22

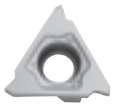
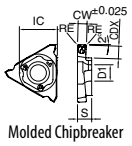
*6 : KGBAL...22-35, KGBAL...22-35JCT, KGBASR...22-35, KIGBAR...22

Recommended cutting conditions ⇒ G141

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GBA43

											Carbon steel / Alloy steel	○	◔	●	◕	●	P
											Stainless steel	○	◔	●	◕		M
											Cast iron						K
											Non-ferrous metals						N
											Titanium alloy						S
											Hard materials (~ 40HRC)						H
											Hard materials (40HRC ~)						

Insert		Description		No. of edges	Dimension (mm)						Tolerance (mm)		Carbide				Cermet	Applicable toolholder ➡ G13~G17 G89
					CW	CDX	IC	S	D1	RE	CW min.	CW max.	PVD				-	
													PR1215	PR1625	PR2015	PR2025	TN620	
	 Molded Chipbreaker	GBA43R	140-010GM	3	1.4	3.5	12.7	4.76	5.5	0.1	-0.025	+0.025	●	●	●	●	●	KGBAR...22-15 KGBAR...22-15JCT KGBASL...22-15 KIGBAL...22
			150-020GM		1.5	3.5				0.2			●	●	●	●	●	
			175-020GM		1.75	3.5				0.2			●	●	●	●	●	
			185-020GM		1.85	3.5				0.2			●	●	●	●	●	
			200-020GM		2	3.5				0.2			●	●	●	●	●	
			230-020GM		2.3	3.5				0.2			●	●	●	●	●	
			250-030GM		2.5	5				0.3			●	●	●	●	●	*1
			265-030GM		2.65	5				0.3			●	●	●	●	●	
			300-030GM		3	5				0.3			●	●	●	●	●	
			330-030GM		3.3	5				0.3			●	●	●	●	●	
			350-030GM		3.5	5				0.3			●	●	●	●	●	*5
			400-040GM		4	5				0.4			●	●	●	●	●	
		GBA43L	140-010GM		1.4	3.5				0.1			●	●	●	●	●	KGBAL...22-15 KGBAL...22-15JCT KGBASR...22-15 KIGBAR...22
			150-020GM		1.5	3.5				0.2			●	●	●	●	●	
			175-020GM		1.75	3.5				0.2			●	●	●	●	●	
			185-020GM		1.85	3.5				0.2			●	●	●	●	●	
			200-020GM		2	3.5				0.2			●	●	●	●	●	
			230-020GM		2.3	3.5				0.2			●	●	●	●	●	
			250-030GM		2.5	5				0.3			●	●	●	●	●	*3
			265-030GM		2.65	5				0.3			●	●	●	●	●	
			300-030GM		3	5				0.3			●	●	●	●	●	
			330-030GM		3.3	5				0.3			●	●	●	●	●	
			350-030GM		3.5	5				0.3			●	●	●	●	●	*6
			400-040GM		4	5				0.4			●	●	●	●	●	

Right-hand shown
CDX shows available grooving depth.

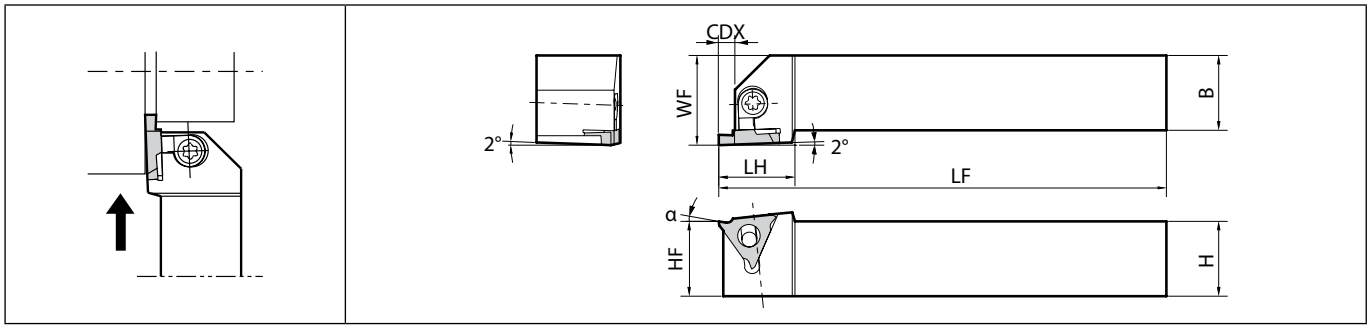
Recommended cutting conditions ➡ G141

*1 : KGBAR...22-25T5, KGBAR...22-25JCT, KGBASL...22-25T5, KIGBAL...22
*3 : KGBAL...22-25T5, KGBAL...22-25JCT, KGBASR...22-25T5, KIGBAR...22
*5 : KGBAR...22-35, KGBAR...22-35JCT, KGBASL...22-35, KIGBAL...22
*6 : KGBAL...22-35, KGBAL...22-35JCT, KGBASR...22-35, KIGBAR...22

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GBA43

KGBA (External grooving / Shallow grooving)



Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description		Availability		Dimension (mm)							Spare parts		Applicable inserts G6~G12
		R	L	CDX	H	B	LH	HF	LF	WF	Clamp set	Wrench	
KGBA$^{R}_{L}$	2020K-16	●	●	2.5	20	20	24	20	125	25	LGBA-16$^{R}_{L}$S	FT-15	GBA32$^{R}_{L}$ type
	2525M-16	●	●		25	25		25	150	30			
KGBA$^{R}_{L}$	2020H22-15	●		4	20	20	25.5	20	100	25	LGBA-22RS	FT-15	GBA43$^{R}_{L}$ type
	2020H22-25	●		4.5									
	2020H22-35	●		5.5									
	2020K22-15	●	●	4					125		LGBA-22$^{R}_{L}$S		
	2020K22-25	●	●	4.5									
	2020K22-25T5	●	●	5.5									
	2020K22-35	●	●										
	2525M22-15	●	●	4	25	25		25	150	30			
	2525M22-25	●	●	4.5									
	2525M22-25T5	●	●	5.5									
	2525M22-35	●	●										

CDX shows the distance from the toolholder to the cutting edge. Available Groove Depth : „CDX" of Insert.
Clamp Set : LGBA-○○RS for Right-hand Toolholder and LGBA-○○LS for Left-hand Toolholder.

Rake Angle (α) after Installment of GBA insert

GBA32$^{R}_{L}$○○○-○○○		GBA43$^{R}_{L}$○○○-○○○		GBA43$^{R}_{L}$○○○-○○○R (Full-R)		
α	Insert grades	α	Insert grades	α	Insert grades	Full-R Description
10°	TN620, TN90, PV7040 PR1215, PR1625, PR2015, PR2025 PR905, PR930 KPD001, KPD010	0°	KBN510, KBN525	10°	TN620, TN90, PV7040 PR1215, PR1625, PR2015, PR2025 PR905, PR930	050R~150R
		10°	TN620, TN90, PV7040 PR1215, PR1625, PR2015, PR2025 PR905, PR930 KPD001, KPD010	14°	TN620, TN90, PV7040 PR1215, PR1625, PR2015, PR2025 PR905, PR930	200R
20°	KW10	20°	KW10		KW10	050R~200R

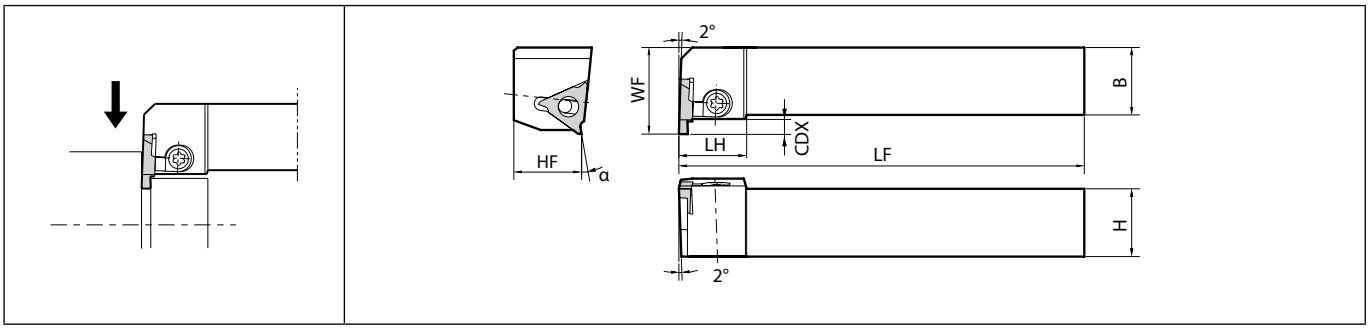
Rake Angle (α) after Installment of GBA-GM insert

α	Insert description
10°	GBA43$^{R}_{L}$150-020GM
15°	GBA43$^{R}_{L}$175-020GM ~ GBA43$^{R}_{L}$265-030GM
12°	GBA43$^{R}_{L}$300-030GM ~ GBA43$^{R}_{L}$400-040GM

α indicates the rake angle at the center of the edge width, after installing insert.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGBAS (External grooving / Shallow grooving)



Right-hand shown | Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

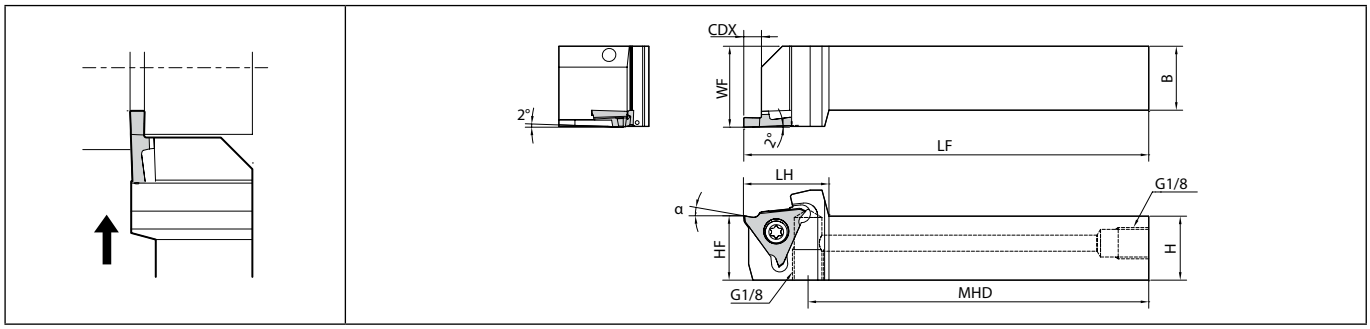
Toolholder dimensions

Description		Availability		Dimension (mm)							Spare parts		Applicable inserts G6~G12
		R	L	CDX	H	B	LH	HF	LF	WF	Clamp set	Wrench	
KGBAS$^{R}/_{L}$	2020K-16	●	●	2.5	20	20	25	20	125	25	LGBA-16$^{L}/_{R}$S	FT-15	GBA32$^{L}/_{R}$ type
	2525M-16	●	●		25	25		25	150	30			
KGBAS$^{R}/_{L}$	2020K22-15	●	●	4	20	20	25	20	125	27	LGBA-22$^{L}/_{R}$S	FT-15	GBA43$^{L}/_{R}$ type
	2020K22-25	●	●	4.5									
	2020K22-25T5	●	●	5.5									
	2020K22-35	●	●										
	2525M22-15	●	●	4	25	25		25	150	32			
	2525M22-25	●	●	4.5									
	2525M22-25T5	●	●	5.5									
	2525M22-35	●	●										

CDX shows the distance from the toolholder to the cutting edge. Available Groove Depth : „CDX" of Insert.
See Page **G13** for Rake Angle (α) after Installment of Insert.
Clamp Set : LGBA-○○LS for Right-hand Toolholder and LGBA-○○RS for Left-hand Toolholder.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGBA-JCT (External grooving / Shallow grooving, Coolant-through holder)



Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

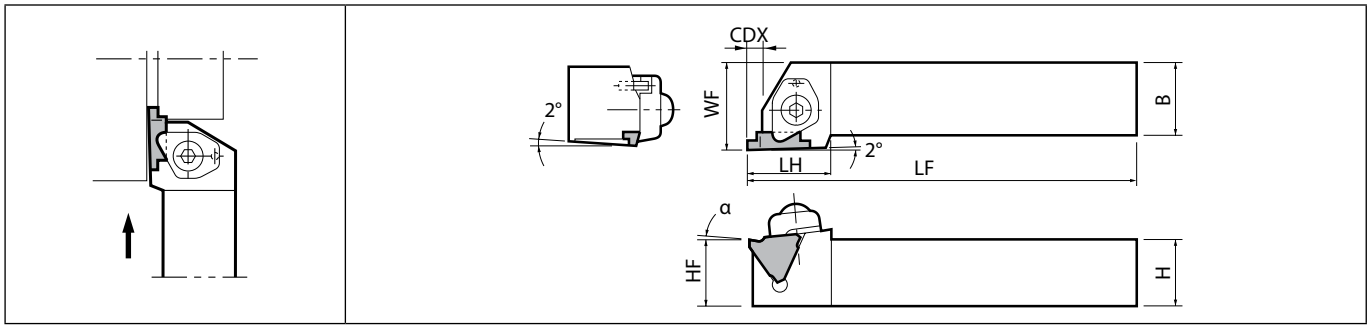
Toolholder dimensions

Description		Availability R	Availability L	Dimension (mm) CDX	H	B	LH	MHD	HF	LF	WF	Coolant hole	Spare parts: Plug	Screw	Wrench	Wrench	Applicable inserts ➡ G6~G12
KGBA R/L	2020K-16JCT	●	●	2.5	20	20	24	107.5	20	125	25	Yes	HSG1/8X8.0	SB-4085TR	FT-15	-	GBA32 R/L type
	2525K-16JCT	●	●		25	25			25		30						
KGBA R/L	2020K22-15JCT	●	●	4	20	20	26.5	105	20	125	25	Yes	HSG1/8X8.0	SB-5085TR	-	LTW-20	GBA43 R/L type
	2020K22-25JCT	●	●	5.5													
	2020K22-35JCT	●	●														
	2525K22-15JCT	●	●	4	25	25			25		30						
	2525K22-25JCT	●	●	5.5													
	2525K22-35JCT	●	●														

CDX shows the distance from the toolholder to the cutting edge. Available Groove Depth : „CDX" of Insert.
See Page **G13** for Rake Angle (α) after Installment of Insert.
KGBA-JCT toolholder is screw clamp type.
Please see page **H16** and **H17** for piping parts of coolant-through holders.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGB (External grooving / Shallow grooving)



Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

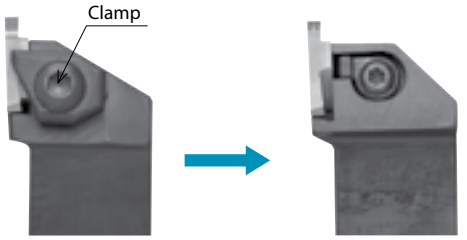
Description		Availability R	Availability L	Dimension (mm) CDX	H	B	LH	HF	LF	WF	Spare parts: Clamp	Clamp bolt	Spring	Wrench	Applicable inserts G6~G12
KGB$^{R/L}$	2020K-16	●	●	2.5	20	20	24	20	125	25	CGB$^{R/L}$	BH6X25	SP-6	LW-4	GBA32$^{R/L}$ type
	2525M-16	●	●		25	25		25	150	30					
KGB$^{R/L}$	2020K22-15	●	●	4	20	20	25.5	20	125	25	CGB$^{R/L}$	BH6X25	SP-6	LW-4	GBA43$^{R/L}$ type
	2020K22-25	●	●	4.5											
	2020K22-35	●	●	5.5											
	2525M22-15	●	●	4	25	25		25	150	30					
	2525M22-25	●	●	4.5											
	2525M22-35	●	●	5.5											

KGB will be switched to KGBA=> **G13**
CDX shows the distance from the toolholder to the cutting edge. Available Groove Depth : „CDX" of Insert.
KGB Clamp : CGBR for Right-hand Toolholder and CGBL for Left-hand Toolholder.

Alternative Toolholder Reference Table

KGBA ←	(KGB)
KGBA$^{R/L}$ ...22-15	KGB$^{R/L}$ ...22-15
KGBA$^{R/L}$ ...22-25	KGB$^{R/L}$ ...22-25
KGBA$^{R/L}$ ...22-35	KGB$^{R/L}$ ...22-35
KGBA$^{R/L}$ ...22-25T5	KGB$^{R/L}$ ...22-25 (Available grooving depth has a limit)

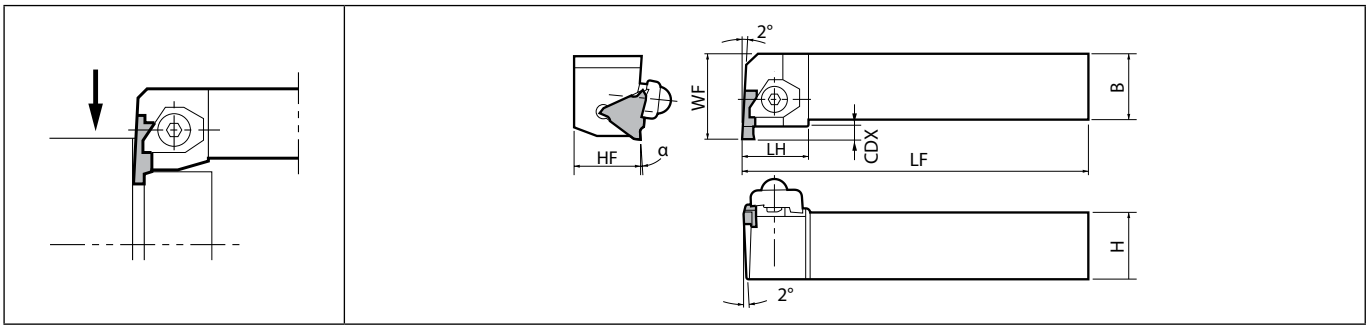
· Short shank type is not available for KGB / KGBS.



* KGB / KGBS toolholder will be switched to KGBA / KGBAS.
Better Chip flow.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGBS (External grooving / Shallow grooving)



Right-hand shown | Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description		Availability		Dimension (mm)							Spare parts				Applicable inserts ⇒ G6~G12
											Clamp	Clamp bolt	Spring	Wrench	
		R	L	CDX	H	B	LH	HF	LF	WF					
KGBS$^{R}_{L}$	2020K-16	●	●	2.5	20	20	25	20	125	25	CGB$^{L}_{R}$	BH6X25	SP-6	LW-4	GBA32$^{L}_{R}$ type
	2525M-16	●	●		25	25		25	150	30					
KGBS$^{R}_{L}$	2020K22-15	●	●	4	20	20	25	20	125	27	CGB$^{L}_{R}$	BH6X25	SP-6	LW-4	GBA43$^{L}_{R}$ type
	2020K22-25	●	●	4.5											
	2020K22-35	●	●	5.5											
	2525M22-15	●	●	4	25	25		25	150	32					
	2525M22-25	●	●	4.5											
	2525M22-35	●	●	5.5											

KGBS will be switched to KGBAS=> **G14**
KGBS Clamp : CGBL for Right-hand Toolholder and CGBR for Left-hand Toolholder.

Alternative Toolholder Reference Table

KGBAS ←	(KGBS)
KGBAS$^{R}_{L}$ …22-15	KGBS$^{R}_{L}$ …22-15
KGBAS$^{R}_{L}$ …22-25	KGBS$^{R}_{L}$ …22-25
KGBAS$^{R}_{L}$ …22-35	KGBS$^{R}_{L}$ …22-35
KGBAS$^{R}_{L}$ …22-25T5	KGBS$^{R}_{L}$ …22-25 (Available grooving depth has a limit)

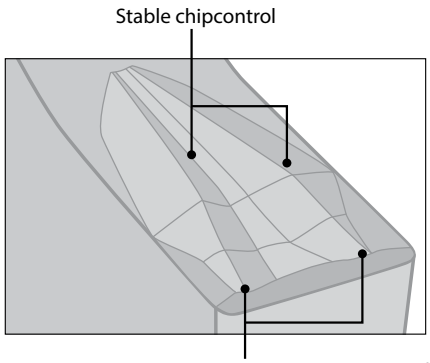
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GBF (for automatic lathe)

High precision with edge width tolerance of ±0.02 mm
High efficiency MEGACOAT coating technology for long tool life

1 Stable chip control with GL chipbreaker

GL Chipbreaker controls chips stable at both grooving and turning.
(Turning is not recommended for GBF32R075-005GL)



Chips are short, curled and break evenly in low feed machining.
Prevents chip clogging.

Chip control comparison (internal evaluation)

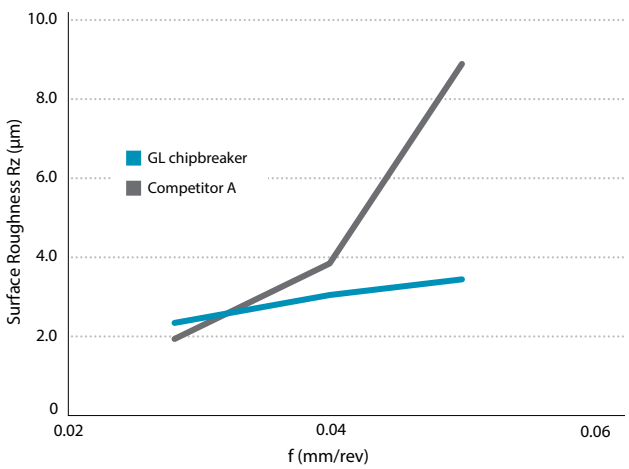
	GL chipbreaker	Competitor A
Grooving f = 0.05 mm/rev d = 1.5 mm		
Turning f = 0.04 mm/rev ap = 0.2 mm		

Cutting conditions: Vc = 80 m/min, edge width 1 mm
Workpiece material : X5CrNi18 10

2 Good surface finish

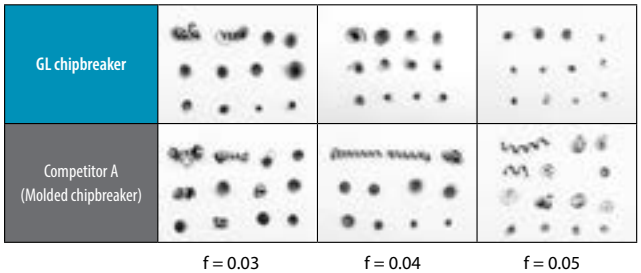
GL chipbreaker controls chips stable at high feed machining,
Good surface finish of side wall

Surface roughness comparison (internal evaluation)



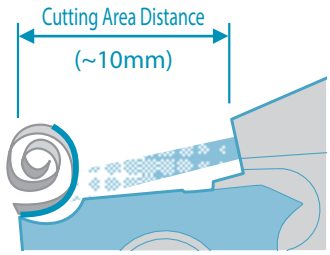
Cutting conditions: Vc = 80 m/min, d = 1.5 mm, f = 0.03~0.05 mm/rev, edge width 1 mm
Workpiece material : 15CrMo4

Chip control comparison (internal evaluation)



KGBF-JCTM (for automatic lathe)

Discharges coolant from the top of the insert



Coolant hole

Ample supply of coolant to the cutting edge.
Prevents coolant stream spreading which slows the coolant flow.

Direction of supply

Sufficient coolant between the chipbreaker and the chips
Stable chip curls and sufficient cooling of the insert

1 Excellent chip control provide long tool life

2 Superior cooling action improves tool life

External Grooving KGBF-JCTM



- **Provides Coolant toward the Rake Surface of Insert**
- **Specification**

Edge Width : 0.25 -3 mm

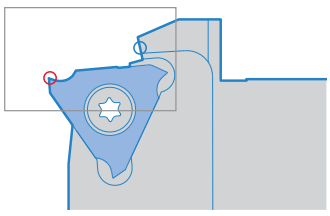
Ground Chipbreaker/Molded GL Chipbreaker

Maximum groove depth : 3 mm

Coolant Discharging Comparison (Internal evaluation)

Small chips and better cooling of the insert leads to longer tool life

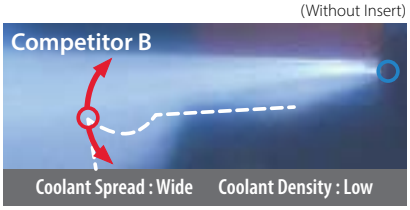
○ Cutting Edge
○ Coolant Hole



(Without Insert)

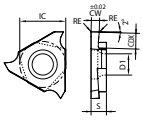
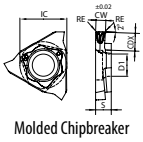


(Without Insert)



GBF

Carbon steel / Alloy steel	P
Stainless steel	M
Cast iron	K
Non-ferrous metals	N
Titanium alloy	S
Hard materials (~ 40HRC)	H
Hard materials (40HRC ~)	H

Insert		Description		No. of edges	Dimension (mm)						Tolerance (mm)		Carbide			Applicable toolholder ⇒ G23~G26
					CW	CDX	IC	S	D1	RE	CW min.	CW max.	PVD PR1215	PVD PR1535	- GW15	
	 Sharp edge	GBF32R	025-000F	3	0.25	0.6	9.525	3.18	4.4	0	-0.02	+0.02	●	●	●	KGBFR...-16F KGBFR...-16FJCTM KGBFSL...-16 S...KGBFL16
			030-000F		0.3	0.8					-0.02	+0.02	●	●	●	
			033-000F		0.33	0.8					-0.025	+0.015	●	●	●	
			043-000F		0.43	1					-0.025	+0.015	●	●	●	
			050-000F		0.5	1.2					-0.02	+0.02	●	●	●	
			053-000F		0.53	1.2					-0.025	+0.015	●	●	●	
			065-000F		0.65	1.2					-0.02	+0.02	●	●	●	
			075-000F		0.75	2					-0.02	+0.02	●	●	●	
			080-000F		0.8	2					-0.02	+0.02	●	●	●	
			095-000F		0.95	2					-0.02	+0.02	●	●	●	
			100-000F		1	2					-0.02	+0.02	●	●	●	
			110-000F		1.1	2					-0.02	+0.02	●	●	●	
			120-000F		1.2	2					-0.02	+0.02	●	●	●	
			125-000F		1.25	2					-0.02	+0.02	●	●	●	
			130-000F		1.3	2					-0.02	+0.02	●	●	●	
			140-000F		1.4	2.7					-0.02	+0.02	●	●	●	
			145-000F		1.45	2.7					-0.02	+0.02	●	●	●	
			150-000F		1.5	2.7					-0.02	+0.02	●	●	●	
			165-000F		1.65	2.7					-0.02	+0.02	●	●	●	
			170-000F		1.7	3					-0.02	+0.02	●	●	●	
			175-000F		1.75	3					-0.02	+0.02	●	●	●	
			200-000F		2	3					-0.02	+0.02	●	●	●	
		GBF32L	025-000F		0.25	0.6					-0.02	+0.02	●	●	●	KGBFL...-16F KGBFSR...-16
			030-000F		0.3	0.8					-0.02	+0.02	●	●	●	
			033-000F		0.33	0.8					-0.025	+0.015	●	●	●	
			043-000F		0.43	1					-0.025	+0.015	●	●	●	
			050-000F		0.5	1.2					-0.02	+0.02	●	●	●	
			053-000F		0.53	1.2					-0.025	+0.015	●	●	●	
			065-000F		0.65	1.2					-0.02	+0.02	●	●	●	
			075-000F		0.75	2					-0.02	+0.02	●	●	●	
			080-000F		0.8	2					-0.02	+0.02	●	●	●	
			095-000F		0.95	2					-0.02	+0.02	●	●	●	
			100-000F		1	2					-0.02	+0.02	●	●	●	
			110-000F		1.1	2					-0.02	+0.02	●	●	●	
			120-000F		1.2	2					-0.02	+0.02	●	●	●	
			125-000F		1.25	2					-0.02	+0.02	●	●	●	
			130-000F		1.3	2					-0.02	+0.02	●	●	●	
			140-000F		1.4	2.7					-0.02	+0.02	●	●	●	
			145-000F		1.45	2.7					-0.02	+0.02	●	●	●	
			150-000F		1.5	2.7					-0.02	+0.02	●	●	●	
			165-000F		1.65	2.7					-0.02	+0.02	●	●	●	
			170-000F		1.7	3					-0.02	+0.02	●	●	●	
			175-000F		1.75	3					-0.02	+0.02	●	●	●	
			200-000F		2	3					-0.02	+0.02	●	●	●	
	 Molded Chipbreaker	GBF32R	075-005GL	3	0.75	2	9.525	3.18	4.4	0.05	-0.02	+0.02	●	●		KGBFR...-16F KGBFR...-16FJCTM KGBFSL...-16 S...KGBFL16
			095-005GL		0.95	2				0.05			●	●		
			100-005GL		1	2				0.05			●	●		
			150-010GL		1.5	2.7				0.1			●	●		
			200-010GL		2	3				0.1			●	●		
			300-010GL		3	3				0.1			●	●		

Right-hand shown
Max. Cutting Dia. : See Page **G27**

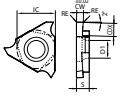
Recommended cutting conditions ⇒ **G142**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GBF

GBF

Carbon steel / Alloy steel										●	◔		P
Stainless steel										○	●		M
Cast iron												●	K
Non-ferrous metals												●	N
Titanium alloy											●	◔	S
Hard materials (~ 40HRC)													H
Hard materials (40HRC ~)													

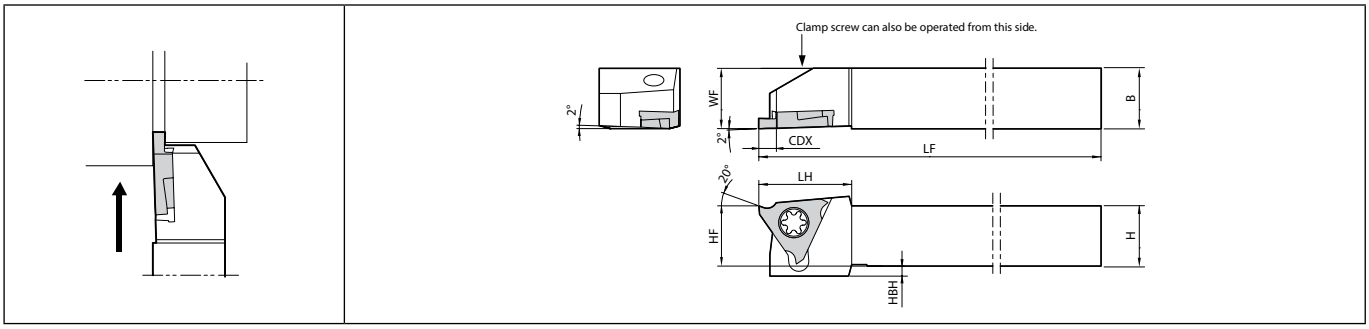
Insert		Description		No. of edges	Dimension (mm)						Tolerance (mm)		Carbide			Applicable toolholder ➡ G23,G25
					CW	CDX	IC	S	D1	RE	CW min.	CW max.	PVD PR1215	PVD PR1535	- GW15	
		GBF32L	025-005	3	0.25	0.6	9.525	3.18	4.4	0.05	-0.02	+0.02	●	●	●	KGBFL...-16F KGBFSR...-16
			030-005		0.3	0.8				0.05	-0.02	+0.02	●	●	●	
			033-005		0.33	0.8				0.05	-0.025	+0.015	●	●	●	
			043-005		0.43	1				0.05	-0.025	+0.015	●	●	●	
			050-005		0.5	1.2				0.05	-0.02	+0.02	●	●	●	
			053-005		0.53	1.2				0.05	-0.025	+0.015	●	●	●	
			065-005		0.65	1.2				0.05	-0.02	+0.02	●	●	●	
			075-005		0.75	2				0.05	-0.02	+0.02	●	●	●	
			075-010		0.75	2				0.1	-0.02	+0.02	●	●	●	
			080-005		0.8	2				0.05	-0.02	+0.02	●	●	●	
			080-010		0.8	2				0.1	-0.02	+0.02	●	●	●	
			095-005		0.95	2				0.05	-0.02	+0.02	●	●	●	
			095-010		0.95	2				0.1	-0.02	+0.02	●	●	●	
			100-005		1	2				0.05	-0.02	+0.02	●	●	●	
			100-010		1	2				0.1	-0.02	+0.02	●	●	●	
			110-005		1.1	2				0.05	-0.02	+0.02	●	●	●	
			110-010		1.1	2				0.1	-0.02	+0.02	●	●	●	
			120-005		1.2	2				0.05	-0.02	+0.02	●	●	●	
			120-010		1.2	2				0.1	-0.02	+0.02	●	●	●	
			125-005		1.25	2				0.05	-0.02	+0.02	●	●	●	
			125-010		1.25	2				0.1	-0.02	+0.02	●	●	●	
			130-005		1.3	2				0.05	-0.02	+0.02	●	●	●	
			130-010		1.3	2				0.1	-0.02	+0.02	●	●	●	
			140-005		1.4	2.7				0.05	-0.02	+0.02	●	●	●	
			140-010		1.4	2.7				0.1	-0.02	+0.02	●	●	●	
			145-005		1.45	2.7				0.05	-0.02	+0.02	●	●	●	
			145-010		1.45	2.7				0.1	-0.02	+0.02	●	●	●	
			150-005		1.5	2.7				0.05	-0.02	+0.02	●	●	●	
			150-010		1.5	2.7				0.1	-0.02	+0.02	●	●	●	
			165-005		1.65	2.7				0.05	-0.02	+0.02	●	●	●	
			165-010		1.65	2.7				0.1	-0.02	+0.02	●	●	●	
			170-005		1.7	3				0.05	-0.02	+0.02	●	●	●	
			170-010		1.7	3				0.1	-0.02	+0.02	●	●	●	
			175-005		1.75	3				0.05	-0.02	+0.02	●	●	●	
			175-010		1.75	3				0.1	-0.02	+0.02	●	●	●	
			200-005		2	3				0.05	-0.02	+0.02	●	●	●	
			200-010		2	3				0.1	-0.02	+0.02	●	●	●	
			225-005		2.25	3				0.05	-0.02	+0.02	●	●	●	
			225-010		2.25	3				0.1	-0.02	+0.02	●	●	●	
			250-005		2.5	3				0.05	-0.02	+0.02	●	●	●	
			250-010		2.5	3				0.1	-0.02	+0.02	●	●	●	
			300-005		3	3				0.05	-0.02	+0.02	●	●	●	
			300-010		3	3				0.1	-0.02	+0.02	●	●	●	

Right-hand shown
Max. Cutting Dia. : See Page **G27**

Recommended cutting conditions ➡ **G142**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGBF-F (External grooving / Shallow grooving)



Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

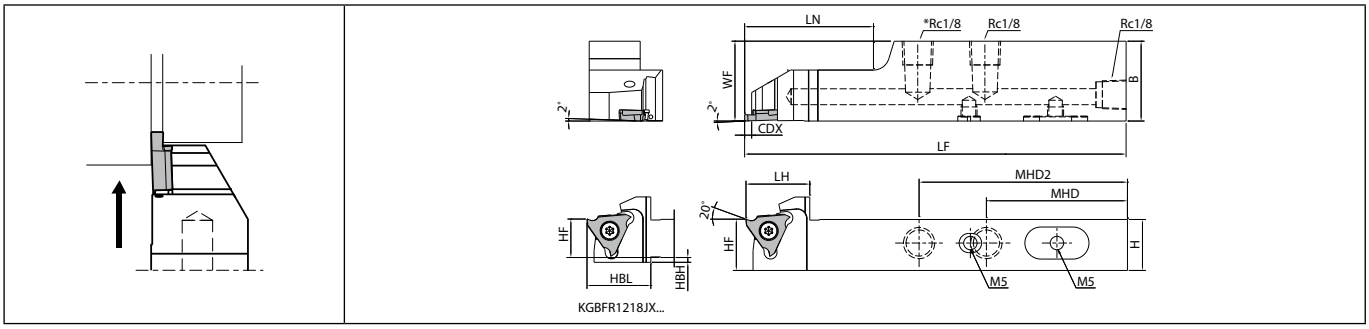
Toolholder dimensions

Description		Availability		Dimension (mm)								Spare parts		Applicable inserts ⇒ G20~G22
		R	L	CDX	H	B	LH	HF	HBH	LF	WF	Screw	Wrench	
KGBF R/L	1010JX-16F	●	●	3	10	10	18.5	10	4	120	10	SB-4070TRW	FT-8	GBF32 R/L type
	1212JX-16F	●	●		12	12		12	2		12			
	1616JX-16F	●	●		16	16		16	-		16			
	2020JX-16F	●	●		20	20		20			20			

CDX shows the distance from the toolholder to the cutting edge. Available Groove Depth : „CDX" of Insert.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGBF-JCTM (External grooving / Shallow grooving, Coolant-through holder)



Right-hand shown | Right-hand Insert for Right-hand Toolholder. | KGBFR1218JX-16FJCTM : 2-Rc1/8

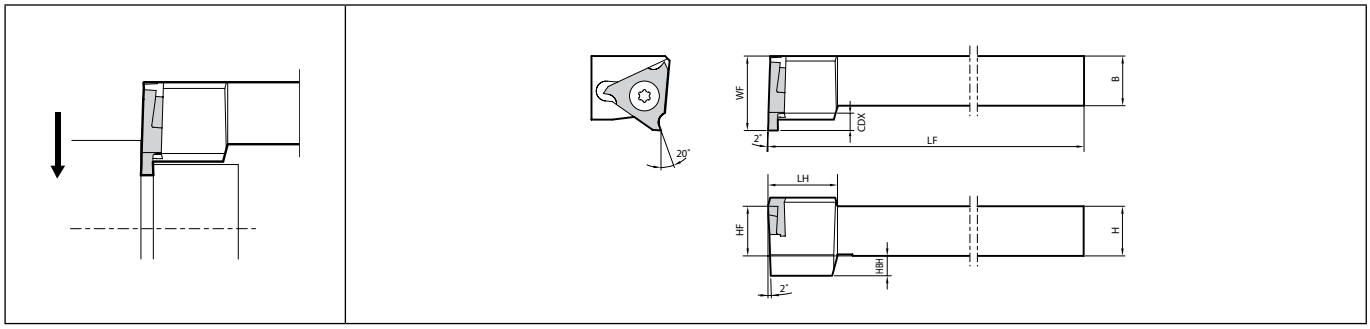
Toolholder dimensions

Description		Availability	Dimension (mm)												Coolant hole	Spare parts				Applicable inserts ⇨ G20,G21
																Plug	Plug	Screw	Wrench	
		R	CDX	H	B	LH	MHD	MHD2	HF	HBH	HBL	LF	LN	WF						
KGBFR	1218JX-16FJCTM	●	3	12	18	20	54	-	12	1.5	20	120	28	12	Yes	GP-1	HS5X4LP	SB-4070TRW	FT-8	GBF32R type
	1625JX-16FJCTM	●		16	25		44	65	16	-	-		40	16			-			
	2025JX-16FJCTM	●		20					20					20						

CDX shows the distance from the toolholder to the cutting edge. Available Groove Depth : „CDX" of Insert.
Please see page **H16** and **H17** for piping parts of coolant-through holders.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGBFS (External grooving / Shallow grooving)



Right-hand shown | Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

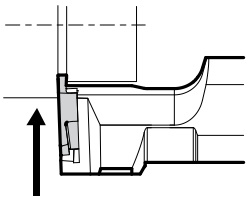
Toolholder dimensions

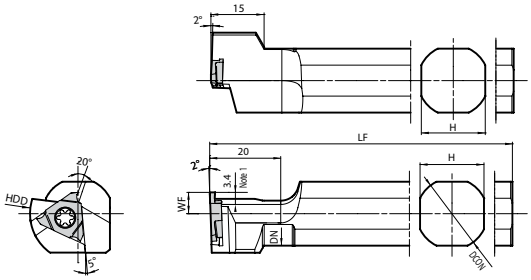
Description		Availability		Dimension (mm)								Spare parts		Applicable inserts
												Screw	Wrench	
		R	L	CDX	H	B	LH	HF	HBH	LF	WF			G20~G22
KGBFS$^{R}/_{L}$	1010JX-16	●	●	3	10	10	14	10	4	120	15	SB-4070TRW	FT-8	GBF32$^{L}/_{R}$ type
	1212JX-16	●	●		12	12		12	2		16			
	1616JX-16	●	●		16	16		16	-		20			

CDX shows the distance from the toolholder to the cutting edge. Available Groove Depth : „CDX" of Insert.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-KGBF (External grooving / Shallow grooving)





Left-hand shown | Right-hand Insert for Left-hand Toolholder. | Note 1) CDX shows available grooving depth.

Toolholder dimensions

Description		Availability	Dimension (mm)						Spare parts		Applicable inserts G20,G21
			L	DCON	H	DN	HDD	LF	WF	Screw	Wrench	
S12F-	KGBFL16	●	12	11	11	27	80	6	SB-4070TRW	FT-8	GBF32R type
S14H-	KGBFL16	●	14	13	13		100				
S15F-	KGBFL16	●	15.875	15	15		85				
S16F-	KGBFL16	●	16								
S19G-	KGBFL16	●	19.05	17	18		90				
S19K-	KGBFL16	●					120				
S20G-	KGBFL16	●	20	18	19		90				
S20K-	KGBFL16	●					120				
S22K	KGBFL16	●	22	20	21						
S25.0H-	KGBFL16	●	25	23	24	32	100	10			
S25K-	KGBFL16	●	25.4								

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Compatiblity with GBF and GBA

1. GBF will fit KGBA / KGBAS toolholders.
   - Caution: The maximum groove depth for KGBA / KGBAS toolholders is 2.5 mm
2. GBA inserts will also fit KGBF-F toolholders
   - Caution: The rake angle after installation in the toolholder is 11°

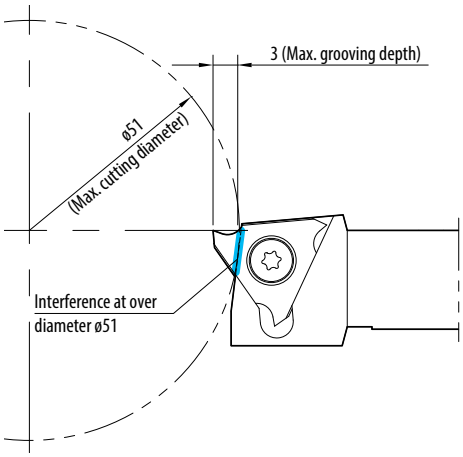
KGBF-F toolholder with GBF insert maximum machining diameter

- 3 mm groove depth is available on workpiece diameters up to ø51mm.
- 2.7 mm groove depth is available on workpiece diameters up to ø100mm.
- 2.5 mm or less groove depth is available on workpiece diameters up to ø200mm

The workpiece will interfere with the holder at maximum diameter or larger

Max. cutting diameter

Max. cutting diameter at 3 mm grooving depth



KGD External grooving

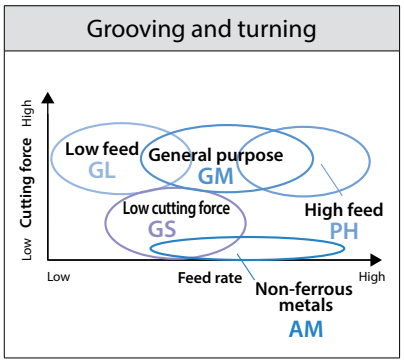
Various insert lineup for KGD toolholder

Smooth chip control
» Newly-introduced chipbreakers designed to cover a variety of workpiece materials.

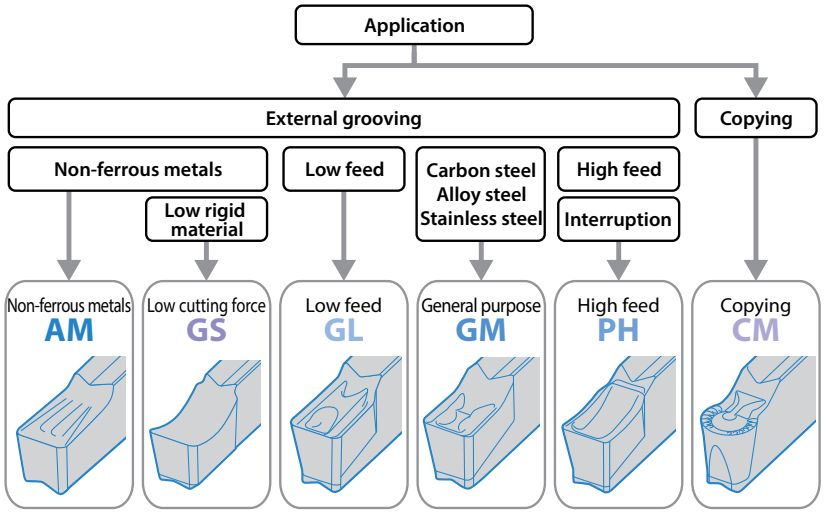
High precision edge preparation
» High precision molding technology with tolerance ±0.03 mm (Edge width 2, 3, 4 mm types)

Highly-reputed MEGACOAT technology
» Long tool life and high efficiency machining achieved by superior oxidation resistance and wear resistance.

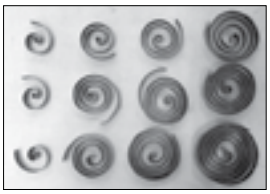
Application map



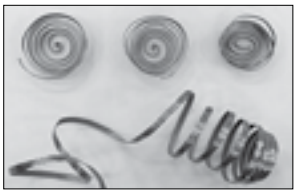
Chipbreaker selection



Comparison of chip control (15CrMo4, Vc = 150 m/min, f = 0.15 mm/rev)


GM chipbreaker

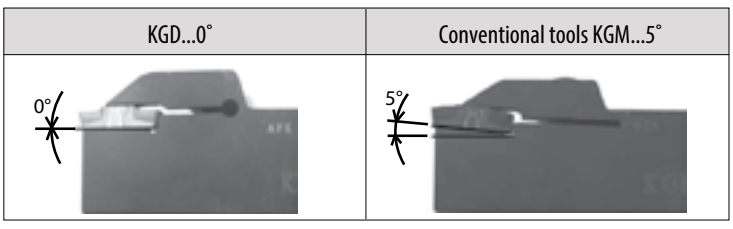

Competitor A

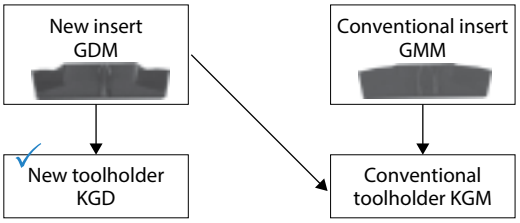

Competitor B

Smooth chip control
» Less chip biting troubles

Toolholder and insert combination of KGD type (new) and KGM type (conventional)

Insert setting angle for grooving toolholders





Installing conventional inserts to the new toolholder is not recommended.

KGD grooving toolholder

Integral type and separate type (toolholder + blade) are available



Integral type



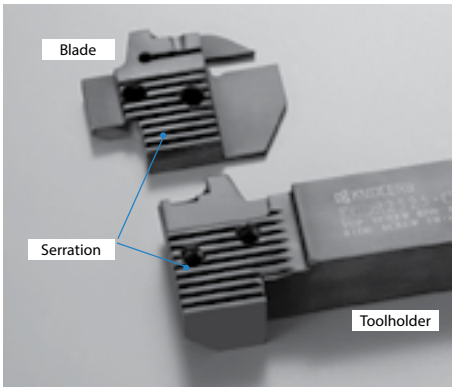
Separate type

High rigidity separate type toolholder

- Adaptable to wide applications by changing blades.
- Deals with various edge widths and cutting depths by changing the blade and toolholder combination.
- Even if the blade is broken, you only need to replace the broken part.

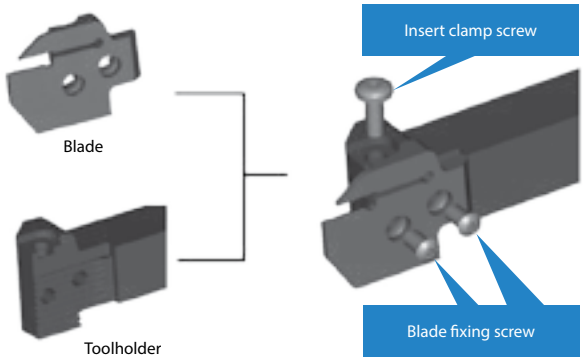
Toolholders for High Pressure Coolant

- Added coolant-through holder KGD-JCT/-JCTM with superior chip control and long tool life



Structure of toolholder unit (toolholder + blade)

KGD-S (0º separate type)



Note for the toolholder and blade combination of 0° separate type

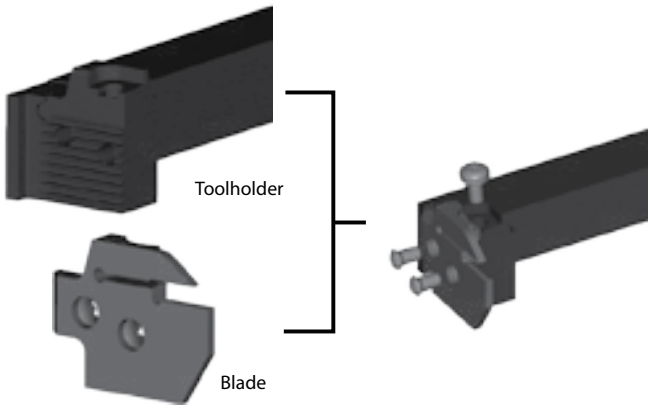
Toolholder (KGD$^{R}/_{L}$○○○○-C)

+

Blade (KGD$^{R}/_{L}$-○T○○-C)

Right-hand blade for right-hand toolholder,
Left-hand blade for left-hand toolholder.

KGDS-S (90º separate type)



Note for the toolholder and blade combination of 90° separate type

Toolholder (KGDS$^{R}/_{L}$○○○○-C)

+

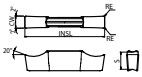
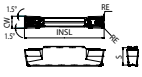
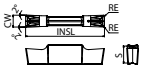
Blade (KGD$^{L}/_{R}$-○T○○-C)

Left-hand blade for right-hand toolholder,
Right-hand blade for left-hand toolholder.

GDM/GDMS/GDG

GDM/GDMS/GDG

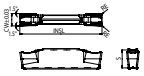
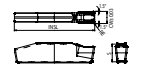
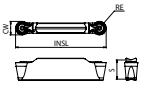
										Carbon steel / Alloy steel	○	●				●	○	P
										Stainless steel	○	○	●					M
										Cast iron	●							K
										Non-ferrous metals				●	○			N
										Titanium alloy			●	○	○			S
										Hard materials (~ 40HRC)		○						H
										Hard materials (40HRC ~)								

Insert		Description		No. of edges	Dimension (mm)				Tolerance (mm)		Carbide				Cer-met		Applicable toolholder ⇒ G34~G42
					CW	S	RE	INSL	CW min.	CW max.	PVD			DLC	-	-	
											PR1215	PR1225	PR1535	PDL015	GW15	TN620	TN90	
	 Low cutting force	GDG	2520N-020GS	2	2.5	4.3	0.2	20	-0.02	+0.02	●	●	●		●	●	●	KGD$^{R/L}$...2.4... KGD$^{R/L}$...2...
		GDG	3020N-020GS	2	3	4.3	0.2	20	-0.02	+0.02	●	●	●		●	●	●	KGD$^{R/L}$...3... KGD$^{R/L}$...2.4... KGD$^{R/L}$...2...
		GDG	3520N-020GS	2	3.5	4.3	0.2	20	-0.02	+0.02	●	●	●		●	●		KGD$^{R/L}$...3...
		GDG	4020N-040GS	2	4	4.3	0.4	20	-0.02	+0.02	●	●	●		●	●	●	KGD$^{R/L}$...4... KGD$^{R/L}$...3...
		GDG	5020N-040GS	2	5	4.3	0.4	20	-0.02	+0.02	●	●	●		●	●	●	KGD$^{R/L}$...5... KGD$^{R/L}$...4...
		GDG	6020N-040GS	2	6	4.3	0.4	20	-0.02	+0.02	●	●	●		●	●		KGD$^{R/L}$...6... KGD$^{R/L}$...5...
		GDG	8030N-040GS	2	8	5.5	0.4	30	-0.02	+0.02	●	●	●		●	●		KGD$^{R/L}$...-8T25
	 Low feed	GDM	2420N-020GL	2	2.4	4.3	0.2	20	-0.03	+0.03	●	●	●			●	●	KGD$^{R/L}$...2.4... KGD$^{R/L}$...2...
		GDM	3020N-020GL 3020N-040GL	2	3	4.3	0.2 0.4	20	-0.03	+0.03	● ●	● ●	● ●			● ●	● ●	KGD$^{R/L}$...3... KGD$^{R/L}$...2.4... KGD$^{R/L}$...2...
		GDM	4020N-020GL 4020N-040GL	2	4	4.3	0.2 0.4	20	-0.03	+0.03	● ●	● ●	● ●			● ●	● ○	KGD$^{R/L}$...4... KGD$^{R/L}$...3...
		GDM	5020N-040GL	2	5	4.3	0.4	20	-0.04	+0.04	●	●	●			●	●	KGD$^{R/L}$...5... KGD$^{R/L}$...4...
		GDM	6020N-040GL	2	6	4.3	0.4	20	-0.04	+0.04	●	●	●			●		KGD$^{R/L}$...6... KGD$^{R/L}$...5...
	 Non-ferrous metals	GDG	3020N-020AM	2	3	4.3	0.2	20	-0.02	+0.02				●	●			KGD$^{R/L}$...3... KGD$^{R/L}$...2.4... KGD$^{R/L}$...2...
		GDG	4020N-040AM	2	4	4.3	0.4	20	-0.02	+0.02				●	●			KGD$^{R/L}$...4... KGD$^{R/L}$...3...
		GDG	5020N-040AM	2	5	4.3	0.4	20	-0.02	+0.02				●	●			KGD$^{R/L}$...5... KGD$^{R/L}$...4...
		GDG	6020N-040AM	2	6	4.3	0.4	20	-0.02	+0.02				●	●			KGD$^{R/L}$...6... KGD$^{R/L}$...5...

Recommended cutting conditions ⇒ G45

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GDM/GDMS/GDG

Insert		Description		No. of edges	Dimension (mm)				Tolerance (mm)		Carbide			Cer-met	Applicable toolholder ⇒ G34~G42
					CW	S	RE	INSL	CW min.	CW max.	PVD			-	
											PR1215	PR1225	PR1535	TN620	TN90	
	 High feed	GDM	2020N-020PH	2	2	4.3	0.2	20	- 0.03	+ 0.03	●	●	●			KGD^{R}/L...2...
		GDM	3020N-030PH	2	3	4.3	0.3	20	- 0.03	+ 0.03	●	●	●			KGD^{R}/L...3... KGD^{R}/L...2.4... KGD^{R}/L...2...
		GDM	4020N-030PH	2	4	4.3	0.3	20	- 0.03	+ 0.03	●	●	●			KGD^{R}/L...4... KGD^{R}/L...3...
	 1-edge / High feed	GDMS	2020N-020PH	1	2	4.3	0.2	20	- 0.03	+ 0.03	●	●	●			KGD^{R}/L...2...
		GDMS	3020N-030PH	1	3	4.3	0.3	20	- 0.03	+ 0.03	●	●	●			KGD^{R}/L...3... KGD^{R}/L...2.4... KGD^{R}/L...2...
		GDMS	4020N-030PH	1	4	4.3	0.3	20	- 0.03	+ 0.03	●	●	●			KGD^{R}/L...4... KGD^{R}/L...3...
	 Full R / Copying	GDM	3020N-150R-CM	2	3	4.3	1.5	20	- 0.03	+ 0.03	●	●	●	●	●	KGD^{R}/L...3... KGD^{R}/L...2.4... KGD^{R}/L...2...
		GDM	4020N-200R-CM	2	4	4.3	2	20	- 0.03	+ 0.03	●	●	●	●	●	KGD^{R}/L...4... KGD^{R}/L...3...
		GDM	5020N-250R-CM	2	5	4.3	2.5	21	- 0.04	+ 0.04	●	●	●	●	●	KGD^{R}/L...5... KGD^{R}/L...4...
		GDM	6020N-300R-CM	2	6	4.3	3	21	- 0.04	+ 0.04	●	●	●	●		KGD^{R}/L...6... KGD^{R}/L...5...

Carbon steel / Alloy steel — P
Stainless steel — M
Cast iron — K
Non-ferrous metals — N
Titanium alloy — S
Hard materials (~ 40HRC) — H
Hard materials (40HRC ~) — H

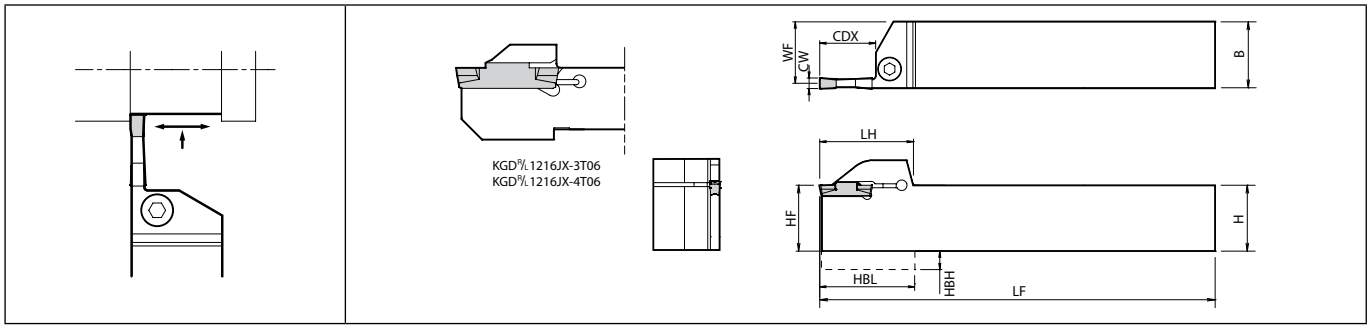
GDM50/60-CM differs from other descriptions in length (INSL) to avoid interference of a toolholder with workpiece.

Recommended cutting conditions ⇒ G45

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GDGS

KGD (External grooving)



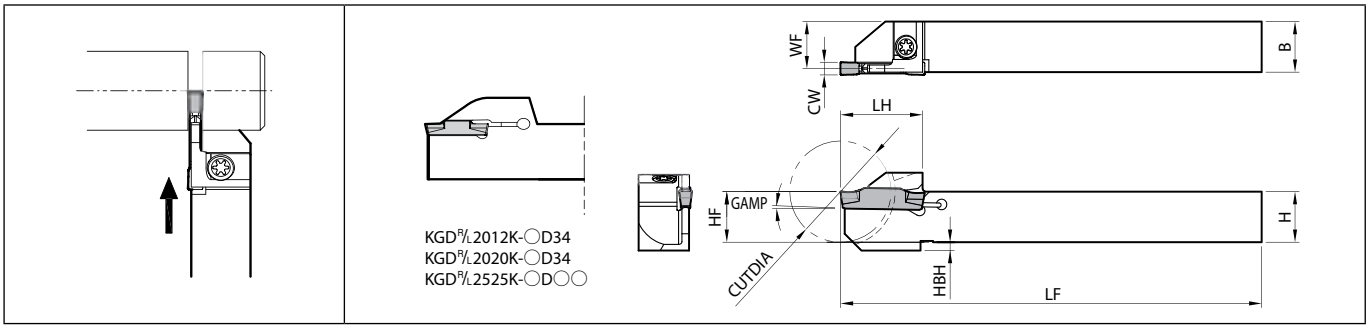
Right-hand shown

Toolholder dimensions

Description		Availability R	Availability L	CDX	H	B	LH	HF	HBH	HBL	LF	WF	CW min.	CW max.	Spare parts: Clamp bolt	Spare parts: Screw	Spare parts: Wrench	Spare parts: Wrench	Applicable inserts ➡ G30~G33
KGDR/L	1616H-2T06	●	●	6	16	16	27.7	16	4	28	100	15.2	2	3	HH5X16	-	LW-4	-	GD..2020... GD..2220... GD..2420... GD..2520... GD..3020...
	1616H-2T10	●	●	10			30.2			30.5									
	1616H-2T17	●	●	17			31.2			31.5									
	2012K-2T17	●	●	17	20	12	32.5	20	-	-	125	11.2							
	2020K-2T06	●	●	6	20	20	28	20			125	19.2							
	2020K-2T10	●	●	10			30.5												
	2020K-2T17	●	●	17			32.5												
	2525M-2T06	●	●	6	25	25	28	25			150	24.2			HH5X25				
	2525M-2T10	●	●	10			30.5												
	2525M-2T17	●	●	17			32.5												
KGDR/L	2012K-2.4T17	●	●	17	20	12	32.5	20	-	-	125	11	2.4	3	HH5X16	-	LW-4	-	GD..2420... , GD..2520... GD..3020...
	2020K-2.4T17	●	●			20						19							
KGDR/L	1216JX-3T06	●	●	6	12	16	19.5	12	2	19	120	14.8	3	4	-	SE-50125TR	-	LTW-20	GD..3020... GD..3520... GD..4020...
	1616H-3T06	●	●		16		27.7	16	4	28	100				HH5X16	-	LW-4	-	
	1616H-3T10	●	●	10			30.2			30.5									
	1616H-3T20	●	●	20			34.2			34.5									
	2012K-3T20	●	●		20	12	34.5	20	-	-	125	10.8							
	2020K-3T06	●	●	6		20	28					18.8							
	2020K-3T10	●	●	10			30.5												
	2020K-3T20	●	●	20			34.5												
	2525M-3T06	●	●	6	25	25	28	25			150	23.8			HH5X25				
	2525M-3T10	●	●	10			30.5												
	2525M-3T20	●	●	20			35.5												
KGDR/L	1216JX-4T06	●	●	6	12	16	19.5	12	2	19	120	14.3	4	5	-	SE-50125TR	-	LTW-20	GD..4020... GD..5020...
	2020K-4T10	●	●	10	20	20	30.5	20	-	-	125	18.3			HH5X16	-	LW-4	-	
	2020K-4T20	●	●	20			34.5												
	2525M-4T10	●	●	10	25	25	30.5	25			150	23.3			HH5X25				
	2525M-4T20	●	●	20			35.5												
	2525M-4T25	●	●	25			40.5												
KGDR/L	2020K-5T10	●	●	10	20	20	30.5	20	-	-	125	17.8	5	6	HH5X16	-	LW-4	-	GD..5020... GD..6020...
	2020K-5T17	●	●	17			37.5								HH5X25				
	2525M-5T10	●	●	10	25	25	30.5	25			150	22.8							
	2525M-5T17	●	●	17			37.5												
	2525M-5T25	●	●	25			40.5												
KGDR/L	2525M-6T15	●	●	15	25	25	32.5	25	-	-	150	22.4	6	6	HH5X25	-	LW-4	-	GD..6020...
	2525M-6T30	●	●	30			45.5												
KGDR/L	2525M-8T25	●	●	25	25	25	43.3	25	7	44.2	150	22	8	8	HH6X25	-	LW-5	-	GD..8030...
	3232P-8T25	●	●		32	32		32	-	-	170	29							

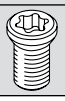
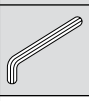
CDX : Maximum depth to which processing can be made. (If the CDX is 20 mm or more, the maximum groove-depth of groove made by the 2-edge insert will be 18 mm.)
Recommended tightening torque of clamp bolt : 6.5N·m (HH5X○○), 8.0N·m (HH6X25), 2.5N·m (SE-50125TR)
Above toolholders are applicable to Cut-off, too.

KGD (External grooving)



Right-hand shown

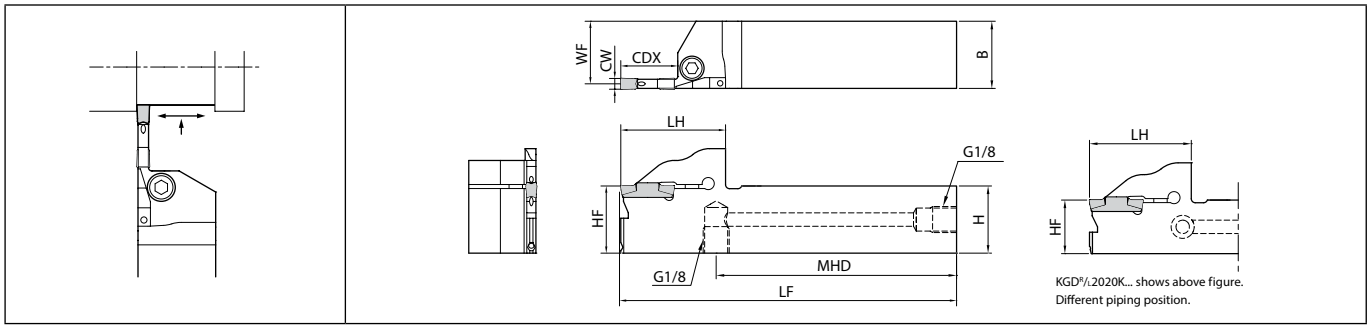
Toolholder dimensions

Description		Availability		Dimension (mm)										Angle (°)	Spare parts					Applicable inserts ⇒ G30~G33
															Clamp bolt	Screw	Screw	Wrench	Wrench	
		R	L	CUTDIA	H	B	LH	HF	HBH	LF	WF	CW min.	CW max.	GAMP						
KGDR/L	1010JX-2	●	●	20	10	10	18	10	2	120	9.2	2	3	1	-	SB-40120TR	-	-	LTW-15S	GD..2020... GD..2220... GD..2420... GD..2520... GD..3020...
	1212F-2	●	●	24	12	12	19.5	12		85	11.2									
	1212JX-2	●	●							120										
	1616JX-2	●	●	32	16	16	24.5	16	-		15.2									
	2012K-2D34	●	●	34	20	12	32.5	20		125	11.2			0	HH5X16	-		LW-4	-	
	2020K-2D34	●	●			20					19.2									
	2525K-2D34	●	●		25	25		25			24.2									
KGDR/L	1010JX-2.4	●	●	20	10	10	18	10	2	120	9	2.4	3	1	-	SB-40120TR	-	-	LTW-15S	GD..2420... GD..2520... GD..3020...
	1212F-2.4	●	●	24	12	12	19.5	12		85	11									
	1212JX-2.4	●	●							120										
	1616JX-2.4	●	●	32	16	16	24.5	16	-		15									
	2012K-2.4D34	●	●	34	20	12	32.5	20		125	11			0	HH5X16	-		LW-4	-	
	2020K-2.4D34	●	●			20					19									
	2525K-2.4D34	●	●		25	25		25			24									
KGDR/L	1212JX-3	●	●	24	12	12	19.5	12	2	120	10.8	3	3	1	-	SB-40120TR	-	-	LTW-15S	GD..3020...
KGDR/L	1616JX-3	●	●	32	16	16	24.5	16	-	120	14.8	3	4	1	-	SB-40120TR	-	-	LTW-15S	GD..3020... GD..3520... GD..4020...
	1616JX-3D38	●	●	38			29									-	SE-50125TR		LTW-20	
	1913K-3D38	●	●		19	13		19		125	11.8									
	2012JX-3D42	●	●	42	20	12	31	20		120	10.8									
	2012JX-3D51	●	●	51			36													
	2020JX-3D42	●	●	42		20	31				18.8									
	2020JX-3D51	●	●	51			36													
	2525K-3D51	●	●		25	25	41.5	25		125	23.8			0	HH5X16		-	LW-4	-	

4mm width Insert cannot be installed in KGDR/L1212JX-3
Recommended tightening torque of clamp screw : 2.0N·m (SB-40120TR), 2.5N·m (SE-50125TR), 6.5N·m (HH5X16)
When machining the material greater than ø36 mm with KGDR/L...-3D38, KGDR/L...-3D42 and KGDR/L...-3D51 toolholders, please use 1-edge inserts.
Maximum cuttinng diameter for 2-edge inserts is ø36 mm.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGD-JCT (External grooving, Coolant-through holder)

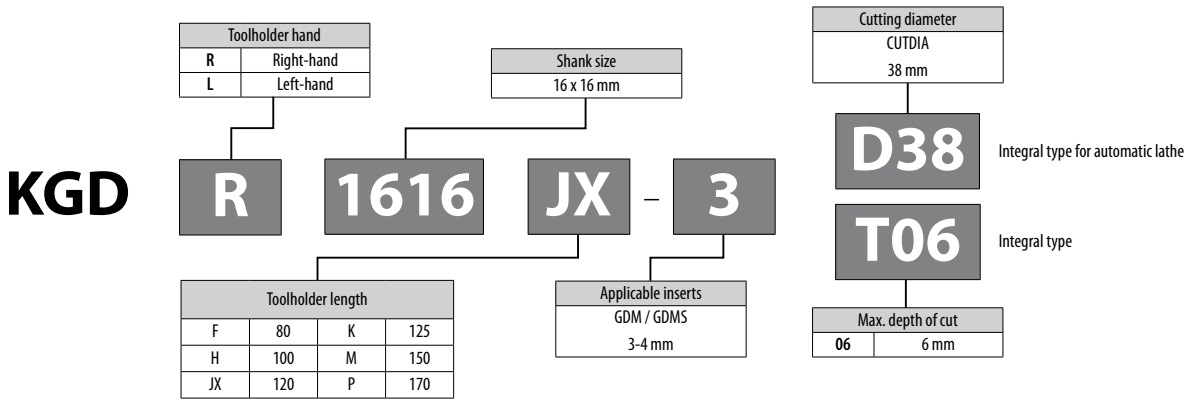


Right-hand shown | Pressure Resistance : ~15MPa

Toolholder dimensions

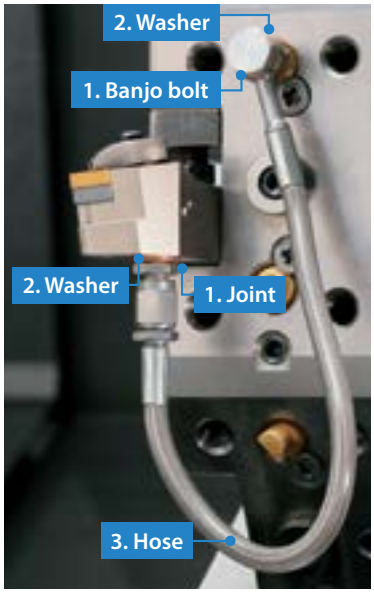
Description		Availability R	Availability L	Dimension (mm) CDX	H	B	LH	MHD	HF	LF	WF	CW min.	CW max.	Coolant hole	Spare parts: Clamp bolt	Spare parts: Plug	Spare parts: Wrench	Applicable inserts ⇒ G30~G33
KGDR/L	2020K-3T06JCT	●	●	6	20	20	31.5	96.2	20	125	18.8	3	4	Yes	HH5X16	HSG1/8X8.0	LW-4	GD..3020... GD..3520... GD..4020...
	2525K-3T06JCT	●	●		25	25		96.5	25		23.8				HH5X25			
KGDR/L	2020K-3T10JCT	●	●	10	20	20	34	94.2	20	125	18.8	3	4	Yes	HH5X16	HSG1/8X8.0	LW-4	
	2525K-3T10JCT	●	●		25	25		94.5	25		23.8				HH5X25			
KGDR/L	2020K-3T20JCT	●	●	20	20	20	38	90.2	20	125	18.8	3	4	Yes	HH5X16	HSG1/8X8.0	LW-4	
	2525K-3T20JCT	●	●		25	25	39	89.5	25		23.8				HH5X25			
KGDR/L	2020K-4T10JCT	●	●	10	20	20	34	94.2	20	125	18.3	4	5	Yes	HH5X16	HSG1/8X8.0	LW-4	GD..4020... GD..5020...
	2525K-4T10JCT	●	●		25	25		94.5	25		23.3				HH5X25			
KGDR/L	2020K-4T20JCT	●	●	20	20	20	38	90.2	20	125	18.3	4	5	Yes	HH5X16	HSG1/8X8.0	LW-4	
	2525K-4T20JCT	●	●		25	25	39	89.5	25		23.3				HH5X25			
KGDR/L	2525K-4T25JCT	●	●	25	25	25	44	84.5	25	125	23.3	4	5	Yes	HH5X25	HSG1/8X8.0	LW-4	

Toolholder identification system



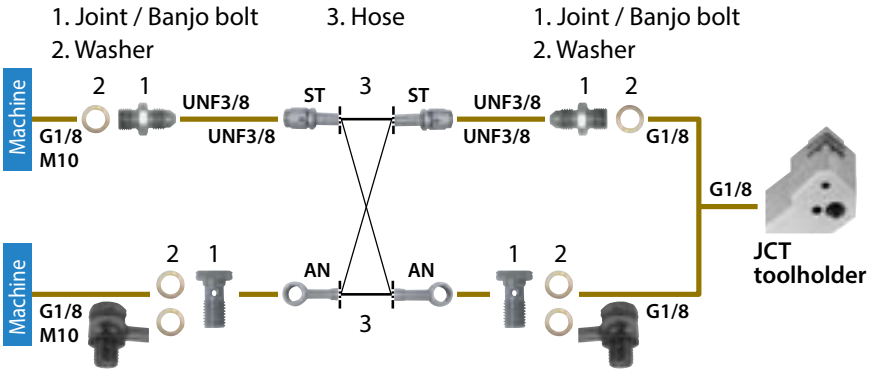
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Easy connection with high pressure hose and joint



- Even without a high pressure pump, internal coolant can be used at a normal pressure
- Banjo bolt available for angled hose connection. Can be used in a variety of machines

Piping installation guide

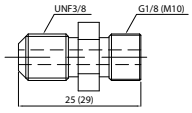
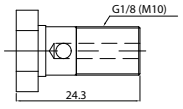


Piping parts

Optional piping parts available (sold separately)
Choose from parts below to match your machine specifications
1. Joint / Banjo bolt × 2 2. Washer × 2-4 3. Hose × 1

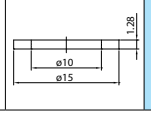
1. Joint / Banjo bolt

Applicable pressure: ~ 30 MPa

Shape		Description	Availability	Thread standard Thread connection to the machine
		J-G1/8-UNF3/8	●	G1/8
		J-M10X1.5-UNF3/8	●	M10X1.5
Banjo bolt (For the angle hose)		BB-G1/8	●	G1/8
		BB-M10X1.5	●	M10X1.5

2. Washer

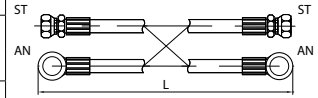
Applicable pressure: ~ 30 MPa

Shape		Description	Availability
		WS-10	●

* Use 2 washers for a banjo bolt

3. Hose

Applicable pressure: ~ 30 MPa

Shape		Description	Availability	Thread standard		Dimensions (mm) L
		HS-ST-ST-200	●	UNF3/8	UNF3/8	200
		HS-ST-ST-250	●			250
		HS-ST-AN-200	●	UNF3/8	– Banjo bolt	200
		HS-ST-AN-250	●			250
		HS-AN-AN-200	●	– Banjo bolt	– Banjo bolt	200
		HS-AN-AN-250	●			250

Precautions

1. Make sure machine door is completely closed before use of these parts.
2. Use appropriate seal for the male thread of the piping parts and make sure the connection is secure. Use plugs to seal off unused coolant holes.
3. Connect and fasten the coolant hose firmly.
4. The use of copper washers may cause leakage but will have no effect on the performance.
5. Commercial piping parts can be used if the thread standards are same. Check the applicable pressure before use.
6. Regularly changing the coolant filter is recommended.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

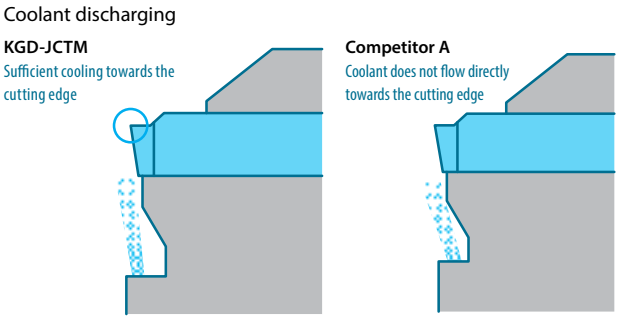
KGD-JCTM (for automatic lathe)

Cut-off holders for high pressure coolant with long tool life
The optimized coolant hole position effectively cools the cutting edge

1 Optimized coolant hole position

2 Discharge coolant towards the flank face of the insert

Coolant discharging





Effective cooling of the cutting edge

Applicable to Different Supply Styles. 2 Supports Internal Coolant with/without Piping System

Internal Coolant without Piping

***When the tool turret supports direct coolant**

Coolant is supplied directly from tool turret into the holder. No need for piping just by installing tools

Applicable to Wide Range of Machines

The tool turret is optional. Please contact our company sales representative for details.

CITIZEN MACHINERY CO., LTD. (L20, D25, M32)
STAR MICRONICS CO., LTD. (SB-R series, SR series, SV series)
TSUGAMI CORPORATION (S205/206-Ⅱ □16 type, S205A/206A-Ⅱ □16 type)

Compatible with various machine including the above.Toolholders can be customized as well.

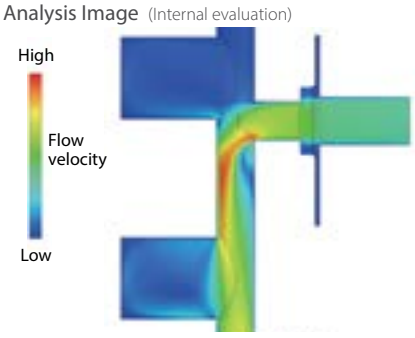
(Random order)
Based on Kyocera Survey in January 2021



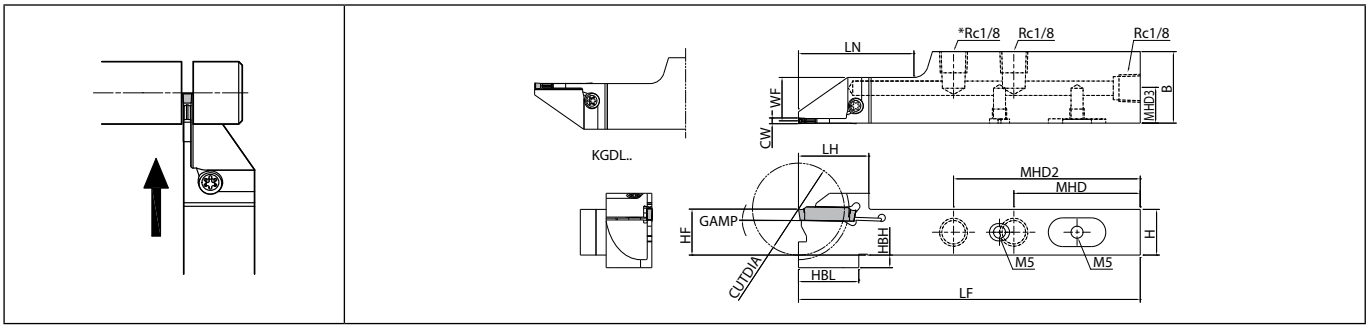
Point

Appropriate hole design to reduce energy loss based on deep analysis

Analysis Image (Internal evaluation)



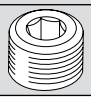
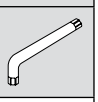
KGD-JCTM (External grooving, Coolant-through holder)



Right-hand shown | KGD$^{R/L}$12-JCTM : 2-Rc1/8

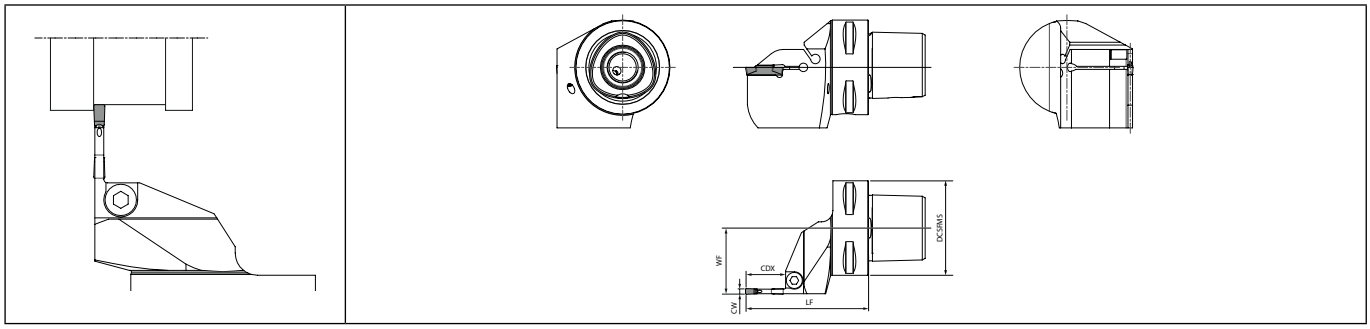
Toolholder dimensions

Description		Availability		Dimension (mm)														Angle (°)	Coolant hole	Applicable inserts ⇨ G30~G33
		R	L	CUTDIA	H	B	LH	MHD	MHD2	MHD3	HF	HBH	HBL	LF	LN	WF	CW min.	CW max.	GAMP		
KGDR	1218JX-2JCTM	●		24	12	18	19.5	54	-	8.4	12	8.5	21	120	44	11.2	2	3	1	Yes	GD..2020... GD..2220... GD..2420... GD..2520... GD..3020...
KGDL	1218JX-2JCTM		●							7.7			21.5							
KGDR	1625JX-2JCTM	●		32	16	25	24.5	44	65	12.2	16	4.5	21		40	15.2				
KGDL	1625JX-2JCTM		●							7.7										
KGDR	1218JX-2.4JCTM	●		24	12	18	19.5	54	-	8.4	12	8.5	21	120	44	11	2.4	3	1	Yes	GD..2420... GD..2520... GD..3020...
KGDL	1218JX-2.4JCTM		●							7.7			21.5							
KGDR	1625JX-2.4JCTM	●		32	16	25	24.5	44	65	12.2	16	4.5	21		40	15				
KGDL	1625JX-2.4JCTM		●							7.7										
KGDR	1218JX-3JCTM	●		24	12	18	19.5	54	-	8.6	12	8.5	21	120	44	10.8	3	3	1	Yes	GD..3020... GD..3520... GD..4020...
KGDL	1218JX-3JCTM		●							7.7			21.5							
KGDR	1625JX-3JCTM	●		32	16	25	24.5	44	65	12.2	16	4.5	21		40	14.8		4		
KGDL	1625JX-3JCTM		●							7.7										

Description		Spare parts			
		Plug	Plug	Screw	Wrench
					
KGDR	1218JX-2JCTM	GP-1	HS5X4LP	SB-40120TR	LTW-15S
KGDL	1218JX-2JCTM				
KGDR	1625JX-2JCTM				
KGDL	1625JX-2JCTM				
KGDR	1218JX-2.4JCTM	GP-1	HS5X4LP	SB-40120TR	LTW-15S
KGDL	1218JX-2.4JCTM				
KGDR	1625JX-2.4JCTM				
KGDL	1625JX-2.4JCTM				
KGDR	1218JX-3JCTM	GP-1	HS5X4LP	SB-40120TR	LTW-15S
KGDL	1218JX-3JCTM				
KGDR	1625JX-3JCTM				
KGDL	1625JX-3JCTM				

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGD polygon taper shank (External grooving)



Right-hand shown

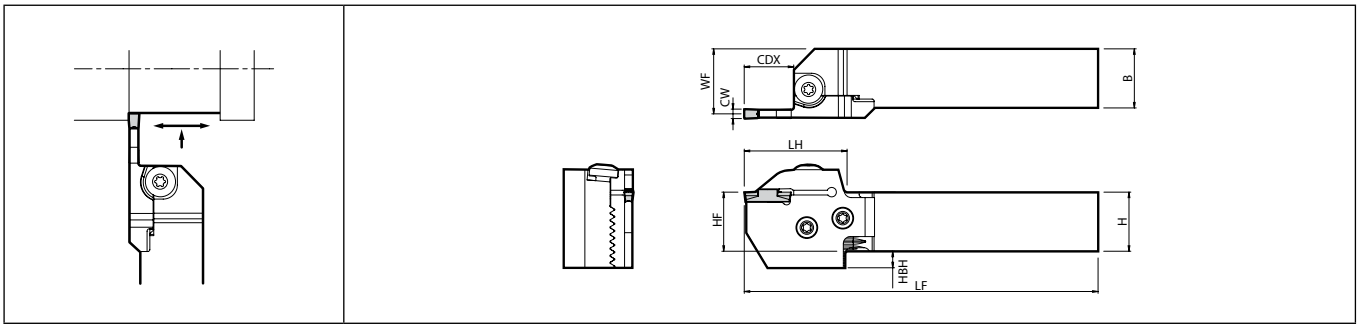
Toolholder dimensions

Description		Availability		Polygpon size	Dimension (mm)						Coolant hole	Spare parts	Applicable inserts G30~G33
		R	L		DCSFMS	LF	WF	CDX	CW min.	CW max.		Clamp bolt	
KUA-KPC4-KGD$^{R}_{L}$	2T17	●	●	C4	40	60	27	17	2.0	3.0	Yes	HH5X16	GDG2020N-... - GDMS3020R-...
KUA-KPC5-KGD$^{R}_{L}$	2T17	●	●	C5	50	60	35	17					GDG2020N-... - GDMS3020R-...
KUA-KPC4-KGD$^{R}_{L}$	3T20	●	●	C4	40	65	27	20	3.0	4.0			GDG3020N-... - GDMS4020R-...
KUA-KPC5-KGD$^{R}_{L}$	3T20	●	●	C5	50	65	35	20					GDG3020N-... - GDMS4020R-...
KUA-KPC6-KGD$^{R}_{L}$	3T20	●	●	C6	60	65	45	20					GDG3020N-... - GDMS4020R-...
KUA-KPC4-KGDR	4T25	●		C4	40	70	27	25	4.0	5.0			GDG4020N-... - GDMS5020N-...
KUA-KPC5-KGDR	4T25	●		C5	50	70	35	25					GDG4020N-... - GDMS5020N-...
KUA-KPC6-KGD	4T25	●		C6	60	70	45	25					GDG4020N-... - GDMS5020N-...
KUA-KPC4-KGD	5T25	●		C4	40	70	27	25	5.0	6.0			GDG5020N-... - GDMS6020N-...
KUA-KPC5-KGD	5T25	●		C5	50	70	35	25					GDG5020N-... - GDMS6020N-...
KUA-KPC6-KGD	5T25	●		C6	60	70	45	25					GDG5020N-... - GDMS6020N-...

Applicable Pressure : ~7MPa
Recommended tightening torque : 6.5 N·m
CDX : Maximum depth to which processing can be made. (If the CDX is 20 mm or more, the maximum groove-depth of groove made by the 2-edge insert will be 18 mm.)

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGD-S (External grooving / 0° separate type)



Right-hand shown (Right-hand blade and right-hand toolholder)

Toolholder dimensions (Blade and toolholder)

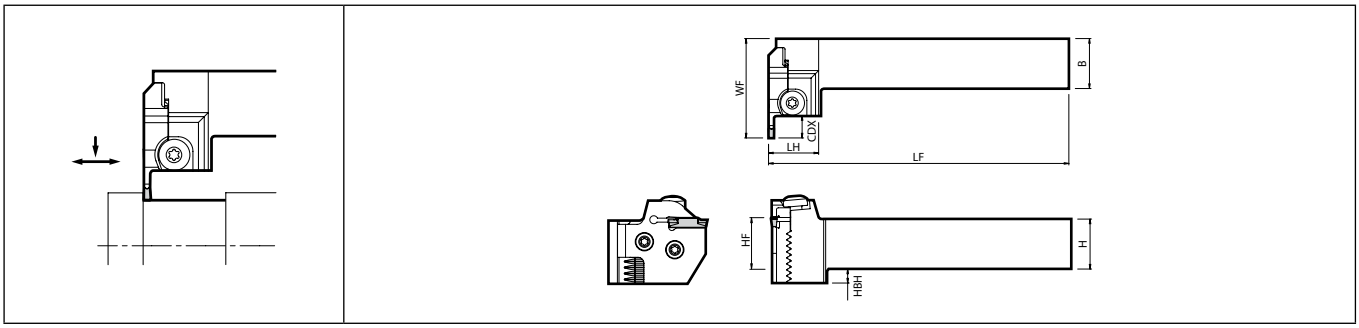
Shank angle	Width (mm)	Max. depth of cut (mm)	Shank size (mm)	Unit description	Availability R	Availability L	Blade description G43	Toolholder description G43	CDX	H	B	LH	HF	HBH	LF	WF	CW min.	CW max.	Spare parts: Clamp bolt (for insert clamp)	Spare parts: Screw (for blade)	Spare parts: Wrench
0°	2	17	□20	KGDR/L 2020X-2T17S	●		KGDR/L-2T17-C	KGDR/L2020-C	17	20	20	40	20	12	122	23.4	2	3	BH6X10TR	SB-60120TR	LTW-25
			□25	2525X-2T17S	●	●		KGDR/L2525-C		25	25		25	7	147	28.4					
			□32	No unit description ⇨				KGDR/L3232-C		32	32		32	-	167	35.4					
	3	10	□20	KGDR/L 2020X-3T10S	●		KGDR/L-3T10-C	KGDR/L2020-C	10	20	20	33	20	12	115	23	3	4			
			□25	2525X-3T10S	●			KGDR/L2525-C		25	25		25	7	140	28					
			□32	No unit description ⇨				KGDR/L3232-C		32	32		32	-	160	35					
		20	□20	KGDR/L 2020X-3T20S	●	●	KGDR/L-3T20-C	KGDR/L2020-C	20	20	20	43	20	12	125	23					
			□25	2525X-3T20S	●	●		KGDR/L2525-C		25	25		25	7	150	28					
			□32	3232X-3T20S	●			KGDR/L3232-C		32	32		32	-	170	35					
	4	10	□20	KGDR/L 2020X-4T10S	●		KGDR/L-4T10-C	KGDR/L2020-C	10	20	20	33	20	12	115	22.5	4	5			
			□25	2525X-4T10S	●			KGDR/L2525-C		25	25		25	7	140	27.5					
			□32	No unit description ⇨				KGDR/L3232-C		32	32		32	-	160	34.5					
		20	□20	KGDR/L 2020X-4T20S	●		KGDR/L-4T20-C	KGDR/L2020-C	20	20	20	43	20	12	125	22.5					
			□25	2525X-4T20S	●	●		KGDR/L2525-C		25	25		25	7	150	27.5					
			□32	3232X-4T20S	●			KGDR/L3232-C		32	32		32	-	170	34.5					
		25	□20	KGDR/L 2020X-4T25S	●	●	KGDR/L-4T25-C	KGDR/L2020-C	25	20	20	48	20	12	130	22.5					
			□25	2525X-4T25S	●	●		KGDR/L2525-C		25	25		25	7	155	27.5					
			□32	3232X-4T25S	●			KGDR/L3232-C		32	32		32	-	175	34.5					
	5	10	□20	KGDR/L 2020X-5T10S	●	●	KGDR/L-5T10-C	KGDR/L2020-C	10	20	20	33	20	12	115	22	5	6			
			□25	2525X-5T10S	●			KGDR/L2525-C		25	25		25	7	140	27					
			□32	No unit description ⇨				KGDR/L3232-C		32	32		32	-	160	34					
		25	□20	No unit description ⇨			KGDR/L-5T25-C	KGDR/L2020-C	25	20	20	48	20	12	130	22					
			□25	KGDR/L 2525X-5T25S	●	●		KGDR/L2525-C		25	25		25	7	155	27					
			□32	3232X-5T25S	●			KGDR/L3232-C		32	32		32	-	175	34					

Applicable inserts ⇨ **G30~G33**

1. When using the toolholder in normal mounting position, the lower jaw of toolholder may interfere with the tool presetter.
2. The toolholder and blade descriptions are printed on the toolholder body. (Unit description is not printed.)
   KGD-S: Right-hand blade for right-hand toolholder, left-hand blade for left-hand toolholder.
   The toolholder is applicable for all blade with suitable hand.
3. When the unit description is not available (No unit description) and/or if stock status is blank, please purchase toolholder and blade separately.
4. CDX: Maximum depth to which processing can be made. (If the CDX is 20 mm or more, the maximum groove-depth of groove made by the 2-edge insert will be 18 mm.)
   Above toolholders are applicable to Cut-off, too.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGDS-S (External grooving / 90° separate type)



Right-hand shown (Left-hand blade and right-hand toolholder)

Toolholder dimensions (Blade and toolholder)

Shank angle	Width (mm)	Max. depth of cut (mm)	Shank size (mm)	Blade description ⇨ G43	Toolholder description ⇨ G43	Unit description	Availability R	Availability L	Dimension (mm) CDX	H	B	LH	HF	HBH	LF	WF	CW min.	CW max.	Spare parts: Clamp bolt (for insert clamp)	Screw (for blade)	Wrench
90°	2	17	□20	KGD$^{L}_{R}$-2T17-C	KGDS$^{R}_{L}$2020-C	-			17	20	20	27.7	20	12	125	56.7	2	3	BH6X10TR	SB-60120TR	LTW-25
			□25		KGDS$^{R}_{L}$2525-C	-				25	25		25	7	150						
	3	10	□20	KGD$^{L}_{R}$-3T10-C	KGDS$^{R}_{L}$2020-C	KGDS$^{R}_{L}$ 2020X-3T10S	●	●	10	20	20		20	12	125	49.7	3	4			
			□25		KGDS$^{R}_{L}$2525-C	2525X-3T10S	●	●		25	25		25	7	150						
		20	□20	KGD$^{L}_{R}$-3T20-C	KGDS$^{R}_{L}$2020-C	-			20	20	20		20	12	125	59.7					
			□25		KGDS$^{R}_{L}$2525-C	-				25	25		25	7	150						
	4	10	□20	KGD$^{L}_{R}$-4T10-C	KGDS$^{R}_{L}$2020-C	-			10	20	20		20	12	125	49.7	4	5			
			□25		KGDS$^{R}_{L}$2525-C	-				25	25		25	7	150						
		20	□20	KGD$^{L}_{R}$-4T20-C	KGDS$^{R}_{L}$2020-C	-			20	20	20		20	12	125	59.7					
			□25		KGDS$^{R}_{L}$2525-C	-				25	25		25	7	150						
		25	□20	KGD$^{L}_{R}$-4T25-C	KGDS$^{R}_{L}$2020-C	-			25	20	20		20	12	125	64.7					
			□25		KGDS$^{R}_{L}$2525-C	-				25	25		25	7	150						
	5	10	□20	KGD$^{L}_{R}$-5T10-C	KGDS$^{R}_{L}$2020-C	-			10	20	20		20	12	125	49.7	5	6			
			□25		KGDS$^{R}_{L}$2525-C	-				25	25		25	7	150						
		25	□20	KGD$^{L}_{R}$-5T25-C	KGDS$^{R}_{L}$2020-C	-			25	20	20		20	12	125	64.7					
			□25		KGDS$^{R}_{L}$2525-C	-				25	25		25	7	150						

1. When using the toolholder in normal mounting position, the lower jaw of toolholder may interfere with the tool presetter.
2. The toolholder and blade descriptions are printed on the toolholder body. (Unit description is not printed.)
   KGDS-S : Left-hand Blade for Right-hand Toolholder, Right-hand Blade for Left-hand Toolholder.
   The toolholder is applicable for all blade with suitable hand.
3. CDX : Maximum depth to which processing can be made. (If the CDX is 20 mm or more, the maximum groove-depth of groove made by the 2-edge insert will be 18 mm.)

Applicable inserts ⇨ **G30~G33**

Toolholder identification system

KGD
KGDS

R | **2020** | **X** – **3** | **T10** | **S**

Toolholder hand	
R	Right-hand
L	Left-hand

Shank size
20 x 20 mm

Toolholder ype
Unit description

Applicable inserts
GDM / GDMS
3-4 mm

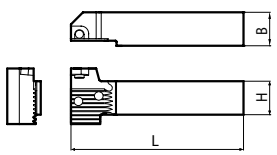
Max. depth of cut	
10	10 mm

S: Separate type / unit description

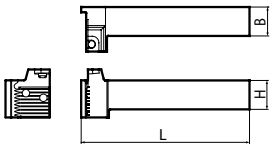
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Toolholder dimensions (Blade and toolholder)

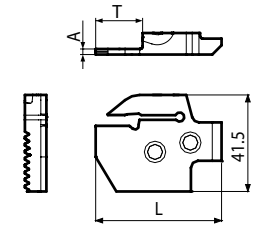
KGD-C (0° Separate Type)

Drawing of 0° type Right-hand shown	Toolholder description		Availability R	Availability L	Dimension (mm) L	B	H
	KGD$^{R/L}$	2020-C	●	●	104	20	20
		2525-C	●	●	129	25	25
		3232-C	●	●	149	32	32

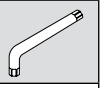
KGDS-C (90° Separate Type)

Drawing of 90° type Right-hand shown	Toolholder description		Availability R	Availability L	Dimension (mm) L	B	H
	KGDS$^{R/L}$	2020-C	●	●	122	20	20
		2525-C	●	●	147	25	25

Blade

Drawing of blade Right-hand shown	Blade description		Availability R	Availability L	Dimension (mm) L	T	A
	KGD$^{R/L}$	-2T17-C	●	●	51.2	17.2	1.7
		-3T10-C	●	●	44.2	10.2	2.4
		-3T20-C	●	●	53.2	20.2	
		-4T10-C	●	●	44.2	10.2	3.4
		-4T20-C	●	●	54.2	20.2	
		-4T25-C	●	●	59.2	25.2	
		-5T10-C	●	●	44.2	10.2	4.4
		-5T25-C	●	●	59.2	25.2	

Spare parts

Unit description	Spare parts Clamp bolt (for insert clamp)	Screw (for blade)	Wrench
			
KGD$^{R/L}$ ...S KGDS$^{R/L}$ ...S	BH6X10TR	SB-60120TR	LTW-25

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Setting the inserts

1. Use compressed air or other measures to remove chips from the insert mounting part (Ref. to Fig. 1).
2. Put the insert into the toolholder and push it makes contact with the back end of toolholder's surface (Ref. to Fig. 1 and 2).
3. Keeping the insert fit to the surface, tighten the insert clamp screw at an appropriate torque.
4. Make sure that there is no gap between the insert and the back end of the toolholder's surface and that the insert is set straight (Ref. to Fig. 2 and 3).

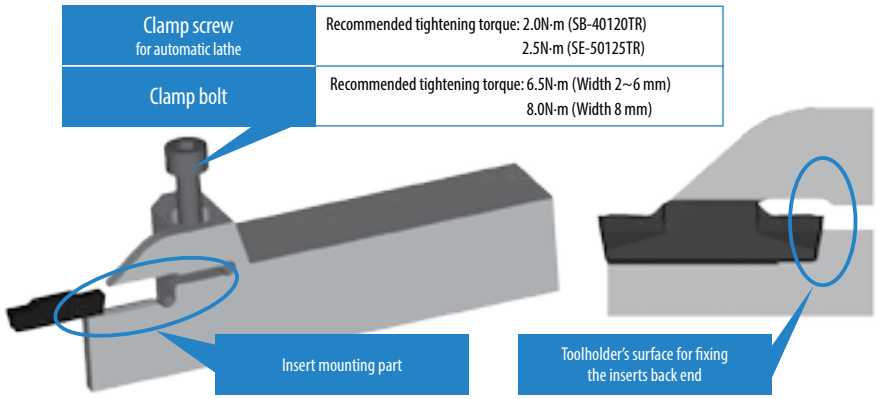


Fig. 1 Fig. 2

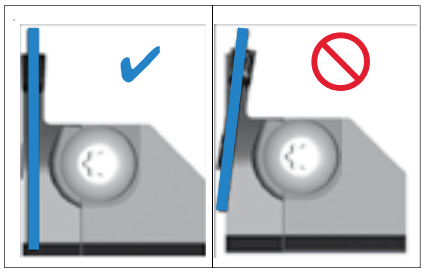


Fig. 3

Setting the blade (Separate type toolholder)

1. Use compressed air or other measures to remove chips and dust from the serration part (Ref. to Fig. 1).
2. Mate and fit the serrations of the blade and toolholder, and also fit the blade end to the toolholder. (Ref. to Fig. 2)
3. Tighten the blade fixing screws at an appropriate torque. You can tighten them in any order. (Ref. to Fig. 2)
   Recommended tightening torque : 8N·m
4. Set the insert after setting the blade.

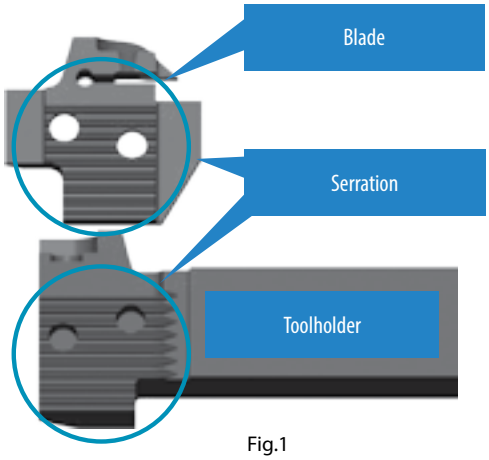


Fig.1

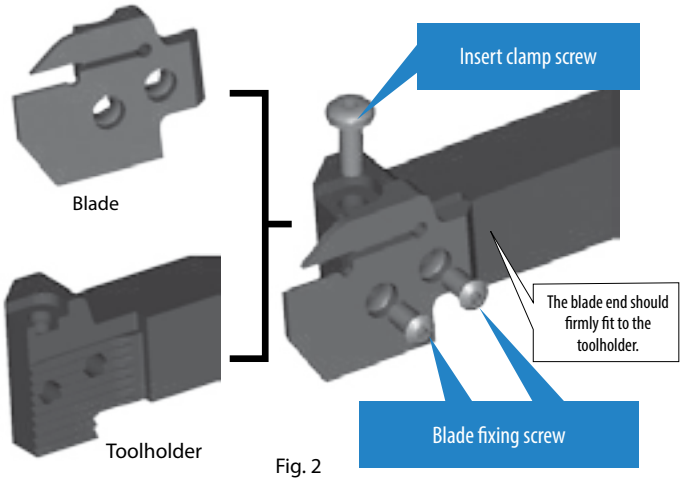
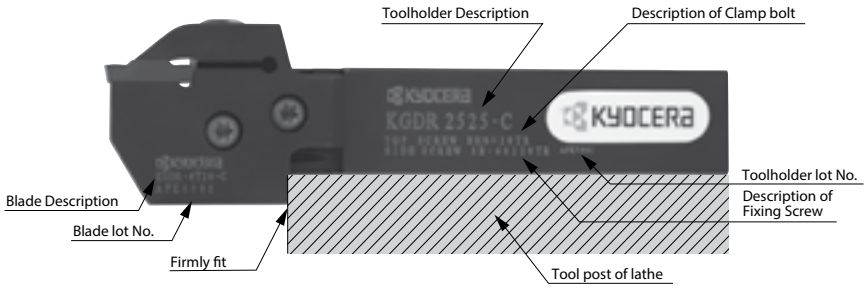


Fig. 2

Separate type toolholder identification system and their setting to lathe

Firmly fit the lower jaw to the tool post of the lathe.



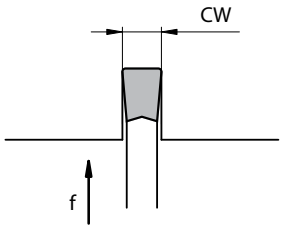
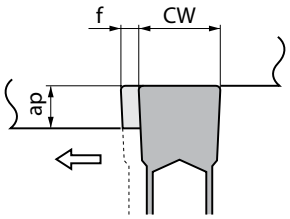
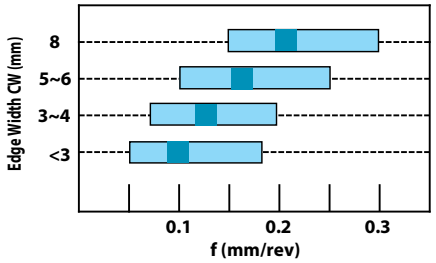
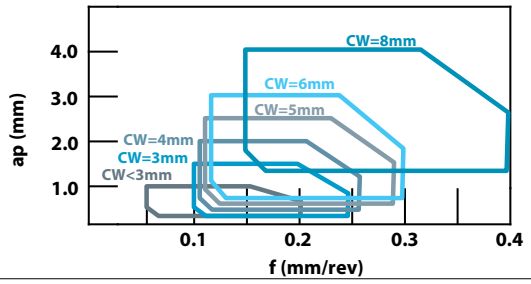
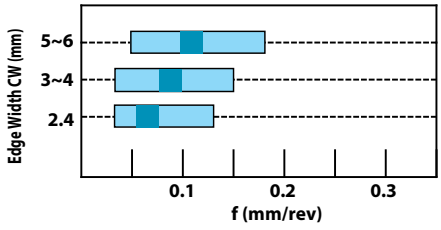
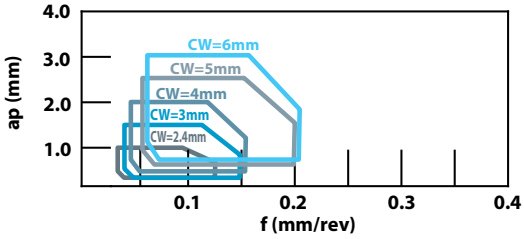
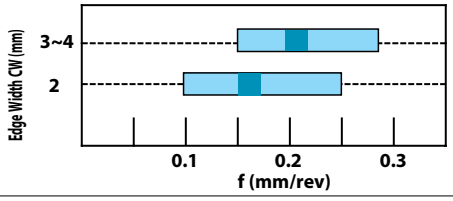
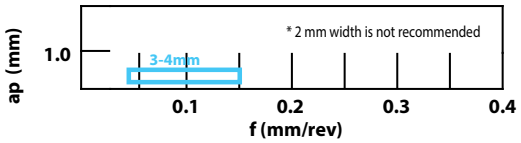
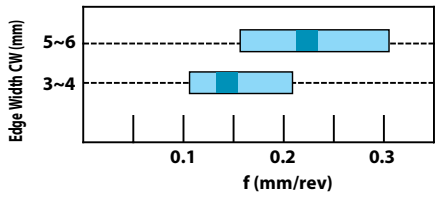
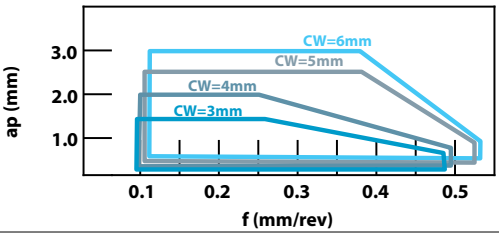
Recommended cutting conditions (cutting speed Vc)

Workpiece material	Chipbreaker	Recommended insert grades (Vc: m/min)									Remarks
		Cermet		MEGACOAT NANO	MEGACOAT		DLC	Carbide	MEGACOAT CBN	CBN	PCD	
		TN620	TN90	PR1535	PR1225	PR1215	PDL015	GW15	KBN05M	KBN570	KPD001	
Carbon steel	GM GL CM PH GS	☆ 80~220	☆ 100~220	☆ 80~200	★ 80~200	☆ 100~200	-	-	-	-	-	Coolant
Alloy steel		☆ 70~200	☆ 80~200	☆ 70~180	★ 70~180	☆ 80~180	-	-	-	-	-	
Stainless steel		-	-	★ 60~150	☆ 60~150	☆ 60~150	-	-	-	-	-	
Cast iron		-	-	-	-	★ 100~200	-	-	-	-	-	
Aluminum	GS AM NB	-	-	-	-	-	★ 200~500	☆ 200~450	-	-	★ 150~2,000	
Brass		-	-	-	-	-	-	☆ 100~200	-	-	★ 200~800	
Hard materials	NB	-	-	-	-	-	-	-	★ 80~150	-	-	
Sintered steel		-	-	-	-	-	-	-	-	★ 100~250	-	

★:1st recommendation ☆:2nd recommendation

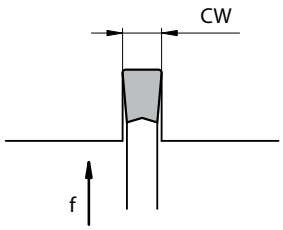
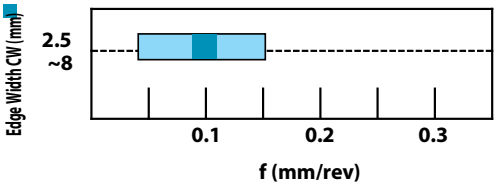
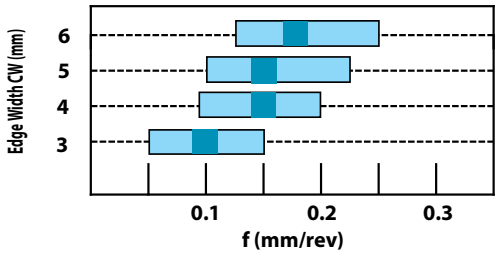
Recommended cutting conditions (feed rate / ap)

Workpiece material: C50

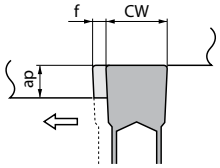
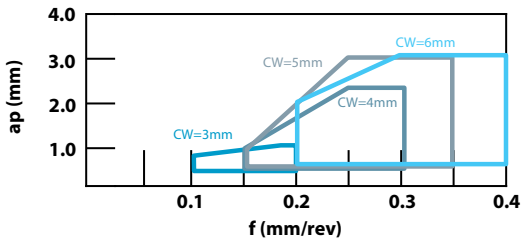
Chipbreaker	Grooving	Turning
	 ■ in the graph below indicates the most recommended value of feed (f)	
GM (General purpose)		
GL (Low feed)		
PH (High feed)		
CM (Copying)		

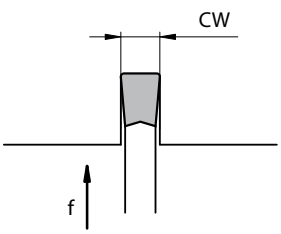
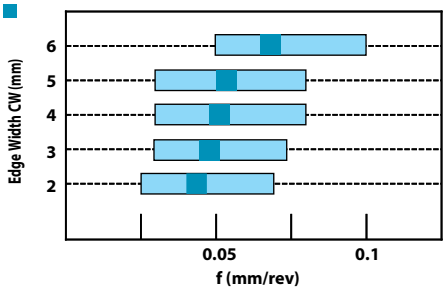
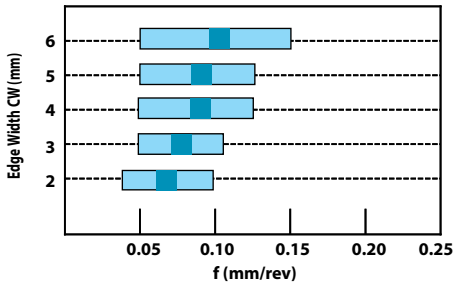
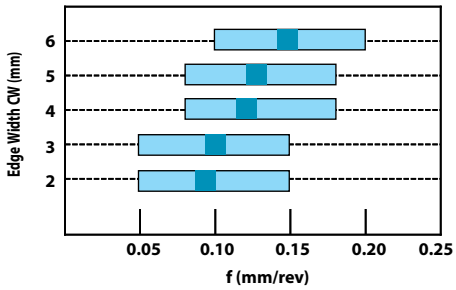
Note 1. The above values are based on the condition that CDX of toolholder is 17 mm or less.
2. If the toolholder is not for the 8 mm width insert and its dimension CDX is over 17 mm, set the values for turning to 90% or less of those above.

Recommended cutting conditions (feed rate / ap)

Chipbreaker	Workpiece material	Grooving
		 in the graph below indicates the most recommended value of feed (f)
GS (Low cutting force)	S50C	 When turning: keep ap less than or equal to the corner-R(RE).
AM (Non-ferrous metals)	AlMg2.5	

Note 1. The above values are based on the condition that CDX of toolholder is 17 mm or less.

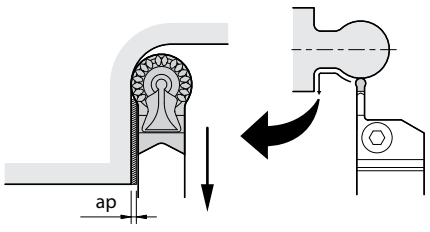
Chipbreaker	Workpiece material	Turning
		
AM (Non-ferrous metals)	AlMg2.5	

Workpiece material	Insert grades	Grooving
		 in the graph below indicates the most recommended value of feed (f)
Hard materials	KBN05M	
Sintered steel	KBN570	
Non-ferrous metals	KPD001	

CM chipbreaker [Cutting amount (ap) in back copying]

Maximum ap in back copying

Description		Maximum ap (mm)				
		Toolholder description				
		KGD…-2T…	KGD…-3T…	KGD…-4T…	KGD…-5T…	KGD…-6T…
GDM	3020N-150R-CM	0.24	0.20	-	-	-
	4020N-200R-CM	-	0.24	0.20	-	-
	5020N-250R-CM	-	-	0.30	0.20	-
	6020N-300R-CM	-	-	-	0.30	0.25



Guide for external grooving

Point 1 - Turning after grooving

1. Grooving depth over 0.5 mm: For roughing - refer to fig. 1
Before turning, pull the tool back about 0.1mm after grooving, instead of turning subsequent to grooving.
Failure to pull the tool back before traverse machining will result in an unbalanced load applied on only one side of the cutting edge.

2. Grooving depth under 0.5 mm: For finishing - refer to fig. 2
Turning subsequent to grooving is possible because shallow groove depths relate a small load on the cutting edge.
Retention time is not necessary.

Point 2

1. When widening the groove width (Refer to Fig.3), apply the "Step Turning."
2. The widened groove and side walls should be finished last. For better chip control, ap over 0.5 mm is recommended. Note: If the workpiece is not supported at the center, reduce the feed rate when grooving towards center.

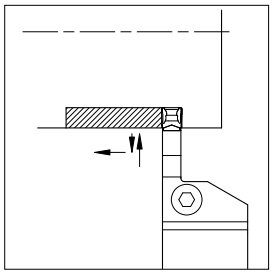


Fig.1
Before turning, pull the tool back about 0.1 mm after grooving. Grooving depth over 0.5 mm: At roughing

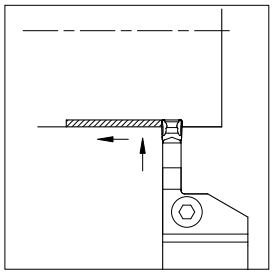


Fig. 2
Turning subsequent to grooving. Grooving depth under 0.5 mm: At finishing

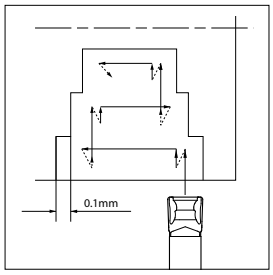
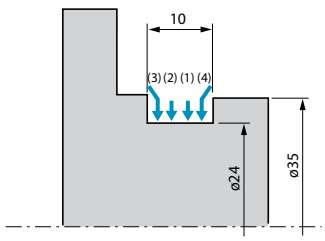


Fig. 3

Case Studies

17Cr3 (Grooving)

Gear
Vc = 113~164 m/min
f = 0.06 mm/rev
Wet
GDM4020N-040GM
(PR1225)
KGDL2525X-3T10S



GM chipbreaker (PR1225)	1,500 pcs/c
Competitor K (PVD coated carbide)	250 pcs/c

- GM chipbreaker (PR1225) showed 6 times longer tool life than that of Competitor K.
- Good chip control without burned chips.

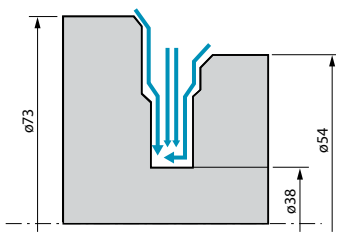


GM chipbreaker Competitor K

Evaluation by the user

20CrMo5 (Grooving / Turning)

Gear
Vc = 170 m/min
f = 0.15 mm/rev (Roughing)
0.10 mm/rev (Finishing)
ap = 0.2 mm (Finishing)
Wet
GDM4020N-040GM
(PR1215)
KGDR2525X-4T20S



GM chipbreaker (PR1215)	250 pcs/c
Competitor L (Roughing: PVD coated carbide; Finishing: cermet)	200 pcs/c

- GM chipbreaker reduced occurrence rate of tangle of chips (occurrence rate 80% to 10%). The problem was persistent with Competitor L.
- Machining productivity is improved.



GM Chipbreaker (Finishing)
Smooth chip control

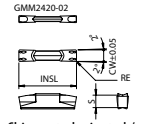
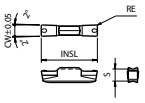
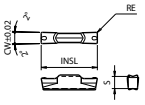


Competitor L (Finishing)
Chips easily tangled

Evaluation by the user

GM/GMN/GMM/GMG/GMGA/FGG

		P	M	K	N	S	H
Carbon steel / Alloy steel		○	●				
Stainless steel		●	○				
Cast iron				●			
Non-ferrous metals					●		
Titanium alloy					●		
Hard materials (~ 40HRC)			○				●
Hard materials (40HRC ~)							

Insert		Description		No. of edges	Dimension (mm) CW	S	RE	INSL	Tolerance (mm) CW min.	CW max.	Carbide CVD CR9025	PVD PR905	PR915	PR930	- KW10	Cermet - TN90	Applicable toolholder ➡ G55~G58 G95
	 Chip control oriented / M class	GMM	2420-020MW	2	2.4	4.3	0.2	20	-0.05	+0.05	●	●		●		●	KGM...2.5(...) KGM...2(...)
		GMM	3020-020MW 3020-040MW	2	3	4.3	0.2 0.4	20	-0.05	+0.05	● ●	● ●	● ●	● ●	● ●	● ●	KGM...3(...) KGM...2.5(...) KGM...2(...)
		GMM	4020-020MW 4020-040MW 4020-080MW	2	4	4.3	0.2 0.4 0.8	20	-0.05	+0.05	● ● ●	● ● ●	 ● ●	● ● ●	 ● ●	● ● ●	KGM...4(...) KGM...3(...)
		GMM	5020-040MW 5020-080MW	2	5	4.3	0.4 0.8	20	-0.05	+0.05	● ●	● ●	 ●	● ●	● ●	● ●	KGM...5(...) KGM...4(...)
		GMM	6020-040MW 6020-080MW	2	6	4.3	0.4 0.8	20	-0.05	+0.05	● ●	● ●	● 	● ●	 ●		KGMR...6T30 KGM...5(...)
		GMM	8030-080MW	2	8	5.5	0.8	30	-0.05	+0.05	●	●	●	●	●		KGM$^{R}_{L}$ 2525M-8 KIGM..6540B-8 KFMS...-8
	 Sharp cutting oriented / M class	GMM	3020-020MS 3020-040MS	2	3	4.3	0.2 0.4	20	-0.05	+0.05	● ●	 	● ●	● ●	● ●	● ●	KGM...3(...) KGM...2.5(...) KGM...2(...)
		GMM	4020-040MS	2	4	4.3	0.4	20	-0.05	+0.05	●		●	●	●	●	KGM...4(...) KGM...3(...)
		GMM	5020-040MS	2	5	4.3	0.4	20	-0.05	+0.05	●		●	●	●		KGM...5(...) KGM...4(...)
	 Sharp cutting oriented / Precision class	GMG	3020-000MS 3020-020MS 3020-040MS	2	3	4.3	0 0.2 0.4	20	-0.02	+0.02	● ●	 	● ●	● ●	● ●	● ●	KGM...3(...) KGM...2.5(...) KGM...2(...)
		GMG	4020-020MS 4020-040MS 4020-080MS	2	4	4.3	0.2 0.4 0.8	20	-0.02	+0.02	● ●	 	 ●	● ●	● ●	● ●	KGM...4(...) KGM...3(...)
		GMG	5020-040MS 5020-080MS	2	5	4.3	0.4 0.8	20	-0.02	+0.02				● ●	●		KGM...5(...) KGM...4(...)
		GMG	6020-080MS	2	6	4.3	0.8	20	-0.02	+0.02					●		KGMR...6T30 KGM...5(...)

Recommended cutting conditions ➡ G143

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

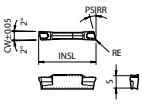
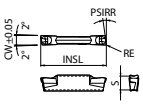
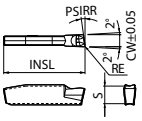
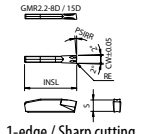
GM/GMN/GMM/GMG/GMGA/FGG

GM/GMN/GMM/GMG/GMGA/FGG

GM/GMN/GMM/GMG/GMGA/FGG

GM/GMN/GMM/GMG/GMGA/FGG

Carbon steel / Alloy steel	◌	●	P
Stainless steel	●	◌	M
Cast iron	●		K
Non-ferrous metals		●	N
Titanium alloy		●	S
Hard materials (~ 40HRC)	○	●	H
Hard materials (40HRC ~)			

Insert		Description		No. of edges	Dimension (mm) CW	S	RE	INSL	Angle (°) PSIR R/L	Tolerance (mm) CW min.	CW max.	Carbide CVD CP9025	Carbide PVD PR905	PR915	PR930	Carbide - KW10	Cermet - TN90	Applicable toolholder G55~G58
	 Sharp cutting oriented	GMM	1520R-MT-15D	2	1.5	4.3	0 0.05	20	15	- 0.05	+ 0.05			●		●		KGM...1.5(...)
		GMM	2020R-MT-15D 2020R-MT-15D 2020L-MT-15D	2	2	4.3	0 0.05 0	20	15	- 0.05	+ 0.05	●		●	● ●	●		KGM...2(...) KGM...1.5(...)
		GMM	2520R-MT-15D	2	2.5	4.3	0 0.05	20	15	- 0.05	+ 0.05			●	●	●		KGM...2.5(...) KGM...2(...)
		GMM	3020R-MT-15D 3020R-MT-15D 3020L-MT-15D	2	3	4.3	0 0.05 0	20	15	- 0.05	+ 0.05	●		●	● ●	●		KGM...3(...) KGM...2.5(...) KGM...2(...)
	 Stability oriented	GMM	2020R-TK-8D	2	2	4.3	0.2	20	8	- 0.05	+ 0.05			●	●	●		KGM...2(...) KGM...1.5(...)
		GMM	2520R-TK-8D	2	2.5	4.3	0.2	20	8	- 0.05	+ 0.05				●			KGM...2.5(...) KGM...2(...)
		GMM	3020R-TK-8D	2	3	4.3	0.25	20	8	- 0.05	+ 0.05	●		●	●			KGM...3(...) KGM...2.5(...) KGM...2(...)
	 1-edge / Stability oriented	GMR	2-TK-8D	1	2	4.3	0.2	20	8	- 0.05	+ 0.05				●	●		KGM...2(...) KGM...1.5(...)
		GMR	3-TK-8D	1	3	4.3	0.25	20	8	- 0.05	+ 0.05			●	●	●		KGM...3(...) KGM...2.5(...) KGM...2(...)
		GMR	4-TK-8D	1	4	4.3	0.3	20	8	- 0.05	+ 0.05			●	●	●		KGM...4(...) KGM...3(...)
	 1-edge / Sharp cutting oriented	GMR GML	2.2-8D 2.2-8D	1	2.2	4.3	0.17	20	8	- 0.05	+ 0.05	●			● ●	●	●	KGM...2(...)
		GMR	2.2-15D	1	2.2	4.3	0	20	15	- 0.05	+ 0.05	●			●	●	●	
		GMR GML	3-4D 3-4D	1	3	4.3	0.2	20	4	- 0.05	+ 0.05	● ●			● ●	●	●	KGM...3(...) KGM...2.5(...) KGM...2(...)
		GMR GML	4-4D 4-4D	1	4	4.3	0.25	20	4	- 0.05	+ 0.05	● ●						KGM...4(...) KGM...3(...)

Handed insert shows Right-hand

Recommended cutting conditions G143

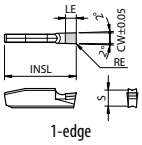
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GM/GMN/GMM/GMG/GMGA/FGG

Cutting edge preparation

Symbol	Specification	Example	
F	Sharp edge	F	Sharp edge
E	R-honed	E008	R0.08mm honed

Carbon steel / Alloy steel																P
Stainless steel																M
Cast iron																K
Non-ferrous metals														●		N
Titanium alloy														●		S
Hard materials (~ 40HRC)																H
Hard materials (40HRC ~)												○	●			

Insert	Description	Edge preparation type	No. of edges	Dimension (mm) CW	S	RE	INSL	LE	Tolerance (mm) CW min.	CW max.	CBN - KBN510	CBN - KBN525	PCD - KPD001	PCD - KPD010	Applicable toolholder ⇒ G55~G58
  1-edge	GMN 2	E008	1	2	4.3	0.2	20	2.9	- 0.05	+ 0.05	●	●			KGM...2(...) KGM...1.5(...)
	GMN 2	F	1	2	4.3	0.2	20	2.9	- 0.05	+ 0.05			●	●	
	GMN 3	E008	1	3	4.3	0.4	20	2.9	- 0.05	+ 0.05	●	●			KGM...3(...) KGM...2.5(...) KGM...2(...)
	GMN 3	F	1	3	4.3	0.2	20	2.9	- 0.05	+ 0.05			●	●	
	GMN 4	E008	1	4	4.3	0.4	20	2.9	- 0.05	+ 0.05	●	●			KGM...4(...) KGM...3(...)
	GMN 4	F	1	4	4.3	0.2	20	2.9	- 0.05	+ 0.05			●	●	
	GMN 5	F	1	5	4.3	0.2	20	2.9	- 0.05	+ 0.05			●	●	KGM...5(...) KGM...4(...)
	GMN 6	F	1	6	4.3	0.2	20	2.9	- 0.05	+ 0.05				●	KGMR...6T30 KGM...5(...)

Recommended cutting conditions ⇒ G146

Features of Chipbreaker

Series	Insert	Features
GMM MW		Excellent chip evacuation at Grooving, Turning, Cut-off
GMG MG		Low cutting force with ground chipbreaker
GMG MS GMM MS		Grooving / Turning / Cut-off operations are minimum cutting force at Positive Edge
GMM MT		Small corner-R(RE) and minimize the core which remains in the center of the face
GMM TK		Large corner-R(RE) and stable performance at cut-off
GMM NB		Flat rake face and non-chipbreake It works well for brass

Edge Preparation

Edge Prep.	Chamfered + R-honed Corner-R(RE) = 0.05	Chamfered + R-honed Sharp Corner
		
MT Chipbreaker	CR9025 / PR915	PR930 / KW10
Edge Prep.	Chamfered + R-honed Corner-R(RE) = 0.2 ~ 0.3	Sharp Edge Corner-R(RE) = 0.2 ~ 0.3
		
TK Chipbreaker	CR9025 / PR915	PR930 / KW10
Edge Prep.	R-honed Corner-R(RE) = 0.05	Sharp Edge Sharp Corner
		
Without Chipbreaker (-NB)	CR9025	PR930 / KW10

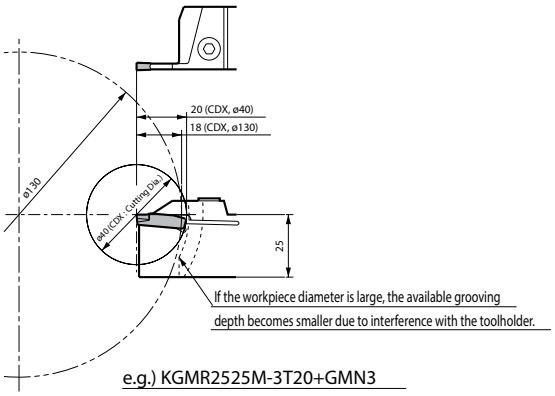
· Sharp Edge Spec. can reduce cutting force by 40% less than that of chamfer edge.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

Available Cutting Diameter of KGM (for automatic lathe) / KGM-T

· There is a limit to available grooving depth depending on the workpiece diameter.



e.g.) KGMR2525M-3T20+GMN3

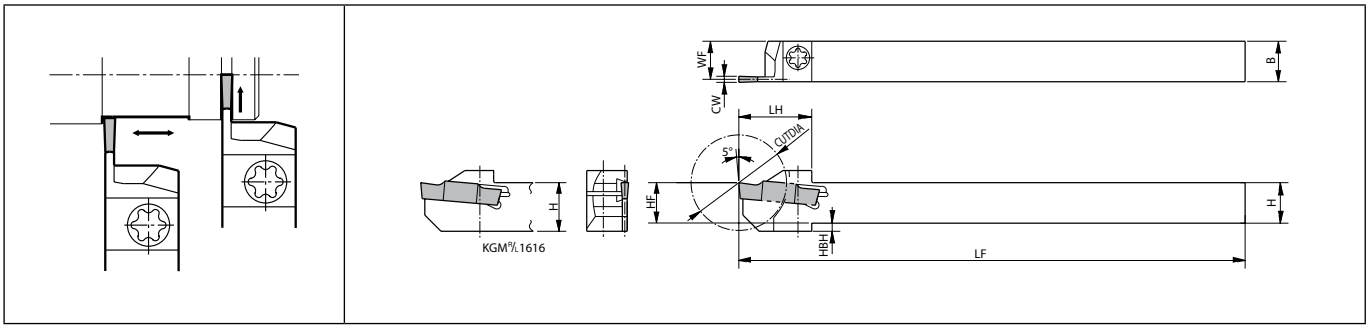
KGM (for automatic lathe) Possible Cutting Diameter and Available Grooving Depth Table

Toolholder Description		DCX (Cutting Dia.)																
KGM$^{R}/_{L}$	1010□-1.5...	-	-	-	-	-	-	-	18	21	26	38	76	∞				
	1212□-1.5...	-	-	-	-	23	27	37	71	∞	∞	∞	∞					
	1010□-2...	-	-	-	-	-	-	-	18	21	26	38	76					
	1212□-2...	-	-	-	-	23	27	37	71	∞								
	1616□-2...	30	37	47	68	89	131	∞	∞									
	1212□-2.5...	-	-	-	-	23	27	37	71									
	1616□-2.5...	30	37	47	68	89	131	∞	∞									
	1616□-3...																	
Available Grooving Depth CDX (mm)		15	14	13	12	11.5	11	10	9	8	7	6	5	4	3	2	1	

KGM-T Possible Cutting Diameter and Available Grooving Depth Table (GMN, GM$^{R}/_{L}$ when using 1-edge insert)

Toolholder Description		DCX (Cutting Dia.)												
KGM$^{R}/_{L}$	2012K-2T17	-	-	-	-	-	-	-	-	66	80	130	260	∞
	2020K-2T17													
	2525M-2T17													
	1616H-3T20	-	-	-	-	-	40	54	70	100	180	∞	∞	
	2012K-3T20	-	-	-	-	-	40	90	130	240	∞			
	2020K-3T20													
	2525M-3T20													
	2020K-4T20													
	2525M-4T20													
	2525M-4T25	-	-	50	140	240	∞	∞	∞	∞				
	2525M-5T25													
	3232P-5T25				280	600								
	2525M-6T30	100	300	∞	∞	∞								
Available Grooving Depth CDX (mm)		30	27	25	23	22	20	19	18	17	16	15	14	13 or under

KGM (External grooving)



Right-hand shown

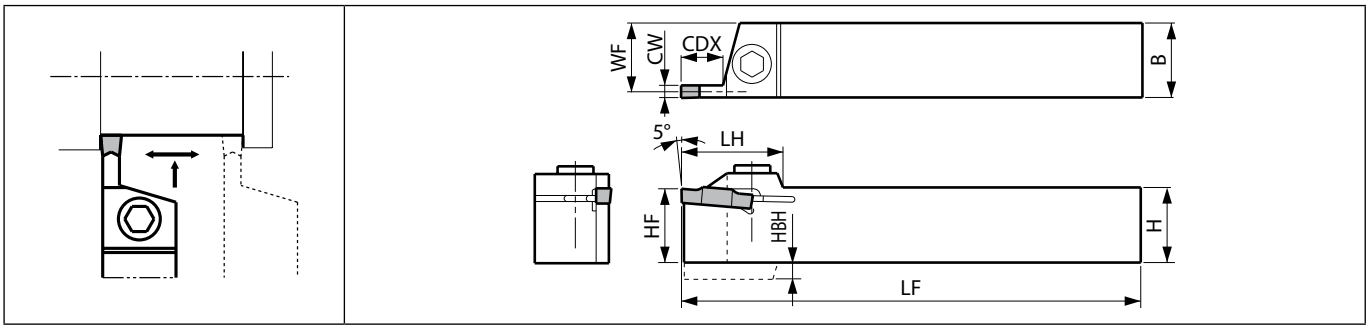
Toolholder dimensions

Description		Availability		Dimension (mm)										Spare parts		Applicable inserts ⇒ G48,G49 G51~G53
		R	L	CUTDIA	H	B	LH	HF	HBH	LF	WF	CW min.	CW max.	Screw	Wrench	
KGM R/L	1010JX-1.5	●	●	18	10	10	18	10	2	120	9.4	1.5	2	SE-40120TR	LTW-15S	GMM1520... GM.2 GM.20...
	1212F-1.5-85	●		23	12	12	19	12		85	11.4					
	1212JX-1.5	●	●							120						
KGM R/L	1010JX-2	●	●	18	10	10	18	10	2	120	9.15	2	3	SE-40120TR	LTW-15S	GM.2 GM.20... GM.24... GM.25... GM.3 GM.30...
	1212F-2-85	●	●	23	12	12	19	12		85	11.15					
	1212JX-2	●	●							120						
	1616JX-2	●	●	30	16	16	24.5	16	-		15.15			SE-50125TR	LTW-20	
KGM R/L	1212F-2.5-85	●		23	12	12	19	12	2	85	11	2.4	3	SE-40120TR	LTW-15S	GM.24... GM.25... GM.3 GM.30...
	1212JX-2.5	●	●							120						
	1616JX-2.5	●	●	30	16	16	24.5	16	-		15			SE-50125TR	LTW-20	
KGM R/L	1616JX-3	●	●	30	16	16	24.5	16	-	120	14.8	3	4	SE-50125TR	LTW-20	GM.3, GM.30..., GM.35..., GM.4, GM.40...

If using a full-R insert, you need to modify the corner of insert adapter part of toolholder.
KGM will be switched to KGD=> **G35**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGM (External grooving)



Right-hand shown

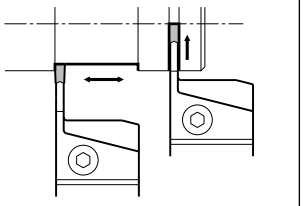
Toolholder dimensions

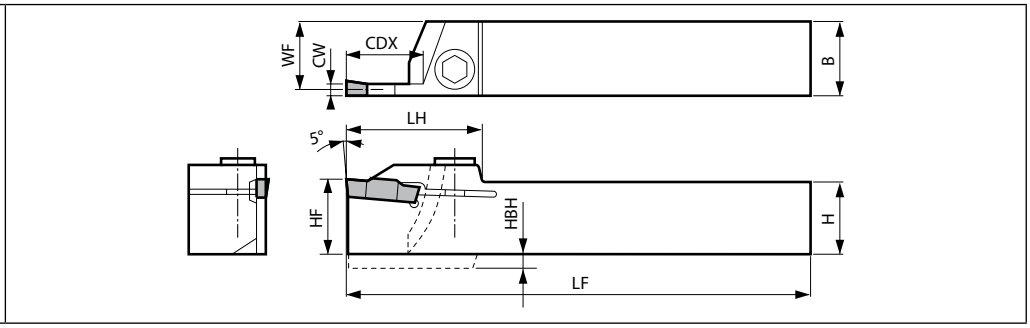
Description		Availability		Dimension (mm)										Spare parts				Applicable inserts ⇒ G48~G53
														Clamp bolt	Clamp screw (Torx)	Wrench	Wrench	
		R	L	CDX	H	B	LH	HF	HBH	LF	WF	CW min.	CW max.					
KGM$^{R}_{L}$	1212H-3	●		9	12	12	27	12	4	100	10.8	3	3	-	SB-5TR	-	LTW-20	GM.3 GM.30...
	1616H-3	●			16	16		16			14.8		4	HH5X16	-	LW-4	-	GM.3 GM.30... GM.35... GM.4 GM.40...
	2020K-3	●	●		20	20		20	-	125	18.8							
	2525M-3	●	●		25	25		25		150	23.8			HH5X25				
KGM$^{R}_{L}$	2020K-4	●		10	20	20	27	20	-	125	18.3	4	5	HH5X16	-	LW-4	-	GM.4 GM.40... GM.5 GM.50...
	2525M-4	●	●		25	25		25		150	23.3			HH5X25				
KGMR	2020K-5	●		10	20	20	27	20	-	125	17.8	5	6	HH5X16	-	LW-4	-	GM.5 GM.50... GM.6 GM.60...
	2525M-5	●			25	25		25		150	22.8			HH5X25				
KGM$^{R}_{L}$	2525M-8	●	●	25	25	25	40	25	7.5	150	22	8	8	HH6X25	-	LW-5	-	GM..8030...

CDX shows available grooving depth.
4mm width Insert can be installed in KGM$^{R}_{L}$ 1212H-3, but is not recommended due to the toolholder's rigidity.
If using a full-R insert, you need to modify the corner of insert adapter part of toolholder.
KGM will be switched to KGD=> **G34**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGM-T (External grooving / Deep grooving)





Right-hand shown

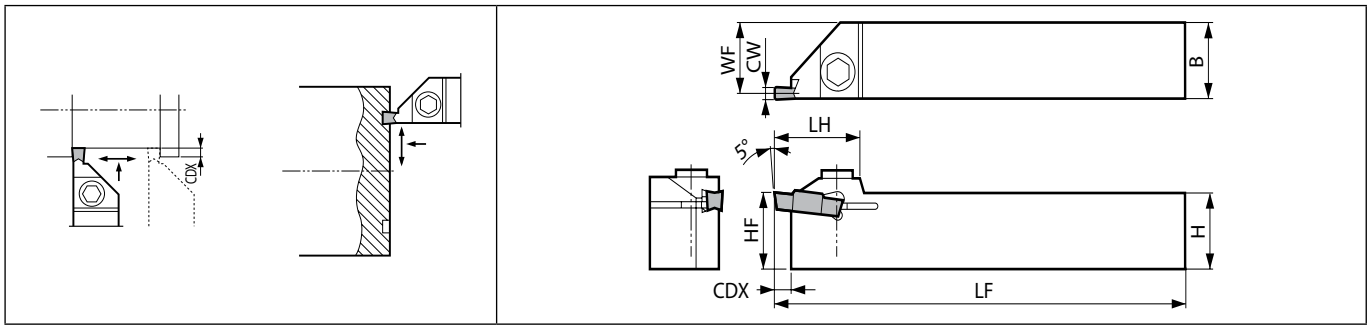
Toolholder dimensions

Description		Availability		Dimension (mm)										Spare parts				Applicable inserts G48~G53
														Clamp bolt	Clamp screw (Torx)	Wrench	Wrench	
		R	L	CDX	H	B	LH	HF	HBH	LF	WF	CW min.	CW max.					
KGM R/L	2012K-2T17		●	17	20	12	33	20	-	125	11.15	2	3	-	SB-5TR	-	LTW-20	GM.2 GM.20... GM.24... GM.25... GM.3 GM.30...
	2020K-2T17	●	●			20					19.15			HH5X16	-	LW-4	-	
	2525M-2T17	●	●		25	25		25		150	24.15			HH5X25				
KGM R/L	1616H-3T20	●		20	16	16	36	16	4	100	14.8	3	4	HH5X16	-	LW-4	-	GM.3 GM.30... GM.35... GM.4 GM.40...
	2012K-3T20		●		20	12		20	-	125	10.8			-	SB-5TR	-	LTW-20	
	2020K-3T20	●	●			20					18.8			HH5X16	-	LW-4	-	
	2525M-3T20	●	●		25	25		25		150	23.8			HH5X25				
KGM R/L	2020K-4T20	●		20	20	20	36	20	-	125	18.3	4	5	HH5X16	-	LW-4	-	GM.4 GM.40... GM.5 GM.50...
	2525M-4T20	●			25	25		25		150	23.3			HH5X25				
	2525M-4T25	●	●	25			41											
KGM R/L	2525M-5T25	●	●	25	25	25	42	25	-	150	22.8	5	6	HH5X25	-	LW-4	-	GM.5 GM.50... GM.6 GM.60...
	3232P-5T25	●			32	32		32		170	29.8							
KGMR	2525M-6T30	●		30	25	25	45	25	-	150	22.4	6	6	HH5X25	-	LW-4	-	GM.6 GM.60...

If using a full-R insert, you need to modify the corner of insert adapter part of toolholder.
CDX shows the distance from the toolholder to the cutting edge. Ref. to the Table (G54) for the relationship between the available grooving depth and the cutting dia.
When using GMG / GMM (2-edge) insert, set the groove depth under 15 mm.
KGM will be switched to KGD=> **G34**

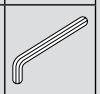
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGMM (External grooving / Face grooving)



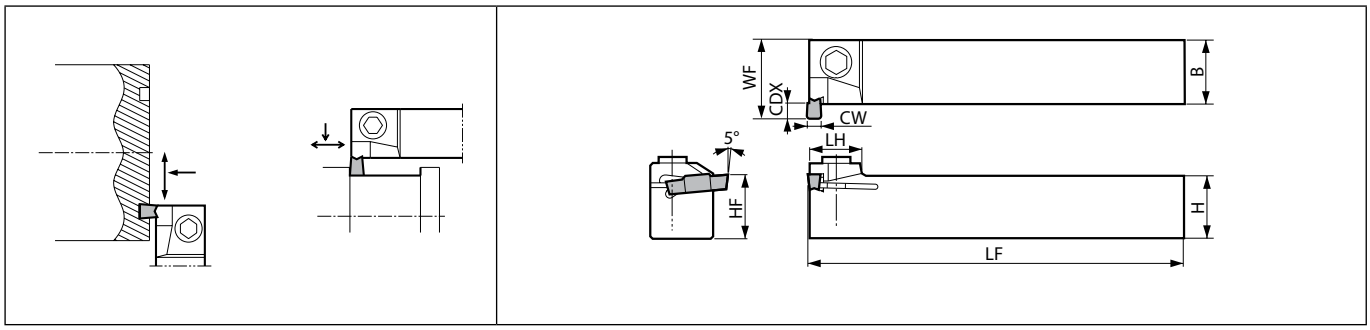
Right-hand shown

Toolholder dimensions

Description	Availability	Dimension (mm)									Spare parts		Applicable inserts G48~G53
											Clamp bolt	Wrench	
	R	CDX	H	B	LH	HF	LF	WF	CW min.	CW max.			
KGMMR 2525M-3	●	4.8	25	25	25	25	150	23.8	3	5	HH5X25	LW-4	FGG... , GM.3(...), GM.4(...), GM.5(...)

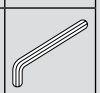
CDX shows available grooving depth. (Ref. to the table **G59** for Face Grooving)

KGMS (External grooving / Face grooving)



Right-hand shown

Toolholder dimensions

Description	Availability	Dimension (mm)									Spare parts		Applicable inserts G48~G53
											Clamp bolt	Wrench	
	R	CDX	H	B	LH	HF	LF	WF	CW min.	CW max.			
KGMSR 2525M-3	●	4.8	25	25	17	25	150	30	3	5	HH5X25	LW-4	FGG... , GM.3(...), GM.4(...), GM.5(...)

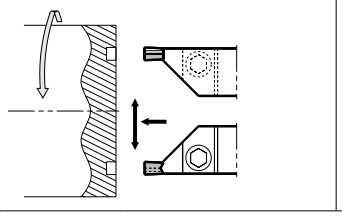
CDX shows available grooving depth. (Ref. to the table **G59** for Face Grooving)

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

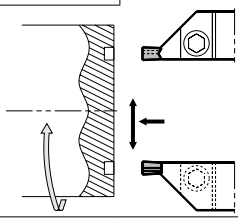
Selection of Insert & Toolholder (Face Grooving)

Case of KGMM

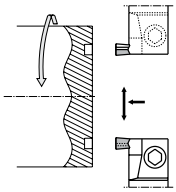
Toolholder	Right-hand
Insert	Left-hand



Toolholder	Right-hand
Insert	Right-hand

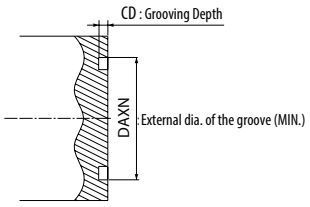


Toolholder	Right-hand
Insert	Left-hand



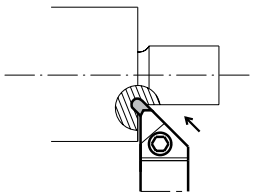
External dia. of the groove (min.) & Grooving Depth (Face Grooving)

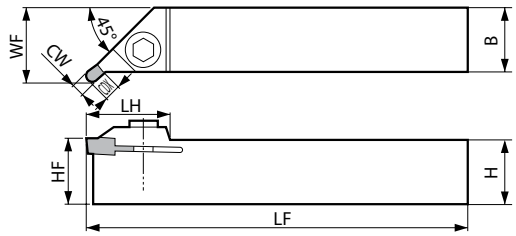
KGMM / KGMS (Common) (mm)



Description	DAXN	CD
GMG/GMM3020-○○○□□	ø100	4.8
GMG/GMM4020-○○○□□		
GMG/GMM5020-○○○□□		
FGG$^{R}/_{L}$3020-02	ø22	4.3
FGG$^{R}/_{L}$4020-04	ø28	4.8
FGG$^{R}/_{L}$5020-04	ø30	
GMG3020-150RU	ø22	4.3
GMG4020-200RU	ø28	4.8

KGMU (External grooving / Undercut grooving)





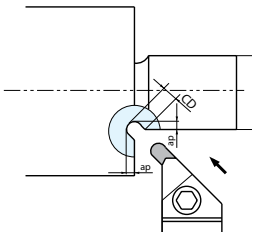
Right-hand shown

Toolholder dimensions

Description	Availability	Dimension (mm)									Spare parts		Applicable inserts G49
											Clamp bolt	Wrench	
	R	CDX	H	B	LH	HF	LF	WF	CW min.	CW max.			
KGMUR 2525M	●	4.8	25	25	28.5	25	150	28.6	3	5 (6)	HH5X25	LW-4	GMG3020..RU , GMG4020..RU

CDX shows the distance from the toolholder to the cutting edge. Ref. to the table below for the available grooving depth.
WF shows at GMM5020-RU. ( ) indicates external grooving inserts when installed.
External grooving inserts (grooving width 3 mm~6 mm) will be attached. (In case of using GMG○○20-○○○□□, GMM○○20-○○○□□, GMN○ insert)

Undercut Depth CD



Description	Undercut Depth	Distance from the face of the workpiece
	CD (mm)	ap (mm)
GMG3020-150RU	3.5	1.8
GMG4020-200RU	4.0	1.9

* In case of undercutting for the diameter 100mm or over,
Inserts for External Grooving
GMG○○20-○○○□□ ,GMM○○20-○○○□□ ,
GMN○ are also available.

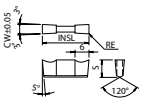
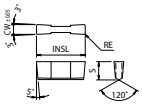
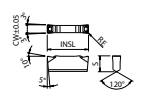
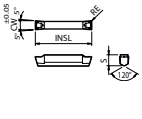
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GH/GHU/GA

Cutting edge preparation

Symbol	Specification	Example	
S	Chamfered and R-honed	S01020	0.10mm × 20° chamfered and R-honed
T	Chamfered	T01020	0.10mm × 20° chamfered

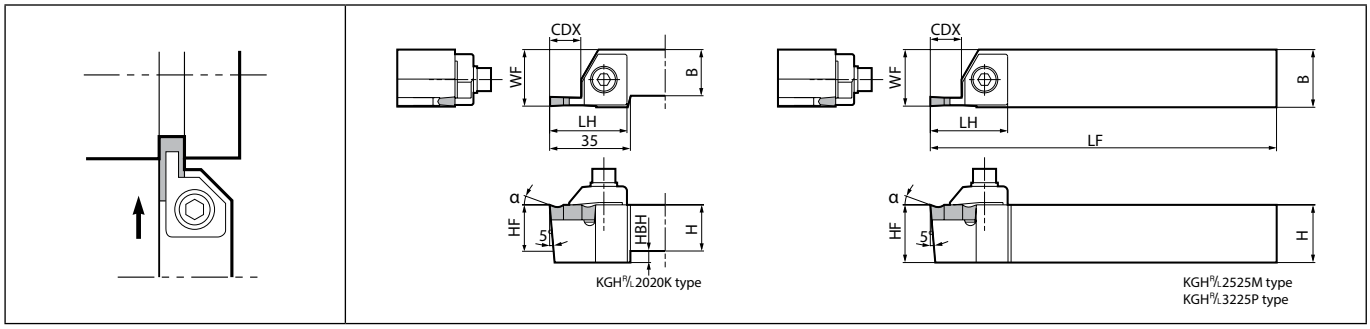
Carbon steel / Alloy steel			✖															P
Stainless steel			●															M
Cast iron				●			●	○										K
Non-ferrous metals				●														N
Titanium alloy				●														S
Hard materials (~ 40HRC)			●															H
Hard materials (40HRC ~)					○	●												

Insert	Description	Edge preparation type	No. of edges	Dimension (mm)				Tolerance (mm)		Carbide			Ceramic			Cermet		Applicable toolholder ➡ G62~G64
				CW	S	RE	INSL	CW min.	CW max.	CVD CR9025	PVD PR930	- KW10	PVD A66N	PVD PT600M	- A65	- TC40	- TN60	
		GH 4020-02	-	2	4	7.5	0.2	20	-0.05	+0.05		●	●				●	KGH$^{R}_{L}$ ...4 KGHS$^{R}_{L}$ ...4
		GH 4020-05	-	2	4	7.5	0.5	20	-0.05	+0.05		●	●				●	
		GH 4520-02	-	2	4.5	7.5	0.2	20	-0.05	+0.05							●	
		GH 4520-05	-	2	4.5	7.5	0.5	20	-0.05	+0.05							●	
		GH 5020-02	-	2	5	7.5	0.2	20	-0.05	+0.05		●	●				●	KGH$^{R}_{L}$ ...5 KGHS$^{R}_{L}$ ...5
		GH 5020-05	-	2	5	7.5	0.5	20	-0.05	+0.05		●	●				●	
		GH 5520-02	-	2	5.5	7.5	0.2	20	-0.05	+0.05							●	
		GH 5520-05	-	2	5.5	7.5	0.5	20	-0.05	+0.05							●	
		GH 6020-02	-	2	6	7.5	0.2	20	-0.05	+0.05		●	●				●	
		GH 6020-05	-	2	6	7.5	0.5	20	-0.05	+0.05		●	●				●	
		GH 6520-02	-	2	6.5	7.5	0.2	20	-0.05	+0.05							●	
		GH 6520-05	-	2	6.5	7.5	0.5	20	-0.05	+0.05							●	
		GH 7020-02	-	2	7	7.5	0.2	20	-0.05	+0.05		●	●				●	KGH$^{R}_{L}$ ...7
		GH 7020-05	-	2	7	7.5	0.5	20	-0.05	+0.05		●	●				●	
		GH 7520-02	-	2	7.5	7.5	0.2	20	-0.05	+0.05							●	
		GH 7520-05	-	2	7.5	7.5	0.5	20	-0.05	+0.05							●	
		GH 8020-02	-	2	8	7.5	0.2	20	-0.05	+0.05		●	●				●	
		GH 8020-05	-	2	8	7.5	0.5	20	-0.05	+0.05		●	●				●	
		GH 10025-05	-	2	10	7.5	0.5	25	-0.05	+0.05		●	●					KGH$^{R}_{L}$ ...10
		GH 12025-05	-	2	12	7.5	0.5	25	-0.05	+0.05		●	●					
		GH 4020-05	S01020 T01020	2	4	7.5	0.5	20	-0.05	+0.05				●	●	●		KGH$^{R}_{L}$ ...4 KGHS$^{R}_{L}$ ...4
		GH 5020-05	S01020 T01020	2	5	7.5	0.5	20	-0.05	+0.05				●	●	●		KGH$^{R}_{L}$ ...5 KGHS$^{R}_{L}$ ...5
		GH 6020-05	T01020	2	6	7.5	0.5	20	-0.05	+0.05						●		
		GH 7020-05	T01020	2	7	7.5	0.5	20	-0.05	+0.05						●		KGH$^{R}_{L}$ ...7
		GHU 40-20	-	2	4	7.5	0.25	20	-0.05	+0.05	●						●	KGH$^{R}_{L}$ ...4 KGHS$^{R}_{L}$ ...4
		GHU 50-20	-	2	5	7.5	0.3	20	-0.05	+0.05	●						●	KGH$^{R}_{L}$ ...5 KGHS$^{R}_{L}$ ...5
		GHU 60-20	-	2	6	7.5	0.3	20	-0.05	+0.05	●						●	
		GA 30	-	2	3	5	0.2	25	-0.05	+0.05	●						●	KGA$^{R}_{L}$ ...3
		GA 40	-	2	4	5	0.25	25	-0.05	+0.05	●						●	KGA$^{R}_{L}$ ...4
		GA 50	-	2	5	5	0.3	30	-0.05	+0.05	●						●	KGA$^{R}_{L}$ ...5

Recommended cutting conditions ➡ G65

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGH (External grooving / Deep grooving)



Right-hand shown

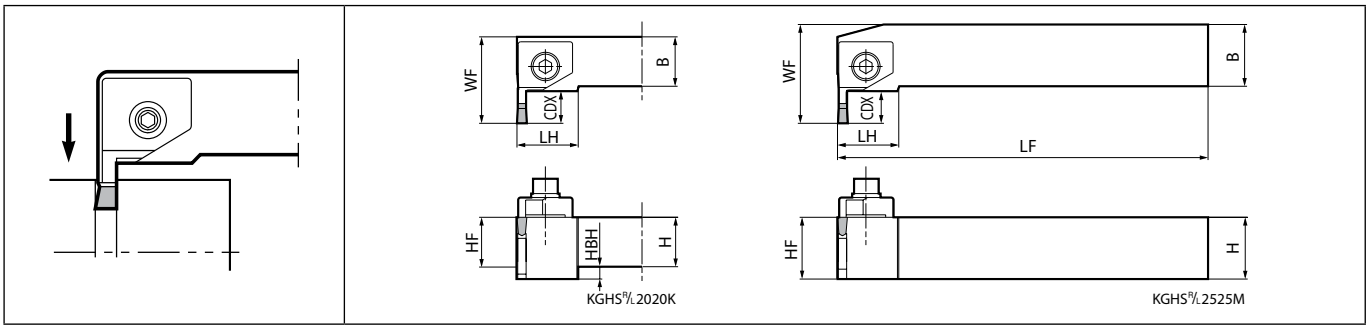
Toolholder dimensions

Description		Availability		Dimension (mm)									Clamp	Clamp bolt	Spring	Washer	Wrench	Applicable inserts ➡ G61
		R	L	CDX	H	B	LH	HF	HBH	LF	WF (min.)	WF (max.)						
KGHR/L	2020K-4	●	●	13	20	20	33.5	20	5	125	24.5	24.8	CGH-1R/L	HH6X25	SP-6	W-6	LW-5	GH4.20-.. , GHU40-20
	2525M-4	●	●		25	25		25	-	150								
KGHR/L	2020K-5	●	●	13	20	20	33.5	20	5	125	25	25.8	CGH-1R/L	HH6X25	SP-6	W-6	LW-5	GH5.20-.. , GHU50-20 GH6.20-.. , GHU60-20
	2525M-5	●	●		25	25		25	-	150								
	3225P-5	●	●		32			32		170								
KGHR/L	2020K-7	●	●	13	20	20	33.5	20	7	125	24.5	25	CGH-2R/L	HH6X25	SP-6	W-6	LW-5	GH7.20-.. GH8020-..
	2525M-7	●	●		25	25		25	-	150								
KGHR/L	2525M-10	●	●	17	25	25	41	25	-	150	25.5	26.5	CGH-3R/L	HH6X25	SP-6	W-6	LW-5	GH10025-05 GH12025-05
	3225P-10	●			32			32		170								

CDX shows available grooving depth.
WF of KGHR/L Toolholder depends on the insert's edge width.
Clamp : CGH-○R for Right-hand Toolholder and CGH-○L for Left-hand Toolholder.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGHS (External grooving / Deep grooving)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)								Spare parts					Applicable inserts ➡ G61
											Clamp	Clamp bolt	Spring	Washer	Wrench	
	R	L	CDX	H	B	LH	HF	HBH	LF	WF						
KGHSR/L 2020K-4	●	●	13	20	20	25	20	5	125	35	CGH-1 1/8R	HH6X25	SP-6	W-6	LW-5	GH4.20-.. , GHU40-20
2525M-4	●	●		25	25		25	-	150	40						
KGHSR/L 2020K-5	●	●	13	20	20	25	20	5	125	35	CGH-1 1/8R	HH6X25	SP-6	W-6	LW-5	GH5.20-.. , GHU50-20 GH6.20-.. , GHU60-20
2525M-5	●	●		25	25		25	-	150	40						

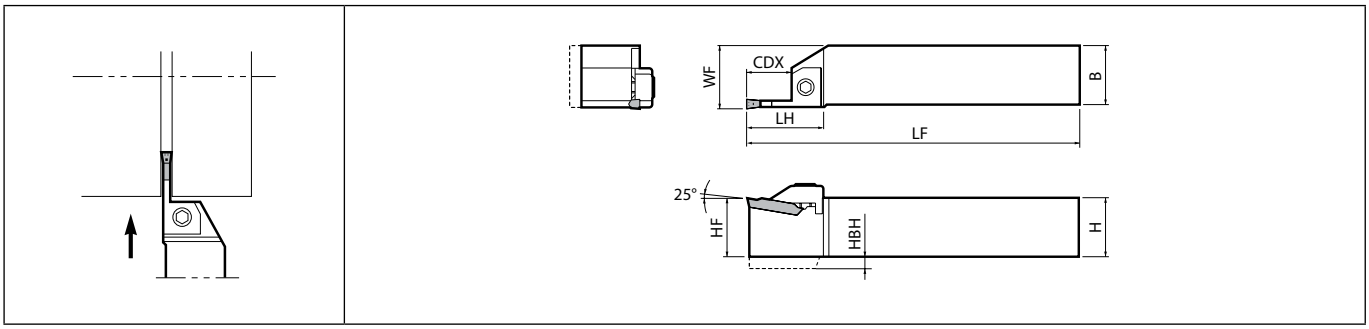
CDX shows available grooving depth.
Clamp : CGH-○L for Right-hand Toolholder and CGH-○R for Left-hand Toolholder.

Rake Angle (α) after Installment of GH / GHU insert

When using GH○○-○○		When using GHU○○-○○	
α	Insert Grades	α	Insert Grades
0°	A65, A66N, PT600M	10°	TN60 CR9025
10°	TC40		
20°	TN90, TC60 PR930 KW10		

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGA (External grooving / Deep grooving)



Right-hand shown

Toolholder dimensions

Description		Availability R	Availability L	Dimension (mm) CDX	H	B	LH	HF	HBH	LF	WF	Spare parts: Clamp bolt	Clamp	Spring	Wrench	Applicable inserts ➡ G61
KGA R/L	2020K-3	●	●	20	20	20	37	20	5	125	21.5	HH6X20	CGA-3 R/L	SP-6	LW-5	GA30
	2525M-3	●	●		25	25		25	-	150	26.5					
KGAR	2020K-4	●		20	20	20	37	20	5	125	21.5	HH6X20	CGA-4R	SP-6	LW-5	GA40
	2525M-4	●			25	25		25	-	150	26.5					
KGAR	2020K-5	●		25	20	20	42	20	5	125	21.5	HH6X20	CGA-5R	SP-6	LW-5	GA50
	2525M-5	●			25	25		25	-	150	26.5					

CDX shows available grooving depth.
Clamp : CGA-○R for Right-hand Toolholder and CGA-○L for Left-hand Toolholder.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Recommended cutting conditions

GH inserts - ground chipbreaker

Workpiece material	Recommended insert grades (Vc: m/min)							(1) f for grooving (mm/rev) (2) f for turning (mm/rev) (3) ap for turning (mm)				Remarks
	Cermet		PVD coated carbide	Carbide	Ceramic							
	TC40	TC60	PR930	KW10	A65	A66N	PT600M	GH 40~50...	GH 55~70...	GH 75~80...	GH 100~120...	
Carbon steel	☆ 150~220	☆ 100~150	★ 80~180	-	-	-	-	(1) 0.07~0.2 (2) 0.07~0.15 (3) Max. 1.0	(1) 0.07~0.2 (2) 0.07~0.15 (3) Max. 1.0	(1) 0.1~0.25 (2) 0.1~0.2 (3) Max. 1.5	(1) 0.15~0.3 (2) 0.15~0.25 (3) Max. 2.0	Coolant
Alloy steel	☆ 130~200	☆ 80~130	★ 80~160	-	-	-	-	(1) 0.07~0.18 (2) 0.07~0.13 (3) Max. 1.0	(1) 0.07~0.18 (2) 0.07~0.13 (3) Max. 1.0	(1) 0.1~0.23 (2) 0.1~0.18 (3) Max. 1.5	(1) 0.15~0.27 (2) 0.15~0.22 (3) Max. 2.0	
Stainless steel	-	☆ 60~100	★ 60~130	-	-	-	-	(1) 0.07~0.16 (2) 0.07~0.13 (3) Max. 1.0	(1) 0.07~0.16 (2) 0.07~0.13 (3) Max. 1.0	(1) 0.1~0.21 (2) 0.1~0.18 (3) Max. 1.5	(1) 0.15~0.25 (2) 0.15~0.22 (3) Max. 2.0	
Cast iron	-	-	-	★ 60~100	☆ 150~300	☆ 150~300	☆ 150~300	KW10 (1) 0.07~0.2 (2) 0.07~0.15 (3) Max. 1.0 A65/A66N (1) 0.03~0.07 (2) Not recom. (3) Not recom.	KW10 (1) 0.07~0.2 (2) 0.07~0.15 (3) Max. 1.0 A65/A66N (1) 0.03~0.07 (2) Not recom. (3) Not recom.	KW10 (1) 0.1~0.25 (2) 0.1~0.2 (3) Max. 1.5 A65/A66N (1) 0.05~0.09 (2) Not recom. (3) Not recom.	KW10 (1) 0.15~0.3 (2) 0.15~0.25 (3) Max. 2.0 A65/A66N (1) 0.05~0.09 (2) Not recom. (3) Not recom.	
Aluminum alloys	-	-	-	★ 150~400	-	-	-	(1) 0.07~0.2 (2) 0.07~0.15 (3) Max. 1.0	(1) 0.07~0.2 (2) 0.07~0.15 (3) Max. 1.0	(1) 0.1~0.25 (2) 0.1~0.2 (3) Max. 1.5	(1) 0.15~0.3 (2) 0.15~0.25 (3) Max. 2.0	
Brass	-	-	-	★ 150~300	-	-	-	(1) 0.07~0.2 (2) 0.07~0.15 (3) Max. 1.0	(1) 0.07~0.2 (2) 0.07~0.15 (3) Max. 1.0	(1) 0.1~0.25 (2) 0.1~0.2 (3) Max. 1.5	(1) 0.15~0.3 (2) 0.15~0.25 (3) Max. 2.0	
Hard materials	-	-	-	-	☆ 40~80	☆ 40~80	☆ 40~80	(1) 0.02~0.05 (2) 0.01~0.03 (3) Max. 0.1	(1) 0.02~0.05 (2) 0.01~0.03 (3) Max. 0.2	(1) 0.02~0.05 (2) 0.01~0.04 (3) Max. 0.2		

* Above cutting condition is for external grooving. Set both cutting speed and feed 10% lower for internal grooving.

★:1st recommendation ☆:2nd recommendation

GHU Inserts - molded chipbreaker

Workpiece material	Recommended insert grades (Vc: m/min)		(1) f for gooving (mm/rev) (2) f for turning (mm/rev) (3) ap for turning (mm)			Remarks
	Cermet	CVD coated carbide				
	TN60	CR9025	GHU 40-20	GHU 50-20	GHU 60-20	
Carbon steel	☆ 130~200	☆ 80~180	(1) 0.06~0.12 (2) 0.05~0.1 (3) Max. 1.0	(1) 0.06~0.12 (2) 0.05~0.1 (3) Max. 1.0	(1) 0.06~0.15 (2) 0.05~0.12 (3) Max. 1.5	Coolant
Alloy steel	☆ 100~180	☆ 80~160	(1) 0.06~0.12 (2) 0.05~0.1 (3) Max. 1.0	(1) 0.06~0.12 (2) 0.05~0.1 (3) Max. 1.0	(1) 0.06~0.15 (2) 0.05~0.12 (3) Max. 1.5	
Stainless steel	-	☆ 60~130	(1) 0.06~0.1 (2) 0.05~0.08 (3) Max. 0.8	(1) 0.06~0.1 (2) 0.05~0.08 (3) Max. 0.8	(1) 0.06~0.12 (2) 0.05~0.1 (3) Max. 1.2	

* Above cutting condition is for external grooving. Set both cutting speed and feed 10% lower for internal grooving.

★:1st recommendation ☆:2nd recommendation

GA inserts - molded chipbreaker

Workpiece material	Recommended insert grades (Vc: m/min)		(1) f for grooving (mm/rev) (2) f for turning (mm/rev) (3) ap for turning (mm)			Remarks
	Cermet	CVD coated carbide				
	TN60	CR9025	GA 30	GA 40	GA 50	
Carbon steel	☆ 130~200	★ 80~180	(1) 0.06~0.18 (2) 0.05~0.15 (3) Max. 0.8	(1) 0.06~0.21 (2) 0.05~0.17 (3) Max. 1.0	(1) 0.06~0.25 (2) 0.05~0.2 (3) Max. 1.3	Coolant
Alloy steel	☆ 100~180	★ 80~160	(1) 0.06~0.15 (2) 0.05~0.12 (3) Max. 0.3	(1) 0.06~0.18 (2) 0.05~0.15 (3) Max. 0.5	(1) 0.06~0.22 (2) 0.05~0.18 (3) Max. 0.8	
Stainless steel	-	★ 60~130	(1) 0.06~0.1 (2) 0.05~0.08 (3) Max. 0.8	(1) 0.06~0.1 (2) 0.05~0.08 (3) Max. 0.8	(1) 0.06~0.12 (2) 0.05~0.1 (3) Max. 1.2	

★:1st recommendation ☆:2nd recommendation

GMGW

Insert		Description	No. of edges	Dimension (mm)					Tolerance (mm)		PCD		Applicable toolholder ⇒ G67
				CW	S	RE	INSL	LE	CW min.	CW max.	-	KPD001	
		GMGW 6030-30R	1	6	5.5	3	30	4.5	- 0.03	+ 0.03	●		KGMW$^{R}_{L}$2525M-6
		GMGW 8030-40R	1	8	5.5	4	30	6	- 0.03	+ 0.03	●		KGMW$^{R}_{L}$2525M-8
		GMGW 8030-40R-HR	1	8	5.5	4	30	5	- 0.03	+ 0.03	●		KGMW$^{R}_{L}$2525M-8

Carbon steel / Alloy steel — P
Stainless steel — M
Cast iron — K
Non-ferrous metals — ● — N
Titanium alloy — ● — S
Hard materials (~ 40HRC) — H
Hard materials (40HRC ~) — H

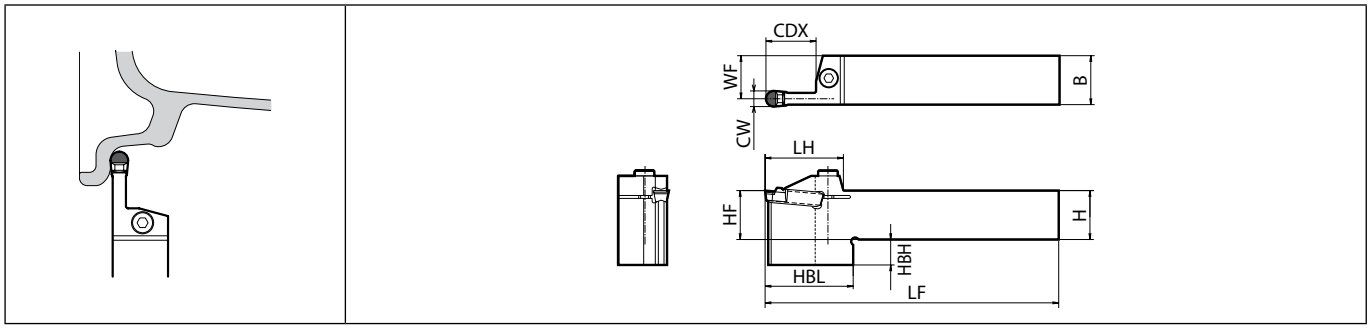
GMGW inserts are exclusively used for KGMW toolholder. It cannot be used for other toolholder because of its different installation angle.
GMGW inserts Edge Preparation : R-honed Cutting Edge.

Recommended cutting conditions ⇒ G67

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

KGMW (External grooving / Face grooving)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)									Spare parts		Applicable inserts ➡ G66
	R	L	CDX	H	B	LH	HF	HBH	HBL	LF	WF	Clamp bolt	Wrench	
KGMW R/L 2525M-6	●	●	25	25	25	40	25	13	55	150	22.8	HH6X25	LW-5	GMGW6030-30R
KGMW R/L 2525M-8	●	●	25	25	25	40	25	13	55	150	22	HH6X25	LW-5	GMGW8030-40R (-HR)

Recommended cutting conditions

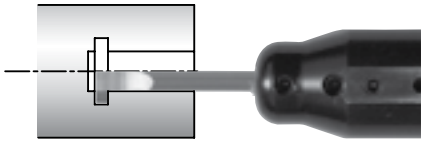
Workpiece material	Recommended insert grades (Vc: m/min)	(1) f for grooving (mm/rev) (2) f for turning (mm/rev) (3) ap for turning (mm)
	PCD	
	KPD001	
Aluminum	★ 150~2,700	(1) 0.05 ~ 0.3 (2) 0.2 ~ 0.8 (3) Max. 3

★ :1st recommendation

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Small diameter internal grooving

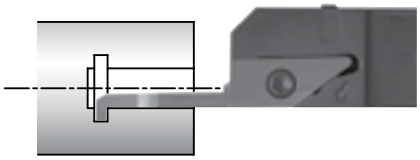
EZ bar and system tip-bars



Type	EZG
Min. bore diameter	ø3~ø8
Edge width (mm)	0.5~2.0
Grooving depth (mm)	1.0~2.0
See Page	**G70**



EZ bars

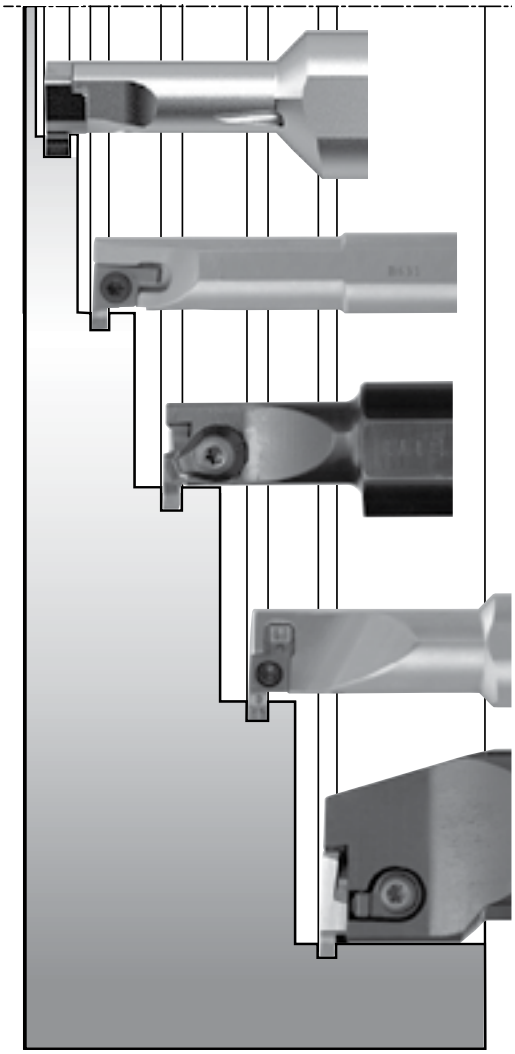


Type	VNG
Min. bore diameter	ø4~ø7
Edge width (mm)	1.0~2.0
Grooving depth (mm)	0.8~2.0
See Page	**G72**



System tip-bars

Internal Grooving ø8~ - shallow grooving



Type	SIGC
Min. bore diameter	ø8~ø12
Edge width (mm)	1.0~3.0
Grooving depth (mm)	1.5~2.2
See Page	**G76,G77**



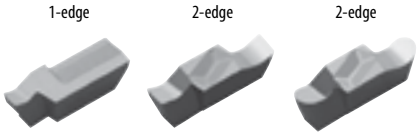
1-edge
Ground chipbreaker

Type	SIGE
Min. bore diameter	ø8~ø12
Edge width (mm)	1.0~3.0
Grooving depth (mm)	1.5~2.2
See Page	**G81~G83**



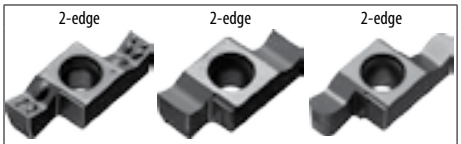
2-edge
Ground chipbreaker
2-edge
Ground chipbreaker Full-R

Type	GIV
Min. bore diameter	ø12~ø40
Edge width (mm)	1.0~5.0
Grooving depth (mm)	1.7~6.3
See Page	**G86~G88**



1-edge
Ground chipbreaker
2-edge
Ground chipbreaker
2-edge
Ground chipbreaker Full-R

Type	SIGE
Min. bore diameter	ø14~ø40
Edge width (mm)	1.0~5.0
Grooving depth (mm)	2.5~6.5
See Page	**G81~G83**



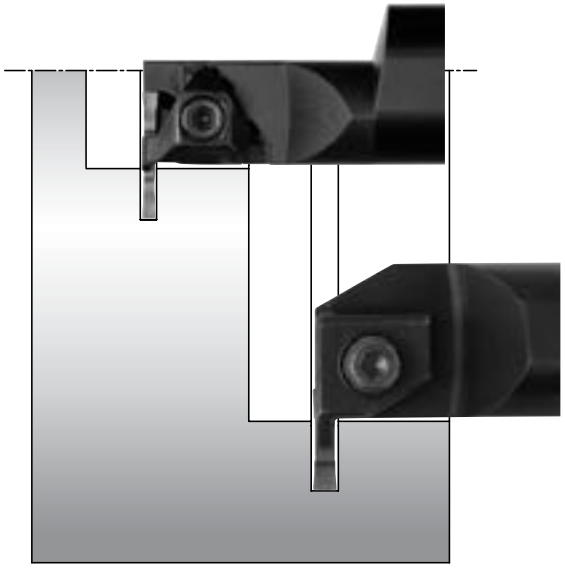
2-edge
Molded chipbreaker
2-edge
Ground chipbreaker
2-edge
Ground chipbreaker Full-R

Type	KIGBA
Min. bore diameter	ø35~ø40
Edge width (mm)	0.33~4.8
Grooving depth (mm)	0.8~2.8
See Page	**G89**



Ground chipbreaker
Ground chipbreaker Full-R
GM chipbreaker
MY chipbreaker

Summary deep grooving



Type	KGIA
Min. bore diameter	ø32~ø66
Edge width (mm)	3.0~5.0
Grooving depth (mm)	10~15
See Page	**G97**



Molded chipbreaker

Type	KIGH
Min. bore diameter	ø45~ø65
Edge width (mm)	4.0~8.0
Grooving depth (mm)	12
See Page	**G93**

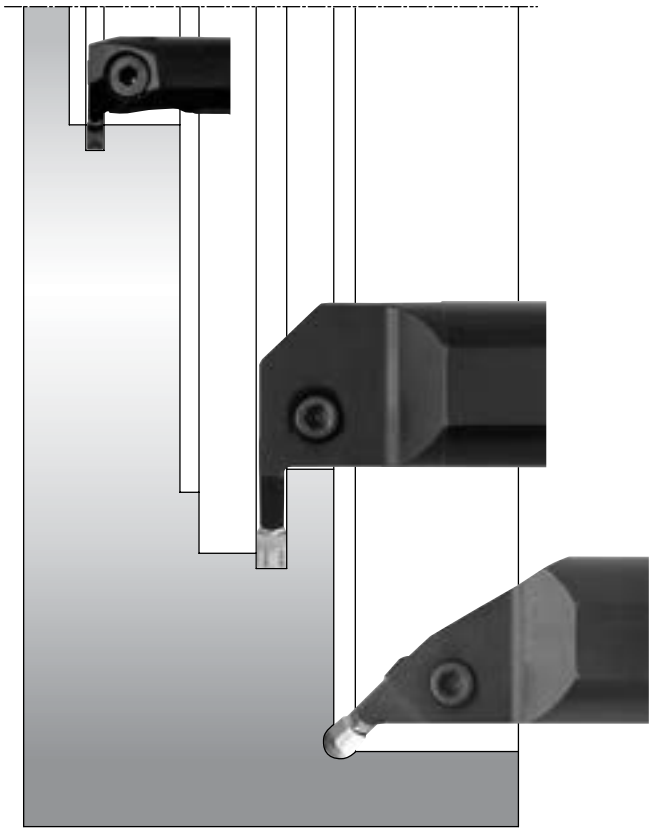


Ground chipbreaker



Molded chipbreaker

Summary internal grooving & turning ø20~



Type	KGDI
Min. bore diameter	ø18~ø40
Edge width (mm)	2.0~5.0
Grooving depth (mm)	4.5~11.0
See Page	**G91**

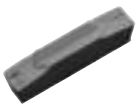


GMI chipbreaker



Molded chipbreaker Full-R

Type	KIGM-8
Min. bore diameter	ø65
Edge width (mm)	8.0
Grooving depth (mm)	20
See Page	**G95**



Molded chipbreaker

Type	KIGMU-8
Min. bore diameter	ø65
Edge width (mm)	8.0
Grooving depth (mm)	2.2
See Page	**G95**

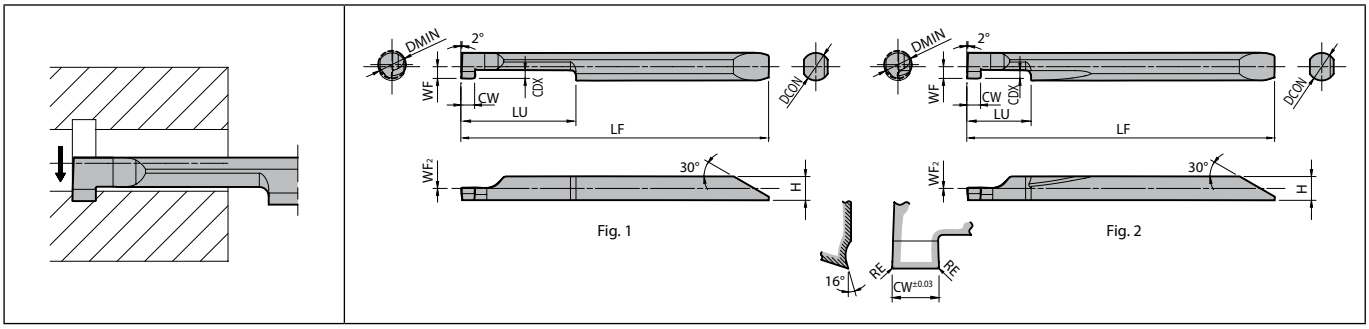


Ground chipbreaker



Molded chipbreaker Full-R

EZG (Internal grooving)



Right-hand shown

Dimensions

Description	No. of edges	Dimension (mm)										Fig.	Tolerance (mm)				Carbide		Applicable sleeve ➡ F38~F43
		DMIN	CW	CDX	RE	DCON	H	LF	LU	WF	WF_2		CW min.	CW max.	RE min.	RE max.	PVD PR1225	- GW05	
EZGR 040040-050	1	4	0.5	1	0.05	4	3.45	44.7	12	1.7	0	2	-0.03	+0.03	-0.013	+0.013	●	●	EZH040...
EZGR 040040-100			1														●	●	
EZGR 040040-150			1.5														●	●	
EZGR 040040-200			2														●	●	
EZGR 050050-100	1	5	1	1.5	0.05	5	4.3	52.8	20	2.15	0	1	-0.03	+0.03	-0.013	+0.013	●	●	EZH050...
EZGR 050050-150			1.5														●	●	
EZGR 050050-200			2														●	●	
EZGR 060060-100	1	6	1	2	0.05	6	5.15	60.7	20	2.65	0	1	-0.03	+0.03	-0.013	+0.013	●	●	EZH060...
EZGR 060060-150			1.5														●	●	
EZGR 060060-200			2														●	●	
EZGR 070070-100	1	7	1	2	0.05	7	6.2	63.7	25	3.05	0	1	-0.03	+0.03	-0.013	+0.013	●	●	EZH070...
EZGR 070070-150			1.5														●	●	
EZGR 070070-200			2														●	●	
EZGR 080070-100	1	8	1	2	0.05	7	6.2	63.7	25	3.45	0	1	-0.03	+0.03	-0.013	+0.013	●	●	
EZGR 080070-150			1.5														●	●	
EZGR 080070-200			2														●	●	
EZGR 030030-050S	1	3	0.5	0.8	0.05	3	2.5	38.7	5	1.25	0	2	-0.03	+0.03	-0.013	+0.013	●		EZH030...
EZGR 030030-100S			1														●		
EZGR 040040-050S	1	4	0.5	1	0.05	4	3.45	44.7	8	1.7	0	2	-0.03	+0.03	-0.013	+0.013	●		EZH040...
EZGR 040040-100S			1														●		
EZGR 040040-150S			1.5														●		
EZGR 040040-200S			2														●		
EZGR 050050-100S	1	5	1	1.5	0.05	5	4.3	52.8	10	2.15	0	2	-0.03	+0.03	-0.013	+0.013	●		EZH050...
EZGR 050050-150S			1.5														●		
EZGR 050050-200S			2														●		
EZGR 060060-100S	1	6	1	2	0.05	6	5.15	60.7	10	2.65	0	2	-0.03	+0.03	-0.013	+0.013	●		EZH060...
EZGR 060060-150S			1.5														●		
EZGR 060060-200S			2														●		
EZGR 070070-100S	1	7	1	2	0.05	7	6.2	63.7	10	3.05	0	2	-0.03	+0.03	-0.013	+0.013	●		EZH070...
EZGR 070070-150S			1.5														●		
EZGR 070070-200S			2														●		
EZGR 080070-100S	1	8	1	2	0.05	7	6.2	63.7	10	3.45	0	2	-0.03	+0.03	-0.013	+0.013	●		
EZGR 080070-150S			1.5														●		
EZGR 080070-200S			2														●		

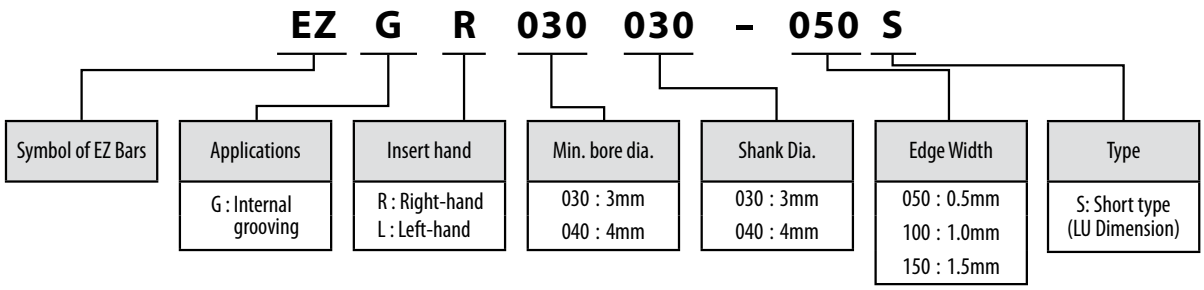
CDX shows available grooving depth.

Recommended cutting conditions ➡ G144

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

EZ bars are sold in 1 piece boxes

EZ Bars Identification System

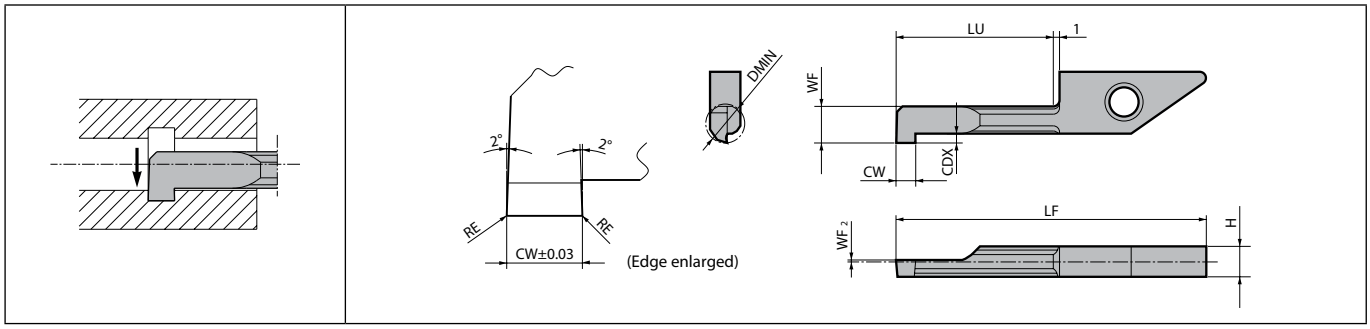


Applicable Sleeves

Sleeve								Applicable Insert for Small Dia. Internal Grooving		Applicable Machine Manufacturer
EZH-CT (Adjustable overhang length with coolant hole) ➡ F38, F39		EZH-HP (Adjustable overhang length) ➡ F40, F41		EZH-ST ➡ F42, F43		Sleeve Shank Dia. DCON(mm)		EZG	Shank Dia. DCON(mm)	
-		-		EZH	03012ST-80	12		EZG_ 030030-...	3	(General purpose)
					04012ST-80			EZG_ 040040-...	4	
					05012ST-80			EZG_ 050050-...	5	
					06012ST-80			EZG_ 060060-...	6	
					07012ST-80			EZG_ 070070-...	7	
								EZG_ 080070-...	8	
-		EZH	03016HP-100	EZH	03016ST-100	16		EZG_ 030030-...	3	(General purpose)
			04016HP-100		04016ST-100			EZG_ 040040-...	4	
			05016HP-100		05016ST-100			EZG_ 050050-...	5	
			06016HP-100		06016ST-100			EZG_ 060060-...	6	
			07016HP-100		07016ST-100			EZG_ 070070-...	7	
								EZG_ 080070-...	8	
EZH	03019CT-120	EZH	03019HP-120	EZH	03019ST-120	19.05		EZG_ 030030-...	3	Citizen Machinery
	04019CT-120		04019HP-120		04019ST-120			EZG_ 040040-...	4	
	05019CT-120		05019HP-120		05019ST-120			EZG_ 050050-...	5	
	06019CT-120		06019HP-120		06019ST-120			EZG_ 060060-...	6	
	07019CT-120		07019HP-120		07019ST-120			EZG_ 070070-...	7	
								EZG_ 080070-...	8	
EZH	03020CT-120	EZH	03020HP-120	EZH	03020ST-120	20		EZG_ 030030-...	3	Eguro Tsugami Citizen Machinery (General purpose)
	04020CT-120		04020HP-120		04020ST-120			EZG_ 040040-...	4	
	05020CT-120		05020HP-120		05020ST-120			EZG_ 050050-...	5	
	06020CT-120		06020HP-120		06020ST-120			EZG_ 060060-...	6	
	07020CT-120		07020HP-120		07020ST-120			EZG_ 070070-...	7	
								EZG_ 080070-...	8	
EZH	03022CT-135	EZH	03022HP-135	EZH	03022ST-135	22		EZG_ 030030-...	3	Star Micronics Nomura DS Tsugami
	04022CT-135		04022HP-135		04022ST-135			EZG_ 040040-...	4	
	05022CT-135		05022HP-135		05022ST-135			EZG_ 050050-...	5	
	06022CT-135		06022HP-135		06022ST-135			EZG_ 060060-...	6	
	07022CT-135		07022HP-135		07022ST-135			EZG_ 070070-...	7	
								EZG_ 080070-...	8	
EZH	03025.0CT-135	EZH	03025.0HP-135	EZH	03025.0ST-135	25		EZG_ 030030-...	3	Eguro Tsugami Citizen Machinery (General purpose)
	04025.0CT-135		04025.0HP-135		04025.0ST-135			EZG_ 040040-...	4	
	05025.0CT-135		05025.0HP-135		05025.0ST-135			EZG_ 050050-...	5	
	06025.0CT-135		06025.0HP-135		06025.0ST-135			EZG_ 060060-...	6	
	07025.0CT-135		07025.0HP-135		07025.0ST-135			EZG_ 070070-...	7	
								EZG_ 080070-...	8	
EZH	03025.4CT-120	EZH	03025.4HP-120	EZH	03025.4ST-120	25.4		EZG_ 030030-...	3	Citizen Machinery
	04025.4CT-120		04025.4HP-120		04025.4ST-120			EZG_ 040040-...	4	
	05025.4CT-120		05025.4HP-120		05025.4ST-120			EZG_ 050050-...	5	
	06025.4CT-120		06025.4HP-120		06025.4ST-120			EZG_ 060060-...	6	
	07025.4CT-120		07025.4HP-120		07025.4ST-120			EZG_ 070070-...	7	
								EZG_ 080070-...	8	

· Choose sleeves (DCB) to meet with DCON dimension of Internal Grooving Inserts.
· Adjustment Pin cannot be installed to **EZH-ST** sleeves.
To adjust overhang of the bar, please use **EZH-CT / HP** Sleeves.
· Machine manufacturers in random order.

VNG



Right-hand shown

Dimensions

Description	No. of edges	Dimension (mm)									Tolerance (mm)		Carbide			Applicable toolholder ➡ F48~F51
		DMIN	CW	CDX	RE	H	LF	LU	WF	WF_2	CW min.	CW max.	PVD PR1225	PVD PR930	- KW10	
VNGR 0410-11	1	4	1	0.8	0.05	3.9	30.8	11	3.5	0.1	-0.03	+0.03	●	●	●	SVNR...-12N
0420-11			2										●	●	●	SVNSR...-12-11N
VNGR 0510-11	1	5	1	1	0.05	3.9	30.8	11	4.4	0.1	-0.03	+0.03	●	●	●	S...-SVNR12N
0520-11			2										●	●	●	S...-SVNR12SN
VNGR 0610-20	1	6	1	1.8	0.05	3.9	39.8	20	5.2	0.3	-0.03	+0.03	●	●	●	SVNR...-12N
0620-20			2										●	●	●	SVNSR...-12-20N
VNGR 0710-20	1	7	1	2	0.05	3.9	39.8	20	6.2	0.3	-0.03	+0.03	●	●	●	S...-SVNR12N
0720-20			2										●	●	●	S...-SVNR12SN

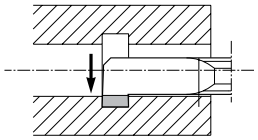
CDX shows available grooving depth.
WF_2 indicates the cutting edge is above the Tool's Center Position.

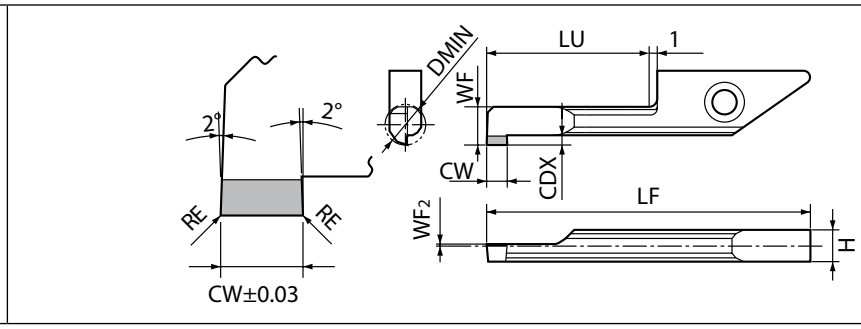
Recommended cutting conditions ➡ G144

System tip-bars are sold in 5 piece boxes

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

VNG





Right-hand shown

Dimensions

Description		No. of edges	Dimension (mm)									Tolerance (mm)		PCD	Applicable toolholder F48~F51
			DMIN	CW	CDX	RE	H	LF	LU	WF	WF_2	CW min.	CW max.	- / KPD001	
VNGR	0410-11NB	1	4	1	0.8	0.05	3.9	30.8	11	3.5	0.1	-0.03	+0.03	MTO	SVNR...-12N SVNSR...-12-11N S...-SVNR12N S...-SVNR12SN
	0420-11NB			2										MTO	
VNGR	0510-11NB	1	5	1	1	0.05	3.9	30.8	11	4.4	0.1	-0.03	+0.03	MTO	
	0520-11NB			2										MTO	
VNGR	0610-20NB	1	6	1	1.8	0.05	3.9	39.8	20	5.2	0.3	-0.03	+0.03	MTO	SVNR...-12N SVNSR...-12-20N S...-SVNR12N S...-SVNR12SN
	0620-20NB			2										MTO	
VNGR	0710-20NB	1	7	1	2	0.05	3.9	39.8	20	6.2	0.3	-0.03	+0.03	MTO	
	0720-20NB			2										MTO	

CDX shows available grooving depth.
WF_2 indicates the cutting edge is above the Tool's Center Position.

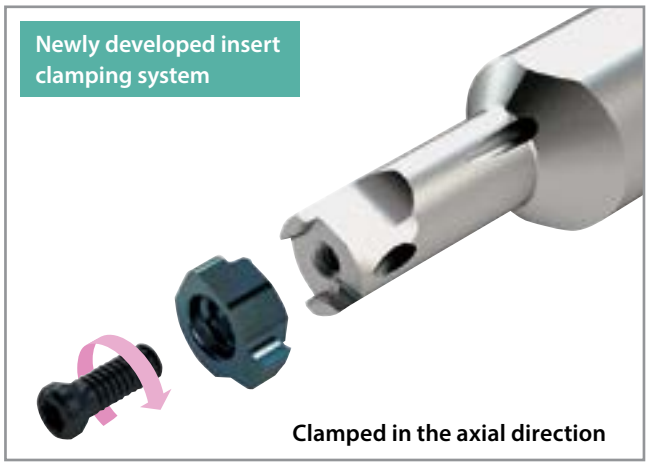
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

SIGC

Newly developed clamping system ensures a firm insert hold to provide high-precision machining. Excellent chip evacuation with double coolant holes and optimized flute shape with a ø8 mm minimum cutting diameter.

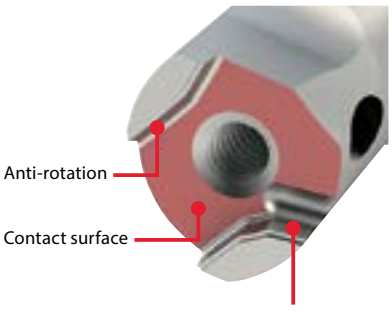
1 Firm insert clamping system provides high-precision machining

Firm clamping action by pulling the bottom surface of the insert in axial direction
Precise machining is achieved by ensuring a firm clamp on the insert

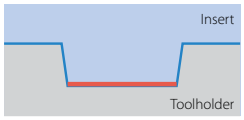


Clamping part (image)

Firm clamping is available due to large contact surface

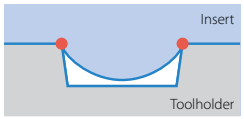


SIGC



Bottom surface contact

Competitor A

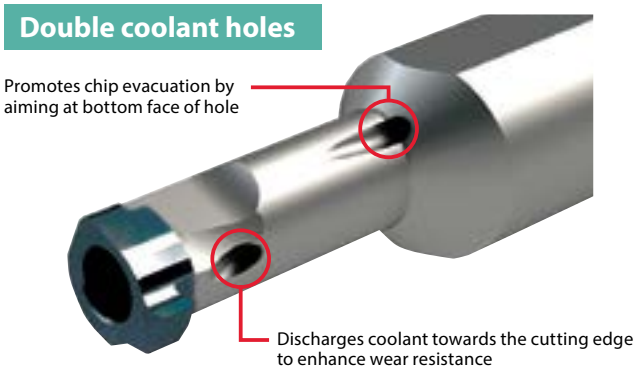


Point contact

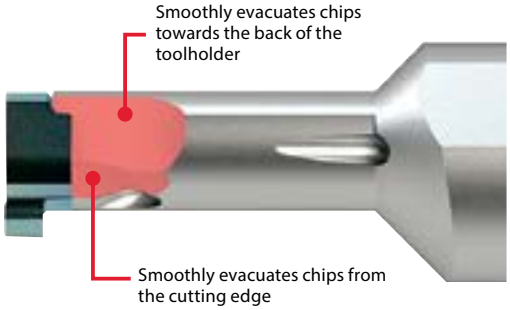
2 Excellent chip evacuation

Excellent chip evacuation with double coolant holes and optimized flute shape

Double coolant holes



Flute shape



Provides a better solution when facing chip evacuation difficulties in small internal grooving.
Prevents chip crunching.

GC

														Carbide		
														PVD		
Insert		Description		No. of edges	Dimension (mm) CW	CDX	S	D1	RE	INSL	W1	Tolerance (mm) CW min.	CW max.	PR1535	PR1725	Applicable toolholder ⇒ G76,G77
		GC08R	100-005	1	1	1.5	3.5	2.7	0.05	7.7	3.4	-0.025	+0.025	●	●	SIGCR08...
			120-005		1.2				0.05					●	●	
			125-005		1.25				0.05					●	●	
			150-010		1.5				0.1					●	●	
			200-010		2				0.1					●	●	
		GC08L	100-005		1				0.05					●	●	SIGCL08...
			120-005		1.2				0.05					●	●	
			125-005		1.25				0.05					●	●	
			150-010		1.5				0.1					●	●	
			200-010		2				0.1					●	●	
		GC10R	100-005	1	1	2.2	4.4	3.5	0.05	9.6	4.7	-0.025	+0.025	●	●	SIGCR10...
			120-005		1.2				0.05					●	●	
			125-005		1.25				0.05					●	●	
			145-010		1.45				0.1					●	●	
			150-010		1.5				0.1					●	●	
			200-010		2				0.1					●	●	
			250-020		2.5				0.2					●	●	
			300-020		3				0.2					●	●	
		GC10L	100-005		1				0.05					●	●	SIGCL10...
			120-005		1.2				0.05					●	●	
			125-005		1.25				0.05					●	●	
			145-010		1.45				0.1					●	●	
			150-010		1.5				0.1					●	●	
			200-010		2				0.1					●	●	
			250-020		2.5				0.2					●	●	
			300-020		3				0.2					●	●	
		GC12R	100-005	1	1	2.2	5.4	3.5	0.05	11.6	4.7	-0.025	+0.025	●	●	SIGCR12...
			120-005		1.2				0.05					●	●	
			125-005		1.25				0.05					●	●	
			145-010		1.45				0.1					●	●	
			150-010		1.5				0.1					●	●	
			200-010		2				0.1					●	●	
			250-020		2.5				0.2					●	●	
			300-020		3				0.2					●	●	
		GC12L	100-005		1				0.05					●	●	SIGCL12...
			120-005		1.2				0.05					●	●	
			125-005		1.25				0.05					●	●	
			145-010		1.45				0.1					●	●	
			150-010		1.5				0.1					●	●	
			200-010		2				0.1					●	●	
			250-020		2.5				0.2					●	●	
			300-020		3				0.2					●	●	
	Full R / Copying	GC08R	100-050R	1	1	1.5	3.5	2.7	0.5	7.7	3.4	-0.025	+0.025	●	●	SIGCR08...
			200-100R		2				1					●	●	
		GC10R	100-050R	1	1	2.2	4.4	3.5	0.5	9.6	4.7	-0.025	+0.025	●	●	SIGCR10...
			200-100R		2				1					●	●	
		GC12R	100-050R	1	1	2.2	5.4	3.5	0.5	11.6	4.7	-0.025	+0.025	●	●	SIGCR12...
			200-100R		2				1					●	●	

Carbon steel / Alloy steel — P
Stainless steel — M
Cast iron — K
Non-ferrous metals — N
Titanium alloy — S
Hard materials (~ 40HRC) — H
Hard materials (40HRC ~) — H

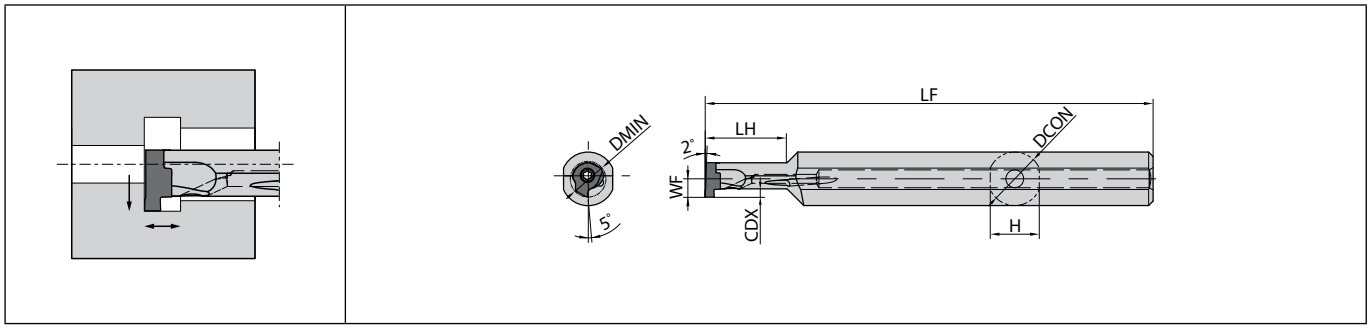
Right-hand shown
CDX shows available grooving depth.

Recommended cutting conditions ⇒ G144

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GC type inserts are sold in 5 piece boxes

SIGC Excellent bar (Internal grooving)



Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description		Availability		Dimension (mm)							Coolant hole	Spare parts		Applicable inserts ⇒ G75
												Screw	Wrench	
		R	L	DMIN	DCON	CDX	H	LH	LF	WF				
SIGC$^{R}_{L}$	0812-EH	●	●	8	12	1.5	11	18	100	4.1	Yes	SB-2270T$^{R}_{L}$	FT-7	GC08$^{R}_{L}$...
SIGC$^{R}_{L}$	1016-EH	●	●	10	16	2.2	15	21	100	5	Yes	SB-3070T$^{R}_{L}$	FT-8	GC10$^{R}_{L}$...
SIGC$^{R}_{L}$	1216-EH	●	●	12	16	2.2	15	25	110	6	Yes	SB-3070T$^{R}_{L}$	FT-8	GC12$^{R}_{L}$...

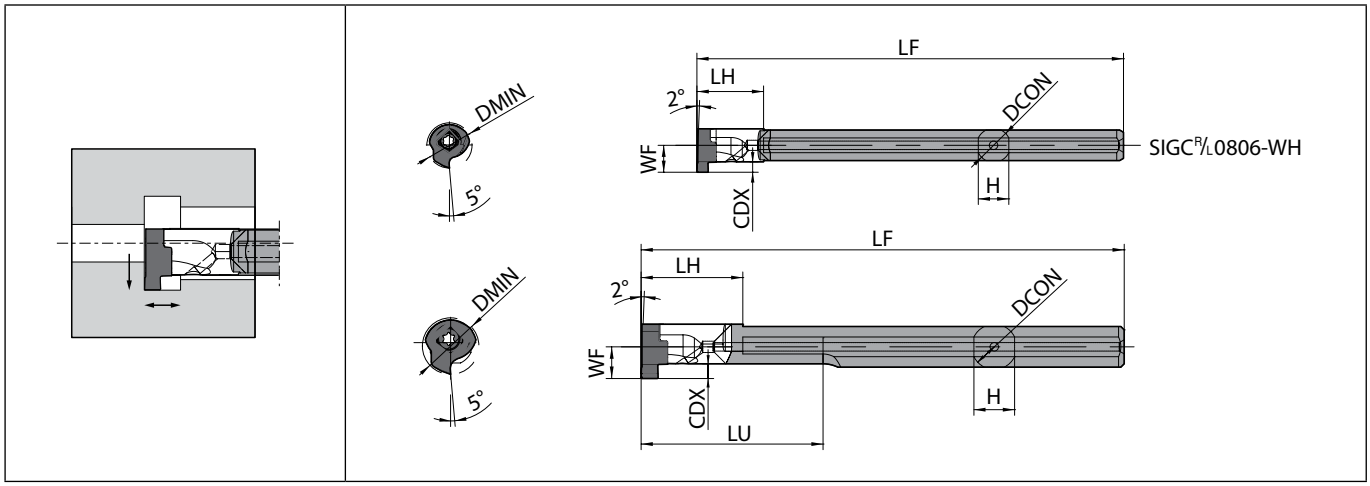
Setting the insert
- Use compressed air or other measures to remove chips from the insert pocket.
- Mount the insert into the toolholder ensure the bottom makes contact with the end of the toolholder's surface.
- Keeping the insert seated, tighten the insert clamp screw at an appropriate torque.

Recommended tightening torque : 0.8 N·m (SB-2270T$^{R}_{L}$), 1.2 N·m (SB-3070T$^{R}_{L}$)
L-hand clamp screw for L-hand toolholder

GC**R-***	GC**L-***
LOCK Right-hand screw	LOCK Left-hand screw
Toolholder : SIGCR....-.. Clamp Screw : SB-....TR	Toolholder : SIGCL....-.. Clamp Screw : SB-....TL

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SIGC Carbide shank bar (Internal grooving)



Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description		Availability R	Availability L	Dimension (mm) DMIN	DCON	CDX	H	LH	LF	LU	WF	Coolant hole	Spare parts Screw	Spare parts Wrench	Applicable inserts G75
SIGC R/L	0806-WH	●	●	8	6	1.5	5.4	12	75	-	4.8	Yes	SB-2270T R/L	FT-7	GC08 R/L...
SIGC R/L	1008-WH-L85	●	●	10	8	2.2	7.2	18	85	32	5.6	Yes	SB-3070T R/L	FT-8	GC10 R/L...
	1008-WH-L100	●							100	45			SB-3070TR		
SIGC R/L	1210-WH-L95	●		12	10	2.2	9.2	18	95	32	6.6	Yes	SB-3070T R/L	FT-8	GC12 R/L...
	1210-WH-L110	●	●						110	45					

Setting the insert
- Use compressed air or other measures to remove chips from the insert pocket.
- Mount the insert into the toolholder ensure the bottom makes contact with the end of the toolholder's surface.
- Keeping the insert seated, tighten the insert clamp screw at an appropriate torque.

Recommended tightening torque : 0.8 N·m (SB-2270T R/L), 1.2 N·m (SB-3070T R/L)
L-hand clamp screw for L-hand toolholder

GC**R-***	GC**L-***
LOCK Right-hand screw	LOCK Left-hand screw
Toolholder : SIGCR....-.. Clamp Screw : SB-....TR	Toolholder : SIGCL....-.. Clamp Screw : SB-....TL

Applicable Sleeves

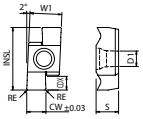
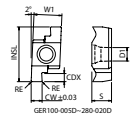
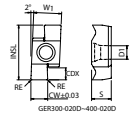
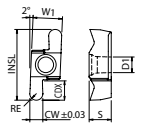
Shank Size (Hole Dia.: mm)	06 (6 mm)	08 (8 mm)	10 (10 mm)	12 (12 mm)	16 (16 mm)
Toolholder Description	SIGC R/L 0806-WH	SIGC R/L 1008-WH-L85 SIGCR 1008-WH-L100	SIGCR 1210-WH-L95 SIGC R/L 1210-WH-L110	SIGC R/L 0812-EH	SIGC R/L 1016-EH SIGC R/L 1216-EH
SH Sleeves (For Boring Bars)	SH 06...	SH 08...	SH 10...	SH 12...	SH 16...
SHC Sleeves (Coolant Sleeve)	–	SHC 08...	SHC 10...	SHC 12...	SHC 16...
SHA Sleeves	–	SHA 08...	SHA 10...	SHA 12...	–
EZH Sleeves (For EZ Bars)	EZH 06...ST/CT/HP...	EZH 08...ST/CT/HP...	–	–	–

* Remove the positioning pin when mounting SIGC to the EZH-CT/HP Sleeve
Positioning function is not available

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GE

GE

													Carbon steel / Alloy steel						P
													Stainless steel						M
													Cast iron						K
													Non-ferrous metals						N
													Titanium alloy						S
													Hard materials (~ 40HRC)						H
													Hard materials (40HRC ~)						
Insert		Description		No. of edges	Dimension (mm)							Tolerance (mm)		Carbide			Cermet	Applicable toolholder ⇒ G81~G83
					CW	CDX	S	D1	RE	INSL	W1	CW min.	CW max.	PVD		-	-	
														PR1225	PR2025	KW10	TN6020	
	 2-edge	GER	100-005C	2	1	2.5	4.05	3.1	0.05	11.48	5.8	- 0.03	+ 0.03	●	●	●	●	SIGER....C-EH SIGER....C-WH SIGER....C-WH-90
			120-005C		1.2				0.05					●	●	●	●	
			125-005C		1.25				0.05					●	●	●	●	
			140-005C		1.4				0.05					●	●	●	●	
			145-010C		1.45				0.1					●	●	●		
			150-010C		1.5				0.1					●	●	●	●	
			170-010C		1.7				0.1					●	●	●		
			185-010C		1.85				0.1					●	●	●		
			195-010C		1.95				0.1					●	●	●		
			200-010C		2				0.1					●	●	●	●	
			250-020C		2.5				0.2					●	●	●	●	
			300-020C		3				0.2					●	●	●	●	
			350-020C		3.5				0.2					●	●	●		
		GEL	100-005C		1				0.05					●	●	●	●	SIGEL....C-EH SIGEL....C-WH
			120-005C		1.2				0.05					●	●			
			125-005C		1.25				0.05					●	●	●		
			145-010C		1.45				0.1					●	●			
			150-010C		1.5				0.1					●	●	●		
			200-010C		2				0.1					●	●	●		
			250-020C		2.5				0.2					●	●	●	●	
			300-020C		3				0.2					●	●		●	
			350-020C		3.5				0.2					●	●			
	 GER100-005D~280-020D  GER300-020D~400-020D 2-edge	GER	100-005D	2	1	2.5	5.05	3.6	0.05	16.44	6.8	- 0.03	+ 0.03	●	●	●	●	SIGER2020D-EH
			140-005D		1.4	2.5			0.05					●	●	●	●	
			145-010D		1.45	2.5			0.1					●	●	●	●	
			150-010D		1.5	3			0.1					●	●	●	●	
			170-010D		1.7	3			0.1					●	●	●	●	
			185-010D		1.85	3			0.1					●	●	●		
			195-010D		1.95	3			0.1					●	●	●		
			200-010D		2	3.2			0.1					●	●	●	●	
			225-010D		2.25	3.2			0.1					●	●	●		
			230-020D		2.3	3.2			0.2					●	●	●	●	
			250-020D		2.5	3.2			0.2					●	●	●	●	
			280-020D		2.8	3.2			0.2					●	●	●		
			300-020D		3	4.5			0.2					●	●	●	●	
			330-020D		3.3	4.5			0.2					●	●	●		
			350-020D		3.5	4.5			0.2					●	●	●		
			400-020D		4	4.5			0.2					●	●	●	●	
		GEL	100-005D		1	2.5			0.05					●	●	●		SIGEL2020D-EH
			140-005D		1.4	2.5			0.05					●	●			
			145-010D		1.45	2.5			0.1					●	●			
			150-010D		1.5	3			0.1					●	●	●	●	
			170-010D		1.7	3			0.1					●	●			
			200-010D		2	3.2			0.1					●	●		●	
			225-010D		2.25	3.2			0.1					●	●			
			230-020D		2.3	3.2			0.2					●	●			
			250-020D		2.5	3.2			0.2					●	●		●	
			300-020D		3	4.5			0.2					●	●	●	●	
			400-020D		4	4.5			0.2					●	●			
	 2-edge / Full R / Copying	GER	200-100CR	2	2	2.5	4.05	3.1	1	11.48	5.8	- 0.03	+ 0.03	●	●	●		SIGER....C-EH SIGER....C-WH(-..)
			250-125CR		2.5				1.25					●	●	●		
			300-150CR		3				1.5					●	●	●		
		GER	200-100DR	2	2	3.2	5.05	3.6	1	16.44	6.8	- 0.03	+ 0.03	●	●	●		SIGER2020D-EH
			300-150DR		3	4.5			1.5					●	●	●		

Right-hand shown
CDX shows available grooving depth.

Recommended cutting conditions ⇒ G145

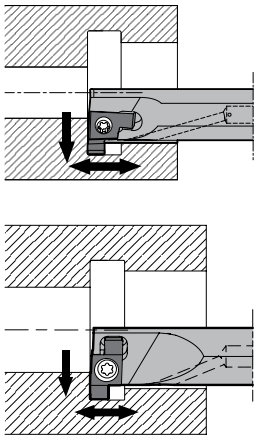
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

G

Grooving

GE/GER

SIGE Excellent bar (Internal grooving)



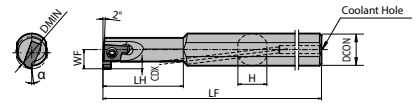


Fig. 1

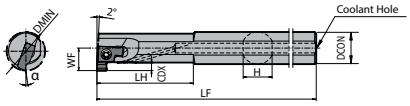


Fig. 2

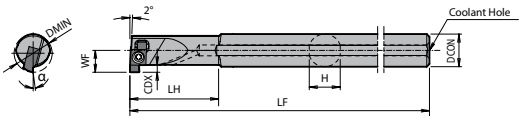
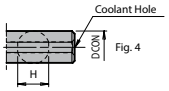


Fig. 3



1612C-EH shank is 3 face cut type (top, bottom and one side)

Fig. 4

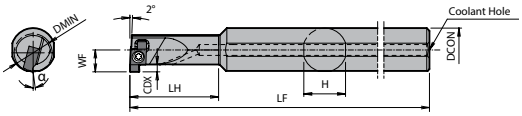


Fig. 5

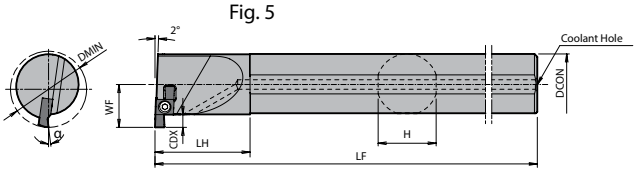


Fig. 6

Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description		Availability R	Availability L	Dimension (mm) DMIN	DCON	CDX	H	LH	LF	WF	Coolant hole	Fig.	Spare parts: Screw	Wrench	Wrench	Wrench	Applicable inserts ➡ G78~G80
SIGE R/L	0808A-EH	●	●	8	8	1.5	7.2	20	100	4.8	Yes	1	SB-2045TRN	-	-	FT-6	GE R/L...A / AR
SIGE R/L	1010B-EH	●	●	10	10	2.2	9	25	125	6.2	Yes	1	SB-2255TR	-	DT-7	-	GE R/L...B GE R/L...BR
	1210B-EH	●	●	12				30		7		2					
SIGE R/L	1412C-EH	●	●	14	12	2.5	11.4	33	150	8	Yes	3	SB-2570TR	-	-	FT-8	GE R/L...C GE R/L...CM GE R/L...CR
	1612C-EH	●	●	16				20		8.5		4					
	1616C-EH	●	●		16		15	36	160	9		5					
SIGE R/L	2020D-EH	●	●	20	20	4.5	19	40	180	12.1	Yes	5	SB-3080TR	-	-	FT-10	GE R/L...D / DM / DR
SIGE R/L	2525E-EH	●	●	25	25	6.5	24	45	200	15.6	Yes	5	SB-4085TR	FT-15	-	-	GE R/L...E GE R/L...EM
	3232E-EH	●	●	32	32		30.4	55	220	19		5					
	4032E-EH	●	●	40				45	250	23		6					

CDX shows the distance from the toolholder to the cutting edge. Available Groove Depth : „CDX" of Insert.

Applicable sleeve ➡ **F155, F156**

Features

Large chip pocket screw clamp toolholder design enables excellent chip evacuation



Screw Clamp

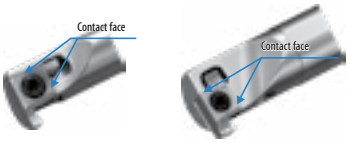
Conventional Clamp

Cost effective chip control from a molded chipbreaker



GER...M

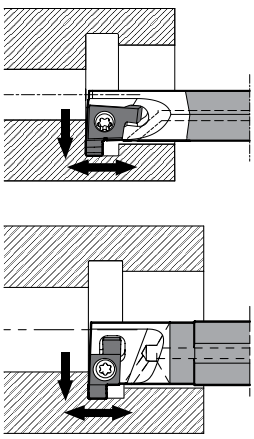
Cutting edge is free from contact face



An 8mm minimum bore diameter with a 2-edge design

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SIGE Carbide shank bar (Internal grooving)



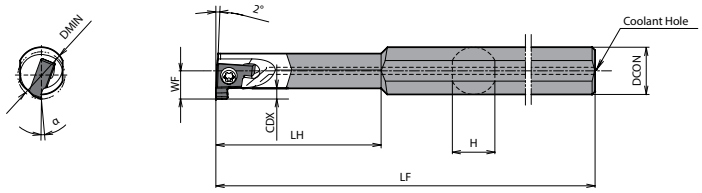


Fig. 1

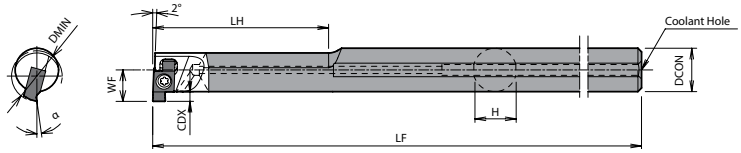


Fig. 2

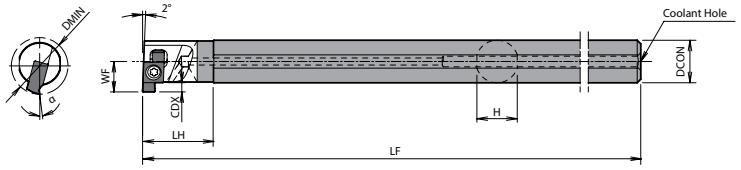


Fig. 3

Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

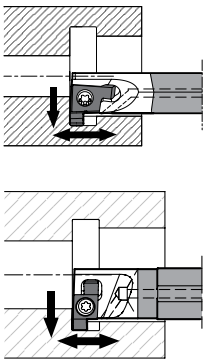
Description		Availability R	Availability L	Dimension (mm) DMIN	DCON	CDX	H	LH	LF	WF	Coolant hole	Fig.	Spare parts Screw	Spare parts Wrench	Spare parts Wrench	Applicable inserts G78,G79
SIGE R/L	0808A-WH	●	●	8	8	1.5	7.2	28	125	4.8	Yes	1	SB-2045TRN	-	FT-6	GE R/L...A / AR
SIGE R/L	1010B-WH	●	●	10	10	2.2	9	35	125	6.2	Yes	1	SB-2255TR	DT-7	-	GE R/L...B
	1210B-WH	●	●	12				45	140	7						GE R/L...BR
SIGE R/L	1412C-WH	●	●	14	12	2.5	11.4	50	150	8.7	Yes	2	SB-2570TR	-	FT-8	GE R/L...C
	1612C-WH	●	●	16				20	180	8.5		3				GE R/L...CM GE R/L...CR

CDX shows the distance from the toolholder to the cutting edge. Available Groove Depth : „CDX" of Insert.

Applicable sleeve F155, F156

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SIGE Carbide shank bar (Internal grooving / for automatic lathe)



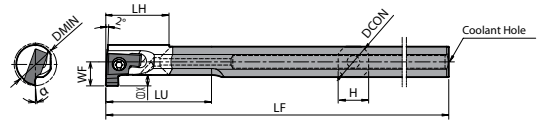


Fig. 1

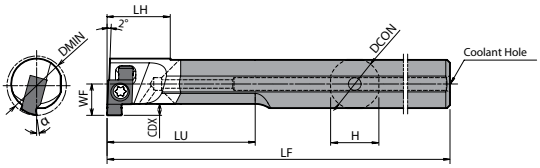


Fig. 2

Right-hand shown | Right-hand Insert for Right-hand Toolholder.

Toolholder dimensions

Description		Availability	Dimension (mm)								Coolant hole	Fig.	Spare parts		Applicable inserts ➡ G78,G79
		R	DMIN	DCON	CDX	H	LH	LF	LU	WF			Screw	Wrench	
SIGER	1008B-WH-90	●	10	8	2.2	7.2	15	90	25	5.6	Yes	1	SB-2255TR	FT-7	GER...B GER...BR
	1210B-WH-90	●	12	10		9.4			30	6.6					
SIGER	1412C-WH-90	●	14	12	2.5	11.4	15	90	35	7.4	Yes	2	SB-2570TR	FT-8	GER...C / CM/ CR

CDX shows the distance from the toolholder to the cutting edge.
LH shows minimum overhang length.

Applicable sleeve ➡ **F155, F156**

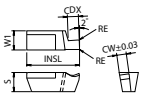
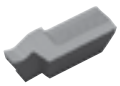
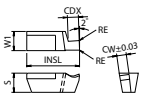
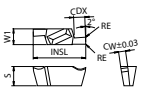
Applicable Insert & Rake Angle (α) after Installment of Insert

Toolholder Description		Applicable Insert & Rake Angle (α) after Installment of Insert			
		Ground Chipbreaker	α	Molded Chipbreaker	α
SIGE$^{R}_{L}$	0808A-EH	GE$^{R}_{L}$100-005A~GE$^{R}_{L}$200-010A GER100-050AR~GER200-100AR	5°	-	-
	1010B-EH	GE$^{R}_{L}$100-005B~GE$^{R}_{L}$300-020B GER100-050BR~GER200-100BR	5°	-	-
	1210B-EH				
	1412C-EH	GE$^{R}_{L}$100-005C~GE$^{R}_{L}$350-020C GER200-100CR~GER300-150CR	8°	GER150-010CM~GER350-020CM	10°
	1612C-EH				
	1616C-EH				
	2020D-EH	GE$^{R}_{L}$100-005D~GE$^{R}_{L}$400-020D GER200-100DR~GER300-150DR	9°	GER150-010DM~GER400-020DM	10°
	2525E-EH	GE$^{R}_{L}$100-005E~GE$^{R}_{L}$500-020E	10°	GER150-010EM~GER500-020EM	10°
	3232E-EH				
	4032E-EH				
SIGE$^{R}_{L}$	0808A-WH	GE$^{R}_{L}$100-005A~GE$^{R}_{L}$200-010A GER100-050AR~GER200-100AR	5°	-	-
	1010B-WH	GE$^{R}_{L}$100-005B~GE$^{R}_{L}$300-020B GER100-050BR~GER200-100BR	5°	-	-
	1210B-WH				
	1008B-WH-90				
	1210B-WH-90				
	1412C-WH	GE$^{R}_{L}$100-005C~GE$^{R}_{L}$350-020C GER200-100CR~GER300-150CR	8°	GER150-010CM~GER350-020CM	10°
	1612C-WH				
	1412C-WH-90				

α indicates the rake angle at the center of the edge width after installing insert.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GV

																Carbon steel / Alloy steel	●	P
																Stainless steel	●	M
																Cast iron	●	K
																Non-ferrous metals	●	N
																Titanium alloy	●	S
																Hard materials (~ 40HRC)		H
																Hard materials (40HRC ~)		
Insert		Description		No. of edges	Dimension (mm)						Tolerance (mm)		Carbide		Cermet	Applicable toolholder ⇒ G86~G88		
					CW	CDX	S	RE	INSL	W1	CW min.	CW max.	PVD		-	-		
													PR1225	PR930	KW10	TG60		
	 1-edge	GVR	100-020SS	1	1	2.3	3	0.2	9	3.6	-0.03	+0.03	●	●	●	●	GIVR1216-1SS
			125-020SS		1.25								●	●	●	●	
			145-020SS		1.45								●	●	●	●	
			200-020SS		2								●	●	●		
			250-020SS		2.5								●	●	●		
			300-020SS		3								●	●	●		
		GVL	100-020SS		1								●		●		GIVL1216-1SS
			125-020SS		1.25								●		●		
			145-020SS		1.45								●		●		
			200-020SS		2								●		●		
			250-020SS		2.5								●		●		
			300-020SS		3								●		●		
	 1-edge	GVR	100-020S	1	1	2.3	4	0.2	11	4	-0.03	+0.03	●	●	●		GIVR1420-1S GIVR1412-1SE
			125-020S		1.25								●	●	●		
			145-020S		1.45								●	●	●	●	
			185-020S		1.85								●	●	●		
			200-020S		2								●	●	●		
			250-020S		2.5								●	●	●		
			340-020S		3.4								●	●	●		
		GVL	100-020S		1								●	●	●		GIVL1420-1S GIVL1412-1SE
			125-020S		1.25										●		
			145-020S		1.45										●		
			185-020S		1.85										●		
			200-020S		2								●	●	●		
			250-020S		2.5								●		●		
			340-020S		3.4										●		
	 2-edge	GVR	100-020A	2	1	2.3	5	0.2	12	4	-0.03	+0.03	●	●	●	●	GIVR1620-1A GIVR1612-1AE GIVR1616-1AW
			125-020A		1.25								●	●	●	●	
			145-020A		1.45								●	●	●	●	
			185-020A		1.85								●	●	●	●	
			200-020A		2								●	●	●	●	
			250-020A		2.5								●	●	●	●	
			300-020A		3								●	●	●	●	
			340-020A		3.4								●	●	●	●	
		GVL	100-020A		1								●	●	●	●	GIVL1620-1A GIVL1612-1AE GIVL1616-1AW
			125-020A		1.25								●		●		
			145-020A		1.45								●		●	●	
			185-020A		1.85								●		●		
			200-020A		2								●	●	●	●	
			250-020A		2.5								●		●		
			300-020A		3										●		
			340-020A		3.4										●		

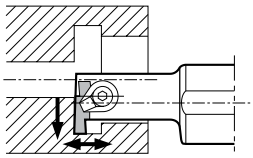
Right-hand shown
CDX shows available grooving depth.

Recommended cutting conditions ⇒ G146

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GV

GIV Steel shank bar (Internal grooving)



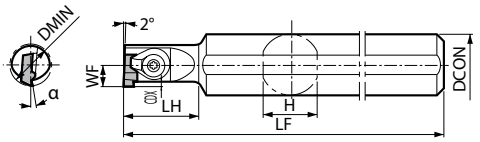
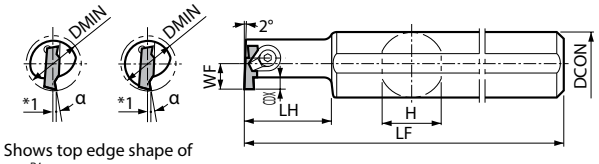


Fig. 1



Shows top edge shape of GIV$^{R}_{L}$1620-1A
(No jaw part under Insert)

Fig. 2

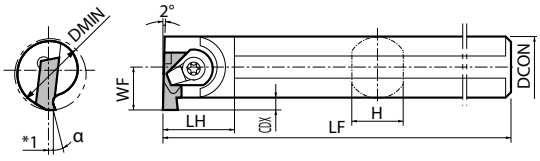


Fig. 3

Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

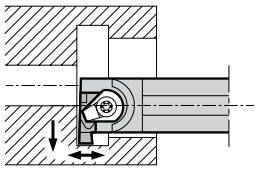
Description		Availability R	Availability L	Dimension (mm) DMIN	DCON	CDX	H	LH	LF	WF	Fig.	Spare parts: Clamp set	Clamp set	Wrench	Wrench	Wrench	Applicable inserts G84,G85
GIV$^{R}_{L}$	1216-1SS	●	●	12	16	2.2	15	20	150	6	1	CPS-4V	-	-	-	FT-10	GV$^{R}_{L}$...-020SS
GIV$^{R}_{L}$	1420-1S	●	●	14	20	2.2	19	24	150	7	1	CPS-5F	-	-	FT-15	-	GV$^{R}_{L}$...-020S
GIV$^{R}_{L}$	1620-1A	●	●	16	20	2.2	19	28	160	8	2	CPS-5V	-	-	FT-15	-	GV$^{R}_{L}$...-...A(R)
GIV$^{R}_{L}$	2025-1B	●	●	20	25	*1 2.8	23	35	180	10	2	CPS-5V	-	-	FT-15	-	GV$^{R}_{L}$145 ~ 250-...B(R)
	2025-2B	●	●			*2 3.2											GV$^{R}_{L}$280 ~ 400-...B(R)
GIV$^{R}_{L}$	2532-1C	●	●	25	32	*3 4.5	30	43	200	12.5	2	-	CPS-6V	LW-3	-	-	GV$^{R}_{L}$280 ~ 340-020C
	2532-2C	●	●			*4 5.5											GV$^{R}_{L}$400 ~ 500-020C
	3232-1C	●	●	32		*3 4.5		52	220	16							GV$^{R}_{L}$280 ~ 340-020C
	3232-2C	●	●			*4 5.5											GV$^{R}_{L}$400 ~ 500-020C
GIV$^{R}_{L}$	4032-1C	●	●	40	32	*3 4.5	30	43	250	21	3	-	CPS-6V	LW-3	-	-	GV$^{R}_{L}$280 ~ 340-020C
	4032-2C	●	●			*4 5.5				22.2							GV$^{R}_{L}$400 ~ 500-020C

GIV are designed to set the cutting edge height 1mm above the center height.
CDX shows available grooving depth.

*1. GV$^{R}_{L}$200~250-020B Insert can be used up to a Groove Depth 3.2mm.
*2. GV$^{R}_{L}$300~400-020B Insert can be used up to a Groove Depth 4.2mm.
*3. GV$^{R}_{L}$340-020C Insert can be used up to a Groove Depth 5.5mm.
*4. GV$^{R}_{L}$430~500-020C Insert can be used up to a Groove Depth 6.3mm.
If you need any of insert groove depth specified in *1 to *4, modify the dimension CDX of toolholder.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GIV-E Excellent bar (Internal grooving)



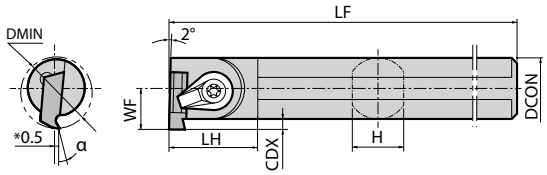
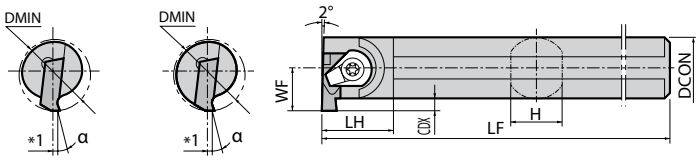


Fig. 1

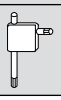


Shows top edge shape of GIV$^{R}_{L}$1612-1AE (No jaw part under Insert)

Fig. 2

Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

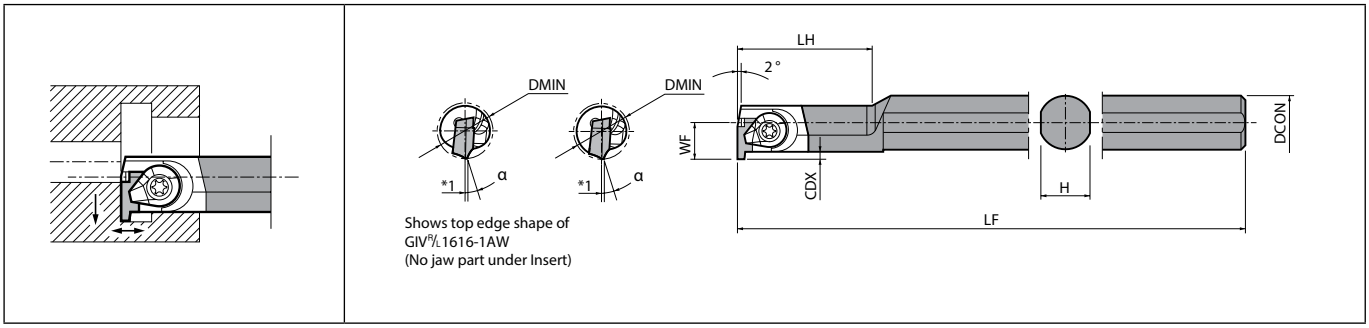
Description		Availability		Dimension (mm)							Fig.	Spare parts				Applicable inserts G84,G85
												Clamp set	Clamp set	Wrench	Wrench	
		R	L	DMIN	DCON	CDX	H	LH	LF	WF						
GIV$^{R}_{L}$	1412-1SE	●	●	14	12	1.7	11.4	18	150	7.7	1	CPS-5F	-	-	FT-15	GV$^{R}_{L}$...-020S
GIV$^{R}_{L}$	1612-1AE	●	●	16	12	2.2	11.4	19	150	8.2	2	CPS-5V	-	-	FT-15	GV$^{R}_{L}$....-...A(R)
GIV$^{R}_{L}$	2016-1BE	●	●	20	16	*1 2.8	15.2	20	180	11.2	2	CPS-5V	-	-	FT-15	GV$^{R}_{L}$145 ~ 250-...B(R)
	2016-2BE	●	●			*5 3.2		19		11.7						GV$^{R}_{L}$280 ~ 400-...B(R)
GIV$^{R}_{L}$	2520-1CE	●	●	25	20	*6 4.5	19	25	200	14.5	2	-	CPS-6V	LW-3	-	GV$^{R}_{L}$280 ~ 340-020C
	2720-2CE	●	●	27		*4 5.5				16.2						GV$^{R}_{L}$400 ~ 500-020C
	3225-1CE	●	●	32	25	*7 4.5	24	24	220	17.5						GV$^{R}_{L}$280 ~ 340-020C
	3225-2CE	●	●			*4 5.5				18.7						GV$^{R}_{L}$400 ~ 500-020C
	4032-1CE	●	●	40	32	*7 4.5	31	29	240	21						GV$^{R}_{L}$280 ~ 340-020C
	4032-2CE	●	●			*4 5.5				22.2						GV$^{R}_{L}$400 ~ 500-020C

GIV-E are designed to set the cutting edge height 1mm above the center height. (0.5mm for GIV$^{R}_{L}$1612-1AE)
CDX shows available grooving depth.

*1. GV$^{R}_{L}$200~250-020B Insert can be used up to a Groove Depth 3.2mm.
*4. GV$^{R}_{L}$430~500-020C Insert can be used up to a Groove Depth 6.3mm.
*5. GV$^{R}_{L}$300~400-020B Insert can be used up to a Groove Depth 3.8mm. (When using GIV$^{R}_{L}$2016-2BE)
*6. GV$^{R}_{L}$340-020C Insert can be used up to a Groove Depth 4.7mm. (When using GIV$^{R}_{L}$2520-1CE)
*7. GV$^{R}_{L}$340-020C Insert can be used up to a Groove Depth 5.3mm. (When using GIV$^{R}_{L}$3225-1CE, GIV$^{R}_{L}$4032-1CE)
If you need any of insert groove depth specified in *1 to *7, modify the dimension CDX of toolholder.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GIV-W Carbide shank bar (Internal grooving)



Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description		Availability		Dimension (mm)							Spare parts				Applicable inserts G84,G85
											Clamp set	Clamp set	Wrench	Wrench	
		R	L	DMIN	DCON	CDX	H	LH	LF	WF					
GIV R/L	1616-1AW	●	●	16	16	2.2	15	48	175	10.6	CPS-5V	-	-	FT-15	GV R/L...-...A(R)
GIV R/L	2020-1BW	●	●	20	20	*1 2.8	19	60	220	14.6	CPS-5V	-	-	FT-15	GV R/L 145 ~ 250-...B(R)
	2020-2BW	●	●			*2 3.2									GV R/L 280 ~ 400-...B(R)
GIV R/L	2525-1CW	●	●	25	25	*3 4.5	24	70	260	19.1	-	CPS-6V	LW-3	-	GV R/L 280 ~ 340-020C
	2525-2CW	●	●			*4 5.5									GV R/L 400 ~ 500-020C

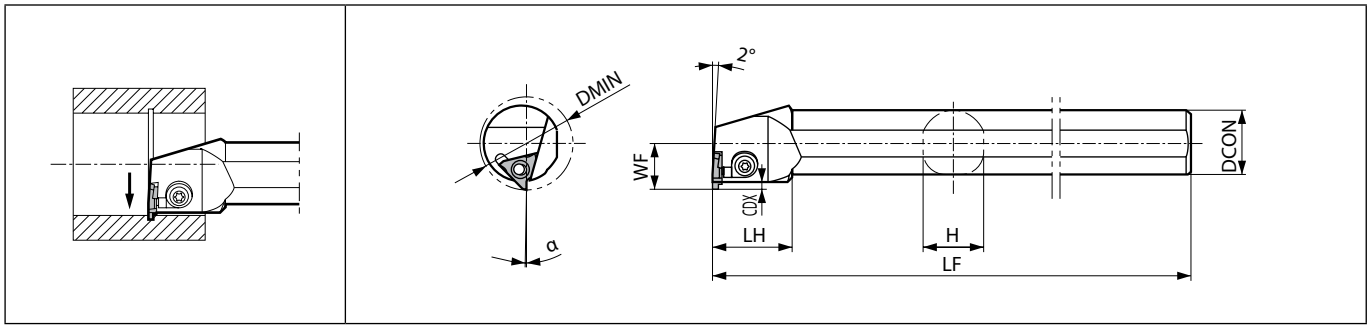
GIV-W are designed to set the cutting edge height 1mm above the center height.
CDX shows available grooving depth.
*1. GV R/L 200~250-020B Insert can be used up to a Groove Depth 3.2mm.
*2. GV R/L 300~400-020B Insert can be used up to a Groove Depth 4.2mm.
*3. GV R/L 340-020C Insert can be used up to a Groove Depth 5.5mm.
*4. GV R/L 430~500-020C Insert can be used up to a Groove Depth 6.3mm.
If you need any of insert groove depth specified in *1 to *4, modify the dimension CDX of toolholder.

Applicable Insert & Rake Angle (α) after Installment of Insert

Toolholder Description	Insert Description G84,G85		Rake Angle (α)	
	General Grooving (Square)	Full-R Grooving (Round)	TC40	TN90,TC60 PR930,PR1225 KW10
GIV R/L...1SS	GV R/L 100~300-020SS	-	10°	15°
GIV R/L...1S	GV R/L 100~340-020S	-	10°	15°
GIV R/L...1SE	GV R/L 100~340-020S	-	3°	8°
GIV R/L...1A(□)	GV R/L 100~340-020A	GV R/L 200-100AR~300-150AR	3°	8°
GIV R/L...1B(□)	GV R/L 145~250-020B	GV R/L 200-100BR	4°	9°
GIV R/L...2B(□)	GV R/L 280~400-020B	GV R/L 300-150BR		
GIV R/L...1C(□)	GV R/L 280~340-020C	-	5°	10°
GIV R/L...2C(□)	GV R/L 400~500-020C	-		

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KIGBA (Internal grooving / Shallow grooving)

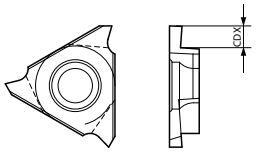


Right-hand shown | Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)							Spare parts		Applicable inserts G6~G12
	R	L	DMIN	DCON	CDX	H	LH	LF	WF	Clamp set	Wrench	
KIGBA$^{R}/_{L}$ 3525-16	●	●	35	25	2.8	23	30	220	17.5	LGBA-16$^{L}/_{R}$S	FT-15	GBA32$^{L}/_{R}$ type
KIGBA$^{R}/_{L}$ 4032-22	●	●	40	32	3	30	30	250	23	LGBA-22$^{L}/_{R}$S	FT-15	GBA43$^{L}/_{R}$ type

CDX shows the distance from the toolholder to the cutting edge.
Available Grooving Depth depends on the insert.
KIGBA$^{R}/_{L}$ 3525-16 : CDX of the applicable insert (GBA32)
4032-22 : CDX of the applicable insert (GBA43) (1) 2.0 mm (CDX < 3.0 mm) (2) 3.0 mm (CDX ≥ 3.0 mm)
Clamp Set : LGBA-○○LS for Right-hand Toolholder, and LGBA-○○RS for Left-hand Toolholder.



Rake Angle (α) after Installment of GBA insert

GBA32$^{R}/_{L}$○○○-○○○		GBA43$^{R}/_{L}$○○○-○○○		GBA43$^{R}/_{L}$○○○-○○○R (Full-R)		
α	Insert Grades	α	Insert Grades	α	Insert Grades	Full-R Description
+1°	TN620, TN90, PV7040 PR1215, PR1625, PR2015, PR2025 PR905, PR930 KPD001, KPD010	-9°	KBN510, KBN525	+1°	TN620, TN90, PV7040 PR1215, PR1625, PR2015, PR2025 PR905, PR930	050R~150R
+11°	KW10	+1°	TN620, TN90, PV7040 PR1215, PR1625, PR2015, PR2025 PR905, PR930 KPD001, KPD010	+5°	TN620, TN90, PV7040 PR1215, PR1625, PR2015, PR2025 PR905, PR930	200R
		+11°	KW10		KW10	050R~200R

Rake Angle (α) after Installment of GBA-GM insert

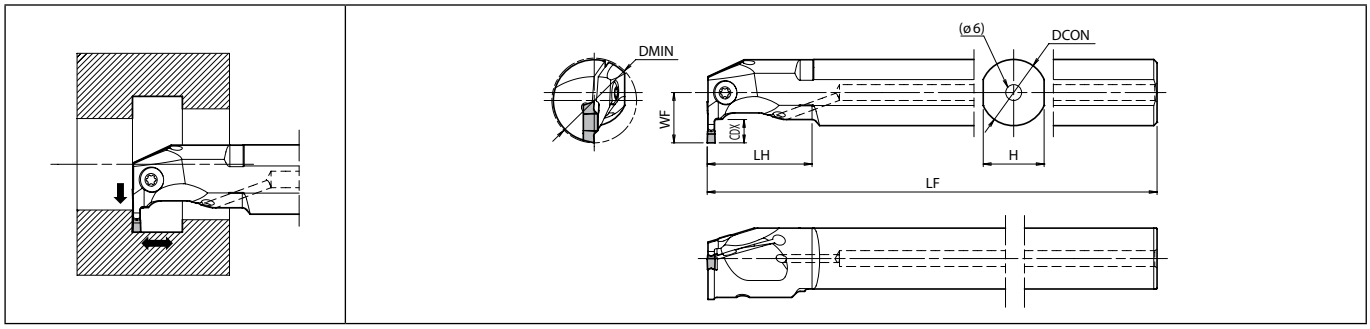
α	Insert Description
+1°	GBA43$^{R}/_{L}$150-020GM
+6°	GBA43$^{R}/_{L}$175-020GM ~ GBA43$^{R}/_{L}$265-030GM
+3°	GBA43$^{R}/_{L}$300-030GM ~ GBA43$^{R}/_{L}$400-040GM

α indicates the rake angle at the center of the edge width, after installing insert.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GDM/GDG

KGDI (Internal grooving)



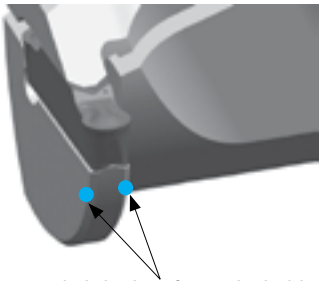
Right-hand shown

Toolholder dimensions

Description		Availability R	Availability L	Dimension (mm) DMIN with GMI/GS	DMIN with CM	DMIN * with CM	DCON	CDX	H	LH	LF	WF	CW min.	CW max.	Coolant hole	Spare parts: Clamp screw (Torx)	Spare parts: Screw	Spare parts: Wrench	Spare parts: Wrench	Applicable inserts ⇒ G90
KGDI R/L	1816B-2	●	●	18	-	-	16	4.5	15	25	150	9.5	2	2	Yes	-	GS-50	LW-3	-	GDM2013N-020GMI
	2520B-2	●	●	25			20	6	18	30	180	14.5								
	3225B-2	●	●	32			25	7	23	40	200	19				SB-5TR	-	-	LTW-20	
KGDI R/L	2016B-3	●	●	20	21	-	16	5.5	15	25	150	11.5	3	3	Yes	-	GS-50	LW-3	-	GDM3015N-... GDG3015N-...
	2520B-3	●	●	25	26		20	6	18	30	180	14.5								
	3225B-3	●	●	32	33		25	8	23	40	200	19				SB-5TR	-	-	LTW-20	
KGDI R/L	3225B-4	●	●	32	40	34	25	8.5	23	40	200	19	4	5	Yes	SB-5TR	-	-	LTW-20	GDM4020N-... GDG4020N-...
	4032B-4	●	●	40	48	42	32	11	29	50	220	23.5								
KGDI R/L	3225B-5	●	●	32	37	34	25	8.5	23	40	200	19	5	5	Yes	SB-5TR	-	-	LTW-20	GDM5020N-... GDG5020N-...
	4032B-5	●	●	40	45	42	32	11	29	50	220	23.5								

* Possible by slightly chamfering toolholder's tip about 0.5 mm

Additional processing of toolholder tip when CM chipbreaker is installed



* By slightly chamfering the holder tip of about 0.5 mm, the cutting diameter can be minimized.

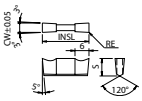
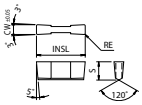
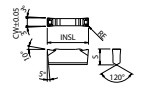
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GH/GHU

Cutting edge preparation

Symbol	Specification	Example	
S	Chamfered and R-honed	S01020	0.10mm × 20° chamfered and R-honed
T	Chamfered	T01020	0.10mm × 20° chamfered

Carbon steel / Alloy steel			✖																P
Stainless steel			●																M
Cast iron				●			●	○											K
Non-ferrous metals				●															N
Titanium alloy				●															S
Hard materials (~ 40HRC)			●																H
Hard materials (40HRC ~)					○	●													

Insert		Description		Edge preparation type	No. of edges	Dimension (mm)				Tolerance (mm)		Carbide			Ceramic		Cermet			Applicable toolholder G93
						CW	S	RE	INSL	CW min.	CW max.	CVD	PVD	-	PVD	-	-			
												CR9025	PR930	KW10	A66N PT600M	A65	TC40	TC60	TN60	
		GH	4020-02 4020-05	-	2	4	7.5	0.2 0.5	20	-0.05	+0.05		● ●	● ●			● ●	● ●		KIGHR4532B-4 KIGHR5540B-4 KIGHR6550B-4
		GH	4520-02 4520-05	-	2	4.5	7.5	0.2 0.5	20	-0.05	+0.05						● ●			
		GH	5020-02 5020-05	-	2	5	7.5	0.2 0.5	20	-0.05	+0.05		● ●	● ●			● ●	● ●		KIGHR4532B-5 KIGHR5540B-5 KIGHR6550B-5
		GH	5520-02 5520-05	-	2	5.5	7.5	0.2 0.5	20	-0.05	+0.05						● ●			
		GH	6020-02 6020-05	-	2	6	7.5	0.2 0.5	20	-0.05	+0.05		● ●	● ●			● ●	● ●		
		GH	6520-02 6520-05	-	2	6.5	7.5	0.2 0.5	20	-0.05	+0.05						● ●			
		GH	7020-02 7020-05	-	2	7	7.5	0.2 0.5	20	-0.05	+0.05		● ●	● ●			● ●	● ●		KIGHR5540B-7 KIGHR6550B-7
		GH	7520-02 7520-05	-	2	7.5	7.5	0.2 0.5	20	-0.05	+0.05						● ●			
		GH	8020-02 8020-05	-	2	8	7.5	0.2 0.5	20	-0.05	+0.05		● ●	● ●			● ●	● ●		
		GH	4020-05	S01020 T01020	2	4	7.5	0.5	20	-0.05	+0.05				● ●	● ●				KIGHR4532B-4 KIGHR5540B-4 KIGHR6550B-4
		GH	5020-05	S01020 T01020	2	5	7.5	0.5	20	-0.05	+0.05				● ●	● ●				KIGHR4532B-5 KIGHR5540B-5 KIGHR6550B-5
		GH	6020-05	T01020	2	6	7.5	0.5	20	-0.05	+0.05					●				
		GH	7020-05	T01020	2	7	7.5	0.5	20	-0.05	+0.05					●				KIGHR5540B-7 KIGHR6550B-7
	 Molded Chipbreaker	GHU	40-20	-	2	4	7.5	0.25	20	-0.05	+0.05	●							●	KIGHR4532B-4 KIGHR5540B-4 KIGHR6550B-4
		GHU	50-20	-	2	5	7.5	0.3	20	-0.05	+0.05	●							●	KIGHR4532B-5 KIGHR5540B-5 KIGHR6550B-5
		GHU	60-20	-	2	6	7.5	0.3	20	-0.05	+0.05	●							●	

Recommended cutting conditions G65

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KIGH (Internal grooving / Deep grooving)

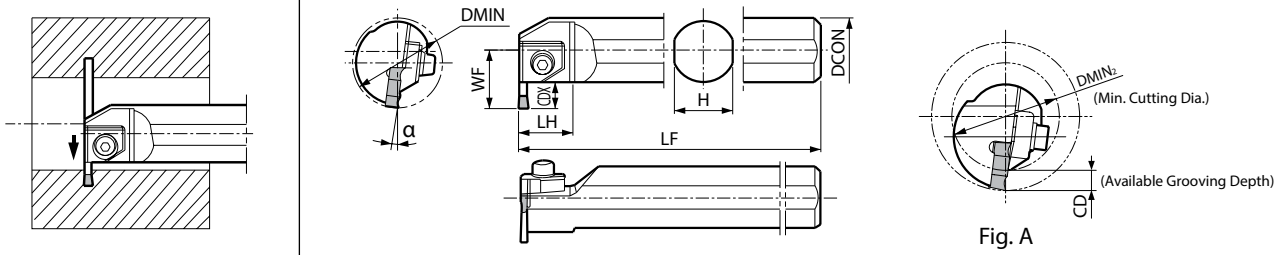


Fig. A

Right-hand shown

Toolholder dimensions

Description		Availability	Dimension (mm)							Spare parts					Applicable inserts ➔ G92
			Clamp	Clamp bolt	Spring	Washer	Wrench								
		R	DMIN	DCON	CDX	H	LH	LF	WF						
KIGHR	4532B-4	●	45	32	12	30	27	200	28.2	CGH-1L	HH6X25	SP-6	W-6	LW-5	GH4020-... / GHU40-... GH4520-...
	5540B-4	●	55	40		38		250	32.3						
	6550B-4	●	65	50		48		300	37.3						
KIGHR	4532B-5	●	45	32	12	30	27	200	28.2	CGH-1L	HH6X25	SP-6	W-6	LW-5	GH5020-... / GHU50-... / GH5520-... GH6020-... / GHU60-... / GH6520-...
	5540B-5	●	55	40		38		250	32.3						
	6550B-5	●	65	50		48		300	37.3						
KIGHR	5540B-7	●	55	40	12	38	27	250	32.3	CGH-2L	HH6X25	SP-6	W-6	LW-5	GH7020-... / GH7520-... / GH8020-...

CDX shows the distance from the toolholder to the cutting edge. For the available grooving depth (CD), ref. to „List of Min. Available Cutting Diameter and Groove Depth".
LH depends on the insert's edge width.

Rake Angle (α) after Installment of GH / GHU insert

GH○○○○-○○		GHU○○-○○	
α	Insert Grades	α	Insert Grades
-5°	A65, A66N, PT600M	+5°	TN60 CR9025
+5°	TC40		
+15°	TN90, TC60 PR930 KW10		

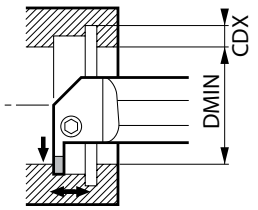
List of the Min. Cutting Diameter and Grooving Depth (Refer to Fig. A)

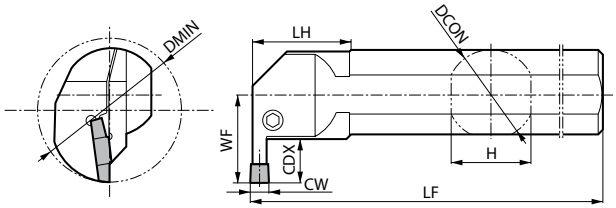
Toolholder Description		$DMIN_2$ (Min. Cutting Dia.)					
KIGHR	4532B-○	ø110	ø70	ø65	ø60	ø55	ø45
	5540B-○	ø70	ø60	ø55			
	6550B-○	ø65					
Available Grooving Depth CD (mm)		12	11.5	11	10	9	Under 8

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GMM/GMG/GMGA

KIGM-8 (Internal grooving)





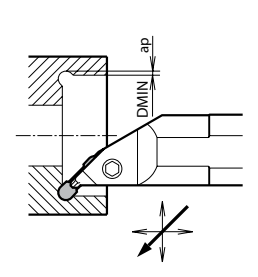
Right-hand shown

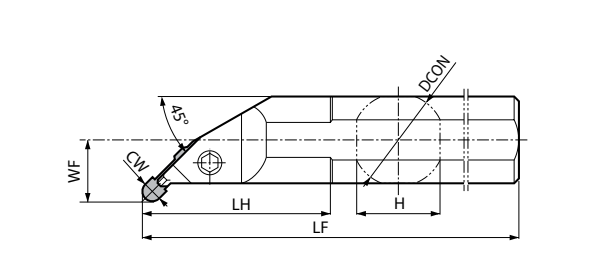
Toolholder dimensions

Description	Availability		Dimension (mm)									Spare parts		Applicable inserts G94
	R	L	DMIN	DCON	CDX	H	LH	LF	WF	CW min.	CW max.	Clamp bolt	Wrench	
KIGMR/L 6540B-8	●	●	65	40	20	36	41	300	41	8	8	HH6X20	LW-5	GM..8030-...

CDX shows available grooving depth.

KIGMU-8 (Internal grooving / Undercut grooving)





Right-hand shown

Toolholder dimensions

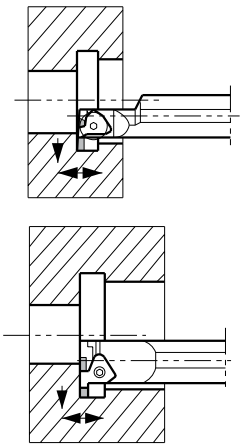
Description	Availability	Dimension (mm)									Spare parts		Applicable inserts G94
	R	DMIN	DCON	H	LH	ap	LF	WF	CW min.	CW max.	Clamp bolt	Wrench	
KIGMUR 6540B-8	●	65	40	36	83	2.2	300	26	8	8	HH6X20	LW-5	GM..8030-...

CDX shows available grooving depth.
ap shows the distance from the internal face of the workpiece.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GIA

KGIA (Internal grooving / Deep grooving)



Integral type

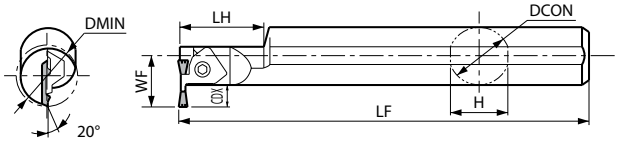


Fig. 1

Separate type

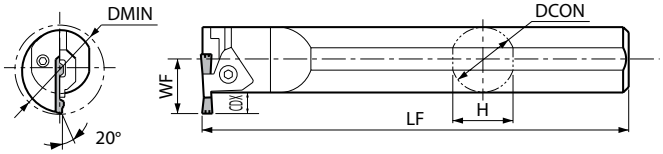


Fig. 2

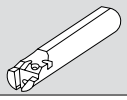
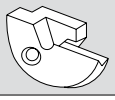
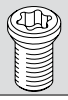
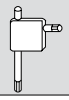
Right-hand shown

Toolholder dimensions

Description		Availability	Dimension (mm)							Fig.	Spare parts				Applicable inserts ➡ G96
											Clamp bolt	Clamp	Spring	Wrench	
		R	DMIN	DCON	CDX	H	LH	LF	WF						
KGIAR	3232B-3	●	32	32	10	30.4	45	200	26.5	1	HH5X15	CGIA-3R	SP-5	LW-4	GIA30
	4332B-3	●	43			30	-		26.3	2					
	5140B-3	●	51	40		38		250	30.3						
KGIAR	3232B-4	●	32	32	10	30.4	45	200	26.5	1	HH5X15	CGIA-4R	SP-5	LW-4	GIA40
	4332B-4	●	43			30	-		26.3	2					
	5140B-4	●	51	40		38		250	30.3						
KGIAR	5640B-5	●	56	40	15	38	-	250	35.3	2	HH5X15	CGIA-5R	SP-5	LW-4	GIA50
	6650B-5	●	66	50		48		300	40.3						

CDX shows available grooving depth.

Composition

Type	Spare Parts / Toolholder Description		Toolholder	Blade	Clamp Screw	Wrench
						
Integral Type	KGIAR	3232B-3	-	-	-	-
Separate Type		4332B-3	KGIAR32H	BGIAR43-3	SB-40140TR	FT-15
		5140B-3	KGIAR40H	BGIAR51-3		
Integral Type		3232B-4	-	-	-	-
Separate Type		4332B-4	KGIAR32H	BGIAR43-4	SB-40140TR	FT-15
		5140B-4	KGIAR40H	BGIAR51-4		
Separate Type		5640B-5	KGIAR40H	BGIAR56-5	SB-40140TR	FT-15
		6650B-5	KGIAR50H	BGIAR66-5		

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

External dia. of the groove DAXN / DAXX

External dia. of the groove within DAXN ~ DAXX are the available range for the initial grooving on the unprocessed workpiece (Ref. to Fig. 1)



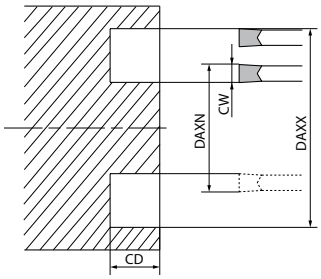
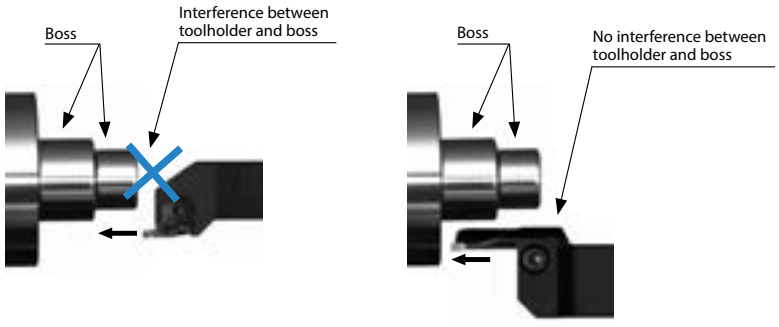


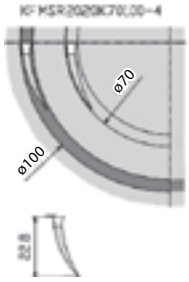
Fig.1

Caution for face grooving

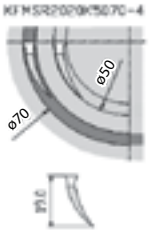
1. When face grooving, the suitable toolholder depends on the length of the boss



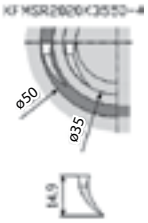
2. Selection of face grooving toolholder



Shape of below jaw



Shape of below jaw

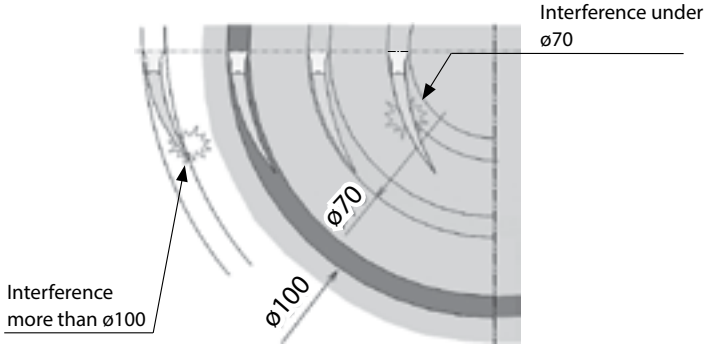


Shape of below jaw

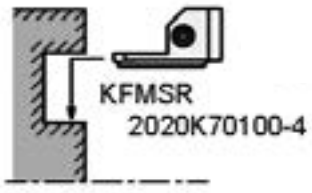
Wider grooving (turning) should be performed from the outside inwards

3. Interference of face grooving toolholder

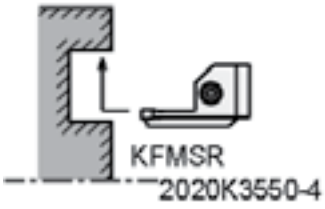
e.g.) KFMSR2525M70100-4



Good



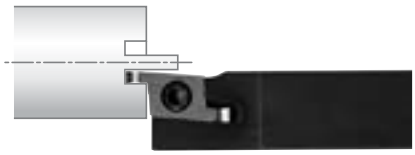
Bad



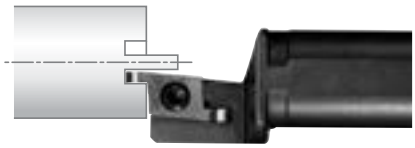
Example of usage for the face grooving toolholder

When face grooving, KFMSR2525M70100-4 should be between ø70~ø100 for grooving the outer diameter at first.
If the workpiece is machined at a diameter ø100 or ø70, the jaw of toolholder interferes with the workpiece.

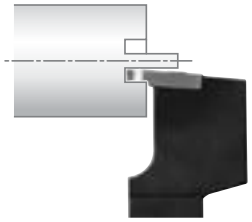
Small diameter face grooving ø6~



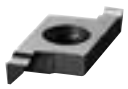
Type	STW
External dia. of the groove (min.)	ø6
Edge width (mm)	0.5~2.0
Grooving depth (mm)	1.0~3.0
See Page	**G106**



Type	S..-STW
External dia. of the groove (min.)	ø6
Edge width (mm)	0.5~2.0
Grooving depth (mm)	1.0~3.0
See Page	**G107**



Type	STWS
External dia. of the groove (min.)	ø6
Edge width (mm)	0.5~2.0
Grooving depth (mm)	1.0~3.0
See Page	**G109**

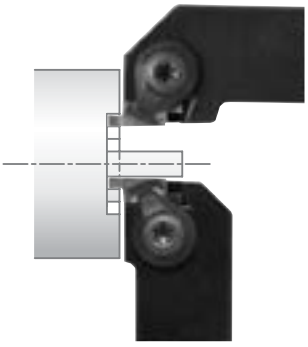


Twin-bars for horizontal type



Twin-bars for vertical type

Small diameter face grooving ø8~



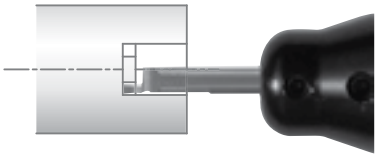
Type	GFVS-AA
External dia. of the groove (min.)	ø8
Edge width (mm)	1.0~3.0
Grooving depth (mm)	2.2
See Page	**G125**

Type	GFVT-AA
External dia. of the groove (min.)	ø8
Edge width (mm)	1.0~3.0
Grooving depth (mm)	2.2
See Page	**G125**

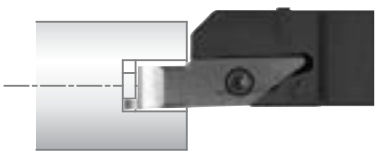


Ground chipbreaker

Small diameter face grooving ø5~, ø8~



Type	EZFG
External dia. of the groove (min.)	ø5, ø 6, ø 8
Edge width (mm)	1.0~3.0
Grooving depth (mm)	1.5~3.0
See Page	**G102**



Type	VNFG
External dia. of the groove (min.)	ø 8
Edge width (mm)	1.0~3.0
Grooving depth (mm)	2.0~3.0
See Page	**G104**



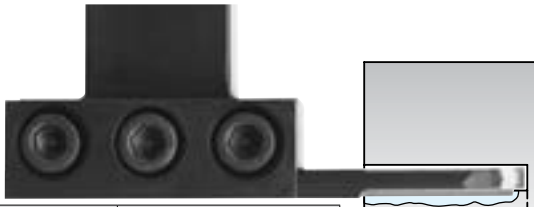
EZ bars



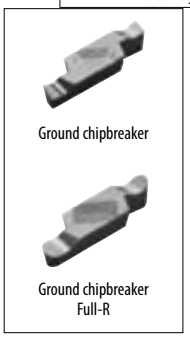
System tip-bars

Face grooving ø20~

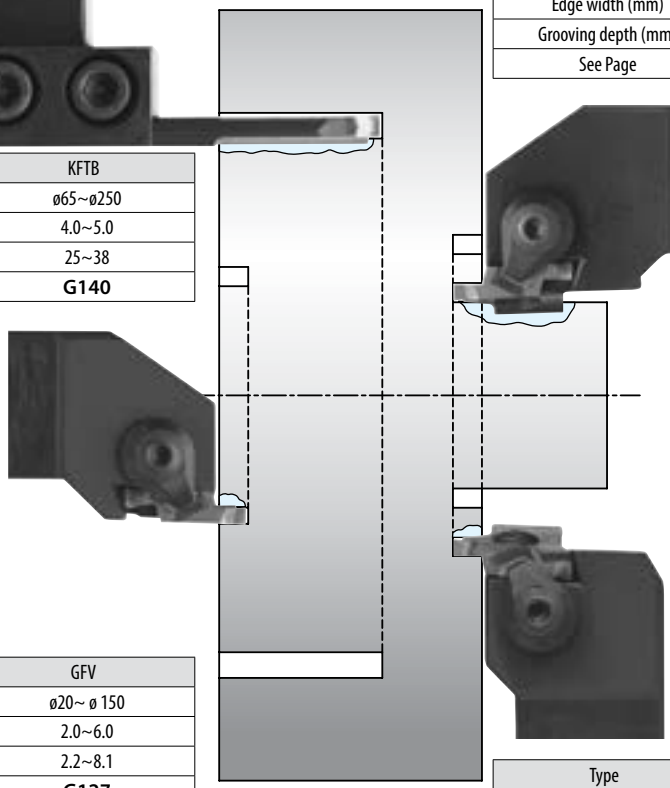

Molded chipbreaker



Type	KFTB
External dia. of the groove (min.)	ø65~ø250
Edge width (mm)	4.0~5.0
Grooving depth (mm)	25~38
See Page	**G140**

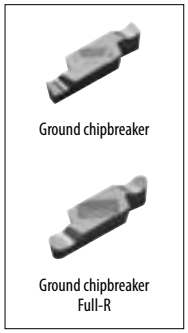

Ground chipbreaker

Ground chipbreaker Full-R



Type	GFV
External dia. of the groove (min.)	ø20~ ø 150
Edge width (mm)	2.0~6.0
Grooving depth (mm)	2.2~8.1
See Page	**G127**

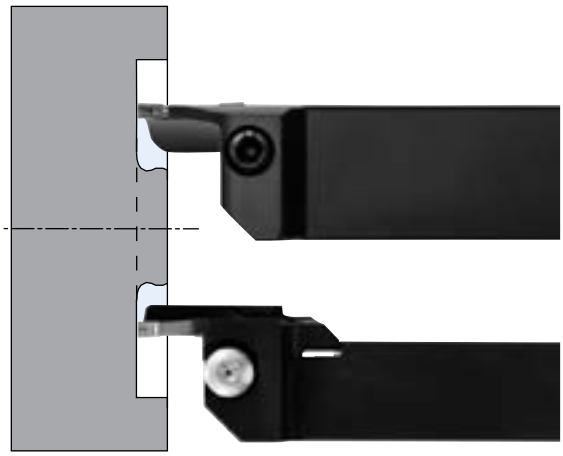
Type	GFVS
External dia. of the groove (min.)	ø35~ø150
Edge width (mm)	2.5~6.0
Grooving depth (mm)	4.6~8.1
See Page	**G129**


Ground chipbreaker

Ground chipbreaker Full-R

Type	GFVT
External dia. of the groove (min.)	ø35~ø150
Edge width (mm)	2.5~6.0
Grooving depth (mm)	4.6~8.1
See Page	**G130**

KGDF face grooving ø25~



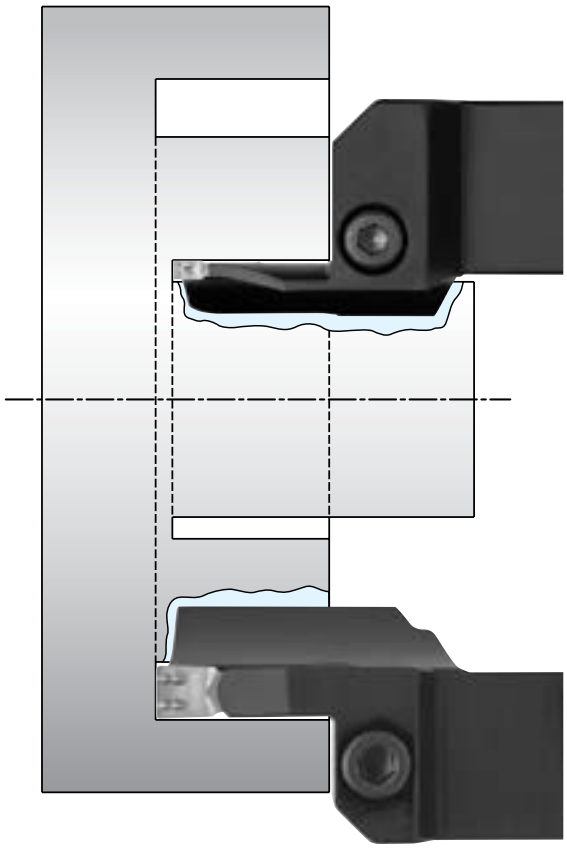
Type	KGDF-Z
External dia. of the groove (min.)	ø50
Edge width (mm)	3.0~5.0
Grooving depth (mm)	15
See Page	**G118**

Type	*KGDF
External dia. of the groove (min.)	ø25
Edge width (mm)	2.0~6.0
Grooving depth (mm)	6~32
See Page	**G114~G117**

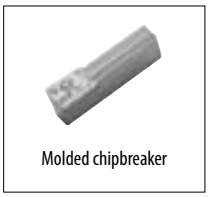
* The separate type toolholders can accept all the blades if their hand is matching.

Grooving and turning GM	Deep grooving and turning DM	High feed GH	Full-R CM
			

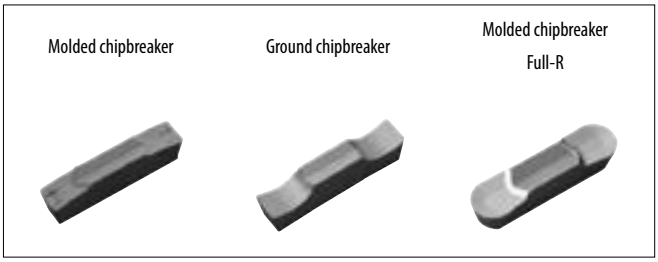
Face grooving & turning ø25~



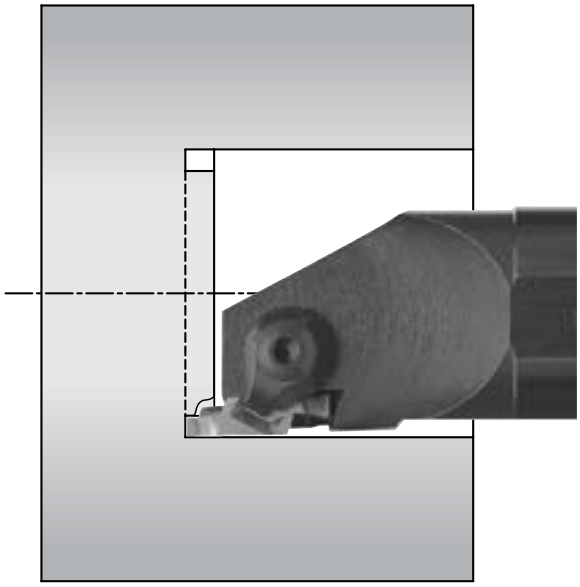
Type	KFMS
External dia. of the groove (min.)	ø25~ø235
Edge width (mm)	3.0~6.0
Grooving depth (mm)	13~32
See Page	**G135**



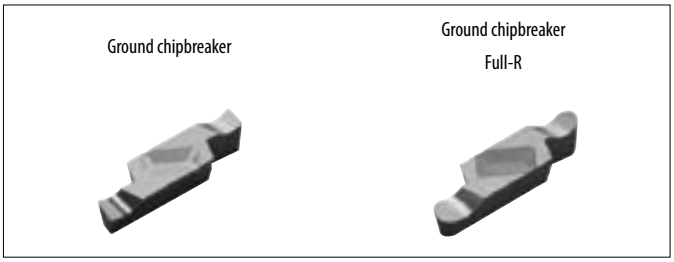
Type	KFMS-8
External dia. of the groove (min.)	ø54~ø155
Edge width (mm)	8.0
Grooving depth (mm)	25
See Page	**G138**



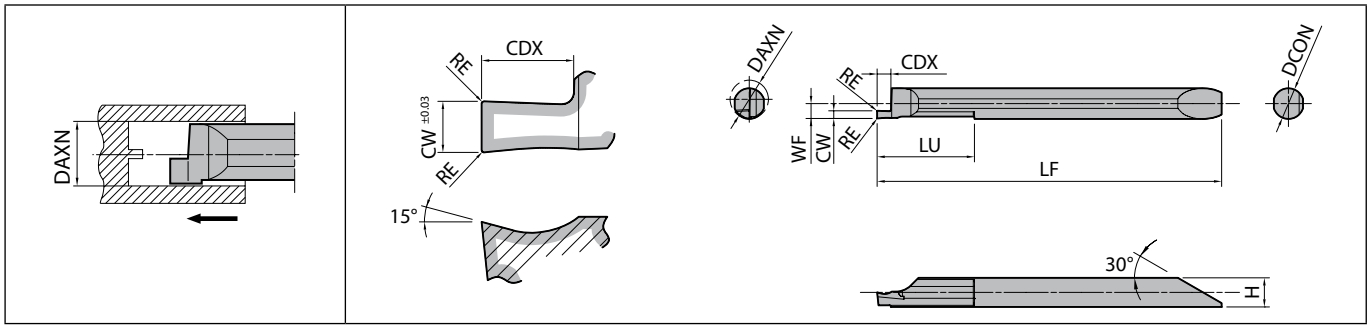
Face grooving ø35~



Type	GIFV
External dia. of the groove (min.)	ø35~ ø 50
Edge width (mm)	2.0~6.0
Grooving depth (mm)	2.2~8.1
See Page	**G133**



EZFG (Internal grooving / Face grooving)



Right-hand shown

Dimensions

Description	No. of edges	External dia.of the groove (mm) DAXN (min.)	Dimension (mm) CW	CDX	RE	DCON	H	LF	LU	WF	Tolerance (mm) CW min.	CW max.	RE min.	RE max.	Carbide PVD PR1225 R	PVD PR1225 L	- GW05 R	Applicable sleeve ➡ F38~F43
EZFG R/L 050040-100	1	5	1	1.5	0.05	4	3.8	45	12	1.9	-0.03	+0.03	-0.013	+0.013	●	●	●	EZH040...
EZFG R/L 050040-150			1.5	2											●	●	●	
EZFG R/L 060050-100	1	6	1	1.5	0.05	5	4.8	53.2	15	2.4	-0.03	+0.03	-0.013	+0.013	●	●	●	EZH050...
EZFG R/L 060050-150			1.5	2.5											●	●	●	
EZFG R/L 060050-200			2	3											●	●	●	
EZFG R/L 080070-100	1	8	1	2	0.05	7	6.8	64.2	25	3.4	-0.03	+0.03	-0.013	+0.013	●	●	●	EZH070...
EZFG R/L 080070-150			1.5	2.5											●	●	●	
EZFG R/L 080070-200			2	3											●	●	●	
EZFG R/L 080070-300			3	3											●	●	●	

CDX shows available grooving depth.

Recommended cutting conditions ➡ G103

EZ Bars Identification System

EZ FG R 050 040 – 100

Symbol of EZ Bars	Applications	Insert hand	External dia. of the groove (min.)	Shank Dia.	Edge Width
	FG : Face Grooving	R : Right-hand L : Left-hand	050 : 5mm 060 : 6mm 080 : 8mm	040 : 4mm 050 : 5mm 070 : 7mm	100 : 1.0mm 150 : 1.5mm 200 : 2.0mm 300 : 3.0mm

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

EZ bars are sold in 1 piece boxes

Applicable sleeves

Sleeve				Applicable insert for internal face grooving		Applicable machine manufacturer
EZH-CT (Adjustable overhang length with coolant hole) ➡ F39	EZH-HP (Adjustable overhang length) ➡ F41	EZH-ST ➡ F43	Sleeve shank dia. DCON(mm)	EZFG	Shank dia. DCON(mm)	
-	-	EZH 04012ST-80	12	EZFG$^{R}_{L}$ 050040-...	4	(General purpose)
		05012ST-80		EZFG$^{R}_{L}$ 060050-...	5	
		07012ST-80		EZFG$^{R}_{L}$ 080070-...	7	
-	EZH 04016HP-100	EZH 04016ST-100	16	EZFG$^{R}_{L}$ 050040-...	4	(General purpose)
	05016HP-100	05016ST-100		EZFG$^{R}_{L}$ 060050-...	5	
	07016HP-100	07016ST-100		EZFG$^{R}_{L}$ 080070-...	7	
EZH 04019CT-120	EZH 04019HP-120	EZH 04019ST-120	19.05	EZFG$^{R}_{L}$ 050040-...	4	Citizen Machinery
05019CT-120	05019HP-120	05019ST-120		EZFG$^{R}_{L}$ 060050-...	5	
07019CT-120	07019HP-120	07019ST-120		EZFG$^{R}_{L}$ 080070-...	7	
EZH 04020CT-120	EZH 04020HP-120	EZH 04020ST-120	20	EZFG$^{R}_{L}$ 050040-...	4	Eguro Tsugami Citizen Machinery (General purpose)
05020CT-120	05020HP-120	05020ST-120		EZFG$^{R}_{L}$ 060050-...	5	
07020CT-120	07020HP-120	07020ST-120		EZFG$^{R}_{L}$ 080070-...	7	
EZH 04022CT-135	EZH 04022HP-135	EZH 04022ST-135	22	EZFG$^{R}_{L}$ 050040-...	4	Star Micronics Nomura DS Tsugami
05022CT-135	05022HP-135	05022ST-135		EZFG$^{R}_{L}$ 060050-...	5	
07022CT-135	07022HP-135	07022ST-135		EZFG$^{R}_{L}$ 080070-...	7	
EZH 04025.0CT-135	EZH 04025.0HP-135	EZH 04025.0ST-135	25	EZFG$^{R}_{L}$ 050040-...	4	Eguro Tsugami Citizen Machinery (General purpose)
05025.0CT-135	05025.0HP-135	05025.0ST-135		EZFG$^{R}_{L}$ 060050-...	5	
07025.0CT-135	07025.0HP-135	07025.0ST-135		EZFG$^{R}_{L}$ 080070-...	7	
EZH 04025.4CT-120	EZH 04025.4HP-120	EZH 04025.4ST-120	25.4	EZFG$^{R}_{L}$ 050040-...	4	Citizen Machinery
05025.4CT-120	05025.4HP-120	05025.4ST-120		EZFG$^{R}_{L}$ 060050-...	5	
07025.4CT-120	07025.4HP-120	07025.4ST-120		EZFG$^{R}_{L}$ 080070-...	7	

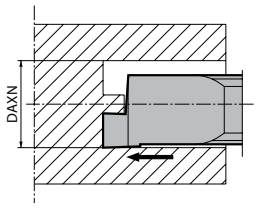
· Choose sleeves (DCB) to meet with DCON dimension of Face Grooving Inserts.
· Adjustment Pin cannot be installed to **EZH-ST** sleeves. To adjust overhang of the bar, please use **EZH-CT / HP** sleeves.
· Machine manufacturers in random order

Recommended cutting conditions

Workpiece material	Insert grades		EZFG$^{R}_{L}$050040-100 EZFG$^{R}_{L}$060050-100 EZFG$^{R}_{L}$080070-100	EZFG$^{R}_{L}$050040-150 EZFG$^{R}_{L}$060050-150 EZFG$^{R}_{L}$080070-150	EZFG$^{R}_{L}$060050-200 EZFG$^{R}_{L}$080070-200	EZFG$^{R}_{L}$080070-300	Remarks
	MEGACOAT	Carbide					
	PR1225	GW05	f (mm/rev)				
Carbon steel / Alloy steel	★ 30~100	-	~0.02	~0.03	~0.04	~0.05	Coolant
Stainless steel	★ 30~80	-	~0.01	~0.02	~0.02	~0.03	
Non-ferrous metals	-	★ ~300	~0.03	~0.05	~0.06	~0.08	

★ : 1st recommendation

VNFG



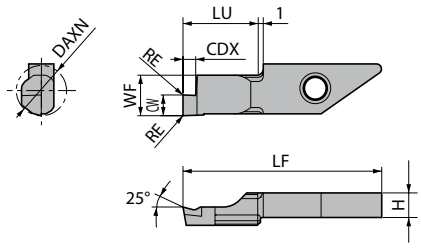


Fig. 1

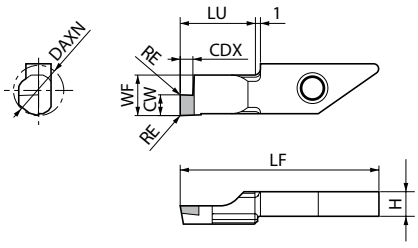


Fig. 2

Right-hand shown

Dimensions

Description	No. of edges	External dia.of the groove (mm)		Dimension (mm)							Tolerance (mm)		Fig.	Carbide			PCD	Applicable toolholder ➡ F48~F51
		DAXN (min.)	DAXX (max.)	CW	CDX	RE	H	LF	LU	WF	CW min.	CW max.		PVD		-	-	
														PR1225	PR930	KW10	KPD001	
VNFGR 0810-10 VNFGR 0820-10 VNFGR 0830-10	1	8 (0)	∞ (∞)	1 2 3	2 2 3	0.05	3.9	29.6	10	7.3	-0.03	+0.03	1	● ● ●	● ● ●	● ● ●		SVNR...-12N S...-SVNR12N S...-SVNR12SN
VNFGR 0820-10NB VNFGR 0830-10NB	1			2 3	2 3	0.05	3.9	29.6	10	7.3	-0.03	+0.03	2				MT0 MT0	

CDX shows available grooving depth.

Recommended cutting conditions ➡ G105

External dia. of the groove DAXN (0) means that you can make the initial groove within DAXN ~ DAXX and then widen it to the center.

CBN & PCD Inserts are sold in 1 piece boxes

System tip-bars are sold in 5 piece boxes

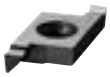
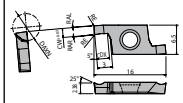
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MT0 : Made to order

Recommended cutting conditions

Workpiece material	Recommended insert grades (Vc: m/min)			VNFG0810	VNFG0820	VNFG0830	Remarks
	MEGACOAT	PVD Coated Carbide	Carbide				
	PR1225	PR930	KW10	f (mm/rev)			
Carbon steel / Alloy steel	★ 30~100	☆ 30~100		~0.02	~0.04	~0.05	Coolant
Stainless steel	★ 30~100	☆ 30~80		~0.01	~0.02	~0.03	
Non-ferrous metals			★ ~300	~0.04	~0.06	~0.08	

★:1st recommendation ☆:2nd recommendation

TWFG (Horizontal type)

Carbon steel / Alloy steel											○	●		P
Stainless steel											○	●		M
Cast iron														K
Non-ferrous metals													●	N
Titanium alloy														S
Hard materials (~ 40HRC)														H
Hard materials (40HRC ~)														
Insert		Description	No. of edges	External dia. of the groove (mm)		Dimension (mm)			Tolerance (mm)		Angle (°)	Carbide			Applicable toolholder ➡ G106 G107
				DAXN (min.)	DAXX (max.)	CW	CDX	RE	CW min.	CW max.	RA	PVD		-	
												PR1025	PR1535	KW10	
		TWFGL 050 080 100 125 150 180 200	2	6 (0)	∞ (∞)	0.5 0.8 1 1.25 1.5 1.8 2	1 1.5 2.2 2.2 2.2 3 3	0.05	- 0.03	+ 0.03	1.5 1.5 2 2 2 2 2	● ● ● ● ● ● ●	● ● ● ● ● ● ●	● ● ● ● ● ● ●	STWL.....-15 S...-STWL15

CDX shows available grooving depth.
External dia. of the groove DAXN (0) means that you can make the initial groove within DAXN ~ DAXX and then widen it to the center.
Left-hand shown

Recommended cutting conditions ➡ G109

STW (Face grooving, Square shank for horizontal type insert)



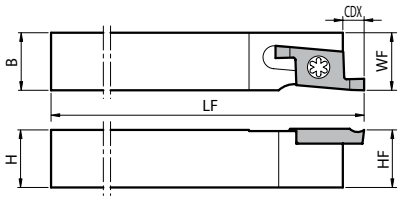


Fig. 1

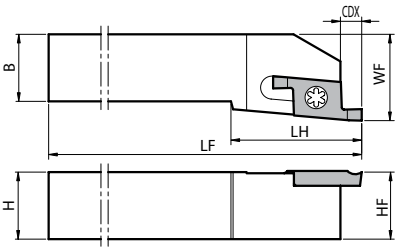


Fig. 2

Left-hand shown | Left-hand Insert for Left-hand Toolholder. | (For right-hand toolholder for boring, See page **F56**.)

Toolholder dimensions

Description		Availability	Dimension (mm)							Fig.	Spare parts		Applicable inserts ➡ G106
											Screw	Wrench	
		L	CDX	H	B	LH	HF	LF	WF				
STWL	1010F-15	●	3.7	10	10	-	10	85	10	1	SB-3080TR	LTW-10S	TWFGL...
	1212F-15	●		12	12		12		12				
	1212K-15	●						125					
	1616K-15	●		16	16		16		16				
STWL	2020K-15	●	3.7	20	20	25	20	125	25	2	SB-3080TR	LTW-10S	TWFGL...
	2525M-15	●		25	25		25	150	32				

CDX shows the distance from the toolholder to the cutting edge. Available Groove Depth : „CDX" of Insert.

Twin-bars are sold in 5 piece boxes

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

STW (Face grooving, Round shank for horizontal type insert)



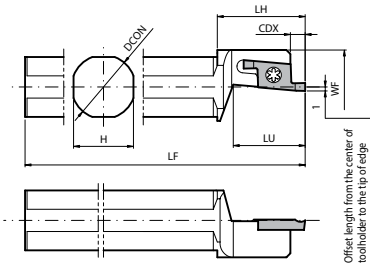


Fig. 1

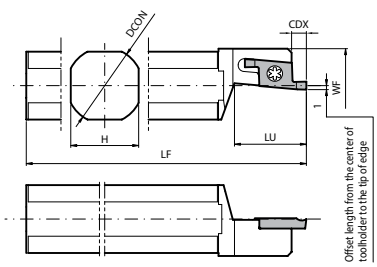


Fig. 2

Left-hand shown | Left-hand Insert for Left-hand Toolholder. | (For right-hand toolholder for boring, See page **F57**.)

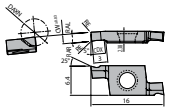
Toolholder dimensions

Description		Availability	Dimension (mm)							Coolant hole	Fig.	Spare parts		Applicable inserts ⇒ **G106**
												Screw	Wrench	
	L	DCON	CDX	H	LH	LF	LU	WF						
S12F-	STWL15	●	12	3.7	11	22	80	18	20	No	1	SB-3080TR	LTW-10S	TWFGL...
S14H-	STWL15	●	14		13		100							
S15F-	STWL15	●	15.875		15		85							
S16F-	STWL15	●	16											
S19G-	STWL15	●	19.05	3.7	17	-	90	18	18.5	No	2	SB-3080TR	LTW-10S	TWFGL...
S19K-	STWL15	●					120							
S20G-	STWL15	●	20		18		90		19.5					
S20K-	STWL15	●					120							
S22K-	STWL15	●	22		20		125	22	21.5					
S25.0J-	STWL15	●	25		23		110		24.5					
S25K-	STWL15	●	25.4				120		25					

CDX shows the distance from the toolholder to the cutting edge. Available Groove Depth : „CDX" of Insert.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

TWFGT (Vertical type)

Carbon steel / Alloy steel											○	●		P
Stainless steel											○	●		M
Cast iron														K
Non-ferrous metals													●	N
Titanium alloy														S
Hard materials (~ 40HRC)														H
Hard materials (40HRC ~)														
Insert		Description	No. of edges	External dia. of the groove (mm)		Dimension (mm)			Tolerance (mm)		Angle (°)	Carbide		Applicable toolholder ➡ G109
				DAXN (min.)	DAXX (max.)	CW	CDX	RE	CW min.	CW max.	$RA^{R/L}$	PVD	-	
												PR1025 / PR1535	KW10	
		TWFGTR 050	2	6 (0)	∞ (∞)	0.5	1	0.05	- 0.03	+ 0.03	1.5	● ●	●	STWSR.....-15T
		TWFGTR 080				0.8	1.5				1.5	● ●	●	
		TWFGTR 100				1	2.2				2	● ●	●	
		TWFGTR 125				1.25	2.2				2	● ●	●	
		TWFGTR 150				1.5	2.2				2	● ●	●	
		TWFGTR 180				1.8	3				2	● ●	●	
		TWFGTR 200				2	3				2	● ●	●	

CDX shows available grooving depth.
External dia. of the groove DAXN (0) means that you can make the initial groove within DAXN ~ DAXX and then widen it to the center.
Right-hand shown

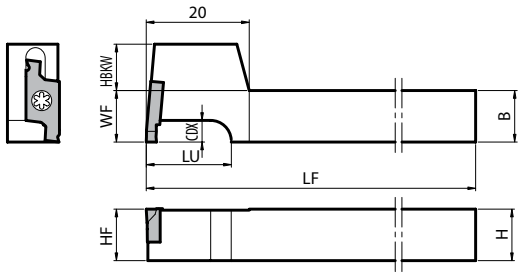
Recommended cutting conditions ➡ G109

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Twin-bars are sold in 5 piece boxes

STWS (Face grooving)





Right-hand shown

Toolholder dimensions

Description		Availability	Dimension (mm)								Spare parts		Applicable inserts G108
											Screw	Wrench	
		R	H	B	LU	HF	HBKW	LF	CDX	WF			
STWSR	1010F-15T	●	10	10	16	10	9	85	4.2	10	SB-3080TR	LTW-10S	TWFGTR...
	1010JX-15T	●						120					
	1212F-15T	●	12	12		12	7	85		12			
	1212JX-15T	●						120					
	1616JX-15T	●	16	16	20	16	3			16			

CDX shows the distance from the toolholder to the cutting edge. Available Groove Depth : „CDX" of Insert.

Recommended cutting conditions TWFG / TWFGT

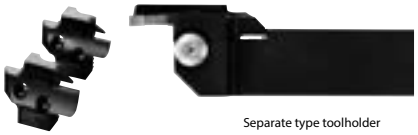
Workpiece material	Recommended insert grades (Vc:m/min)			TWFGL050 TWFGL080 TWFGL100 TWFGTR050 TWFGTR080 TWFGTR100	TWFGL125 TWFGL150 TWFGTR125 TWFGTR150	TWFGL180 TWFGL200 TWFGTR180 TWFGTR200	Remarks
	MEGACOAT	PVD coated carbide	Carbide				
	PR1535	PR1025	KW10	f (mm/rev)			
Carbon steel / Alloy steel	★ 30~100	☆ 30~100	-	~0.02	~0.03	~0.04	Coolant
Stainless steel	★ 30~80	☆ 30~80	-	~0.01	~0.02	~0.02	
Non-ferrous metals	-	-	★ ~300	~0.03	~0.04	~0.06	

★:1st recommendation ☆:2nd recommendation

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGDF: Face grooving

Separate type toolholder (toolholder + blade) and Integral type toolholder are available.
Adaptable to a wide range of face grooving applications by changing blades



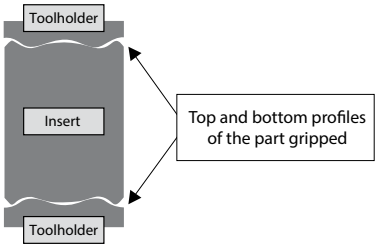
Separate type toolholder



Insert clamping system "W grip"

Unique "W Grip" (insert anti-slip structure) provides stable machining quality

1. Prevents abnormal machining surface and / or insert breakage resulting from slip of insert.
2. Improves repetitive installation accuracy of insert (GDFM and GDFMS inserts are not applicable to KGD external grooving, cut-off and KGDI internal grooving toolholders.)

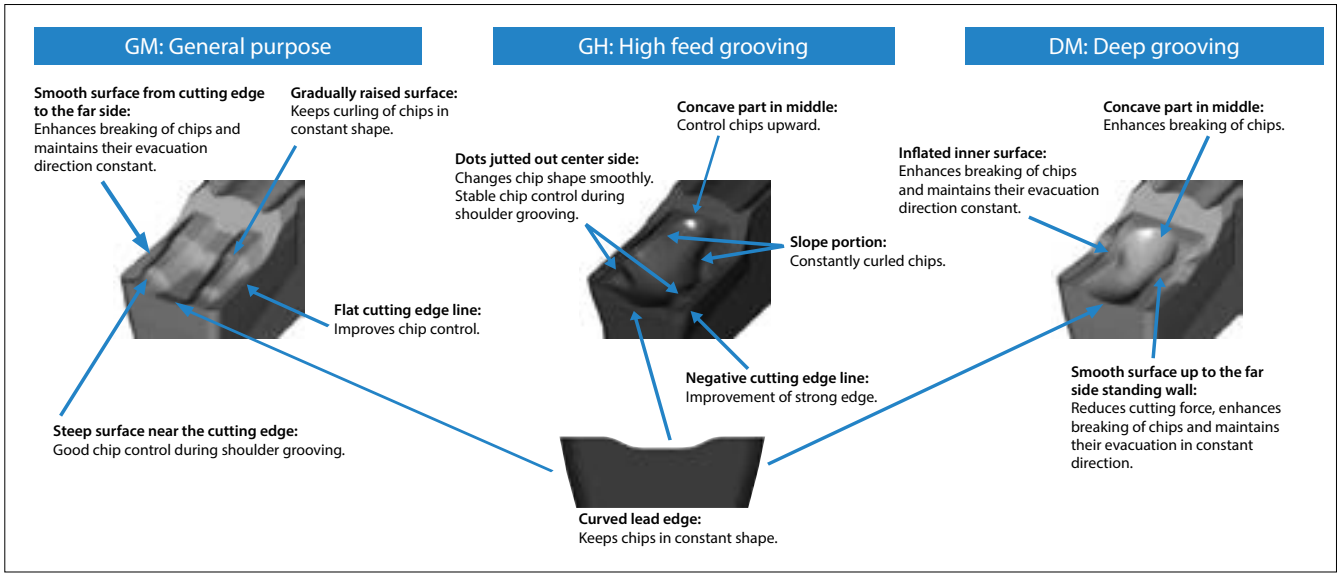


W grip technology

Smooth chip control

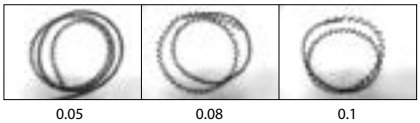
For general purpose GM chipbreaker, for high feed grooving GH chipbreaker, for deep grooving DM chipbreaker and for non-ferrous metals GS chipbreaker

Advantages of chipbreaker



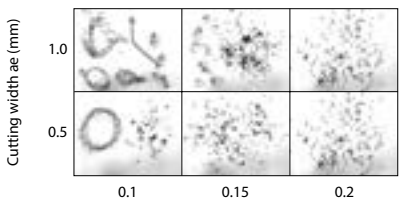
Chip control of GM chipbreaker

Face grooving (ø62)



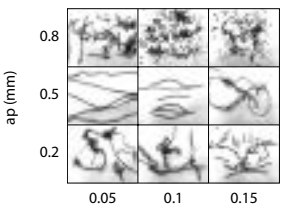
Feed rate f (mm/rev)

Side grooving



f (mm/rev)

Turning



f (mm/rev)

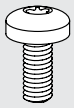
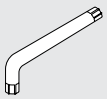
Cutting conditions: Vc = 150 m/min, f = 0.05 ~ 0.2 mm/rev, GDFM5020N-040GM, 15CrMo4, wet

GDFM/GDMFS

KGDF: Toolholder assembly identification

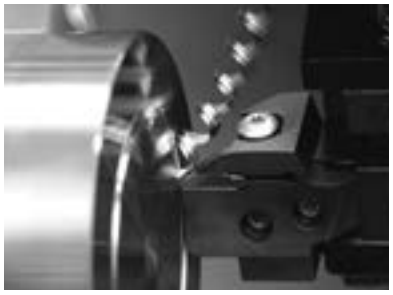
	Blade (Blade Description is printed.)		Toolholder (Toolholder Description is printed.)
Left-hand	Left-hand : KGDFL…-C		Right-hand : KGDR…-C
	 Left-hand shown		 Right-hand shown
Right-hand	Right-hand : KGDFR…-C		Left-hand : KGDL…-C
	 Right-hand shown		 Left-hand shown

- Right-hand blade for left-hand toolholder, left-hand blade for right-hand toolholder.
- Please purchase the toolholder and blade separately..
- The insert clamping screw (BH6X10TR), blade fixing screw (SB-60120TR) and wrench (LTW-25) which are included in the toolholder can be used.

Clamp Bolt (for Insert Clamp)	Clamp Screw (for Blade)	Wrench
		
BH6X10TR	SB-60120TR	LTW-25

External dia. of the groove DAXN / DAXX

External dia. of the groove within DAXN ~ DAXX are the available range for the initial grooving on the unprocessed workpiece (Ref. to Fig. 1).
Then, you can widen it up to the center towards the inside (excluding the models listed in the right table)
and towards the outside according to machine limits.



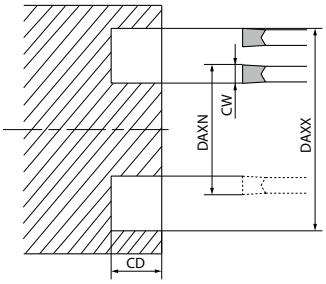
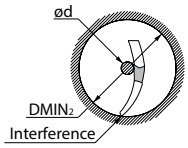


Fig. 1

Limit of Turning toward Center

Turning towards the Center causes the toolholder to interfere with the groove wall depending on the initial cut's diameter.

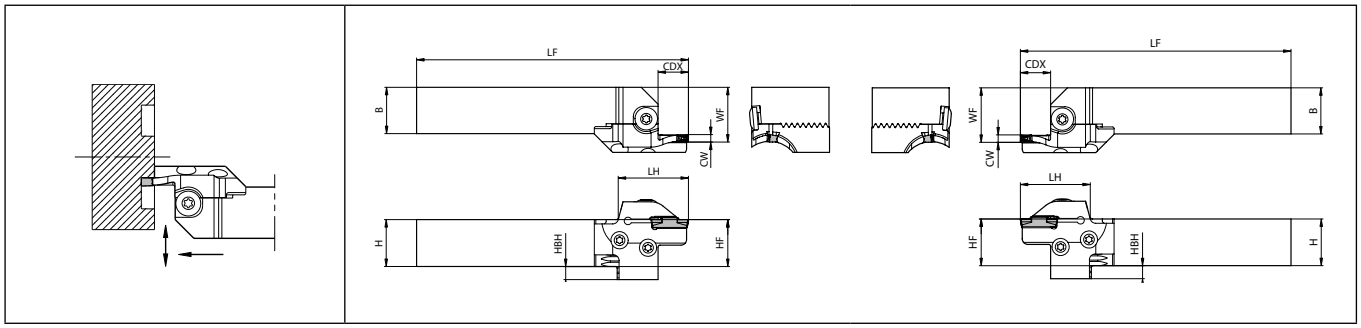


Remaining Boss Dia.ød

Description	DMIN2	25	26	27	28 and over
		ød (mm)			
KGDF$^{R}/_{L}$-25-3A-C + KGD$^{L}/_{R}$2020-C		4	2	0	0 (No remaining Boss)
KGDF$^{R}/_{L}$-25-3A-C + KGD$^{L}/_{R}$2525-C					
KGDF$^{R}/_{L}$-25-4A-C + KGD$^{L}/_{R}$2020-C		6	3	0	
KGDF$^{R}/_{L}$-25-4A-C + KGD$^{L}/_{R}$2525-C					
KGDF$^{R}/_{L}$-25-5B-C + KGD$^{L}/_{R}$2020-C		7	4	1	
KGDF$^{R}/_{L}$-25-5B-C + KGD$^{L}/_{R}$2525-C					
KGDF$^{R}/_{L}$-25-6B-C + KGD$^{L}/_{R}$2020-C		9	4	1	
KGDF$^{R}/_{L}$-25-6B-C + KGD$^{L}/_{R}$2525-C					

e.g.)
Toolholder assembled from KGDFR-25-3A-C and KGDL2020-C with ø25 as first cut towards the center, it will cause a rubbing with the toolholder cartridge if ød is 4.0mm.

KGDF (Face grooving / 0° separate type)



Right-hand shown
(Right-hand blade and left-hand toolholder)

Left-hand shown
(Left-hand blade and right-hand toolholder)

Toolholder dimensions (Blade and toolholder)

Shank angle	Cutting width CW (mm)	Shank size (mm)	Max. depth of cut CDX(mm)	External dia. of the groove (mm) DAXN (min.)	DAXX (max.)	Blade description G121	Toolholder description G43	Dimension (mm) H	B	LH	HF	HBH	LF	WF
0°	2	□20	6	25	30	KGDFR	-25-2A-C	20	20	33	20	12	115	24.5
				30	35		-30-2A-C							
				35	45		-35-2A-C							
				45	60		-45-2A-C							
				60	80		-60-2A-C							
				80	100		-80-2A-C							
				100	130		-100-2A-C							
			13	25	30	KGDFR	-25-2B-C			36			118	
				30	35		-30-2B-C							
				35	45		-35-2B-C							
			15	45	60		-45-2B-C			38			120	
				60	80		-60-2B-C							
				80	100		-80-2B-C							
				100	130		-100-2B-C							
		□25	6	25	30	KGDFR	-25-2A-C	25	25	33	25	7	140	29.5
				30	35		-30-2A-C							
				35	45		-35-2A-C							
				45	60		-45-2A-C							
				60	80		-60-2A-C							
				80	100		-80-2A-C							
				100	130		-100-2A-C							
			13	25	30	KGDFR	-25-2B-C			36			143	
				30	35		-30-2B-C							
				35	45		-35-2B-C							
			15	45	60		-45-2B-C			38			145	
				60	80		-60-2B-C							
				80	100		-80-2B-C							
				100	130		-100-2B-C							
		□32	6	25	30	KGDFR	-25-2A-C	32	32	33	32	-	160	36.5
				30	35		-30-2A-C							
				35	45		-35-2A-C							
				45	60		-45-2A-C							
				60	80		-60-2A-C							
				80	100		-80-2A-C							
				100	130		-100-2A-C							
			13	25	30	KGDFR	-25-2B-C			36			163	
				30	35		-30-2B-C							
				35	45		-35-2B-C							
			15	45	60		-45-2B-C			38			165	
				60	80		-60-2B-C							
				80	100		-80-2B-C							
				100	130		-100-2B-C							

Applicable inserts G111

1. KGDF: Right-hand blade for left-hand toolholder, left-hand blade for right-hand toolholder.
   The toolholder is applicable for all blade with suitable hand.
2. CDX: Maximum depth to which processing can be made. (If the CDX is 20 mm or more, the maximum groove-depth of groove made by the 2-edge insert will be 18 mm.)
   Above toolholders are applicable to Cut-off, too.
3. The insert clamping Screw (BH6X10TR), blade fixing Screw (SB-60120TR) and Wrench (LTW-25) which are included in the toolholder can be used.

Toolholder dimensions (Blade and toolholder)

Shank angle	Cutting width CW (mm)	Shank size (mm)	Max. depth of cut CDX(mm)	External dia. of the groove (mm) DAXN (min.)	DAXX (max.)	Blade description G121	Toolholder description G43	H	B	LH	HF	HBH	LF	WF
0°	3	□20	13	25	30	KGDF$^{R}_{L}$ -25-3A-C	KGD$^{L}_{R}$2020-C	20	20	36	20	12	118	24.5
				30	40	-30-3A-C								
				40	50	-40-3A-C								
			15	50	65	KGDF$^{R}_{L}$ -50-3B-C				38			120	
				65	85	-65-3B-C								
				85	110	-85-3B-C								
				110	145	-110-3B-C								
			22	50	65	KGDF$^{R}_{L}$ -50-3C-C				45			127	
				65	85	-65-3C-C								
			25	85	110	-85-3C-C				48			130	
				110	145	-110-3C-C								
		□25	13	25	30	KGDF$^{R}_{L}$ -25-3A-C	KGD$^{L}_{R}$2525-C	25	25	36	25	7	143	29.5
				30	40	-30-3A-C								
				40	50	-40-3A-C								
			15	50	65	KGDF$^{R}_{L}$ -50-3B-C				38			145	
				65	85	-65-3B-C								
				85	110	-85-3B-C								
				110	145	-110-3B-C								
			22	50	65	KGDF$^{R}_{L}$ -50-3C-C				45			152	
				65	85	-65-3C-C								
			25	85	110	-85-3C-C				48			155	
				110	145	-110-3C-C								
		□32	13	25	30	KGDF$^{R}_{L}$ -25-3A-C	KGD$^{L}_{R}$3232-C	32	32	36	32	-	163	36.5
				30	40	-30-3A-C								
				40	50	-40-3A-C								
			15	50	65	KGDF$^{R}_{L}$ -50-3B-C				38			165	
				65	85	-65-3B-C								
				85	110	-85-3B-C								
				110	145	-110-3B-C								
			22	50	65	KGDF$^{R}_{L}$ -50-3C-C				45			172	
				65	85	-65-3C-C								
			25	85	110	-85-3C-C				48			175	
				110	145	-110-3C-C								
0°	4	□20	13	25	35	KGDF$^{R}_{L}$ -25-4A-C	KGD$^{L}_{R}$2020-C	20	20	36	20	12	118	24.5
			15	35	50	KGDF$^{R}_{L}$ -35-4B-C				38			120	
				50	70	-50-4B-C								
				70	100	-70-4B-C								
				100	150	-100-4B-C								
				150	220	-150-4B-C								
				220	∞	-220-4B-C								
			25	35	50	KGDF$^{R}_{L}$ -35-4C-C				48			130	
				50	70	-50-4C-C								
				70	100	-70-4C-C								
				100	150	-100-4C-C								
				150	220	-150-4C-C								
				220	∞	-220-4C-C								
		□25	13	25	35	KGDF$^{R}_{L}$ -25-4A-C	KGD$^{L}_{R}$2525-C	25	25	36	25	7	143	29.5
			15	35	50	KGDF$^{R}_{L}$ -35-4B-C				38			145	
				50	70	-50-4B-C								
				70	100	-70-4B-C								
				100	150	-100-4B-C								
				150	220	-150-4B-C								
				220	∞	-220-4B-C								
			25	35	50	KGDF$^{R}_{L}$ -35-4C-C				48			155	
				50	70	-50-4C-C								
				70	100	-70-4C-C								
				100	150	-100-4C-C								
				150	220	-150-4C-C								
				220	∞	-220-4C-C								
		□32	13	25	35	KGDF$^{R}_{L}$ -25-4A-C	KGD$^{L}_{R}$3232-C	32	32	36	32	-	163	36.5
			15	35	50	KGDF$^{R}_{L}$ -35-4B-C				38			165	
				50	70	-50-4B-C								
				70	100	-70-4B-C								
				100	150	-100-4B-C								
				150	220	-150-4B-C								
				220	∞	-220-4B-C								
			25	35	50	KGDF$^{R}_{L}$ -35-4C-C				48			175	
				50	70	-50-4C-C								
				70	100	-70-4C-C								
				100	150	-100-4C-C								
				150	220	-150-4C-C								
				220	∞	-220-4C-C								

Applicable inserts ➡ G111

1. KGDF: Right-hand blade for left-hand toolholder, left-hand blade for right-hand toolholder.
   The toolholder is applicable for all blade with suitable hand.
2. CDX: Maximum depth to which processing can be made. (If the CDX is 20 mm or more, the maximum groove-depth of groove made by the 2-edge insert will be 18 mm.)
   Above toolholders are applicable to Cut-off, too.
3. The insert clamping Screw (BH6X10TR), blade fixing Screw (SB-60120TR) and Wrench (LTW-25) which are included in the toolholder can be used.

Toolholder dimensions (Blade and toolholder)

Shank angle	Cutting width CW (mm)	Shank size (mm)	Max. depth of cut CDX(mm)	External dia. of the groove (mm) DAXN (min.)	DAXX (max.)	Blade description G121	Toolholder description G43	Dimension (mm) H	B	LH	HF	HBH	LF	WF
0°	5	□20	15	25	35	KGDF$^{R}_{L}$ -25-5B-C	KGD$^{L}_{R}$2020-C	20	20	38	20	12	120	24.5
				35	50	-35-5B-C								
				50	75	-50-5B-C								
				75	115	-75-5B-C								
				115	180	-115-5B-C								
				180	235	-180-5B-C								
				235	∞	-235-5B-C								
			20	25	35	KGDF$^{R}_{L}$ -25-5C-C				43			125	
			25	35	50	-35-5C-C				48			130	
				50	75	-50-5C-C								
				75	115	-75-5C-C								
				115	180	-115-5C-C								
				180	235	-180-5C-C								
				235	∞	-235-5C-C								
			32	75	115	KGDF$^{R}_{L}$ -75-5D-C				55			137	
				115	180	-115-5D-C								
				180	235	-180-5D-C								
				235	∞	-235-5D-C								
		□25	15	25	35	KGDF$^{R}_{L}$ -25-5B-C	KGD$^{L}_{R}$2525-C	25	25	38	25	7	145	29.5
				35	50	-35-5B-C								
				50	75	-50-5B-C								
				75	115	-75-5B-C								
				115	180	-115-5B-C								
				180	235	-180-5B-C								
				235	∞	-235-5B-C								
			20	25	35	KGDF$^{R}_{L}$ -25-5C-C				43			150	
			25	35	50	-35-5C-C				48			155	
				50	75	-50-5C-C								
				75	115	-75-5C-C								
				115	180	-115-5C-C								
				180	235	-180-5C-C								
				235	∞	-235-5C-C								
			32	75	115	KGDF$^{R}_{L}$ -75-5D-C				55			162	
				115	180	-115-5D-C								
				180	235	-180-5D-C								
				235	∞	-235-5D-C								
		□32	15	25	35	KGDF$^{R}_{L}$ -25-5B-C	KGD$^{L}_{R}$3232-C	32	32	38	32	-	165	36.5
				35	50	-35-5B-C								
				50	75	-50-5B-C								
				75	115	-75-5B-C								
				115	180	-115-5B-C								
				180	235	-180-5B-C								
				235	∞	-235-5B-C								
			20	25	35	KGDF$^{R}_{L}$ -25-5C-C				43			170	
			25	35	50	-35-5C-C				48			175	
				50	75	-50-5C-C								
				75	115	-75-5C-C								
				115	180	-115-5C-C								
				180	235	-180-5C-C								
				235	∞	-235-5C-C								
			32	75	115	KGDF$^{R}_{L}$ -75-5D-C				55			182	
				115	180	-115-5D-C								
				180	235	-180-5D-C								
				235	∞	-235-5D-C								

1. KGDF: Right-hand blade for left-hand toolholder, left-hand blade for right-hand toolholder.
   The toolholder is applicable for all blade with suitable hand.
2. CDX: Maximum depth to which processing can be made. (If the CDX is 20 mm or more, the maximum groove-depth of groove made by the 2-edge insert will be 18 mm.)
   Above toolholders are applicable to Cut-off, too.

Applicable inserts G111

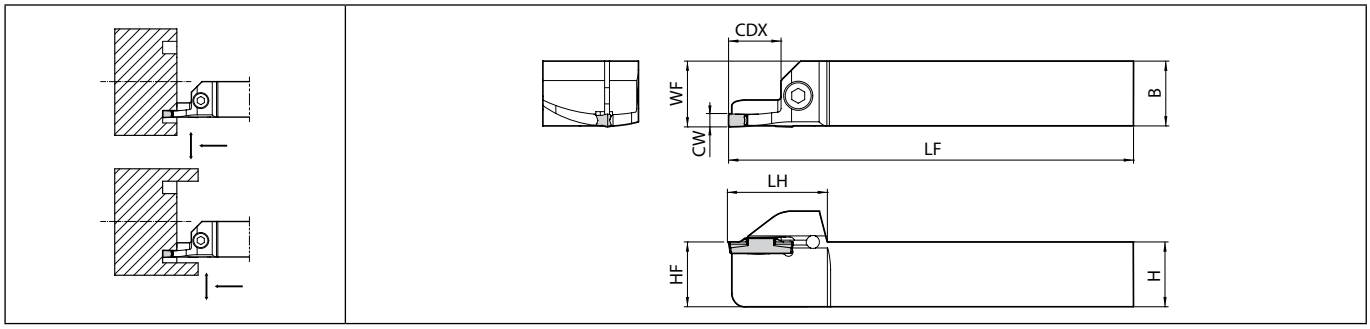
Toolholder dimensions (Blade and toolholder)

Shank angle	Cutting width CW (mm)	Shank size (mm)	Max. depth of cut CDX(mm)	External dia. of the groove (mm) DAXN (min.)	DAXX (max.)	Blade description G121	Toolholder description G43	Dimension (mm) H	B	LH	HF	HBH	LF	WF
0°	6	□20	15	25	35	KGDF$^{R}_{L}$ -25-6B-C	KGD$^{L}_{R}$2020-C	20	20	38	20	12	120	24.5
				35	50	-35-6B-C								
				50	75	-50-6B-C								
				75	115	-75-6B-C								
				115	180	-115-6B-C								
				180	235	-180-6B-C								
				235	∞	-235-6B-C								
			20	25	35	KGDF$^{R}_{L}$ -25-6C-C				43			125	
			25	35	50	-35-6C-C				48			130	
				50	75	-50-6C-C								
				75	115	-75-6C-C								
				115	180	-115-6C-C								
				180	235	-180-6C-C								
				235	∞	-235-6C-C								
			32	75	115	KGDF$^{R}_{L}$ -75-6D-C				55			137	
				115	180	-115-6D-C								
				180	235	-180-6D-C								
				235	∞	-235-6D-C								
		□25	15	25	35	KGDF$^{R}_{L}$ -25-6B-C	KGD$^{L}_{R}$2525-C	25	25	38	25	7	145	29.5
				35	50	-35-6B-C								
				50	75	-50-6B-C								
				75	115	-75-6B-C								
				115	180	-115-6B-C								
				180	235	-180-6B-C								
				235	∞	-235-6B-C								
			20	25	35	KGDF$^{R}_{L}$ -25-6C-C				43			150	
			25	35	50	-35-6C-C				48			155	
				50	75	-50-6C-C								
				75	115	-75-6C-C								
				115	180	-115-6C-C								
				180	235	-180-6C-C								
				235	∞	-235-6C-C								
			32	75	115	KGDF$^{R}_{L}$ -75-6D-C				55			162	
				115	180	-115-6D-C								
				180	235	-180-6D-C								
				235	∞	-235-6D-C								
		□32	15	25	35	KGDF$^{R}_{L}$ -25-6B-C	KGD$^{L}_{R}$3232-C	32	32	38	32	-	165	36.5
				35	50	-35-6B-C								
				50	75	-50-6B-C								
				75	115	-75-6B-C								
				115	180	-115-6B-C								
				180	235	-180-6B-C								
				235	∞	-235-6B-C								
			20	25	35	KGDF$^{R}_{L}$ -25-6C-C				43			170	
			25	35	50	-35-6C-C				48			175	
				50	75	-50-6C-C								
				75	115	-75-6C-C								
				115	180	-115-6C-C								
				180	235	-180-6C-C								
				235	∞	-235-6C-C								
			32	75	115	KGDF$^{R}_{L}$ -75-6D-C				55			182	
				115	180	-115-6D-C								
				180	235	-180-6D-C								
				235	∞	-235-6D-C								

1. KGDF: Right-hand blade for left-hand toolholder, left-hand blade for right-hand toolholder.
   The toolholder is applicable for all blade with suitable hand.
2. CDX: Maximum depth to which processing can be made. (If the CDX is 20 mm or more, the maximum groove-depth of groove made by the 2-edge insert will be 18 mm.)
   Above toolholders are applicable to Cut-off, too.

Applicable inserts G111

KGDF-Z (Face grooving)

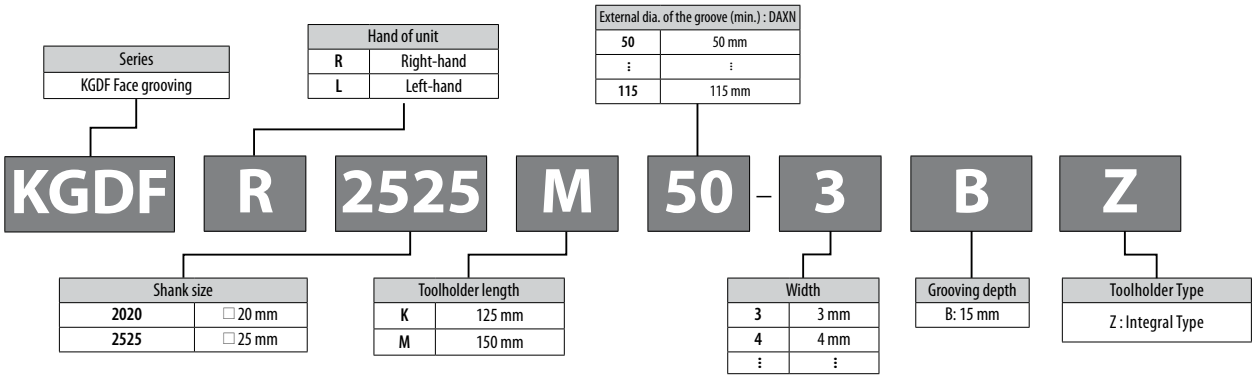


Right-hand shown

Toolholder dimensions

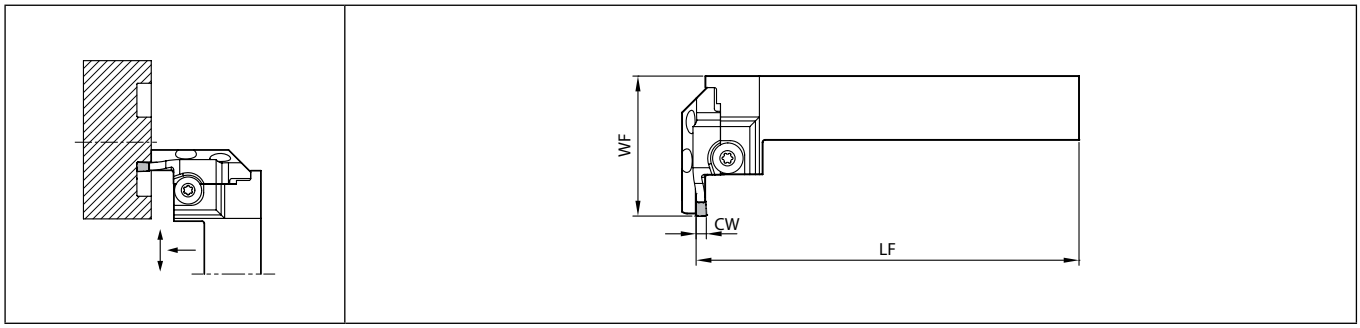
Description		Availability R	Availability L	External dia.of the groove (mm) DAXN (min.)	DAXX (max.)	Dimension (mm) CW	CDX	H	B	LH	HF	LF	WF	Spare parts: Clamp bolt	Spare parts: Wrench	Applicable inserts G111
KGDF R/L	2020K50-3B-Z	●	●	50	65	3	15	20	20	30.5	20	125	20.3	HH5X16	LW-4	GDFM 3020... GDFMS 3020... GDFG 3020...
	2020K65-3B-Z	●	●	65	85											
	2020K85-3B-Z	●	●	85	110											
	2020K110-3B-Z	●	●	110	145											
	2525M50-3B-Z	●	●	50	65			25	25		25	150	25.3			
	2525M65-3B-Z	●	●	65	85											
	2525M85-3B-Z	●	●	85	110											
	2525M110-3B-Z	●	●	110	145											
KGDF R/L	2020K50-4B-Z	●	●	50	70	4	15	20	20	30.5	20	125	20.3	HH5X16	LW-4	GDFM 4020... GDFMS 4020... GDFG 4020...
	2020K70-4B-Z	●	●	70	100											
	2020K100-4B-Z	●	●	100	150											
	2525M50-4B-Z	●	●	50	70			25	25		25	150	25.3			
	2525M70-4B-Z	●	●	70	100											
	2525M100-4B-Z	●	●	100	150											
KGDF R/L	2020K50-5B-Z	●	●	50	75	5	15	20	20	30.5	20	125	20.3	HH5X16	LW-4	GDFM 5020... GDFMS 5020... GDFG 5020...
	2020K75-5B-Z	●	●	75	115											
	2020K115-5B-Z	●	●	115	180											
	2525M50-5B-Z	●	●	50	75			25	25		25	150	25.3			
	2525M75-5B-Z	●	●	75	115											
	2525M115-5B-Z	●	●	115	180											

KGDF-Z toolholder identification system



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGDF (Face grooving / 90° separate type)



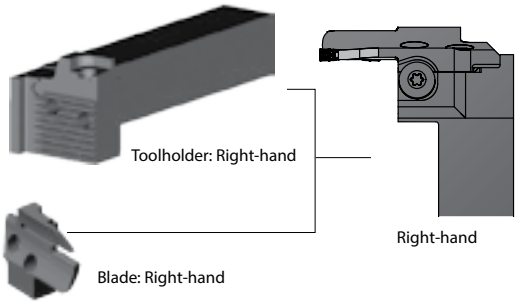
Right-hand shown (Right-hand blade and right-hand toolholder)

Toolholder dimensions (Blade and toolholder)

Shank angle	Cutting width CW (mm)	Shank size (mm)	Max. depth of cut CDX(mm)	External dia. of the groove (mm) DAXN (min.)	DAXX (max.)	Blade description G121	Toolholder description G43	Dimension (mm) LF	WF
90°	2	□20	6	25	30	KGDFR -25-2A-C	KGDSR2020-C	125	49.7
				30	35	-30-2A-C			
				35	45	-35-2A-C			
				45	60	-45-2A-C			
				60	80	-60-2A-C			
				80	100	-80-2A-C			
				100	130	-100-2A-C			
			13	25	30	KGDFR -25-2B-C			52.7
				30	35	-30-2B-C			
			15	35	45	-35-2B-C			54.7
				45	60	-45-2B-C			
				60	80	-60-2B-C			
				80	100	-80-2B-C			
				100	130	-100-2B-C			
		□25	6	25	30	KGDFR -25-2A-C	KGDSR2525-C	150	49.7
				30	35	-30-2A-C			
				35	45	-35-2A-C			
				45	60	-45-2A-C			
				60	80	-60-2A-C			
				80	100	-80-2A-C			
				100	130	-100-2A-C			
			13	25	30	KGDFR -25-2B-C			52.7
				30	35	-30-2B-C			
			15	35	45	-35-2B-C			54.7
				45	60	-45-2B-C			
				60	80	-60-2B-C			
				80	100	-80-2B-C			
				100	130	-100-2B-C			
90°	3	□20	13	25	30	KGDF$^{R}_{L}$ -25-3A-C	KGDS$^{R}_{L}$2020-C	125	52.7
				30	40	-30-3A-C			
				40	50	-40-3A-C			
			15	50	65	KGDF$^{R}_{L}$ -50-3B-C			54.7
				65	85	-65-3B-C			
				85	110	-85-3B-C			
				110	145	-110-3B-C			
			22	50	65	KGDF$^{R}_{L}$ -50-3C-C			59.7
				65	85	-65-3C-C			
			25	85	110	-85-3C-C			61.7
				110	145	-110-3C-C			
		□25	13	25	30	KGDF$^{R}_{L}$ -25-3A-C	KGDS$^{R}_{L}$2525-C	150	52.7
				30	40	-30-3A-C			
				40	50	-40-3A-C			
			15	50	65	KGDF$^{R}_{L}$ -50-3B-C			54.7
				65	85	-65-3B-C			
				85	110	-85-3B-C			
				110	145	-110-3B-C			
			22	50	65	KGDF$^{R}_{L}$ -50-3C-C			59.7
				65	85	-65-3C-C			
			25	85	110	-85-3C-C			61.7
				110	145	-110-3C-C			

Shank angle	Cutting width CW (mm)	Shank size (mm)	Max. depth of cut CDX(mm)	External dia. of the groove (mm) DAXN (min.)	DAXX (max.)	Blade description G121	Toolholder description G43	Dimension (mm) LF	WF
90°	4	□20	13	25	35	KGDF$^{R}_{L}$ -25-4A-C	KGDS$^{R}_{L}$2020-C	125	52.7
			15	35	50	KGDF$^{R}_{L}$ -35-4B-C			54.7
				50	70	-50-4B-C			
				70	100	-70-4B-C			
				100	150	-100-4B-C			
				150	220	-150-4B-C			
				220	∞	-220-4B-C			
			25	35	50	KGDF$^{R}_{L}$ -35-4C-C			64.7
				50	70	-50-4C-C			
				70	100	-70-4C-C			
				100	150	-100-4C-C			
				150	220	-150-4C-C			
				220	∞	-220-4C-C			
		□25	13	25	35	KGDF$^{R}_{L}$ -25-4A-C	KGDS$^{R}_{L}$2525-C	150	52.7
			15	35	50	KGDF$^{R}_{L}$ -35-4B-C			54.7
				50	70	-50-4B-C			
				70	100	-70-4B-C			
				100	150	-100-4B-C			
				150	220	-150-4B-C			
				220	∞	-220-4B-C			
			25	35	50	KGDF$^{R}_{L}$ -35-4C-C			64.7
				50	70	-50-4C-C			
				70	100	-70-4C-C			
				100	150	-100-4C-C			
				150	220	-150-4C-C			
				220	∞	-220-4C-C			

Applicable inserts G111



· KGDF 90° type is not available as unit (Toolholder + blade). Please purchase toolholder and blade separately.
· Right-hand Blade for Right-hand Toolholder, Left-hand Blade for Left-hand Toolholder.
· The insert clamping Screw (BH6X10TR), blade fixing Screw (SB-60120TR) and Wrench (LTW-25) which are included in the toolholder can be used.

Toolholder dimensions (Blade and toolholder)

Shank angle	Cutting width CW (mm)	Shank size (mm)	Max. depth of cut CDX(mm)	External dia. of the groove (mm) DAXN (min.)	DAXX (max.)	Blade description G121	Toolholder description G43	Dimension (mm) LF	WF
90°	5	□20	15	25	35	KGDF R/L -25-5B-C	KGDS R/L 2020-C	125	54.7
				35	50	-35-5B-C			
				50	75	-50-5B-C			
				75	115	-75-5B-C			
				115	180	-115-5B-C			
				180	235	-180-5B-C			
				235	∞	-235-5B-C			
			20	25	35	KGDF R/L -25-5C-C			59.7
			25	35	50	-35-5C-C			64.7
				50	75	-50-5C-C			
				75	115	-75-5C-C			
				115	180	-115-5C-C			
				180	235	-180-5C-C			
				235	∞	-235-5C-C			
			32	75	115	KGDF R/L -75-5D-C			71.7
				115	180	-115-5D-C			
				180	235	-180-5D-C			
				235	∞	-235-5D-C			
		□25	15	25	35	KGDF R/L -25-5B-C	KGDS R/L 2525-C	150	54.7
				35	50	-35-5B-C			
				50	75	-50-5B-C			
				75	115	-75-5B-C			
				115	180	-115-5B-C			
				180	235	-180-5B-C			
				235	∞	-235-5B-C			
			20	25	35	KGDF R/L -25-5C-C			59.7
			25	35	50	-35-5C-C			64.7
				50	75	-50-5C-C			
				75	115	-75-5C-C			
				115	180	-115-5C-C			
				180	235	-180-5C-C			
				235	∞	-235-5C-C			
			32	75	115	KGDF R/L -75-5D-C			71.7
				115	180	-115-5D-C			
				180	235	-180-5D-C			
				235	∞	-235-5D-C			

Shank angle	Cutting width CW (mm)	Shank size (mm)	Max. depth of cut CDX(mm)	External dia. of the groove (mm) DAXN (min.)	DAXX (max.)	Blade description G121	Toolholder description G43	Dimension (mm) LF	WF
90°	6	□20	15	25	35	KGDF R/L -25-6B-C	KGDS R/L 2020-C	125	54.7
				35	50	-35-6B-C			
				50	75	-50-6B-C			
				75	115	-75-6B-C			
				115	180	-115-6B-C			
				180	235	-180-6B-C			
				235	∞	-235-6B-C			
			20	25	35	KGDF R/L -25-6C-C			59.7
			25	35	50	-35-6C-C			64.7
				50	75	-50-6C-C			
				75	115	-75-6C-C			
				115	180	-115-6C-C			
				180	235	-180-6C-C			
				235	∞	-235-6C-C			
			32	75	115	KGDF R/L -75-6D-C			71.7
				115	180	-115-6D-C			
				180	235	-180-6D-C			
				235	∞	-235-6D-C			
		□25	15	25	35	KGDF R/L -25-6B-C	KGDS R/L 2525-C	150	54.7
				35	50	-35-6B-C			
				50	75	-50-6B-C			
				75	115	-75-6B-C			
				115	180	-115-6B-C			
				180	235	-180-6B-C			
				235	∞	-235-6B-C			
			20	25	35	KGDF R/L -25-6C-C			59.7
			25	35	50	-35-6C-C			64.7
				50	75	-50-6C-C			
				75	115	-75-6C-C			
				115	180	-115-6C-C			
				180	235	-180-6C-C			
				235	∞	-235-6C-C			
			32	75	115	KGDF R/L -75-6D-C			71.7
				115	180	-115-6D-C			
				180	235	-180-6D-C			
				235	∞	-235-6D-C			

· KGDF 90° type is not available as unit (Toolholder + blade). Please purchase toolholder and blade separately.
· Right-hand Blade for Right-hand Toolholder, Left-hand Blade for Left-hand Toolholder.
· The insert clamping Screw (BH6X10TR), blade fixing Screw (SB-60120TR) and Wrench (LTW-25) which are included in the toolholder can be used.

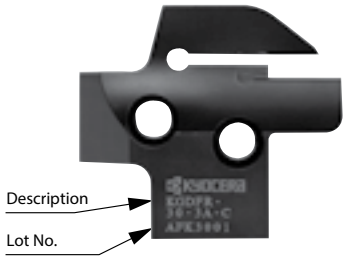
Applicable inserts G111

Face grooving blade identification system

KGDF R – 25 – 3 A – C

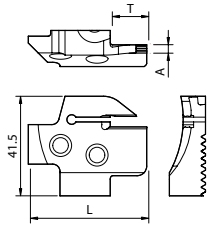
- **Hand of blade**: R : Right-hand; L : Left-hand
- **Width**: 2: 2 mm; 3: 3 mm; 4: 4 mm; 5: 5 mm; 6: 6 mm
- **Blade symbol**: C: Applicable to toolholder with suffix "-C"
- **External dia. of the groove (min.): DAXN**: Indicates the minimum external diameter suitable for the initial face grooving.
- **Grooving depth**:

A: 6/13mm B: 13/15mm	2-edge insert (1-edge insert can also be used.)
C : 20mm~25mm D : 32mm	1-edge insert



Example of printing of blade description

Blade dimensions

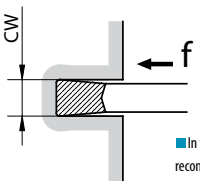
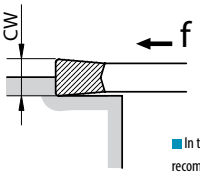
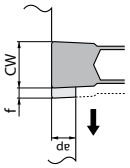
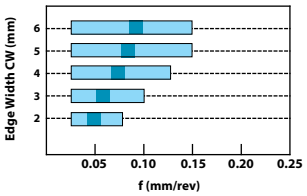
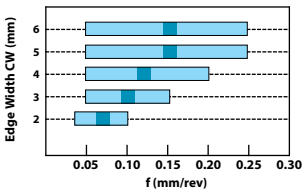
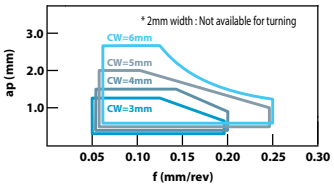
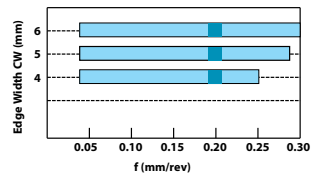
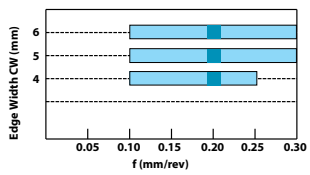
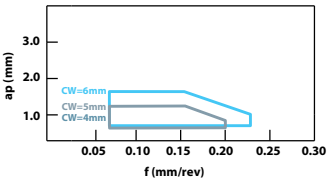
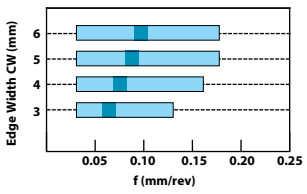
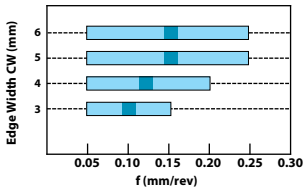
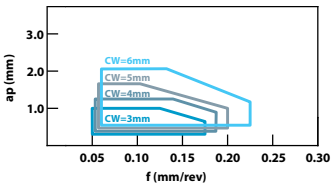
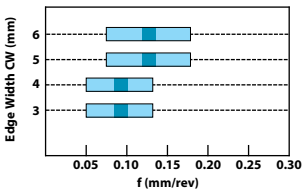
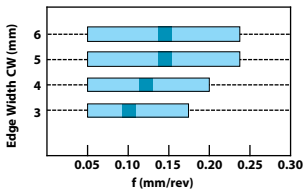
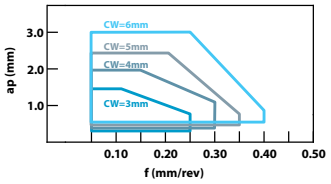
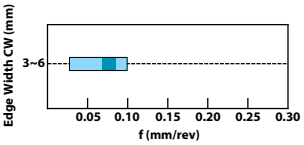
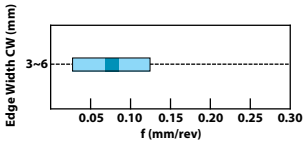
Shape	Blade description	Availability R	Availability L	External dia. of the groove (mm) DAXN (min.)	External dia. of the groove (mm) DAXX (max.)	Dimension (mm) L	Dimension (mm) T	Dimension (mm) A	Cutting width CW (mm)	Applicable inserts G111	Applicable toolholder G43
 Right-hand shown	KGDFR -25-2A-C	●		25	30	44.35	6	1.5	2	GDFM 2020N-020GM	KGD$^{L}_{R}$....-C KGDS$^{R}_{L}$.....-C
	KGDFR -30-2A-C	●		30	35						
	KGDFR -35-2A-C	●		35	45						
	KGDFR -45-2A-C	●		45	60						
	KGDFR -60-2A-C	●		60	80						
	KGDFR -80-2A-C	●		80	100						
	KGDFR -100-2A-C	●		100	130						
	KGDFR -25-2B-C	●		25	30	47.35	13				
	KGDFR -30-2B-C	●		30	35	49.35	15				
	KGDFR -35-2B-C	●		35	45						
	KGDFR -45-2B-C	●		45	60						
	KGDFR -60-2B-C	●		60	80						
	KGDFR -80-2B-C	●		80	100						
	KGDFR -100-2B-C	●		100	130						
	KGDF$^{R}_{L}$ -25-3A-C	●	●	25	30	47.35	13	2	3	GDFM 3020... GDFMS 3020... GDFG 3020...	
	KGDF$^{R}_{L}$ -30-3A-C	●	●	30	40						
	KGDF$^{R}_{L}$ -40-3A-C	●	●	40	50						
	KGDF$^{R}_{L}$ -50-3B-C	●	●	50	65	49.35	15				
	KGDF$^{R}_{L}$ -65-3B-C	●	●	65	85						
	KGDF$^{R}_{L}$ -85-3B-C	●	●	85	110						
	KGDF$^{R}_{L}$ -110-3B-C	●	●	110	145						
	KGDF$^{R}_{L}$ -50-3C-C	●	●	50	65	56.35	22				
	KGDF$^{R}_{L}$ -65-3C-C	●	●	65	85						
	KGDF$^{R}_{L}$ -85-3C-C	●	●	85	110	59.35	25				
	KGDF$^{R}_{L}$ -110-3C-C	●	●	110	145						
	KGDF$^{R}_{L}$ -25-4A-C	●	●	25	35	47.35	13	3	4	GDFM 4020... GDFMS 4020... GDFG 4020...	
	KGDF$^{R}_{L}$ -35-4B-C	●	●	35	50	49.35	15				
	KGDF$^{R}_{L}$ -50-4B-C	●	●	50	70						
	KGDF$^{R}_{L}$ -70-4B-C	●	●	70	100						
	KGDF$^{R}_{L}$ -100-4B-C	●	●	100	150						
	KGDF$^{R}_{L}$ -150-4B-C	●	●	150	220						
	KGDF$^{R}_{L}$ -220-4B-C	●	●	220	∞						
	KGDF$^{R}_{L}$ -35-4C-C	●	●	35	50	59.35	25				
	KGDF$^{R}_{L}$ -50-4C-C	●	●	50	70						
	KGDF$^{R}_{L}$ -70-4C-C	●	●	70	100						
	KGDF$^{R}_{L}$ -100-4C-C	●	●	100	150						
	KGDF$^{R}_{L}$ -150-4C-C	●	●	150	220						
	KGDF$^{R}_{L}$ -220-4C-C	●	●	220	∞						
	KGDF$^{R}_{L}$ -25-5B-C	●	●	25	35	49.35	15	4	5	GDFM 5020... GDFMS 5020... GDFG 5020...	
	KGDF$^{R}_{L}$ -35-5B-C	●	●	35	50						
	KGDF$^{R}_{L}$ -50-5B-C	●	●	50	75						
	KGDF$^{R}_{L}$ -75-5B-C	●	●	75	115						
	KGDF$^{R}_{L}$ -115-5B-C	●	●	115	180						
	KGDF$^{R}_{L}$ -180-5B-C	●	●	180	235						
	KGDF$^{R}_{L}$ -235-5B-C	●	●	235	∞						
	KGDF$^{R}_{L}$ -25-5C-C	●	●	25	35	54.35	20				
	KGDF$^{R}_{L}$ -35-5C-C	●	●	35	50	59.35	25				
	KGDF$^{R}_{L}$ -50-5C-C	●	●	50	75						
	KGDF$^{R}_{L}$ -75-5C-C	●	●	75	115						
	KGDF$^{R}_{L}$ -115-5C-C	●	●	115	180						
	KGDF$^{R}_{L}$ -180-5C-C	●	●	180	235						
	KGDF$^{R}_{L}$ -235-5C-C	●	●	235	∞						
	KGDF$^{R}_{L}$ -75-5D-C	●	●	75	115	66.35	32				
	KGDF$^{R}_{L}$ -115-5D-C	●	●	115	180						
	KGDF$^{R}_{L}$ -180-5D-C	●	●	180	235						
	KGDF$^{R}_{L}$ -235-5D-C	●	●	235	∞						
	KGDF$^{R}_{L}$ -25-6B-C	●	●	25	35	49.35	15	5	6	GDFM 6020... GDFMS 6020... GDFG 6020...	
	KGDF$^{R}_{L}$ -35-6B-C	●	●	35	50						
	KGDF$^{R}_{L}$ -50-6B-C	●	●	50	75						
	KGDF$^{R}_{L}$ -75-6B-C	●	●	75	115						
	KGDF$^{R}_{L}$ -115-6B-C	●	●	115	180						
	KGDF$^{R}_{L}$ -180-6B-C	●	●	180	235						
	KGDF$^{R}_{L}$ -235-6B-C	●	●	235	∞						
	KGDF$^{R}_{L}$ -25-6C-C	●	●	25	35	54.35	20				
	KGDF$^{R}_{L}$ -35-6C-C	●	●	35	50	59.35	25				
	KGDF$^{R}_{L}$ -50-6C-C	●	●	50	75						
	KGDF$^{R}_{L}$ -75-6C-C	●	●	75	115						
	KGDF$^{R}_{L}$ -115-6C-C	●	●	115	180						
	KGDF$^{R}_{L}$ -180-6C-C	●	●	180	235						
	KGDF$^{R}_{L}$ -235-6C-C	●	●	235	∞						
	KGDF$^{R}_{L}$ -75-6D-C	●	●	75	115	66.35	32				
	KGDF$^{R}_{L}$ -115-6D-C	●	●	115	180						
	KGDF$^{R}_{L}$ -180-6D-C	●	●	180	235						
	KGDF$^{R}_{L}$ -235-6D-C	●	●	235	∞						

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Recommended cutting conditions

Workpiece material	Recommended insert grades (Vc: m/min)					Remarks
	Cermet		MEGACOAT		Carbide	
	TN620	TN90	PR1225	PR1215	GW15	
Carbon steel	☆ 60~200	☆ 80~200	★ 60~160	☆ 80~160	-	Coolant
Alloy steel	☆ 60~160	☆ 70~160	★ 60~150	☆ 60~150	-	
Stainless steel	-	-	★ 50~120	☆ 50~120	-	
Cast iron	-	-	-	★ 80~160	-	
Aluminum alloys	-	-	-	-	★ 160~400	
Brass	-	-	-	-	★ 80~160	

★: 1st recommendation ☆: 2nd recommendation

	Grooving	Shoulder grooving (side grooving)	Turning
Chipbreaker	 In the graph below indicates the most recommended value of feed (f)	 In the graph below indicates the most recommended value of feed (f)	
GM (Grooving, turning)			
GH (Grooving, turning, high feed grooving)			
DM (Deep grooving, turning)			
CM (Copying)			
GS (Non-ferrous metals)			- **When turning: keep ap less than or equal to the corner-R(RE).**

When shoulder grooving

- If ap is set smaller, set feed higher.
- If ap is set larger, set feed lower.

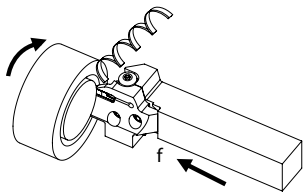
Workpiece material: C50, AlMg2.5(GS)

1. The above values are based on the condition that the CDX of toolholder is 15 mm or less.
2. If the toolholder's CDX is over 15 mm, set the values for turning to 90% or less of those above.

Guide for face grooving

1. Toolholder selection

Check the range of applicable "external diameter of the groove" as well as the groove width and depth.

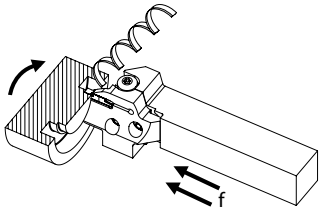
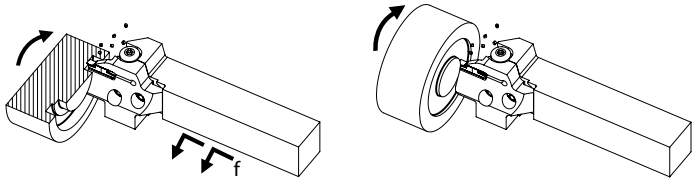


2. Cutting conditions (Feed rate: f)

When machining on steel, set the feed rate (f) so that chips are created in a helical form in cut-off.

3. How to widen the groove (plunge milling and turning)

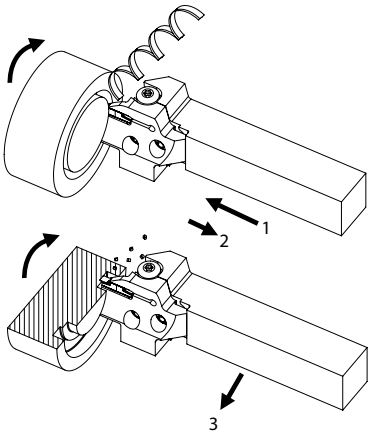
Start machining from the outside and then proceed to the inside.
Chip control will be better in this way.

Plunge milling (Grooving + side grooving)	Turning
	

4. Guide for turning

A. When the cutting amount (ap) is over 0.5 mm

1. Perform plunge milling.
2. Return the cutting by 0.1 mm. Failure to pull the tool back before traverse machining will result in an unbalanced load applied on only one side of the cutting edge.
3. Perform turning (Ref. to Fig. 1)



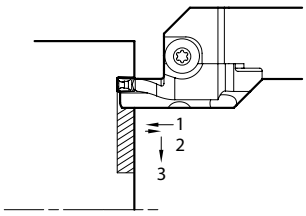


Fig. 1

When widening the face groove width (Ref. to Fig. 2).
Apply the “step turning”.
Then perform finishing.

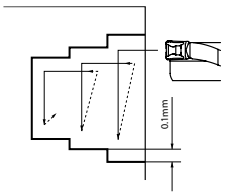
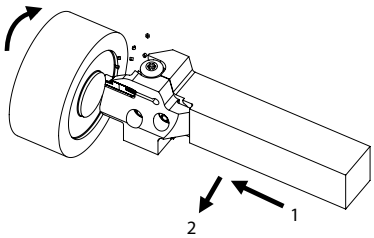


Fig. 2

B. When the cutting amount (ap) is under 0.5 mm

1. Perform Plunge milling.
2. Perform turning.
   Machining without interruption is possible.
   (Ref. to Fig. 3)



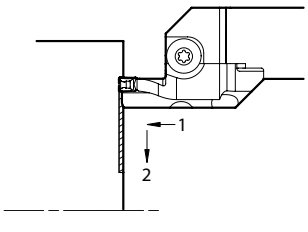


Fig. 3

GVF-AA

Carbon steel / Alloy steel	●	○		P
Stainless steel	●	○		M
Cast iron			●	K
Non-ferrous metals			●	N
Titanium alloy			●	S
Hard materials (~ 40HRC)				H
Hard materials (40HRC ~)				

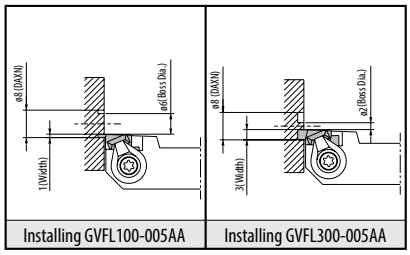
Insert	Description	No. of edges	Dimension (mm) CW	CDX	S	RE	INSL	W1	Tolerance (mm) CW min.	CW max.	Carbide PVD PR1225	PVD PR930	- KW10	Applicable toolholder G125
	GVFR 100-005AA	2	1	2.2	4.5	0.05	12	4.3	-0.02	+0.02	●	●	●	GFVSL....-08AA GFVTL....-08AA
	GVFR 200-005AA		2								●	●	●	
	GVFR 300-005AA		3								●	●	●	
	GVFL 100-005AA		1								●	●	●	GFVSR....-08AA GFVTR....-08AA
	GVFL 200-005AA		2								●	●	●	
	GVFL 300-005AA		3								●	●	●	

CDX shows available grooving depth.
GVF$^{R/L}$...005AA inserts are not compatible with GVF$^{R/L}$...—○○○A (See Page **G126**) inserts because their Side Relief Angle is 10°.

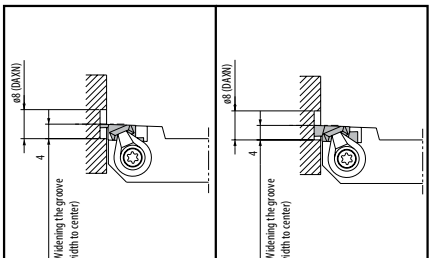
External dia. of the groove of GFVS-AA (apply to GFVT-AA)

Description	External dia. of the groove (mm) DAXN (min.)	DAXX (max.)	Applicable inserts
GFVS$^{R/L}$ 2020K-08AA	8 (0)	∞ (∞)	GVF$^{L/R}$...-...AA
GFVS$^{R/L}$ 2525M-08AA			

- It is available to infinity ∞ in case of machining the first groove bigger than DAXN.
- When machining towards the outer diameter then there is no MAX. limit to the further groove machining.
- When machining the initial groove on the face at DAXN ø8
  If the initial groove is made smaller than this, the toolholder interferes with the workpiece.
- When widening the groove width to inner diameter.
  For machining up to the center of the workpiece regardless of insert width.



Installing GVFL100-005AA | Installing GVFL300-005AA



Installing GVFL100-005AA | Installing GVFL300-005AA

Recommended cutting conditions GFVS-AA / GFVT-AA

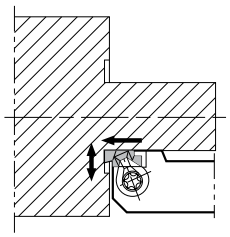
Workpiece material	Recommended insert grades (Vc: m/min) MEGACOAT PR1225	PVD coated carbide PR930	Carbide KW10	Grooving f (mm/rev)	Turning* ap (mm)	Turning* f (mm/rev)	Remarks
Carbon steel / Alloy steel	★ 50~100	☆ 50~100		0.01~0.05	Max. 0.5	0.01~0.05	Coolant
Stainless steel	★ 50~80	☆ 50~80		0.01~0.03	Max. 0.3	0.01~0.02	
Non-ferrous metals			★ ~200	0.01~0.08	Max. 0.5	0.01~0.08	

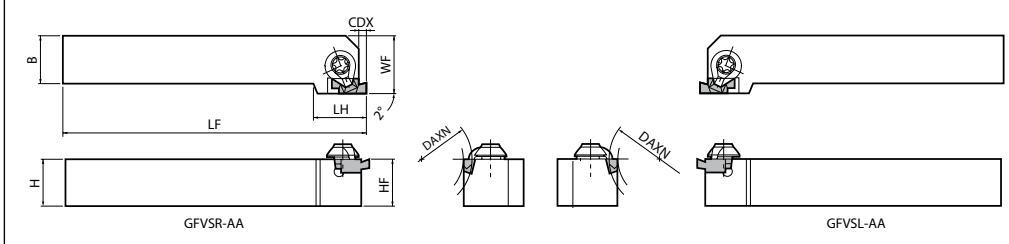
* ap has to be set for less than corner-R(RE) when turning of edge width 1.0 mm (GVF$^{R/L}$100-005AA).

★:1st recommendation ☆:2nd recommendation

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GFVS-AA (Face grooving)





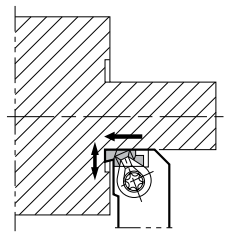
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

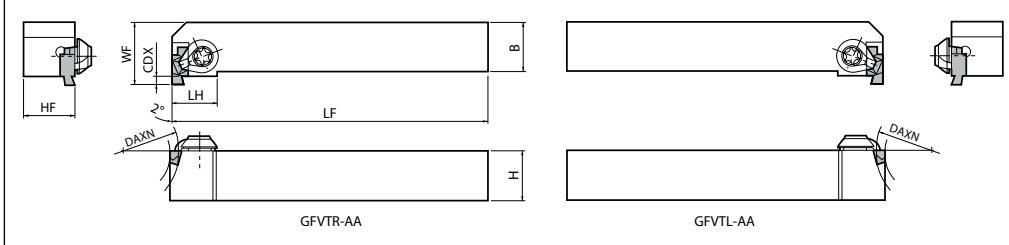
Toolholder dimensions

Description		Availability R	Availability L	External dia. of the groove (mm) DAXN (min.)	DAXX (max.)	Dimension (mm) CDX	H	B	LH	HF	LF	WF	Spare parts: Clamp set	Spare parts: Wrench	Applicable inserts G124
GFVS$^{R}/_{L}$	2020K-08AA	●	●	8	∞	2.2	20	20	18	20	125	25	CPS-5V	FT-15	GVF$^{L}/_{R}$...-...AA
	2525M-08AA	●	●	(0)	(∞)		25	25		25	150	32			

CDX shows available grooving depth.
The value ( ) of External dia. of the groove (DAXX) is the maximum outer diameter value after the initial groove between DAXN ~ DAXX. (It is possible to widen the groove to infinity ∞).
The value ( ) of External dia. of the groove (DAXN) is the minimum diameter of the boss which remains in the center when widening the groove width to a smaller value after the initial groove between DAXN ~ DAXX.

GFVT-AA (Face grooving)





Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

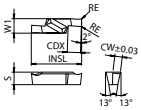
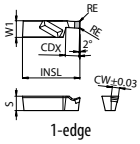
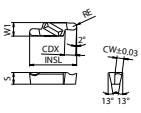
Description		Availability R	Availability L	External dia. of the groove (mm) DAXN (min.)	DAXX (max.)	Dimension (mm) CDX	H	B	LH	HF	LF	WF	Spare parts: Clamp set	Spare parts: Wrench	Applicable inserts G124
GFVT$^{R}/_{L}$	2020K-08AA	●	●	8	∞	2.2	20	20	14	20	125	25	CPS-5V	FT-15	GVF$^{L}/_{R}$...-...AA
	2525M-08AA	●	●	(0)	(∞)		25	25		25	150	32			

CDX shows available grooving depth.
The value ( ) of External dia. of the groove (DAXX) is the maximum outer diameter value after the initial groove between DAXN ~ DAXX. (It is possible to widen the groove to infinity ∞).
The value ( ) of External dia. of the groove (DAXN) is the minimum diameter of the boss which remains in the center when widening the groove width to a smaller value after the initial groove between DAXN ~ DAXX.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GVF

Carbon steel / Alloy steel											●	◔						P
Stainless steel											●	◔						M
Cast iron													●					K
Non-ferrous metals													●			●		N
Titanium alloy													●			●		S
Hard materials (~ 40HRC)																		H
Hard materials (40HRC ~)																		

Insert		Description		No. of edges	Dimension (mm) CW	CDX	S	RE	INSL	W1	Tolerance (mm) CW min.	CW max.	Carbide PVD PR1225	Carbide PVD PR930	Carbide - KW10	Cer-met - TC40	Cer-met - TG60	PCD - KPD010	Applicable toolholder G127~G129
		GVFR	200-020A	2	2	2.3	4.5	0.2	12	4.3	-0.03	+0.03	●	●	●	●	●		GFVR....-201A GIFVR....-201A
			230-020A		2.3								●		●	●			
			250-020A		2.5								●	●	●	●	●		
			270-020A		2.7								●		●				
			290-020A		2.9								●	●	●	●			
			340-020A		3.4								●	●	●	●			
		GVFL	200-020A		2								●	●	●	●	●		GFVL....-201A GIFVL....-201A
			230-020A		2.3								●		●				
			250-020A		2.5								●	●	●	●			
			270-020A		2.7								●		●				
			290-020A		2.9								●		●	●			
			340-020A		3.4								●	●	●				
		GVFR	250-020B	2	2.5	4.8	5	0.2	20	5.8	-0.03	+0.03	●	●	●	●	●		GFVR....-..1B *1 GFVSL....-..1B GFVTL....-..1B GIFVR....-..1B
			300-020B		3	4.8							●	●	●	●	●		
			350-020B		3.5	4.8							●	●	●	●	●		
			400-020B		4	5.3							●	●	●	●	●		GFVR....-..2B *2 GFVSL....-..2B GFVTL....-..2B GIFVR....-..2B
			430-020B		4.3	5.3							●		●	●	●		
			460-020B		4.6	5.3							●		●	●			
			490-020B		4.9	5.3							●	●	●	●	●		
		GVFL	250-020B		2.5	4.8							●	●	●	●	●		GFVL....-..1B *3 GFVSR....-..1B GFVTR....-..1B GIFVL....-..1B
			300-020B		3	4.8							●	●	●	●	●		
			350-020B		3.5	4.8							●	●	●	●	●		
			400-020B		4	5.3							●	●	●	●	●		GFVL....-..2B *4 GFVSR....-..2B GFVTR....-..2B GIFVL....-..2B
			430-020B		4.3	5.3							●	●	●	●	●		
			460-020B		4.6	5.3							●		●	●			
			490-020B		4.9	5.3							●	●	●	●	●		
		GVFR	350-040C	2	3.5	6.8	7	0.4	27	7	-0.03	+0.03	●	●	●	●	●		GFVR....-..1C *5 GFVSL....-..1C GFVTL....-..1C GIFVR....-..1C
			400-040C		4	6.8							●	●	●	●	●		
			450-040C		4.5	6.8							●	●	●	●	●		
			500-040C		5	8.3							●	●	●	●	●		GFVR....-..2C GFVSL....-..2C GFVTL....-..2C GIFVR....-..2C
			550-040C		5.5	8.3							●	●	●		●		
			600-040C		6	8.3							●	●	●	●			
		GVFL	350-040C		3.5	6.8							●	●	●	●	●		GFVL....-..1C GFVSR....-..1C GFVTR....-..1C GIFVL....-..1C
			400-040C		4	6.8							●	●	●	●	●		
			450-040C		4.5	6.8							●	●	●	●	●		
			500-040C		5	8.3							●	●	●	●	●		GFVL....-..2C GFVSR....-..2C GFVTR....-..2C GIFVL....-..2C
			550-040C		5.5	8.3							●	●	●		●		
			600-040C		6	8.3							●	●	●	●			
	 1-edge	GVFR	250-020B	1	2.5	4.8	5	0.2	20	5.8	-0.03	+0.03						●	*1
			300-020B		3	4.8												●	
			400-020B		4	5.3												MTO	*2
		GVFL	250-020B		2.5	4.8												●	*3
			300-020B		3	4.8												●	
			400-020B		4	5.3												MTO	*4
		GVFR	350-040C	1	3.5	6.8	7	0.4	27	7	-0.03	+0.03						MTO	*5
	 Full R / Copying	GVFR	200-100AR	2	2	2.3	4.5	1	12	4.3	-0.03	+0.03	●	●	●				GFVR....-201A GIFVR....-201A
			250-125AR		2.5			1.25					●	●	●				
			300-150AR		3			1.5					●	●	●				
		GVFL	200-100AR		2			1					●	●	●				GFVL....-201A GIFVL....-201A
			250-125AR		2.5			1.25					●		●				
			300-150AR		3			1.5					●	●	●				
		GVFR	300-150BR	2	3	4.8	5	1.5	20	5.8	-0.03	+0.03	●	●	●				*1
			400-200BR		4	5.3		2					●	●	●				*2
		GVFL	300-150BR		3	4.8		1.5					●	●	●				*3
			400-200BR		4	5.3		2					●	●	●				*4

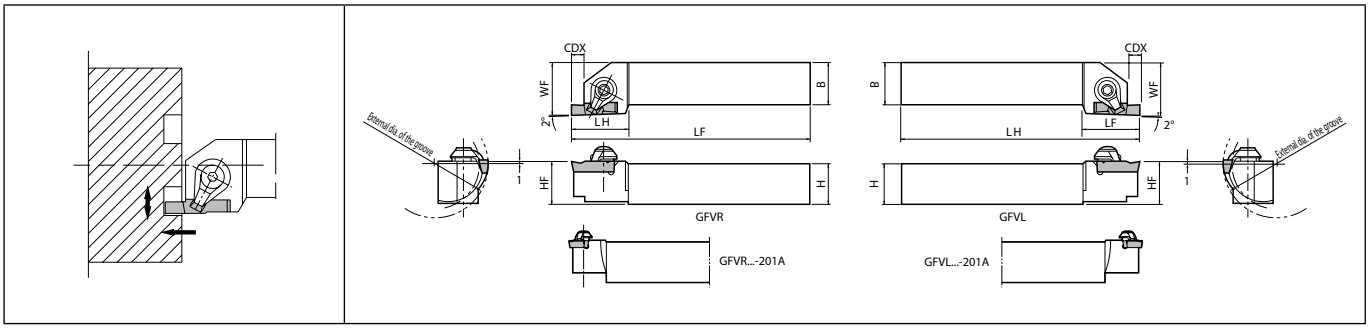
Right-hand shown
CDX shows available grooving depth.

Recommended cutting conditions G146

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

CBN & PCD Inserts are sold in 1 piece boxes

GFV (Face grooving)



Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

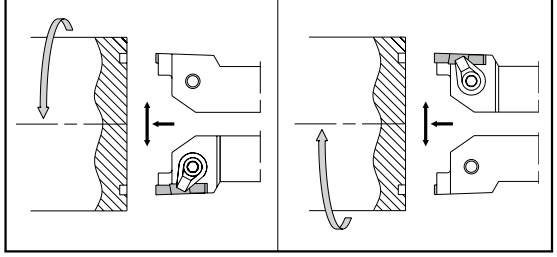
Description		Availability		External dia. of the groove (mm)		Dimension (mm)							Spare parts				Applicable inserts G126
		R	L	DAXN (min.)	DAXX (max.)	CDX	H	B	LH	HF	LF	WF	Clamp set	Clamp set	Wrench	Wrench	
GFVR/L	2020K-201A	●	●	20 (12)	∞ (∞)	2.2	20	20	20	21	125	25	CPS-5V	-	-	FT-15	GVFR/L200 ~ 340-...A
	2525M-201A	●	●				25	25	23	26	150	32					GVFR/L200 ~ 300-...AR
GFVR/L	2020K-351B	●	●	35 (25)	50 (∞)	4.6	20	20	28	21	125	25	-	CPS-6V	LW-3	-	GVFR/L250 ~ 350-...B
	2525M-351B	●	●				25	25	30	26	150	32					GVFR/L300-150BR
	2020K-352B	●	●			5.1	20	20	28	21	125	25					GVFR/L400 ~ 490-...B
	2525M-352B	●	●				25	25	30	26	150	32					GVFR/L400-200BR
	2020K-501B	●	●	50 (25)	70 (∞)	4.6	20	20	28	21	125	25					GVFR/L250 ~ 350-...B
	2525M-501B	●	●				25	25	30	26	150	32					GVFR/L300-150BR
	2020K-502B	●	●			5.1	20	20	28	21	125	25					GVFR/L400 ~ 490-...B
	2525M-502B	●	●				25	25	30	26	150	32					GVFR/L400-200BR
	2020K-701B	●	●	70 (25)	100 (∞)	4.6	20	20	28	21	125	25					GVFR/L250 ~ 350-...B
	2525M-701B	●	●				25	25	30	26	150	32					GVFR/L300-150BR
	2020K-702B	●	●			5.1	20	20	28	21	125	25					GVFR/L400 ~ 490-...B
	2525M-702B	●	●				25	25	30	26	150	32					GVFR/L400-200BR
GFVR/L	2525M-501C	●	●	50 (25)	70 (∞)	6.6	25	25	35	26	150	32	-	CPS-8V	LW-4	-	GVFR/L350 ~ 450-...C
	2525M-502C	●	●			8.1											GVFR/L500 ~ 600-...C
	2525M-701C	●	●	70 (25)	100 (∞)	6.6											GVFR/L350 ~ 450-...C
	2525M-702C	●	●			8.1											GVFR/L500 ~ 600-...C
	2525M-1001C	●	●	100 (25)	150 (∞)	6.6											GVFR/L350 ~ 450-...C
	2525M-1002C	●	●			8.1											GVFR/L500 ~ 600-...C
	2525M-1501C	●	●	150 (25)	250 (∞)	6.6											GVFR/L350 ~ 450-...C
	2525M-1502C	●	●			8.1											GVFR/L500 ~ 600-...C

CDX shows available grooving depth.
The value ( ) of External dia. of the groove (DAXX) is the maximum outer diameter value after the initial groove between DAXN ~ DAXX. (It is possible to widen the groove to infinity ∞).
The value ( ) of External dia. of the groove (DAXN) is the minimum diameter of the boss which remains in the center when widening the groove width to a smaller value after the initial groove between DAXN ~ DAXX.
Standard toolholders are designed with the edge position 1.0 mm above the center. When using non-standard toolholders, set the edge position 1.0 mm above the center.

Selection of Toolholder & Insert

Toolholder	Right-hand
Insert	Right-hand

Toolholder	Left-hand
Insert	Left-hand



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

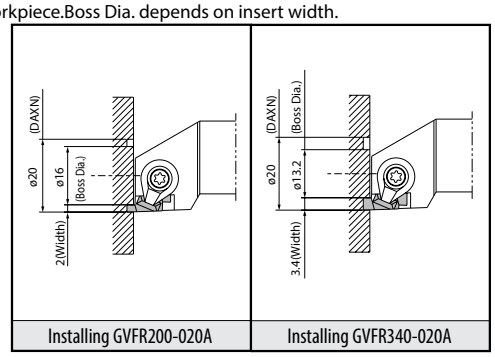
External dia. of the groove of GFV

(1) e.g.) GFV$^{R}/_{L}$...-201A

Description		External dia.of the groove (mm) DAXN (min.)	DAXX (max.)	Applicable inserts
GFV$^{R}/_{L}$	2020K-201A 2525M-201A	20 (12)	∞ (∞)	GVF$^{R}/_{L}$200 ~ 340-...A GVF$^{R}/_{L}$200 ~ 300-...AR

- It is available to infinity ∞ in case of machining the first groove bigger than DAXN.
- When machining towards the outer diameter then there is no MAX. limit to the further groove machining.
- When machining the initial groove on the face at DAXN ø20

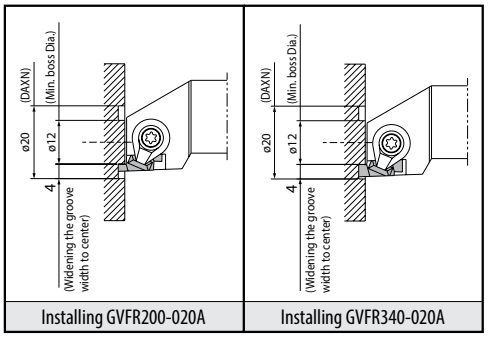
If the initial groove is made smaller than this, the toolholder interferes with the workpiece.Boss Dia. depends on insert width.



Installing GVFR200-020A | Installing GVFR340-020A

- When widening the groove width to inner diameter.

Face groove diameter DAXN (12) is the limit; the toolholder interferes with the workpiece in case of smaller than ø12.The toolholder interferes with the workpiece when closer to the center.



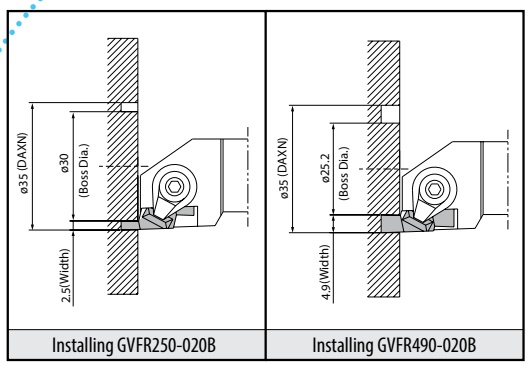
Installing GVFR200-020A | Installing GVFR340-020A

(2) e.g.) GFV$^{R}/_{L}$...-351B/352B (same as GFV$^{R}/_{L}$...-○○○B or GFV$^{R}/_{L}$...-○○○C)

Description		External dia.of the groove (mm) DAXN (min.)	DAXX (max.)	Applicable inserts
GFV$^{R}/_{L}$	2020K-351B 2525M-351B 2020K-352B 2525M-352B	35 (25)	50 (∞)	GVF$^{R}/_{L}$250 ~ 350-...B GVF$^{R}/_{L}$300-150BR GVF$^{R}/_{L}$400 ~ 490-...B GVF$^{R}/_{L}$400-200BR

- It is possible to widen the groove to infinity ∞ when machining the initial groove within DAXN ~ DAXX and then widening to outer diameter.
- When machining the initial groove on the face at DAXN ø35

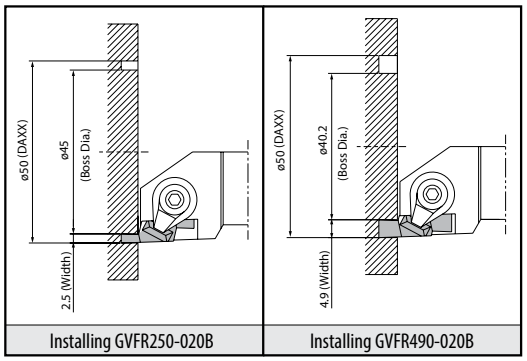
If the initial groove is made smaller than this, the toolholder interferes with the workpiece.Boss Dia. depends on insert width.



Installing GVFR250-020B | Installing GVFR490-020B

- When machining the initial groove on the face at DAXX ø50.

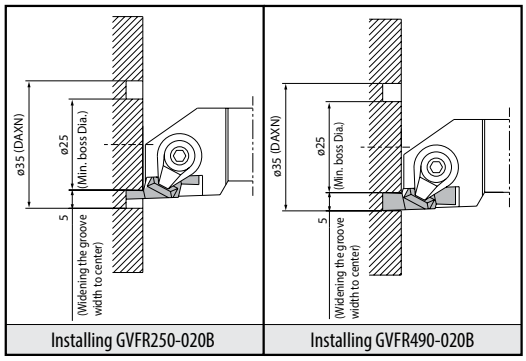
If the initial groove is made larger than this, the toolholder interferes with the workpiece.Boss Dia. depends on insert width.



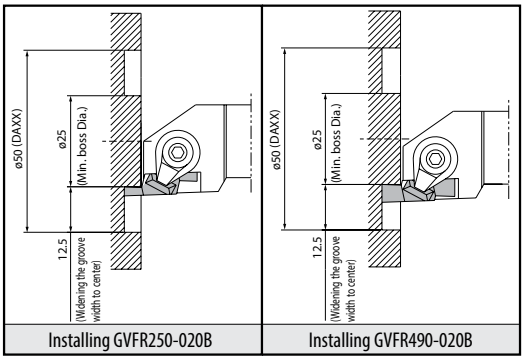
Installing GVFR250-020B | Installing GVFR490-020B

- When widening the groove width to inner diameter.

ø25 Boss Dia. is the limitation regardless of insert width,
even widening the groove width to the center from the initial groove at DAXN (ø35) or DAXX (ø50).
The toolholder interferes with the workpiece when closer to the center.

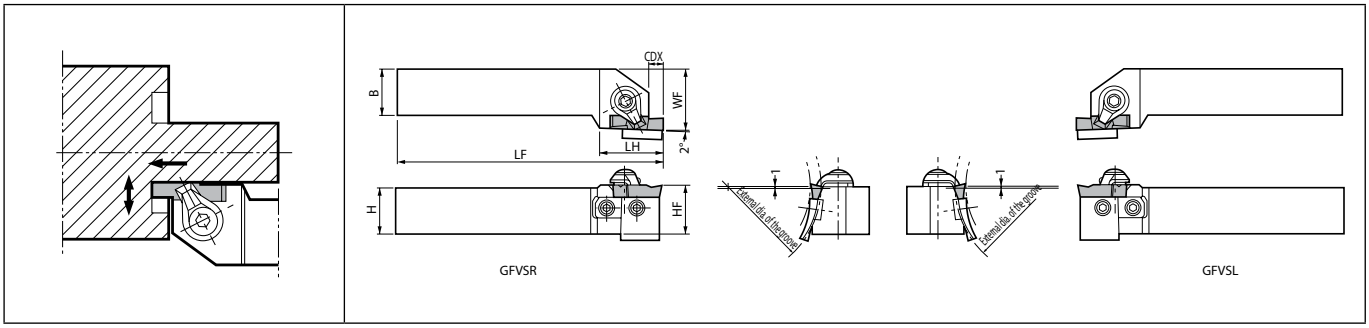


Installing GVFR250-020B | Installing GVFR490-020B



Installing GVFR250-020B | Installing GVFR490-020B

GFVS (Face grooving)



Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.
This toolholder can machine various face grooving diameters by replacing the blade.

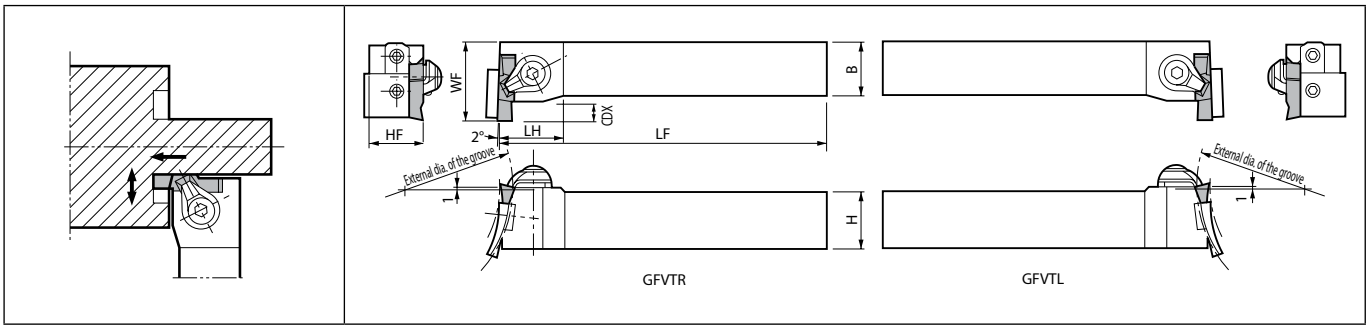
Toolholder dimensions

Description		Availability		External dia. of the groove (mm)		Dimension (mm)							Spare parts				Applicable inserts ⇒ G126
													Blade	Bolt	Clamp set	Wrench	
		R	L	DAXN (min.)	DAXX (max.)	CDX	H	B	LH	HF	LF	WF					
GFVS$^{R}_{L}$	2020K-351B	●	●	35 (25)	50 (∞)	5.1 (4.6)	20	20	30	21	125	25	SF$^{R}_{L}$-351B	HH4X12	CPS-6V	LW-3	GVF$^{L}_{R}$250 ~ 350-...B
	2525M-351B	●	●				25	25	32	26	150	32					GVF$^{L}_{R}$300-150BR
	2020K-352B	●	●			5.1 (5.1)	20	20	30	21	125	25	SF$^{R}_{L}$-352B				GVF$^{L}_{R}$400 ~ 490-...B
	2525M-352B	●	●				25	25	32	26	150	32					GVF$^{L}_{R}$400-200BR
	2020K-501B	●	●	50 (25)	70 (∞)	5.1 (4.6)	20	20	30	21	125	25	SF$^{R}_{L}$-501B				GVF$^{L}_{R}$250 ~ 350-...B
	2525M-501B	●	●				25	25	32	26	150	32					GVF$^{L}_{R}$300-150BR
	2020K-502B	●	●			5.1 (5.1)	20	20	30	21	125	25	SF$^{R}_{L}$-502B				GVF$^{L}_{R}$400 ~ 490-...B
	2525M-502B	●	●				25	25	32	26	150	32					GVF$^{L}_{R}$400-200BR
	2020K-701B	●	●	70 (25)	100 (∞)	5.1 (4.6)	20	20	30	21	125	25	SF$^{R}_{L}$-701B				GVF$^{L}_{R}$250 ~ 350-...B
	2525M-701B	●	●				25	25	32	26	150	32					GVF$^{L}_{R}$300-150BR
	2020K-702B	●	●			5.1 (5.1)	20	20	30	21	125	25	SF$^{R}_{L}$702B				GVF$^{L}_{R}$400 ~ 490-...B
	2525M-702B	●	●				25	25	32	26	150	32					GVF$^{L}_{R}$400-200BR
GFVS$^{R}_{L}$	2525M-501C	●	●	50 (25)	70 (∞)	8.1 (*5.1)	25	25	32	26	150	32	SF$^{R}_{L}$-501C	HH4X12	CPS-8V	LW-4	GVF$^{L}_{R}$350 ~ 450-...C
	2525M-502C	●	●			8.1 (8.1)							SF$^{R}_{L}$-502C				GVF$^{L}_{R}$500 ~ 600-...C
	2525M-701C	●	●	70 (25)	100 (∞)	8.1 (*5.1)							SF$^{R}_{L}$-701C				GVF$^{L}_{R}$350 ~ 450-...C
	2525M-702C	●	●			8.1 (8.1)							SF$^{R}_{L}$-702C				GVF$^{L}_{R}$500 ~ 600-...C
	2525M-1001C	●	●	100 (25)	150 (∞)	8.1 (*5.1)							SF$^{R}_{L}$-1001C				GVF$^{L}_{R}$350 ~ 450-...C
	2525M-1002C	●	●			8.1 (8.1)							SF$^{R}_{L}$-1002C				GVF$^{L}_{R}$500 ~ 600-...C
	2525M-1501C	●	●	150 (25)	250 (∞)	8.1 (*5.1)							SF$^{R}_{L}$-1501C				GVF$^{L}_{R}$350 ~ 450-...C
	2525M-1502C	●	●			8.1 (8.1)							SF$^{R}_{L}$-1502C				GVF$^{L}_{R}$500 ~ 600-...C

CDX shows available grooving depth.
The value ( ) of External dia. of the groove (DAXX) is the maximum outer diameter value after the initial groove between DAXN ~ DAXX. (It is possible to widen the groove to infinity ∞).
The value ( ) of External dia. of the groove (DAXN) is the minimum diameter of the boss which remains in the center when widening the groove width to a smaller value after the initial groove between DAXN ~ DAXX.
Standard toolholders are designed with the edge position 1.0 mm above the center. When using non-standard toolholders, set the edge position 1.0 mm above the center.
CDX shows the distance from the toolholder to the cutting edge. The grooving depth is the mentioned in ( ).
GFVS is composed of a base-holder and a blade. If the blade should be damaged, replace it with a new blade as listed in the table on **G131**.
(e.g.) GFVSR2020K-HB + SFR-351B = GFVSR2020K-351B
*GVF$^{L}_{R}$400~450-040C: CDX is 6.6

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GFVT (Face grooving)



Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.
This toolholder can machine various face grooving diameters by replacing the blade.

Toolholder dimensions

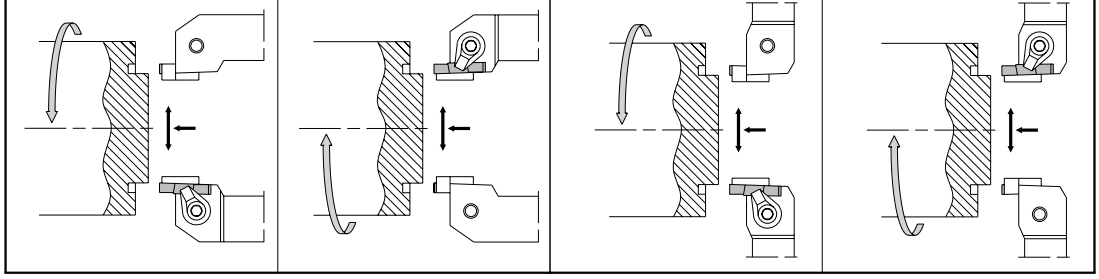
Description		Availability R	Availability L	External dia. of the groove (mm) DAXN (min.)	DAXX (max.)	Dimension (mm) CDX	H	B	LH	HF	LF	WF	Spare parts: Blade	Bolt	Clamp set	Wrench	Applicable inserts G126
GFVT$^{R}_{L}$	2020K-351B	●	●	35 (25)	50 (∞)	5.1 (4.6)	20	20	22	21	125	30	SF$^{R}_{L}$-351B	HH4X12	CPS-6V	LW-3	GVF$^{L}_{R}$250 ~ 350-...B
	2525M-351B	●	●				25	25	25	26	150	35					GVF$^{L}_{R}$300-150BR
	2020K-352B	●	●			5.1 (5.1)	20	20	22	21	125	30	SF$^{R}_{L}$-352B				GVF$^{L}_{R}$400 ~ 490-...B
	2525M-352B	●	●				25	25	25	26	150	35					GVF$^{L}_{R}$400-200BR
	2020K-501B	●	●	50 (25)	70 (∞)	5.1 (4.6)	20	20	22	21	125	30	SF$^{R}_{L}$-501B				GVF$^{L}_{R}$250 ~ 350-...B
	2525M-501B	●	●				25	25	25	26	150	35					GVF$^{L}_{R}$300-150BR
	2020K-502B	●	●			5.1 (5.1)	20	20	22	21	125	30	SF$^{R}_{L}$-502B				GVF$^{L}_{R}$400 ~ 490-...B
	2525M-502B	●	●				25	25	25	26	150	35					GVF$^{L}_{R}$400-200BR
	2020K-701B	●	●	70 (25)	100 (∞)	5.1 (4.6)	20	20	22	21	125	30	SF$^{R}_{L}$-701B				GVF$^{L}_{R}$250 ~ 350-...B
	2525M-701B	●	●				25	25	25	26	150	35					GVF$^{L}_{R}$300-150BR
	2020K-702B	●	●			5.1 (5.1)	20	20	22	21	125	30	SF$^{R}_{L}$-702B				GVF$^{L}_{R}$400 ~ 490-...B
	2525M-702B	●	●				25	25	25	26	150	35					GVF$^{L}_{R}$400-200BR
GFVT$^{R}_{L}$	2525M-501C	●	●	50 (25)	70 (∞)	8.1 (*5.1)	25	25	27	26	150	38	SF$^{R}_{L}$-501C	HH4X12	CPS-8V	LW-4	GVF$^{L}_{R}$350 ~ 450-...C
	2525M-502C	●	●			8.1 (8.1)							SF$^{R}_{L}$-502C				GVF$^{L}_{R}$500 ~ 600-...C
	2525M-701C	●	●	70 (25)	100 (∞)	8.1 (*5.1)							SF$^{R}_{L}$-701C				GVF$^{L}_{R}$350 ~ 450-...C
	2525M-702C	●	●			8.1 (8.1)							SF$^{R}_{L}$-702C				GVF$^{L}_{R}$500 ~ 600-...C
	2525M-1001C	●	●	100 (25)	150 (∞)	8.1 (*5.1)							SF$^{R}_{L}$-1001C				GVF$^{L}_{R}$350 ~ 450-...C
	2525M-1002C	●	●			8.1 (8.1)							SF$^{R}_{L}$-1002C				GVF$^{L}_{R}$500 ~ 600-...C
	2525M-1501C	●	●	150 (25)	250 (∞)	8.1 (*5.1)							SF$^{R}_{L}$-1501C				GVF$^{L}_{R}$350 ~ 450-...C
	2525M-1502C	●	●			8.1 (8.1)							SF$^{R}_{L}$-1502C				GVF$^{L}_{R}$500 ~ 600-...C

CDX shows available grooving depth.
The value ( ) of External dia. of the groove (DAXX) is the maximum outer diameter value after the initial groove between DAXN ~ DAXX. (It is possible to widen the groove to infinity ∞).
The value ( ) of External dia. of the groove (DAXN) is the minimum diameter of the boss which remains in the center when widening the groove width to a smaller value after the initial groove between DAXN ~ DAXX.
Standard toolholders are designed with the edge position 1.0 mm above the center. When using non-standard toolholders, set the edge position 1.0 mm above the center.
CDX shows the distance from the toolholder to the cutting edge. The grooving depth is the mentioned in ( ).
GFVT is composed of a base-holder and a blade. If the blade should be damaged, replace it with a new blade as listed in the table on **G131**.
(e.g.) GFVTR2020K-HB + SFR-351B = GFVTR2020K-351B
*GVF$^{L}_{R}$400~450-040C: CDX is 6.6

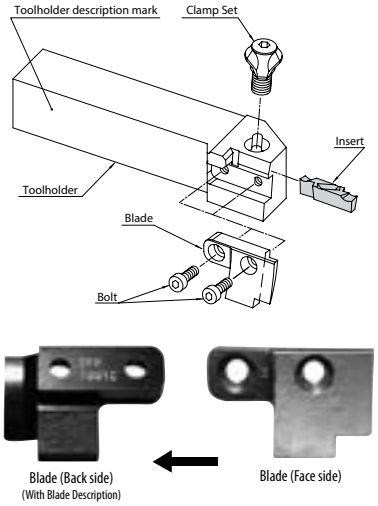
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Selection of Toolholder & Insert

GFVS				GFVT			
Toolholder	Right-hand	Toolholder	Left-hand	Toolholder	Right-hand	Toolholder	Left-hand
Insert	Left-hand	Insert	Right-hand	Insert	Left-hand	Insert	Right-hand



Combination of Base-Holder & Blade

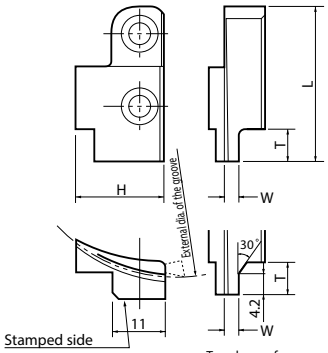
Toolholder Description (Stamped below)	Stock R	Stock L	Blade Description	Toolholder Description (Unit Description)	Example of installation (GFVS)	How to refer to the face grooving toolholder and blade
GFVS$^{R}_{L}$2020K-HB GFVT$^{R}_{L}$2020K-HB	●	●	SF$^{R}_{L}$ -351B -352B -501B -502B -701B -702B	GFVS$^{R}_{L}$2020K -351B GFVT$^{R}_{L}$2020K -352B -501B -502B -701B -702B		Q : Though "GFVSR2525M-HC" is marked on the face grooving toolholder, the size of cutting dia. is unknown. How could it be found out? A : Take off the blade. Description of the blade is listed on the back of the blade. Using the description, check the description of the toolholder in the catalog. If "SFR-1001C" is integrated to "GFVSR2525M-HC", the description of the toolholder is "GVFSR2525M-1001C".
GFVS$^{R}_{L}$2525M-HB GFVT$^{R}_{L}$2525M-HB	●	●	SF$^{R}_{L}$ -351B -352B -501B -502B -701B -702B	GFVS$^{R}_{L}$2525M -351B GFVT$^{R}_{L}$2525M -352B -501B -502B -701B -702B		
GFVS$^{R}_{L}$2525M-HC GFVT$^{R}_{L}$2525M-HC	●	●	SF$^{R}_{L}$ -501C -502C -701C -702C -1001C -1002C -1501C -1502C	GFVS$^{R}_{L}$2525M -501C GFVT$^{R}_{L}$2525M -502C -701C -702C -1001C -1002C -1501C -1502C		

· Right-hand Blade for Right-hand Toolholder, Left-hand Blade for Left-hand Toolholder.

· Installation of GFVT is also pursuing example of installation of GFVS.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Blade Dimensions

Shape	Description	Stock R	Stock L	Dimension (mm) L	H	T	W	External dia. of the groove (mm) DAXN (min.)	DAXX (max.)	Applicable Inserts	Applicable Toolholders
 ● Right-hand shown · Right-hand Blade for Right-hand Toolholder, Left-hand Blade for Left-hand Toolholder.	SF R/L -351B	●	●	30.5	11	4.7	2.0	35	50	GVF R/L 250~350-020B GVF R/L 300-150BR	GFV(S/T) R/L ○○○○□ -○○○B (Toolholder Stamp GFV(S/T) R/L ○○○○□-HB)
	-352B	●	●				3.4			GVF R/L 400~490-020B GVF R/L 400-200BR	
	SF R/L -501B	●	●		15		2.0	50	70	GVF R/L 250~350-020B GVF R/L 300-150BR	
	-502B	●	●				3.4			GVF R/L 400~490-020B GVF R/L 400-200BR	
	SF R/L -701B	●	●		17		2.0	70	100	GVF R/L 250~350-020B GVF R/L 300-150BR	
	-702B	●	●				3.4			GVF R/L 400~490-020B GVF R/L 400-200BR	
	SF R/L -501C	●	●	35	15	7.5	2.8	50	70	GVF R/L 350~450-040C	GFV(S/T) R/L ○○○○□ -○○○C (Toolholder Stamp GFV(S/T) R/L ○○○○□-HC)
	-502C	●	●				4.3			GVF R/L 500~600-040C	
	SF R/L -701C	●	●		20		2.8	70	100	GVF R/L 350~450-040C	
	-702C	●	●				4.3			GVF R/L 500~600-040C	
	SF R/L -1001C	●	●		23		2.8	100	150	GVF R/L 350~450-040C	
	-1002C	●	●				4.3			GVF R/L 500~600-040C	
	SF R/L -1501C	●	●		23		2.8	150	250	GVF R/L 350~450-040C	
	-1502C	●	●				4.3			GVF R/L 500~600-040C	

External dia. of the groove of GFVS / GFVT

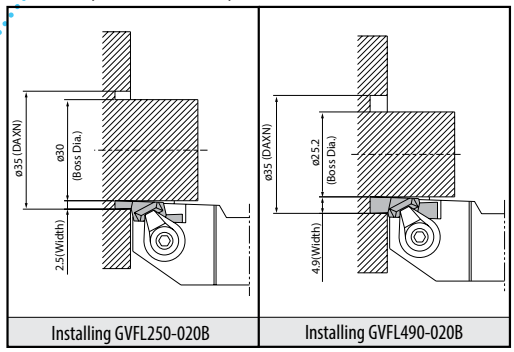
e.g.) GFVS R/L...-351B/352B
(same as GFVS R/L...-○○○B, ...-○○○C G129
GFVT R/L...-○○○B, ...-○○○C G130)

Description	External dia.of the groove (mm) DAXN (min.)	DAXX (max.)	Applicable inserts
GFVS R/L 2020K-351B	35 (25)	50 (∞)	GVF L/R 250 ~ 350-...B GVF L/R 300-150BR
2525M-351B			
2020K-352B			GVF L/R 400 ~ 490-...B GVF L/R 400-200BR
2525M-352B			

●It is possible to widen the groove to infinity ∞ when machining the initial groove within DAXN ~ DAXX and then widening to outer diameter.

●When machining the initial groove on the face at DAXN ø35

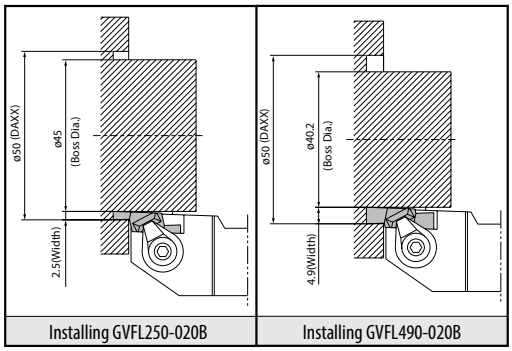
If the initial groove is made smaller than this, the toolholder interferes with the workpiece.Boss Dia. depends on insert width.



Installing GVFL250-020B | Installing GVFL490-020B

●When machining the initial groove on the face at DAXX ø50

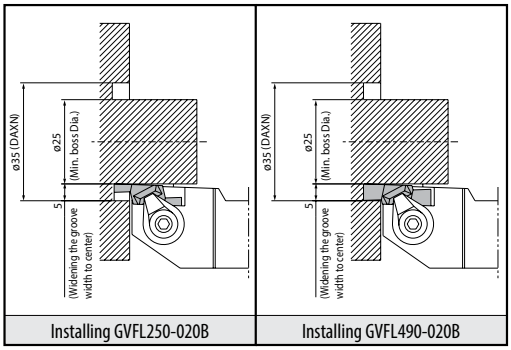
If the initial groove is made larger than this, the toolholder interferes with the workpiece.Boss Dia. depends on insert width.



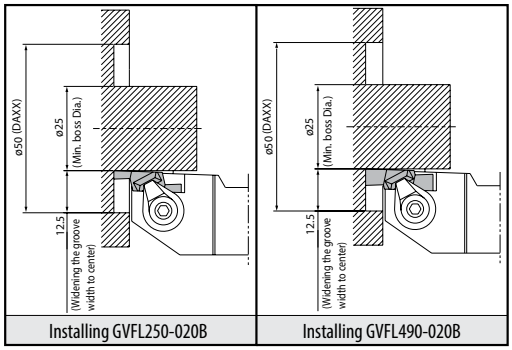
Installing GVFL250-020B | Installing GVFL490-020B

●When widening the groove width to inner diameter

ø25 Boss Dia. is the limitation regardless of insert width, even widening the groove width to the center from the initial groove at DAXN (ø35) or DAXX (ø50).
The toolholder interferes with the workpiece when closer to the center.



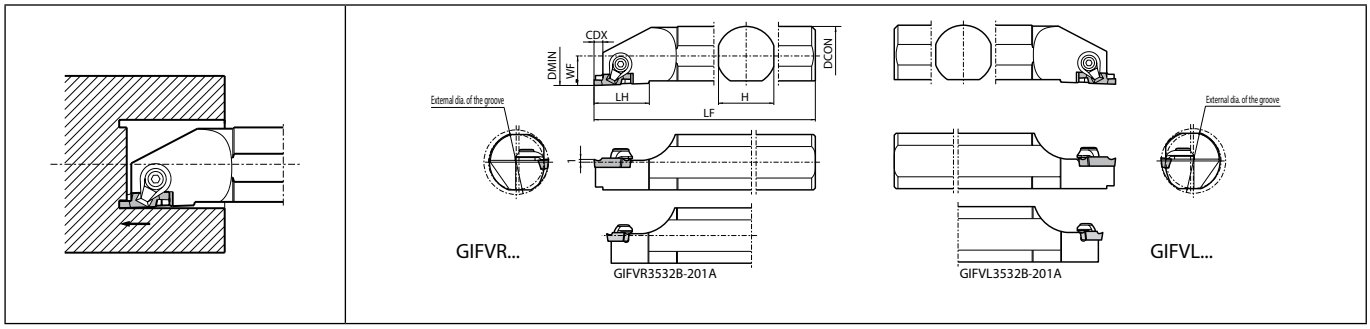
Installing GVFL250-020B | Installing GVFL490-020B



Installing GVFL250-020B | Installing GVFL490-020B

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GIFV (Face grooving)



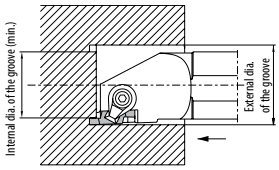
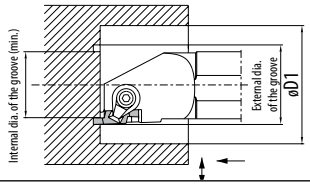
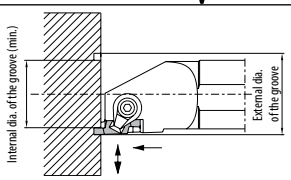
Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description		Availability R	Availability L	External dia. of the groove (mm) DAXN (min.)	External dia. of the groove (mm) DAXX (max.)	Dimension (mm) DMIN	DCON	CDX	H	LH	LF	WF	Spare parts Clamp set	Spare parts Clamp set	Spare parts Wrench	Spare parts Wrench	Applicable inserts G126
GIFV$^{R}_{L}$	3532B-201A	●	●	35 (12)	∞ (∞)	35	32	2.2	30	23	250	16	CPS-5V	-	-	FT-15	GVF$^{R}_{L}$...-...A(R)
GIFV$^{R}_{L}$	3532B-351B	●	●	35 (25)	50 (∞)	35	32	4.6	30	30	250	16	-	CPS-6V	LW-3	-	GVF$^{R}_{L}$250 ~ 350-...B(R)
	3532B-352B	●	●					5.1									GVF$^{R}_{L}$400 ~ 490-...B(R)
	5032B-501B	●	●	50 (25)	70 (∞)	50		4.6									GVF$^{R}_{L}$250 ~ 350-...B(R)
	5032B-502B	●						5.1									GVF$^{R}_{L}$400 ~ 490-...B(R)
GIFV$^{R}_{L}$	5032B-501C	●	●	50 (25)	70 (∞)	50	32	6.6	30	35	250	16	-	CPS-8V	LW-4	-	GVF$^{R}_{L}$350 ~ 450-040C
	5032B-502C	●	●					8.1									GVF$^{R}_{L}$500 ~ 600-040C

CDX shows available grooving depth.
Standard toolholders are designed with the edge position 1.0 mm above the center.

External dia. of the groove depends on the application.

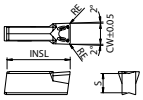
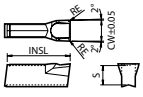
Applications	Description		Internal dia. of the groove (min.)	External dia. of the groove DAXN [min.]	External dia. of the groove DAXX [max.]	External dia. of the groove (max.)	Remarks
	GIFV$^{R}_{L}$	3532B-201A	-	35	∞	∞	-
	GIFV$^{R}_{L}$	3532B-351B			50		
		3532B-352B					
		5032B-501B		50	70		
		5032B-502B					
	GIFV$^{R}_{L}$	5032B-501C					
		5032B-502C					
	GIFV$^{R}_{L}$	3532B-201A	12	35	∞	∞	If øD1 ≥ 58-2CW, the Face Grooving Dia. can be expanded to Internal dia. of the groove (min.) toward the Center. CW = Edge Width If øD1 ≥ 75-2CW, the Face Grooving Dia. can be expanded to Internal dia. of the groove (min.) toward the Center. CW = Edge Width
	GIFV$^{R}_{L}$	3532B-351B	25		50		
		3532B-352B					
		5032B-501B		50	70		
		5032B-502B					
	GIFV$^{R}_{L}$	5032B-501C					
		5032B-502C					
	GIFV$^{R}_{L}$	3532B-201A	12	35	∞	∞	-
	GIFV$^{R}_{L}$	3532B-351B	25		50		
		3532B-352B					
		5032B-501B		50	70		
		5032B-502B					
	GIFV$^{R}_{L}$	5032B-501C					
		5032B-502C					

The value ( ) of External dia. of the groove (max.) is the maximum outer diameter value after the initial groove between DAXN ~ DAXX (It is possible to widen the groove to infinity ∞).
The value ( ) of Internal dia. of the groove (min.) is the minimum diameter of the boss which remains in the center when widening the groove width to a smaller value after the initial groove between DAXN ~ DAXX.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

FMM/FMN

Carbon steel / Alloy steel	P
Stainless steel	M
Cast iron	K
Non-ferrous metals	N
Titanium alloy	S
Hard materials (~ 40HRC)	H
Hard materials (40HRC ~)	H

Insert		Description		No. of edges	Dimension (mm)				Tolerance (mm)		Carbide					Cermet	Applicable toolholder ⇨ G135,G136
					CW	S	RE	INSL	CW min.	CW max.	CVD	PVD		-	-		
											CR9025	PR905	PR915	PR930	KW10	TN90	
	 Chip control oriented / M class	FMM	30-04	1	3	3.5	0.3	12	-0.05	+0.05	●	●	●	●	●	●	KFMS$^{R}_{L}$...-3
		FMM	40-04	1	4	3.5	0.4	12	-0.05	+0.05	●	●	●	●	●	●	KFMS$^{R}_{L}$...-4
		FMM	50-04	1	5	3.5	0.4	12	-0.05	+0.05	●	●	●	●	●	●	KFMS$^{R}_{L}$...-5
		FMM	60-04	1	6	3.5	0.4	12	-0.05	+0.05	●	●		●	●	●	
	 Sharp cutting oriented / M class	FMN	3	1	3	3.5	0.25	12	-0.05	+0.05	●			●	●	●	KFMS$^{R}_{L}$...-3
		FMN	4	1	4	3.5	0.25	12	-0.05	+0.05	●			●	●	●	KFMS$^{R}_{L}$...-4
		FMN	5	1	5	3.5	0.25	12	-0.05	+0.05	●			●	●	●	KFMS$^{R}_{L}$...-5
		FMN	6	1	6	3.5	0.25	12	-0.05	+0.05	●			●	●		

FMN inserts are only for Deep Grooving and not applicable for Turning.

Recommended cutting conditions

Workpiece material	Recommended insert grades (Vc: m/min)						Face gooving (FMM / FMN)			Turning (FMM)			Remarks
	Cermet	CVD coated carbide	PVD coated carbide			Carbide	Edge width (mm)			Edge width (mm)			
	TN90	CR9025	PR915	PR930	PR905	KW10	3.0	4.0	5.0 / 6.0	3.0	4.0	5.0 / 6.0	
							f (mm/rev)			f (mm/rev)			
Carbon steel	☆ 100~220	☆ 80~200	☆ 80~200	★ 80~200	-	-	0.03~0.05	0.03~0.08	0.05~0.10	0.05~0.10	0.05~0.25	0.10~0.30	Coolant
Alloy steel	☆ 80~200	☆ 70~180	☆ 70~180	★ 70~180	-	-	0.03~0.05	0.03~0.08	0.05~0.10	0.05~0.10	0.05~0.25	0.10~0.30	
Stainless steel	☆ 70~160	☆ 60~150	★ 60~150	☆ 60~150	-	-	0.03~0.05	0.03~0.08	0.05~0.10	0.05~0.10	0.05~0.25	0.10~0.30	
Cast iron	-	-	-	-	★ 80~180	☆ 70~150	0.03~0.05	0.03~0.08	0.05~0.10	0.05~0.10	0.05~0.25	0.10~0.30	
Aluminum alloys	-	-	-	-	-	★ 200~500	0.03~0.05	0.03~0.08	0.05~0.10	0.05~0.10	0.05~0.25	0.10~0.30	
Brass	-	-	-	-	-	★ 100~200	0.03~0.05	0.03~0.08	0.05~0.10	0.05~0.10	0.05~0.25	0.10~0.30	

• Set the feed rate 1/100 of edge width on the first groove and check chip evacuation.
• FMN type Inserts are only for deep grooving, and when used for turning, set to ap = 0.2 mm and under.

★:1st recommendation ☆:2nd recommendation

Refer to the notes below for turning conditions

ap and f of FMM

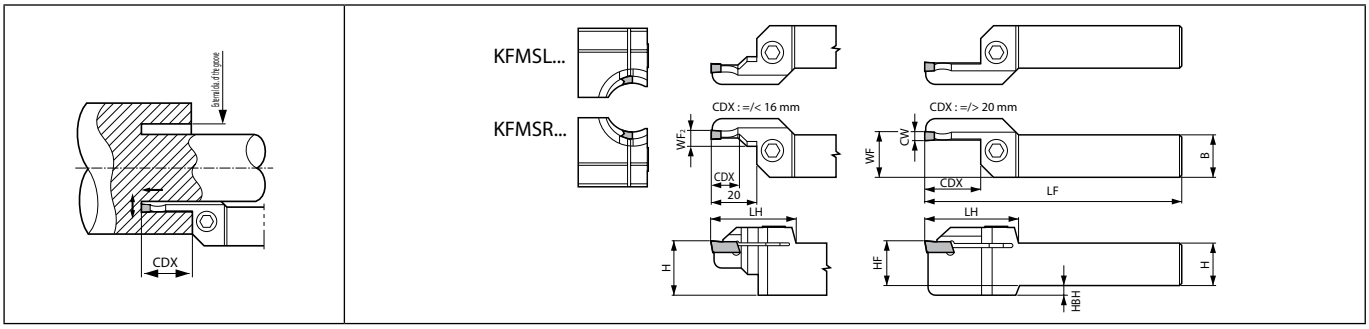
	Recommended cutting conditions	
ap (MAX.) (mm)	under 50% of edge width	ap ≤ 0.5CW
f (MAX.) (mm/rev)	under 3~5% of edge width	f ≤ [0.03(Min.) ~ 0.05(Max.)]cw

ap x f should be as follows.

Load (mm^2) \ Edge Width(mm)	3.0	4.0	5.0	6.0	
ap x f	~0.09	~0.14	~0.25	~0.36	ap x f ≤ $0.01CW^2$

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KFMS (Face grooving)



Toolholder dimensions

Description		Availability		External dia. of the groove (mm)		Dimension (mm)										Spare parts		Applicable inserts G134
		R	L	DAXN (min.)	DAXX (max.)	CDX	H	B	LH	HF	HBH	LF	WF	WF_2	CW	Clamp bolt	Wrench	
KFMS R/L	2020K2530-3	●		25	30													
	2020K3040-3	●		30	40	13			39					6.1				
	2020K4050-3	●		40	50						-							
	2020K5065-3	●		50	65													
	2020K6585-3	●		65	85	22	20	20	41	20		125	20.7	-		HH5X20		
	2020K85110-3	●		85	110				44									
	2020K110145-3	●		110	145	25			44		5							
	2525M2530-3	●	●	25	30													FMM30-03 FMN3
	2525M3040-3	●	●	30	40	13			39					6.1				
	2525M4050-3	●	●	40	50						-							
	2525M5065-3	●	●	50	65													
	2525M6585-3	●	●	65	85	22	25	25	41	25		150	25.7	-	3	HH5X25	LW-4	
	2525M85110-3	●	●	85	110				44									
	2525M110145-3	●	●	110	145	25			44		-							
KFMS R/L	2020K2535-4	●		25	35	12			39					7.1				
	2020K3550-4	●		35	50	20					-							
	2020K5070-4	●		50	70													
	2020K70100-4	●		70	100													
	2020K100150-4	●		100	150	25	20	20	44	20		125	20.7	-		HH5X20		
	2020K150220-4	●		150	220						5							
	2020K220800-4	●		220	∞													
	2525M2535-4	●	●	25	35	12			39					7.1				FMM40-04 FMN4
	2525M3550-4	●	●	35	50	20					-							
	2525M5070-4	●	●	50	70													
	2525M70100-4	●	●	70	100													
	2525M100150-4	●	●	100	150	25	25	25	44	25		150	25.7	-	4	HH5X25	LW-4	
	2525M150220-4	●	●	150	220						-							
	2525M220800-4	●	●	220	∞													

CDX shows available grooving depth.
External dia. of the groove : The diameter range of the initial groove.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

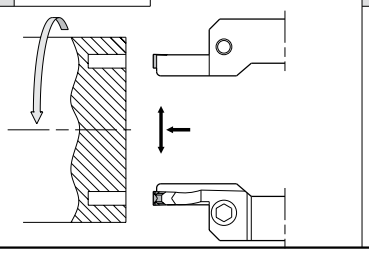
Toolholder dimensions

Description		Availability R	Availability L	External dia. of the groove (mm) DAXN (min.)	DAXX (max.)	Dimension (mm) CDX	H	B	LH	HF	HBH	LF	WF	WF_2	CW	Spare parts: Clamp bolt	Spare parts: Wrench	Applicable inserts G134
$KFMS^{R/L}$	2020K2535-5	●		25	35	20	20	20	39	20	-	125	20.7 (21.2)	-	5 (6)	HH5X20	LW-4	FMM50-04 FMN5 FMM60-04 FMN6
	2020K3550-5	●		35	50													
	2020K5075-5	●		50	75	25			44		5							
	2020K75115-5	●		75	115													
	2020K115180-5	●		115	180													
	2020K180235-5	●		180	235													
	2020K235800-5	●		235	∞													
	2525M2535-5	●	●	25	35	20	25	25	39	25	-	150	25.7 (26.2)			HH5X25		
	2525M3550-5	●	●	35	50													
	2525M5075-5	●	●	50	75	25			44									
	2525M75115-5	●	●	75	115	32			51									
	2525M115180-5	●	●	115	180													
	2525M180235-5	●	●	180	235													
	2525M235800-5	●	●	235	∞													

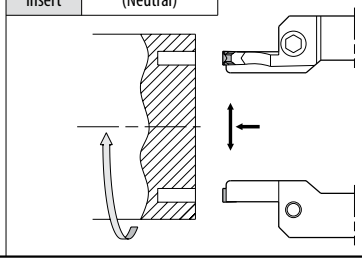
CDX shows available grooving depth.
External dia. of the groove : The diameter range of the initial groove.
For $KFMS^{R/L}$...-5 toolholder can hold a 6 mm width insert. ( ) value shows the dimension of a 6mm width insert.

Selection of Toolholder & Insert

Toolholder	Right-hand
Insert	(Neutral)

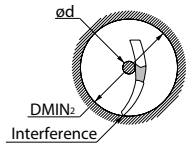


Toolholder	Left-hand
Insert	(Neutral)



Limit of Turning toward Center

Turning towards the Center causes the toolholder to interfere with the groove wall depending on the initial cut's diameter.



Remaining Boss Dia. ød

Description		$DMIN_2$ 25	26	27	28 and over
		ød (mm)			
$KFMS^{R/L}$	2020K2530-3	4	2	0	0
$KFMS^{R/L}$	2525M2530-3				
$KFMS^{R/L}$	2020K2535-4	6	3	0	(No remaining Boss)
$KFMS^{R/L}$	2525M2535-4				
$KFMS^{R/L}$	2020K2535-5	7	4	1	
$KFMS^{R/L}$	2525M2535-5	*(5)	*(2)	*(0)	

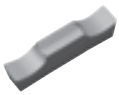
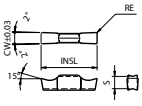
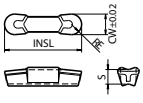
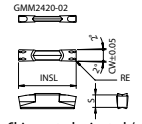
e.g.)
KFMSR 2525M2530-3 with ø25 as first cut towards the center, it will cause a rubbing with the toolholder cartridge if ød is 4.0mm.

*( ) value shows the Dimension using FMM60-04 Insert.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GMM/GMG/GMGA

Carbon steel / Alloy steel	P
Stainless steel	M
Cast iron	K
Non-ferrous metals	N
Titanium alloy	S
Hard materials (~ 40HRC)	H
Hard materials (40HRC ~)	H

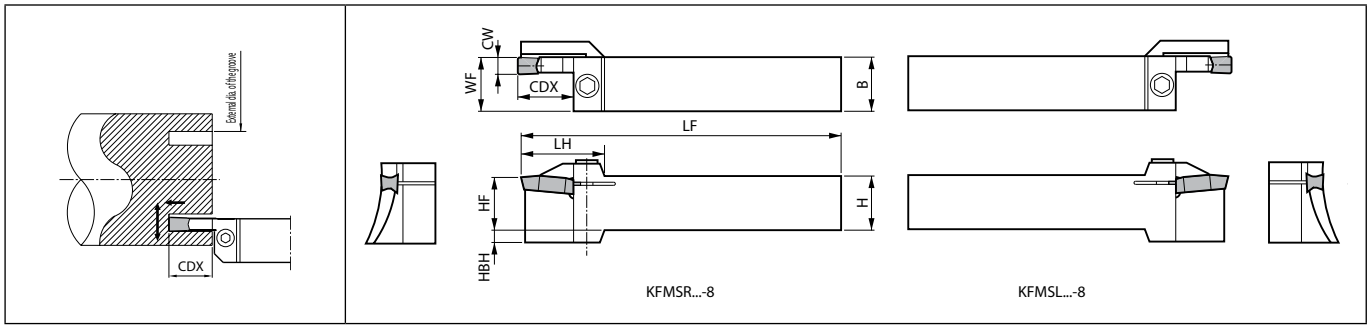
Insert		Description		No. of edges	Dimension (mm)				Tolerance (mm)		Carbide					Cermet	Applicable toolholder G138
					CW	S	RE	INSL	CW min.	CW max.	CVD	PVD			-	-	
											CR9025	PR905	PR915	PR930	KW10	TN90	
	 Sharp cutting oriented / Precision class (ground chipbreaker)	GMG	8030-050MG	2	8	5.5	0.5	30	- 0.03	+ 0.03	●	●		●	●	●	KFMS$^{R}_{L}$/....-8
	 Full R / Copying / Sharp cutting oriented / Precision class	GMGA	8030-400R	2	8	5.5	4	30	- 0.02	+ 0.02					●		
	 Chip control oriented / M class	GMM	8030-080MW	2	8	5.5	0.8	30	- 0.05	+ 0.05	●	●	●	●	●		

If using a full-R insert with KFMS-8 toolholder, you need to modify the corner of insert adapter of toolholder.

Recommended cutting conditions G143

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KFMS-8 (Face grooving)



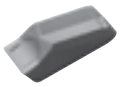
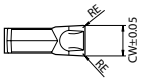
Toolholder dimensions

Description		Availability R	Availability L	External dia. of the groove (mm) DAXN (min.)	External dia. of the groove (mm) DAXX (max.)	Dimension (mm) CDX	H	B	LH	HF	HBH	LF	WF	CW	Spare parts: Clamp bolt	Spare parts: Wrench	Applicable inserts G137
KFMS R/L	2525M5464-8	●	●	54 (0)	64 (∞)	25	25	25	41	25	-	150	26	8	HH6X25	LW-5	GMG8030-050MG GMGA8030-400R GMM8030-080MW
	2525M6382-8	●	●	63 (0)	82 (∞)						2.4						
	2525M80115-8	●	●	80 (0)	115 (∞)				40		6						
	2525M105160-8	●	●	105 (0)	160 (∞)												
	2525M155510-8	●	●	155 (0)	510 (∞)				43								
	3232P155510-8	●					32	32		32	-	170	33				

CDX shows available grooving depth.
The value ( ) of External dia. of the groove (DAXX) is the maximum outer diameter value after the initial groove between DAXN ~ DAXX. (It is possible to widen the groove to infinity ∞).
The value ( ) of External dia. of the groove (DAXN) is the minimum diameter of the boss which remains in the center when widening the groove width to a smaller value after the initial groove between DAXN ~ DAXX.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

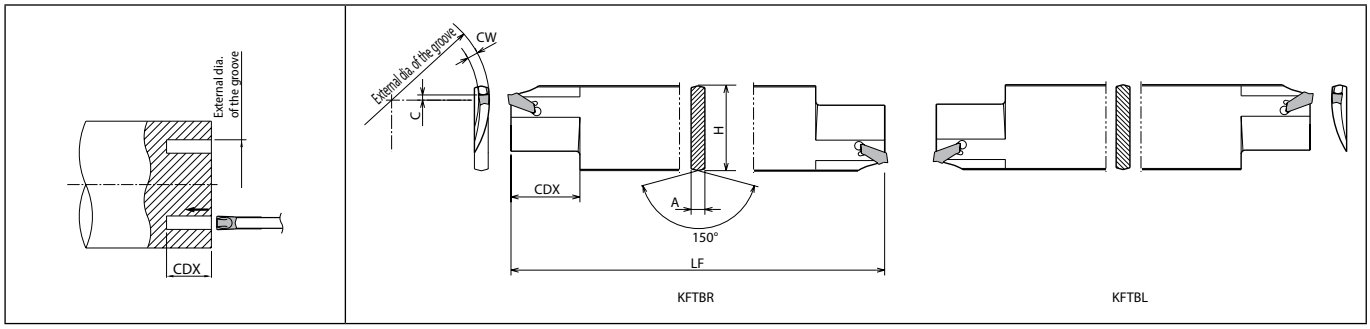
FTK

								Carbon steel / Alloy steel		●	P
								Stainless steel		●	M
								Cast iron			● K
								Non-ferrous metals			● N
								Titanium alloy			● S
								Hard materials (~ 40HRC)		○	H
								Hard materials (40HRC ~)			
Insert		Description		No. of edges	Dimension (mm)		Tolerance (mm)		Carbide		Applicable toolholder ➡ G140
					CW	RE	CW min.	CW max.	CVD CR9025	PVD PR930	- KW10
		FTK	4	1	4	0.25	- 0.05	+ 0.05	●	●	● KFTB[R/L]...-4S
		FTK	5	1	5	0.25	- 0.05	+ 0.05	●	●	● KFTB[R/L]...-5S

Recommended cutting conditions ➡ G146

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KFTB (Face grooving)



Toolholder dimensions

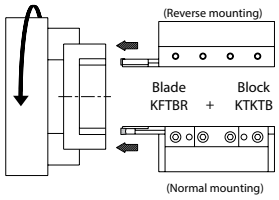
Description		Availability R	Availability L	External dia.of the groove (mm) DAXN (min.)	DAXX (max.)	Dimension (mm) CDX	H	A	C	LF	CW	Applicable inserts G139	Applicable tool block H62, H63
KFTB R/L	65100-4S	●	●	65	100	25	32	5.2	4	150	4	FTK4	KPKTB..-32JCT KTKTB..-32 KTKTBF..-32
	90150-4S	●	●	90	150	30			0				
	150250-4S	●	●	140	250	30							
	250800-4S	●	●	230	∞			3.2					
KFTB R/L	90150-5S	●	●	90	150	30	32	5.2	0	150	5	FTK5	
	150250-5S	●	●	150	250	32							
	250800-5S	●	●	250	∞	38		4					

CDX shows available grooving depth.
External dia. of the groove : The diameter range of the initial groove.
The insert has Self-Clamping system and it is not suitable for tight tolerance grooves (tolerance±0.05mm).
Lightly tap an Insert with a Plastic hammer. (End of insert does not touch toolholder.)
KFTB R/L 65100-4S toolholder is designed with the edge position 4 mm above the Center.
Dimension H shows virtual apex distance.

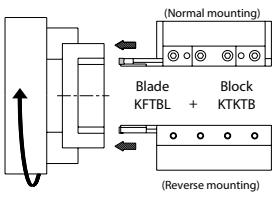
Selection of Blade and Insert

Combination of Blade + KTKTB

Blade	Right-hand
Insert	Neutral

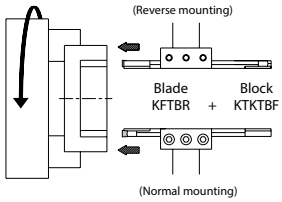


Blade	Left-hand
Insert	Neutral

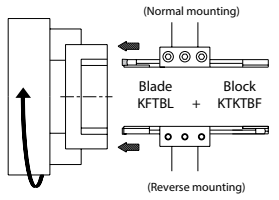


Combination of Blade + KTKTBF

Blade	Right-hand
Insert	Neutral



Blade	Left-hand
Insert	Neutral



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GBA inserts - ground chipbreaker

Workpiece material	Recommended insert grades (Vc: m/min)												Remarks
	MEGACOAT	MEGACOAT NANO	MEGACOAT NANO EX		MEGACOAT cermet	Cermet		PVD coated carbide		Carbide	CBN	PCD	
	PR1215	PR1625	PR2015	PR2025	PV7040	TN620	TN90	PR930	PR905	KW10	KBN510 KBN525	KPD001 (KPD010)	
Carbon steel	☆ 80~200	☆ 80~180	★ 80~200	★ 80~180	☆ 150~240	★ 80~220	☆ 150~220	☆ 80~180	-	-	-	-	Coolant
Alloy steel	☆ 80~180	☆ 80~160	★ 80~180	☆ 80~160	☆ 130~220	★ 80~200	☆ 130~200	☆ 80~160	-	-	-	-	
Stainless steel	☆ 60~150	☆ 60~130	☆ 60~150	★ 60~130	-	-	☆ 70~150	☆ 60~130	-	-	-	-	
Cast iron	-	-	★ 80~180	-	-	-	-	-	☆ 80~180	☆ 60~120	★ 150~400	-	
Aluminum alloys	-	-	-	-	-	-	-	-	-	★ 150~400	-	★ 150~2,000	
Brass	-	-	-	-	-	-	-	-	-	★ 150~300	-	★ 200~800	
Hard materials	-	-	-	-	-	-	-	-	-	-	★ 80~120	-	

★:1st recommendation ☆:2nd recommendation

Workpiece material	(1) f for grooving (mm/rev) (2) f for turning (mm/rev) (3) ap for turning (mm)					Remarks
	GBA○○$^{R}/_{L}$ 033~120-...	GBA○○$^{R}/_{L}$ 125~225-...	GBA○○$^{R}/_{L}$ 230~325-...	GBA○○$^{R}/_{L}$ 330~350-...	GBA○○$^{R}/_{L}$ 400~480-...	
Carbon steel	(1) 0.03~0.08 (2) Not recom. (3) Not recom.	(1) 0.04~0.09 (2) 0.04~0.09 (3) Max. 0.3	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.12 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.12 (2) 0.05~0.1 (3) Max. 0.8	Coolant
Alloy steel	(1) 0.03~0.07 (2) Not recom. (3) Not recom.	(1) 0.04~0.08 (2) 0.04~0.08 (3) Max. 0.3	(1) 0.05~0.09 (2) 0.05~0.09 (3) Max. 0.5	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.8	
Stainless steel	(1) 0.03~0.07 (2) Not recom. (3) Not recom.	(1) 0.04~0.08 (2) 0.04~0.08 (3) Max. 0.3	(1) 0.05~0.09 (2) 0.05~0.09 (3) Max. 0.5	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.8	
Cast iron	(1) 0.03~0.08 (2) Not recom. (3) Not recom.	(1) 0.04~0.09 (2) 0.04~0.09 (3) Max. 0.3	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.12 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.12 (2) 0.05~0.1 (3) Max. 0.8	
Aluminum alloys	(1) 0.05~0.12 (2) Not recom. (3) Not recom.	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.5	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.8	(1) 0.08~0.15 (2) 0.08~0.15 (3) Max. 0.8	(1) 0.08~0.15 (2) 0.08~0.15 (3) Max. 0.8	
Brass	(1) 0.05~0.12 (2) Not recom. (3) Not recom.	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.5	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.8	(1) 0.08~0.15 (2) 0.08~0.15 (3) Max. 0.8	(1) 0.08~0.15 (2) 0.08~0.15 (3) Max. 0.8	
Hard materials	-	(1) 0.02~0.05 (2) Not recom. (3) Not recom.	(1) 0.03~0.07 (2) 0.01~0.04 (3) Max. 0.1	-	-	

* Above cutting condition is for external grooving. Set both cutting speed and feed 10% lower for internal grooving.

GBA inserts - GM chipbreaker

Workpiece material	Recommended insert grades (Vc: m/min)					(1) f for grooving (mm/rev) (2) f for turning (mm/rev) (3) ap for turning (mm)					Remarks
	MEGACOAT	MEGACOAT NANO	MEGACOAT NANO EX		Cermet						
	PR1215	PR1625	PR2015	PR2025	TN620	GBA43$^{R}/_{L}$ 140-010GM	GBA43$^{R}/_{L}$ 150-020GM	GBA43$^{R}/_{L}$ 175-020GM~ 230-020GM	GBA43$^{R}/_{L}$ 250-030GM~ 350-030GM	GBA43$^{R}/_{L}$ 400-040GM	
Carbon steel	☆ 80~220	☆ 80~220	★ 80~220	★ 80~220	★ 80~240	(1) 0.03~0.1 (2) 0.03~0.08 (3) Max. 0.2	(1) 0.03~0.12 (2) 0.03~0.08 (3) Max. 0.3	(1) 0.03~0.12 (2) 0.03~0.09 (3) Max. 0.3	(1) 0.04~0.15 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.15 (2) 0.05~0.1 (3) Max. 0.8	Coolant
Alloy steel	☆ 80~200	☆ 80~200	★ 80~200	☆ 80~200	★ 80~220	(1) 0.03~0.1 (2) 0.03~0.08 (3) Max. 0.2	(1) 0.03~0.12 (2) 0.03~0.08 (3) Max. 0.3	(1) 0.03~0.12 (2) 0.03~0.09 (3) Max. 0.3	(1) 0.04~0.15 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.15 (2) 0.05~0.1 (3) Max. 0.8	
Stainless steel	☆ 60~150	☆ 60~150	☆ 60~150	★ 60~150	-	(1) 0.03~0.1 (2) 0.03~0.08 (3) Max. 0.2	(1) 0.03~0.1 (2) 0.03~0.08 (3) Max. 0.3	(1) 0.03~0.1 (2) 0.03~0.09 (3) Max. 0.3	(1) 0.04~0.12 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.04~0.12 (2) 0.05~0.1 (3) Max. 0.8	
Cast iron	-	-	★ 80~200	-	-	(1) 0.03~0.1 (2) 0.03~0.08 (3) Max. 0.2	(1) 0.03~0.12 (2) 0.03~0.08 (3) Max. 0.3	(1) 0.03~0.12 (2) 0.03~0.09 (3) Max. 0.3	(1) 0.04~0.15 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.15 (2) 0.05~0.1 (3) Max. 0.8	

* Above cutting condition is for external grooving. Set both cutting speed and feed 20% lower for internal grooving.

★:1st recommendation ☆:2nd recommendation

GBF

Workpiece material	Recommended insert grades (Vc: m/min)			(1) f for grooving (mm/rev)				Remarks
	MEGACOAT	MEGACOAT NANO	Carbide	(2) f for turning (mm)				
	PR1215	PR1535	GW15	(3) ap for turning (mm)				
				GBF32R/L 025 – 053	GBF32R/L 065 – 095	GBF32R/L 100 – 145	GBF3R/L 150 – 300	
Carbon steel	★ 80~180	☆ 70~160	-	(1) 0.01~0.05	(1) 0.02~0.07	(1) 0.03~0.08	(1) 0.03~0.08	Coolant
				(2) Not recom.	(2) Not recom.	(2) 0.03~0.06	(2) 0.03~0.06	
				(3) Not recom.	(3) Not recom.	(3) Max. 0.2	(3) Max. 0.2	
Alloy steel	★ 80~180	☆ 70~160	-	(1) 0.01~0.04	(1) 0.02~0.06	(1) 0.03~0.07	(1) 0.03~0.07	
				(2) Not recom.	(2) Not recom.	(2) 0.02~0.05	(2) 0.02~0.05	
				(3) Not recom.	(3) Not recom.	(3) Max. 0.2	(3) Max. 0.2	
Stainless steel	☆ 60~130	★ 50~120	-	(1) 0.01~0.04	(1) 0.02~0.06	(1) 0.03~0.07	(1) 0.03~0.07	
				(2) Not recom.	(2) Not recom.	(2) 0.02~0.05	(2) 0.02~0.05	
				(3) Not recom.	(3) Not recom.	(3) Max. 0.2	(3) Max. 0.2	
Cast iron	-	-	★ 60~100	(1) 0.01~0.05	(1) 0.02~0.07	(1) 0.03~0.08	(1) 0.03~0.08	
				(2) Not recom.	(2) Not recom.	(2) 0.03~0.06	(2) 0.03~0.06	
				(3) Not recom.	(3) Not recom.	(3) Max. 0.2	(3) Max. 0.2	
Aluminum	-	-	★ 150~400	(1) 0.01~0.05	(1) 0.02~0.07	(1) 0.03~0.08	(1) 0.03~0.08	
				(2) Not recom.	(2) Not recom.	(2) 0.03~0.06	(2) 0.03~0.06	
				(3) Not recom.	(3) Not recom.	(3) Max. 0.2	(3) Max. 0.2	
Brass	-	-	★ 150~300	(1) 0.01~0.04	(1) 0.02~0.06	(1) 0.03~0.07	(1) 0.03~0.07	
				(2) Not recom.	(2) Not recom.	(2) 0.02~0.05	(2) 0.02~0.05	
				(3) Not recom.	(3) Not recom.	(3) Max. 0.2	(3) Max. 0.2	

★:1st recommendation ☆:2nd recommendation

GBF-000F inserts (RE=0.00)

Workpiece Material	Recommended insert grades (Vc: m/min)			(1) f for grooving (mm/rev)				Remarks
	MEGACOAT	MEGACOAT NANO	Carbide	(2) f for turning (mm)				
	PR1215	PR1535	GW15	(3) ap for turning (mm)				
				GBF32R/L 025 ~ 053 - 000F	GBF32R/L 065 ~ 095 - 000F	GBF32R/L 100 ~ 145 - 000F	GBF32R/L 150 ~ 200 - 000F	
Carbon steel	★ 80 ~ 180	☆ 70 ~ 160	-	(1) 0.005~0.03	(1) 0.01~0.04	(1) 0.01~0.05	(1) 0.01~0.05	Coolant
				(2) Not recom.	(2) Not recom.	(2) 0.01~0.04	(2) 0.01~0.04	
				(3) Not recom.	(3) Not recom.	(3) Max. 0.2	(3) Max. 0.2	
Alloy steel	★ 80 ~ 180	☆ 70 ~ 160	-	(1) 0.005~0.025	(1) 0.01~0.03	(1) 0.01~0.04	(1) 0.01~0.04	
				(2) Not recom.	(2) Not recom.	(2) 0.01~0.03	(2) 0.01~0.03	
				(3) Not recom.	(3) Not recom.	(3) Max. 0.2	(3) Max. 0.2	
Stainless steel	☆ 60 ~ 130	★ 50 ~ 120	-	(1) 0.005~0.02	(1) 0.01~0.025	(1) 0.01~0.03	(1) 0.01~0.03	
				(2) Not recom.	(2) Not recom.	(2) 0.01~0.025	(2) 0.01~0.025	
				(3) Not recom.	(3) Not recom.	(3) Max. 0.2	(3) Max. 0.2	
Cast iron	-	-	★ 60 ~ 100	(1) 0.005~0.03	(1) 0.01~0.04	(1) 0.01~0.05	(1) 0.01~0.05	
				(2) Not recom.	(2) Not recom.	(2) 0.01~0.04	(2) 0.01~0.04	
				(3) Not recom.	(3) Not recom.	(3) Max. 0.2	(3) Max. 0.2	
Aluminum	-	-	★ 150 ~ 400	(1) 0.005~0.03	(1) 0.01~0.04	(1) 0.01~0.05	(1) 0.01~0.05	
				(2) Not recom.	(2) Not recom.	(2) 0.01~0.04	(2) 0.01~0.04	
				(3) Not recom.	(3) Not recom.	(3) Max. 0.2	(3) Max. 0.2	
Brass	-	-	★ 150 ~ 300	(1) 0.01~0.03	(1) 0.01~0.04	(1) 0.01~0.05	(1) 0.01~0.05	
				(2) Not recom.	(2) Not recom.	(2) 0.01~0.04	(2) 0.01~0.04	
				(3) Not recom.	(3) Not recom.	(3) Max. 0.2	(3) Max. 0.2	

★:1st recommendation ☆:2nd recommendation

GBF-GL inserts

Workpiece Material	Recommended insert rades (Vc : m/min)		(1) f for grooving (mm/rev)				Remarks
	MEGACOAT	MEGACOAT NANO	(2) f for turning (mm)				
	PR1215	PR1535	(3) ap for turning (mm)				
			GBF32R075 - 005GL	GBF32R095 - 100-005GL	GBF32R150 - 200-010GL	GBF32R300 - 010GL	
Carbon Steel	★ 80 ~ 180	☆ 70 ~ 160	(1) 0.02~0.07	(1) 0.03~0.08	(1) 0.03~0.08	(1) 0.04~0.1	Coolant
			(2) Not recom.	(2) 0.03~0.06	(2) 0.03~0.06	(2) 0.04~0.08	
			(3) Not recom.	(3) Max. 0.2	(3) Max. 0.3	(3) Max. 0.5	
Alloy Steel	★ 80 ~ 180	☆ 70 ~ 160	(1) 0.02~0.06	(1) 0.03~0.07	(1) 0.03~0.07	(1) 0.04~0.09	
			(2) Not recom.	(2) 0.03~0.06	(2) 0.03~0.06	(2) 0.04~0.08	
			(3) Not recom.	(3) Max. 0.2	(3) Max. 0.3	(3) Max. 0.5	
Stainless Steel	☆ 60 ~ 130	★ 50 ~ 120	(1) 0.02~0.06	(1) 0.03~0.07	(1) 0.03~0.07	(1) 0.04~0.09	
			(2) Not recom.	(2) 0.03~0.06	(2) 0.03~0.06	(2) 0.04~0.08	
			(3) Not recom.	(3) Max. 0.2	(3) Max. 0.3	(3) Max. 0.5	

★:1st recommendation ☆:2nd recommendation

GMG / GMM / GMN / GMGA

Workpiece material	Recommended insert grades (Vc: m/min)						Grooving				Turning				Remarks
	Cermet	CVD coated carbide	PVD coated carbide			Carbide	Edge width (mm)				Edge width (mm)				
	TN90	CR9025	PR915	PR930	PR905	KW10	2.0~3.0	4.0	5.0	6.0 / 8.0	2.0~3.0	4.0	5.0	6.0 / 8.0	
							f (mm/rev)				f (mm/rev)				
Carbon steel	☆ 100~220	☆ 80~200	☆ 80~200	★ 80~200	-	-	0.05~0.15	0.10~0.25	0.15~0.35	0.20~0.35	0.10~0.20	0.15~0.30	0.20~0.40	0.25~0.40	Coolant
Alloy steel	☆ 80~200	☆ 70~180	☆ 70~180	★ 70~180	-	-	0.05~0.15	0.10~0.25	0.15~0.35	0.20~0.35	0.10~0.20	0.15~0.30	0.20~0.40	0.25~0.40	
Stainless steel	☆ 70~160	☆ 60~150	★ 60~150	☆ 60~150	-	-	0.05~0.15	0.10~0.20	0.15~0.35	0.20~0.35	0.10~0.20	0.15~0.25	0.20~0.40	0.25~0.40	
Cast iron	-	-	-	-	★ 100~200	☆ 70~150	0.05~0.20	0.10~0.30	0.15~0.40	0.20~0.40	0.10~0.25	0.15~0.35	0.20~0.45	0.25~0.45	
Aluminum alloys	-	-	-	-	-	★ 200~500	0.05~0.20	0.08~0.25	0.10~0.25	0.12~0.30	0.10~0.20	0.10~0.25	0.10~0.25	0.15~0.30	
Brass	-	-	-	-	-	★ 100~200	0.05~0.15	0.08~0.20	0.10~0.25	0.12~0.30	0.10~0.20	0.10~0.25	0.10~0.25	0.15~0.30	

★:1st recommendation ☆:2nd recommendation

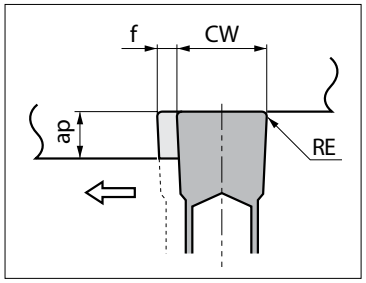
Refer to the notes below for turning conditions

1. When using KGM toolholder

	Recommended cutting conditions	
ap (max.) (mm)	80% or under of edge width	ap ≤ 0.8CW
f (max.) (mm/rev)	10% or under of edge width	f ≤ 0.1CW

(ap) x (f) shall not exceed 1/2 of ap (max.) x f (max.)

Load(mm^2) \ Edge width(mm)	2.0~2.5	3.0	4.0	5.0	6.0	8.0
ap x f	~0.20	~0.36	~0.64	~1.00	~1.44	~2.56



ap x f ≤ $\frac{1}{2}$ x 0.8CW x 0.1CW=0.04CW^2

2. When using KGM-T toolholder (Deep grooving type) - use 90% of KGM conditions

3. When using KGMM / KGMS / KFMS-8 Toolholder

	Recommended cutting conditions	
ap (max.) (mm)	50% or under of edge width	ap ≤ 0.5CW
f (max.) (mm/rev)	4% or under of edge width	f ≤ 0.04CW

(ap) x (f) should be as follows. (50% or under of KGM)

Load(mm^2) \ Edge width(mm)	2.0~2.5	3.0	4.0	5.0	6.0	8.0
ap x f	~0.10	~0.18	~0.32	~0.50	~0.72	~1.28

ap x f ≤ 0.02CW^2

4. When using KIGM toolholder

	Recommended cutting conditions	
ap (max.) (mm)	70% or under of Edge Width	ap ≤ 0.7CW
f (max.) (mm/rev)	8% or under of Edge Width	f ≤ 0.08CW

(ap) x (f) should be as follows: 70% or under of KGM

Load(mm^2) \ Edge width(mm)	3.0	4.0	5.0
ap x f	~0.25	~0.44	~0.70

ap×f ≤ 0.04CW^2

GMG / GMM / GMGA 8030 - face grooving

Workpiece material	Recommended insert grades (Vc: m/min)						Face grooving	Turning	Remarks
	Cermet	CVD coated carbide	PVD coated carbide			Carbide	Edge width (mm)	Edge width (mm)	
	TN90	CR9025	PR915	PR930	PR905	KW10	8.0	8.0	
							f (mm/rev)	f (mm/rev)	
Carbon steel	☆ 100~220	☆ 80~160	☆ 80~160	★ 80~160	-	-	0.1~0.2	0.1~0.25	Coolant
Alloy steel	☆ 80~160	☆ 70~160	☆ 70~160	★ 70~160	-	-	0.1~0.2	0.1~0.25	
Stainless steel	☆ 70~140	☆ 60~130	★ 60~130	☆ 60~130	-	-	0.1~0.2	0.1~0.25	
Cast iron	-	-	-	-	★ 80~180	☆ 70~130	0.1~0.3	0.1~0.35	
Aluminum alloys	-	-	-	-	-	★ 200~300	0.08~0.25	0.08~0.30	
Brass	-	-	-	-	-	★ 100~150	0.08~0.25	0.08~0.30	

★:1st recommendation ☆:2nd recommendation

EZG

Workpiece material	Insert grades (Vc: m/min)		EZGR030030-...S	EZG$^{R}_{L}$040040-... EZG$^{R}_{L}$050050-... EZG$^{R}_{L}$040040-...S EZG$^{R}_{L}$050050-...S	EZG$^{R}_{L}$060060-... EZG$^{R}_{L}$070070-... EZG$^{R}_{L}$080070-... EZG$^{R}_{L}$060060-...S EZG$^{R}_{L}$070070-...S EZG$^{R}_{L}$080070-...S	Remarks
	MEGACOAT	Carbide				
	PR1225	GW05	f (mm/rev)			
Carbon steel / Alloy steel	★ 30~100	-	~0.02	~0.03	~0.05	Coolant
Stainless steel	★ 30~80	-	~0.01	~0.02	~0.03	
Non-ferrous metals	-	★ ~300	-	~0.05	~0.08	

★:1st recommendation

G

Grooving

VNG

Workpiece material	Recommended insert grades (Vc: m/min)			VNG04 VNG05	VNG06 VNG07	Remarks
	MEGACOAT	PVD Coated carbide	Carbide			
	PR1225	PR930	KW10	f (mm/rev)		
Carbon steel / Alloy steel	★ 30~100	☆ 30~100		~0.03	~0.05	Coolant
Stainless steel	★ 30~80	☆ 30~80		~0.02	~0.03	
Non-ferrous metals			★ ~300	~0.05	~0.08	

★:1st recommendation ☆:2nd recommendation

SIGC

Workpiece material	Recommended insert grades (Vc: m/min)		(1) f for grooving (mm/rev) (2) f for turning (mm/rev) (3) ap for turning (mm)			Remarks
	MEGACOAT NANO PLUS	MEGACOAT NANO				
	PR1725	**PR1535**	GC08$^{R}_{L}$...	GC10$^{R}_{L}$, GC12$^{R}_{L}$ 100 ~ 200...	GC10$^{R}_{L}$, GC12$^{R}_{L}$ 250 ~ 300...	
Carbon steel	★ 50~80	☆ 50~80	(1) 0.01~0.03	(1) 0.02~0.04	(1) 0.02~0.04	Coolant
			(2) 0.01~0.03	(2) 0.02~0.04	(2) 0.02~0.04	
			(3) Max. 0.05	(3) Max. 0.05	(3) Max. 0.1	
Alloy steel	★ 50~80	☆ 50~80	(1) 0.01~0.03	(1) 0.02~0.04	(1) 0.02~0.04	
			(2) 0.01~0.03	(2) 0.02~0.04	(2) 0.02~0.04	
			(3) Max. 0.05	(3) Max. 0.05	(3) Max. 0.1	
Stainless steel	☆ 50~80	★ 50~80	(1) 0.01~0.03	(1) 0.01~0.03	(1) 0.01~0.03	
			(2) 0.01~0.03	(2) 0.01~0.03	(2) 0.01~0.03	
			(3) Max. 0.05	(3) Max. 0.05	(3) Max. 0.1	

★:1st recommendation ☆:2nd recommendation

Ground chipbreaker: GE$^{R}/_{L}$···A(R), GE$^{R}/_{L}$···B(R)

Workpiece material	Recommended insert grades (Vc: m/min)				(1) f for grooving (mm/rev)			Remarks
	MEGACOAT	MEGACOAT NANO EX	Carbide	Cermet	(2) f for turning (mm/rev)			
	PR1225	PR2025	KW10	TN6020	(3) ap for turning (mm)			
					GE$^{R}/_{L}$ 100~200-010A 100~200-100AR	GE$^{R}/_{L}$ 100~200-010B 100~200-100BR	GE$^{R}/_{L}$ 250~300-020B	
Carbon steel	☆ 50~80	★ 50~80	-	☆ 50~80	(1) 0.01~0.03	(1) 0.02~0.04	(1) 0.02~0.04	Coolant
					(2) 0.01~0.03	(2) 0.02~0.04	(2) 0.02~0.04	
					(3) Max. 0.05	(3) Max. 0.05	(3) Max. 0.1	
Alloy steel	☆ 50~80	★ 50~80	-	☆ 50~80	(1) 0.01~0.03	(1) 0.02~0.04	(1) 0.02~0.04	
					(2) 0.01~0.03	(2) 0.02~0.04	(2) 0.02~0.04	
					(3) Max. 0.05	(3) Max. 0.05	(3) Max. 0.1	
Stainless steel	☆ 50~80	★ 50~80	-	-	(1) 0.01~0.03	(1) 0.01~0.03	(1) 0.01~0.03	
					(2) 0.01~0.03	(2) 0.01~0.03	(2) 0.01~0.03	
					(3) Max. 0.05	(3) Max. 0.05	(3) Max. 0.1	
Cast iron	-	-	★ 50~80	-	(1) 0.01~0.03	(1) 0.02~0.04	(1) 0.02~0.04	
					(2) 0.01~0.03	(2) 0.02~0.04	(2) 0.02~0.04	
					(3) Max. 0.05	(3) Max. 0.05	(3) Max. 0.1	
Aluminum	-	-	★ 50~100	-	(1) 0.01~0.03	(1) 0.02~0.04	(1) 0.02~0.04	
					(2) 0.01~0.03	(2) 0.02~0.04	(2) 0.02~0.04	
					(3) Max. 0.1	(3) Max. 0.1	(3) Max. 0.2	
Brass	-	-	★ 50~100	-	(1) 0.01~0.03	(1) 0.02~0.04	(1) 0.02~0.04	
					(2) 0.01~0.03	(2) 0.02~0.04	(2) 0.02~0.04	
					(3) Max. 0.1	(3) Max. 0.1	(3) Max. 0.2	

* Use PVD coated grade or carbide for turning with edge width 1mm. (GE$^{R}/_{L}$100-005A / 100-005B) ★:1st recommendation ☆:2nd recommendation

Ground chipbreaker: GE$^{R}/_{L}$···C(R), GE$^{R}/_{L}$···D(R), GE$^{R}/_{L}$···E

Workpiece material	Recommended insert grades (Vc: m/min)				(1) f for grooving (mm/rev)						Remarks
	MEGACOAT	MEGACOAT NANO EX	Carbide	Cermet	(2) f for turning (mm/rev)						
	PR1225	PR2025	GW15	TN6020	(3) ap for turning (mm)						
					GE$^{R}/_{L}$ 100~200-010C 200-100CR	GE$^{R}/_{L}$ 250~350-020C 250~300-150CR					
					GE$^{R}/_{L}$ 100~145-010D	GE$^{R}/_{L}$ 150~195-010D	GE$^{R}/_{L}$ 200~280-020D 200-100DR		GE$^{R}/_{L}$ 300~400-020D 300-150DR		
					GE$^{R}/_{L}$ 100-010E	GE$^{R}/_{L}$ 150~195-010E	GE$^{R}/_{L}$ 200~225-010E 230-020E	GE$^{R}/_{L}$ 250~330-020E		GE$^{R}/_{L}$ 350~430-020E	GE$^{R}/_{L}$ 450~500-020E
Carbon steel	☆ 60~140	★ 60~140	-	☆ 120~180	(1) 0.03~0.08	(1) 0.03~0.08	(1) 0.04~0.09	(1) 0.04~0.09	(1) 0.05~0.12	(1) 0.05~0.12	(1) 0.05~0.12
					(2) 0.03~0.08	(2) 0.03~0.08	(2) 0.04~0.09	(2) 0.04~0.09	(2) 0.05~0.1	(2) 0.05~0.1	(2) 0.05~0.1
					(3) Max. 0.3	(3) Max. 0.3	(3) Max. 0.3	(3) Max. 0.3	(3) Max. 0.5	(3) Max. 0.5	(3) Max. 0.5
Alloy steel	☆ 60~120	★ 60~120	-	☆ 100~160	(1) 0.03~0.07	(1) 0.03~0.07	(1) 0.04~0.08	(1) 0.04~0.08	(1) 0.05~0.1	(1) 0.05~0.1	(1) 0.05~0.1
					(2) 0.03~0.1	(2) 0.03~0.1	(2) 0.04~0.08	(2) 0.04~0.08	(2) 0.05~0.1	(2) 0.05~0.1	(2) 0.05~0.1
					(3) Max. 0.3	(3) Max. 0.3	(3) Max. 0.3	(3) Max. 0.3	(3) Max. 0.5	(3) Max. 0.5	(3) Max. 0.5
Stainless steel	☆ 60~110	★ 60~110	-	☆ 70~130	(1) 0.03~0.07	(1) 0.03~0.07	(1) 0.04~0.08	(1) 0.04~0.08	(1) 0.05~0.1	(1) 0.05~0.1	(1) 0.05~0.1
					(2) 0.03~0.1	(2) 0.03~0.1	(2) 0.04~0.08	(2) 0.04~0.08	(2) 0.05~0.1	(2) 0.05~0.1	(2) 0.05~0.1
					(3) Max. 0.3	(3) Max. 0.3	(3) Max. 0.3	(3) Max. 0.3	(3) Max. 0.5	(3) Max. 0.5	(3) Max. 0.5
Cast iron	-	-	★ 60~100	-	(1) 0.03~0.08	(1) 0.03~0.08	(1) 0.04~0.09	(1) 0.04~0.09	(1) 0.05~0.12	(1) 0.05~0.12	(1) 0.05~0.12
					(2) 0.03~0.08	(2) 0.03~0.08	(2) 0.04~0.09	(2) 0.04~0.09	(2) 0.05~0.1	(2) 0.05~0.1	(2) 0.05~0.1
					(3) Max. 0.3	(3) Max. 0.3	(3) Max. 0.3	(3) Max. 0.3	(3) Max. 0.5	(3) Max. 0.5	(3) Max. 0.5
Aluminum	-	-	★ 150~300	-	(1) 0.05~0.12	(1) 0.05~0.12	(1) 0.05~0.15	(1) 0.05~0.15	(1) 0.08~0.15	(1) 0.08~0.15	(1) 0.08~0.15
					(2) 0.05~0.12	(2) 0.05~0.12	(2) 0.05~0.15	(2) 0.05~0.15	(2) 0.08~0.15	(2) 0.08~0.15	(2) 0.08~0.15
					(3) Max. 0.5	(3) Max. 0.5	(3) Max. 0.5	(3) Max. 0.5	(3) Max. 0.8	(3) Max. 0.8	(3) Max. 0.8
Brass	-	-	★ 100~250	-	(1) 0.05~0.12	(1) 0.05~0.12	(1) 0.05~0.15	(1) 0.05~0.15	(1) 0.08~0.15	(1) 0.08~0.15	(1) 0.08~0.15
					(2) 0.05~0.12	(2) 0.05~0.12	(2) 0.05~0.15	(2) 0.05~0.15	(2) 0.08~0.15	(2) 0.08~0.15	(2) 0.08~0.15
					(3) Max. 0.5	(3) Max. 0.5	(3) Max. 0.5	(3) Max. 0.5	(3) Max. 0.8	(3) Max. 0.8	(3) Max. 0.8

* Use PVD coated grade or carbide for turning with edge width 1mm. (GE$^{R}/_{L}$ 100-010C / 100-010D / 100-010E) ★:1st recommendation ☆:2nd recommendation

Molded chipbreakers: GER···CM, GER···DM, GER···EM

Workpiece material	Recommended insert grades (Vc: m/min)				(1) f for grooving (mm/rev)						Remarks
	MEGACOAT	MEGACOAT NANO EX	Carbide	Cermet	(2) f for turning (mm/rev)						
	PR1225	PR2025	GW15	TN6020	(3) ap for turning (mm)						
					GER 150~200-010CM	GER 250~350-020CM					
					GER 150~200-010DM		GER 230~250-020DM	GER 300~400-020DM			
					GER 150~200-010EM			GER 250~300-020EM	GER 350~400-020EM	GER 450~500-020EM	
Carbon steel	☆ 60~160	★ 60~160	-	-	(1) 0.03~0.1	(1) 0.03~0.12	(1) 0.04~0.12	(1) 0.05~0.12	(1) 0.05~0.12	(1) 0.05~0.12	
					(2) 0.03~0.1	(2) 0.03~0.1	(2) 0.04~0.1	(2) 0.05~0.1	(2) 0.05~0.1	(2) 0.05~0.1	
					(3) Max.1.0	(3) Max.1.5	(3) Max.1.5	(3) Max.1.5	(3) Max.1.5	(3) Max.1.5	
Alloy steel	☆ 60~140	★ 60~140	-	-	(1) 0.03~0.1	(1) 0.03~0.1	(1) 0.04~0.12	(1) 0.05~0.12	(1) 0.05~0.12	(1) 0.05~0.12	Coolant
					(2) 0.03~0.1	(2) 0.03~0.1	(2) 0.04~0.1	(2) 0.05~0.1	(2) 0.05~0.1	(2) 0.05~0.1	
					(3) Max.1.0	(3) Max.1.5	(3) Max.1.5	(3) Max.1.5	(3) Max.1.5	(3) Max.1.5	
Stainless steel	☆ 60~110	★ 60~110	-	-	(1) 0.03~0.08	(1) 0.03~0.08	(1) 0.04~0.08	(1) 0.05~0.1	(1) 0.05~0.1	(1) 0.05~0.1	
					(2) 0.03~0.1	(2) 0.03~0.1	(2) 0.04~0.1	(2) 0.05~0.1	(2) 0.05~0.1	(2) 0.05~0.1	
					(3) Max.1.0	(3) Max.1.5	(3) Max.1.5	(3) Max.1.5	(3) Max.1.5	(3) Max.1.5	

★: 1st recommendation ☆: 2nd recommendation

GV Inserts - ground chipbreaker

Workpiece material	Recommended insert grades (Vc: m/min)						f (mm/rev) = (1) grooving, (2) turning ap (mm) = (3) turning							Remarks
	Cermet			MEGA COAT	PVD coated carbide	Carbide	GV$^{R}_{L}$ 100~300-...SS 100~300-...S	GV$^{R}_{L}$ 145~185-...B	GV$^{R}_{L}$ 200~280-...B	GV$^{R}_{L}$ 300~400-...B				
	TN90	TC40	TC60	PR1225	PR930	KW10	GV$^{R}_{L}$ 100~340-...A 200~300-...AR		GV$^{R}_{L}$ 200-100BR	GV$^{R}_{L}$ 300-150BR	GV$^{R}_{L}$ 280~300-...C	GV$^{R}_{L}$ 340~400-...C	GV$^{R}_{L}$ 430~500-...C	
Carbon steel	☆ 120~180	☆ 120~180	☆ 80~120	★ 80~160	☆ 80~140	-	(1) 0.03~0.08 (2) 0.03~0.08 (3) Max. 0.3	(1) 0.03~0.08 (2) 0.03~0.08 (3) Max. 0.3	(1) 0.04~0.09 (2) 0.04~0.09 (3) Max. 0.3	(1) 0.05~0.12 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.04~0.09 (2) 0.04~0.09 (3) Max. 0.3	(1) 0.05~0.12 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.12 (2) 0.05~0.1 (3) Max. 0.5	Coolant
Alloy steel	☆ 100~160	☆ 100~160	☆ 80~100	★ 80~140	☆ 80~120	-	(1) 0.03~0.07 (2) 0.03~0.1 (3) Max. 0.3	(1) 0.03~0.07 (2) 0.03~0.1 (3) Max. 0.3	(1) 0.04~0.08 (2) 0.04~0.08 (3) Max. 0.3	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.04~0.08 (2) 0.04~0.08 (3) Max. 0.3	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.5	
Stainless steel	☆ 70~130	-	☆ 60~100	★ 60~130	☆ 60~110	-	(1) 0.03~0.07 (2) 0.03~0.1 (3) Max. 0.3	(1) 0.03~0.07 (2) 0.03~0.1 (3) Max. 0.3	(1) 0.04~0.08 (2) 0.04~0.08 (3) Max. 0.3	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.04~0.08 (2) 0.04~0.08 (3) Max. 0.3	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.5	
Cast iron	-	-	-	-	-	★ 60~100	(1) 0.03~0.08 (2) 0.03~0.08 (3) Max. 0.3	(1) 0.03~0.08 (2) 0.03~0.08 (3) Max. 0.3	(1) 0.04~0.09 (2) 0.04~0.09 (3) Max. 0.3	(1) 0.05~0.12 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.04~0.09 (2) 0.04~0.09 (3) Max. 0.3	(1) 0.05~0.12 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.12 (2) 0.05~0.1 (3) Max. 0.5	
Aluminum alloys	-	-	-	-	-	★ 150~300	(1) 0.05~0.12 (2) 0.05~0.12 (3) Max. 0.5	(1) 0.05~0.12 (2) 0.05~0.12 (3) Max. 0.5	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.5	(1) 0.08~0.15 (2) 0.08~0.15 (3) Max. 0.8	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.5	(1) 0.08~0.15 (2) 0.08~0.15 (3) Max. 0.8	(1) 0.08~0.15 (2) 0.08~0.15 (3) Max. 0.8	
Brass	-	-	-	-	-	★ 100~250	(1) 0.05~0.12 (2) 0.05~0.12 (3) Max. 0.5	(1) 0.05~0.12 (2) 0.05~0.12 (3) Max. 0.5	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.5	(1) 0.08~0.15 (2) 0.08~0.15 (3) Max. 0.8	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.5	(1) 0.08~0.15 (2) 0.08~0.15 (3) Max. 0.8	(1) 0.08~0.15 (2) 0.08~0.15 (3) Max. 0.8	

* Use MEGACOAT, PVD coated carbide or carbide for turning with edge width 1mm (GV$^{R}_{L}$100SS / 100S / 100A)

★:1st recommendation ☆:2nd recommendation

GVF Inserts - ground chipbreaker

Workpiece material	Recommended insert grades (Vc: m/min)						f (mm/rev) = (1) grooving, (2) turning ap (mm) = (3) turning					Remarks
	Cermet			MEGACOAT	PVD coated carbide	Carbide	GVF$^{R}_{L}$ 200~340...A	GVF$^{R}_{L}$ 250~350...B	GVF$^{R}_{L}$ 400~490...B	GVF$^{R}_{L}$ 350~450...C	GVF$^{R}_{L}$ 500~600...C	
	TN90	TC40	TC60	PR1225	PR930	KW10	GVF$^{R}_{L}$ 200-100AR ~300-150AR	GVF$^{R}_{L}$ 300-150BR	GVF$^{R}_{L}$ 400-200BR			
Carbon steel	☆ 150~220	☆ 150~220	☆ 100~150	★ 80~200	☆ 80~180	-	(1) 0.03~0.08 (2) 0.03~0.08 (3) Max. 0.3	(1) 0.04~0.09 (2) 0.04~0.09 (3) Max. 0.3	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.12 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.12 (2) 0.05~0.1 (3) Max. 0.8	Coolant
Alloy steel	☆ 130~200	☆ 130~200	☆ 80~130	★ 80~180	☆ 80~160	-	(1) 0.03~0.07 (2) 0.03~0.1 (3) Max. 0.3	(1) 0.04~0.08 (2) 0.04~0.08 (3) Max. 0.3	(1) 0.05~0.09 (2) 0.05~0.09 (3) Max. 0.5	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.8	
Stainless steel	☆ 70~150	-	☆ 60~100	★ 80~150	☆ 60~130	-	(1) 0.03~0.07 (2) 0.03~0.1 (3) Max. 0.3	(1) 0.04~0.08 (2) 0.04~0.08 (3) Max. 0.3	(1) 0.05~0.09 (2) 0.05~0.09 (3) Max. 0.5	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.8	
Cast iron	-	-	-	-	-	★ 60~100	(1) 0.03~0.08 (2) 0.03~0.08 (3) Max. 0.3	(1) 0.04~0.09 (2) 0.04~0.09 (3) Max. 0.3	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.12 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.12 (2) 0.05~0.1 (3) Max. 0.8	
Aluminum alloys	-	-	-	-	-	★ 150~400	(1) 0.05~0.12 (2) 0.05~0.12 (3) Max. 0.5	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.5	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.8	(1) 0.08~0.15 (2) 0.08~0.15 (3) Max. 0.8	(1) 0.08~0.15 (2) 0.08~0.15 (3) Max. 0.8	
Brass	-	-	-	-	-	★ 150~300	(1) 0.05~0.12 (2) 0.05~0.12 (3) Max. 0.5	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.5	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.8	(1) 0.08~0.15 (2) 0.08~0.15 (3) Max. 0.8	(1) 0.08~0.15 (2) 0.08~0.15 (3) Max. 0.8	

Apply a sufficient amount of coolant
The ap should be under 0.5 mm if a good surface finish is required

★:1st recommendation ☆:2nd recommendation

FTK

Workpiece material	Recommended insert grades (Vc: m/min)				Edge width (mm)		Remarks
	Cermet	CVD coated carbide	PVD coated carbide	Carbide	4.0	5.0	
	TN90	CR9025	PR930	KW10	f (mm/rev)		
Carbon steel	☆ 120~200	★ 80~180	☆ 60~130	-	0.05~0.15	0.05~0.15	Coolant
Alloy steel	☆ 100~160	★ 70~150	☆ 60~130	-	0.05~0.15	0.05~0.15	
Stainless steel	☆ 80~150	☆ 60~140	☆ 50~120	-	0.05~0.15	0.05~0.15	
Cast iron	-	-	-	★ 50~100	0.10~0.30	0.10~0.30	
Aluminum alloys	-	-	-	★ 200~450	0.05~0.25	0.05~0.25	
Brass	-	-	-	★ 100~200	0.05~0.25	0.05~0.25	

★:1st recommendation ☆:2nd recommendation

GMN inserts (CBN / PCD)

Workpiece material	Recommended insert grades (Vc: m/min)		f (mm/rev) = (1) grooving, (2) turning ap (mm) = (3) turning				Remarks
	CBN	PCD					
	KBN510, KBN525	KPD001 (KPD010)	GMN2	GMN3	GMN4, GMN5	GMN6	
Aluminum alloys	-	★ 150~2,000	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.5	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.8	(1) 0.08~0.18 (2) 0.08~0.18 (3) Max. 0.8	(1) 0.10~0.20 (2) 0.10~0.20 (3) Max. 0.8	Coolant
Brass	-	★ 200~800	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.5	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.8	(1) 0.08~0.18 (2) 0.08~0.18 (3) Max. 0.8	(1) 0.10~0.20 (2) 0.10~0.20 (3) Max. 0.8	
Cast iron	★ 150~400	-	(1) 0.04~0.09 (2) 0.04~0.09 (3) Max. 0.3	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.12 (2) 0.05~0.12 (3) Max. 0.5	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.8	
Hard materials	★ 80~120	-	(1) 0.02~0.05 (2) 0.01~0.03 (3) Max. 0.1	(1) 0.03~0.07 (2) 0.01~0.05 (3) Max. 0.2	(1) 0.03~0.08 (2) 0.03~0.08 (3) Max. 0.3	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.4	

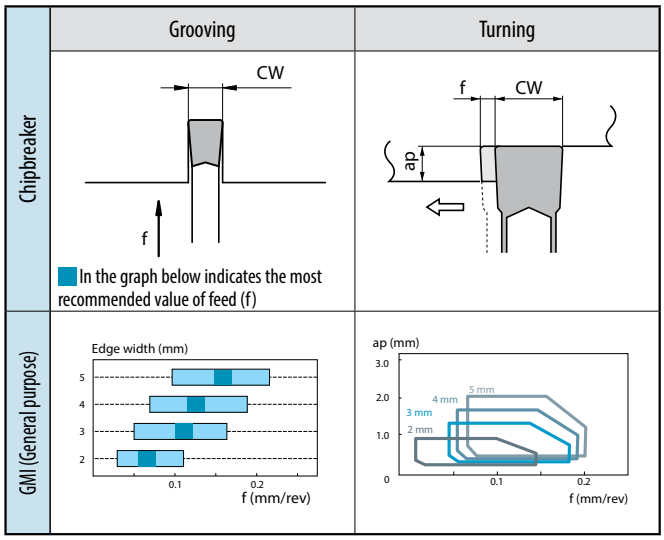
★:1st recommendation

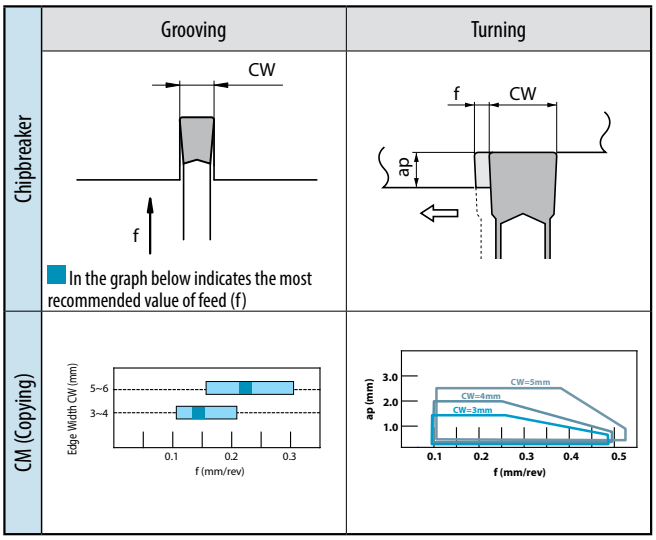
KGDI - recommended cutting conditions (Vc)

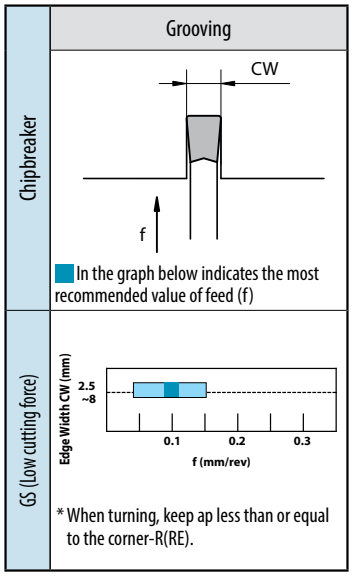
Workpiece material	Chipbreaker	Recommended insert grades (Vc: m/min)						Remarks
		Cermet		MEGACOAT NANO	MEGACOAT		Carbide	
		TN620	TN90	PR1535	PR1225	PR1215	GW15	
Carbon steel	GMI CM GS	☆ 100~220	☆ 100~220	☆ 80~150	★ 80~200	☆ 100~200	-	Coolant
Alloy steel		☆ 80~200	☆ 80~200	☆ 70~150	★ 70~180	☆ 80~180	-	
Stainless steel		☆ 70~180	☆ 70~180	★ 60~150	☆ 60~150	☆ 60~150	-	
Cast iron		-	-	-	-	★ 100~200	-	
Aluminum alloys		-	-	-	-	-	★ 200~500	
Brass		-	-	-	-	-	★ 100~200	

★ : 1st recommendation ☆: 2nd recommendation

KGDI - recommended cutting conditions (f and ap)

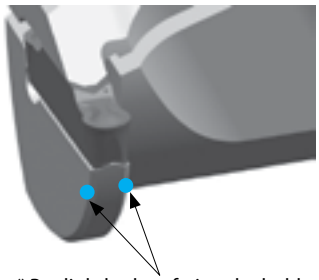






* When turning, keep ap less than or equal to the corner-R(RE).

Additional processing of toolholder tip when CM chipbreaker is installed



* By slightly chamfering the holder tip of about 0.5 mm, the cutting diameter can be minimized.

Guide for External Grooving

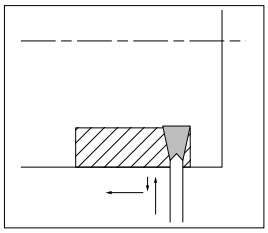
Point (I) (Turning after Grooving)

1) Grooving Depth 0.5mm or over : For roughing (Refer to Fig. 1)

Before turning, pull the tool back about 0.1mm after grooving, instead of turning subsequent to grooving.
(Failure to pull the tool back before traverse machining will result in an unbalanced load applied on only one side of the cutting edge.)

2) Grooving Depth 0.5mm or under : For finishing (Refer to Fig. 2)

Turning subsequent to grooving is possible because shallow groove depths relate a small load on the cutting edge. (Retention time is not necessary.)

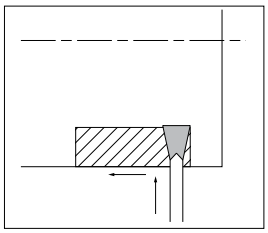


Before turning, pull the tool back about 0.1mm after grooving.
(Grooving Depth 0.5mm or over at roughing)
Fig. 1

Point (II)

1) When widening the groove width (Refer to Fig. 3), apply the "Step Turning."
2) The widened groove and side walls should be finished last.
(For better chip control, ap 0.5mm or over is recommended.)

Note) If the workpiece is not supported at the center, reduce the feed rate when grooving towards center.



Turning subsequent to grooving
(Grooving Depth 0.5mm or under at finishing)
Fig. 2

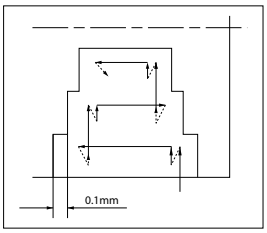


Fig. 3

Guide for Face Grooving

<Toolholder Selection>

(1) Choose the best tool depending on the groove width.
External dia. of the groove listed in the catalog indicates the available range (between DAXN and DAXX) for the initial grooving on the unprocessed workpiece (Ref. to Fig. 1).

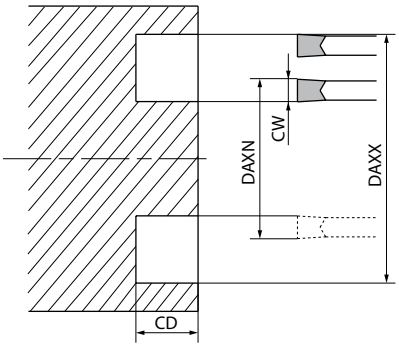


Fig. 1

(2) Confirm Grooving Depth (CD)

(3) It is recommended to install the toolholder in the reverse position. (Fig. 2)
(This will provide smooth chip flow and chip clearance.)

Toolholder	Right-hand	Toolholder	Left-hand
Insert	(Neutral)	Insert	(Neutral)

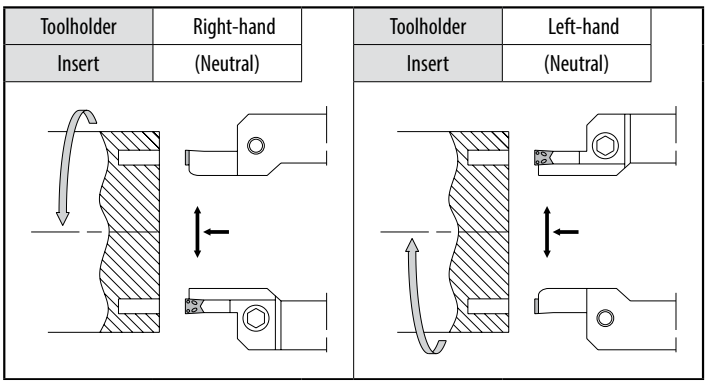


Fig. 2 Toolholder's hand and rotation

<Guide for turning>

Turning direction should be from the outer diameter to the inner diameter as shown in Fig. 3
This improves chip evacuation.

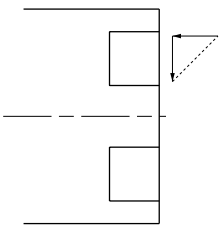


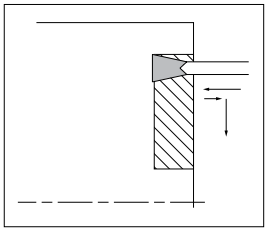
Fig. 3

Guide for Face Grooving (Continued)

Point (I) (Turning after Grooving)

1) Grooving Depth 0.5mm or over : For roughing (Refer to Fig. 4)

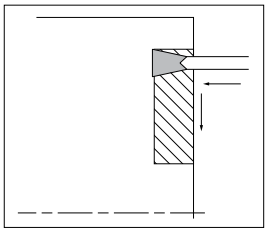
Before turning, pull the tool back about 0.1mm after grooving, instead of turning subsequent to grooving.
(Failure to pull the tool back before traverse machining will result in
an unbalanced load applied on only one side of the cutting edge.)



Before turning, pull the tool back about 0.1mm after grooving.
(Grooving Depth 0.5mm or over at roughing)
Fig. 4

2) Grooving Depth 0.5mm or under : For finishing (Refer to Fig. 5)

Turning subsequent to grooving is possible because shallow groove depths relate a small load on the cutting edge.
(Retention time is not necessary.)



Turning subsequent to grooving
(Grooving Depth 0.5mm or under at finishing)
Fig. 5

Point (II)

1) When widening the groove width. (Ref. to Fig. 6)
Apply the "Step Turning".
2) The widened groove and side walls should be finished last.
(For better chip control, ap 0.5mm or over is recommended.)

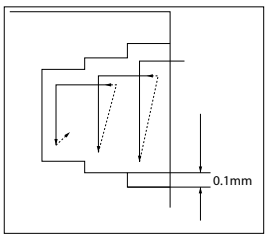
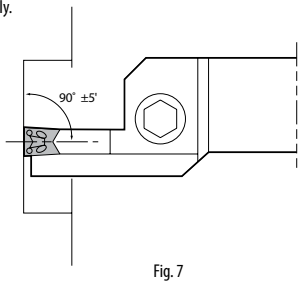
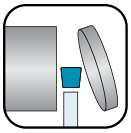


Fig. 6

Trouble shooting

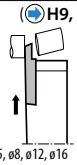
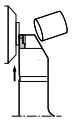
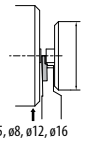
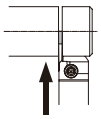
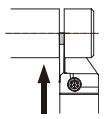
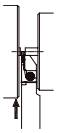
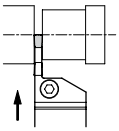
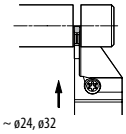
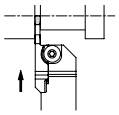
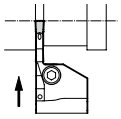
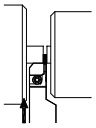
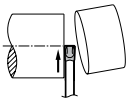
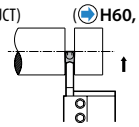
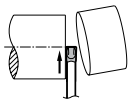
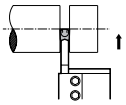
Trouble	Countermeasures
Whitish trace remains at the groove bottom.	(1) Increase the cutting speed for finishing process only. (This can handle most of the cases.) If the method is not successful, try (2) as follows. (2) Check the insert edge's parallelness. (Adjustment: Apply the insert edge to the workpiece face and adjust the toolholder within the angle of ±5'. (Fig. 7)  Fig. 7
Chips are entangled.	(1) Install the toolholder in the reverse position. Adjust the coolant flow to the cutting edge. (2) When widening the groove, do not machine one deep groove. Instead, repeat shallow grooving and turning.
Insert cracks when turning.	Reverse the facing direction.
Groove is not straight.	Check the edge's parallelness. Decrease the feed rate.

H

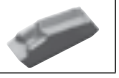


Introduction		**H2**
Small diameter cut-off		**H6**
TKF type	KTKF	H9
	KTKF-JCTM	H15
	KTKF-S	H18
KGZ type		**H20**
Inserts	GZM/GZMS/GZG	H24
Toolholder	KGZ-JCTM (Integral type for automatic lathe)	H26
	KGZ (Integral type for automatic lathe)	H28
	KGZS (for sub spindle tooling)	H29
KGD type		**H32**
GDM/GDMS/GDG type	KGD (Integral type for automatic lathe)	H34
	KGDS (for sub spindle tooling)	H36
	KGD-JCTM (Integral type for automatic lathe)	H39
	KGD (Integral type)	H40
	KGD-S (Integral type)	H41
	KGD-JCT (Integral type)	H43
KGM type		**H46**
KGM type	KGM/KGM-T/KGMM/KGMS	H50
PKM type		**H56**
PKM type	KPKB-JCT/KPKB	H60
	Toolblocks	H62
	KPKH-JCT/KPKH (Integral type)	H67
1-edge-cut-off inserts		**H70**
TKN/TK type	KTKB-SS/KTKB-S	H72
	KTKH-S (Integral type)	H73

Product lineup

For small diameter cut-off (automatic lathes) CUTDIA ~ø16 mm	KTKF (H9, H10, H12)  CUTDIA : ~ ø5, ø8, ø12, ø16 CW : 0.5 ~ 2.0 mm	KTKF-JCTM (H15)  CUTDIA : ~ ø5, ø8, ø12, ø16 CW : 0.5 ~ 2.0 mm		For sub spindle tooling	KTKF-S (H18)  CUTDIA : ~ ø5, ø8, ø12, ø16 CW : 0.5 ~ 2.0 mm
KGZ (Top clamp) CUTDIA ~ø51 mm	KGZ (H28)  CW : 1.3 ~ 3.0 mm	KGZ-JCTM (H26)  CUTDIA : ~ ø24, ø32 CW : 2.0 ~ 3.0 mm		For sub spindle tooling	KGZS (H29)  CUTDIA : ~ ø24 CW : 1.3 ~ 3.0 mm
KGD (Top clamp) CUTDIA ~ø51 mm	KGD (H34, H40)  CW : 1.3 ~ 4.0 mm	KGD-JCTM (for automatic lathes) (H39)  CUTDIA : ~ ø24, ø32 CW : 2.0 ~ 4.0 mm	KGD-S (H41)  CW : 2.0 ~ 4.0 mm	KGD-JCT (H43)  CW : 3.0 ~ 4.0 mm	For sub spindle tooling KGDS (H36)  CUTDIA : ~ ø24 CW : 1.3 ~ 3.0 mm
KPK (1-edge) CUTDIA ~ ø120	Toolholder Type CUTDIA ø35 ~ ø79	KPKH(-JCT) (H67, H68)  CW : 2.0 ~ 5.0 mm		Blade type CUTDIA ø32 ~ ø120	KPKB(-JCT) (H60, H61)  CW : 1.6 ~ 6.0 mm
KTKB **KTKH** (1-edge) CUTDIA ~ ø120	Toolholder Type CUTDIA ø30 ~ ø79	KTKH-S (H73)  CW : 2.2 ~ 5.1 mm		Blade type CUTDIA ø32 ~ ø120	KTKB-S(S) (H72)  CW : 1.6 ~ 9.6 mm

Cut-off tools

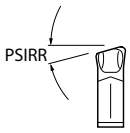
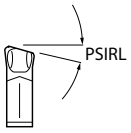
Series name	Shape	Advantage	Applications
For small diameter cut-off		1) Insert clamp is side screw type from lateral side 2) 2-edge insert 3) Max. Cut-off Dia. : ø16	1) For cut-off and grooving of small workpieces 2) For automatic lathe, small machine
KGD		1) Insert is clamped from top side 2) 1-edge and 2-edge inserts available 3) Integral type and separate type are available 4) Max. Cut-off Dia. : ø50	1) PM chipbreaker ··· for cut-off 2) PH chipbreaker ··· for cut-off (high feed rate) for grooving 3) PG chipbreaker ··· for cut-off (for automatic lathe), sharp-cutting oriented 4) PF chipbreaker ··· for cut-off (for automatic lathe), low feed 5) PQ chipbreaker ··· for cut-off (for automatic lathe), medium feed
KGZ		1) Stable machining with sturdy clamp design Easy insert management 2) 1-edge and 2-edge inserts available 3) Max. Cut-off Dia. : ø51	1) For cut-off and grooving of small workpieces 2) For automatic lathe, small machine
KPK		1) Self-clamping System that Opens and Closes the Contact Surface with a Wrench 2) 1-edge insert 3) Molded Chipbreaker 4) Blade Type JCT Type for High-pressure Coolant (Internal Coolant) is Available 5) Max. Cut-off Dia. : ø100	1) For cut-off and deep grooving 2) PM Chipbreaker ··· General Purpose PH Chipbreaker ··· For Tough Edge / High Feed Rate
KTKB KTKH		1) Self-Clamping System Tap the insert lightly with a plastic hammer to set it in the pocket 2) 1-edge insert 3) Blade type and Integral Shank type 4) Max. Cut-off Dia. : ø120	1) For cut-off and deep grooving 2) Standard chipbreaker is general cut-off type Feed rate : 0.1mm/rev or over  P Chipbreaker is for cut-off at low feed rates Feed rate : 0.03~0.08mm/rev 

Tool selection

		For small diameter cut-off	KGD	KGZ	KPK	KTKB / KTKH
Insert	1. Insert's edge number 1-edge insert···For larger dia. workpiece (max. ø120)	-	-	-	✓	✓
	2-edge insert···For smaller dia. workpiece Cost per corner is reduced	✓	✓	✓	-	-
	2. Use a neutral angle insert if there is no limit to the finished shape.	TKF...S TKF...NB	GDM GDMS	GDZ	PKM	TKN
	3. Insert with lead angle is recommended to prevent remaining boss.	TKF...DR	GDM-R/L (➡ Fig. 2)	GZM / GZG-R/L (➡ Fig. 2)	PKM-R/L (➡ Fig. 1)	TKR/L (➡ Fig. 1)
	4. If you want to make the remaining boss smaller when machining small or thin parts, use sharp corner and lead angle insert.	TKF...DR	-	-	-	-
	5. Use the minimum width insert suitable for the machining.	✓	✓	✓	✓	✓
Toolholder	1. Use a suitable toolholder (blade) for the workpiece dia.	✓	✓	✓	✓	✓
	2. Use a more rigid toolholder (blade).	✓	✓	✓	✓	✓
	3. Use a back clamp toolholder if there is no space for clamping tools from top side (automatic lathe).	✓	-	-	-	-

How to select cut-off inserts with / without lead angle (Including sharp corner)

1. Use a neutral angle insert if there is no limit to the finished shape.
2. Use an angled insert to reduce the size of the remaining boss.
3. Use a sharp-cornered lead-angled insert to make the remaining boss much smaller when machining small parts and thin parts.

Hand of lead angle	N (Neutral)	R (Right-hand)	L (Left-hand)
			
	Angled insert can reduce the burr size when cutting off. When using a larger lead angle , cutting force becomes smaller, but the feed rate should be reduced.		

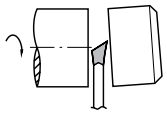
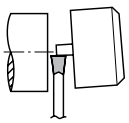
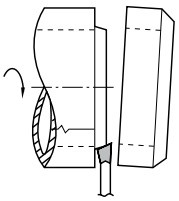
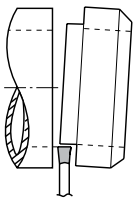
	Right-hand (R) Lead angle	Neutral
Example: Solid workpiece		
Example: Hollow workpiece (Pipe)		

Fig.1

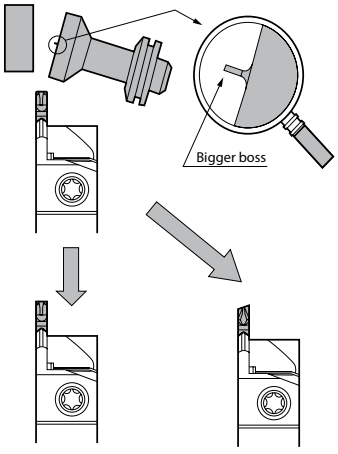


Fig.2

Caution

1. For PKM, PKM-R/L, TKN and TKR/L, set the cutting edge height 0.1~0.2 mm above the center height (Fig. 3)
   For other toolholders, set the cutting edge to the center height.
2. Be sure to perform wet processing. Apply enough coolant to the cutting edge.
3. Keep a constant rate during processing so that optimum product life will be achieved.
4. Cut off as close to the chuck as possible.
5. Lower the feed rate to 1/2 to 1/3 at the near center to prevent impact caused by machining.

Overuse of insert and toolholder (blade) may cause insert breakage and toolholder (blade) damage.
Do not rework the insert and toolholder (blade) to prevent damage.
Clean the insert pocket well with compressed air when replacing insert.

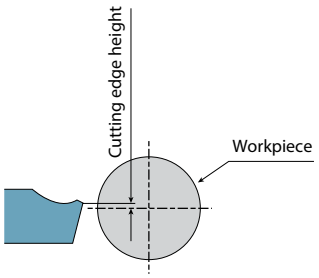
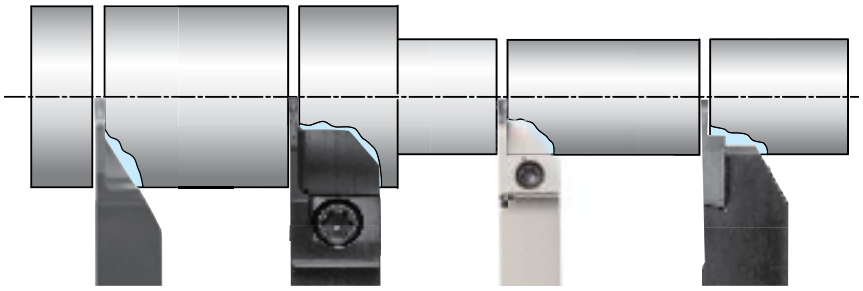
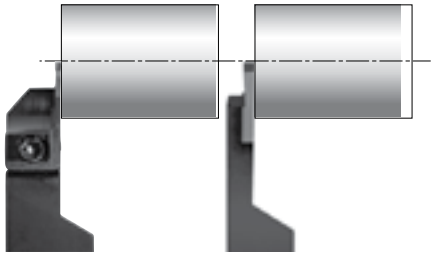


Fig. 3 (PKM, PKM-R/L, TKN, TKR/L)

Small dia. cut-off ~ø51

Small shank





KPKH / KTKH-S	KGD / KGD-JCTM	KGZ	KTKF	KGDS / KGZS	KTKF-S
CUTDIA: ~ø45 Shank: □20~25 (KPKH) □10~25 (KTKH-S) CW: 3.0~4.0 (KPKH) 2.2~4.1 (KTKH-S) Self clamp	CUTDIA: ~ø51 Shank: □10~25 CW: 1.3~4.0 Top clamp	CUTDIA: ~ø51 Shank: □10~25 CW: 1.3~3.0 Top clamp	CUTDIA: ~ø16 Shank: □10~25 CW: 0.5~2.0 Lateral side clamp	CUTDIA: ~ø24 Shank: □16 CW: 1.3~3.0 Top clamp	CUTDIA: ~ø16 Shank: □10~12 CW: 0.5~2.0 Lateral side clamp
H67 H68 H73	H34 H39	H28	H9, H10, H12, H15	H29 H36	H18

For KGZ



Low feed
PF chipbreaker



Medium feed
PM chipbreaker



High feed
PH chipbreaker



Low cutting force
PG chipbreaker

For KTKF / KTKF-S

2-edge



Low cutting force

For KPKH



PM chipbreaker
for general cut-off



PH chipbreaker
Tough edge

For KGD



Sharp cutting
PG chipbreaker



Low feed
PF chipbreaker



Medium feed
PQ chipbreaker

For KTKH-S



Chipbreaker for
general cut-off



Chipbreaker for
low feed cut-off



KTKH-S
(Self clamp)

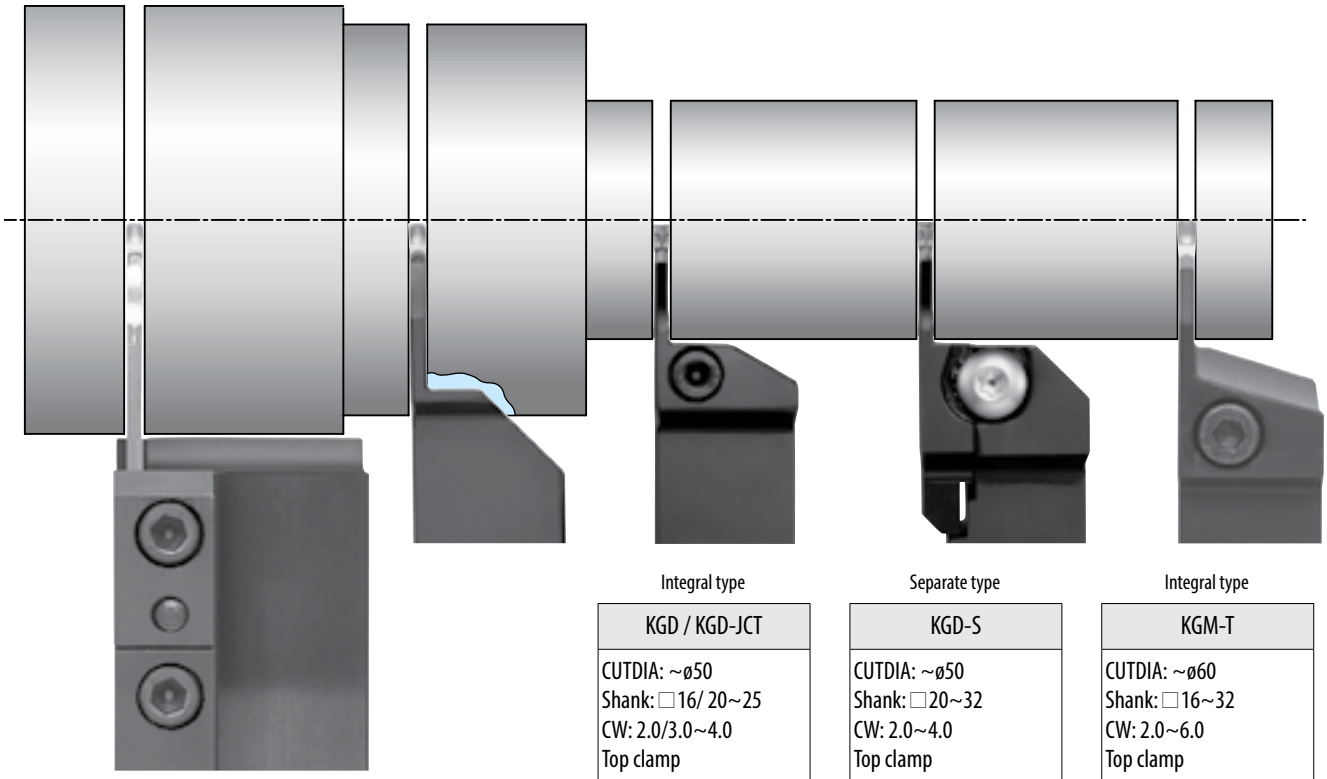


KGZ
(Top clamp)



KTKF
(Lateral side clamp)

General cut-off ~ø120



Blade +Toolblock

KPKB / KTKB
CUTDIA: ~ø120 Toolblock: □16~32 CW: 1.6~6.0 (KPKB) 1.6~9.6 (KTKB) Self clamp

H60, H61, H72

Integral type

KPKH / KTKH-S
CUTDIA: ~ø79 Shank: □20~25 CW: 2.0~5.0 (KPKH) 3.1~5.1 (KTKH-S) Self clamp

H67, H68, H73

For KPKB / KPKH

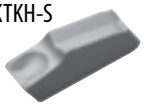


PM chipbreaker for general cut-off

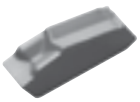


PH chipbreaker Tough edge

For KTKB / KTKH-S



Chipbreaker for general cut-off



Chipbreaker for low feed cut-off

Integral type

KGD / KGD-JCT
CUTDIA: ~ø50 Shank: □16/ 20~25 CW: 2.0/3.0~4.0 Top clamp

H40, H43

Separate type

KGD-S
CUTDIA: ~ø50 Shank: □20~32 CW: 2.0~4.0 Top clamp

H41

Integral type

KGM-T
CUTDIA: ~ø60 Shank: □16~32 CW: 2.0~6.0 Top clamp

H52

2-edge
Good chip control



PM chipbreaker

1-edge
Good chip control



PM chipbreaker

2-edge
High feed rate



PH chipbreaker

1-edge
High feed rate



PH chipbreaker

2-edge



Chipbreaker for sharp cutting

2-edge



Chipbreaker for stability

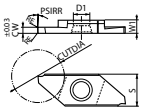
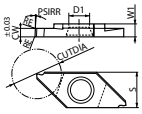
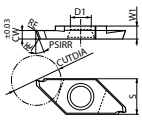
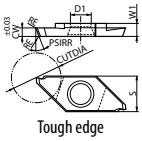
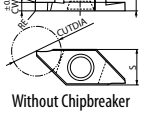
1-edge



Chipbreaker for stability

Blade + Toolblock		Separate type	Integral type		
					
KPKB	KTKB	KGD-S	KTKH-S	KGD / KGD-JCT	KGM-T

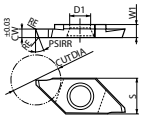
TKF12

Insert		Description		No. of edges	Dimension (mm) CW	S	D1	RE	W1	CUTDIA	Angle (°) PSIRR	Tolerance (mm) CW min.	CW max.	Carbide DLC PDL025	PVD PR1225	PVD PR1535	PVD PR1725	- KW10	Applicable toolholder H9, H10 H12, H15 H18
Carbon steel / Alloy steel															○	○	●		P
Stainless steel															○	●	○		M
Cast iron																		●	K
Non-ferrous metals														●				○	N
		TKF12R	050-S	2	0.5	8.7	5	0.03	3	5	0	- 0.03	+ 0.03	●	●	●	●	●	KTKFR...-12
			070-S		0.7					8				●	●	●	●	●	KTKFR...-12-Y
			100-S		1					12				●	●	●	●	●	KTKFR-12JCTM
			125-S		1.25					12				●	●	●	●		KTKFR...-12SA
			150-S		1.5					12				●	●	●	●	●	KTKFR...-12SB
			200-S		2					12				●	●	●	●		
		TKF12L	050-S		0.5					5				●		●	●	●	KTKFL...-12
			070-S		0.7					8				●		●	●	●	KTKFL-12JCTM
			100-S		1					12				●	●	●	●	●	KTKFL...-12SA
			125-S		1.25					12				●		●	●		KTKFL...-12SB
			150-S		1.5					12				●	●	●	●	●	
			200-S		2					12				●	●	●	●		
	 Tough edge	TKF12R	100-T	2	1	8.7	5	0.08	3	12	0	- 0.03	+ 0.03		●	●	●		KTKFR...-12
			150-T		1.5										●	●	●		KTKFR...-12-Y
			200-T		2										●	●	●		KTKFR-12JCTM
		TKF12L	100-T		1										●	●	●		KTKFR...-12SA
			150-T		1.5										●	●	●		KTKFR...-12SB
			200-T		2											●	●		KTKFL...-12
																			KTKFL-12JCTM
																			KTKFL...-12SA
																			KTKFL...-12SB
		TKF12R	050-S-16DR	2	0.5	8.7	5	0.03	3	5	16	- 0.03	+ 0.03			●	●	●	KTKFR...-12
			070-S-16DR		0.7					8					●	●	●	●	KTKFR...-12-Y
			100-S-16DR		1					12				●	●	●	●	●	KTKFR-12JCTM
			125-S-16DR		1.25					12				●	●	●	●		KTKFR...-12SA
			150-S-16DR		1.5					12				●	●	●	●	●	KTKFR...-12SB
			200-S-16DR		2					12				●	●	●	●		
		TKF12L	050-S-16DR		0.5					5						●	●	●	KTKFL...-12
			070-S-16DR		0.7					8						●	●	●	KTKFL-12JCTM
			100-S-16DR		1					12				●	●	●	●	●	KTKFL...-12SA
			125-S-16DR		1.25					12				●		●	●		KTKFL...-12SB
			150-S-16DR		1.5					12				●	●	●	●	●	
			200-S-16DR		2					12				●		●	●		
	 Tough edge	TKF12R	100-T-16DR	2	1	8.7	5	0.08	3	12	16	- 0.03	+ 0.03			●	●	●	KTKFR...-12
			150-T-16DR		1.5											●	●	●	KTKFR...-12-Y
			200-T-16DR		2											●	●	●	KTKFR-12JCTM
		TKF12L	100-T-16DR		1											●	●	●	KTKFR...-12SA
			150-T-16DR		1.5											●	●	●	KTKFR...-12SB
			200-T-16DR		2												●	●	KTKFL...-12
																			KTKFL-12JCTM
																			KTKFL...-12SA
																			KTKFL...-12SB
	 Without Chipbreaker	TKF12R	050-NB	2	0.5	8.7	5	0	3	5	0	- 0.03	+ 0.03				●	●	KTKFR...-12
			070-NB		0.7					8							●	●	KTKFR...-12-Y
			100-NB		1					12							●	●	KTKFR-12JCTM
			150-NB		1.5					12							●	●	KTKFR...-12SA
			200-NB		2					12							●	●	KTKFR...-12SB
		TKF12L	050-NB		0.5					5							●	●	KTKFL...-12
			070-NB		0.7					8							●	●	KTKFL-12JCTM
			100-NB		1					12							●	●	KTKFL...-12SA
			150-NB		1.5					12							●	●	KTKFL...-12SB
			200-NB		2					12							●	●	

Lead angle (PSIRR) shows the angle when installed in toolholder.
As Fig. 1 of **H11** shows, the cut-off diameter of the insert (CUTDIA) is indicated when the top of the cut-off edge progresses 1 mm from the center.
Right-hand shown

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

TKF12

Carbon steel / Alloy steel													◔	●		P
Stainless steel													●	◔		M
Cast iron															●	K
Non-ferrous metals															◔	N
Insert		Description		No. of edges	Dimension (mm)						Angle (°)	Tolerance (mm)		Carbide		Applicable toolholder ➡ H9, H10 H12, H15 H18
					CW	S	D1	RE	W1	CUTDIA	PSIRR	CW min.	CW max.	PVD PR1535	PVD PR1725	- KW10	
	 Without Chipbreaker	TKF12R	050-NB-20DR	2	0.5	8.7	5	0	3	5	20	- 0.03	+ 0.03	●	●	●	KTKFR...-12
			070-NB-20DR		0.7					8				●	●	●	KTKFR...-12-Y
			100-NB-20DR		1					12				●	●	●	KTKFR-12JCTM
			150-NB-20DR		1.5					12				●	●	●	KTKFR...-12SA
			200-NB-20DR		2					12				●	●	●	KTKFR...-12SB
		TKF12L	050-NB-20DR		0.5					5				●	●	●	KTKFL...-12
			070-NB-20DR		0.7					8				●	●	●	KTKFL-12JCTM
			100-NB-20DR		1					12				●	●	●	KTKFL...-12SA
			150-NB-20DR		1.5					12				●	●	●	KTKFL...-12SB
			200-NB-20DR		2					12				●	●	●	

Lead angle (PSIRR) shows the angle when installed in toolholder.
As Fig. 1 of **H11** shows, the cut-off diameter of the insert (CUTDIA) is indicated when the top of the cut-off edge progresses 1 mm from the center.
Right-hand shown

Inserts identification system

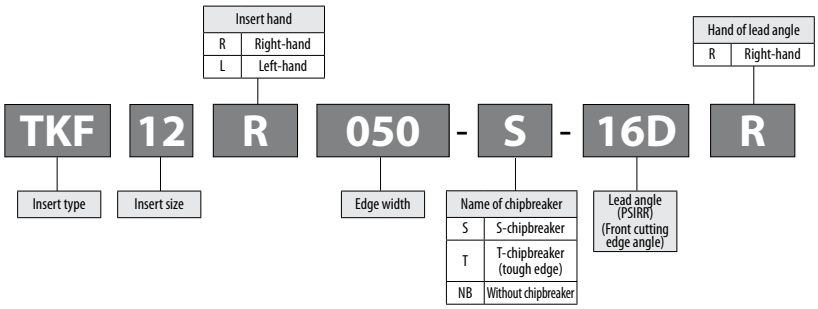
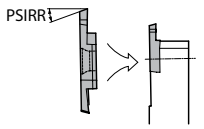
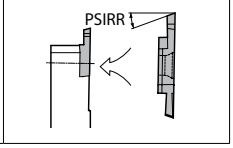
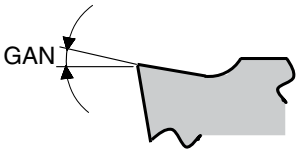


Table 1

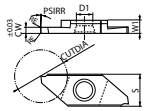
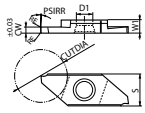
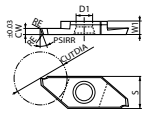
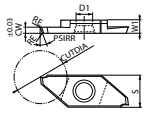
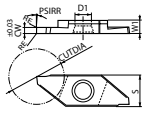
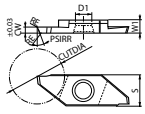
Toolholder	Right-hand	Toolholder	Left-hand
Insert	Right-hand	Insert	Left-hand
Lead angle	Right-hand	Lead angle	Right-hand
			

Descriptions of chipbreaker edge shape

Chipbreaker / Edge shape	S chipbreaker		T chipbreaker (Tough edge)		NB (Without chipbreaker)	
	GAN	Description	GAN	Description	GAN	Description
	15°	TKF12...-S	12°	TKF...-T TKF...-T-16DR	0°	TKF...-NB TKF...-NB-20DR
	20°	TKF16...-S TKF16...-S-16DR				
	25°	TKF12...-S-16DR				

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

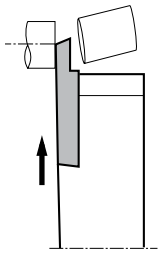
TKF16

Insert		Description		No. of edges	Dimension (mm) CW	S	D1	RE	W1	CUTDIA	Angle (°) PSIRR	Tolerance (mm) CW min.	CW max.	Carbide DLC PDL025	PVD PR1225	PVD PR1535	PVD PR1725	- KW10	Applicable toolholder ⇒ H9, H15 H18
Carbon steel / Alloy steel															◡	◡	●		P
Stainless steel															◡	●	◡		M
Cast iron																		●	K
Non-ferrous metals														●				◡	N
		TKF16R	150-S 200-S	2	1.5 2	9.5	5	0.05	4	16	0	- 0.03	+ 0.03	● ●	● ●	● ●	● ●	● ●	KTKFR...-16 KTKFR-16JCTM KTKFR...-16SA KTKFR...-16SB
		TKF16L	150-S 200-S		1.5 2									● ●	● ●	● ●	● ●	● ●	KTKFL...-16 KTKFL-16JCTM KTKFL...-16SA KTKFL...-16SB
	 Tough edge	TKF16R	150-T 200-T	2	1.5 2	9.5	5	0.08	4	16	0	- 0.03	+ 0.03		● ●	● ●	● ●		KTKFR...-16 KTKFR-16JCTM KTKFR...-16SA KTKFR...-16SB
		TKF16L	150-T 200-T		1.5 2										● ●	● ●	● ●		KTKFL...-16 KTKFL-16JCTM KTKFL...-16SA KTKFL...-16SB
		TKF16R	150-S-16DR 200-S-16DR	2	1.5 2	9.5	5	0.05	4	16	16	- 0.03	+ 0.03	● ●	● ●	● ●	● ●	● ●	KTKFR...-16 KTKFR-16JCTM KTKFR...-16SA KTKFR...-16SB
		TKF16L	150-S-16DR 200-S-16DR		1.5 2									● ●	● ●	● ●	● ●	● ●	KTKFL...-16 KTKFL-16JCTM KTKFL...-16SA KTKFL...-16SB
	 Tough edge	TKF16R	150-T-16DR 200-T-16DR	2	1.5 2	9.5	5	0.08	4	16	16	- 0.03	+ 0.03		● ●	● ●	● ●		KTKFR...-16 KTKFR-16JCTM KTKFR...-16SA KTKFR...-16SB
		TKF16L	150-T-16DR 200-T-16DR		1.5 2										● ●	● ●	● ●		KTKFL...-16 KTKFL-16JCTM KTKFL...-16SA KTKFL...-16SB
	 Without Chipbreaker	TKF16R	150-NB 200-NB	2	1.5 2	9.5	5	0	4	16	0	- 0.03	+ 0.03			● ●	● ●	● ●	KTKFR...-16 KTKFR-16JCTM KTKFR...-16SA KTKFR...-16SB
		TKF16L	150-NB 200-NB		1.5 2											● ●	● ●	● ●	KTKFL...-16 KTKFL-16JCTM KTKFL...-16SA KTKFL...-16SB
	 Without Chipbreaker	TKF16R	150-NB-20DR 200-NB-20DR	2	1.5 2	9.5	5	0	4	16	20	- 0.03	+ 0.03			● ●	● ●	● ●	KTKFR...-16 KTKFR-16JCTM KTKFR...-16SA KTKFR...-16SB
		TKF16L	150-NB-20DR 200-NB-20DR		1.5 2											● ●	● ●	● ●	KTKFL...-16 KTKFL-16JCTM KTKFL...-16SA KTKFL...-16SB

Lead angle (PSIRR) shows the angle when installed in toolholder.
As Fig. 1 of **H11** shows, the cut-off diameter of the insert (CUTDIA) is indicated when the top of the cut-off edge progresses 1 mm from the center.
Right-hand shown

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KTKF



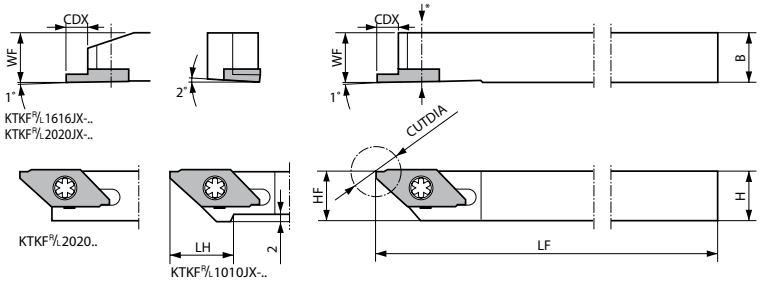


Fig. 1

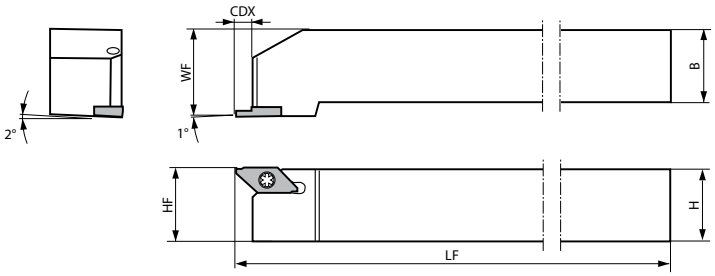


Fig. 2

Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

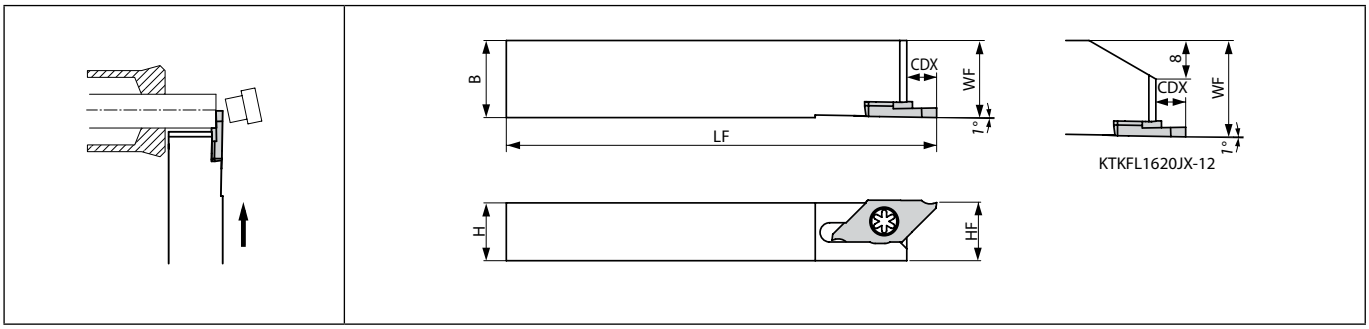
Description		Availability		Dimension (mm)							Fig.	Spare parts		Applicable inserts ⇨ H6~H8
												Screw	Wrench	
		R	L	CDX	H	B	LH	HF	LF	WF				
KTKF$^{R/L}$	1010JX-12	●	●	6	10	10	15	10	120	10	1	SB-4590TRWN	FT-10	TKF12$^{R/L}$...
	1212F-12	●	●		12	12	-	12	85	12				
	1212JX-12	●	●						120					
	1616JX-12	●	●		16	16		16		16				
	2020JX-12	●	●		20	20		20		20				
	2525M-12	●			25	25		25	150	30	2			TKF12R...
KTKF$^{R/L}$	1010JX-16	●	●	8	10	10	20	10	120	10	1	SB-4590TRWN	FT-10	TKF16$^{R/L}$...
	1212F-16	●	●		12	12	-	12	85	12				
	1212JX-16	●	●						120					
	1616JX-16	●	●		16	16		16		16				
	2020JX-16	●	●		20	20		20		20				
	2525M-16	●			25	25		25	150	30	2			TKF16R...

CDX shows the distance from the toolholder to the cutting edge.
See **H6** to **H8** for the actual cut-off diameter.

Recommended cutting conditions ⇨ **H19**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KTKF (Goose-neck holder)



Left-hand shown | Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description		Availability	Dimension (mm)						Spare parts		Applicable inserts ⇒ H6, H7
		L	CDX	H	B	HF	LF	WF	Screw	Wrench	
KTKFL	1216JX-12	●	6	12	16	12	120	16	SB-4590TRWN	FT-10	TKF12L...
	1620JX-12	●		16	20	16		20			

CDX shows the distance from the toolholder to the cutting edge.
See **H6** to **H7** for the actual cut-off diameter.

Recommended cutting conditions ⇒ **H19**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

How to Use

1) When using main spindle only

Maximum cutting diameter is CUTDIA (Fig.1).
Even if the cutting edge runs beyond the center line (Fig.2),
the insert does not contact the workpiece, since the workpiece falls off.
(The clearance between the insert and the workpiece is 0.2 mm)

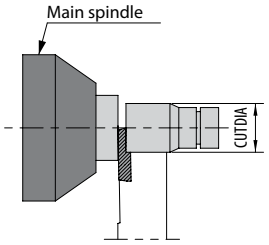


Fig.1
(When the edge is at the center)

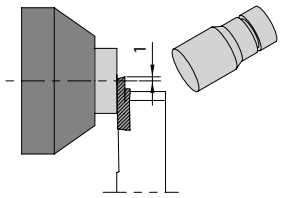


Fig.2
(When the edge is 1mm beyond the center)

2) When using both main and sub spindles

In this case, when the cutting edge runs beyond the center line, the insert will contact the workpiece, since the workpiece does not fall off.
Therefore the programmed distance beyond the center must be considered.
e.g.) When the cutting edge is programmed to run 1mm beyond the center.
Workpiece maximum, CUTDIA2 (Fig.4) = [CUTDIA −1 mm × 2] (mm)
(The clearance between the insert and the workpiece is 0.2 mm)

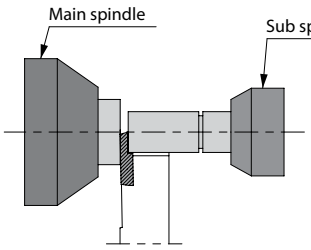


Fig.3
(When the edge is at the center)

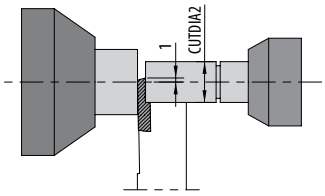
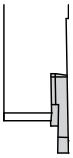
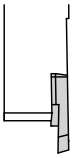
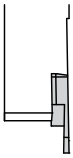
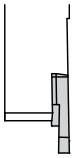
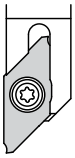
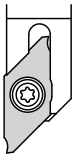
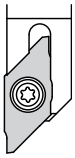


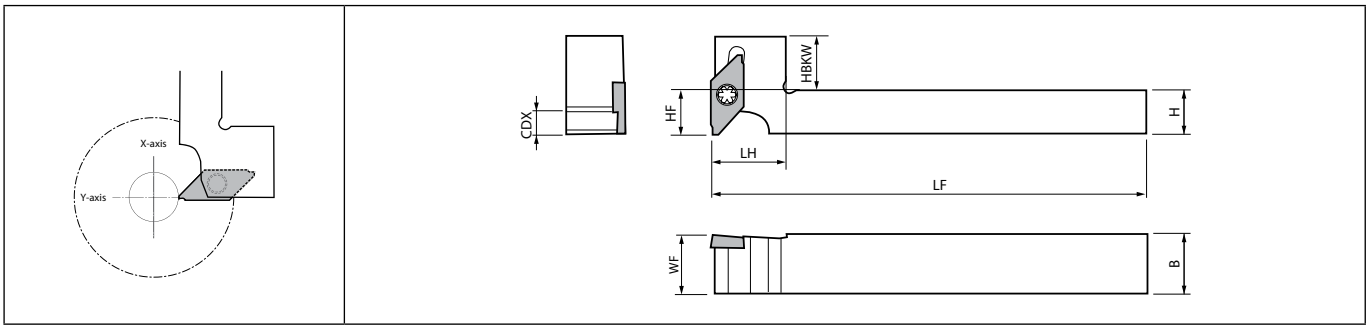
Fig.4
(When the edge is 1mm beyond the center)

How to select edge preparation

Troubleshooting

Problems	Countermeasures	Countermeasures						
		Lead angle (PSIRR)		Edge width		Name of chipbreaker		
		Neutral (0°)	Yes	Narrower	Wider	S	T	NB
								
Insert fracture	Insert fracture prevention	Effective			Effective		Effective	Effective
Long cutting time	Cutting time reduction	Effective			Effective		Effective	Effective
Entangled chips	Prevention of chip entanglement	Effective		Effective		Effective		
Large boss remain	Small boss remain		Effective	Effective		Effective		
Ring remain (Hollow workpiece)	Prevention of ring remain		Effective	Effective		Effective		
Deformation of hollow workpiece (pipe)	Preventing deformation		Effective	Effective		Effective		

KTKF (Y-axis toolholder)



Right-hand shown | Right-hand Insert for Right-hand Toolholder.

Toolholder dimensions

Description		Availability	Dimension (mm)								Spare parts		Applicable inserts ➡ H6, H7
											Screw	Wrench	
		R	CDX	H	B	LH	HF	HBKW	LF	WF			
KTKFR	1216JX-12-Y	●	6	12	16	20	12	15	120	16	SB-4590TRWN	FT-10	TKF12R...
	1616JX-12-Y	●		16		25	16	11					

CDX shows the distance from the toolholder to the cutting edge.
See **H6** to **H7** for the actual cut-off diameter.

Recommended cutting conditions ➡ **H19**

H

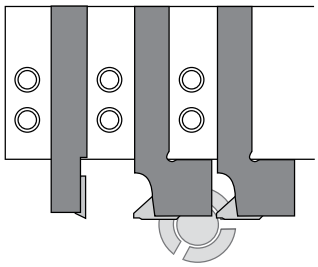
Cut-Off

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

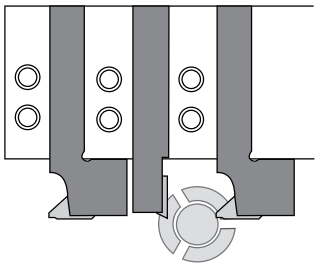
Precautions for using Y-axis toolholder

Do not use Y-axis toolholders side by side to prevent interference. (Only two Y-axis holder can be used at the same time)

With interference

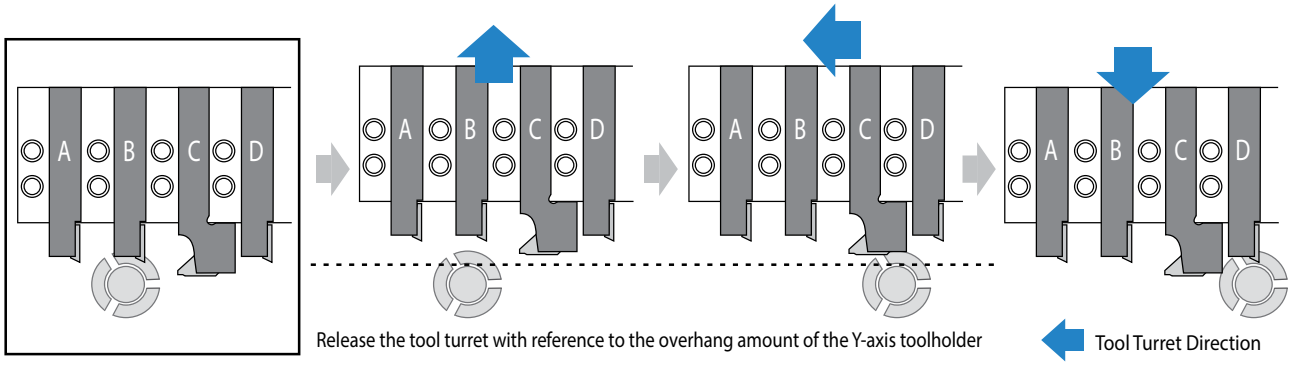


Without interference



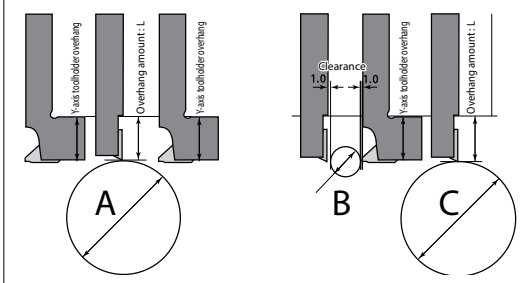
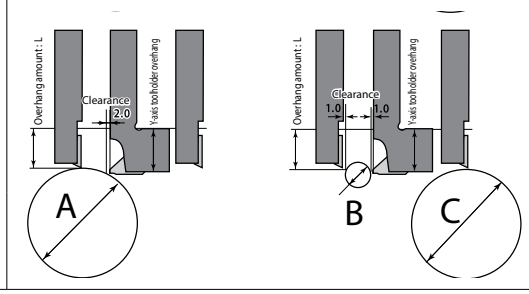
Standard toolholders may be mounted between two Y-axis toolholders

When changing the tool, set the retracted position with reference to the cutting edge of the Y-axis holder. (When exchanging from tool B to D)



Note that using other toolholders together will result in dierent outside diameters

(Unit : mm)

Y-axis toolholder overhang	Examples	Overhang amount L / Available outside cutting diameter (ø)	20	22	25
20		A	Without restriction	Without restriction	Without restriction
		B	13.0	13.0	13.0
		C	Without restriction	Without restriction	Without restriction
25		A	38.0	58.0	Without restriction
		B	14.9	13.6	13.0
		C	45.0	60.0	Without restriction

Cut-off toolholders for automatic lathe great for high pressure coolant

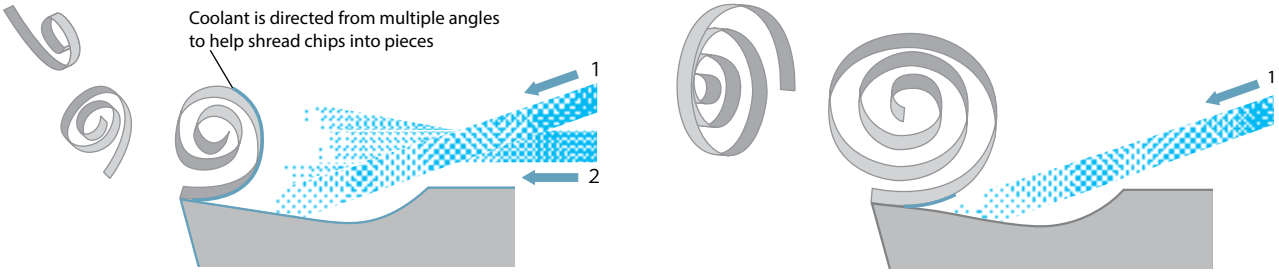
KTKF-JCTM

Finely breaks chips into small pieces. Superior chip control performance when machining difficult-to-cut material and stainless steel. Superior cooling action improves tool life.

1 Superior chip control performance

Discharges coolant in two directions toward rake surface of insert. Finely breaks chips into small pieces.

Coolant discharge structure comparison



KTKF-JCT　　Competitor A

Chip control comparison (Internal evaluation)

X5CrNi18 10

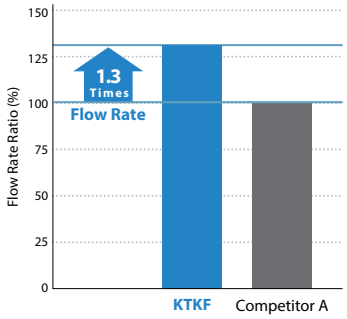
f (mm/rev)	0.01	0.02	0.03
KTKF -JCT			
Competitor A			

TAB6400 (Ti-6Al-4V)

f (mm/rev)	0.01	0.02	0.03
KTKF -JCT			
Competitor A			

Cutting conditions: Vc = 80 m/min, Wet (Oil-based) lubricating pressure: 1.5 MPa (Internal)
Workpiece: ø12 mm

Coolant flow rate comparison (Internal evaluation)



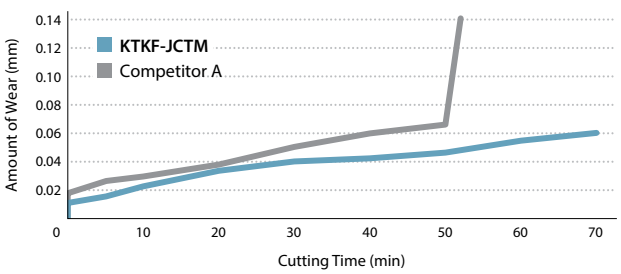
Lubricating pressure : 1.5 MPa (Internal)

2 Superior cooling action improves tool life

Coolant is directed from the flank face of the insert as well
An ample supply of coolant to the tool edge area helps to further suppresse insert wear

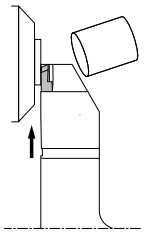


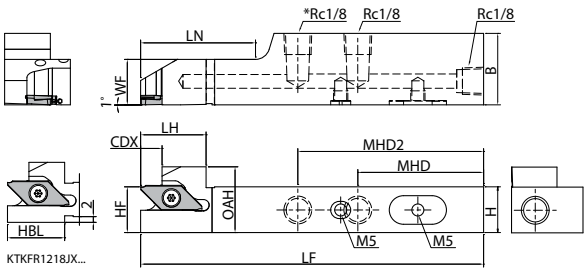
Wear resistance comparison (Internal evaluation)



Cutting conditions: Vc = 100 m/min, f = 0.02 mm/rev, Wet (Oil-based)
Lubricating pressure: 1.5 MPa(Internal) Workpiece material: TAB6400 (Ti-6Al-4V) ø12

KTKFR-JCTM (Coolant-through holders)





Right-hand shown | Right-hand Insert for Right-hand Toolholder. | KTKFR12-JCTM : 2-Rc1/8

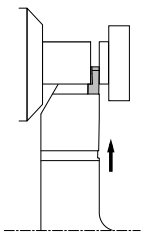
Toolholder dimensions

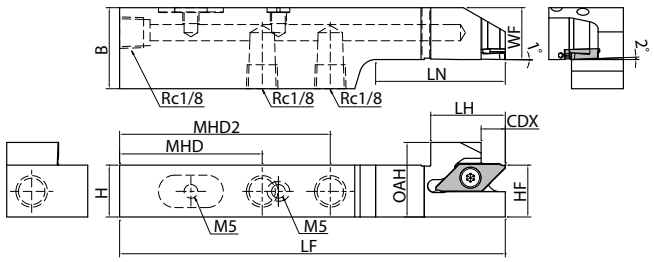
Description		Availability	Dimension (mm)												Coolant hole	Spare parts				Applicable inserts ⇒ H6~H8
																Plug	Plug	Screw	Wrench	
		R	CDX	H	B	LH	OAH	MHD	MHD2	HF	HBL	LF	LN	WF						
KTKFR	1218JX-12JCTM	●	7.5	12	25	23	19	44	65	12	20	120	28	12	Yes	GP-1	HS5X4LP	SB-4590TRWN	FT-10	TKF12R...
	1625JX-12JCTM	●		16			23			16	-		40	16			-			
	2025JX-12JCTM	●		20			27			20				20						
KTKFR	1625JX-16JCTM	●	9.6	16	25	23	23	44	65	16	-	120	40	16	Yes	GP-1	HS5X4LP	SB-4590TRWN	FT-10	TKF16R...
	2025JX-16JCTM	●		20			27			20			41	20						

CDX shows the distance from the toolholder to the cutting edge.
See **H6** to **H8** for the actual cut-off diameter.

Recommended cutting conditions ⇒ **H19**

KTKFL-JCTM (Coolant-through holders)





Left-hand shown | Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description		Availability	Dimension (mm)											Coolant hole	Spare parts				Applicable inserts ⇒ H6~H8
															Plug	Plug	Screw	Wrench	
		L	CDX	H	B	LH	OAH	MHD	MHD2	HF	LF	LN	WF						
KTKFL	1625JX-12JCTM	●	7.5	16	25	23	23	44	65	16	120	40	16	Yes	GP-1	HS5X4LP	SB-4590TRWN	FT-10	TKF12L...
	2025JX-12JCTM	●		20			27			20			20			-			
KTKFL	1625JX-16JCTM	●	9.6	16	25	23	23	44	65	16	120	40	16	Yes	GP-1	HS5X4LP	SB-4590TRWN	FT-10	TKF16L...
	2025JX-16JCTM	●		20			27			20		41	20						

CDX shows the distance from the toolholder to the cutting edge.
See **H6** to **H8** for the actual cut-off diameter.

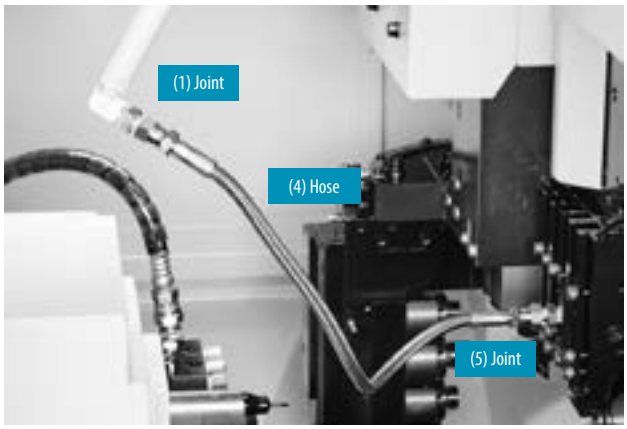
Recommended cutting conditions ⇒ **H19**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

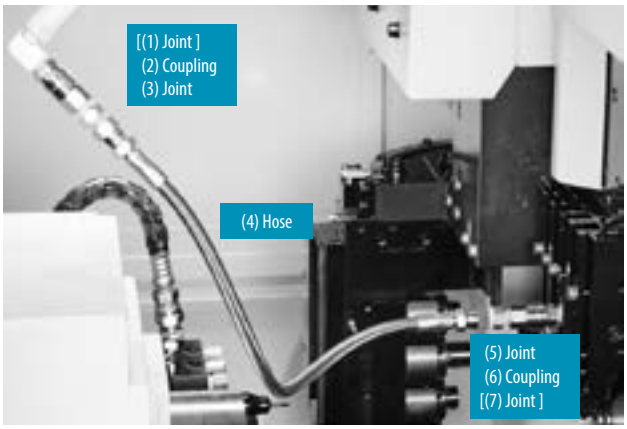
Coolant pipe parts

Pipe parts will be required separately if internal coolant is used.

Without coupling (Pump pressure: Up to **20 MPa**)



With coupling (Pump pressure: Up to **7.5 MPa**)



Combination part description (Example)

Spare parts	Description
(1) Joint	J-ST-R1/8-G1/8
(4) Hose	HS-G1/8-G1/8-500
(5) Joint	J-ST-R1/8-G1/8

Convert the thread standards on the machine's side (Rc1/4, Rc1/8, NPT1/8, etc.) to the thread standard on the hose side (G1/8) for use.
Use sealing agents such as seal tapes when installing piping parts.

Combination part description (Example)

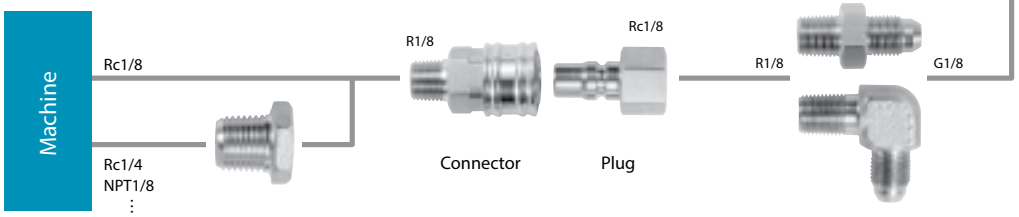
Spare parts	Description
[(1) Joint]	-
(2) Coupling	CP-ST-R1/8, P-ST-RC1/8
(3) Joint	J-ST-R1/8-G1/8
(4) Hose	HS-G1/8-G1/8-500
(5) Joint	J-ST-R1/8-G1/8
(6) Coupling	P-ST-RC1/8, CP-ST-R1/8
[(7) Joint]	-

Convert the thread standards on the machine's side (Rc1/4, Rc1/8, NPT1/8, etc.) to thread standards of the coupling (Rc1/8, etc.) or hose (G1/8) for use.
Use sealing agents such as seal tapes when installing piping parts.

Without coupling (Pump pressure: Up to 20 MPa)



With coupling (Pump pressure: Up to 7 . 5 MPa)

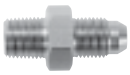
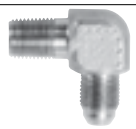


(1) Joint (2) Coupling (3) Joint (4) Hose

Piping installation parts description

Joint [(1)(3)(5)(7)]

Pressure resistance: ~20.0MPa

Exterior	Description	Thread standard	Std.
	J-ST-R1/4-G1/8	R1/4 ⇔ G1/8	●
	J-ST-NPT1/8-G1/8	NPT1/8 ⇔ G1/8	●
	J-ST-R1/8-G1/8	R1/8 ⇔ G1/8	●
	J-AN-R1/8-G1/8		●
	J-ST-R1/4-RC1/8	R1/4 ⇔ Rc1/8	●
	J-ST-NPT1/8-RC1/8	NPT1/8 ⇔ Rc1/8	●
	J-ST-R1/8-RC1/8	Rc1/8 ⇔ R1/8 (Extension Joint)	●

Coupling [(2)(6)]

Pressure resistance: ~7.5MPa

Exterior	Description	Thread standard	Std.
	CP-ST-R1/8	R1/8	●
	P-ST-RC1/8	Rc1/8	●

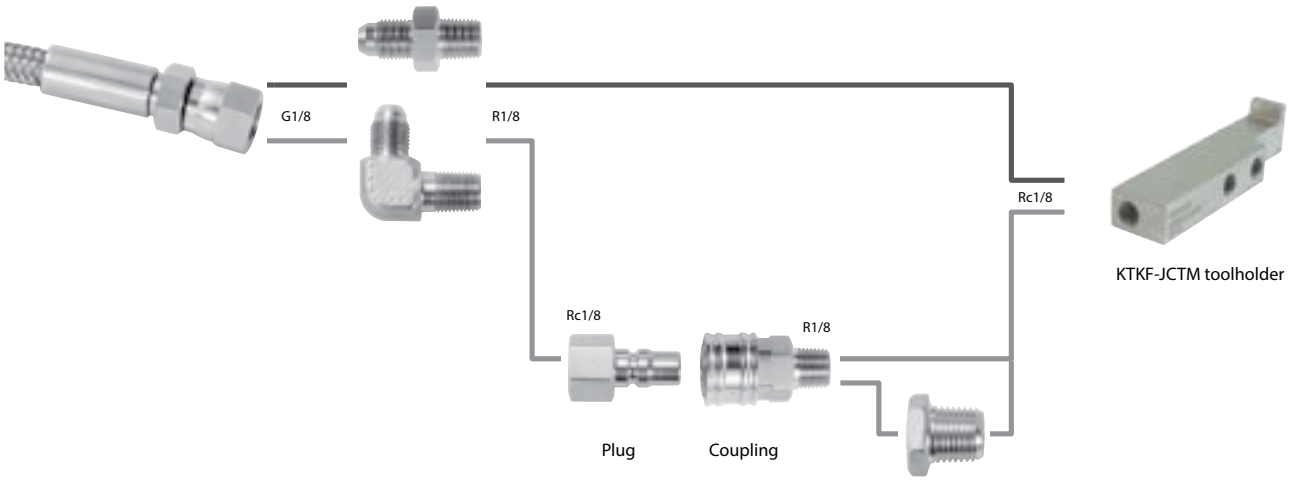
Hose (4)

Pressure resistance: ~20.0MPa

Exterior	Description	Thread standard	Total length (mm)	Std.
	HS-G1/8-G1/8-200	G1/8	200	●
	HS-G1/8-G1/8-300		300	●
	HS-G1/8-G1/8-400		400	●
	HS-G1/8-G1/8-500		500	●
	HS-G1/8-G1/8-600		600	●
	HS-G1/8-G1/8-800		800	●

Cautions

1. Make sure machine door is completely closed before use of these parts.
2. Use appropriate seal for the male thread of the piping parts and make sure the connection is secure.
   Use plugs to seal off unused coolant holes.
3. Connect and fasten the coolant hose firmly.
4. The use of copper washers may cause leakage but will have no effect on the performance.
5. Commercial piping parts can be used if the thread standards are same. Check the pressure resistance before use.
6. Regularly changing the coolant filter is recommended.



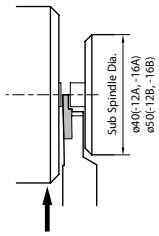
(4) Hose (5) Joint (6) Coupling (7) Joint (Extension joint)

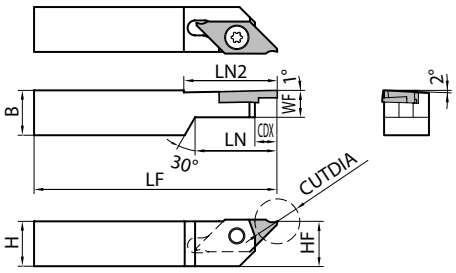
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

H

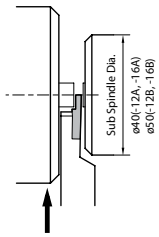
Cut-Off

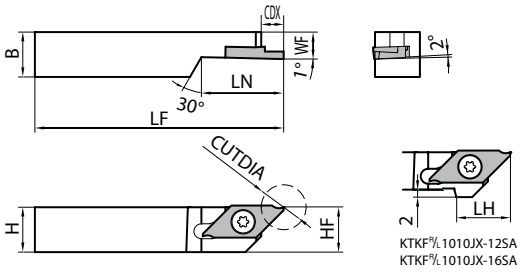
KTKF-S (Cut-off / for sub spindle tooling)





Right-hand shown | Right-hand Insert for Right-hand Toolholder.





Left-hand shown | Left-hand Insert for Left-hand Toolholder.

H

Cut-Off

Toolholder dimensions

Description		Availability		Dimension (mm)									Spare parts		Applicable inserts ⇒ H6~H8
		R	L	CDX	H	B	LH	HF	LF	LN	LN2	WF	Screw	Wrench	
KTKF R/L	1010JX-12SA	●	●	6	10	10	15	10	120	22	26	7.2	SB-4570TRN	FT-10	TKF12 R/L...
	1212F-12SA	●	●		12	12	-	12	85						
KTKF R/L	1212JX-12SB	●	●						120	26					
KTKF R/L	1010JX-16SA	●	●	8	10	10	20	10	120	22	30	7.2	SB-4570TRN	FT-10	TKF16 R/L...
	1212F-16SA	●	●		12	12	-	12	85						
KTKF R/L	1212JX-16SB	●	●						120	26					

CDX shows the distance from the toolholder to the cutting edge.
Cut-off diameter (CUTDIA) depends on the insert edge width.
See **H6** to **H8** for the actual cut-off diameter.
Only Right-hand is available for LN2 dimension.

Recommended cutting conditions ⇒ **H19**

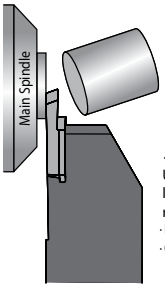
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KTKF / KTKF-S selection reference

KTKF

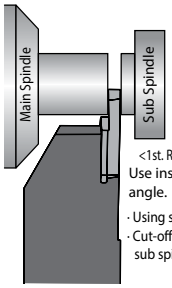
· Both Right-hand and Left-hand types are applicable to gang tool post.
· Basically Left-hand type is used for cut-off operation using a sub spindle.

KTKFR (Right-hand toolholder)



<1st. Recommendation>
Use insert with lead angle to remove boss.
· Not using sub spindle
· Cut-off operation near main spindle side

KTKFL (Left-hand toolholder)

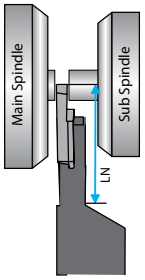


<1st. Recommendation>
Use insert without lead angle.
· Using sub spindle
· Cut-off operation near sub spindle side

KTKF-S

· When machining workpiece with small diameter, use KTKF-S to reduce overhang distance from the main spindle.

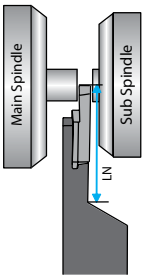
KTKFR-SA/B (Right-hand toolholder)



<How to select>
Hand of Toolholder
· Long workpiece and more rigidity
· Cut-off operation near main spindle side

<How to select>
LN dimension
· Sub Spindle Dia.
ø40→22 (SA type)
ø50→26 (SB type)

KTKFL-SA/B (Left-hand toolholder)



<How to select>
Hand of Toolholder
· Short workpiece and less rigidity
· Cut-off operation near sub spindle side

<How to select>
LN dimension
· Sub Spindle Dia.
ø40→22 (SA type)
ø50→26 (SB type)

Recommended cutting conditions (TKF12 / 16)

Workpiece material	Recommended insert grades (Vc: m/min)					TKF12						TKF16		Remarks
						Edge width CW (mm)								
	MEGACOAT NANO PLUS	MEGACOAT NANO	MEGACOAT	DLC coated carbide	Carbide	0.5	0.7	1.0	1.25	1.5	2.0	1.5	2.0	
	PR1725	PR1535	PR1225	PDL025	KW10	f (mm/rev)								
Carbon steel	★ 70 ~ 170 (50 ~ 140)	☆ 70 ~ 150 (50 ~ 120)	☆ 70 ~ 150 (50 ~ 120)	-	-	0.01 ~ 0.02	0.01 ~ 0.03	0.01 ~ 0.04 (0.01~0.05)	0.01 ~ 0.04	0.01 ~ 0.04 (0.02 ~ 0.1)	0.01 ~ 0.04 (0.02 ~ 0.1)	0.02 ~ 0.07 (0.02 ~ 0.1)	0.02 ~ 0.07 (0.02 ~ 0.1)	Coolant
Alloy steel	★ 70 ~ 170 (50 ~ 140)	☆ 70 ~ 150 (50 ~ 120)	☆ 70 ~ 150 (50 ~ 120)	-	-	0.01 ~ 0.02	0.01 ~ 0.03	0.01 ~ 0.04 (0.01 ~ 0.05)	0.01 ~ 0.04	0.01 ~ 0.04 (0.02 ~ 0.1)	0.01 ~ 0.04 (0.02 ~ 0.1)	0.02 ~ 0.07 (0.02 ~ 0.1)	0.02 ~ 0.07 (0.02 ~ 0.1)	
Stainless steel	☆ 60 ~ 140 (40 ~ 120)	★ 60 ~ 120 (40 ~ 100)	☆ 60 ~ 120 (40 ~ 100)	-	-	0.005 ~ 0.015	0.01 ~ 0.02	0.01 ~ 0.02 (0.01 ~ 0.03)	0.01 ~ 0.02	0.01 ~ 0.02 (0.01 ~ 0.05)	0.01 ~ 0.02 (0.01 ~ 0.05)	0.01 ~ 0.04 (0.01 ~ 0.05)	0.01 ~ 0.04 (0.01 ~ 0.05)	
Cast iron	-	-	-	-	★ 50 ~ 100	0.01 ~ 0.03	0.01 ~ 0.04	0.01 ~ 0.05	0.01 ~ 0.05	0.01 ~ 0.05	0.01 ~ 0.05	0.02 ~ 0.08	0.02 ~ 0.08	
Aluminum alloys	-	-	-	★ 200 ~ 500	☆ 200 ~ 450	0.01 ~ 0.03	0.01 ~ 0.04	0.01 ~ 0.05	0.01 ~ 0.05	0.01 ~ 0.05	0.01 ~ 0.05	0.02 ~ 0.08	0.02 ~ 0.08	
Brass	-	-	-	-	★ 100 ~ 200	0.01 ~ 0.03	0.01 ~ 0.04	0.01 ~ 0.06	0.01 ~ 0.06	0.01 ~ 0.06	0.01 ~ 0.06	0.02 ~ 0.1	0.02 ~ 0.1	

*( ): Tough edge type (TKF..T..)

★: 1st Recommendation ☆: 2nd Recommendation

Cut-off solutions for small parts machining

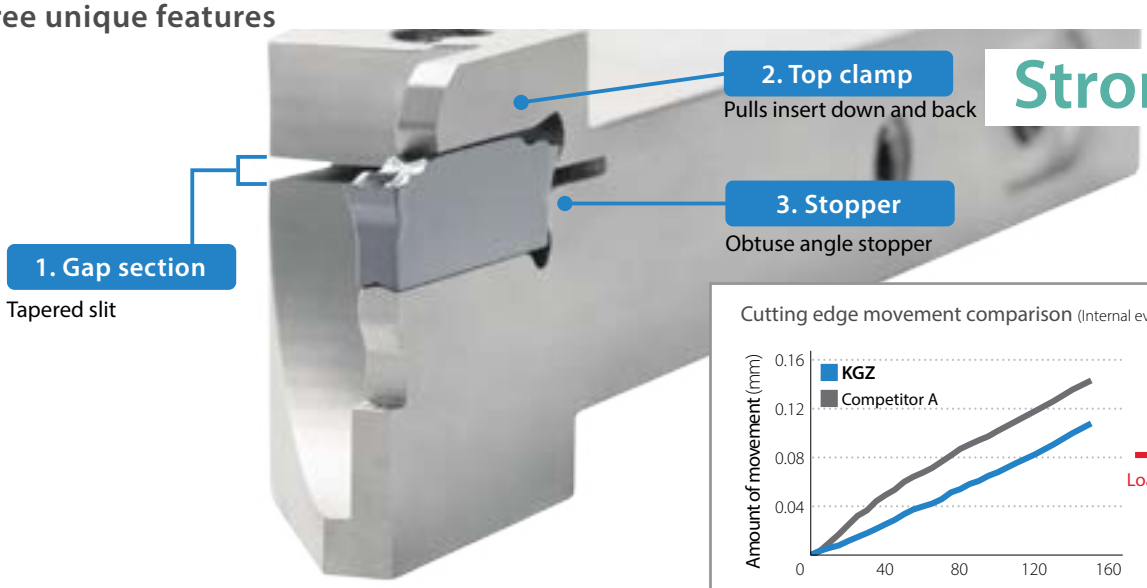
KGZ

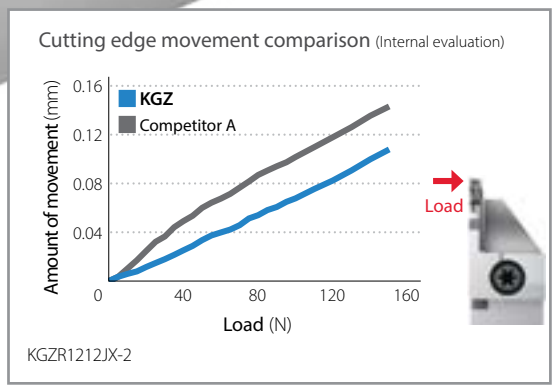
Provides stable machining and is easy to use with unique clamp design
New coating PR20 series provides longer tool life and supports a wide range of applications

1 Achieved stable machining with newly developed clamp structure

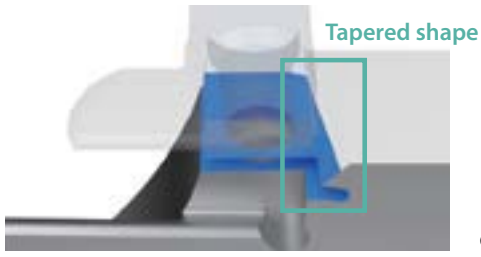
Toolholder Sturdy clamps

Three unique features





1. Gap section Tapered slit creates strong insert hold



CG Image



CG Image

2. Top clamp

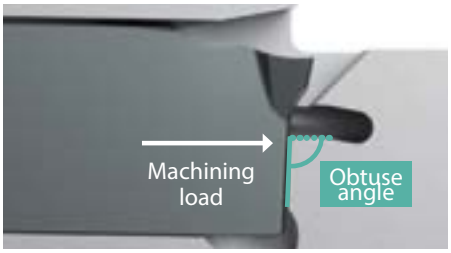
Pulls insert inward to increase hold



CG Image

3. Stopper

The insert stop is designed with an obtuse shape to resist machining load and a large surface area distributes stress
Improved holder durability for high-eciency machining



CG Image

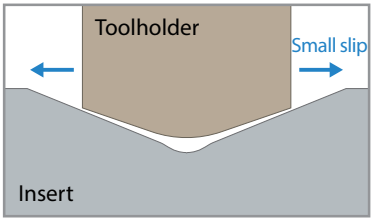
Insert Ease insert installation

Top V Shape Different groove angles at ends and center

Dependability

Groove end

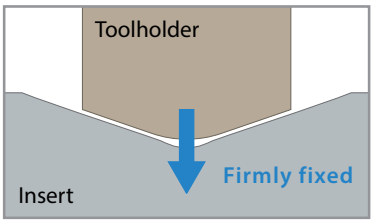
Small groove angle on top of insert
These grooves prevent the insert from shifting and provide fast and accurate insert mounts



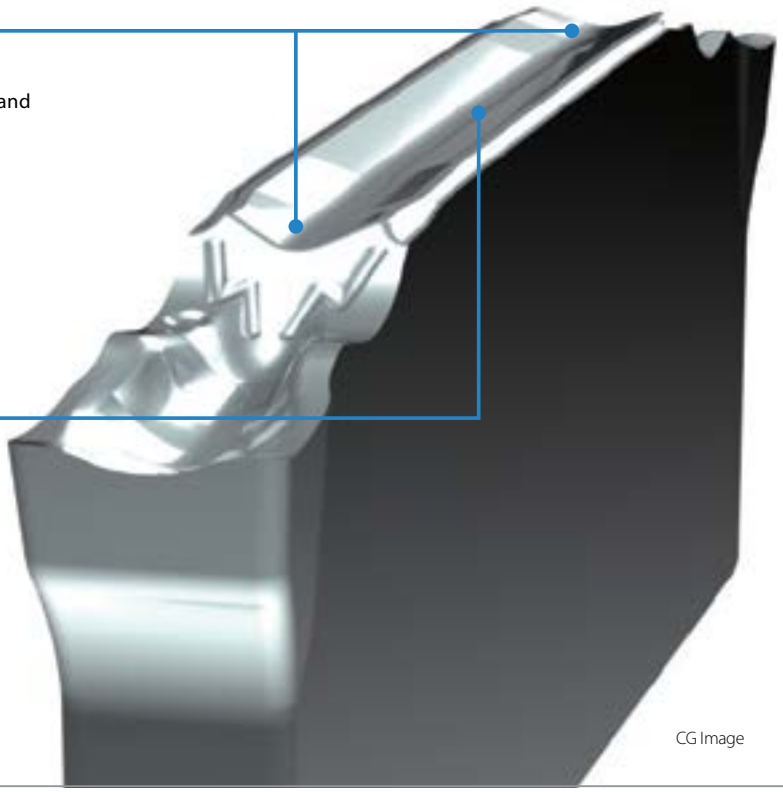
Image

Center of groove

Large groove angle on top of insert
Firmly engages the toolholder to increase hold



Image



CG Image

Excellent chatter resistance

Machined surface comparison (Internal evaluation)





Cutting conditions : Vc = ~ 60 m/min, f = 0.12 mm/rev, Workpiece material : X10CrNiS18 9 (ø14)
Wet (External coolant) KGZR1212JX-2 Edge width : 2 mm(PM Chipbreaker)

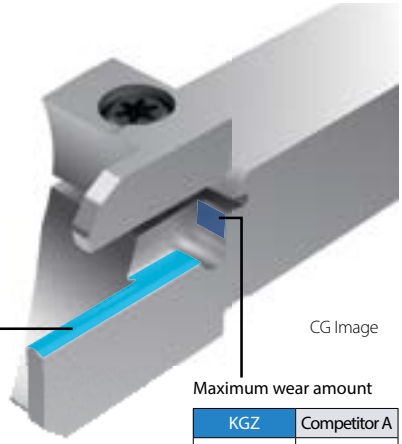
Strong toolholder durability

Toolholder durability comparison (Internal evaluation)

Toolholder damage comparison after 100,000 cuts

Maximum wear amount

KGZ	Competitor A
0.015 mm	0.02 mm
	Large



CG Image

Maximum wear amount

KGZ	Competitor A
0.01 mm	0.035 mm
	Large

Cutting conditions : Vc = ~ 80 m/min, f = 0.1 mm/rev, Workpiece material : X10CrNiS18 9 (ø14)
Wet (External coolant) KGZR1212JX-2 Edge width : 2 mm(PM Chipbreaker)

2 New insert grades PR20 series is available MEGACOAT NANO EX coating technology provides longer tool life

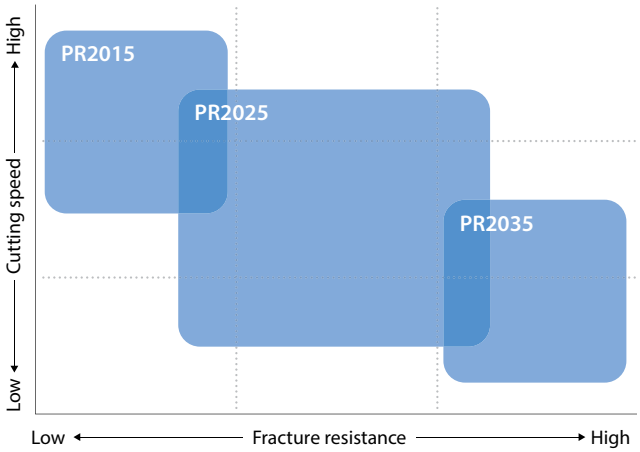
New insert grades for grooving and cut-off solutions

PR20 Series

PR2015 **1st recommendation for cast iron**
Also available for steel and stainless steel

PR2025 **1st recommendation for steel**
Also available for stainless steel

PR2035 **1st recommendation for stainless steel**
Also available for steel



H

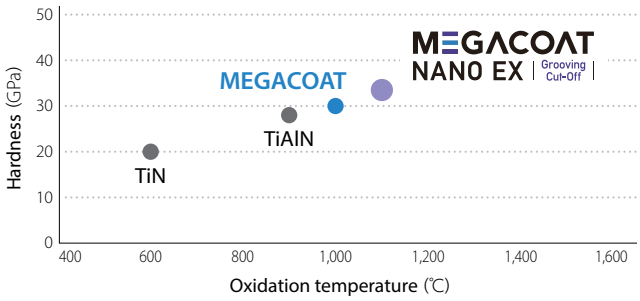
Cut-Off

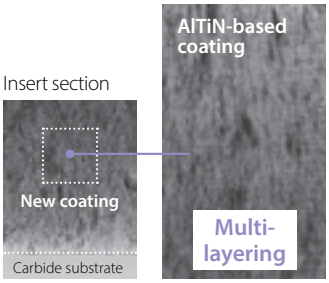
New coating for grooving and cut-o machining

MEGACOAT NANO EX Grooving Cut-Off

Achieve long tool life and high stability with
the combination of high content aluminum nano coating layer

Coating characteristics (Internal evaluation)





Special nano coating layer

Long tool life — Excellent wear and fracture resistance

Multi-layering of high content aluminum nano layers added with high melting point material having dierent concentration
Suppresses hexagonal crystal precipitation and achieves excellent oxidation resistance

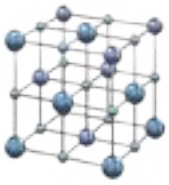
Stable machining — High coating toughness

Crystal grain renement
Optimized internal stress suppresses crack growth

Unique Technology (Patent applied)

Proprietary coating process
Improve high content aluminum nano layers performance

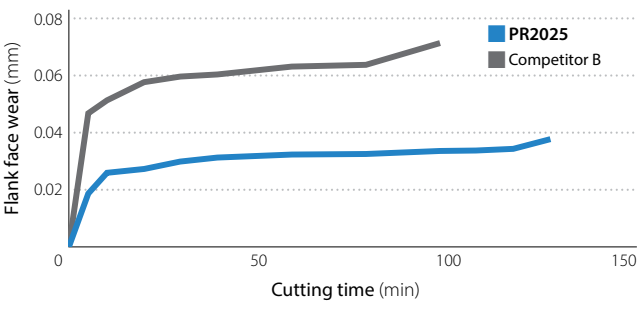
Maintains a cubic crystal structure to maximize the properties of aluminum (Al)



CG image

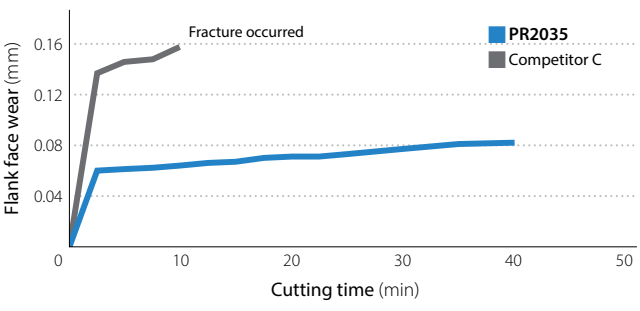
Cutting performance

C45 Wear resistance comparison (Internal evaluation)



Cutting conditions : Vc = ~ 100 m/min, f = 0.1 mm/rev
Workpiece material : C45 (ø20) Wet (External coolant) GZM2020N-020PM

X5CrNi18 10 Wear resistance comparison (Internal evaluation)



Cutting conditions : Vc = ~ 80 m/min, f = 0.05 mm/rev
Workpiece material : X5CrNi18 10 (ø20) Wet (External coolant)) GZM2020N-020PM

3 Choose from a variety of insert and chipbreaker combinations for a wide range of applications

	Chip control oriented			Sharp edge
	Low feed machining	Medium feed machining	High feed machining	Low cutting force
Chipbreakers	**PF Chipbreaker**	**PM Chipbreaker**	**PH Chipbreaker**	**PG Chipbreaker**
				
	With/Without Lead angle	With/Without Lead angle	No Lead angle	With/Without Lead angle
Grades	PR2015 PR2025 PR2035	PR2015 PR2025 PR2035	PR2015 PR2025 PR2035	PR2025 PR2035 PDL025 GW15
Features	Edge width from 1.3 mm For reducing cost of steel workpiece	High versatility For a variety of machining	Reduced cycle time For high feed machining	Superior sharpness For aluminum alloy machining
				
	S10C	SUS304	S45C	A6061

4 Supports vibration/oscillation machining with stable chip control and longer tool life

Stable machining **Breaks chips into small pieces with vibration machining**

X5CrNi18 10 Chip control comparison (Internal evaluation)

PF Chipbreaker



Good — Breaks chips into small pieces

Cutting conditions : Vc = ~ 120 m/min, f = 0.03 mm/rev
Workpiece material : X5CrNi18 10 (ø14) Wet (External coolant)
KGZR1212JX-2 Edge width : 2 mm

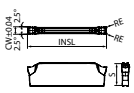
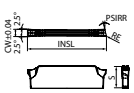
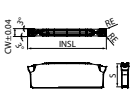
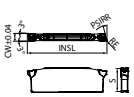
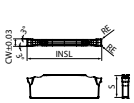
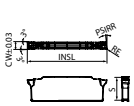
PM Chipbreaker



Good — Breaks chips into small pieces

Cutting conditions : Vc = ~ 120 m/min, f = 0.05 mm/rev
Workpiece material : X5CrNi18 10 (ø14) Wet (External coolant)
KGZR1616JX-2 Edge width : 2 mm

GZM/GZMS/GZG

														Carbon steel / Alloy steel		P
														Stainless steel		M
														Cast iron		K
														Non-ferrous metals		N
Insert		Description			No. of edges	Dimension (mm)				Angle (°)	Tolerance (mm)		Carbide			Applicable toolholder ➡ H26~H29
						CW	S	RE	INSL	PSIR^{R}/$_{L}$	CW min.	CW max.	PVD			
													PR2015	PR2025	PR2035	
	 Low feed	GZM	1316N-003PF 1316N-015PF		2	1.3	4.4	0.03 0.15	16	-	- 0.04	+ 0.04	● ●	● ●	● ●	KGZ^{R}/L...-1.3(...) KGZS^{R}/L...-1.3(...)
		GZM	1516N-003PF 1516N-015PF		2	1.5	4.4	0.03 0.15	16	-	- 0.04	+ 0.04	● ●	● ●	● ●	KGZ^{R}/L...-1.5(...) KGZS^{R}/L...-1.5(...)
	 Low feed	GZM	1316R-003PF-15D 1316L-003PF-15D		2	1.3	4.4	0.03	16	15	- 0.04	+ 0.04	● ●	● ●	● ●	KGZ^{R}/L...-1.3(...) KGZS^{R}/L...-1.3(...)
		GZM	1516R-003PF-15D 1516L-003PF-15D 1516R-015PF-15D		2	1.5	4.4	0.03 0.03 0.15	16	15	- 0.04	+ 0.04	● ● ●	● ● ●	● ● ●	KGZ^{R}/L...-1.5(...) KGZS^{R}/L...-1.5(...)
	 Low feed	GZM	2020N-003PF 2020N-015PF		2	2	5.9	0.03 0.15	20	-	- 0.04	+ 0.04	● ●	● ●	● ●	KGZ^{R}/L...-2(...) KGZS^{R}/L-2(...)
		GZM	2520N-003PF 2520N-015PF		2	2.5	5.9	0.03 0.15	20	-	- 0.04	+ 0.04	● ●	● ●	● ●	KGZ^{R}/L...-2(...) KGZ^{R}/L...-2.4(...) KGZS^{R}/L-2(...)
		GZM	3020N-003PF 3020N-015PF		2	3	5.9	0.03 0.15	20	-	- 0.04	+ 0.04	● ●	● ●	● ●	KGZ^{R}/L...-2(...) KGZ^{R}/L...-2.4(...) KGZ^{R}/L...-3(...) KGZS^{R}/L-2(...)
	 Low feed	GZM	2020R-003PF-15D 2020L-003PF-15D 2020R-015PF-15D		2	2	5.9	0.03 0.03 0.15	20	15	- 0.04	+ 0.04	● ● ●	● ● ●	● ● ●	KGZ^{R}/L...-2(...) KGZS^{R}/L-2(...)
		GZM	2520R-003PF-15D 2520L-003PF-15D 2520R-015PF-15D		2	2.5	5.9	0.03 0.03 0.15	20	15	- 0.04	+ 0.04	● ● ●	● ● ●	● ● ●	KGZ^{R}/L...-2(...) KGZ^{R}/L...-2.4(...) KGZS^{R}/L-2(...)
		GZM	3020R-003PF-15D 3020L-003PF-15D 3020R-015PF-15D		2	3	5.9	0.03 0.03 0.15	20	15	- 0.04	+ 0.04	● ● ●	● ● ●	● ● ●	KGZ^{R}/L...-2(...) KGZ^{R}/L...-2.4(...) KGZ^{R}/L...-3(...) KGZS^{R}/L-2(...)
	 Medium feed	GZM	2020N-020PM		2	2	5.9	0.2	20	-	- 0.03	+ 0.03	●	●	●	KGZ^{R}/L...-2(...) KGZS^{R}/L-2(...)
		GZM	2520N-020PM		2	2.5	5.9	0.2	20	-	- 0.03	+ 0.03	●	●	●	KGZ^{R}/L...-2(...) KGZ^{R}/L...-2.4(...) KGZS^{R}/L-2(...)
		GZM	3020N-025PM		2	3	5.9	0.25	20	-	- 0.03	+ 0.03	●	●	●	KGZ^{R}/L...-2(...) KGZ^{R}/L...-2.4(...) KGZ^{R}/L...-3(...) KGZS^{R}/L-2(...)
	 Medium feed	GZM	2020R-020PM-6D		2	2	5.9	0.2	20	6	- 0.03	+ 0.03	●	●	●	KGZ^{R}/L...-2(...) KGZS^{R}/L-2(...)
		GZM	2520R-020PM-6D		2	2.5	5.9	0.2	20	6	- 0.03	+ 0.03	●	●	●	KGZ^{R}/L...-2(...) KGZ^{R}/L...-2.4(...) KGZS^{R}/L-2(...)
		GZM	3020R-025PM-6D		2	3	5.9	0.25	20	6	- 0.03	+ 0.03	●	●	●	KGZ^{R}/L...-2(...) KGZ^{R}/L...-2.4(...) KGZ^{R}/L...-3(...) KGZS^{R}/L-2(...)

Handed insert shows Right-hand
Using the PF / PM chipbreaker (for cut-off) for grooving cannot create a flat bottom (Ref. to the right figure).


Groove bottom created by PF / PM chipbreaker

GZM/GZMS/GZG

									Carbon steel / Alloy steel		●	●	●			P
									Stainless steel		●	●	●			M
									Cast iron		●					K
									Non-ferrous metals	●				●		N
Insert		Description			No. of edges	Dimension (mm)				Angle (°)	Tolerance (mm)		Carbide				Applicable toolholder ⇨ H26~H29
						CW	S	RE	INSL	PSIR$^{R}/_{L}$	CW min.	CW max.	DLC	PVD		-	
													PDL025	PR2015	PR2025	PR2035	GW15	
		GZM	2020N-020PH		2	2	5.9	0.2	20	-	- 0.03	+ 0.03		●	●	●		KGZ$^{R}/_{L}$....-2(...) KGZS$^{R}/_{L}$-2(...)
	High feed	GZM	2520N-020PH		2	2.5	5.9	0.2	20	-	- 0.03	+ 0.03		●	●	●		KGZ$^{R}/_{L}$....-2(...) KGZ$^{R}/_{L}$....-2.4(...) KGZS$^{R}/_{L}$-2(...)
		GZM	3020N-030PH		2	3	5.9	0.03	20	-	- 0.03	+ 0.03		●	●	●		KGZ$^{R}/_{L}$....-2(...) KGZ$^{R}/_{L}$....-2.4(...) KGZ$^{R}/_{L}$....-3(...) KGZS$^{R}/_{L}$-2(...)
		GZMS	2020N-020PH		1	2	5.9	0.2	20	-	- 0.03	+ 0.03		●	●	●		KGZ$^{R}/_{L}$....-2(...) KGZS$^{R}/_{L}$-2(...)
	High feed	GZMS	3020N-030PH		1	3	5.9	0.03	20	-	- 0.03	+ 0.03		●	●	●		KGZ$^{R}/_{L}$....-2(...) KGZ$^{R}/_{L}$....-2.4(...) KGZ$^{R}/_{L}$....-3(...) KGZS$^{R}/_{L}$-2(...)
		GZG	2020N-005PG		2	2	5.9	0.05	20	-	- 0.02	+ 0.02	●		●	●	●	KGZ$^{R}/_{L}$....-2(...) KGZS$^{R}/_{L}$-2(...)
	Low cutting force	GZG	2520N-005PG		2	2.5	5.9	0.05	20	-	- 0.02	+ 0.02	●		●	●	●	KGZ$^{R}/_{L}$....-2(...) KGZ$^{R}/_{L}$....-2.4(...) KGZS$^{R}/_{L}$-2(...)
		GZG	3020N-005PG		2	3	5.9	0.05	20	-	- 0.02	+ 0.02	●		●	●	●	KGZ$^{R}/_{L}$....-2(...) KGZ$^{R}/_{L}$....-2.4(...) KGZ$^{R}/_{L}$....-3(...) KGZS$^{R}/_{L}$-2(...)
		GZG	2020R-005PG-15D		2	2	5.9	0.05	20	15	- 0.02	+ 0.02	●		●	●	●	KGZ$^{R}/_{L}$....-2(...) KGZS$^{R}/_{L}$-2(...)
	Low cutting force	GZG	2520R-005PG-15D		2	2.5	5.9	0.05	20	15	- 0.02	+ 0.02	●		●	●	●	KGZ$^{R}/_{L}$....-2(...) KGZ$^{R}/_{L}$....-2.4(...) KGZS$^{R}/_{L}$-2(...)
		GZG	3020R-005PG-15D		2	3	5.9	0.05	20	15	- 0.02	+ 0.02	●		●	●	●	KGZ$^{R}/_{L}$....-2(...) KGZ$^{R}/_{L}$....-2.4(...) KGZ$^{R}/_{L}$....-3(...) KGZS$^{R}/_{L}$-2(...)

Handed insert shows Right-hand
Using the PF / PM chipbreaker (for cut-off) for grooving cannot create a flat bottom (Ref. to the right figure).



Groove bottom created by PF / PM chipbreaker

Inserts identification system

Tolerance symbol	
G	Ground insert
M	M class

Edge width			
13	1.3 mm	25	2.5 mm
15	1.5 mm	30	3 mm
20	2 mm		

Hand of tool	
R	Right-hand
L	Left-hand
N	Neutral

Chipbreaker symbol			
PF	Cut-off (Low feed)	PG	Cut-off (Low cutting force)
PM	Cut-off (Medium feed)		
PH	Cut-off (High feed rate)		

GZ **M** **[ ]** **30** **20** **R** - **025** **PM** - **6D**

Series
Cut-off
GZ Series

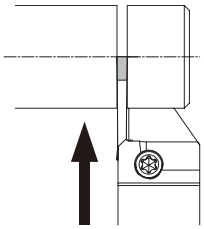
No. of edge	
No indication	2-edge
S	1-edge

Insert length	
16	16 mm
20	20 mm

Corner-R (RE)			
003	0.03 mm	020	0.2 mm
005	0.05 mm	025	0.25 mm
015	0.15 mm	030	0.3 mm

Lead angle	
No indication	0°
6D	6°
15D	15°

KGZ-JCTM (Coolant-through holders)



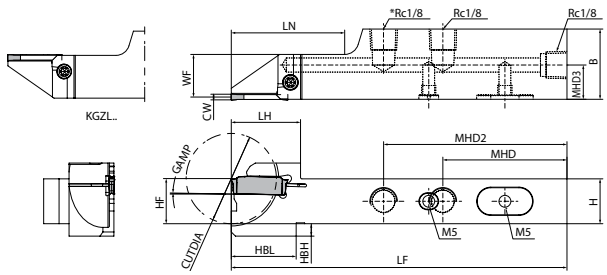


Fig. 1

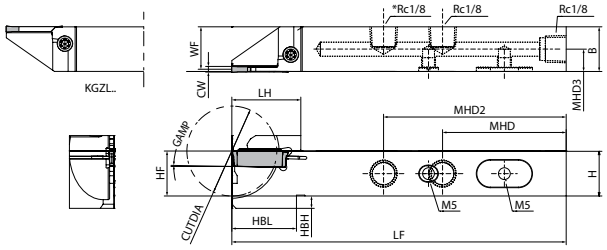


Fig. 2

Right-hand shown | KGZ R/L 12...JCTM : 2-Rc1/8

H

Cut-Off

Toolholder dimensions

Description		Availability		Dimension (mm)															Angle	Coolant hole	Fig.	Spare parts				Applicable inserts ⇒ H24, H25
																						Plug 1	Plug 2	Screw	Wrench	
		R	L	CUTDIA	H	B	LH	MHD	MHD2	MHD3	HF	HBH	HBL	LF	LN	WF	CW min.	CW max.	GAMP (°)							
KGZR	1212JX-2JCTM	●		24	12	12	19.8	59	-	6	12	5	19.8	120	-	11.2	2	3	1	Yes	2	GP-1	HS5X4LP	SB-40120TR	LTW-15S	GZG2020... GZM2020... GZMS2020... GZG2520... GZM2520... GZG3020... GZM3020... GZMS3020...
KGZL	1212JX-2JCTM		●																							
KGZR	1218JX-2JCTM	●				18		54		8.4		8.5			43.7						1					
KGZL	1218JX-2JCTM		●							7.7																
KGZR	1616JX-2JCTM	●		32	16	16	24.8	44	65	8	16	4.5	23.2	120	-	15.2	2	3	1	Yes	2					
KGZL	1616JX-2JCTM		●																							
KGZR	1625JX-2JCTM	●				25				12.2					40						1					
KGZL	1625JX-2JCTM		●							7.7																
KGZR	1212JX-2.4JCTM	●		24	12	12	19.8	59	-	6	12	5	19.8	120	-	11	2.4	3	1	Yes	2	GP-1	HS5X4LP	SB-40120TR	LTW-15S	GZG2520... GZM2520... GZG3020... GZM3020... GZMS3020...
KGZL	1212JX-2.4JCTM		●																							
KGZR	1218JX-2.4JCTM	●				18		54		8.4		8.5			43.7						1					
KGZL	1218JX-2.4JCTM		●							7.7																
KGZR	1616JX-2.4JCTM	●		32	16	16	24.8	44	65	8	16	4.5	23.2	120	-	15	2.4	3	1	Yes	2					
KGZL	1616JX-2.4JCTM		●																							
KGZR	1625JX-2.4JCTM	●				25				12.2					40						1					
KGZL	1625JX-2.4JCTM		●							7.7																
KGZR	1212JX-3JCTM	●		24	12	12	19.8	59	-	6	12	5	19.8	120	-	10.8	3	3	1	Yes	2	GP-1	HS5X4LP	SB-40120TR	LTW-15S	GZG3020... GZM3020... GZMS3020...
KGZL	1212JX-3JCTM		●																							
KGZR	1218JX-3JCTM	●				18		54		8.6		8.5			43.7						1					
KGZL	1218JX-3JCTM		●							7.7																
KGZR	1616JX-3JCTM	●		32	16	16	24.8	44	65	8	16	4.5	23.2	120	-	14.8	3	3	1	Yes	2					
KGZL	1616JX-3JCTM		●																							
KGZR	1625JX-3JCTM	●				25				12.2					40						1					
KGZL	1625JX-3JCTM		●							7.7																

Recommended cutting conditions ⇒ H44, H45

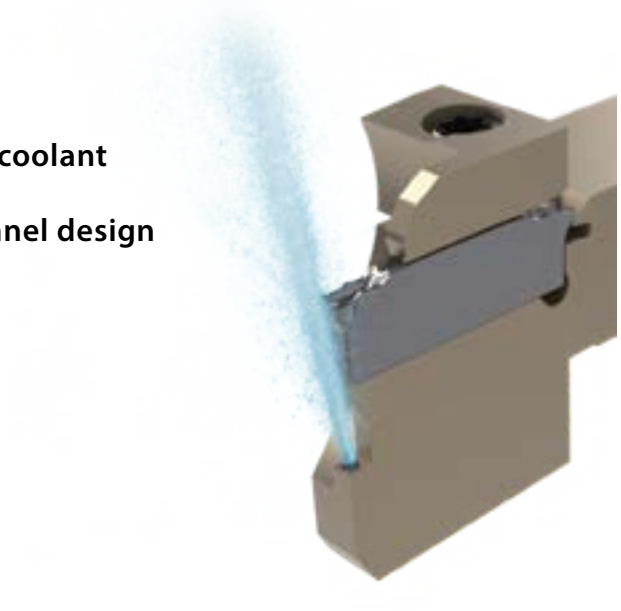
Direct coolant holder for small parts machining

JCTM Series

Long tool life and stable machining by internal coolant with/without piping system
Rectangular shank with optimized coolant channel design

1st recommendation

Square shank is also available



CG Image

Without piping When the tool turret supports direct coolant

- Coolant is supplied directly from tool turret into the holder
- No need for piping just by installing tools

With piping

- Compatible with internal coolant on any machine with standard piping parts

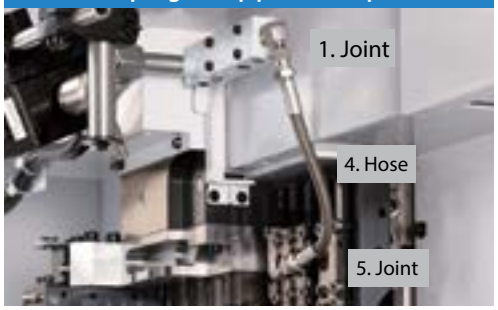
H

Cut-Off

Piping parts

Piping parts will be required separately if internal coolant is used.
Pump pressure : Up to 20 MPa. Pump pressure: Up to 7.5 MPa if coupling is used.

Without coupling (Pump pressure: Up to 20 MPa)

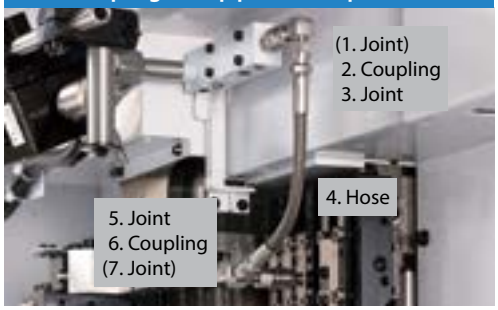


Combination Part Description (Example)

Spare Parts	Description
1. Joint	J-AN-R1/8-G1/8
4. Hose	HS-G1/8-G1/8-200
5. Joint	J-AN-R1/8-G1/8

Convert the thread standards on the machine's side (Rc1/4, Rc1/8, NPT1/8, etc.) to the thread standard on the hose side (G1/8) for use.
Use sealing agents such as seal tapes when installing piping parts.

With coupling (Pump pressure: Up to 7.5 MPa)



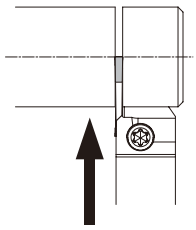
Combination Part Description (Example)

Spare Parts	Description
(1. Joint)	–
2. Coupling	CP-ST-R1/8, P-ST-RC1/8
3. Joint	J-AN-R1/8-G1/8
4. Hose	HS-G1/8-G1/8-200
5. Joint	J-AN-R1/8-G1/8
6. Coupling	P-ST-RC1/8, CP-ST-R1/8
(7. Joint)	–

Convert the thread standards on the machine's side (Rc1/4, Rc1/8, NPT1/8, etc.) to the thread standards of the coupling (Rc1/8, etc.) or hose (G1/8) for use.
Use sealing agents such as seal tapes when installing piping parts.

For piping installation parts description, please refer to H17.

KGZ (for Automatic Lathe)



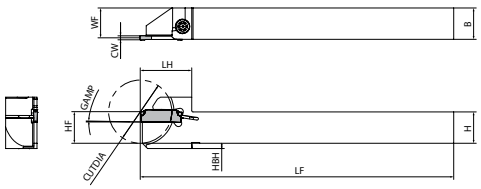


Fig. 1

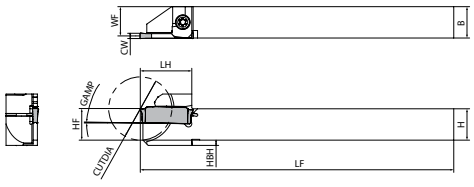
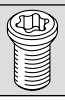


Fig. 2

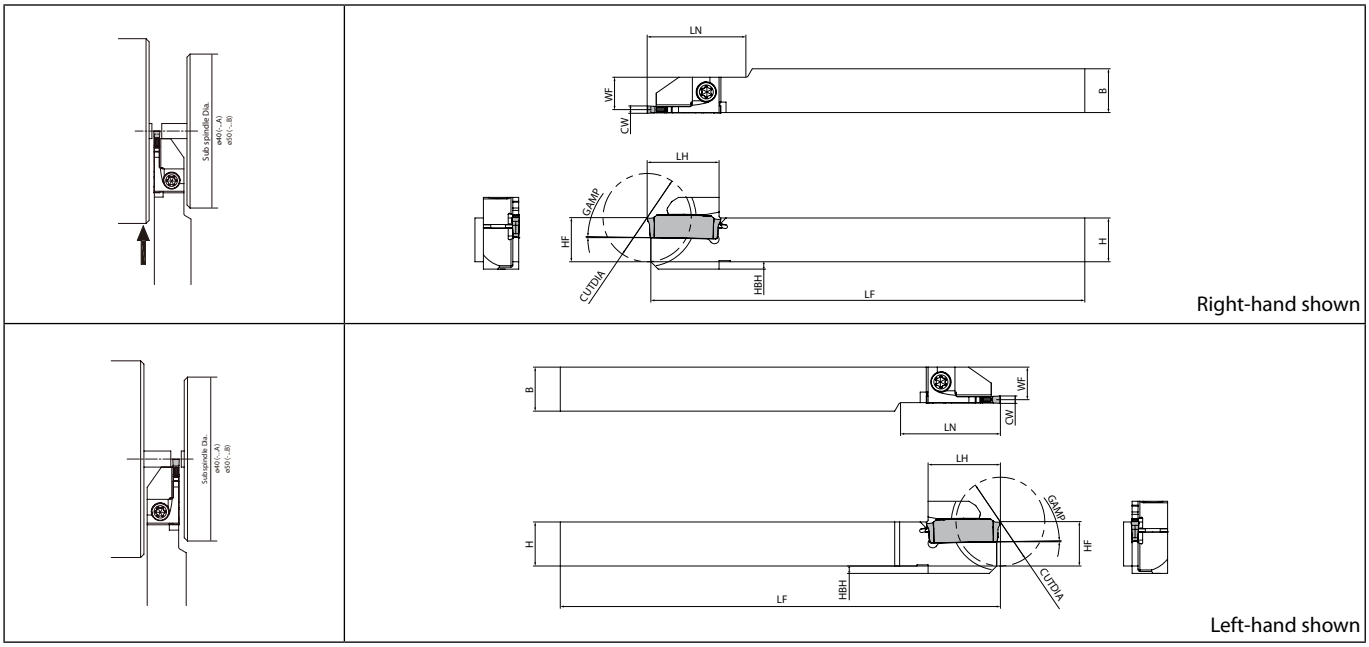
Right-hand shown

Toolholder dimensions

Description		Availability		Dimension (mm)										Angle	Fig.	Spare parts					Applicable inserts ⇨ H24, H25
																Clamp bolt	Screw	Screw	Wrench	Wrench	
		R	L	CUTDIA	H	B	LH	HF	HBH	LF	WF	CW min.	CW max.	GAMP (°)							
KGZ R/L	1010JX-1.3D16	●	●	16	10	10	17.8	10	2.1	120	9.5	1.3	1.3	1	1	-	SB-40120TR	-	-	LTW-15S	GZM1316...
	1010JX-1.3	●	●	20			18.7														
	1212F-1.3D16	●	●	16	12	12	17.8	12		85	11.5										
	1212JX-1.3D16	●	●							120											
	1212F-1.3	●	●	24			19.8			85											
	1212JX-1.3	●	●							120											
KGZ R/L	1010JX-1.5D16	●	●	16	10	10	17.8	10	2.1	120	9.4	1.5	1.5	1	1	-	SB-40120TR	-	-	LTW-15S	GZM1516...
	1010JX-1.5	●	●	20			18.7														
	1212F-1.5D16	●	●	16	12	12	17.8	12		85	11.4										
	1212JX-1.5D16	●	●							120											
	1212F-1.5	●	●	24			19.8			85											
	1212JX-1.5	●	●							120											
KGZ R/L	1010JX-2	●	●	20	10	10	18.7	10	2.1	120	9.2	2	3	2	2	-	SB-40120TR	-	-	LTW-15S	GZG2020... GZM2020... GZMS2020... GZG2520... GZM2520... GZG3020... GZM3020... GZMS3020...
	1212F-2	●	●	24	12	12	19.8	12		85	11.2										
	1212JX-2	●	●							120											
	1616JX-2	●	●	32	16	16	24.8	16	-		15.2										
	2012K-2D34	●	●	34	20	12	26.8	20		125	11.2						-	SE-50125TR		LTW-20	
	2020K-2D34	●	●			20					19.2										
	2525K-2D34	●	●		25	25	32.7	25			24.2					HH5X16		-	LW-4	-	
KGZ R/L	1010JX-2.4	●	●	20	10	10	18.7	10	2.1	120	9	2.4	3	2	2	-	SB-40120TR	-	-	LTW-15S	GZG2520... GZM2520... GZG3020... GZM3020... GZMS3020...
	1212F-2.4	●	●	24	12	12	19.8	12		85	11										
	1212JX-2.4	●	●							120											
	1616JX-2.4	●	●	32	16	16	24.6	16	-		15										
	2012K-2.4D34	●	●	34	20	12	26.6	20		125	11						-	SE-50125TR		LTW-20	
	2020K-2.4D34	●	●			20					19										
	2525K-2.4D34	●	●		25	25	32.7	25			24					HH5X16		-	LW-4	-	
KGZ R/L	1212JX-3	●	●	24	12	12	19.8	12	2.1	120	10.8	3	3	1	2	-	SB-40120TR	-	-	LTW-15S	GZG3020... GZM3020... GZMS3020...
	1616JX-3	●	●	32	16	16	24.6	16	-		14.8										
	1616JX-3D38	●	●	38			28.6									-	-	SE-50125TR	-	LTW-20	
	1913K-3D38	●	●		19	13		19		125	11.8										
	2012JX-3D42	●	●	42	20	12	30.7	20		120	10.8										
	2012JX-3D51	●	●	51			35.2														
	2020JX-3D42	●	●	42		20	30.7				18.8										
	2020JX-3D51	●	●	51			35.2														
	2525K-3D51	●	●		25	25	41.7	25		125	23.8					HH5X16		-	LW-4	-	

Recommended cutting conditions ⇨ H31

KGZS (Cut-off / for sub spindle tooling)

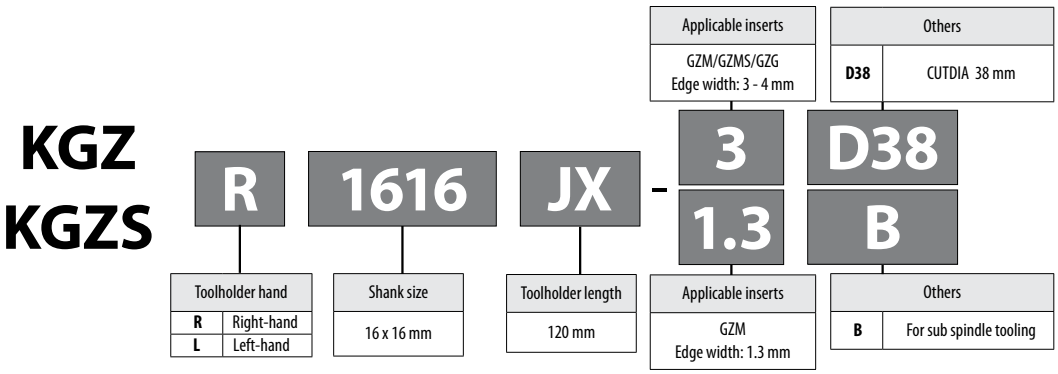


Toolholder dimensions

Description		Availability		Dimension (mm)											Angle	Spare parts		Applicable inserts ➡ H24, H25
		R	L	CUTDIA	H	B	LH	HF	HBH	LF	LN	WF	CW min.	CW max.	GAMP (°)	Screw	Wrench	
KGZS R/L	1212F-1.3A	●	●	24	12	12	19.8	12	2.1	85	22	8.4	1.3	1.3	1	SB-40120TR	LTW-15S	GZM1316...
	1212JX-1.3B	●	●							120	27							
	1616JX-1.3B	●	●		16	16		16	-									
KGZS R/L	1212F-1.5A	●	●		12	12		12	2.1	85	22	8.4	1.5	1.5		SB-40120TR	LTW-15S	GZM1516...
	1212JX-1.5B	●	●							120	27							
	1616JX-1.5B	●	●		16	16		16	-									
KGZS R/L	1212F-2A	●	●		12	12		12	2.1	85	22	8.7	2	3		SB-40120TR	LTW-15S	GZG2020... , GZM2020... , GZMS2020... , GZG2520... , GZM2520... , GZG3020... , GZM3020... , GZMS3020...
	1212JX-2B	●	●							120	27							
	1616JX-2B	●	●		16	16		16	-									

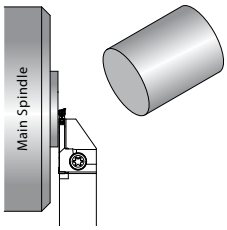
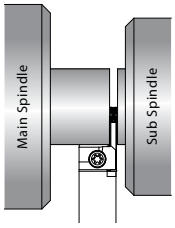
Recommended cutting conditions ➡ H31

Toolholder identification system

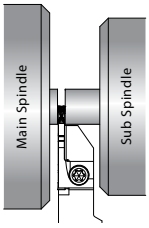
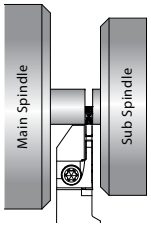


KGZ / KGZS selection reference

KGZ

Standard type	
· Both Right-hand and Left-hand types are applicable to gang tool post. · Basically Left-hand type is used for cut-off operation using a sub spindle.	
KGZR (Right-hand toolholder)	KGZL (Left-hand toolholder)
	
<1st. Recommendation> Use insert with lead angle to remove boss. · Not using sub spindle · Cut-off operation near main spindle side	<1st. Recommendation> Use insert without lead angle. · Using sub spindle · Cut-off operation near sub spindle side

KGZS

Sub spindle type	
· When machining workpiece with small diameter, use KGZS to reduce overhang distance from the main spindle.	
KGZSR (Right-hand toolholder)	KGZSL (Left-hand toolholder)
	
· Long workpiece and more rigidity · Cut-off operation near main spindle side	· Short workpiece and less rigidity · Cut-off operation near sub spindle side

H

Cut-Off

KGZ recommended cutting conditions

Workpiece material	Recommended insert grades (Vc: m/min)			f (mm/rev)						Remarks
				PF (RE = 0.03 mm)			PF (RE = 0.15 mm)			
	MEGACOAT NANO EX			Edge width CW (mm)						
	PR2015	PR2025	PR2035	1.3 / 1.5	2.0	2.5 / 3.0	1.3 / 1.5	2.0	2.5 / 3.0	
Carbon steel	☆ 70 ~ 180	★ 70 ~ 150	☆ 70 ~ 150	0.01 ~ 0.04	0.02 ~ 0.06	0.02 ~ 0.08	0.01 ~ 0.05	0.03 ~ 0.08	0.04 ~ 0.10	Coolant
Alloy steel	☆ 70 ~ 180	★ 70 ~ 150	☆ 70 ~ 150							
Stainless steel	☆ 60 ~ 150	☆ 60 ~ 120	★ 60 ~ 120	0.01 ~ 0.03	0.01 ~ 0.04	0.01 ~ 0.05	0.01 ~ 0.04	0.03 ~ 0.07	0.04 ~ 0.08	
Cast iron	★ 80 ~ 200	-	-	0.01 ~ 0.05	0.02 ~ 0.07	0.03 ~ 0.08	0.01 ~ 0.06	0.03 ~ 0.09	0.04 ~ 0.10	

★: 1st Recommendation : 2nd Recommendation

Workpiece material	Recommended insert grades (Vc: m/min)					f (mm/rev)				Remarks
						PM	PH	PG		
	MEGACOAT NANO EX			DLC coated carbide	Carbide	Edge width CW (mm)				
	PR2015	PR2025	PR2035	PDL025	GW15	2.0 ~ 3.0	2.0 ~ 3.0	2.0	2.5 / 3.0	
Carbon steel	☆ 70 ~ 180	★ 70 ~ 150	☆ 70 ~ 150	-	-	0.05 ~ 0.15	0.10 ~ 0.20	0.01 ~ 0.04	0.01 ~ 0.05	Coolant
Alloy steel	☆ 70 ~ 180	★ 70 ~ 150	☆ 70 ~ 150	-	-					
Stainless steel	☆ 60 ~ 150	☆ 60 ~ 120	★ 60 ~ 120	-	-	0.04 ~ 0.12	0.08~ 0.16	0.01 ~ 0.03	0.01 ~ 0.04	
Cast iron	★ 80 ~ 200	-	-	-	☆ 50 ~ 100	0.05 ~ 0.15	0.10 ~ 0.20	0.01 ~ 0.04	0.01 ~ 0.05	
Aluminum alloys	-	-	-	★ 200 ~ 500	☆ 200 ~ 450	-	-	0.01 ~ 0.05	0.01 ~ 0.06	
Brass	-	-	-	-	★ 100 ~ 200	-	-	0.01 ~ 0.07	0.01 ~ 0.08	

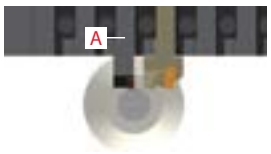
★: 1st Recommendation : 2nd Recommendation

Precautions

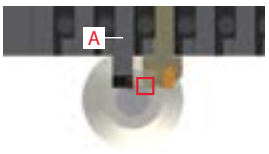
Maximum ap of the next tool (indicated as tool A) and holder interference

1. When using JCTM holder 1218/1212 , note maximum ap of the next tool to avoid interference.

No interference



Interference

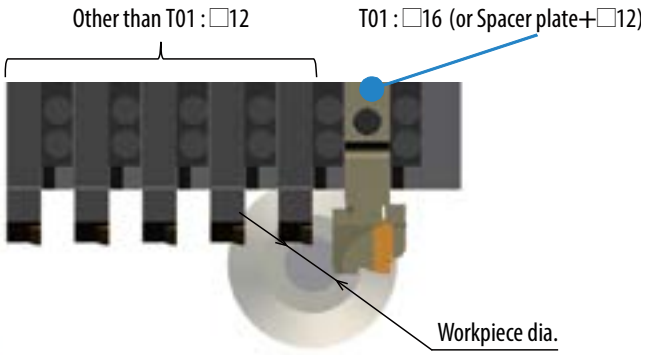


Estimated maximum ap of tool A (mm)

Workpiece dia. / JCTM Description	ø12	ø16	ø20
KGZ$^{R}_{L}$ 1218JX-*JCTM	2.4	2.0	1.7
KGZ$^{R}_{L}$ 1212JX-*JCTM	-	-	3.8

2. When using JCTM holder 1218/1625/1616 for T01 of the following target models, check the workpiece dia. in advance to avoid interference.

<Target models> T01: □16 (or Spacer plate + □12) holder is mounted, and machines other than T01: □12 holder only is mounted.



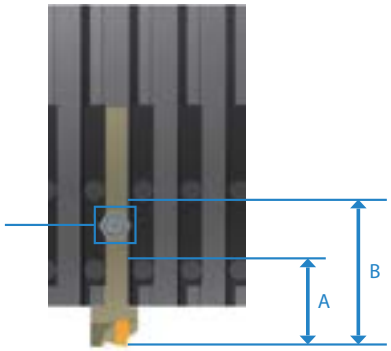
Interference guideline of workpiece dia. (mm)

Workpiece dia. / JCTM Description	ø14 or less	Greater than ø14
KGZ$^{R}_{L}$ 1218JX-*JCTM	Available	Not available →Use □12 square shank
KGZ$^{R}_{L}$ 1616JX-*JCTM		
KGZ$^{R}_{L}$ 1625JX-*JCTM		

Piping part interference avoidance

Rectangular shank (KGZ$^{R}_{L}$1218..., KGZ$^{R}_{L}$1625...) are recommended for use with piping parts connected to JCTM holders.
When connecting piping parts to the JCTM square shank, check the lengths of A and B below to avoid interference with the screws of the tool turret

Adjust the piping part to fit between the top and bottom screws.

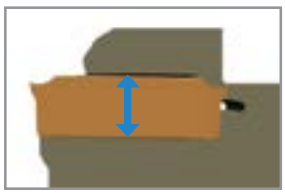


Shank size	Availability of square shank use
□12	"A" shorter than 51.5 mm and "B" longer than 68.5 mm → Available Other than the above conditions → Not available (Use a rectangular shank)
□16	Available

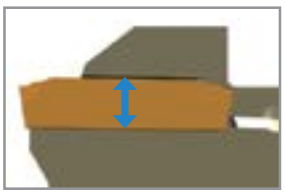
Compatibility with conventional tools

KGZ is not compatible with the conventional tools (KGD/KGM)

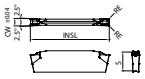
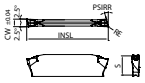
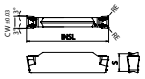
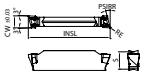
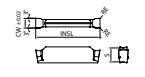
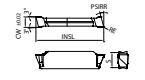
KGZ



Conventional



GDM/GDMS/GDG

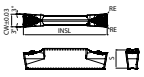
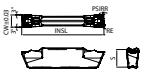
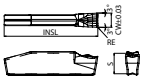
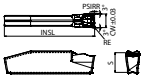
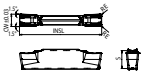
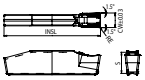
										Carbon steel / Alloy steel		○	●	○		P
										Stainless steel		○	○	●		M
										Cast iron		●				K
										Non-ferrous metals	●				○	N
Insert		Description			No. of edges	Dimension (mm)				Angle (°)	Tolerance (mm)		Carbide				Applicable toolholder ⇨ H34, H36, H39 H40, H41, H43
						CW	S	RE	INSL	PSIR$^{R}_{L}$	CW min.	CW max.	DLC	PVD		-	
													PDL025	PR1215	PR1225	PR1535	GW15	
	 Low feed	GDM	1316N-003PF 1316N-015PF		2	1.3	3.7	0.03 0.15	16	-	- 0.04	+ 0.04		● ●	● ●	● ●		KGD$^{R}_{L}$...-1.3(D16) KGDS$^{R}_{L}$...-1.3B
		GDM	1516N-003PF 1516N-015PF			1.5		0.03 0.15						● ●	● ●	● ●		KGD$^{R}_{L}$...-1.5(D16) KGDS$^{R}_{L}$...-1.5B
		GDM	2020N-003PF 2020N-015PF			2		0.03 0.15						● ●	● ●	● ●		KGD$^{R}_{L}$...-2(...) KGDS$^{R}_{L}$...-2B
		GDM	2520N-003PF 2520N-015PF			2.5	4.3	0.03 0.15	20					● ●	● ●	● ●		KGD$^{R}_{L}$...-2(...), KGD$^{R}_{L}$...-2.4(...) KGDS$^{R}_{L}$...-2B
		GDM	3020N-003PF 3020N-015PF			3		0.03 0.15						● ●	● ●	● ●		KGD$^{R}_{L}$...-2(...), KGD$^{R}_{L}$...-2.4(...) KGD$^{R}_{L}$...-3(...), KGDS$^{R}_{L}$...-2B
	 Low feed	GDM	1316R-003PF-15D 1316L-003PF-15D		2	1.3	3.7	0.03	16	15	- 0.04	+ 0.04		● ●	● ●	● ●		KGD$^{R}_{L}$...-1.3(D16) KGDS$^{R}_{L}$...-1.3B
		GDM	1516R-003PF-15D 1516L-003PF-15D 1516R-015PF-15D			1.5		0.03 0.03 0.15						● ● ●	● ● ●	● ● ●		KGD$^{R}_{L}$...-1.5(D16) KGDS$^{R}_{L}$...-1.5B
		GDM	2020R-003PF-15D 2020L-003PF-15D 2020R-015PF-15D			2		0.03 0.03 0.15						● ● ●	● ● ●	● ● ●		KGD$^{R}_{L}$...-2(...) KGDS$^{R}_{L}$...-2B
		GDM	2520R-003PF-15D 2520L-003PF-15D 2520R-015PF-15D			2.5	4.3	0.03 0.03 0.15	20					● ● ●	● ● ●	● ● ●		KGD$^{R}_{L}$...-2(...), KGD$^{R}_{L}$...-2.4(...) KGDS$^{R}_{L}$...-2B
		GDM	3020R-003PF-15D 3020L-003PF-15D 3020R-015PF-15D			3		0.03 0.03 0.15						● ● ●	● ● ●	● ● ●		KGD$^{R}_{L}$...-2(...), KGD$^{R}_{L}$...-2.4(...) KGD$^{R}_{L}$...-3(...), KGDS$^{R}_{L}$...-2B
	 Medium feed	GDM	2020N-010PQ		2	2	4.3	0.1	20	-	- 0.03	+ 0.03		●	●	●		KGD$^{R}_{L}$...-2(...) KGDS$^{R}_{L}$...-2B
		GDM	2520N-010PQ			2.5								●	●	●		KGD$^{R}_{L}$...-2(...), KGD$^{R}_{L}$...-2.4(...) KGDS$^{R}_{L}$...-2B
		GDM	3020N-010PQ			3								●	●	●		KGD$^{R}_{L}$...-2(...), KGD$^{R}_{L}$...-2.4(...) KGD$^{R}_{L}$...-3(...), KGDS$^{R}_{L}$...-2B
	 Medium feed	GDM	2020R-010PQ-15D		2	2	4.3	0.1	20	15	- 0.03	+ 0.03		●	●	●		KGD$^{R}_{L}$...-2(...) KGDS$^{R}_{L}$...-2B
		GDM	2520R-010PQ-15D			2.5								●	●	●		KGD$^{R}_{L}$...-2(...), KGD$^{R}_{L}$...-2.4(...) KGDS$^{R}_{L}$...-2B
		GDM	3020R-010PQ-15D			3								●	●	●		KGD$^{R}_{L}$...-2(...), KGD$^{R}_{L}$...-2.4(...) KGD$^{R}_{L}$...-3(...), KGDS$^{R}_{L}$...-2B
	 Low cutting force	GDG	2020N-005PG		2	2	4.3	0.05	20	-	- 0.02	+ 0.02	●		●	●	●	KGD$^{R}_{L}$...-2(...) KGDS$^{R}_{L}$...-2B
		GDG	2520N-005PG			2.5							●		●	●	●	KGD$^{R}_{L}$...-2(...), KGD$^{R}_{L}$...-2.4(...) KGDS$^{R}_{L}$...-2B
		GDG	3020N-005PG			3							●		●	●	●	KGD$^{R}_{L}$...-2(...), KGD$^{R}_{L}$...-2.4(...) KGD$^{R}_{L}$...-3(...), KGDS$^{R}_{L}$...-2B
	 Low cutting force	GDG	2020R-005PG-15D		2	2	4.3	0.05	20	15	- 0.02	+ 0.02	●		●	●	●	KGD$^{R}_{L}$...-2(...) KGDS$^{R}_{L}$...-2B
		GDG	2520R-005PG-15D			2.5							●		●	●	●	KGD$^{R}_{L}$...-2(...), KGD$^{R}_{L}$...-2.4(...) KGDS$^{R}_{L}$...-2B
		GDG	3020R-005PG-15D			3							●		●	●	●	KGD$^{R}_{L}$...-2(...), KGD$^{R}_{L}$...-2.4(...) KGD$^{R}_{L}$...-3(...), KGDS$^{R}_{L}$...-2B

Handed insert shows Right-hand
Using the PF / PM chipbreaker (for cut-off) for grooving cannot create a flat bottom (Ref. to the right figure).


Groove bottom created by PF / PM chipbreaker

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

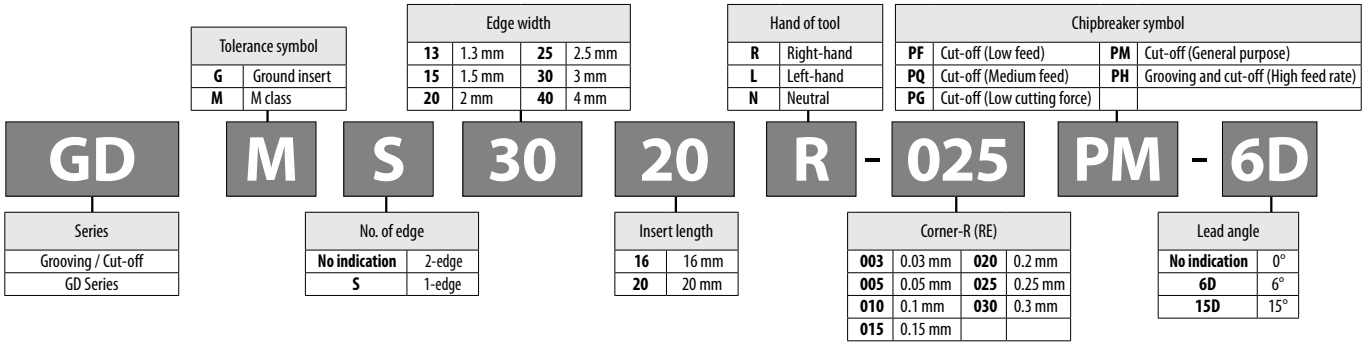
GDM/GDMS/GDG

												Carbon steel / Alloy steel				P
												Stainless steel				M
												Cast iron				K
												Non-ferrous metals				N
Insert		Description			No. of edges	Dimension (mm)				Angle (°)	Tolerance (mm)		Carbide			Applicable toolholder ⇨ H34, H39~H41, H43
						CW	S	RE	INSL	PSIR$^{R}_{L}$	CW min.	CW max.	PVD			
													PR1215	PR1225	PR1535	
		 General purpose	GDM	2020N-020PM	2	2	4.3	0.2	20	-	- 0.03	+ 0.03	●	●	●	KGD$^{R}_{L}$...-2(...) KGDS$^{R}_{L}$...-2B
			GDM	2520N-020PM		2.5							●	●	●	KGD$^{R}_{L}$...-2(...), KGD$^{R}_{L}$...-2.4(...) KGDS$^{R}_{L}$...-2B
			GDM	3020N-025PM		3		0.25					●	●	●	KGD$^{R}_{L}$...-2(...), KGD$^{R}_{L}$...-2.4(...) KGD$^{R}_{L}$...-3(...), KGDS$^{R}_{L}$...-2B
			GDM	4020N-030PM		4		0.3					●	●	●	KGD$^{R}_{L}$...-3(...), KGD$^{R}_{L}$...-3... KGD$^{R}_{L}$...-4T...
		 General purpose	GDM	2020R-020PM-6D	2	2	4.3	0.2	20	6	- 0.03	+ 0.03	●	●	●	KGD$^{R}_{L}$...-2(...) KGDS$^{R}_{L}$...-2B
			GDM	2520R-020PM-6D		2.5							●	●	●	KGD$^{R}_{L}$...-2(...), KGD$^{R}_{L}$...-2.4(...) KGDS$^{R}_{L}$...-2B
			GDM	3020R-025PM-6D		3		0.25					●	●	●	KGD$^{R}_{L}$...-2(...), KGD$^{R}_{L}$...-2.4(...) KGD$^{R}_{L}$...-3(...), KGDS$^{R}_{L}$...-2B
		 General purpose	GDMS	2020N-020PM	1	2	4.3	0.2	20	-	- 0.03	+ 0.03	●	●	●	KGD$^{R}_{L}$...-2(...) KGDS$^{R}_{L}$...-2B
			GDMS	3020N-025PM		3		0.25					●	●	●	KGD$^{R}_{L}$...-2(...), KGD$^{R}_{L}$...-2.4(...) KGD$^{R}_{L}$...-3(...), KGDS$^{R}_{L}$...-2B
			GDMS	4020N-030PM		4		0.3					●	●	●	KGD$^{R}_{L}$...-3(...), KGD$^{R}_{L}$...-3... KGD$^{R}_{L}$...-4T...
		 General purpose	GDMS	2020R-020PM-6D	1	2	4.3	0.2	20	6	- 0.03	+ 0.03	●	●	●	KGD$^{R}_{L}$...-2(...) KGDS$^{R}_{L}$...-2B
			GDMS	3020R-025PM-6D		3		0.25					●	●	●	KGD$^{R}_{L}$...-2(...), KGD$^{R}_{L}$...-2.4(...) KGD$^{R}_{L}$...-3(...), KGDS$^{R}_{L}$...-2B
			GDMS	4020R-030PM-6D		4		0.3					●	●	●	KGD$^{R}_{L}$...-3(...), KGD$^{R}_{L}$...-3... KGD$^{R}_{L}$...-4T...
		 High feed	GDM	2020N-020PH	2	2	4.3	0.2	20	-	- 0.03	+ 0.03	●	●	●	KGD$^{R}_{L}$...-2(...) KGDS$^{R}_{L}$...-2B
			GDM	3020N-030PH		3		0.3					●	●	●	KGD$^{R}_{L}$...-2(...), KGD$^{R}_{L}$...-2.4(...) KGD$^{R}_{L}$...-3(...), KGDS$^{R}_{L}$...-2B
			GDM	4020N-030PH		4		0.3					●	●	●	KGD$^{R}_{L}$...-3(...), KGD$^{R}_{L}$...-3... KGD$^{R}_{L}$...-4T...
		 1-edge / High feed	GDMS	2020N-020PH	1	2	4.3	0.2	20	-	- 0.03	+ 0.03	●	●	●	KGD$^{R}_{L}$...-2(...) KGDS$^{R}_{L}$...-2B
			GDMS	3020N-030PH		3		0.3					●	●	●	KGD$^{R}_{L}$...-2(...), KGD$^{R}_{L}$...-2.4(...) KGD$^{R}_{L}$...-3(...), KGDS$^{R}_{L}$...-2B
			GDMS	4020N-030PH		4		0.3					●	●	●	KGD$^{R}_{L}$...-3(...), KGD$^{R}_{L}$...-3... KGD$^{R}_{L}$...-4T...

Handed insert shows Right-hand
Using the PF / PM chipbreaker (for cut-off) for grooving cannot create a flat bottom (Ref. to the right figure).

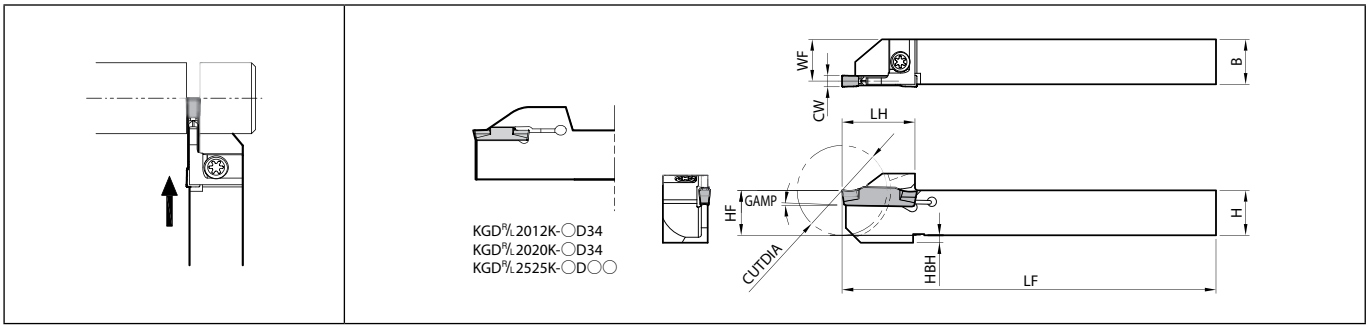
 Groove bottom created by PF / PM chipbreaker

Inserts identification system



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGD (for Automatic Lathe)



Right-hand shown

Toolholder dimensions

Description		Availability		Dimension (mm)									Angle	Spare parts					Applicable inserts ➡ H32, H33
														Clamp bolt	Screw	Screw	Wrench	Wrench	
		R	L	CUTDIA	H	B	LH	HF	HBH	LF	WF	CW min.	CW max.	GAMP (°)						
KGDR/L	1010JX-1.3D16	●	●	16	10	10	18	10	2	120	9.9	1.3	1.3	5	-	SB-40120TR	-	-	LTW-15S	GDM1316...
	1010JX-1.3	●	●	20							9.5									
	1212F-1.3D16	●	●	16	12	12	19.5	12		85	11.9									
	1212JX-1.3D16	●	●							120										
	1212F-1.3	●	●	24						85	11.5									
	1212JX-1.3	●	●							120										
KGDR/L	1010JX-1.5D16	●	●	16	10	10	18	10	2	120	9.7	1.5	1.5	5	-	SB-40120TR	-	-	LTW-15S	GDM1516...
	1010JX-1.5	●	●	20							9.4									
	1212F-1.5D16	●	●	16	12	12	19.5	12		85	11.7									
	1212JX-1.5D16	●	●							120										
	1212F-1.5	●	●	24						85	11.4									
	1212JX-1.5	●	●							120										
KGDR/L	1010JX-2	●	●	20	10	10	18	10	2	120	9.2	2	3	1	-	SB-40120TR	-	-	LTW-15S	GDG2020... GDM2020... GDMS2020... GDG2520... GDM2520... GDG3020... GDM3020... GDMS3020...
	1212F-2	●	●	24	12	12	19.5	12		85	11.2									
	1212JX-2	●	●							120										
	1616JX-2	●	●	32	16	16	24.5	16	-		15.2									
	2012K-2D34	●	●	34	20	12	32.5	20		125	11.2			0	HH5X16	-		LW-4	-	
	2020K-2D34	●	●			20					19.2									
	2525K-2D34	●	●		25	25		25			24.2									
KGDR/L	1010JX-2.4	●	●	20	10	10	18	10	2	120	9	2.4	3	1	-	SB-40120TR	-	-	LTW-15S	GDG2520... GDM2520... GDG3020... GDM3020... GDMS3020...
	1212F-2.4	●	●	24	12	12	19.5	12		85	11									
	1212JX-2.4	●	●							120										
	1616JX-2.4	●	●	32	16	16	24.5	16	-		15									
	2012K-2.4D34	●	●	34	20	12	32.5	20		125	11			0	HH5X16	-		LW-4	-	
	2020K-2.4D34	●	●			20					19									
	2525K-2.4D34	●	●		25	25		25			24									
KGDR/L	1212JX-3	●	●	24	12	12	19.5	12	2	120	10.8	3	3	1	-	SB-40120TR	-	-	LTW-15S	GDG3020..., GDM3020... GDMS3020...
KGDR/L	1616JX-3	●	●	32	16	16	24.5	16	-	120	14.8	3	4	1	-	SB-40120TR	-	-	LTW-15S	GDG3020... GDM3020... GDMS3020... GDM4020... GDMS4020...
	1616JX-3D38	●	●	38			29									-	SE-50125TR		LTW-20	
	1913K-3D38	●	●		19	13		19		125	11.8									
	2012JX-3D42	●	●	42	20	12	31	20		120	10.8									
	2012JX-3D51	●	●	51			36													
	2020JX-3D42	●	●	42		20	31				18.8									
	2020JX-3D51	●	●	51			36													
	2525K-3D51	●	●		25	25	41.5	25		125	23.8			0	HH5X16		-	LW-4	-	

4mm width Insert cannot be installed in KGDR/L1212JX-3

Recommended cutting conditions ➡ H44, H45

Recommended tightening torque of clamp screw : 2.0N·m (SB-40120TR), 2.5N·m (SE-50125TR), 6.5N·m (HH5X16)

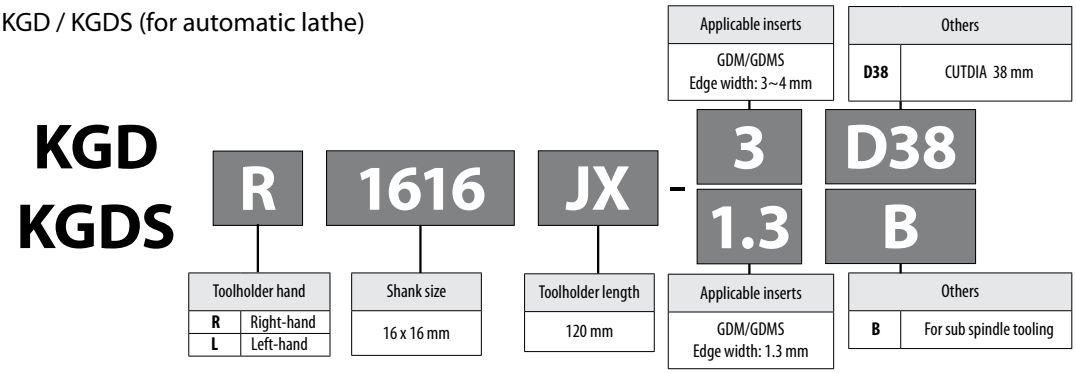
When machining the material greater than ø36 mm with KGDR/L...-3D38, KGDR/L...-3D42 and KGDR/L...-3D51 toolholders, please use 1-edge inserts.

Maximum cuttinng diameter for 2-edge inserts is ø36 mm.

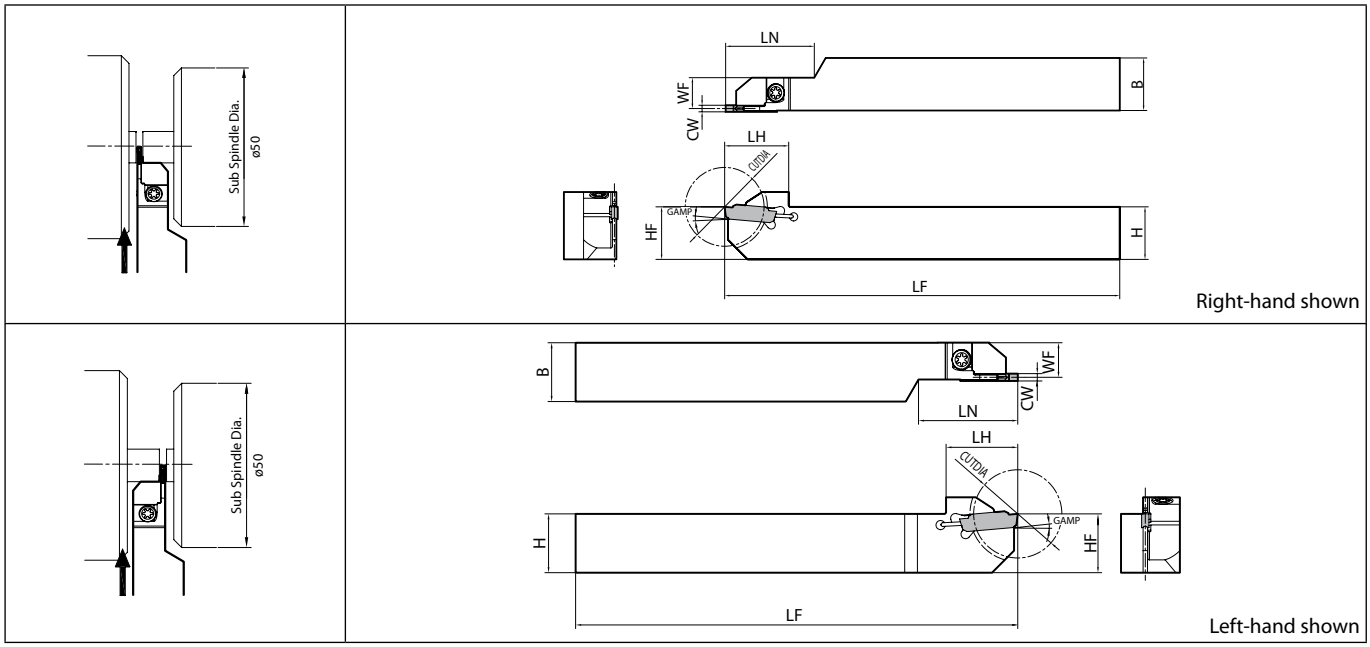
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Toolholder identification system

KGD / KGDS (for automatic lathe)



KGDS (Cut-off / for sub spindle tooling)



H

Cut-Off

Toolholder dimensions

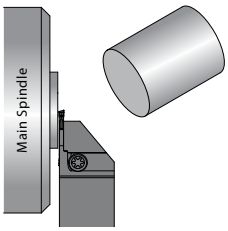
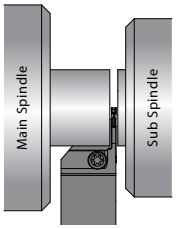
Description		Availability		Dimension (mm)										Angle	Spare parts		Applicable inserts ➡ H32, H33
		R	L	CUTDIA	H	B	LH	HF	LF	LN	WF	CW min.	CW max.	GAMP (°)	Screw	Wrench	
KGDS R/L	1616JX-1.3B	●	●	24	16	16	19.5	16	120	27	9.5	1.3	1.3	5	SB-40120TR	LTW-15S	GDM1316...
	1616JX-1.5B	●	●								9.4	1.5	1.5				GDM1516...
	1616JX-2B	●	●								9.2	2	3	1			GDG2020..., GDM2020..., GDMS2020..., GDG2520... GDM2520..., GDG3020..., GDM3020..., GDMS3020...

Recommended cutting conditions ➡ **H44, H45**

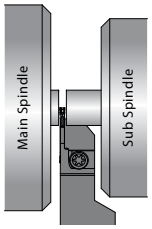
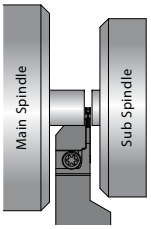
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGD / KGDS selection reference

KGD

Standard type	
· Both Right-hand and Left-hand types are applicable to gang tool post. · Basically Left-hand type is used for cut-off operation using a sub spindle.	
KGDR (Right-hand toolholder)	KGDL (Left-hand toolholder)
	
<1st. Recommendation> Use insert with lead angle to remove boss. · Not using sub spindle · Cut-off operation near main spindle side	<1st. Recommendation> Use insert without lead angle. · Using sub spindle · Cut-off operation near sub spindle side

KGDS

Sub spindle type	
· When machining workpiece with small diameter, use KGDS to reduce overhang distance from the main spindle.	
KGDSR (Right-hand toolholder)	KGDSL (Left-hand toolholder)
	
· Long workpiece and more rigidity · Cut-off operation near main spindle side	· Short workpiece and less rigidity · Cut-off operation near sub spindle side

Direct coolant cut-off toolholders for automatic lathe

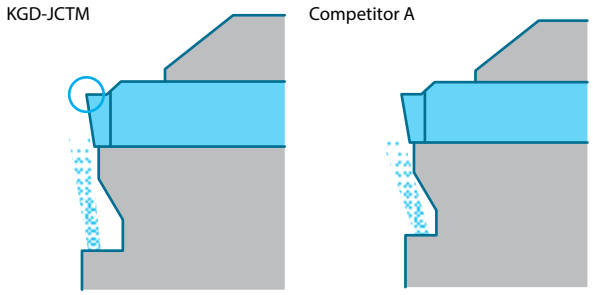
KGD-JCTM (for automatic lathe)

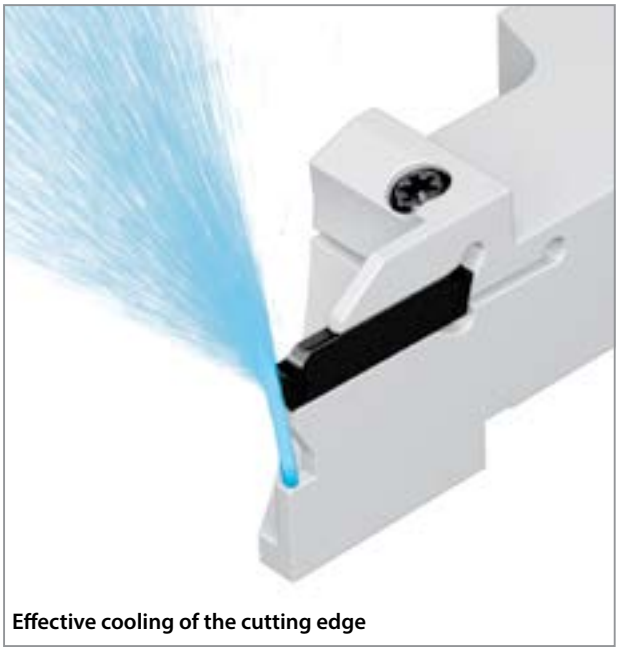
1 Optimized coolant hole position

2 Discharge coolant towards the flank face of the insert

Directing coolant towards the cutting edge lengthens tool life.

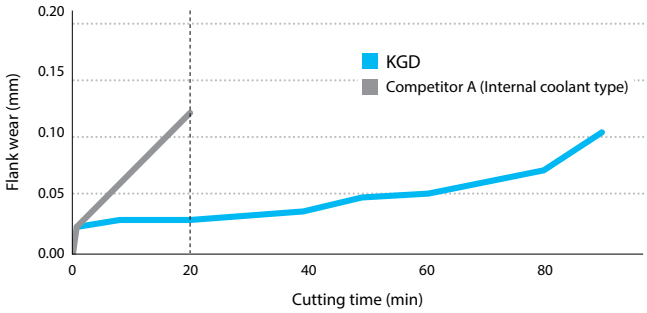
Coolant discharging





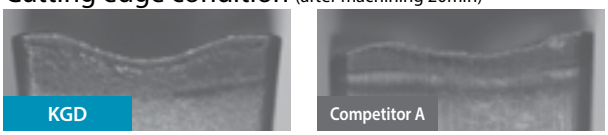
Effective cooling of the cutting edge

Wear resistance comparison (Internal evaluation)



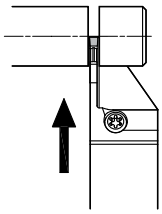
Cutting conditions: Vc = 80 m/min, f = 0.06 mm/rev (~2 mm : f=0.02 mm/rev),
KGDR1625H-2JCT, GDM2020N-015PF PR1535 (CW: 2.0 mm)
Workpiece material : X5CrNi18 10 (ø25) Internal coolant (1.5MPa) Cut-off

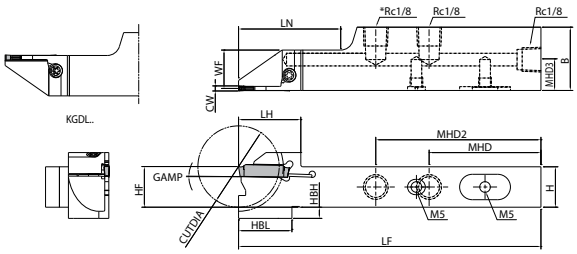
Cutting edge condition (after machining 20min)



High density and high speeds coolant provides effective cooling of the cutting edge
Superior cooling action improves tool life

KGD-JCTM (Coolant-through holders)





Right-hand shown | KGD%L12-JCTM : 2-Rc1/8

Toolholder dimensions

Description		Availability		Dimension (mm)															Angle	Coolant hole	Spare parts				Applicable inserts
																					Plug	Plug	Screw	Wrench	
		R	L	CUTDIA	H	B	LH	MHD	MHD2	MHD3	HF	HBH	HBL	LF	LN	WF	CW min.	CW max.	GAMP (°)						
KGDR	1218JX-2JCTM	●		24	12	18	19.5	54	-	8.4	12	8.5	21	120	44	11.2	2	3	1	Yes	GP-1	HS5X4LP	SB-40120TR	LTW-15S	GDG2020... GDM2020... GDMS2020...
KGDL	1218JX-2JCTM		●							7.7			21.5												
KGDR	1625JX-2JCTM	●		32	16	25	24.5	44	65	12.2	16	4.5	21		40	15.2									GDG2520... GDM2520... GDG3020... GDM3020... GDMS3020...
KGDL	1625JX-2JCTM		●							7.7															
KGDR	1218JX-2.4JCTM	●		24	12	18	19.5	54	-	8.4	12	8.5	21	120	44	11	2.4	3	1	Yes					GDG2520... GDM2520... GDG3020... GDM3020... GDMS3020...
KGDL	1218JX-2.4JCTM		●							7.7			21.5												
KGDR	1625JX-2.4JCTM	●		32	16	25	24.5	44	65	12.2	16	4.5	21		40	15									
KGDL	1625JX-2.4JCTM		●							7.7															
KGDR	1218JX-3JCTM	●		24	12	18	19.5	54	-	8.6	12	8.5	21	120	44	10.8	3	3	1	Yes					GDG3020... GDM3020... GDMS3020...
KGDL	1218JX-3JCTM		●							7.7			21.5												
KGDR	1625JX-3JCTM	●		32	16	25	24.5	44	65	12.2	16	4.5	21		40	14.8		4							GDG3020... GDM3020... GDMS3020... GDM4020... GDMS4020...
KGDL	1625JX-3JCTM		●							7.7															

Recommended cutting conditions **H44, H45**

Toolholder identification system

KGD-JCTM (Coolant-through holders)

KGD **R** **1218** **JX** - **2** **JCTM**

Toolholder hand	
R	Right-hand
L	Left-hand

Shank size
12 x 18 mm

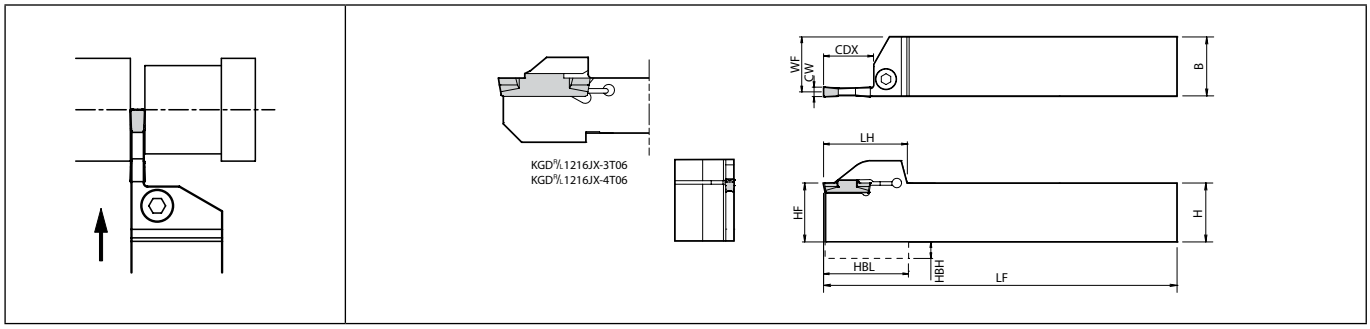
Toolholder length
120 mm

Applicable inserts
GDM/GDMS 2~3 mm

Others
Coolant-through holders

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGD (Integral type)



Right-hand shown

Toolholder dimensions

Description		Availability R	Availability L	Dimension (mm) CDX	H	B	LH	HF	HBH	HBL	LF	WF	CW min.	CW max.	Spare parts: Clamp bolt	Spare parts: Screw	Spare parts: Wrench	Spare parts: Wrench	Applicable inserts ➡ H32, H33
KGDR/L	1616H-2T06	●	●	6	16	16	27.7	16	4	28	100	15.2	2	3	HH5X16	-	LW-4	-	GDG2020... GDM2020... GDMS2020... GDG2520... GDM2520... GDG3020... GDM3020... GDMS3020...
	1616H-2T10	●	●	10			30.2			30.5									
	1616H-2T17	●	●	17			31.2			31.5									
	2012K-2T17	●	●		20	12	32.5	20	-	-	125	11.2							
	2020K-2T06	●	●	6		20	28					19.2							
	2020K-2T10	●	●	10			30.5												
	2020K-2T17	●	●	17			32.5												
	2525M-2T06	●	●	6	25	25	28	25			150	24.2			HH5X25				
	2525M-2T10	●	●	10			30.5												
	2525M-2T17	●	●	17			32.5												
KGDR/L	2012K-2.4T17	●	●	17	20	12	32.5	20	-	-	125	11	2.4	3	HH5X16	-	LW-4	-	GDG2520..., GDM2520..., GDG3020... GDM3020..., GDMS3020...
	2020K-2.4T17	●	●			20						19							
KGDR/L	1216JX-3T06	●	●	6	12	16	19.5	12	2	19	120	14.8	3	4	-	SE-50125TR	-	LTW-20	GDG3020... GDM3020... GDMS3020... GDM4020... GDMS4020...
	1616H-3T06	●	●		16		27.7	16	4	28	100				HH5X16	-	LW-4	-	
	1616H-3T10	●	●	10			30.2			30.5									
	1616H-3T20	●	●	20			34.2			34.5									
	2012K-3T20	●	●		20	12	34.5	20	-	-	125	10.8							
	2020K-3T06	●	●	6		20	28					18.8							
	2020K-3T10	●	●	10			30.5												
	2020K-3T20	●	●	20			34.5												
	2525M-3T06	●	●	6	25	25	28	25			150	23.8			HH5X25				
	2525M-3T10	●	●	10			30.5												
	2525M-3T20	●	●	20			35.5												
KGDR/L	1216JX-4T06	●	●	6	12	16	19.5	12	2	19	120	14.3	4	5	-	SE-50125TR	-	LTW-20	GDM4020... GDMS4020...
	2020K-4T10	●	●	10	20	20	30.5	20			125	18.3			HH5X16				
	2020K-4T20	●	●	20			34.5												
	2525M-4T10	●	●	10	25	25	30.5	25	-	-	150	23.3			HH5X25	-	LW-4	-	
	2525M-4T20	●	●	20			35.5												
	2525M-4T25	●	●	25			40.5												

CDX : Maximum depth to which processing can be made. (If the CDX is 20 mm or more, the maximum groove-depth of groove made by the 2-edge insert will be 18 mm.)
Recommended tightening torque of clamp bolt : 6.5N·m (HH5X○○), 8.0N·m (HH6X25), 2.5N·m (SE-50125TR)
Above toolholders are applicable to external grooving, too.

Recommended cutting conditions ➡ H44, H45

Toolholder identification system

KGD (Integral type)

KGD | **R** | **1616** | **H** | **-** | **2** | **T** | **06**

Toolholder hand	
R	Right-hand
L	Left-hand

Shank size
16 × 16 mm

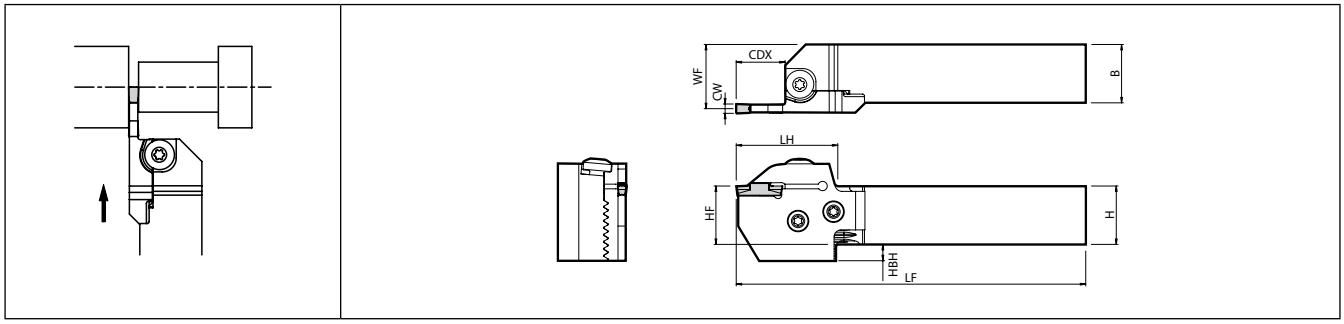
Toolholder length
100mm

Applicable inserts
GDM/GDMS 2~3 mm

Max. depth of cut
06: 6 mm

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGD-S (0° separate type)



Right-hand shown (Right-hand blade and right-hand toolholder)

Toolholder dimensions (Blade and toolholder)

Shank angle	Width (mm)	Max. depth of cut (mm)	Shank size (mm)	Unit description	Availability R	Availability L	Blade description ⇨ G43	Toolholder description ⇨ G43	CDX	H	B	LH	HF	HBH	LF	WF	CW min.	CW max.	Spare parts: Clamp bolt (for insert clamp)	Spare parts: Screw (for blade)	Spare parts: Wrench
0°	2	17	□20	KGDR/L 2020X-2T17S	●		KGDR/L-2T17-C	KGDR/L 2020-C	17	20	20	40	20	12	122	23.4	2	3	BH6X10TR	SB-60120TR	LTW-25
			□25	2525X-2T17S	●	●		KGDR/L 2525-C		25	25		25	7	147	28.4					
			□32	No unit description ⇨				KGDR/L 3232-C		32	32		32	-	167	35.4					
	3	10	□20	KGDR/L 2020X-3T10S	●		KGDR/L-3T10-C	KGDR/L 2020-C	10	20	20	33	20	12	115	23	3	4			
			□25	2525X-3T10S	●			KGDR/L 2525-C		25	25		25	7	140	28					
			□32	No unit description ⇨				KGDR/L 3232-C		32	32		32	-	160	35					
		20	□20	KGDR/L 2020X-3T20S	●	●	KGDR/L-3T20-C	KGDR/L 2020-C	20	20	20	43	20	12	125	23					
			□25	2525X-3T20S	●	●		KGDR/L 2525-C		25	25		25	7	150	28					
			□32	3232X-3T20S	●			KGDR/L 3232-C		32	32		32	-	170	35					
	4	10	□20	KGDR/L 2020X-4T10S	●		KGDR/L-4T10-C	KGDR/L 2020-C	10	20	20	33	20	12	115	22.5	4	5			
			□25	2525X-4T10S	●			KGDR/L 2525-C		25	25		25	7	140	27.5					
			□32	No unit description ⇨				KGDR/L 3232-C		32	32		32	-	160	34.5					
		20	□20	KGDR/L 2020X-4T20S	●		KGDR/L-4T20-C	KGDR/L 2020-C	20	20	20	43	20	12	125	22.5					
			□25	2525X-4T20S	●	●		KGDR/L 2525-C		25	25		25	7	150	27.5					
			□32	3232X-4T20S	●			KGDR/L 3232-C		32	32		32	-	170	34.5					
		25	□20	KGDR/L 2020X-4T25S	●	●	KGDR/L-4T25-C	KGDR/L 2020-C	25	20	20	48	20	12	130	22.5					
			□25	2525X-4T25S	●	●		KGDR/L 2525-C		25	25		25	7	155	27.5					
			□32	3232X-4T25S	●			KGDR/L 3232-C		32	32		32	-	175	34.5					

1. When using the toolholder in normal mounting position, the lower jaw of toolholder may interfere with the tool presetter.
2. The toolholder and blade descriptions are printed on the toolholder body. (Unit description is not printed.)
   KGD-S: Right-hand blade for right-hand toolholder, left-hand blade for left-hand toolholder.
   The toolholder is applicable for all blade with suitable hand.
3. When the unit description is not available (No unit description) and/or if stock status is blank, please purchase toolholder and blade separately.
4. CDX: Maximum depth to which processing can be made. (If the CDX is 20 mm or more, the maximum groove-depth of groove made by the 2-edge insert will be 18 mm.)
5. Recommended tightening torque of clamp bolt for insert : 6.5N·m (Groove width 2 ~ 4mm)
6. Above toolholders are applicable to external grooving, too.

Applicable inserts ⇨ **H32, H33**
Recommended cutting conditions ⇨ **H44, H45**

Toolholder identification system

KGD (Separate type / Unit description)

KGD **R** **2020** **X** - **2** **T** **17** **S**

Toolholder hand	
R	Right-hand
L	Left-hand

Shank size
20 x 20 mm

Toolholder type
Unit description

Applicable inserts
GDM/GDMS 2~3 mm

Max. depth of cut
17: 17mm

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Great for high pressure coolant External grooving and cut-off

KGD-JCT

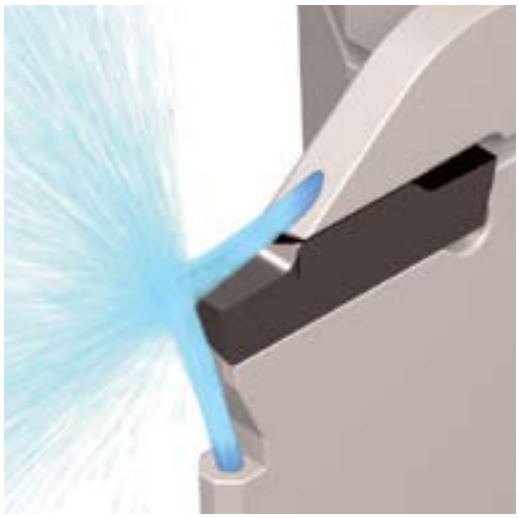
Coolant is directed from two directions towards the flank face of the insert

Improved chip control and longer tool life for external grooving and cut-off

1 Excellent chip control

Coolant towards the rake face

Coolant hole position and angle improve chip control



Chip control comparison (Internal evaluation)

KGD-JCT showed better chip control performance even at lower feed rates

f = 0.05 mm/rev (1.5MPa)



Cutting Conditions : Vc = 150 m/min, d = 8mm, f = 0.05 mm/rev, Wet
Edge Width 4 mm Workpiece Material : 15CrMo4 Grooving

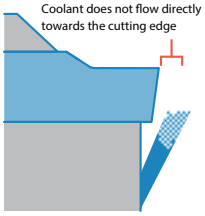
2 Cooling the cutting edge leads to longer tool life

Coolant towards the rake surface and the flank face of the insert
Directing coolant towards the cutting edge lengthens tool life

KGD-JCT



Competitor E

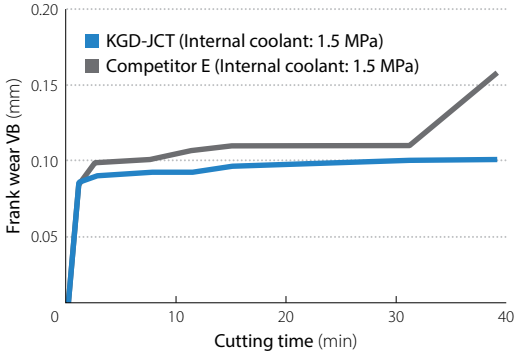


After machining 39 min



Fracture

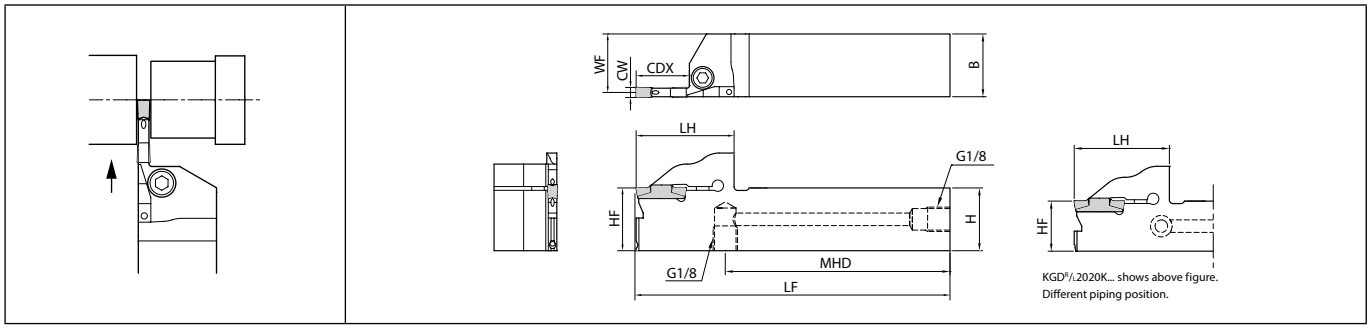
Wear resistance comparison (Internal evaluation)



Cutting conditions : Vc = 180 m/min, d = 9 mm, f = 0.15 mm/rev, Wet
Edge width 4 mm Workpiece material : 15CrMo4 Grooving

KGD-JCT minimizes wear and provides longer tool life without insert fracturing

KGD-JCT (Coolant-through holders)



Right-hand shown | Applicable pressure : ~15MPa

Toolholder dimensions

Description		Availability		Dimension (mm)										Spare parts			Applicable inserts ➔ H32, H33
		R	L	CDX	H	B	LH	HF	LF	WF	MHD	CW min.	CW max.	Clamp bolt	Plug	Wrench	
KGDR/L	2020K-3T06JCT	●	●	6	20	20	31.5	20	125	18.8	96.2	3	4	HH5X16	HSG1/8X8.0	LW-4	GDG3020... GDM3020... GDMS3020... GDM4020... GDMS4020...
	2020K-3T10JCT	●	●	10			34				94.2						
	2020K-3T20JCT	●	●	20			38				90.2						
	2525K-3T06JCT	●	●	6	25	25	31.5	25		23.8	96.5			HH5X25			
	2525K-3T10JCT	●	●	10			34				94.5						
	2525K-3T20JCT	●	●	20			39				89.5						
KGDR/L	2020K-4T10JCT	●	●	10	20	20	34	20	125	18.3	94.2	4	5	HH5X16	HSG1/8X8.0	LW-4	GDM4020... GDMS4020...
	2020K-4T20JCT	●	●	20			38				90.2						
	2525K-4T10JCT	●	●	10	25	25	34	25		23.3	94.5			HH5X25			
	2525K-4T20JCT	●	●	20			39				89.5						
	2525K-4T25JCT	●	●	25			44				84.5						

Please see page **D12** for piping parts of coolant-through holders.

Recommended cutting conditions ➔ **H44, H45**

Toolholder identification system

KGD (Integral type)

KGD **R** **2525** **K** **-** **3** **T** **06** **JCT**

Toolholder hand	
R	Right-hand
L	Left-hand

Shank size
25 × 25 mm

Toolholder length
125mm

Applicable inserts
GDM/GDMS 3~4 mm

Max. depth of cut
06: 6 mm

Others
Coolant-through holders

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGD recommended cutting conditions (PF/PQ/PG chipbreaker)

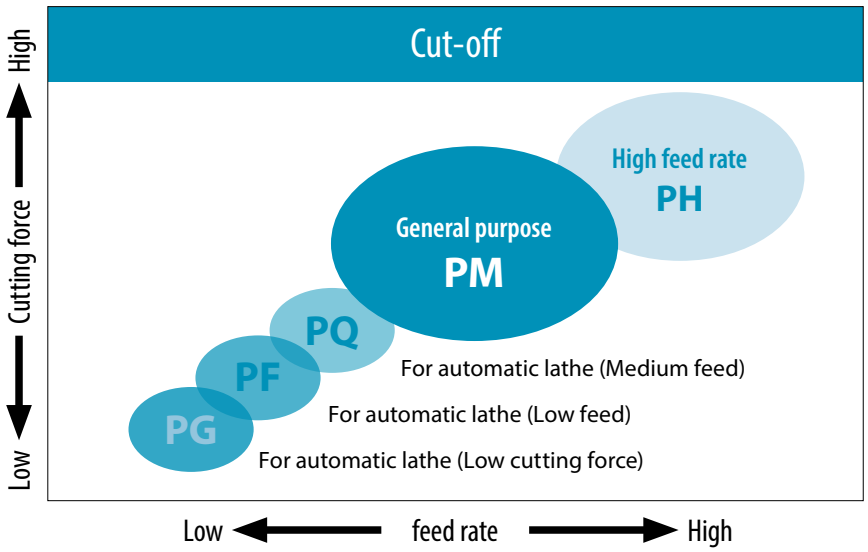
Workpiece material	Recommended insert grades (Vc: m/min)			f (mm/rev)						Remarks
				PF (RE = 0.03 mm)			PF (RE = 0.15 mm)			
	MEGACOAT NANO	MEGACOAT		Edge width CW (mm)						
	PR1535	PR1225	PR1215	1.3 / 1.5	2.0	2.5 / 3.0	1.3 / 1.5	2.0	2.5 / 3.0	
Carbon steel	☆ 70 ~ 150	★ 70 ~ 150	☆ 70 ~ 180	0.01 ~ 0.04	0.02 ~ 0.06	0.02 ~ 0.08	0.01 ~ 0.05	0.03 ~ 0.08	0.04 ~ 0.10	Coolant
Alloy steel	☆ 70 ~ 150	★ 70 ~ 150	☆ 70 ~ 180							
Stainless steel	★ 60 ~ 120	☆ 60 ~ 120	☆ 60 ~ 150	0.01 ~ 0.03	0.01 ~ 0.04	0.01 ~ 0.05	0.01 ~ 0.04	0.03 ~ 0.07	0.04 ~ 0.08	
Cast iron	-	-	★ 80 ~ 200	0.01 ~ 0.05	0.02 ~ 0.07	0.03 ~ 0.08	0.01 ~ 0.06	0.03 ~ 0.09	0.04 ~ 0.10	

★: 1st Recommendation ☆: 2nd Recommendation

Workpiece Material	Recommended insert grades (Vc: m/min)					f (mm/rev)				Remarks
						PQ		PG		
	MEGACOAT NANO	MEGACOAT		DLC coated carbide	Carbide	Edge width CW (mm)				
	PR1535	PR1225	PR1215	PDL025	GW15	2.0	2.5 / 3.0	2.0	2.5 / 3.0	
Carbon steel	☆ 70 ~ 150	★ 70 ~ 150	☆ 70 ~ 180	-	-	0.03 ~ 0.1	0.04 ~ 0.12	0.01 ~ 0.04	0.01 ~ 0.05	Coolant
Alloy steel	☆ 70 ~ 150	★ 70 ~ 150	☆ 70 ~ 180	-	-					
Stainless steel	★ 60 ~ 120	☆ 60 ~ 120	☆ 60 ~ 150	-	-	0.02 ~ 0.07	0.02 ~ 0.08	0.01 ~ 0.03	0.01 ~ 0.04	
Cast iron	-	-	★ 80 ~ 200	-	☆ 50 ~ 100	0.04 ~ 0.1	0.04 ~ 0.12	0.01 ~ 0.04	0.01 ~ 0.05	
Aluminum Alloys	-	-	-	★ 200 ~ 500	☆ 200 ~ 450	-	-	0.01 ~ 0.05	0.01 ~ 0.06	
Brass	-	-	-	-	★ 100 ~ 200	-	-	0.01 ~ 0.07	0.01 ~ 0.08	

★: 1st Recommendation ☆: 2nd Recommendation

Application map

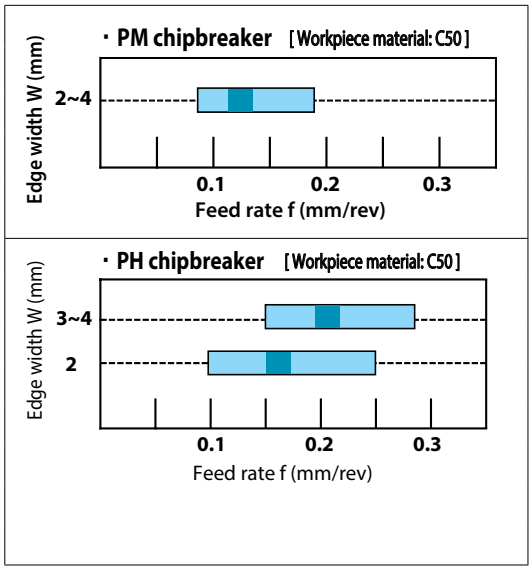


KGD recommended cutting conditions (PM / PH chipbreaker)

Workpiece material	Recommended insert grades (Vc: m/min)			f (mm/rev)			Remarks
				PM	PH		
	MEGACOAT NANO	MEGACOAT		Edge width CW (mm)			
	PR1535	PR1225	PR1215	2 ~ 4	2	3 ~ 4	
Carbon steel	☆ 80 ~ 200	★ 80 ~ 200	☆ 100 ~ 200	0.08 ~ 0.18	0.10 ~ 0.25	0.15 ~ 0.28	Coolant
Alloy steel	☆ 70 ~ 180	★ 70 ~ 180	☆ 80 ~ 180				
Stainless steel	★ 60 ~ 150	☆ 60 ~ 150	☆ 60 ~ 150	0.06 ~ 0.12	0.05 ~ 0.12	0.08 ~ 0.15	
Cast iron	-	-	★ 100 ~ 200	0.08 ~ 0.18	0.10 ~ 0.25	0.15 ~ 0.28	

★: 1st Recommendation ☆: 2nd Recommendation

Example of feed [■ In the graph indicates the most recommended value of feed (f)]



Caution (Cut-off)

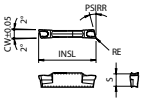
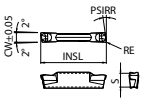
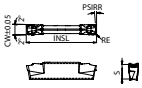
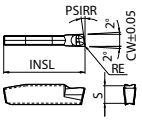
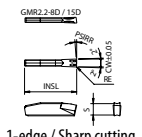
1. Be sure to perform wet processing. Apply enough coolant to the cutting edge.
2. Keep a constant rate during processing so that optimum product life will be achieved.
3. Cut-off as close to the chuck as possible.
4. Lower the feed rate to 1/2 to 1/3 at the near center to prevent impact caused by machining.

GM/GMM/GMN/GM$^{R/L}$

			Carbon steel / Alloy steel									◔	●			○	P
			Stainless steel									●	◔				M
			Cast iron												●		K
			Non-ferrous metals												●		N
Insert		Description	No. of edges	Dimension (mm)				Tolerance (mm)		Carbide						Cermet	Applicable toolholder ⇨ H50~H52
				CW	S	RE	INSL	CW min.	CW max.	CVD	PVD			-	-		
										CR9025	PR915	PR930	PR1115	KW10	TN90		
	Sharp cutting oriented	GMM 1520-MT	2	1.5	4.3	0 0.05	20	- 0.05	+ 0.05		●	●		●			KGM$^{R/L}$...-1.5(-85)
		GMM 2020-MT	2	2	4.3	0 0.05	20	- 0.05	+ 0.05	●	●	●		●			KGM$^{R/L}$...-1.5(-85) KGM$^{R/L}$...-2(...)
		GMM 2520-MT	2	2.5	4.3	0 0.05	20	- 0.05	+ 0.05		●	●					KGM$^{R/L}$...-2(...) KGM$^{R/L}$...-2.5(-85)
		GMM 3020-MT	2	3	4.3	0 0.05	20	- 0.05	+ 0.05	●	●	●		●			KGM$^{R/L}$...-2(...), KGM$^{R/L}$...-2.5(-85) KGM$^{R/L}$...-3(T20)
	Sharp cutting oriented / Without Chipbreaker	GMM 1520-NB	2	1.5	4.3	0	20	- 0.05	+ 0.05			●		●			KGM$^{R/L}$...-1.5(-85)
		GMM 2020-NB	2	2	4.3	0	20	- 0.05	+ 0.05			●		●			KGM$^{R/L}$...-1.5(-85) KGM$^{R/L}$...-2(...)
		GMM 2520-NB	2	2.5	4.3	0	20	- 0.05	+ 0.05			●					KGM$^{R/L}$...-2(...) KGM$^{R/L}$...-2.5(-85)
		GMM 3020-NB	2	3	4.3	0	20	- 0.05	+ 0.05					●			KGM$^{R/L}$...-2(...), KGM$^{R/L}$...-2.5(-85) KGM$^{R/L}$...-3(T20)
	Stability oriented	GMM 2020-TK	2	2	4.3	0.2	20	- 0.05	+ 0.05		●	●		●			KGM$^{R/L}$...-1.5(-85) KGM$^{R/L}$...-2(...)
		GMM 2520-TK	2	2.5	4.3	0.2	20	- 0.05	+ 0.05		●	●		●			KGM$^{R/L}$...-2(...) KGM$^{R/L}$...-2.5(-85)
		GMM 3020-TK	2	3	4.3	0.25	20	- 0.05	+ 0.05	●	●	●		●			KGM$^{R/L}$...-2(...), KGM$^{R/L}$...-2.5(-85) KGM$^{R/L}$...-3(T20)
	High feed	GMM 2020-TMR	2	2	4.3	0.2	20	- 0.05	+ 0.05				●				KGM$^{R/L}$...-1.5(-85) KGM$^{R/L}$...-2(...)
		GMM 2520-TMR	2	2.5	4.3	0.2	20	- 0.05	+ 0.05				●				KGM$^{R/L}$...-2(...) KGM$^{R/L}$...-2.5(-85)
		GMM 3020-TMR	2	3	4.3	0.25	20	- 0.05	+ 0.05				●				KGM$^{R/L}$...-2(...), KGM$^{R/L}$...-2.5(-85) KGM$^{R/L}$...-3(T20)
	1-edge / Stability oriented	GMN 2-TK	1	2	4.3	0.2	20	- 0.05	+ 0.05		●	●					KGM$^{R/L}$...-1.5(-85) KGM$^{R/L}$...-2(...)
		GMN 3-TK	1	3	4.3	0.25	20	- 0.05	+ 0.05	●	●	●		●			KGM$^{R/L}$...-2(...), KGM$^{R/L}$...-2.5(-85) KGM$^{R/L}$...-3(T20)
		GMN 4-TK	1	4	4.3	0.3	20	- 0.05	+ 0.05	●	●	●		●			KGM$^{R/L}$...-3(T20), KGM$^{R/L}$...-4(T..)
	1-edge	GMN 2.2	1	2.2	4.3	0.17	20	- 0.05	+ 0.05	●		●		●	●		KGM$^{R/L}$...-2(...)
		GMN 3	1	3	4.3	0.2	20	- 0.05	+ 0.05	●		●		●			KGM$^{R/L}$...-2(...), KGM$^{R/L}$...-2.5(-85) KGM$^{R/L}$...-3(T20)
		GMN 4	1	4	4.3	0.25	20	- 0.05	+ 0.05	●		●		●			KGM$^{R/L}$...-3(T20), KGM$^{R/L}$...-4(T..)
		GMN 5	1	5	4.3	0.8	20	- 0.05	+ 0.05	●		●		●			KGM$^{R/L}$...-4(T..), KGM$^{R/L}$...-5(T25)
		GMN 6	1	6	4.3	0.8	20	- 0.05	+ 0.05	●		●		●			KGM$^{R/L}$...-5(T25), KGMR...-6T30

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GM/GMM/GMN/GM$^{R/L}$

			Carbon steel / Alloy steel									◔	●					P
			Stainless steel									●	◔					M
			Cast iron								●					●		K
			Non-ferrous metals													●		N
Insert		Description	No. of edges	Dimension (mm)				Angle (°)	Tolerance (mm)		Carbide					Cermet		Applicable toolholder ➔ H50~H52
				CW	S	RE	INSL	PSIR$^{R/L}$	CW min.	CW max.	CVD	PVD				-	-	
											CR9025	PR905	PR915	PR930	PR1115	KW10	TN90	
	 Sharp cutting oriented	GMM 1520R-MT-15D	2	1.5	4.3	0 0.05	20	15	- 0.05	+ 0.05			● ●			●		KGM$^{R/L}$...-1.5(-85)
		GMM 2020R-MT-15D 2020R-MT-15D 2020L-MT-15D	2	2	4.3	0 0.05 0	20	15	- 0.05	+ 0.05	●		● ●	● ●		●		KGM$^{R/L}$...-1.5(-85) KGM$^{R/L}$...-2(...)
		GMM 2520R-MT-15D	2	2.5	4.3	0 0.05	20	15	- 0.05	+ 0.05			● ●	● ●				KGM$^{R/L}$...-2(...) KGM$^{R/L}$...-2.5(-85)
		GMM 3020R-MT-15D 3020R-MT-15D 3020L-MT-15D	2	3	4.3	0 0.05 0	20	15	- 0.05	+ 0.05	●		● ●	● ●		●		KGM$^{R/L}$...-2(...), KGM$^{R/L}$...-2.5(-85) KGM$^{R/L}$...-3(T20)
	 Stability oriented	GMM 2020R-TK-8D	2	2	4.3	0.2	20	8	- 0.05	+ 0.05			●	●		●		KGM$^{R/L}$...-1.5(-85) KGM$^{R/L}$...-2(...)
		GMM 2520R-TK-8D	2	2.5	4.3	0.2	20	8	- 0.05	+ 0.05				●				KGM$^{R/L}$...-2(...) KGM$^{R/L}$...-2.5(-85)
		GMM 3020R-TK-8D	2	3	4.3	0.25	20	8	- 0.05	+ 0.05	●		●	●				KGM$^{R/L}$...-2(...), KGM$^{R/L}$...-2.5(-85) KGM$^{R/L}$...-3(T20)
	 High feed	GMM 2020R-TMR-6D	2	2	4.3	0.2	20	6	- 0.05	+ 0.05					●			KGM$^{R/L}$...-1.5(-85) KGM$^{R/L}$...-2(...)
		GMM 2520R-TMR-6D	2	2.5	4.3	0.2	20	6	- 0.05	+ 0.05					●			KGM$^{R/L}$...-2(...) KGM$^{R/L}$...-2.5(-85)
		GMM 3020R-TMR-6D	2	3	4.3	0.25	20	6	- 0.05	+ 0.05					●			KGM$^{R/L}$...-2(...), KGM$^{R/L}$...-2.5(-85) KGM$^{R/L}$...-3(T20)
	 1-edge / Stability oriented	GMR 2-TK-8D	1	2	4.3	0.2	20	8	- 0.05	+ 0.05				●		●		KGM$^{R/L}$...-1.5(-85) KGM$^{R/L}$...-2(...)
		GMR 3-TK-8D	1	3	4.3	0.25	20	8	- 0.05	+ 0.05			●	●		●		KGM$^{R/L}$...-2(...), KGM$^{R/L}$...-2.5(-85) KGM$^{R/L}$...-3(T20)
		GMR 4-TK-8D	1	4	4.3	0.3	20	8	- 0.05	+ 0.05			●	●		●		KGM$^{R/L}$...-3(T20), KGM$^{R/L}$...-4(T..)
	 1-edge / Sharp cutting oriented	GMR 2.2-8D GML 2.2-8D	1	2.2	4.3	0.17	20	8	- 0.05	+ 0.05	●			● ●		●	●	KGM$^{R/L}$...-2(...)
		GMR 2.2-15D	1	2.2	4.3	0	20	15	- 0.05	+ 0.05	●			●		●	●	KGM$^{R/L}$...-2(...)
		GMR 3-4D GML 3-4D	1	3	4.3	0.2	20	4	- 0.05	+ 0.05	● ●			● ●		●	●	KGM$^{R/L}$...-2(...), KGM$^{R/L}$...-2.5(-85) KGM$^{R/L}$...-3(T20)
		GMR 4-4D GML 4-4D	1	4	4.3	0.25	20	4	- 0.05	+ 0.05	● ●							KGM$^{R/L}$...-3(T20), KGM$^{R/L}$...-4(T..)

Handed insert shows Right-hand

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Edge preparation

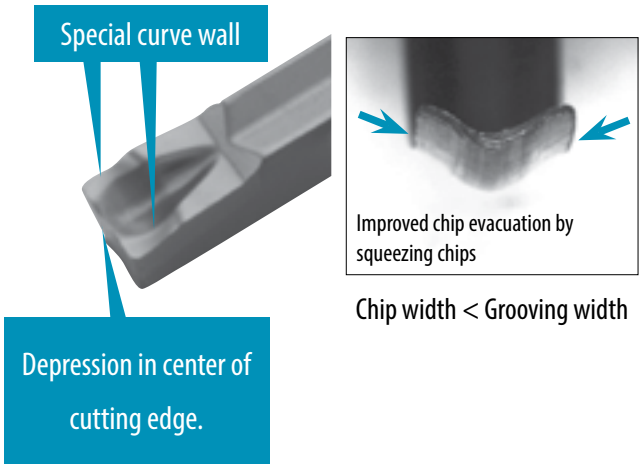
Series	MT-chipbreaker		TK-chipbreaker		TMR-chipbreaker	Without chipbreaker (NB)	
Edge prep.	Chamfer + R honed	Chamfer + R honed	Chamfer + R honed	Sharp Edge	Chamfer + R honed	R honed	Sharp Edge
	Corner-R (RE) = 0.05	Sharp corner	Corner-R (RE) = 0.2-0.3	Corner-R (RE) = 0.2-0.3	Corner-R (RE) = 0.2	Corner-R (RE) = 0.05	Sharp Corner
							
	CR9025/PR915	PR930/KW10	CR9025/PR915	PR930/KW10	PR1115	CR9025	PR930/KW10

· Sharp edge specification can reduce cutting force by 40% less than that of chamfer edge.

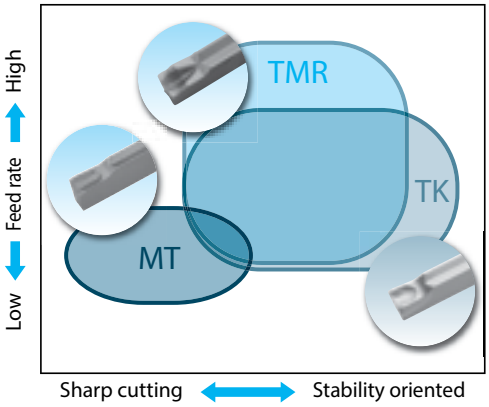
Series	Advantage
GMM-MT	Specific chipbreaker for cut-off operations requiring sharp cutting performance. Minimizes the boss.
GMM-NB	Cutting edge is flat with non-chipbreaker. It works well for brass, etc.
GMM-TK	Stable design with chipbreaker for cut-off. Large corner-R. 2-edge for economical performance.
GMN-TK	Same chipbreaker geometry as GMM-TK. 1-edge. Wide application range.
GMN (Std.) (No indication)	Mainly for deep grooving, but available for groove widening and turning due to projection near side cutting edge. 1-edge and wide application range. Available for cut-off applications.

TMR-chipbreaker

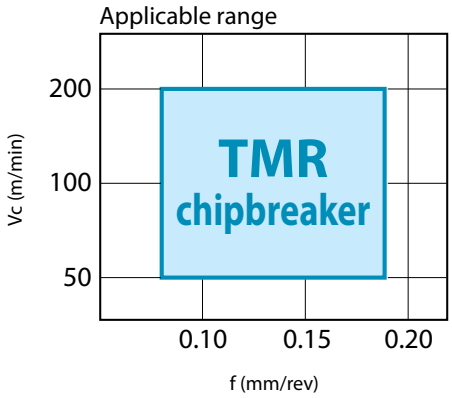
Advantages



GMM chipbreaker MAP



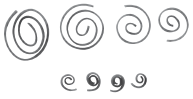
TMR application range



TMR-chipbreaker enables stable chip control also for high feed rates

Good chip control even when cutting speed (spindle revolution) is increased.

(Workpiece Material: 15CrMo4, ø30, constant spindle revolution)

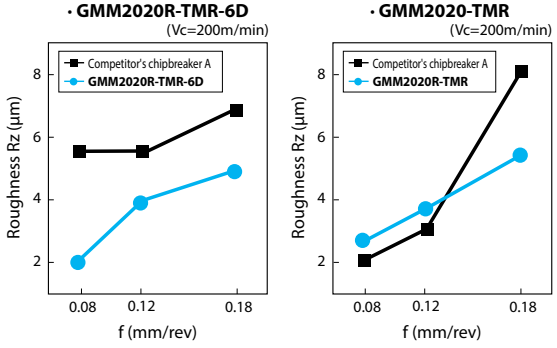
Description	n=1,060min^{-1}(Vc=100m/min)		n=2,123min^{-1}(Vc=200m/min)	
	f=0.12mm/rev	f=0.18mm/rev	f=0.12mm/rev	f=0.18mm/rev
GMM 3020-TMR (Neutral)				
GMM 3020R-TMR-6D (Lead angle)				

Recommended cutting conditions

Workpiece Material	Vc (m/min)	f (mm/rev)
Carbon steel	60 ~ 200	0.08 ~ 0.18
Alloy steel	60 ~ 150	
Stainless steel	50 ~ 140	

Workpiece surface roughness

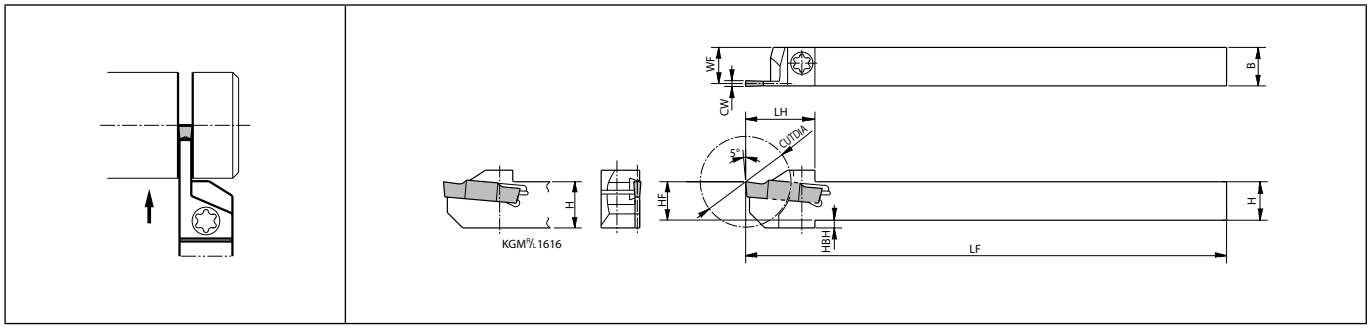
TMR Chipbreaker provides good surface roughness on the workpiece end face at high feed rate ranges.



H

Cut-Off

KGM (for Automatic Lathe)



Right-hand shown

Toolholder dimensions

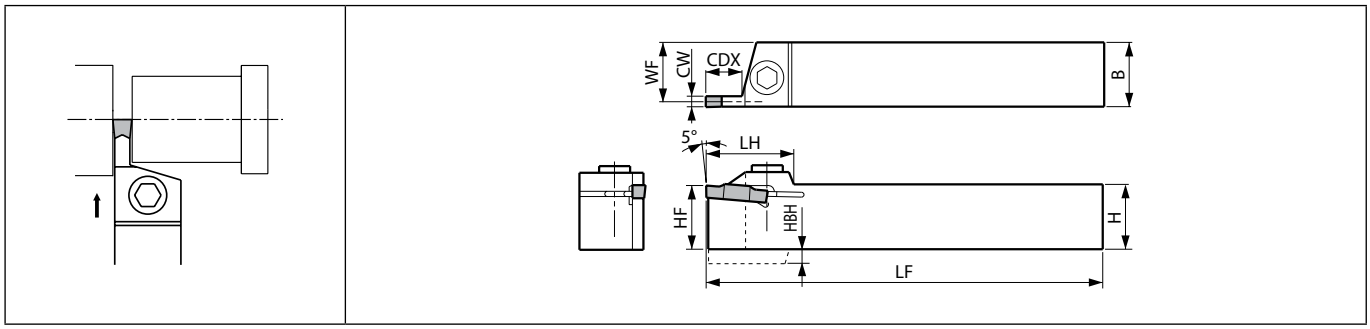
Description		Availability		Dimension (mm)										Spare parts		Applicable inserts ➡ H46, H47
														Screw	Wrench	
		R	L	CUTDIA	H	B	LH	HF	HBH	LF	WF	CW min.	CW max.			
KGM□/L	1010JX-1.5	□	□	18	10	10	18	10	2	120	9.4	1.5	2	SE-40120TR	LTW-15S	GMM1520... GMM2020... GM_2-TK(-8D)
	1212F-1.5-85	□		23	12	12	19	12		85	11.4					
	1212JX-1.5	□	□							120						
KGM□/L	1010JX-2	□	□	18	10	10	18	10	2	120	9.15	2	3	SE-40120TR	LTW-15S	GMM2020... GM_2-TK(-8D) GM_2.2(-..D) GM_3(...)
	1212F-2-85	□	□	23	12	12	19	12		85	11.15					
	1212JX-2	□	□							120						
	1616JX-2	□	□	30	16	16	24.5	16	-		15.15			SE-50125TR	LTW-20	
KGM□/L	1212F-2.5-85	□		23	12	12	19	12	2	85	11	2.4	3	SE-40120TR	LTW-15S	GMM2520... GMM3020... GM_3(...)
	1212JX-2.5	□	□							120						
	1616JX-2.5	□	□	30	16	16	24.5	16	-		15			SE-50125TR	LTW-20	
KGM□/L	1616JX-3	□	□	30	16	16	24.5	16	-	120	14.8	3	4	SE-50125TR	LTW-20	GMG3020..., GM_3(...), GM_4(...)

KGM will be switched to KGZ=> **H28**

Recommended cutting conditions ➡ **H55**

● : Standard item R : Right-hand only L : Left-hand only □ : Will be discontinued

KGM



Right-hand shown

Toolholder dimensions

Description		Availability		Dimension (mm)										Spare parts				Applicable inserts ⇒ H46, H47
														Clamp bolt	Screw	Wrench	Wrench	
		R	L	CDX	H	B	LH	HF	HBH	LF	WF	CW min.	CW max.					
KGM$^{R/L}$	1212H-3	●		9	12	12	27	12	4	100	10.8	3	3	-	SB-5TR	-	LTW-20	GMG3020..., GM_3(...)
	1616H-3	●			16	16		16			14.8		4	HH5X16	-	LW-4	-	GMG3020..., GM_3(...), GM_4(...)
	2020K-3	●	●		20	20		20	-	125	18.8							
	2525M-3	●	●		25	25		25		150	23.8			HH5X25				
KGM$^{R/L}$	2020K-4	●		10	20	20	27	20	-	125	18.3	4	5	HH5X16	-	LW-4	-	GM_4(...) GMN5
	2525M-4	●	●		25	25		25		150	23.3			HH5X25				
KGMR	2020K-5	●		10	20	20	27	20	-	125	17.8	5	6	HH5X16	-	LW-4	-	GMN5 GMN6
	2525M-5	●			25	25		25		150	22.8			HH5X25				

CDX shows available grooving depth.

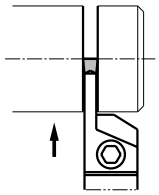
4mm width Insert can be installed in KGM$^{R/L}$1212H-3, but is not recommended due to the toolholder's rigidity.

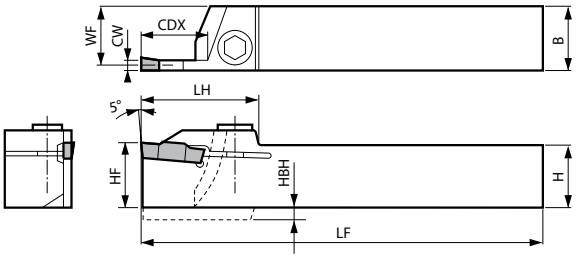
KGM will be switched to KGD=> **H40**

Recommended cutting conditions ⇒ **H55**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGM (Deep grooving)





Right-hand shown

Toolholder dimensions

Description		Availability		Dimension (mm)										Spare parts				Applicable inserts ➔ H46, H47
														Clamp bolt	Screw	Wrench	Wrench	
		R	L	CDX	H	B	LH	HF	HBH	LF	WF	CW min.	CW max.					
KGM[R/L]	2012K-2T17		●	17	20	12	33	20		125	11.15	2	3	-	SB-5TR	-	LTW-20	GMM2020..., GM_2-TK(-8D) GM_2.2(-..D), GM_3(...)
	2020K-2T17	●	●			20					19.15			HH5X16	-	LW-4	-	
	2525M-2T17	●	●		25	25		25		150	24.15			HH5X25				
KGM[R/L]	1616H-3T20	●		20	16	16	36	16	4	100	14.8	3	4	HH5X16	-	LW-4	-	GMG3020... GM_3(...) GM_4(...)
	2012K-3T20		●		20	12		20		125	10.8			-	SB-5TR	-	LTW-20	
	2020K-3T20	●	●			20					18.8			HH5X16	-	LW-4	-	
	2525M-3T20	●	●		25	25		25		150	23.8			HH5X25				
KGM[R/L]	2020K-4T20	●		20	20	20	36	20		125	18.3	4	5	HH5X16	-	LW-4	-	GM_4(...) GMN5
	2525M-4T20	●			25	25		25		150	23.3			HH5X25				
	2525M-4T25	●	●	25			41											
KGM[R/L]	2525M-5T25	●	●	25	25	25	42	25		150	22.8	5	6	HH5X25	-	LW-4	-	GMN5 GMN6
	3232P-5T25	●			32	32		32		170	29.8							
KGMR	2525M-6T30	●		30	25	25	45	25		150	22.4	6	6	HH5X25	-	LW-4	-	GMN6

CDX shows the distance from the toolholder to the cutting edge. Ref. to the Table (**H54**) for the relationship between the available grooving depth and the cutting dia.
When using GMG / GMM (2-edge) insert, set the groove depth under 15 mm.
KGM will be switched to KGD=> **H40**

Recommended cutting conditions ➔ **H55**

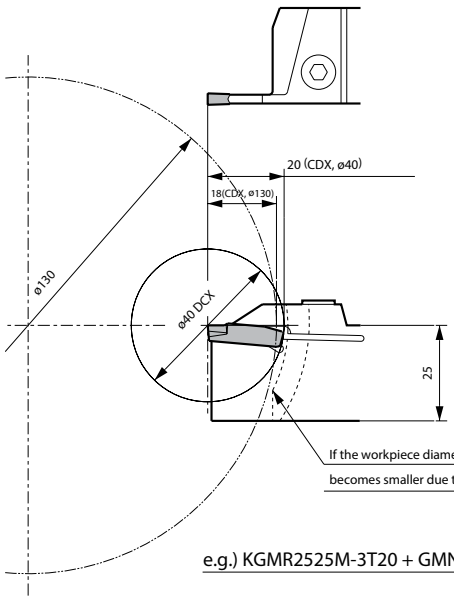
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts

Applications	Grooving / Turning	Grooving / Turning	Grooving	Full-R / Copying	Full-R / Copying	Cut-off / Deep grooving	Cut-off / Deep grooving	Cut-off / Deep grooving	Cut-off / Deep grooving	Cut-off / Deep grooving
See page	G48	G48	G49	G49	G50	H46, H47	H46	H46, H47	H46, H47	H46, H47
Insert / Toolholder description	MW 	MS 	MG 			MT 	NB 	TK  TMR	TK 	
KGM$^{R}/_{L}$...1.5	-	-	-	-	-	GMM1520..MT GMM2020..MT GMM1520$^{R}/_{L}$..MT GMM2020$^{R}/_{L}$..MT	GMM1520..NB GMM2020..NB	GMM2020..T. GMM2020R..T.	GMN2..TK GMR2..TK	-
KGM$^{R}/_{L}$...2(T)	GMM2420..MW GMM3020..MW	GMG3020..MS GMM3020..MS	GMG2520..MG GMG3020..MG	GMG3020..R GMM3020..R	-	GMM2020..MT GMM2520..MT GMM3020..MT GMM2020$^{R}/_{L}$..MT GMM2520$^{R}/_{L}$..MT GMM3020$^{R}/_{L}$..MT	GMM2020..NB GMM2520..NB GMM3020..NB	GMM2020..T. GMM2520..T. GMM3020..T. GMM2020R..T. GMM2520R..T. GMM3020R..T.	GMN2..TK GMN3..TK GMR2..TK GMR3..TK	GMN2.2 GMN3 GM$^{R}/_{L}$2.2 GM$^{R}/_{L}$3
KGM$^{R}/_{L}$...2.5	GMM2420..MW GMM3020..MW	GMG3020..MS GMM3020..MS	GMG2520..MG GMG3020..MG	GMG3020..R GMM3020..R	-	GMM2520..MT GMM3020..MT GMM2520$^{R}/_{L}$..MT GMM3020$^{R}/_{L}$..MT	GMM2520..NB GMM3020..NB	GMM2520..T. GMM3020..T. GMM2520R..T. GMM3020R..T.	GMN3..TK GMR3..TK	GMN3 GM$^{R}/_{L}$3
KGM$^{R}/_{L}$...3(T)	GMM3020..MW GMM4020..MW	GMG3020..MS GMM3020..MS GMG4020..MS GMM4020..MS	GMG3020..MG GMG3520..MG GMG4020..MG	GMG3020..R GMM3020..R GMG4020..R GMM4020..R	-	GMM3020..MT GMM3020$^{R}/_{L}$..MT	GMM3020..NB	GMM3020..T. GMM3020R..T.	GMN3..TK GMN4..TK GMR3..TK GMR4..TK	GMN3 GMN4 GM$^{R}/_{L}$3 GM$^{R}/_{L}$4
KGM$^{R}/_{L}$...4(T)	GMM4020..MW GMM5020..MW	GMG4020..MS GMM4020..MS GMG5020..MS GMM5020..MS	GMG4020..MG GMG5020..MG	GMG4020..R GMM4020..R GMG5020..R GMM5020..R	-	-	-	-	GMN4..TK GMR4..TK	GMN4 GMN5 GM$^{R}/_{L}$4
KGM$^{R}/_{L}$...5T	GMM5020..MW GMM6020..MW	GMG5020..MS GMM5020..MS GMG6020..MS GMM6020..MS	GMG5020..MG GMG6020..MG	GMG5020..R GMM5020..R GMG6020..R GMM6020..R	GMGA6020..R	-	-	-	-	GMN5 GMN6
KGM$^{R}/_{L}$...6T	GMM6020..MW	GMG6020..MS GMM6020..MS	GMG6020..MG	GMG6020..R GMM6020..R	GMGA6020..R	-	-	-	-	GMN6
KGM$^{R}/_{L}$...8	GMM8030..MW	-	GMG8030..MG	-	GMGA8030..R	-	-	-	-	-

Recommended cutting conditions ⊕ H55

Possible cutting diameter of KGM / KGM-T type



There is a limit to available grooving depth depending on the workpiece diameter.

KGM (for automatic lathe) possible cutting diameter and available grooving depth table

Toolholder description		DCX (Cutting dia.)																
KGM$^{R}_{L}$	1010□-1.5...	-	-	-	-	-	-	-	18	21	26	38	76	∞				
	1212□-1.5...	-	-	-	-	23	27	37	71	∞	∞	∞	∞					
	1010□-2...	-	-	-	-	-	-	-	18	21	26	38	76					
	1212□-2...	-	-	-	-	23	27	37	71	∞								
	1616□-2...	30	37	47	68	89	131	∞	∞									
	1212□-2.5...	-	-	-	-	23	27	37	71									
	1616□-2.5...	30	37	47	68	89	131	∞	∞									
	1616□-3...																	
Available grooving depth CDX (mm)		15	14	13	12	11.5	11	10	9	8	7	6	5	4	3	2	1	

KGM-T possible cutting diameter and available grooving depth table (GMN, GM$^{R}_{L}$ when using 1-edge insert)

Toolholder description		DCX (Cutting dia.)												
KGM$^{R}_{L}$	2012K-2T17	-	-	-	-	-	-	-	-	66	80	130	260	∞
	2020K-2T17													
	2525M-2T17													
	1616H-3T20	-	-	-	-	-	40	54	70	100	180	∞	∞	
	2012K-3T20	-	-	-	-	-	40	90	130	240	∞			
	2020K-3T20													
	2525M-3T20													
	2020K-4T20													
	2525M-4T20													
	2525M-4T25	-	-	50	140	240	∞	∞	∞	∞				
	2525M-5T25													
	3232P-5T25				280	600								
	2525M-6T30	100	300	∞	∞	∞								
Available grooving depth CDX (mm)		30	27	25	23	22	20	19	18	17	16	15	14	13 or under

Recommended cutting conditions (GMM-MT, GMM-TK, GMM-NB)

Workpiece material	Recommended insert grades (Vc: m/min)				Edge width CW (mm)				Remarks
	CVD coated carbide	PVD coated carbide		Carbide	1.5	2.0 / 2.5	3.0	4.0	
	CR9025	PR915	PR930	KW10	f (mm/rev)				
Carbon steel	☆ 80 ~ 180	★ 60 ~ 150	☆ 60 ~ 130	-	0.01 ~ 0.04	0.02 ~ 0.15	0.03 ~ 0.20	0.08 ~ 0.30	Coolant
Alloy steel	☆ 70 ~ 150	★ 60 ~ 150	☆ 60 ~ 130	-	0.01 ~ 0.04	0.02 ~ 0.15	0.03 ~ 0.20	0.08 ~ 0.30	
Stainless steel	☆ 60 ~ 140	★ 50 ~ 140	☆ 50 ~ 120	-	0.01 ~ 0.03	0.02 ~ 0.10	0.03 ~ 0.15	0.08 ~ 0.25	
Cast iron	-	-	-	★ 50 ~ 100	0.01 ~ 0.05	0.05 ~ 0.12	0.10 ~ 0.25	0.10 ~ 0.30	
Aluminum alloys	-	-	-	★ 200 ~ 450	0.01 ~ 0.05	0.05 ~ 0.10	0.05 ~ 0.20	0.05 ~ 0.25	
Brass	-	-	-	★ 100 ~ 200	0.01 ~ 0.05	0.05 ~ 0.10	0.05 ~ 0.15	0.05 ~ 0.20	

· When machining Steel and Stainless Steel by Insert of PR930, decrease the feed rate by 20%.

★: 1st Recommendation ☆: 2nd Recommendation

Recommended cutting conditions (GMM-TMR)

Workpiece material	Vc (m/min)	f (mm/rev)	Remarks
Carbon steel	60 ~ 200	0.08 ~ 0.18	Coolant
Alloy steel	60 ~ 150		
Stainless steel	50 ~ 140		

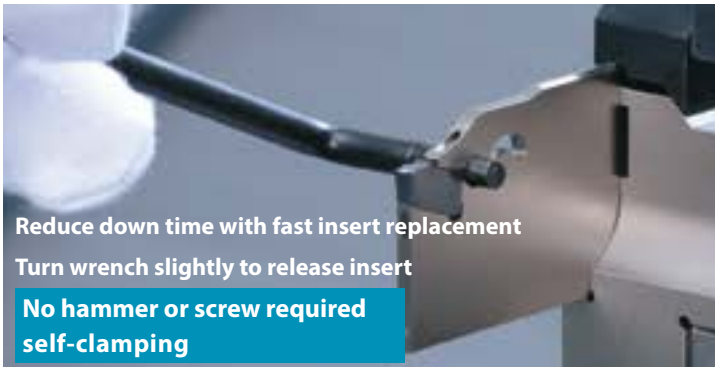
High-performance cut-off solutions

KPK Series

Easy insert replacement reduces downtime

High performance, long tool life and stable machining with strong clamping mechanism

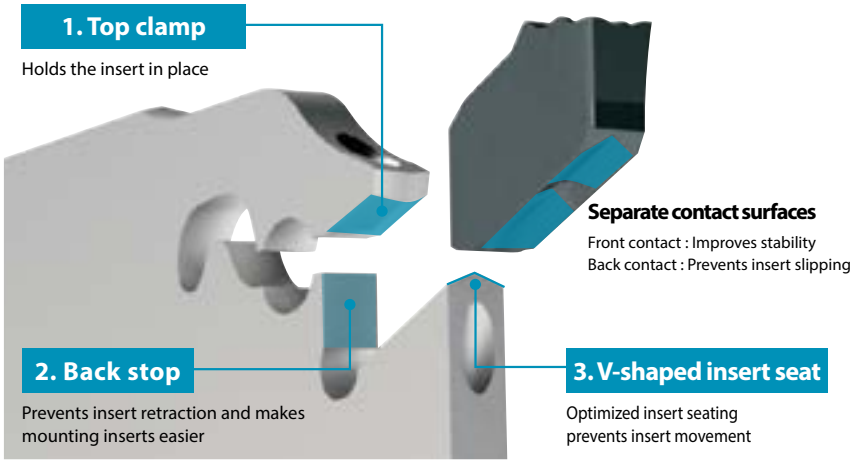
1 Easy insert replacement



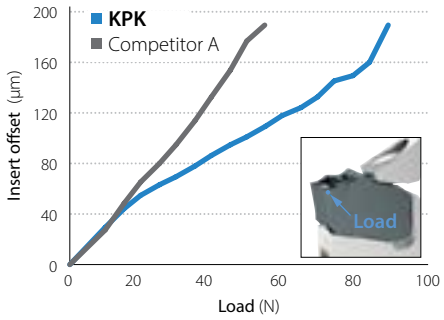


2 Firm insert clamp ensures added safety and security

The firmly secured insert uses three contact surfaces to eliminate sliding or chattering

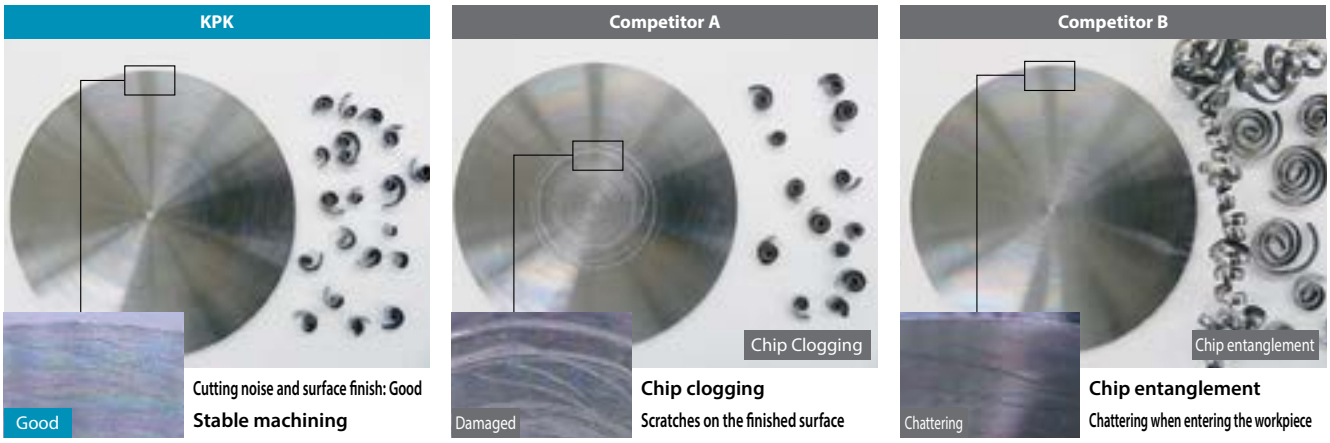


Insert deviation comparison (Internal evaluation)



Measured tool : KPKB32-3 PKM30N-025PM

Cutting performance comparison (Internal evaluation)



Cutting conditions : n = 320 min^{-1} (constant), Vc = ~100 m/min, f = 0.12 mm/rev, Wet (External coolant) Workpiece material : 34CrMo4 (ø100) Edge width : 3mm

3 Unique chipbreaker for long tool life and stable machining

Advanced chipbreaker technology inherited from KGD lineup provides excellent chip control



General purpose
PM Chipbreaker

Insert grade

For Steel	: **PR1625**
For Stainless steel	: **PR1535**
For Cast iron and Aluminum	: **GW15**

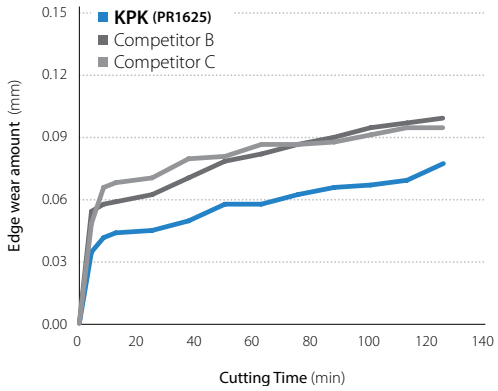


For tough edge and high-feed machining
PH Chipbreaker

Insert grade

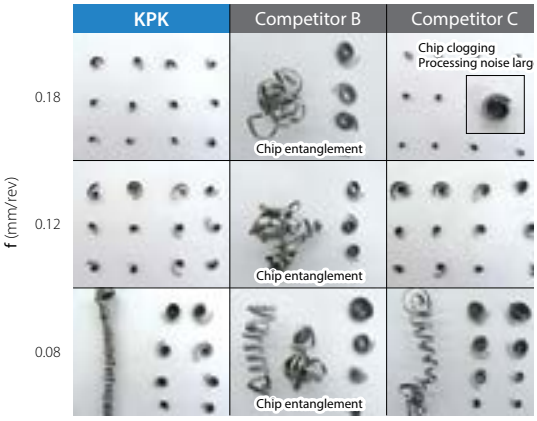
For Steel	: **PR1625**
For Stainless steel	: **PR1535**

Wear resistance comparison (Internal evaluation)



Cutting conditions : n = 955 min^{-1} (constant), Vc = ~150 m/min
f = 0.12 mm/rev (~ø10 : f = 0.05 mm/rev) Wet (External coolant)
Workpiece material : 15CrMo4 (ø50) Edge width : 3 mm (PM Chipbreaker)

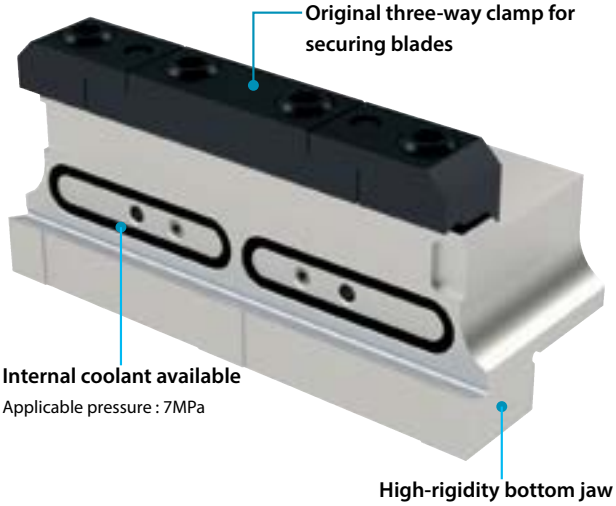
Chip control comparison (Internal evaluation)



Cutting conditions : n = 780 min^{-1} (constant), Vc = ~120 m/min, Wet (External coolant)
Workpiece material : 15CrMo4 (ø50) Edge width : 3 mm (PM Chipbreaker)

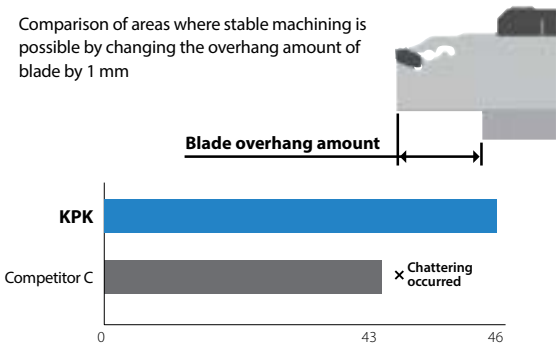
4 Rigid toolblock prevents chattering and provides internal coolant

KPKTB-JCT



Chattering resistance comparison (Internal evaluation)

Comparison of areas where stable machining is possible by changing the overhang amount of blade by 1 mm

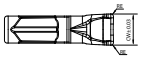
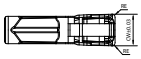
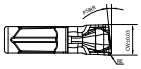


Cutting conditions : n = 650 min^{-1} (constant), Vc = ~100m/min, f = 0.12 mm/rev
Wet (Internal coolant : Normal pressure) Workpiece material : 34CrMo4(ø50),
Edge width : 3 mm (PM Chipbreaker)

Check KTKTB type is compatible with internal coolant with an optional internal connector. (~ 1 MPa)

*Refer to page H65 for the supply method (Type C).

PKM

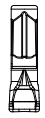
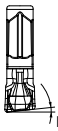
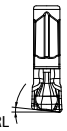
			Carbon steel / Alloy steel					◔	●		P
			Stainless steel					●	◔		M
			Cast iron							●	K
			Non-ferrous metals							●	N
Insert		Description	No. of edges	Dimension (mm) CW	Dimension (mm) RE	Angle (°) PSIR$^{R}_{L}$	Tolerance (mm) CW min.	Tolerance (mm) CW max.	Carbide PVD PR1535	Carbide PVD PR1625	Carbide - GW15	Applicable toolholder ⇨ H60, H61, H67, H68
	 General purpose	PKM 16N-015PM	1	1.6	0.15	-	-0.03	+0.03	●	●	●	KPKB19-1, KPKB26-1(JCT) KPKB32-1(JCT)
		PKM 20N-020PM		2	0.2				●	●	●	KPKB19-2, KPKB26-2(JCT) KPKB32-2(JCT), KPKH$^{R}_{L}$2020K-2(JCT)
		PKM 24N-020PM		2.4	0.2				●	●	●	KPKB19-2, KPKB26-2(JCT) KPKB32-2(JCT), KPKH$^{R}_{L}$2020K-2(JCT)
		PKM 30N-025PM		3	0.25				●	●	●	KPKB26-3(JCT), KPKB32-3(JCT) KPKH$^{R}_{L}$...-3(JCT), KPKH$^{R}_{L}$...-3D45
		PKM 40N-030PM		4	0.3				●	●	●	KPKB26-4(JCT), KPKB32-4(JCT) KPKH$^{R}_{L}$...-4(JCT), KPKH$^{R}_{L}$...-4D45
		PKM 48N-030PM		4.8	0.3				●	●	●	KPKB26-5(JCT), KPKB32-5(JCT) KPKH$^{R}_{L}$2525M-5
		PKM 50N-030PM		5	0.3				●	●	●	KPKB26-5(JCT), KPKB32-5(JCT) KPKH$^{R}_{L}$2525M-5
		PKM 60N-035PM		6	0.35				●	●	●	KPKB32-6(JCT)
	 High feed	PKM 20N-020PH	1	2	0.2	-	-0.03	+0.03	●	●		KPKB19-2, KPKB26-2(JCT) KPKB32-2(JCT), KPKH$^{R}_{L}$2020K-2(JCT)
		PKM 30N-030PH		3	0.3				●	●		KPKB26-3(JCT), KPKB32-3(JCT) KPKH$^{R}_{L}$...-3(JCT), KPKH$^{R}_{L}$...-3D45
		PKM 40N-030PH		4	0.3				●	●		KPKB26-4(JCT), KPKB32-4(JCT) KPKH$^{R}_{L}$...-4(JCT), KPKH$^{R}_{L}$...-4D45
		PKM 50N-030PH		5	0.3				●	●		KPKB26-5(JCT), KPKB32-5(JCT) KPKH$^{R}_{L}$2525M-5
		PKM 60N-040PH		6	0.4				●	●		KPKB32-6(JCT)
	 General purpose with lead angle	PKM 16R-015PM-6D 16L-015PM-6D	1	1.6	0.15	6	-0.03	+0.03	● ●	● ●	● ●	KB19-1, KPKB26-1(JCT)KPKB32-1(JCT)
		PKM 20R-020PM-6D 20L-020PM-6D		2	0.2				● ●	● ●	● ●	KPKB19-2, KPKB26-2(JCT) KPKB32-2(JCT), KPKH$^{R}_{L}$2020K-2(JCT)
		PKM 24R-020PM-6D 24L-020PM-6D		2.4	0.2				● ●	● ●	● ●	KPKB19-2, KPKB26-2(JCT) KPKB32-2(JCT), KPKH$^{R}_{L}$2020K-2(JCT)
		PKM 30R-025PM-6D 30L-025PM-6D		3	0.25				● ●	● ●	● ●	KPKB26-3(JCT), KPKB32-3(JCT) KPKH$^{R}_{L}$...-3(JCT), KPKH$^{R}_{L}$...-3D45
		PKM 40R-030PM-6D 40L-030PM-6D		4	0.3				● ●	● ●	● ●	KPKB26-4(JCT), KPKB32-4(JCT) KPKH$^{R}_{L}$...-4(JCT), KPKH$^{R}_{L}$...-4D45
		PKM 50R-030PM-6D 50L-030PM-6D		5	0.3				● ●	● ●	● ●	KPKB26-5(JCT), KPKB32-5(JCT) KPKH$^{R}_{L}$2525M-5

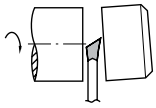
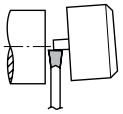
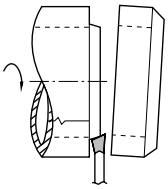
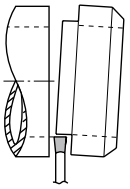
Handed insert shows Right-hand

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Lead angle direction and usage

1. If there is no restriction on the finished shape, use an insert without lead angle.
2. Insert with lead angle is recommended to prevent remaining boss.
3. If you want to make the remaining boss smaller when machining small or thin parts, use insert with lead angle.

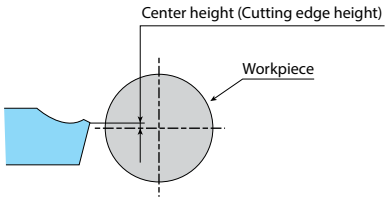
Hand of lead angle	N (Neutral)	R (Right-hand)	L (Left-hand)
			
· Inserts with lead angle (PSIR R/L) reduce burrs at cut-off machining. · The larger the lead angle (PSIR R/L), the smaller the cutting force. The feed also needs to be smaller.			

	Right-hand (R) Lead angle	Neutral		Right-hand (R) Lead angle	Neutral
Solid workpiece			Hollow workpiece (Pipe)		

Caution

1. Set cutting edge height 0.1mm above core height.
2. Machining with ample supply of coolant is recommended.
3. Keep a constant rate during processing so that optimum product life will be achieved.
4. Cut off as close to the chuck as possible.
5. To prevent impacts, reduce feed rate by 1/2 ~ 1/3 when nearing the center of the workpiece.

Overuse of insert and toolholder (blade) may cause insert breakage and toolholder (blade) damage.



KPKB-JCT (Coolant-through holders)



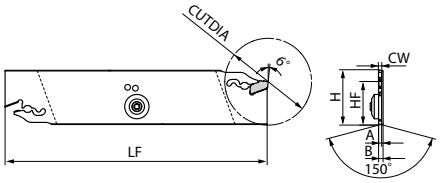


Fig. 1

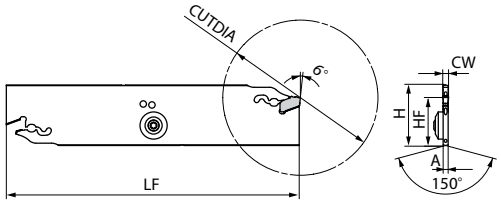


Fig. 2

With coolant supply | Applicable pressure : ~7MPa

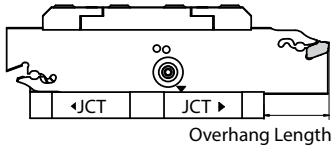
Toolholder dimensions

Description		Availability	Dimension (mm)							Coolant hole	Fig.	Spare parts				Applicable inserts ➡ H58	Applicable tool block ➡ H62, H63
			CUTDIA	A	B	H	HF	LF	CW			Releasing wrench	Coolant cap	Screw	Wrench		
KPKB	26-1JCT	●	35	1.4	2.6	26	21.4	110	1.6	Yes	1	LPW-5	CCP-4	SB-4065TR	FT-15	PKM16...	KPKTB..-26JCT KTKTB..-26
	26-2JCT	●	50	1.8					2 2.4							PKM20... PKM24...	
	26-3JCT	●	75	2.6	-				3		2					PKM30...	
	26-4JCT	●	80	3.4					4							PKM40...	
	26-5JCT	●		4.2					4.8 5					Coolant cap screw Tightening torque 3.0 N·m		PKM48... PKM50...	
KPKB	32-1JCT	●	35	1.4	2.6	32	25	150	1.6	Yes	1	LPW-5	CCP-4	SB-4065TR	FT-15	PKM16...	KPKTB..-32JCT KTKTB..-32 KTKTBF..-32
	32-2JCT	●	50	1.8					2 2.4							PKM20... PKM24...	
	32-3JCT	●	100	2.6	-				3		2					PKM30...	
	32-4JCT	●		3.4					4							PKM40...	
	32-5JCT	●	120	4.2					4.8 5					Coolant cap screw Tightening torque 3.0 N·m		PKM48... PKM50...	
	32-6JCT	●		5.4					6							PKM60...	

See page **H64** for insert mounting and removal instructions
When using internal coolant with KTKTB, KTKTBF type toolblocks, coolant supply piping (CCN -5) sold separately.
H: Length between virtual vertices

Recommended cutting conditions ➡ **H69**

Minimum /maximum overhang length while using internal coolant



Description		Overhang length	
Blade	Toolblocks	min.	max.
KPKB26-1JCT	KPKTB20-26JCT	15	34.5
KPKB26-2/3/4JCT		20	40
KPKB26-5JCT		23	43
KPKB32-1JCT	KPKTB20-32JCT	18	49
	KPKTB25-32JCT	13	
	KPKTB32-32JCT		
KPKB32-2/3/4JCT	KPKTB20-32JCT	27.5	59
	KPKTB25-32JCT	22.5	
	KPKTB32-32JCT		
KPKB32-5/6JCT	KPKTB20-32JCT	31.5	63
	KPKTB25-32JCT	26.5	
	KPKTB32-32JCT		

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KPKB



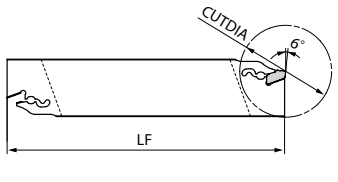


Fig. 1

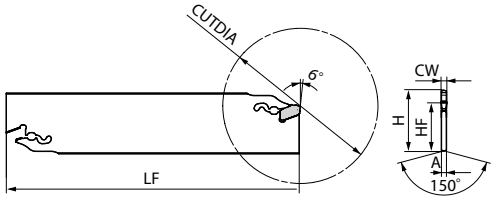


Fig. 2

Toolholder dimensions

Description		Availability	Dimension (mm)							Coolant hole	Fig.	Spare parts	Applicable inserts ⇒ H58	Applicable tool block ⇒ H62, H63
			CUTDIA	A	B	H	HF	LF	CW			Releasing wrench		
KPKB	19-1	●	32	1.4	2.6	19	15.7	86	1.6	No	1	LPW-5	PKM16...	KTKTB..-19
	19-2	●	40	1.8	-				2 2.4		2		PKM20... PKM24...	
KPKB	26-1	●	35	1.4	2.6	26	21.4	110	1.6	No	1	LPW-5	PKM16...	KPKTB..-26JCT KTKTB..-26
	26-2	●	50	1.8	-				2 2.4		2		PKM20... PKM24...	
	26-3	●	75	2.6					3				PKM30...	
	26-4	●	80	3.4					4				PKM40...	
	26-5	●		4.2					4.8 5				PKM48... PKM50...	
KPKB	32-1	●	35	1.4	2.6	32	25	150	1.6	No	1	LPW-5	PKM16...	KPKTB..-32JCT KTKTB..-32 KTKTBF..-32
	32-2	●	50	1.8					2 2.4				PKM20... PKM24...	
	32-3	●	100	2.6	-				3		2		PKM30...	
	32-4	●		3.4					4				PKM40...	
	32-5	●	120	4.2					4.8 5				PKM48... PKM50...	
	32-6	●		5.4					6				PKM60...	

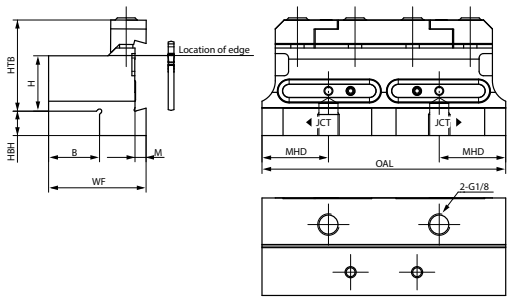
See page **H64** for insert mounting and removal instructions
H: Length between virtual vertices

Recommended cutting conditions ⇒ **H69**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KPKTB-JCT (Coolant-through type)





With coolant supply | Applicable pressure : ~7MPa

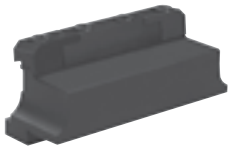
Toolholder dimensions

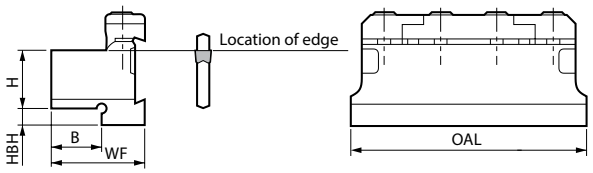
Description		Availability	Dimension (mm)								Coolant hole	Spare parts						Applicable blade ➡ G140 H60 H61 H72
			H	B	HBH	HTB	M	MHD	OAL	WF		Clamp bolt	Clamp set (separate type)	O-ring	Plug	Screw	Wrench	
KPKTB	20-26JCT	●	20	19	12.4	33	4	23.5	86	39	Yes	HH6X16	BCS-2	GR-020	HSG1/8X8.0	HS3X4	LW-5	KPKB26-_JCT , KTKB26-_
	20-32JCT	●			16	41	5	25	100	40	Yes		BCS-3	GR-026		HS4X4		KPKB32-_JCT KTKB32-_ KFTB$^{R/L}$...-4S KFTB$^{R/L}$...-5S
	25-32JCT	●	25	23	11			30	110	44	Yes		BCS-4	GR-029				
	32-32JCT	●	32	29	5					50	Yes							

Includes only one HSG1/8X8.0 plug.
KPKTB-JCT type block is also compatible with conventional KTKB type blades.
See page **H66** for coolant piping parts.
When using internal coolant, the coolant may appear to leak slightly, but this should not affect machining performance.
(If the O-ring is damaged, order separately.)

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KTKTB



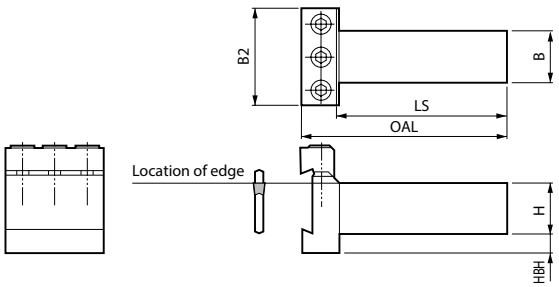


Toolholder dimensions

Description		Availability	Dimension (mm)					Spare parts				Applicable blade G140 H60 H61 H72	
			H	B	HBH	OAL	WF	Clamp bolt	Clamp set (integral type)	Clamp set (separate type)	Wrench	Cut-off	Face grooving
KTKTB	16-19	●	16	15.5	4	76	29.5	HH5X25	BCS-1	-	LW-4	KPKB19-_ KTKB19-1SS , KTKB19-2S	-
	20-19	●	20	19			34						
KTKTB	16-26	●	16	15.5	13	86	31.5	HH6X30	-	BCS-2	LW-5	KPKB26-_(JCT) KTKB26-1SS , KTKB26-_S	-
	20-26	●	20	19	9		36						
KTKTB	20-32	●	20	19	13	100	38	HH6X30	-	BCS-3	LW-5	KPKB32-_(JCT) KTKB32-1SS , KTKB32-_ KTKB$^{R/L}$32-_S	KFTB$^{R/L}$...-4S KFTB$^{R/L}$...-5S
	25-32	●	25	23	8	110	42			BCS-4			
	32-32	●	32	29	5		48						

KTKTBF





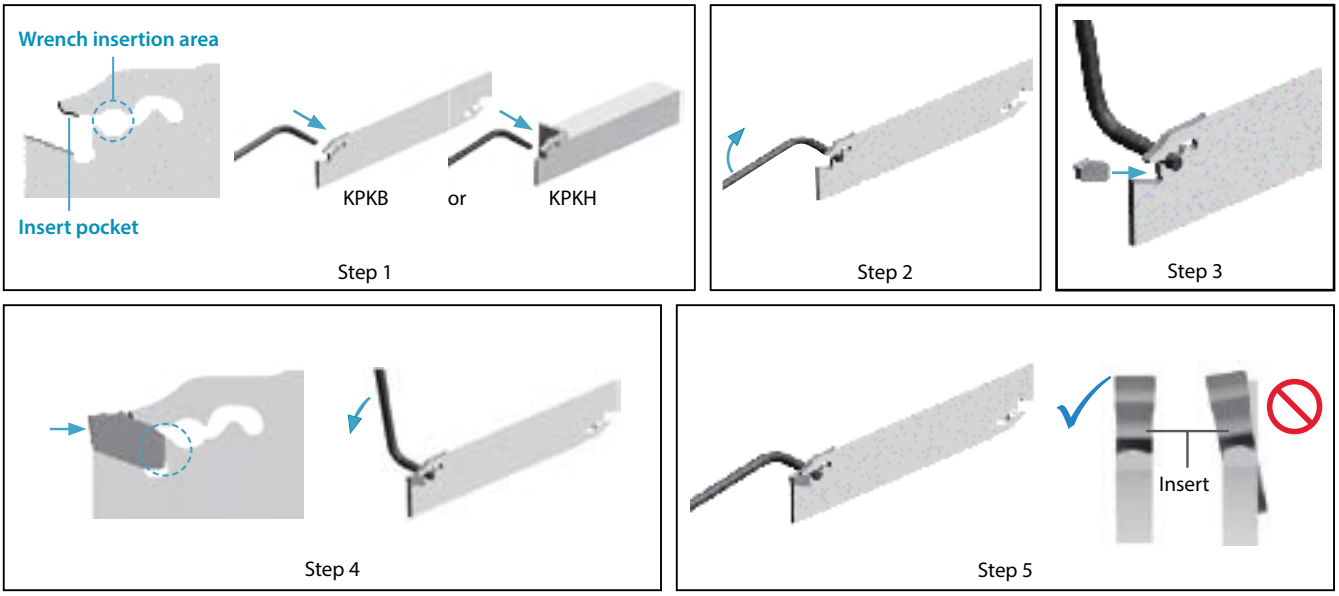
Toolholder dimensions

Description		Availability	Dimension (mm)						Spare parts			Applicable blade G140 H60 H61 H72	
			H	B	B2	HBH	LS	OAL	Clamp bolt	Clamp set (integral type)	Wrench	Cut-off	Face grooving
KTKTBF	25-32	●	25	25	48	9.5	84.5	102	HH6X30	BCS-5	LW-5	KPKB32-_(JCT) KTKB32-1SS , KTKB32-_ KTKB$^{R/L}$32-_S	KFTB$^{R/L}$...-4S KFTB$^{R/L}$...-5S
	32-32	●	32	32		2.5	99.5	117					

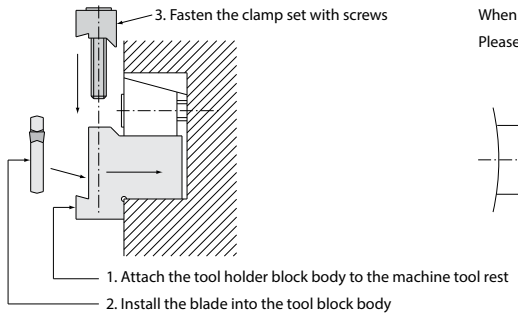
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

How to mount and remove the insert

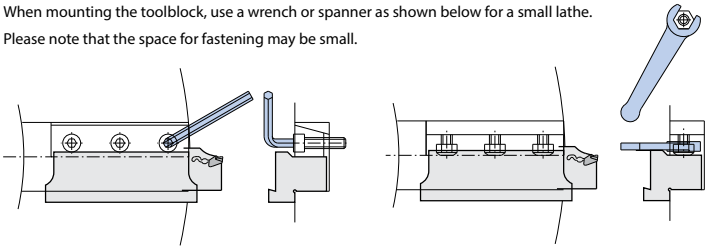
1. Use compressed air or other measures to remove chips from the insert mounting part and wrench insertion space and put in the wrench.
2. Turn the wrench.
3. Put in the insert into insert mounting part. (When removing the insert, follow the same procedure and remove it at step 3.)
4. Please clamp it while gently pressing it makes contact with the back end of blade's surface.
5. Make sure that the insert is set straight.



Installation guide

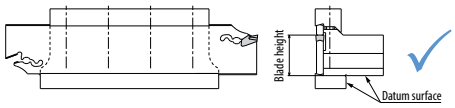


When mounting the toolblock, use a wrench or spanner as shown below for a small lathe.
Please note that the space for fastening may be small.

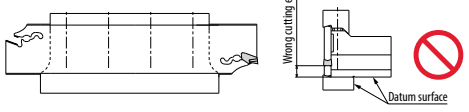


How to install the tool holder block and blade

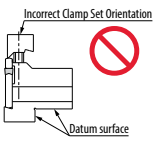
Correct blade installation



Incorrect blade installation



Incorrect Clamp Set Orientation

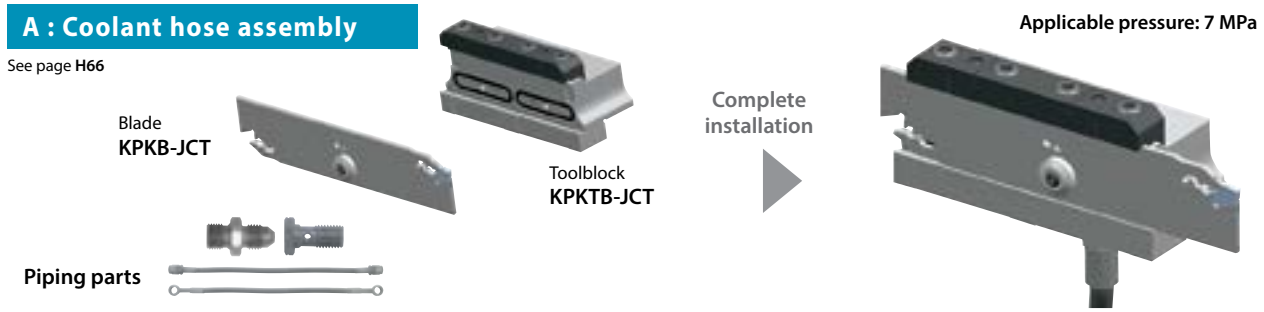


If the clamp set is mounted in the reverse direction, a large gap is created between the tool holder block main body and the clamp set as shown in the left figure. If you continue to use the product, the blade may break off. Reinstall in the correct orientation.

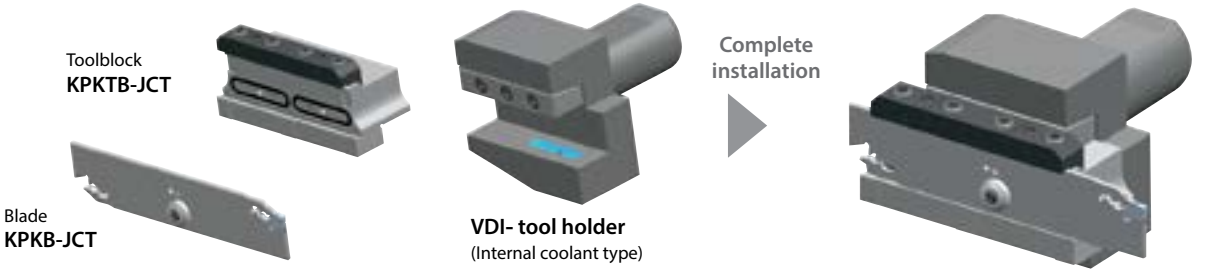
Internal coolant supply method Supplies according to machine specifications and requirements

A : Coolant hose assembly

See page **H66**

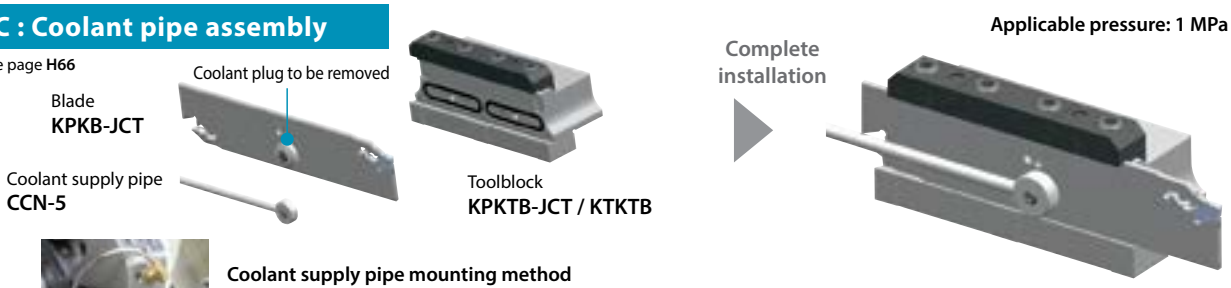


B : VDI holder assembly (Internal coolant type)



C : Coolant pipe assembly

See page **H66**





Coolant supply pipe mounting method
Attach to the blade with the supplied screw
Form pipe to the required shape and connect it to the piping of the machine.

Cautions

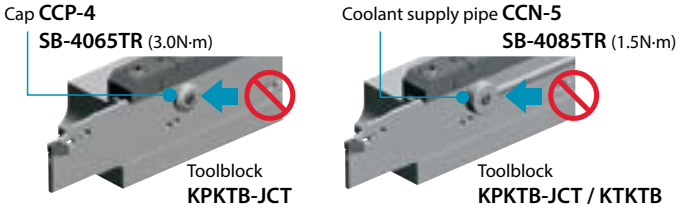
When mounting KPKB-JCT blade

When using internal coolant, keep the arrow (▼) on the blade within the range marked on the toolblock.



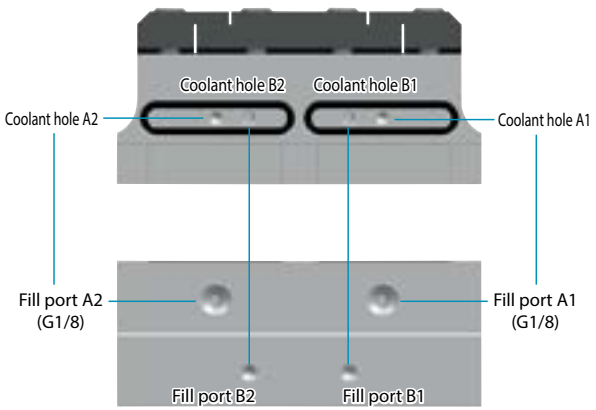
When the cap and coolant supply pipe are mounted

Coolant cannot be supplied correctly if it is mounted in the wrong position.



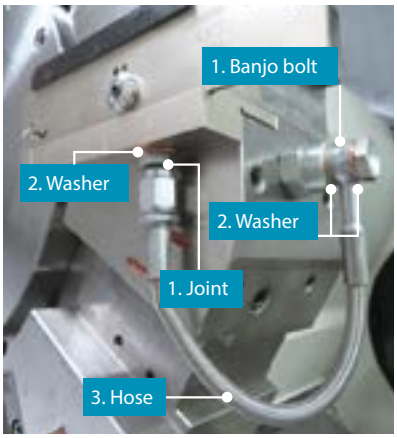
When using a toolblock

When using the discharge port B1 (B2), use a sealant for the filler cap (HSG 1/8 X 8.0) of the accessory part of the coolant supply port A1 (A2).



A : Coolant hose assembly

Connection method and piping parts

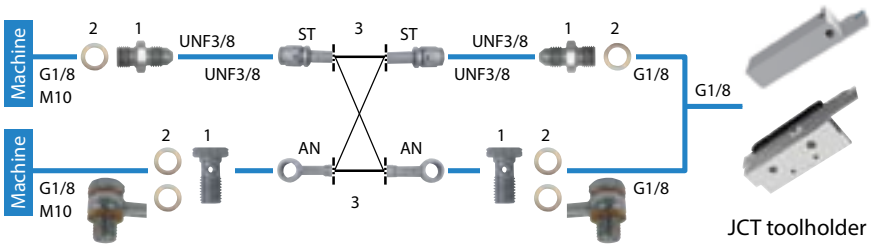


Easy connection with high pressure hose and joint

Even without a high pressure pump, internal coolant can be used at a normal pressure.

Banjo bolt available for angled hose connection

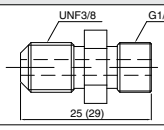
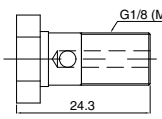
<Piping installation guide>



Depending on machine specifications and piping methods, 1.Joint / Banjo bolt x 2 2.Washer x 2-4 3.Hose x 1

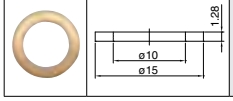
1. Joint / Banjo bolt (Sold separately)

Pressure Resistance : ~30MPa

Shape	Description	Stock	Thread standard Thread connection to the machine
 	J-G1/8-UNF3/8	●	G1/8
	J-M10X1.5-UNF3/8	●	M10X1.5
Banjo bolt (for angled hose)  	BB-G1/8	●	G1/8
	BB-M10X1.5	●	M10X1.5

2.Washer (Sold separately)

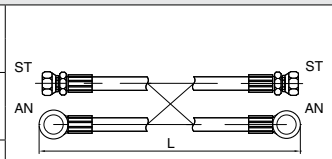
Pressure Resistance : ~30MPa

Shape	Description	Stock
	WS-10	●

*Use 2 washers for a banjo bolt

3.Hose (Sold separately)

Pressure Resistance : ~30MPa

Shape		Description	Stock	Thread standard		Dimension (mm) L
Straight/Straight		HS-ST-ST-200	●	UNF3/8	UNF3/8	200
		HS-ST-ST-250	●			250
Straight/Angled		HS-ST-AN-200	●	UNF3/8	– (Banjo bolt)	200
		HS-ST-AN-250	●			250
Angled/Angled		HS-AN-AN-200	●	– (Banjo bolt)	– (Banjo bolt)	200
		HS-AN-AN-250	●			250

Cautions

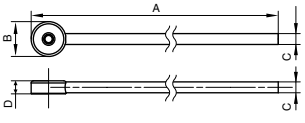
1. Make sure machine door is completely closed before use of these parts.
2. Use appropriate seal for the male thread of the piping parts and make sure the connection is secure.
   Use plugs to seal off unused coolant holes.
3. Connect and fasten the coolant hose firmly.
4. The use of copper washers may cause leakage but will have no effect on the performance.
5. Commercial piping parts can be used if the thread standards are same. Check the pressure resistance before use.
6. Regularly changing the coolant filter is recommended.

C : Coolant pipe assembly

Piping parts

Coolant supply pipe (Sold separately)

Pressure resistance : ~1MPa

Shape		Description	Stock	Dimension				Parts (Screw)
				A	B	C	D	
		CCN-5	●	190	16	5	6	SB-4085TR

Use wrench (FT -15) supplied with the blade when connecting.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KPKH-JCT (Coolant-through holders)



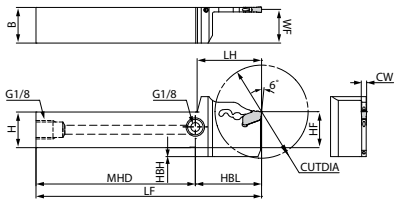
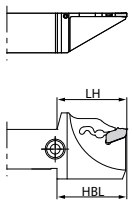


Fig. 1



KPKH R/L 2020K-2JCT

Fig. 2

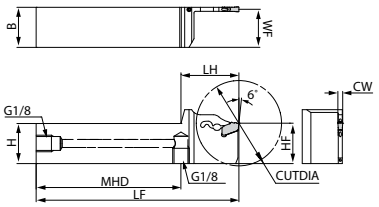


Fig. 3

Right-hand shown

Toolholder dimensions

Description		Availability		Dimension (mm)											Coolant hole	Fig.	Spare parts		Applicable inserts ⇒ H58
		R	L	CUTDIA	H	B	LH	MHD	HF	HBH	HBL	LF	WF	CW			Plug	Releasing wrench	
																			
KPKH R/L	2020K-2JCT	●	●	38	20	20	35.1	89	20	5	35.1	125	19.15	2 2.4	Yes	2	HSG1/8X8.0	LPW-5	PKM20... PKM24...
KPKH R/L	2020K-3JCT	●	●	52	20	20	36	88	20	5	37	125	18.75	3	Yes	1	HSG1/8X8.0	LPW-5	PKM30...
	2525K-3JCT	●	●	53	25	25		89	25	-	-		23.75			3			
KPKH R/L	2020K-4JCT	●	●	62	20	20	42.5	83	20	5	42	125	18.35	4	Yes	1	HSG1/8X8.0	LPW-5	PKM40...
	2525K-4JCT	●	●	68	25	25		82	25	-	-		23.35			3			

See page **H64** for insert mounting and removal instructions
See page **H66** for coolant piping parts.

Recommended cutting conditions ⇒ **H69**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KPKH



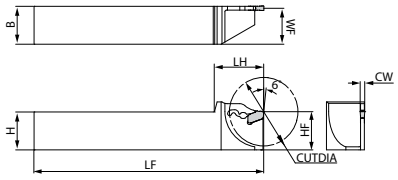
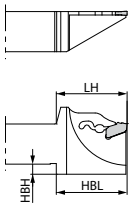


Fig. 1



KPKH R/L 2020K-2

Fig. 2

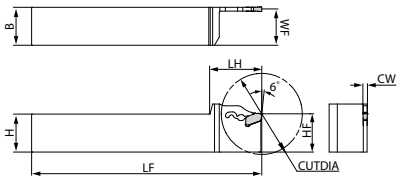


Fig. 3

Right-hand shown

Toolholder dimensions

Description		Availability		Dimension (mm)										Coolant hole	Fig.	Spare parts: Releasing wrench	Applicable inserts ⇒ H58
		R	L	CUTDIA	H	B	LH	HF	HBH	HBL	LF	WF	CW				
KPKH R/L	2020K-2	●	●	38	20	20	33.1	20	5	33.1	125	19.15	2 2.4	No	2	LPW-5	PKM20... PKM24...
KPKH R/L	2020K-3	●	●	52	20	20	34	20	-	-	125	18.75	3	No	3	LPW-5	PKM30...
	2525M-3	●	●	53	25	25		25			150	23.75					
KPKH R/L	2020K-4	●	●	62	20	20	40.5	20			125	18.35	4	No			PKM40...
	2525M-4	●	●	68	25	25		25			150	23.35					
KPKH R/L	2525M-5	●	●	79	25	25	45.9	25			150	22.95	4.8 5	No			PKM48... PKM50...
KPKH R/L	2020K-3D35	●	●	35	20	20	32.5	20	-	-	125	18.75	3	No	1	LPW-5	PKM30...
	2525M-3D45	●	●	45	25	25		25			150	23.75					
KPKH R/L	2020K-4D45	●	●	45	20	20	35	20			125	18.35	4	No			PKM40...
	2525M-4D45	●	●	45	25	25		25			150	23.35					

See page **H64** for insert mounting and removal instructions

Recommended cutting conditions ⇒ **H69**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Recommended cutting conditions

PM Chipberaker

Workpiece material	Recommended insert grades (Vc: m/min)			f (mm/rev)			Remarks
	MEGACOAT NANO		Carbide	Edge width CW (mm)			
	PR1625	PR1535	GW15	1.6	2 ~ 4	4.8 ~ 6	
Carbon steel	★ 80 – 220	☆ 80 – 220	-	0.03 – 0.12	0.08 – 0.18	0.10 – 0.22	Coolant
Alloy steel	★ 70 – 200	☆ 70 – 200	-				
Stainless steel	☆ 60 – 150	★ 60 – 150	-	0.03 – 0.08	0.06 – 0.12	0.08 – 0.15	
Cast iron	-	-	★ 50 – 100	0.03 – 0.08	0.08 – 0.18	0.10 – 0.22	
Aluminum alloys	-	-	★ 200 – 450	0.03 – 0.08	0.08 – 0.18	0.10 – 0.22	
Brass	-	-	★ 100 – 200				

Reduce feed to 1/2 ~ 1/3 at the center of the workpiece.

★: 1st Recommendation ☆: 2nd Recommendation

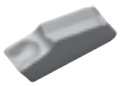
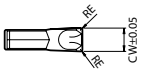
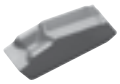
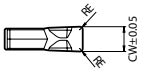
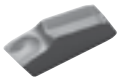
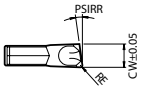
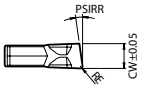
PH Chipberaker

Workpiece material	Recommended insert grades (Vc: m/min)			f (mm/rev)			Remarks
	MEGACOAT NANO		Carbide	Edge width CW (mm)			
	PR1625	PR1535	GW15	2	3 ~ 4	5 ~ 6	
Carbon steel	★ 80 – 220	☆ 80 – 220	-	0.10 – 0.22	0.15 – 0.28	0.15 – 0.35	Coolant
Alloy steel	★ 70 – 200	☆ 70 – 200	-				
Stainless steel	☆ 60 – 150	★ 60 – 150	-	0.05 – 0.12	0.08 – 0.15	0.08 – 0.18	

Reduce feed to 1/2 ~ 1/3 at the center of the workpiece.

★: 1st Recommendation ☆: 2nd Recommendation

TKN/TK

				Carbon steel / Alloy steel			●		○		○		P	
				Stainless steel			◔	●	○				M	
				Cast iron						●			K	
				Non-ferrous metals						●			N	
Insert		Description		No. of edges	Dimension (mm)		Angle (°)	Tolerance (mm)		Carbide			Cermet		Applicable toolholder ⇒ H72, H73
					CW	RE	PSIR$^{R}_{L}$	CW min.	CW max.	CVD	PVD	-	-		
										CR9025	PR1535 PR930	KW10	TN620	TN90	
		TKN	1.6	1	1.6	0.15	-	- 0.05	+ 0.05	●	●	●	●	●	KTKB..-1SS
		TKN	2	1	2.2	0.2				●	●	●	●	●	KTKB19-2S, KTKB26-2S, KTKB32-2S, KTKH$^{R}_{L}$...-2S
		TKN	2.4	1	2.4	0.2				●	●	●	●	●	
		TKN	3	1	3.1	0.25				●	●	●	●	●	KTKB26-3S, KTKB32-3S,KTKH$^{R}_{L}$...-3S, KTKH$^{R}_{L}$...-3T..S
		TKN	4	1	4.1	0.3				●	●	●	●	●	KTKB26-4S, KTKB32-4S,KTKH$^{R}_{L}$...-4S, KTKH$^{R}_{L}$...-4T22S
		TKN	4.8	1	4.8	0.3				●	●				KTKB26-5S, KTKB32-5S, KTKH$^{R}_{L}$2525M-5S
		TKN	5	1	5.1	0.3				●	●	●	●		
		TKN	6	1	6.4	0.35				●	●		●		KTKB32-6S
		TKN	8	1	8	0.4				●	●				KTKB$^{R}_{L}$32-8S
		TKN	9	1	9.6	0.45				●	●				KTKB$^{R}_{L}$32-9S
	 Low feed	TKN	1.6-P	1	1.6	0.2	-	- 0.05	+ 0.05	●	●		●		KTKB..-1SS
		TKN	2-P	1	2.2	0.2				●	●	●	●	●	KTKB19-2S, KTKB26-2S, KTKB32-2S, KTKH$^{R}_{L}$...-2S
		TKN	3-P	1	3.1	0.25				●	●	●	●		KTKB26-3S, KTKB32-3S,KTKH$^{R}_{L}$...-3S, KTKH$^{R}_{L}$...-3T..S
		TKR TKL	1.6 1.6	1	1.6	0.15	8	- 0.05	+ 0.05	● ●	● ●	● ●	● ●		KTKB..-1SS
		TKR TKL	2 2	1	2.2	0.2	8	- 0.05	+ 0.05	● ●	● ●	● ●	● ●	● ●	KTKB19-2S, KTKB26-2S, KTKB32-2S, KTKH$^{R}_{L}$...-2S
		TKR TKL	2.4 2.4	1	2.4	0.2	8	- 0.05	+ 0.05	● ●	● ●	● ●	● ●		
		TKR TKL	3 3	1	3.1	0.25	8	- 0.05	+ 0.05	● ●	● ●	● ●	● ●	● ●	KTKB26-3S, KTKB32-3S,KTKH$^{R}_{L}$...-3S, KTKH$^{R}_{L}$...-3T..S
		TKR TKL	4 4	1	4.1	0.3	8	- 0.05	+ 0.05	● ●	● ●	● ●	● ●	● ●	KTKB26-4S, KTKB32-4S,KTKH$^{R}_{L}$...-4S, KTKH$^{R}_{L}$...-4T22S
		TKR TKL	5 5	1	5.1	0.3	8	- 0.05	+ 0.05	● ●	● ●	● ●	● ●		KTKB26-5S, KTKB32-5S, KTKH$^{R}_{L}$2525M-5S
	 Low feed	TKR	1.6-P	1	1.6	0.2	8	- 0.05	+ 0.05	●	●	●	●	●	KTKB..-1SS
		TKR TKL	2-P 2-P	1	2.2	0.2	8	- 0.05	+ 0.05	● ●	● ●	● ●	● ●	● ●	KTKB19-2S, KTKB26-2S, KTKB32-2S, KTKH$^{R}_{L}$...-2S
		TKR TKL	3-P 3-P	1	3.1	0.25	8	- 0.05	+ 0.05	● ●	● ●	● ●	● ●	● ●	KTKB26-3S, KTKB32-3S,KTKH$^{R}_{L}$...-3S, KTKH$^{R}_{L}$...-3T..S

Handed insert shows Right-hand

TKN – cut-off tools

Cutting range	Chipbreaker		Advantage
General cut-off	Standard (No indication)		General cut-off type for feed rates over 0.1mm/rev Superior chip evacuation
Low feed cut-off	P		Chipbreaker specially designed for low feed machining on automatic lathes, etc. Chips are controlled at feed rate 0.03~0.08mm/rev

Inserts edge preparation

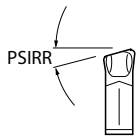
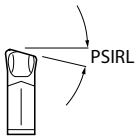
	Chamfer + R honed	Sharp edge	R honed
Edge preparation			
Standard chipbreaker	TN90 / PR1535 / CR9025	PR930 / KW10	-
P-chipbreaker	-	-	TN620 / TN90 / CR9025 PR1535 / PR930 / KW10

Sharp edge specification can reduce cutting force by 40% less than that of chamfer edge.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

How to select cut-off inserts with / without lead angle (Including sharp corner)

1. Use a neutral angle insert if there is no limit to the finished shape.
2. Use an angled insert to reduce the size of the remaining boss.
3. Use a sharp-cornered lead-angled insert to make the remaining boss much smaller when machining small parts and thin parts.

Hand of lead angle	N (Neutral)	R (Right-hand)	L (Left-hand)
			
Angled insert can reduce the burr size when cutting off. When using a larger lead angle , cutting force becomes smaller, but the feed rate should be reduced.			

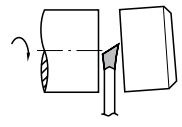
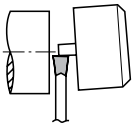
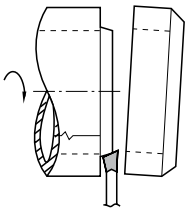
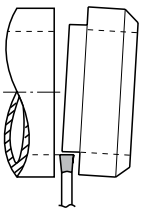
	Right-hand (R) Lead angle	Neutral
Example: Solid workpiece		
Example: Hollow workpiece (Pipe)		

Fig.1

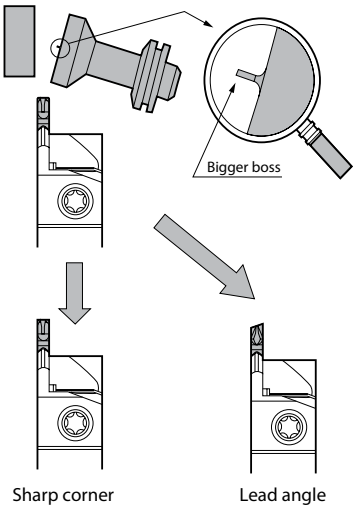


Fig.2

Caution

1. For PKM, PKM-R/L, TKN and TKR/L, set the cutting edge height 0.1~0.2 mm above the center height (Fig. 3) For other toolholders, set the cutting edge to the center height. 2. Be sure to perform wet processing. Apply enough coolant to the cutting edge. 3. Keep a constant rate during processing so that optimum product life will be achieved. 4. Cut off as close to the chuck as possible. 5. Lower the feed rate to 1/2 to 1/3 at the near center to prevent impact caused by machining.
Overuse of insert and toolholder (blade) may cause insert breakage and toolholder (blade) damage. Do not rework the insert and toolholder (blade) to prevent damage. Clean the insert pocket well with compressed air when replacing insert.

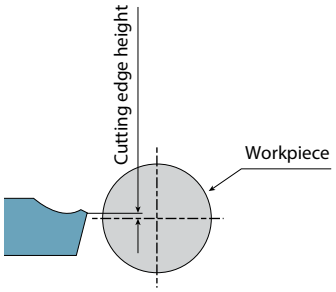


Fig. 3 (PKM, PKM-R/L, TKN, TKR/L)

Set up (TKN / TKR/L)

1. Tap the insert lightly with a plastic hammer to push it into the extent that it cannot be removed by hand. (Fig.1) (Pull it to the point where it does not fall out when picked up lightly with fingers)
2. Remove the insert with the supplied wrench. (Fig.2)

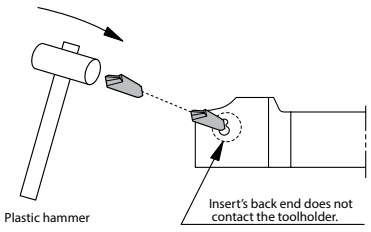


Fig.1: How to attach inserts

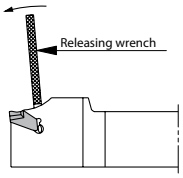
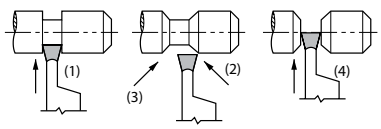


Fig.2: How to detach inserts

Application example of cut-off

1. Cut-off after chamfering

(1) Grooving (2)(3) Chamfering (4) Cut-off

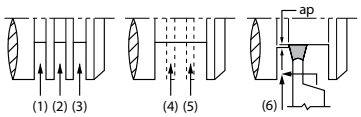


2. Wide grooving

(1)~(5) Groove widening

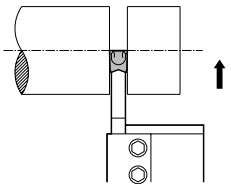
(6) Finishing

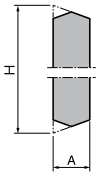
(Value of "ap" shall be under the value of Corner-R)



(In order to prevent both corners' unequal wear)

KTKB





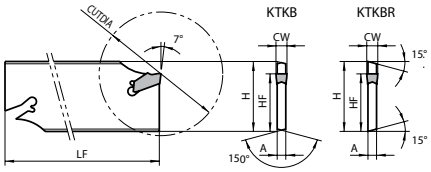


Fig. 1

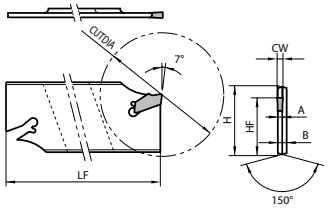


Fig. 2

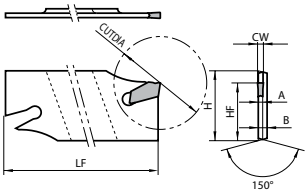


Fig. 3

H

Cut-Off

Toolholder dimensions

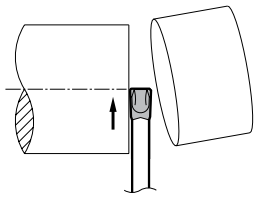
Description		Availability	Dimension (mm) CUTDIA	A	B	H	HF	LF	CW	Fig.	Spare parts: Releasing wrench	Applicable inserts ⇨ H70	Applicable tool block ⇨ H62, H63
KTKB	19-1SS	●	32	1.2	2.4	19	15.7	86	1.6	3	LTK-5	TKN1.6, TKN1.6-P TK$^{R}_{L}$1.6, TKR1.6-P	KTKTB16-19, KTKTB20-19
	26-1SS	●	35			26	21.4	110					KTKTB16-26, KTKTB20-26, KPKTB20-26JCT
	32-1SS	●				32	25	150					KTKTB20-32, KTKTB25-32, KTKTB32-32 KTKTBF25-32, KTKTBF32-32, KPKTB20-32JCT KPKTB25-32JCT, KPKTB32-32JCT
KTKB	19-2S	●	40	1.8	-	19	15.7	86	2.2 2.4	1		TKN2, TKN2-P TK$^{R}_{L}$2, TK$^{R}_{L}$2-P TKN2.4, TK$^{R}_{L}$2.4	KTKTB16-19, KTKTB20-19
KTKB	26-2S	●	50	1.8	-	26	21.4	110	2.2 2.4	1			KTKTB16-26 KTKTB20-26 KPKTB20-26JCT
	26-3S	●	75	2.6					3.1			TKN3, TKN3-P, TK$^{R}_{L}$3, TK$^{R}_{L}$3-P	
	26-4S	●	80	3.4					4.1			TKN4, TK$^{R}_{L}$4	
	26-5S	●		4.2					4.8 5.1			TKN5, TK$^{R}_{L}$5	
KTKB	32-2S	●	50	1.8	2.6	32	25	150	2.2 2.4	2		TKN2, TKN2-P, TK$^{R}_{L}$2, TK$^{R}_{L}$2-P TKN2.4, TK$^{R}_{L}$2.4	KTKTB20-32 KTKTB25-32 KTKTB32-32 KTKTBF25-32 KTKTBF32-32 KPKTB20-32JCT KPKTB25-32JCT KPKTB32-32JCT
	32-3S	●	100	2.6	-				3.1	1		TKN3, TKN3-P, TK$^{R}_{L}$3, TK$^{R}_{L}$3-P	
	32-4S	●		3.4					4.1			TKN4, TK$^{R}_{L}$4	
	32-5S	●	120	4.2					4.8 5.1			TKN5, TK$^{R}_{L}$5	
	32-6S	●		5.4					6.4			TKN6	
KTKBR	32-8S	R	120	6.8	-	32	25	150	8	1	LTK-5	TKN8	
KTKBL	32-8S	L											
KTKBR	32-9S	R	120	8	-	32	25	150	9.6	1		TKN9	

Suffix "-SS" means silver coating.
Releasing wrench is "LTK-5".
How to attach inserts, See Page **H71**.
Dimension H shows virtual apex distance.

Recommended cutting conditions ⇨ **H74**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KTKH



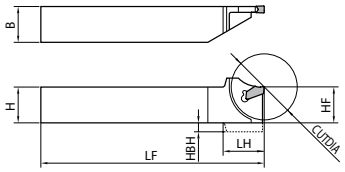


Fig. 1

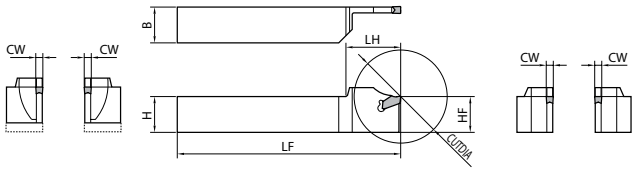


Fig. 2

Right-hand shown

Toolholder dimensions

Description		Availability		Dimension (mm)								Fig.	Spare parts	Applicable inserts ➡ H70
													Releasing wrench	
		R	L	CUTDIA	H	B	LH	HF	HBH	LF	CW			
KTKH[R/L]	1010F-2S	●	●	28	10	10	18.6	10	5	80	2.2 2.4	1	LTK-5	TKN2 TKN2-P TK[R/L]2 TK[R/L]2-P TKN2.4 TK[R/L]2.4
	1212H-2S	●	●	31	12	12	19.8	12	4	100				
	1612H-2S	●	●		16			16	-					
	1616H-2S	●	●			16								
	2012K-2S	●	●	36	20	12	22.8	20		125				
	2020K-2S	●	●			20								
KTKH[R/L]	1612H-3S	●	●	35	16	12	21.7	16	4	100	3.1	1		TKN3 TKN3-P TK[R/L]3 TK[R/L]3-P
	1616H-3S	●	●			16								
	2012K-3S	●	●	40	20	12	25.3	20	-	125				
	2020K-3S	●	●	51		20	31					2		
	2525M-3S	●	●	52	25	25	31.5	25		150				
KTKH[R/L]	2012K-4S	●	●	43	20	12	26.3	20	-	125	4.1	1		TKN4 TK[R/L]4
	2020K-4S	●	●	59		20	35					2		
	2525M-4S	●	●	66	25	25	38	25		150				
KTKH[R/L]	2525M-5S	●	●	77	25	25	43.5	25	-	150	4.8 5.1	2		TKN5 TK[R/L]5
KTKH[R/L]	2020K-3T17S	●	●	33	20	20	21.8	20	-	125	3.1	1	LTK-5	TKN3, TKN3-P TK[R/L]3, TK[R/L]3-P
	2525M-3T22S	●	●	43	25	25	26.8	25		150				
KTKH[R/L]	2020K-4T22S	●	●	44	20	20	26.8	20	-	125	4.1			TKN4 TK[R/L]4
	2525M-4T22S	●	●		25	25		25		150				

How to attach inserts, See Page **H71**.

Recommended cutting conditions ➡ **H74**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Recommended cutting conditions (TKN, TK$^{R}/_{L}$)

Workpiece material	Recommended insert grades (Vc: m/min)						Edge width CW (mm)					Remarks
	Cermet		CVD coated carbide	MEGACOAT NANO	PVD coated carbide	Carbide	1.6	2.2 / 2.4	3.1	4.1	4.8 ~ 9.6	
	TN620	TN90	CR9025	PR1535	PR930	KW10	f (mm/rev)					
Carbon steel	☆ 60 ~ 200	☆ 120 ~ 200	★ 80 ~ 180	☆ 60 ~ 150	☆ 60 ~ 130	-	0.02 ~ 0.08	0.04 ~ 0.18	0.05 ~ 0.25	0.08 ~ 0.30	0.15 ~ 0.40	Coolant
Alloy steel	☆ 60 ~ 160	☆ 100 ~ 160	★ 70 ~ 150	☆ 60 ~ 150	☆ 60 ~ 130	-	0.02 ~ 0.08	0.04 ~ 0.18	0.05 ~ 0.25	0.08 ~ 0.30	0.15 ~ 0.40	
Stainless steel	☆ 60 ~ 150	☆ 80 ~ 150	☆ 60 ~ 140	★ 50 ~ 120	☆ 60 ~ 140	-	0.02 ~ 0.06	0.04 ~ 0.12	0.05 ~ 0.18	0.08 ~ 0.25	0.10 ~ 0.30	
Cast iron	-	-	-	-	-	★ 50 ~ 100	0.02 ~ 0.08	0.05 ~ 0.12	0.10 ~ 0.25	0.10 ~ 0.30	0.15 ~ 0.35	
Aluminum alloys	-	-	-	-	-	★ 100 ~ 450	0.02 ~ 0.10	0.05 ~ 0.10	0.05 ~ 0.20	0.05 ~ 0.25	0.10 ~ 0.25	
Brass	-	-	-	-	-	★ 100 ~ 200	0.02 ~ 0.10	0.05 ~ 0.10	0.05 ~ 0.15	0.05 ~ 0.20	0.10 ~ 0.25	

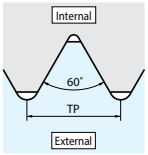
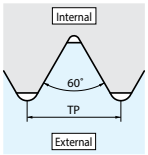
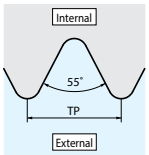
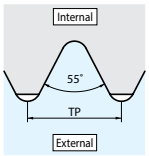
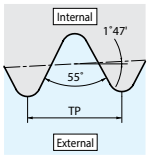
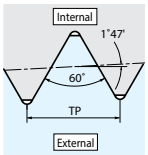
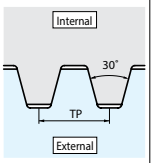
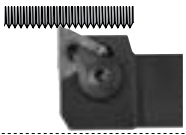
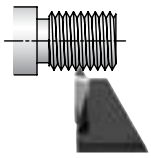
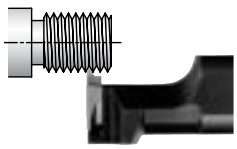
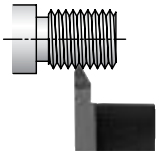
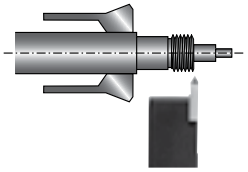
★: 1st Recommendation ☆: 2nd Recommendation



J

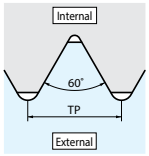
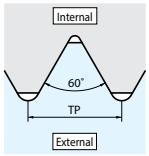
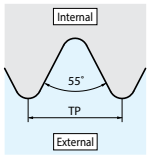
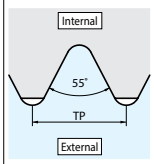
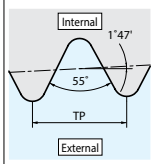
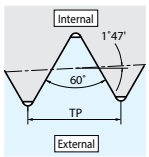
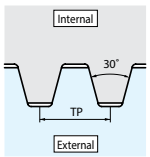
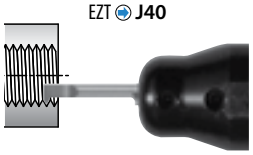
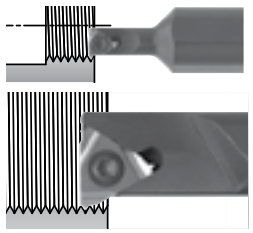
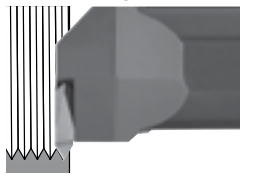
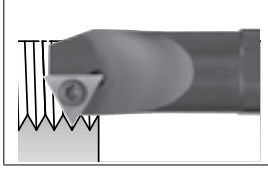
Introduction		**J2**
Threading inserts		**J6**
Metric	External threading	J6
	Internal threading	J7
Unified	External threading	J8
	Internal threading	J9
Parallel pipe, Whitworth	External threading	J10
	Internal threading	J11
Tapered pipe	External threading	J12
	Internal threading	J13
American national tapered pipe	External threading	J14
	Internal threading	J15
60° type (Partial profile/M, UN)	External threading	J16
	Internal threading	J17
55° type (Partial profile/G, R, Rc, W)	External threading	J18
	Internal threading	J19
30° type (Trapezoidal)	External threading	J20
	Internal threading	J21
Threading toolholders		**J22**
External toolholders	KTN/KTNS/KTN-JCT	J22
	S-KTN	J25
Internal toolholders	SIN/CIN	J26
Multipurpose threading tools		**J28**
TKFT for small parts machining	KTKF	J29
Threading tools		**J34**
TTX	KTTX/S-KTTX	J35
TT for external threading	KTT	J37
TT for internal threading	KITG	J39
EZ Bars for micro internal threading	EZT	J40
System Tip-Bars for micro internal threading	VNT	J44
TPGB for internal threading	S-STWP/S-STWP-E	J47
Recommended cutting conditions		**J48**
Depth of cut and number of passes		**J49**
Applicable toolholders and inserts		**J58**
Threading methods		**J63**
Thread types and basic profiles		**J65**

Tooling application table (External thread)

Thread types		Metric	Unified	Parallel pipe	Whitworth	Tapered pipe	American national tapered pipe	30° trapezoidal
		M	UN, UNC UNF, UNEF	G(PF)	W	R(PT) (BSPT)	NPT	Tr
Thread shape								
Toolholder shape \ Pitch		mm	TPI	TPI	TPI	TPI	TPI	mm
KTN ⇒ **J22** (KTN-JCT) ⇒ **J23** 	Full profile	0.5~5.0 (0.5~3.0) ⇒ **J6**	24~8 (24~8) ⇒ **J8**	19~11 (19~11) ⇒ **J10**	16~11 (16~11) ⇒ **J10**	28~11 (28~11) ⇒ **J12**	18~11.5 (18~11.5) ⇒ **J14**	-
	Partial profile	0.5~5.0 (0.5~3.0) ⇒ **J16**	48~5 (48~8) ⇒ **J16**	28~11 (28~11) ⇒ **J18**	40~5 (40~8) ⇒ **J18**	28~11 (28~11) ⇒ **J18**	-	2.0~5.0 (2.0~3.0) ⇒ **J20**
KTNS ⇒ **J24** 	Full profile	0.5~3.0 ⇒ **J6**	24~8 ⇒ **J8**	19~11 ⇒ **J10**	16~11 ⇒ **J10**	28~11 ⇒ **J12**	18~11.5 ⇒ **J14**	-
Sleeve holder S-KTN ⇒ **J25**	Partial profile	0.5~3.0 ⇒ **J16**	48~8 ⇒ **J16**	28~11 ⇒ **J18**	40~8 ⇒ **J18**	28~11 ⇒ **J18**	-	2.0~3.0 ⇒ **J20**
KTT ⇒ **J37** 	Full profile	1.0~2.0 ⇒ **J36**	-	-	-	-	-	-
	Partial profile	0.5~3.5 ⇒ **J36**	56~8 ⇒ **J36**	28~11 ⇒ **J36**	24~7 ⇒ **J36**	28~11 ⇒ **J36**	-	-
KTTX ⇒ **J35** 	Partial profile	0.5~2.0 ⇒ **J34**	56~14 ⇒ **J34**	28~11 ⇒ **J34**	24~11 ⇒ **J34**	28~11 ⇒ **J34**	-	-
S-KTTX ⇒ **J35** 	Partial profile	0.5~2.0 ⇒ **J34**	56~14 ⇒ **J34**	28~11 ⇒ **J34**	24~11 ⇒ **J34**	28~11 ⇒ **J34**	-	-
KTKF ⇒ **J29** 	Partial profile	0.2~1.5 ⇒ **J29**	64~18 ⇒ **J29**	28~19 ⇒ **J29**	40~16 ⇒ **J29**	28~19 ⇒ **J29**	-	-
KTKF / KTKF-Y ⇒ **J30, J31** (Goose-neck holder / Y-axis holder) 								

Pitch inside ( ) indicates KTN-JCT.

Tooling application table (Internal thread)

Thread types		Metric	Unified	Parallel pipe	Whitworth	Tapered pipe	American national tapered pipe	30° trapezoidal
		M	UN, UNC UNF, UNEF	G(PF) Rp(PS)	W	Rc(PT) (BSPT)	NPT	Tr
Thread shape								
Pitch / Toolholder shape		mm	TPI	TPI	TPI	TPI	TPI	mm
EZT ➡ **J40** 	Partial profile	0.5~1.75 ➡ **J40**	36~16 ➡ **J40**	28~19 ➡ **J40**	24~18 ➡ **J40**	28~19 ➡ **J40**	18~14 ➡ **J40**	-
VNT ➡ **J44** 	Partial profile	0.75~1.5 ➡ **J44**	28~18 ➡ **J44**	-	-	-	-	-
SIN ➡ **J26** 	Full profile	0.5~5.0 ➡ **J7**	24~8 ➡ **J9**	19~11 ➡ **J11**	16~11 ➡ **J11**	28~11 ➡ **J13**	18~11.5 ➡ **J15**	-
	Partial profile	0.5~5.0 ➡ **J17**	48~5 ➡ **J17**	28~11 ➡ **J19**	40~5 ➡ **J19**	28~11 ➡ **J19**	-	2.0~5.0 ➡ **J21**
CIN ➡ **J27** 	Full profile	1.0~5.0 ➡ **J7**	24~8 ➡ **J9**	19~11 ➡ **J11**	16~11 ➡ **J11**	14~11 ➡ **J13**	18~11.5 ➡ **J15**	-
	Partial profile	0.5~5.0 ➡ **J17**	48~5 ➡ **J17**	28~11 ➡ **J19**	40~5 ➡ **J19**	28~11 ➡ **J19**	-	2.0~5.0 ➡ **J21**
KITG ➡ **J39** 	Partial profile	0.5~3.0 ➡ **J38**	48~8 ➡ **J38**	28~11 ➡ **J38**	24~8 ➡ **J38**	28~11 ➡ **J38**	-	-
STWP ➡ **J47** 	Partial profile	0.75~3.5 ➡ **J46**	28~8 ➡ **J46**	-	-	-	-	-

For parallel pipe and tapered pipe, the average values are only to be used if specifically recommendation.

Threading insert with molded chipbreaker

TQ chipbreaker

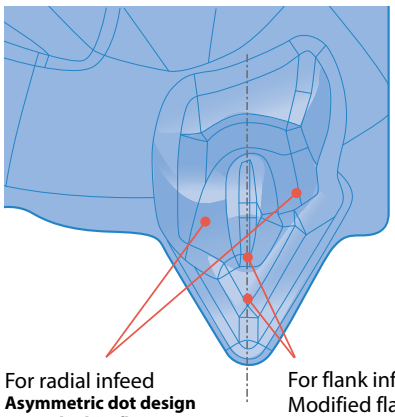
Increase productivity with improved chip control
Improved tool life with new insert grades

1 Stable chip control

Stable chip control with asymmetric chipbreaker design

Chipbreaker geometry

Stable chip control regardless of cutting direction



For radial infeed
Asymmetric dot design controls chip-flow direction

For flank infeed / Modified flank infeed
Breaks chips easily with shallow breaker depth

Chip control performance (Internal evaluation)

Radial infeed



Modified flank infeed

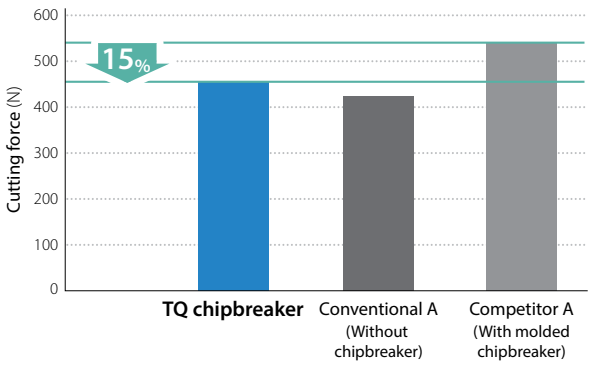


Cutting conditions: Vc = 150 m/min, ap = 0.12 mm (4th pass), L = 25 mm, wet, 16ER150 ISO type M45×1.5 workpiece material: 15CrMo4

2 Low cutting force and suppressed vibration

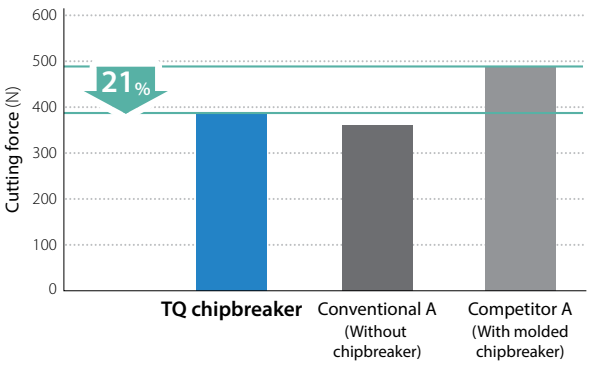
Strong edge and low cutting force

Comparison of cutting force radial infeed (Internal evaluation)



Cutting conditions: Vc = 150 m/min, wet, 16ER150 ISO type
Cutting force shows the average of 6 passes, M35×1.5 workpiece material : 15CrMo4

Cutting force comparison modified flank infeed (Internal evaluation)



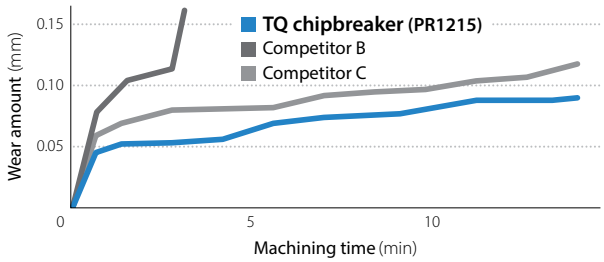
Cutting conditions: Vc = 150 m/min, adjusted angle: 5 degrees, wet, 16ER150 ISO type
Cutting force shows the average of 6 passes, M35×1.5 workpiece material : 15CrMo4

3 Improved tool life with new insert grades

For steel machining **PR1215**
For Stainless steel machining **PR1515 (First recommendation)** **PR1535 (Stability focused)**

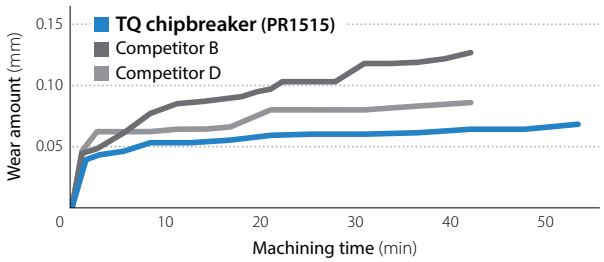
Wear resistance comparison (Internal evaluation)

Workpiece material : 34CrMo4



Cutting conditions: Vc = 150 m/min, TP = 1.5 mm, number of passes = 6, wet, 16ER150 ISO type
Radial infeed

Workpiece material : X5CrNi1810



Cutting conditions: Vc = 100 m/min, TP = 1.5 mm, number of passes = 8, wet, 16ER150 ISO type
Radial infeed

KTKF J29~J31

"Threading" is added to small parts machining special tool series

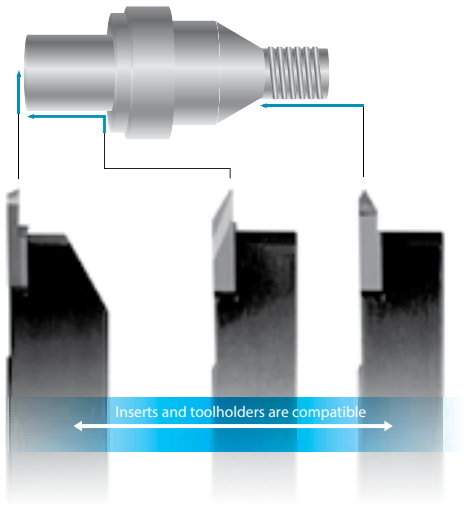
For threading

TKFT



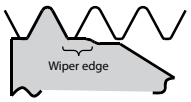
Applicable for various type of threading

Metric (M)	Parallel pipe [G(PF)]
Unified (UN)	Tapered pipe [R(PT) (BSPT)]



Threading insert features

Full profile and partial profile

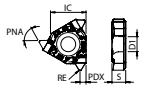
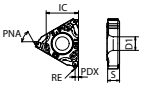
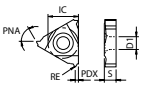
	Insert shape	Function	Features
Full profile			(1) Burr-free thread surface; high quality (Smooth feeling) (2) Leave the workpiece diameter slightly oversized for full topping (3) Every pitch size requires a specific insert
Partial profile			(1) Thread's corner tends to be sharp edged (2) Thread's O.D. or I.D. need to be finished to the size before threading (3) One insert can machine various pitch sizes

Thread precision

Thread types		Thread precision		
		Strict ←		→ loose
Metric	External	4h (1st class)	6g (2nd class)	8g (3rd class)
	Internal	5H (1st class)	6H (2nd class)	7H (3rd class)
Unified	External	3A	2A	1A
	Internal	3B	2B	1B
Applicable precision with		*⃠	✓	✓

* Not recommended if strict thread precision is required.

External threading (Metric)

Insert		Description		Thread type	Symbol thread type	Pitch (mm)	Profile type	Thread angle PNA (°)	Dimension (mm) IC	S	D1	RE	PDX	Carbide PVD PR1115	PR1215	PR1515	PR1535	Carbide - GW15	Cermet - TC60	Applicable toolholder J22~J25
Carbon steel / Alloy steel														○	●					P
Stainless steel																	●			M
Cast iron																		●		K
Non-ferrous metals																		●		N
		16ER	100ISO-TF	Metric	M	1	Full profile	60	9.525	3.68	4	0.12	0.8	●	●	●	●			KTNR...-16 KTNR...-16F KTNR...-16JCT KTNSR...-16 S...-KTNL16
			125ISO-TF			1.25						0.15	0.9	●	●	●	●			
			150ISO-TF			1.5						0.19	1	●	●	●	●			
			175ISO-TF			1.75						0.22	1.6	●	●	●	●			
			200ISO-TF			2						0.25	1.5	●	●	●	●			
			250ISO-TF			2.5						0.33	1.6	●	●	●	●			
			300ISO-TF			3						0.41	1.6	●	●	●	●			
	 Molded Chipbreaker	16ER	100ISO-TQ	Metric	M	1	Full profile	60	9.525	3.68	4	0.12	0.8		●	●	●			
			125ISO-TQ			1.25						0.15	0.9		●	●	●			
			150ISO-TQ			1.5						0.19	1		●	●	●			
			175ISO-TQ			1.75						0.22	1.6		●	●	●			
			200ISO-TQ			2						0.25	1.5		●	●	●			
			250ISO-TQ			2.5						0.33	1.6		●	●	●			
			300ISO-TQ			3						0.41	1.6		●	●	●			
		16ER	050ISO	Metric	M	0.5	Full profile	60	9.525	3.68	4	0.06	0.4	●				●	●	
			075ISO			0.75						0.09	0.53	●				●	●	
			100ISO			1						0.12	0.8	●				●	●	
			125ISO			1.25						0.15	0.9	●				●	●	
			150ISO			1.5						0.19	1	●				●	●	
			175ISO			1.75						0.22	1.5	●					●	
			200ISO			2						0.25	1.5	●				●	●	
			250ISO			2.5						0.32	1.6	●				●	●	
		16EL	050ISO			0.5						0.06	0.4	●						KTNL...-16 KTNL...-16F
			075ISO			0.75						0.09	0.53	●						
			100ISO			1						0.12	0.8	●						
			125ISO			1.25						0.15	0.9	●						
			150ISO			1.5						0.19	1	●						
			200ISO			2						0.25	1.5	●						
		22ER	300ISO	Metric	M	3	Full profile	60	12.7	4.9	4.85	0.41	2.1	●					●	KTNR...-22
			350ISO			3.5						0.48	2.1	●					●	
			400ISO			4						0.55	2.8	●					●	
			450ISO			4.5						0.62	2.8	●					●	
			500ISO			5						0.7	2.8	●					●	

Right-hand shown

Recommended cutting conditions J48
Depth of Cut & Number of Passes J49

Threading inserts identification system (Full profile)

External / Internal	
E	External threading
I	Internal threading

Insert hand	
R	Right-hand
L	Left-hand

Manufacture's option	
-TF	TF cutting edge
-TQ	With molded chipbreaker

16 **E** **R** **100** **ISO** - **TF**

Insert size	
11	6.35
16	9.525
22	12.7
Symbol	I.C. size (mm)

Pitch	
Metric	
100	Pitch 1mm
150	Pitch 1.5mm
Inch screw thread	
24	24 TPI
20	20 TPI

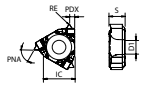
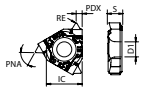
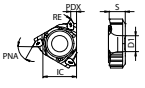
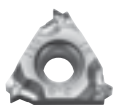
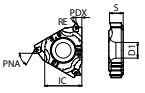
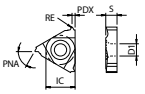
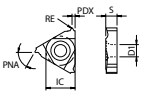
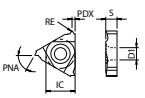
Type of applicable thread	
ISO	Metric
M	Metric
UN	Unified
W	Whitworth
BSPT	Tapered pipe
NPT	American national tapered pipe

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Threading inserts are sold in 5 piece boxes

TC60 (Threading inserts) are sold in 10 piece boxes

Internal threading (Metric)

Insert		Description		Thread type	Symbol thread type	Pitch (mm)	Profile type	Thread angle PNA (°)	Dimension (mm) IC	S	D1	RE	PDX	Carbide PVD PR1115	PR1215	PR1515	PR1535	Carbide - GW15	Cermet - TC60	Applicable toolholder ⇨ J26, J27
Carbon steel / Alloy steel														○	●					P
Stainless steel																	●			M
Cast iron																		●		K
Non-ferrous metals																		●		N
		11IR	100ISO-TF 125ISO-TF 150ISO-TF 175ISO-TF	Metric	M	1 1.25 1.5 1.75	Full profile	60	6.35	3.18	3	0.07 0.08 0.11 0.12	0.8 1.1 1.1 1.1	●	●	●	●			SINR..-11E SINR..-11
		16IR	100ISO-TF 125ISO-TF 150ISO-TF 175ISO-TF 200ISO-TF 250ISO-TF 300ISO-TF	Metric	M	1 1.25 1.5 1.75 2 2.5 3	Full profile	60	9.525	3.68	4	0.07 0.08 0.11 0.12 0.14 0.17 0.19	0.8 1.1 1.1 1.1 1.5 1.5 1.6	●	●	●	●			SINR..-16 CINR..-16
	 Molded Chipbreaker	11IR	100ISO-TQ 125ISO-TQ 150ISO-TQ 175ISO-TQ	Metric	M	1 1.25 1.5 1.75	Full profile	60	6.35	3.18	3	0.07 0.08 0.11 0.12	0.8 1.1 1.1 1.1		●	●	●			SINR..-11E SINR..-11
	 Molded Chipbreaker	16IR	100ISO-TQ 125ISO-TQ 150ISO-TQ 175ISO-TQ 200ISO-TQ 250ISO-TQ 300ISO-TQ	Metric	M	1 1.25 1.5 1.75 2 2.5 3	Full profile	60	9.525	3.68	4	0.07 0.08 0.11 0.12 0.14 0.17 0.19	0.8 1.1 1.1 1.1 1.5 1.5 1.6		●	●	●			SINR..-16 CINR..-16
		11IR	050ISO 075ISO 100ISO 125ISO 150ISO 175ISO 200ISO	Metric	M	0.5 0.75 1 1.25 1.5 1.75 2	Full profile	60	6.35	3.18	3	0.03 0.05 0.07 0.08 0.11 0.12 0.14	0.55 0.68 0.8 1.1 1.1 1.1 0.9	●				●	●	SINR..-11E SINR..-11
		11IL	100ISO 150ISO			1 1.5						0.07 0.11	0.8 1.1	●						SINL..-11E SINL..-11
		16IR	100ISO 125ISO 150ISO 175ISO 200ISO 250ISO 300ISO	Metric	M	1 1.25 1.5 1.75 2 2.5 3	Full profile	60	9.525	3.68	4	0.07 0.08 0.11 0.12 0.14 0.16 0.19	0.8 1.1 1.1 1.1 1.5 1.5 1.6	●				●	●	SINR..-16 CINR..-16
		16IL	100ISO 150ISO 200ISO			1 1.5 2						0.07 0.11 0.14	0.8 1.1 1.5	●						SINL..-16 CINL..-16
		22IR	300ISO 350ISO 400ISO 450ISO 500ISO	Metric	M	3 3.5 4 4.5 5	Full profile	60	12.7	4.9	4.85	0.19 0.23 0.26 0.3 0.34	1.8 2.1 2.8 2.8 2.8	●					●	SINR..-22 CINR..-22

Right-hand shown

Recommended cutting conditions ⇨ J48
Depth of Cut & Number of Passes ⇨ J49

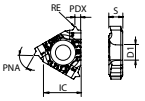
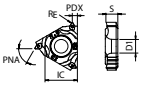
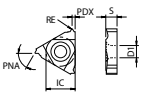
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Threading inserts are sold in 5 piece boxes

TC60 (Threading inserts) are sold in 10 piece boxes

External threading (Unified)

Internal threading (Unified)

				Carbon steel / Alloy steel								○	●				P
				Stainless steel											●		M
				Cast iron													K
				Non-ferrous metals													N
Insert		Description		Thread type	Symbol thread type	Pitch (TPI)	Profile type	Thread angle PNA (°)	Dimension (mm)					Carbide				Cermet	Applicable toolholder ⇨ J26, J27
									IC	S	D1	RE	PDX	PVD				-	
														PR1115	PR1215	PR1515	PR1535	TC60	
		16IR	08UN-TF	Unified	UN UNF UNEF	8	Full profile	60	9.525	3.68	4	0.21	1.8	●	●	●	●		
			10UN-TF			10						0.17	1.5	●	●	●	●		
			12UN-TF			12						0.14	1.5	●	●	●	●		
			13UN-TF			13						0.13	1.5	●	●	●	●		
			14UN-TF			14						0.12	1.5	●	●	●	●		
			16UN-TF			16						0.1	1.1	●	●	●	●		
			18UN-TF			18						0.09	1	●	●	●	●		
			20UN-TF			20						0.08	1	●	●	●	●		
			24UN-TF			24						0.06	0.8	●	●	●	●		
	 Molded Chipbreaker	16IR	08UN-TQ	Unified	UN UNF UNEF	8	Full profile	60	9.525	3.68	4	0.21	1.8		●	●	●		SINR..-16 CINR..-16
			10UN-TQ			10						0.17	1.5		●	●	●		
			12UN-TQ			12						0.14	1.5		●	●	●		
			13UN-TQ			13						0.13	1.5		●	●	●		
			14UN-TQ			14						0.12	1.5		●	●	●		
			16UN-TQ			16						0.1	1.1		●	●	●		
			18UN-TQ			18						0.09	1		●	●	●		
			20UN-TQ			20						0.08	1		●	●	●		
			24UN-TQ			24						0.06	0.8		●	●	●		
		16IR	12UN	Unified	UN UNF UNEF	12	Full profile	60	9.525	3.68	4	0.14	1.5	●					
			14UN			14						0.12	1.5	●				●	
			16UN			16						0.1	1.1	●				●	
			18UN			18						0.09	1	●				●	
			20UN			20						0.07	1	●					
			24UN			24						0.05	0.8	●				●	
		22IR	08UN			8	Full profile	60	12.7	4.9	4.85	0.2	1.8	●				●	SINR..-22 CINR..-22

Right-hand shown

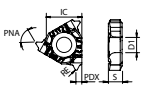
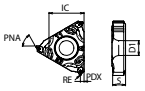
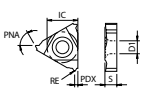
Recommended cutting conditions ⇨ J48
Depth of Cut & Number of Passes ⇨ J49

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Threading inserts are sold in 5 piece boxes

TC60 (Threading inserts) are sold in 10 piece boxes

External threading (Parallel pipe G(PF), Whitworth W)

			Carbon steel / Alloy steel										○	●				P
			Stainless steel													●		M
			Cast iron															K
			Non-ferrous metals															N
Insert		Description	Thread type	Symbol thread type	Pitch (TPI)		Profile type	Thread angle PNA (°)	Dimension (mm)					Carbide			Cermet	Applicable toolholder ➡ J22~J25
														PVD			-	
					G(PF)	W			IC	S	D1	RE	PDX	PR1115	PR1215	PR1515	TC60	
		16ER 11W-TF 14W-TF 16W-TF 19W-TF	Parallel pipe Whitworth	G(PF) W	11 14 - 19	11 14 16 -	Full profile	55	9.525	3.68	4	0.3 0.23 0.19 0.16	1.5 1.5 1.1 1	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●		
	 Molded Chipbreaker	16ER 11W-TQ 14W-TQ 16W-TQ 19W-TQ	Parallel pipe Whitworth	G(PF) W	11 14 - 19	11 14 16 -	Full profile	55	9.525	3.68	4	0.3 0.23 0.19 0.16	1.5 1.5 1.1 1		● ● ● ●	● ● ● ●	● ● ● ●		KTNR...-16 KTNR...-16F KTNR...-16JCT KTNSR...-16 S...-KTNL16
		16ER 11W 14W 19W	Parallel pipe Whitworth	G(PF) W	11 14 19	11 14 -	Full profile	55	9.525	3.68	4	0.3 0.23 0.16	1.5 1.5 1	● ● ●				● ● ●	

Right-hand shown

Recommended cutting conditions ➡ J48
Depth of Cut & Number of Passes ➡ J50

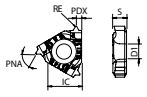
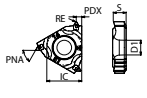
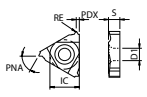
J
Threading

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Threading inserts are sold in 5 piece boxes

TC60 (Threading inserts) are sold in 10 piece boxes

Internal threading (Parallel pipe G(PF), Whitworth W)

				Carbon steel / Alloy steel																P
				Stainless steel																M
				Cast iron																K
				Non-ferrous metals																N
Insert		Description		Thread type	Symbol thread type	Pitch (TPI)		Profile type	Thread angle PNA (°)	Dimension (mm)					Carbide				Cermet	Applicable toolholder J26, J27
						G(PF)	W			IC	S	D1	RE	PDX	PVD				-	
															PR1115	PR1215	PR1515	PR1535	TC60	
		16IR	11W-TF 14W-TF 16W-TF 19W-TF	Parallel pipe Whitworth	G(PF) W	11 14 - 19	11 14 16 -	Full profile	55	9.525	3.68	4	0.3 0.23 0.19 0.16	1.5 1.5 1.1 1	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●		
	 Molded Chipbreaker	16IR	11W-TQ 14W-TQ 16W-TQ 19W-TQ	Parallel pipe Whitworth	G(PF) W	11 14 - 19	11 14 16 -	Full profile	55	9.525	3.68	4	0.3 0.23 0.19 0.16	1.5 1.5 1.1 1		● ● ● ●	● ● ● ●	● ● ● ●		SINR..-16 CINR..-16
		16IR	11W 14W	Parallel pipe Whitworth	G(PF) W	11 14	11 14	Full profile	55	9.525	3.68	4	0.3 0.23	1.5	● ●				● ●	

No wiper effect is expected when threading the internal whitworth screw using 16IR00W insert.
Right-hand shown

Recommended cutting conditions J48
Depth of Cut & Number of Passes J50

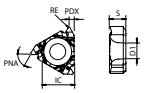
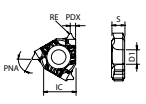
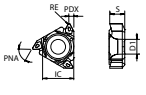
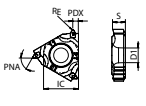
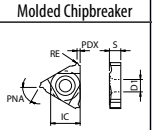
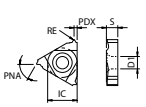
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Threading inserts are sold in 5 piece boxes

TC60 (Threading inserts) are sold in 10 piece boxes

External threading (Tapered pipe R(PT)(BSPT))

Internal threading (Tapered pipe Rc(PT)(BSPT))

			Carbon steel / Alloy steel																		P
			Stainless steel																		M
			Cast iron																		K
			Non-ferrous metals																		N
Insert		Description	Thread type	Symbol thread type	Pitch (TPI)	Profile type	Thread angle PNA (°)	Dimension (mm)					Carbide					Cermet		Applicable toolholder ⇨ J26, J27
								IC	S	D1	RE	PDX	PVD				-	-		
													PR1115	PR1215	PR1515	PR1535	GW15	TC60		
		11IR 14BSPT-TF 19BSPT-TF 28BSPT-TF	Tapered pipe	Rc,(PT) (BSPT)	14 19 28	Full profile	55	6.35	3.18	3	0.22 0.16 0.1	0.97 0.78 0.6	● ● ●	● ● ●	● ● ●	● ● ●				SINR..-11E SINR..-11
		16IR 11BSPT-TF 14BSPT-TF	Tapered pipe	Rc,(PT) (BSPT)	11 14	Full profile	55	9.525	3.68	4	0.29 0.22	1.5 0.97	● ●	● ●	● ●	● ●				SINR..-16 CINR..-16
	 Molded Chipbreaker	11IR 14BSPT-TQ 19BSPT-TQ 28BSPT-TQ	Tapered pipe	Rc,(PT) (BSPT)	14 19 28	Full profile	55	6.35	3.18	3	0.22 0.16 0.1	0.97 0.78 0.6		● ● ●	● ● ●	● ● ●				SINR..-11E SINR..-11
	 Molded Chipbreaker	16IR 11BSPT-TQ 14BSPT-TQ	Tapered pipe	Rc,(PT) (BSPT)	11 14	Full profile	55	9.525	3.68	4	0.29 0.22	1.5 0.97		● ●	● ●	● ●				SINR..-16 CINR..-16
		11IR 14BSPT 19BSPT 28BSPT	Tapered pipe	Rc,(PT) (BSPT)	14 19 28	Full profile	55	6.35	3.18	3	0.22 0.16 0.1	0.97 0.78 0.6	● ● ●				● ● ●	 ●		SINR..-11E SINR..-11
		16IR 11BSPT 14BSPT	Tapered pipe	Rc,(PT) (BSPT)	11 14	Full profile	55	9.525	3.68	4	0.29 0.22	1.5 0.97	● ●				● ●			SINR..-16 CINR..-16

Right-hand shown

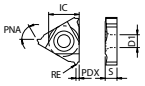
Recommended cutting conditions ⇨ J48
Depth of Cut & Number of Passes ⇨ J50

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Threading inserts are sold in 5 piece boxes

TC60 (Threading inserts) are sold in 10 piece boxes

External threading (American national tapered pipe NPT)

			Carbon steel / Alloy steel										●			P
			Stainless steel										●			M
			Cast iron											●		K
			Non-ferrous metals											●		N
Insert		Description	Thread type	Symbol thread type	Pitch (TPI)	Profile type	Thread angle PNA (°)	Dimension (mm)					Carbide		Cermet	Applicable toolholder ⇨ J22~J25
								IC	S	D1	RE	PDX	PVD	-	-	
													PR1115	GW15	TC60	
		16ER 11.5NPT 14NPT 18NPT	American national tapered pipe	NPT	11.5 14 18	Full profile	60	9.525	3.68	4	0.06 0.05 0.04	1.5 1.5 0.9	● ● ●	● ● ●	● ● ●	KTNR...-16 KTNR...-16F KTNR...-16JCT KTNSR...-16 S...-KTNL16

Right-hand shown

Recommended cutting conditions ⇨ J48
Depth of Cut & Number of Passes ⇨ J50

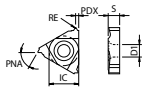
J
Threading

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Threading inserts are sold in 5 piece boxes

TC60 (Threading inserts) are sold in 10 piece boxes

Internal threading (American national tapered pipe NPT)

		Carbon steel / Alloy steel										●			P
		Stainless steel										●			M
		Cast iron											●		K
		Non-ferrous metals											●		N
Insert	Description	Thread type	Symbol thread type	Pitch (TPI)	Profile type	Thread angle PNA (°)	Dimension (mm) IC	S	D1	RE	PDX	Carbide PVD PR1115	Carbide - GW15	Cermet - TC60	Applicable toolholder J26, J27
		16IR 11.5NPT 14NPT 18NPT	American national tapered pipe	NPT	11.5 14 18	Full profile	60	9.525	3.68	4	0.06 0.05 0.04	1.5 1.5 0.9	● ● ●	● ● ●	● ● ●	SINR..-16 CINR..-16

Right-hand shown

Recommended cutting conditions J48
Depth of Cut & Number of Passes J50

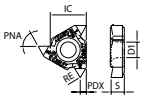
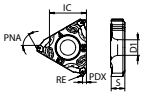
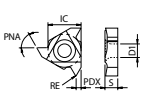
J
Threading

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Threading inserts are sold in 5 piece boxes

TC60 (Threading inserts) are sold in 10 piece boxes

External threading (60° Partial profile / Metric, Unified)

				Carbon steel / Alloy steel																	○	●	P
				Stainless steel																		●	M
				Cast iron																		●	K
				Non-ferrous metals																		●	N
Insert		Description		Thread type	Symbol thread type	Pitch				Profile type	Thread angle PNA (°)	Dimension (mm)					Carbide				Cermet	Applicable toolholder ➡ J22~J25
						Metric (mm)		Unified (TPI)									PVD			-	-	
						min.	max.	min.	max.			IC	S	D1	RE	PDX	PR1115	PR1215	PR1515	PR1535	GW15	TC60	
		16ER	A60-TF AG60-TF G60-TF	Metric Unified	M UN/UNF	0.5 0.5 1.75	1.5 3 3	48 48 14	16 8 8	Partial profile	60	9.525	3.68	4	0.06 0.06 0.22	1 1.6 1.6	● ● ●	● ● ●	● ● ●	● ● ●			
	 Molded Chipbreaker	16ER	A60-TQ AG60-TQ G60-TQ	Metric Unified	M UN/UNF	0.5 0.5 1.75	1.5 3 3	48 48 14	16 8 8	Partial profile	60	9.525	3.68	4	0.06 0.06 0.22	1 1.6 1.6		● ● ●	● ● ●	● ● ●			KTNR...-16 KTNR...-16F KTNR...-16JCT KTNSR...-16 S...-KTNL16
		16ER	6001 6002 A60 AG60 G60	Metric Unified	M UN/UNF	1 1.5 0.5 0.5 1.75	2.5 2.5 1.5 3 3	24 16 48 48 14	11 11 16 8 8	Partial profile	60	9.525	3.68	4	0.1 0.2 0.06 0.06 0.22	1.5 1.5 1 1.7 1.7				● ● ●	● ●	
		22ER	N60	Metric Unified	M UN/UNF	3.5	5	7	5	Partial profile	60	12.7	4.9	4.85	0.48	2.5	●			●		KTNR...-22

Right-hand shown

Recommended cutting conditions ➡ **J48**
Depth of Cut & Number of Passes ➡ **J50, J51, J54**

Threading inserts identification system (Partiall profile)

External / Internal	
E	External threading
I	Internal threading

Insert hand	
R	Right-hand
L	Left-hand

Manufacture's option	
-TF	TF cutting edge
-TQ	With molded chipbreaker

16 E R A60 - TF

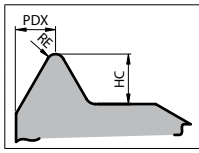
Insert size	
06	3.97
08	4.76
11	6.35
16	9.525
22	12.70
Symbol	I.C. size (mm)

Pitch		
60°	**A60**	60° Type (Partial profile) 0.5~1.5mm
	G60	60° Type (Partial profile) 1.75~3mm
	AG60	60° Type (Partial profile) 0.5~3mm
55°	**A55**	55° Type (Partial profile) 40~16 TPI
	G55	55° Type (Partial profile) 14~8 TPI
	AG55	55° Type (Partial profile) 40~8 TPI
Vertex angle		Partial profile

Pitch		
60°	**6001**	60° Type (Partial profile) Corner-R(RE)=0.1mm
		1.0~2.5mm
55°	**5501**	55° Type (Partial profile) Corner-R(RE)=0.1mm
		28~11 TPI
Vertex angle		Partial profile

Note) Pitch and threads per inch of an insert without wiper depend on the size of insert.

Example of shape of A, G and AG



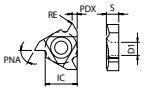
Description	Dimension(mm)		
	RE	PDX	HC
16ER A60-TF	0.06	1.00	1.5
16ER G60-TF	0.22	1.60	2.6
16ER AG60-TF	0.06	1.60	2.7

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Threading inserts are sold in 5 piece boxes

TC60 (Threading inserts) are sold in 10 piece boxes

Internal threading (60° Partial profile / Metric, Unified)

				Carbon steel / Alloy steel											●			P
				Stainless steel											●			M
				Cast iron												●		K
				Non-ferrous metals												●		N
Insert		Description		Thread type	Symbol thread type	Pitch				Profile type	Thread angle PNA (°)	Dimension (mm)					Carbide		Cermet	Applicable toolholder ⇨ J26, J27
						Metric (mm)		Unified (TPI)				IC	S	D1	RE	PDX	PVD	-	-	
						min.	max.	min.	max.								PR1115	GW15	TC60	
		06IR	60005	Metric Unified	M UN/UNF	0.75	1.25	28	20	Partial profile	60	3.97	1.91	2.3	0.05	0.6	●			SINR..-06E
		08IR	60007			1	1.75	20	16			4.76	2.38	2.3	0.07	0.8	●			SINR..-08E
		11IR	60005			0.75	1.5	32	16			6.35	3.18	3	0.05	1			●	SINR..-11E
			A60			0.5	1.5	48	16						0.02		●	●		SINR..-11
		16IR	6001			1.5	2.5	16	10			9.525	3.68	4	0.1	1.5			●	SINR..-16 CINR..-16
			60015			2.5	2.5	11	10						0.15	1.5			●	
			A60			0.5	1.5	48	16						0.02	1	●	●		
			AG60			0.5	3	48	8						0.02	1.7	●	●		
			G60			1.75	3	14	8						0.11	1.7	●	●		
		22IR	N60			3.5	5	7	5			12.7	4.9	4.85	0.22	2.5	●	●		SINR..-22 CINR..-22

Right-hand shown

Recommended cutting conditions ⇨ J48
Depth of Cut & Number of Passes ⇨ J51, J52, J54

Corner-R(RE) selection for partial profiling insert

	External threading	Internal threading
Metric unified	RE ≤ 0.1443TP	RE ≤ 0.0720TP
Parallel pipe (Whitworth) Tapered pipe	(For both external and Internal thread) RE ≤ 0.1373TP	

RE: Corner-R TP: Pitch (= $\frac{25.4}{n}$) n: TPI

Metric, Unified thread
Corner-R(RE) at Internal threading is almost half of that of External

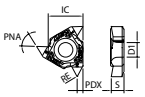
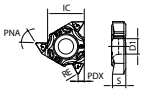
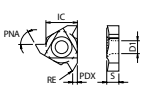
Parallel pipe, Tapered pipe, Whitworth thread
Same Corner-R(RE) for both External and Internal threading

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Threading inserts are sold in 5 piece boxes

TC60 (Threading inserts) are sold in 10 piece boxes

External threading (55° Partial profile / G, R, W)

				Carbon steel / Alloy steel									○	●								P
				Stainless steel													●					M
				Cast iron														●				K
				Non-ferrous metals														●				N
Insert		Description		Thread type	Symbol thread type	Pitch				Profile type	Thread angle PNA (°)	Dimension (mm)					Carbide				Cermet	Applicable toolholder ⇒ J22~J25
						G(PF), Rc(PT) (TPI)		W (TPI)				IC	S	D1	RE	PDX	PVD			-	-	
						min.	max.	min.	max.								PR1115	PR1215	PR1515	PR1535	GW15	TC60	
		16ER	A55-TF AG55-TF G55-TF	Parallel / Tapered pipe Whitworth	G(PF) R(PT) W	28 28 14	19 11 11	40 40 14	16 8 8	Partial profile	55	9.525	3.68	4	0.06 0.06 0.22	1 1.6 1.6	● ● ●	● ● ●	● ● ●	● ● ●			
	 Molded Chipbreaker	16ER	A55-TQ AG55-TQ G55-TQ	Parallel / Tapered pipe Whitworth	G(PF) R(PT) W	28 28 14	19 11 11	40 40 14	16 8 8	Partial profile	55	9.525	3.68	4	0.06 0.06 0.22	1 1.6 1.6		● ● ●	● ● ●	● ● ●			KTNR...-16 KTNR...-16F KTNR...-16JCT KTNSR...-16 S...-KTNL16
		16ER	5501 5502 A55 AG55 G55	Parallel / Tapered pipe Whitworth	G(PF) R(PT) W	28 14 28 28 14	11 11 19 11 11	24 16 40 40 14	10 9 16 8 8	Partial profile	55	9.525	3.68	4	0.1 0.2 0.06 0.06 0.22	1.5 1.5 1 1.65 1.7				● ●	● ● ● ● ●		
		22ER	N55			-	-	7	5		55	12.7	4.9	4.85	0.47	2.5	●			●		KTNR...-22

Right-hand shown

Recommended cutting conditions ⇒ J48
Depth of Cut & Number of Passes ⇒ J52~J54

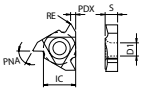
J
Threading

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Threading inserts are sold in 5 piece boxes

TC60 (Threading inserts) are sold in 10 piece boxes

Internal threading (55° Partial profile / G, Rc, W)

			Carbon steel / Alloy steel											●			P
			Stainless steel											●			M
			Cast iron												●		K
			Non-ferrous metals												●		N
Insert		Description	Thread type	Symbol thread type	Pitch G(PF), Rc(PT) (TPI) min.	Pitch G(PF), Rc(PT) (TPI) max.	Pitch W (TPI) min.	Pitch W (TPI) max.	Profile type	Thread angle PNA (°)	Dimension (mm) IC	S	D1	RE	PDX	Carbide PVD PR1115	Carbide - GW15	Cermet - TC60	Applicable toolholder J26, J27
		06IR 5501	Parallel / Tapered pipe Whitworth	G(PF) Rc(PT) W	28		24		Partial profile	55	3.97	1.91	2.3	0.1	0.6	●			SINR..-06E
		08IR 5501			28	19	24	20		55	4.76	2.38	2.3	0.1	0.8	●			SINR..-08E
		11IR 55005			28	14	24	14		55	6.35	3.18	3	0.05	1.1			●	SINR..-11E
		11IR A55			28	19	40	16						0.06		●	●		SINR..-11
		16IR 5501			28	11	24	11		55	9.525	3.68	4	0.1	1.5			●	SINR..-16 CINR..-16
		16IR A55			28	19	40	16						0.06	1	●	●		
		16IR AG55			28	11	40	8						0.06	1.7	●	●		
		16IR G55			14	11	14	8						0.22	1.7	●	●		
		22IR N55			-	-	7	5		55	12.7	4.9	4.85	0.47	2.5	●	●		SINR..-22 CINR..-22

Right-hand shown

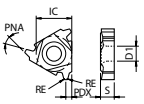
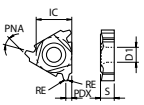
Recommended cutting conditions J48
Depth of Cut & Number of Passes J52~J54

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Threading inserts are sold in 5 piece boxes

TC60 (Threading inserts) are sold in 10 piece boxes

External threading (30° Trapezoidal Tr)

			Carbon steel / Alloy steel										●		P
			Stainless steel										●		M
			Cast iron												K
			Non-ferrous metals												N
Insert		Description	Thread type	Symbol thread type	Pitch (mm)	Profile type	Thread angle PNA (°)	Dimension (mm) IC	S	D1	RE	PDX	Carbide PVD PR1115	Cermet - TC60	Applicable toolholder ⇨ J22~J25
		16ER 200TR 300TR	30° type (Trape-zoidal)	Tr	2 3	Partial profile	30	9.525	3.68	4	0.2	1.6	● ●	● ●	KTNR...-16 KTNR...-16F KTNR...-16JCT KTNSR...-16 S...-KTNL16
		22ER 400TR 500TR	30° type (Trape-zoidal)	Tr	4 5	Partial profile	30	12.7	4.9	4.85	0.2	2.5	● ●	● ●	KTNR...-22

Right-hand shown

Recommended cutting conditions ⇨ **J48**
Depth of Cut & Number of Passes ⇨ **J53**

J

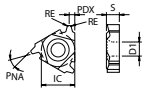
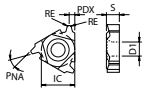
Threading

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Threading inserts are sold in 5 piece boxes

TC60 (Threading inserts) are sold in 10 piece boxes

Internal threading (30° Trapezoidal Tr)

Insert		Description	Thread type	Symbol thread type	Pitch (mm)	Profile type	Thread angle PNA (°)	Dimension (mm) IC	S	D1	RE	PDX	Carbide PVD PR1115	Applicable toolholder ⇒ J26, J27
Carbon steel / Alloy steel													●	P
Stainless steel													●	M
Cast iron														K
Non-ferrous metals														N
		16IR 200TR 300TR	30° type (Trapezoidal)	Tr	2 3	Partial profile	30	9.525	3.68	4	0.2	1.6	● ●	SINR..-16 CINR..-16
		22IR 400TR 500TR	30° type (Trapezoidal)	Tr	4 5	Partial profile	30	12.7	4.9	4.85	0.2	2.5	● ●	SINR..-22 CINR..-22

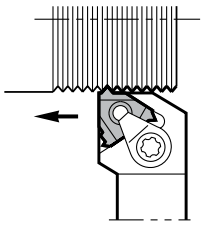
Right-hand shown

Recommended cutting conditions ⇒ J48
Depth of Cut & Number of Passes ⇒ J53

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Threading inserts are sold in 5 piece boxes

KTN (External threading)



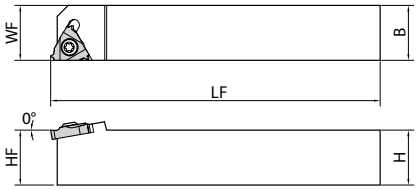


Fig. 1

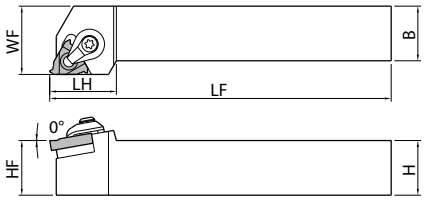


Fig. 2

Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

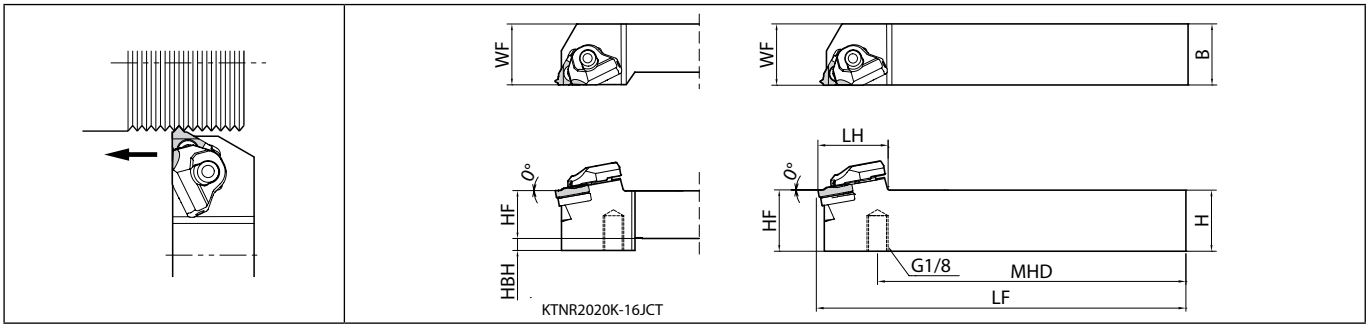
Toolholder dimensions

Description		Availability R	Availability L	Dimension (mm) H	B	LH	HF	LF	WF	Fig.	Applicable inserts J6, J8, J10 J12, J14, J16 J18, J20
KTN&	1216JX-16F	●	●	12	16	-	12	120	16	1	16E$^{R/L}$...
	1616H-16	●	●	16		25	16	100	20	2	
	1616JX-16F	●	●			-		120	16	1	
	2020H-16	●		20	20	25	20	100	25	2	
	2020JX-16F	●	●			-		120	20	1	
	2020K-16	●	●			25		125	25	2	
	2525M-16	●	●	25	25		25	150	30		
KTNR	2525M-22	●		25	25	29	25	150	32	2	22ER...
	3225P-22	●		32		34	32	170			

Description		Spare parts: Clamp set	Clamp set	Screw	Shim screw	Shim	Wrench	Wrench	Wrench
KTN&	1216JX-16F	-	-	SB-3.5TR	-	-	-	-	LTW-15S
	1616H-16	CPS-5S		-	SP3X8	TN-32		FT-15	-
	1616JX-16F	-		SB-3.5TR	-	-		-	LTW-15S
	2020H-16	CPS-5S		-	SP3X8	TN-32		FT-15	-
	2020JX-16F	-		SB-3.5TR	-	-		-	LTW-15S
	2020K-16	CPS-5S		-	SP3X8	TN-32		FT-15	-
	2525M-16								
KTN	2525M-22	-	CPS-6S	-	SP3X8	TN-43	LW-3	-	-
	3225P-22								

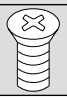
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KTN-JCT (External threading, Coolant-through holders)



Right-hand shown | Right-hand Insert for Right-hand Toolholder. | Pressure Resistance : ~15MPa

Toolholder dimensions

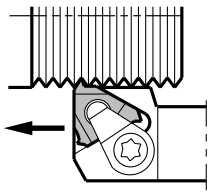
Description		Availability	Dimension (mm)								Coolant hole	Spare parts					Applicable inserts
												Clamp set	Pipe connection	Shim screw	Shim	Wrench	
		R	H	B	LH	MHD	HF	HBH	LF	WF							**J6, J8, J10 J12, J14, J16 J18, J20**
KTNR	2020K-16JCT	●	20	20	33.3	100.7	20	5	125	25	Yes	CPS-5S-R-JCT	FP-12	SP3X8	TN-32	FT-15	16ER...
	2525M-16JCT	●	25	25	-	125.7	25	-	150								

Please see page **D12** for piping parts of coolant-through holders.
Only the O-ring (SS-035) included with the pipe connection can be ordered.

J
Threading

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KTNS (External threading)



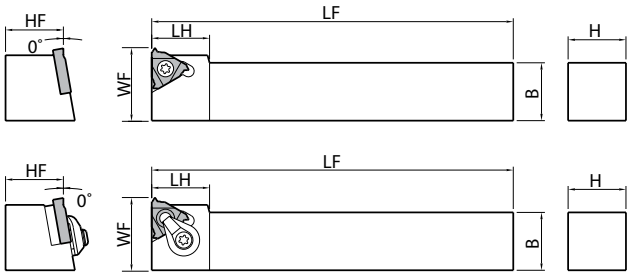
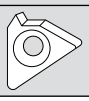
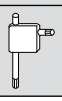


Fig. 1

Fig. 2

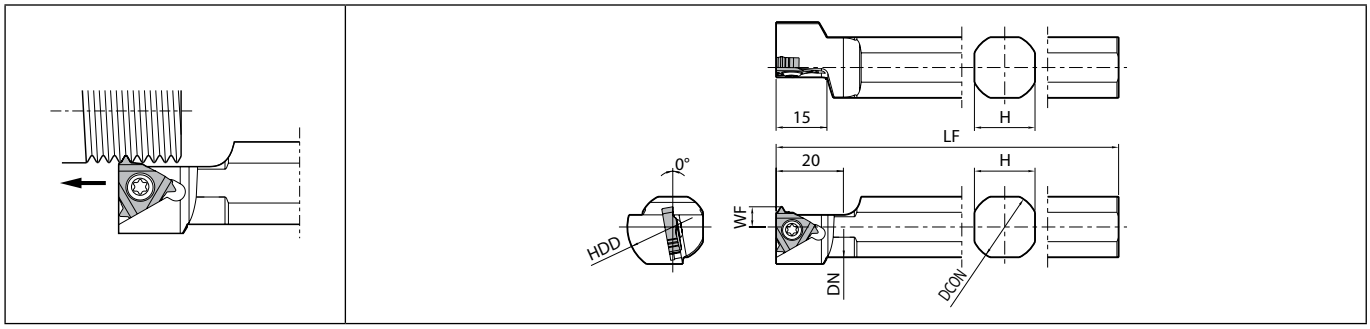
Right-hand shown | Right-hand Insert for Right-hand Toolholder.

Toolholder dimensions

Description		Availability	Dimension (mm)						Fig.	Spare parts					Applicable inserts J6, J8, J10 J12, J14, J16 J18, J20
										Clamp set	Screw	Shim screw	Shim	Wrench	
		R	H	B	LH	HF	LF	WF							
KTNSR	1010H-16	●	10	10	16	10	100	16	1	-	SB-3.5TR	-	-	FT-15	16ER...
	1212K-16	●	12	12	18	12	125	18							
	1616K-16	●	16	16		16		22	2	CPS-5S	-	SP3X8	TN-32		
	2020K-16	●	20	20	20	20		27.4							

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-KTN (External threading)



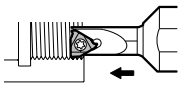
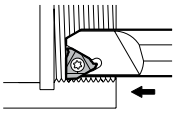
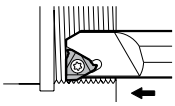
Left-hand shown | Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description		Availability	Dimension (mm)						Spare parts		Applicable inserts J6, J8, J10 J12, J14, J16 J18, J20
			L	DCON	H	DN	HDD	LF	WF	Screw	Wrench	
S16F-	KTNL16	●	16	15	15	27	85	6	SB-3.5TR	LTW-15S	16ER...
S19K-	KTNL16	●	19.05	17	18		120				
S20K-	KTNL16	●	20	18	19						
S22K-	KTNL16	●	22	20	21						
S25.0H-	KTNL16	●	25	23	24	32	100	10			
S25K-	KTNL16	●	25.4				120				

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SIN

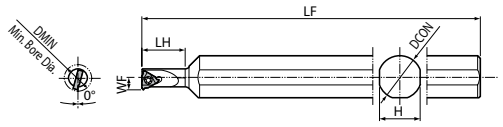


Fig. 1

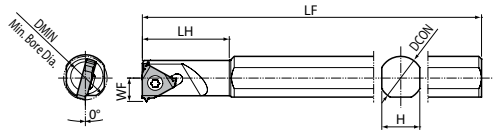


Fig. 2

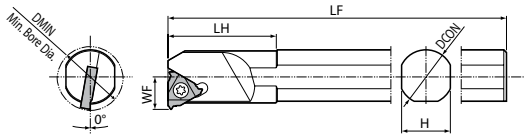


Fig. 3

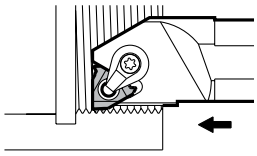
Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

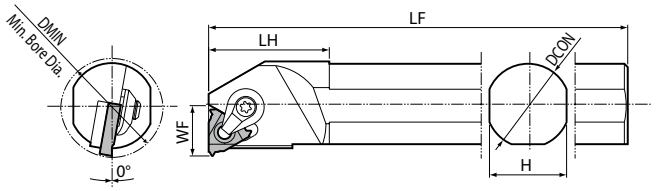
Toolholder dimensions

Description		Availability		Dimension (mm)						Fig.	Spare parts			Applicable inserts
											Screw	Wrench	Wrench	
		R	L	DMIN	DCON	H	LH	LF	WF					**J7, J9, J11 J13, J15, J17 J19, J21**
SINR	0612S-06E	●		6.4	12	11	10	100	3.8	1	SB-2040TR	-	FT-6	06IR...
SINR	0816S-08E	●		7.8	16	15	16	125	4	1	SB-2050TR	-	FT-6	08IR...
SINR/L	1216S-11E	●	●	12	16	14	25	150	6.3	1	SB-2TR	-	FT-8	11IR/L...
	1516S-11	●	●	15			30		7.5					
SINR/L	1616S-16	●	●	16	16	14	32	150	8.6	2	SB-3.5TR	FT-15	-	16IR/L...
	2016S-16	●	●	20			37		10	3				
	2420S-16	●	●	24	20	18	40	180	12					
SINR	2420S-22	●		24	20	18	40	180	13.5	3	SB-4085TR	FT-15	-	22IR...

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

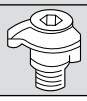
CIN





Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description		Availability		Dimension (mm)						Spare parts						Applicable inserts
										Clamp set	Clamp set	Shim screw	Shim	Wrench	Wrench	
		R	L	DMIN	DCON	H	LH	LF	WF							J7, J9, J11 J13, J15, J17 J19, J21
CINR/L	3025S-16	●	●	30	25	23	36	200	15	CPS-5S	-	SP3X8	TN-32	-	FT-15	16IR/L...
	3732S-16	●		37	32	30	45	250	18.5							
CINR	3025S-22	●		30	25	23	40	200	16.5	-	CPS-6S	SP3X8	TN-43	LW-3	-	22IR...
	3732S-22	●		37	32	30	45	250	20							

Guide for internal threading

For internal threading, pay extra attention to "stabilizing bore dia." and "chip evacuation".

1. "Stabilizing bore dia."

Because small pitch Internal threading has small corner-R (RE), there is variation in the bore dia. which may greatly influence the tool life of an insert.
In order to eliminate the variation in the bore dia., "0" Cutting (zero cutting) should be performed as the zero pass, before the first pass in threading.
The bore dia. is cut with the specified dimension, and the first pass of threading becomes stable.

2. "Chip evacuation"

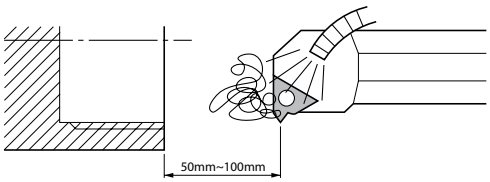
If machining process is continued when chips are tangled with a toolholder and other parts of the machine, it may cause damages to the insert.
Therefore, please ensure that there are no tangled chips in the machine by the following method.

<When processing the first workpiece>

Set the program with the "single block"
Keep the threading starting point 50 mm~100 mm away from the side of workpiece, and confirm that coolant is flushing down the chips for each pass.

<When processing the second workpiece and later>

Ensure that chips are not tangled; then, start the continuous run.



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

TKFT

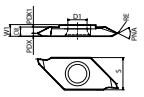
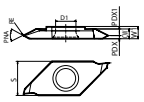
				Carbon steel / Alloy steel								○	○	●		P			
				Stainless steel								○	●	○		M			
				Cast iron											●	K			
				Non-ferrous metals											●	N			
Insert		Description		Thread type	Symbol thread type	Dimension (mm)							Carbide			Applicable toolholder ⇨ J29~J31			
						CW	S	D1	RE	W1	PDX	PDX1	PVD			-			
													PR1225	PR1535	PR1725	KW10			
	 Right-hand shown	TKFT12 RA6000 TKFT12 RB6000		Metric Unified	M UN	2.5	8.7	5.2	Max. 0.05 Flat	3	0.4 2.1	2.1 0.4	● ●	● ●	● ●	● ●	KTKFR...12(-Y)		
		TKFT12 RA60005 TKFT12 RB60005				2.5	8.7	5.2	0.05	3	0.8 1.7	1.7 0.8	● ●	● ●	● ●	● ●			
		TKFT12 RN6001				2.5	8.7	5.2	0.1	3	1.25	1.25	●	●	●	●			
		TKFT12 RA55005 TKFT12 RB55005		Parallel/ Tapered pipe Whitworth	G, R, W	2.5	8.7	5.2	0.05	3	0.8 1.7	1.7 0.8	●	● ●	● ●	● ●			
	 Left-hand shown	TKFT12 LA6000 TKFT12 LB6000		Metric Unified	M UN	2.5	8.7	5.2	Max. 0.05 Flat	3	2.1 0.4	0.4 2.1		● ●	● ●	● ●	KTKFL...12		
		TKFT12 LA60005 TKFT12 LB60005				2.5	8.7	5.2	0.05	3	1.7 0.8	0.8 1.7	● ●	● ●	● ●	● ●			
		TKFT12 LN6001				2.5	8.7	5.2	0.1	3	1.25	1.25	●	●	●	●			
		TKFT12 LA55005 TKFT12 LB55005		Parallel/ Tapered pipe Whitworth	G, R, W	2.5	8.7	5.2	0.05	3	1.7 0.8	0.8 1.7		● ●	● ●	● ●			

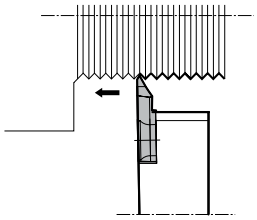
Photo shows Right-hand

Recommended cutting conditions ⇨ J33
Depth of Cut & Number of Passes ⇨ J33

Description		Thread type	Symbol thread type	Pitch				Profile type	Thread angle PNA (°)
				M (mm)		UN, G, R, W (TPI)			
				min.	max.	min.	max.		
TKFT12	RA6000 RB6000	Metric Unified	M UN	0.2	0.6	64	48	Partial profile	60
TKFT12	RA60005 RB60005			0.5	1.25	48	24		60
TKFT12	RN6001			1	1.5	24	18		60
TKFT12	RA55005 RB55005	Parallel/ Tapered pipe Whitworth	G, R, W	-	-	40	16		55
TKFT12	LA6000 LB6000	Metric Unified	M UN	0.2	0.6	64	48	Partial profile	60
TKFT12	LA60005 LB60005			0.5	1.25	48	24		60
TKFT12	LN6001			1	1.5	24	18		60
TKFT12	LA55005 LB55005	Parallel/ Tapered pipe Whitworth	G, R, W	-	-	40	16		55

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KTKF (Threading)



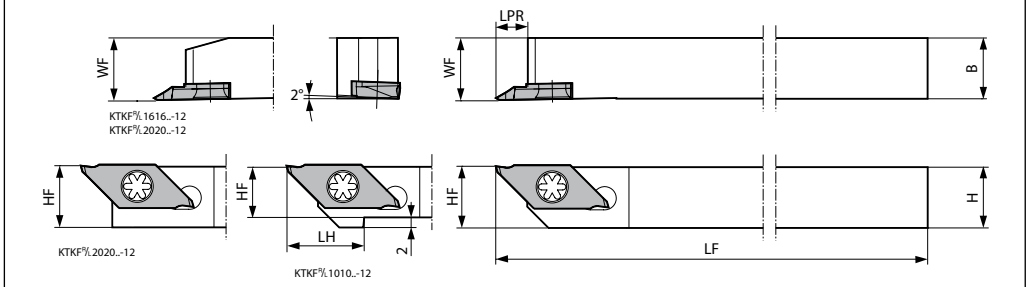


Fig. 1

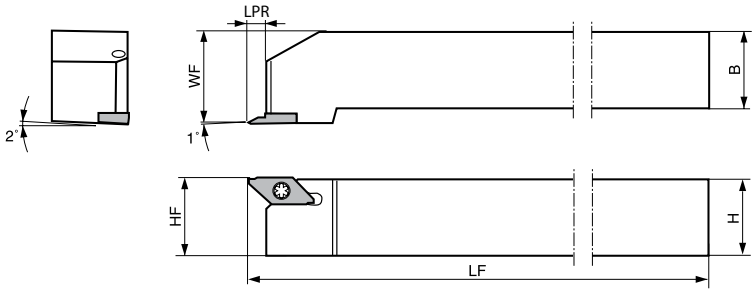


Fig. 2

Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description		Availability R	Availability L	Dimension (mm) H	B	LH	LPR	HF	LF	WF	Fig.	Spare parts: Screw	Spare parts: Wrench	Applicable inserts J28
KTKF R/L	1010JX-12	●	●	10	10	15	6	10	120	10	1	SB-4590TRWN	FT-10	TKFT12R/L...
	1212F-12	●	●	12	12	-		12	85	12				
	1212JX-12	●	●						120					
	1616JX-12	●	●	16	16			16		16				
	2020JX-12	●	●	20	20			20		20				
	2525M-12	●		25	25			25	150	30	2			TKFT12R...

LPR shows the distance from the toolholder to the cutting edge.
See Page **H15** for internal coolant type (coolant-through holders)

Threading inserts identification system (Ref. to Table 1)

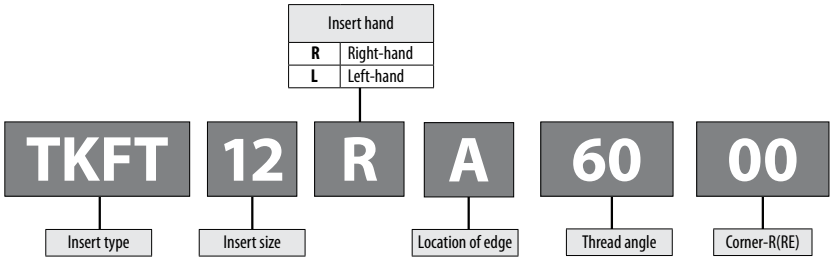
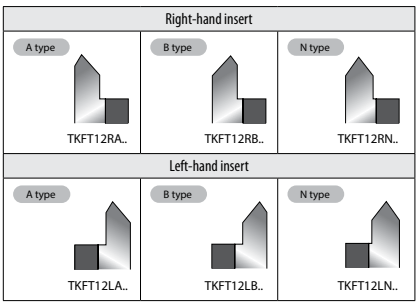
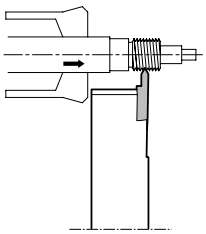


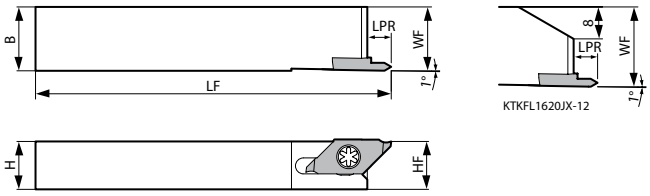
Table 1



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KTKF (Threading, Goose-neck holder)





Left-hand shown | Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

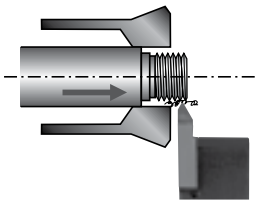
Description		Availability	Dimension (mm)						Spare parts		Applicable inserts J28
		L	H	B	LPR	HF	LF	WF	Screw	Wrench	
KTKFL	1216JX-12	●	12	16	6	12	120	16	SB-4590TRWN	FT-10	TKFT12L...
	1620JX-12	●	16	20		16		20			

LPR shows the distance from the toolholder to the cutting edge.

Swiss tool automatic lathe (Guide bush system)

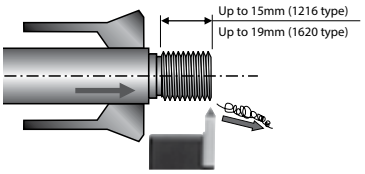
Goose-neck holder is applicable to automatic lathes whose toolholder does not move to longitudinal direction (Z-axis direction).

Conventional tool



Chips may come into the guide bush and scratch the thread surface.

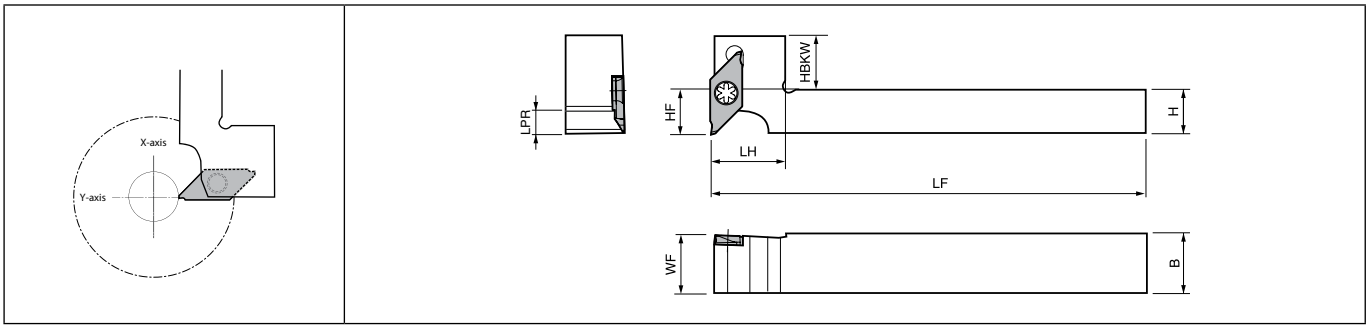
Goose-neck holder



Goose-neck holder is capable of threading without returning the thread part into the guide bush (thread length up to 15 mm or 19 mm).

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KTKF-Y (Threading, Y-axis toolholder)



Right-hand shown | Right-hand Insert for Right-hand Toolholder.

Toolholder dimensions

Description		Availability	Dimension (mm)								Spare parts		Applicable inserts J28
											Screw	Wrench	
		R	H	B	LH	HF	LPR	HBKW	LF	WF			
KTKFR	1216JX-12-Y	●	12	16	20	12	6	15	120	16	SB-4590TRWN	FT-10	TKFT12R...
	1616JX-12-Y	●	16		25	16		11					

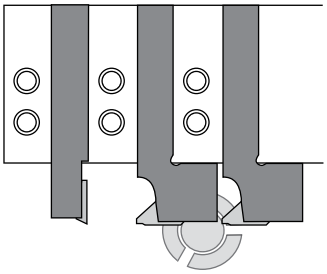
LPR shows the distance from the toolholder to the cutting edge.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

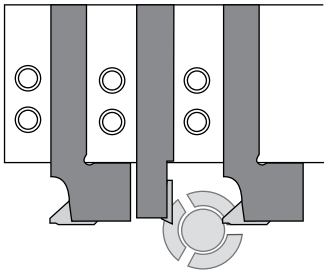
Precautions for using Y-axis toolholder

Do not use Y-axis toolholders side by side to prevent interference. (Only two Y-axis holder can be used at the same time)

With interference

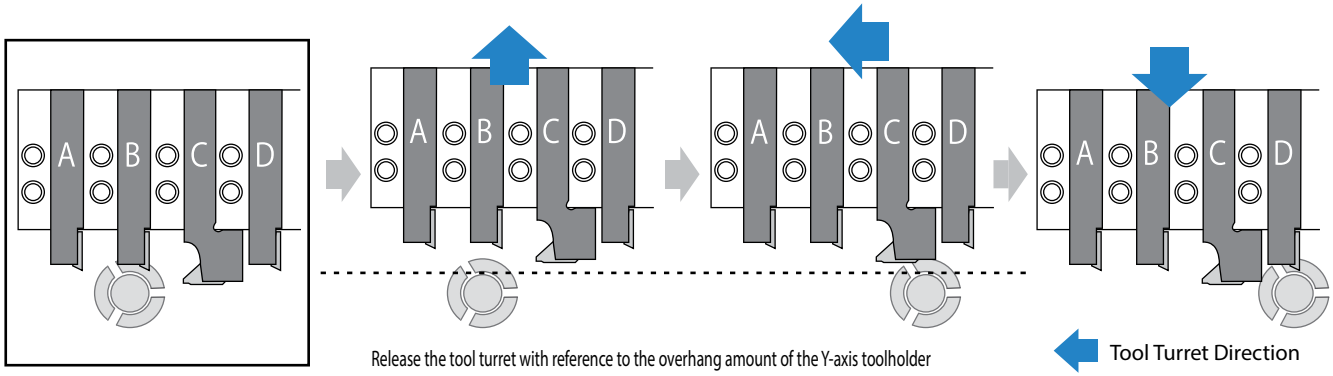


Without interference



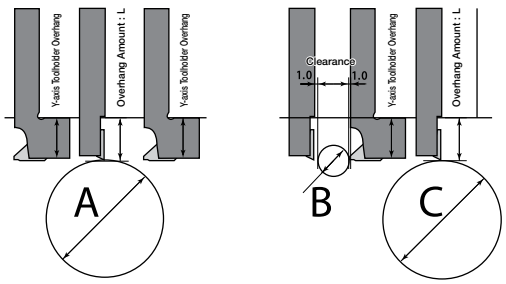
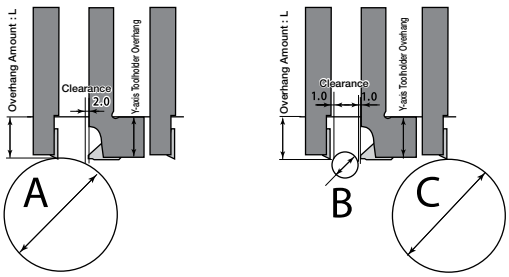
Standard toolholders may be mounted between two Y-axis toolholders

When changing the tool, set the retracted position with reference to the cutting edge of the Y-axis holder. (When exchanging from tool B to D)



Note that using other toolholders together will result in dierent outside diameters

(Unit : mm)

Y-axis Toolholder Overhang	Examples	Available Outside Cutting Diameter(ø) \ Overhang Amount L	20	22	25
20		A	Without Restriction	Without Restriction	Without Restriction
		B	13.0	13.0	13.0
		C	Without Restriction	Without Restriction	Without Restriction
25		A	38.0	58.0	Without Restriction
		B	14.9	13.6	13.0
		C	45.0	60.0	Without Restriction

Recommended cutting conditions

Workpiece material	Recommended insert grades			
	MEGACOAT NANO PLUS	MEGACOAT NANO	MEGACOAT	Carbide
	PR1725	PR1535	PR1225	KW10
Carbon steel	Vc = 70 ~170 m/mim			-
	First ap (Radial): 0.2mm and under			
Alloy steel	Vc = 70 ~170 m/mim			-
	First ap (Radial): 0.2 mm and under			
Stainless steel	Vc = 60~100 m/mim			-
	First ap (Radial): 0.15 mm and under			
Cast iron	-			Vc = 100 m/mim
				First ap (Radial): 0.2 mm and under
Aluminum alloys	-			Vc = 150~400 m/mim
				First ap (Radial): 0.2 mm and under
Brass	-			Vc = 150~300 m/mim
				First ap (Radial): 0.15 mm and under

· Coolant is recommended.
· In case of threading stainless steel, please set two to three passes more than <ap - passes> listed below.

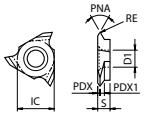
Depth of cut & number of passes

TKFT 60˚ / 55˚ Partial profile

(ap shows the value of radial ap)

Type		Pitch (mm/TPI)	Description	Corner-R (RE)	Total ap (mm)	No. of passes	1	2	3	4	5	6	7	8	9	10	11
Metric	External thread	0.20 mm	TKFT 12R/L A/B6000	Max 0.05 Flat	0.15	4	0.06	0.04	0.03	0.02							
		0.25 mm			0.19	4	0.07	0.06	0.04	0.02							
		0.30 mm			0.23	4	0.08	0.07	0.06	0.02							
		0.35 mm			0.27	5	0.08	0.07	0.06	0.04	0.02						
		0.40 mm			0.30	5	0.10	0.08	0.06	0.04	0.02						
		0.45 mm			0.34	6	0.10	0.08	0.06	0.04	0.04	0.02					
		0.50 mm	TKFT 12R/L A/B6000		0.38	6	0.10	0.10	0.07	0.05	0.04	0.02					
			TKFT 12R/L A/B60005	0.05	0.33	5	0.10	0.10	0.07	0.04	0.02						
		0.60 mm	TKFT 12R/L A/B6000	Max 0.05 Flat	0.45	7	0.10	0.10	0.08	0.06	0.05	0.04	0.02				
			TKFT 12R/L A/B60005	0.05	0.40	6	0.10	0.10	0.08	0.06	0.04	0.02					
		0.70 mm	TKFT 12R/L A/B60005	0.05	0.48	6	0.10	0.10	0.10	0.10	0.06	0.02					
		0.75 mm		0.05	0.52	7	0.10	0.10	0.10	0.08	0.07	0.05	0.02				
		0.80 mm		0.05	0.56	7	0.10	0.10	0.10	0.10	0.08	0.06	0.02				
		1.00 mm	TKFT 12R/L A/B60005 12R/L N6001	0.05	0.71	8	0.15	0.15	0.12	0.10	0.08	0.06	0.03	0.02			
				0.10	0.66	7	0.18	0.15	0.12	0.10	0.06	0.03	0.02				
		1.25 mm		0.05	0.90	9	0.20	0.18	0.13	0.10	0.10	0.07	0.05	0.05	0.02		
				0.10	0.85	8	0.20	0.18	0.13	0.10	0.10	0.07	0.05	0.02			
		1.50 mm	TKFT 12R/L N6001	0.10	1.04	10	0.20	0.18	0.14	0.12	0.10	0.10	0.08	0.05	0.05	0.02	
Parallel pipe	External thread	28 TPI	TKFT 12R/L A/B55005	0.05	0.67	7	0.18	0.15	0.12	0.10	0.06	0.04	0.02				
		19 TPI		0.05	1.01	9	0.20	0.18	0.14	0.12	0.12	0.10	0.08	0.05	0.02		
Whitworth	External thread	24 TPI	TKFT 12R/L A/B55005	0.05	0.79	8	0.18	0.18	0.12	0.10	0.08	0.07	0.04	0.02			
		20 TPI		0.05	0.96	9	0.20	0.20	0.15	0.10	0.10	0.08	0.06	0.05	0.02		
		18 TPI		0.05	1.07	10	0.20	0.18	0.15	0.12	0.10	0.10	0.08	0.07	0.05	0.02	
		16 TPI		0.05	1.21	11	0.20	0.18	0.15	0.15	0.12	0.10	0.10	0.08	0.07	0.04	0.02

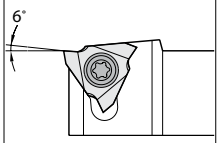
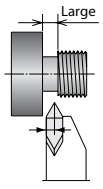
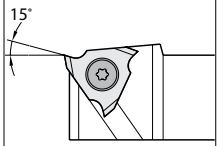
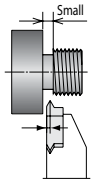
TTX

				Carbon steel / Alloy steel									●	○		P			
				Stainless steel									●	○		M			
				Cast iron											●	K			
				Non-ferrous metals											●	N			
Insert		Description	Thread type	Symbol thread type	Pitch				Profile type	Thread angle PNA (°)	Dimension (mm)						Carbide		Applicable toolholder J35
					M (mm) G, R (TPI)		UN, W (TPI)										PVD	-	
					min.	max.	min.	max.			IC	S	D1	RE	PDX	PDX1	PR1115 PR930	KW10	
		TTX32R 6000	Metric Unified	M UN	0.5	1	56	32	Partial profile	60	9.525	3.18	4.4	0	0.6	1.12		●	KTTXR...-16 S...KTTXL16
		TTX32R 60005			0.5	1	48	32		60	9.525	3.18	4.4	0.05	0.6	1.12	●	●	●
		TTX32R 6001			1	2	28	14		60	9.525	3.18	4.4	0.1	1.1	1.62	●	●	●
		TTX32R 6000S			0.5		56	48		60	9.525	3.18	4.4	0	0.3	1.12	●		●
		TTX32R 60005S			0.5		48			60	9.525	3.18	4.4	0.05	0.3	1.12	●	●	●
		TTX32R 5501	Parallel/ Tapered pipe	G R W	28	19	24	20		55	9.525	3.18	4.4	0.1	0.75	1.01	●	●	●
		TTX32R 55015	Whitworth		19	11	20	11		55	9.525	3.18	4.4	0.15	1.2	1.46			●

Right-hand shown

Recommended cutting conditions J48
Depth of Cut & Number of Passes J56

TT and TTX

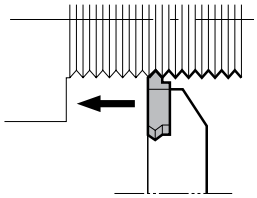
Type	Shape	Features		
		Rake Angle after Installation	Condition	Dead Space
TT			· One insert can machine various pitch sizes	
TTX			· The Least Cutting Force · Thread to shoulder (Less dead space) · One Insert can machine various pitch sizes (less than TT)	

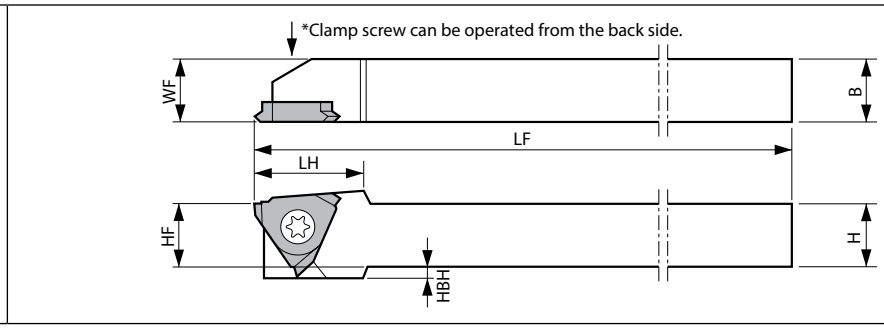
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

PR930 / PR1115 (Threading inserts) are sold in 5 piece boxes

KW10 / TC60 (Threading inserts) are sold in 10 piece boxes

KTTX



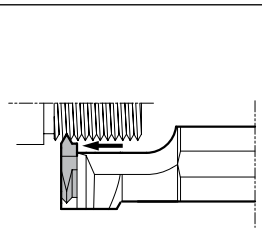


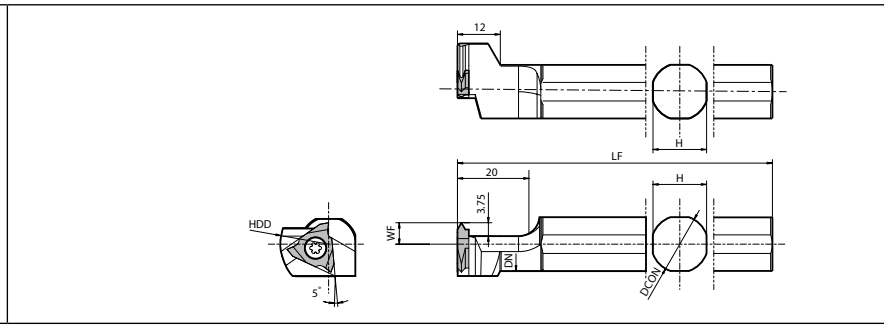
Thread to shoulder | Right-hand shown | Right-hand Insert for Right-hand Toolholder.

Toolholder dimensions

Description		Availability	Dimension (mm)							Spare parts		Applicable inserts J34
		R	H	B	LH	HF	HBH	LF	WF	Screw	Wrench	
KTTXR	1010JX-16F	●	10	10	17.6	10	2	120	10	SB-4070TRW	FT-8	TTX32R...
	1212F-16F	●	12	12		12	-	85	12			
	1212JX-16F	●						120				
	1616JX-16F	●	16	16		16			16			
	2020K-16F	●	20	20		20		125	20			

S-KTTX





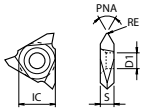
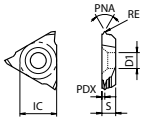
Thread to shoulder | Left-hand shown | Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description		Availability	Dimension (mm)						Spare parts		Applicable inserts J34
		L	DCON	H	DN	HDD	LF	WF	Screw	Wrench	
S12F-	KTTXL16	●	12	11	11	27	80	6	SB-4070TRW	FT-8	TTX32R...
S14H-	KTTXL16	●	14	13	13		100				
S15F-	KTTXL16	●	15.875	15	14.6		85				
S16F-	KTTXL16	●	16								
S19G-	KTTXL16	●	19.05	17	17.6		90				
S19K-	KTTXL16	●					120				
S20G-	KTTXL16	●	20	18	18.6		90				
S20K-	KTTXL16	●					120				
S25.0H-	KTTXL16	●	25	23	23.6	32	100	10			
S25K-	KTTXL16	●	25.4				120				

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

TT (External threading)

Insert		Description	Thread type	Symbol thread type	Pitch M(mm) G, PT (TPI) min.	Pitch M(mm) G, PT (TPI) max.	Pitch UN, W (TPI) min.	Pitch UN, W (TPI) max.	Profile type	Thread angle PNA (°)	Dimension (mm) IC	S	D1	RE	PDX	Carbide PVD PR1115	Carbide PVD PR930	Carbide - KW10	Applicable toolholder ➡ J37
Carbon steel / Alloy steel																●	○		P
Stainless steel																●	○		M
Cast iron																		●	K
Non-ferrous metals																		●	N
		TT32R 6000 6001 6002 6003	Metric Unified	M UN	0.5 1 1.5 2.5	2.5	56 24 16 11	10	Partial profile	60	9.525	3.18	4.4	0 0.1 0.2 0.3	-	● ● ● ●	● ● ● ●	 ● ●	KTTR...-16
		TT32L 6000 6001 6002			0.5 1 1.5	2.5	56 24 16	10						0 0.1 0.2		● ● ●	● ● ●	 ● ●	KTTL...-16
		TT32R 5501 5502	Parallel/ Tapered pipe Whitworth	G PT W	28 14	11 11	24 14	10 10		55				0.1 0.2		● ●	● ●	● ●	KTTR...-16
		TT32L 5501 5502			28 14	11 11	24 14	10 10						0.1 0.2			● ●	● ●	KTTL...-16
		TT43R 6001 6002 6003 6004	Metric Unified	M UN	1 1.5 2.5 3	3.5	24 16 11 8	8		60	12.7	4.76	5.5	0.1 0.2 0.3 0.4		● ● ● ●	● ● ● ●	● ● ●	KTTR...-22
		TT43L 6001 6002			1 1.5	3.5	24 16	8						0.1 0.2		● ●	● ○	● ●	KTTL...-22
		TT43R 5501 5502 5503	Parallel/ Tapered pipe Whitworth	G PT W	28 14 11	11 11 11	24 16 10	7		55	12.7	4.76	5.5	0.1 0.2 0.3		● ● ●	● ● ●	● ● ●	KTTR...-22
		TT43L 5501 5502			28 14	11 11	24 16	7			12.7	4.76	5.5	0.1 0.2			○ ○	● ●	KTTL...-22
		TT43ER 100M 125M 150M 200M	Metric	M	1 1.25 1.5 2		-		Full profile	60	12.7	4.76	5.5	0.12 0.15 0.19 0.25	0.8 0.9 1 1.7	● ● ● ●	● ● ● ●		KTTR...-22

Right-hand shown

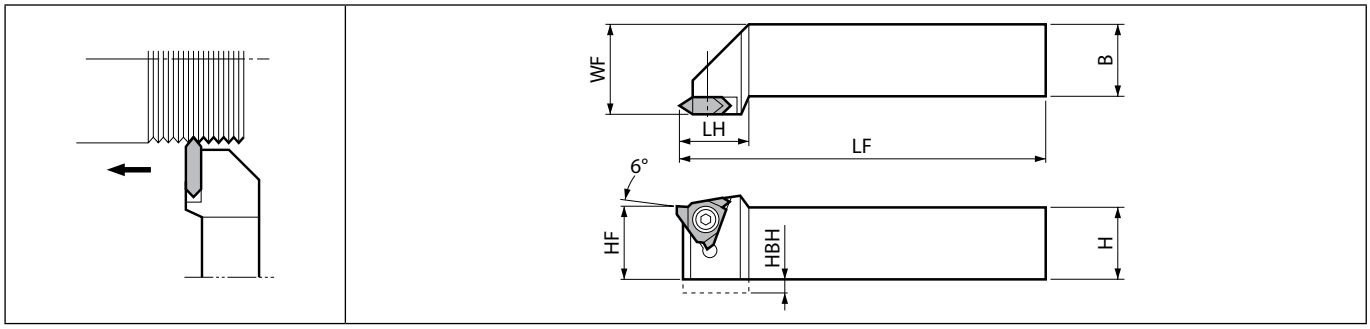
Recommended cutting conditions ➡ **J48**
Depth of Cut & Number of Passes ➡ **J55, J56**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

PR930 / PR1115 (Threading inserts) are sold in 5 piece boxes

KW10 (Threading inserts) are sold in 10 piece boxes

KTT



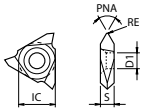
Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description		Availability		Dimension (mm)							Spare parts					Applicable inserts ➡ J36
											Screw	Screw	Wrench	Wrench	Wrench	
		R	L	H	B	LH	HF	HBH	LF	WF						
KTTR/L	1010F-16	●	●	10	10	18	10	4	80	12	SB-4070TRS	-	-	-	FT-10	TT32&...
	1212H-16	●	●	12	12		12	2	100	16						
	1616H-16	●	●	16	16		16	-		20						
	2020K-16	●	●	20	20		20		125	25	SB-4TR			FT-15	-	
	2525M-16	●	●	25	25		25		150	30						
KTTR/L	2020K-22	●	●	20	20	25	20	-	125	25	-	GS-50	LW-3	-	-	TT43&... TT43ER...M
	2525M-22	●	●	25	25		25		150	30						

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

TT (Internal threading)

				Carbon steel / Alloy steel										●	○		P
				Stainless steel										●	○		M
				Cast iron												●	K
				Non-ferrous metals												●	N
Insert		Description		Thread type	Symbol thread type	Pitch				Profile type	Thread angle PNA (°)	Dimension (mm)				Carbide			Applicable toolholder ⇨ J39
						M(mm) G, PT (TPI)		UN, W (TPI)				IC	S	D1	RE	PVD		-	
						min.	max.	min.	max.							PR1115	PR930	KW10	
		TT32R	6000 6001	Metric Unified	M UN	0.5 1.5	2.5	48 16	10	Partial profile	60	9.525	3.18	4.4	0 0.1	● ●	● ●	 ●	KITGL...-16
		TT32L	6000 6001			0.5 1.5	2.5	48 16	10						0 0.1	● ●	● ●	 ●	KITGR...-16
		TT32R	5501 5502	Parallel/ Tapered pipe Whitworth	G PT W	28 -	11 -	24 16	10 18		55				0.1 0.2	● ●	● ●	● ●	KITGL...-16
		TT32L	5501 5502			28 -	11 -	24 16	10 18						0.1 0.2		● ●	● ●	KITGR...-16
		TT43R	6001 6002	Metric Unified	M UN	1.5 3	3	16 8	10 8		60	12.7	4.76	5.5	0.1 0.2	● ●	● ●	● ●	KITGL...-22
		TT43L	6001 6002			1.5 3	3	16 8	10 8						0.1 0.2	● ●	●	● ●	KITGR...-22
		TT43R	5501 5502 5503	Parallel/ Tapered pipe Whitworth	G PT W	28 14 11	11 11 11	24 16 11	8		55				0.1 0.2 0.3	● ● ●	● ● ●	● ● ●	KITGL...-22
		TT43L	5501 5502			28 14	11 11	24 16	8						0.1 0.2			● ●	KITGR...-22

Right-hand shown

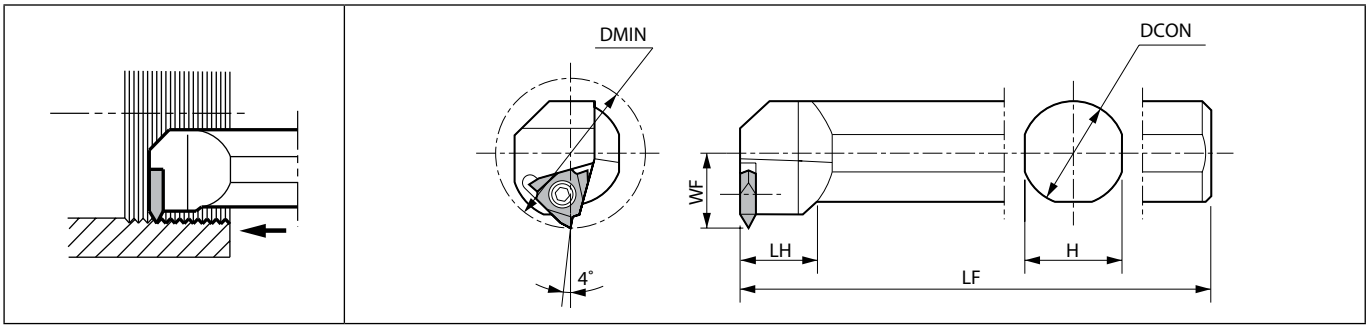
Recommended cutting conditions ⇨ **J48**
Depth of Cut & Number of Passes ⇨ **J55, J56**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

PR930 / PR1115 (Threading inserts) are sold in 5 piece boxes

KW10 (Threading inserts) are sold in 10 piece boxes

KITG



Right-hand shown | Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

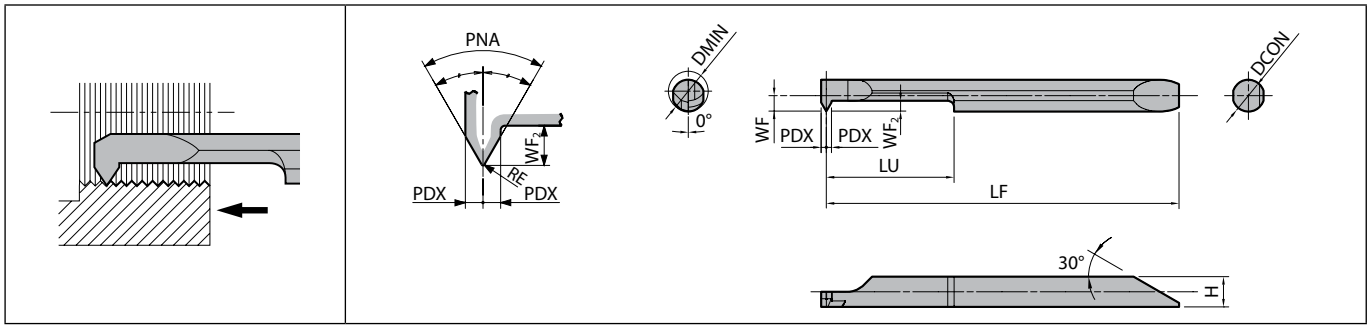
Toolholder dimensions

Description		Availability		Dimension (mm)						Spare parts				Applicable inserts J38
		R	L	DMIN	DCON	H	LH	LF	WF	Screw	Screw	Wrench	Wrench	
KITG$^{R}_{L}$	3525T-16	●	●	35	25	23	18	220	17.5	SB-4TR	-	-	FT-15	TT32$^{L}_{R}$...
KITG$^{R}_{L}$	4532T-22	●	●	45	32	30	20	250	22.5	-	GS-50	LW-3	-	TT43$^{L}_{R}$...

Max. available Pitch : KITG&3525T-16···TP 2.5mm or 10TPI, KITG&4532T-22···TP 3.0mm or 8TPI.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

EZT (Internal threading)



Right-hand shown

Dimensions

Description	No. of edges	Dimension (mm)									Thread angle PNA (°)	Tolerance (mm)		Carbide		Applicable Thread					
														PVD	-	Metric		Unified		American National Tapered Pipe	
		DMIN	DCON	H	LF	LU	WF	WF_2	PDX	RE		RE min.	RE max.	PR1225	GW05	Nominal Thread	Pitch (mm)	Nominal Thread	Pitch (TPI)	Nominal Thread	Pitch (TPI)
EZTR 030025-60-002	1	3	2.5	2.3	34.5	6	1.19	1	0.5	0.02	60°	0.01	0.01	●	●	M4 and over (Fine Thread : M3.5 and over)	0.35~0.8	No.8-32UNC No.8-36UNF and over	36~32	-	-
035030-60-002		3.5	3	2.8	38.4	8.4	1.44	1.2	0.6					●	●	M4.5 and over (Fine Thread : M4.5 and over)	0.5~1.0	No.10-24UNC No.8-36UNF and over	36~24	-	-
040035-60-004		4	3.5	3.3	41.4	10.4	1.69			0.04				●	●	M5 and over (Fine Thread : M6 and over)	0.75~1.25	No.12-24UNC No.12-28UNF and over	28~20	-	-
050040-60-004		5	4	3.8	44.35	15.35	1.94	1.3	0.65					●	●	M7 and over (Fine Thread : M6 and over)	0.75~1.5	1/4-20UNC 1/4-28UNF and over	28~18	-	-
060050-60-004		6	5	4.8	52.4	19.2	2.44	1.6	0.8					●	●	M8 and over (Fine Thread : M7 and over)	0.75~1.5	5/16-18UNC 5/16-24UNF and over	24~16	1/4NPT 3/8NPT	18
070060-60-004		7	6	5.8	60.2	24	2.94	2	1					●	●	M9 and over (Fine Thread : M8 and over)	0.75~1.75	3/8-16UNC 3/8-24UNF and over	24~16	1/4NPT and over	18,14
																Whitworth		Parallel Pipe / Tapered Pipe			
																Nominal Thread	Pitch (TPI)	Nominal Thread	Pitch (TPI)		
EZTR 060050-55-008	1	6	5	4.8	52.4	19.2	2.44	1.6	0.8	0.085	55°	0.015	0.015	●	●	W10 TPI24 and over	24~20	G1/16 and over R1/16 and over	28	-	-
080070-55-008		8	7	6.8	63.2	24	3.44	2	1					●	●	W11 TPI20 and over	20~18	G1/8 and over R1/8 and over	28,19	-	-

For American National Tapered Pipe (NPT), use EZTR..-60-004. J43

Applicable sleeves J41
Recommended cutting conditions J42
Depth of Cut & Number of Passes J42, J43

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

EZ bars are sold in 1 piece boxes

Applicable sleeves

Sleeve description							Applicable inserts		Applicable machine manufacturer
EZH-CT (Adjustable overhang length / with coolant hole) F38, F39		EZH-HP (Adjustable overhang length) F40, F41		EZH-ST F42, F43		Sleeve shank dia. DCON (mm)	EZT	Shank dia. DCON (mm)	
-		-		EZH	02512ST-80	12	EZTR030025-...	2.5	(General purpose)
					03012ST-80		EZTR035030-...	3	
					03512ST-80		EZTR040035-...	3.5	
					04012ST-80		EZTR050040-...	4	
					05012ST-80		EZTR060050-...	5	
					06012ST-80		EZTR070060-...	6	
					07012ST-80		EZTR080070-...	7	
-		EZH	02516HP-100	EZH	02516ST-100	16	EZTR030025-...	2.5	(General purpose)
			03016HP-100		03016ST-100		EZTR035030-...	3	
			03516HP-100		03516ST-100		EZTR040035-...	3.5	
			04016HP-100		04016ST-100		EZTR050040-...	4	
			05016HP-100		05016ST-100		EZTR060050-...	5	
			06016HP-100		06016ST-100		EZTR070060-...	6	
			07016HP-100		07016ST-100		EZTR080070-...	7	
EZH	02519CT-120	EZH	02519HP-120	EZH	02519ST-120	19.05	EZTR030025-...	2.5	Citizen machinery
	03019CT-120		03019HP-120		03019ST-120		EZTR035030-...	3	
	03519CT-120		03519HP-120		03519ST-120		EZTR040035-...	3.5	
	04019CT-120		04019HP-120		04019ST-120		EZTR050040-...	4	
	05019CT-120		05019HP-120		05019ST-120		EZTR060050-...	5	
	06019CT-120		06019HP-120		06019ST-120		EZTR070060-...	6	
	07019CT-120		07019HP-120		07019ST-120		EZTR080070-...	7	
EZH	02520CT-120	EZH	02520HP-120	EZH	02520ST-120	20	EZTR030025-...	2.5	Eguro Tsugami Citizen machinery (General purpose)
	03020CT-120		03020HP-120		03020ST-120		EZTR035030-...	3	
	03520CT-120		03520HP-120		03520ST-120		EZTR040035-...	3.5	
	04020CT-120		04020HP-120		04020ST-120		EZTR050040-...	4	
	05020CT-120		05020HP-120		05020ST-120		EZTR060050-...	5	
	06020CT-120		06020HP-120		06020ST-120		EZTR070060-...	6	
	07020CT-120		07020HP-120		07020ST-120		EZTR080070-...	7	
EZH	02522CT-135	EZH	02522HP-135	EZH	02522ST-135	22	EZTR030025-...	2.5	Star micronics Nomura DS Tsugami
	03022CT-135		03022HP-135		03022ST-135		EZTR035030-...	3	
	03522CT-135		03522HP-135		03522ST-135		EZTR040035-...	3.5	
	04022CT-135		04022HP-135		04022ST-135		EZTR050040-...	4	
	05022CT-135		05022HP-135		05022ST-135		EZTR060050-...	5	
	06022CT-135		06022HP-135		06022ST-135		EZTR070060-...	6	
	07022CT-135		07022HP-135		07022ST-135		EZTR080070-...	7	
EZH	02525.0CT-135	EZH	02525.0HP-135	EZH	02525.0ST-135	25	EZTR030025-...	2.5	Eguro Tsugami Citizen machinery (General purpose)
	03025.0CT-135		03025.0HP-135		03025.0ST-135		EZTR035030-...	3	
	03525.0CT-135		03525.0HP-135		03525.0ST-135		EZTR040035-...	3.5	
	04025.0CT-135		04025.0HP-135		04025.0ST-135		EZTR050040-...	4	
	05025.0CT-135		05025.0HP-135		05025.0ST-135		EZTR060050-...	5	
	06025.0CT-135		06025.0HP-135		06025.0ST-135		EZTR070060-...	6	
	07025.0CT-135		07025.0HP-135		07025.0ST-135		EZTR080070-...	7	
EZH	02525.4CT-120	EZH	02525.4HP-120	EZH	02525.4ST-120	25.4	EZTR030025-...	2.5	Citizen machinery
	03025.4CT-120		03025.4HP-120		03025.4ST-120		EZTR035030-...	3	
	03525.4CT-120		03525.4HP-120		03525.4ST-120		EZTR040035-...	3.5	
	04025.4CT-120		04025.4HP-120		04025.4ST-120		EZTR050040-...	4	
	05025.4CT-120		05025.4HP-120		05025.4ST-120		EZTR060050-...	5	
	06025.4CT-120		06025.4HP-120		06025.4ST-120		EZTR070060-...	6	
	07025.4CT-120		07025.4HP-120		07025.4ST-120		EZTR080070-...	7	

Choose sleeves (DCB) to meet with DCON dimension of bar.

Adjustment Pin cannot be installed to EZH-ST sleeves. To adjust overhang of the bar, please use EZH-CT / HP sleeves.

Machine manufacturers in random order.

Recommended cutting conditions

Workpiece material	Recommended insert grades (Vc: m/min)	
	MEGACOAT	Carbide
	PR1225	GW15
Carbon steel / Alloy steel	★ 30~50	-
Stainless steel	★ 30~50	-
Non-ferrous metals	-	★ 30~50

★: 1st Recommendation

<Note>
1) The standard cutting speed is Vc=30~50m/min.
The table feed may not follow the expected conditions when machining small diameter workpieces at high speeds.
2) Coolant is recommended.

Depth of cut & number of passes (Metric: M)

Pitch (mm)	Total ap (mm)	No. of passes	1Pass	2Pass	3Pass	4Pass	5Pass	6Pass	7Pass	8Pass	9Pass	10Pass	11Pass	12Pass	13Pass	14Pass	15Pass	16Pass	17Pass	18Pass	19Pass	20Pass
0.5	0.3	9	0.05	0.05	0.04	0.04	0.03	0.03	0.02	0.02	0.02											
0.7	0.42	10	0.06	0.05	0.05	0.05	0.05	0.04	0.04	0.03	0.03	0.02										
0.75	0.45	10	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.03	0.03										
0.8	0.48	11	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.03	0.03	0.03									
1.00	0.61	12	0.07	0.07	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.03								
1.25	0.77	14	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.04	0.04	0.04	0.03						
1.50	0.93	17	0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.03			
1.75	1.1	20	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.03	0.03

Depth of cut & number of passes (Whitworth)

TPI	Total ap (mm)	No. of passes	1Pass	2Pass	3Pass	4Pass	5Pass	6Pass	7Pass	8Pass	9Pass	10Pass	11Pass	12Pass	13Pass	14Pass	15Pass	16Pass	17Pass
24	0.65	13	0.07	0.07	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.03	0.03				
20	0.81	15	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.03		
18	0.91	17	0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.03	0.03

Depth of cut & number of passes (Unified: UN, UNC, UNF, UNEF)

TPI	Total ap (mm)	No. of passes	1Pass	2Pass	3Pass	4Pass	5Pass	6Pass	7Pass	8Pass	9Pass	10Pass	11Pass	12Pass	13Pass	14Pass	15Pass	16Pass	17Pass	18Pass
36	0.44	10	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.03	0.02	0.02								
32	0.5	11	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.03	0.03							
28	0.55	12	0.07	0.06	0.05	0.05	0.05	0.05	0.05	0.04	0.04	0.03	0.03	0.03						
24	0.65	12	0.07	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.04	0.03						
20	0.78	14	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.04	0.04	0.03				
18	0.88	17	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.03	0.03	
16	0.99	18	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.03

Parallel pipe: G(PF), Rp(PS)

Nominal thread Symbol (Previous symbol)	TPI	Internal thread (G, Rp) Insert		Bore dia.	Same root's radius
G 1/16 (-)	28	EZTR	060050-55-008	6.56	0.12
G 1/8 (PF 1/8)			080070-55-008	8.57	
G 1/4 (PF 1/4)	19	EZTR	080070-55-008	11.45	0.18
G 3/8 (PF 3/8)				14.95	

Tapered pipe: R, Rc(PT)(BSPT)

Nominal thread Symbol (Previous symbol)	TPI	Internal thread (Rc) Insert		Bore dia.	Same root's radius
R 1/16, Rc 1/16 (-)	28	EZTR	060050-55-008	-	0.12
R 1/8, Rc 1/8 (PT 1/8)			080070-55-008	-	
R 1/4, Rc 1/4 (PT 1/4)	19	EZTR	080070-55-008	-	0.18
R 3/8, Rc 3/8 (PT 3/8)				-	

· When using "EZT type" for Parallel pipe / Tapered pipe threading, thread's corners become sharp edged due to its Partial profile, and the shape will not be the same as the standard shape for Parallel pipe / tapered pipe.

Depth of cut & number of passes (Parallel pipe / Tapered pipe)

TPI	Total ap (mm)	No. of passes	1 Pass	2 Pass	3 Pass	4 Pass	5 Pass	6 Pass	7 Pass	8 Pass	9 Pass	10 Pass	11 Pass	12 Pass	13 Pass	14 Pass	15 Pass	16 Pass	17 Pass	18 Pass
28	0.61	12	0.07	0.07	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.03						
19	0.95	18	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.03	0.03

Application of American national tapered pipe thread (NPT)

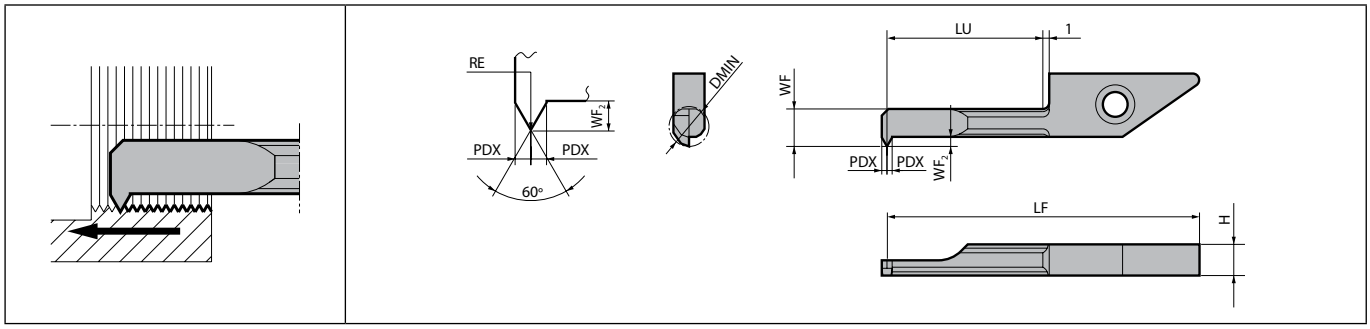
Nominal thread	TPI	Internal thread Toolholder	Insert Partial profile	Insert Full profile
1/16 NPT 1/8 NPT	27	No tools available		
1/4 NPT 3/8 NPT	18	EZH Sleeves	EZTR060050-60-004 EZTR070060-60-004	-
1/2 NPT 3/4 NPT	14	EZH Sleeves	EZTR070060-60-004	-
1/2 NPT	14	SINR1616S-16	-	16IR14NPT
3/4 NPT		SINR2016S-16		

• Application of NPTF thread
NPTF is the thread for sealing pipes without using any sealing material.
Thread symbol is similar to NPT but the tolerance is different from that of NPT, therefore the above inserts are not available for NPTF.

Depth of cut & number of passes (American national tapered pipe)

TPI	Total ap (mm)	No. of passes	1 Pass	2 Pass	3 Pass	4 Pass	5 Pass	6 Pass	7 Pass	8 Pass	9 Pass	10 Pass	11 Pass	12 Pass	13 Pass	14 Pass	15 Pass	16 Pass	17 Pass	18 Pass	19 Pass
18	1.23	16	0.18	0.14	0.12	0.12	0.10	0.09	0.08	0.08	0.07	0.06	0.05	0.04	0.03	0.03	0.02	0.02			
14	1.56	19	0.18	0.16	0.14	0.14	0.12	0.10	0.09	0.09	0.08	0.07	0.07	0.06	0.05	0.05	0.04	0.04	0.03	0.03	0.02

VNT



Right-hand shown

Dimensions

Description	No. of edges	Dimension (mm)								Tolerance (mm)		Carbide			Applicable Thread				Applicable toolholder F48~F51
												PVD		-	Metric		Unified		
		DMIN	H	LF	LU	WF	WF_2	PDX	RE	RE min.	RE max.	PR1225	PR930	KW10	Nominal Thread	Pitch (mm)	Nominal Thread	Pitch (TPI)	
VNTR 045-11	1	4.5	3.9	30.2	10.4	3.6	1.3	0.6	0.05	0.02	0	●	●	●	M6 and over	0.75~1.25	1/4-20UNC, 1/4-28UNF and over	28~20	SVNR...-12N SVNSR-12-11N S...-SVNR12N S...-SVNR12SN
060-11		6		30	10.2	4.6	1.6	0.8				●	●	●	M8 and over	0.75~1.50	5/16-18UNC, 5/16-24UNF and over	24~18	

Recommended cutting conditions J45
Depth of Cut & Number of Passes J45

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

System tip-bars are sold in 5 piece boxes

Recommended cutting condition

Workpiece material	Recommended insert grades (Vc: m/min)		
	MEGACOAT	PVD coated carbide	Carbide
	PR1225	PR930	KW10
Carbon steel	★ 30~50	☆ 30~50	-
Stainless steel	★ 30~50	☆ 30~50	-
Non-ferrous metals	-	-	★ 30~50

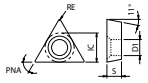
★: 1st Recommendation ☆: 2nd Recommendation

<Note>
1) The standard cutting speed is Vc=30~50m/min. The table feed may not follow the expected conditions when machining small diameter workpieces at high speeds.
2) Coolant is recommended.

Depth of cut and number of passes (Metric: M)

Pitch (mm)	Total ap (mm)	No. of passes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
0.75	0.44	10	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.03	0.03							
1.00	0.60	12	0.07	0.07	0.06	0.06	0.06	0.05	0.05	0.04	0.04	0.04	0.03	0.03					
1.25	0.76	14	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.03			
1.50	0.92	17	0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.03

TPGB

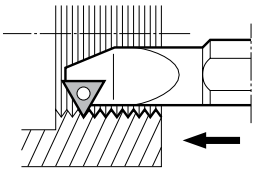
			Carbon steel / Alloy steel																							P
			Stainless steel																							M
			Cast iron																							K
			Non-ferrous metals																							N
Insert		Description	No. of edges	Dimension (mm)				Angle (°)		Pitch				Profile type	Thread type	Symbol thread type	Carbide	Cermet				Applicable toolholder J47
				IC	S	D1	RE	AN	PNA	M (mm)		UN (TPI)					-	PVD		-		
										min.	max.	min.	max.				KW10	PV720	PV730	TN60	TN620	
	 Without Chipbreaker	TPGB 1102005	3	6.35	2.38	3.7	0.05	11	60	0.75	1.5	28	16	Partial profile	Metric Unified	M UN	●			●		...STWP&11-12(E)
		110201					0.1			1.5		16					●			●		
		TPGB 1103005	3	6.35	3.18	3.3	0.05	11	60	0.75	3.5	28	11				●			●		...STWP&11-16(E)
		110301					0.1			1.5		16	8				●			●		...STWP&11-20(E)
		110302					0.2			3		8	8				●	●	●	●	●	...STWP&11-25(E)

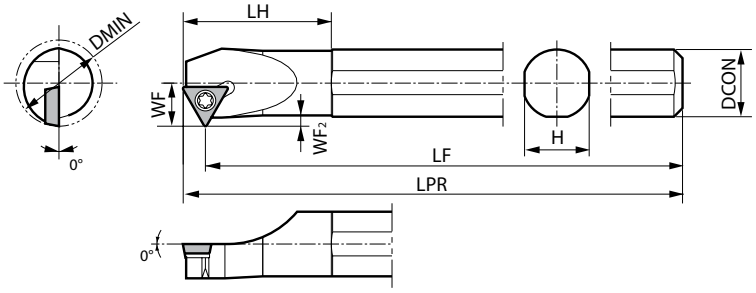
Recommended cutting conditions J48
Depth of Cut & Number of Passes J57

J
Threading

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-STWP (Steel shank bar)





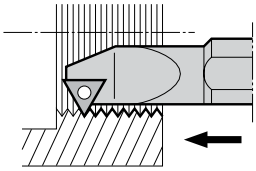
This toolholder can also be used as a boring bar | Right-hand shown

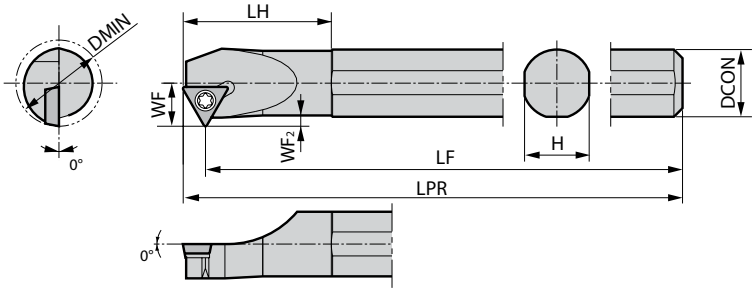
Toolholder dimensions

Description		Availability	Dimension (mm)								GAMO (°)	Coolant hole	Pitch max (mm)	Spare parts		Applicable inserts J46
		R	DMIN	DCON	H	LH	LPR	LF	WF	WF2				Screw	Wrench	
S10M-	STWPR11-12	●	12	10	9.2	23	150	144.5	6	1	0	No	1.5	SB-3STR	FT-10	TPGB1102..
S12M-	STWPR11-16	●	16	12	11	30			8	1.5			2			TPGB1103..
S16Q-	STWPR11-20	●	20	16	15	35	180	174.5	10	2			3	SB-3TR		
S20R-	STWPR11-25	●	25	20	19	40	200	194.5	12.5	2.5			3.5			

WF_2 : shows the Max. available ap.

S-STWP-E (Excellent bar)





This toolholder can also be used as a boring bar | Right-hand shown

Toolholder dimensions

Description		Availability		Dimension (mm)								GAMO (°)	Coolant hole	Pitch max (mm)	Spare parts		Applicable inserts J46
		R	L	DMIN	DCON	H	LH	LPR	LF	WF	WF2				Screw	Wrench	
S10M-	STWP$^{R}_{L}$11-12E	●	●	12	10	9.2	23	150	144.5	6	1	0	No	1.5	SB-3STR	FT-10	TPGB1102..
S12M-	STWP$^{R}_{L}$11-16E	●	●	16	12	11	30			8	1.5			2			TPGB1103..
S16R-	STWP$^{R}_{L}$11-20E	●	●	20	16	15	35	200	194.5	10	2			3	SB-3TR		
S20X-	STWP$^{R}_{L}$11-25E	●	●	25	20	19	40	220	214.5	12.5	2.5			3.5			

WF_2 : shows the Max. available ap.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KTN / KTNS / SIN / CIN / S-KTN

Workpiece material	Recommended insert grades (Vc: m/min)					
	Cermet	MEGACOAT	MEGACOAT NANO		PVD coated carbide	Carbide
	TC60	PR1215	PR1515	PR1535	PR1115	GW15
Carbon steel	☆ 100~150	★ 100~150	-	-	☆ 100~150	-
First ap (Radial)	0.3 mm and under	0.3 mm and under			0.3 mm and under	
Alloy steel	☆ 100~150	★ 100~150	-	-	☆ 100~150	-
First ap (Radial)	0.3 mm and under	0.3 mm and under			0.3 mm and under	
Stainless steel	☆ 60~80	-	☆ 60~100	★ 40~80	☆ 60~80	-
First ap (Radial)	0.25 mm and under		0.25 mm and under	0.25 mm and under	0.25 mm and under	
Cast iron	-	-	-	-	-	★ 100
First ap (Radial)						0.3 mm and under
Aluminum alloys	-	-	-	-	-	★ 150 ~400
First ap (Radial)						0.3 mm and under
Brass	-	-	-	-	-	★ 150~300
First ap (Radial)						0.3m and under

For 06IR / 08IR, please lower it to a figure under 40% of above condition list

KTT

Workpiece material	Recommended insert grades (Vc: m/min)		
	PVD coated carbide		Carbide
	PR930	PR1115	KW10
Carbon steel	☆ 100~150	★ 100~150	-
First ap (Radial)	0.3 mm and under	0.3 mm and under	
Alloy steel	☆ 100~150	★ 100~150	-
First ap (Radial)	0.3 mm and under	0.3 mm and under	
Stainless steel	☆ 60~80	★ 60~80	-
First ap (Radial)	0.25 mm and under	0.25 mm and under	
Cast iron	-	-	★ 100
First ap (Radial)			0.3 mm and under
Aluminum alloys	-	-	★ 150~400
First ap (Radial)			0.3 mm and under
Brass	-	-	★ 150~300
First ap (Radial)			0.3 mm and under

S-STWP(-E)

Workpiece material	Recommended insert grades (Vc: m/min)			
	Cermet		PVD coated cermet	Carbide
	TN620	TN60	PV720	KW10
Carbon steel	☆ 100~150	☆ 100~150	★ 100~150	-
First ap (Radial)	0.25 mm and under	0.25 mm and under	0.25 mm and under	
Alloy steel	☆ 100~150	☆ 100~150	★ 100~150	-
First ap (Radial)	0.25 mm and under	0.25 mm and under	0.25 mm and under	
Stainless steel	-	-	-	-
First ap (Radial)				
Cast iron	-	-	-	★ 100
First ap (Radial)				0.25 mm and under
Aluminum alloys	-	-	-	★ 150~400
First ap (Radial)				0.25 mm and under
Brass	-	-	-	★ 150~300
First ap (Radial)				0.25 mm and under

KTTX / S-KTTX

Workpiece material	Recommended insert grades (Vc: m/min)			
	Cermet	PVD coated carbide		Carbide
	TC60	PR930	PR1115	KW10
Carbon steel	☆ 100~150	☆ 100~150	★ 100~150	-
First ap (Radial)	0.3 mm and under	0.3 mm and under	0.3 mm and under	
Alloy steel	☆ 100~150	☆ 100~150	★ 100~150	-
First ap (Radial)	0.3 mm and under	0.3 mm and under	0.3 mm and under	
Stainless steel	☆ 60~80	☆ 60~80	★ 60~80	-
First ap (Radial)	0.25 mm and under	0.25 mm and under	0.25 mm and under	
Cast iron	-	-	-	★ 100
First ap (Radial)				0.3 mm and under
Aluminum alloys	-	-	-	★ 150~400
First ap (Radial)				0.3 mm and under
Brass	-	-	-	★ 150~300
First ap (Radial)				0.3 mm and under

KITG

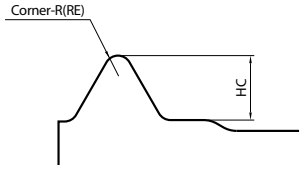
Workpiece material	Recommended insert grades (Vc: m/min)		
	PVD coated carbide		Carbide
	PR930	PR1115	KW10
Carbon steel	☆ 100~150	★ 100~150	-
First ap (Radial)	0.3 mm and under	0.3 mm and under	
Alloy steel	☆ 100~150	★ 100~150	-
First ap (Radial)	0.3 mm and under	0.3 mm and under	
Stainless steel	☆ 60~80	★ 60~80	-
First ap (Radial)	0.25 mm and under	0.25 mm and under	
Cast iron	-	-	★ 100
First ap (Radial)			0.3 mm and under
Aluminum alloys	-	-	★ 150~400
First ap (Radial)			0.3 mm and under
Brass	-	-	★ 150~300
First ap (Radial)			0.3 mm and under

★: 1st Recommendation ☆: 2nd Recommendation

- Coolant is recommended.
- In case of using cermet insert, honing the edge with hand lapper enables higher stability.
- In case of threading Stainless steel, please set two to three passes more than previous description of <Depth of cut & number of passes>.

Cautions for usage of Full profile insert.

1) Max. ap is based on the value of 0.05~0.08 mm
2) Finishing ap should be 0.02~0.05mm.
3) Prepare chamfering for C0.3~C0.5 to the workpiece to prevent the insert cracking during the 1st pass.
4) Coolant is recommended.



11/16/22 (Full profile) type

(ap shows the value of radial ap)

Type		Pitch / TPI mm / TPI	Description		HC (mm)	Total ap (mm)	No. of passes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Metric	External thread	1.00 mm	16ER	100ISO-TF/TQ	0.64	0.72	5	0.23	0.19	0.15	0.10	0.05														
		1.25 mm		125ISO-TF/TQ	0.80	0.88	6	0.26	0.21	0.16	0.12	0.08	0.05													
		1.50 mm		150ISO-TF/TQ	0.95	1.03	6	0.26	0.24	0.21	0.16	0.11	0.05													
		1.75 mm		175ISO-TF/TQ	1.11	1.19	8	0.26	0.22	0.19	0.16	0.13	0.10	0.08	0.05											
		2.00 mm		200ISO-TF/TQ	1.27	1.35	10	0.26	0.21	0.18	0.16	0.14	0.12	0.10	0.08	0.05	0.05									
		2.50 mm		250ISO-TF/TQ	1.57	1.65	12	0.26	0.23	0.21	0.18	0.14	0.12	0.12	0.10	0.10	0.08	0.06	0.05							
		3.00 mm		300ISO-TF/TQ	1.87	1.95	14	0.26	0.24	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.10	0.08	0.08	0.05	0.02					
		0.50 mm	16E R/L	050ISO	0.33	0.38	4	0.14	0.12	0.08	0.04															
		0.75 mm		075ISO	0.48	0.53	5	0.17	0.14	0.10	0.08	0.04														
		1.00 mm		100ISO	0.64	0.72	5	0.23	0.19	0.15	0.10	0.05														
		1.25 mm		125ISO	0.80	0.88	6	0.26	0.21	0.16	0.12	0.08	0.05													
		1.50 mm		150ISO	0.95	1.03	6	0.26	0.24	0.21	0.16	0.11	0.05													
		2.00 mm		200ISO	1.27	1.35	10	0.26	0.21	0.18	0.16	0.14	0.12	0.10	0.08	0.05	0.05									
		2.50 mm		250ISO	1.57	1.65	12	0.26	0.23	0.21	0.18	0.14	0.12	0.12	0.10	0.10	0.08	0.06	0.05							
		3.00 mm	22ER	300ISO	1.87	1.95	14	0.26	0.24	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.10	0.08	0.08	0.05	0.02					
		3.50 mm		350ISO	2.18	2.26	15	0.28	0.25	0.22	0.20	0.20	0.18	0.16	0.15	0.15	0.12	0.10	0.10	0.08	0.05	0.02				
		4.00 mm		400ISO	2.48	2.56	17	0.28	0.25	0.24	0.22	0.20	0.18	0.16	0.15	0.15	0.14	0.12	0.12	0.10	0.10	0.08	0.05	0.02		
		4.50 mm		450ISO	2.79	2.87	18	0.30	0.28	0.26	0.24	0.22	0.20	0.18	0.16	0.16	0.14	0.14	0.13	0.12	0.10	0.10	0.07	0.05	0.02	
		5.00 mm		500ISO	3.10	3.18	19	0.30	0.28	0.27	0.26	0.23	0.20	0.18	0.18	0.17	0.16	0.16	0.15	0.15	0.13	0.12	0.10	0.07	0.05	0.02
	Internal thread	1.00 mm	11IR	100ISO-TF/TQ	0.60	0.68	5	0.20	0.18	0.15	0.11	0.04														
		1.25 mm		125ISO-TF/TQ	0.74	0.82	7	0.20	0.18	0.14	0.12	0.08	0.06	0.04												
		1.50 mm		150ISO-TF/TQ	0.88	0.96	8	0.24	0.18	0.14	0.10	0.10	0.08	0.07	0.05											
		1.75 mm		175ISO-TF/TQ	1.02	1.10	9	0.24	0.18	0.16	0.14	0.10	0.10	0.08	0.05	0.05										
		0.50 mm	11I R/L	050ISO	0.31	0.36	4	0.14	0.10	0.08	0.04															
		0.75 mm		075ISO	0.45	0.50	5	0.15	0.14	0.10	0.07	0.04														
		1.00 mm		100ISO	0.60	0.68	5	0.20	0.18	0.15	0.11	0.04														
		1.25 mm		125ISO	0.74	0.82	7	0.20	0.18	0.14	0.12	0.08	0.06	0.04												
		1.50 mm		150ISO	0.88	0.96	8	0.24	0.18	0.14	0.10	0.10	0.08	0.07	0.05											
		1.75 mm		175ISO	1.02	1.10	9	0.24	0.18	0.16	0.14	0.10	0.10	0.08	0.05	0.05										
		2.0 0mm		200ISO	1.18	1.26	10	0.24	0.20	0.18	0.14	0.12	0.10	0.10	0.08	0.05	0.05									
		1.00 mm	16IR	100ISO-TF/TQ	0.60	0.68	5	0.20	0.18	0.15	0.11	0.04														
		1.25 mm		125ISO-TF/TQ	0.74	0.82	7	0.20	0.18	0.14	0.12	0.08	0.06	0.04												
		1.50 mm		150ISO-TF/TQ	0.88	0.96	8	0.22	0.18	0.14	0.12	0.10	0.08	0.07	0.05											
		1.75 mm		175ISO-TF/TQ	1.02	1.10	9	0.22	0.18	0.16	0.14	0.12	0.10	0.08	0.05	0.05										
		2.00 mm		200ISO-TF/TQ	1.18	1.26	10	0.24	0.20	0.18	0.14	0.12	0.10	0.10	0.08	0.05	0.05									
		2.50 mm		250ISO-TF/TQ	1.46	1.54	12	0.26	0.22	0.18	0.16	0.14	0.12	0.10	0.10	0.08	0.08	0.05	0.05							
		3.00 mm		300ISO-TF/TQ	1.76	1.84	14	0.26	0.24	0.21	0.18	0.16	0.15	0.13	0.12	0.10	0.10	0.07	0.05	0.05	0.02					
		1.00 mm	16I R/L	100ISO	0.60	0.68	5	0.20	0.18	0.15	0.11	0.04														
		1.25 mm		125ISO	0.74	0.82	7	0.20	0.18	0.14	0.12	0.08	0.06	0.04												
		1.50 mm		150ISO	0.88	0.96	8	0.22	0.18	0.14	0.12	0.10	0.08	0.07	0.05											
		2.00 mm		200ISO	1.18	1.26	10	0.24	0.20	0.18	0.14	0.12	0.10	0.10	0.08	0.05	0.05									
		2.50 mm		250ISO	1.46	1.54	12	0.26	0.22	0.18	0.16	0.14	0.12	0.10	0.10	0.08	0.08	0.05	0.05							
		3.00 mm		300ISO	1.76	1.84	14	0.26	0.24	0.21	0.18	0.16	0.15	0.13	0.12	0.10	0.10	0.07	0.05	0.05	0.02					
		3.00 mm	22IR	300ISO	1.76	1.84	14	0.26	0.24	0.21	0.18	0.16	0.15	0.13	0.12	0.10	0.10	0.07	0.05	0.05	0.02					
		3.50 mm		350ISO	2.05	2.13	15	0.26	0.24	0.22	0.20	0.17	0.17	0.14	0.14	0.12	0.12	0.10	0.10	0.08	0.05	0.02				
		4.00 mm		400ISO	2.34	2.42	17	0.26	0.24	0.22	0.20	0.18	0.18	0.16	0.15	0.14	0.13	0.12	0.12	0.10	0.10	0.05	0.05	0.02		
		4.50 mm		450ISO	2.63	2.71	18	0.26	0.25	0.24	0.22	0.22	0.20	0.18	0.17	0.15	0.13	0.13	0.12	0.12	0.10	0.10	0.05	0.05	0.02	
		5.00 mm		500ISO	2.92	3.00	19	0.28	0.26	0.24	0.22	0.20	0.20	0.18	0.18	0.16	0.16	0.15	0.14	0.13	0.12	0.11	0.10	0.10	0.05	0.02
Unified	External thread	24 TPI	16ER	24UN-TF/TQ	0.67	0.75	5	0.24	0.20	0.16	0.10	0.05														
		20 TPI		20UN-TF/TQ	0.80	0.88	6	0.24	0.20	0.16	0.13	0.10	0.05													
		18 TPI		18UN-TF/TQ	0.89	0.97	6	0.26	0.22	0.18	0.15	0.11	0.05													
		16 TPI		16UN-TF/TQ	1.01	1.09	7	0.26	0.22	0.18	0.15	0.12	0.11	0.05												
		14 TPI		14UN-TF/TQ	1.15	1.23	8	0.26	0.22	0.18	0.16	0.14	0.12	0.10	0.05											
		13 TPI		13UN-TF/TQ	1.24	1.32	9	0.26	0.22	0.18	0.16	0.14	0.12	0.11	0.08	0.05										
		12 TPI		12UN-TF/TQ	1.34	1.42	11	0.26	0.22	0.18	0.16	0.13	0.12	0.10	0.08	0.07	0.05	0.05								
		10 TPI		10UN-TF/TQ	1.59	1.67	12	0.26	0.22	0.20	0.18	0.16	0.14	0.12	0.12	0.10	0.07	0.05	0.05							
		8 TPI		08UN-TF/TQ	1.98	2.06	14	0.26	0.24	0.22	0.20	0.18	0.16	0.14	0.14	0.12	0.12	0.10	0.08	0.05	0.05					
		24 TPI	16ER	24UN	0.67	0.75	5	0.24	0.20	0.16	0.10	0.05														
		20 TPI		20UN	0.80	0.88	6	0.24	0.20	0.16	0.13	0.10	0.05													
		18 TPI		18UN	0.89	0.97	6	0.26	0.22	0.18	0.15	0.11	0.05													
		16 TPI		16UN	1.01	1.09	7	0.26	0.22	0.18	0.15	0.12	0.11	0.05												
		14 TPI		14UN	1.15	1.23	8	0.26	0.22	0.18	0.16	0.14	0.12	0.10	0.05											
		12 TPI		12UN	1.34	1.42	11	0.26	0.22	0.18	0.16	0.13	0.12	0.10	0.08	0.07	0.05	0.05								
		8 TPI	22ER	08UN	1.98	2.06	15	0.30	0.26	0.22	0.20	0.16	0.15	0.14	0.13	0.10	0.10	0.10	0.07	0.06	0.05	0.02				
	Internal thread	24 TPI	16IR	24UN-TF/TQ	0.62	0.70	5	0.22	0.19	0.15	0.10	0.04														
		20 TPI		20UN-TF/TQ	0.75	0.83	6	0.22	0.20	0.16	0.12	0.08	0.05													
		18 TPI		18UN-TF/TQ	0.83	0.91	6	0.24	0.20	0.18	0.14	0.10	0.05													
		16 TPI		16UN-TF/TQ	0.94	1.02	7	0.24	0.20	0.18	0.14	0.11	0.10	0.05												
		14 TPI		14UN-TF/TQ	1.07	1.15	8	0.24	0.22	0.18	0.14	0.12	0.10	0.10	0.05											
		13 TPI		13UN-TF/TQ	1.15	1.23	9	0.24	0.22	0.18	0.14	0.12	0.10	0.10	0.08	0.05										
		12 TPI		12UN-TF/TQ	1.24	1.32	11	0.24	0.22	0.16	0.15	0.12	0.10	0.10	0.07	0.07	0.05	0.04								
		10 TPI		10UN-TF/TQ	1.48	1.56	12	0.24	0.22	0.20	0.16	0.15	0.12	0.12	0.10	0.09	0.07	0.05	0.04							
		8 TPI		08UN-TF/TQ	1.86	1.94	14	0.24	0.22	0.20	0.18	0.16	0.16	0.14	0.14	0.12	0.12	0.10	0.07	0.05	0.04					
		24 TPI	16IR	24UN	0.62	0.70	5	0.22	0.19	0.15	0.10	0.04														
		20 TPI		20UN	0.75	0.83	6	0.22	0.20	0.16	0.12	0.08	0.05													
		18 TPI		18UN	0.83	0.91	6	0.24	0.21	0.17	0.14	0.10	0.05													
		16 TPI		16UN	0.94	1.02	7	0.24	0.20	0.18	0.14	0.11	0.10	0.05												
		14 TPI		14UN	1.07	1.15	8	0.24	0.22	0.18	0.14	0.12	0.10	0.10	0.05											
		12 TPI		12UN	1.24	1.32	11	0.24	0.22	0.16	0.15	0.12	0.10	0.10	0.07	0.07	0.05	0.04								
		8 TPI	22IR	08UN	1.84	1.92	15	0.24	0.22	0.20	0.18	0.16	0.14	0.13	0.12	0.12	0.10	0.10	0.09	0.05	0.05	0.02				

11/16 (Full profile)

(ap shows the value of radial ap)

Type		Pitch / TPI	Description		HC (mm)	Total ap (mm)	No. of Passes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
		mm / TPI																								
Parallel pipe	External thread	19 TPI	16ER	19W-TF/TQ	0.89	0.97	6	0.27	0.22	0.18	0.15	0.10	0.05													
		14 TPI		14W-TF/TQ	1.19	1.27	9	0.27	0.22	0.18	0.16	0.11	0.10	0.10	0.08	0.05										
		11 TPI		11W-TF/TQ	1.50	1.58	12	0.27	0.22	0.18	0.16	0.12	0.12	0.12	0.10	0.10	0.07	0.07	0.05							
	Internal thread	19 TPI	16IR	19W-TF/TQ	0.88	0.96	6	0.25	0.21	0.20	0.15	0.10	0.05													
		14 TPI		14W-TF/TQ	1.19	1.27	9	0.27	0.22	0.18	0.16	0.11	0.10	0.10	0.08	0.05										
		11 TPI		11W-TF/TQ	1.50	1.58	12	0.27	0.22	0.18	0.16	0.12	0.12	0.12	0.10	0.10	0.07	0.07	0.05							
Whitworth	External thread	16 TPI	16ER	16W-TF/TQ	1.05	1.13	8	0.25	0.21	0.18	0.16	0.12	0.08	0.08	0.05											
		14 TPI		14W-TF/TQ	1.19	1.27	9	0.27	0.22	0.18	0.16	0.11	0.10	0.10	0.08	0.05										
		11 TPI		11W-TF/TQ	1.50	1.58	12	0.27	0.22	0.18	0.16	0.12	0.12	0.12	0.10	0.10	0.07	0.07	0.05							
	Internal thread	16 TPI	16IR	16W-TF/TQ	1.05	1.13	8	0.25	0.21	0.18	0.16	0.12	0.08	0.08	0.05											
		14 TPI		14W-TF/TQ	1.19	1.27	9	0.27	0.22	0.18	0.16	0.11	0.10	0.10	0.08	0.05										
		11 TPI		11W-TF/TQ	1.50	1.58	12	0.27	0.22	0.18	0.16	0.12	0.12	0.12	0.10	0.10	0.07	0.07	0.05							
Tapered pipe	External thread	28 TPI	16ER	28BSPT-TF/TQ	0.58	0.63	5	0.20	0.15	0.13	0.11	0.04														
		19 TPI		19BSPT-TF/TQ	0.86	0.94	6	0.26	0.20	0.18	0.15	0.10	0.05													
		14 TPI		14BSPT-TF/TQ	1.16	1.24	9	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.04										
		11 TPI		11BSPT-TF/TQ	1.48	1.56	12	0.26	0.22	0.18	0.16	0.12	0.12	0.11	0.10	0.10	0.07	0.07	0.05							
		28 TPI	16ER	28BSPT	0.58	0.63	5	0.20	0.15	0.13	0.11	0.04														
		19 TPI		19BSPT	0.86	0.94	6	0.26	0.20	0.18	0.15	0.10	0.05													
		14 TPI		14BSPT	1.16	1.24	9	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.04										
		11 TPI		11BSPT	1.48	1.56	12	0.26	0.22	0.18	0.16	0.12	0.12	0.11	0.10	0.10	0.07	0.07	0.05							
	Internal thread	28 TPI	11IR	28BSPT-TF/TQ	0.58	0.63	5	0.20	0.16	0.13	0.10	0.04														
		19 TPI		19BSPT-TF/TQ	0.86	0.94	7	0.22	0.20	0.18	0.14	0.10	0.06	0.04												
		14 TPI		14BSPT-TF/TQ	1.16	1.24	9	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.04										
		28 TPI	11IR	28BSPT	0.58	0.63	5	0.20	0.16	0.13	0.10	0.04														
		19 TPI		19BSPT	0.86	0.94	7	0.22	0.20	0.18	0.14	0.10	0.06	0.04												
		14 TPI		14BSPT	1.16	1.24	9	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.04										
		14 TPI	16IR	14BSPT-TF/TQ	1.16	1.24	9	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.04										
		11 TPI		11BSPT-TF/TQ	1.48	1.56	12	0.26	0.22	0.18	0.16	0.12	0.12	0.11	0.10	0.10	0.07	0.07	0.05							
		14 TPI	16IR	14BSPT	1.16	1.24	9	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.04										
		11 TPI		11BSPT	1.48	1.56	12	0.26	0.22	0.18	0.16	0.12	0.12	0.11	0.10	0.10	0.07	0.07	0.05							
American national tapered pipe	External thread	18 TPI	16ER	18NPT	1.14	1.22	13	0.20	0.16	0.14	0.12	0.10	0.10	0.08	0.08	0.07	0.06	0.05	0.04	0.02						
		14 TPI		14NPT	1.46	1.54	15	0.20	0.18	0.15	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.07	0.06	0.05	0.04	0.02				
		11.5 TPI		11.5NPT	1.77	1.85	16	0.22	0.20	0.18	0.16	0.15	0.14	0.13	0.12	0.10	0.10	0.08	0.08	0.07	0.06	0.04	0.02			
	Internal thread	18 TPI	16IR	18NPT	1.14	1.22	13	0.20	0.16	0.14	0.12	0.10	0.10	0.08	0.08	0.07	0.06	0.05	0.04	0.02						
		14 TPI		14NPT	1.46	1.54	15	0.20	0.18	0.15	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.07	0.06	0.05	0.04	0.02				
		11.5 TPI		11.5NPT	1.77	1.85	16	0.22	0.20	0.18	0.16	0.15	0.14	0.13	0.12	0.10	0.10	0.08	0.08	0.07	0.06	0.04	0.02			

60˚/ 55˚(Partial profile)

(ap shows the value of radial ap)

Type		Pitch / TPI	Description		Corner-R (RE)	Total ap (mm)	No. of Passes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
		mm / TPI																								
Metric	External thread	0.5 mm	16ER	A60-TF/TQ	0.06	0.33	5	0.10	0.08	0.07	0.05	0.03														
				AG60-TF/TQ	0.06	0.33	5	0.10	0.08	0.07	0.05	0.03														
		0.75 mm	16ER	A60-TF/TQ	0.06	0.51	6	0.14	0.11	0.09	0.07	0.06	0.04													
				AG60-TF/TQ	0.06	0.51	6	0.14	0.11	0.09	0.07	0.06	0.04													
		1.00 mm	16ER	A60-TF/TQ	0.06	0.70	7	0.18	0.13	0.12	0.09	0.08	0.06	0.04												
				AG60-TF/TQ	0.06	0.70	7	0.18	0.13	0.12	0.09	0.08	0.06	0.04												
		1.25 mm	16ER	A60-TF/TQ	0.06	0.89	8	0.18	0.15	0.14	0.12	0.10	0.08	0.07	0.05											
				AG60-TF/TQ	0.06	0.89	8	0.18	0.15	0.14	0.12	0.10	0.08	0.07	0.05											
		1.50 mm	16ER	A60-TF/TQ	0.06	1.08	9	0.21	0.17	0.16	0.14	0.11	0.09	0.08	0.07	0.05										
				AG60-TF/TQ	0.06	1.08	9	0.21	0.17	0.16	0.14	0.11	0.09	0.08	0.07	0.05										
		1.75 mm	16ER	G60-TF/TQ	0.22	1.11	8	0.24	0.20	0.18	0.16	0.13	0.10	0.06	0.04											
				AG60-TF/TQ	0.06	1.27	11	0.22	0.20	0.18	0.13	0.11	0.09	0.09	0.08	0.07	0.06	0.04								
		2.00 mm	16ER	G60-TF/TQ	0.22	1.30	10	0.24	0.20	0.18	0.16	0.14	0.12	0.09	0.07	0.06	0.04										
				AG60-TF/TQ	0.06	1.46	11	0.25	0.22	0.20	0.16	0.14	0.12	0.10	0.09	0.08	0.06	0.04								
		2.50 mm	16ER	G60-TF/TQ	0.22	1.67	12	0.25	0.22	0.20	0.18	0.16	0.14	0.12	0.12	0.10	0.08	0.06	0.04							
				AG60-TF/TQ	0.06	1.84	13	0.25	0.22	0.20	0.19	0.17	0.16	0.14	0.11	0.10	0.09	0.09	0.07	0.05						
		3.00 mm	16ER	G60-TF/TQ	0.22	2.05	14	0.25	0.23	0.22	0.20	0.18	0.16	0.14	0.13	0.12	0.11	0.10	0.09	0.07	0.05						
				AG60-TF/TQ	0.06	2.22	15	0.27	0.25	0.22	0.20	0.18	0.16	0.14	0.13	0.12	0.12	0.11	0.10	0.09	0.08	0.05				
		0.5 mm	16ER	A60	0.06	0.33	5	0.10	0.08	0.07	0.05	0.03														
				AG60	0.06	0.33	5	0.10	0.08	0.07	0.05	0.03														
		0.75 mm	16ER	A60	0.06	0.51	6	0.14	0.11	0.09	0.07	0.06	0.04													
				AG60	0.06	0.51	6	0.14	0.11	0.09	0.07	0.06	0.04													
		1.00 mm	16ER	A60	0.06	0.70	7	0.18	0.13	0.12	0.09	0.08	0.06	0.04												
				AG60	0.06	0.70	7	0.18	0.13	0.12	0.09	0.08	0.06	0.04												
		1.25 mm	16ER	A60	0.06	0.89	8	0.18	0.15	0.14	0.12	0.10	0.08	0.07	0.05											
				AG60	0.06	0.89	8	0.18	0.15	0.14	0.12	0.10	0.08	0.07	0.05											
		1.50 mm	16ER	A60	0.06	1.08	9	0.21	0.17	0.16	0.14	0.11	0.09	0.08	0.07	0.05										
				AG60	0.06	1.08	9	0.21	0.17	0.16	0.14	0.11	0.09	0.08	0.07	0.05										
		1.75 mm	16ER	G60	0.22	1.11	8	0.24	0.20	0.18	0.16	0.13	0.10	0.06	0.04											
				AG60	0.06	1.27	11	0.22	0.20	0.18	0.13	0.11	0.09	0.09	0.08	0.07	0.06	0.04								
		2.00 mm	16ER	G60	0.22	1.30	10	0.24	0.20	0.18	0.16	0.14	0.12	0.09	0.07	0.06	0.04										
				AG60	0.06	1.46	11	0.25	0.22	0.20	0.16	0.14	0.12	0.10	0.09	0.08	0.06	0.04								
		2.50 mm	16ER	G60	0.22	1.67	12	0.25	0.22	0.20	0.18	0.16	0.14	0.12	0.12	0.10	0.08	0.06	0.04							
				AG60	0.06	1.84	13	0.25	0.22	0.20	0.19	0.17	0.16	0.14	0.11	0.10	0.09	0.09	0.07	0.05						
		3.00 mm	16ER	G60	0.22	2.05	14	0.25	0.23	0.22	0.20	0.18	0.16	0.14	0.13	0.12	0.11	0.10	0.09	0.07	0.05						
				AG60	0.06	2.22	15	0.27	0.25	0.22	0.20	0.18	0.16	0.14	0.13	0.12	0.12	0.11	0.10	0.09	0.08	0.05				

60˚/ 55˚(Partial profile)

(ap shows the value of radial ap)

Type		Pitch / TPI / mm / TPI	Description	Corner-R (RE)	Total ap (mm)	No. of Passes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Metric	External thread	3.50 mm	22ER N60	0.48	2.17	15	0.27	0.25	0.22	0.20	0.18	0.16	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.07	0.05				
		4.00 mm			2.55	17	0.28	0.26	0.24	0.22	0.20	0.18	0.17	0.16	0.14	0.13	0.12	0.10	0.09	0.08	0.07	0.06	0.05		
		4.50 mm			2.93	18	0.30	0.28	0.26	0.25	0.24	0.22	0.20	0.18	0.16	0.14	0.13	0.12	0.10	0.09	0.08	0.07	0.06	0.05	
		5.00 mm			3.31	19	0.30	0.28	0.27	0.26	0.25	0.24	0.23	0.22	0.20	0.18	0.16	0.14	0.13	0.10	0.09	0.08	0.07	0.06	0.05
	Internal thread	0.75 mm	06IR 60005	0.05	0.44	10	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.03	0.03									
		1.00 mm	06IR 60005	0.05	0.60	12	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.04	0.04	0.04	0.04	0.03							
			08IR 60007	0.07	0.58	12	0.07	0.06	0.06	0.06	0.06	0.05	0.04	0.04	0.04	0.04	0.03	0.03							
		1.25 mm	06IR 60005	0.05	0.76	14	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.04	0.04	0.03					
			08IR 60007	0.07	0.74	14	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.03					
		1.5 mm	08IR 60007	0.07	0.90	17	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.03	0.03		
		1.75 mm		0.07	1.07	19	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.03
		0.50 mm	11IR A60	0.02	0.30	5	0.08	0.07	0.06	0.05	0.04														
		1.00 mm			0.63	6	0.16	0.14	0.12	0.10	0.07	0.04													
		1.50 mm			0.95	9	0.18	0.16	0.13	0.12	0.10	0.08	0.08	0.06	0.04										
		0.5 mm	16IR A60	0.02	0.30	5	0.08	0.07	0.06	0.05	0.04														
			AG60	0.02	0.30	5	0.08	0.07	0.06	0.05	0.04														
		0.75 mm	16IR A60	0.02	0.47	6	0.12	0.10	0.08	0.07	0.06	0.04													
			AG60	0.02	0.47	6	0.12	0.10	0.08	0.07	0.06	0.04													
		1.00 mm	16IR A60	0.02	0.63	6	0.16	0.14	0.12	0.10	0.07	0.04													
			AG60	0.02	0.63	6	0.16	0.14	0.12	0.10	0.07	0.04													
		1.25 mm	16IR A60	0.02	0.79	7	0.16	0.15	0.14	0.13	0.10	0.07	0.04												
			AG60	0.02	0.79	7	0.16	0.15	0.14	0.13	0.10	0.07	0.04												
		1.50 mm	16IR A60	0.02	0.95	9	0.18	0.16	0.13	0.12	0.10	0.08	0.08	0.06	0.04										
			AG60	0.02	0.95	9	0.18	0.16	0.13	0.12	0.10	0.08	0.08	0.06	0.04										
		1.75 mm	16IR G60	0.11	1.03	9	0.20	0.17	0.15	0.13	0.11	0.10	0.08	0.05	0.04										
			AG60	0.02	1.12	10	0.20	0.18	0.16	0.13	0.12	0.10	0.08	0.06	0.05	0.04									
		2.00 mm	16IR G60	0.11	1.19	10	0.20	0.18	0.17	0.15	0.13	0.11	0.08	0.07	0.06	0.04									
			AG60	0.02	1.28	12	0.20	0.17	0.15	0.13	0.12	0.11	0.10	0.09	0.07	0.06	0.04	0.04							
		2.50 mm	16IR G60	0.11	1.51	14	0.20	0.18	0.16	0.14	0.14	0.12	0.12	0.10	0.10	0.08	0.06	0.05	0.04	0.02					
			AG60	0.02	1.60	16	0.20	0.18	0.16	0.14	0.14	0.12	0.12	0.10	0.10	0.08	0.06	0.05	0.05	0.04	0.04	0.02			
		3.00 mm	16IR G60	0.11	1.84	16	0.20	0.18	0.17	0.16	0.15	0.14	0.13	0.12	0.12	0.10	0.10	0.08	0.07	0.06	0.04	0.02			
			AG60	0.02	1.93	18	0.20	0.18	0.17	0.16	0.15	0.14	0.13	0.13	0.12	0.10	0.10	0.08	0.07	0.06	0.05	0.04	0.03	0.02	
		3.50 mm	22IR N60	0.22	2.05	14	0.26	0.25	0.22	0.20	0.18	0.16	0.14	0.12	0.12	0.11	0.10	0.08	0.06	0.05					
		4.00 mm			2.38	16	0.26	0.24	0.23	0.22	0.20	0.18	0.16	0.14	0.13	0.12	0.11	0.10	0.10	0.08	0.06	0.05			
		4.50 mm			2.70	18	0.26	0.24	0.23	0.22	0.20	0.18	0.17	0.16	0.15	0.14	0.13	0.12	0.11	0.10	0.10	0.08	0.06	0.05	
		5.00 mm			3.03	19	0.30	0.27	0.25	0.24	0.22	0.20	0.18	0.17	0.16	0.15	0.14	0.13	0.12	0.11	0.10	0.10	0.08	0.06	0.05
Unified	External thread	48 TPI	16ER A60-TF/TQ	0.06	0.35	5	0.10	0.08	0.07	0.06	0.04														
			AG60-TF/TQ	0.06	0.35	5	0.10	0.08	0.07	0.06	0.04														
		24 TPI	16ER A60-TF/TQ	0.06	0.75	7	0.18	0.15	0.13	0.10	0.08	0.07	0.04												
			AG60-TF/TQ	0.06	0.75	7	0.18	0.15	0.13	0.10	0.08	0.07	0.04												
		20 TPI	16ER A60-TF/TQ	0.06	0.91	8	0.18	0.16	0.14	0.12	0.10	0.09	0.07	0.05											
			AG60-TF/TQ	0.06	0.91	8	0.18	0.16	0.14	0.12	0.10	0.09	0.07	0.05											
		18 TPI	16ER A60-TF/TQ	0.06	1.01	8	0.20	0.18	0.16	0.14	0.12	0.08	0.08	0.05											
			AG60-TF/TQ	0.06	1.01	8	0.20	0.18	0.16	0.14	0.12	0.08	0.08	0.05											
		16 TPI	16ER A60-TF/TQ	0.06	1.15	10	0.22	0.18	0.15	0.13	0.11	0.10	0.08	0.08	0.06	0.04									
			AG60-TF/TQ	0.06	1.15	10	0.22	0.18	0.15	0.13	0.11	0.10	0.08	0.08	0.06	0.04									
		14 TPI	16ER G60-TF/TQ	0.22	1.15	9	0.20	0.18	0.16	0.14	0.13	0.12	0.10	0.07	0.05										
			AG60-TF/TQ	0.06	1.32	11	0.22	0.20	0.18	0.15	0.13	0.10	0.09	0.08	0.07	0.06	0.04								
		13 TPI	16ER G60-TF/TQ	0.22	1.26	9	0.24	0.20	0.18	0.16	0.14	0.12	0.10	0.07	0.05										
			AG60-TF/TQ	0.06	1.43	11	0.25	0.23	0.20	0.16	0.14	0.12	0.10	0.08	0.06	0.05	0.04								
		12 TPI	16ER G60-TF/TQ	0.22	1.38	10	0.25	0.22	0.20	0.17	0.15	0.12	0.10	0.07	0.06	0.04									
			AG60-TF/TQ	0.06	1.55	12	0.24	0.20	0.18	0.16	0.15	0.14	0.12	0.10	0.09	0.07	0.06	0.04							
		10 TPI	16ER G60-TF/TQ	0.22	1.71	12	0.25	0.22	0.20	0.18	0.16	0.15	0.14	0.12	0.10	0.08	0.06	0.05							
			AG60-TF/TQ	0.06	1.87	13	0.25	0.22	0.21	0.20	0.18	0.16	0.14	0.12	0.11	0.10	0.08	0.06	0.04						
		9 TPI	16ER G60-TF/TQ	0.22	1.92	13	0.27	0.24	0.22	0.20	0.18	0.16	0.14	0.12	0.11	0.10	0.08	0.06	0.04						
			AG60-TF/TQ	0.06	2.08	14	0.27	0.24	0.22	0.20	0.18	0.16	0.14	0.13	0.12	0.11	0.10	0.09	0.07	0.05					
		8 TPI	16ER G60-TF/TQ	0.22	2.19	15	0.27	0.25	0.22	0.20	0.18	0.16	0.14	0.12	0.12	0.11	0.10	0.10	0.09	0.08	0.05				
			AG60-TF/TQ	0.06	2.35	16	0.30	0.25	0.23	0.20	0.18	0.17	0.16	0.14	0.12	0.12	0.11	0.10	0.09	0.08	0.05	0.05			
		48 TPI	16ER A60	0.06	0.35	5	0.10	0.08	0.07	0.06	0.04														
			AG60	0.06	0.35	5	0.10	0.08	0.07	0.06	0.04														
		24 TPI	16ER A60	0.06	0.75	7	0.18	0.15	0.13	0.10	0.08	0.07	0.04												
			AG60	0.06	0.75	7	0.18	0.15	0.13	0.10	0.08	0.07	0.04												
		20 TPI	16ER A60	0.06	0.91	8	0.18	0.16	0.14	0.12	0.10	0.09	0.07	0.05											
			AG60	0.06	0.91	8	0.18	0.16	0.14	0.12	0.10	0.09	0.07	0.05											
		18 TPI	16ER A60	0.06	1.01	8	0.20	0.18	0.16	0.14	0.12	0.08	0.08	0.05											
			AG60	0.06	1.01	8	0.20	0.18	0.16	0.14	0.12	0.08	0.08	0.05											
		16 TPI	16ER A60	0.06	1.15	10	0.22	0.18	0.15	0.13	0.11	0.10	0.08	0.08	0.06	0.04									
			AG60	0.06	1.15	10	0.22	0.18	0.15	0.13	0.11	0.10	0.08	0.08	0.06	0.04									
		14 TPI	16ER G60	0.22	1.15	9	0.20	0.18	0.16	0.14	0.13	0.12	0.10	0.07	0.05										
			AG60	0.06	1.32	11	0.22	0.20	0.18	0.15	0.13	0.10	0.09	0.08	0.07	0.06	0.04								
		13 TPI	16ER G60	0.22	1.26	9	0.24	0.20	0.18	0.16	0.14	0.12	0.10	0.07	0.05										
			AG60	0.06	1.43	11	0.25	0.23	0.20	0.16	0.14	0.12	0.10	0.08	0.06	0.05	0.04								
		12 TPI	16ER G60	0.22	1.38	10	0.25	0.22	0.20	0.17	0.15	0.12	0.10	0.07	0.06	0.04									
			AG60	0.06	1.55	12	0.24	0.20	0.18	0.16	0.15	0.14	0.12	0.10	0.09	0.07	0.06	0.04							
		10 TPI	16ER G60	0.22	1.71	12	0.25	0.22	0.20	0.18	0.16	0.15	0.14	0.12	0.10	0.08	0.06	0.05							
			AG60	0.06	1.87	13	0.25	0.22	0.21	0.20	0.18	0.16	0.14	0.12	0.11	0.10	0.08	0.06	0.04						
		9 TPI	16ER G60	0.22	1.92	13	0.27	0.24	0.22	0.20	0.18	0.16	0.14	0.12	0.11	0.10	0.08	0.06	0.04						
			AG60	0.06	2.08	14	0.27	0.24	0.22	0.20	0.18	0.16	0.14	0.13	0.12	0.11	0.10	0.09	0.07	0.05					
		8 TPI	16ER G60	0.22	2.19	15	0.27	0.25	0.22	0.20	0.18	0.16	0.14	0.12	0.12	0.11	0.10	0.10	0.09	0.08	0.05				
			AG60	0.06	2.35	16	0.30	0.25	0.23	0.20	0.18	0.17	0.16	0.14	0.12	0.12	0.11	0.10	0.09	0.08	0.05	0.05			
		7 TPI	22ER N60	0.48	2.27	15	0.27	0.25	0.24	0.23	0.20	0.18	0.15	0.13	0.12	0.11	0.10	0.10	0.08	0.06	0.05				
		6 TPI			2.73	18	0.27	0.25	0.23	0.22	0.20	0.18	0.17	0.16	0.15	0.14	0.13	0.12	0.12	0.10	0.10	0.08	0.06	0.05	
		5 TPI			3.37	19	0.30	0.29	0.28	0.27	0.26	0.25	0.24	0.22	0.20	0.18	0.16	0.14	0.13	0.10	0.09	0.08	0.07	0.06	0.05

60˚/ 55˚ (Partial profile)

(ap shows the value of radial ap)

Type		Pitch / TPI mm / TPI	Description	Corner-R (RE)	Total ap (mm)	No. of passes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Unified	Internal thread	28 TPI	06IR 60005	0.05	0.54	12	0.07	0.06	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.03	0.03	0.03							
		24 TPI	06IR 60005	0.05	0.64	12	0.07	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.04	0.03							
		20 TPI	06IR 60005	0.05	0.77	14	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03					
			08IR 60007	0.07	0.75	14	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.04	0.04	0.03	0.03					
		18 TPI	08IR 60007	0.07	0.85	17	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.03	0.03	0.03		
		16 TPI	08IR 60007	0.07	0.96	18	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.03	
		48 TPI	11IR A60	0.02	0.32	5	0.08	0.07	0.07	0.06	0.04														
		24 TPI			0.67	7	0.14	0.13	0.12	0.10	0.08	0.06	0.04												
		20 TPI			0.8	8	0.14	0.13	0.12	0.12	0.11	0.08	0.06	0.04											
		18 TPI			0.9	9	0.15	0.14	0.13	0.12	0.11	0.08	0.07	0.06	0.04										
		16 TPI			1.01	10	0.15	0.14	0.13	0.12	0.12	0.10	0.08	0.07	0.06	0.04									
		48 TPI	16IR A60	0.02	0.32	5	0.08	0.07	0.07	0.06	0.04														
			AG60	0.02	0.32	5	0.08	0.07	0.07	0.06	0.04														
		24 TPI	16IR A60	0.02	0.67	7	0.14	0.13	0.12	0.10	0.08	0.06	0.04												
			AG60	0.02	0.67	7	0.14	0.13	0.12	0.10	0.08	0.06	0.04												
		20 TPI	16IR A60	0.02	0.80	8	0.14	0.13	0.12	0.12	0.11	0.08	0.06	0.04											
			AG60	0.02	0.80	8	0.14	0.13	0.12	0.12	0.11	0.08	0.06	0.04											
		18 TPI	16IR A60	0.02	0.90	9	0.15	0.14	0.13	0.12	0.11	0.08	0.07	0.06	0.04										
			AG60	0.02	0.90	9	0.15	0.14	0.13	0.12	0.11	0.08	0.07	0.06	0.04										
		16 TPI	16IR A60	0.02	1.01	10	0.15	0.14	0.13	0.12	0.12	0.10	0.08	0.07	0.06	0.04									
			AG60	0.02	1.01	10	0.15	0.14	0.13	0.12	0.12	0.10	0.08	0.07	0.06	0.04									
		14 TPI	16IR G60	0.11	1.07	9	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.05	0.04										
			AG60	0.02	1.16	11	0.15	0.14	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.06	0.04								
		13 TPI	16IR G60	0.11	1.16	10	0.20	0.18	0.16	0.14	0.12	0.11	0.08	0.07	0.06	0.04									
			AG60	0.02	1.25	12	0.18	0.16	0.15	0.13	0.12	0.11	0.10	0.09	0.07	0.06	0.04	0.04							
		12 TPI	16IR G60	0.11	1.26	11	0.20	0.18	0.16	0.14	0.13	0.12	0.10	0.08	0.06	0.05	0.04								
			AG60	0.02	1.35	13	0.20	0.18	0.16	0.14	0.12	0.11	0.10	0.08	0.07	0.06	0.05	0.04	0.04						
		10 TPI	16IR G60	0.11	1.54	14	0.20	0.18	0.16	0.15	0.14	0.13	0.12	0.11	0.10	0.08	0.06	0.05	0.04	0.02					
			AG60	0.02	1.63	16	0.20	0.18	0.16	0.15	0.14	0.13	0.12	0.11	0.10	0.08	0.06	0.05	0.05	0.04	0.04	0.02		
		9 TPI	16IR G60	0.11	1.72	16	0.20	0.18	0.16	0.15	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.07	0.07	0.06	0.04	0.02			
			AG60	0.02	1.81	17	0.20	0.18	0.16	0.15	0.14	0.13	0.12	0.11	0.11	0.10	0.10	0.08	0.07	0.06	0.05	0.03	0.02		
		8 TPI	16IR G60	0.11	1.95	17	0.22	0.20	0.18	0.17	0.16	0.15	0.14	0.12	0.11	0.10	0.09	0.08	0.07	0.06	0.05	0.03	0.02		
			AG60	0.02	2.04	19	0.20	0.19	0.18	0.17	0.15	0.14	0.14	0.13	0.13	0.11	0.10	0.09	0.07	0.06	0.05	0.04	0.04	0.03	0.02
		7 TPI	22IR N60	0.22	2.14	14	0.26	0.24	0.23	0.22	0.20	0.18	0.16	0.14	0.12	0.11	0.10	0.07	0.06	0.05					
		6 TPI	22IR N60		2.53	17	0.28	0.26	0.23	0.22	0.20	0.18	0.17	0.15	0.14	0.13	0.12	0.10	0.09	0.08	0.07	0.06	0.05		
		5 TPI	22IR N60		3.08	19	0.30	0.28	0.26	0.25	0.23	0.22	0.20	0.17	0.16	0.14	0.13	0.12	0.12	0.11	0.10	0.10	0.08	0.06	0.05
Parallel pipe / Tapered pipe	External thread	28 TPI	16ER A55-TF/TQ	0.06	0.67	7	0.16	0.14	0.10	0.09	0.08	0.06	0.04												
			AG55-TF/TQ	0.06	0.67	7	0.16	0.14	0.10	0.09	0.08	0.06	0.04												
		19 TPI	16ER A55-TF/TQ	0.06	1.02	8	0.20	0.18	0.16	0.14	0.12	0.10	0.07	0.05											
			AG55-TF/TQ	0.06	1.02	8	0.20	0.18	0.16	0.14	0.12	0.10	0.07	0.05											
		14 TPI	16ER G55-TF/TQ	0.22	1.20	9	0.22	0.19	0.17	0.15	0.13	0.12	0.10	0.08	0.04										
			AG55-TF/TQ	0.06	1.40	11	0.24	0.22	0.19	0.16	0.14	0.12	0.10	0.08	0.06	0.05	0.04								
		11 TPI	16ER G55-TF/TQ	0.22	1.60	12	0.24	0.22	0.20	0.18	0.16	0.14	0.13	0.10	0.08	0.06	0.05	0.04							
			AG55-TF/TQ	0.06	1.79	13	0.25	0.22	0.21	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.05	0.05	0.03						
		28 TPI	16ER A55	0.06	0.67	7	0.16	0.14	0.10	0.09	0.08	0.06	0.04												
			AG55	0.06	0.67	7	0.16	0.14	0.10	0.09	0.08	0.06	0.04												
		19 TPI	16ER A55	0.06	1.02	8	0.20	0.18	0.16	0.14	0.12	0.10	0.07	0.05											
			AG55	0.06	1.02	8	0.20	0.18	0.16	0.14	0.12	0.10	0.07	0.05											
		14 TPI	16ER G55	0.22	1.20	9	0.22	0.19	0.17	0.15	0.13	0.12	0.10	0.08	0.04										
			AG55	0.06	1.40	11	0.24	0.22	0.19	0.16	0.14	0.12	0.10	0.08	0.06	0.05	0.04								
		11 TPI	16ER G55	0.22	1.60	12	0.24	0.22	0.20	0.18	0.16	0.14	0.13	0.10	0.08	0.06	0.05	0.04							
			AG55	0.06	1.79	13	0.25	0.22	0.21	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.05	0.05	0.03						
	Internal thread	28 TPI	06IR 5501	0.10	0.61	12	0.07	0.07	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.03							
			08IR 5501																						
		19 TPI	08IR 5501	0.10	0.95	18	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.03	0.03	
		28 TPI	11IR A55	0.06	0.67	7	0.16	0.14	0.10	0.09	0.08	0.06	0.04												
		19 TPI	11IR A55	0.06	1.02	8	0.20	0.18	0.16	0.14	0.12	0.10	0.07	0.05											
		28 TPI	16IR A55	0.06	0.67	7	0.16	0.14	0.10	0.09	0.08	0.06	0.04												
			AG55	0.06	0.67	7	0.16	0.14	0.10	0.09	0.08	0.06	0.04												
		19 TPI	16IR A55	0.06	1.02	8	0.20	0.18	0.16	0.14	0.12	0.10	0.07	0.05											
			AG55	0.06	1.02	8	0.20	0.18	0.16	0.14	0.12	0.10	0.07	0.05											
		14 TPI	16IR G55	0.22	1.20	9	0.22	0.19	0.17	0.15	0.13	0.12	0.10	0.08	0.04										
			AG55	0.06	1.40	11	0.24	0.22	0.19	0.16	0.14	0.12	0.10	0.08	0.06	0.05	0.04								
		11 TPI	16IR G55	0.22	1.60	12	0.24	0.22	0.20	0.18	0.16	0.14	0.13	0.10	0.08	0.06	0.05	0.04							
			AG55	0.06	1.79	13	0.25	0.22	0.21	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.05	0.05	0.03						
Whitworth	External thread	48 TPI	16ER A55-TF/TQ	0.06	0.37	5	0.12	0.09	0.07	0.05	0.04														
			AG55-TF/TQ	0.06	0.37	5	0.12	0.09	0.07	0.05	0.04														
		24 TPI	16ER A55-TF/TQ	0.06	0.79	7	0.18	0.16	0.14	0.11	0.08	0.07	0.05												
			AG55-TF/TQ	0.06	0.79	7	0.18	0.16	0.14	0.11	0.08	0.07	0.05												
		20 TPI	16ER A55-TF/TQ	0.06	0.96	8	0.20	0.18	0.15	0.13	0.10	0.08	0.07	0.05											
			AG55-TF/TQ	0.06	0.96	8	0.20	0.18	0.15	0.13	0.10	0.08	0.07	0.05											
		18 TPI	16ER A55-TF/TQ	0.06	1.07	9	0.20	0.17	0.16	0.14	0.11	0.09	0.08	0.07	0.05										
			AG55-TF/TQ	0.06	1.07	9	0.20	0.17	0.16	0.14	0.11	0.09	0.08	0.07	0.05										
		16 TPI	16ER A55-TF/TQ	0.06	1.22	11	0.20	0.18	0.16	0.13	0.11	0.10	0.09	0.08	0.07	0.06	0.04								
			AG55-TF/TQ	0.06	1.22	11	0.20	0.18	0.16	0.13	0.11	0.10	0.09	0.08	0.07	0.06	0.04								
		14 TPI	16ER G55-TF/TQ	0.22	1.20	9	0.22	0.19	0.17	0.15	0.13	0.12	0.10	0.08	0.04										
			AG55-TF/TQ	0.06	1.40	11	0.24	0.22	0.19	0.16	0.14	0.12	0.10	0.08	0.06	0.05	0.04								
		12 TPI	16ER G55-TF/TQ	0.22	1.44	10	0.24	0.22	0.20	0.18	0.15	0.12	0.12	0.09	0.07	0.05									
			AG55-TF/TQ	0.06	1.64	12	0.24	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.09	0.08	0.06	0.05							
		11 TPI	16ER G55-TF/TQ	0.22	1.60	12	0.24	0.22	0.20	0.18	0.16	0.14	0.13	0.10	0.08	0.06	0.05	0.04							
			AG55-TF/TQ	0.06	1.79	13	0.25	0.22	0.21	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.05	0.05	0.03						
		10 TPI	16ER G55-TF/TQ	0.22	1.78	12	0.24	0.22	0.20	0.18	0.17	0.16	0.15	0.13	0.12	0.09	0.07	0.05							
			AG55-TF/TQ	0.06	1.98	14	0.25	0.22	0.20	0.18	0.16	0.15	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.05					
		9 TPI	16ER G55-TF/TQ	0.22	2.01	14	0.24	0.22	0.20	0.19	0.18	0.16	0.15	0.14	0.12	0.11	0.10	0.08	0.07	0.05					
			AG55-TF/TQ	0.06	2.20	15	0.27	0.25	0.22	0.20	0.18	0.16	0.14	0.13	0.12	0.11	0.10	0.10	0.09	0.08	0.05				
		8 TPI	16ER G55-TF/TQ	0.22	2.29	15	0.28	0.26	0.24	0.22	0.19	0.16	0.14	0.13	0.12	0.12	0.11	0.10	0.09	0.08	0.05				
			AG55-TF/TQ	0.06	2.49	16	0.30	0.28	0.26	0.24	0.20	0.18	0.16	0.14	0.12	0.12	0.11	0.10	0.09	0.08	0.06	0.05			

60˚/ 55˚ (Partial profile)

(ap shows the value of radial ap)

Type		Pitch / TPI mm / TPI	Description	Corner-R (RE)	Total ap (mm)	No. of passes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Whitworth	External thread	48 TPI	16ER A55	0.06	0.37	5	0.12	0.09	0.07	0.05	0.04														
			AG55	0.06	0.37	5	0.12	0.09	0.07	0.05	0.04														
		24 TPI	16ER A55	0.06	0.79	7	0.18	0.16	0.14	0.11	0.08	0.07	0.05												
			AG55	0.06	0.79	7	0.18	0.16	0.14	0.11	0.08	0.07	0.05												
		20 TPI	16ER A55	0.06	0.96	8	0.20	0.18	0.15	0.13	0.10	0.08	0.07	0.05											
			AG55	0.06	0.96	8	0.20	0.18	0.15	0.13	0.10	0.08	0.07	0.05											
		18 TPI	16ER A55	0.06	1.07	9	0.20	0.17	0.16	0.14	0.11	0.09	0.08	0.07	0.05										
			AG55	0.06	1.07	9	0.20	0.17	0.16	0.14	0.11	0.09	0.08	0.07	0.05										
		16 TPI	16ER A55	0.06	1.22	11	0.20	0.18	0.16	0.13	0.11	0.10	0.09	0.08	0.07	0.06	0.04								
			AG55	0.06	1.22	11	0.20	0.18	0.16	0.13	0.11	0.10	0.09	0.08	0.07	0.06	0.04								
		14 TPI	16ER G55	0.22	1.20	9	0.22	0.19	0.17	0.15	0.13	0.12	0.10	0.08	0.04										
			AG55	0.06	1.40	11	0.24	0.22	0.19	0.16	0.14	0.12	0.10	0.08	0.06	0.05	0.04								
		12 TPI	16ER G55	0.22	1.44	10	0.24	0.22	0.20	0.18	0.15	0.12	0.12	0.09	0.07	0.05									
			AG55	0.06	1.64	12	0.24	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.09	0.08	0.06	0.05							
		11 TPI	16ER G55	0.22	1.60	12	0.24	0.22	0.20	0.18	0.16	0.14	0.13	0.10	0.08	0.06	0.05	0.04							
			AG55	0.06	1.79	13	0.25	0.22	0.21	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.05	0.05	0.03						
		10 TPI	16ER G55	0.22	1.78	12	0.24	0.22	0.20	0.18	0.17	0.16	0.15	0.13	0.12	0.09	0.07	0.05							
			AG55	0.06	1.98	14	0.25	0.22	0.20	0.18	0.16	0.15	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.05					
		9 TPI	16ER G55	0.22	2.01	14	0.24	0.22	0.20	0.19	0.18	0.16	0.15	0.14	0.12	0.11	0.10	0.08	0.07	0.05					
			AG55	0.06	2.20	15	0.27	0.25	0.22	0.20	0.18	0.16	0.14	0.13	0.12	0.11	0.10	0.10	0.09	0.08	0.05				
		8 TPI	16ER G55	0.22	2.29	15	0.28	0.26	0.24	0.22	0.19	0.16	0.14	0.13	0.12	0.12	0.11	0.10	0.09	0.08	0.05				
			AG55	0.06	2.49	16	0.30	0.28	0.26	0.24	0.20	0.18	0.16	0.14	0.12	0.12	0.11	0.10	0.09	0.08	0.06	0.05			
		7 TPI	22ER N55	0.47	2.43	16	0.30	0.27	0.25	0.22	0.20	0.18	0.16	0.14	0.12	0.11	0.10	0.10	0.09	0.08	0.06	0.05			
		6 TPI			2.92	18	0.30	0.27	0.25	0.23	0.22	0.20	0.18	0.17	0.16	0.15	0.14	0.13	0.12	0.11	0.10	0.08	0.06	0.05	
		5 TPI			3.60	21	0.30	0.28	0.27	0.26	0.25	0.24	0.22	0.20	0.19	0.18	0.17	0.16	0.15	0.14	0.13	0.11	0.10	0.09	0.07
							0.05	0.04																	
	Internal thread	28 TPI	06IR 5501 08IR 5501	0.10	0.65	13	0.07	0.07	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.03	0.03						
		19 TPI	08IR 5501	0.10	0.81	15	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.03				
		24 TPI	11IR A55	0.06	0.72	7	0.16	0.14	0.12	0.10	0.08	0.07	0.05												
		20 TPI			0.87	8	0.16	0.15	0.14	0.13	0.11	0.08	0.06	0.04											
		18 TPI			0.97	8	0.20	0.18	0.16	0.14	0.10	0.08	0.06	0.05											
		16 TPI			1.10	9	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.07	0.05										
		24 TPI	16IR A55	0.06	0.72	7	0.16	0.14	0.12	0.10	0.08	0.07	0.05												
			AG55	0.06	0.72	7	0.16	0.14	0.12	0.10	0.08	0.07	0.05												
		20 TPI	16IR A55	0.06	0.87	8	0.16	0.15	0.14	0.13	0.11	0.08	0.06	0.04											
			AG55	0.06	0.87	8	0.16	0.15	0.14	0.13	0.11	0.08	0.06	0.04											
		18 TPI	16IR A55	0.06	0.97	8	0.20	0.18	0.16	0.14	0.10	0.08	0.06	0.05											
			AG55	0.06	0.97	8	0.20	0.18	0.16	0.14	0.10	0.08	0.06	0.05											
		16 TPI	16IR A55	0.06	1.10	9	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.07	0.05										
			AG55	0.06	1.10	9	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.07	0.05										
		14 TPI	16IR G55	0.22	1.06	8	0.21	0.19	0.17	0.15	0.12	0.10	0.07	0.05											
			AG55	0.06	1.27	11	0.20	0.18	0.17	0.15	0.13	0.10	0.09	0.08	0.07	0.06	0.04								
		12 TPI	16IR G55	0.22	1.28	9	0.22	0.20	0.19	0.17	0.15	0.13	0.10	0.08	0.04										
			AG55	0.06	1.48	11	0.24	0.22	0.20	0.18	0.16	0.13	0.11	0.09	0.06	0.05	0.04								
		11 TPI	16IR G55	0.22	1.42	10	0.24	0.22	0.20	0.18	0.15	0.12	0.10	0.09	0.07	0.05									
			AG55	0.06	1.62	12	0.24	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.07	0.06	0.05							
		10 TPI	16IR G55	0.22	1.59	12	0.24	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.06	0.05	0.04							
			AG55	0.06	1.79	13	0.25	0.22	0.21	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.05	0.05	0.03						
		9 TPI	16IR G55	0.22	1.79	12	0.24	0.22	0.20	0.18	0.17	0.16	0.15	0.13	0.12	0.10	0.07	0.05							
			AG55	0.06	1.99	14	0.25	0.23	0.20	0.18	0.16	0.15	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.05					
		8 TPI	16IR G55	0.22	2.05	14	0.24	0.23	0.22	0.20	0.18	0.16	0.15	0.14	0.12	0.11	0.10	0.08	0.07	0.05					
			AG55	0.06	2.25	15	0.28	0.26	0.24	0.21	0.18	0.16	0.14	0.13	0.12	0.11	0.10	0.10	0.09	0.08	0.05				
		7 TPI	22IR N55	0.47	2.09	14	0.24	0.23	0.22	0.20	0.19	0.17	0.15	0.14	0.13	0.12	0.10	0.08	0.07	0.05					
		6 TPI			2.53	16	0.30	0.28	0.25	0.23	0.21	0.20	0.18	0.16	0.13	0.11	0.10	0.10	0.09	0.08	0.06	0.05			
		5 TPI			3.14	19	0.30	0.28	0.27	0.26	0.24	0.22	0.20	0.18	0.16	0.15	0.14	0.12	0.12	0.11	0.10	0.10	0.08	0.06	0.05
30˚ trapezoidal	External thread	2.0 mm	16ER 200TR	-	1.25	10	0.22	0.20	0.17	0.16	0.13	0.12	0.10	0.07	0.05	0.03									
		3.0 mm	16ER 300TR	-	1.75	14	0.24	0.20	0.18	0.16	0.15	0.14	0.12	0.11	0.10	0.10	0.10	0.07	0.05	0.03					
		4.0 mm	22ER 400TR	-	2.24	15	0.26	0.23	0.22	0.20	0.20	0.18	0.16	0.15	0.14	0.13	0.12	0.10	0.07	0.05	0.03				
		5.0 mm	22ER 500TR	-	2.73	17	0.28	0.26	0.24	0.22	0.21	0.20	0.19	0.18	0.16	0.15	0.14	0.13	0.12	0.10	0.07	0.05	0.03		
	Internal thread	2.0 mm	16IR 200TR	-	1.25	10	0.22	0.20	0.17	0.16	0.13	0.12	0.10	0.07	0.05	0.03									
		3.0 mm	16IR 300TR	-	1.75	14	0.24	0.20	0.18	0.16	0.15	0.14	0.12	0.11	0.10	0.10	0.10	0.07	0.05	0.03					
		4.0 mm	22IR 400TR	-	2.24	15	0.26	0.23	0.22	0.20	0.20	0.18	0.16	0.15	0.14	0.13	0.12	0.10	0.07	0.05	0.03				
		5.0 mm	22IR 500TR	-	2.73	17	0.28	0.26	0.24	0.22	0.21	0.20	0.19	0.18	0.16	0.15	0.14	0.13	0.12	0.10	0.07	0.05	0.03		

Corner-R(RE) selection for partial profiling insert

	External threading	Internal threading
Metric unified	RE ≤ 0.1443TP	RE ≤ 0.0720TP
Parallel pipe (Whitworth) Tapered pipe	(For both external and Internal thread) RE ≤ 0.1373TP	

Metric, Unified thread
Corner-R(RE) at Internal threading is almost half of that of External

Parallel pipe, Tapered pipe, Whitworth thread
Same Corner-R(RE) for both External and Internal threading

RE: Corner-R TP: Pitch (= $\frac{25.4}{n}$) n: TPI

11 / 16 (60˚ / 55˚, Partial profile)

(ap shows the value of radial ap)

Type		Pitch / TPI mm / TPI	Description	Corner-R (RE)	Total ap (mm)	No. of passes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Metric (60°)	External thread	1.00 mm	16ER 6001	0.10	0.66	5	0.21	0.19	0.12	0.09	0.05														
		1.25 mm	16ER 6001	0.10	0.85	6	0.25	0.21	0.15	0.12	0.07	0.05													
		1.50 mm	16ER 6001	0.10	1.04	8	0.23	0.21	0.19	0.15	0.11	0.06	0.05	0.04											
			6002	0.20	0.94	7	0.23	0.20	0.18	0.14	0.10	0.05	0.04												
		1.75 mm	16ER 6001	0.10	1.23	9	0.25	0.22	0.20	0.17	0.14	0.09	0.07	0.05	0.04										
			6002	0.20	1.13	8	0.25	0.22	0.20	0.16	0.14	0.07	0.05	0.04											
		2.00 mm	16ER 6001	0.10	1.42	11	0.25	0.22	0.20	0.16	0.14	0.12	0.10	0.08	0.06	0.05	0.04								
			6002	0.20	1.32	10	0.25	0.22	0.20	0.16	0.14	0.12	0.08	0.07	0.04	0.04									
		2.50 mm	16ER 6001	0.10	1.79	13	0.25	0.22	0.20	0.18	0.16	0.16	0.14	0.12	0.10	0.09	0.08	0.05	0.04						
			6002	0.20	1.69	12	0.25	0.22	0.20	0.18	0.16	0.16	0.12	0.12	0.10	0.08	0.06	0.04							
	Internal thread	0.75 mm	11IR 60005	0.05	0.44	5	0.14	0.12	0.10	0.06	0.02														
		1.00 mm	11IR 60005	0.05	0.60	6	0.18	0.15	0.10	0.08	0.05	0.04													
		1.25 mm	11IR 60005	0.05	0.76	7	0.18	0.15	0.12	0.10	0.10	0.07	0.04												
		1.50 mm	11IR 60005	0.05	0.92	9	0.18	0.16	0.12	0.10	0.10	0.08	0.08	0.06	0.04										
			16IR 6001	0.10	0.87	8	0.18	0.16	0.12	0.10	0.10	0.08	0.08	0.05											
		1.75 mm	16IR 6001	0.10	1.04	9	0.20	0.18	0.15	0.12	0.12	0.10	0.08	0.05	0.04										
		2.00 mm	16IR 6001	0.10	1.20	11	0.20	0.18	0.15	0.12	0.12	0.10	0.10	0.08	0.06	0.05	0.04								
		2.50 mm	16IR 6001	0.10	1.52	14	0.20	0.18	0.16	0.14	0.14	0.12	0.12	0.10	0.10	0.08	0.06	0.06	0.04	0.02					
			60015	0.15	1.47	13	0.20	0.18	0.16	0.15	0.14	0.12	0.12	0.10	0.10	0.08	0.06	0.04	0.02						
Parallel pipe / Tapered pipe (55°)	External thread	28 TPI	16ER 5501	0.10	0.61	5	0.20	0.16	0.12	0.08	0.05														
		19 TPI	16ER 5501	0.10	0.95	7	0.22	0.20	0.16	0.14	0.10	0.08	0.05												
		14 TPI	16ER 5501	0.10	1.34	10	0.24	0.20	0.18	0.16	0.13	0.10	0.10	0.10	0.08	0.05									
			5502	0.20	1.22	9	0.24	0.20	0.18	0.16	0.11	0.10	0.10	0.08	0.05										
		11 TPI	16ER 5501	0.10	1.73	13	0.25	0.22	0.22	0.20	0.18	0.14	0.12	0.10	0.10	0.08	0.05	0.05	0.02						
			5502	0.20	1.62	12	0.25	0.22	0.22	0.20	0.18	0.14	0.12	0.10	0.08	0.05	0.04	0.02							
	Internal thread	28 TPI	11IR 55005	0.05	0.67	7	0.18	0.15	0.12	0.08	0.06	0.05	0.03												
			16IR 5501	0.10	0.61	6	0.18	0.15	0.12	0.08	0.05	0.03													
		19 TPI	11IR 55005	0.05	1.01	8	0.20	0.18	0.16	0.14	0.12	0.08	0.08	0.05											
			16IR 5501	0.10	0.95	7	0.20	0.18	0.16	0.14	0.12	0.10	0.05												
		14 TPI	11IR 55005	0.05	1.39	11	0.20	0.18	0.16	0.14	0.14	0.12	0.12	0.10	0.10	0.08	0.05								
			16IR 5501	0.10	1.34	10	0.20	0.18	0.18	0.16	0.14	0.14	0.11	0.10	0.08	0.05									
			5502	0.20	1.22	9	0.20	0.18	0.18	0.16	0.15	0.12	0.10	0.08	0.05										
		11 TPI	16IR 5501	0.10	1.73	12	0.25	0.20	0.18	0.18	0.16	0.16	0.14	0.12	0.12	0.10	0.07	0.05							
			5502	0.20	1.62	11	0.25	0.20	0.18	0.18	0.16	0.16	0.14	0.12	0.11	0.07	0.05								
Whitworth (55°)	External thread	24 TPI	16ER 5501	0.10	0.73	6	0.22	0.18	0.12	0.09	0.07	0.05													
		20 TPI	16ER 5501	0.10	0.90	6	0.22	0.18	0.17	0.16	0.12	0.05													
		18 TPI	16ER 5501	0.10	1.01	7	0.24	0.20	0.18	0.16	0.10	0.08	0.05												
		16 TPI	16ER 5501	0.10	1.15	9	0.24	0.20	0.16	0.14	0.12	0.10	0.08	0.06	0.05										
			5502	0.20	1.04	8	0.24	0.20	0.16	0.14	0.10	0.08	0.07	0.05											
		14 TPI	16ER 5501	0.10	1.34	10	0.24	0.20	0.18	0.16	0.13	0.10	0.10	0.10	0.08	0.05									
			5502	0.20	1.22	9	0.24	0.20	0.18	0.16	0.11	0.10	0.10	0.08	0.05										
		12 TPI	16ER 5501	0.10	1.58	12	0.25	0.20	0.18	0.16	0.15	0.14	0.12	0.10	0.08	0.08	0.07	0.05							
			5502	0.20	1.46	11	0.25	0.20	0.18	0.16	0.15	0.14	0.10	0.08	0.08	0.07	0.05								
		11 TPI	16ER 5501	0.10	1.73	12	0.25	0.20	0.18	0.18	0.16	0.16	0.14	0.12	0.12	0.10	0.07	0.05							
			5502	0.20	1.62	11	0.25	0.20	0.18	0.18	0.16	0.16	0.14	0.12	0.10	0.08	0.05								
		10 TPI	16ER 5501	0.10	1.92	14	0.25	0.23	0.23	0.20	0.18	0.16	0.12	0.12	0.10	0.10	0.08	0.08	0.05	0.02					
			5502	0.20	1.80	13	0.25	0.23	0.23	0.20	0.18	0.16	0.12	0.10	0.10	0.08	0.08	0.05	0.02						
		9 TPI	16ER 5502	0.20	2.03	14	0.25	0.23	0.23	0.20	0.20	0.18	0.16	0.12	0.12	0.10	0.08	0.08	0.06	0.02					
	Internal thread	24 TPI	11IR 55005	0.05	0.71	7	0.18	0.15	0.12	0.10	0.08	0.05	0.03												
			16IR 5501	0.10	0.65	6	0.18	0.15	0.12	0.10	0.07	0.03													
		20 TPI	11IR 55005	0.05	0.87	8	0.18	0.16	0.14	0.12	0.10	0.06	0.06	0.05											
			16IR 5501	0.10	0.81	7	0.18	0.16	0.14	0.12	0.10	0.06	0.05												
		18 TPI	11IR 55005	0.05	0.97	8	0.20	0.18	0.16	0.14	0.10	0.08	0.06	0.05											
			16IR 5501	0.10	0.91	7	0.20	0.18	0.16	0.14	0.10	0.08	0.05												
		16 TPI	11IR 55005	0.05	1.09	9	0.20	0.18	0.16	0.14	0.10	0.10	0.08	0.08	0.05										
			16IR 5501	0.10	1.04	8	0.20	0.18	0.16	0.15	0.12	0.10	0.08	0.05											
			5502	0.20	0.92	7	0.20	0.18	0.16	0.15	0.10	0.08	0.05												
		14 TPI	11IR 55005	0.05	1.26	10	0.20	0.18	0.16	0.14	0.13	0.12	0.10	0.10	0.08	0.05									
			16IR 5501	0.10	1.20	9	0.20	0.18	0.17	0.16	0.14	0.12	0.10	0.08	0.05										
			5502	0.20	1.08	8	0.20	0.18	0.18	0.16	0.13	0.10	0.08	0.05											
		12 TPI	16IR 5501	0.10	1.42	10	0.25	0.20	0.18	0.16	0.14	0.14	0.12	0.10	0.08	0.05									
			5502	0.20	1.30	9	0.25	0.22	0.18	0.16	0.14	0.12	0.10	0.08	0.05										
		11 TPI	16IR 5501	0.10	1.56	11	0.25	0.20	0.18	0.16	0.16	0.14	0.12	0.12	0.10	0.08	0.05								
			5502	0.20	1.44	10	0.25	0.20	0.18	0.16	0.16	0.14	0.12	0.10	0.08	0.05									

Note 1) Select the insert with suitable corner-R(RE) determined by the pitch.
2) Do not exceed 0.3mm for the 1st ap.
3) Finishing ap should be 0.02~0.05mm.
4) Prepare chamfering for C0.3~C0.5 to the workpiece to prevent the insert cracking during the 1st pass.
5) Coolant is recommended.

TT (60˚ / 55˚, Partial profile) Part 1

(ap shows the value of radial ap)

Type		Pitch / TPI mm / TPI	Description	Corner-R (RE)	Total ap (mm)	No. of passes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Metric (60°)	External thread	0.50 mm	TT32 R/L 6000	0.00	0.38	6	0.10	0.10	0.07	0.05	0.04	0.02											
		0.70 mm	TT32 R/L 6000	0.00	0.53	7	0.10	0.10	0.10	0.08	0.07	0.06	0.02										
		0.75 mm	TT32 R/L 6000	0.00	0.57	8	0.10	0.10	0.10	0.08	0.08	0.05	0.04	0.02									
		0.80 mm	TT32 R/L 6000	0.00	0.61	8	0.10	0.10	0.10	0.10	0.08	0.06	0.05	0.02									
		1.00 mm	TT32 R/L 6000	0.00	0.76	8	0.15	0.12	0.12	0.11	0.10	0.08	0.06	0.02									
			TT32/43 R/L 6001	0.10	0.66	6	0.20	0.15	0.12	0.10	0.07	0.02											
		1.25 mm	TT32 R/L 6000	0.00	0.95	9	0.18	0.16	0.14	0.12	0.10	0.10	0.08	0.05	0.02								
			TT32/43 R/L 6001	0.10	0.85	7	0.25	0.20	0.13	0.10	0.10	0.05	0.02										
		1.50 mm	TT32 R/L 6000	0.00	1.14	10	0.20	0.18	0.16	0.14	0.12	0.10	0.10	0.07	0.05	0.02							
			TT32/43 R/L 6001	0.10	1.04	9	0.25	0.18	0.14	0.12	0.10	0.10	0.08	0.05	0.02								
			6002	0.20	0.94	8	0.25	0.18	0.14	0.12	0.10	0.08	0.05	0.02									
		1.75 mm	TT32 R/L 6000	0.00	1.33	11	0.25	0.23	0.20	0.13	0.10	0.10	0.10	0.08	0.07	0.05	0.02						
			TT32/43 R/L 6001	0.10	1.23	10	0.25	0.23	0.20	0.13	0.10	0.10	0.08	0.07	0.05	0.02							
			6002	0.20	1.13	9	0.25	0.23	0.20	0.13	0.10	0.08	0.07	0.05	0.02								
		2.00 mm	TT32 R/L 6000	0.00	1.52	12	0.25	0.23	0.20	0.16	0.13	0.10	0.10	0.10	0.10	0.08	0.05	0.02					
			TT32/43 R/L 6001	0.10	1.42	11	0.25	0.23	0.20	0.16	0.13	0.10	0.10	0.10	0.08	0.05	0.02						
			6002	0.20	1.32	10	0.25	0.23	0.20	0.16	0.13	0.10	0.10	0.08	0.05	0.02							
		2.50 mm	TT32 R/L 6000	0.00	1.89	13	0.27	0.25	0.20	0.18	0.17	0.15	0.14	0.14	0.13	0.10	0.08	0.06	0.02				
			TT32/43 R/L 6001	0.10	1.79	12	0.27	0.25	0.20	0.18	0.17	0.15	0.14	0.13	0.12	0.10	0.06	0.02					
			6002	0.20	1.69	11	0.27	0.25	0.20	0.18	0.17	0.15	0.14	0.13	0.10	0.08	0.02						
			6003	0.30	1.59	11	0.27	0.25	0.20	0.18	0.17	0.15	0.12	0.10	0.08	0.05	0.02						
		3.00 mm	TT43 R/L 6001	0.10	2.17	14	0.30	0.25	0.23	0.20	0.20	0.18	0.16	0.14	0.14	0.12	0.10	0.08	0.05	0.02			
			6002	0.20	2.07	13	0.30	0.25	0.23	0.20	0.20	0.18	0.15	0.14	0.13	0.12	0.10	0.05	0.02				
			6003	0.30	1.97	12	0.30	0.25	0.23	0.20	0.20	0.18	0.15	0.14	0.12	0.10	0.08	0.02					
			6004	0.40	1.87	12	0.30	0.25	0.23	0.20	0.20	0.18	0.14	0.12	0.10	0.08	0.05	0.02					
		3.50 mm	TT43 R/L 6001	0.10	2.55	16	0.30	0.27	0.23	0.22	0.20	0.18	0.18	0.16	0.16	0.14	0.14	0.12	0.10	0.08	0.05	0.02	
			6002	0.20	2.45	15	0.30	0.27	0.23	0.22	0.20	0.18	0.18	0.16	0.16	0.14	0.14	0.10	0.10	0.05	0.02		
			6003	0.30	2.35	14	0.30	0.27	0.23	0.22	0.20	0.18	0.18	0.16	0.15	0.14	0.12	0.10	0.08	0.02			
			6004	0.40	2.25	14	0.30	0.27	0.23	0.22	0.20	0.18	0.18	0.16	0.14	0.12	0.10	0.08	0.05	0.02			
	Internal thread	0.50 mm	TT32 R/L 6000	0.00	0.32	5	0.12	0.08	0.06	0.04	0.02												
		0.70 mm	TT32 R/L 6000	0.00	0.45	6	0.15	0.10	0.08	0.06	0.04	0.02											
		0.75 mm	TT32 R/L 6000	0.00	0.49	6	0.15	0.12	0.08	0.07	0.05	0.02											
		0.80 mm	TT32 R/L 6000	0.00	0.52	6	0.15	0.12	0.10	0.08	0.05	0.02											
		1.00 mm	TT32 R/L 6000	0.00	0.65	7	0.15	0.14	0.12	0.10	0.08	0.04	0.02										
		1.25 mm	TT32 R/L 6000	0.00	0.81	8	0.18	0.16	0.14	0.12	0.10	0.05	0.04	0.02									
		1.50 mm	TT32 R/L 6000	0.00	0.97	9	0.20	0.18	0.16	0.14	0.10	0.08	0.05	0.04	0.02								
			TT32/43 R/L 6001	0.10	0.87	8	0.20	0.18	0.16	0.14	0.08	0.05	0.04	0.02									
		1.75 mm	TT32 R/L 6000	0.00	1.14	10	0.20	0.18	0.16	0.13	0.12	0.10	0.10	0.08	0.05	0.02							
			TT32/43 R/L 6001	0.10	1.04	9	0.20	0.18	0.16	0.13	0.12	0.10	0.08	0.05	0.02								
		2.00 mm	TT32 R/L 6000	0.00	1.30	12	0.20	0.18	0.16	0.13	0.13	0.12	0.10	0.10	0.08	0.05	0.03	0.02					
			TT32/43 R/L 6001	0.10	1.20	11	0.20	0.18	0.16	0.13	0.13	0.12	0.10	0.08	0.05	0.03	0.02						
		2.50 mm	TT32 R/L 6000	0.00	1.62	14	0.23	0.20	0.18	0.18	0.13	0.13	0.12	0.10	0.10	0.08	0.07	0.05	0.03	0.02			
			TT32/43 R/L 6001	0.10	1.52	13	0.23	0.20	0.18	0.18	0.13	0.13	0.12	0.10	0.08	0.07	0.05	0.03	0.02				
		3.00 mm	TT43 R/L 6001	0.10	1.85	15	0.25	0.22	0.20	0.18	0.14	0.14	0.13	0.12	0.10	0.10	0.08	0.07	0.05	0.05	0.02		
			6002	0.20	1.75	14	0.25	0.22	0.20	0.18	0.14	0.14	0.13	0.12	0.10	0.08	0.07	0.05	0.05	0.02			
Parallel pipe / Tapered pipe (55°)	External thread	28TPI	TT32 R/L 5501	0.10	0.61	5	0.20	0.18	0.15	0.06	0.02												
		19TPI	TT32/43 R/L 5501	0.10	0.95	8	0.20	0.18	0.15	0.13	0.12	0.10	0.05	0.02									
		14TPI	TT32/43 R/L 5501	0.10	1.34	10	0.25	0.22	0.20	0.16	0.14	0.12	0.10	0.08	0.05	0.02							
			5502	0.20	1.22	9	0.25	0.22	0.20	0.18	0.12	0.10	0.08	0.05	0.02								
		11TPI	TT32/43 R/L 5501	0.10	1.73	13	0.25	0.22	0.22	0.20	0.18	0.14	0.12	0.10	0.10	0.08	0.05	0.05	0.02				
			5502	0.20	1.62	12	0.25	0.22	0.22	0.20	0.18	0.14	0.12	0.10	0.08	0.05	0.04	0.02					
			5503	0.30	1.50	11	0.25	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.07	0.04	0.02						
	Internal thread	28TPI	TT32/43 R/L 5501	0.10	0.61	6	0.18	0.15	0.12	0.08	0.06	0.02											
		19TPI	TT32/43 R/L 5501	0.10	0.95	7	0.20	0.18	0.16	0.14	0.12	0.10	0.05										
		14TPI	TT32/43 R/L 5501	0.10	1.34	10	0.20	0.18	0.18	0.16	0.14	0.14	0.11	0.10	0.08	0.05							
			5502	0.20	1.22	9	0.20	0.18	0.18	0.16	0.15	0.12	0.10	0.08	0.05								
		11TPI	TT32/43 R/L 5501	0.10	1.73	13	0.25	0.22	0.22	0.20	0.18	0.14	0.12	0.10	0.10	0.08	0.05	0.05	0.02				
			5502	0.20	1.62	12	0.25	0.22	0.22	0.20	0.18	0.14	0.12	0.10	0.08	0.05	0.04	0.02					
			5503	0.30	1.50	11	0.25	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.07	0.04	0.02						
Whitworth (55°)	External thread	24TPI	TT32/43 R/L 5501	0.10	0.73	6	0.20	0.18	0.16	0.12	0.05	0.02											
		20TPI	TT32/43 R/L 5501	0.10	0.90	7	0.20	0.18	0.16	0.14	0.12	0.08	0.02										
		18TPI	TT32/43 R/L 5501	0.10	1.01	8	0.20	0.18	0.18	0.16	0.12	0.10	0.05	0.02									
		16TPI	TT32/43 R/L 5501	0.10	1.15	9	0.25	0.20	0.18	0.14	0.12	0.10	0.08	0.06	0.02								
			5502	0.20	1.04	8	0.25	0.20	0.18	0.14	0.10	0.08	0.07	0.02									
		14TPI	TT32/43 R/L 5501	0.10	1.34	10	0.25	0.22	0.20	0.16	0.14	0.12	0.10	0.08	0.05	0.02							
			5502	0.20	1.22	9	0.25	0.22	0.20	0.18	0.12	0.10	0.08	0.05	0.02								
		12TPI	TT32/43 R/L 5501	0.10	1.58	12	0.25	0.20	0.18	0.16	0.15	0.14	0.12	0.12	0.10	0.08	0.06	0.02					
			5502	0.20	1.46	11	0.25	0.20	0.18	0.16	0.15	0.14	0.12	0.10	0.08	0.06	0.02						
		11TPI	TT32/43 R/L 5501	0.10	1.73	13	0.25	0.22	0.22	0.20	0.18	0.14	0.12	0.10	0.10	0.08	0.05	0.05	0.02				
			5502	0.20	1.62	12	0.25	0.22	0.22	0.20	0.18	0.14	0.12	0.10	0.08	0.05	0.04	0.02					
			TT43 R/L 5503	0.30	1.50	11	0.25	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.07	0.04	0.02						
		10TPI	TT32/43 R/L 5501	0.10	1.92	14	0.25	0.23	0.23	0.20	0.18	0.16	0.12	0.12	0.10	0.10	0.08	0.08	0.05	0.02			
			5502	0.20	1.80	13	0.25	0.23	0.23	0.20	0.18	0.16	0.12	0.10	0.10	0.08	0.08	0.05	0.02				
			TT43 R/L 5503	0.30	1.68	12	0.25	0.23	0.20	0.18	0.18	0.14	0.13	0.12	0.10	0.08	0.05	0.02					
		9TPI	TT43 R/L 5501	0.10	2.14	14	0.25	0.23	0.23	0.20	0.20	0.18	0.18	0.16	0.14	0.12	0.10	0.08	0.05	0.02			
			5502	0.20	2.03	13	0.25	0.23	0.23	0.20	0.20	0.18	0.16	0.14	0.12	0.12	0.10	0.08	0.02				
			5503	0.30	1.91	12	0.30	0.25	0.23	0.23	0.20	0.18	0.15	0.12	0.10	0.08	0.05	0.02					
		8TPI	TT43 R/L 5501	0.10	2.43	15	0.27	0.25	0.23	0.23	0.20	0.20	0.18	0.16	0.16	0.14	0.12	0.12	0.10	0.05	0.02		
			5502	0.20	2.31	14	0.27	0.25	0.23	0.23	0.20	0.20	0.18	0.16	0.16	0.14	0.12	0.10	0.05	0.02			
			5503	0.30	2.19	13	0.30	0.27	0.25	0.23	0.20	0.18	0.18	0.15	0.14	0.12	0.10	0.05	0.02				
			5504	0.40	2.08	12	0.30	0.27	0.25	0.23	0.23	0.20	0.18	0.15	0.12	0.08	0.05	0.02					

TT (60˚ / 55˚, Partial profile) Part 2

(ap shows the value of radial ap)

Type		Pitch / TPI mm / TPI	Description		Corner-R (RE)	Total ap (mm)	No. of passes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Whitworth (55°)	Internal thread	24TPI	TT32/43 R/L	5501	0.10	0.65	6	0.20	0.16	0.12	0.10	0.05	0.02											
		20TPI	TT32/43 R/L	5501	0.10	0.81	7	0.20	0.18	0.16	0.12	0.08	0.05	0.02										
		18TPI	TT32/43 R/L	5501	0.10	0.91	8	0.20	0.18	0.16	0.15	0.10	0.05	0.05	0.02									
		16TPI	TT32/43 R/L	5501	0.10	1.04	9	0.20	0.18	0.15	0.14	0.12	0.10	0.08	0.05	0.02								
				5502	0.20	0.92	8	0.20	0.18	0.16	0.13	0.10	0.08	0.05	0.02									
		14TPI	TT32/43 R/L	5501	0.10	1.20	10	0.20	0.18	0.16	0.15	0.14	0.12	0.10	0.08	0.05	0.02							
				5502	0.20	1.08	9	0.20	0.18	0.16	0.15	0.14	0.10	0.08	0.05	0.02								
		12TPI	TT32/43 R/L	5501	0.10	1.42	10	0.23	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.05	0.02							
				5502	0.20	1.30	9	0.25	0.22	0.20	0.18	0.16	0.12	0.10	0.05	0.02								
		11TPI	TT32/43 R/L	5501	0.10	1.56	11	0.25	0.22	0.22	0.18	0.16	0.14	0.12	0.10	0.10	0.05	0.02						
				5502	0.20	1.44	10	0.25	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.05	0.02							
			TT43 R/L	5503	0.30	1.33	9	0.25	0.22	0.20	0.18	0.16	0.14	0.10	0.06	0.02								
		10TPI	TT32/43 R/L	5501	0.10	1.73	12	0.25	0.22	0.20	0.18	0.16	0.15	0.14	0.14	0.12	0.10	0.05	0.02					
				5502	0.20	1.61	11	0.25	0.22	0.20	0.18	0.17	0.16	0.14	0.12	0.10	0.05	0.02						
			TT43 R/L	5503	0.30	1.50	10	0.25	0.22	0.22	0.20	0.18	0.14	0.12	0.10	0.05	0.02							
		9TPI	TT43 R/L	5501	0.10	1.93	13	0.25	0.23	0.22	0.20	0.18	0.18	0.16	0.14	0.12	0.10	0.08	0.05	0.02				
				5502	0.20	1.82	12	0.25	0.23	0.22	0.20	0.18	0.16	0.15	0.14	0.12	0.10	0.05	0.02					
				5503	0.30	1.70	11	0.25	0.22	0.22	0.20	0.20	0.18	0.14	0.12	0.10	0.05	0.02						
		8TPI	TT43 R/L	5501	0.10	2.19	15	0.27	0.25	0.23	0.21	0.20	0.18	0.16	0.14	0.12	0.12	0.10	0.08	0.06	0.05	0.02		
				5502	0.20	2.07	14	0.27	0.25	0.23	0.21	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.06	0.05	0.02			
				5503	0.30	1.96	13	0.30	0.25	0.23	0.22	0.20	0.18	0.15	0.12	0.10	0.08	0.06	0.05	0.02				
				5504	0.40	1.84	12	0.30	0.25	0.23	0.21	0.20	0.18	0.14	0.12	0.08	0.06	0.05	0.02					

TT (60˚, Full profile)

(ap shows the value of radial ap)

Type		Pitch / TPI mm / TPI	Description		HC (mm)	Total ap (mm)	No. of passes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Metric	External thread	1.00 mm	TT43E R/L	100M	0.64	0.72	5	0.23	0.19	0.15	0.10	0.05												
		1.25 mm		125M	0.80	0.88	6	0.26	0.21	0.16	0.12	0.08	0.05											
		1.50 mm		150M	0.95	1.03	6	0.26	0.24	0.21	0.16	0.11	0.05											
		2.00 mm		200M	1.27	1.35	10	0.26	0.21	0.18	0.16	0.14	0.12	0.10	0.08	0.05	0.05							

TTX (60˚ / 55˚, Partial profile)

(ap shows the value of radial ap)

Type		Pitch / TPI mm / TPI	Description		Corner-R (RE)	Total ap (mm)	No. of passes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Metric (60°)	External thread	0.50 mm	TTX32R	6000 6000S	0.00	0.38	6	0.10	0.10	0.07	0.05	0.04	0.02											
				60005 60005S	0.05	0.33	5	0.10	0.10	0.07	0.04	0.02												
		0.70 mm	TTX32R	6000	0.00	0.53	7	0.10	0.10	0.10	0.08	0.07	0.06	0.02										
				60005	0.05	0.48	6	0.10	0.10	0.10	0.10	0.06	0.02											
		0.75 mm	TTX32R	6000	0.00	0.57	8	0.10	0.10	0.10	0.08	0.08	0.05	0.04	0.02									
				60005	0.05	0.52	7	0.10	0.10	0.10	0.08	0.07	0.05	0.02										
		0.80 mm	TTX32R	6000	0.00	0.61	8	0.10	0.10	0.10	0.10	0.08	0.06	0.05	0.02									
				60005	0.05	0.56	7	0.10	0.10	0.10	0.10	0.08	0.06	0.02										
		1.00 mm	TTX32R	6000	0.00	0.76	8	0.15	0.13	0.12	0.12	0.10	0.08	0.04	0.02									
				60005	0.05	0.71	7	0.18	0.15	0.12	0.10	0.08	0.06	0.02										
				6001	0.10	0.66	6	0.20	0.15	0.12	0.10	0.07	0.02											
		1.25 mm	TTX32R	6001	0.10	0.85	7	0.25	0.20	0.13	0.10	0.10	0.05	0.02										
		1.50 mm			0.10	1.04	9	0.25	0.18	0.14	0.12	0.10	0.10	0.08	0.05	0.02								
		1.75 mm			0.10	1.23	10	0.25	0.23	0.20	0.13	0.10	0.10	0.08	0.07	0.05	0.02							
		2.00 mm			0.10	1.42	11	0.25	0.23	0.20	0.16	0.13	0.10	0.10	0.10	0.08	0.05	0.02						
Parallel pipe / Tapered pipe (55°)	External thread	28TPI	TTX32R	5501	0.10	0.61	5	0.20	0.18	0.15	0.06	0.02												
		19TPI	TTX32R	5501	0.10	0.95	8	0.20	0.18	0.15	0.13	0.12	0.10	0.05	0.02									
				55015	0.15	0.90	7	0.20	0.18	0.16	0.14	0.12	0.08	0.02										
		14TPI	TTX32R	55015	0.15	1.28	10	0.25	0.20	0.18	0.16	0.12	0.12	0.10	0.08	0.05	0.02							
		11TPI			0.15	1.67	12	0.25	0.22	0.20	0.18	0.16	0.14	0.14	0.12	0.10	0.08	0.06	0.02					
Whitworth (55°)	External thread	24TPI	TTX32R	5501	0.10	0.73	6	0.20	0.18	0.16	0.12	0.05	0.02											
		20TPI	TTX32R	5501	0.10	0.90	7	0.20	0.18	0.16	0.14	0.12	0.08	0.02										
			TTX32R	55015	0.15	0.84	7	0.20	0.18	0.16	0.12	0.10	0.06	0.02										
		18TPI	TTX32R	55015	0.15	0.95	8	0.20	0.18	0.15	0.14	0.12	0.10	0.04	0.02									
		16TPI			0.15	1.10	9	0.20	0.18	0.16	0.14	0.12	0.12	0.10	0.06	0.02								
		14TPI			0.15	1.28	10	0.25	0.20	0.18	0.16	0.12	0.12	0.10	0.08	0.05	0.02							
		12TPI			0.15	1.52	11	0.25	0.20	0.18	0.16	0.16	0.14	0.14	0.12	0.10	0.05	0.02						
		11TPI			0.15	1.67	12	0.25	0.22	0.20	0.18	0.16	0.14	0.14	0.12	0.10	0.08	0.06	0.02					

<Note> 1) Select the insert with suitable corner-R(RE) determined by the pitch.
2) Do not exceed 0.3mm for the 1st ap.
3) Finishing ap should be 0.02~0.05mm.
4) Prepare chamfering for C0.3~C0.5 to the workpiece to prevent the insert cracking during the 1st pass.
5) Coolant is recommended.

TTX

Suitable for threading of smaller pitch sizes or more TPI than TT. Suitable for threading to the shoulder.

Insert description \ Thread types	Metric (mm)	Unified (TPI)	Parallel pipe (TPI)	Whitworth (TPI)
TTX32R 6000	0.5~1.0	56~32	-	-
60005	0.5~1.0	48~32	-	-
6001	1.0~2.0	28~14	-	-
TTX32R 6000S	0.5	56~48	-	-
60005S	0.5	48	-	-
TTX32R 5501	-	-	28~19	24~20
55015	-	-	19~11	20~14

TPGB (60˚, Partial profile)

(ap shows the value of radial ap)

Type		Pitch / TPI mm / TPI	Description	Corner-R (RE)	Total ap (mm)	No. of passes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Metric (60°)	Internal thread	0.75 mm	TPGB 1102005 1103005	0.05	0.44	5	0.15	0.12	0.10	0.05	0.02												
		0.80 mm	TPGB 1102005 1103005	0.05	0.47	5	0.15	0.14	0.10	0.06	0.02												
		1.00 mm	TPGB 1102005 1103005	0.05	0.60	6	0.18	0.14	0.12	0.10	0.04	0.02											
		1.25 mm	TPGB 1102005 1103005	0.05	0.76	7	0.18	0.16	0.14	0.12	0.10	0.04	0.02										
		1.50 mm	TPGB 1102005 1103005	0.05	0.92	8	0.20	0.18	0.16	0.14	0.10	0.08	0.04	0.02									
			110201 110301	0.10	0.87	8	0.20	0.18	0.16	0.14	0.08	0.05	0.04	0.02									
		1.75 mm	TPGB 1102005 1103005	0.05	1.09	9	0.20	0.18	0.16	0.14	0.13	0.12	0.10	0.04	0.02								
			110301	0.10	1.04	9	0.20	0.18	0.16	0.13	0.12	0.10	0.08	0.05	0.02								
		2.00 mm	TPGB 1102005 1103005	0.05	1.25	11	0.20	0.18	0.16	0.14	0.13	0.12	0.10	0.10	0.06	0.04	0.02						
			110301	0.10	1.20	11	0.20	0.18	0.16	0.13	0.13	0.12	0.10	0.08	0.05	0.03	0.02						
		2.50 mm	TPGB 1102005 1103005	0.05	1.57	13	0.23	0.20	0.18	0.18	0.14	0.13	0.12	0.10	0.08	0.07	0.07	0.05	0.02				
			110301	0.10	1.52	13	0.23	0.20	0.18	0.18	0.13	0.13	0.12	0.10	0.08	0.07	0.05	0.03	0.02				
		3.00 mm	TPGB 1102005 1103005	0.05	1.90	15	0.25	0.22	0.20	0.18	0.14	0.14	0.13	0.12	0.12	0.10	0.08	0.08	0.07	0.05	0.02		
			110301	0.10	1.85	15	0.25	0.22	0.20	0.18	0.14	0.14	0.13	0.12	0.10	0.10	0.08	0.07	0.05	0.05	0.02		
			110302	0.20	1.75	14	0.25	0.22	0.20	0.18	0.14	0.14	0.13	0.12	0.10	0.08	0.07	0.05	0.05	0.02			
		3.50 mm	TPGB 1102005 1103005	0.05	2.22	16	0.25	0.22	0.20	0.18	0.18	0.16	0.16	0.14	0.14	0.12	0.12	0.10	0.10	0.08	0.05	0.02	
			110301	0.10	2.17	16	0.25	0.22	0.20	0.18	0.18	0.16	0.16	0.14	0.14	0.12	0.10	0.10	0.08	0.07	0.05	0.02	
			110302	0.20	2.07	15	0.25	0.22	0.20	0.18	0.18	0.16	0.16	0.14	0.14	0.12	0.10	0.08	0.07	0.05	0.02		

Guide for internal threading

For internal threading, pay extra attention to "stabilizing bore dia." and "chip evacuation".

1. "Stabilizing bore dia."

Because small pitch Internal threading has small corner-R (RE), there is variation in the bore dia. which may greatly influence the tool life of an insert.
In order to eliminate the variation in the bore dia., "0" Cutting (zero cutting) should be performed as the zero pass, before the first pass in threading.
The bore dia. is cut with the specified dimension, and the first pass of threading becomes stable.

2. "Chip evacuation"

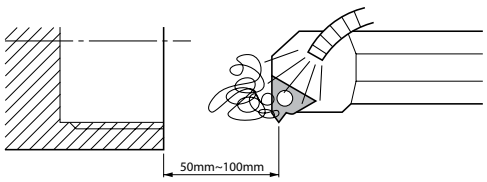
If machining process is continued when chips are tangled with a toolholder and other parts of the machine, it may cause damages to the insert.
Therefore, please ensure that there are no tangled chips in the machine by the following method.

<When processing the first workpiece>

Set the program with the "single block"
Keep the threading starting point 50 mm~100 mm away from the side of workpiece,
and confirm that coolant is flushing down the chips for each pass.

<When processing the second workpiece and later>

Ensure that chips are not tangled; then, start the continuous run.



In applicable toolholder / insert lists on **J58**- **J62**, right-hand insert / right-hand toolholder descriptions are listed based on the previous TNN type inserts.
For other applicable inserts / toolholders or stock availability of left-hand, see each relevant page and **J65**.

Parallel pipe [G(PF), Rp(PS)]

Nominal thread Symbol (Previous symbol)	TPI	External thread (G) Toolholder	Insert Partial profile	Insert Full profile	Internal thread (G, Rp) Toolholder	Insert Partial profile	Insert Full profile	Bore dia.	Same root's radius
G 1/16 (-)	28	KTNR○○○○□-16 KTNSR○○○○□-16 S○○□-KTNL16	16ERA55-TF/TQ 16ERAG55-TF/TQ 16ERA55 16ERAG55	-	SINR0612S-06E (EZT ⇒ **J40**)	06IR5501	-	6.56	0.12
G 1/8 (PF 1/8)								8.57	
G 1/4 (PF 1/4)	19	KTNR○○○○□-16 KTNSR○○○○□-16 S○○□-KTNL16	16ERA55-TF/TQ 16ERAG55-TF/TQ 16ERA55 16ERAG55	16ER19W-TF/TQ 16ER19W	SINR0816S-08E (EZT ⇒ **J40**)	08IR5501	-	11.45	0.18
G 3/8 (PF 3/8)					SINR1216S-11E (EZT ⇒ **J40**)	11IRA55 11IR55005	-	14.95	
G 1/2 (PF 1/2)	14	KTNR○○○○□-16 KTNSR○○○○□-16 S○○□-KTNL16	16ERAG55-TF/TQ 16ERG55-TF/TQ 16ERAG55 16ERG55	16ER14W-TF/TQ 16ER14W	SINR1516S-11	11IR55005	-	18.63	0.25
					SINR1616S-16	16IRAG55 16IRG55 16IR5501 16IR5502	16IR14W-TF/TQ 16IR14W		
G 5/8 (PF 5/8)					SINR2016S-16			20.59	
G 3/4 (PF 3/4)								24.12	
G 7/8 (PF 7/8)					SINR2420S-16			27.88	
G 1 (PF 1)	11	KTNR○○○○□-16 KTNSR○○○○□-16 S○○□-KTNL16	16ERAG55-TF/TQ 16ERG55-TF/TQ 16ERAG55 16ERG55	16ER11W-TF/TQ 16ER11W	SINR2420S-16	16IRAG55 16IRG55 16IR5501 16IR5502	16IR11W-TF/TQ 16IR11W	30.29	0.32
G 1 1/8 (PF 1 1/8)					CINR3025S-16			34.94	
G 1 1/4 (PF 1 1/4)					CINR3732S-16			38.95	
		Hereafter, all the threads are 11 TPI and the root's radius 0.32. The same tool for G1¼ is recommended.							

Tapered pipe [R Rc(PT)(BSPT)]

Nominal thread Symbol (Previous symbol)	TPI	External thread (R) Toolholder	Insert Partial profile	Insert Full profile	Internal thread (Rc) Toolholder	Insert Partial profile	Insert Full profile		Same root's radius
R 1/16, Rc 1/16 (-)	28	KTNR○○○○□-16 KTNSR○○○○□-16 S○○□-KTNL16	(16ERA55-TF/TQ) (16ERAG55-TF/TQ) (16ERA55) (16ERAG55)	16ER28BSPT-TF/TQ 16ER28BSPT	SINR0612S-06E (EZT ⇒ **J40**)	06IR5501	-		0.12
R 1/8, Rc 1/8 (PT 1/8)									
R 1/4 Rc 1/4 (PT 1/4)	19	KTNR○○○○□-16 KTNSR○○○○□-16 S○○□-KTNL16	(16ERA55-TF/TQ) (16ERAG55-TF/TQ) (16ERA55) (16ERAG55)	16ER19BSPT-TF/TQ 16ER19BSPT	SINR0816S-08E (EZT ⇒ **J40**)	08IR5501	-		0.18
R 3/8, Rc 3/8 (PT 3/8)					SINR1216S-11E (EZT ⇒ **J40**)	(11IRA55) (11IR55005)	11IR19BSPT-TF/TQ 11IR19BSPT		
R 1/2, Rc 1/2 (PT 1/2)	14	KTNR○○○○□-16 KTNSR○○○○□-16 S○○□-KTNL16	(16ERAG55-TF/TQ) (16ERG55-TF/TQ) (16ERAG55) (16ERG55)	16ER14BSPT-TF/TQ 16ER14BSPT	SINR1516S-11	(11IR55005)	11IR14BSPT-TF/TQ 11IR14BSPT		0.25
					SINR1616S-16	(16IRAG55) (16IRG55) (16IR5501) (16IR5502)	16IR14BSPT-TF/TQ 16IR14BSPT		
R 3/4, Rc 3/4 (PT 3/4)					SINR2016S-16				
R 1, Rc 1 (PT 1)	11	KTNR○○○○□-16 KTNSR○○○○□-16 S○○□-KTNL16	(16ERAG55-TF/TQ) (16ERG55-TF/TQ) (16ERAG55) (16ERG55)	16ER11BSPT-TF/TQ 16ER11BSPT	SINR2420S-16		16IR11BSPT-TF/TQ 16IR11BSPT		0.32
R 1 1/4, Rc 1 1/4 (PT 1 1/4)					CINR3025S-16				
R 1 1/2, Rc 1 1/2 (PT 1 1/2)					CINR3732S-16				
		Hereafter, all the threads are 11 TPI and the root's radius 0.32. The same tool for R1½ is recommended.			Hereafter, all the threads are 11 TPI and the root's radius 0.32. The same tool for Rc1½ is recommended.				

1) The largest size of minimum diameter toolholder is recommended for Internal threading toolholders.
Therefore it is available if minimum diameter is smaller than recommended toolholders.
(e.g.) SINR2420S-16 (Min. Bore dia.: ø24mm) is recommended for the Tool of G7/8 Internal threading from the above table, but SINR2016S-16 can also be used.
2) When using "Partial profile" for Tapered pipe threading, thread's corners become sharp edged, and the shape will not be the same as the standard shape for Tapered pipe.

American national tapered pipe (NPT)

Nominal thread	TPI	External thread			Internal thread		
		Toolholder	Insert		Toolholder	Insert	
			Partial profile	Full profile		Partial profile	Full profile
1/16NPT 1/8NPT	27	KTTR○○○○□-16 KTTXR○○○○□-16F	TT32R6000 TTX32R6000	-	No tools available		
1/4NPT 3/8NPT	18	KTNR○○○○□-16 KTNSR○○○○□-16 S○○□-KTNL16	-	16ER18NPT	EZH Sleeves J41	EZTR060050-60-004 EZTR070060-60-004	-
1/4NPT 3/4NPT	14	KTNR○○○○□-16 KTNSR○○○○□-16 S○○□-KTNL16	-	16ER14NPT	EZH Sleeves J41	EZTR070060-60-004	-
1/2NPT	14	KTNR○○○○□-16 KTNSR○○○○□-16 S○○□-KTNL16	-	16ER14NPT	SINR1616S-16	-	16IR14NPT
3/4NPT					SINR2016S-16		
1 NPT	11.5	KTNR○○○○□-16 KTNSR○○○○□-16 S○○□-KTNL16	-	16ER11.5NPT	SINR2420S-16	-	16IR11.5NPT
1 1/2NPT					CINR3025S-16		
1 1/2NPT 2 NPT					CINR3732S-16		

• Application of NPTF thread
NPTF is the thread for sealing pipes without using any sealing material.
Thread symbol is similar to NPT but the tolerance is different from that of NPT, therefore the above inserts are not available for NPTF.

30˚ Trapezoidal (Tr)

The JIS Standard Trapezoidal Size to be machined by previous TNN Insert are shown.

Nominal thread	Pitch (mm)	External thread			Internal thread			Bore dia.
		Toolholder	Insert		Toolholder	Insert		
			Partial profile	Full profile		Partial profile	Full profile	
Tr 16X2	2	No tools available			No tools available	-	-	14.00
Tr 18X2 Tr 20X2	2	KTNR○○○○□-16 KTNSR○○○○□-16 S○○□-KTNL16	16ER200TR	-	SINR1616S-16	16IR200TR	-	16.00 18.00
Tr 22X3	3	KTNR○○○○□-16 KTNSR○○○○□-16 S○○□-KTNL16	16ER300TR	-	SINR1616S-16	16IR300TR	-	19.00
Tr 24X3 Tr 26X3	3				SINR2016S-16	16IR300TR	-	21.00 23.00
Tr 28X3 Tr 30X3 Tr 32X3	3				SINR2420S-16	16IR300TR	-	25.00 27.00 29.00
Tr 34X3 Tr 36X3 Tr 38X3 Tr 40X3	3				CINR3025S-16	16IR300TR	-	31.00 33.00 35.00 37.00
Tr 42X3 Tr 44X3 Tr 46X3 Tr 48X3 Tr 50X3 Tr 52X3 Tr 55X3 Tr 60X3 Tr 65X3	3				CINR3732S-16	16IR300TR	-	39.00 41.00 43.00 45.00 47.00 49.00 52.00 57.00 62.00
Tr 70X4 Tr 75X4 Tr 80X4 Tr 90X4 Tr 95X4 Tr 100X4 Tr 105X4 Tr 110X4	4	KTNR○○○○□-22	22ER400TR	-	CINR3732S-22	22IR400TR	-	66.00 71.00 76.00 86.00 91.00 96.00 101.00 106.00

• TM thread: TM thread (old JIS 30˚ trapezoidal thread) has been discontinued. But if the "Nominal dia. X pitch" is the same, the above Tr thread can be used.
• TW thread: TW thread is 29˚ trapezoidal thread, therefore the above inserts are not available.

Metric coarse thread: M

Nominal thread	Pitch (mm)	Internal thread			
		Toolholder	Insert		Bore dia.
			Partial profile	Full profile	
M1 . . . M3	0.25 0.5	No tools available	-	-	0.73 . . . 2.46
M4	0.7		EZTR030025-60-002		3.24
M5	0.8		EZTR040035-60-004		4.13
M6	1.0	-	VNTR045-11	-	4.92
M7	1.0		EZTR050040-60-004	-	5.92
			VNTR045-11	-	
M8	1.25	-	EZTR060050-60-004	-	6.65
			VNTR060-11	-	
		SINR0612S-06E	06IR60005	-	
M9	1.25	-	EZTR070060-60-004	-	7.65
		SINR0612S-06E	06IR60005	-	
M10	1.5	SINR0816S-08E	08IR60007	-	8.38
M11	1.5				9.38
M12	1.75	SINR0816S-08E	08IR60007	-	10.11
M16	2.0	SINR1216S-11E	-	11IR200ISO	13.84
M18	2.5	No tools available			15.29
M20	2.5	SINR1616S-16	Table 5	16IR250ISO-□□	17.29
M22	2.5				19.29
M24	3.0	SINR2016S-16	Table 4	16IR300ISO-□□	20.75
M27	3.0				23.75
M30	3.5	SINR2420S-22	22IRN60	22IR350ISO	26.21
M33	3.5				29.21
M36	4.0	CINR3025S-22		22IR400ISO	31.67
M39	4.0				34.67
M42	4.5	CINR3732S-22		22IR450ISO	37.13
M45	4.5				40.13
M48	5.0	CINR3732S-22		22IR500ISO	42.59
M52	5.0				46.59
M56 . . .	5.5	* Threading of M56 and over is not available due to too large pitch size.			50.05 . . .

Metric fine thread: M

Part 1

Nominal thread	Pitch (mm)	Internal thread			
		Toolholder	Insert		Bore dia.
			Partial profile	Full profile	
M1x0.2 . . . M3x0.35	0.2 0.35	No tools available	-	-	0.78 . . . 2.62
M3.5x0.35	0.35	-	EZTR030025-60-002		3.12
M4.5x0.5	0.5	-	EZTR035030-60-002		3.96
M5x0.5	0.5	-			4.46
M6x0.75	0.75	-	VNTR045-11	-	5.19
M7x0.75	0.75	-	EZTR050040-60-004	-	6.20
			VNTR060-11	-	
M8x1.0	1.0	-	EZTR060050-60-004	-	6.92
			VNTR060-11	-	
		SINR0612S-06E	06IR60005	-	
M8x0.75	0.75	-	EZTR060050-60-004	-	7.19
			VNTR060-11	-	
		SINR0612S-06E	06IR60005	-	
M9x1.0	1.0	-	EZTR070060-60-004	-	7.92
			VNTR060-11	-	
		SINR0612S-06E	06IR60005	-	
		SINR0816S-08E	08IR60007		
M9x0.75	0.75	-	EZTR070060-60-004	-	8.19
			VNTR060-11	-	
		SINR0612S-06E	06IR60005	-	
M10x1.25	1.25	-	VNTR060-11	-	8.65
		SINR0816S-08E	08IR60007	-	
M10x1.0	1.0	-	VNTR060-11	-	8.92
		SINR0816S-08E	08IR60007	-	
M10x0.75	0.75	-	VNTR060-11	-	9.19
		SINR0612S-06E	06IR600005	-	
M11x1.0	1.0	-	VNTR060-11	-	9.92
		SINR0816S-08E	08IR60007	-	
M11x0.75	0.75	-	VNTR060-11	-	10.19
		SINR0612S-06E	06IR60005	-	
M12x1.5	1.5	SINR0816S-08E	08IR60007	-	10.38
M12x1.25	1.25				10.65
M12x1.0	1.0				10.92

Above shows the usage example of applicable toolholder / insert.

Metric fine thread: M

Part 2

Nominal thread	Pitch (mm)	Internal thread			
		Toolholder	Insert		Bore dia.
			Partial profile	Full profile	
M14x1.5	1.5	SINR1216S-11E	11IRA60 11IR60005	11IR150ISO-□□	12.38
M14x1.25	1.25			11IR125ISO-□□	12.65
M14x1.0	1.0			11IR100ISO-□□	12.92
M15x1.5	1.5	SINR1216S-11E	11IRA60 11IR60005	11IR150ISO-□□	13.38
M15x1.0	1.0			11IR100ISO-□□	13.92
M16x1.5	1.5	SINR1216S-11E	11IRA60 11IR60005	11IR150ISO-□□	14.38
M16x1.0	1.0			11IR100ISO-□□	14.92
M17x1.5	1.5	SINR1516S-11	11IRA60 11IR60005	11IR150ISO-□□	15.38
M17x1.0	1.0			11IR100ISO-□□	15.92
M18x2.0	2.0	SINR1516S-11	-	11IR200ISO	15.84
M18x1.5	1.5	SINR1616S-16	Table 2	16IR150ISO-□□	16.38
M18x1.0	1.0		Table 3	16IR100ISO-□□	16.92
M20x2.0	2.0	SINR1616S-16	Table 1	16IR200ISO-□□	17.84
M20x1.5	1.5		Table 2	16IR150ISO-□□	18.38
M20x1.0	1.0		Table 3	16IR100ISO-□□	18.92
M22x2.0	2.0	SINR1616S-16	Table 1	16IR200ISO-□□	19.84
M22x1.5	1.5	SINR2016S-16	Table 2	16IR150ISO-□□	20.38
M22x1.0	1.0		Table 3	16IR100ISO-□□	20.92
M24x2.0	2.0	SINR2016S-16	Table 1	16IR200ISO-□□	21.84
M24x1.5	1.5		Table 2	16IR150ISO-□□	22.38
M24x1.0	1.0		Table 3	16IR100ISO-□□	22.92
M25x2.0	2.0	SINR2016S-16	Table 1	16IR200ISO-□□	22.84
M25x1.5	1.5		Table 2	16IR150ISO-□□	23.38
M25x1.0	1.0		Table 3	16IR100ISO-□□	23.92
M26x1.5	1.5	SINR2420S-16	Table 2	16IR150ISO-□□	24.38
M27x2.0	2.0	SINR2420S-16	Table 1	16IR200ISO-□□	24.84
M27x1.5	1.5		Table 2	16IR150ISO-□□	25.38
M27x1.0	1.0		Table 3	16IR100ISO-□□	25.92
M28x2.0	2.0	SINR2420S-16	Table 1	16IR200ISO-□□	25.84
M28x1.5	1.5		Table 2	16IR150ISO-□□	26.38
M28x1.0	1.0		Table 3	16IR100ISO-□□	26.92
M30x3.0	3.0	SINR2420S-22	-	22IR300ISO	26.75
		SINR2420S-16	Table 4	16IR300ISO-□□	
M30x2.0	2.0	SINR2420S-16	Table 1	16IR200ISO-□□	27.84
M30x1.5	1.5		Table 2	16IR150ISO-□□	28.38
M30x1.0	1.0		Table 3	16IR100ISO-□□	28.92
M32x2.0	2.0	SINR2420S-16	Table 1	16IR200ISO-□□	29.84
M32x1.5	1.5	CINR3025S-16	Table 2	16IR150ISO-□□	30.38
M33x3.0	3.0	SINR2420S-22	-	22IR300ISO	29.75
		SINR2420S-16	Table 4	16IR300ISO-□□	
M33x2.0	2.0	CINR3025S-16	Table 1	16IR200ISO-□□	30.84
M33x1.5	1.5		Table 2	16IR150ISO-□□	31.38
M35x1.5	1.5	CINR3025S-16	Table 2	16IR150ISO-□□	33.38
M36x3.0	3.0	CINR3025S-22	-	22IR300ISO	32.75
		CINR3025S-16	Table 4	16IR300ISO-□□	
M36x2.0	2.0	CINR3025S-16	Table 1	16IR200ISO-□□	33.84
M36x1.5	1.5		Table 2	16IR150ISO-□□	34.38
M38x1.5	1.5	CINR3025S-16	Table 2	16IR150ISO-□□	36.38
M39x3.0	3.0	CINR3025S-22	-	22IR300ISO	35.75
		CINR3025S-16	Table 4	16IR300ISO-□□	
M39x2.0	2.0	CINR3025S-16	Table 1	16IR200ISO-□□	36.84
M39x1.5	1.5	CINR3732S-16	Table 2	16IR150ISO-□□	37.38
M40x3.0	3.0	CINR3025S-22	-	22IR300ISO	36.75
		CINR3025S-16	Table 4	16IR300ISO-□□	
M40x2.0	2.0	CINR3732S-16	Table 1	16IR200ISO-□□	37.84
M40x1.5	1.5		Table 2	16IR150ISO-□□	38.38
M42x4.0	4.0	CINR3732S-22	22IRN60	22IR400ISO	37.67
M42x3.0	3.0		-	22IR300ISO	38.75
		CINR3732S-16	Table 4	16IR300ISO-□□	
M42x2.0	2.0	CINR3732S-16	Table 1	16IR200ISO-□□	39.84
M42x1.5	1.5		Table 2	16IR150ISO-□□	40.38
M45x4.0 . . .	4.0	* Threading of M45 and over can be machined by the same tool for M42. (TP=4.0, 3.0, 2.0, 1.5)			40.67 . . .

Table 1 (TP=2.0 mm)

16IRG60
16IRAG60
16IR6001

Table 2 (TP=1.5 mm)

16IRA60
16IRAG60
16IR6001

Table 3 (TP=1.0 mm)

16IRA60
16IRAG60

Table 4 (TP=3.0 mm)

16IRG60
16IRAG60

Table 5 (TP=2.5 mm)

16IRG60
16IRAG60
16IR6001
16IR60015

Unified coarse thread: UNC

Nominal thread	TPI	Internal thread			
		Toolholder	Insert		Bore dia.
			Partial profile	Full profile	
No.2-56 UNC · · · No.6-32 UNC	56 32	No tools available	-	-	1.69 · · · 2.65
No.8-32 UNC	32	-	EZTR030025-60-002	-	3.31
No.10-24 UNC	24	-	EZTR035030-60-002	-	3.68
No.12-24 UNC	24	-	EZTR040035-60-004	-	4.34
1/4-20 UNC	20	-	EZTR050040-60-004	-	4.98
		-	VNTR045-11	-	
5/16-18 UNC	18	-	EZTR060050-60-004	-	6.41
		-	VNTR060-11	-	
3/8-16 UNC	16	-	EZTR070060-60-004	-	7.81
7/16-14 UNC	14	No tools available			9.15
1/2-13 UNC	13				10.58
9/16-12 UNC	12				12.00
5/8-11 UNC	11				13.38
3/4-10 UNC	10	SINR1616S-16	16IRAG60 16IRG60	16IR10UN-□□	16.30
7/8- 9 UNC	9			-	19.17
1- 8 UNC	8	SINR2016S-16		16IR08UN-□□	21.96
1 1/8- 7 UNC 1 1/4- 7 UNC	7	SINR2420S-22	22IRN60	-	24.65 27.82
1 3/8- 6 UNC 1 1/2- 6 UNC	6	CINR3025S-22			30.34 33.52
1 3/4- 5 UNC	5	CINR3732S-22			38.95
2-4 1/2 UNC · · ·	4 1/2	* 2-4 1/2 UNC and over cannot be machined, because no inserts are available for the TPI.			44.69 · · ·

Unified fine thread: UNF

Nominal thread	TPI	Internal thread			
		Toolholder	Insert		Bore dia.
			Partial profile	Full profile	
No.0-80 UNF · · · No.6-40 UNF	80 40	No tools available	-	-	1.18 · · · 2.82
No.8-36 UNF	36	-	EZTR030025-60-002	-	3.40
No.10-32 UNF	32	-	EZTR035030-60-002	-	3.97
No.12-28 UNF	28	-	EZTR040035-60-004	-	4.50
1/4-28 UNF	28	-	EZTR050040-60-004	-	5.37
		-	VNTR045-11	-	
5/16-24 UNF	24	-	EZTR060050-60-004	-	6.79
		-	VNTR060-11	-	
		SINR0612S-06E	06IR60005	-	
3/8-24 UNF	24	-	EZTR070060-60-004	-	8.38
		SINR0612S-06E	06IR60005	-	
7/16-20 UNF 1/2-20 UNF	20	SINR0816S-08E	08IR60007	-	9.74 11.33
9/16-18 UNF 5/8-18 UNF	18	SINR1216S-11E	11IRA60 11IR60005	-	12.76 14.35
3/4-16 UNF	16	SINR1516S-11	11IRA60 11IR60005	-	17.33
		SINR1616S-16	16IRAG60 16IRG60 16IR6001	16IR16UN(-□□)	
7/8-14 UNF	14	SINR2016S-16		16IR14UN(-□□)	20.26
1-12 UNF	12	SINR2016S-16		16IR12UN(-□□)	23.10
1 1/8-12 UNF 1 1/4-12 UNF	12	SINR2420S-16			26.28 29.46
1 3/8-12 UNF 1 1/2-12 UNF	12	CINR3025S-16			32.63 36.81

Unified extra fine thread: UNEF

Nominal thread	TPI	Internal thread			
		Toolholder	Insert		Bore dia.
			Partial profile	Full profile	
No.12 -32UNEF 1/4-32UNEF 5/16-32UNEF 3/8-32UNEF	32	-	EZTR035030-60-002	-	4.63 5.49 7.08 8.67
7/16-28UNEF 1/2-28UNEF	28	SINR0612S-06E	06IR60005	-	10.13 11.72
9/16-24UNEF 5/8-24UNEF	24	SINR1216S-11E	11IRA60 11IR60005	-	13.14 14.73
11/16-24UNEF		SINR1516S-11			16.32
		SINR1616S-16	16IRA60 16IRAG60	16IR24UN(-□□)	
3/4-20UNEF 13/16-20UNEF 7/8-20UNEF 15/16-20UNEF 1-20UNEF	20			16IR20UN(-□□)	17.68 19.26 20.85 22.44 24.03
		SINR2016S-16			
1 1/16 -18UNEF 1 1/8-18UNEF 1 3/16 -18UNEF 1 1/4-18UNEF 1 5/16 -18UNEF 1 3/8-18UNEF 1 7/16 -18UNEF 1 1/2-18UNEF	18	SINR2420S-16		16IR18UN(-□□)	25.46 27.05 28.63 30.22 31.81 33.40 34.98 36.57
		CINR3025S-16			
1 9/16 -18UNEF 1 5/8 -18UNEF 1 11/16 -18UNEF		CINR3732S-16			38.16 39.75 41.33

J

Threading

Whitworth coarse thread: W

Nominal thread	TPI	Internal thread			
		Toolholder	Insert		Bore dia.
			Partial profile	Full profile	
W 1/4 W 5/16	20 18	No tools available	-	-	4.91 6.34
W 3/8	16	No tools available			7.73
W 7/16	14				9.06
W 1/2 W 9/16	12				10.30 11.89
W 5/8	11				13.26
W 3/4	10	SINR1616S-16	16IRAG55 16IRG55	-	16.17
W 7/8	9				19.03
W 1	8	SINR2016S-16		-	21.80
W 1 1/8 W 1 1/4	7	SINR2420S-22	22IRN55	-	24.47 27.64
W 1 3/8 W 1 1/2	6	CINR3025S-22	22IRN55	-	30.13 33.30
W 1 5/8	5				35.52
W 1 3/4	5	CINR3732S-22	22IRN55	-	38.69
W 1 7/8 W 2	4 1/2	No tools available			41.23 44.41
W 2 1/4	4				49.96

Whitworth fine thread: W

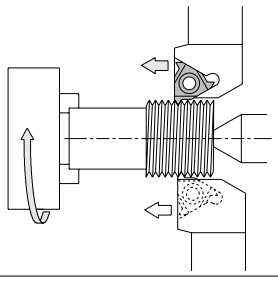
Nominal thread	TPI	Internal thread			
		Toolholder	Insert		Bore dia.
			Partial profile	Full profile	
W9.5 TPI 24 W10 TPI 24 W10.5 TPI 24	24	SINR0816S-08E	08IR5501	-	8.30 8.80 9.30
		-	EZTR060050-55-008		
W9.5 TPI 20 W10 TPI 20 W10.5 TPI 20 W11 TPI 20 W11.5 TPI 20 W12 TPI 20 W12.5 TPI 20 W13 TPI 20	20	SINR0816S-08E	08IR5501	-	8.06 8.56 9.06 9.56 10.06 10.56 11.06 11.56
		-	EZTR060050-55-008 EZTR080070-55-008		
W13.5 TPI 20	20	SINR1216S-11E	11IRA55 11IR55005	-	12.06
W11 TPI 18 W11.5 TPI 18 W12 TPI 18 W12.5 TPI 18	18	No tools available			9.40 9.90 10.40 10.90
W14 TPI 18 W14.5 TPI 18 W15 TPI 18 W16 TPI 18	18	SINR1216S-11E	11IRA55 11IR55005	-	12.40 12.90 13.40 14.40
W13 TPI 16 W13.5 TPI 16	16	No tools available			11.20 11.70
W14 TPI 16 W14.5 TPI 16 W15 TPI 16	16	SINR1216S-11E	11IRA55 11IR55005	-	12.20 12.70 13.20
W17 TPI 16	16	SINR1516S-11			15.20
W18 TPI 16 W19 TPI 16 W20 TPI 16	16	SINR1616S-16	16IRAG55 16IRG55 16IR5501 16IR5502	(16IR16W-□□)	16.20 17.20 18.20
W16 TPI 14 W17 TPI 14	14	SINR1216S-11E	11IRA55 11IR55005	-	13.94 14.94
W18 TPI 14	14	SINR1516S-11			15.94
W21 TPI 14 W22 TPI 14	14	SINR1616S-16	16IRAG55 16IRG55 16IR5501 16IR5502	(16IR14W□□) (16IR14W)	18.94 19.94
W23 TPI 14 W24 TPI 14 W25 TPI 14 W26 TPI 14	14	SINR2016S-16			20.94 21.94 22.94 23.94
W19 TPI 12 W20 TPI 12 W21 TPI 12 W22 TPI 12	12	SINR1616S-16	16IRAG55 16IRG55 16IR5501 16IR5502	-	16.60 17.60 18.60 19.60
W28 TPI 12 W30 TPI 12 W32 TPI 12	12	SINR2420S-16		-	25.60 27.60 29.60
W34 TPI 12 W35 TPI 12 W36 TPI 12 W38 TPI 12	12	CINR3025S-16		-	31.60 32.60 33.60 35.60
W40 TPI 12 W42 TPI 12 W44 TPI 12 W45 TPI 12 W46 TPI 12 W48 TPI 12 W50 TPI 12 . . .	12	CINR3732S-16		-	37.60 39.60 41.60 42.60 43.60 45.60 47.60 . . .
		* Hereafter, 12 TPI whitworth fine thread can be machined by the same tool as above.			
W23 TPI 10 W24 TPI 10 W25 TPI 10 W26 TPI 10	10	SINR2016S-16	16IRAG55 16IRG55	-	20.12 21.12 22.12 23.12
W28 TPI 9 W30 TPI 9 W32 TPI 9	9	SINR2420S-16		-	24.80 26.80 28.80
W34 TPI 8 W35 TPI 8 W36 TPI 8 W38 TPI 8 W40 TPI 8 W42 TPI 8	8	CINR3025S-16		-	30.40 31.40 32.40 34.40 36.40 38.40
W44 TPI 7 W45 TPI 7 W46 TPI 7 W48 TPI 7 W50 TPI 7 W52 TPI 7	7	CINR3732S-22	22IRN55	-	39.89 40.89 41.89 43.89 45.89 47.89
W55 TPI 6 W58 TPI 6 W60 TPI 6 W62 TPI 6 . W72 TPI 6	6	CINR3732S-22	22IRN55	-	50.20 53.20 55.20 57.20 . 67.20
W75 TPI 5 . . W105 TPI 5	5	CINR3732S-22	22IRN55	-	69.24 . . 99.24
W110 TPI 4 . .	4	No tools available			102.8 . .

External threading (Left-hand thread / Right-hand thread)

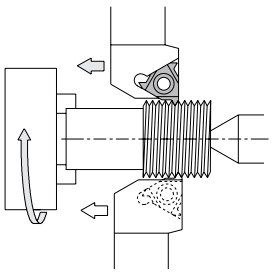
External thread

Left-hand thread

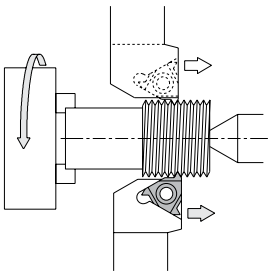
Toolholder	Left-hand
Insert	Left-hand
The direction of spindle revolution	M04



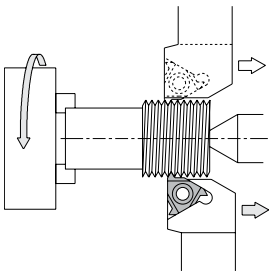
Toolholder	Right-hand
Insert	Right-hand
The direction of spindle revolution	M04



Toolholder	Left-hand
Insert	Left-hand
The direction of spindle revolution	M03

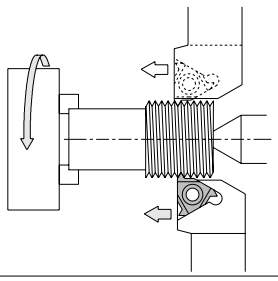


Toolholder	Right-hand
Insert	Right-hand
The direction of spindle revolution	M03

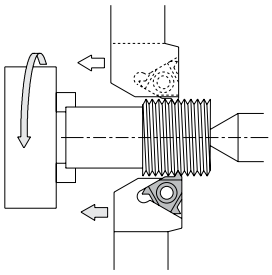


Right-hand thread

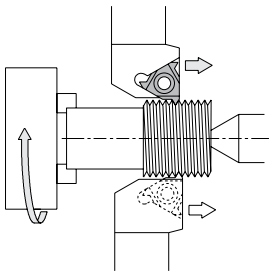
Toolholder	Right-hand
Insert	Right-hand
The direction of spindle revolution	M03



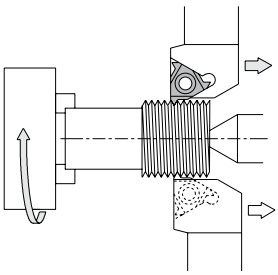
Toolholder	Left-hand
Insert	Left-hand
The direction of spindle revolution	M03



Toolholder	Right-hand
Insert	Right-hand
The direction of spindle revolution	M04



Toolholder	Left-hand
Insert	Left-hand
The direction of spindle revolution	M04



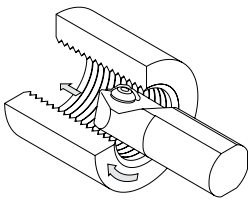
* These tables are based on KTN / KTNS / KTT / KTTX toolholder.

Internal threading (Left-hand thread / Right-hand thread)

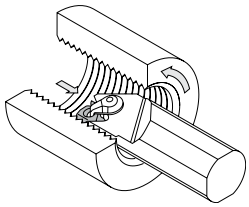
Internal thread

Left-hand thread

Toolholder	Left-hand
Insert	Left-hand
The direction of spindle revolution	M04

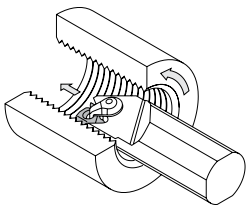


Toolholder	Right-hand
Insert	Right-hand
The direction of spindle revolution	M03

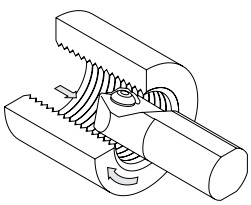


Right-hand thread

Toolholder	Right-hand
Insert	Right-hand
The direction of spindle revolution	M03

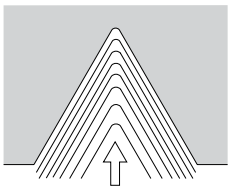
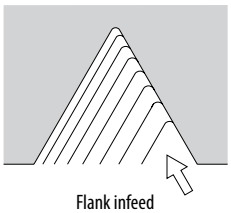
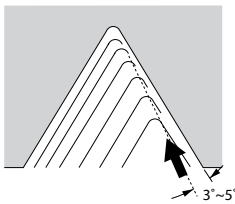


Toolholder	Left-hand
Insert	Left-hand
The direction of spindle revolution	M04



* These tables are based on SIN / CIN toolholder.
For KITG (for large Internal threading), left-hand insert for right-hand toolholder, right-hand insert for left-hand toolholder.

Infeed methods

Infeed methods	Features
 Radial infeed	• The most common threading method. The cutting edge moves toward the center of the workpiece every pass. • Suitable for relatively small pitch size threading. • V-shape chips are generated and chip control may be difficult depending on workpiece material.
 Flank infeed	• Suitable for large pitch size threading. • The wear on the right side edge of the figure (no ap) tends to become greater. • Chips flow to one side.
 Modified flank infeed	• Revised compound methods of the above flank infeed method. • No "no ap." condition. • Chips flow to one side.

Lead angle of thread

Thread's lead angle β as shown in Fig. 1 decides from the workpiece diameter "D" (Pitch dia.) And the lead "L" (In case of single-start thread, it is the same as pitch "TP").
By rolling a right-angled triangle around a cylinder and the angle ACB in Fig. 2 becomes the lead angle β. The calculation formula is shown as follows.

$$\tan\beta = \frac{L}{\pi D} = \frac{nTP}{\pi D}$$

β: Lead angle D: Pitch dia. n: Number of thread TP: Pitch
L: Lead (In case of single-start thread, it is equal to TP. In case of n-start thread, it is equal to n x TP.)

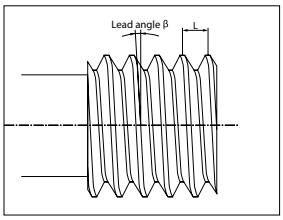


Fig. 1

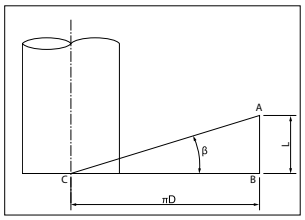


Fig. 2

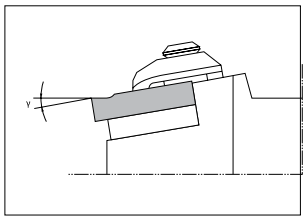


Fig. 3

Relief angle of thread

Against this lead angle, the threading insert requires side relief angle α. Negative type threading insert has no relief angle.
When installing the negative type insert in the toolholder, the edge inclination angle γ (Fig. 3) is set, and at the same time front relief angle as well as side relief angle are generated to the insert. Side relief angle is described by the following formula. (Fig. 4)

$$\tan\alpha = \tan\gamma \times \tan\left(\frac{\theta}{2}\right)$$

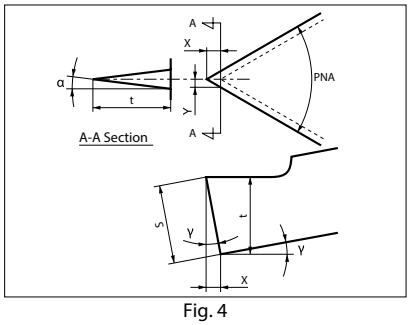


Fig. 4

Symbol	e.g.)
α: Side relief angle	
γ: Inclination angle after installing insert	External insert:10° Internal insert:15°
PNA: Insert's thread angle	Metric: 60° Tapered pipe: 55° 30° trapezoidal: 30°
S: Insert thickness	

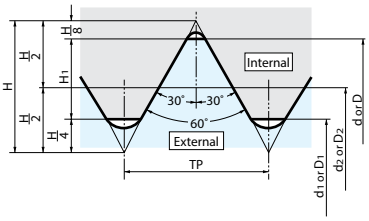
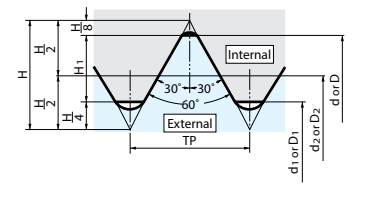
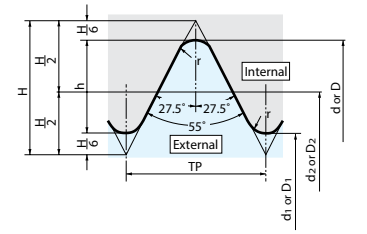
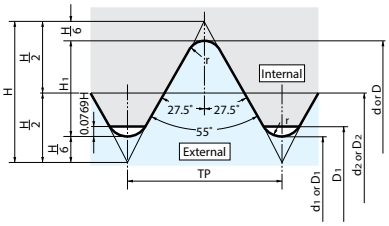
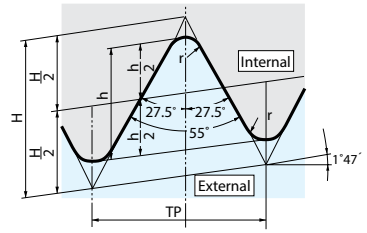
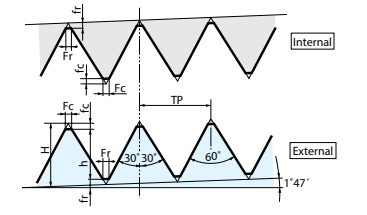
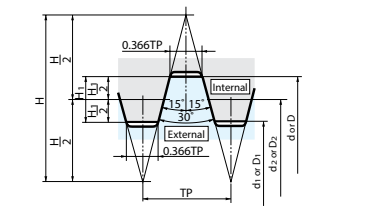
$$\begin{cases} X = S \cdot \sin\gamma \\ Y = X \cdot \tan(\theta/2) = t \cdot \tan\alpha \\ t = S \cdot \cos\gamma \end{cases}$$

Table 1

Inserts	Side relief angle α	
	External	Internal
60° thread (M, UN, NPT)	5° 49´	8° 47´
55° thread (W, G, PT)	5° 14´	7° 56´
30° trapezoidal (Tr)	2° 43´	5° 7´

Ref. to Table 1 for the side relief angle depending on the insert type.
However, the side relief angle is set for 1° in the traveling direction by the toolholder itself, so that the actual side relief angle becomes α+1°.

Thread types & basic profile / Applicable toolholders & inserts

	Basic profile	Symbol (Previous symbol)	Type	Applicable inserts	Applicable toolholders
Metric		M e.g.) M30	External	○○E R/L○○○ISO(-TF/TQ) ○○ER□□60(-TF/TQ) 16ER60○○	KTN R/L○○○○□-○○ KTNSR○○○○□-16 S○○□-KTNL16
				TT43E R/L○○○M TT○○R/L60○○	KTT R/L○○○○□-○○
				TTX32R60○○	KTTXR○○○○□-16F, S○○□-KTTXL16
			Internal	○○IR/L○○○ISO(-TF/TQ) ○○IR□□60 ○○IR60○○(○)	SIN R/L○○○○S-○○(E) CIN R/L○○○○S-○○
				TT○○1/R60○○	KITG R/L○○○○T-○○
				TPGB11○○○○(○)	S○○□-STWP R/L11-○○(E)
Unified		UN UNC UNF UNEF e.g.) ¾-16 UNF	External	○○ER○○UN(-TF/TQ) ○○ER□□60(-TF/TQ) 16ER60○○	KTNR○○○○□-○○ KTNSR○○○○□-16 S○○□-KTNL16
				TT○○R/L60○○	KTT R/L○○○○□-○○
				TTX32R60○○	KTTXR○○○○□-16F, S○○□-KTTXL16
			Internal	○○IR○○UN-(TF/TQ) ○○IR□□60 ○○IR60○○(○)	SINR○○○○S-○○(E) CINR○○○○S-○○
				TT○○1/R60○○	KITG R/L○○○○T-○○
				TPGB11○○○○(○)	S○○□-STWP R/L11-○○(E)
Parallel pipe		External: G(PF) Internal: G(PF) Rp(PS) e.g.) G ¾ (PF ¾)	External	○○ER○○W(-TF/TQ) ○○ER□□55 16ER55○○	KTNR○○○○□-○○ KTNSR○○○○□-16 S○○□-KTNL16
				TT○○R/L55○○	KTT R/L○○○○□-○○
				TTX32R55○○	KTTXR○○○○□-16F, S○○□-KTTXL16
			Internal	○○IR○○W(-TF/TQ) ○○IR□□55 ○○IR55○○(○)	SINR○○○○S-○○(E) CINR○○○○S-○○
				TT○○1/R55○○	KITG R/L○○○○T-○○
Whitworth		W e.g.) W ⅜	External	○○ER○○W(-TF/TQ) ○○ER□□55 16ER55○○	KTNR○○○○□-○○ KTNSR○○○○□-16 S○○□-KTNL16
				TT○○R/L55○○	KTT R/L○○○○□-○○
				TTX32R55○○	KTTXR○○○○□-16F, S○○□-KTTXL16
			Internal	○○IR○○W(-TF/TQ) ○○IR□□55 ○○IR55○○(○)	SINR○○○○S-○○(E) CINR○○○○S-○○
				TT○○1/R55○○	KITG R/L○○○○T-○○
Tapered pipe		External: R(PT) (BSPT) Internal: Rc(PT) (BSPT) e.g.) R ½ (PT ½)	External	16ER○○BSPT(-TF/TQ)	KTNR○○○○□-○○ KTNSR○○○○□-16 S○○□-KTNL16
				TT○○R/L55○○*	KTT R/L○○○○□-○○
				TTX32R55○○*	KTTXR○○○○□-16F, S○○□-KTTXL16
			Internal	○○IR○○BSPT(-TF/TQ)	SINR○○○○S-○○(E) CINR○○○○S-○○
				TT○○1/R55○○*	KITG R/L○○○○T-○○
American national tapered pipe		NPT e.g.) ⅜-18 NPT	External	16ER○○(.○)NPT	KTNR○○○○□-○○ KTNSR○○○○□-16 S○○□-KTNL16
			Internal	16IR○○(.○)NPT	SINR○○○○S-○○ CINR○○○○S-○○
30° Trapezoidal		Tr e.g.) Tr 26x3	External	○○ER○○○TR	KTNR○○○○□-○○ KTNSR○○○○□-16 S○○□-KTNL16
			Internal	○○IR○○○TR	SINR○○○○S-○○ CINR○○○○S-○○

Above shows the usage example of applicable Toolholder / Insert.

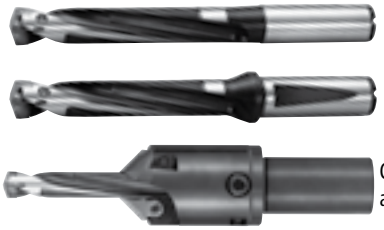
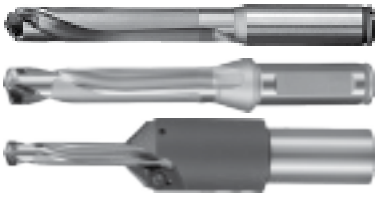
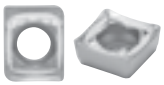
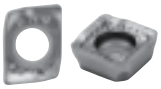
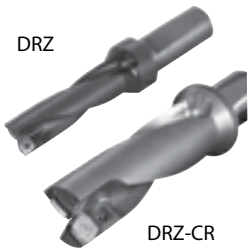
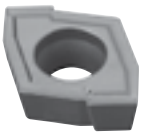
* For the case when the thread root's corner-R(RE) can be smaller than the standard.

K

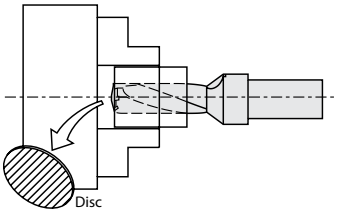


Introduction		K2
MagicDrill DRA		K4
Applicable drill heads	DRA drill heads (GM - General purpose)	K6
	DRA drill heads (FTP-H - for steel beam / FTP - Counterboring)	K9
	DRA drill heads (HQP - Precision / for Carbon steel)	K12
	DRA drill heads (HQS - For difficult-to-cut materials/stainless steel)	K15
Straight shank SS	SS-DRA 1.5 DC	K16
	SS-DRA 3 DC	K17
	SS-DRA 5 DC	K18
	SS-DRA 8 DC	K19
Chamfering attachment for SS-DRA	CH-DRA	K20
Flanged shank SF	SF-DRA 1.5 DC	K22
	SF-DRA 3 DC	K23
	SF-DRA 5 DC	K24
	SF-DRA 8 DC	K25
	SF-DRA 12 DC	K26
MagicDrill DRC		K32
MagicDrill DRV		K48
Applicable inserts	LCMT (outer edge)	K50
	SCMT (outer edge)	K51
	LCMT (inner edge)	K52
	SCMT (inner edge)	K53
Toolholder DRV	DRV 2 DC	K54
	DRV 3 DC	K56
	DRV 4 DC	K58
	DRV 5 DC	K60
	DRV 6 DC	K62
Chamfering attachment for DRV	DRV-CH	K66
Adjustable sleeve (DRV/DRZ)		K70
SHE type	SHE	K70
MagicDrill DRZ		K74
MagicDrill DRW for bigger diameter (ø60 ~ø100 mm and more)		K88

Product lineup

Type	Shape	Drill dia. Drilling depth)	Cutting edge	Remarks
DRA K4	 Screw clamp	ø7.94~ø25.50 (1.5D) ø7.94~ø33.0 (3D/5D/8D) ø12~ø25.5 (12D)	Module type with double edges 	Lineup  SS-DRA SF-DRA Chamfering attachment
DRC K32	 Self-clamping	ø7.94~ø25.99 (3D/5D/8D)	Module type with double edges 	Lineup  SS-DRC SF-DRC Chamfering attachment
DRV K48	 Silver coating	ø12~ø60 (2D/3D/4D 5D/6D)	Individually designed Inner & outer edges  Outer edge  Inner edge	Chip shape (Workpiece material: C50) drill dia. ø20 Chip from outer edge  Chip from inner edge 
DRZ K74	DRZ  DRZ-CR	ø13~ø59 (2D/3D) ø13~ø50 (4D) ø27~ø50 (5D)	Inner & outer edges on one insert 	Chip shape (Workpiece material: C50) drill dia. ø23 Chip from outer edge  Chip from inner edge
DRZ-CR [Cartridge type] (Made to order) K83		ø60~ (2D/3D/4D)		

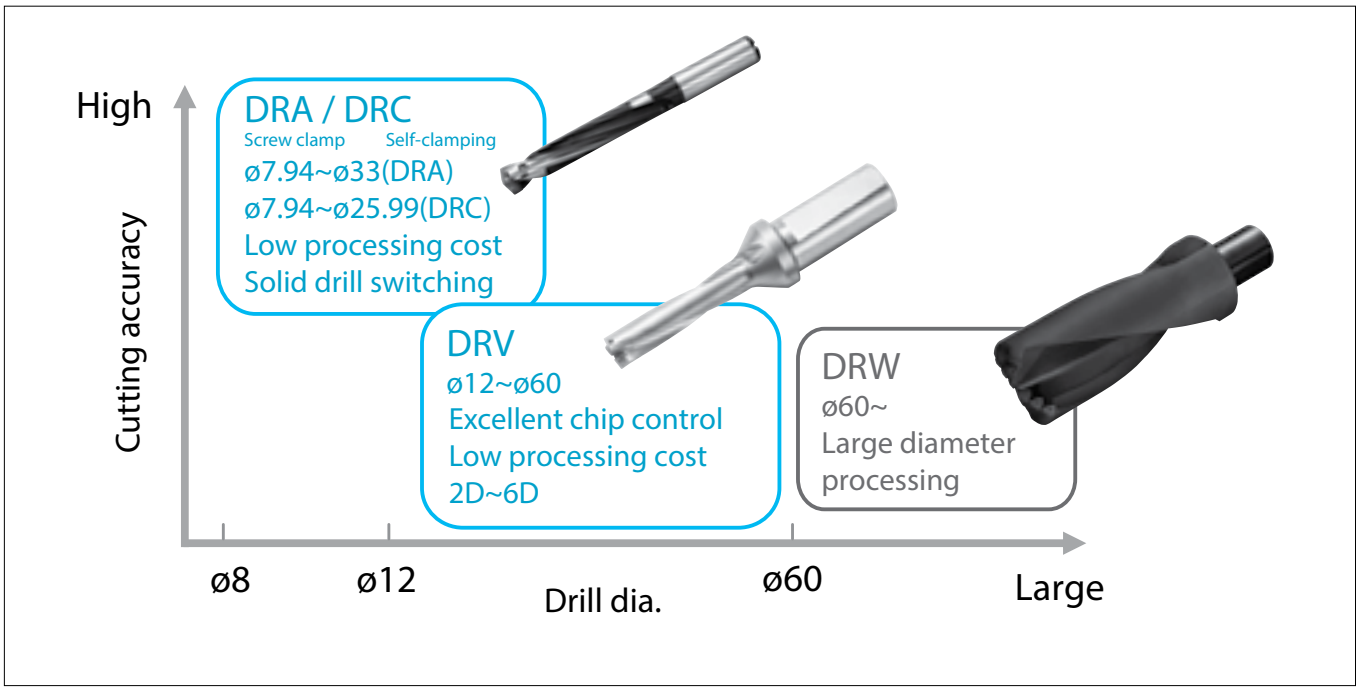
Caution



When drilling through the workpiece, a disk may be ejected.
Proper machine guarding is necessary to prevent injury.
The safety cover is necessary for the conventional lathe machines to prevent any accidents.

Type	Shape	Drill dia. Drilling depth)	Cutting edge	Remarks
DRW (Made to order for some products) K88		ø60~ (1D/2D/3D)	Inner & outer edges on one insert 	Custom-order item  BT integral arbor type is also available  Maximum drilling diameter is ø200.

MagicDrill series application map



High efficiency modular drill

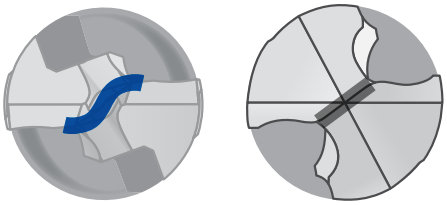
MagicDrill DRA

Excellent hole accuracy with a low cutting force design
5 advantages to solve common drilling difficulties

1 Low cutting force design improves hole accuracy

Special chisel edge with S-curve reduces thrust force and reduces vibration.

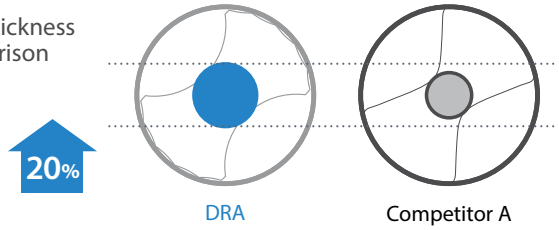
Cutting edge image



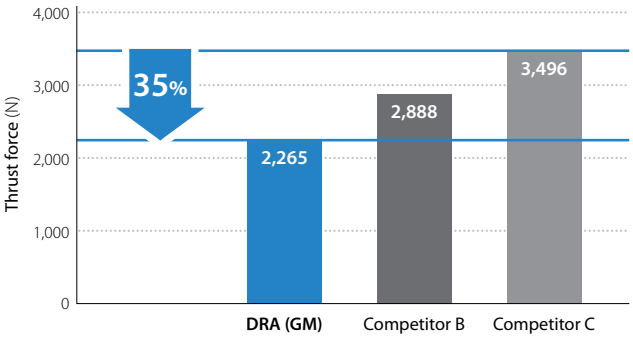
2 Optimal web thickness reduces deflection

Improved hole accuracy by controlling drill deflection with a 20% thicker web compared with Competitor A.

Web thickness comparison

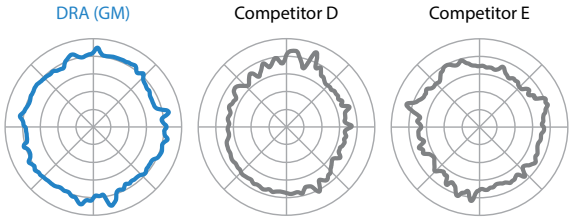


Cutting force comparison (Internal evaluation)



Cutting conditions: Vc = 120 m/min, f = 0.25 mm/rev
Drilling diameter ø14, L/D = 5, Drilling depth 45 mm, Wet, Workpiece material: C50

Roundness · Cylindricity comparison (Internal evaluation)



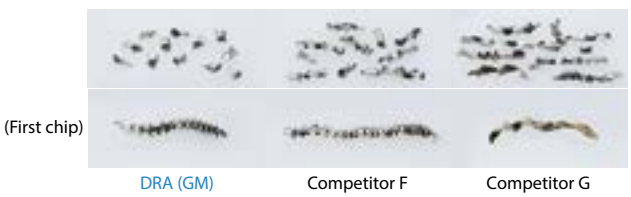
	DRA (GM)	Competitor D	Competitor E
Roundness	18.7 µm	31.1 µm	27.3 µm
Cylindricity	23.6 µm	34.3 µm	30.1 µm

Cutting conditions: Vc = 120 m/min, f = 0.3 mm/rev
Drilling diameter ø14, L/D = 5, Measurement position 55 mm,
Wet, Workpiece material: C50

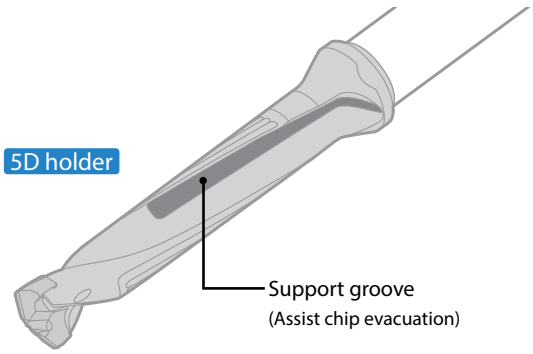
3 Fine chip breaking even in deep hole drilling applications

Optimized chip thinning for stable chip evacuation.
Support groove with wider flute (5D, 8D) enables smooth chip evacuation.

Chip comparison
(Internal evaluation)

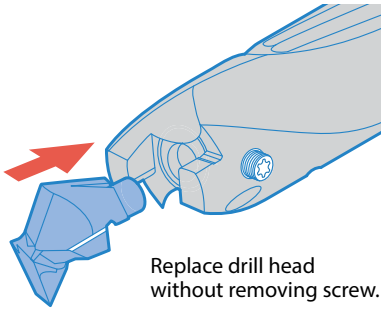


Cutting conditions: Vc = 60 m/min, f = 0.2 mm/rev, Drilling diameter ø14, L/D = 5
Drilling depth 70 mm, Wet, Workpiece material: X5CrNi1810

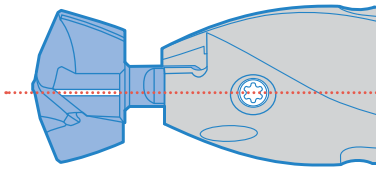


4 Easy drill head replacement

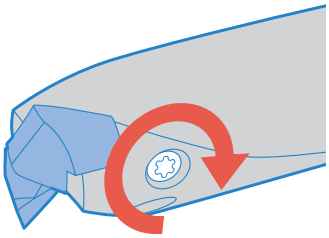
Replace drill head without removing screw.



Replace drill head without removing screw.



Install the drill head onto toolholder (Align drill head guide line with screw position).



Fix the drill head by tightening the screw.

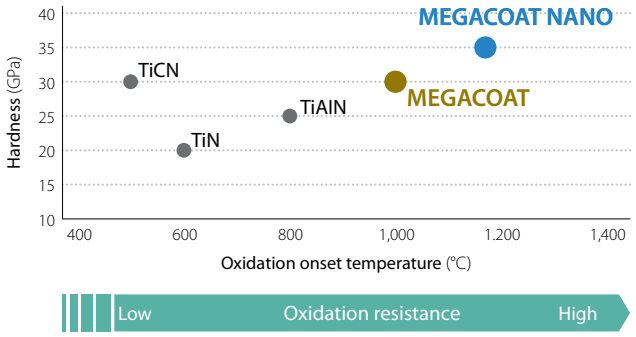
5 Long tool life and stable machining of various workpieces

MEGACOAT NANO grade PR1535 is used to machine various materials from steel to stainless steel, with the combination of a tough substrate and a special nano layer coating.

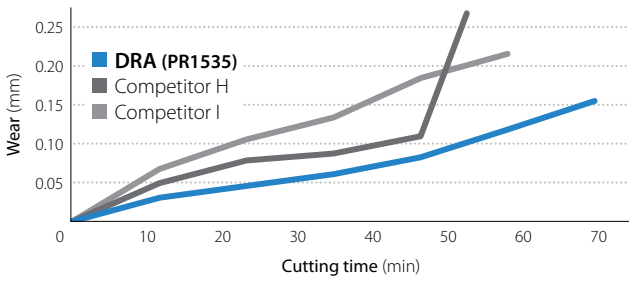
1st recommendation

Steel / Stainless steel	Cast iron
PR1535	PR1525

Coating properties



Wear resistance comparison (Internal evaluation)

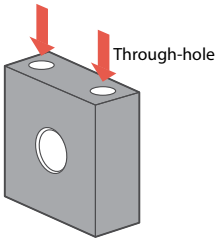


Cutting conditions: Vc = 100 m/min, f = 0.25 mm/rev
Drilling dia. ø14, L/D = 5, Drilling depth 45 mm, Wet, Workpiece material: 42CrMo4

Case studies

Attachment ST44-2

Vc = 70 m/min (n = 1,240 min^{-1})
f = 0.23 mm/rev (Vf = 285 mm/min)
Drilling depth 100 mm
Wet (Internal coolant)
With center hole drilling
SF25-DRA180M-8
DA1800M-GM PR1535



Cutting time

DRA ø18-8D — **45** sec — 30%

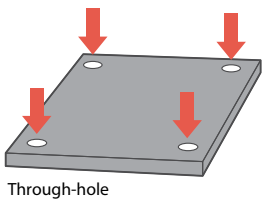
Competitor J ø18-7D (Modular drill) — **65** sec

Competitor J applied a peck cycle to avoid chip clogging.
DRA controlled chip evacuation without pecking.

(User evaluation)

Plate X5CrNi1810

Vc = 60 m/min (n = 2,120 min^{-1})
f = 0.12 mm/rev (Vf = 254 mm/min)
Drilling depth 15 mm
Wet (Internal coolant)
SS10-DRA090M-3
DA0900M-GM PR1535



Number of holes

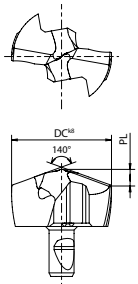
DRA ø9-3D — **500** — 5 times

Competitor K ø9-3D (Modular drill) — **100**

DRA extended the tool life by 5 times compared to Competitor K.
DRA maintained stable machining and excellent surface finish with less cutting noise.

(User evaluation)

DRA drill heads (GM - General purpose)

Drill head		Description		Dimension (mm) DC	Dimension (mm) PL	Tolerance k8 (min.)	Tolerance k8 (max.)	Carbide PVD PR1525	Carbide PVD PR1535	Applicable toolholder ⇨ K16~K19 K22~K26
Carbon steel / Alloy steel								○	●	P
Mold and die steel										P
Stainless steel								○	●	M
Cast iron								●	○	K
Non-ferrous metals										N
	 General purpose	DA	0794M-GM	7.94	1.34	0	+0.022	●	●	SF12-DRA080M-○ SS10-DRA080M-○
			0800M-GM	8	1.35			●	●	
			0810M-GM	8.1	1.37			●	●	
			0820M-GM	8.2	1.38			●	●	
			0830M-GM	8.3	1.4			●	●	
			0840M-GM	8.4	1.42			●	●	
		DA	0850M-GM	8.5	1.44	0	+0.022	●	●	SF12-DRA085M-○ SS10-DRA085M-○
			0860M-GM	8.6	1.46			●	●	
			0870M-GM	8.7	1.48			●	●	
			0880M-GM	8.8	1.49			●	●	
			0890M-GM	8.9	1.51			●	●	
		DA	0900M-GM	9	1.52	0	+0.022	●	●	SF12-DRA090M-○ SS10-DRA090M-○
			0910M-GM	9.1	1.54			●	●	
			0920M-GM	9.2	1.56			●	●	
			0930M-GM	9.3	1.58			●	●	
			0940M-GM	9.4	1.59			●	●	
		DA	0950M-GM	9.5	1.61	0	+0.022	●	●	SF12-DRA095M-○ SS10-DRA095M-○
			0960M-GM	9.6	1.63			●	●	
			0970M-GM	9.7	1.65			●	●	
			0980M-GM	9.8	1.67			●	●	
			0990M-GM	9.9	1.68			●	●	
		DA	1000M-GM	10	1.7	0	+0.022	●	●	SF16-DRA100M-○ SS12-DRA100M-○
			1010M-GM	10.1	1.72		+0.027	●	●	
			1020M-GM	10.2	1.74		+0.027	●	●	
			1030M-GM	10.3	1.75		+0.027	●	●	
			1040M-GM	10.4	1.77		+0.027	●	●	
		DA	1050M-GM	10.5	1.79	0	+0.027	●	●	SF16-DRA105M-○ SS12-DRA105M-○
			1060M-GM	10.6	1.81			●	●	
			1070M-GM	10.7	1.83			●	●	
			1080M-GM	10.8	1.85			●	●	
			1090M-GM	10.9	1.86			●	●	
		DA	1100M-GM	11	1.87	0	+0.027	●	●	SF16-DRA110M-○ SS12-DRA110M-○
			1110M-GM	11.1	1.89			●	●	
			1120M-GM	11.2	1.91			●	●	
			1130M-GM	11.3	1.92			●	●	
			1140M-GM	11.4	1.94			●	●	
		DA	1150M-GM	11.5	1.96	0	+0.027	●	●	SF16-DRA115M-○ SS12-DRA115M-○
			1160M-GM	11.6	1.98			●	●	
			1170M-GM	11.7	2			●	●	
			1180M-GM	11.8	2.01			●	●	
			1190M-GM	11.9	2.03			●	●	
		DA	1200M-GM	12	2.03	0	+0.027	●	●	SF16-DRA120M-○ SS14-DRA120M-○
			1210M-GM	12.1	2.05			●	●	
			1220M-GM	12.2	2.07			●	●	
			1230M-GM	12.3	2.08			●	●	
			1240M-GM	12.4	2.1			●	●	

k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

Recommended cutting conditions ⇨ K28

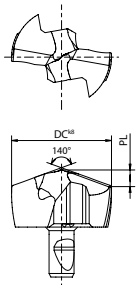
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DA drill heads are sold in 1 piece boxes

DRA drill heads (GM - General purpose)

					Carbon steel / Alloy steel	○	●	P
					Mold and die steel			
					Stainless steel	○	●	M
					Cast iron	●	○	K
					Non-ferrous metals			N
Drill head		Description			Dimension (mm)		Tolerance		Carbide		Applicable toolholder ⇒ K16~K19 K22~K26
					DC	PL	k8 (min.)	k8 (max.)	PVD PR1525	PVD PR1535	
		DA	1250M-GM		12.5	2.12	0	+0.027	●	●	SF16-DRA125M-○ SS14-DRA125M-○
			1260M-GM		12.6	2.14			●	●	
			1270M-GM		12.7	2.16			●	●	
			1280M-GM		12.8	2.17			●	●	
			1290M-GM		12.9	2.19			●	●	
		DA	1300M-GM		13	2.2	0	+0.027	●	●	SF16-DRA130M-○ SS14-DRA130M-○
			1310M-GM		13.1	2.22			●	●	
			1320M-GM		13.2	2.24			●	●	
			1330M-GM		13.3	2.25			●	●	
			1340M-GM		13.4	2.27			●	●	
		DA	1350M-GM		13.5	2.29	0	+0.027	●	●	SF16-DRA135M-○ SS14-DRA135M-○
			1360M-GM		13.6	2.31			●	●	
			1370M-GM		13.7	2.33			●	●	
			1380M-GM		13.8	2.35			●	●	
			1390M-GM		13.9	2.36			●	●	
		DA	1400M-GM		14	2.33	0	+0.027	●	●	SF16-DRA140M-○ SS16-DRA140M-○
			1410M-GM		14.1	2.34			●	●	
			1420M-GM		14.2	2.36			●	●	
			1430M-GM		14.3	2.38			●	●	
			1440M-GM		14.4	2.4			●	●	
		DA	1450M-GM		14.5	2.42	0	+0.027	●	●	SF16-DRA145M-○ SS16-DRA145M-○
			1460M-GM		14.6	2.43			●	●	
			1470M-GM		14.7	2.45			●	●	
			1480M-GM		14.8	2.47			●	●	
			1490M-GM		14.9	2.49			●	●	
		DA	1500M-GM		15	2.52	0	+0.027	●	●	SF20-DRA150M-○ SS16-DRA150M-○
			1510M-GM		15.1	2.54			●	●	
			1520M-GM		15.2	2.55			●	●	
			1530M-GM		15.3	2.57			●	●	
			1540M-GM		15.4	2.59			●	●	
			1550M-GM		15.5	2.61			●	●	
			1560M-GM		15.6	2.63			●	●	
			1570M-GM		15.7	2.65			●	●	
			1580M-GM		15.8	2.66			●	●	
			1590M-GM		15.9	2.68			●	●	
		DA	1600M-GM		16	2.69	0	+0.027	●	●	SF20-DRA160M-○ SS18-DRA160M-○
			1610M-GM		16.1	2.71			●	●	
			1620M-GM		16.2	2.73			●	●	
			1630M-GM		16.3	2.75			●	●	
			1640M-GM		16.4	2.76			●	●	
			1650M-GM		16.5	2.78			●	●	
			1660M-GM		16.6	2.8			●	●	
			1670M-GM		16.7	2.82			●	●	
			1680M-GM		16.8	2.84			●	●	
			1690M-GM		16.9	2.86			●	●	





General purpose

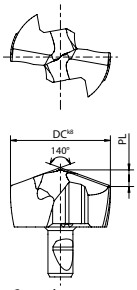
k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

Recommended cutting conditions ⇒ K28

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DA drill heads are sold in 1 piece boxes

DRA drill heads (GM - General purpose)

					Carbon steel / Alloy steel	○	●	P	
					Mold and die steel				
					Stainless steel	○	●	M	
					Cast iron	●	○	K	
					Non-ferrous metals			N	
Drill head		Description		Dimension (mm)		Tolerance		Carbide	Applicable toolholder ➡ K16~K19 K22~K26
				DC	PL	k8 (min.)	k8 (max.)	PVD PR1525	PVD PR1535	
		DA	1700M-GM	17	2.86	0	+0.027	●	●	SF20-DRA170M-○ SS18-DRA170M-○
			1710M-GM	17.1	2.88			●	●	
			1720M-GM	17.2	2.9			●	●	
			1730M-GM	17.3	2.92			●	●	
			1740M-GM	17.4	2.93			●	●	
			1750M-GM	17.5	2.95			●	●	
			1760M-GM	17.6	2.97			●	●	
			1770M-GM	17.7	2.99			●	●	
			1780M-GM	17.8	3.01			●	●	
			1790M-GM	17.9	3.03			●	●	
		DA	1800M-GM	18	3.04	0	+0.027	●	●	SF25-DRA180M-○ SS20-DRA180M-○
			1810M-GM	18.1	3.06		+0.033	●	●	
			1820M-GM	18.2	3.07		+0.033	●	●	
			1830M-GM	18.3	3.09		+0.033	●	●	
			1840M-GM	18.4	3.11		+0.033	●	●	
			1850M-GM	18.5	3.13		+0.033	●	●	
			1860M-GM	18.6	3.15		+0.033	●	●	
			1870M-GM	18.7	3.17		+0.033	●	●	
			1880M-GM	18.8	3.18		+0.033	●	●	
			1890M-GM	18.9	3.2		+0.033	●	●	
	 General purpose	DA	1900M-GM	19	3.21	0	+0.033	●	●	SF25-DRA190M-○ SS20-DRA190M-○
			1910M-GM	19.1	3.23			●	●	
			1920M-GM	19.2	3.25			●	●	
			1930M-GM	19.3	3.27			●	●	
			1940M-GM	19.4	3.29			●	●	
			1950M-GM	19.5	3.3			●	●	
			1960M-GM	19.6	3.32			●	●	
			1970M-GM	19.7	3.34			●	●	
			1980M-GM	19.8	3.36			●	●	
			1990M-GM	19.9	3.38			●	●	
		DA	2000M-GM	20	3.37	0	+0.033	●	●	SF25-DRA200M-○ SS25-DRA200M-○
			2010M-GM	20.1	3.39			●	●	
			2020M-GM	20.2	3.41			●	●	
			2030M-GM	20.3	3.43			●	●	
			2040M-GM	20.4	3.45			●	●	
			2050M-GM	20.5	3.46			●	●	
			2060M-GM	20.6	3.48			●	●	
			2070M-GM	20.7	3.5			●	●	
			2080M-GM	20.8	3.52			●	●	
			2090M-GM	20.9	3.54			●	●	
		DA	2100M-GM	21	3.54	0	+0.033	●	●	SF25-DRA210M-○ SS25-DRA210M-○
			2150M-GM	21.5	3.63			●	●	
		DA	2200M-GM	22	3.71	0	+0.033	●	●	SF25-DRA220M-○ SS25-DRA220M-○
			2250M-GM	22.5	3.8			●	●	
		DA	2300M-GM	23	3.87	0	+0.033	●	●	SF25-DRA230M-○ SS25-DRA230M-○
			2350M-GM	23.5	3.96			●	●	
		DA	2400M-GM	24	4.04	0	+0.033	●	●	SF25-DRA240M-○ SS25-DRA240M-○
			2450M-GM	24.5	4.13			●	●	
		DA	2500M-GM	25	4.2	0	+0.033	●	●	SF25-DRA250M-○ SS32-DRA250M-○
			2550M-GM	25.5	4.29			●	●	
		DA	2600M-GM	26	4.8	0	+0.033	●	●	SF32-DRA260M-○
			2650M-GM	26.5	4.9			●	●	

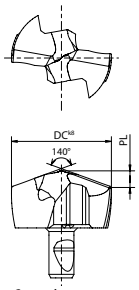
k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

Recommended cutting conditions ➡ K28

DA drill heads are sold in 1 piece boxes

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DRA drill heads (GM - General purpose)

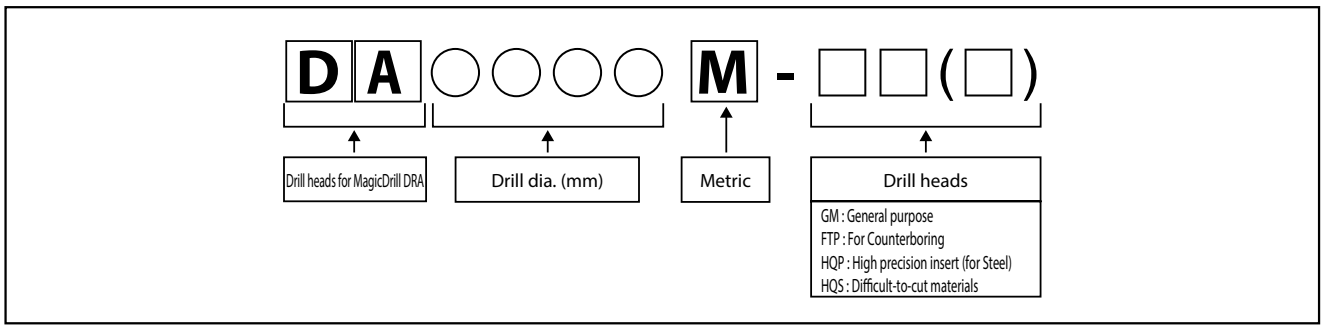
						Carbon steel / Alloy steel	○	●	P
						Mold and die steel			
						Stainless steel	○	●	M
						Cast iron	●	○	K
						Non-ferrous metals			N
Drill head		Description		Dimension (mm)		Tolerance		Carbide		Applicable toolholder ➡ K23~K25
				DC	PL	k8 (min.)	k8 (max.)	PVD PR1525	PVD PR1535	
		DA	2700M-GM	27	4.99	0	+0.033	●	●	SF32-DRA270M-○
			2750M-GM	27.5	5.09			●	●	
		DA	2800M-GM	28	4.73	0	+0.033	●	●	SF32-DRA280M-○
			2850M-GM	28.5	4.83			●	●	
		DA	2900M-GM	29	4.9	0	+0.033	●	●	SF32-DRA290M-○
			2950M-GM	29.5	5.01			●	●	
		DA	3000M-GM	30	5.07	0	+0.033	●	●	SF32-DRA300M-○
			3050M-GM	30.5	5.17		+0.039	●	●	
		DA	3100M-GM	31	5.26	0	+0.039	●	●	SF32-DRA310M-○
			3150M-GM	31.5	5.37			●	●	
		DA	3200M-GM	32	5.41	0	+0.039	●	●	SF32-DRA320M-○
			3250M-GM	32.5	5.51			●	●	
			3300M-GM	33	5.62			●	●	

General purpose

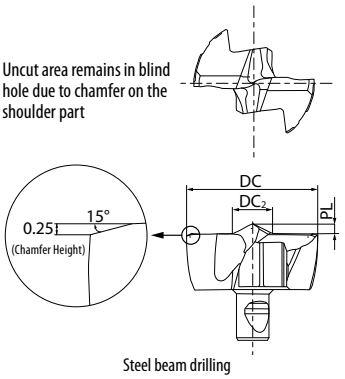
k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

Recommended cutting conditions ➡ K28

Description Identification System (Drill head)



DRA drill heads (FTP-H - steel beam drilling)

							Carbon steel / Alloy steel		●		P	
							Mold and die steel					
							Stainless steel		●		M	
							Cast iron		○		K	
							Non-ferrous metals				N	
Drill head			Description			Dimension (mm)			Tolerance		Carbide	Applicable toolholder ➡ K23~K25
						DC	DC_2	PL	k8 (min.)	k8 (max.)	PVD PR1535	
		DA	1400M-FTP-H	14	4.20	0.60					●	SS16-DRA140M-○ SF16-DRA140M-○
		DA	1600M-FTP-H	16	4.60	0.70	0		+0.027		●	SS18-DRA160M-○ SF20-DRA160M-○
		DA	1800M-FTP-H	18	5.00	0.80					●	SS20-DRA180M-○ SF25-DRA180M-○
		DA	2000M-FTP-H	20	5.70	0.90					●	SS25-DRA200M-○ SF25-DRA200M-○
		DA	2100M-FTP-H	21	6.00	0.95					●	SS25-DRA210M-○ SF25-DRA210M-○
		DA	2200M-FTP-H	22	6.40	1.00	0		+0.033		●	SS25-DRA220M-○ SF25-DRA220M-○
		DA	2400M-FTP-H	24	6.80	1.10					●	SS25-DRA240M-○ SF25-DRA240M-○
		DA	2600M-FTP-H	26	7.00	1.20					●	SF25-DRA250M-○ SS32-DRA250M-○

Uncut area remains in blind hole due to chamfer on the shoulder part

0.25 (Chamfer Height) 15° DC DC_2 PL

Steel beam drilling

k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.
Applicable to 1.5D ,3D ,5D and 8D holders, Prepared hole (0.5 x DC) is needed when using 8D holder

Please note that the insert DA2600M-FTP-H should be mounted on toolholder size S...-DRA250M-○ type only.

Recommended cutting conditions ➡ K28

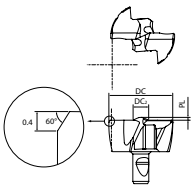
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DA drill heads are sold in 1 piece boxes

DRA drill heads (FTP - Counterboring)

Drill head		Description		Dimension (mm)			Tolerance		Carbide	Applicable toolholder ⇒ K16~K19 K22~K26
				DC	DC_2	PL	k8 (min.)	k8 (max.)	PVD	
									PR1525 PR1535	
		DA	0800M-FTP 0830M-FTP	8 8.3	2.9	0.4	0	+0.022	● ● ● ●	SF12-DRA080M-○ SS10-DRA080M-○
		DA	0850M-FTP 0880M-FTP	8.5 8.8	2.9	0.4	0	+0.022	● ● ● ●	SF12-DRA085M-○ SS10-DRA085M-○
		DA	0900M-FTP 0930M-FTP	9 9.3	3	0.43	0	+0.022	● ● ● ●	SF12-DRA090M-○ SS10-DRA090M-○
		DA	0950M-FTP	9.5	3	0.43	0	+0.022	● ●	SF12-DRA095M-○ SS10-DRA095M-○
		DA	1000M-FTP 1030M-FTP	10 10.3	3.3	0.46	0	+0.022 +0.027	● ● ● ●	SF16-DRA100M-○ SS12-DRA100M-○
		DA	1050M-FTP 1080M-FTP	10.5 10.8	3.3	0.46	0	+0.027	● ● ● ●	SF16-DRA105M-○ SS12-DRA105M-○
		DA	1100M-FTP	11	3.4	0.5	0	+0.027	● ●	SF16-DRA110M-○ SS12-DRA110M-○
		DA	1150M-FTP	11.5	3.4	0.5	0	+0.027	● ●	SF16-DRA115M-○ SS12-DRA115M-○
		DA	1200M-FTP	12	3.7	0.53	0	+0.027	● ●	SF16-DRA120M-○ SS14-DRA120M-○
		DA	1250M-FTP 1270M-FTP	12.5 12.7	3.7	0.53	0	+0.027	● ● ● ●	SF16-DRA125M-○ SS14-DRA125M-○
		DA	1300M-FTP	13	3.9	0.56	0	+0.027	● ●	SF16-DRA130M-○ SS14-DRA130M-○
		DA	1350M-FTP	13.5	3.9	0.56	0	+0.027	● ●	SF16-DRA135M-○ SS14-DRA135M-○
		DA	1400M-FTP	14	4.2	0.6	0	+0.027	● ●	SF16-DRA140M-○ SS16-DRA140M-○
		DA	1450M-FTP	14.5	4.2	0.6	0	+0.027	● ●	SF16-DRA145M-○ SS16-DRA145M-○
		DA	1500M-FTP 1550M-FTP	15 15.5	4.4	0.65	0	+0.027	● ● ● ●	SF20-DRA150M-○ SS16-DRA150M-○
		DA	1600M-FTP 1650M-FTP	16 16.5	4.6	0.7	0	+0.027	● ● ● ●	SF20-DRA160M-○ SS18-DRA160M-○
		DA	1700M-FTP 1750M-FTP	17 17.5	5	0.75	0	+0.027	● ● ● ●	SF20-DRA170M-○ SS18-DRA170M-○
		DA	1800M-FTP 1850M-FTP	18 18.5	5	0.8	0	+0.027 +0.033	● ● ● ●	SF25-DRA180M-○ SS20-DRA180M-○
		DA	1900M-FTP 1950M-FTP	19 19.5	5.3	0.85	0	+0.033	● ● ● ●	SF25-DRA190M-○ SS20-DRA190M-○
		DA	2000M-FTP 2050M-FTP	20 20.5	5.7	0.9	0	+0.033	● ● ● ●	SF25-DRA200M-○ SS25-DRA200M-○
		DA	2100M-FTP 2150M-FTP	21 21.5	6	0.95	0	+0.033	● ● ● ●	SF25-DRA210M-○ SS25-DRA210M-○
		DA	2200M-FTP 2250M-FTP	22 22.5	6.4	1	0	+0.033	● ● ● ●	SF25-DRA220M-○ SS25-DRA220M-○
		DA	2300M-FTP 2350M-FTP	23 23.5	6.6	1.05	0	+0.033	● ● ● ●	SF25-DRA230M-○ SS25-DRA230M-○
		DA	2400M-FTP 2450M-FTP	24 24.5	6.8	1.1	0	+0.033	● ● ● ●	SF25-DRA240M-○ SS25-DRA240M-○
		DA	2500M-FTP 2540M-FTP	25 25.4	7	1.2	0	+0.033	● ● ● ●	SF25-DRA250M-○ SS32-DRA250M-○





Counterboring

k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

Carbon steel / Alloy steel ○ ● P
Mold and die steel
Stainless steel ○ ● M
Cast iron ● ○ K
Non-ferrous metals N

Recommended cutting conditions ⇒ K28

DA drill heads are sold in 1 piece boxes

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Double margin type

High-precision drill heads for steel machining

PR1525

HQP

Drilling diameter ø7.94 ~ ø19.9

Special two-step bottom and double margin
Reduces shock for higher-precision machining of steel



For difficult-to-cut materials/ stainless steel machining

PR1535

HQS

Drilling diameter ø8.00 ~ ø19.5

Special two-step bottom and double margin
Improving stability of difficult-to-cut materials and stainless steel during machining operations

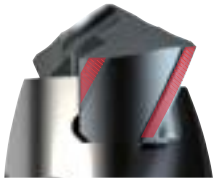


Special two-step bottom



Suppress sudden fracture when entering the workpiece
Improvement of cutting edge strength

Double margin



Optimized for difficult-to-cut materials machining
Improvement of heat resistance

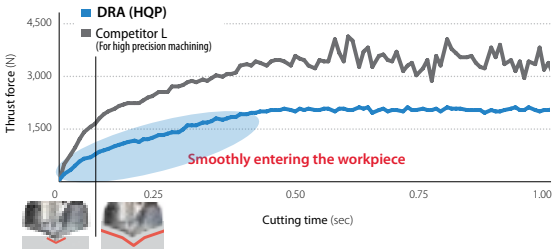
Unique flute shape



Superior chip control
Prevents damage to hole walls.
Excellent finished surface

High-precision drill heads for steel machining HQP

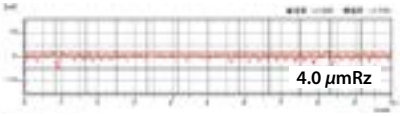
Cutting force comparison when entering the workpiece
(Internal evaluation)



Cutting conditions: Vc = 100 m/min, f = 0.25 mm/rev, H = 30 mm, Wet
Workpiece material: C50 ø16 (3D)

Hole wall surface finish comparison
(Internal evaluation)



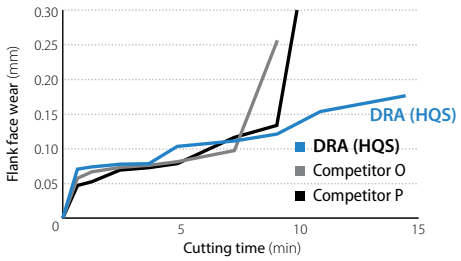


Cutting conditions: Vc = 100 m/min, f = 0.25 mm/rev, H = 80 mm, Wet
Workpiece material: C50 ø16 (5D)

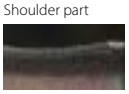
For difficult-to-cut materials/ stainless steel machining HQS

Inconel

Wear resistance comparison (Internal evaluation)



Shoulder part



Normal wear condition



Fracture on the shoulder of drill head

Chisel part



Good without fracture

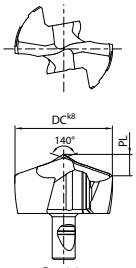


Fracture on the chisel

DRA (HQS) | Competitor O | DRA (HQS) | Competitor P

Cutting conditions: Vc = 20 m/min, f = 0.15 mm/rev, Drilling diameter ø14.5 (3D)
Drilling depth 40 mm, Wet (internal/external), Workpiece material: Inconel 718, BT50 M/C

DRA drill heads (HQP - Precision / for Carbon steel)

				Carbon steel / Alloy steel				●	P
				Mold and die steel					
				Stainless steel					M
				Cast iron					K
				Non-ferrous metals					N
Drill head		Description		Dimension (mm)		Tolerance		Carbide PVD PR1525	Applicable toolholder ⇒ K16~K19 K22~K26
				DC	PL	k8 (min.)	k8 (max.)		
	 Precision	DA	0794M-HQP	7.94	1.9	0	+0.022	●	SF12-DRA080M-○ SS10-DRA080M-○
			0800M-HQP	8	1.91			●	
			0810M-HQP	8.1	1.93			●	
			0820M-HQP	8.2	1.94			●	
			0830M-HQP	8.3	1.96			●	
			0840M-HQP	8.4	1.98			●	
		DA	0850M-HQP	8.5	1.99	0	+0.022	●	SF12-DRA085M-○ SS10-DRA085M-○
			0860M-HQP	8.6	2.01			●	
			0870M-HQP	8.7	2.03			●	
			0880M-HQP	8.8	2.05			●	
			0890M-HQP	8.9	2.06			●	
		DA	0900M-HQP	9	2.19	0	+0.022	●	SF12-DRA090M-○ SS10-DRA090M-○
			0910M-HQP	9.1	2.21			●	
			0920M-HQP	9.2	2.22			●	
			0930M-HQP	9.3	2.24			●	
			0940M-HQP	9.4	2.26			●	
		DA	0950M-HQP	9.5	2.27	0	+0.022	●	SF12-DRA095M-○ SS10-DRA095M-○
			0960M-HQP	9.6	2.29			●	
			0970M-HQP	9.7	2.31			●	
			0980M-HQP	9.8	2.32			●	
			0990M-HQP	9.9	2.34			●	
		DA	1000M-HQP	10	2.35	0	+0.022	●	SF16-DRA100M-○ SS12-DRA100M-○
			1010M-HQP	10.1	2.36		+0.027	●	
			1020M-HQP	10.2	2.38		+0.027	●	
			1030M-HQP	10.3	2.4		+0.027	●	
			1040M-HQP	10.4	2.41		+0.027	●	
		DA	1050M-HQP	10.5	2.43	0	+0.027	●	SF16-DRA105M-○ SS12-DRA105M-○
			1060M-HQP	10.6	2.44			●	
			1070M-HQP	10.7	2.46			●	
			1080M-HQP	10.8	2.47			●	
			1090M-HQP	10.9	2.49			●	
		DA	1100M-HQP	11	2.65	0	+0.027	●	SF16-DRA110M-○ SS12-DRA110M-○
			1110M-HQP	11.1	2.67			●	
			1120M-HQP	11.2	2.68			●	
			1130M-HQP	11.3	2.7			●	
			1140M-HQP	11.4	2.72			●	
		DA	1150M-HQP	11.5	2.73	0	+0.027	●	SF16-DRA115M-○ SS12-DRA115M-○
			1160M-HQP	11.6	2.75			●	
			1170M-HQP	11.7	2.76			●	
			1180M-HQP	11.8	2.78			●	
			1190M-HQP	11.9	2.8			●	
		DA	1200M-HQP	12	2.79	0	+0.027	●	SF16-DRA120M-○ SS14-DRA120M-○
			1210M-HQP	12.1	2.81			●	
			1220M-HQP	12.2	2.82			●	
			1230M-HQP	12.3	2.84			●	
			1240M-HQP	12.4	2.86			●	
		DA	1250M-HQP	12.5	2.87	0	+0.027	●	SF16-DRA125M-○ SS14-DRA125M-○
			1260M-HQP	12.6	2.89			●	
			1270M-HQP	12.7	2.91			●	
			1280M-HQP	12.8	2.92			●	
			1290M-HQP	12.9	2.94			●	

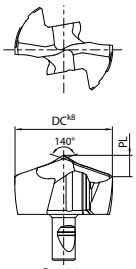
k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

Recommended cutting conditions ⇒ K29

DA drill heads are sold in 1 piece boxes

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DRA drill heads (HQP - Precision / for Carbon steel)

						Carbon steel / Alloy steel		●		P
						Mold and die steel				
						Stainless steel				M
						Cast iron				K
						Non-ferrous metals				N
Drill head			Description			Dimension (mm)		Tolerance		Carbide	Applicable toolholder ➡ K16~K19 K22~K26
						DC	PL	k8 (min.)	k8 (max.)	PVD / PR1525	
		DA	1300M-HQP			13	2.98	0	+0.027	●	SF16-DRA130M-○ SS14-DRA130M-○
			1310M-HQP			13.1	2.99			●	
			1320M-HQP			13.2	3.01			●	
			1330M-HQP			13.3	3.02			●	
			1340M-HQP			13.4	3.04			●	
		DA	1350M-HQP			13.5	3.06	0	+0.027	●	SF16-DRA135M-○ SS14-DRA135M-○
			1360M-HQP			13.6	3.07			●	
			1370M-HQP			13.7	3.09			●	
			1380M-HQP			13.8	3.1			●	
			1390M-HQP			13.9	3.12			●	
		DA	1400M-HQP			14	3.11	0	+0.027	●	SF16-DRA140M-○ SS16-DRA140M-○
			1410M-HQP			14.1	3.12			●	
			1420M-HQP			14.2	3.14			●	
			1430M-HQP			14.3	3.16			●	
			1440M-HQP			14.4	3.17			●	
		DA	1450M-HQP			14.5	3.19	0	+0.027	●	SF16-DRA145M-○ SS16-DRA145M-○
			1460M-HQP			14.6	3.21			●	
			1470M-HQP			14.7	3.22			●	
			1480M-HQP			14.8	3.24			●	
			1490M-HQP			14.9	3.25			●	
	 Precision	DA	1500M-HQP			15	3.33	0	+0.027	●	SF20-DRA150M-○ SS16-DRA150M-○
			1510M-HQP			15.1	3.35			●	
			1520M-HQP			15.2	3.36			●	
			1530M-HQP			15.3	3.38			●	
			1540M-HQP			15.4	3.39			●	
			1550M-HQP			15.5	3.41			●	
			1560M-HQP			15.6	3.42			●	
			1570M-HQP			15.7	3.44			●	
			1580M-HQP			15.8	3.46			●	
			1590M-HQP			15.9	3.47			●	
		DA	1600M-HQP			16	3.55	0	+0.027	●	SF20-DRA160M-○ SS18-DRA160M-○
			1610M-HQP			16.1	3.57			●	
			1620M-HQP			16.2	3.58			●	
			1630M-HQP			16.3	3.6			●	
			1640M-HQP			16.4	3.62			●	
			1650M-HQP			16.5	3.63			●	
			1660M-HQP			16.6	3.65			●	
			1670M-HQP			16.7	3.66			●	
			1680M-HQP			16.8	3.68			●	
			1690M-HQP			16.9	3.69			●	
		DA	1700M-HQP			17	3.73	0	+0.027	●	SF20-DRA170M-○ SS18-DRA170M-○
			1710M-HQP			17.1	3.75			●	
			1720M-HQP			17.2	3.77			●	
			1730M-HQP			17.3	3.78			●	
			1740M-HQP			17.4	3.8			●	
			1750M-HQP			17.5	3.81			●	
			1760M-HQP			17.6	3.83			●	
			1770M-HQP			17.7	3.84			●	
			1780M-HQP			17.8	3.86			●	
			1790M-HQP			17.9	3.88			●	

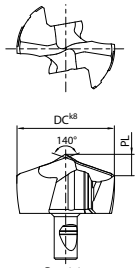
k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

Recommended cutting conditions ➡ K29

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DA drill heads are sold in 1 piece boxes

DRA drill heads (HQP - Precision / for Carbon steel)

						Carbon steel / Alloy steel		●		P
						Mold and die steel				
						Stainless steel				M
						Cast iron				K
						Non-ferrous metals				N
Drill head		Description			Dimension (mm)		Tolerance		Carbide PVD PR1525	Applicable toolholder ⇒ K16~K19 K22~K26
					DC	PL	k8 (min.)	k8 (max.)		
	 Precision	DA	1800M-HQP		18	3.97	0	+0.027	●	SF25-DRA180M-○ SS20-DRA180M-○
			1810M-HQP		18.1	3.98		+0.033	●	
			1820M-HQP		18.2	4		+0.033	●	
			1830M-HQP		18.3	4.02		+0.033	●	
			1840M-HQP		18.4	4.03		+0.033	●	
			1850M-HQP		18.5	4.05		+0.033	●	
			1860M-HQP		18.6	4.06		+0.033	●	
			1870M-HQP		18.7	4.08		+0.033	●	
			1880M-HQP		18.8	4.09		+0.033	●	
			1890M-HQP		18.9	4.11		+0.033	●	
		DA	1900M-HQP		19	4.2	0	+0.033	●	SF25-DRA190M-○ SS20-DRA190M-○
			1910M-HQP		19.1	4.22			●	
			1920M-HQP		19.2	4.23			●	
			1930M-HQP		19.3	4.25			●	
			1940M-HQP		19.4	4.26			●	
			1950M-HQP		19.5	4.28			●	
			1960M-HQP		19.6	4.29			●	
			1970M-HQP		19.7	4.31			●	
			1980M-HQP		19.8	4.33			●	
			1990M-HQP		19.9	4.34			●	

k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

Recommended cutting conditions ⇒ K29

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

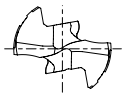
DA drill heads are sold in 1 piece boxes

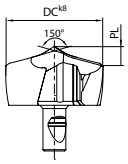
DRA drill heads (HQS - For difficult-to-cut materials / stainless steel)

						Carbon steel / Alloy steel				P
						Mold and die steel				
						Stainless steel			●	M
						Cast iron				K
						Non-ferrous metals				N
Drill head			Description			Dimension (mm)		Tolerance		Carbide
						DC	PL	k8 (min.)	k8 (max.)	PVD / PR1535
		DA	0800M-HQS			8	1.76	0	+0.022	●
			0820M-HQS			8.2	1.78			●
		DA	0850M-HQS			8.5	1.82	0	+0.022	●
			0870M-HQS			8.7	1.85			●
			0880M-HQS			8.8	1.86			●
		DA	0900M-HQS			9	1.97	0	+0.022	●
			0930M-HQS			9.3	2.01			●
			0940M-HQS			9.4	2.02			●
		DA	0950M-HQS			9.5	2.03	0	+0.022	●
			0970M-HQS			9.7	2.05			●
			0980M-HQS			9.8	2.06			●
		DA	1000M-HQS			10	2.17	0	+0.022	●
			1030M-HQS			10.3	2.21		+0.027	●
			1040M-HQS			10.4	2.22		+0.027	●
		DA	1050M-HQS			10.5	2.23	0	+0.027	●
			1080M-HQS			10.8	2.27			●
		DA	1100M-HQS			11	2.38	0	+0.027	●
		DA	1150M-HQS			11.5	2.44	0	+0.027	●
		DA	1200M-HQS			12	2.5	0	+0.027	●
		DA	1250M-HQS			12.5	2.57	0	+0.027	●
			1260M-HQS			12.6	2.58			●
		DA	1300M-HQS			13	2.68	0	+0.027	●
		DA	1350M-HQS			13.5	2.74	0	+0.027	●
			1390M-HQS			13.9	2.78			●
		DA	1400M-HQS			14	2.79	0	+0.027	●
			1420M-HQS			14.2	2.81			●
		DA	1450M-HQS			14.5	2.85	0	+0.027	●
		DA	1500M-HQS			15	2.96	0	+0.027	●
			1520M-HQS			15.2	2.99			●
			1530M-HQS			15.3	3			●
			1550M-HQS			15.5	3.02			●
			1570M-HQS			15.7	3.04			●
		DA	1600M-HQS			16	3.18	0	+0.027	●
			1610M-HQS			16.1	3.2			●
			1620M-HQS			16.2	3.21			●
			1630M-HQS			16.3	3.22			●
			1650M-HQS			16.5	3.25			●
		DA	1700M-HQS			17	3.38	0	+0.027	●
			1750M-HQS			17.5	3.44			●
			1770M-HQS			17.7	3.46			●
		DA	1800M-HQS			18	3.59	0	+0.027	●
			1810M-HQS			18.1	3.6		+0.033	●
			1850M-HQS			18.5	3.65		+0.033	●
		DA	1900M-HQS			19	3.79	0	+0.033	●
			1930M-HQS			19.3	3.82			●
			1950M-HQS			19.5	3.84			●

Applicable toolholder ➡ K16~K19 K22~K26
SF12-DRA080M-○ SS10-DRA080M-○
SF12-DRA085M-○ SS10-DRA085M-○
SF12-DRA090M-○ SS10-DRA090M-○
SF12-DRA095M-○ SS10-DRA095M-○
SF16-DRA100M-○ SS12-DRA100M-○
SF16-DRA105M-○ SS12-DRA105M-○
SF16-DRA110M-○ SS12-DRA110M-○
SF16-DRA115M-○ SS12-DRA115M-○
SF16-DRA120M-○ SS14-DRA120M-○
SF16-DRA125M-○ SS14-DRA125M-○
SF16-DRA130M-○ SS14-DRA130M-○
SF16-DRA135M-○ SS14-DRA135M-○
SF16-DRA140M-○ SS16-DRA140M-○
SF16-DRA145M-○ SS16-DRA145M-○
SF20-DRA150M-○ SS16-DRA150M-○
SF20-DRA160M-○ SS18-DRA160M-○
SF20-DRA170M-○ SS18-DRA170M-○
SF25-DRA180M-○ SS20-DRA180M-○
SF25-DRA190M-○ SS20-DRA190M-○







Difficult-to-cut materials

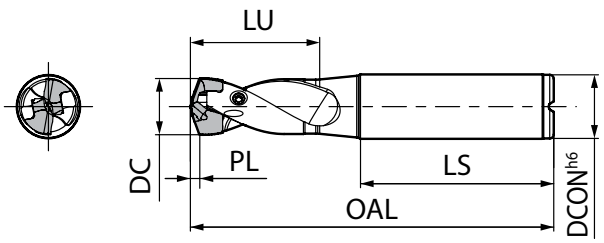
k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

Recommended cutting conditions ➡ K29

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DA drill heads are sold in 1 piece boxes

SS-DRA (Drilling depth : 1.5 x DC)



1.5D

For PL indicates distance from drill point to corner edge **K6~K15**

Toolholder dimensions

Description		Availability	Dimension (mm)						Coolant hole	Spare parts			Applicable drill heads K6~K15	Applicable chamfering attachment K20
			DC min.	DC max.	DCON	OAL	LU	LS		Screw	Wrench	Wrench		
SS10-	DRA080M-1.5	●	7.94	8.49	10	66.2	12.8	40	Yes	HS-2524TRP	-	FTP-5	DA0794M-...~DA0840M-...	S20-CH10-DRA
	DRA085M-1.5	●	8.5	8.99		67.5	13.5						DA0850M-...~DA0890M-...	
	DRA090M-1.5	●	9	9.49		68.7	14.3						DA0900M-...~DA0940M-...	
	DRA095M-1.5	●	9.5	9.99		70	15						DA0950M-...~DA0990M-...	
SS12-	DRA100M-1.5	●	10	10.49	12	76.2	15.8	45	Yes	HS-2534TRP	-	FTP-5	DA1000M-...~DA1040M-...	S32-CH12-DRA
	DRA105M-1.5	●	10.5	10.99		77.5	16.5						DA1050M-...~DA1090M-...	
	DRA110M-1.5	●	11	11.49		79.7	17.3						DA1100M-...~DA1140M-...	
	DRA115M-1.5	●	11.5	11.99		81	18						DA1150M-...~DA1190M-...	
SS14-	DRA120M-1.5	●	12	12.49	14	82.2	18.8	45	Yes	HS-2534TRP	-	FTP-5	DA1200M-...~DA1240M-...	S32-CH14-DRA
	DRA125M-1.5	●	12.5	12.99		83.5	19.5						DA1250M-...~DA1290M-...	
	DRA130M-1.5	●	13	13.49		84.7	20.3						DA1300M-...~DA1340M-...	
	DRA135M-1.5	●	13.5	13.99		86	21						DA1350M-...~DA1390M-...	
SS16-	DRA140M-1.5	●	14	14.49	16	90.2	21.8	48	Yes	HS-3048TRP	DTP-6	-	DA1400M-...~DA1440M-...	S32-CH16-DRA
	DRA145M-1.5	●	14.5	14.99		91.5	22.5						DA1450M-...~DA1490M-...	
	DRA150M-1.5	●	15	15.99		95	24						DA1500M-...~DA1590M-...	
SS18-	DRA160M-1.5	●	16	16.99	18	98.5	25.5	48	Yes	HS-3048TRP	DTP-6	-	DA1600M-...~DA1690M-...	S32-CH18-DRA
	DRA170M-1.5	●	17	17.99		101	27						DA1700M-...~DA1790M-...	
SS20-	DRA180M-1.5	●	18	18.99	20	106.5	28.5	50	Yes	HS-4067TRP	DTP-7	-	DA1800M-...~DA1890M-...	S32-CH20-DRA
	DRA190M-1.5	●	19	19.99		109	30						DA1900M-...~DA1990M-...	
SS25-	DRA200M-1.5	●	20	20.99	25	117.5	31.5	56	Yes	HS-4067TRP	DTP-7	-	DA2000M-...~DA2090M-...	-
	DRA210M-1.5	●	21	21.99		120	33						DA2100M-...~DA2150M-...	
	DRA220M-1.5	●	22	22.99		123.5	34.5						DA2200M-...~DA2250M-...	
	DRA230M-1.5	●	23	23.99		126	36						DA2300M-...~DA2350M-...	
	DRA240M-1.5	●	24	24.99		128.5	37.5						DA2400M-...~DA2450M-...	
SS32-	DRA250M-1.5	●	25	25.5	32	135	39	60	Yes	HS-4067TRP	DTP-7	-	DA2500M-...~DA2550M-...	-

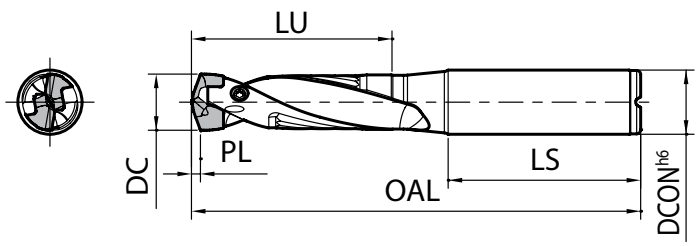
Description Identification System (Toolholder)

□□○○ - DRA ○○○ M - ○

Shank type	Shank dia.(mm)	Minimum drill head dia.	Metric	Drilling depth
SS : Straight Shank SF : Flanged Shank				1.5(LU ≒ 1.5 x DC) 3 (LU ≒ 3 x DC) 5 (LU ≒ 5 x DC) 8 (LU ≒ 8 x DC) 12 (LU ≒ 12 x DC)

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SS-DRA (Drilling depth : 3 x DC)



3D

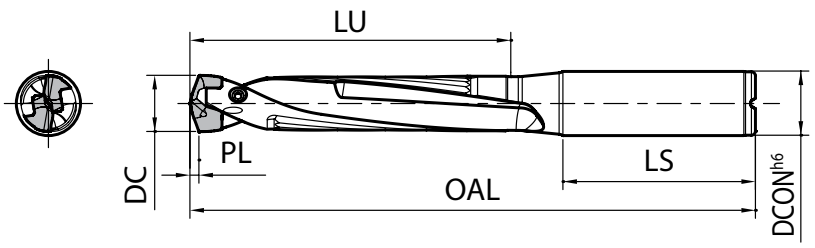
For PL indicates distance from drill point to corner edge **K6~K15**

Toolholder dimensions

Description		Availability	Dimension (mm)						Coolant hole	Spare parts			Applicable drill heads ⇨ K6~K15	Applicable chamfering attachment ⇨ K20
			DC min.	DC max.	DCON	OAL	LU	LS		Screw	Wrench	Wrench		
SS10-	DRA080M-3	●	7.94	8.49	10	79	25.5	40	Yes	HS-2524TRP	-	FTP-5	DA0794M-...~DA0840M-...	S20-CH10-DRA
	DRA085M-3	●	8.5	8.99		81	27						DA0850M-...~DA0890M-...	
	DRA090M-3	●	9	9.49		83	28.5						DA0900M-...~DA0940M-...	
	DRA095M-3	●	9.5	9.99		85	30						DA0950M-...~DA0990M-...	
SS12-	DRA100M-3	●	10	10.49	12	92	31.5	45	Yes	HS-2534TRP	-	FTP-5	DA1000M-...~DA1040M-...	S32-CH12-DRA
	DRA105M-3	●	10.5	10.99		94	33						DA1050M-...~DA1090M-...	
	DRA110M-3	●	11	11.49		97	34.5						DA1100M-...~DA1140M-...	
	DRA115M-3	●	11.5	11.99		99	36						DA1150M-...~DA1190M-...	
SS14-	DRA120M-3	●	12	12.49	14	101	37.5	45	Yes	HS-2534TRP	-	FTP-5	DA1200M-...~DA1240M-...	S32-CH14-DRA
	DRA125M-3	●	12.5	12.99		103	39						DA1250M-...~DA1290M-...	
	DRA130M-3	●	13	13.49		105	40.5						DA1300M-...~DA1340M-...	
	DRA135M-3	●	13.5	13.99		107	42						DA1350M-...~DA1390M-...	
SS16-	DRA140M-3	●	14	14.49	16	112	43.5	48	Yes	HS-3048TRP	DTP-6	-	DA1400M-...~DA1440M-...	S32-CH16-DRA
	DRA145M-3	●	14.5	14.99		114	45						DA1450M-...~DA1490M-...	
	DRA150M-3	●	15	15.99		119	48						DA1500M-...~DA1590M-...	
SS18-	DRA160M-3	●	16	16.99	18	124	51	48	Yes	HS-3048TRP	DTP-6	-	DA1600M-...~DA1690M-...	S32-CH18-DRA
	DRA170M-3	●	17	17.99		128	54						DA1700M-...~DA1790M-...	
SS20-	DRA180M-3	●	18	18.99	20	135	57	50	Yes	HS-4067TRP	DTP-7	-	DA1800M-...~ DA1890M-...	S32-CH20-DRA
	DRA190M-3	●	19	19.99		139	60						DA1900M-...~DA1990M-...	
SS25-	DRA200M-3	●	20	20.99	25	149	63	56	Yes	HS-4067TRP	DTP-7	-	DA2000M-...~DA2090M-...	-
	DRA210M-3	●	21	21.99		153	66						DA2100M-...~DA2150M-...	
	DRA220M-3	●	22	22.99		158	69						DA2200M-...~DA2250M-...	
	DRA230M-3	●	23	23.99		162	72						DA2300M-...~DA2350M-...	
	DRA240M-3	●	24	24.99		166	75						DA2400M-...~DA2450M-...	
SS32-	DRA250M-3	●	25	25.5	32	174	78	60	Yes	HS-4067TRP	DTP-7	-	DA2500M-...~DA2550M-...	-

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SS-DRA (Drilling depth : 5 x DC)



5D

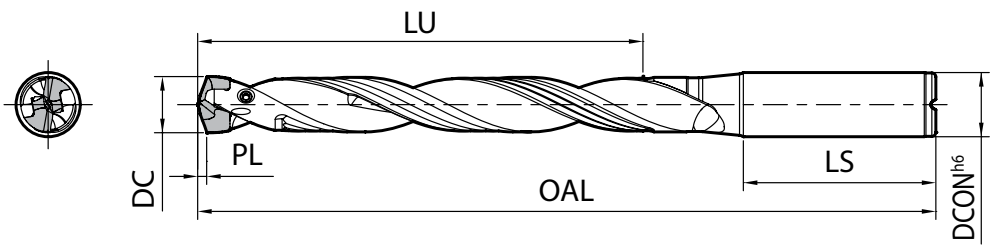
For PL indicates distance from drill point to corner edge **K6~K15**

Toolholder dimensions

Description		Availability	Dimension (mm)						Coolant hole	Spare parts			Applicable drill heads K6~K15	Applicable chamfering attachment K20
			DC min.	DC max.	DCON	OAL	LU	LS		Screw	Wrench	Wrench		
SS10-	DRA080M-5	●	7.94	8.49	10	96	42.5	40	Yes	HS-2524TRP	-	FTP-5	DA0794M-...~DA0840M-...	S20-CH10-DRA
	DRA085M-5	●	8.5	8.99		99	45						DA0850M-...~DA0890M-...	
	DRA090M-5	●	9	9.49		102	47.5						DA0900M-...~DA0940M-...	
	DRA095M-5	●	9.5	9.99		105	50						DA0950M-...~DA0990M-...	
SS12-	DRA100M-5	●	10	10.49	12	113	52.5	45	Yes	HS-2534TRP	-	FTP-5	DA1000M-...~DA1040M-...	S32-CH12-DRA
	DRA105M-5	●	10.5	10.99		116	55						DA1050M-...~DA1090M-...	
	DRA110M-5	●	11	11.49		120	57.5						DA1100M-...~DA1140M-...	
	DRA115M-5	●	11.5	11.99		123	60						DA1150M-...~DA1190M-...	
SS14-	DRA120M-5	●	12	12.49	14	126	62.5	45	Yes	HS-2534TRP	-	FTP-5	DA1200M-...~DA1240M-...	S32-CH14-DRA
	DRA125M-5	●	12.5	12.99		129	65						DA1250M-...~DA1290M-...	
	DRA130M-5	●	13	13.49		132	67.5						DA1300M-...~DA1340M-...	
	DRA135M-5	●	13.5	13.99		135	70						DA1350M-...~DA1390M-...	
SS16-	DRA140M-5	●	14	14.49	16	141	72.5	48	Yes	HS-3048TRP	DTP-6	-	DA1400M-...~DA1440M-...	S32-CH16-DRA
	DRA145M-5	●	14.5	14.99		144	75						DA1450M-...~DA1490M-...	
	DRA150M-5	●	15	15.99		151	80						DA1500M-...~DA1590M-...	
SS18-	DRA160M-5	●	16	16.99	18	158	85	48	Yes	HS-3048TRP	DTP-6	-	DA1600M-...~DA1690M-...	S32-CH18-DRA
	DRA170M-5	●	17	17.99		164	90						DA1700M-...~DA1790M-...	
SS20-	DRA180M-5	●	18	18.99	20	173	95	50	Yes	HS-4067TRP	DTP-7	-	DA1800M-...~DA1890M-...	S32-CH20-DRA
	DRA190M-5	●	19	19.99		179	100						DA1900M-...~DA1990M-...	
SS25-	DRA200M-5	●	20	20.99	25	191	105	56	Yes	HS-4067TRP	DTP-7	-	DA2000M-...~DA2090M-...	-
	DRA210M-5	●	21	21.99		197	110						DA2100M-...~DA2150M-...	
	DRA220M-5	●	22	22.99		204	115						DA2200M-...~DA2250M-...	
	DRA230M-5	●	23	23.99		210	120						DA2300M-...~DA2350M-...	
	DRA240M-5	●	24	24.99		216	125						DA2400M-...~DA2450M-...	
SS32-	DRA250M-5	●	25	25.5	32	226	130	60	Yes	HS-4067TRP	DTP-7	-	DA2500M-...~DA2550M-...	-

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SS-DRA (Drilling depth : 8 x DC)



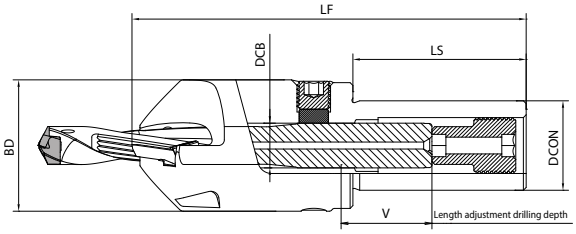
For PL indicates distance from drill point to corner edge **K6~K15**

Toolholder dimensions

Description		Availability	Dimension (mm)						Coolant hole	Spare parts			Applicable drill heads K6~K15	Applicable chamfering attachment K20
			DC min.	DC max.	DCON	OAL	LU	LS		Screw	Wrench	Wrench		
SS10-	DRA080M-8	●	7.94	8.49	10	121	68	40	Yes	HS-2524TRP	-	FTP-5	DA0794M-...~DA0840M-...	S20-CH10-DRA
	DRA085M-8	●	8.5	8.99		126	72						DA0850M-...~DA0890M-...	
	DRA090M-8	●	9	9.49		130	76						DA0900M-...~DA0940M-...	
	DRA095M-8	●	9.5	9.99		135	80						DA0950M-...~DA0990M-...	
SS12-	DRA100M-8	●	10	10.49	12	144	84	45	Yes	HS-2534TRP	-	FTP-5	DA1000M-...~DA1040M-...	S32-CH12-DRA
	DRA105M-8	●	10.5	10.99		149	88						DA1050M-...~DA1090M-...	
	DRA110M-8	●	11	11.49		154	92						DA1100M-...~DA1140M-...	
	DRA115M-8	●	11.5	11.99		159	96						DA1150M-...~DA1190M-...	
SS14-	DRA120M-8	●	12	12.49	14	163	100	45	Yes	HS-2534TRP	-	FTP-5	DA1200M-...~DA1240M-...	S32-CH14-DRA
	DRA125M-8	●	12.5	12.99		168	104						DA1250M-...~DA1290M-...	
	DRA130M-8	●	13	13.49		172	108						DA1300M-...~DA1340M-...	
	DRA135M-8	●	13.5	13.99		177	112						DA1350M-...~DA1390M-...	
SS16-	DRA140M-8	●	14	14.49	16	184	116	48	Yes	HS-3048TRP	DTP-6	-	DA1400M-...~DA1440M-...	S32-CH16-DRA
	DRA145M-8	●	14.5	14.99		189	120						DA1450M-...~DA1490M-...	
	DRA150M-8	●	15	15.99		199	128						DA1500M-...~DA1590M-...	
SS18-	DRA160M-8	●	16	16.99	18	209	136	48	Yes	HS-3048TRP	DTP-6	-	DA1600M-...~DA1690M-...	S32-CH18-DRA
	DRA170M-8	●	17	17.99		218	144						DA1700M-...~DA1790M-...	
SS20-	DRA180M-8	●	18	18.99	20	230	152	50	Yes	HS-4067TRP	DTP-7	-	DA1800M-...~DA1890M-...	S32-CH20-DRA
	DRA190M-8	●	19	19.99		239	160						DA1900M-...~DA1990M-...	
SS25-	DRA200M-8	●	20	20.99	25	254	168	56	Yes	HS-4067TRP	DTP-7	-	DA2000M-...~DA2090M-...	-
	DRA210M-8	●	21	21.99		263	176						DA2100M-...~DA2150M-...	
	DRA220M-8	●	22	22.99		273	184						DA2200M-...~DA2250M-...	
	DRA230M-8	●	23	23.99		282	192						DA2300M-...~DA2350M-...	
	DRA240M-8	●	24	24.99		291	200						DA2400M-...~DA2450M-...	
SS32-	DRA250M-8	●	25	25.5	32	304	208	60	Yes	HS-4067TRP	DTP-7	-	DA2500M-...~DA2550M-...	-

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

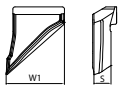
Chamfering attachment



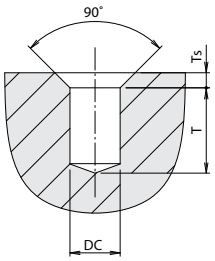
Dimensions

Description	Availability	Applicable drill shank dia. (mm) DCB	Dimension (mm)					Applicable inserts
			DCON	BD	LF	LS	V(Max.)	
S20-CH10-DRA	●	10	20	39	110	52	18	CT12T3-45DA
S32-CH12-DRA	●	12	32	43	130	62	24	
S32-CH14-DRA	●	14	32	45	130	62	24	
S32-CH16-DRA	●	16	32	47	141	62	24	
S32-CH18-DRA	●	18	32	49	145	62	24	
S32-CH20-DRA	●	20	32	53	150	62	24.5	

Applicable inserts

Insert		Description	MEGACOAT NANO	Dimension (mm)	
			PR1535	W1	S
		CT12T3-45DA	●	13.54	3.97

Drilling depth and chamfering dimension



Drill dia. (mm) DC		Drilling depth (mm)						Chamfering dimension (mm)		Applicable chamfering holder
		T (3D Drill)		T (5D Drill)		T (8D Drill)				
min.	max.	min.	max.	min.	max.	min.	max.	Ts	Ts max.	
7.94	8.49	12.5	20	18	36	43	60	2.5	8	S20-CH10-DRA
8.50	8.99	12.5	21.5	21.5	38.5	48	64			
9.00	9.49	12.5	23	24	41	52	68			
9.50	9.99	12.5	24.5	27.5	43.5	57.5	72.5			
10.00	10.49	15.5	26	22	46	52	76	4	8	S32-CH12-DRA
10.50	10.99	16	27.5	24.5	48.5	56	80			
11.00	11.49	16.5	29	27	51	60	84			
11.50	11.99	17.5	30.5	29.5	53.5	64	88			
12.00	12.49	18	32	32	56	68	92	4	8	S32-CH14-DRA
12.50	12.99	19	34	35	59	72.5	96.5			
13.00	13.49	19.5	35.5	37.5	61.5	76	100			
13.50	13.99	20	36.5	39.5	63.5	80	104			
14.00	14.49	21	38.5	42.5	66.5	84.5	108.5	4	8	S32-CH16-DRA
14.50	14.99	21.5	40	45	69	88.5	112.5			
15.00	15.99	22.5	41.5	47.5	71.5	92.5	116.5			
16.00	16.99	24	44.5	52.5	76.5	100.5	124.5	4	8	S32-CH18-DRA
17.00	17.99	25.5	47.5	57.5	81.5	108.5	132.5			
18.00	18.99	27.5	51	64	87	121	141	4	8	S32-CH20-DRA
19.00	19.99	29.5	54	69	92	129	149			

Ts: Maximum chamfer depth with recommended cutting conditions for DRA
Ts max. : Adjusting cutting conditions, such as reducing feed to 50% and/or lower cutting speed, is required.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Spare parts

Chamfering holder	Adjustment screw		For fixing drills					For mounting inserts		
			Clamp	Clamp screw			Plunge screw	Clamp	Clamp screw	Wrench
Description		Hexagon hole two side widths (mm)			Hexagon hole two side widths (mm)	Tightening torque (N·m)				
S20-CH10-DRA	AJ-12X22	6	CP-CH10	HS8X8	4	12	BNP6	C09N	W6X18N	DTM-15
S32-CH12-DRA	AJ-16X30		CP-CH12			15				
S32-CH14-DRA	AJ-20X30	8	CP-CH14	HS10X10	5	20				
S32-CH16-DRA			CP-CH16	HS12X10	6	30				
S32-CH18-DRA	AJ-22X35	10	CP-CH18			30				
S32-CH20-DRA			CP-CH20	HS16X10	8	45				

Method to use DRA chamfering attachment

1. Mount DRA drill into the chamfering attachment.



Fig. 1 Install the DRA

2. Install an insert and tighten temporarily with clearance between the cutting edge and DRA body.

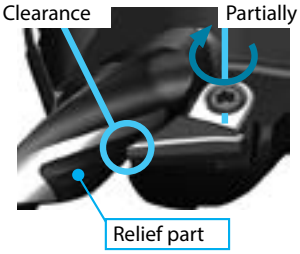


Fig. 2 Install inserts

3. Adjust drilling depth by turning adjustment screw with hexagon wrench

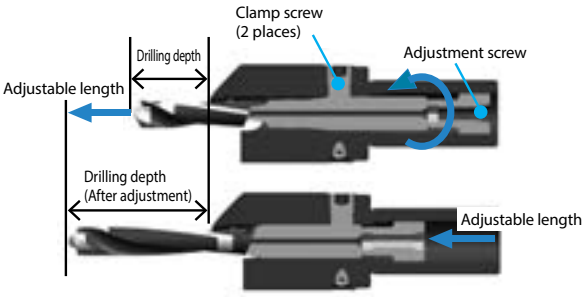


Fig. 3 Adjustment of drilling depth

4. Align the flute edge and black relief part of the drill to the position shown in Fig.4 by rotating the DRA drill.

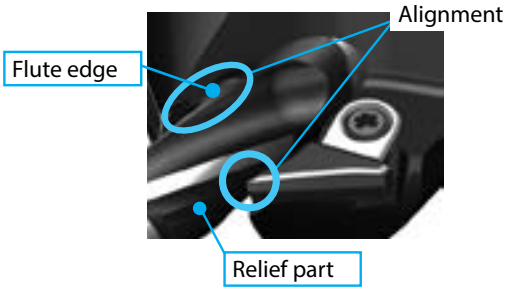


Fig. 4 DRA alignment

5. Fasten the two clamp screws for DRA
(See Table 1. for recommended torque)

Table 1 Recommended torque

Chamfering attachment	Clamp screw	
	Recommended torque (N·m)	Hexagon hole two side widths (mm)
S20-CH10-DRA	12	4
S32-CH12-DRA	15	
S32-CH14-DRA	20	5
S32-CH16-DRA	30	6
S32-CH18-DRA	30	
S32-CH20-DRA	45	8

6. Tighten the inserts while lightly pressing the edge of insert against the relief part.
(Recommended torque 3.5N·m)

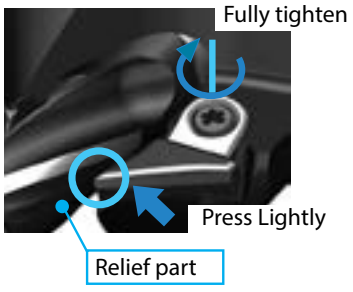
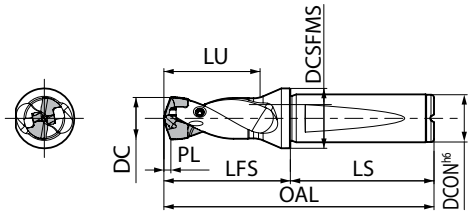


Fig. 5 Fully tighten

Cautions

- Chamfering attachment is dedicated for straight shank SS-DRA.
- It cannot be used for flanged shank SF-DRA.
- Chamfering requires two chamfering inserts. Using one insert is not recommended.
- Only fully remove clamp screws when replacing them.
- Clamps and clamp screws for mounting inserts need to be replaced regularly
- Screw locking adhesive is applied to adjustment screw. The effect will eventually wear off if the screws are used for a long time. Regular replacement isr ecommended.
- Please do not operate the plunge screws.

SF-DRA (Drilling depth : 1.5 x DC)



1.5D

For PL indicates distance from drill point to corner edge **K6~K15**

Toolholder dimensions

Description		Availability	Dimension (mm)								Coolant hole	Spare parts			Applicable drill heads K6~K15
			DC min.	DC max.	DCON	OAL	LFS	LU	LS	DCSFMS		Screw	Wrench	Wrench	
SF12-	DRA080M-1.5	●	7.94	8.49	12	71.2	26.2	12.8	45	16	Yes	HS-2524TRP	-	FTP-5	DA0794M-...~DA0840M-...
	DRA085M-1.5	●	8.5	8.99		72.5	27.5	13.5							DA0850M-...~DA0890M-...
	DRA090M-1.5	●	9	9.49		73.7	28.7	14.3							DA0900M-...~DA0940M-...
	DRA095M-1.5	●	9.5	9.99		75	30	15							DA0950M-...~DA0990M-...
SF16-	DRA100M-1.5	●	10	10.49	16	79.2	31.2	15.8	48	20	Yes	HS-2534TRP	-	FTP-5	DA1000M-...~DA1040M-...
	DRA105M-1.5	●	10.5	10.99		80.5	32.5	16.5							DA1050M-...~DA1090M-...
	DRA110M-1.5	●	11	11.49		82.7	34.7	17.3							DA1100M-...~DA1140M-...
	DRA115M-1.5	●	11.5	11.99		84	36	18							DA1150M-...~DA1190M-...
	DRA120M-1.5	●	12	12.49		85.2	37.2	18.8							DA1200M-...~DA1240M-...
	DRA125M-1.5	●	12.5	12.99		86.5	38.5	19.5							DA1250M-...~DA1290M-...
	DRA130M-1.5	●	13	13.49		87.7	39.7	20.3							DA1300M-...~DA1340M-...
	DRA135M-1.5	●	13.5	13.99		89	41	21							DA1350M-...~DA1390M-...
	DRA140M-1.5	●	14	14.49		90.2	42.2	21.8				HS-3048TRP	DTP-6	-	DA1400M-...~DA1440M-...
	DRA145M-1.5	●	14.5	14.99		91.5	43.5	22.5							DA1450M-...~DA1490M-...
SF20-	DRA150M-1.5	●	15	15.99	20	97	47	24	50	25	Yes	HS-3048TRP	DTP-6	-	DA1500M-...~DA1590M-...
	DRA160M-1.5	●	16	16.99		100.5	50.5	25.5							DA1600M-...~DA1690M-...
	DRA170M-1.5	●	17	17.99		103	53	27							DA1700M-...~DA1790M-...
SF25-	DRA180M-1.5	●	18	18.99	25	112.5	56.5	28.5	56	32	Yes	HS-4067TRP	DTP-7	-	DA1800M-...~DA1890M-...
	DRA190M-1.5	●	19	19.99		115	59	30							DA1900M-...~DA1990M-...
	DRA200M-1.5	●	20	20.99		117.5	61.5	31.5							DA2000M-...~DA2090M-...
	DRA210M-1.5	●	21	21.99		120	64	33							DA2100M-...~DA2150M-...
	DRA220M-1.5	●	22	22.99		123.5	67.5	34.5							DA2200M-...~DA2250M-...
	DRA230M-1.5	●	23	23.99		126	70	36							DA2300M-...~DA2350M-...
	DRA240M-1.5	●	24	24.99		128.5	72.5	37.5							DA2400M-...~DA2450M-...
	DRA250M-1.5	●	25	25.5		131	75	39							DA2500M-...~DA2550M-...

Description Identification System (Toolholder)



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SF-DRA (Drilling depth : 3 x DC)

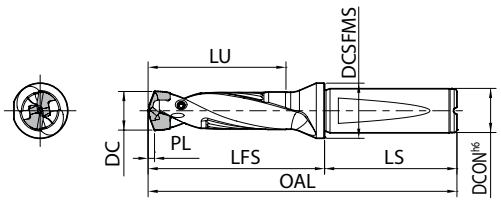


Fig. 1

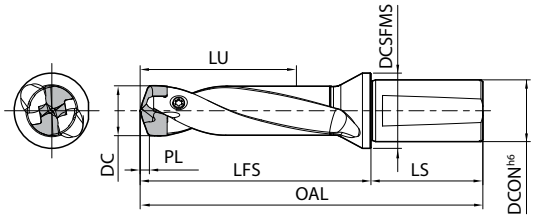


Fig. 2

3D

For PL indicates distance from drill point to corner edge **K6~K15**

Toolholder dimensions

Description		Availability	Dimension (mm)								Coolant hole	Fig.	Spare parts			Applicable drill heads ➡ K6~K15
			DC min.	DC max.	DCON	OAL	LFS	LU	LS	DCSFMS			Screw	Wrench	Wrench	
SF12-	DRA080M-3	●	7.94	8.49	12	84	39	25.5	45	16	Yes	1	HS-2524TRP	-	FTP-5	DA0794M-...~DA0840M-...
	DRA085M-3	●	8.5	8.99		86	41	27				1				DA0850M-...~DA0890M-...
	DRA090M-3	●	9	9.49		88	43	28.5				1				DA0900M-...~DA0940M-...
	DRA095M-3	●	9.5	9.99		90	45	30				1				DA0950M-...~DA0990M-...
SF16-	DRA100M-3	●	10	10.49	16	95	47	31.5	48	20	Yes	1	HS-2534TRP	-	FTP-5	DA1000M-...~DA1040M-...
	DRA105M-3	●	10.5	10.99		97	49	33				1				DA1050M-...~DA1090M-...
	DRA110M-3	●	11	11.49		100	52	34.5				1				DA1100M-...~DA1140M-...
	DRA115M-3	●	11.5	11.99		102	54	36				1				DA1150M-...~DA1190M-...
	DRA120M-3	●	12	12.49		104	56	37.5				1				DA1200M-...~DA1240M-...
	DRA125M-3	●	12.5	12.99		106	58	39				1				DA1250M-...~DA1290M-...
	DRA130M-3	●	13	13.49		108	60	40.5				1				DA1300M-...~DA1340M-...
	DRA135M-3	●	13.5	13.99		110	62	42				1				DA1350M-...~DA1390M-...
	DRA140M-3	●	14	14.49		112	64	43.5				1	HS-3048TRP	DTP-6	-	DA1400M-...~DA1440M-...
	DRA145M-3	●	14.5	14.99		114	66	45				1				DA1450M-...~DA1490M-...
SF20-	DRA150M-3	●	15	15.99	20	121	71	48	50	25	Yes	1	HS-3048TRP	DTP-6	-	DA1500M-...~DA1590M-...
	DRA160M-3	●	16	16.99		126	76	51				1				DA1600M-...~DA1690M-...
	DRA170M-3	●	17	17.99		130	80	54				1				DA1700M-...~DA1790M-...
SF25-	DRA180M-3	●	18	18.99	25	141	85	57	56	32	Yes	1	HS-4067TRP	DTP-7	-	DA1800M-...~DA1890M-...
	DRA190M-3	●	19	19.99		145	89	60				1				DA1900M-...~DA1990M-...
	DRA200M-3	●	20	20.99		149	93	63				1				DA2000M-...~DA2090M-...
	DRA210M-3	●	21	21.99		153	97	66				1				DA2100M-...~DA2150M-...
	DRA220M-3	●	22	22.99		158	102	69				1				DA2200M-...~DA2250M-...
	DRA230M-3	●	23	23.99		162	106	72				1				DA2300M-...~DA2350M-...
	DRA240M-3	●	24	24.99		166	110	75				1				DA2400M-...~DA2450M-...
	DRA250M-3	●	25	25.99		170	114	78				1				DA2500M-...~DA2550M-...
SF32-	DRA260M-3	●	26	26.99	32	178	120	81	58	39	Yes	2	HS-50100TRP	DTPM-15	-	DA2600M-...~DA2650M-...
	DRA270M-3	●	27	27.99		181	123	84				2				DA2700M-...~DA2750M-...
	DRA280M-3	●	28	28.99		185	127	87				2				DA2800M-...~DA2850M-...
	DRA290M-3	●	29	29.99		189	131	90				2				DA2900M-...~DA2950M-...
	DRA300M-3	●	30	30.99		193	135	93				2				DA3000M-...~DA3050M-...
	DRA310M-3	●	31	31.99		196	138	96				2				DA3100M-...~DA3150M-...
	DRA320M-3	●	32	33		200	142	99				2				DA3200M-...~DA3300M-...

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SF-DRA (Drilling depth : 5 x DC)

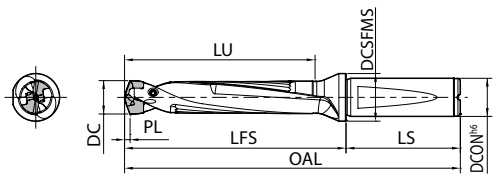


Fig. 1

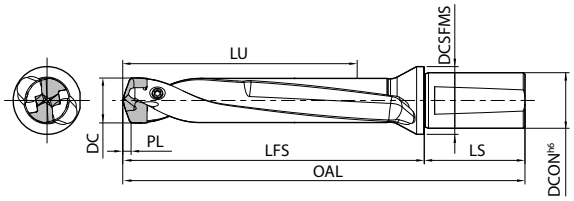


Fig. 2

5D

For PL indicates distance from drill point to corner edge **K6~K15**

Toolholder dimensions

Description		Availability	Dimension (mm)								Coolant hole	Fig.	Spare parts			Applicable drill heads ➡ K6~K15
			DC min.	DC max.	DCON	OAL	LFS	LU	LS	DCSFMS			Screw	Wrench	Wrench	
SF12-	DRA080M-5	●	7.94	8.49		101	56	42.5				1				DA0794M-...~DA0840M-...
	DRA085M-5	●	8.5	8.99	12	104	59	45	45	16	Yes	1	HS-2524TRP	-	FTP-5	DA0850M-...~DA0890M-...
	DRA090M-5	●	9	9.49		107	62	47.5				1				DA0900M-...~DA0940M-...
	DRA095M-5	●	9.5	9.99		110	65	50				1				DA0950M-...~DA0990M-...
SF16-	DRA100M-5	●	10	10.49		116	68	52.5				1				DA1000M-...~DA1040M-...
	DRA105M-5	●	10.5	10.99		119	71	55				1				DA1050M-...~DA1090M-...
	DRA110M-5	●	11	11.49		123	75	57.5				1				DA1100M-...~DA1140M-...
	DRA115M-5	●	11.5	11.99		126	78	60				1				DA1150M-...~DA1190M-...
	DRA120M-5	●	12	12.49		129	81	62.5				1	HS-2534TRP	-	FTP-5	DA1200M-...~DA1240M-...
	DRA125M-5	●	12.5	12.99	16	132	84	65	48	20	Yes	1				DA1250M-...~DA1290M-...
	DRA130M-5	●	13	13.49		135	87	67.5				1				DA1300M-...~DA1340M-...
	DRA135M-5	●	13.5	13.99		138	90	70				1				DA1350M-...~DA1390M-...
	DRA140M-5	●	14	14.49		141	93	72.5				1				DA1400M-...~DA1440M-...
	DRA145M-5	●	14.5	14.99		144	96	75				1	HS-3048TRP	DTP-6	-	DA1450M-...~DA1490M-...
SF20-	DRA150M-5	●	15	15.99		153	103	80				1				DA1500M-...~DA1590M-...
	DRA160M-5	●	16	16.99	20	160	110	85	50	25	Yes	1	HS-3048TRP	DTP-6	-	DA1600M-...~DA1690M-...
	DRA170M-5	●	17	17.99		166	116	90				1				DA1700M-...~DA1790M-...
SF25-	DRA180M-5	●	18	18.99		179	123	95				1				DA1800M-...~DA1890M-...
	DRA190M-5	●	19	19.99		185	129	100				1				DA1900M-...~DA1990M-...
	DRA200M-5	●	20	20.99		191	135	105				1				DA2000M-...~DA2090M-...
	DRA210M-5	●	21	21.99	25	197	141	110	56	32	Yes	1	HS-4067TRP	DTP-7	-	DA2100M-...~DA2150M-...
	DRA220M-5	●	22	22.99		204	148	115				1				DA2200M-...~DA2250M-...
	DRA230M-5	●	23	23.99		210	154	120				1				DA2300M-...~DA2350M-...
	DRA240M-5	●	24	24.99		216	160	125				1				DA2400M-...~DA2450M-...
	DRA250M-5	●	25	25.99		222	166	130				1				DA2500M-...~DA2550M-...
SF32-	DRA260M-5	●	26	26.99		232	174	135				2				DA2600M-...~DA2650M-...
	DRA270M-5	●	27	27.99		237	179	140				2				DA2700M-...~DA2750M-...
	DRA280M-5	●	28	28.99		243	185	145				2				DA2800M-...~DA2850M-...
	DRA290M-5	●	29	29.99	32	249	191	150	58	39	Yes	2	HS-50100TRP	DTPM-15	-	DA2900M-...~DA2950M-...
	DRA300M-5	●	30	30.99		255	197	155				2				DA3000M-...~DA3050M-...
	DRA310M-5	●	31	31.99		260	202	160				2				DA3100M-...~DA3150M-...
	DRA320M-5	●	32	33		266	208	165				2				DA3200M-...~DA3300M-...

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SF-DRA (Drilling depth : 8 x DC)

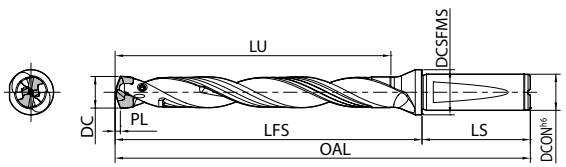


Fig. 1

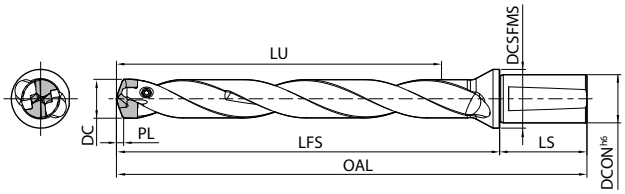


Fig. 2

8D

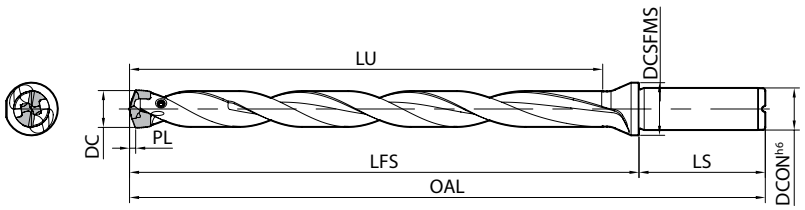
For PL indicates distance from drill point to corner edge **K6~K15**

Toolholder dimensions

Description		Availability	Dimension (mm)								Coolant hole	Fig.	Spare parts			Applicable drill heads ⇒ K6~K15
			DC min.	DC max.	DCON	OAL	LFS	LU	LS	DCSFMS			Screw	Wrench	Wrench	
SF12-	DRA080M-8	●	7.94	8.49		126	81	68				1				DA0794M-...~DA0840M-...
	DRA085M-8	●	8.5	8.99	12	131	86	72	45	16	Yes	1	HS-2524TRP	-	FTP-5	DA0850M-...~DA0890M-...
	DRA090M-8	●	9	9.49		135	90	76				1				DA0900M-...~DA0940M-...
	DRA095M-8	●	9.5	9.99		140	95	80				1				DA0950M-...~DA0990M-...
SF16-	DRA100M-8	●	10	10.49		147	99	84				1				DA1000M-...~DA1040M-...
	DRA105M-8	●	10.5	10.99		152	104	88				1				DA1050M-...~DA1090M-...
	DRA110M-8	●	11	11.49		157	109	92				1				DA1100M-...~DA1140M-...
	DRA115M-8	●	11.5	11.99		162	114	96				1				DA1150M-...~DA1190M-...
	DRA120M-8	●	12	12.49		166	118	100				1	HS-2534TRP	-	FTP-5	DA1200M-...~DA1240M-...
	DRA125M-8	●	12.5	12.99	16	171	123	104	48	20	Yes	1				DA1250M-...~DA1290M-...
	DRA130M-8	●	13	13.49		175	127	108				1				DA1300M-...~DA1340M-...
	DRA135M-8	●	13.5	13.99		180	132	112				1				DA1350M-...~DA1390M-...
	DRA140M-8	●	14	14.49		184	136	116				1				DA1400M-...~DA1440M-...
	DRA145M-8	●	14.5	14.99		189	141	120				1	HS-3048TRP	DTP-6	-	DA1450M-...~DA1490M-...
SF20-	DRA150M-8	●	15	15.99		201	151	128				1				DA1500M-...~DA1590M-...
	DRA160M-8	●	16	16.99	20	211	161	136	50	25	Yes	1	HS-3048TRP	DTP-6	-	DA1600M-...~DA1690M-...
	DRA170M-8	●	17	17.99		220	170	144				1				DA1700M-...~DA1790M-...
SF25-	DRA180M-8	●	18	18.99		236	180	152				1				DA1800M-...~DA1890M-...
	DRA190M-8	●	19	19.99		245	189	160				1				DA1900M-...~DA1990M-...
	DRA200M-8	●	20	20.99		254	198	168				1				DA2000M-...~DA2090M-...
	DRA210M-8	●	21	21.99		263	207	176				1				DA2100M-...~DA2150M-...
	DRA220M-8	●	22	22.99	25	273	217	184	56	32	Yes	1	HS-4067TRP	DTP-7	-	DA2200M-...~DA2250M-...
	DRA230M-8	●	23	23.99		282	226	192				1				DA2300M-...~DA2350M-...
	DRA240M-8	●	24	24.99		291	235	200				1				DA2400M-...~DA2450M-...
	DRA250M-8	●	25	25.99		300	244	208				1				DA2500M-...~DA2550M-...
SF32-	DRA260M-8	●	26	26.99		313	255	216				2				DA2600M-...~DA2650M-...
	DRA270M-8	●	27	27.99		321	263	224				2				DA2700M-...~DA2750M-...
	DRA280M-8	●	28	28.99		330	272	232				2				DA2800M-...~DA2850M-...
	DRA290M-8	●	29	29.99	32	339	281	240	58	39	Yes	2	HS-50100TRP	DTPM-15	-	DA2900M-...~DA2950M-...
	DRA300M-8	●	30	30.99		348	290	248				2				DA3000M-...~DA3050M-...
	DRA310M-8	●	31	31.99		356	298	256				2				DA3100M-...~DA3150M-...
	DRA320M-8	●	32	33		365	307	264				2				DA3200M-...~DA3300M-...

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SF-DRA (Drilling depth : 12 x DC)



12D

For PL indicates distance from drill point to corner edge **K6~K15**

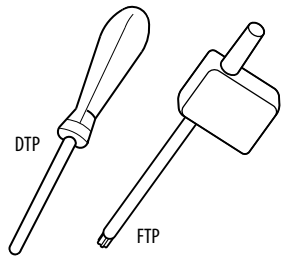
Toolholder dimensions

Description		Availability	Dimension (mm)								Coolant hole	Spare parts			Applicable drill heads ➡ K6~K15
			DC min.	DC max.	DCON	OAL	LFS	LU	LS	DCSFMS		Screw	Wrench	Wrench	
SF16-	DRA120M-12	●	12	12.49	16	216	168	150	48	20	Yes	HS-2534TRP	-	FTP-5	DA1200M-...~DA1240M-...
	DRA125M-12	●	12.5	12.99		223	175	156							DA1250M-...~DA1290M-...
	DRA130M-12	●	13	13.49		229	181	162							DA1300M-...~DA1340M-...
	DRA135M-12	●	13.5	13.99		236	188	168							DA1350M-...~DA1390M-...
	DRA140M-12	●	14	14.49		242	194	174				HS-3048TRP	DTP-6	-	DA1400M-...~DA1440M-...
	DRA145M-12	●	14.5	14.99		249	201	180							DA1450M-...~DA1490M-...
SF20-	DRA150M-12	●	15	15.99	20	265	215	192	50	25	Yes	HS-3048TRP	DTP-6	-	DA1500M-...~DA1590M-...
	DRA160M-12	●	16	16.99		279	229	204							DA1600M-...~DA1690M-...
	DRA170M-12	●	17	17.99		292	242	216							DA1700M-...~DA1790M-...
SF25-	DRA180M-12	●	18	18.99	25	312	256	228	56	32	Yes	HS-4067TRP	DTP-7	-	DA1800M-...~DA1890M-...
	DRA190M-12	●	19	19.99		325	269	240							DA1900M-...~DA1990M-...
	DRA200M-12	●	20	20.99		338	282	252							DA2000M-...~DA2090M-...
	DRA210M-12	●	21	21.99		351	295	264							DA2100M-...~DA2150M-...
	DRA220M-12	●	22	22.99		365	309	276							DA2200M-...~DA2250M-...
	DRA230M-12	●	23	23.99		378	322	288							DA2300M-...~DA2350M-...
	DRA240M-12	●	24	24.99		391	335	300							DA2400M-...~DA2450M-...
	DRA250M-12	●	25	25.5		404	348	312							DA2500M-...~DA2550M-...

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Spare parts

Clamp screw	Description
	HS-2524TRP
	HS-2534TRP
	HS-3048TRP
	HS-4067TRP

Wrench	Description	Tightening torque (N·m)
	FTP-5	0.5
	DTP-6	0.8
	DTP-7	1.2

Recommended cutting conditions

General purpose GM

Workpiece material	Recommended drill heads grades / Vc (m/min)		n (min^{-1})	Drill dia. DC (mm)							
	PR1535	PR1525	f (mm/rev)	ø8	ø11	ø14	ø18	ø22	ø25	ø29	ø33
Low carbon steel	★ 100 - 180	☆ 100 - 180	n (min^{-1})	3,980 - 7,160	2,890 - 5,210	2,270 - 4,090	1,770 - 3,180	1,450 - 2,600	1,270 - 2,290	1,100 - 1,980	970 - 1,740
			f (mm/rev)	0.12 - 0.24	0.12 - 0.31	0.16 - 0.36	0.16 - 0.4	0.2 - 0.45	0.2 - 0.45	0.2 - 0.45	0.2 - 0.45
Carbon steel	★ 100 - 150	☆ 100 - 150	n (min^{-1})	3,980 - 5,970	2,890 - 4,340	2,270 - 3,410	1,770 - 2,650	1,450 - 2,170	1,270 - 1,910	1,100 - 1,650	970 - 1,450
			f (mm/rev)	0.12 - 0.24	0.12 - 0.31	0.16 - 0.36	0.16 - 0.4	0.2 - 0.45	0.2 - 0.45	0.2 - 0.45	0.2 - 0.45
Alloy steel	★ 70 - 120	☆ 70 - 120	n (min^{-1})	2,790 - 4,780	2,030 - 3,470	1,590 - 2,730	1,240 - 2,120	1,010 - 1,740	890 - 1,530	770 - 1,320	680 - 1,160
			f (mm/rev)	0.12 - 0.24	0.12 - 0.31	0.16 - 0.36	0.16 - 0.4	0.2 - 0.45	0.2 - 0.45	0.2 - 0.45	0.2 - 0.45
Mold steel	★ 50 - 90	☆ 50 - 90	n (min^{-1})	1,990 - 3,580	1,450 - 2,600	1,140 - 2,050	880 - 1,590	720 - 1,300	640 - 1,150	550 - 990	490 - 870
			f (mm/rev)	0.08 - 0.17	0.08 - 0.22	0.11 - 0.25	0.11 - 0.28	0.14 - 0.32	0.14 - 0.32	0.14 - 0.32	0.14 - 0.32
Stainless steel	★ 40 - 70	☆ 40 - 70	n (min^{-1})	1,590 - 2,790	1,160 - 2,030	910 - 1,590	710 - 1,240	580 - 1,010	510 - 890	440 - 770	390 - 680
			f (mm/rev)	0.1 - 0.24	0.1 - 0.24	0.12 - 0.3	0.15 - 0.3	0.15 - 0.3	0.15 - 0.35	0.15 - 0.35	0.15 - 0.35
				*Feed rate 0.15 mm/rev or less is recommended until drilling depth reaches 0.5 x DC. The combination of internal and external coolant is recommended							
Titanium alloys	★ 30 - 40	☆ 30 - 40	n (min^{-1})	1,190 - 1,590	870 - 1,160	680 - 910	530 - 710	430 - 580	380 - 510	330 - 440	290 - 390
			f (mm/rev)	0.08 - 0.12	0.08 - 0.15	0.10 - 0.15	0.12 - 0.18	0.12 - 0.18	0.12 - 0.23	0.12 - 0.23	0.12 - 0.23
				*Feed rate 0.15 mm/rev or less is recommended until drilling depth reaches 0.5 x DC. The combination of internal and external coolant is recommended							
Gray cast iron	☆ 90 - 170	★ 90 - 170	n (min^{-1})	3,580 - 6,760	2,600 - 4,920	2,050 - 3,870	1,590 - 3,010	1,300 - 2,460	1,150 - 2,170	990 - 1,870	870 - 1,640
			f (mm/rev)	0.14 - 0.29	0.14 - 0.37	0.19 - 0.43	0.19 - 0.45	0.24 - 0.45	0.24 - 0.45	0.24 - 0.45	0.24 - 0.45
Nodular cast iron	☆ 40 - 120	★ 40 - 120	n (min^{-1})	1,590 - 4,780	1,160 - 3,470	910 - 2,730	710 - 2,120	580 - 1,740	510 - 1,530	440 - 1,320	390 - 1,160
			f (mm/rev)	0.12 - 0.24	0.12 - 0.31	0.16 - 0.36	0.16 - 0.4	0.2 - 0.45	0.2 - 0.45	0.2 - 0.45	0.2 - 0.45

Recommended cutting conditions above is for 1.5D/3D type.
As drilling depth increases (1.5D/3D → 5D → 8D → 12D), cutting speed and feed rates need to be set lower than the recommended values.
Recommended feed rate : 1.5/3D type=100%, 5D type=80% or less
Recommended cutting speed and feed rate: 8D type=80% or less, 12D type=70% or less

★:1st recommendation ☆:2nd recommendation

Counterboring FTP

Workpiece material	Recommended drill head grades / Vc (m/min)		n (min^{-1})	Drill dia. DC (mm)					
	PR1535	PR1525	f (mm/rev)	ø8	ø11	ø14	ø18	ø22	ø25
Low carbon steel	★ 80 - 150	☆ 80 - 150	n (min^{-1})	3,150 - 6,000	2,300 - 4,350	1,800 - 3,400	1,400 - 2,650	1,150 - 2,200	1,000 - 1,900
			f (mm/rev)	0.12 - 0.24	0.12 - 0.31	0.16 - 0.36	0.16 - 0.40	0.20 - 0.45	0.20 - 0.45
Carbon steel	★ 80 - 120	☆ 80 - 120	n (min^{-1})	3,150 - 4,750	2,300 - 3,450	1,800 - 2,700	1,400 - 2,100	1,150 - 1,750	1,000 - 1,500
			f (mm/rev)	0.12 - 0.24	0.12 - 0.31	0.16 - 0.36	0.16 - 0.40	0.20 - 0.45	0.20 - 0.45
Alloy steel	★ 70 - 120	☆ 70 - 120	n (min^{-1})	2,800 - 4,750	2,000 - 3,450	1,600 - 2,700	1,250 - 2,100	1,000 - 1,750	900 - 1,500
			f (mm/rev)	0.12 - 0.24	0.12 - 0.31	0.16 - 0.36	0.16 - 0.40	0.20 - 0.40	0.20 - 0.45
Mold steel	★ 40 - 70	☆ 40 - 70	n (min^{-1})	1,600 - 2,800	1,150 - 2,000	900 - 1,600	700 - 1,250	600 - 1,000	500 - 900
			f (mm/rev)	0.08 - 0.17	0.08 - 0.22	0.11 - 0.25	0.11 - 0.28	0.14 - 0.30	0.14 - 0.32
Stainless steel	★ 40 - 70	☆ 40 - 70	n (min^{-1})	1,600 - 2,800	1,150 - 2,000	900 - 1,600	700 - 1,250	600 - 1,000	500 - 900
			f (mm/rev)	0.10 - 0.20	0.10 - 0.20	0.10 - 0.24	0.15 - 0.24	0.15 - 0.24	0.15 - 0.28
				*Feed rate 0.15 mm/rev or less is recommended until drilling depth reaches 0.5 x DC. The combination of internal and external coolant is recommended					
Gray cast iron	☆ 70 - 140	★ 70 - 140	n (min^{-1})	2,800 - 5,600	2,000 - 4,050	1,600 - 3,200	1,250 - 2,500	1,000 - 2,000	900 - 1,800
			f (mm/rev)	0.14 - 0.29	0.14 - 0.37	0.19 - 0.43	0.19 - 0.45	0.24 - 0.45	0.24 - 0.45
Nodular cast iron	☆ 40 - 100	★ 40 - 100	n (min^{-1})	1,600 - 4,000	1,150 - 2,900	900 - 2,750	700 - 1,750	600 - 1,450	500 - 1,250
			f (mm/rev)	0.12 - 0.24	0.12 - 0.31	0.16 - 0.36	0.16 - 0.40	0.2 - 0.45	0.2 - 0.45

* The recommended cutting conditions are for drilling on plain surface
The conditions for drilling on slant hole shows the depth from the top of workpiece
Set the feed rate 50% or under when inclination angle is 30 or under. Set the feed rate 30% or under when inclination angle is over 30°
Traversing is not recommented. Applicable to 1.5D,3D,5D,8D and 12D holders. Prepared hole (0.5xDC) is needed when using 8D/12D holder
Recommended feed rate : 1.5/3D type=100%, 5D type=80% or less
Recommended cutting speed and feed rate: 8D type=80% or less, 12D type=70% or less

★:1st recommendation ☆:2nd recommendation

Counterboring FTP-H (steel beam drilling)

Workpiece material	Recommended drill head grade / Vc (m/min)	f (mm/rev) accroding to drill dia. DC (mm)							
	PR1535	ø14	ø16	ø18	ø20	ø21	ø22	ø24	ø26
Structural steel (S355, St52)	★ 90	0.18	0.18	0.18	0.20	0.20	0.20	0.20	0.22

* Please reduce feed in case of operation on thinner plates.
Oil mist quantity is different by machine. Please adjust cutting speed by checking colors of chips.

High precision insert for steel HQP

Workpiece material	Recommended drill heads grade / Vc(m/min)	n (min^{-1})	Drill dia. DC (mm)			
	PR1525	f (mm/rev)	ø8	ø11	ø14	ø18
Low carbon steel	80 - 180	n (min^{-1})	3,180 - 7,160	2,310 - 5,210	1,810 - 4,090	1,410 - 3,180
		f (mm/rev)	0.12 - 0.24	0.12 - 0.28	0.16 - 0.32	0.16 - 0.36
Carbon steel	80 - 150	n (min^{-1})	3,180 - 7,160	2,310 - 5,210	1,810 - 4,090	1,410 - 3,180
		f (mm/rev)	0.12 - 0.24	0.12 - 0.28	0.16 - 0.32	0.16 - 0.36
Alloy steel	70 - 120	n (min^{-1})	2,790 - 4,780	2,030 - 3,470	1,590 - 2,730	1,240 - 2,120
		f (mm/rev)	0.12 - 0.24	0.12 - 0.28	0.16 - 0.32	0.16 - 0.36
Mold steel	50 - 90	n (min^{-1})	1,990 - 3,580	1,450 - 2,600	1,140 - 2,050	880 - 1,590
		f (mm/rev)	0.08 - 0.17	0.08 - 0.2	0.11 - 0.23	0.11 - 0.26

Caution : Recommended cutting conditions above is for 1.5D/3D type. As drilling depth increases (1.5D/3D→5D→8D→12D), feed rates need to be set lower than the recommended values.
Recommended feed rate : 1.5D/3D type=100%, 5D type=80% or less, 8D/12D type=70% or less

Difficult-to-cut materials / Stainless steel HQS

Workpiece material	Recommended drill heads grade / Vc(m/min)	n (min^{-1})	Drill dia. DC (mm)			
	PR1535	f (mm/rev)	ø8	ø11	ø14	ø18
Stainless steel	40 - 50	n (min^{-1})	1,590 - 1,990	1,160 - 1,450	910-1,140	710 - 880
		f (mm/rev)	0.08 - 0.12	0.10 - 0.15	0.10-0.15	0.12 - 0.18
			*Feed rate 0.08 mm/rev or less is recommended until drilling depth reaches 1.0 x DC. The combination of internal and external coolant is recommended			
Heat-resistant alloy	15 - 20	n (min^{-1})	600 - 800	430 - 580	340 - 450	270 - 350
		f (mm/rev)	0.08 - 0.12	0.08 - 0.15	0.10 - 0.15	0.12 - 0.18
			*Feed rate 0.08 mm/rev or less is recommended until drilling depth reaches 1.0 x DC. The combination of internal and external coolant is recommended			
Titanium alloy	30 - 40	n (min^{-1})	1,190 - 1,590	870 - 1,160	680 - 910	530 - 710
		f (mm/rev)	0.08 - 0.12	0.08 - 0.15	0.10 - 0.15	0.12 - 0.18
			*Feed rate 0.08 mm/rev or less is recommended until drilling depth reaches 1.0 x DC. The combination of internal and external coolant is recommended			

Caution : Recommended cutting conditions above is for 1.5D/3D type. As drilling depth increases (1.5D/3D→5D→8D→12D), feed rates need to be set lower than the recommended values.
Recommended feed rate : 1.5D/3D type=100%, 5D type=80% or less, 8D/12D type=70% or less

If chip clogging occurs at the entrance to drilling, refer to "Cautions for machining with HQS drill head" in **K31**.

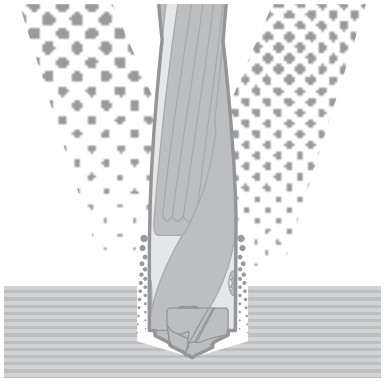
Coolant * Dry machining is not recommended.

1st recommendation

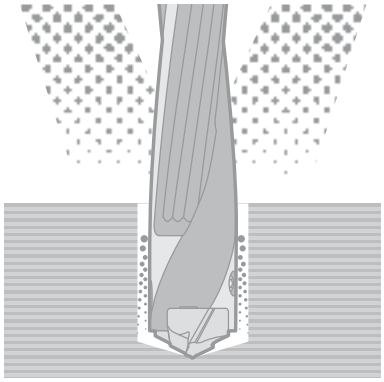
Internal coolant

Internal and external coolant is recommended

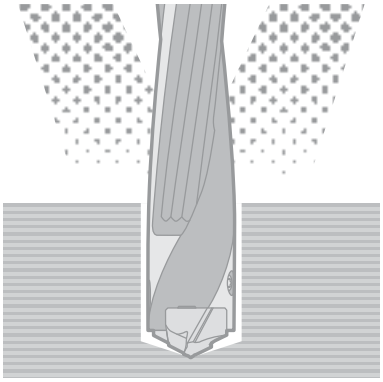
Drilling depth less than 1DC



Stainless steel, high feed rate



In case of external coolant

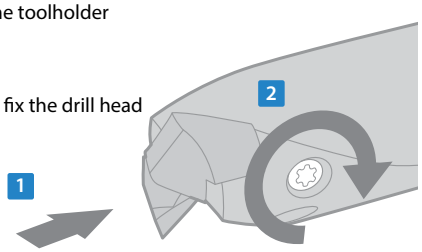


Lathe: 3DC or less
Vertical M/C: 1.5DC or less

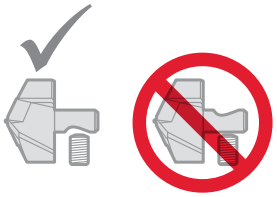
How to attach drill heads

1 Install drill head onto the toolholder in the right direction

2 Tighten clamp screw to fix the drill head
K27



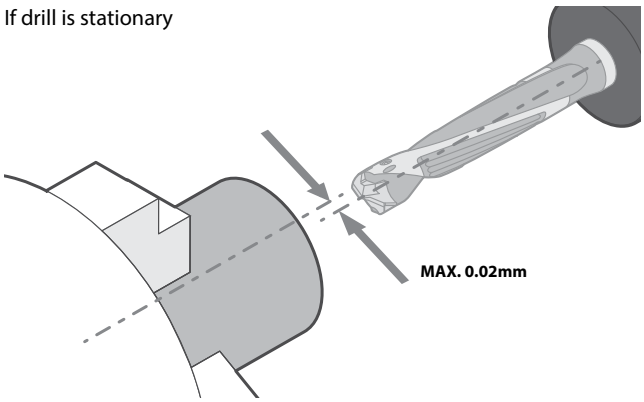
Be careful of the drill head direction



* 1 Remove dust on chip pockets using air blow for every replacement.
* 2 Make sure that the locating surfaces of the drill head closely contacts the toolholder.

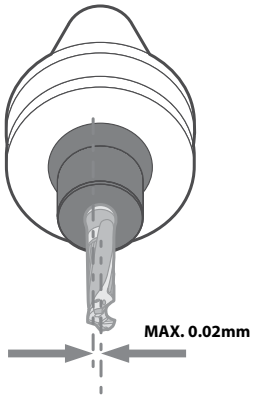
Core deviation

If drill is stationary



This can be used with a boring sleeve and collet chuck, please be sure to set deviation amount 0.02mm or under between workpiece and drill.

If drill is rotating



Make sure to use arbor that is not deformed.
Center of arbor deviation must be within 0.02mm.

Cautions for installation on machining center

For installation of MagicDrill DRA

1st choice

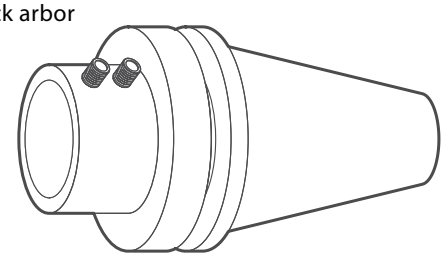
Hydro chuck, power chuck, collet chuck, etc.

- Hydro chuck
- Power chuck
- Collet chuck

Install MagicDrill DRA to the chucks

2nd choice

Side lock arbor

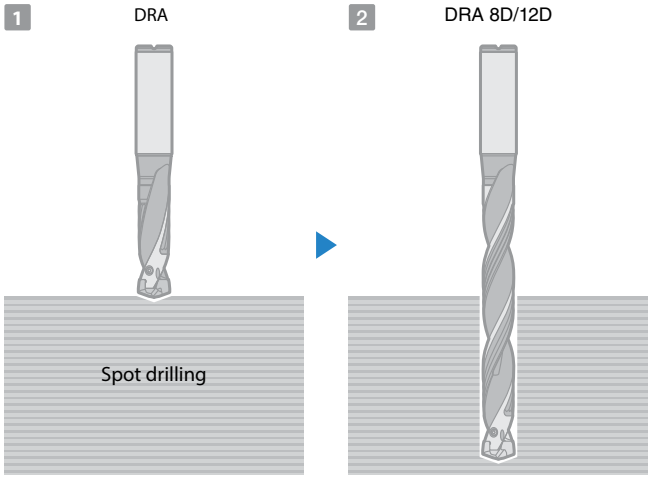


Example of side lock arbor

Cautions for machining with 8D/12D holder

Recommended machining

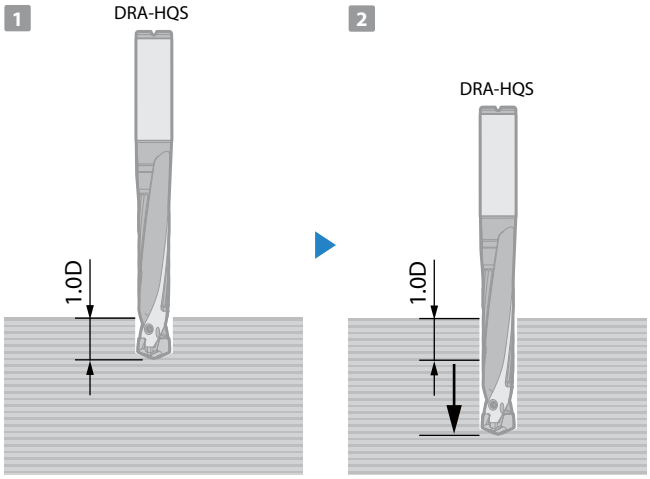
1. **Make a center spot using DRA 1.5D/3D/5D type. (Center spot should be at least half of cutting diameter)**
2. **Then drill the hole using DRA (8D/12D type).**



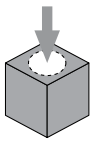
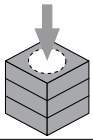
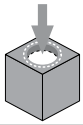
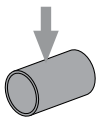
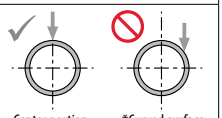
Cautions for machining with HQS drill head

If chips are clogged at the entrance of drill hole machining in stainless steel machining, etc., the following machining method is recommended.

1. **Up to 1.0D, the feed rate shall be 0.08 mm/rev or less.**
2. **After 1.0D, machining at the feed rate within the recommended range.**

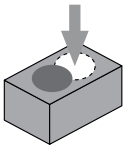
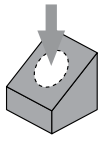
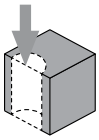
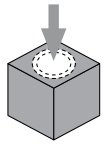


Applicable workpieces

Applications	Shape of workpiece	Caution for machining
Plain surface		1. When machining stainless steel, for hole depths of up to 0.5DC, keep feed rate at 0.15mm/rev or less. 2. Internal coolant is recommended for smooth chip removal. For stainless steel, the combination of internal and external coolant is recommended.
Stacked plates		1. Fix stacked plates securely to ensure they do not slip while machining.
Concave surface		1. When machining concave holes, set the feed rate at half of recommended feed or less for continuous hole machining. 2. Utilize a step feeding if chips are not broken short at the inlet.
Pipe material		1. Hole machining above the centerline of the pipe is possible. 2. Do not machine on curved surface areas.  Center portion machining *Curved surface portion machining

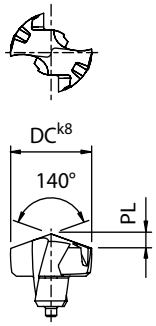
* Machining possible with FTP and 1.5D toolholder

Not recommended workpieces

Applications	Shape of workpiece
*Hole expansion	
*Slant surface	
Half cylindrical	
*Cored hole	

* Machining possible with FTP and 1.5D toolholder

DRC drill heads (SC - Carbide - Carbon steel, alloy steel and cast iron)

Drill head	Description	Dimension (mm) DC	Dimension (mm) PL	Tolerance k8 (min.)	Tolerance k8 (max.)	Carbide PVD PR0315	Applicable toolholder ➡ K35~K37 K40~K42
 	DC 0794M-SC	7.94	1.37	0	+0.022	●	SF12-DRC080M-○ SS10-DRC080M-○
	0800M-SC	8	1.38			●	
	0810M-SC	8.1	1.4			●	
	0820M-SC	8.2	1.42			●	
	0830M-SC	8.3	1.43			●	
	0840M-SC	8.4	1.45			●	
	DC 0850M-SC	8.5	1.47	0	+0.022	●	SF12-DRC085M-○ SS10-DRC085M-○
	0860M-SC	8.6	1.48			●	
	0870M-SC	8.7	1.5			●	
	0880M-SC	8.8	1.52			●	
	0890M-SC	8.9	1.54			●	
	DC 0900M-SC	9	1.55	0	+0.022	●	SF12-DRC090M-○ SS10-DRC090M-○
	0910M-SC	9.1	1.57			●	
	0920M-SC	9.2	1.59			●	
	0930M-SC	9.3	1.61			●	
	0940M-SC	9.4	1.62			●	
	DC 0950M-SC	9.5	1.64	0	+0.022	●	SF12-DRC095M-○ SS10-DRC095M-○
	0960M-SC	9.6	1.66			●	
	0970M-SC	9.7	1.67			●	
	0980M-SC	9.8	1.69			●	
	0990M-SC	9.9	1.71			●	
	DC 1000M-SC	10	1.72	0	+0.022	●	SF16-DRC100M-○ SS12-DRC100M-○
	1010M-SC	10.1	1.74		+0.027	●	
	1020M-SC	10.2	1.76		+0.027	●	
	1030M-SC	10.3	1.78		+0.027	●	
	1040M-SC	10.4	1.8		+0.027	●	
	DC 1050M-SC	10.5	1.81	0	+0.027	●	SF16-DRC105M-○ SS12-DRC105M-○
	1060M-SC	10.6	1.83			●	
	1070M-SC	10.7	1.85			●	
	1080M-SC	10.8	1.86			●	
	1090M-SC	10.9	1.88			●	
	DC 1100M-SC	11	1.9	0	+0.027	●	SF16-DRC110M-○ SS12-DRC110M-○
	1110M-SC	11.1	1.91			●	
	1120M-SC	11.2	1.93			●	
	1130M-SC	11.3	1.95			●	
	1140M-SC	11.4	1.97			●	
	DC 1150M-SC	11.5	1.98	0	+0.027	●	SF16-DRC115M-○ SS12-DRC115M-○
	1160M-SC	11.6	2			●	
	1170M-SC	11.7	2.02			●	
	1180M-SC	11.8	2.04			●	
	1190M-SC	11.9	2.06			●	
	DC 1200M-SC	12	2.07	0	+0.027	●	SF16-DRC120M-○ SS14-DRC120M-○
	1210M-SC	12.1	2.09			●	
	1220M-SC	12.2	2.11			●	
	1230M-SC	12.3	2.12			●	
	1240M-SC	12.4	2.14			●	
	DC 1250M-SC	12.5	2.16	0	+0.027	●	SF16-DRC125M-○ SS14-DRC125M-○
	1260M-SC	12.6	2.17			●	
	1270M-SC	12.7	2.19			●	
	1280M-SC	12.8	2.21			●	
	1290M-SC	12.9	2.23			●	
	DC 1300M-SC	13	2.24	0	+0.027	●	SF16-DRC130M-○ SS14-DRC130M-○
	1310M-SC	13.1	2.26			●	
	1320M-SC	13.2	2.28			●	
	1330M-SC	13.3	2.3			●	
	1340M-SC	13.4	2.31			●	

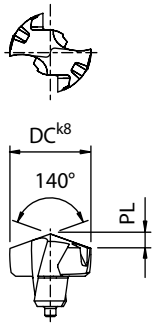
k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

Recommended cutting conditions ➡ K44

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DC drill heads are sold in 1 piece boxes

DRC drill heads (SC - Carbide - Carbon steel, alloy steel and cast iron)

Drill head	Description	Dimension (mm) DC	Dimension (mm) PL	Tolerance k8 (min.)	Tolerance k8 (max.)	Carbide PVD PR0315	Applicable toolholder ➡ K35~K37 K40~K42
 	DC 1350M-SC	13.5	2.33	0	+0.027	●	SF16-DRC135M-○ SS14-DRC135M-○
	1360M-SC	13.6	2.35			●	
	1370M-SC	13.7	2.36			●	
	1380M-SC	13.8	2.38			●	
	1390M-SC	13.9	2.4			●	
	DC 1400M-SC	14	2.41	0	+0.027	●	SF16-DRC140M-○ SS16-DRC140M-○
	1410M-SC	14.1	2.43			●	
	1420M-SC	14.2	2.45			●	
	1430M-SC	14.3	2.47			●	
	1440M-SC	14.4	2.49			●	
	DC 1450M-SC	14.5	2.5	0	+0.027	●	SF16-DRC145M-○ SS16-DRC145M-○
	1460M-SC	14.6	2.52			●	
	1470M-SC	14.7	2.54			●	
	1480M-SC	14.8	2.55			●	
	1490M-SC	14.9	2.57			●	
	DC 1500M-SC	15	2.59	0	+0.027	●	SF20-DRC150M-○ SS16-DRC150M-○
	1510M-SC	15.1	2.6			●	
	1520M-SC	15.2	2.62			●	
	1530M-SC	15.3	2.64			●	
	1540M-SC	15.4	2.66			●	
	1550M-SC	15.5	2.68			●	
	1560M-SC	15.6	2.7			●	
	1570M-SC	15.7	2.71			●	
	1580M-SC	15.8	2.73			●	
	DC 1600M-SC	16	2.76	0	+0.027	●	SF20-DRC160M-○ SS18-DRC160M-○
	1610M-SC	16.1	2.78			●	
	1620M-SC	16.2	2.8			●	
	1630M-SC	16.3	2.81			●	
	1640M-SC	16.4	2.83			●	
	1650M-SC	16.5	2.85			●	
	1660M-SC	16.6	2.87			●	
	1670M-SC	16.7	2.89			●	
	1680M-SC	16.8	2.9			●	
	1690M-SC	16.9	2.92			●	
	DC 1700M-SC	17	2.93	0	+0.027	●	SF20-DRC170M-○ SS18-DRC170M-○
	1710M-SC	17.1	2.95			●	
	1720M-SC	17.2	2.97			●	
	1730M-SC	17.3	2.99			●	
	1740M-SC	17.4	3			●	
	1750M-SC	17.5	3.02			●	
	1760M-SC	17.6	3.04			●	
	1770M-SC	17.7	3.06			●	
	1780M-SC	17.8	3.08			●	
	1790M-SC	17.9	3.09			●	
	DC 1800M-SC	18	3.1	0	+0.027	●	SF25-DRC180M-○ SS20-DRC180M-○
	1810M-SC	18.1	3.12		+0.033	●	
	1820M-SC	18.2	3.14		+0.033	●	
	1830M-SC	18.3	3.16		+0.033	●	
	1840M-SC	18.4	3.18		+0.033	●	
	1850M-SC	18.5	3.19		+0.033	●	
	1860M-SC	18.6	3.21		+0.033	●	
	1870M-SC	18.7	3.23		+0.033	●	
	1880M-SC	18.8	3.25		+0.033	●	
	1890M-SC	18.9	3.27		+0.033	●	

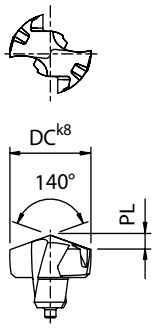
k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

Recommended cutting conditions ➡ K44

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DC drill heads are sold in 1 piece boxes

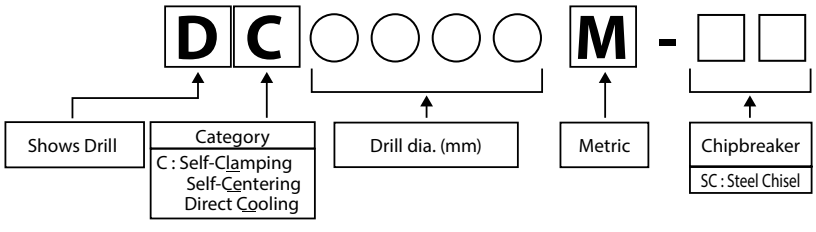
DRC drill heads (SC - Carbide - Carbon steel, alloy steel and cast iron)

Drill head	Description	Dimension (mm) DC	Dimension (mm) PL	Tolerance k8 (min.)	Tolerance k8 (max.)	Carbide PVD PR0315	Applicable toolholder ➡ K35~K37 K40~K42
 	DC 1900M-SC	19	3.28	0	+0.033	●	SF25-DRC190M-○ SS20-DRC190M-○
	1910M-SC	19.1	3.29			●	
	1920M-SC	19.2	3.31			●	
	1930M-SC	19.3	3.33			●	
	1940M-SC	19.4	3.35			●	
	1950M-SC	19.5	3.37			●	
	1960M-SC	19.6	3.39			●	
	1970M-SC	19.7	3.4			●	
	1980M-SC	19.8	3.42			●	
	1990M-SC	19.9	3.44			●	
	DC 2000M-SC	20	3.45	0	+0.033	●	SF25-DRC200M-○ SS25-DRC200M-○
	2010M-SC	20.1	3.47			●	
	2020M-SC	20.2	3.48			●	
	2030M-SC	20.3	3.5			●	
	2040M-SC	20.4	3.52			●	
	2050M-SC	20.5	3.54			●	
	2060M-SC	20.6	3.56			●	
	2070M-SC	20.7	3.58			●	
	2080M-SC	20.8	3.59			●	
	2090M-SC	20.9	3.61			●	
	2099M-SC	20.99	3.63			●	
	DC 2100M-SC	21	3.62	0	+0.033	●	SF25-DRC210M-○ SS25-DRC210M-○
	2150M-SC	21.5	3.71			●	
	DC 2200M-SC	22	3.79	0	+0.033	●	SF25-DRC220M-○ SS25-DRC220M-○
	2250M-SC	22.5	3.88			●	
	DC 2300M-SC	23	3.97	0	+0.033	●	SF25-DRC230M-○ SS25-DRC230M-○
	2350M-SC	23.5	4.06			●	
	DC 2400M-SC	24	4.14	0	+0.033	●	SF25-DRC240M-○ SS25-DRC240M-○
	2450M-SC	24.5	4.23			●	
	DC 2500M-SC	25	4.31	0	+0.033	●	SF25-DRC250M-○ SS32-DRC250M-○
	2550M-SC	25.5	4.4			●	
	2599M-SC	25.99	4.49			●	

k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

Recommended cutting conditions ➡ K44

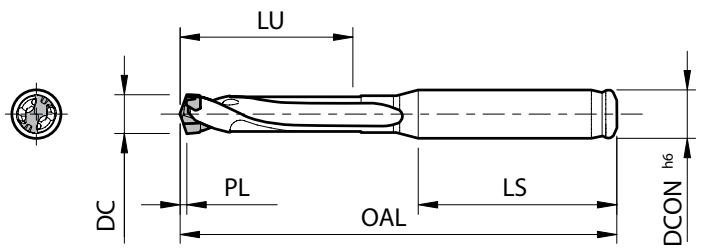
Description Identification System (Drill head)



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DC drill heads are sold in 1 piece boxes

SS-DRC (Drilling depth : 3 x DC)



3D

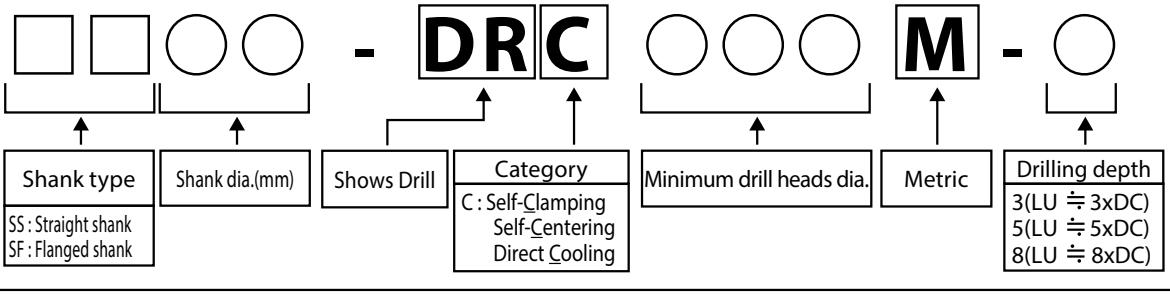
For PL indicates distance from drill point to corner edge **K32~K34**

Toolholder dimensions

Description		Availability	Dimension (mm)						Coolant hole	Spare parts	Applicable drill heads ➡ K32~K34	Applicable chamfering attachment ➡ K38
			DC min.	DC max.	DCON	OAL	LU	LS		Wrench		
SS10-	DRC080M-3	●	7.94	8.49	10	79	25.5	40	Yes	WDRC17 *(Included wrench : WDRC8)	DC0794M-SC~DC0840M-SC	S20-CH10
	DRC085M-3	●	8.5	8.99		81	27				DC0850M-SC~DC0890M-SC	
	DRC090M-3	●	9	9.49		83	28.5				DC0900M-SC~DC0940M-SC	
	DRC095M-3	●	9.5	9.99		85	30				DC0950M-SC~DC0990M-SC	
SS12-	DRC100M-3	●	10	10.49	12	92	31.5	45	Yes	WDRC17 *(Included wrench : WDRC10)	DC1000M-SC~DC1040M-SC	S32-CH12
	DRC105M-3	●	10.5	10.99		94	33				DC1050M-SC~DC1090M-SC	
	DRC110M-3	●	11	11.49		96	34.5				DC1100M-SC~DC1140M-SC	
	DRC115M-3	●	11.5	11.99		98	36				DC1150M-SC~DC1190M-SC	
SS14-	DRC120M-3	●	12	12.49	14	101	37.5	45	Yes	WDRC17 *(Included wrench : WDRC12)	DC1200M-SC~DC1240M-SC	S32-CH14
	DRC125M-3	●	12.5	12.99		103	39				DC1250M-SC~DC1290M-SC	
	DRC130M-3	●	13	13.49		105	40.5				DC1300M-SC~DC1340M-SC	
	DRC135M-3	●	13.5	13.99		107	42				DC1350M-SC~DC1390M-SC	
SS16-	DRC140M-3	●	14	14.49	16	112	43.5	48	Yes	WDRC17 *(Included wrench : WDRC14)	DC1400M-SC~DC1440M-SC	S32-CH16
	DRC145M-3	●	14.5	14.99		114	45				DC1450M-SC~DC1490M-SC	
	DRC150M-3	●	15	15.99		118	48				DC1500M-SC~DC1580M-SC	
SS18-	DRC160M-3	●	16	16.99	18	122	51	48	Yes		DC1600M-SC~DC1690M-SC	S32-CH18
	DRC170M-3	●	17	17.99		127	54				DC1700M-SC~DC1790M-SC	
SS20-	DRC180M-3	●	18	18.99	20	133	57	50	Yes	WDRC17	DC1800M-SC~DC1890M-SC	-
	DRC190M-3	●	19	19.99		137	60				DC1900M-SC~DC1990M-SC	
SS25-	DRC200M-3	●	20	20.99	25	147	63	56	Yes		DC2000M-SC~DC2099M-SC	
	DRC210M-3	●	21	21.99		151	66				DC2100M-SC~DC2150M-SC	
	DRC220M-3	●	22	22.99		156	69				DC2200M-SC~DC2250M-SC	
	DRC230M-3	●	23	23.99		160	72				DC2300M-SC~DC2350M-SC	
	DRC240M-3	●	24	24.99		164	75				DC2400M-SC~DC2450M-SC	
SS32-	DRC250M-3	●	25	25.99	32	172	78	60	Yes		DC2500M-SC~DC2599M-SC	

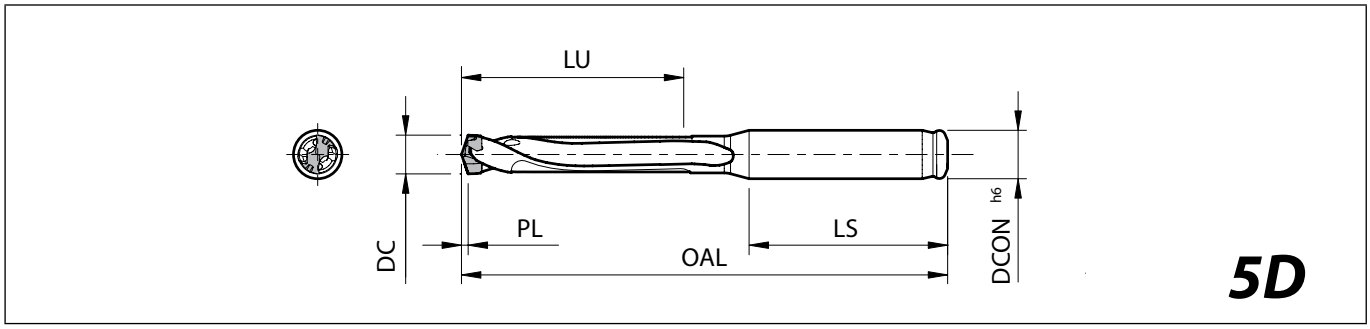
* Choose „WDRC17“, when purchasing wrench only.

Description Identification System (Toolholder)



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SS-DRC (Drilling depth : 5 x DC)



For PL indicates distance from drill point to corner edge **K32~K34**

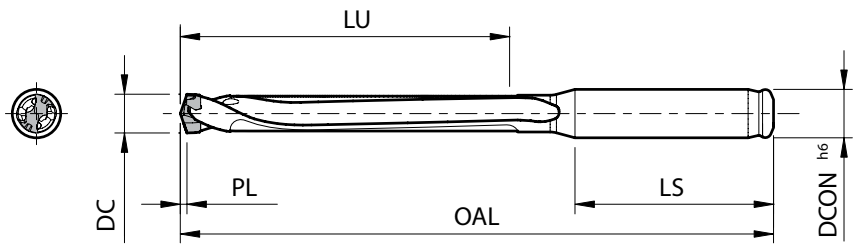
Toolholder dimensions

Description		Availability	Dimension (mm)						Coolant hole	Spare parts	Applicable drill heads ➡ K32~K34	Applicable chamfering attachment ➡ K38
			DC min.	DC max.	DCON	OAL	LU	LS		Wrench		
SS10-	DRC080M-5	●	7.94	8.49	10	97	42.5	40	Yes	WDRC17 *(Included wrench : WDRC8)	DC0794M-SC~DC0840M-SC	S20-CH10
	DRC085M-5	●	8.5	8.99		100	45				DC0850M-SC~DC0890M-SC	
	DRC090M-5	●	9	9.49		103	47.5				DC0900M-SC~DC0940M-SC	
	DRC095M-5	●	9.5	9.99		107	50				DC0950M-SC~DC0990M-SC	
SS12-	DRC100M-5	●	10	10.49	12	115	52.5	45	Yes	WDRC17 *(Included wrench : WDRC10)	DC1000M-SC~DC1040M-SC	S32-CH12
	DRC105M-5	●	10.5	10.99		118	55				DC1050M-SC~DC1090M-SC	
	DRC110M-5	●	11	11.49		121	57.5				DC1100M-SC~DC1140M-SC	
	DRC115M-5	●	11.5	11.99		124	60				DC1150M-SC~DC1190M-SC	
SS14-	DRC120M-5	●	12	12.49	14	127	62.5	45	Yes	WDRC17 *(Included wrench : WDRC12)	DC1200M-SC~DC1240M-SC	S32-CH14
	DRC125M-5	●	12.5	12.99		130	65				DC1250M-SC~DC1290M-SC	
	DRC130M-5	●	13	13.49		133	67.5				DC1300M-SC~DC1340M-SC	
	DRC135M-5	●	13.5	13.99		137	70				DC1350M-SC~DC1390M-SC	
SS16-	DRC140M-5	●	14	14.49	16	143	72.5	48	Yes	WDRC17 *(Included wrench : WDRC14)	DC1400M-SC~DC1440M-SC	S32-CH16
	DRC145M-5	●	14.5	14.99		146	75				DC1450M-SC~DC1490M-SC	
	DRC150M-5	●	15	15.99		152	80				DC1500M-SC~DC1580M-SC	
SS18-	DRC160M-5	●	16	16.99	18	158	85	48	Yes		DC1600M-SC~DC1690M-SC	S32-CH18
	DRC170M-5	●	17	17.99		165	90			WDRC17	DC1700M-SC~DC1790M-SC	
SS20-	DRC180M-5	●	18	18.99	20	173	95	50	Yes		DC1800M-SC~DC1890M-SC	-
	DRC190M-5	●	19	19.99		179	100				DC1900M-SC~DC1990M-SC	
SS25-	DRC200M-5	●	20	20.99	25	191	105	56	Yes		DC2000M-SC~DC2099M-SC	
	DRC210M-5	●	21	21.99		198	110				DC2100M-SC~DC2150M-SC	
	DRC220M-5	●	22	22.99		204	115				DC2200M-SC~DC2250M-SC	
	DRC230M-5	●	23	23.99		210	120				DC2300M-SC~DC2350M-SC	
	DRC240M-5	●	24	24.99		216	125				DC2400M-SC~DC2450M-SC	
SS32-	DRC250M-5	●	25	25.99	32	227	130	60	Yes		DC2500M-SC~DC2599M-SC	

* Choose „WDRC17“, when purchasing wrench only.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SS-DRC (Drilling depth : 8 x DC)



8D

For PL indicates distance from drill point to corner edge **K32~K34**

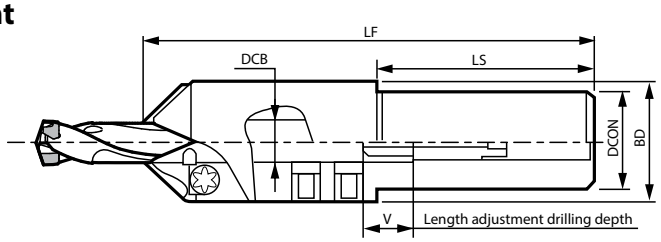
Toolholder dimensions

Description		Availability	Dimension (mm)						Coolant hole	Spare parts	Applicable drill heads ➡ K32~K34	Applicable chamfering attachment ➡ K38
			DC min.	DC max.	DCON	OAL	LU	LS		Wrench		
SS10-	DRC080M-8	●	7.94	8.49	10	122.5	68	40	Yes	WDRC17 *(Included wrench : WDRC8)	DC0794M-SC~DC0840M-SC	S20-CH10
	DRC085M-8	●	8.5	8.99		127	72				DC0850M-SC~DC0890M-SC	
	DRC090M-8	●	9	9.49		131.5	76				DC0900M-SC~DC0940M-SC	
	DRC095M-8	●	9.5	9.99		137	80				DC0950M-SC~DC0990M-SC	
SS12-	DRC100M-8	●	10	10.49	12	146.5	84	45	Yes	WDRC17 *(Included wrench : WDRC10)	DC1000M-SC~DC1040M-SC	S32-CH12
	DRC105M-8	●	10.5	10.99		151	88				DC1050M-SC~DC1090M-SC	
	DRC110M-8	●	11	11.49		155.5	92				DC1100M-SC~DC1140M-SC	
	DRC115M-8	●	11.5	11.99		160	96				DC1150M-SC~DC1190M-SC	
SS14-	DRC120M-8	●	12	12.49	14	164.5	100	45	Yes	WDRC17 *(Included wrench : WDRC12)	DC1200M-SC~DC1240M-SC	S32-CH14
	DRC125M-8	●	12.5	12.99		169	104				DC1250M-SC~DC1290M-SC	
	DRC130M-8	●	13	13.49		173.5	108				DC1300M-SC~DC1340M-SC	
	DRC135M-8	●	13.5	13.99		179	112				DC1350M-SC~DC1390M-SC	
SS16-	DRC140M-8	●	14	14.49	16	186.5	116	48	Yes	WDRC17 *(Included wrench : WDRC14)	DC1400M-SC~DC1440M-SC	S32-CH16
	DRC145M-8	●	14.5	14.99		191	120				DC1450M-SC~DC1490M-SC	
	DRC150M-8	●	15	15.99		200	128				DC1500M-SC~DC1580M-SC	
SS18-	DRC160M-8	●	16	16.99	18	209	136	48	Yes		DC1600M-SC~DC1690M-SC	S32-CH18
	DRC170M-8	●	17	17.99		219	144				DC1700M-SC~DC1790M-SC	
SS20-	DRC180M-8	●	18	18.99	20	230	152	50	Yes	WDRC17	DC1800M-SC~DC1890M-SC	-
	DRC190M-8	●	19	19.99		239	160				DC1900M-SC~DC1990M-SC	
SS25-	DRC200M-8	●	20	20.99	25	254	168	56	Yes		DC2000M-SC~DC2099M-SC	
	DRC210M-8	●	21	21.99		264	176				DC2100M-SC~DC2150M-SC	
	DRC220M-8	●	22	22.99		273	184				DC2200M-SC~DC2250M-SC	
	DRC230M-8	●	23	23.99		282	192				DC2300M-SC~DC2350M-SC	
	DRC240M-8	●	24	24.99		291	200				DC2400M-SC~DC2450M-SC	
SS32-	DRC250M-8	●	25	25.99	32	305	208	60	Yes		DC2500M-SC~DC2599M-SC	

* Choose „WDRC17“, when purchasing wrench only.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Chamfering attachment

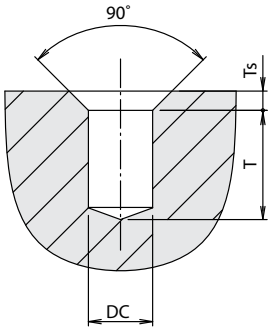


Dimensions

Description	Availability	Applicable Drill Shank Dia. (mm) DCB	Dimension (mm)					Applicable Inserts K39
			DCON	BD	LF	LS	V	
S20-CH10	●	10	20	29	122	52	17	CT08T2-45A
S32-CH12	●	12	32	38	133	62	21	CT12T3-45A
S32-CH14	●	14		40	137		16	
S32-CH16	●	16		42	141		19	
S32-CH18	●	18		47	144		15	

Chamfering attachment is dedicated for Straight Shank SS-DRC.
It cannot be used for Flanged Shank SF-DRC.

Drilling depth and chamfering dimension

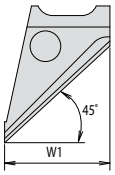


Drill dia. (mm) DC		Drilling depth (mm)						Chamfering dimension (mm) Ts		Applicable chamfering holder
		T(3D drill)		T(5D drill)		T(8D drill)				
min.	max.	min.	max.	min.	max.	min.	max.	Ts 100	Ts max.	
7.94	8.49	11	19	21	37	47	63	2.5	5.0	S20-CH10
8.50	8.99	12	21	24	40	51	67			
9.00	9.49	12	23	27	43	56	72			
9.50	9.99	13	25	31	47	61	77			
10.00	10.49	13	26	28	49	60	81	3.5	7.0	S32-CH12
10.50	10.99	14	28	31	52	64	85			
11.00	11.49	14	30	34	55	69	90			
11.50	11.99	15	32	37	58	73	94			
12.00	12.49	15	30	41	56	79	94	4.0	8.0	S32-CH14
12.50	12.99	17	32	44	59	83	96			
13.00	13.49	19	34	47	62	88	103			
13.50	13.99	21	36	51	66	93	108			
14.00	14.49	19	37	50	68	94	112	4.0	8.0	S32-CH16
14.50	14.99	21	39	53	71	98	116			
15.00	15.99	25	43	59	77	107	125			
16.00	16.99	30	44	66	80	117	131	4.0	8.0	S32-CH18
17.00	17.99	35	49	73	87	127	141			

Ts 100: Max. chamfering dimension at the full feed.
Ts max.: Max. chamfering dimension at a 50% feed reduction.
(Max. chamfering dimension of machining possible without step feeding)

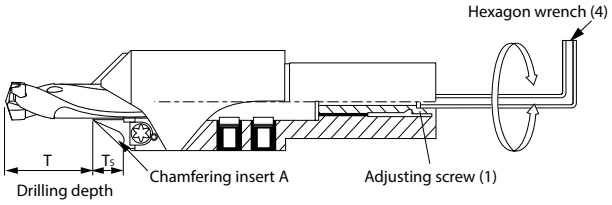
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts

Insert			Description	Dimension (mm)		PVD coated carbide	Applicable chamfering holder K38
				W1	S	PR0315	
			CT08T2-45A	8	2.83	●	S20-CH10
			CT12T3-45A	12	3.98	●	S32-CH12 ~ S32-CH18

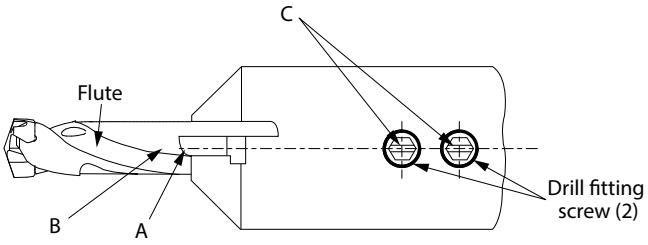
Method to use DRC chamfering attachment

I. Drilling depth adjustment



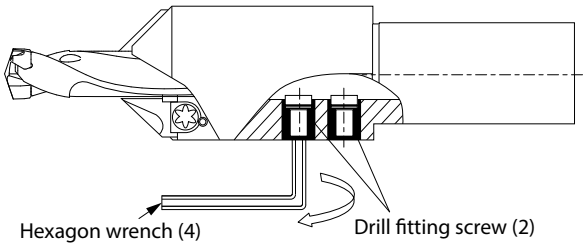
Insert drill into chamfering holder.
Next, temporarily attach the chamfering insert A.
Turn the adjusting screw (1) with the hexagon wrench (4).
to set the drilling depth T.

II. Drill location check



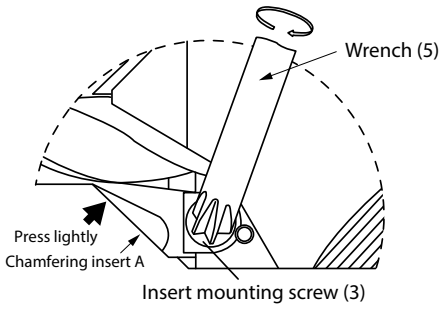
Rotate the drill so that the lower end of the chamfering insert A is aligned with the body clearance B of the drill.
Set it so that slot C and the drill fitting screws (2) are lined up as shown in the figure above.

III. Fix the drill



Tighten the drill fitting screws (2) with the hexagon wrench (4)
(When using a torque wrench, please refer to the table below)

IV. Installation of the chamfering insert



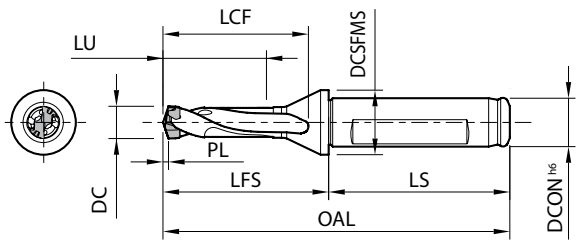
Press the chamfering insert A lightly into the drill and tighten the insert mounting screw (3) with wrench (5).

Spare parts

Chamfering holder	Tightening torque [N•m]	Adjusting screw (1)	Drill fitting screw (2)	Insert mounting screw (3)	Hexagon wrench (4)	Wrench (5)
S20-CH10	10	AJ-6X38	FS-10	MT-3	LW-3	DT-9
S32-CH12	15	AJ-8X44-9.5	FS-12	MT-4	LW-4	DT-15
S32-CH14	20	AJ-10X46	FS-14		LW-5	
S32-CH16	30		FS-16			
S32-CH18	45		FS-18			

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SF-DRC (Drilling depth : 3 x DC)



3D

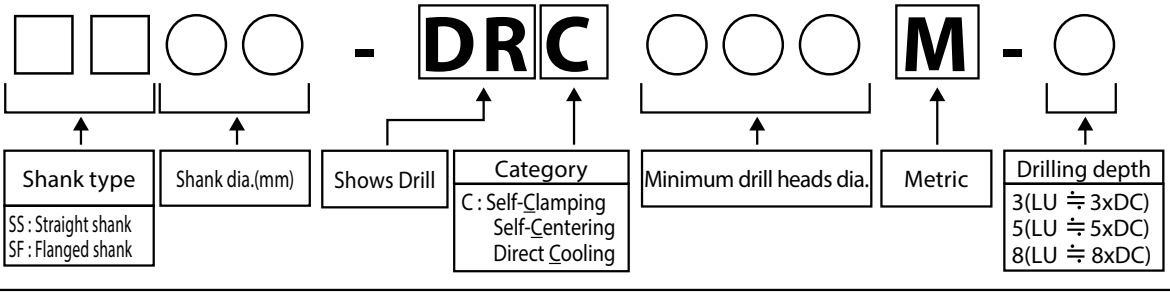
For PL indicates distance from drill point to corner edge **K32~K34**

Toolholder dimensions

Description		Availability	Dimension (mm)								Coolant hole	Spare parts	Applicable drill heads ⇒ K32~K34
			DC min.	DC max.	DCON	OAL	LFS	LCF	LU	LS	DCSFMS	Wrench	
SF12-	DRC080M-3	●	7.94	8.49	12	86	41	35	26	45	16	Yes	WDRC17 *(Included wrench : WDRC8)	DC0794M-SC~DC0840M-SC
	DRC085M-3	●	8.5	8.99		88	43	37	27					DC0850M-SC~DC0890M-SC
	DRC090M-3	●	9	9.49		90	45	39	29					DC0900M-SC~DC0940M-SC
	DRC095M-3	●	9.5	9.99		92	47	41	30					DC0950M-SC~DC0990M-SC
SF16-	DRC100M-3	●	10	10.49	16	97	49	43	32	48	20	Yes	WDRC17 *(Included wrench : WDRC10)	DC1000M-SC~DC1040M-SC
	DRC105M-3	●	10.5	10.99		99	51	45	33					DC1050M-SC~DC1090M-SC
	DRC110M-3	●	11	11.49		101	53	47	35					DC1100M-SC~DC1140M-SC
	DRC115M-3	●	11.5	11.99		103	55	49	36					DC1150M-SC~DC1190M-SC
	DRC120M-3	●	12	12.49		106	58	52	38				WDRC17 *(Included wrench : WDRC12)	DC1200M-SC~DC1240M-SC
	DRC125M-3	●	12.5	12.99		108	60	54	39					DC1250M-SC~DC1290M-SC
	DRC130M-3	●	13	13.49		110	62	56	41					DC1300M-SC~DC1340M-SC
	DRC135M-3	●	13.5	13.99		112	64	58	42					DC1350M-SC~DC1390M-SC
	DRC140M-3	●	14	14.49		114	66	60	44				WDRC17 *(Included wrench : WDRC14)	DC1400M-SC~DC1440M-SC
	DRC145M-3	●	14.5	14.99		116	68	62	45					DC1450M-SC~DC1490M-SC
SF20-	DRC150M-3	●	15	15.99	20	122	72	66	48	50	25	Yes		DC1500M-SC~DC1580M-SC
	DRC160M-3	●	16	16.99		126	76	70	51					DC1600M-SC~DC1690M-SC
	DRC170M-3	●	17	17.99		131	81	75	54				WDRC17	DC1700M-SC~DC1790M-SC
SF25-	DRC180M-3	●	18	18.99	25	141	85	79	57	56	32	Yes		DC1800M-SC~DC1890M-SC
	DRC190M-3	●	19	19.99		145	89	83	60					DC1900M-SC~DC1990M-SC
	DRC200M-3	●	20	20.99		149	93	87	63					DC2000M-SC~DC2099M-SC
	DRC210M-3	●	21	21.99		153	97	91	66					DC2100M-SC~DC2150M-SC
	DRC220M-3	●	22	22.99		158	102	96	69					DC2200M-SC~DC2250M-SC
	DRC230M-3	●	23	23.99		162	106	100	72					DC2300M-SC~DC2350M-SC
	DRC240M-3	●	24	24.99		166	110	104	75					DC2400M-SC~DC2450M-SC
	DRC250M-3	●	25	25.99		170	114	108	78					DC2500M-SC~DC2599M-SC

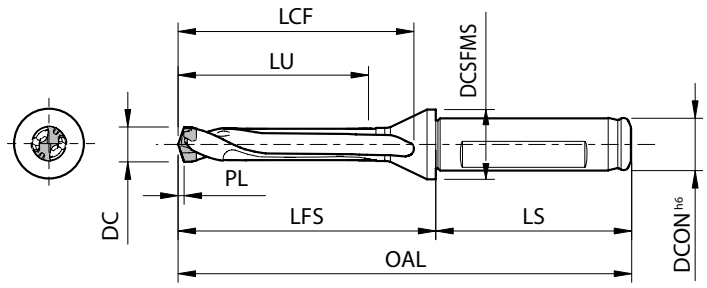
* Choose„WDRC17“, when purchasing wrench only.

Description Identification System (Toolholder)



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SF-DRC (Drilling depth : 5 x DC)



For PL indicates distance from drill point to corner edge **K32~K34**

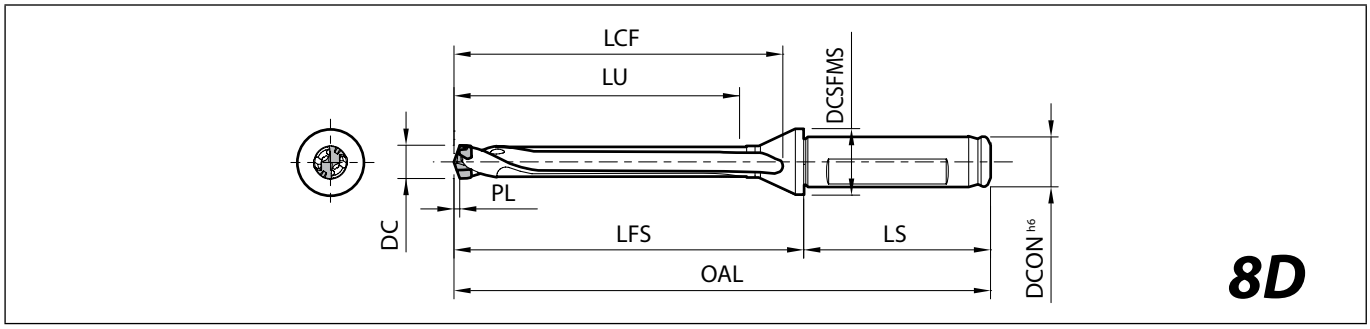
Toolholder dimensions

Description		Availability	Dimension (mm)								Coolant hole	Spare parts	Applicable drill heads ⇒ K32~K34
			DC min.	DC max.	DCON	OAL	LFS	LCF	LU	LS	DCSFMS	Wrench	
SF12-	DRC080M-5	●	7.94	8.49	12	104	59	53	43	45	16	Yes	WDRC17 *(Included wrench : WDRC8)	DC0794M-SC~DC0840M-SC
	DRC085M-5	●	8.5	8.99		107	62	56	45					DC0850M-SC~DC0890M-SC
	DRC090M-5	●	9	9.49		110	65	59	48					DC0900M-SC~DC0940M-SC
	DRC095M-5	●	9.5	9.99		114	69	63	50					DC0950M-SC~DC0990M-SC
SF16-	DRC100M-5	●	10	10.49	16	120	72	66	53	48	20	Yes	WDRC17 *(Included wrench : WDRC10)	DC1000M-SC~DC1040M-SC
	DRC105M-5	●	10.5	10.99		123	75	69	55					DC1050M-SC~DC1090M-SC
	DRC110M-5	●	11	11.49		126	78	72	58					DC1100M-SC~DC1140M-SC
	DRC115M-5	●	11.5	11.99		129	81	75	60					DC1150M-SC~DC1190M-SC
	DRC120M-5	●	12	12.49		132	84	78	63				WDRC17 *(Included wrench : WDRC12)	DC1200M-SC~DC1240M-SC
	DRC125M-5	●	12.5	12.99		135	87	81	65					DC1250M-SC~DC1290M-SC
	DRC130M-5	●	13	13.49		138	90	84	68					DC1300M-SC~DC1340M-SC
	DRC135M-5	●	13.5	13.99		142	94	88	70					DC1350M-SC~DC1390M-SC
	DRC140M-5	●	14	14.49		145	97	91	73				WDRC17 *(Included wrench : WDRC14)	DC1400M-SC~DC1440M-SC
	DRC145M-5	●	14.5	14.99		148	100	94	75					DC1450M-SC~DC1490M-SC
SF20-	DRC150M-5	●	15	15.99	20	156	106	100	80	50	25	Yes		DC1500M-SC~DC1580M-SC
	DRC160M-5	●	16	16.99		162	112	106	85					DC1600M-SC~DC1690M-SC
	DRC170M-5	●	17	17.99		169	119	113	90				WDRC17	DC1700M-SC~DC1790M-SC
SF25-	DRC180M-5	●	18	18.99	25	181	125	119	95	56	32	Yes		DC1800M-SC~DC1890M-SC
	DRC190M-5	●	19	19.99		187	131	125	100					DC1900M-SC~DC1990M-SC
	DRC200M-5	●	20	20.99		193	137	131	105					DC2000M-SC~DC2099M-SC
	DRC210M-5	●	21	21.99		200	144	138	110					DC2100M-SC~DC2150M-SC
	DRC220M-5	●	22	22.99		206	150	144	115					DC2200M-SC~DC2250M-SC
	DRC230M-5	●	23	23.99		212	156	150	120					DC2300M-SC~DC2350M-SC
	DRC240M-5	●	24	24.99		218	162	156	125					DC2400M-SC~DC2450M-SC
	DRC250M-5	●	25	25.99		225	169	163	130					DC2500M-SC~DC2599M-SC

* Choose „WDRC17“, when purchasing wrench only.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SF-DRC (Drilling depth : 8 x DC)



For PL indicates distance from drill point to corner edge **K32~K34**

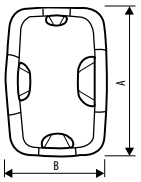
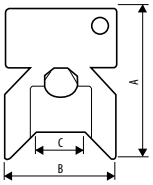
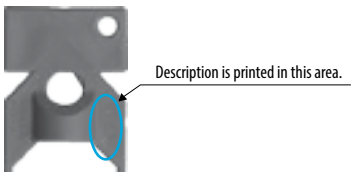
Toolholder dimensions

Description		Availability	Dimension (mm)								Coolant hole	Spare parts	Applicable drill heads ⇒ K32~K34
			DC min.	DC max.	DCON	OAL	LFS	LCF	LU	LS	DCSFMS	Wrench	
SF12-	DRC080M-8	●	7.94	8.49	12	129	84	79	68	45	16	Yes	WDRC17 *(Included wrench : WDRC8)	DC0794M-SC~DC0840M-SC
	DRC085M-8	●	8.5	8.99		134	89	83	72					DC0850M-SC~DC0890M-SC
	DRC090M-8	●	9	9.49		138	93	88	76					DC0900M-SC~DC0940M-SC
	DRC095M-8	●	9.5	9.99		144	99	93	80					DC0950M-SC~DC0990M-SC
SF16-	DRC100M-8	●	10	10.49	16	151	103	97	84	48	20	Yes	WDRC17 *(Included wrench : WDRC10)	DC1000M-SC~DC1040M-SC
	DRC105M-8	●	10.5	10.99		156	108	102	88					DC1050M-SC~DC1090M-SC
	DRC110M-8	●	11	11.49		160	112	107	92					DC1100M-SC~DC1140M-SC
	DRC115M-8	●	11.5	11.99		165	117	111	96					DC1150M-SC~DC1190M-SC
	DRC120M-8	●	12	12.49		169	121	116	100				WDRC17 *(Included wrench : WDRC12)	DC1200M-SC~DC1240M-SC
	DRC125M-8	●	12.5	12.99		174	126	120	104					DC1250M-SC~DC1290M-SC
	DRC130M-8	●	13	13.49		178	130	124	108					DC1300M-SC~DC1340M-SC
	DRC135M-8	●	13.5	13.99		184	136	130	112					DC1350M-SC~DC1390M-SC
	DRC140M-8	●	14	14.49		188	140	134	116				WDRC17 *(Included wrench : WDRC14)	DC1400M-SC~DC1440M-SC
	DRC145M-8	●	14.5	14.99		193	145	139	120					DC1450M-SC~DC1490M-SC
SF20-	DRC150M-8	●	15	15.99	20	204	154	148	128	50	25	Yes		DC1500M-SC~DC1580M-SC
	DRC160M-8	●	16	16.99		213	163	157	136					DC1600M-SC~DC1690M-SC
	DRC170M-8	●	17	17.99		223	173	167	144				WDRC17	DC1700M-SC~DC1790M-SC
SF25-	DRC180M-8	●	18	18.99	25	238	182	176	152	56	32	Yes		DC1800M-SC~DC1890M-SC
	DRC190M-8	●	19	19.99		247	191	185	160					DC1900M-SC~DC1990M-SC
	DRC200M-8	●	20	20.99		256	200	194	168					DC2000M-SC~DC2099M-SC
	DRC210M-8	●	21	21.99		266	210	204	176					DC2100M-SC~DC2150M-SC
	DRC220M-8	●	22	22.99		275	219	213	184					DC2200M-SC~DC2250M-SC
	DRC230M-8	●	23	23.99		284	228	222	192					DC2300M-SC~DC2350M-SC
	DRC240M-8	●	24	24.99		293	237	231	200					DC2400M-SC~DC2450M-SC
	DRC250M-8	●	25	25.99		303	247	241	208					DC2500M-SC~DC2599M-SC

* Choose„WDRC17“, when purchasing wrench only.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Wrench

Shape		Description	Dimension (mm)			Remarks
			A	B	C	
		WDRC17	77	52	-	· WDRC17(Multiple type wrench) has four drill head entry points. If using an drill head ranging from DC1700M-SC to DC2099M-SC, use the entry point printed as "ø17.00~ø20.99". · WDRC17 can be used instead of WDRC8~14 wrench.
		WDRC8	43	33	ø10.2	
		WDRC10			ø12.2	
		WDRC12			ø14.2	
		WDRC14			ø17.2	

Method to change MagicDrill DRC drill heads

How to attach drill heads



1. Fix drill holder on arbor. For drill head exchange, fix arbor on the machine or set on toolpresetter.
2. Use compressed air to remove dust.



3. Install drill head onto holder.
(Use gloves to protect your hand from any danger.)



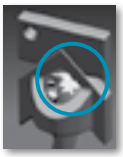
4. Turn lightly in a clockwise direction.
(Use gloves to protect your hand from any danger.)



5. Align the wrench properly with the drill head.



6. Make sure the wrench is aligned with the wrench slots on the drill head.



(Improper alignment shown)



Slot for wrench



7. Turn the wrench in a slow counterclockwise direction.
8. Completed.

How to detach drill heads



1. Use compressed air to remove dust.
2. Align the wrench properly with the drill head.



3. Make sure the wrench is aligned with the wrench slots on the drill head.



4. Turn the wrench in a counterclockwise direction.



5. Once lock is released, drill head can be turned by fingers.
(Use gloves to protect your hand from any danger.)



6. Remove drill head.
(Use gloves to protect your hand from any danger.)

Recommended cutting conditions

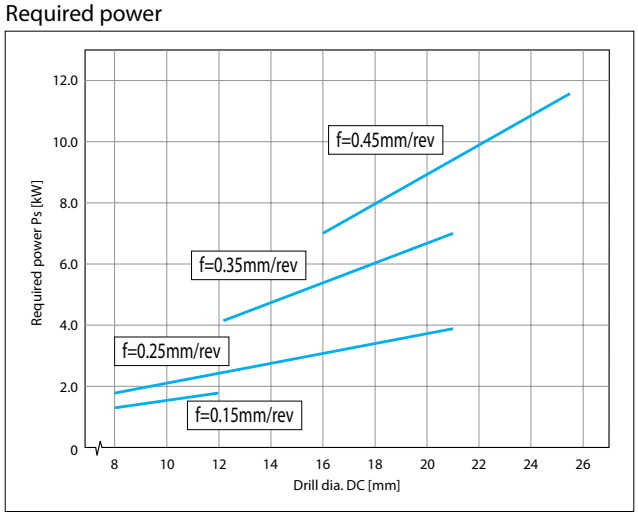
Workpiece material		Hard-ness (HB)	Cutting conditions		Drill dia. DC (mm)								Remarks
			Vc (m/min)	n (min^{-1}) / f (mm/rev)	ø8	ø10	ø12	ø14	ø16	ø18	ø20	ø25	
Low carbon steel	C10E~C25	125	120 -180	n (min^{-1})	4,780 - 7,170	3,820 - 5,730	3,180 - 4,780	2,730 - 4,090	2,390 - 3,580	2,120 - 3,180	1,910 - 2,870	1,530 - 2,290	Coolant
				f (mm/rev)	0.11 - 0.20	0.13 - 0.24	0.14 - 0.28	0.17 - 0.32	0.19 - 0.35	0.23 - 0.38	0.25 - 0.41	0.30 - 0.50	
Carbon steel	C30~C60 (Annealed)	190	100 -150	n (min^{-1})	3,980 - 5,970	3,180 - 4,780	2,650 - 3,980	2,270 - 3,410	1,990 - 2,990	1,770 - 2,650	1,590 - 2,390	1,270 - 1,910	
				f (mm/rev)	0.13 - 0.24	0.15 - 0.29	0.17 - 0.33	0.19 - 0.36	0.22 - 0.41	0.25 - 0.46	0.28 - 0.48	0.32 - 0.60	
	C30~C60 (Heat treated)	250	80 -120	n (min^{-1})	3,180 - 4,780	2,550 - 3,820	2,120 - 3,180	1,820 - 2,730	1,590 - 2,390	1,420 - 2,120	1,270 - 1,910	1,020 - 1,530	
				f (mm/rev)	0.13 - 0.21	0.15 - 0.25	0.18 - 0.31	0.21 - 0.39	0.23 - 0.45	0.25 - 0.53	0.28 - 0.61	0.38 - 0.64	
		300	50 -75	n (min^{-1})	1,990 - 2,990	1,590 - 2,390	1,330 - 1,990	1,140 - 1,710	1,000 - 1,490	880 - 1,330	800 - 1,190	640 - 960	
				f (mm/rev)	0.11 - 0.19	0.12 - 0.23	0.16 - 0.28	0.21 - 0.32	0.23 - 0.35	0.25 - 0.41	0.28 - 0.41	0.32 - 0.45	
Alloy steel	(Annealed)	180	70 -95	n (min^{-1})	2,790 - 3,780	2,230 - 3,030	1,860 - 2,520	1,590 - 2,160	1,390 - 1,890	1,240 - 1,680	1,110 - 1,510	890 - 1,210	
				f (mm/rev)	0.15 - 0.28	0.16 - 0.35	0.21 - 0.37	0.23 - 0.46	0.25 - 0.46	0.25 - 0.51	0.30 - 0.51	0.35 - 0.60	
	(Heat treated)	275	70 -95	n (min^{-1})	2,790 - 3,780	2,230 - 3,030	1,860 - 2,520	1,590 - 2,160	1,390 - 1,890	1,240 - 1,680	1,110 - 1,510	890 - 1,210	
				f (mm/rev)	0.11 - 0.21	0.14 - 0.25	0.19 - 0.30	0.21 - 0.33	0.23 - 0.37	0.28 - 0.43	0.28 - 0.46	0.32 - 0.58	
		300	60 -90	n (min^{-1})	2,390 - 3,580	1,910 - 2,870	1,590 - 2,390	1,360 - 2,050	1,190 - 1,790	1,060 - 1,590	960 - 1,430	760 - 1,150	
				f (mm/rev)	0.11 - 0.19	0.12 - 0.23	0.16 - 0.26	0.18 - 0.31	0.21 - 0.33	0.23 - 0.36	0.25 - 0.38	0.30 - 0.50	
		350	50 -70	n (min^{-1})	1,990 - 2,990	1,590 - 2,390	1,330 - 1,990	1,140 - 1,710	1,000 - 1,490	880 - 1,330	800 - 1,190	640 - 960	
				f (mm/rev)	0.11 - 0.20	0.12 - 0.23	0.16 - 0.25	0.17 - 0.29	0.18 - 0.32	0.20 - 0.36	0.23 - 0.38	0.28 - 0.50	
Stainless steel	X5CrNi18 9 X5CrNiMo17 122	220	60 -80	n (min^{-1})	2,390 - 3,180	1,910 - 2,550	1,590 - 2,120	1,360 - 1,820	1,190 - 1,590	1,060 - 1,420	960 - 1,270	760 - 1,020	
				f (mm/rev)	0.11 - 0.19	0.12 - 0.23	0.16 - 0.26	0.18 - 0.31	0.21 - 0.33	0.23 - 0.36	0.25 - 0.38	0.28 - 0.42	
	X5CrNiCuNb 16-4	300	50 -70	n (min^{-1})	1,990 - 2,790	1,590 - 2,230	1,330 - 1,860	1,140 - 1,590	1,000 - 1,390	880 - 1,240	800 - 1,110	640 - 890	
				f (mm/rev)	0.11 - 0.20	0.12 - 0.23	0.16 - 0.25	0.17 - 0.29	0.18 - 0.32	0.20 - 0.36	0.23 - 0.38	0.25 - 0.40	
Gray cast iron	GG15~GG20	180	120 -170	n (min^{-1})	4,780 - 6,770	3,820 - 5,410	3,180 - 4,510	2,730 - 3,870	2,390 - 3,380	2,120 - 3,010	1,910 - 2,710	1,530 - 2,170	
				f (mm/rev)	0.17 - 0.32	0.20 - 0.37	0.23 - 0.43	0.27 - 0.48	0.30 - 0.55	0.33 - 0.61	0.33 - 0.61	0.40 - 0.74	
	GG25~GG35	260	90 -120	n (min^{-1})	3,580 - 4,780	2,870 - 3,820	2,390 - 3,180	2,050 - 2,730	1,790 - 2,390	1,590 - 2,120	1,430 - 1,910	1,150 - 1,530	
				f (mm/rev)	0.14 - 0.25	0.16 - 0.31	0.19 - 0.35	0.23 - 0.42	0.26 - 0.47	0.28 - 0.53	0.30 - 0.58	0.36 - 0.70	
Nodular cast iron	GGG40~GGG50	160	60 -90	n (min^{-1})	2,390 - 3,580	1,910 - 2,870	1,590 - 2,390	1,360 - 2,050	1,190 - 1,790	1,060 - 1,590	960 - 1,430	760 - 1,150	
				f (mm/rev)	0.14 - 0.25	0.16 - 0.30	0.19 - 0.35	0.22 - 0.40	0.24 - 0.45	0.28 - 0.51	0.28 - 0.56	0.34 - 0.67	
	GGG60~GGG80	250	40 -65	n (min^{-1})	1,590 - 2,590	1,270 - 2,070	1,060 - 1,730	910 - 1,480	800 - 1,290	710 - 1,150	640 - 1,040	510 - 830	
				f (mm/rev)	0.10 - 0.19	0.12 - 0.22	0.14 - 0.25	0.16 - 0.31	0.19 - 0.35	0.23 - 0.51	0.25 - 0.53	0.30 - 0.60	

As drilling depth increases (3D→5D→8D), feed rates should be reduced.

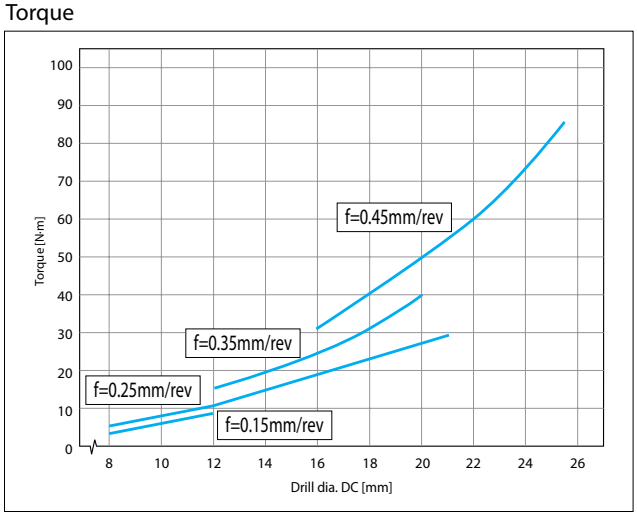
Reference charts

Cutting conditions: Workpiece material heat treated steel (Hardness 240HB) Vc = 80 m/min, wet

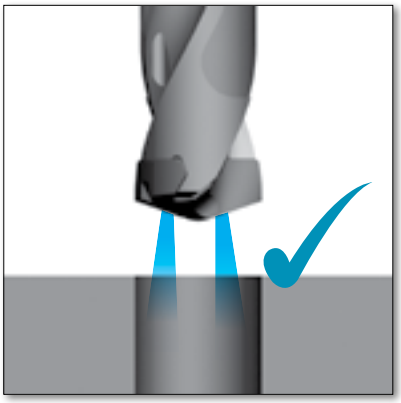
Required power



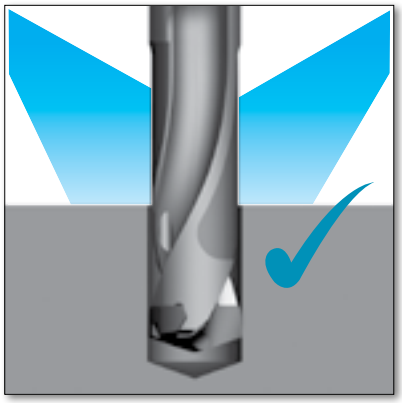
Torque



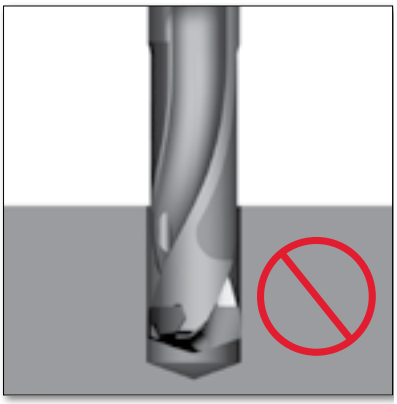
Coolant



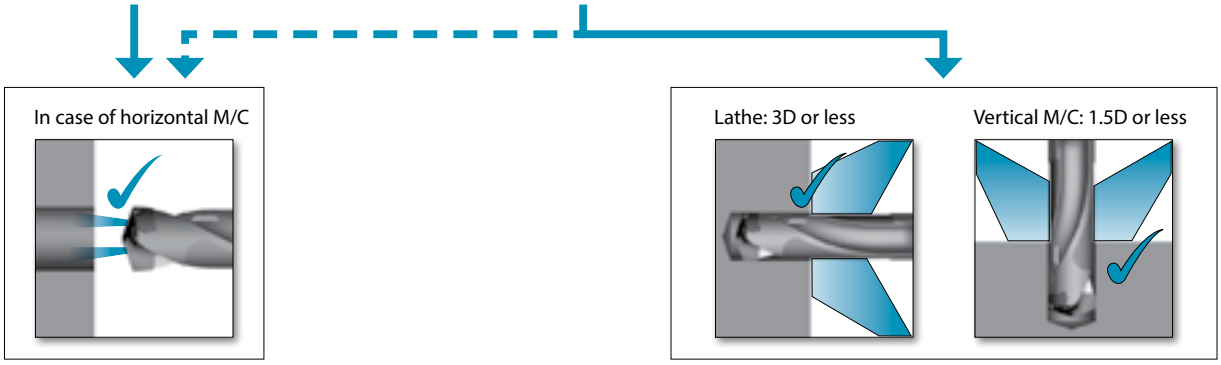
1. Internal coolant is recommended.



2. In case of using external coolant system



3. Dry machining is not recommended.

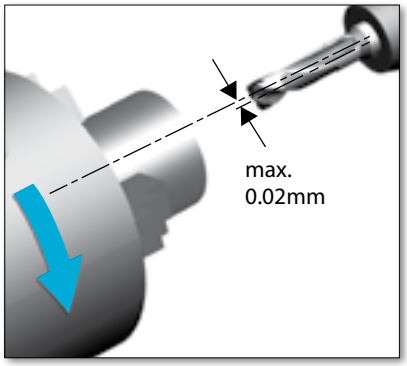


Internal coolant is recommended for horizontal machining center because external coolant may not sufficiently be applied to inside because the tool is revolving.

Precautions for use

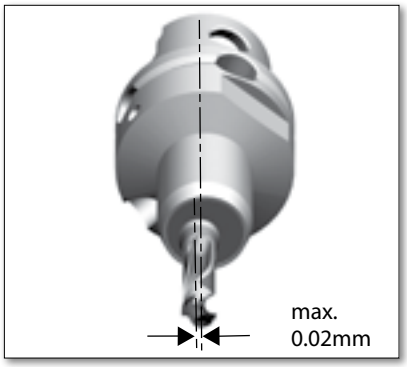
Core deviation

1. If drill is stationary



This can be used with a boring sleeve (Screw clamp) and collet chuck,
please be sure to set deviation amount within 0.02mm between workpiece and drill.

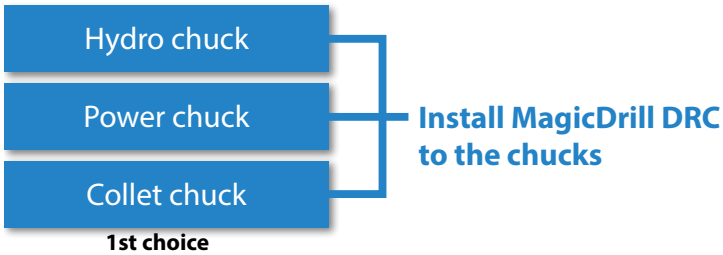
2. If drill is rotating



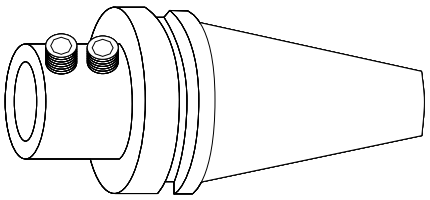
Make sure to use arbor that is not deformed.
Center of arbor deviation must be within 0.02mm.

Cautions for installation on machining center

For installation of MagicDrill DRC,
1st choice hydro chuck, power chuck, collet chuck, etc.
2nd choice side lock arbor

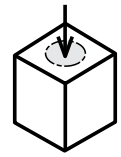
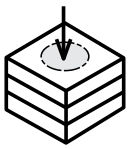
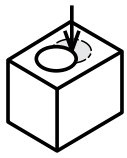
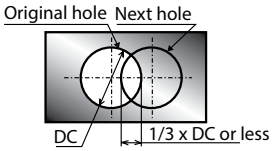
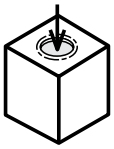
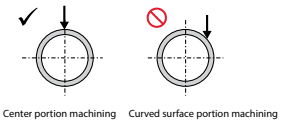


1st choice

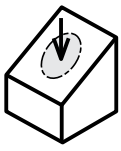
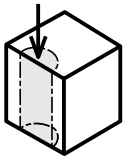
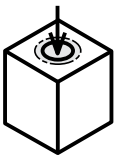


Example of side lock arbor
2nd choice

Applicable workpieces

Applications	Shape of workpiece	Caution for machining
Plain surface		1. Due to good chip control, step machining is not necessary for low carbon steel. 2. When machining X5CrNi18 10, for hole depths of more than 2.5D, utilize the step machining process. 3. In order to have smooth chip removal, we recommend internal coolant.
Stacked plates		1. Fix stacked plates securely to ensure so that they do not slip while machining.
Hole expansion		1. If the overlap amount is 1/3 x DC or less, machining is possible. 
Concave surface		1. When machining concave holes, set the feed rates at half or less than continuous hole machining.
Pipe material		1. Hole machining above the centerline of the pipe is possible. 2. Do not machine on curved surface areas. 

Not recommended workpieces

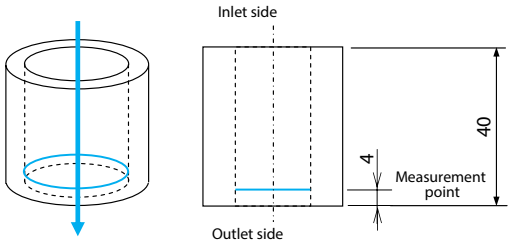
Applications	Shape of workpiece
Slant surface	
Half cylindrical	
Cored hole	

Comparison of Machining Precision

Cutting Condition and Measurement Point

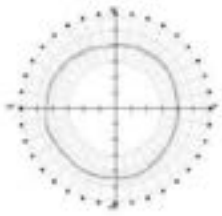
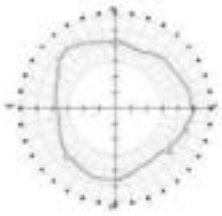
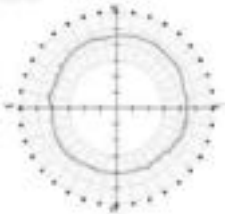
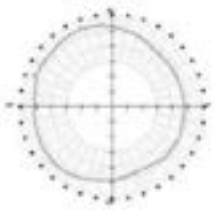
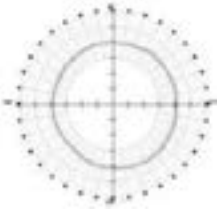
<Cutting Conditions>

Workpiece Material	C45
Vc	100m/min
f	0.2mm/rev, 0.3mm/rev
Drilling Depth H	Through hole (40mm)
Coolant	Wet (Internal coolant)
Tool	ø14-3D type
Machine	M/C



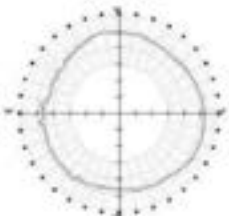
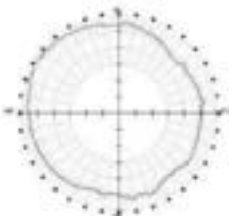
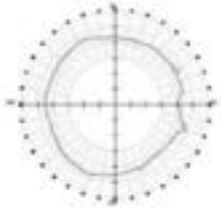
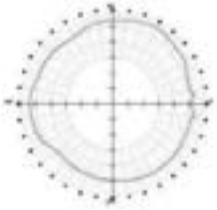
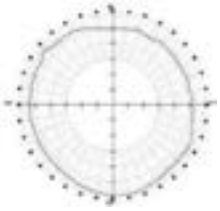
Roundness

1) Roundness (f=0.2mm/rev)

Indexable drill		Carbide solid drill		
Kyocera	Competitor F	Competitor B	Competitor C	Competitor N
				
Roundness : 5.5µm	Roundness : 22.5µm	Roundness : 6.4µm	Roundness : 9.8µm	Roundness : 5.2µm

(Internal evaluation)

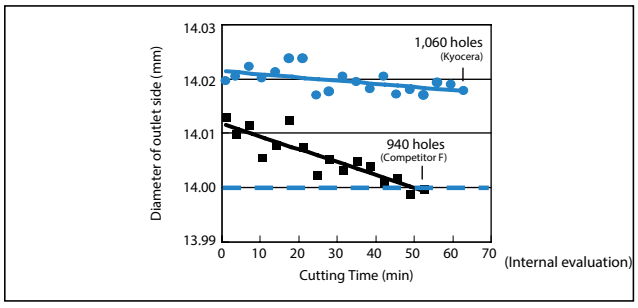
2) Roundness (f=0.3mm/rev)

Indexable drill		Carbide solid drill		
Kyocera	Competitor F	Competitor B	Competitor C	Competitor N
				
Roundness : 10.7µm	Roundness : 15.2µm	Roundness : 12.0µm	Roundness : 11.8µm	Roundness : 12.3µm

(Internal evaluation)

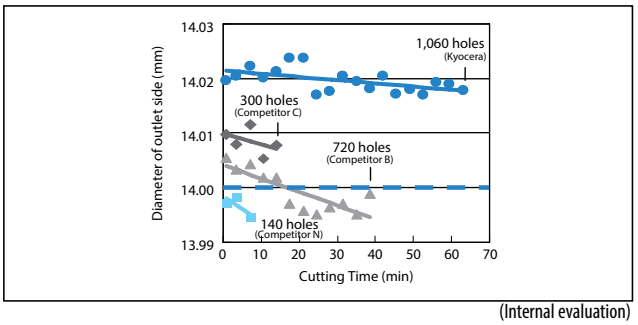
Comparison of Hole Dia. (f=0.3mm/rev)

1) Comparison with indexable drill



(Internal evaluation)

2) Comparison with carbide solid drill



(Internal evaluation)

High efficiency indexable insert drill

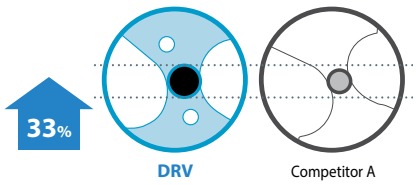
MagicDrill DRV

Economical inserts with 4 cutting edges.
Excellent chip evacuation with 6D maximum deep-hole drilling.

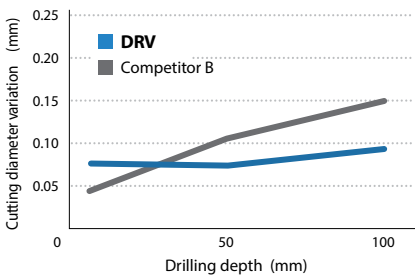
1 Excellent drilling precision with less variation in cutting diameter
Up to 6D drilling capabilities with a low cutting force design

Optimal web thickness reduces chattering with a low cutting force design

Web thickness comparison
(Internal evaluation)

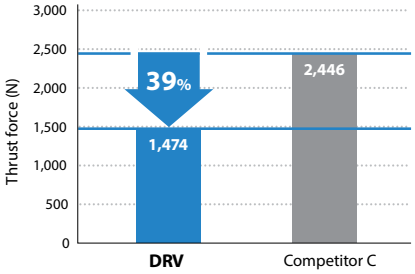


Comparison of cutting diameter variation
(Internal evaluation)



Cutting conditions: Vc = 150 m/min, f = 0.06 mm/rev
Drill dia. ø20(5D), wet Workpiece material: C50

Cutting force comparison
(Internal evaluation)



Cutting conditions: Vc = 200 m/min, f = 0.12 mm/rev
Drill dia. ø20(3D), wet Workpiece material: C50

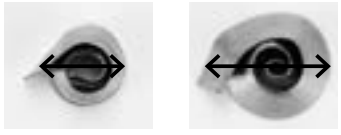
2 Unique insert design to control chip flow

Outer edge Smooth chip evacuation with compact chips

Unique insert pattern to differentiate between outside and inside inserts



Chipshape comparison of outer insert cutting edge (Internal evaluation)

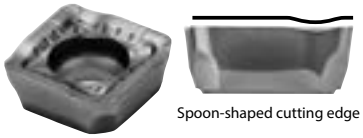


DRV: 10mm Competitor D: 12mm

16% Diameter of chips

Cutting conditions: Vc = 150 m/min, f = 0.06 mm/rev, Drill dia. ø20(3D), wet workpiece material: C50

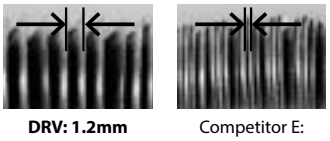
Inner edge Excellent chip evacuation as well as less wear resistance with reduced chips weight



Weight per unit of length for chips generated by the inner edge
(Internal evaluation)



Pitch comparison of chips generated by the inner edge (Internal evaluation)

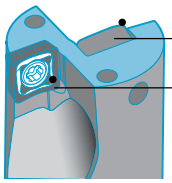


DRV: 1.2mm Competitor E: 0.5mm

47% Weight of chips

Cutting conditions: Vc = 250 m/min, f = 0.08 mm/rev, Drill dia. ø20(5D), wet workpiece material: X5CrNi18 10

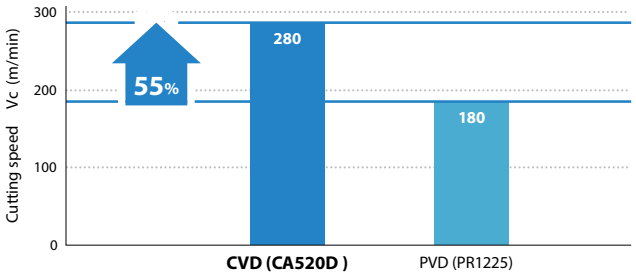
3 CVD insert on the outer edge for highly efficient drilling



New grades developed for drilling

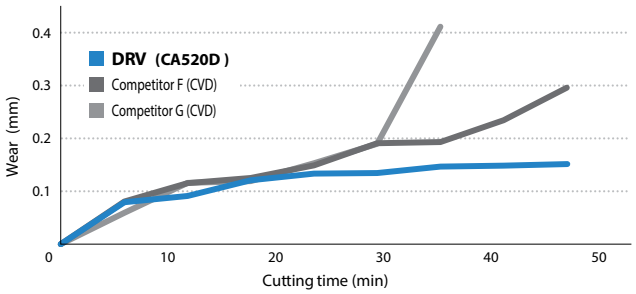
High speed and highly efficient machining available with the combination
Of CVD (Outer edge) and PVD (Inner edge) inserts.

Recommended cutting speed (Maximum value)



Drill dia. ø20(3D) workpiece material: C50

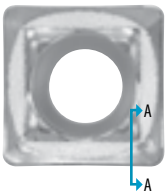
Wear resistance comparison (Internal evaluation)



Cutting conditions: Vc = 200 m/min, f = 0.12 mm/rev, Drill dia. ø20(3D) , wet
workpiece material: 41Cr4

4 Economical inserts with 4 cutting edges 4 types of chipbreakers for various machining applications

General purpose GM chipbreaker



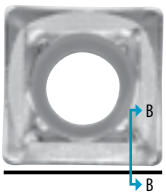
Chipbreaker for steel machining
Stable deep-hole machining with low cutting force



A-A Section

Edge shape optimized for
various machining applications

Tough edge GH chipbreaker



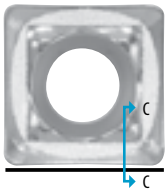
1st recommendation for machining cast iron
Good for continuous steel machining
Reduced breakages common in through-hole machining



B-B Section

Negative land with
Strong edge

For stainless steel machining SM chipbreaker



Stable chip control when machining
gummy stainless steel.
Reduces chip clogging in the holder body



C-C Section

Sharp cutting and
large rake angle

Chip control comparison (Internal evaluation)



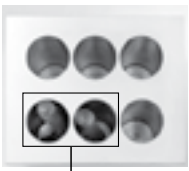
DRV (SM chipbreaker) Competitor H

Cutting conditions: Vc = 100 m/min, f = 0.1 Mm/rev
drill dia. Ø20(3d), drilling depth 60mm
wet, workpiece material: X5CrNi18 10

Comparison of remaining chips (Internal evaluation)

DRV (SM chipbreaker)

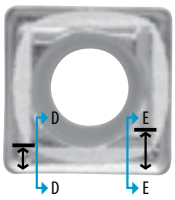
Competitor I



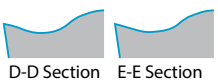
Remaining chips

Cutting conditions: Vc = 150 m/min, f = 0.08 Mm/rev
drill dia. Ø25(5d),
drilling depth 98mm, wet,
workpiece material: X5CrNi18 10

For machining soft steel XM chipbreaker



Stable chip control of outer cutting edge



D-D Section E-E Section

Excellent chip control
With the changing
Width of the chipbreaker

Chip control comparison (Internal evaluation)



DRV (XM chipbreaker) Competitor J

Cutting conditions: Vc = 200 m/min, f = 0.12 mm/rev
Drill dia. ø16(3D), Drilling depth 48 mm
Wet Workpiece material: ST44-2

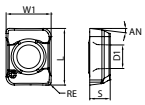
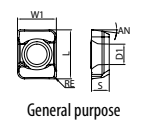
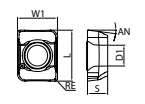
LCMT (outer edge)

Classification of usage

★ : High speed and highly efficient drilling

☆ : Stable machining oriented

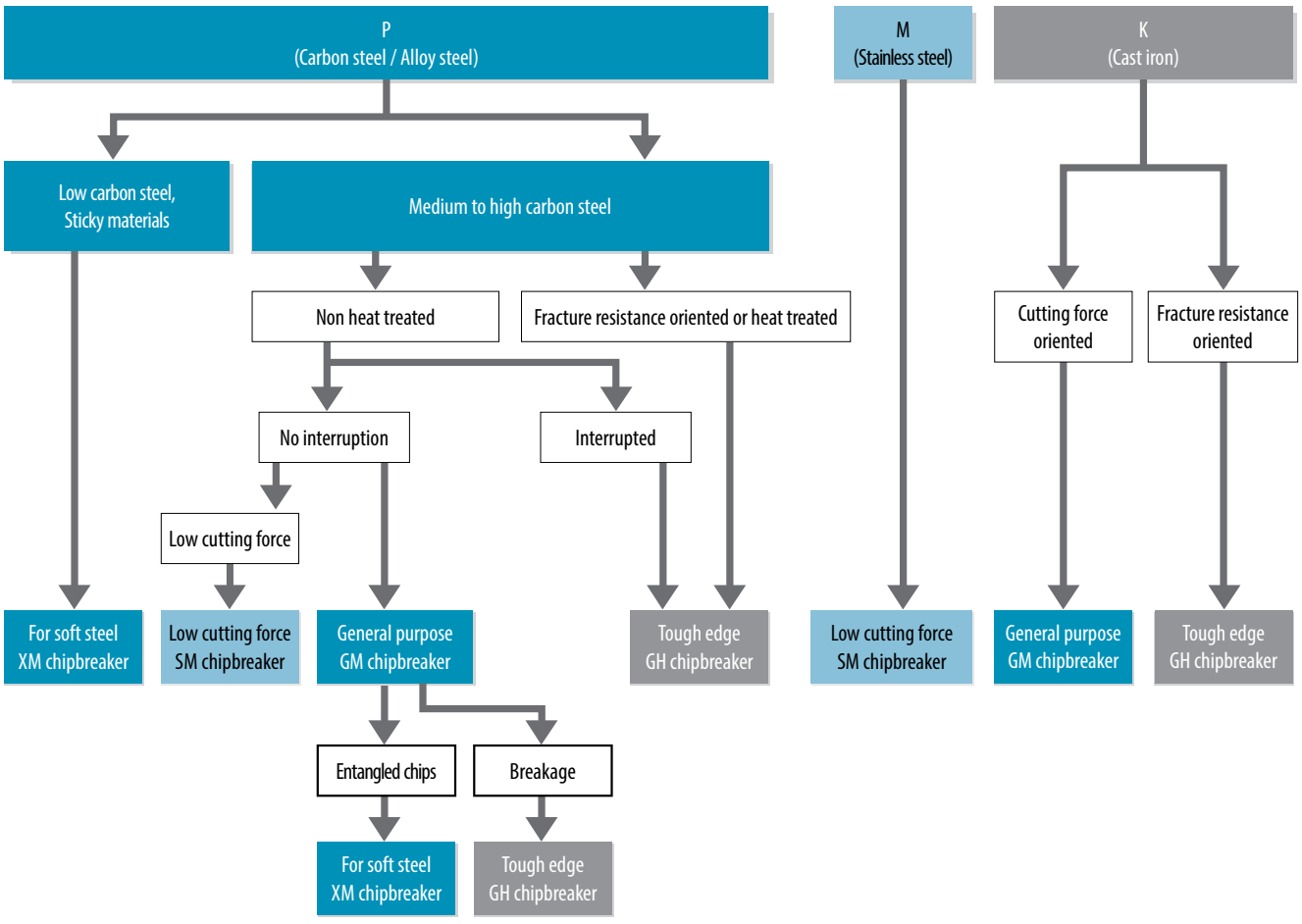
Carbon steel / Alloy steel										★	☆	P
Mold and die steel										★	☆	P
Stainless steel										★	☆	M
Cast iron										★	☆	K

Insert		Description	No. of edges	Dimension (mm) S	D1	RE	L	W1	Angle (°) AN	Carbide CVD CA415D / CA520D	Carbide PVD PR1225	Applicable toolholder
	 Tough edge	LCMT 030203-GH-E	2	2	2.3	0.3	5.54	4.4	7	●	●	S20-DRV...M-○-03
	 General purpose	LCMT 030203-GM-E	2	2	2.3	0.3	5.54	4.4	7	●	●	S20-DRV...M-○-03
	 Stainless steel	LCMT 030203-SM-E	2	2	2.3	0.3	5.54	4.4	7		●	S20-DRV...M-○-03

Applicable toolholder: K54, K56, K58, K60, K62

Recommended cutting conditions K68~K69

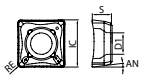
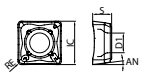
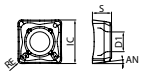
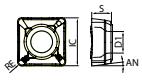
Chipbreaker selection chart



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SCMT (outer edge)

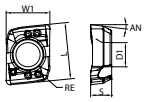
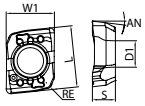
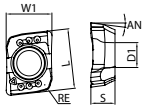
Classification of usage ★ : High speed and highly efficient drilling ☆ : Stable machining oriented												
								Carbon steel / Alloy steel		★	☆	P
								Mold and die steel		★	☆	P
								Stainless steel		★	☆	M
								Cast iron	★		☆	K

Insert		Description		No. of edges	Dimension (mm)				Angle (°)	Carbide			Applicable toolholder ➡ K54~K62
					IC	S	D1	RE	AN	CVD		PVD	
										CA415D	CA520D	PR1225	
	 Tough edge	SCMT	040205-GH-E	4	4.8	2.2	2.4	0.5	7	●	●	●	S..-DRV...M-○-04
		SCMT	050205-GH-E	4	5.25	2.6	2.4	0.5	7	●	●	●	S..-DRV...M-○-05
		SCMT	060205-GH-E	4	6.4	2.8	2.9	0.5	7	●	●	●	S..-DRV...M-○-06
		SCMT	070305-GH-E	4	7.65	3.2	3.5	0.5	7	●	●	●	S..-DRV...M-○-07
		SCMT	090405-GH-E	4	9.1	4.1	4	0.5	7	●	●	●	S..-DRV...M-○-09
		SCMT	110406-GH-E	4	11	4.5	4.6	0.6	7	●	●	●	S..-DRV...M-○-11
		SCMT	140508-GH-E	4	13.8	5	5.7	0.8	7	●	●	●	S..-DRV...M-○-14
		SCMT	170608-GH-E	4	16.8	6.58	6.9	0.8	7	●	●	●	S..-DRV...M-○-17
	 General purpose	SCMT	040205-GM-E	4	4.8	2.2	2.4	0.5	7	●	●	●	S..-DRV...M-○-04
		SCMT	050205-GM-E	4	5.25	2.6	2.4	0.5	7	●	●	●	S..-DRV...M-○-05
		SCMT	060205-GM-E	4	6.4	2.8	2.9	0.5	7	●	●	●	S..-DRV...M-○-06
		SCMT	070305-GM-E	4	7.65	3.2	3.5	0.5	7	●	●	●	S..-DRV...M-○-07
		SCMT	090405-GM-E	4	9.1	4.1	4	0.5	7	●	●	●	S..-DRV...M-○-09
		SCMT	110406-GM-E	4	11	4.5	4.6	0.6	7	●	●	●	S..-DRV...M-○-11
		SCMT	140508-GM-E	4	13.8	5	5.7	0.8	7	●	●	●	S..-DRV...M-○-14
		SCMT	170608-GM-E	4	16.8	6.58	6.9	0.8	7	●	●	●	S..-DRV...M-○-17
	 Stainless steel	SCMT	040205-SM-E	4	4.8	2.2	2.4	0.5	7		●	●	S..-DRV...M-○-04
		SCMT	050205-SM-E	4	5.25	2.6	2.4	0.5	7		●	●	S..-DRV...M-○-05
		SCMT	060205-SM-E	4	6.4	2.8	2.9	0.5	7		●	●	S..-DRV...M-○-06
		SCMT	070305-SM-E	4	7.65	3.2	3.5	0.5	7		●	●	S..-DRV...M-○-07
		SCMT	090405-SM-E	4	9.1	4.1	4	0.5	7		●	●	S..-DRV...M-○-09
		SCMT	110406-SM-E	4	11	4.5	4.6	0.6	7		●	●	S..-DRV...M-○-11
		SCMT	140508-SM-E	4	13.8	5	5.7	0.8	7		●	●	S..-DRV...M-○-14
		SCMT	170608-SM-E	4	16.8	6.58	6.9	0.8	7		●	●	S..-DRV...M-○-17
	 Low carbon steel	SCMT	040205-XM-E	4	4.8	2.2	2.4	0.5	7		●	●	S..-DRV...M-○-04
		SCMT	050205-XM-E	4	5.25	2.6	2.4	0.5	7		●	●	S..-DRV...M-○-05
		SCMT	060205-XM-E	4	6.4	2.8	2.9	0.5	7		●	●	S..-DRV...M-○-06
		SCMT	070305-XM-E	4	7.65	3.2	3.5	0.5	7		●	●	S..-DRV...M-○-07
		SCMT	090405-XM-E	4	9.1	4.1	4	0.5	7		●	●	S..-DRV...M-○-09
		SCMT	110406-XM-E	4	11	4.5	4.6	0.6	7		●	●	S..-DRV...M-○-11
		SCMT	140508-XM-E	4	13.8	5	5.7	0.8	7		●	●	S..-DRV...M-○-14
		SCMT	170608-XM-E	4	16.8	6.58	6.9	0.8	7		●	●	S..-DRV...M-○-17

Recommended cutting conditions ➡ K68~K69

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

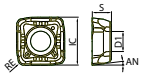
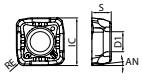
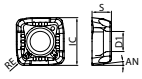
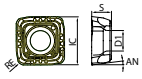
LCMT (inner edge)

												Carbon steel / Alloy steel	P
												Mold and die steel	P
												Stainless steel	M
												Cast iron	K
Insert		Description	No. of edges	Dimension (mm)					Angle (°)	Carbide		Applicable toolholder ➡ K54, K56 K58, K60 K62	
				S	D1	RE	L	W1	AN	PVD	PR1535		
	 Tough edge	LCMT 030205-GH-I	2	2	2.3	0.5	5.37	4.16	7	●		S20-DRV...M-○-03	
	 General purpose	LCMT 030205-GM-I	2	2	2.3	0.5	5.37	4.16	7	●			
	 Stainless steel	LCMT 030205-SM-I	2	2	2.3	0.5	5.37	4.16	7	●			

Recommended cutting conditions ➡ K68~K69

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SCMT (inner edge)

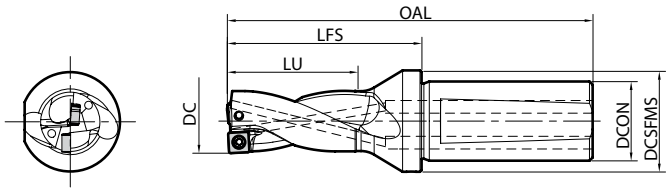
Insert		Description		No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide PVD PR1535	Applicable toolholder ➡ K54~K62
		Carbon steel / Alloy steel									P
		Mold and die steel									
		Stainless steel									M
		Cast iron									K
	 Tough edge	SCMT	040209-GH-I	4	5	2.2	2.4	0.9	7	●	S..-DRV...M-○-04
		SCMT	050210-GH-I	4	5.7	2.6	2.4	1	7	●	S..-DRV...M-○-05
		SCMT	060210-GH-I	4	6.9	2.8	2.9	1	7	●	S..-DRV...M-○-06
		SCMT	070310-GH-I	4	8.2	3.2	3.5	1	7	●	S..-DRV...M-○-07
		SCMT	090410-GH-I	4	9.8	4.1	4	1	7	●	S..-DRV...M-○-09
		SCMT	110410-GH-I	4	11.9	4.5	4.6	1	7	●	S..-DRV...M-○-11
		SCMT	140510-GH-I	4	14.9	5	5.7	1	7	●	S..-DRV...M-○-14
		SCMT	170610-GH-I	4	17.9	6.58	6.9	1	7	●	S..-DRV...M-○-17
	 General purpose	SCMT	040209-GM-I	4	5	2.2	2.4	0.9	7	●	S..-DRV...M-○-04
		SCMT	050210-GM-I	4	5.7	2.6	2.4	1	7	●	S..-DRV...M-○-05
		SCMT	060210-GM-I	4	6.9	2.8	2.9	1	7	●	S..-DRV...M-○-06
		SCMT	070310-GM-I	4	8.2	3.2	3.5	1	7	●	S..-DRV...M-○-07
		SCMT	090410-GM-I	4	9.8	4.1	4	1	7	●	S..-DRV...M-○-09
		SCMT	110410-GM-I	4	11.9	4.5	4.6	1	7	●	S..-DRV...M-○-11
		SCMT	140510-GM-I	4	14.9	5	5.7	1	7	●	S..-DRV...M-○-14
		SCMT	170610-GM-I	4	17.9	6.58	6.9	1	7	●	S..-DRV...M-○-17
	 Stainless steel	SCMT	040209-SM-I	4	5	2.2	2.4	0.9	7	●	S..-DRV...M-○-04
		SCMT	050210-SM-I	4	5.7	2.6	2.4	1	7	●	S..-DRV...M-○-05
		SCMT	060210-SM-I	4	6.9	2.8	2.9	1	7	●	S..-DRV...M-○-06
		SCMT	070310-SM-I	4	8.2	3.2	3.5	1	7	●	S..-DRV...M-○-07
		SCMT	090410-SM-I	4	9.8	4.1	4	1	7	●	S..-DRV...M-○-09
		SCMT	110410-SM-I	4	11.9	4.5	4.6	1	7	●	S..-DRV...M-○-11
		SCMT	140510-SM-I	4	14.9	5	5.7	1	7	●	S..-DRV...M-○-14
		SCMT	170610-SM-I	4	17.9	6.58	6.9	1	7	●	S..-DRV...M-○-17
	 Low carbon steel	SCMT	040209-XM-I	4	5	2.2	2.4	0.9	7	●	S..-DRV...M-○-04
		SCMT	050210-XM-I	4	5.7	2.6	2.4	1	7	●	S..-DRV...M-○-05
		SCMT	060210-XM-I	4	6.9	2.8	2.9	1	7	●	S..-DRV...M-○-06
		SCMT	070310-XM-I	4	8.2	3.2	3.5	1	7	●	S..-DRV...M-○-07
		SCMT	090410-XM-I	4	9.8	4.1	4	1	7	●	S..-DRV...M-○-09
		SCMT	110410-XM-I	4	11.9	4.5	4.6	1	7	●	S..-DRV...M-○-11
		SCMT	140510-XM-I	4	14.9	5	5.7	1	7	●	S..-DRV...M-○-14
		SCMT	170610-XM-I	4	17.9	6.58	6.9	1	7	●	S..-DRV...M-○-17

Recommended cutting conditions ➡ K68~K69

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DRV (Drilling depth : 2 x DC)





2D

Toolholder dimensions

Description		Availability	No. of inserts	Dimension (mm)						Coolant hole	Radial offset max.	Spare parts				Applicable inserts ⇒ K50~K53
				DC	DCON	OAL	LFS	LU	DCSFMS			Screw	Wrench	Wrench	Wrench	
S20-	DRV120M-2-03	●	2	12	20	82	39	24	27	Yes	+0.25	SB-2037TRP	-	FTP-6	-	LCMT030203-□□-E (Outer) LCMT030205-□□-I (Inner)
	DRV125M-2-03	●		12.5		83	40	25			+0.2					
	DRV130M-2-03	●		13		84	41	26			+0.15					
	DRV135M-2-03	●		13.5		85	42	27			+0.1					
S20-	DRV140M-2-04	●	2	14	20	92	49	28	27	Yes	+0.4	SB-2037TRP	-	FTP-6	-	SCMT040205-□□-E (Outer) SCMT040209-□□-I (Inner)
	DRV145M-2-04	●		14.5		93	50	29			+0.35					
	DRV150M-2-04	●		15		94	51	30			+0.3					
	DRV155M-2-04	●		15.5		95	52	31			+0.25					
S25-	DRV160M-2-05	●	2	16	25	110	56	32	32	Yes	+0.4	SB-2041TRP	-	FTP-6	-	SCMT050205-□□-E (Outer) SCMT050210-□□-I (Inner)
	DRV165M-2-05	●		16.5		111	57	33			+0.35					
	DRV170M-2-05	●		17		112	58	34			+0.3					
	DRV175M-2-05	●		17.5		113	59	35			+0.25					
	DRV180M-2-05	●		18		114	60	36			+0.2					
	DRV185M-2-05	●		18.5		115	61	37			+0.15					
S25-	DRV190M-2-06	●	2	19	25	113	59	38	32	Yes	+0.65	SB-2555TRP	DTPM-8	-	-	SCMT060205-□□-E (Outer) SCMT060210-□□-I (Inner)
	DRV195M-2-06	●		19.5		114	60	39			+0.6					
	DRV200M-2-06	●		20		115	61	40			+0.55					
	DRV205M-2-06	●		20.5		116	62	41			0.5					
	DRV210M-2-06	●		21		117	63	42			+0.45					
	DRV215M-2-06	●		21.5		118	64	43			+0.35					
	DRV220M-2-06	●		22		119	65	44			+0.3					
S25-	DRV225M-2-07	●	2	22.5	25	120	66	45	32	Yes	+0.9	SB-3060TRP	DTPM-10	-	-	SCMT070305-□□-E (Outer) SCMT070310-□□-I (Inner)
	DRV230M-2-07	●		23		121	67	46			+0.8					
	DRV235M-2-07	●		23.5		122	68	47			+0.75					
	DRV240M-2-07	●		24		123	69	48			+0.7					
	DRV245M-2-07	●		24.5		124	70	49			+0.65					
	DRV250M-2-07	●		25		125	71	50			+0.6					
	DRV255M-2-07	●		25.5		126	72	51			+0.5					
	DRV260M-2-07	●		26		127	73	52			+0.45					
S32-	DRV270M-2-09	●	2	27	32	136	77	54	41	Yes	+1.05	SB-3573TRP	DTPM-10	-	-	SCMT090405-□□-E (Outer) SCMT090410-□□-I (Inner)
	DRV280M-2-09	●		28		138	79	56			+0.95					
	DRV290M-2-09	●		29		140	81	58			+0.85					
	DRV300M-2-09	●		30		142	83	60			+0.75					
	DRV310M-2-09	●		31		144	85	62			+0.6					
	DRV320M-2-09	●		32		146	87	64			+0.5					

When offset drilling, reduce feed rate to 0.08 mm/rev or less.
See page **K70** for Adjustable Sleeve (SHE).

Recommended cutting conditions ⇒ **K68**
Trouble shooting ⇒ **K65**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Toolholder dimensions

2xDC

Description		Availability	No. of inserts	Dimension (mm)						Coolant hole	Radial offset max.	Spare parts				Applicable inserts ➡ K51, K53
				DC	DCON	OAL	LFS	LU	DCSFMS			Screw	Wrench	Wrench	Wrench	
																
S40-	DRV330M-2-11	●	2	33	40	161	92	66	49	Yes	+1.25	SB-4086TRP	DTPM-15	-	-	SCMT110406-□□-E (Outer) SCMT110410-□□-I (Inner)
	DRV340M-2-11	●		34		163	94	68			+1.15					
	DRV350M-2-11	●		35		165	96	70			+1					
	DRV360M-2-11	●		36		167	98	72			+0.9					
	DRV370M-2-11	●		37		169	100	74			+0.8					
	DRV380M-2-11	●		38		171	102	76			+0.65					
	DRV390M-2-11	●		39		173	104	78			+0.55					
S40-	DRV400M-2-14	●	2	40	40	181	112	80	49	Yes	+1.75	SB-50120TRPH	-	-	TTP-20	SCMT140508-□□-E (Outer) SCMT140510-□□-I (Inner)
	DRV410M-2-14	●		41		183	114	82			+1.6					
	DRV420M-2-14	●		42		185	116	84			+1.5					
	DRV430M-2-14	●		43		187	118	86			+1.4					
	DRV440M-2-14	●		44		189	120	88			+1.3					
	DRV450M-2-14	●		45		191	122	90			+1.15					
	DRV460M-2-14	●		46		193	124	92	54		+1.05					
	DRV470M-2-14	●		47		195	126	94			+0.95					
	DRV480M-2-14	●		48		197	128	96			+0.8					
	DRV490M-2-14	●		49		199	130	98			+0.7					
S40-	DRV500M-2-17	●	2	50	40	198	129	100	59	Yes	+2.1	SB-60130TRP	-	-	TTP-20	SCMT170608-□□-E (Outer) SCMT170610-□□-I (Inner)
	DRV510M-2-17	●		51		200	131	102			+1.95					
	DRV520M-2-17	●		52		202	133	104			+1.85					
	DRV530M-2-17	●		53		204	135	106			+1.75					
	DRV540M-2-17	●		54		206	137	108			+1.65					
	DRV550M-2-17	●		55		208	139	110			+1.5					
	DRV560M-2-17	●		56		210	141	112			+1.4					
	DRV570M-2-17	●		57		212	143	114	64		+1.3					
	DRV580M-2-17	●		58		214	145	116			+1.15					
	DRV590M-2-17	●		59		216	147	118			+1.05					
	DRV600M-2-17	●		60		218	149	120			+0.95					

When offset drilling, reduce feed rate to 0.08 mm/rev or less.
See page **K70** for Adjustable Sleeve (SHE).

Recommended cutting conditions ➡ **K68**
Trouble shooting ➡ **K65**

Hole Dia. Tolerance (2D type)

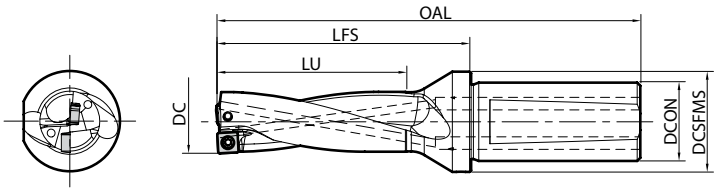
DC	Hole Dia. Tolerance (mm)
ø12 - ø60	+0.30 0

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DRV (Drilling depth : 3 x DC)





3D

Toolholder dimensions

Description		Availability	No. of inserts	Dimension (mm)						Coolant hole	Radial offset max.	Spare parts				Applicable inserts ⇨ K50~K53
				DC	DCON	OAL	LFS	LU	DCSFMS			Screw	Wrench	Wrench	Wrench	
S20-	DRV120M-3-03	●	2	12	20	94	51	36	27	Yes	+0.25	SB-2037TRP	-	FTP-6	-	LCMT030203-□□-E (Outer) LCMT030205-□□-I (Inner)
	DRV125M-3-03	●		12.5		96	53	37.5			+0.2					
	DRV130M-3-03	●		13		97	54	39			+0.15					
	DRV135M-3-03	●		13.5		99	56	40.5			+0.1					
S20-	DRV140M-3-04	●	2	14	20	106	63	42	27	Yes	+0.4	SB-2037TRP	-	FTP-6	-	SCMT040205-□□-E (Outer) SCMT040209-□□-I (Inner)
	DRV145M-3-04	●		14.5		108	65	43.5			+0.35					
	DRV150M-3-04	●		15		109	66	45			+0.3					
	DRV155M-3-04	●		15.5		111	68	46.5			+0.25					
S25-	DRV160M-3-05	●	2	16	25	126	72	48	32	Yes	+0.4	SB-2041TRP	-	FTP-6	-	SCMT050205-□□-E (Outer) SCMT050210-□□-I (Inner)
	DRV165M-3-05	●		16.5		127	73	49.5			+0.35					
	DRV170M-3-05	●		17		129	75	51			+0.3					
	DRV175M-3-05	●		17.5		130	76	52.5			+0.25					
	DRV180M-3-05	●		18		132	78	54			+0.2					
	DRV185M-3-05	●		18.5		133	79	55.5			+0.15					
S25-	DRV190M-3-06	●	2	19	25	132	78	57	32	Yes	+0.65	SB-2555TRP	DTPM-8	-	-	SCMT060205-□□-E (Outer) SCMT060210-□□-I (Inner)
	DRV195M-3-06	●		19.5		134	80	58.5			+0.6					
	DRV200M-3-06	●		20		135	81	60			+0.55					
	DRV205M-3-06	●		20.5		137	83	61.5			+0.5					
	DRV210M-3-06	●		21		138	84	63			+0.45					
	DRV215M-3-06	●		21.5		140	86	64.5			+0.35					
	DRV220M-3-06	●		22		141	87	66			+0.3					
S25-	DRV225M-3-07	●	2	22.5	25	142	88	67.5	32	Yes	+0.9	SB-3060TRP	DTPM-10	-	-	SCMT070305-□□-E (Outer) SCMT070310-□□-I (Inner)
	DRV230M-3-07	●		23		144	90	69			+0.8					
	DRV235M-3-07	●		23.5		145	91	70.5			+0.75					
	DRV240M-3-07	●		24		147	93	72			+0.7					
	DRV245M-3-07	●		24.5		148	94	73.5			+0.65					
	DRV250M-3-07	●		25		150	96	75			+0.6					
	DRV255M-3-07	●		25.5		151	97	76.5			+0.5					
	DRV260M-3-07	●		26		153	99	78			+0.45					

When offset drilling, reduce feed rate to 0.08 mm/rev or less.
See page **K70** for Adjustable Sleeve (SHE).

Recommended cutting conditions ⇨ **K68**
Trouble shooting ⇨ **K65**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Toolholder dimensions

3xDC

Description		Availability	No. of inserts	Dimension (mm)						Coolant hole	Radial offset max.	Spare parts				Applicable inserts ➡ K51, K53
				DC	DCON	OAL	LFS	LU	DCSFMS			Screw	Wrench	Wrench	Wrench	
S32-	DRV265M-3-09	●	2	26.5	32	161	102	79.5	41	Yes	+1.15	SB-3573TRP	DTPM-10	-	-	SCMT090405-□□-E (Outer) SCMT090410-□□-I (Inner)
	DRV270M-3-09	●		27		163	104	81			+1.05					
	DRV275M-3-09	●		27.5		164	105	82.5			+1					
	DRV280M-3-09	●		28		166	107	84			+0.95					
	DRV285M-3-09	●		28.5		167	108	85.5			+0.9					
	DRV290M-3-09	●		29		169	110	87			+0.85					
	DRV295M-3-09	●		29.5		170	111	88.5			+0.8					
	DRV300M-3-09	●		30		172	113	90			+0.75					
	DRV305M-3-09	●		30.5		173	114	91.5			+0.65					
	DRV310M-3-09	●		31		175	116	93			+0.6					
	DRV315M-3-09	●		31.5		176	117	94.5			+0.55					
	DRV320M-3-09	●		32		178	119	96			+0.5					
S40-	DRV330M-3-11	●	2	33	40	194	125	99	49	Yes	+1.25	SB-4086TRP	DTPM-15	-	-	SCMT110406-□□-E (Outer) SCMT110410-□□-I (Inner)
	DRV340M-3-11	●		34		197	128	102			+1.15					
	DRV350M-3-11	●		35		200	131	105			+1					
	DRV360M-3-11	●		36		203	134	108			+0.9					
	DRV370M-3-11	●		37		206	137	111			+0.8					
	DRV380M-3-11	●		38		209	140	114			+0.65					
	DRV390M-3-11	●		39		212	143	117			+0.55					
S40-	DRV400M-3-14	●	2	40	40	221	152	120	49	Yes	+1.75	SB-50120TRPH	-	-	TTP-20	SCMT140508-□□-E (Outer) SCMT140510-□□-I (Inner)
	DRV410M-3-14	●		41		224	155	123			+1.6					
	DRV420M-3-14	●		42		227	158	126			+1.5					
	DRV430M-3-14	●		43		230	161	129			+1.4					
	DRV440M-3-14	●		44		233	164	132			+1.3					
	DRV450M-3-14	●		45		236	167	135			+1.15					
	DRV460M-3-14	●		46		239	170	138	54		+1.05					
	DRV470M-3-14	●		47		242	173	141			+0.95					
	DRV480M-3-14	●		48		245	176	144			+0.8					
	DRV490M-3-14	●		49		248	179	147			+0.7					
S40-	DRV500M-3-17	●	2	50	40	248	179	150	59	Yes	+2.1	SB-60130TRP	-	-	TTP-20	SCMT170608-□□-E (Outer) SCMT170610-□□-I (Inner)
	DRV510M-3-17	●		51		251	182	153			+1.95					
	DRV520M-3-17	●		52		254	185	156			+1.85					
	DRV530M-3-17	●		53		257	188	159			+1.75					
	DRV540M-3-17	●		54		260	191	162			+1.65					
	DRV550M-3-17	●		55		263	194	165			+1.5					
	DRV560M-3-17	●		56		266	197	168			+1.4					
	DRV570M-3-17	●		57		269	200	171	64		+1.3					
	DRV580M-3-17	●		58		272	203	174			+1.15					
	DRV590M-3-17	●		59		275	206	177			+1.05					
	DRV600M-3-17	●		60		278	209	180			+0.95					

When offset drilling, reduce feed rate to 0.08 mm/rev or less.
See page **K70** for Adjustable Sleeve (SHE).

Recommended cutting conditions ➡ **K68**
Trouble shooting ➡ **K65**

Hole Dia. Tolerance (3D type)

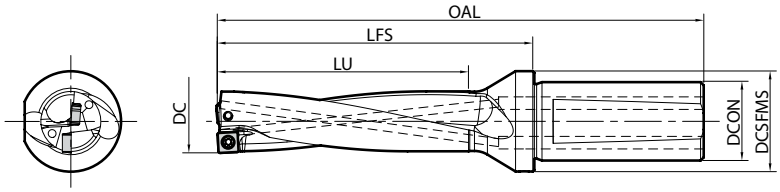
DC	Hole Dia. Tolerance (mm)
ø12 - ø60	+0.30 0

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DRV (Drilling depth : 4 x DC)





4D

Toolholder dimensions

Description		Availability	No. of inserts	Dimension (mm)						Coolant hole	Radial offset max.	Spare parts				Applicable inserts ⇒ K50~K53
				DC	DCON	OAL	LFS	LU	DCSFMS			Screw	Wrench	Wrench	Wrench	
S20-	DRV120M-4-03	●	2	12	20	106	63	48	27	Yes	+0.25	SB-2037TRP	-	FTP-6	-	LCMT030203-□□-E (Outer) LCMT030205-□□-I (Inner)
	DRV125M-4-03	●		12.5		108	65	50			+0.2					
	DRV130M-4-03	●		13		110	67	52			+0.15					
	DRV135M-4-03	●		13.5		112	69	54			+0.1					
S20-	DRV140M-4-04	●	2	14	20	120	77	56	27	Yes	+0.4	SB-2037TRP	-	FTP-6	-	SCMT040205-□□-E (Outer) SCMT040209-□□-I (Inner)
	DRV145M-4-04	●		14.5		122	79	58			+0.35					
	DRV150M-4-04	●		15		124	81	60			+0.3					
	DRV155M-4-04	●		15.5		126	83	62			+0.25					
S25-	DRV160M-4-05	●	2	16	25	142	88	64	32	Yes	+0.4	SB-2041TRP	-	FTP-6	-	SCMT050205-□□-E (Outer) SCMT050210-□□-I (Inner)
	DRV165M-4-05	●		16.5		144	90	66			+0.35					
	DRV170M-4-05	●		17		146	92	68			+0.3					
	DRV175M-4-05	●		17.5		148	94	70			+0.25					
	DRV180M-4-05	●		18		150	96	72			+0.2					
	DRV185M-4-05	●		18.5		152	98	74			+0.15					
S25-	DRV190M-4-06	●	2	19	25	151	97	76	32	Yes	+0.65	SB-2555TRP	DTPM-8	-	-	SCMT060205-□□-E (Outer) SCMT060210-□□-I (Inner)
	DRV195M-4-06	●		19.5		153	99	78			+0.6					
	DRV200M-4-06	●		20		155	101	80			+0.55					
	DRV205M-4-06	●		20.5		157	103	82			+0.5					
	DRV210M-4-06	●		21		159	105	84			+0.45					
	DRV215M-4-06	●		21.5		161	107	86			+0.35					
	DRV220M-4-06	●		22		163	109	88			+0.3					
S25-	DRV225M-4-07	●	2	22.5	25	165	111	90	32	Yes	+0.9	SB-3060TRP	DTPM-10	-	-	SCMT070305-□□-E (Outer) SCMT070310-□□-I (Inner)
	DRV230M-4-07	●		23		167	113	92			+0.8					
	DRV235M-4-07	●		23.5		169	115	94			+0.75					
	DRV240M-4-07	●		24		171	117	96			+0.7					
	DRV245M-4-07	●		24.5		173	119	98			+0.65					
	DRV250M-4-07	●		25		175	121	100			+0.6					
	DRV255M-4-07	●		25.5		177	123	102			+0.5					
	DRV260M-4-07	●		26		179	125	104			+0.45					
S32-	DRV270M-4-09	●	2	27	32	190	131	108	41	Yes	+1.05	SB-3573TRP	DTPM-10	-	-	SCMT090405-□□-E (Outer) SCMT090410-□□-I (Inner)
	DRV280M-4-09	●		28		194	135	112			+0.95					
	DRV290M-4-09	●		29		198	139	116			+0.85					
	DRV300M-4-09	●		30		202	143	120			+0.75					
	DRV310M-4-09	●		31		206	147	124			+0.6					
	DRV320M-4-09	●		32		210	151	128			+0.5					

When offset drilling, reduce feed rate to 0.06 mm/rev or less.
See page **K70** for Adjustable Sleeve (SHE).

Recommended cutting conditions ⇒ **K68**
Trouble shooting ⇒ **K65**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Toolholder dimensions

4xDC

Description		Availability	No. of inserts	Dimension (mm)						Coolant hole	Radial offset max.	Spare parts				Applicable inserts ➡ K51, K53
				DC	DCON	OAL	LFS	LU	DCSFMS			Screw	Wrench	Wrench	Wrench	
																
S40-	DRV330M-4-11	●	2	33	40	227	158	132	49	Yes	+1.25	SB-4086TRP	DTPM-15	-	-	SCMT110406-□□-E (Outer) SCMT110410-□□-I (Inner)
	DRV340M-4-11	●		34		231	162	136			+1.15					
	DRV350M-4-11	●		35		235	166	140			+1					
	DRV360M-4-11	●		36		239	170	144			+0.9					
	DRV370M-4-11	●		37		243	174	148			+0.8					
	DRV380M-4-11	●		38		247	178	152			+0.65					
	DRV390M-4-11	●		39		251	182	156			+0.55					
S40-	DRV400M-4-14	●	2	40	40	261	192	160	49	Yes	+1.75	SB-50120TRPH	-	-	TTP-20	SCMT140508-□□-E (Outer) SCMT140510-□□-I (Inner)
	DRV410M-4-14	●		41		265	196	164			+1.6					
	DRV420M-4-14	●		42		269	200	168			+1.5					
	DRV430M-4-14	●		43		273	204	172			+1.4					
	DRV440M-4-14	●		44		277	208	176			+1.3					
	DRV450M-4-14	●		45		281	212	180			+1.15					
	DRV460M-4-14	●		46		285	216	184	54		+1.05					
	DRV470M-4-14	●		47		289	220	188			+0.95					
S50-	DRV480M-4-14	●		48	50	293	224	192	59		+0.8					
	DRV490M-4-14	●		49		297	228	196			+0.7					
S50-	DRV500M-4-17	●	2	50	50	298	229	200	59	Yes	+2.1	SB-60130TRP	-	-	TTP-20	SCMT170608-□□-E (Outer) SCMT170610-□□-I (Inner)
	DRV510M-4-17	●		51		302	233	204			+1.95					
	DRV520M-4-17	●		52		306	237	208			+1.85					
	DRV530M-4-17	●		53		310	241	212			+1.75					
	DRV540M-4-17	●		54		314	245	216			+1.65					
	DRV550M-4-17	●		55		318	249	220			+1.5					
	DRV560M-4-17	●		56		322	253	224			+1.4					
	DRV570M-4-17	●		57		326	257	228	64		+1.3					
	DRV580M-4-17	●		58		330	261	232			+1.15					
	DRV590M-4-17	●		59		334	265	236			+1.05					
	DRV600M-4-17	●		60		338	269	240			+0.95					

When offset drilling, reduce feed rate to 0.06 mm/rev or less.
See page **K70** for Adjustable Sleeve (SHE).

Recommended cutting conditions ➡ **K68**
Trouble shooting ➡ **K65**

Hole Dia. Tolerance (4D type)

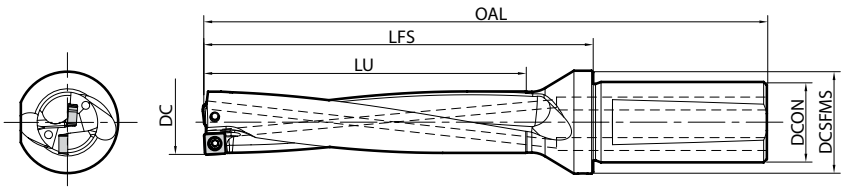
DC	Hole Dia. Tolerance (mm)
ø12 - ø39	+0.35 0
ø40 - ø60	+0.40 0

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DRV (Drilling depth : 5 x DC)





5D

Toolholder dimensions

Description		Availability	No. of inserts	Dimension (mm)						Coolant hole	Radial offset max.	Spare parts				Applicable inserts ➡ K50~K53
				DC	DCON	OAL	LFS	LU	DCSFMS			Screw	Wrench	Wrench	Wrench	
S20-	DRV120M-5-03	●	2	12	20	118	75	60	27	Yes	+0.25	SB-2037TRP	-	FTP-6	-	LCMT030203-□□-E (Outer) LCMT030205-□□-I (Inner)
	DRV130M-5-03	●		13		123	80	65			+0.15					
S20-	DRV140M-5-04	●	2	14	20	134	91	70	27	Yes	+0.4	SB-2037TRP	-	FTP-6	-	SCMT040205-□□-E (Outer) SCMT040209-□□-I (Inner)
	DRV150M-5-04	●		15		139	96	75			+0.3					
S25-	DRV160M-5-05	●		16		158	104	80			+0.4					
	DRV170M-5-05	●	2	17	25	163	109	85	32	Yes	+0.3	SB-2041TRP	-	FTP-6	-	SCMT050205-□□-E (Outer) SCMT050210-□□-I (Inner)
	DRV180M-5-05	●		18		168	114	90			+0.2					
S25-	DRV190M-5-06	●		19		170	116	95			+0.65					
	DRV200M-5-06	●	2	20	25	175	121	100	32	Yes	+0.55	SB-2555TRP	DTPM-8	-	-	SCMT060205-□□-E (Outer) SCMT060210-□□-I (Inner)
	DRV210M-5-06	●		21		180	126	105			+0.45					
	DRV220M-5-06	●		22		185	131	110			+0.3					
S25-	DRV230M-5-07	●		23		190	136	115			+0.8					
	DRV240M-5-07	●	2	24	25	195	141	120	32	Yes	+0.7	SB-3060TRP	DTPM-10	-	-	SCMT070305-□□-E (Outer) SCMT070310-□□-I (Inner)
	DRV250M-5-07	●		25		200	146	125			+0.6					
	DRV260M-5-07	●		26		205	151	130			+0.45					
S32-	DRV270M-5-09	●		27		217	158	135			+1.05					
	DRV280M-5-09	●		28		222	163	140			+0.95					
	DRV290M-5-09	●	2	29	32	227	168	145	41	Yes	+0.85	SB-3573TRP	DTPM-10	-	-	SCMT090405-□□-E (Outer) SCMT090410-□□-I (Inner)
	DRV300M-5-09	●		30		232	173	150			+0.75					
	DRV310M-5-09	●		31		237	178	155			+0.6					
	DRV320M-5-09	●		32		242	183	160			+0.5					
S40-	DRV330M-5-11	●		33		260	191	165			+1.25					
	DRV340M-5-11	●		34		265	196	170			+1.15					
	DRV350M-5-11	●		35		270	201	175			+1					
	DRV360M-5-11	●	2	36	40	275	206	180	49	Yes	+0.9	SB-4086TRP	DTPM-15	-	-	SCMT110406-□□-E (Outer) SCMT110410-□□-I (Inner)
	DRV370M-5-11	●		37		280	211	185			+0.8					
	DRV380M-5-11	●		38		285	216	190			+0.65					
	DRV390M-5-11	●		39		290	221	195			+0.55					

When offset drilling, reduce feed rate to 0.05 mm/rev or less.
See page **K70** for Adjustable Sleeve (SHE).

Recommended cutting conditions ➡ **K69**
Trouble shooting ➡ **K65**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Toolholder dimensions

5xDC

Description		Availability	No. of inserts	Dimension (mm)						Coolant hole	Radial offset max.	Spare parts				Applicable inserts ➡ K51, K53
				DC	DCON	OAL	LFS	LU	DCSFMS			Screw	Wrench	Wrench	Wrench	
S40-	DRV400M-5-14	●	2	40	40	301	232	200	49	Yes	+1.75	SB-50120TRPH	-	-	TTP-20	SCMT140508-□□-E (Outer) SCMT140510-□□-I (Inner)
	DRV410M-5-14	●		41		306	237	205			+1.6					
	DRV420M-5-14	●		42		311	242	210			+1.5					
	DRV430M-5-14	●		43		316	247	215			+1.4					
	DRV440M-5-14	●		44		321	252	220			+1.3					
	DRV450M-5-14	●		45		326	257	225			+1.15					
	DRV460M-5-14	●		46		331	262	230	54		+1.05					
	DRV470M-5-14	●		47		336	267	235			+0.95					
S50-	DRV480M-5-14	●		48	50	341	272	240	59		+0.8					
	DRV490M-5-14	●		49		346	277	245			+0.7					
S50-	DRV500M-5-17	●	2	50	50	348	279	250	59	Yes	+2.1	SB-60130TRP	-	-	TTP-20	SCMT170608-□□-E (Outer) SCMT170610-□□-I (Inner)
	DRV510M-5-17	●		51		353	284	255			+1.95					
	DRV520M-5-17	●		52		358	289	260			+1.85					
	DRV530M-5-17	●		53		363	294	265			+1.75					
	DRV540M-5-17	●		54		368	299	270			+1.65					
	DRV550M-5-17	●		55		373	304	275			+1.5					
	DRV560M-5-17	●		56		378	309	280			+1.4					
	DRV570M-5-17	●		57		383	314	285	64		+1.3					
	DRV580M-5-17	●		58		388	319	290			+1.15					
	DRV590M-5-17	●		59		393	324	295			+1.05					
	DRV600M-5-17	●		60		398	329	300			+0.95					

When offset drilling, reduce feed rate to 0.05 mm/rev or less.
See page **K70** for Adjustable Sleeve (SHE).

Recommended cutting conditions ➡ **K69**
Trouble shooting ➡ **K65**

Hole Dia. Tolerance (5D type)

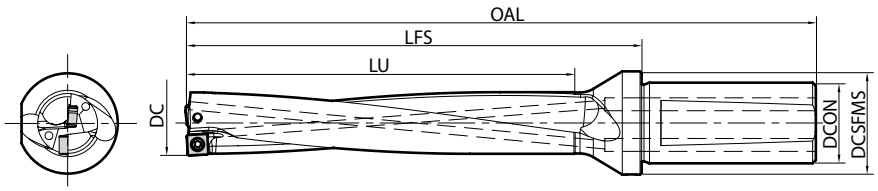
DC	Hole Dia. Tolerance (mm)
ø12 - ø39	+0.35 0
ø40 - ø60	+0.40 0

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DRV (Drilling depth : 6 x DC)





6D

Toolholder dimensions

Description		Availability	No. of inserts	Dimension (mm)						Coolant hole	Radial offset max.	Spare parts				Applicable inserts ➡ K50~K53
				DC	DCON	OAL	LFS	LU	DCSFMS			Screw	Wrench	Wrench	Wrench	
S20-	DRV120M-6-03	●	2	12	20	130	87	72	27	Yes	+0.25	SB-2037TRP	-	FTP-6	-	LCMT030203-□□-E (Outer) LCMT030205-□□-I (Inner)
	DRV130M-6-03	●		13		136	93	78			+0.15					
S20-	DRV140M-6-04	●	2	14	20	148	105	84	27	Yes	+0.4	SB-2037TRP	-	FTP-6	-	SCMT040205-□□-E (Outer) SCMT040209-□□-I (Inner)
	DRV150M-6-04	●		15		154	111	90			+0.3					
S25-	DRV160M-6-05	●	2	16	25	174	120	96	32	Yes	+0.4	SB-2041TRP	-	FTP-6	-	SCMT050205-□□-E (Outer) SCMT050210-□□-I (Inner)
	DRV170M-6-05	●		17		180	126	102			+0.3					
	DRV180M-6-05	●		18		186	132	108			+0.2					
S25-	DRV190M-6-06	●	2	19	25	189	135	114	32	Yes	+0.65	SB-2555TRP	DTPM-8	-	-	SCMT060205-□□-E (Outer) SCMT060210-□□-I (Inner)
	DRV200M-6-06	●		20		195	141	120			+0.55					
	DRV210M-6-06	●		21		201	147	126			+0.45					
	DRV220M-6-06	●		22		207	153	132			+0.3					
S25-	DRV230M-6-07	●	2	23	25	213	159	138	32	Yes	+0.8	SB-3060TRP	DTPM-10	-	-	SCMT070305-□□-E (Outer) SCMT070310-□□-I (Inner)
	DRV240M-6-07	●		24		219	165	144			+0.7					
	DRV250M-6-07	●		25		225	171	150			+0.6					
	DRV260M-6-07	●		26		231	177	156			+0.45					
S32-	DRV270M-6-09	●	2	27	32	244	185	162	41	Yes	+1.05	SB-3573TRP	DTPM-10	-	-	SCMT090405-□□-E (Outer) SCMT090410-□□-I (Inner)
	DRV280M-6-09	●		28		250	191	168			+0.95					
	DRV290M-6-09	●		29		256	197	174			+0.85					
	DRV300M-6-09	●		30		262	203	180			+0.75					
	DRV310M-6-09	●		31		268	209	186			+0.6					
	DRV320M-6-09	●		32		274	215	192			+0.5					
S40-	DRV330M-6-11	●	2	33	40	293	224	198	49	Yes	+1.25	SB-4086TRP	DTPM-15	-	-	SCMT110406-□□-E (Outer) SCMT110410-□□-I (Inner)
	DRV340M-6-11	●		34		299	230	204			+1.15					
	DRV350M-6-11	●		35		305	236	210			+1					
	DRV360M-6-11	●		36		311	242	216			+0.9					
	DRV370M-6-11	●		37		317	248	222			+0.8					
	DRV380M-6-11	●		38		323	254	228			+0.65					
	DRV390M-6-11	●		39		329	260	234			+0.55					
S40-	DRV400M-6-14	●	2	40	40	341	272	240	49	Yes	+1.75	SB-50120TRPH	-	-	TTP-20	SCMT140508-□□-E (Outer) SCMT140510-□□-I (Inner)
	DRV410M-6-14	●		41		347	278	246			+1.6					
	DRV420M-6-14	●		42		353	284	252			+1.5					
	DRV430M-6-14	●		43		359	290	258			+1.4					
	DRV440M-6-14	●		44		365	296	264			+1.3					
	DRV450M-6-14	●		45		371	302	270			+1.15					
S50-	DRV500M-6-17	●	2	50	50	398	329	300	59	Yes	+2.1	SB-60130TRP	-	-	TTP-20	SCMT170608-□□-E (Outer) SCMT170610-□□-I (Inner)
	DRV550M-6-17	●		55		428	359	330			+1.5					
	DRV600M-6-17	●		60		458	389	360	64		+0.95					

When offset drilling, reduce feed rate to 0.04 mm/rev or less.
See page **K70** for Adjustable Sleeve (SHE).

Recommended cutting conditions ➡ **K69**
Trouble shooting ➡ **K65**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Hole Dia. Tolerance (6D type)

DC	Hole Dia. Tolerance (mm)
ø12 - ø39	+0.45 0
ø40 - ø60	+0.50 0

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

Insert grade selection guide

Select CVD for the outer edge when performing high speed and high efficiency drilling. Drilling for high efficiency, abrasion resistance and long tool life.
Select PVD for the outer edge for stable drilling and a better surface finish.
PVD is recommended for the outer edge when chattering occurs or drilling with lathe is not available, even if cutting conditions are increased.

High speed and high efficiency drilling

Outer edge: CVD (CA520D/CA415D)



Inner edge: PVD (PR1535).



Stable machining oriented
(1st recommendation for lathe machining)

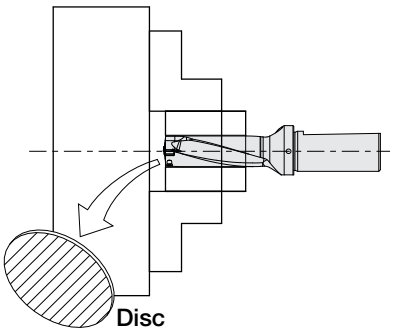
Outer edge: PVD (PR1225).



Inner edge: PVD (PR1535).



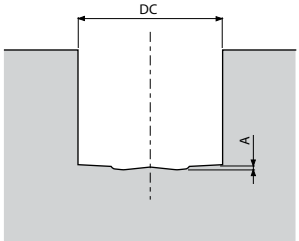
Caution



When drilling through the workpiece, a disk may be ejected.
Proper machine guarding is necessary to prevent injury.

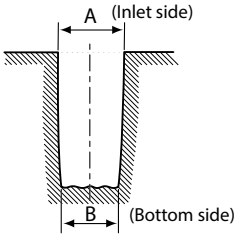
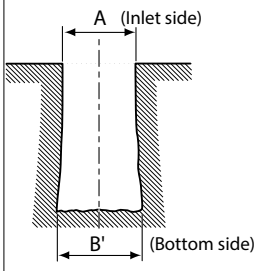
DRV hole bottom shape (mm)

Insert size	DC	A	Insert size	DC	A	Insert size	DC	A	Insert size	DC	A
03	12.0	0.70	06	19.0	1.2	09	26.5	1.2	14	40.0	1.9
	12.5			19.5			27.0			41.0	
	13.0			20.0			27.5	1.3		42.0	2.0
	13.5			20.5	1.3		28.0			43.0	
04	14.0	1.0		21.0			28.5			44.0	
	14.5			21.5			29.0			45.0	2.1
	15.0			22.0			29.5	1.4		46.0	
	15.5		07	22.5	1.2		30.0			47.0	
05	16.0	1.1		23.0			30.5			48.0	2.2
	16.5			23.5			31.0			49.0	
	17.0			24.0			31.5	1.5	17	50.0	2.0
	17.5			24.5	1.3		32.0			51.0	2.1
	18.0	1.2		25.0		11	33.0	1.5		52.0	
	18.5			25.5			34.0			53.0	
				26.0			35.0			54.0	2.2
							36.0	1.6		55.0	
							37.0			56.0	
							38.0			57.0	2.3
							39.0	1.7		58.0	
										59.0	2.4
										60.0	



Common for 2D, 3D, 4D, 5D, 6D type
* Above is numeric guideline. (Varies within ±0.1mm depending on workpiece materials and cutting conditions)

Trouble shooting (DRV / DRZ)

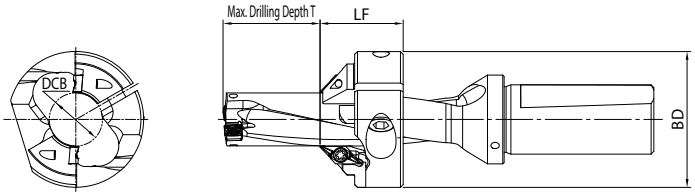
Trouble condition	Condition		Cause	Countermeasures
Hole diameter becomes smaller (At hole bottom)		There is no problem for inlet, however gradually hole diameter is getting smaller at the bottom. A>B	Chip jam (External or internal edge chip stuck)	Change the cutting conditions · Increase the cutting speed · Lower the feed rate **K68, K69, K85**
Hole diameter becomes larger (At hole bottom)		There is no problem for inlet, however gradually hole diameter is getting larger at the bottom. A<B'	Internal edge chip jam.	Change the cutting conditions · Increase the cutting speed · Lower the feed rate **K68, K69, K85** Check the core height **K72, K73** **K86, K87**
Hole diameter is small (From the hole inlet)		Hole diameter is small from inlet. (At turning moment)	Inappropriate adjustment of hole diameter.	In case of using lathe machine, use X-axis and adjustment hole diameter. **K72** **K86**
			No core at internal edge. (No core remains)	Adjust the center height. **K72, K73** **K86, K87**

Indication of tool life of MagicDrill (DRV/ DRZ)

How to judge tool life	Indication of judging tool life
Judgement of tool condition and insert wear	· When an insert is new, the toolholder is slightly bent to the side during drilling (therefore, the drill diameter is slightly bigger during drilling). Once drilling is finished, the toolholder will return back to normal size. No tool marks will appear on the finished surface (This depends on workpiece and cutting condition. Slight tool mark might appear if cutting force on external dia. is too low.) · When an insert is at the end of its tool life, gradually the external corner part gets worn out. Also the toolholder does not bend slightly outwards, and it starts to bend inwards. After the drilling is finished, the toolholder returns to the normal position. When taking off a toolholder under this condition, the cutting edge of the insert creates external tool marks on the finished surface of the workpiece.
Checking hole diameter	When hole diameter is measured, suddenly it shows small diameter. In this case, a worn out insert can be the cause and it must be exchange.
Checking the surface on the outlet side	If insert wear progresses, the burrs of penetrated hole entrance becomes bigger. This is a clear indication that the tool must be exchanged.
Variation of drilling noise	Light drilling noise at the beginning turns to brady noise which contains vibration noise.
Variation of vibration	As the end of tool life is getting closer, there is more vibration and the drilling noise changes. However, when drilling smaller diameters these factors are difficult to detect.

Chamfering attachment

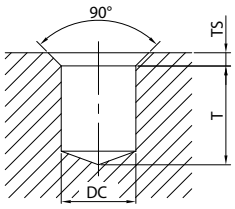




Dimensions

Description	Availability	Applicable drills	Dimension (mm)			Applicable inserts	Spare parts			
			BD	DCB	LF		Clamp Screw	Wrench	Clamp bolt	Wrench
DRV-CH17	●	S25-DRV165M-◯-05 S25-DRV170M-◯-05	47	16.2	30	CH0503-45	SB-3080TR	FT-10	HH6X18	LW-5
DRV-CH18	●	S25-DRV175M-◯-05 S25-DRV180M-◯-05	47	17.2	30					
DRV-CH19	●	S25-DRV185M-◯-05 S25-DRV190M-◯-06	49	18.2	30					
DRV-CH20	●	S25-DRV195M-◯-06 S25-DRV200M-◯-06	49	19.2	30					
DRV-CH21	●	S25-DRV205M-◯-06 S25-DRV210M-◯-06	49	20.2	30					
DRV-CH22	●	S25-DRV215M-◯-06 S25-DRV220M-◯-06	49	21.2	30					
DRV-CH23	●	S25-DRV225M-◯-07 S25-DRV230M-◯-07	51	22.2	30					
DRV-CH24	●	S25-DRV235M-◯-07 S25-DRV240M-◯-07	51	23.2	30					
DRV-CH25	●	S25-DRV245M-◯-07 S25-DRV250M-◯-07	53	24.2	30					
DRV-CH26	●	S25-DRV255M-◯-07 S25-DRV260M-◯-07	53	25.2	30					
DRV-CH27	●	S32-DRV265M-◯-09 S32-DRV270M-◯-09	64	26	35				HH8X20	LW-6

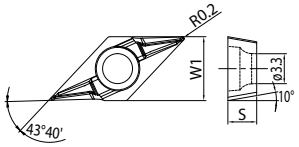
Max. drilling depth and chamfering dimension



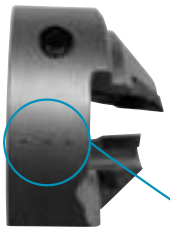
Drill dia. (mm)	Max. drilling depth T (mm)					Max. chamfering dimension (mm)	Applicable chamfering attachment
DC	2D drill	3D drill	4D drill	5D drill	6D drill	Ts	
ø16.5	0.5	17	33.5	-	-	2.5	DRV-CH17
ø17	1.5	18.5	35.5	52.5	69.5		
ø17.5	2.5	20	37.5	-	-		DRV-CH18
ø18	3.5	21.5	39.5	57.5	75.5		
ø18.5	4.5	23	41.5	-	-		DRV-CH19
ø19	5.5	24.5	43.5	62.5	81.5		
ø19.5	6.5	26	45.5	-	-		DRV-CH20
ø20	7.5	27.5	47.5	67.5	87.5		
ø20.5	8.5	29	49.5	-	-		DRV-CH21
ø21	9.5	30.5	51.5	72.5	93.5		
ø21.5	10.5	32	53.5	-	-		DRV-CH22
ø22	11.5	33.5	55.5	77.5	99.5		
ø22.5	12.5	35	57.5	-	-		DRV-CH23
ø23	13.5	36.5	59.5	82.5	105.5		
ø23.5	14.5	38	61.5	-	-		DRV-CH24
ø24	15.5	39.5	63.5	87.5	111.5		
ø24.5	16.5	41	65.5	-	-		DRV-CH25
ø25	17.5	42.5	67.5	92.5	117.5		
ø25.5	18.5	44	69.5	-	-		DRV-CH26
ø26	19.5	45.5	71.5	97.5	123.5		
ø26.5	-	47	-	-	-		DRV-CH27
ø27	16.5	43.5	75.5	97.5	124.5		

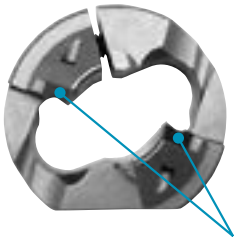
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable insert

Insert		Description	Dimension (mm)		MEGACOAT NANO	Applicable chamfering attachment
			W1	S	PR1535	
		CH0503-45	7.05	3.18	●	DRV-CH○○

How to install chamfering attachment

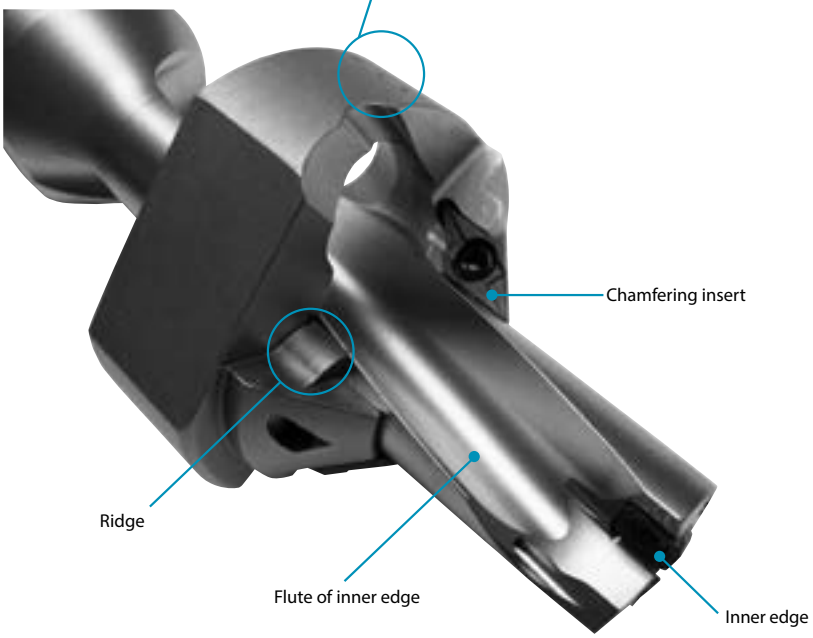






Identification on inner edge

Chamfering insert



Instructions
1. Install the attachment over the DRV body so that "..." mark on the side of the attachment aligns with the inside flute edge (see image).
2. Adjust the position to avoid interference between the chamfering inserts, chamfering attachment ridges, and drill body flutes. Then fasten the clamp bolt with the recommended torque below.

Recommended tightening torque

Description	Tightening torque (N m)	Clamp bolt	Wrench
DRV-CH17~CH26	10	HH6X18	LW-5
DRV-CH27	14	HH8X20	LW-6

●: Standard item R: Right-hand only L: Left-hand only □: Check availability

Recommended cutting conditions DRV 2D-4D (Coolant)

Workpiece material	Recommended insert grades (Vc: m/min)										Drill dia. DC (mm)	Drill type							
	PVD coated carbide				CVD coated carbide							2D~3D				4D			
	PR1225				CA520D				CA415D			f (mm/rev)							
	GM	GH	XM	SM	GM	GH	XM	SM	GM	GH		GM	GH	XM	SM	GM	GH	XM	SM
Low carbon steel	-	-	★ 120-200	☆ 120-200	-	-	★ 150-280	☆ 150-280	-	-	ø12-ø13.5	-	-	-	0.04-0.06	-	-	-	0.04-0.06
											ø14-ø15.5	-	-	0.04-0.09	0.04-0.07	-	-	0.04-0.08	0.04-0.07
											ø16-ø18.5	-	-	0.04-0.10	0.04-0.08	-	-	0.04-0.08	0.04-0.08
											ø19-ø22	-	-	0.04-0.12	0.04-0.08	-	-	0.04-0.10	0.04-0.08
											ø22.5-ø26	-	-	0.04-0.14	0.06-0.10	-	-	0.04-0.12	0.05-0.10
											ø26.5-ø32	-	-	0.06-0.14	0.06-0.10	-	-	0.04-0.12	0.05-0.10
											ø33-ø39	-	-	0.06-0.14	0.06-0.10	-	-	0.06-0.12	0.05-0.10
											ø40-ø60	-	-	0.06-0.16	0.08-0.12	-	-	0.06-0.16	0.05-0.10
Carbon steel	★ 100-180	☆ 100-180	☆ 100-180	☆ 100-180	★ 150-280	☆ 150-280	☆ 150-280	☆ 150-280	-	-	ø12-ø13.5	0.04-0.14	0.04-0.14	-	0.04-0.10	0.04-0.10	0.04-0.10	-	0.04-0.08
											ø14-ø15.5	0.04-0.14	0.04-0.14	0.04-0.10	0.04-0.10	0.04-0.10	0.04-0.10	0.04-0.08	0.04-0.08
											ø16-ø18.5	0.06-0.16	0.06-0.16	0.06-0.12	0.06-0.12	0.05-0.12	0.05-0.12	0.04-0.10	0.05-0.10
											ø19-ø26	0.08-0.20	0.08-0.20	0.06-0.14	0.06-0.14	0.07-0.16	0.07-0.16	0.04-0.12	0.05-0.12
											ø26.5-ø32	0.08-0.20	0.08-0.20	0.06-0.14	0.06-0.14	0.07-0.16	0.07-0.16	0.04-0.12	0.05-0.12
											ø33-ø39	0.08-0.20	0.08-0.20	0.06-0.16	0.06-0.14	0.07-0.16	0.07-0.16	0.06-0.14	0.05-0.12
											ø40-ø60	0.08-0.20	0.08-0.20	0.06-0.18	0.06-0.14	0.07-0.16	0.07-0.16	0.06-0.16	0.05-0.12
Alloy steel	★ 100-160	☆ 100-160	☆ 100-160	-	★ 140-220	☆ 140-220	☆ 140-220	-	-	-	ø12-ø13.5	0.04-0.12	0.04-0.12	-	-	0.04-0.10	0.04-0.10	-	-
											ø14-ø15.5	0.04-0.14	0.04-0.14	-	-	0.04-0.10	0.04-0.10	-	-
											ø16-ø18.5	0.06-0.16	0.06-0.16	-	-	0.05-0.12	0.05-0.12	-	-
											ø19-ø26	0.08-0.20	0.08-0.20	-	-	0.07-0.16	0.07-0.16	-	-
											ø26.5-ø32	0.08-0.20	0.08-0.20	-	-	0.07-0.16	0.07-0.16	-	-
											ø33-ø39	0.08-0.20	0.08-0.20	-	-	0.07-0.16	0.07-0.16	-	-
											ø40-ø60	0.08-0.20	0.08-0.20	-	-	0.07-0.16	0.07-0.16	-	-
Mold steel	☆ 80-150	★ 80-150	-	-	☆ 130-210	★ 130-210	-	-	-	-	ø12-ø13.5	0.04-0.08	0.04-0.08	-	-	0.04-0.07	0.04-0.07	-	-
											ø14-ø15.5	0.04-0.08	0.04-0.08	-	-	0.04-0.07	0.04-0.07	-	-
											ø16-ø18.5	0.06-0.12	0.06-0.12	-	-	0.05-0.10	0.05-0.10	-	-
											ø19-ø26	0.08-0.15	0.08-0.15	-	-	0.06-0.12	0.06-0.12	-	-
											ø26.5-ø32	0.08-0.15	0.08-0.15	-	-	0.06-0.12	0.06-0.12	-	-
											ø33-ø39	0.08-0.15	0.08-0.15	-	-	0.06-0.12	0.06-0.12	-	-
											ø40-ø60	0.08-0.15	0.08-0.15	-	-	0.06-0.12	0.06-0.12	-	-
Stainless steel (Austenitic related)	-	-	-	★ 70-140	-	-	-	★ 140-200	-	-	ø12-ø13.5	-	-	-	0.04-0.10	-	-	-	0.04-0.08
											ø14-ø15.5	-	-	-	0.04-0.10	-	-	-	0.04-0.08
											ø16-ø18.5	-	-	-	0.06-0.12	-	-	-	0.05-0.11
											ø19-ø26	-	-	-	0.06-0.14	-	-	-	0.06-0.12
											ø26.5-ø32	-	-	-	0.06-0.14	-	-	-	0.06-0.12
											ø33-ø39	-	-	-	0.06-0.14	-	-	-	0.06-0.12
											ø40-ø60	-	-	-	0.06-0.14	-	-	-	0.06-0.12
Gray cast iron	☆ 100-150	★ 100-150	-	-	-	-	-	-	☆ 150-220	★ 150-220	ø12-ø13.5	0.08-0.14	0.08-0.14	-	-	0.06-0.10	0.06-0.10	-	-
											ø14-ø15.5	0.08-0.14	0.08-0.14	-	-	0.06-0.12	0.06-0.12	-	-
											ø16-ø18.5	0.08-0.18	0.08-0.18	-	-	0.08-0.16	0.08-0.16	-	-
											ø19-ø26	0.08-0.20	0.08-0.20	-	-	0.08-0.18	0.08-0.18	-	-
											ø26.5-ø32	0.08-0.20	0.08-0.20	-	-	0.08-0.18	0.08-0.18	-	-
											ø33-ø39	0.08-0.20	0.08-0.20	-	-	0.08-0.18	0.08-0.18	-	-
											ø40-ø60	0.08-0.20	0.08-0.20	-	-	0.08-0.18	0.08-0.18	-	-
Nodular cast iron	☆ 80-120	★ 80-120	-	-	-	-	-	-	☆ 120-180	★ 120-180	ø12-ø13.5	0.08-0.12	0.08-0.12	-	-	0.06-0.10	0.06-0.10	-	-
											ø14-ø15.5	0.08-0.12	0.08-0.12	-	-	0.06-0.10	0.06-0.10	-	-
											ø16-ø18.5	0.08-0.16	0.08-0.16	-	-	0.08-0.14	0.08-0.14	-	-
											ø19-ø26	0.08-0.18	0.08-0.18	-	-	0.08-0.16	0.08-0.16	-	-
											ø26.5-ø32	0.08-0.18	0.08-0.18	-	-	0.08-0.16	0.08-0.16	-	-
											ø33-ø39	0.08-0.18	0.08-0.18	-	-	0.08-0.16	0.08-0.16	-	-
											ø40-ø60	0.08-0.18	0.08-0.18	-	-	0.08-0.16	0.08-0.16	-	-

· Internal coolant is recommended

★: 1st recommendation ☆: 2nd recommendation

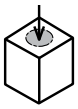
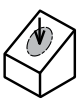
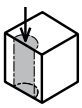
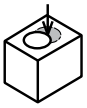
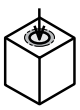
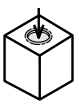
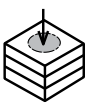
Recommended cutting conditions DRV 5D-6D (Coolant)

Workpiece material	Recommended insert grades (Vc: m/min)										Drill dia. DC (mm)	Drill type							
	PVD coated carbide				CVD coated carbide							5D				6D			
	PR1225				CA520D				CA415D			f (mm/rev)							
	GM	GH	XM	SM	GM	GH	XM	SM	GM	GH		GM	GH	XM	SM	GM	GH	XM	SM
Low carbon steel	-	-	★ 120-200	☆ 120-200	-	-	★ 150-280	☆ 150-280	-	-	ø12-ø13.5	-	-	-	0.03-0.05	-	-	-	0.03-0.05
											ø14-ø15.5	-	-	0.04-0.07	0.04-0.06	-	-	0.04-0.06	0.04-0.06
											ø16-ø18.5	-	-	0.04-0.08	0.04-0.06	-	-	0.04-0.06	0.04-0.06
											ø19-ø22	-	-	0.04-0.10	0.04-0.07	-	-	0.04-0.07	0.04-0.07
											ø22.5-ø26	-	-	0.04-0.12	0.04-0.08	-	-	0.04-0.08	0.04-0.07
											ø26.5-ø32	-	-	0.04-0.12	0.04-0.08	-	-	0.04-0.08	0.04-0.07
											ø33-ø39	-	-	0.05-0.12	0.04-0.10	-	-	0.04-0.09	0.04-0.08
											ø40-ø60	-	-	0.06-0.14	0.04-0.10	-	-	0.06-0.12	0.04-0.08
Carbon steel	★ 100-180	☆ 100-180	☆ 100-180	☆ 100-180	★ 150-280	☆ 150-280	☆ 150-280	☆ 150-280	-	-	ø12-ø13.5	0.04-0.08	0.04-0.08	-	0.04-0.07	0.03-0.05	0.03-0.05	-	0.03-0.05
											ø14-ø15.5	0.04-0.08	0.04-0.08	0.04-0.07	0.04-0.07	0.04-0.06	0.04-0.06	0.04-0.06	0.04-0.06
											ø16-ø18.5	0.05-0.10	0.05-0.10	0.05-0.08	0.05-0.08	0.05-0.08	0.05-0.08	0.05-0.07	0.05-0.07
											ø19-ø26	0.06-0.12	0.06-0.12	0.05-0.10	0.05-0.10	0.06-0.10	0.06-0.10	0.05-0.08	0.05-0.08
											ø26.5-ø32	0.06-0.12	0.06-0.12	0.05-0.12	0.05-0.10	0.06-0.10	0.06-0.10	0.05-0.08	0.05-0.08
											ø33-ø39	0.06-0.12	0.06-0.12	0.05-0.12	0.05-0.10	0.06-0.10	0.06-0.10	0.05-0.08	0.05-0.08
											ø40-ø60	0.06-0.12	0.06-0.12	0.06-0.12	0.05-0.10	0.06-0.10	0.06-0.10	0.06-0.10	0.05-0.08
Alloy steel	★ 100-160	☆ 100-160	☆ 100-160	-	★ 140-220	☆ 140-220	☆ 140-220	-	-	-	ø12-ø13.5	0.04-0.08	0.04-0.08	-	-	0.03-0.05	0.03-0.05	-	-
											ø14-ø15.5	0.04-0.08	0.04-0.08	-	-	0.04-0.06	0.04-0.06	-	-
											ø16-ø18.5	0.05-0.10	0.05-0.10	-	-	0.05-0.08	0.05-0.08	-	-
											ø19-ø26	0.06-0.12	0.06-0.12	-	-	0.06-0.10	0.06-0.10	-	-
											ø26.5-ø32	0.06-0.12	0.06-0.12	-	-	0.06-0.10	0.06-0.10	-	-
											ø33-ø39	0.06-0.12	0.06-0.12	-	-	0.06-0.10	0.06-0.10	-	-
											ø40-ø60	0.06-0.12	0.06-0.12	-	-	0.06-0.10	0.06-0.10	-	-
Mold steel	☆ 80-150	★ 80-150	-	-	☆ 130-210	★ 130-210	-	-	-	-	ø12-ø13.5	0.04-0.06	0.04-0.06	-	-	0.03-0.05	0.03-0.05	-	-
											ø14-ø15.5	0.04-0.06	0.04-0.06	-	-	0.04-0.05	0.04-0.05	-	-
											ø16-ø18.5	0.04-0.08	0.04-0.08	-	-	0.04-0.06	0.04-0.06	-	-
											ø19-ø26	0.05-0.10	0.05-0.10	-	-	0.05-0.08	0.05-0.08	-	-
											ø26.5-ø32	0.05-0.10	0.05-0.10	-	-	0.05-0.08	0.05-0.08	-	-
											ø33-ø39	0.05-0.10	0.05-0.10	-	-	0.05-0.08	0.05-0.08	-	-
											ø40-ø60	0.05-0.10	0.05-0.10	-	-	0.05-0.08	0.05-0.08	-	-
Stainless steel (Austenitic related)	-	-	-	★ 70-140	-	-	-	★ 140-200	-	-	ø12-ø13.5	-	-	-	0.04-0.08	-	-	-	0.03-0.05
											ø14-ø15.5	-	-	-	0.04-0.08	-	-	-	0.04-0.06
											ø16-ø18.5	-	-	-	0.04-0.10	-	-	-	0.04-0.09
											ø19-ø26	-	-	-	0.06-0.12	-	-	-	0.06-0.10
											ø26.5-ø32	-	-	-	0.06-0.12	-	-	-	0.06-0.10
											ø33-ø39	-	-	-	0.06-0.12	-	-	-	0.06-0.10
											ø40-ø60	-	-	-	0.06-0.12	-	-	-	0.06-0.10
Gray cast iron	☆ 100-150	★ 100-150	-	-	-	-	-	-	☆ 150-220	★ 150-220	ø12-ø13.5	0.04-0.10	0.04-0.10	-	-	0.04-0.08	0.04-0.08	-	-
											ø14-ø15.5	0.04-0.10	0.04-0.10	-	-	0.04-0.08	0.04-0.08	-	-
											ø16-ø18.5	0.06-0.12	0.06-0.12	-	-	0.06-0.10	0.06-0.10	-	-
											ø19-ø26	0.06-0.14	0.06-0.14	-	-	0.06-0.12	0.06-0.12	-	-
											ø26.5-ø32	0.06-0.14	0.06-0.14	-	-	0.06-0.12	0.06-0.12	-	-
											ø33-ø39	0.06-0.14	0.06-0.14	-	-	0.06-0.12	0.06-0.12	-	-
											ø40-ø60	0.06-0.14	0.06-0.14	-	-	0.06-0.12	0.06-0.12	-	-
Nodular cast iron	☆ 80-120	★ 80-120	-	-	-	-	-	-	☆ 120-180	★ 120-180	ø12-ø13.5	0.04-0.08	0.04-0.08	-	-	0.03-0.05	0.03-0.05	-	-
											ø14-ø15.5	0.04-0.08	0.04-0.08	-	-	0.04-0.06	0.04-0.06	-	-
											ø16-ø18.5	0.06-0.10	0.06-0.10	-	-	0.06-0.08	0.06-0.08	-	-
											ø19-ø26	0.06-0.12	0.06-0.12	-	-	0.06-0.10	0.06-0.10	-	-
											ø26.5-ø32	0.06-0.12	0.06-0.12	-	-	0.06-0.10	0.06-0.10	-	-
											ø33-ø39	0.06-0.12	0.06-0.12	-	-	0.06-0.10	0.06-0.10	-	-
											ø40-ø60	0.06-0.12	0.06-0.12	-	-	0.06-0.10	0.06-0.10	-	-

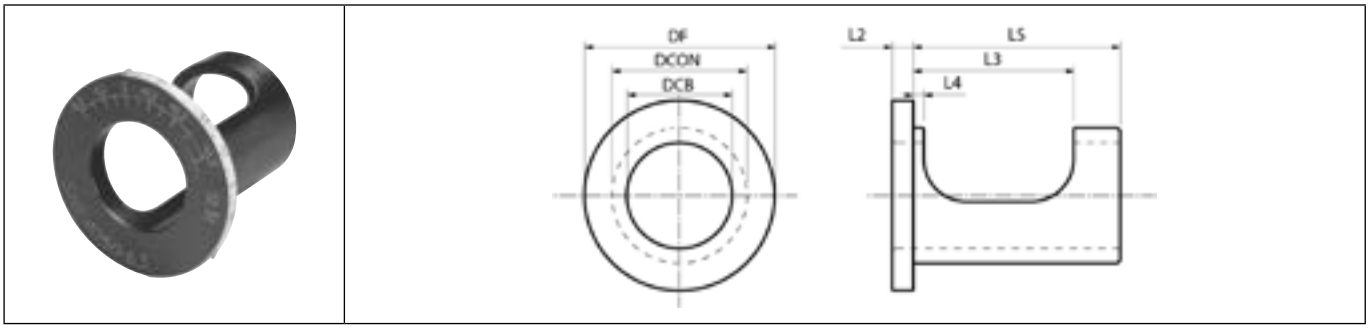
Internal coolant is recommended

★: 1st recommendation ☆: 2nd recommendation

Cutting conditions by application

Applications	Plain surface	Slant surface	Half cylindrical	Hole expansion	Cored hole	Concave surface	Stacked plates
Shape of workpiece							
Vc (m/min)	See above	120 (PVD insert is recommended for outer edge)					Not available
f (mm/rev)	See above	Half of the above recommended conditions is recommended.				Concave surface: Use half of the above recommended conditions . Continuous part: See above.	Not available
Coolant (Internal coolant)	Yes						Not available

SHE



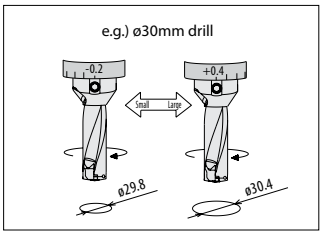
Toolholder dimensions

Description		Availability	Dimension (mm)							* Drill Dia. Adjustable Range	Center Height Adjustable Range
			DCB	DCON	DF	L2	L3	L4	LS		
SHE	2025-43	●	20	25	41	4	36	3	43	+0.4~-0.2	+0.2~-0.15
	2532-48	●	25	32	49		38	2.5	48	+0.4~-0.2	+0.2~-0.15
	3240-53	●	32	40	58	6	43		53	+0.4~-0.2	+0.2~-0.15
	4050-63	●	40	50	74		49	3	63	+0.6~-0.2	+0.3~-0.2

Diameter Adjustment Range adjusts the drill diameter.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

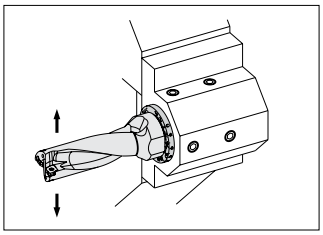
1. Diameter adjustment ~For machining center~



● Diameter adjustment range (mm)

Shank dia.	Adjustment range
ø20	+0.4~-0.2
ø25	
ø32	
ø40	+0.6~-0.2

2. Center height adjustment ~Fewer problems owing to height adjustment for lathes~



● Center height adjustment Range (mm)

Shank dia.	Adjustment range
ø20	+0.2~-0.15
ø25	
ø32	
ø40	+0.3~-0.2

How to use the adjustable sleeve

1. Hole diameter adjustment when drilling

1. Adjust the scale at the flange periphery of the sleeve to the reference mark (DRV) or the center of coolant plug (DRZ). (Fig. 1)
2. When making the hole diameter larger, rotate the sleeve in (+) direction and to make it smaller, rotate the sleeve in (-) direction.
3. When rotating the sleeve, insert the wrench supplied with the drill into the hole on the flange periphery to rotate the sleeve.
4. Using the bottom screw of the side-lock arbor, firmly tighten on the drill directly through the sleeve's window.
   The upper screw should be tightened slightly so that the sleeve will not be damaged.

Caution:
· Not applicable for collet chuck type arbor.
· Scale on the sleeve is the reference value.
Check the actual hole diameter after adjusting.

DRV

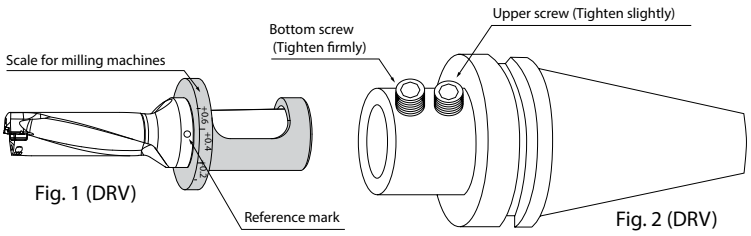


Fig. 1 (DRV)

Fig. 2 (DRV)

DRZ

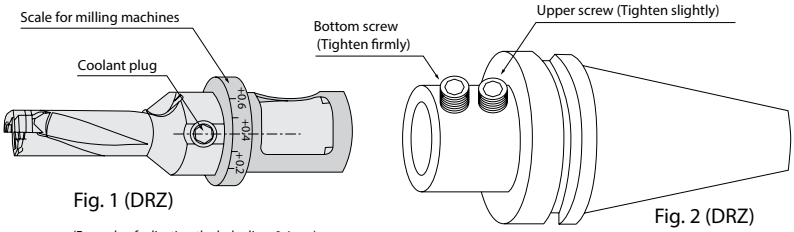


Fig. 1 (DRZ)

(Example of adjusting the hole dia. +0.4mm)

Fig. 2 (DRZ)

2. Center-height adjustment for lathes

Most lathe problem occur due to center height deviation.
The center height is appropriate if a core approximately 0.5mm diameter remains at the center of the end face. (Fig. 3)
Center-height adjustment is necessary for the case as follows:

◆ No core remains or ◆ core diameter is more than 1mm

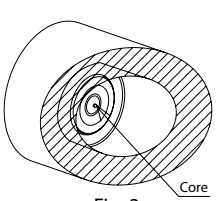


Fig. 3

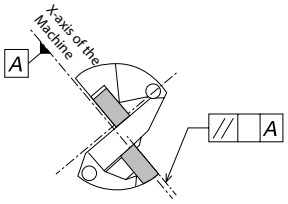


Fig. 4

1. Align the drill with the outer insert face parallel to the x-axis of the tool turret. (Fig. 4)
2. Adjust the scale at the flange periphery of the sleeve to the reference mark (DRV) or the center of coolant plug (DRZ).
3. When no core remains, rotate the sleeve to (+) direction to make the core larger, and when the core diameter is 1mm or more, rotate the sleeve to (-) direction to make the core smaller.
4. When rotating the sleeve, insert the wrench supplied with the drill into the hole on the flange periphery to rotate the sleeve.
5. After completing the adjustment, firmly tighten on the drill directly through the sleeve's window.

Note: depending on amount of the center height adjustment, the hole diameter may change. It is recommended that the hole diameter is checked after the center height adjustment.

Lathe installation

1. The top face of the outer insert should be parallel to the X-axis to allow for offset cutting. (Drill diameter can be changed by moving X-axis.)
2. It is recommended to set the outer insert as shown in Fig. 1 with the outer insert facing the operator. (Fig. 1)
   (It is also possible to use it by setting it in 180° reverse position)
   If the lathe has two turrets, when installing the drill into the lower turret, the outer insert should be set to face the operator.
   (It is also possible to use it by setting at 180° reverse position)

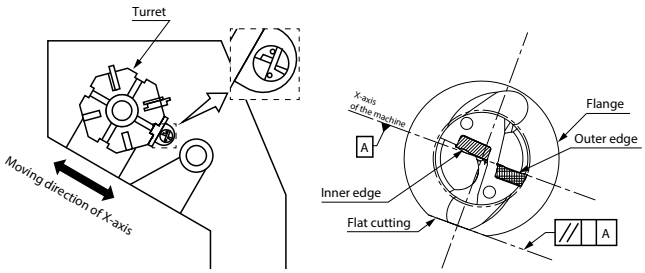


Fig. 1 Installed into the lathe

Drill diameter adjustment

1. Drill diameter adjustment

1. Drill diameter is adjusted by moving X-axis.
   The moving direction of the X-axis depends on the position of the toolholder.
2. In case of making the hole diameter larger, slide the tool along the X-axis toward the outer insert side. (Fig. 2, Fig. 3)
   For making the hole diameter smaller, slide the tool along the X-axis in the opposite direction.
   (This movement of the axis is called "Offset")
   However, be sure not to make the hole diameter smaller than the drill diameter by 0.2mm or more. Otherwise, the toolholder will interfere with the drilled hole. (Fig. 4)
   e.g.) In case of using ø20 drill, the hole diameter must not be smaller than 19.8mm.

2. Offset Limit of the Drill Diameter

For the maximum limit of the drill diameter, refer to "Max. Offset (Radial)" in the toolholder dimensions table.
(The figure in the table shows how much it is possible the offset the drill in the radial direction.)
When using ø20 drill, for example, it is possible to make a hole up to ø21.1 since "Max. offset (Radial)" is +0.55mm.

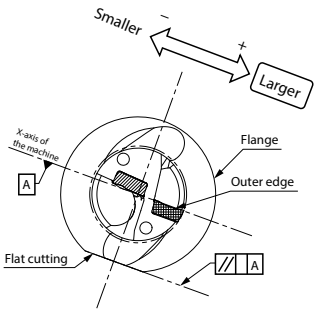


Fig. 2 Outer insert facing up

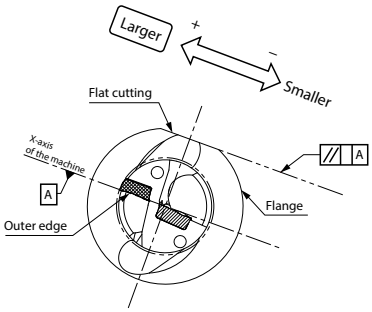


Fig. 3 Outer insert facing down

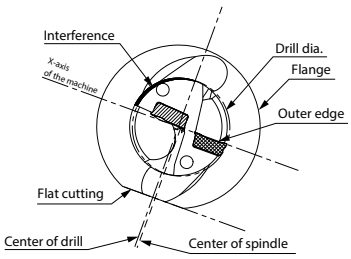


Fig. 4 Excessive offset (For smaller hole diameter)

Center height adjustment

1. Center Height of the Inner Insert

When installing inner insert as shown in Fig. 1, it will be set around 0.05mm below the center of spindle. (Fig. 5)
This is the normal position of the center height and the drill is designed to be handled in this condition.
However, in case that the turret of the lathe is out of the center of spindle, sometimes the inner insert may be set above the center, or excessively below the center.
For stable drilling, it is essential to check the center height carefully.

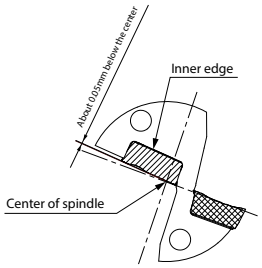


Fig. 5 Front view of the drill

2. How to Check the Center Height

For checking the center height of the inner insert, see the core which remains at the center of the end face of the drilled hole. (Fig. 6)
If the center height is in the normal position, a core about 0.5mm in diameter, will remain after machining.
Adjustment of center height is required if a large core diameter of 1mm or more remains.
* The drilled hole for verification purposes needs to be machined at approximately 10mm in depth and at a feed rate of 0.1mm/rev or lower.

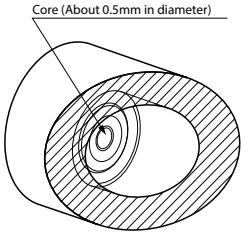


Fig. 6 Center core

3. Center height adjustment

a) When there are no remaining cores and insert breakage near the center of the drill.
This happens when the inner insert is set above the center height. (Fig. 7)

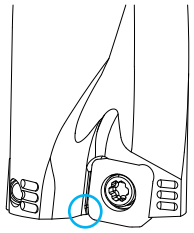


Fig. 7 Insert breakage near the center of the drill

[How to adjust]

1. Install the drill rotated 180°.
   Most problems will be solved by this method. (Fig. 8)

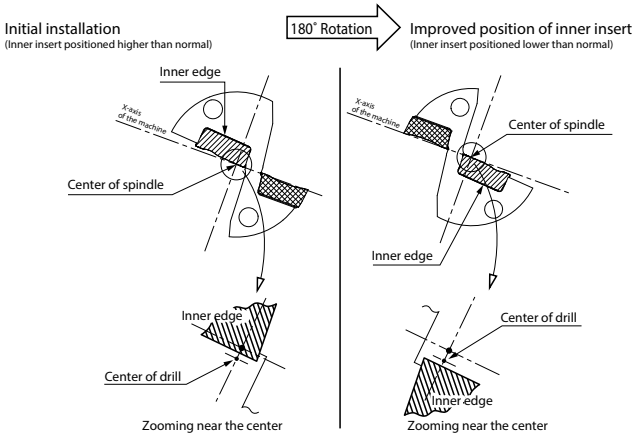


Fig. 8

[How to adjust]

2. If the core diameter becomes too large after the above adjustment, install the drill by rotating 90° counter-clockwise as shown in Fig. 9 (outer insert is positioned lower) and adjust the center height by moving the tool in the X-axis direction. (However, this will make it impossible to adjust the cutting diameter.)
   Caution: In case of installing the drill in the reverse direction (outer insert is positioned above), the hole diameter will become smaller, which may cause the drill body to interfere with the drilled hole.
   The best solution is to readjust the center position of the turret itself.

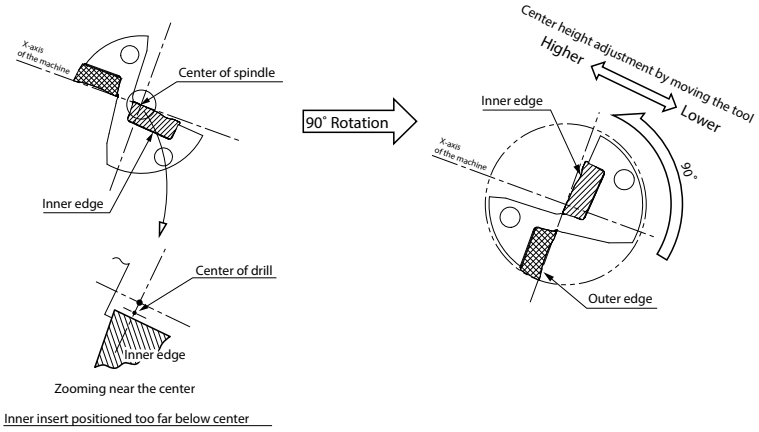


Fig. 9

b) Core with excessively large diameter (More than 1mm)
This occurs when the inner insert is excessively below the center.
This condition causes poor chip evacuation and an adjustment is required.

[How to adjust]

Install the drill rotating 90˚ as shown in Fig. 10 (outer insert is positioned on the upper side) and adjust the center height by moving tool in the X-axis direction. (However, this will make it impossible to adjust the cutting diameter.)
Caution: In case of installing the drill in the opposite direction (outer insert is positioned lower), the hole diameter will become smaller, which may cause the drill body to interfere with the drilled hole.
The best solution is to readjust the center position of the turret itself.

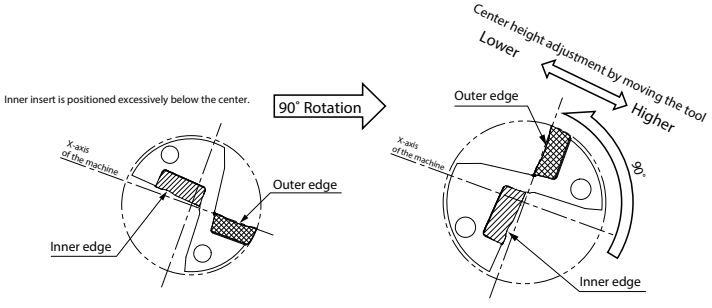


Fig. 10

ZCMT

Suitable chipbreaker (ZCMT)

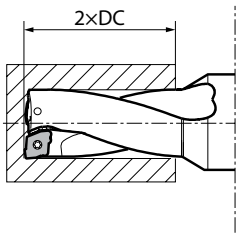
Workpiece material	Insert size	ZCMT05									ZCMT06									ZCMT08					
	Chipbreaker	Standard			SP			SU			Standard			SP			SU			Standard			SP		
	Drilling depth	2D	3D	4D	2D	3D	4D	2D	3D	4D	2D	3D	4D	2D	3D	4D	2D	3D	4D	2D	3D	4D	2D	3D	4D
Low carbon steel		☆	☆	-	★	★	★	-	-	-	☆	☆	-	★	★	★	☆	☆	☆	☆	☆	-	★	★	★
Carbon steel		★	★	☆	☆	☆	★	-	-	-	★	★	☆	☆	☆	★	-	-	-	★	★	☆	☆	☆	★
Alloy steel		★	★	☆	☆	☆	★	-	-	-	★	★	☆	☆	☆	★	-	-	-	★	★	☆	☆	☆	★
Mold steel		★	★	☆	☆	☆	★	-	-	-	★	★	☆	☆	☆	★	-	-	-	★	★	☆	☆	☆	★
Stainless steel		☆	☆	-	★	★	★	☆	☆	-	-	-	-	☆	☆	☆	★	★	★	☆	☆	-	★	★	★
Cast iron		★	★	★	☆	☆	☆	-	-	-	★	★	★	☆	☆	☆	-	-	-	★	★	★	☆	☆	☆
Aluminum alloys		☆	☆	☆	★	★	★	-	-	-	☆	☆	☆	★	★	★	-	-	-	☆	☆	☆	★	★	★
Brass		★	★	★	☆	☆	☆	-	-	-	★	★	★	☆	☆	☆	-	-	-	★	★	★	☆	☆	☆
Titanium alloys		☆	☆	☆	★	★	★	-	-	-	☆	☆	☆	★	★	★	-	-	-	☆	☆	☆	★	★	★

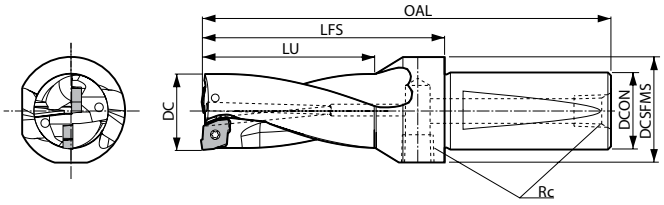
Workpiece material	Insert size	ZCMT10								ZCMT12								ZCMT15								ZCMT20		
	Chipbreaker	Standard				SP				Standard				SP				Standard				SP				Standard		
	Drilling depth	2D	3D	4D	5D	2D	3D	4D	5D	2D	3D	4D	5D	2D	3D	4D	5D	2D	3D	4D	5D	2D	3D	4D	5D	2D	3D	4D
Low carbon steel		☆	☆	-	-	★	★	★	★	☆	☆	-	-	★	★	★	★	☆	☆	-	-	★	★	★	★	★	★	★
Carbon steel		★	★	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★	★	★
Alloy steel		★	★	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★	★	★
Mold steel		★	★	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★	★	★
Stainless steel		☆	☆	-	-	★	★	★	★	☆	☆	-	-	★	★	★	★	☆	☆	-	-	★	★	★	★	★	★	★
Cast iron		★	★	★	★	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★
Aluminum alloys		☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★	★	★	★	★
Brass		★	★	★	★	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★
Titanium alloys		☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★	★	★	★	★

Standard chipbreakers (Without symbol) may function better when interrupted drilling.
When drilling aluminum alloys, chips become long and difficult to be discharged at the depth over 2D.
5D type is the same as 4D type.

★: 1st choice ☆: 2nd choice

DRZ (Drilling depth : 2 x DC)





2D

Toolholder dimensions

Description		Availability	No. of inserts	Dimension (mm) DC	DCON	OAL	LFS	LU	DCSFMS	Rc	Coolant hole	Radial offset max.	Spare parts: Plug	Screw	Wrench	Wrench	Applicable inserts (K74)
S20-	DRZ1326-05	●	2	13	20	95	52	26	27	Rc1/8	Yes	+0.5	GP-1	SB-2045TR	-	FT-6	ZCMT050203 ZCMT050203SP ZCMT050203SU
	DRZ135270-05	●		13.5				27									
	DRZ1428-05	●		14		98	55	28									
	DRZ145290-05	●		14.5				29									
	DRZ1530-05	●		15		100	57	30									
	DRZ155310-05	●		15.5				31									
S25-	DRZ1632-06	●	2	16	25	115	61	32	32	Rc1/8	Yes	+1.1	GP-1	SB-2260TR	DT-7	-	ZCMT06T204 ZCMT06T204SP ZCMT06T204SU
	DRZ165330-06	●		16.5				33				+0.9					
	DRZ1734-06	●		17		116	62	34				+0.8					
	DRZ175350-06	●		17.5				35				+0.7					
	DRZ1836-06	●		18		118	64	36				+0.6					
	DRZ185370-06	●		18.5				37									
	DRZ1938-06	●		19		120	66	38				+0.5					
	DRZ195390-06	●		19.5				39									
	DRZ2040-06	●		20		123	69	40									
	DRZ205410-06	●		20.5		125	71	41				+0.3					
	DRZ2142-06	●		21				42				+0.2					
S25-	DRZ215430-08	●	2	21.5	25	128	74	43	33	Rc1/8	Yes	+1.8	GP-1	SB-2570TR	DT-8	-	ZCMT080304 ZCMT080304SP
	DRZ2244-08	●		22				44				+1.6					
	DRZ225450-08	●		22.5				45				+1.4					
	DRZ2346-08	●		23		130	76	46				+1.3					
	DRZ235470-08	●		23.5				47				+1.2					
	DRZ2448-08	●		24		131	77	48	35			+1.1					
	DRZ245490-08	●		24.5				49				+0.9					
	DRZ2550-08	●		25		133	79	50				+0.8					
	DRZ255510-08	●		25.5				51				+0.7					
	DRZ2652-08	●		26		135	81	52				+0.6					
	DRZ265530-08	●		26.5				53				+0.5					

When offset drilling, reduce feed rate to 0.08 mm/rev or less.
See page **K70** for Adjustable Sleeve (SHE).

Recommended cutting conditions **K85**
Trouble shooting **K65**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Toolholder dimensions

2xDC

Description		Availability	No. of inserts	Dimension (mm) DC	DCON	OAL	LFS	LU	DCSFMS	Rc	Coolant hole	Radial offset max.	Spare parts: Plug	Screw	Wrench	Wrench	Applicable inserts ⇒ K74
S32-	DRZ2754-10	●	2	27	32	149	90	54	42	Rc1/4	Yes	+2.5	GP-2	SB-4085TR	DT-15	-	ZCMT10T304 ZCMT10T304SP
	DRZ275550-10	●		27.5				55				+2.3					
	DRZ2856-10	●		28		151	92	56				+2.2					
	DRZ285570-10	●		28.5				57				+2.1					
	DRZ2958-10	●		29		153	94	58				+2					
	DRZ295590-10	●		29.5				59				+1.8					
	DRZ3060-10	●		30		154	95	60	45			+1.7					
	DRZ305610-10	●		30.5				61				+1.5					
	DRZ3162-10	●		31		155	96	62				+1.5					
	DRZ315630-10	●		31.5				63				+1.3					
	DRZ3264-10	●		32		158	99	64				+1.2					
	DRZ325650-10	●		32.5				65				+1					
S40-	DRZ3366-12	●	2	33	40	173	104	66	55	Rc1/4	Yes	+2.9	GP-2	SB-5085TR	DT-20	-	ZCMT12T304SP ZCMT12T306
	DRZ3468-12	●		34		176	107	68				+2.7					
	DRZ3570-12	●		35		177	108	70				+2.4					
	DRZ3672-12	●		36		180	111	72				+2.2					
	DRZ3774-12	●		37		181	112	74				+1.9					
	DRZ3876-12	●		38		183	114	76				+1.7					
	DRZ3978-12	●		39		185	116	78				+1.4					
	DRZ4080-12	●		40				80				+1.2					
S40-	DRZ4182-15	●	2	41	40	186	117	82	55	Rc1/4	Yes	+4	GP-2	SB-5085TR	DT-20	-	ZCMT150406SP ZCMT150408
	DRZ4284-15	●		42		188	119	84				+3.7					
	DRZ4386-15	●		43		190	121	86				+3.5					
	DRZ4488-15	●		44		192	123	88				+3.2					
	DRZ4590-15	●		45				90				+3					
	DRZ4692-15	●		46		198	129	92	60			+2.7					
	DRZ4794-15	●		47		201	132	94				+2.5					
	DRZ4896-15	●		48		203	134	96				+2.2					
	DRZ4998-15	●		49		204	135	98				+2					
	DRZ50100-15	●		50				100				+1.7					
	DRZ51102-15	●		51		205	136	102				+1.2					
	DRZ52104-15	●		52				104				+1					
	DRZ53106-15	●		53		208	139	106				+0.7					
S40-	DRZ54108-20	●	2	54	40	214	145	108	65	Rc1/4	Yes	+5	GP-2	SB-60120TR	DT-25	-	ZCMT200608
	DRZ55110-20	●		55		215	146	110				+4.7					
	DRZ56112-20	●		56		217	148	112				+4.4					
	DRZ57114-20	●		57		219	150	114				+4.1					
	DRZ58116-20	●		58		221	152	116				+3.8					
	DRZ59118-20	●		59		223	154	118				+3.5					

When offset drilling, reduce feed rate to 0.08 mm/rev or less.
See page **K70** for Adjustable Sleeve (SHE).

Recommended cutting conditions ⇒ **K85**
Trouble shooting ⇒ **K65**

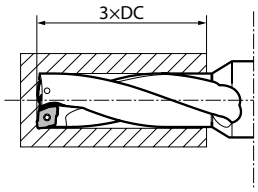
Hole Dia. Tolerance (2D type)

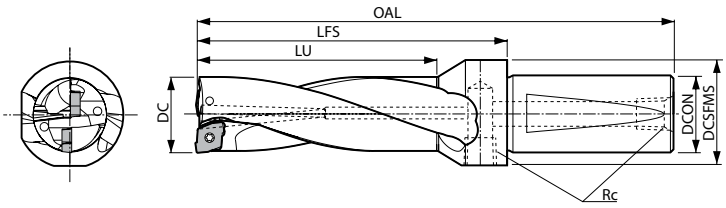
DC	Hole Dia. Tolerance (mm)
ø13~ø26.5	+0.20 -0.10
ø27~ø40	+0.25 -0.15
ø41~ø59	+0.30 -0.20

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DRZ (Drilling depth : 3 x DC)





3D

Toolholder dimensions

Description		Availability	No. of inserts	Dimension (mm) DC	DCON	OAL	LFS	LU	DCSFMS	Rc	Coolant hole	Radial offset max.	Spare parts: Plug	Screw	Wrench	Wrench	Applicable inserts (K74)
S20-	DRZ1339-05	●	2	13	20	108	65	39	27	Rc1/8	Yes	+0.5	GP-1	SB-2045TR	-	FT-6	ZCMT050203 ZCMT050203SP ZCMT050203SU
	DRZ135405-05	●		13.5				40.5									
	DRZ1442-05	●		14		112	69	42									
	DRZ145435-05	●		14.5				43.5									
	DRZ1545-05	●		15		115	72	45									
	DRZ155465-05	●		15.5				46.5									
S25-	DRZ1648-06	●	2	16	25	131	77	48	32	Rc1/8	Yes	+1.1	GP-1	SB-2260TR	DT-7	-	ZCMT06T204 ZCMT06T204SP ZCMT06T204SU
	DRZ165495-06	●		16.5				49.5				+0.9					
	DRZ1751-06	●		17		133	79	51				+0.8					
	DRZ175525-06	●		17.5				52.5				+0.7					
	DRZ1854-06	●		18		136	82	54				+0.6					
	DRZ185555-06	●		18.5				55.5									
	DRZ1957-06	●		19		139	85	57				+0.5					
	DRZ195585-06	●		19.5				58.5									
	DRZ2060-06	●		20		143	89	60				+0.5					
	DRZ205615-06	●		20.5		146	92	61.5				+0.3					
	DRZ2163-06	●		21		146	92	63				+0.2					
S25-	DRZ215645-08	●	2	21.5	25	147	93	64.5	33	Rc1/8	Yes	+1.8	GP-1	SB-2570TR	DT-8	-	ZCMT080304 ZCMT080304SP
	DRZ2266-08	●		22				66				+1.6					
	DRZ225675-08	●		22.5				67.5				+1.4					
	DRZ2369-08	●		23		150	96	69				+1.3					
	DRZ235705-08	●		23.5				70.5				+1.2					
	DRZ2472-08	●		24		152	98	72	35			+1.1					
	DRZ245735-08	●		24.5				73.5				+0.9					
	DRZ2575-08	●		25		155	101	75				+0.8					
	DRZ255765-08	●		25.5				76.5				+0.7					
	DRZ2678-08	●		26		158	104	78				+0.6					
	DRZ265795-08	●		26.5				79.5				+0.5					

When offset drilling, reduce feed rate to 0.08 mm/rev or less.
See page **K70** for Adjustable Sleeve (SHE).

Recommended cutting conditions **K85**
Trouble shooting **K65**

Hole Dia. Tolerance (3D type)

DC	Hole Dia. Tolerance (mm)
ø13~ø26.5	+0.20 -0.10
ø27~ø40	+0.25 -0.15
ø41~ø59	+0.30 -0.20

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Toolholder dimensions

3xDC

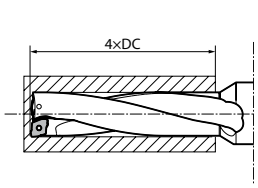
Description		Availability	No. of inserts	Dimension (mm) DC	DCON	OAL	LFS	LU	DCSFMS	Rc	Coolant hole	Radial offset max.	Spare parts: Plug	Screw	Wrench	Wrench	Applicable inserts ⇒ K74
S32-	DRZ2781-10	●	2	27	32	173	114	81	42	Rc1/4	Yes	+2.5	GP-2	SB-4085TR	DT-15	-	ZCMT10T304 ZCMT10T304SP
	DRZ275825-10	●		27.5				82.5				+2.3					
	DRZ2884-10	●		28		176	117	84				+2.2					
	DRZ285855-10	●		28.5				85.5				+2.1					
	DRZ2987-10	●		29		179	120	87				+2					
	DRZ295885-10	●		29.5				88.5				+1.8					
	DRZ3090-10	●		30		181	122	90	45			+1.7					
	DRZ305915-10	●		30.5				91.5				+1.5					
	DRZ3193-10	●		31		183	124	93				+1.5					
	DRZ315945-10	●		31.5				94.5				+1.3					
	DRZ3296-10	●		32		187	128	96				+1.2					
	DRZ325975-10	●		32.5				97.5				+1					
S32-	DRZ3399-12	●	2	33	32	193	134	99	55	Rc1/4	Yes	+2.9	GP-2	SB-5085TR	DT-20	-	ZCMT12T304SP ZCMT12T306
	DRZ34102-12	●		34		197	138	102				+2.7					
	DRZ35105-12	●		35		199	140	105				+2.4					
	DRZ36108-12	●		36		203	144	108				+2.2					
	DRZ37111-12	●		37		205	146	111				+1.9					
	DRZ38114-12	●		38		208	149	114				+1.7					
	DRZ39117-12	●		39		211	152	117				+1.4					
	DRZ40120-12	●		40		212	153	120				+1.2					
S40-	DRZ3399-12	●		33	40	203	134	99				+2.9					
	DRZ34102-12	●		34		207	138	102				+2.7					
	DRZ35105-12	●		35		209	140	105				+2.4					
	DRZ36108-12	●		36		213	144	108				+2.2					
	DRZ37111-12	●		37		215	146	111				+1.9					
	DRZ38114-12	●		38		218	149	114				+1.7					
	DRZ39117-12	●		39		221	152	117				+1.4					
	DRZ40120-12	●		40		222	153	120				+1.2					
S40-	DRZ41123-15	●	2	41	40	224	155	123	55	Rc1/4	Yes	+4	GP-2	SB-5085TR	DT-20	-	ZCMT150406SP ZCMT150408
	DRZ42126-15	●		42		227	158	126				+3.7					
	DRZ43129-15	●		43		230	161	129				+3.5					
	DRZ44132-15	●		44		233	164	132				+3.2					
	DRZ45135-15	●		45		234	165	135				+3					
	DRZ46138-15	●		46		241	172	138	60			+2.7					
	DRZ47141-15	●		47		245	176	141				+2.5					
	DRZ48144-15	●		48		248	179	144				+2.2					
	DRZ49147-15	●		49		250	181	147				+2					
	DRZ50150-15	●		50		251	182	150				+1.7					
	DRZ51153-15	●		51		254	185	153				+1.2					
	DRZ52156-15	●		52		257	188	156				+1					
	DRZ53159-15	●		53		260	191	159				+0.7					
S40-	DRZ54162-20	●	2	54	40	266	197	162	65	Rc1/4	Yes	+5	GP-2	SB-60120TR	DT-25	-	ZCMT200608
	DRZ55165-20	●		55		269	200	165				+4.7					
	DRZ56168-20	●		56		272	203	168				+4.4					
	DRZ57171-20	●		57		275	206	171				+4.1					
	DRZ58174-20	●		58		278	209	174				+3.8					
	DRZ59177-20	●		59		281	212	177				+3.5					

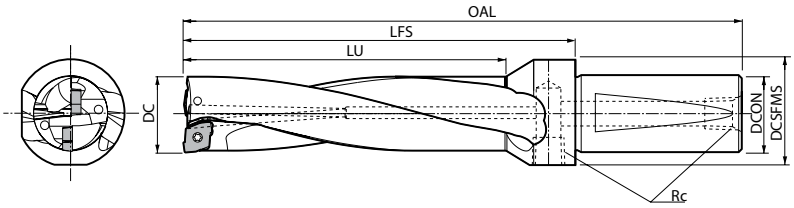
When offset drilling, reduce feed rate to 0.08 mm/rev or less.
See page **K70** for Adjustable Sleeve (SHE).

Recommended cutting conditions ⇒ **K85**
Trouble shooting ⇒ **K65**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DRZ (Drilling depth : 4 x DC)





4D

Toolholder dimensions

Description		Availability	No. of inserts	Dimension (mm) DC	DCON	OAL	LFS	LU	DCSFMS	Rc	Coolant hole	Radial offset max.	Spare parts: Plug	Screw	Wrench	Wrench	Applicable inserts (K74)
S20-	DRZ1352-05	●	2	13	20	121	78	52	27	Rc1/8	Yes	+0.5	GP-1	SB-2045TR	-	FT-6	ZCMT050203 ZCMT050203SP ZCMT050203SU
	DRZ135540-05	●		13.5				54									
	DRZ1456-05	●		14		126	83	56									
	DRZ145580-05	●		14.5				58									
	DRZ1560-05	●		15		130	87	60									
	DRZ155620-05	●		15.5				62									
S25-	DRZ1664-06	●	2	16	25	147	93	64	32	Rc1/8	Yes	+1.1	GP-1	SB-2260TR	DT-7	-	ZCMT06T204 ZCMT06T204SP ZCMT06T204SU
	DRZ165660-06	●		16.5				66				+0.9					
	DRZ1768-06	●		17		149	95	68				+0.8					
	DRZ175700-06	●		17.5				70				+0.7					
	DRZ1872-06	●		18		153	99	72				+0.6					
	DRZ185740-06	●		18.5				74									
	DRZ1976-06	●		19		157	103	76				+0.5					
	DRZ195780-06	●		19.5				78									
	DRZ2080-06	●		20		156	102	80				+0.5					
	DRZ205820-06	●		20.5		161	107	82				+0.3					
	DRZ2184-06	●		21		161	107	84				+0.2					
S25-	DRZ215860-08	●	2	21.5	25	169	115	86	33	Rc1/8	Yes	+1.8	GP-1	SB-2570TR	DT-8	-	ZCMT080304 ZCMT080304SP
	DRZ2288-08	●		22				88				+1.6					
	DRZ225900-08	●		22.5				90				+1.4					
	DRZ2392-08	●		23		173	119	92				+1.3					
	DRZ235940-08	●		23.5				94				+1.2					
	DRZ2496-08	●		24		176	122	96	35			+1.1					
	DRZ245980-08	●		24.5				98				+0.9					
	DRZ25100-08	●		25		180	126	100				+0.8					
	DRZ2551020-08	●		25.5				102				+0.7					
	DRZ26104-08	●		26		184	130	104				+0.6					
	DRZ2651060-08	●		26.5				106				+0.5					

When offset drilling, reduce feed rate to 0.06 mm/rev or less.
See page **K70** for Adjustable Sleeve (SHE).

Recommended cutting conditions **K85**
Trouble shooting **K65**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Toolholder dimensions

4xDC

Description		Availability	No. of inserts	Dimension (mm) DC	DCON	OAL	LFS	LU	DCSFMS	Rc	Coolant hole	Radial offset max.	Spare parts: Plug	Screw	Wrench	Wrench	Applicable inserts ⇒ K74
S32-	DRZ27108-10	●	2	27	32	200	141	108	42	Rc1/4	Yes	+2.5	GP-2	SB-4085TR	DT-15	-	ZCMT10T304 ZCMT10T304SP
	DRZ2751100-10	●		27.5				110				+2.3					
	DRZ28112-10	●		28		204	145	112				+2.2					
	DRZ2851140-10	●		28.5				114				+2.1					
	DRZ29116-10	●		29		208	149	116				+2					
	DRZ2951180-10	●		29.5				118				+1.8					
	DRZ30120-10	●		30		211	152	120	45			+1.7					
	DRZ3051220-10	●		30.5				122				+1.5					
	DRZ31124-10	●		31		214	155	124									
	DRZ3151260-10	●		31.5				126				+1.3					
	DRZ32128-10	●		32		219	160	128				+1.2					
	DRZ3251300-10	●		32.5				130				+1					
S32-	DRZ33132-12	●	2	33	32	226	167	132	55	Rc1/4	Yes	+2.9	GP-2	SB-5085TR	DT-20	-	ZCMT12T304SP ZCMT12T306
	DRZ34136-12	●		34		231	172	136				+2.7					
	DRZ35140-12	●		35		234	175	140				+2.4					
	DRZ36144-12	●		36		239	180	144				+2.2					
	DRZ37148-12	●		37		242	183	148				+1.9					
	DRZ38152-12	●		38		246	187	152				+1.7					
	DRZ39156-12	●		39		250	191	156				+1.4					
	DRZ40160-12	●		40		252	193	160				+1.2					
S40-	DRZ33132-12	●	2	33	40	236	167	132	55	Rc1/4	Yes	+2.9	GP-2	SB-5085TR	DT-20	-	ZCMT12T304SP ZCMT12T306
	DRZ34136-12	●		34		241	172	136				+2.7					
	DRZ35140-12	●		35		244	175	140				+2.4					
	DRZ36144-12	●		36		249	180	144				+2.2					
	DRZ37148-12	●		37		252	183	148				+1.9					
	DRZ38152-12	●		38		256	187	152				+1.7					
	DRZ39156-12	●		39		260	191	156				+1.4					
	DRZ40160-12	●		40		262	193	160				+1.2					
S40-	DRZ41164-15	●	2	41	40	265	196	164	55	Rc1/4	Yes	+4	GP-2	SB-5085TR	DT-20	-	ZCMT150406SP ZCMT150408
	DRZ42168-15	●		42		269	200	168				+3.7					
	DRZ43172-15	●		43		273	204	172				+3.5					
	DRZ44176-15	●		44		277	208	176				+3.2					
	DRZ45180-15	●		45		279	210	180				+3					
	DRZ46184-15	●		46		287	218	184	60			+2.7					
	DRZ47188-15	●		47		292	223	188				+2.5					
	DRZ48192-15	●		48		296	227	192				+2.2					
	DRZ49196-15	●		49		300	231	196				+2					
	DRZ50200-15	●		50		301	232	200				+1.7					

When offset drilling, reduce feed rate to 0.06 mm/rev or less.
See page **K70** for Adjustable Sleeve (SHE).

Recommended cutting conditions ⇒ **K85**
Trouble shooting ⇒ **K65**

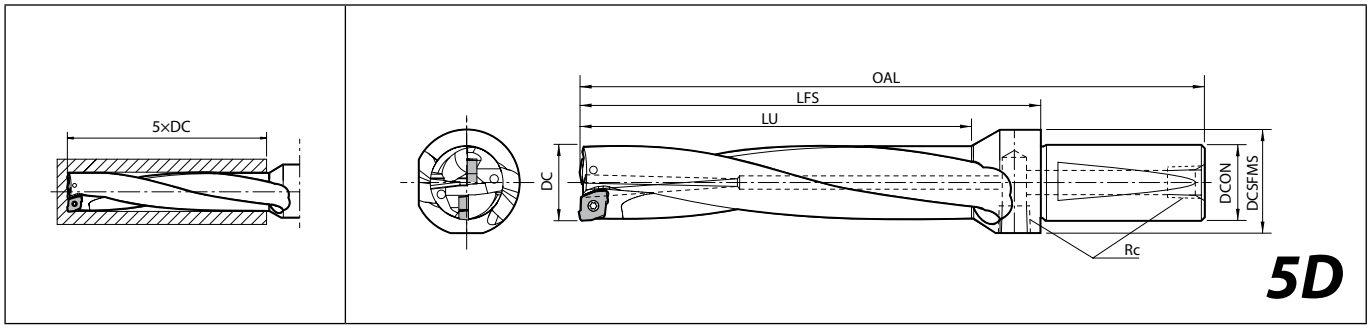
Hole Dia. Tolerance (4D type)

DC	Hole Dia. Tolerance (mm)
ø13~ø26.5	+0.25 -0.10
ø27~ø40	+0.30 -0.15
ø41~ø50	+0.35 -0.20

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DRZ (Drilling depth : 5 x DC)



Toolholder dimensions

Description		Availability	No. of inserts	Dimension (mm) DC	DCON	OAL	LFS	LU	DCSFMS	Rc	Coolant hole	Radial offset max.	Spare parts: Plug	Screw	Wrench	Applicable inserts K74
S32-	DRZ27135-10	●	2	27	32	277	168	135	42	Rc1/4	Yes	+2.5	GP-2	SB-4085TR	DT-15	ZCMT10T304 ZCMT10T304SP
	DRZ28140-10	●		28		232	173	140				+2.2				
	DRZ29145-10	●		29		237	178	145				+2				
	DRZ30150-10	●		30		241	182	150	45			+1.7				
	DRZ31155-10	●		31		245	186	155				+1.5				
	DRZ32160-10	●		32		251	192	160				+1.2				
S40-	DRZ33165-12	●	2	33	40	269	200	165	55	Rc1/4	Yes	+2.9	GP-2	SB-5085TR	DT-20	ZCMT12T304SP ZCMT12T306
	DRZ34170-12	●		34		275	206	170				+2.7				
	DRZ35175-12	●		35		279	210	175				+2.4				
	DRZ36180-12	●		36		285	216	180				+2.2				
	DRZ37185-12	●		37		289	220	185				+1.9				
	DRZ38190-12	●		38		294	225	190				+1.7				
	DRZ39195-12	●		39		299	230	195				+1.4				
	DRZ40200-12	●		40		302	233	200				+1.2				
S40-	DRZ41205-15	●	2	41	40	306	237	205	55	Rc1/4	Yes	+4	GP-2	SB-5085TR	DT-20	ZCMT150406SP ZCMT150408
	DRZ42210-15	●		42		311	242	210				+3.7				
	DRZ43215-15	●		43		316	247	215				+3.5				
	DRZ44220-15	●		44		321	252	220				+3.2				
	DRZ45225-15	●		45		324	255	225				+3				
	DRZ46230-15	●		46		333	264	230	60			+2.7				
	DRZ47235-15	●		47		339	270	235				+2.5				
	DRZ48240-15	●		48		344	275	240				+2.2				
	DRZ49245-15	●		49		349	280	245				+2				
	DRZ50250-15	●		50		351	282	250				+1.7				

When offset drilling, reduce feed rate to 0.05 mm/rev or less.
See page **K70** for Adjustable Sleeve (SHE).

Recommended cutting conditions **K85**
Trouble shooting **K65**

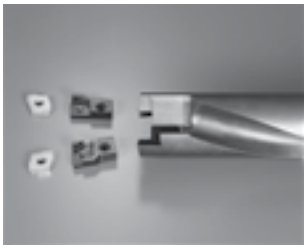
Hole Dia. Tolerance (5D type)

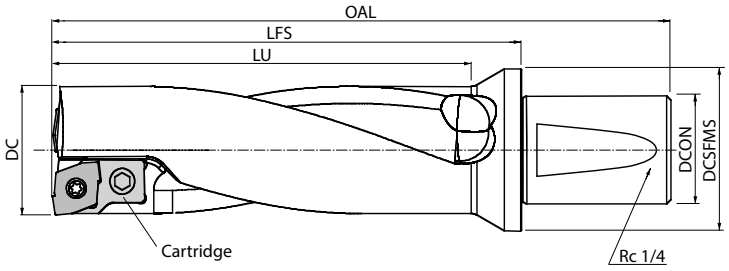
DC	Hole Dia. Tolerance (mm)
ø27~ø40	+0.35 -0.15
ø41~ø50	+0.40 -0.20

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DRZ-CR





Toolholder dimensions

Description		Availability	No. of inserts	Dimension (mm)						Coolant hole	Radial offset max.	Spare parts				Applicable inserts ➡ K74
				DC	DCON	OAL	LFS	LU	DCSFMS			Cartridge (inner edge)	Cartridge (outer edge)	Screw	Wrench	
S50-	DRZ60180-20CR	MTO	2	60	50	286	217	195	75	Yes	+3	DR20CR-IN (1pc)	DR20CR-OUT (1pc)	SB-60120TR	DT-25	ZCMT200608
	DRZ65195-20CR	MTO		65		296	227	206			+1.5					
	DRZ70210-20CR	MTO		70		308	239	220			+0.2					
S50-	DRZ75225-12CR	MTO	4	75	50	330	261	225	80	Yes	Offset N.A.	DR12CR-IN (2pcs)	DR12CR-OUT (2pcs)	SB-5085TR	DT-20	ZCMT12T304SP ZCMT12T306
	DRZ80240-12CR	MTO		80		340	271	240								

Clamp screws for cartridges are included in toolholders : HH6X12 for DR20CR and HH4X12 for DR12CR.

Recommended cutting conditions ➡ K85

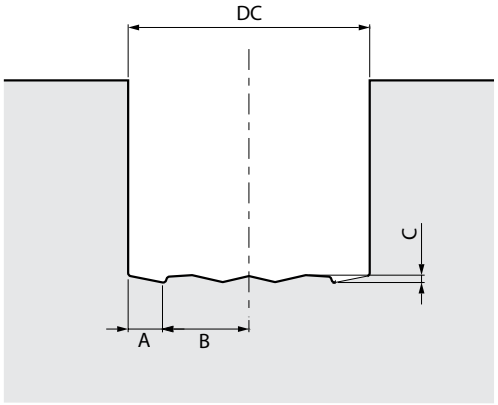
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

DRZ hole bottom shape (Common for 2D, 3D, 4D, 5D) (mm)

DC	A	B	C
13.0	2.1	4.4	0.4
13.5		4.7	
14.0		4.9	
14.5		5.2	0.5
15.0		5.4	
15.5		5.7	
16.0	2.7	5.3	0.6
16.5		5.6	
17.0		5.8	
17.5		6.1	0.7
18.0		6.3	
18.5		6.6	
19.0		6.8	
19.5		7.1	
20.0		7.3	
20.5		7.6	
21.0		7.8	0.8

DC	A	B	C
21.5	3.1	7.7	0.6
22.0		7.9	
22.5		8.2	
23.0		8.4	
23.5		8.7	0.7
24.0		8.9	
24.5		9.2	
25.0		9.4	
25.5		9.7	
26.0		9.9	
26.5		10.2	
27.0	4.0	9.5	0.7
27.5		9.8	
28.0		10.0	
28.5		10.3	
29.0		10.5	
29.5		10.8	0.8
30.0		11.0	
30.5		11.3	
31.0		11.5	
31.5		11.8	
32.0		12.0	
32.5		12.3	

DC	A	B	C
33.0	5.7	10.8	0.8
34.0		11.3	
35.0		11.8	
36.0		12.3	
37.0		12.8	
38.0		13.3	0.9
39.0		13.8	
40.0		14.3	
41.0	6.5	14.0	1.0
42.0		14.5	
43.0		15.0	
44.0		15.5	
45.0		16.0	
46.0		16.5	
47.0		17.0	1.1
48.0		17.5	
49.0		18.0	
50.0		18.5	
51.0		19.0	
52.0		19.5	
53.0		20.0	
54.0	8.5	18.5	1.2
55.0		19.0	
56.0		19.5	
57.0		20.0	
58.0		20.5	
59.0		21.0	



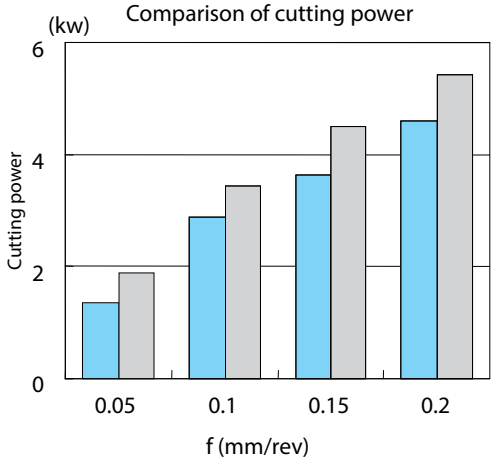
* Above is numeric guideline.
(Varies within ±0.1mm depending on workpiece materials and cutting conditions)

Cutting power

ø20 cutting power comparison

Magic Drill DRZ
Competitor A

Vc=100m/min, (n=1,600min^{-1})
ø20 indexable drill
15CrMo4 wet (Internal coolant)



Case studies

MagicDrill dia.		ø16	ø27		ø50	
Machine		Competitor A	Competitor B		Competitor C	Competitor D
Machine power		AC 5.5/7.5 kW	AC 5.5/7.5 kW		AC 5.5/7.5 kW	AC 7.5/11 kW
Cutting conditions	Vc (mm/min)	150	130	150	120	110	157
	f (mm/rev)	0.06	0.13		0.1	0.08	0.12
Workpiece material		ST44-2	34CrMo4		15CrMo4	ST44-2	
Required power (Load meter values)		60%	80%	95%	100%	60%	100%
Remarks		-	-		With conventional drill, limited up to ø40	-	

Formula for calculating required power (Approximate value)

Recommended cutting conditions (Coolant)

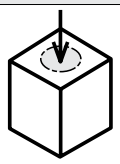
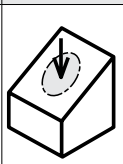
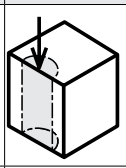
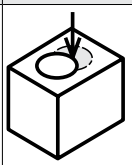
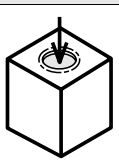
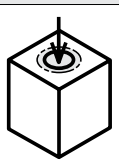
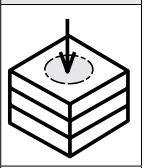
Workpiece material	Recommended insert grades (Vc: m/min)				DC (mm)	Drill type (Drilling depth)			
	MEGACOAT			Carbide		2D	3D	4D	5D
	PR1230	PR1225	PR1210	KW10		f (mm/rev)			
	Standard SP SU	Standard SP SU	Standard	Standard SP					
Low carbon steel	★ 120~220	☆ 120~220	-	-	ø13~ø15.5	0.06~0.10	0.06~0.10	0.04~0.08	-
					ø16~ø26.5	0.08~0.15	0.08~0.15	0.06~0.12	-
					ø27~ø50	0.08~0.18	0.08~0.15	0.06~0.12	0.05~0.09
					ø50~	0.08~0.18	0.08~0.15	0.06~0.12	-
Carbon steel	★ 100~160	☆ 100~160	-	-	ø13~ø15.5	0.06~0.10	0.06~0.10	0.04~0.08	-
					ø16~ø26.5	0.08~0.15	0.08~0.15	0.06~0.12	-
					ø27~ø50	0.08~0.18	0.08~0.15	0.06~0.12	0.05~0.09
					ø50~	0.08~0.18	0.08~0.15	0.06~0.12	-
Alloy steel	★ 80~140	☆ 80~140	-	-	ø13~ø15.5	0.06~0.10	0.06~0.10	0.04~0.08	-
					ø16~ø26.5	0.08~0.15	0.08~0.15	0.06~0.12	-
					ø27~ø50	0.08~0.18	0.08~0.15	0.06~0.12	0.05~0.09
					ø50~	0.08~0.18	0.08~0.15	0.06~0.12	-
Mold steel	★ 70~130	☆ 70~130	-	-	ø13~ø15.5	0.04~0.08	0.04~0.08	0.03~0.07	-
					ø16~ø26.5	0.08~0.12	0.06~0.10	0.06~0.08	-
					ø27~ø50	0.08~0.15	0.06~0.12	0.06~0.10	0.04~0.07
					ø50~	0.08~0.15	0.06~0.12	0.06~0.10	-
Stainless steel (Austenitic related)	☆ 60~120	★ 60~120	-	-	ø13~ø15.5	0.04~0.08	0.04~0.08	0.03~0.06	-
					ø16~ø26.5	0.06~0.10	0.06~0.10	0.04~0.08	-
					ø27~ø50	0.06~0.10	0.06~0.12	0.04~0.10	0.04~0.07
					ø50~	0.06~0.12	0.06~0.12	0.04~0.10	-
Gray cast iron	-	-	★ 100~150	☆ 100~120	ø13~ø15.5	0.08~0.12	0.08~0.10	0.06~0.08	-
					ø16~ø26.5	0.10~0.18	0.10~0.15	0.08~0.12	-
					ø27~ø50	0.10~0.20	0.10~0.18	0.08~0.15	0.06~0.10
					ø50~	0.10~0.20	0.10~0.18	0.08~0.15	-
Nodular cast iron	-	-	★ 80~120	☆ 80~100	ø13~ø15.5	0.08~0.12	0.08~0.10	0.06~0.08	-
					ø16~ø26.5	0.10~0.18	0.10~0.15	0.08~0.12	-
					ø27~ø50	0.10~0.20	0.10~0.18	0.08~0.15	0.06~0.10
					ø50~	0.10~0.20	0.10~0.18	0.08~0.15	-
Non-ferrous metals	-	-	-	★ 200~600	ø13~ø15.5	0.06~0.12	0.06~0.10	0.04~0.08	-
					ø16~ø26.5	0.08~0.18	0.08~0.15	0.06~0.15	-
					ø27~ø50	0.08~0.20	0.08~0.18	0.06~0.15	0.05~0.10
					ø50~	0.08~0.20	0.08~0.18	0.06~0.15	-
Titanium alloys	-	-	-	★ 40~70	ø13~ø15.5	0.05~0.06	0.05~0.06	0.05~0.06	-
					ø16~ø26.5	0.05~0.07	0.05~0.07	0.05~0.07	-
					ø27~ø50	0.06~0.08	0.06~0.08	0.06~0.08	0.04~0.05
					ø50~	0.06~0.08	0.06~0.08	0.06~0.08	-

· Apply a sufficient amount of coolant.

★: 1st recommendation ☆: 2nd recommendation

Cutting conditions by application

[Workpiece material: C50]

Applications		Plain surface	Slant surface	Half cylindrical	Hole expansion	Concave surface	Cored hole	Stacked plates
Shape of workpiece								
DRZ	Cutting speed Vc (m/min)	120	120	120	120	120	120	Not available
DRZ	f (mm/rev)	0.1	0.05	0.05	0.05	Concave surface 0.05 Continuous part 0.1	*0.05	Not available
Coolant (Internal)		Yes	Yes	Yes	Yes	Yes	Yes	Not available

* Cutting width (Torus-shaped part) when drilling cored hole. (Same as when using a boring bar).

Drill type	2D ~ 3D	4D ~ 5D
Cutting width (Torus-shaped part)	0.1 x DC or less	Not recommended

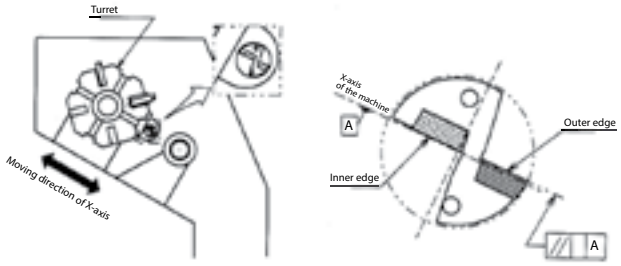
e.g.) In case of drilling using DRZ3090-10 (3 x DC)
1. For milling, pre-drilled hole should be cut ø24 (ø30 - 0.1 x 30 x 2) or bigger
2. For turning, ap should be set ap = 3mm (0.1 x 30) or under

Max. depth for drilling with external coolant

In case of using external coolant system, chip evacuation will be bad. Therefore ap should be measured within 1.5 times (1.5 x DC) of drill diameter (DC).

Lathe installation (DRZ)

1. The top face of the outer insert should be parallel to the X-axis to allow for offset machining.
   Drill diameter can be changed by moving X-axis.
2. It is recommended to set the outer insert as shown in Fig. 1 with the outer insert facing the operator.
   (It is also possible to use it by setting it in 180˚ reverse position)
   If the lathe has two turrets, when installing the drill into the lower turret, the outer insert should be set to face the operator.
   (It is also possible to use it by setting at 180˚ reverse position)



(Fig. 1) Installed to the lathe

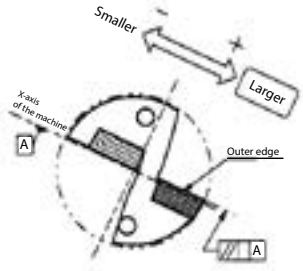
Drill diameter adjustment

1. Drill diameter adjustment

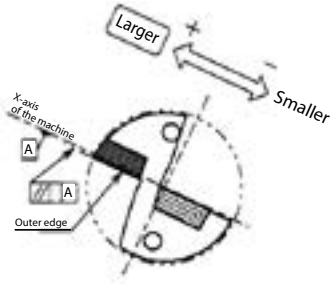
1. Drill diameter is adjusted by moving X-axis.
   The moving direction of the X-axis depends on the position of the toolholder.
2. In case of making the hole diameter larger, slide the tool along the X-axis toward the outer insert side. (Fig. 2, Fig. 3)
   For making the hole diameter smaller, slide the tool along the X-axis in the opposite direction.
   (This movement of the axis is called "Offset")
   However, be sure not to make the hole diameter smaller than the drill diameter by 0.2mm or more. Otherwise, the toolholder will interfere with the drilled hole. (Fig. 4)
   e.g.) In case of using ø20 drill, the hole diameter must not be smaller than 19.8mm.

2. Offset limit of the drill diameter

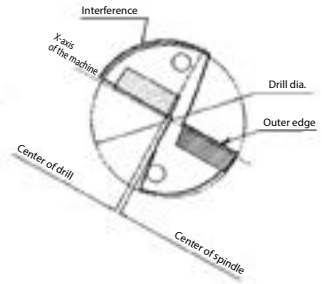
For the maximum limit of the drill diameter, refer to "Max. Offset (Radial)" in the Toolholder Dimensions table.
(The figure in the table shows how much it is possible the offset the drill in the radial direction.)
e.g.) In case of using ø20 drill, it is possible to make a hole up to ø21 since "Max. Offset (Radial)" is +0.5mm.



(Fig. 2) Outer insert facing up



(Fig. 3) Outer insert facing down

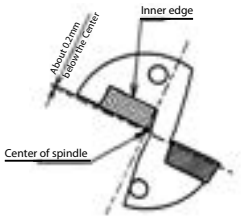


(Fig. 4) Excessive offset (For smaller hole diameter)

Center height adjustment

1. Center height of the inner insert

When installing inner insert as shown in Fig. 1, it will be set around 0.2mm below the Center of Spindle. (Fig. 5)
This is the normal position of the center height and the drill is designed to be handled in this condition.
However, in case that the turret of the lathe is out of the center of Spindle, sometimes the inner insert may be set above the center, or excessively below the center.
For stable drilling, it is essential to check the Center Height carefully.

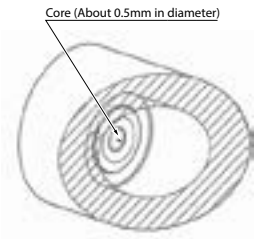


(Fig. 5) Front view of the drill

2. How to check the center height

For checking the center height of the inner insert, see the core which remains at the center of the end face of the drilled hole. (Fig. 6)
If the center height is in the normal position,
a core about 0.5mm in diameter, will remain after machining.
In the following cases, it is necessary to adjust the center height.
· No core remains
· Core diameter is more than 1mm

* The drilled hole for verification purposes needs to be machined at approximately 10mm in depth and at a feed rate of 0.1mm/rev or lower.

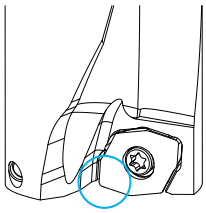


(Fig. 6) Center core

3. Center height adjustment

a) No core remains / Core with Excessively Small Diameter

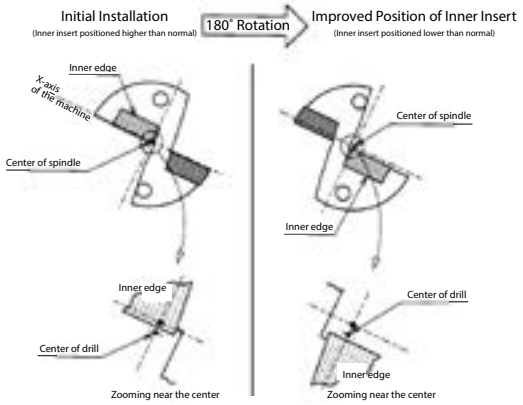
This happens when the inner insert is set above the center height.
In this case, adjustment is necessary since insert breakage will be probable at the center of the drill. (Fig. 7)



(Fig. 7) Insert breakage near the center of the drill

[How to adjust]

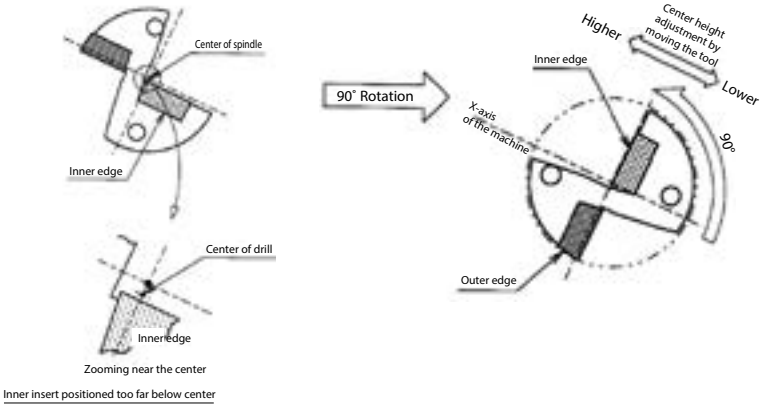
1. Install the drill rotated 180˚.
   Most problems will be solved by this method. (Fig. 8)



(Fig. 8)

[How to adjust]

2. If the core diameter becomes too large after the above adjustment, install the drill by rotating 90˚ counter-clockwise as shown in Fig. 9 (outer insert is positioned lower) and adjust the center height by moving the tool in the X-axis direction. (However, this makes it impossible to adjust the drill diameter)
   Caution: In case of installing the drill in the reverse direction (outer insert is positioned above), the hole diameter will become smaller, which may cause the drill body to interfere with the drilled hole.
   The best solution is to readjust the center position of the turret itself.



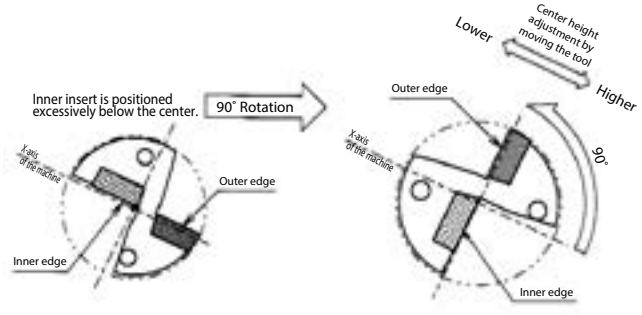
(Fig. 9)

b) Core with excessively large diameter (More than 1mm)

This occurs when the inner insert is excessively below the center.
This condition causes poor chip evacuation and an adjustment is required.

[How to adjust]

Install the drill rotating 90˚ as shown in Fig. 10 (outer insert is positioned on the upper side) and adjust the center height by moving tool in the X-axis direction.
(However, this makes it impossible to adjust the drill diameter)
Caution: In case of installing the drill in the opposite direction (outer insert is positioned lower), the hole diameter will become smaller, which may cause the drill body to interfere with the drilled hole.
The best solution is to readjust the center position of the turret itself.



(Fig. 10)

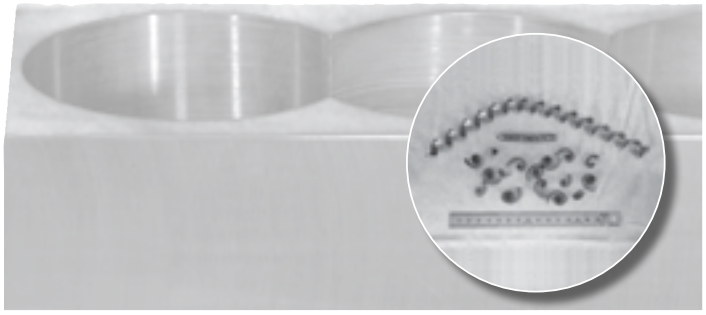
Large diameter indexable drill

MagicDrill DRW

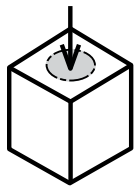
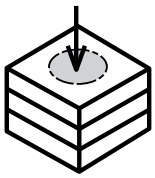
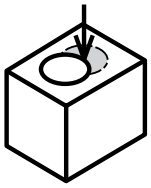


Sharp cutting and enhanced chip evacuation.
Superior fracture resistance and long tool life with MEGACOAT NANO PR1535 grade.

Applicable diameter: ø60~ø100 mm
Drilling depth: 1D, 2D, 3D
Use single type of insert.

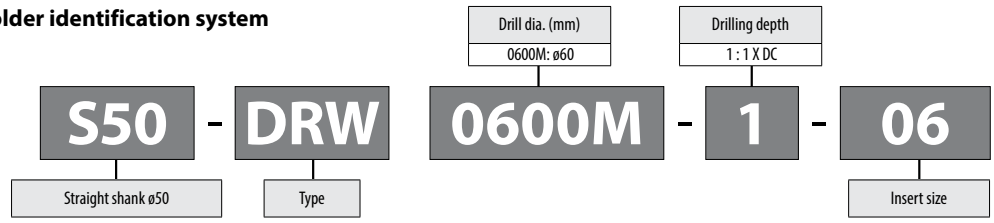


Applicable workpiece

Plain surface	Stacked plates	Hole expansion	Slant surface
			

* Hole expansion: Overlap amount of through hole must be 0.2 x DC or less.
Expansion of blind holes is not possible because chips are built up in the next hole and will cause chip biting.

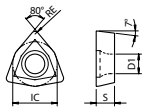
Toolholder identification system



DRW custom-order item (Applicable drill diameter: ø22~ø200 mm)

 BT integral arbor type is also available.	 Max. ø200 is applicable	**Standard item**  Straight shank (1D~3D)

WCMT

			Carbon steel / Alloy steel			●			P			
			Mold and die steel			●			P			
			Stainless steel	●			○		M			
			Cast iron			●			K			
			Non-ferrous metals						N			
Insert		Description	No. of edges	Dimension (mm)				Carbide			Applicable toolholder ⇒ K90~K93	
				IC	S	D1	RE	CVD	PVD			
								CA6535	PR1230	PR1535		
		WCMT 050308	3	7.94	3.18	3.2	0.8		●		-	
		WCMT 06T308	3	9.525	3.97	3.7	0.8	●	●	●	S50-DRW...-06	

K
Drilling

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DRW



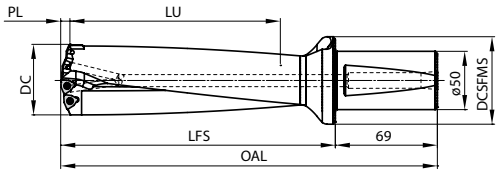


Fig. 1

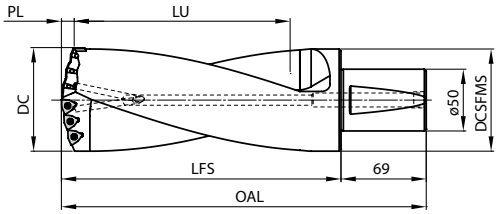


Fig. 2

Toolholder dimensions (Drilling depth : 1 x DC)

Description		Availability	No. of inserts	Dimension (mm)						Coolant hole	Fig.	Spare parts		Applicable inserts K89
				DC	OAL	LFS	LU	DCSFMS	PL			Screw	Wrench	
S50-	DRW0600M-1-06	MTO	4	60	175	106	60	63	7.6	Yes	1	SB-3592TR	DT-10	WCMT06T308
	DRW0610M-1-06	MTO		61	176	107	61		7.7		1			
	DRW0620M-1-06	MTO		62	178	109	62		7.8		1			
	DRW0630M-1-06	MTO		63	179	110	63		7.9		1			
	DRW0640M-1-06	MTO		64	182	113	64		8		1			
	DRW0650M-1-06	MTO		65	184	115	65		8.2		2			
	DRW0660M-1-06	MTO		66	185	116	66	64	8.3		2			
	DRW0670M-1-06	MTO		67	187	118	67	65	8.4		2			
	DRW0680M-1-06	MTO		68	189	120	68	66	8.5		2			
	DRW0690M-1-06	MTO		69	190	121	69	67	8.6		2			
	DRW0700M-1-06	MTO		70	192	123	70	68	8.7		2			
	DRW0710M-1-06	MTO		71	193	124	71	69	8.8		2			
	DRW0720M-1-06	MTO		72	195	126	72	70	9		2			
	DRW0730M-1-06	MTO		73	198	129	73	71	9.1		2			
	DRW0740M-1-06	MTO		74	199	130	74	72	9.2		2			
S50-	DRW0750M-1-06	MTO	6	75	201	132	75	73	9.3	Yes	2	SB-3592TR	DT-10	WCMT06T308
	DRW0760M-1-06	MTO		76	203	134	76	74	9.4		2			
	DRW0770M-1-06	MTO		77	204	135	77	75	9.5		2			
	DRW0780M-1-06	MTO		78	206	137	78	76	9.7		2			
	DRW0790M-1-06	MTO		79	207	138	79	77	9.8		2			
	DRW0800M-1-06	MTO		80			80	78			2			
	DRW0810M-1-06	MTO		81	208	139	81	79			2			
	DRW0820M-1-06	MTO		82	210	141	82	80	9.9		2			
	DRW0830M-1-06	MTO		83			83	81			2			
	DRW0840M-1-06	MTO		84			84	82			2			

Offset Drilling
Offset for DRW should be 0 ~ +0.15 mm in radius (0 ~ +0.3 mm in diameter).
Do not set it to a negative value to make the diameter smaller.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

Toolholder dimensions (Drilling depth : 1 x DC)

Description		Availability	No. of inserts	Dimension (mm)						Coolant hole	Fig.	Spare parts		Applicable inserts K89
				DC	OAL	LFS	LU	DCSFMS	PL			Screw	Wrench	
														
S50-	DRW0850M-1-06	MTO	6	85	211	142	85	83	10.5	Yes	2	SB-3592TR	DT-10	WCMT06T308
	DRW0860M-1-06	MTO		86	213	144	86	84						
	DRW0870M-1-06	MTO		87	215	146	87	85						
	DRW0880M-1-06	MTO		88	216	147	88	86						
	DRW0890M-1-06	MTO		89	218	149	89	87						
	DRW0900M-1-06	MTO		90	219	150	90	88	11					
	DRW0910M-1-06	MTO		91	220	151	91	89						
	DRW0920M-1-06	MTO		92	222	153	92	90						
	DRW0930M-1-06	MTO		93	223	154	93	91						
	DRW0940M-1-06	MTO		94	225	156	94	92						
	DRW0950M-1-06	MTO		95	226	157	95	93	11.6					
	DRW0960M-1-06	MTO		96	228	159	96	94						
	DRW0970M-1-06	MTO		97			97	95						
	DRW0980M-1-06	MTO		98	230	161	98	96						
	DRW0990M-1-06	MTO		99	231	162	99	97						
	DRW1000M-1-06	MTO		100	232	163	100	98	12.2					

Offset Drilling
Offset for DRW should be 0 ~ +0.15 mm in radius (0 ~ +0.3 mm in diameter).
Do not set it to a negative value to make the diameter smaller.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

Toolholder dimensions (Drilling depth : 2 x DC)

Description		Availability	No. of inserts	Dimension (mm)						Coolant hole	Fig.	Spare parts		Applicable inserts ⇨ K89
				DC	OAL	LFS	LU	DCSFMS	PL			Screw	Wrench	
S50-	DRW0600M-2-06	●	4	60	235	166	120	63	7.6	Yes	1	SB-3592TR	DT-10	WCMT06T308
	DRW0610M-2-06	MTO		61	237	168	122		7.7		1			
	DRW0620M-2-06	MTO		62	240	171	124		7.8		1			
	DRW0630M-2-06	MTO		63	242	173	126		7.9		1			
	DRW0640M-2-06	MTO		64	246	177	128		8		1			
	DRW0650M-2-06	●		65	249	180	130		8.2		2			
	DRW0660M-2-06	MTO		66	251	182	132	64	8.3		2			
	DRW0670M-2-06	MTO		67	254	185	134	65	8.4		2			
	DRW0680M-2-06	MTO		68	257	188	136	66	8.5		2			
	DRW0690M-2-06	MTO		69	259	190	138	67	8.6		2			
	DRW0700M-2-06	●		70	262	193	140	68	8.7		2			
	DRW0710M-2-06	MTO		71	264	195	142	69	8.8		2			
	DRW0720M-2-06	MTO		72	267	198	144	70	9		2			
	DRW0730M-2-06	MTO		73	271	202	146	71	9.1		2			
	DRW0740M-2-06	●		74	273	204	148	72	9.2		2			
S50-	DRW0750M-2-06	●	6	75	276	207	150	73	9.3	Yes	2	SB-3592TR	DT-10	WCMT06T308
	DRW0760M-2-06	MTO		76	279	210	152	74	9.4		2			
	DRW0770M-2-06	MTO		77	281	212	154	75	9.5		2			
	DRW0780M-2-06	MTO		78	284	215	156	76	9.7		2			
	DRW0790M-2-06	MTO		79	286	217	158	77	9.8		2			
	DRW0800M-2-06	●		80	287	218	160	78	9.9		2			
	DRW0810M-2-06	MTO		81	289	220	162	79			2			
	DRW0820M-2-06	MTO		82	292	223	164	80			2			
	DRW0830M-2-06	MTO		83	293	224	166	81			2			
	DRW0840M-2-06	MTO		84	294	225	168	82			2			
	DRW0850M-2-06	●		85	296	227	170	83	10.5		2			
	DRW0860M-2-06	MTO		86	299	230	172	84			2			
	DRW0870M-2-06	MTO		87	302	233	174	85			2			
	DRW0880M-2-06	MTO		88	304	235	176	86			2			
	DRW0890M-2-06	MTO		89	307	238	178	87			2			
	DRW0900M-2-06	●		90	309	240	180	88	11		2			
	DRW0910M-2-06	MTO		91	311	242	182	89			2			
	DRW0920M-2-06	MTO		92	314	245	184	90			2			
	DRW0930M-2-06	MTO		93	316	247	186	91			2			
	DRW0940M-2-06	●		94	319	250	188	92			2			
	DRW0950M-2-06	●		95	321	252	190	93	11.6		2			
	DRW0960M-2-06	MTO		96	324	255	192	94			2			
	DRW0970M-2-06	MTO		97	325	256	194	95			2			
	DRW0980M-2-06	MTO		98	328	259	196	96			2			
	DRW0990M-2-06	MTO		99	330	261	198	97			2			
	DRW1000M-2-06	●		100	332	263	200	98	12.2		2			

Offset Drilling
Offset for DRW should be 0 ~ +0.15 mm in radius (0 ~ +0.3 mm in diameter).
Do not set it to a negative value to make the diameter smaller.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

Toolholder dimensions (Drilling depth : 3 x DC)

Description		Availability	No. of inserts	Dimension (mm)						Coolant hole	Fig.	Spare parts		Applicable inserts ⇨ K89
				DC	OAL	LFS	LU	DCSFMS	PL			Screw	Wrench	
S50-	DRW0600M-3-06	●	4	60	295	226	180	63	7.6	Yes	1	SB-3592TR	DT-10	WCMT06T308
	DRW0610M-3-06	MTO		61	298	229	183		7.7		1			
	DRW0620M-3-06	MTO		62	302	233	186		7.8		1			
	DRW0630M-3-06	MTO		63	305	236	189		7.9		1			
	DRW0640M-3-06	MTO		64	310	241	192		8		1			
	DRW0650M-3-06	●		65	314	245	195		8.2		2			
	DRW0660M-3-06	MTO		66	317	248	198	64	8.3		2			
	DRW0670M-3-06	MTO		67	321	252	201	65	8.4		2			
	DRW0680M-3-06	MTO		68	325	256	204	66	8.5		2			
	DRW0690M-3-06	MTO		69	328	259	207	67	8.6		2			
	DRW0700M-3-06	●		70	332	263	210	68	8.7		2			
	DRW0710M-3-06	MTO		71	335	266	213	69	8.9		2			
	DRW0720M-3-06	MTO		72	339	270	216	70	9		2			
	DRW0730M-3-06	MTO		73	344	275	219	71	9.1		2			
	DRW0740M-3-06	●		74	347	278	222	72	9.2		2			
S50-	DRW0750M-3-06	●	6	75	351	282	225	73	9.3	Yes	2	SB-3592TR	DT-10	WCMT06T308
	DRW0760M-3-06	MTO		76	355	286	228	74	9.4		2			
	DRW0770M-3-06	MTO		77	358	289	231	75	9.5		2			
	DRW0780M-3-06	MTO		78	362	293	234	76	9.7		2			
	DRW0790M-3-06	MTO		79	365	296	237	77	9.8		2			
	DRW0800M-3-06	●		80	367	298	240	78			2			
	DRW0810M-3-06	MTO		81	370	301	243	79			2			
	DRW0820M-3-06	MTO		82	374	305	246	80	9.9		2			
	DRW0830M-3-06	MTO		83	376	307	249	81			2			
	DRW0840M-3-06	MTO		84	378	309	252	82			2			
	DRW0850M-3-06	●		85	381	312	255	83			2			
	DRW0860M-3-06	MTO		86	385	316	258	84			2			
	DRW0870M-3-06	MTO		87	389	320	261	85	10.5		2			
	DRW0880M-3-06	MTO		88	392	323	264	86			2			
	DRW0890M-3-06	MTO		89	396	327	267	87			2			
	DRW0900M-3-06	●		90	399	330	270	88			2			
	DRW0910M-3-06	MTO		91	402	333	273	89			2			
	DRW0920M-3-06	MTO		92	406	337	276	90	11		2			
	DRW0930M-3-06	MTO		93	409	340	279	91			2			
	DRW0940M-3-06	●		94	413	344	282	92			2			
	DRW0950M-3-06	●		95	416	347	285	93			2			
	DRW0960M-3-06	MTO		96	420	351	288	94			2			
	DRW0970M-3-06	MTO		97	422	353	291	95	11.6		2			
	DRW0980M-3-06	MTO		98	426	357	294	96			2			
	DRW0990M-3-06	MTO		99	429	360	297	97			2			
	DRW1000M-3-06	●		100	432	363	300	98	12.2		2			

Offset Drilling
Offset for DRW should be 0 ~ +0.15 mm in radius (0 ~ +0.3 mm in diameter).
Do not set it to a negative value to make the diameter smaller.

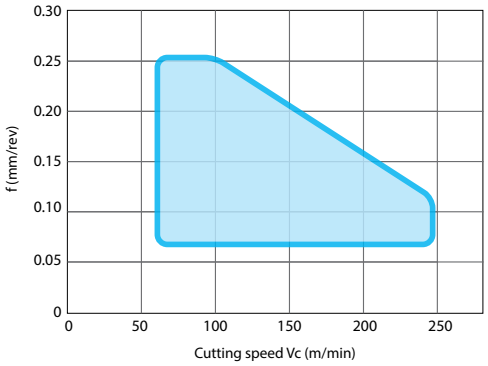
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

Recommended cutting conditions

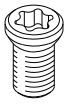
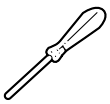
Workpiece material	Vc (m/min)	f (mm/rev)
Carbon steel	80~200	0.07~0.25
Alloy steel	80~160	0.07~0.25
Mold steel	70~150	0.06~0.20
Gray cast iron	100~240	0.07~0.30
Nodular cast iron	80~150	0.07~0.25

· Apply enough amount of coolant (Internal supply).
· Feed rate should be calculated as single insert.

Application map (Carbon steel / Alloy steel)



Spare parts

Description	Clamp screw	Wrench
		
S50-DRW. . .-06	SB-3592TR	DT-10

Hole dia. tolerance

DC	Hole diameter tolerance (mm)
ø60~ø100	0~+0.4

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

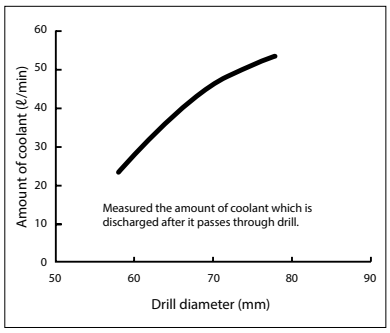
Offset drilling

Offset for DRW should be 0~+0.15 mm in radius
(0~+0.3mm in diameter).
Do not set it to a negative value to make the diameter smaller.

External coolant is not recommended because the amount of chips will be enormous.
Use internal coolant.
See the graph of "Drill diameter and coolant amount".

Higher output is preferable.
What is important is enough torque rather than high spindle rate.
See the examples of required power as below.

Drill diameter and coolant amount



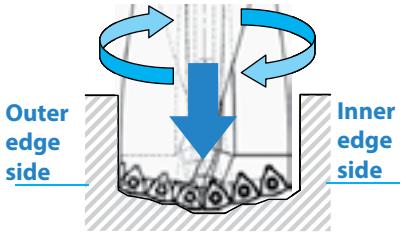
Drill dia.	Workpiece material	Machine	Cutting conditions	Spindle power	*Required power
ø75 (2D)	15CrMo4	M/C	Vc=130m/min (n=550min^{-1}) f=0.12mm/rev (Vf=66mm/min)	22kW	60%
ø85 (2D)	Alloy steel	M/C	Vc=150m/min (n=560min^{-1}) f=0.1mm/rev (Vf=56mm/min)	30kW	85%
ø94 (2D)	C45	NC lathe	Vc=120m/min (n=410min^{-1}) f=0.1mm/rev (Vf=41mm/min)	20kW	100%
ø94 (2D)	X5CrNi18 10	NC lathe	Vc=80m/min (n=270min^{-1}) f=0.2mm/rev (Vf=54mm/min)	20kW	40%

* The required power was read on the load meter.

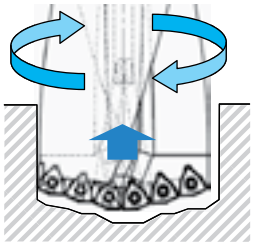
During processing, force of deflection is applied to the center of the drill.
If the drill is just pulled out from the position where processing is finished, tool markings will be made.
To prevent tool markings, perform offset before pulling out the drill.

How to prevent tool markings

1. Drilling the hole (The spindle revolves)



2. Turn back approximately 0.5 mm (The spindle revolves)

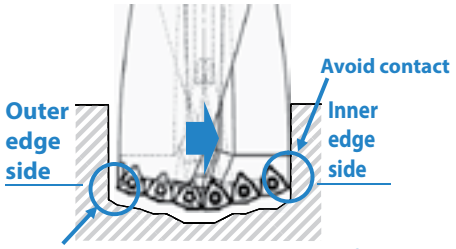




Chips are adhering to the bottom when drilling stops.

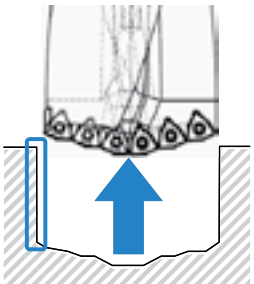
- Without turning back, chips remains adhering to the bottom.
- If offset (3) is performed without turning back, the bottom of drill contacts with the inner surface of hole.
- Turning back is necessary for blind holes but not for through holes.

3. Stop revolution and perform offset (The spindle stops)



Make a clearance to prevent the tool from contacting when pulling out. (Approximately 0.1~0.2 mm)

4. Pull out the drill



Example of drilling program

```
G90G54G0G43X0Y0Z100.0H10
S477M03
Z2.5M8
G01Z -80.0F48
Z-79.5M19   ← The spindle
X0.2Y0.2      stops at the
Z100.0M9      specified position
```

* The M code and X and Y moving directions are unique to the equipment.

Tool markings are not made (or are only slight even if made).

M



Introduction		**M2**
Cutting edge angle 45°/ 66°/ 70°		**M12**
MB45		M12
MFPN45		M22
MFPN66		M30
MFSE45		M36
MFLN	MFLN45 / MFLN70	M42
MFK	MFK / MFK-SF	M48
Cutting edge angle 75°		**M58**
MSRS15		M58
Cutting edge angle 88°/90°		**M62**
MA90		M62
MEW		M74
MEC	MEC / MECX	M86
MEV		M104
MEWH		M112
MECH		M116
MECHT		M126
MFWN		M130
MFWN-Mini		M138
MFSN88		M144
MFLN		M150
MSRS90		M156
MSR	MSR / MSR-BT50	M163
DMC	DMC-SX / DMC-H	M170
MFAH		M174
MEAS		M184
Cutter for finishing		**M190**
MFF		M190
High feed cutter		**M196**
MFH Series	MFH Harrier	M196
	MFH Boost	M208
	MFH Mini	M217
	MFH Micro	M224
Multi-Function end mill		**M230**
MEY		M230
Slott mill		**M236**
MST	MSTA	M238
	MSTB	M242
	MSTC	M248
Ball-nose / radius type cutters		**M258**
MRF	MRF / MRFW	M258
MRW		M262
MRX		M270
Other applications		**M280**
MCSE	Chamfering end mill	M280
MEF	Bolt countersink end mill	M283
METS	T-Slot mill	M287
MGI	Grooving end mill for M/C	M290
MVG	Ring grooving end milll for M/C	M292
Other inserts		**M294**

Cutting edge angle 45˚/66°/70°/75°

Cutting edge angle	Shape \ Applications	Facing	Chamfering
	MB45  M16~M18	• Economical double-sided 8-edge insert • Delivers the "low cutting force" benefits of positive inserts and the "fracture resistance" benefits of negative inserts • End mills have ø32 cylindrical shank	
45°	MFPN45  M12~M25	• 10-edge pentagonal inserts (double-sided) • Low cutting force with helical cutting-edge design • Dual cutting edge design (High toughness) • End mills have ø32 cylindrical shank	
45°	MFSE45  With Wiper Insert M38	• Roughing condition (fz = 0.25 mm/t) Provides Excellent surface finish (0.8 µmRa or less) * (*Based on internal evaluation with wiper insert installed.) • Maintains long tool life with high-precision inserts • Newly developed chipbreakers for steel, stainless steel, and aluminum • Improved productivity with excellent chip control	

Cutting edge angle	Shape \ Applications	Facing
66°	MFPN66  M31~M33	• Double-sided 10-edge insert • Cutting edge angle 66˚ • Reduces chattering with low cutting force design • End mills have ø32 cylindrical shank
75°	MSRS15  M59	• For heavy milling • Max. ap 12 mm • High chip evacuation rate per unit

Cutting edge angle	Shape \ Applications	Facing	Chamfering
45°	MFLN45  M44	• For heavy milling • Tough 4-edge vertical inserts • For large depths of cut and high feed rates • Max. ap 12 mm	

Cutting edge angle	Shape \ Applications	Facing
70°	MFLN70  M45	• For heavy milling • Tough 4-edge vertical inserts • For large depths of cut and high feed rates • Max. ap 17 mm
70°	MFK  M50	• High efficiency multi-edge cutter for cast iron • 10-edge pentagonal inserts (double-sided) • Low cutting force with helical cutting-edge design Improved surface finish, minimizing chattering and prevented burr formation • Dual cutting edge design (High toughness)
70°	MFK-SF  M52	• For cast iron • Adjustable cutting edge height • High speed and high precision machining of cast iron by combining ceramic insert and CBN wiper insert

Cutting edge angle 88˚/90˚ (Double-sided insert)

Cutting edge angle	Shape \ Applications	Facing	Shouldering	Slotting
90°	MA90  M66~M68	• Economical double-sided 4-edge insert • Original tangential 90° end mill • Newly designed inserts high quality surface finish and excellent wall accuracy • Supports multi-functional machining such as 3D milling		
	MA90 head (Modular type)  M69			
	MEW  M76~M78	• Economical double-sided 4-edge insert • Obtuse edge increases cutting edge toughness • Smooth surface wall with low cutting force and reduced chattering		
	MEW head (Modular type)  M79			

Cutting edge angle	Shape \ Applications	Facing	Shouldering	Slotting
90°	MFWN  M131, M132, M134	• Economical double-sided 6-edge insert • Superior fracture resistance with thick edge design • "Large slant edge" design reduces shock when cutting edge enters the workpiece • Low cutting force and reduce chattering • End mills have ø32 cylindrical shank		
	MFWN Mini  M139, M140	• Can be used up to 5 mm D.O.C. • Good cost performance • Economical double-sided 6-edge insert • Superior fracture resistance with thick edge design • "Large slant edge" design reduces shock when cutting edge enters the workpiece • Low cutting force and reduce chattering • End mills have ø25, ø32 cylindrical shank		
88°	MFSN88  M145, M147	• Economical double-sided 8-edge insert • Reduces chattering with low cutting force design • Contribute to cost-cutting for Shoulder Roughing • End mills have ø32, ø40 cylindrical shank		

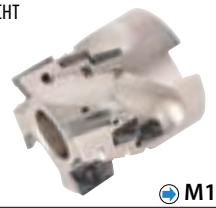
Cutting edge angle 90˚

Cutting edge angle	Shape \ Applications	Facing	Shouldering	Slotting
90°	MEC  M86~M89	• Good squareness • Low cutting force • The silver coating prevents chip wear on the tool body • With coolant hole (Over shank size ø16) • The twisted cutting edge improves cutting performance • Smooth surface of shoulder wall		
	MEC head (Modular type)  M90			
	MECX  M98, M99	• Good squareness • Small size insert with multi-edge specification • Recommended for small machines: low cutting force and high strength design • The silver coating prevents chip wear on the tool body • With coolant hole		

Cutting edge angle	Shape \ Applications	Facing	Shouldering	Slotting
90°	MEV  M106, M107	• Newly developed vertical triangle inserts • Economical 3-edge insert • The MEV can perform a wide variety of machining processes		
	MEV head (Modular)  M108			
	DMC-H  M171	• High Rake • For small milling machine and M/C		
	DMC-SX  M170	• For small milling machine and M/C		

Cutting edge angle 90˚ (Heavy milling)

Cutting edge angle	Shape \ Applications	Facing	Shouldering	Slotting
90°(Long cutting edge)	MEWH  M112	• Low cutting force and sharp cutting performance • Excellent surface finish quality • Economical double-sided 4-edge insert • High quality and stable machining with heavy milling		
	MEWH shell mill  M113	• MEWH shell mill		
	MSRS90  M159	• High efficiency, low cutting force and stable machining without chatter • Various expansive possibilities with combining neutral insert and custom-ordered cutter		
	MSR  M165	• Low cutting force and restrain chattering with notched insert • Chipbreaker design with specialized notches improves chip evacuation • Chipbreaker achieves stabilized machining for heavy milling		
	MSR-BT50  M166	• Highly rigid BT50 Arbor integrated for MSR		
	MFLN90  M152	• For heavy milling • Tough 4-edge vertical inserts • For large depths of cut and high feed rates • Max. ap 20 mm • Chamfered corner type available • Prevents chattering and insert fracturing		

Cutting edge angle	Shape \ Applications	Facing	Shouldering	Slotting
90°(Long cutting edge)	MECH  M116	• Notched insert improves higher productivity		
	MECH shell mill  M117	• MECH shell mill		
	MECH-BT50 MECH-BT50SA  M118, M119	• Highly rigid BT50 Arbor integrated for MECH • Head exchangeable type is available (MECH-BT50SA)		
	MECHT  M127	• Excellent chattering resistance and good chip control with special design for titanium alloys • End mills have ø32, cylindrical shank		

Cutting edge angle 90° (For aluminum alloys)

Cutting edge angle	Shape \ Applications	Facing	Shouldering	Slotting
90°	MFAH  M176~M178	• High efficiency milling cutter for finishing aluminum alloys • Light-weight hybrid body with internal coolant available/Steel body • Adjustable cutting edge height • 3 different cutting edge design		
	MEAS  M186	• High efficiency milling cutter for finishing aluminum alloys • Excellent scatter prevention to ensure stable		

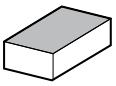
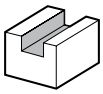
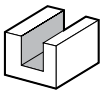
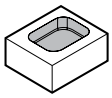
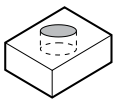
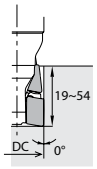
For finishing operations

Shape \ Applications	Facing
MFF  M193	• High-quality surface finish • Molded wiper insert • Cutter body design provides excellent reliability • Easy-to-adjust cutting edge

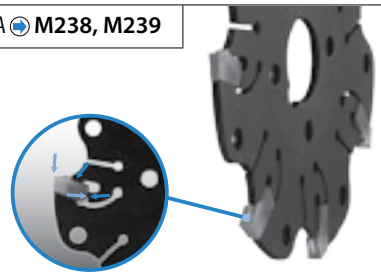
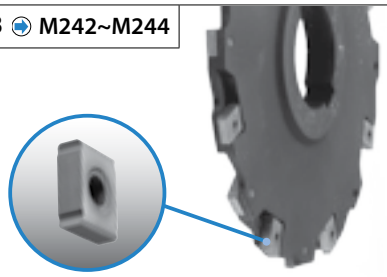
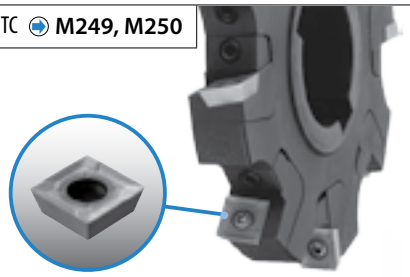
High feed cutter

Shape \ Applications	Facing	Shouldering	Slotting	Pocketing	Cutting diameter DC (ø8, ø16, ø25, ø32, ø40, ø50, ø80, ø160)
MFH Harrier (Face mill)  M198,M199	• Various applications with 4 types of inserts  GM type (General purpose)  GH type (Tough edge)  LD type (Large D.O.C.) MAX. ap = 5mm  FL type (With wiper edge) Roughing and finishing • 3D convex cutting edge reduces shock of biting workpiece • Multi-functional cutter for ramping, helical milling vertical milling (plunging) etc. (GM/GH type)			(SOMT10 type) ø50 ø80 ø50 ø160 (SOMT14 type)
MFH Harrier (End mill)  M200,M201				(SOMT10 type) ø25 ø40 (SOMT14 type) ø50 ø80
MFH Harrier (Modular type)  M202				(SOMT10 type) ø25 ø40
MFH Boost (Face mill)  M212	• Economical double-sided 4-edge insert • High feed milling with large depth of cut capabilities			ø40 ø80
MFH Boost (End mill)  M211	 GM type (General purpose) • Achieves high efficiency machining in various shouldering, slotting, helical milling, and ramping applications			ø22 ø40
MFH Boost (Modular type)  M213				ø22 ø42
MFH mini (Face mill)  M219	• Economical double-sided 4-edge insert  GM type (General purpose)  GH type (Tough edge) • High efficiency and high feed machining at small dia. machining and small machining center			ø40 ø50
MFH mini (End mill)  M218				ø16 ø32
MFH mini (Modular type)  M220				ø16 ø32
MFH micro (end mill)  M226	• Micro diameter cutter for high feed machining • High efficiency machining with low cutting force and reduced chattering 			ø8 ø16
MFH micro (modular type)  M227				ø8 ø16

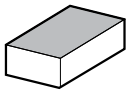
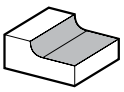
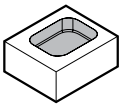
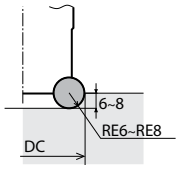
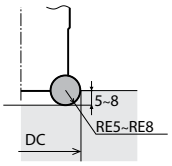
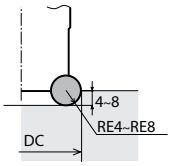
Multi-function machining end mill

Applications / Shape	Facing	Shouldering	Slotting	Deep slotting	Pocketing	Drilling	Lead angle and max. ap	Cutting dia. DC
								ø16 ø25 ø50
MEY  M230, M231	• Multi-function machining (Drilling/Ramping/ Shouldering/Grooving) • High efficiency mold machining • Low cutting force, Good chip evacuation		• Full 2-insert structure and high stability • Good chip control when Ramping		• Cutting diameters that are larger than the shank diameters enables wall shouldering • The silver coating prevents chip wear on the tool body			

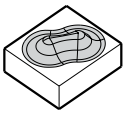
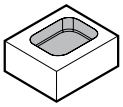
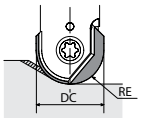
Slot mill MST

MSTA M238, M239	MSTB M242~M244	MSTC M249, M250
		
• Self-clamping type • Remove insert with appropriate wrench	• Easy screw on tangential clamped insert	• Adjustable slotting width due to unique cam adjustment structure

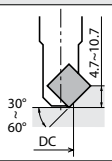
Radius

Applications / Shape	Facing	Shouldering	Pocketing	Lead angle and max. ap	Cutting dia. DC
					ø12 ø16 ø32 ø40 ø50 ø63 ø80 ø100 ø125
MRW  M264 M266	• High efficiency radius cutter with double-sided insert • Combine sharpness and cutting edge strength (A.R. Max. +12°) • Prevent insert rotation during machining with flat lock structure • Wide application range from steel to heat-resistant alloys				
MRX face mill  M271	• Low cutting force and high performance radius cutter • Low cutting force with helical cutting-edge design (A.R. Max. +10°) • Prevent insert rotation during machining with flat lock structure • Wide application from facing, grooving, pocketing to plunging • Wide application range from steel to heat-resistant alloys				
MRX end mill  M274					
MRX head (Modular type)  M275					

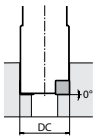
Ball-nose end mill

Applications / Shape	Contouring/Profiling	Pocketing	Lead angle and max. ap	Cutting dia. DC
				ø8 ø25 ø50 ø80
MRF  M258	• For high quality mold finishing • High R-accuracy (Insert's R-accuracy: ±0.01mm or under) • The bushing ensures insert installation accuracy			
MRFW  M259	• Carbide shank • For high quality mold finishing • High R-accuracy (Insert's R-accuracy: ±0.01mm or under) • The bushing ensures insert installation accuracy • Superior to anti vibration, and stable machining is possible with long overhang length without chattering			

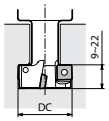
Chamfering

Shape \ Applications	Chamfering	Back chamfering	V shape slotting	Countersinking	Lead angle and max. ap
MCSE  M280	• For 30˚, 45˚, 60˚ chamfering • Economical 4-edge insert • Available back chamfering				

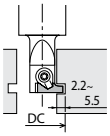
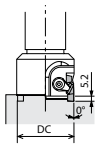
Bolt countersinking

Shape \ Applications	Bolt countersinking	Facing	Shouldering	Lead angle and max. ap
MEF  M284	• Countersink for hexagon socket bolt (M6 ~ M30) • Economical 4-edge insert			

T-Slotting

Shape \ Applications	T-Slotting	Back side milling	Lead angle and max. ap
METS  M287	• T-Slotting • Recommended for high feed machining with 2 flute design • Economical 4-edge insert		

Grooving

Shape \ Applications	Internal grooving	Ring grooving	Lead angle and max. ap
MGI  M290	• Edge width 1.0 ~ 4.0mm • Grooving for M/C		
MVG  M292		• Cutting dia. ø30 ~ ø75 • Edge width 4.0 ~ 4.9mm • O-Ring grooving	

Milling inserts identification system

Symbol	Shape
H	Hexagon
O	Octagon
P	Pentagon
S	Square
T	Triangle
C	80° Rhombic
D	55° Rhombic
E	75° Rhombic
F	50° Rhombic
M	86° Rhombic
V	35° Rhombic
W	Trigon
L	Rectangle
A	85° Parallelogram
B	82° Parallelogram
K	55° Parallelogram
R	Round

Shown angle stands for acute angle for rhombic and parallelogram inserts.

Shape

Symbol	Relief angle
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
O	Other angles

Relief angle

Symbol (Class)	Tolerance (mm)		
	Corner Height	Thickness	I.C. Size
A	±0.005	±0.025	±0.025
F			±0.013
C	±0.013		±0.025
H			±0.013
E	±0.025		±0.025
G		±0.13	
J	±0.005	±0.025	±0.05~±0.15
K*	±0.013		
L*	±0.025		
M*	±0.08~±0.18	±0.13	
N*		±0.025	
U*	±0.13~±0.38	±0.13	±0.08~±0.25

Insert's periphery is as fired.
* Tolerance difference is depending on insert size.

Tolerance

Symbol	Shape
W	No chipbreaker, with hole
T	Single-sided chipbreaker, with hole
F	Double-sided chipbreakers, without hole
N	No chipbreaker, without hole
R	Single-sided chipbreaker, without hole
M	Single-sided chipbreaker, with hole
A	No chipbreaker, with hole

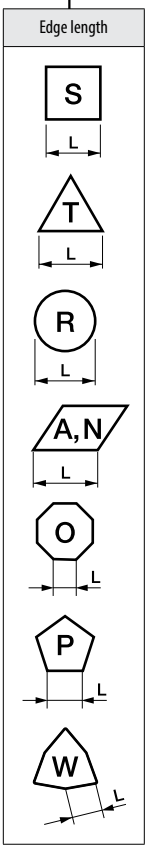
Chipbreaker / Hole

Symbol	Shape
F	Sharp edge
E	R-honed
T	Chamfered
S	Chamfered + R-honed

Edge preparation

S E K N 12 03 A F T N -

Edge length



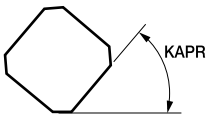
Tickness

Symbol	Thickness (mm)
02	2.38
03	3.18
T3	3.97
04	4.76
05	5.56
06	6.35



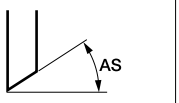
Cutting edge angle

Symbol	Cutting edge angle
A	45°
D	60°
E	75°
F	85°
H	87°
P	90°
X	65°



Relief angle

Symbol	Relief angle
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
R	10°
S	14°
T	22°
U	23°



Hand of tool

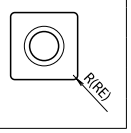
Symbol	Hand of tool
R	Right-hand
L	Left-hand
N	Neutral

Manufacturer's option

Chipbreaker, etc.

In case of indicating corner-R(RE)

Corner-R (RE) (mm)	
04	0.4
08	0.8
12	1.2
16	1.6
20	2.0



New 45° General purpose milling series

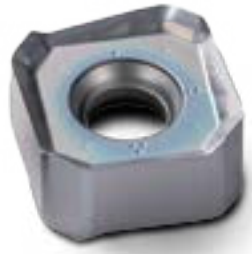
MB45

Provides high quality and high performance machining solutions with long tool life
Delivers the "low cutting force" benefits of positive inserts and the "fracture resistance" benefits of negative inserts, and provides excellent surface finish

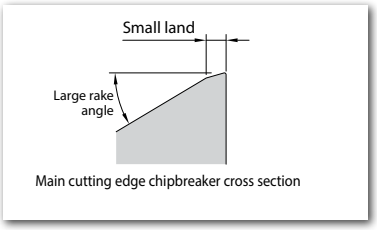
1 "Versatility" + "Quality" Large insert lineup Supports a wide variety of machining applications

Five types of inserts for various machining applications
Economical inserts with 8 cutting edges
General purpose GM insert with E-Class and M-Class options based on required machining accuracy

Low cutting force SM (E-Class)



Sharpness oriented with a low cutting force design
-10% cutting resistance compared to general purpose GM insert
Recommended for small machines (BT30)

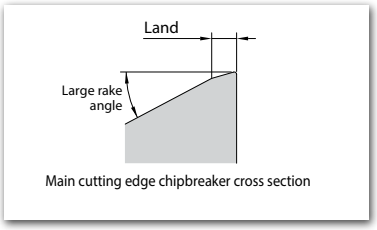


Main cutting edge chipbreaker cross section

General GM (E-Class / M-Class)



1st recommendation for steel machining
Low cutting force and fracture resistance
E-Class or M-Class selectable

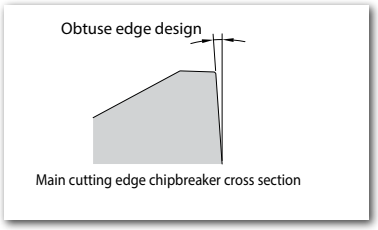


Main cutting edge chipbreaker cross section

Tough edge GH (M-Class)



Tough cutting edge and excellent fracture resistance
Obtuse edge design is resistant to chipping
Recommended for intermittent machining



Main cutting edge chipbreaker cross section

Wiper insert W (E-Class)

Ultra-long wiper edge (Wiper edge length approx. 8 mm)

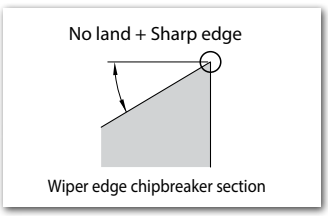


* Double-sided 2-edge insert

for Aluminum Alloys AM

No land + Sharp edge specifications
Excellent sharpness

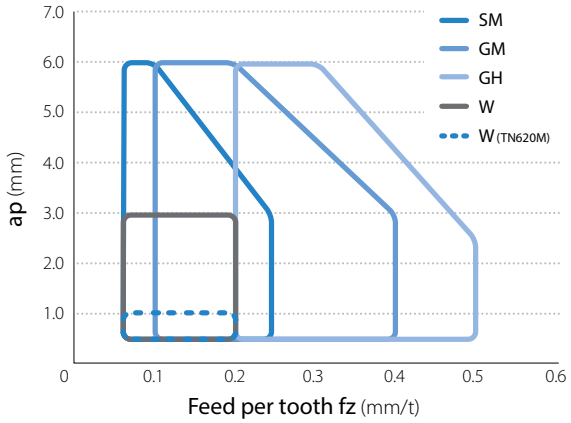




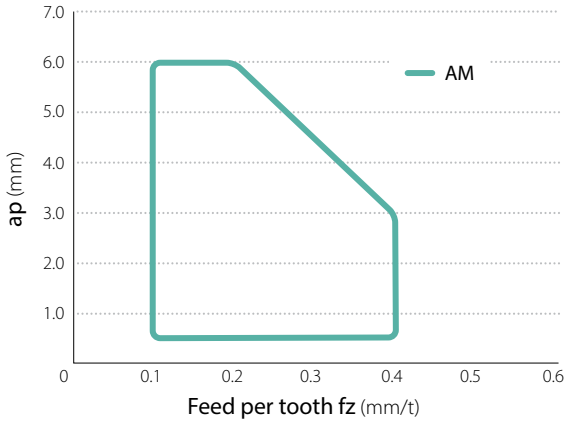
Wiper edge chipbreaker section

Applicable insert range

Steel



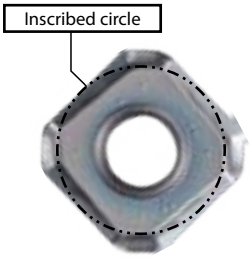
Aluminum alloy



When to use GM (Class E/M)

Selection by machining application

Surface finish oriented : GM (E-Class)
Cost-effective and surface finish oriented : GM (M-Class)
Efficiency and surface roughness oriented: W (E-Class)



Criteria	GM (E-Class)	GM (M-Class)	W (E-Class) * Wiper
Tolerance	Inscribed circle tolerance ±0.013mm	Inscribed circle tolerance ±0.005mm	Inscribed circle tolerance ±0.013mm
Surface finish	○ Approx. 1.6μmRa	△ Approx. 3.2μmRa	◎ Approx. 0.8μmRa or less
(Gloss)	(○)	(◎)	(◎)
Machining efficiency	○	○	◎
Economy	○	◎	△

*Surface finish is based on internal assessment and varies depending on the machining environment

Toolholder Lineup

Coarse pitch	Fine pitch	Extra fine pitch	Shank type
			
Recommended for workpieces or machines with low rigidity (such as sheet machining or BT30) Economical	1st recommendation Good balance of stability, machining accuracy and efficiency Supports a wide range of machining areas	Recommended for high rigid workpiece and machine	Compatible with milling chucks (face mill recommended basically) *Shank size: ø32
Cutting diameter ø80 to ø315 (inch spec) Cutting diameter ø40 to ø315 (metrics) *ø315: Made to order	Cutting diameter ø80 to ø315 (inch spec) Cutting diameter ø40 to ø315 (metrics) *ø315: Made to order	Cutting diameter ø80 to ø250 (inch spec) Cutting diameter ø40 to ø250 (metrics)	Cutting diameter ø40 to ø80

2 "Versatility" + "Long tool life" Large lineup of insert grades
Steel, stainless steel, cast iron, heat-resistant alloys to aluminum alloy machining

For steel, stainless steel and cast iron

PR1825/PR1835/PR1810 New development MEGACOAT NANO EX

PR1825 P
For Steel (Wear resistance oriented)

PR1835 M
For Steel (Stability oriented)
1st Recommendation for stainless steel

PR1810 K
For Cast iron

Workpiece	P Steel					M Stainless steel					K Cast iron				
ISO	01	10	20	30	40	01	10	20	30	40	01	10	20	30	40
Grade		Wear resistance oriented PR1825					1st Recommendation PR1835					1st Recommendation PR1810			
		Stability oriented PR1835													

For hardened material

PR015S MEGACOAT HARD PVD coating

For steel Surface finish oriented

TN620M Cermet

For stainless steel and heat-resistant alloys

CA6535 CVD coating

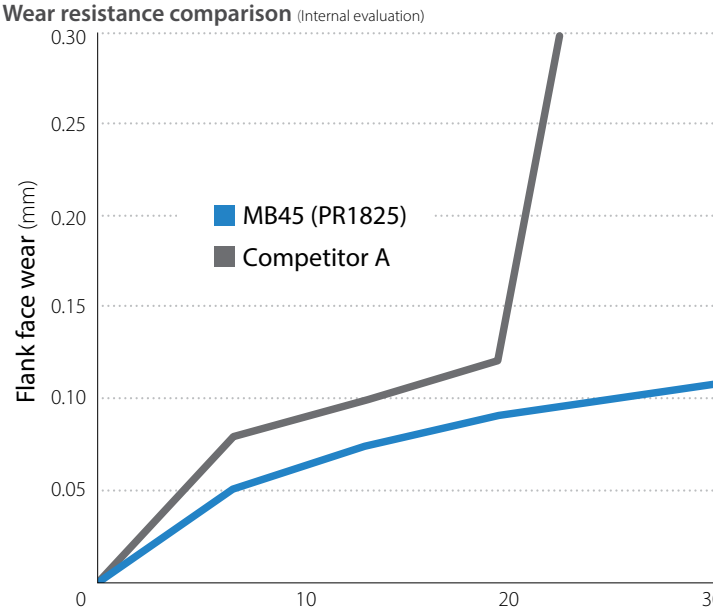
For aluminum machining

PDL025 DLC coating

GW25 Non-coated carbide

PR1825 with PVD coating MEGACOAT NANO EX provides long tool life

Wear resistance comparison (Internal evaluation)



Cutting edge condition (after 20 min machining)

MB45(PR1825)



Competitor A



Cutting conditions: Vc = 120 m/min, ap = 2.0 mm, ae/DC = 80 %, fz = 0.20 mm/t, Dry ,Workpiece material: X153CrMoV12, ø125 BT50

3 "Versatility" + "High Performance" New design utilizes unique technology
Low cutting force and excellent fracture resistance with excellent surface finish

Low cutting force and excellent fracture resistance

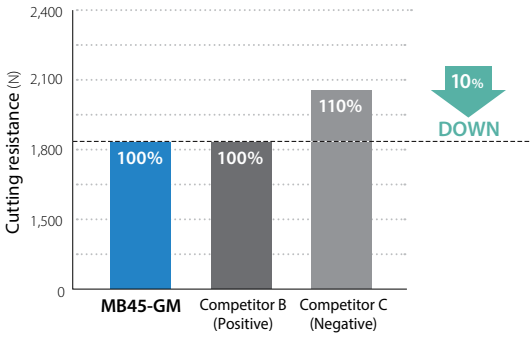
Unique helical cutting edge and double-edge structure

A unique helical cutting edge



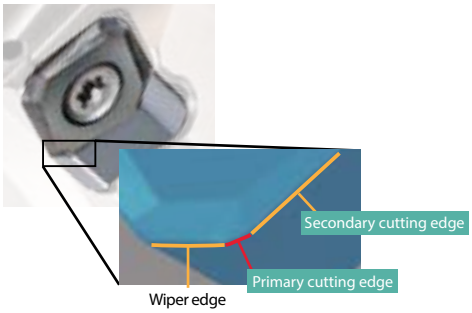
A.R. Ensures a maximum of 13° and suppresses chatter with low cutting force.

Cutting resistance comparison (Internal evaluation)



Cutting conditions: Vc = 180 m/min, ap = 3.0 mm, ae/DC = 80 % Center cut, fz = 0.30 mm/t,
Workpiece material: C50

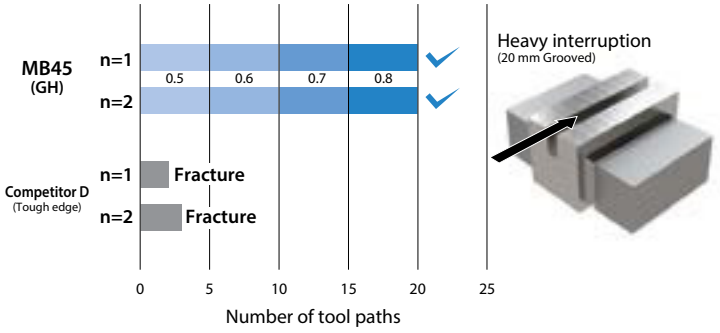
Double edge structure



Primary cutting edge generates thin chips
Reduces impact load and greatly reduces vibration when exiting the part

Fracture resistance comparison (Internal evaluation)

fz = 0.5~0.8 mm/t



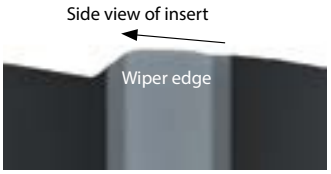
Cutting conditions: Vc = 100 m/min, ap × ae = 2 × 100 mm Center cut, BT50
Workpiece material: 42CrMo4 ø125 (10 inserts)

High quality

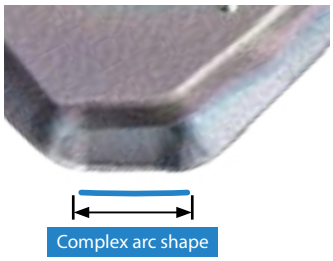
Long arc wiper edge utilizing unique technology

Unique long arc wiper edge

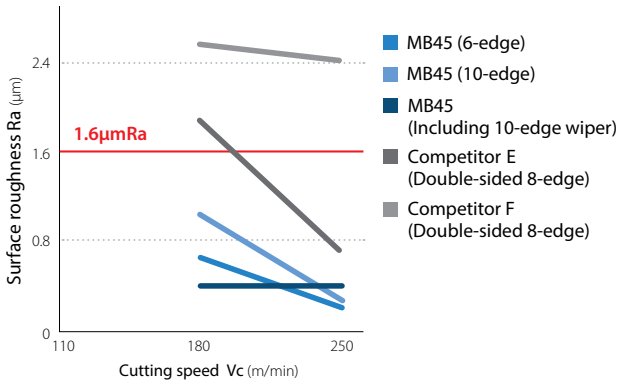
Reduces variation in mounting accuracy and provides superior finished surface quality



Convex curved shape with wiper edge protruding upward
*GM/SM/AM (E-Class)

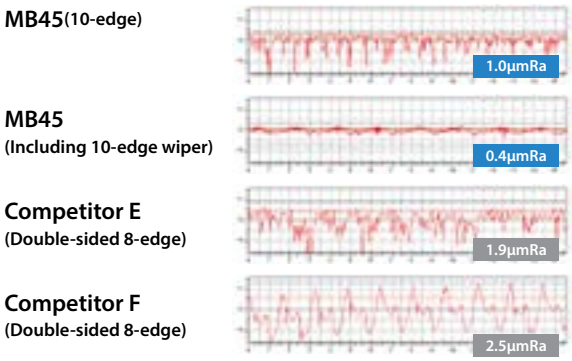


Surface roughness comparison (Internal evaluation)



Cutting conditions: ap × ae = 1 × 100 mm (Center cut), fz = 0.20 mm/t, Dry
Workpiece material: C50 ø125 (6 inserts/10 inserts) GM (PR1825) BT50

Finishing surface condition (Vc = 180 m/min)



Proprietary long arc wiper edge provides excellent finishing surface quality

MB45 (Face mill)



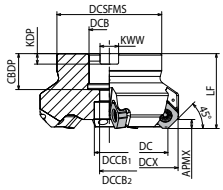


Fig. 1

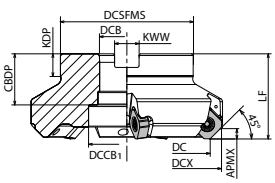


Fig. 2

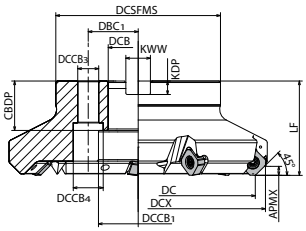


Fig. 3

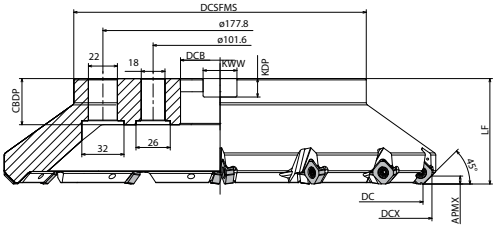


Fig. 4

Toolholder dimensions

Description				Availability	Inserts	Dimension (mm)															A.R. max.(°)	R.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Fig.	Applicable inserts ⇒ M20
				R		DC	DCX	DCSFMS	DCB	DCCB1	DCCB2	DCCB3	DCCB4	DBC1	LF	CBDP	KDP	KWW	APMX								
Metric	Coarse pitch	MB45-	040R-14T2C-M	●	2	40	54	38	16	13.5	9	-	-	-	40	19	5.6	8.4	6	+13	-12	Yes	12700	0.4	1	SN□U1406...
			050R-14T3C-M	●	3	50	64	48	22	18	11					21	6.3	10.4					11400	0.5		
			063R-14T4C-M	●	4	63	77	50															10100	0.7		
			080R-14T5C-M	●	5	80	94	70	27	20	13				50	24	7	12.4					9000	1.4		
			100R-14T5C-M	●		100	114	78	32	45	-					30	8	14.4					8000	1.9	2	
			125R-14T6C-M	●	6	125	139	89	40	55					63	33	9	16.4					7200	3.2		
			160R-14T7-M	●	7	160	174	110				14	20	66.7								No	6300	5.1	3	
			200R-14T8-M	●	8	200	214	142	60	110		18	26	101.6		35	14	25.7					5700	7.3		
			250R-14T10-M	●	10	250	264																5100	10.5		
			315R-14T14-M	MTO	14	315	329	222		-		-	-	-	80								4500	19.4	4	
	Fine pitch	MB45-	040R-14T3C-M	●	3	40	54	38	16	13.5	9	-	-	-	40	19	5.6	8.4	6	+13	-12	Yes	12700	0.3	1	SN□U1406...
			040R-14T3C-22M	●				47	22	12	-				50	21	6.3	10.4						0.5		
			050R-14T4C-M	●	4	50	64	48		18	11				40								11400	0.4		
			063R-14T5C-M	●	5	63	77	50															10100	0.6		
			080R-14T6C-M	●	6	80	94	70	27	20	13				50	24	7	12.4					9000	1.4		
			100R-14T8C-M	●	8	100	114	78	32	45	-					30	8	14.4					8000	1.8	2	
			125R-14T10C-M	●	10	125	139	89	40	55					63	33	9	16.4					7200	3		
			160R-14T12-M	●	12	160	174	110				14	20	66.7								No	6300	4.9	3	
			200R-14T14-M	●	14	200	214	142	60	110		18	26	101.6		35	14	25.7					5700	7		
			250R-14T16-M	●	16	250	264																5100	10.2		
			315R-14T18-M	MTO	18	315	329	222		-		-	-	-	80								4500	19.2	4	
	Extra fine pitch	MB45-	040R-14T4C-M	●	4	40	54	38	16	13.5	9	-	-	-	40	19	5.6	8.4	6	+13	-12	Yes	12700	0.3	1	SN□U1406...
			040R-14T4C-22M	●				47	22	12	-				50	21	6.3	10.4						0.4		
			050R-14T5C-M	●	5	50	64	48	22	18	11				40								11400	0.4		
			063R-14T6C-M	●	6	63	77	50															10100	0.6		
			080R-14T8C-M	●	8	80	94	70	27	20	13				50	24	7	12.4					9000	1.3		
			100R-14T10C-M	●	10	100	114	78	32	45	-					30	8	14.4					8000	1.7	2	
			125R-14T13C-M	●	13	125	139	89	40	55					63	33	9	16.4					7200	2.9		
			160R-14T16-M	●	16	160	174	110				14	20	66.7							-13	No	6300	4.8	3	
			200R-14T18-M	●	18	200	214	142	60	110		18	26	101.6		35	14	25.7					5700	6.9		
			250R-14T20-M	●	20	250	264														-12		5100	10.1		

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

Toolholder dimensions

Description			Availability R	Inserts	Dimension (mm) DC	DCX	DCSFMS	DCB	DCCB1	DCCB2	DCCB3	DCCB4	DBC1	LF	CBDP	KDP	KWW	APMX	A.R. max.(°)	R.R.(°)	Coolant hole	Max. revolution (min^{-1})	Weight (kg)	Fig.	Applicable inserts ⇒ M20
Bore dia. inch spec	Coarse pitch	MB45- 080R-14T5C	●	5	80	94	70	25.4	20	13	-	-	-	50	27	6	9.5	6	+13	-12	Yes	9000	1.4	1	SN□U1406...
		100R-14T5C	●		100	114	78	31.75	45						34	8	12.7					8000	2		
		125R-14T6C	●	6	125	139	89	38.1	55					63	38	10	15.9					7200	3.3	2	
		160R-14T7	●	7	160	174	110	50.8	70	-						11	19.1				No	6300	5.1		
		200R-14T8	●	8	200	214	140	47.625	110		18	26	101.6			14	25.4					5700	7.6	3	
		250R-14T10	●	10	250	264																5100	10.8		
		315R-14T14	MTO	14	315	329	222		-		-	-	-	80								4500	20.4	4	
	Fine pitch	MB45- 080R-14T6C	●	6	80	94	70	25.4	20	13	-	-	-	50	27	6	9.5	6	+13	-12	Yes	9000	1.4	1	SN□U1406...
		100R-14T8C	●	8	100	114	78	31.75	45						34	8	12.7					8000	1.8	2	
		125R-14T10C	●	10	125	139	89	38.1	55					63	38	10	15.9					7200	3.1		
		160R-14T12	●	12	160	174	110	50.8	70	-						11	19.1				No	6300	4.9		
		200R-14T14	●	14	200	214	140	47.625	110		18	26	101.6			14	25.4					5700	7.4	3	
		250R-14T16	●	16	250	264																5100	10.5		
		315R-14T18	MTO	18	315	329	222		-		-	-	-	80								4500	20.2	4	
	Extra fine pitch	MB45- 080R-14T8C	●	8	80	94	70	25.4	20	13	-	-	-	50	27	6	9.5	6	+13	-12	Yes	9000	1.3	1	SN□U1406...
		100R-14T10C	●	10	100	114	78	31.75	45						34	8	12.7					8000	1.8	2	
		125R-14T13C	●	13	125	139	89	38.1	55					63	38	10	15.9					7200	3		
		160R-14T16	●	16	160	174	110	50.8	70	-						11	19.1			-13	No	6300	4.8		
		200R-14T18	●	18	200	214	140	47.625	110		18	26	101.6			14	25.4					5700	7.2	3	
		250R-14T20	●	20	250	264														-12		5100	10.4		

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

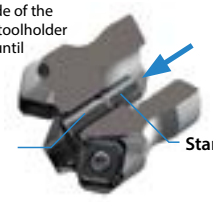
Spare parts

Description			Spare parts: Clamp screw	Wrench	Anti-seize compound	Mounting bolt	
Face mill	MB45-	040R/050R-14T...-M	SB-50110TRP	TTP-20	P-37	HH8X25	-
		040R/050R-14T...-22M				-	W10X31
		063R-14T...				HH10X30	-
		080R-14T...				HH12X35	-
		100R-14T...	Tightening torque 4.5N·m			-	-
		≀					
		315R-14T...					

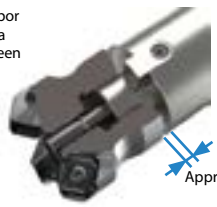
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

How to install double screw

1. Insert the fine pitch side of the double screw into the toolholder and carefully rotate it until the screw stops.



2. To ensure that the holder and arbor are securely connected, provide a clearance of approx. 4 mm between the holder and arbor before tightening the screws.



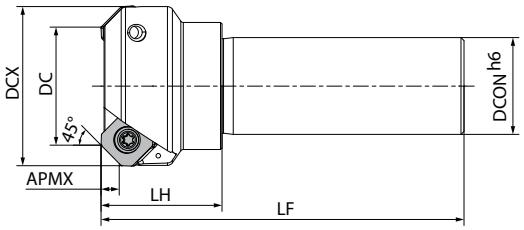
3. Rotate the screw until there is no clearance, and check the holder is attached to the arbor.



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

MB45 (End mill)





Toolholder dimensions

Description		Availability	Inserts	Dimension (mm)						A.R. max.(°)	R.R. (°)	Coolant hole	Max. revolution (min^{-1})	Weight (kg)	Spare parts			Applicable inserts ➡ M20
				DC	DCX	DCON	LF	LH	APMX						Anti-seize compound	Screw	Wrench	
MB45-	40S32-14T2C	●	2	40	54	32	120	40	6	+13	-12	Yes	12700	0.9	P-37	SB-50110TRP	TTP-20	SN□U1406...
	50S32-14T3C	●	3	50	64								11400	1				
	63S32-14T4C	●	4	63	77								10100	1.1				
	80S32-14T5C	●	5	80	94								9000	1.5				

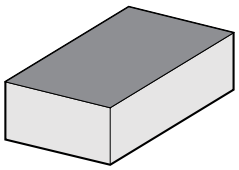
Tightening torque 4.5N-m

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Precautions

Applications



Facing

How to mount inserts

1. Completely eliminate chips and dust from the insert mounting side.
2. Coat anti-seize compound thinly on portion of taper and thread of clamp screw prior to installation.
3. After mounting a clamp screw on the top edge of wrench, tighten the screw while keeping the insert pushed against the shim seat surface and holder surface (Fig.1).
4. Tighten the wrench in a direction parallel to the clamp screw.
   Recommended tightening torque · · · 4.5 N·m
5. After tightening, check that there is no gap between the contact surface of the insert and the surface of the shim, or between the side surface of insert and the holder surface.

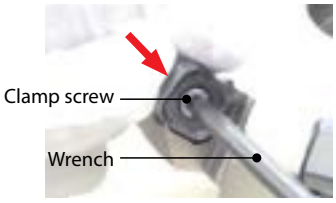


Fig.1

Defining the machining diameter (DC)

With respect to the machining diameter (DC) specified in ISO*, the numerical value of the machining diameter (Fig. 2) where the plane surface is finished depends on the insert. Please be careful.

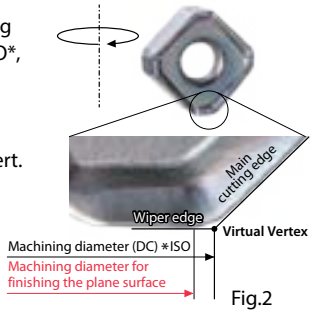


Fig.2

Machining diameter at which the plane surface is finished (for ø125mm)

	GM	GH	SM	AM
Difference to machining diameter (DC)	-1.1	-2.0	-1.1	-1.1
Machining diameter (mm) at which the plane surface is finished *Dimensional tolerance $^{0}_{-0.2}$	123.9	123.0	123.9	123.9

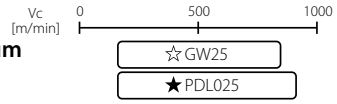
* GH has a larger double-edge size, so the machining diameter at which the plane surface is finished is smaller than other inserts.

Precautions when machining

Precautions when machining aluminum

- Be sure to use within recommended conditions.
- Do not rotate more than the maximum speed listed on the main unit.

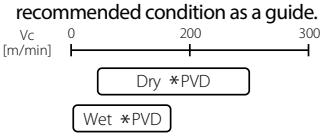
* The number of revolutions listed on the holder is the maximum number of revolutions without load.



	Recommended cutting speed [m/min]
PDL025	200~600~900
GW25	200~500~800

Precautions for wet machining of steel

For wet machining, select PR1835 and use a cutting speed of 70% or less of the recommended condition as a guide.



MB45-125R-14T10C
SCREW:SB-50110TRP WRENCH:
MAX 7,200 RPM
Rotating at maximum speed is prohibited.



How to use a wiper insert

1. Use when the feed amount per revolution [mm/rev] becomes large. The table below shows the standard feed amount per revolution and the number of wipers installed.

Feed per rotation	Number of wiper inserts	Pocket for wiper insert
2.0<f[mm/rev]≤4.0	1 pc	Pocket with "Single dot" (Fig. 3)
4.0<f[mm/rev]	2 pcs	"Single dot" and "Double dots" pockets (Figs. 3, 4) * Only holders with 12 or more inserts have "Double dots"

Fig.3



Fig.4



"Double dots" are placed in the diagonal pocket of "Single dot"
* For only holders with 12 or more inserts

2. Chipbreaker recommended for use with wiper insert

	GM chipbreaker	GH chipbreaker	SM chipbreaker	AM chipbreaker
Wiper insert	✓	Not recommended	✓	Not recommended

3. Install the wiper insert correctly as shown in Fig. 5.
* Fig. 6 shows the insert incorrectly attached to the holder.

Fig.5

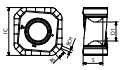
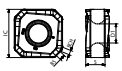
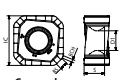
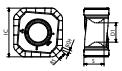
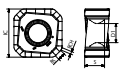
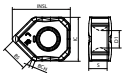


Fig.6



SNMU/SNEU

Classification of usage											
★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)	Carbon steel / Alloy steel					★	☆		■	P
	Mold and die steel					★	☆		■	P
	Austenitic stainless steel					☆	★			M
	Martensitic stainless steel	★					☆			M
	Precipitation hardening stainless steel						★			M
	Gray cast iron				★					K
	Nodular cast iron				★					K
	Non-ferrous metals		★					☆		N
	Heat-resistant alloy	★					☆			S
	Titanium alloy						★			S
	Hard materials			★						H

Insert		Description	No. of edges	Dimension (mm)					Carbide						Cermet		Applicable toolholder ➡ M16 M17 M18
				IC	S	D1	BCH	BS	CVD	DLC	PVD			-	-		
									CA6535	PDL025	PR015S	PR1810	PR1825	PR1835	GW25	TN620M	
	 General purpose (M class)	SNMU 1406ANER-GM	8	14.7	6.07	5.8	0.8	2.3	●			●	●	●		●	MB45-...
	 Tough edge (M class)	SNMU 1406ANER-GH	8	14.7	5.89	5.8	1.4	1.7	●		●	●	●	●			MB45-...
	 General purpose (Precision class)	SNEU 1406ANER-GM	8	14.7	6.07	5.8	0.8	2.3	●			●	●	●		●	MB45-...
	 Low cutting force (Precision class)	SNEU 1406ANER-SM	8	14.7	6.07	5.8	0.8	2.3	●				●	●			MB45-...
	 Non-ferrous metals (Precision class)	SNEU 1406ANFR-AM	8	14.7	6.07	5.8	0.8	2.3		●					●		MB45-...
	 2-edge / With wiper edge	SNEU 1406ANEN-W	2	14.7	6.15	5.8	1.1	8.8	●			●	●	●		●	MB45-...

Recommended cutting conditions ➡ M21

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SNEU1406ANEN-W inserts are sold in 5 piece boxes

Recommended cutting conditions

Chipbreaker	Workpiece material	fz (mm/t) ( ): TN620M	Recommended insert grades (Vc: m/min)							
			MEGACOAT(PVD coated carbide)				PVD coated carbide	Cermet	DLC coated carbide	Carbide
			PR1835	PR1825	PR1810	PR015S	CA6535	TN620M	PDL025	GW15
GM	Carbon steel	0.1~**0.2**~0.4 (0.06~**0.12**~0.20)	☆ 120~**180**~250	★ 120~**180**~250	-	-	-	★ 200~**250**~300	-	-
	Alloy steel	0.1~**0.2**~0.4 (0.06~**0.12**~0.20)	☆ 100~**160**~220	★ 100~**160**~220	-	-	-	★ 180~**220**~250	-	-
	Mold steel	0.1~**0.2**~0.35 (0.06~**0.08**~0.15)	☆ 80~**140**~180	★ 80~**140**~180	-	-	-	★ 150~**180**~220	-	-
	Stainless steel (Austenitic related)	0.1~**0.2**~0.4	☆ 100~**160**~200	☆ 100~**160**~200	-	-	-	-	-	-
	Stainless steel (Martensitic related)	0.1~**0.2**~0.4	☆ 150~**200**~250	-	-	-	☆ 180~**240**~300	-	-	-
	Stainless steel (Precipitation hardening)	0.1~**0.2**~0.3	★ 90~**120**~150	-	-	-	-	-	-	-
	Gray cast iron	0.1~**0.2**~0.4	-	-	★ 120~**180**~250	-	-	-	-	-
	Nodular cast iron	0.1~**0.2**~0.35	-	-	★ 100~**150**~200	-	-	-	-	-
	Ni-base heat-resistant alloys	0.1~**0.12**~0.2	☆ 20~**30**~50	-	-	-	★ 20~**30**~50	-	-	-
SM	Carbon steel	0.06~**0.12**~0.25	☆ 120~**180**~250	☆ 120~**180**~250	-	-	-	-	-	-
	Alloy steel	0.06~**0.12**~0.25	☆ 100~**160**~220	☆ 100~**160**~220	-	-	-	-	-	-
	Mold steel	0.06~**0.1**~0.2	☆ 80~**140**~180	☆ 80~**140**~180	-	-	-	-	-	-
	Stainless steel (Austenitic related)	0.06~**0.12**~0.25	★ 100~**160**~200	☆ 100~**160**~200	-	-	-	-	-	-
	Stainless steel (Martensitic related)	0.06~**0.12**~0.25	☆ 150~**200**~250	-	-	-	★ 180~**240**~300	-	-	-
	Stainless steel (Precipitation hardening)	0.06~**0.12**~0.25	☆ 90~**120**~150	-	-	-	-	-	-	-
	Gray cast iron	0.06~**0.12**~0.25	-	-	☆ 120~**180**~250	-	-	-	-	-
	Nodular cast iron	0.06~**0.1**~0.2	-	-	☆ 100~**150**~200	-	-	-	-	-
	Ni-base heat-resistant alloys	0.06~**0.1**~0.15	☆ 20~**30**~50	-	-	-	☆ 20~**30**~50	-	-	-
	Titanium alloys	0.06~**0.08**~0.15	★ 40~**60**~80	-	-	-	-	-	-	-
GH	Carbon steel	0.2~**0.3**~0.5	☆ 120~**180**~250	☆ 120~**180**~250	-	-	-	-	-	-
	Alloy steel	0.2~**0.3**~0.5	☆ 100~**160**~220	☆ 100~**160**~220	-	-	-	-	-	-
	Mold steel	0.2~**0.3**~0.45	☆ 80~**140**~180	☆ 80~**140**~180	-	-	-	-	-	-
	Stainless steel (Austenitic related)	0.2~**0.3**~0.4	☆ 100~**160**~200	☆ 100~**160**~200	-	-	-	-	-	-
	Stainless steel (Martensitic related)	0.2~**0.3**~0.4	☆ 150~**200**~250	-	-	-	☆ 180~**240**~300	-	-	-
	Stainless steel (Precipitation hardening)	0.2~**0.3**~0.4	☆ 90~**120**~150	-	-	-	-	-	-	-
	Gray cast iron	0.2~**0.3**~0.5	-	-	☆ 120~**180**~250	-	-	-	-	-
	Nodular cast iron	0.2~**0.3**~0.45	-	-	☆ 100~**150**~200	-	-	-	-	-
	Ni-base heat-resistant alloys	0.1~**0.2**~0.3	☆ 20~**30**~50	-	-	-	☆ 20~**30**~50	-	-	-
	Hard materials (40HRC or less)	0.05~**0.1**~0.2	-	-	-	★ 50~**80**~100	-	-	-	-
AM	Aluminum alloys	0.1~**0.2**~0.4							★ 200~**600**~900	☆ 200~**500**~800

★: 1st Recommendation ☆: 2nd Recommendation

The **bold-faced** number indicates a center value of recommended cutting condition. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.
Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys. When choosing wet machining for other workpieces, reduce the cutting speed to 70% or less.
When machining aluminum, be sure to use within recommended conditions. Do not rotate more than the maximum speed listed on the main unit.
Dry machining is recommended for cermet.

MFPN45 (Face mill)



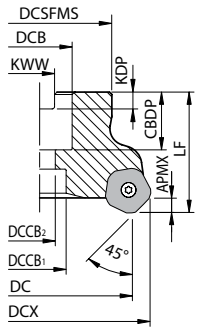


Fig. 1

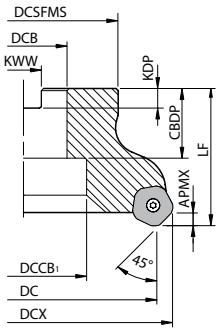


Fig. 2

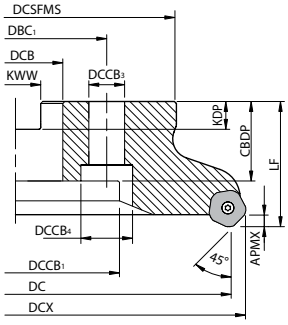


Fig. 3

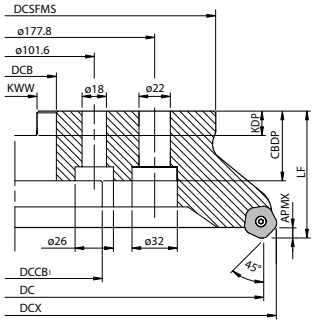


Fig. 4

Toolholder dimensions

Description				Availability R	Availability L	Inserts	Dimension (mm) DC	DCX	DCSFMS	DCB	DCCB1	DCCB2	DCCB3	DCCB4	DBC1	LF	CBDP	KDP	KWW	APMX	A.R. max.(°)	R.R. (°)	Coolant hole	Weight (kg)	Fig.	Applicable inserts ⇒ M26
Metric	Coarse pitch	MFPN	45063R-4T-M	●		4	63	76	47	22	19	11				40	21	6.3	10.4			-10		0.5	1	
			45080R-5T-M	●		5	80	93	60	27	22	13	-	-	-	50	24	7	12.4			-8		1.1	1	
			45100R-6T-M	●		6	100	113	70	32	48						30	8	14.4					1.4	2	
			45125R-7T-M	●		7	125	138	87	40	58					63	32	9	16.4	6	+10		No	2.6	2	PN□U1205ANER-..
			45160R-8T-M	●		8	160	173	102		68		14	20	66.7							-6		3.8	3	
			45200R-10T-M	●		10	200	213	142	60	110	-	18	26	101.6		40	14	25.7					6.4	3	
			45250R-12T-M	●		12	250	263																9.1	3	
			45315R-14T-M	MTO		14	315	328	220				-	-	-	80								21.3	4	
	Fine pitch	MFPN	45063R-5T-M	●		5	63	76	47	22	19	11				40	21	6.3	10.4			-10		0.5	1	
			45080R-6T-M	●		6	80	93	60	27	22	13	-	-	-	50	24	7	12.4			-8		1	1	
			45100R-8T-M	●		8	100	113	70	32	48						30	8	14.4					1.4	2	
			45125R-10T-M	●		10	125	138	87	40	58					63	32	9	16.4	6	+10		No	2.5	2	PN□U1205ANER-..
			45160R-12T-M	●		12	160	173	102		68	-	14	20	66.7							-6		3.8	3	
			45200R-14T-M	●		14	200	213	142	60	110		18	26	101.6		40	14	25.7					6.5	3	
			45250R-16T-M	●		16	250	263																9.1	3	
			45315R-18T-M	MTO		18	315	328	220				-	-	-	80								21.7	4	
	Extra fine pitch	MFPN	45063R-6T-M	●		6	63	76	47	22	19	11				40	21	6.3	10.4			-10		0.5	1	
			45080R-8T-M	●		8	80	93	60	27	22	13	-	-	-	50	24	7	12.4	6	+10	-8	No	1.1	1	PN□U1205ANER-..
			45100R-10T-M	●		10	100	113	70	32	48	-					30	8	14.4			-6		1.3	2	
			45125R-13T-M	●		13	125	138	87	40	58					63	32	9	16.4					2.6	2	

APMX : 6 mm (GM, SM, GH chipbreakers), 5 mm (GL chipbreaker), 3 mm (Wiper insert)

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

Toolholder dimensions

Description				Availability R	Availability L	Inserts	Dimension (mm) DC	DCX	DCSFMS	DCB	$DCCB_1$	$DCCB_2$	$DCCB_3$	$DCCB_4$	DBC_1	LF	CBDP	KDP	KWW	APMX	A.R. max.(°)	R.R. (°)	Coolant hole	Weight (kg)	Fig.	Applicable inserts ⇒ M26
Bore dia. inch spec	Coarse pitch	MFPN	45080R/L-5T	□	□	5	80	93	60	25.4	22	13	-	-	-	50	27	6	9.5	6	+10	-8	No	1.1	1	PN□U1205ANER/L-..
			45100R/L-6T	□	□	6	100	113	70	31.75	48	-					32	8	12.7			-6		1.4	2	
			45125R/L-7T	□	□	7	125	138	87	38.1	58					63	36	10	15.9					2.6	2	
			45160R/L-8T	□	□	8	160	173	102	50.8	72						38	11	19.1					4	2	
			45200R-10T	□		10	200	213	142	47.625	110		18	26	101.6		40	14	25.4					6.7	3	
			45250R-12T	□		12	250	263																9.4	3	
			45315R-14T	MTO		14	315	328	220				-	-	-	80								21.2	4	
	Fine pitch	MFPN	45080R-6T	□		6	80	93	60	25.4	22	13	-	-	-	50	27	6	9.5	6	+10	-8	No	1.1	1	PN□U1205ANER-..
			45100R-8T	□		8	100	113	70	31.75	48	-					32	8	12.7			-6		1.4	2	
			45125R-10T	□		10	125	138	87	38.1	58					63	36	10	15.9					2.7	2	
			45160R-12T	□		12	160	173	102	50.8	72						38	11	19.1					4	2	
			45200R-14T	□		14	200	213	142	47.625	110		18	26	101.6		40	14	25.4					6.9	3	
			45250R-16T	□		16	250	263																9.6	3	
			45315R-18T	MTO		18	315	328	220				-	-	-	80								21.5	4	
	Extra fine pitch	MFPN	45080R-8T	□		8	80	93	60	25.4	22	13	-	-	-	50	27	6	9.5	6	+10	-8	No	1.1	1	PN□U1205ANER-..
			45100R-10T	□		10	100	113	70	31.75	48	-					32	8	12.7			-6		1.3	2	
			45125R-13T	□		13	125	138	87	38.1	58					63	36	10	15.9					2.7	2	
			45160R-16T	□		16	160	173	102	50.8	72						38	11	19.1					4	2	
			45200R-18T	□		18	200	213	142	47.625	110		18	26	101.6		40	14	25.4					6.9	3	
			45250R-20T	□		20	250	263																9.6	3	

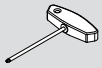
APMX : 6 mm (GM, SM, GH chipbreakers), 5 mm (GL chipbreaker), 3 mm (Wiper insert)

M

Milling

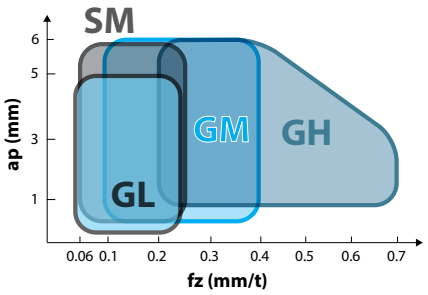
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

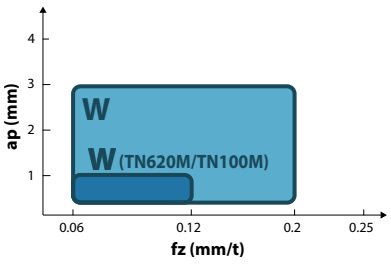
Spare parts (common to Metric / Inch spec)

Description			Spare parts							
			Clamp screw	Wrench		Shim	Shim screw	Wrench	Anti-seize compound	Mounting bolt
				TTW	DTM					
										
Coarse pitch	MFPN	45063R-4T-M	SB-50140TR	TTW-15	-	MFPN-45	SPW-7050	LW-5	P-37	HH10X30
	MFPN	45080R/L-5T(-M)								HH12X35
	MFPN	45100R/L-6T(-M) ~ 45315R-14T(-M)	for insert clamp tightening torque 4.2N·m				for shim clamp tightening torque 6.0N·m			-
Fine pitch	MFPN	45063R-5T-M	SB-50140TR	TTW-15	-	-	-	-	P-37	HH10X30
	MFPN	45080R-6T(-M)								HH12X35
	MFPN	45100R-8T(-M) ~ 45315R-18T(-M)	for insert clamp tightening torque 4.2N·m							-
Extra fine pitch	MFPN	45063R-6T-M	SB-40140TRN	-	DTM-15	-	-	-	P-37	HH10X30
	MFPN	45080R-8T(-M)								HH12X35
	MFPN	45100R-10T(-M) ~ 45250R-20T	for insert clamp tightening torque 3.5N·m							-

 Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

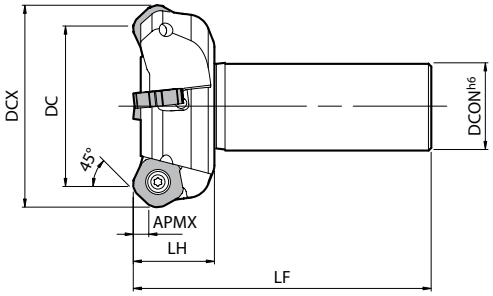
Applicable chipbreaker range





MFPN45





Toolholder dimensions

Description		Availability	Inserts	Dimension (mm)					A.R. max.(°)	R.R. (°)	Coolant hole	Spare parts			Applicable inserts M26
		R		DC	DCX	DCON	LF	LH				Anti-seize compound	Screw	Wrench	
MFPN	45050R-S32-3T	●	3	50	63	32	110	30	+10	-12	No	P-37	SB-50140TR	TTW-15	PN□U1205ANER-..
	45063R-S32-4T	●	4	63	76					-10			Tightening torque 4.2N·m		
	45080R-S32-5T	●	5	80	93					-8					

APMX : 6 mm (GM, SM, GH chipbreakers), 5 mm (GL chipbreaker), 3 mm (Wiper insert)
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

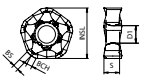
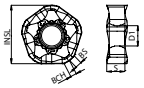
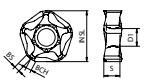
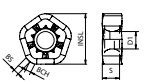
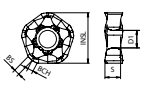
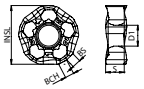
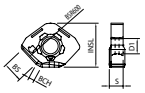
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

PNMU/PNEU

Classification of usage

★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice
(In case hardness is 45HRC or under)

Carbon steel / Alloy steel				☆			★	☆		■	P
Mold and die steel				☆			★	☆		■	
Austenitic stainless steel					☆		☆	★			M
Martensitic stainless steel	★							☆			
Precipitation hardening stainless steel					☆			★			
Gray cast iron			☆			★					K
Nodular cast iron			☆			★					
Non-ferrous metals											N
Heat-resistant alloy	★							☆			S
Titanium alloy					☆			★			
Hard materials		★									H

Insert		Description		No. of edges	Dimension (mm) S	D1	INSL	BCH	BS	Carbide CVD CA6535	Carbide PVD PR0155	PR1510	PR1525	PR1535	PR1810	PR1825	PR1835	Cermet - TN100M	TN620M	Applicable toolholder ➡ M22 M23 M25
	 General purpose	PNMU	1205ANER-GM	10	5.56	6.2	17.88	2	2	●		●	●	●	●	●	●		●	MFPN45...R-..
	 General purpose	PNMU	1205ANEL-GM	10	5.56	6.2	17.88	2	2	●		●	●	●	●	●	●		●	MFPN45...L-..
	 Low cutting force	PNMU	1205ANER-SM	10	5.56	6.2	17.88	2	2	●		●	●	●	●	●	●			MFPN45...R-..
	 Tough edge	PNMU	1205ANER-GH	10	6.17	6.2	17.98	2	2	●	●	●	●	●	●	●	●			MFPN45...R-..
	 Surface finish oriented	PNEU	1205ANER-GL	10	5.56	6.2	17.51	2.7	2.7	●		●	●	●	●	●	●		●	MFPN45...R-..
	 Surface finish oriented	PNEU	1205ANEL-GL	10	5.56	6.2	17.51	2.7	2.7	●		●	●	●	●	●	●		●	MFPN45...L-..
	 2-edge / With wiper edge	PNEU	1205ANER-W	2	5.56	6.2	17.85	2.3	8.1	●		●	●	●	●	●	●	●	●	MFPN45...R-..

Recommended cutting conditions ➡ M27

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

PNEU1205ANER-W inserts are sold in 5 piece boxes

Recommended cutting conditions

Chipbreaker	Workpiece material	fz (mm/t) ( ): TN620M	Recommended insert grades (Vc: m/min)					
			Cermet	MEGACOAT(PVD coated carbide)				CVD coated carbide
			TN620M	PR1835 (PR1535)	PR1825 (PR1525)	PR1810 (PR1810)	PR015S	CA6535
GM	Carbon steel	0.1~**0.2**~0.4 (0.06~**0.12**~0.20)	★ 200~**250**~300	☆ 120~**180**~250	★ 120~**180**~250	-	-	-
	Alloy steel	0.1~**0.2**~0.4 (0.06~**0.12**~0.20)	★ 180~**220**~250	☆ 100~**160**~220	★ 100~**160**~220	-	-	-
	Mold steel	0.1~**0.2**~0.35 (0.06~**0.08**~0.15)	★ 150~**180**~220	☆ 80~**140**~180	★ 80~**140**~180	-	-	-
	Stainless steel (Austenitic related)	0.1~**0.2**~0.4	-	☆ 100~**160**~200	☆ 100~**160**~200	-	-	-
	Stainless steel (Martensitic related)	0.1~**0.2**~0.4	-	☆ 150~**200**~250	-	-	-	☆ 180~**240**~300
	Stainless steel (Precipitation hardening)	0.1~**0.2**~0.3	-	★ 90~**120**~150	-	-	-	-
	Gray cast iron	0.1~**0.2**~0.4	-	-	-	★ 120~**180**~250	-	-
	Nodular cast iron	0.1~**0.2**~0.35	-	-	-	★ 100~**150**~200	-	-
	Ni-base heat-resistant alloys	0.1~**0.12**~0.2	-	☆ 20~**30**~50	-	-	-	★ 20~**30**~50
SM *1GL	Carbon steel	0.06~**0.12**~0.25 (0.06~**0.10**~0.15)	★ 200~**250**~300	☆ 120~**180**~250	☆ 120~**180**~250	-	-	-
	Alloy steel	0.06~**0.12**~0.25 (0.06~**0.10**~0.15)	★ 180~**220**~250	☆ 100~**160**~220	☆ 100~**160**~220	-	-	-
	Mold steel	0.06~**0.1**~0.2 (0.06~**0.08**~0.12)	★ 150~**180**~220	☆ 80~**140**~180	☆ 80~**140**~180	-	-	-
	Stainless steel (Austenitic related)	0.06~**0.12**~0.25	-	★ 100~**160**~200	☆ 100~**160**~200	-	-	-
	Stainless steel (Martensitic related)	0.06~**0.12**~0.25	-	☆ 150~**200**~250	-	-	-	★ 180~**240**~300
	Stainless steel (Precipitation hardening)	0.06~**0.12**~0.25	-	☆ 90~**120**~150	-	-	-	-
	Gray cast iron	0.06~**0.12**~0.25	-	-	-	☆ 120~**180**~250	-	-
	Nodular cast iron	0.06~**0.1**~0.2	-	-	-	☆ 100~**150**~200	-	-
	Ni-base heat-resistant alloys	0.06~**0.1**~0.15	-	☆ 20~**30**~50	-	-	-	☆ 20~**30**~50
	Titanium alloys	0.06~**0.08**~0.15	-	★ 40~**60**~80	-	-	-	-
*2GH	Carbon steel	0.2~**0.4**~0.7	-	☆ 120~**180**~250	☆ 120~**180**~250	-	-	-
	Alloy steel	0.2~**0.4**~0.6	-	☆ 100~**160**~220	☆ 100~**160**~220	-	-	-
	Mold steel	0.2~**0.35**~0.5	-	☆ 80~**140**~180	☆ 80~**140**~180	-	-	-
	Stainless steel (Austenitic related)	0.2~**0.3**~0.4	-	☆ 100~**160**~200	☆ 100~**160**~200	-	-	-
	Stainless steel (Martensitic related)	0.2~**0.3**~0.4	-	☆ 150~**200**~250	-	-	-	☆ 180~**240**~300
	Stainless steel (Precipitation hardening)	0.2~**0.3**~0.4	-	☆ 90~**120**~150	-	-	-	-
	Gray cast iron	0.2~**0.4**~0.7	-	-	-	☆ 120~**180**~250	-	-
	Nodular cast iron	0.2~**0.35**~0.5	-	-	-	☆ 100~**150**~200	-	-
	Ni-base heat-resistant alloys	0.2~**0.3**~0.4	-	☆ 20~**30**~50	-	-	-	☆ 20~**30**~50
	Hard materials (60HRC or less)	0.05~**0.1**~0.2	-	-	-	-	★ 50~**80**~100	-

★: 1st Recommendation ☆: 2nd Recommendation

The bold-faced number indicates a center value of recommended cutting condition. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.
Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.

*1. GL chipbreaker: Recommended for surface finish oriented milling.
*2. GH chipbreaker: Fine pitch → fz≤0.4 (mm/t)
Extra fine pitch → Not recommended

Cutter type and chipbreaker selection

Milling purpose	Cutter type			Chipbreaker				
	Coarse pitch	Fine pitch	Extra fine pitch	GM	SM	GH	GL	W
General milling for steel and alloy steel		●		●				
Steel and alloy steel (At chattering due to low rigidity machine or poor clamping power)	●				●			
Productivity oriented (Running cost decrease) (ap=4mm or over, fz=0.35mm/t or over)	●					●		
Surface finish oriented	●	●					●	
General milling of stainless steel		●			●			
Stainless steel (To prevent chattering due to low rigidity machine or poor clamping power)	●				●			
Cast iron (For processing efficiency improvement)			●	●				
Cast iron (ap=4mm or over, fz=0.35mm/t or over)	●					●		
Improved surface finish in high efficiency milling		●	●					●

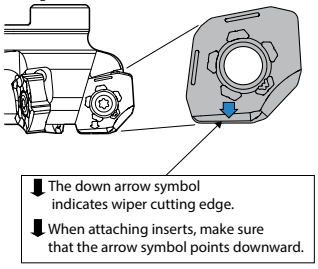
How to use wiper insert

1. Please use one wiper insert on one cutter.
(If you use 2 inserts or more on one cutter, the workpiece surface may be muddy white.)
2. Combination of wiper insert with other chipbreakers

Combination \ Chipbreaker	GM	SM	W
Recommended combination	●		●
Recommended combination		●	●

The combinations of GH+W and GL+W are not recommended.

How to attach wiper inserts on MFPN cutter



3. For checking the protrusion amount of the wiper insert, use tool presetter. (Appropriate protrusion: 0.1mm)

Applicable chipbreaker

Cutter type	Chipbreaker		
	GM	SM (GL)	GH
Coarse pitch (With shim)	✓	✓	✓
Fine pitch (Without shim)	✓	✓	△ (Feed rate is recommended fz=0.4mm/t or under)
Extra fine pitch (Without shim)	✓	✓	Not recommended

Precautions for use (How to mount an insert)

1. Be sure to remove dust and chips from the insert mounting pocket.
2. After applying anti-seize compound on portion of taper and thread, while pressing the insert against the constraint surfaces, put the screw into the hole of the insert and tighten the screw with appropriate torque. (Ref. to Fig. 1 and Fig. 2)
   Recommended tightening torque: The torque for coarse pitch (using M5 screw) is 4.2 N·m
   The torque for extra fine pitch (using M4 screw) is 3.5 N·m.
3. After tightening the screw, make sure that there is no clearance between the insert seat surface and the bearing surface of the toolholder and between the insert side surfaces and the constraint surface of the toolholder.
4. To change the cutting edge of the insert, turn the insert counterclockwise. (Fig. 3)
   Insert corner identification number is stamped on the top surface of insert. (Fig. 4) To protect the wiper edge, use the corners of insert in the sequence of corner numbers.

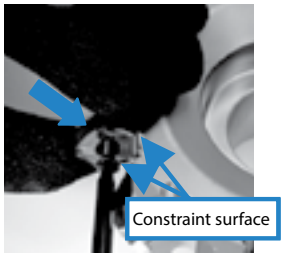


Fig. 1


Fig. 2


Fig. 3

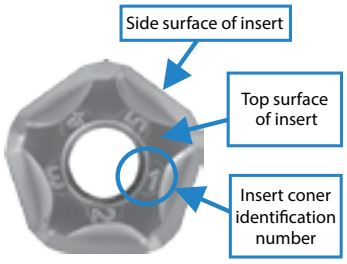


Fig. 4 (Right-hand insert)

How to replace a shim (for coarse pitch)

1. Be sure to remove dust and chips from the insert mounting pocket.
2. The shim must be mounted in the proper direction. While aligning the surface of the shim with the mark on it to the corresponding constraint surface (ref. to Fig. 5) and lightly pressing the shim toward the constraint surface, insert the screw into the hole of the shim and tighten it (ref. to Fig. 6).
   When tightening the screw, make sure that the screw is vertical to the bearing surface. Recommended tightening torque is 6.0 N·m.
3. After tightening the screw, make sure that there is no clearance between the shim seat surface and the bearing surface. If there is any clearance, remove the insert and mount it again according to the above steps.

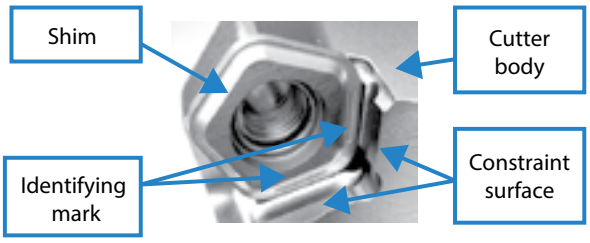


Fig. 5

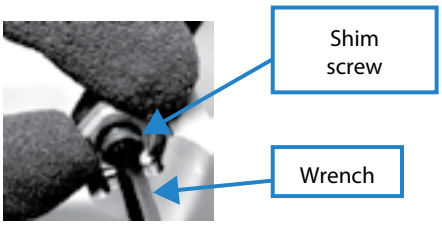


Fig. 6

Cutting edge angle 66°

MFPN66

Economical double-sided 10-edge insert reduces chattering with low cutting force design
Reduces cutting costs when machining auto parts and other general purpose machining applications

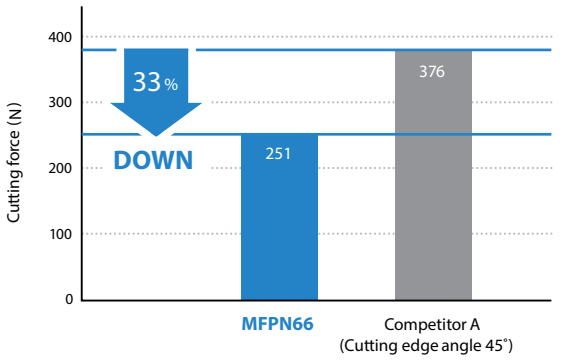
1 Economical double-sided 10-edge insert
Applicable to various machining applications with wide size range from ø32

Cost reduction in various applications from general parts to automotive parts machining

2 Reduces chattering with low cutting force design
Available for application from small ap to medium ap

Suppresses vibration for excellent surface finish with 66° cutting edge angle

Cutting force comparison (Internal evaluation)



Cutting force is thrust force

Cutting conditions: Vc=200 m/min, ap=3 mm, fz=0.15 mm/t
Cutter dia. ø63 Workpiece material: C50

Surface finish (Machining with workpiece overhang length of 80mm)



Excellent surface finish with low workpiece clamping rigidity

Cutting conditions: Vc=200 m/min, ap=0.5 mm, fz=0.2 mm/t
Cutter dia. ø63 Workpiece material: C50

3 Extended tool life by MEGACOAT NANO technology
Insert lineup also contains cermet grade for better surface finish



General purpose
GM chipbreaker



Tough edge
GH chipbreaker



For stainless steel
SM chipbreaker

MFPN66



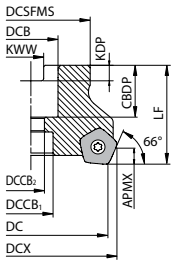


Fig. 1

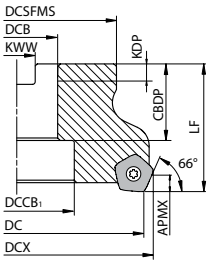


Fig. 2

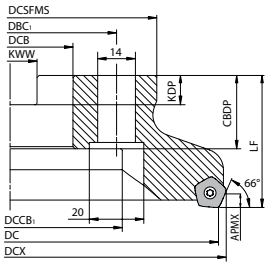


Fig. 3

Toolholder dimensions

Description				Availability	Inserts	Dimension (mm)												A.R. max.(°)	R.R. (°)	Coolant hole	Weight (kg)	Fig.	Applicable inserts ➔ M34
				R		DC	DCX	DCSFMS	DCB	DCCB1	DCCB2	DBC1	LF	CBDP	KDP	KWW							
Metric	Fine pitch	MFPN	66050R-4T-M-G	●	4	50	58	48	22	18	11	-	40	21	6.3	10.4	+12	-9	No	0.3	1	PNMU0905...
			66063R-5T-M-G	●	5	63	71											-8		0.5		
			66080R-6T-M-G	●	6	80	88	70	27	20	13		50	24	7	12.4		-7		1.2		
			66100R-7T-M-G	●	7	100	107	78	32	45	-			30	8	14.4		-6		1.6	2	
			66125R-9T-M-G	●	9	125	132	89	40	55			63	33	9	16.4				2.8		
			66160R-11T-M-G	●	11	160	167					66.7								3.8	3	
	Extra fine pitch	MFPN	66050R-5T-M-G	●	5	50	58	48	22	18	11	-	40	21	6.3	10.4	+12	-9	No	0.4	1	PNMU0905...
			66063R-7T-M-G	●	7	63	71											-8		0.5		
			66080R-9T-M-G	●	9	80	88	70	27	20	13		50	24	7	12.4		-7		1.2		
			66100R-11T-M-G	●	11	100	107	78	32	45	-			30	8	14.4		-6		1.6	2	
			66125R-13T-M-G	●	13	125	132	89	40	55			63	33	9	16.4				3		
			66160R-15T-M-G	●	15	160	167					66.7								4	3	
Bore dia. inch spec	Fine pitch	MFPN	66080R-6T-G	□	6	80	88	70	25.4	20	13	-	50	27	6	9.5	+12	-7	No	1.2	1	PNMU0905...
			66100R-7T-G	□	7	100	107	78	31.75	45	-			34	8	12.7		-6		1.7	2	
			66125R-9T-G	□	9	125	132	89	38.1	55			63	38	10	15.9				2.9		
			66160R-11T-G	□	11	160	167	110	50.8	72					11	19.1				4.5		
	Extra fine pitch	MFPN	66080R-9T-G	□	9	80	88	70	25.4	20	13	-	50	27	6	9.5	+12	-7	No	1.2	1	PNMU0905...
			66100R-11T-G	□	11	100	107	78	31.75	45	-			34	8	12.7		-6		1.7	2	
			66125R-13T-G	□	13	125	132	89	38.1	55			63	38	10	15.9				3		
			66160R-15T-G	□	15	160	167	110	50.8	72					11	19.1				4.8		

APMX : 5 mm (GM, SM, GH chipbreakers, Coated cabide), 3 mm (GM chipbreaker, Cermet)

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

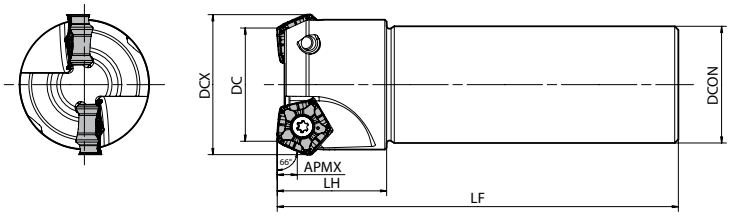
Spare parts (common to Metric / Inch spec)

Description			Clamp screw	Wrench	Anti-seize compound	Mounting bolt
						
Fine pitch	MFPN	66050R-4T-M-G	SB-4090TRP Recommended tightening torque for insert clamp 3.5N·m	DTPM-15	P-37	HH10X30
		66063R-5T-M-G				HH10X30
		66080R-6T(-M)-G				HH12X35
		66100R-7T(-M)-G				-
		66125R-9T(-M)-G				
		66160R-11T(-M)-G				
Extra fine pitch	MFPN	66050R-5T-M-G	SB-4090TRP Recommended tightening torque for insert clamp 3.5N·m	DTPM-15	P-37	HH10X30
		66063R-7T-M-G				HH10X30
		66080R-9T(-M)-G				HH12X35
		66100R-11T(-M)-G				-
		66125R-13T(-M)-G				
		66160R-15T(-M)-G				

 Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

MFPN66





Toolholder dimensions

Description		Availability	Inserts	Dimension (mm)					A.R. max.(°)	R.R.(°)	Coolant hole	Spare parts			Applicable inserts ➡ M34
		R		DC	DCX	DCON	LF	LH				Anti-seize compound	Screw	Wrench	
MFPN	66032R-S32-2T-G	●	2	32	39.5	32	110	30	+12	-14	No	P-37	SB-4090TRP	DTPM-15	PNMU0905...
	66040R-S32-3T-G	●	3	40	47.5					-12					

APMX : 5 mm (GM, SM, GH chipbreakers, Coated cabide), 3 mm (GM chipbreaker, Cermet)
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.
Recommended tightening torque for insert clamp : 3.5N·m

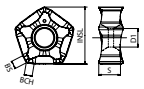
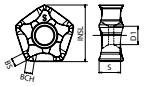
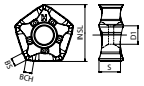
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PNMU

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Carbon steel / Alloy steel			☆			★	☆	■	P
Mold and die steel			☆			★	☆	■	
Austenitic stainless steel				☆		☆	★		M
Martensitic stainless steel							☆		
Precipitation hardening stainless steel				☆			★		
Gray cast iron		☆			★				K
Nodular cast iron		☆			★				
Non-ferrous metals									N
Heat-resistant alloy							☆		S
Titanium alloy				☆			★		
Hard materials	★								H

Insert		Description		No. of edges	Dimension (mm)					Carbide						Cermet	Applicable toolholder ➡ M31 M33
					S	D1	INSL	BCH	BS	PVD						-	
										PR015S	PR1510	PR1525	PR1535	PR1810	PR1825	PR1835	TN620M	
	 General purpose	PNMU	0905XNER-GM	10	5.56	4.7	14.6	2	2		●	●	●	●	●	●	MFPN66...
	 Low cutting force	PNMU	0905XNER-SM	10	5.56	4.7	14.6	2	2		●	●	●	●	●		MFPN66...
	 Tough edge	PNMU	0905XNER-GH	10	5.56	4.7	14.6	2	2	●	●	●	●	●	●		MFPN66...

Recommended cutting conditions ➡ M35

M

Milling

Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi-Function
Slot Mill
Ball-nose Radius
Others

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Recommended cutting conditions

Coated carbide

Chipbreaker	Workpiece material	Feed (fz: mm/t)	Recommended insert grades (Vc: m/min)			
			MEGACOAT (PVD coated carbide)			
			PR1835 (PR1535)	PR1825 (PR1525)	PR1810 (PR1510)	PR015S
GM	Carbon steel	0.1~**0.2**~0.3	☆ 120~**180**~250	★ 120~**180**~250	-	-
	Alloy steel	0.1~**0.2**~0.3	☆ 100~**160**~220	★ 100~**160**~220	-	-
	Mold steel	0.1~**0.18**~0.25	☆ 80~**140**~180	★ 80~**140**~180	-	-
	Stainless steel (Austenitic related)	0.1~**0.18**~0.25	☆ 100~**150**~200	☆ 100~**150**~200	-	-
	Stainless steel (Martensitic related)	0.1~**0.18**~0.25	☆ 100~**150**~200	-	-	-
	Stainless steel (Precipitation hardening)	0.1~**0.18**~0.25	★ 90~**120**~150	-	-	-
	Gray cast iron	0.1~**0.2**~0.3	-	-	★ 120~**180**~250	-
	Nodular cast iron	0.1~**0.18**~0.25	-	-	★ 100~**150**~200	-
	Ni-base heat-resistant alloys	0.1~**0.12**~0.2	☆ 20~**30**~50	-	-	-
SM	Carbon steel	0.06~**0.12**~0.2	-	☆ 120~**180**~250	-	-
	Alloy steel	0.06~**0.12**~0.2	-	☆ 100~**160**~220	-	-
	Mold steel	0.06~**0.1**~0.15	-	☆ 80~**140**~180	-	-
	Stainless steel (Austenitic related)	0.06~**0.12**~0.2	★ 100~**150**~200	☆ 100~**150**~200	-	-
	Stainless steel (Martensitic related)	0.06~**0.12**~0.2	★ 100~**150**~200	-	-	-
	Stainless steel (Precipitation hardening)	0.06~**0.12**~0.2	☆ 90~**120**~150	-	-	-
	Gray cast iron	0.06~**0.12**~0.2	-	-	☆ 120~**180**~250	-
	Nodular cast iron	0.06~**0.1**~0.15	-	-	☆ 100~**150**~200	-
	Ni-base heat-resistant alloys	0.06~**0.08**~0.15	★ 20~**30**~50	-	-	-
	Titanium alloys	0.06~**0.08**~0.15	★ 40~**60**~80	-	-	-
GH	Carbon steel	0.15~**0.25**~0.35	-	☆ 120~**180**~250	-	-
	Alloy steel	0.15~**0.25**~0.35	-	☆ 100~**160**~220	-	-
	Mold steel	0.1~**0.2**~0.3	-	☆ 80~**140**~180	-	-
	Gray cast iron	0.15~**0.25**~0.35	-	-	☆ 120~**180**~250	-
	Nodular cast iron	0.1~**0.2**~0.3	-	-	☆ 100~**150**~200	-
	Hard materials (60HRC or less)	0.05~**0.08**~0.16	-	-	-	★ 50~**80**~100

★: 1st Recommendation ☆: 2nd Recommendation

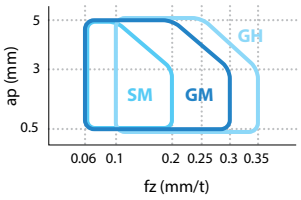
Cermet

Chipbreaker	Workpiece material	Feed (fz: mm/t)	Recommended insert grades Vc: m/min
			Cermet
			TN620M
GM	Carbon steel	0.06~**0.12**~0.15	★ 200~**250**~300
	Alloy steel	0.06~**0.12**~0.15	★ 180~**220**~250
	Mold steel	0.06~**0.1**~0.13	★ 150~**180**~220

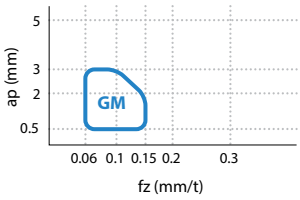
★: 1st Recommendation

Applicable chipbreaker range

Coated carbide



Cermet



Applicable chipbreaker

Cutter type	Chipbreaker		
	GM	SM	GH
Fine pitch	✓	✓	✓
Extra fine pitch	✓	✓	△ (Feed rate is recommended fz=0.2mm/t or under)

High precision and high efficiency high rake cutter

MFSE45

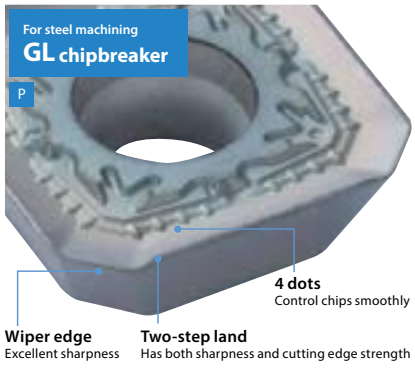
Rough and finish in 1 pass with excellent surface finish
Roughing condition (fz = 0.25 mm/t) provides excellent surface finish (0.8 µmRa or less)

1 The MFSE45 milling solution

Delivers high-quality surfaces by roughing and finishing simultaneously



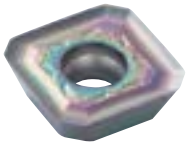
Kyocera's newly developed unique molded chipbreaker



For stainless steel machining
SL chipbreaker
M
Micro-horning



For aluminum machining
AL chipbreaker
N
Sharp edge



Machining comparison simulation (example)

MFSE45 1 Pass and cutting time was cut by 1/3, with a good surface finish (0.8 µmRa or less)

fz = 0.25 mm/t (ap = 1.0 mm)



ø 160 -8T GL chipbreaker
(With wiper insert)

Cutting time Roughing + Finishing

Cutting conditions: Vc = 300 m/min, Dry C50 (Internal evaluation)

0.24µmRa



SOLUTION
1 Pass
Time = 1/3
Surface finish ✓

Conventional machining

Two separate passes for roughing and finishing. Cutting time is longer due to low feed rates during finishing

fz = 0.15 mm/t (ap = 0.8 mm)



ø160-8T

fz = 0.125 mm/t (ap = 0.2 mm)



ø160-8T

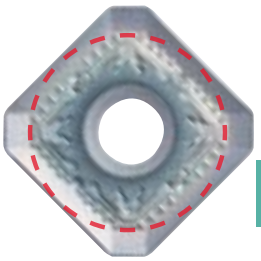
Cutting time Roughing → Finishing

CG image

2 Beautiful surface finish and long tool life

Strict control of insert inscribed circle tolerance

Improved surface finish quality and longer tool life with reducing front edge runout



Inscribed circle tolerance
± 0.015 mm or less

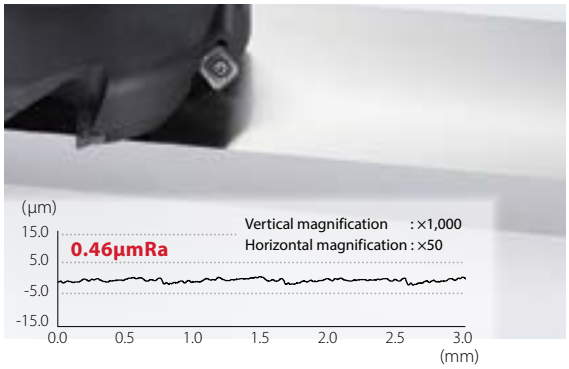
(Class E standard ± 0.025 mm or less)

Excellent front edge runout accuracy

Advantage ① **Theoretical reduction of roughness on finished surface, excellent surface roughness**

Front edge runout: Small ⇒ Surface roughness: Good

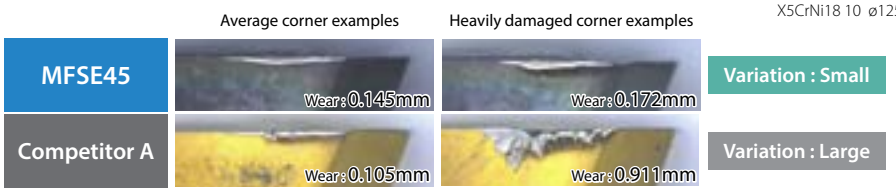
Surface roughness in stainless steel machining (Internal evaluation)



Cutting conditions : Vc = 250 m/min, ap x ae = 1.0 x 100 mm, fz = 0.15 mm/t, Wet
X5CrNi18 10 ø125 (Standard 6 inserts) SL chipbreaker

Advantage ② **Insert wear progresses evenly and tool life can be improved**

Effect on wear (User evaluation)



Cutting conditions : Vc = 270 m/min, ap = ~ 1.5 mm, fz = 0.2 mm/t, Wet ST44-2 ø 250 (15 inserts) SL chipbreaker (PR1535)

Due to the high wear rate of the insert, all inserts need to be replaced, which may result in shorter tool life.

3 Various holders available for multiple applications

In addition to styles with a wiper insert, the standard type with only the standard inserts are also available

Toolholder Specifications

Type	With wiper insert	Standard
Surface roughness	Approx. 0.8μmRa	Approx. 1.6μmRa
Recommended feed	fz = 0.25 mm/t	fz = 0.12 mm/t (Finish machining time)
Application	High efficiency finishing	General purpose (Uses 1 insert style)



Using wiper insert for MFF
(Cutting edge adjustment mechanism with excellent operability)

MFSE45





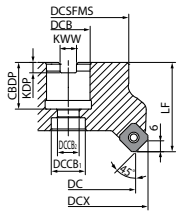


Fig. 1

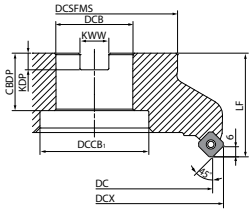


Fig. 2

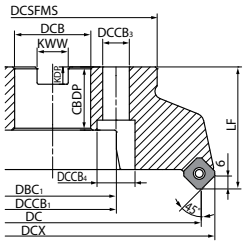
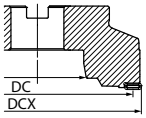


Fig. 3



Wiper insert pocket

Toolholder dimensions

Description				Availability R	Availability L	Inserts	Dimension (mm) DC	DCX	DCB	DCSFMS	DCCB1	DCCB2	DCCB3	DCCB4	DBC1	LF	CBDP	KDP	KWW	Coolant hole	Max. revolution (min-1)	Weight (kg)	Fig.	Applicable inserts M40 M194
Standard	Metric	MFSE	45063R-5T-M	MT0		5	63	71.7	22	48		5	-	-	-	40	21	6.3	10.4	No	14400	0.6	1	SEET13T3...
			45080R-5T-M	MT0			80	88.7	27	70						50	24	7	12.4		12800	1.4	1	
			45100R-5T-M	MT0			100	108.7	32	78							30	8	14.4		11500	1.8	2	
			45125R-6T-M	MT0		6	125	133.7	40	89	-	6				63	33	9	16.4		10200	3.2	2	
			45160R-7T-M	MT0		7	160	168.7		110		7	14	20	66.7		32				9000	5.4	3	
			45200R-8T-M	MT0		8	200	208.7	60	142		8									8100	7	3	
			45250R-10T-M	MT0		10	250	258.7		222		10	18	26	101.6		40	14	25.7		7200	15.5	3	
	Bore dia. inch spec	MFSE	45080R-5T	MT0		5	80	88.7	25.4	70	20	13				50	27	6	9.5	No	12800	1.4	1	SEET13T3...
			45100R-5T	MT0			100	108.7	31.75	78	48		-	-	-		32	8	12.7		11500	1.9	2	
			45125R-6T	MT0		6	125	133.7	38.1	89	55					63	38	10	15.9		10200	3.3	2	
			45160R/L-7T	MT0	MT0	7	160	168.7	50.8	110	72	-						11	19.1		9000	5.3	2	
			45200R/L-8T	MT0	MT0	8	200	208.7	47.625	142	100										8100	7.3	3	
			45250R/L-10T	MT0	MT0	10	250	258.7		222	110		18	26	101.6		40	14	25.4		7200	15.8	3	
Wiper insert	Metric	MFSE	45160R-8T-W-M	MT0		8	160	168.7	40	110		8	-	-	-		33	9	16.4		1000	5.5	2	SEET13T3... LNGX1209...
			45200R-9T-W-M	MT0		9	200	212.8	60	142	1	9	18	26	101.6	63	40	14	25.7	No	800	7.3	3	
			45250-11T-W-M	MT0		11	250	262.7		222		11					38					12	3	
	Bore dia. inch spec	MFSE	45160R-8T-W	MT0		8	160	168.7	50.8	102	72		-	-	-		38	11	19.1		1000	5.5	3	SEET13T3... LNGX1209...
			45200R-9T-W	MT0		9	200	208.7	47.625	142	133	-	18	26	101.6	63	40	14	25.4	No	800	7.6	3	
			45250R-11T-W	MT0		11	250	258.7		222							38					12.3	3	

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Spare parts

Common

Clamp Screw	Wrench	Shim	Shim screw	Wrench	Anti-seize compound
					
SB-35120TRP	DTPM-15	MFSE-105	SPW-5035	LW-3.5	P-37
Recommended tightening torque for insert clamp 4N·m		Recommended tightening torque for shim clamp 5N·m			

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

For Wiper insert

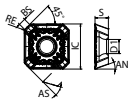
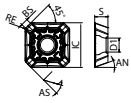
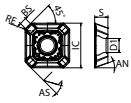
Clamp screw	Wrench	Wedge	Cartridge	Cartridge clamp screw	Wrench	Adjustment Screw
						
SB-3592TR	DTM-10	AD-MFF	CR-MFF	HH5X15L	TTW-15	W6X18N
Recommended tightening torque for wiper insert clamp 1.2N·m						

SEET

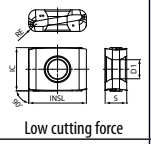
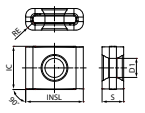
Classification of usage

★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice
(In case hardness is 45HRC or under)

Carbon steel / Alloy steel	☆		☆	★	☆	★	P
Mold and die steel	☆		★	☆	★	☆	
Austenitic stainless steel	☆		☆	★	☆	★	M
Martensitic stainless steel	★		☆	☆	☆	☆	
Precipitation hardening stainless steel							
Gray cast iron	★		☆	☆	☆	☆	K
Nodular cast iron	★		☆	☆	☆	☆	
Non-ferrous metals		★					N
Heat-resistant alloy	★			☆		☆	S
Titanium alloy				★		★	
Hard materials							H

Insert		Description	No. of edges	Dimension (mm) IC	S	D1	RE	BS	Angle (°) AN	AS	Carbide CVD CA6535	DLC PDL025	PVD PR1525	PR1535	PR1825	PR1835	Applicable toolholder ⇒ M38
	 General purpose	SEET 13T3AGSN-GL	4	13.4	3.97	4.2	1.5	2.1	20	29	●		●	●	●	●	MFSE45...
	 Stainless steel	SEET 13T3AGSN-SL	4	13.4	3.97	4.2	1.5	2.1	20	29	●		●	●	●	●	MFSE45...
	 Non-ferrous metals	SEET 13T3AGFN-AL	4	13.4	3.97	4.2	1.5	2.1	20	29		●					MFSE45...

LNGX

Insert		Description	No. of edges	Dimension (mm) IC	S	D1	RE	INSL	Carbide PVD PR1525	PR1825	Cermet PVD PV60M	Applicable toolholder ⇒ M38 M193
	 Low cutting force	LNGX 120916R-TT	4	9.525	4.76	4.2	1.6	12.7	MTO	MTO	MTO	MFSE45...-W MFSE45...-W-M MFF...-SF
		LNGX 120916	4	9.525	4.76	4.2	1.6	12.7	MTO	MTO	MTO	MFSE45...-W MFSE45...-W-M MFF...-SF

Recommended cutting conditions ⇒ M41

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

Recommended cutting conditions

Chipbreaker	Workpiece	Feed (fz: mm/t)	Recommended insert grade (Vc: m/min)			
			MEGACOAT NANO EX (MEGACOAT NANO)		CVD coating	DLC coated carbide
			PR1835 (PR1535)	PR1825 (PR1525)	CA6535	PDL025
GL	Carbon steel	0.1 – **0.15** – 0.3	★ 150 – **200** – 300	☆ 150 – **200** – 300	☆ 150 – **200** – 300	–
	Alloy steel	0.1 – **0.15** – 0.3	★ 150 – **200** – 300	☆ 150 – **200** – 300	☆ 150 – **200** – 300	–
	Mold steel	0.1 – **0.15** – 0.25	☆ 100 – **150** – 250	★ 100 – **150** – 250	☆ 100 – **150** – 250	–
	Stainless steel (Austenitic related)	0.1 – **0.15** – 0.25	★ 100 – **200** – 250	☆ 100 – **200** – 250	☆ 100 – **200** – 250	–
	Stainless steel (Martensitic related)	0.1 – **0.15** – 0.25	★ 100 – **200** – 250	☆ 100 – **200** – 250	☆ 100 – **200** – 250	–
	Gray cast iron	0.1 – **0.15** – 0.25	☆ 100 – **200** – 250	☆ 100 – **200** – 250	☆ 100 – **200** – 250	–
	Nodular cast iron	0.1 – **0.15** – 0.25	☆ 100 – **200** – 250	☆ 100 – **200** – 250	★ 100 – **200** – 250	–
SL	Carbon steel	0.1 – **0.12** – 0.15	☆ 150 – **200** – 300	☆ 150 – **200** – 300	☆ 150 – **200** – 300	–
	Alloy steel	0.1 – **0.12** – 0.15	☆ 150 – **200** – 300	☆ 150 – **200** – 300	☆ 150 – **200** – 300	–
	Mold steel	–	–	–	–	–
	Stainless steel (Austenitic related)	0.1 – **0.15** – 0.2	★ 100 – **200** – 250	☆ 100 – **200** – 250	☆ 100 – **200** – 250	–
	Stainless steel (Martensitic related)	0.1 – **0.15** – 0.2	★ 100 – **200** – 250	☆ 100 – **200** – 250	☆ 100 – **200** – 250	–
AL	Aluminum alloys (Si Ratio13% or less)	0.1 – **0.15** – 0.3	–	–	–	★ 200 – **400** – 500

★ : 1st recommendation ☆ : 2nd recommendation

The number in **bold font** is recommended starting conditions. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.

Face mills for heavy milling

MFLN

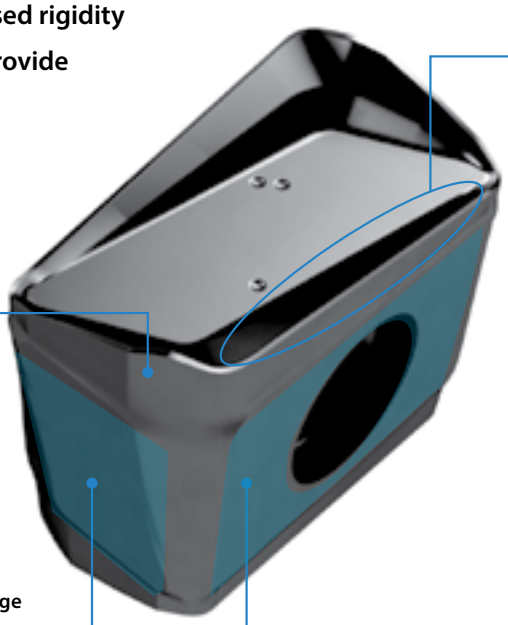
Tough 4-edge tangencial inserts provide high reliability on heavy milling at large depths of cut and high feed rates.
Three cutting edge angles (incl. MFLN90) optimized for various machining applications.

1 Tough and reliable inserts for stable heavy milling

22 mm long inserts offer increased rigidity

Tangentially mounted inserts provide

2 cutting edges on both sides

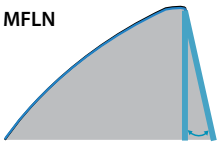


Obtuse edge design

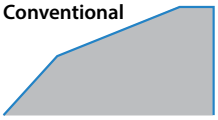
Increases the cutting edge angle only at the tip to maintain both strength and sharpness

Cross-section view of cutting edge

MFLN



Conventional

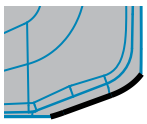


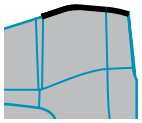
Corner chamfer

only available on MFLN90

Both general corner-R type and chamfered corner type available

Prevents chattering and insert fracturing





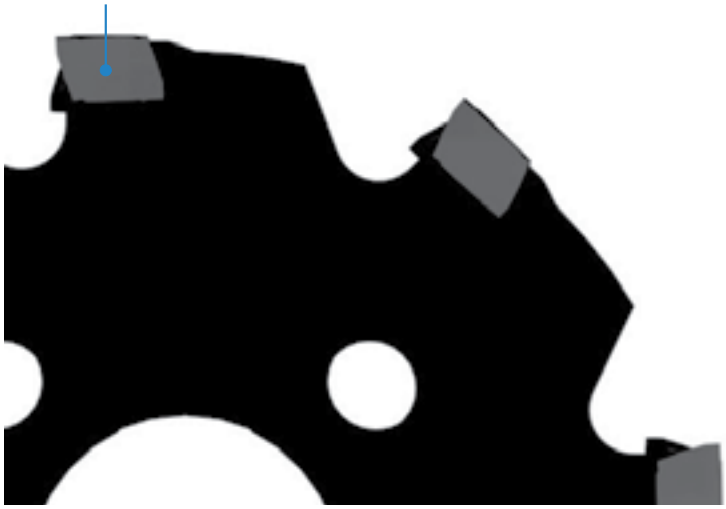
Convex cutting edge ridge

Reduced impact forces when entering the workpiece

Wide flat mounting surface

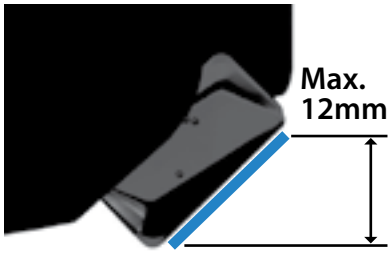
Hold an insert firmly in heavy milling

Tangentially mounted inserts increase rigidity

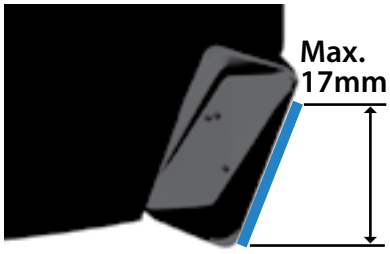


2 Large D.O.C. and high feed rates

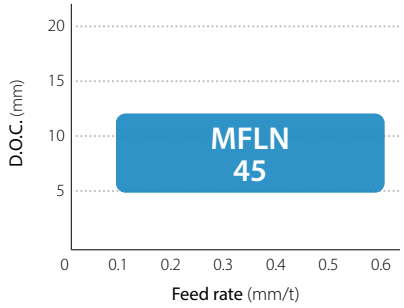
MFLN45
Cutting edge angle 45°

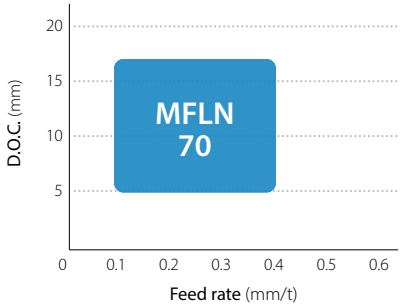


MFLN70
Cutting edge angle 70°



Applicable range

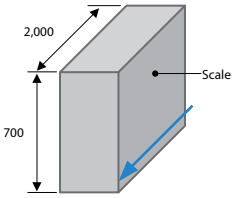




Case Studies

Forging Die for Automotive Parts

Vc = 90 m/min
ap × ae = ~10 × ~80 mm
fz = 0.36 mm/t Dry
MFLN45080R-4T-M (ø80-4 flutes)
LOGU221616ER-GM PR1535



Chip Evacuation Rate

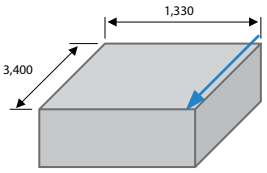


MFLN achieved 1.2 times machining efficiency.
Quieter machining and good chip shapes.

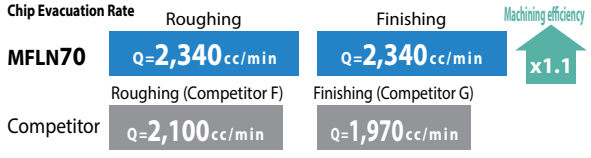
(User Evaluation)

Machining base GGG60

Vc = 120 m/min
ap = 11×165 mm
fz = 0.65 mm/t Dry
XMFLN70250R-13T-OH-M (ø250-13 flutes)
Fine pitch, internal coolant, custom holder
LOGU221616ER-GM PR1525



Chip Evacuation Rate



MFLN improved machining efficiency with lower cutting force.
Also it can be used both for roughing and finishing.

(User Evaluation)

MFLN45



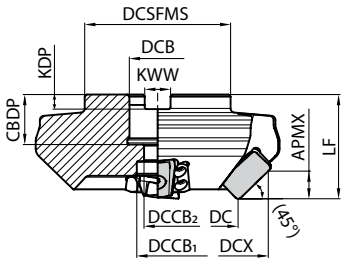


Fig. 1

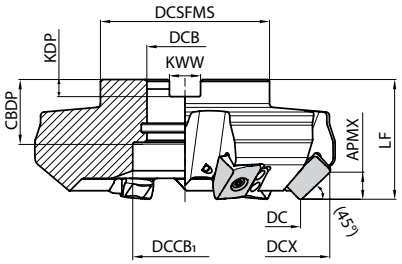


Fig. 2

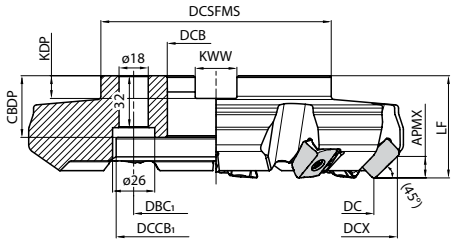


Fig. 3

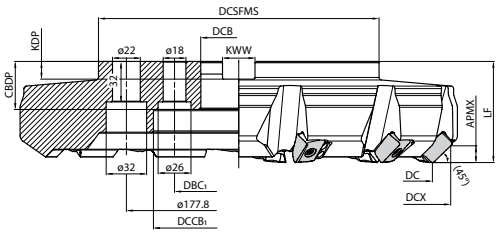


Fig. 4

Toolholder dimensions

Description			Availability	Inserts	Dimension (mm)												A.R. max.(°)	R.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Fig.	Applicable inserts ➡ M46
			R		DC	DCX	DCSFMS	DCB	DCCB1	DCCB2	DBC1	LF	CBDP	KDP	KWW	APMX							
Metric	MFLN	45080R-4T-M	●	4	80	104	70	27	20	13		50	24	7	12.4			-15.5		5970	2	1	
		45100R-4T-M	●		100	124	78	32	45		-		30	8	14.4			-14.5	Yes	4780	2.7	2	
		45125R-6T-M	●	6	125	149	89	40	55			63	33	9	16.4					3820	4.6	2	
		45160R-7T-M	●	7	160	184	110		90		66.7					12	+2			2990	6.7	3	LOGU221616ER-GM
		45200R-8T-M	●	8	200	224	142		124	-			38	14	25.7			-13.5	No	2390	9.7	3	
		45250R-10T-M	●	10	250	274	222	60	160		101.6									1910	16.9	3	
		45315R-12T-M	MTO	12	315	339			215			80								1520	25.1	4	
Bore dia. inch spec	MFLN	45080R-4T	□	4	80	104	70	25.4	20	13		50	27	6	9.5			-15.5		5970	2	1	
		45100R-4T	□		100	124	78	31.75	45		-		34	8	12.7			-14.5	Yes	4780	2.7	2	
		45125R-6T	□	6	125	149	89	38.1	55			63		10	15.9					3820	4.6	2	
		45160R-7T	□	7	160	184	110	50.8	90					11	19.1	12	+2			2990	6.8	2	LOGU221616ER-GM
		45200R-8T	□	8	200	224	142		124	-			38					-13.5	No	2390	10	3	
		45250R-10T	□	10	250	274	222	47.625	160		101.6			14	25.4					1910	17.1	3	
		45315R-12T	MTO	12	315	339			215			80								1520	25.3	4	

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MFLN70



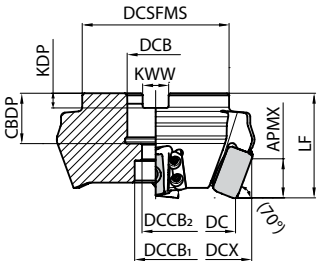


Fig. 1

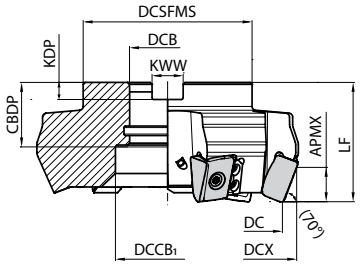


Fig. 2

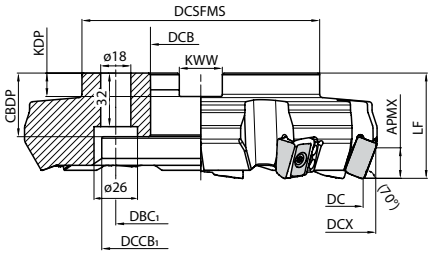


Fig. 3

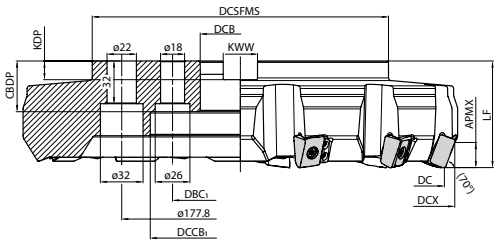


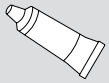
Fig. 4

Toolholder dimensions

Description			Availability	Inserts	Dimension (mm)												A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Fig.	Applicable inserts ➡ M46
			R		DC	DCX	DCSFMS	DCB	DCCB1	DCCB2	DBC1	LF	CBDP	KDP	KWW	APMX							
Metric	MFLN	70080R-4T-M	●	4	80	93	70	27	20	13	-	50	24	7	12.4	17	+1	-16.5	Yes	5970	1.4	1	LOGU221616ER-GM
		70100R-4T-M	●		100	113	78	32	45				30	8	14.4			-14.5		4780	1.9	2	
		70125R-6T-M	●	6	125	138	89	40	55			63	33	9	16.4			-13.5	No	3820	3.4	2	
		70160R-7T-M	●	7	160	173	110		90		66.7									2990	5.3	3	
		70200R-8T-M	●	8	200	213	142	60	120	-			38	14	25.7					2390	8.2	3	
		70250R-10T-M	●	10	250	263	222		160		101.6									1910	14.8	3	
		70315R-12T-M	MTO	12	315	328			215			80								1520	21.9	4	
Bore dia. inch spec	MFLN	70080R-4T	□	4	80	93	70	25.4	20	13	-	50	27	6	9.5	17	+1	-16.5	Yes	5970	1.4	1	LOGU221616ER-GM
		70100R-4T	□		100	113	78	31.75	45				34	8	12.7			-14.5		4780	2	2	
		70125R-6T	□	6	125	138	89	38.1	55			63	38	10	15.9			-13.5	No	3820	3.5	2	
		70160R-7T	□	7	160	173	110	50.8	70	-				11	19.1					2990	5.8	2	
		70200R-8T	□	8	200	213	142		120											2390	8.5	3	
		70250R-10T	□	10	250	263	222	47.625	160		101.6			14	25.4					1910	15.1	3	
		70315R-12T	MTO	12	315	328			215			80								1520	22.2	4	

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Spare parts

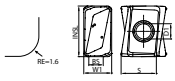
Description		Parts						
		Clamp screw	Wrench	Shim	Clamp screw	Wrench	Coat anti-seize compound	Arbor bolt
								
MFLN	○○080R-4T(-M)	SB-60200TRP	TTP-20	MAP-2216	SB-40140TR	DTM-15	P-37	HH12X35
	○○100R-4T(-M) ~ ○○315R-12T(-M)	Tightening torque for clamping insert 6.0 N-m		Tightening torque for clamping shim 3.5 N-m				–

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

LOGU

Classification of usage								
★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)	Carbon steel / Alloy steel	☆		★	☆	P
	Mold and die steel	☆		★	☆	
	Austenitic stainless steel					M
	Martensitic stainless steel					
	Precipitation hardening stainless steel					
	Gray cast iron	☆		★	☆	K
	Nodular cast iron	☆		★	☆	
	Non-ferrous metals					N
	Heat-resistant alloy					S
	Titanium alloy					
	Hard materials					H

Insert		Description	No. of edges	Dimension (mm)						Carbide				Applicable toolholder ⇒ M44 M45 M152
				S	D1	RE	W1	INSL	BS	PVD				
										PR1525	PR1535	PR1825	PR1835	
	 Corner-R	LOGU 221616ER-GM	4	16.6	6.8	1.6	12.5	22.8	6.3	●	●	●	●	MFLN45... MFLN70... MFLN90...

Recommended cutting conditions ⇒ M47

About applicable insert

	LOGU221616ER-GM (Corner-R)	LOGU2216PAER-GM (Corner Chamfer)
MFLN 45	✓	not applicable
MFLN 70	✓	not applicable

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Recommended cutting conditions

	Workpiece	D.O.C. (mm)		fz: mm/t	Recommended insert grades (Vc: m/min)	
					MEGACOAT NANO EX (MEGACOAT NANO)	
		Width of cut ≦0.5×DC	Width of cut >0.5×DC		PR1825 (PR1525)	PR1835 (PR1535)
MFLN 45	Carbon steel	~10	~8	0.1 – **0.3** – 0.6	★ 100 – **150** – 180	☆ 80 – **120** – 150
	Alloy steel				★ 100 – **150** – 180	☆ 80 – **120** – 150
	Mold steel				★ 80 – **120** – 150	☆ 70 – **100** – 120
	Gray cast iron	~12	~10	0.1 – **0.3** – 0.6	★ 100 – **150** – 180	☆ 80 – **120** – 150
	Nodular cast iron				★ 100 – **150** – 180	☆ 80 – **120** – 150
MFLN 70	Carbon steel	~15	~12	0.1 – **0.2** – 0.4	★ 100 – **150** – 180	☆ 80 – **120** – 150
	Alloy steel				★ 100 – **150** – 180	☆ 80 – **120** – 150
	Mold steel				★ 80 – **120** – 150	☆ 70 – **100** – 120
	Gray cast iron	~17	~15	0.1 – **0.2** – 0.4	★ 100 – **150** – 180	☆ 80 – **120** – 150
	Nodular cast iron				★ 100 – **150** – 180	☆ 80 – **120** – 150

The table above provides recommendations based on product specifications.
Before using the product, check the machine's specifications such as power.
The number in bold font is recommended starting conditions. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.
Dry machining is recommended.

★ : 1st recommendation ☆ : 2nd recommendation

How to mount an insert

1 . Completely eliminate chips and dust from the insert mounting side.
2. After mounting a clamp screw on the top edge of wrench, tighten the screw while keeping the insert pushed against the shim seat surface and holder surface (Fig.1,2)
3. Make sure that the identification on the top of the insert is the same in each pocket.(Fig.3)
4. Tighten the wrench (TTP-20) in while holding parallel to the clamp screw.
5. Tighten the insert clamp screw at an appropriate torque. (Recommended torque: 6.0 N·m)
6. After tightening, check that there is no gap between the insert and the surface of the shim, or between the side surface of insert and the holder surface. If there is a gap, remount the insert using the directions above.

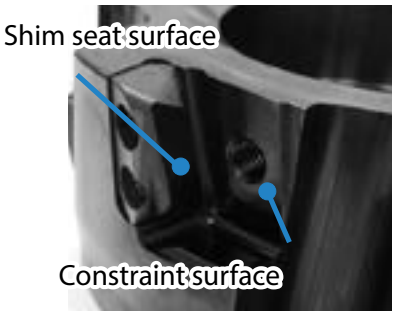


Fig.1

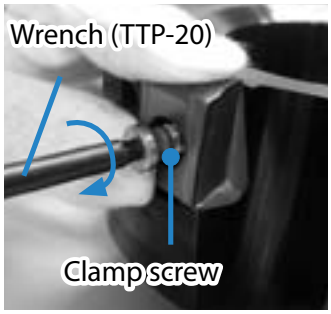
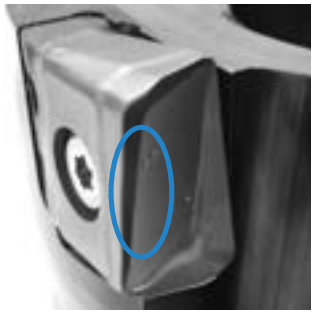


Fig.2


Fig.3

How to replace a shim

1. Completely eliminate chips and dust from the shim mounting side.
2. Coat medium strength screw locking adhesive on the screws.
3. Tighten the screw keeping the shim pushed against the pocket surface of toolholder.
4. After tightening both screws temporarily, tighten them with appropriate torque. (Recommended torque:3.5 N·m)
   Perform temporarily tightening and tightening in the order of (1) and (2) (See Figs. 2 and 3).
5. Please check that there is no gap between the shim and the pocket surfaces of toolholder.

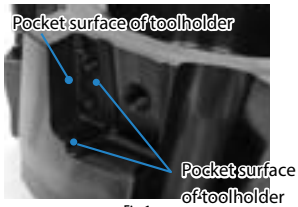


Fig.1

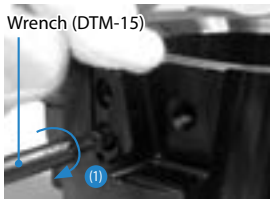


Fig.2

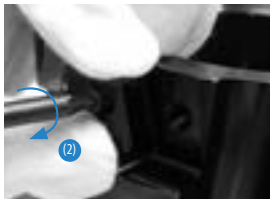


Fig.3


Fig.4

High efficiency cast iron machining

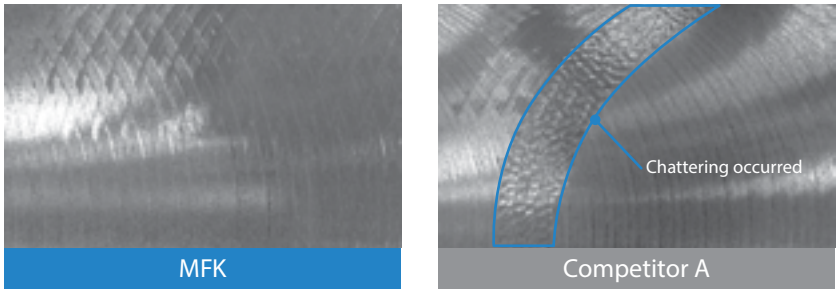
MFK

10-edge pentagonal inserts for stable and economical machining



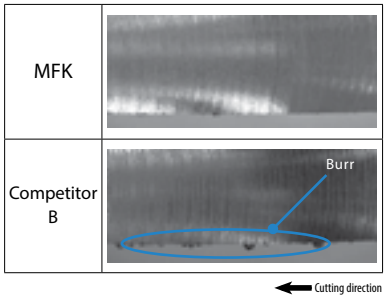
MFK reduces cutting force by good balanced design
Excellent surface finish by controlling chattering

Surface finish comparison (Internal evaluation)



Cutting conditions:
Workpiece material: GGG60, Dry, Vc=180m/min, ap×ae=3×78mm, fz=0.3mm/t

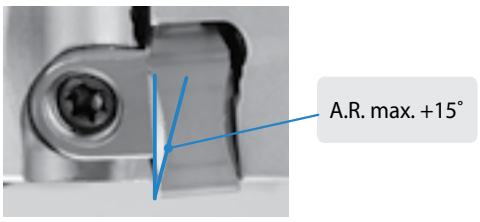
Burr comparison (Internal evaluation)



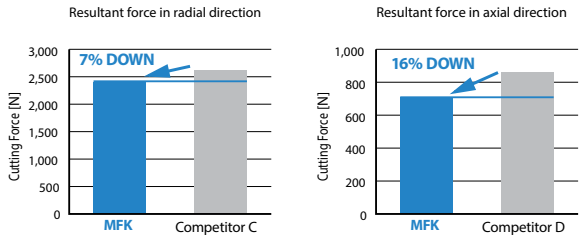
Sharp cutting prevents burr formation

Two special insert structures reduce cutting force and improve edge strength

1 Low cutting force with helical cutting-edge design

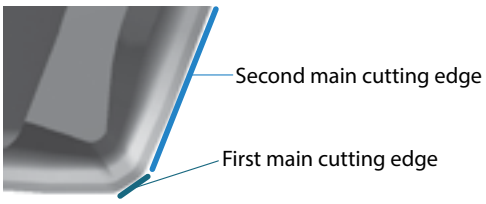


Cutting force comparison (Internal evaluation)

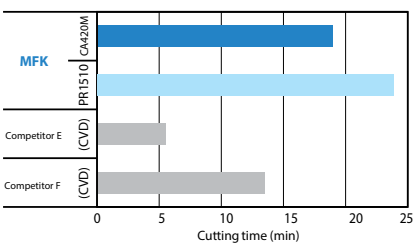


Cutting conditions:
Workpiece material: GGG60, dry, ø125
Vc=180 m/min, ap×ae=3.0×62 mm, fz=0.3 mm/t

2 Dual cutting edge design (High toughness)



Fracture resistance comparison (Internal evaluation)



Cutting conditions:
Workpiece material:
GGG45 with 4 bores
VC=300 m/min
ap=2.0 mm
fZ=0.5 mm/t
Wet

Reducing impact load when biting into the workpiece

Toolholder lineup to meet various applications

Fine pitch type and extra fine pitch type are available
Choose most suitable cutter for your application



Fine pitch (Example: ø125 12 flutes)

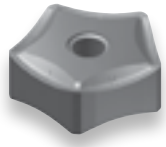
- Recommended for low rigid workpiece
- For wide application range



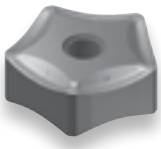
Extra fine pitch (Example: ø125 18 flutes)

- Recommended for high rigid workpiece
- For high efficiency machining

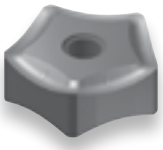
Applicable to various applications with wide range lineup of chipbreakers



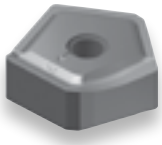
General purpose:
GM chipbreaker



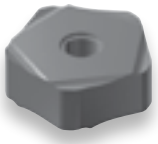
Tough edge:
GH chipbreaker



Finishing:
GL ground chipbreaker

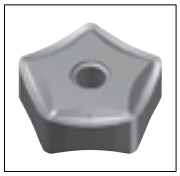


With wiper edge:
W ground chipbreaker

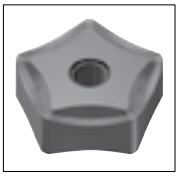


High speed machining:
Ceramic with chipbreaker

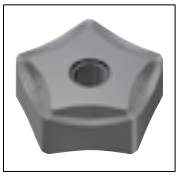
Insert grade lineup



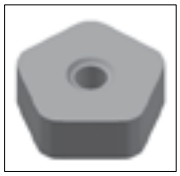
Long tool life
(1st Recommendation)
CA420M
(CVD)



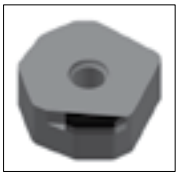
Stable machining
PR1510
(PVD)



Fracture resistance oriented
PR1525
(PVD)



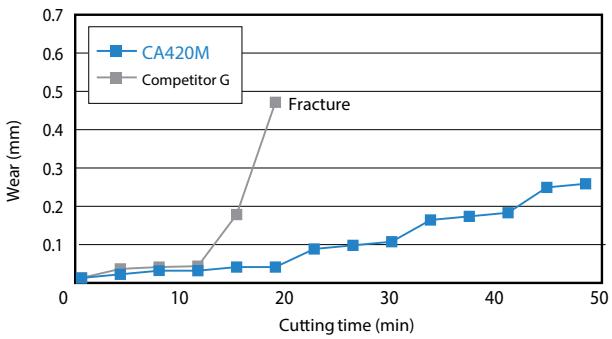
High speed machining
KS6050/CS7050
(Ceramic)



High speed and high precision machining
KBN475
(CBN wiper insert)

Use CBN wiper inserts together with ceramic (KS6050/CS7050) inserts.

Wear resistance comparison (Internal evaluation)



Cutting conditions:
Workpiece material: GGG45, dry
Vc=200 m/min, apxae=2.0x80 mm, fz=0.3 mm/t

MFK



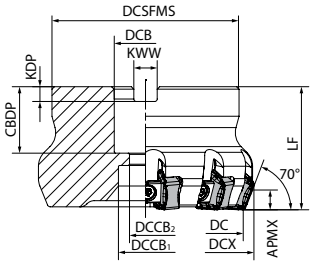


Fig. 1

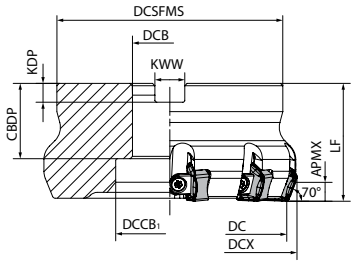


Fig. 2

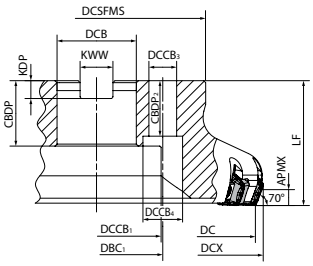


Fig. 3

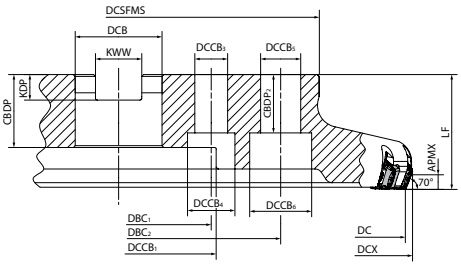


Fig. 4

Toolholder dimensions

Description				Availability	Inserts	Dimension (mm)																			A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Fig.
				R		DC	DCX	DCSFMS	DCB	DCB_1	DCB_2	DCB_3	DCB_4	DCB_5	DCB_6	DBC_1	DBC_2	LF	CBDP	KDP	KWW	APMX	$CBDP_2$						
Metric	Fine pitch	MFK	080R-11-8T-M	●	8	80	89	76	27	20	13								24	7	12.4						8000	1.87	1
			100R-11-10T-M	●	10	100	109	96	32	26	17	-	-			-			28	8	14.4		-		-6		7000	2.99	1
			125R-11-12T-M	●	12	125	134	100	40	55									33	9	16.4						6100	3.56	2
			160R-11-16T-M	●	16	160	169			70		14	20	-	-	66.7	-	63				6	28	+15		No	5300	4.51	3
			200R-11-20T-M	●	20	200	209	142	60	110	-	18	26			101.6			40	14	25.7		32		-5		4700	7.35	3
			250R-11-24T-M	●	24	250	259																				4200	10.43	3
			315R-11-28T-M	MTO	28	315	324	220						22	32		177.8										3700	19.41	4
	Extra fine pitch	MFK	080R-11-10T-M	●	10	80	89	76	27	20	13								24	7	12.4						8000	1.81	1
			100R-11-14T-M	●	14	100	109	96	32	26	17	-	-			-			28	8	14.4		-		-6		7000	2.86	1
			125R-11-18T-M	●	18	125	134	100	40	55									33	9	16.4						6100	3.38	2
			160R-11-22T-M	●	22	160	169			70		14	20	-	-	66.7	-	63				6	28	+15		No	5300	4.32	3
			200R-11-28T-M	●	28	200	209	142	60	110	-	18	26			101.6			40	14	25.7		32		-5		4700	7.1	3
			250R-11-36T-M	●	36	250	259																				4200	10.07	3
			315R-11-44T-M	MTO	44	315	324	220						22	32		177.8										3700	18.92	4
Bore dia. inch spec	Fine pitch	MFK	080R-11-8T	□	8	80	89	76	31.75	26	17								32	8	12.7				-7		8000	1.76	1
			100R-11-10T	□	10	100	109	96				-	-			-							-		-6		7000	2.98	1
			125R-11-12T	□	12	125	134	100	38.1	55				-	-		-		38	10	15.9						6100	3.65	2
			160R-11-16T	□	16	160	169		50.8	70								63		11	19.1	6		+15		No	5300	4.62	3
			200R-11-20T	□	20	200	209	142	47.625	110	-	18	26			101.6			40	14	25.4		32		-5		4700	7.65	3
			250R-11-24T	□	24	250	259																				4200	10.73	3
			315R-11-28T	MTO	28	315	324	220						22	32		177.8										3700	19.71	4
	Extra fine pitch	MFK	080R-11-10T	□	10	80	89	76	31.75	26	17								32	8	12.7				-7		8000	1.7	1
			100R-11-14T	□	14	100	109	96				-	-			-							-		-6		7000	2.85	1
			125R-11-18T	□	18	125	134	100	38.1	55				-	-		-		38	10	15.9						6100	3.44	2
			160R-11-22T	□	22	160	169		50.8	70								63		11	19.1	6		+15		No	5300	4.44	2
			200R-11-28T	□	28	200	209	142	47.625	110	-	18	26			101.6			40	14	25.4		32		-5		4700	7.4	3
			250R-11-36T	□	36	250	259																				4200	10.36	3
			315R-11-44T	MTO	44	315	324	220						22	32		177.8										3700	19.21	4

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

Spare parts and applicable inserts (MFK)

Description	Spare parts				Applicable inserts ⇒ M54
	Wedge	Wedge screw	Wrench	Mounting bolt	
					
MFK 080R-11-8T-M	C09N	W6X18N	TT-15	HH12X35	PNMG1106XNEN-GM PNMG1106XNEN-GH PNEG1106XNEN-GL PNEG1106XNER-W PNEA1106XNTN-T01020 PNEG1106XNTR-T00515 PNEG1106XNTR-T01015W
100R-11-10T-M				HH16X40	
125R-11-12T-M				-	
160R-11-16T-M					
200R-11-20T-M					
250R-11-24T-M					
315R-11-28T-M					
MFK 080R-11-10T-M	C09N	W6X18N	TT-15	HH12X35	PNMG1106XNEN-GM PNMG1106XNEN-GH PNEG1106XNEN-GL PNEG1106XNER-W PNEA1106XNTN-T01020 PNEG1106XNTR-T00515 PNEG1106XNTR-T01015W
100R-11-14T-M				HH16X40	
125R-11-18T-M				-	
160R-11-22T-M					
200R-11-28T-M					
250R-11-36T-M					
315R-11-44T-M					

Description	Spare parts				Applicable inserts ⇒ M54
	Wedge	Wedge screw	Wrench	Mounting bolt	
					
MFK 080R-11-8T	C09N	W6X18N	TT-15	HH16X40	PNMG1106XNEN-GM PNMG1106XNEN-GH PNEG1106XNEN-GL PNEG1106XNER-W PNEA1106XNTN-T01020 PNEG1106XNTR-T00515 PNEG1106XNTR-T01015W
100R-11-10T				-	
125R-11-12T					
160R-11-16T					
200R-11-20T					
250R-11-24T					
315R-11-28T					
MFK 080R-11-10T	C09N	W6X18N	TT-15	HH16X40	PNMG1106XNEN-GM PNMG1106XNEN-GH PNEG1106XNEN-GL PNEG1106XNER-W PNEA1106XNTN-T01020 PNEG1106XNTR-T00515 PNEG1106XNTR-T01015W
100R-11-14T				-	
125R-11-18T					
160R-11-22T					
200R-11-28T					
250R-11-36T					
315R-11-44T					

MFK-SF



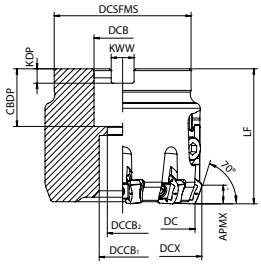


Fig. 1

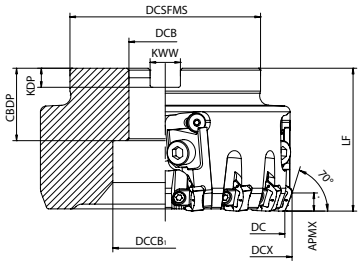


Fig. 2

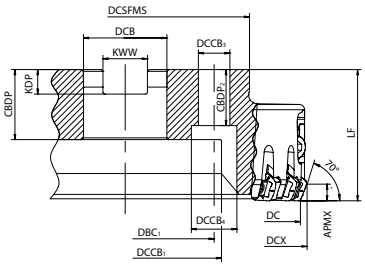


Fig. 3

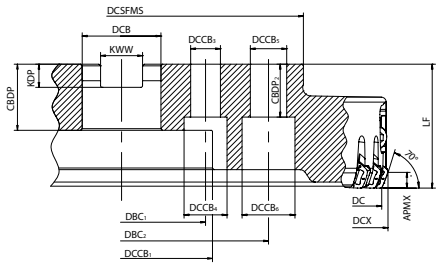


Fig. 4

Toolholder dimensions

Description			Availability	Inserts	Dimension (mm)																		A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Fig.
			R		DC	DCX	DCSFMS	DCB	DCCB1	DCCB2	DCCB3	DCCB4	DCCB5	DCCB6	DBC1	DBC2	LF	CBDP	KDP	KWW	APMX	CBDP2						
Metric	MFK	080R-11-9T-M-SF	●	9 (3)	80	89	76	27	20	13								24	7	12.4				-7		8000	2.21	1
		100R-11-12T-M-SF	●	12 (4)	100	109	96	32	26	17	-	-			-			28	8	14.4		-		-6		7000	3.49	1
		125R-11-15T-M-SF	●	15 (5)	125	134	100	40	55				-	-		-		33	9	16.4						6100	4.47	2
		160R-11-18T-M-SF	●	18 (6)	160	169					14	20			66.7		75				6	28	+15		No	5300	6.99	3
		200R-11-24T-M-SF	●	24 (8)	200	209	142			-														-5		4700	9.89	3
		250R-11-30T-M-SF	MTO	30 (10)	250	259		60	110		18	26			101.6			35	14	25.7		32				4200	16.35	3
		315R-11-39T-M-SF	MTO	39 (13)	315	324	220						22	32		177.8										3700	28.14	4
Bore dia. inch spec	MFK	080R-11-9T-SF	□	9 (3)	80	89	76	31.75	26	17								32	8	12.7				-7		8000	2.08	1
		100R-11-12T-SF	□	12 (4)	100	109	96				-	-			-							-		-6		7000	3.49	1
		125R-11-15T-SF	□	15 (5)	125	134	100	38.1	55				-	-		-		38	10	15.9						6100	4.54	2
		160R-11-18T-SF	□	18 (6)	160	169		50.8	70								75		11	19.1	6		+15		No	5300	6.82	2
		200R-11-24T-SF	□	24 (8)	200	209	142			-														-5		4700	10.39	3
		250R-11-30T-SF	MTO	30 (10)	250	259		47.625	110		18	26			101.6			40	14	25.4		32				4200	16.85	3
		315R-11-39T-SF	MTO	39 (13)	315	324	220						22	32		177.8										3700	28.65	4

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Numbers in parenthese ( ) are the number of adjustable cutting edge pockets.
Please install wiper inserts in the adjustable cutting edge pockets.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

Spare parts and applicable inserts (MFK-SF)

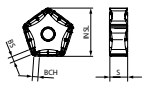
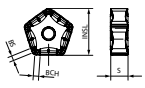
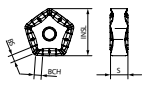
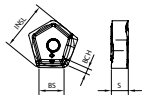
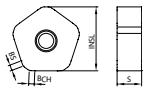
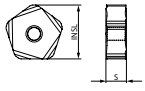
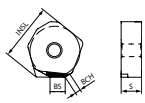
Description		Spare parts								Applicable inserts M54
		Wedge	Wedge screw	Wrench	Cartridge	Cartridge clamp screw	Wrench	Adjustment screw	Mounting bolt	
MFK	080R-11-9T-M-SF	C09N	W6X18N	TT-15	CR-MFK70R	HH8X25	LW-6	AJ-519TR	HH12X35	PNMG1106XNEN-GM PNMG1106XNEN-GH PNEG1106XNEN-GL PNEG1106XNER-W PNEA1106XNTN-T01020 PNEG1106XNTR-T00515 PNEG1106XNTR-T01015W
	100R-11-12T-M-SF								HH16X40	
	125R-11-15T-M-SF								-	
	160R-11-18T-M-SF									
	200R-11-24T-M-SF									
	250R-11-30T-M-SF									
	315R-11-39T-M-SF									
MFK	080R-11-9T-SF	C09N	W6X18N	TT-15	CR-MFK70R	HH8X25	LW-6	AJ-519TR	HH16X40	PNMG1106XNEN-GM PNMG1106XNEN-GH PNEG1106XNEN-GL PNEG1106XNER-W PNEA1106XNTN-T01020 PNEG1106XNTR-T00515 PNEG1106XNTR-T01015W
	100R-11-12T-SF									
	125R-11-15T-SF								-	
	160R-11-18T-SF									
	200R-11-24T-SF									
	250R-11-30T-SF									
	315R-11-39T-SF									

PNMG/PNEG/PNEA

Classification of usage

★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice
(In case hardness is 45HRC or under)

Carbon steel / Alloy steel									P
Mold and die steel									
Austenitic stainless steel									M
Martensitic stainless steel									
Precipitation hardening stainless steel									
Gray cast iron	★			☆		☆	★		K
Nodular cast iron	★			☆		★	☆		
Non-ferrous metals									N
Heat-resistant alloy									S
Titanium alloy									
Hard materials									H

Insert		Description		No. of edges	Dimension (mm) S	INSL	BCH	BS	Carbide CVD CA420M	PVD PR1510	PR1525	PR1810	PR1825	Cera-mic CVD CS7050	- KS6050	CBN - KBN475	Applicable toolholder ➡ M50 M52
	 General purpose	PNMG	1106XNEN-GM	10	6.35	17.23	2	2	●	●	●	●	●				MFK... MFK...-M MFK...-SF
	 Tough edge	PNMG	1106XNEN-GH	10	6.35	17.23	2	2	●	●	●	●	●				MFK... MFK...-M MFK...-SF
	 Surface finish oriented	PNEG	1106XNEN-GL	10	6.35	17.18	2.6	2.6	●	●	●	●	●				MFK... MFK...-M MFK...-SF
	 2-edge / With wiper edge	PNEG	1106XNER-W	2	6.35	18.02	2	10	●	●	●	●	●				MFK... MFK...-M MFK...-SF
	 High speed machining	PNEA	1106XNTN-T01020	10	6.5	16.94	1.5	1.5						●	●		MFK... MFK...-M MFK...-SF
	 High speed machining (With chipbreaker)	PNEG	1106XNTR-T00515	10	6.35	17.07	-	-						●	●		MFK... MFK...-M MFK...-SF
	 2-edge / Wiper insert	PNEG	1106XNTR-T01015W	2	6.5	18.06	1.7	4.8								●	MFK... MFK...-M MFK...-SF

Handed insert shows Right-hand

Recommended cutting conditions ➡ M55, M56

PNEG1106XNER-W inserts are sold in 5 piece boxes

PNEG1106XNTR-T01015W inserts are sold in 1 piece boxes

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Recommended cutting conditions (Ceramic/CBN)

Without chipbreaker

Workpiece material	Insert grades	Vc (m/min)	Edge preparation	fz(mm/t) 0.05 0.1 0.2 0.3 0.4
Gray cast iron	KS6050★ CS7050☆	600~**900**~1,200	0.10x20°	0.1
Nodular cast iron	KS6050☆ CS7050★	400~**600**~900		

With chipbreaker

Workpiece material	Insert grades	Vc (m/min)	Edge preparation	fz(mm/t) 0.05 0.1 0.2 0.3 0.4
Gray cast iron	KS6050★ CS7050☆	600~**900**~1,200	0.05x15°	0.1
Nodular cast iron	KS6050☆ CS7050★	400~**600**~900		

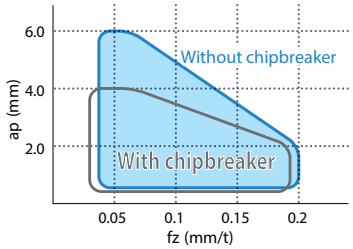
CBN wiper insert

Workpiece material	Insert grades	Vc (m/min)	Edge preparation	fz(mm/t) 0.05 0.1 0.2 0.3 0.4
Gray cast iron	KBN475	600~**900**~1,200	0.10x15°	0.1
Nodular cast iron		400~**600**~900		

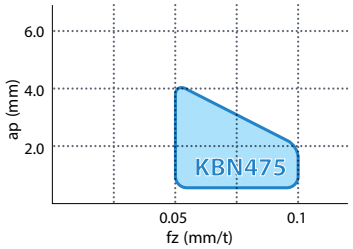
★: 1st Recommendation ☆: 2nd Recommendation

Recommended application range (Ceramic/CBN)

Workpiece material: Cast iron (Ceramic)



Workpiece material: Cast iron (CBN)



When using CBN wiper inserts

1. Please use CBN wiper inserts together with ceramic inserts. Feed rate should be fz=0.1mm/t or under.
2. The main cutting edge of CBN wiper insert is slightly higher than that of ceramic inserts. Therefore, the feed rate for the inserts next to CBN wiper inserts is double that of other inserts.

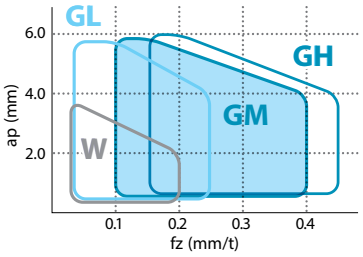
Recommended cutting conditions (Coated carbide)

Workpiece material	Insert grades	Vc (m/min)	Chipbreaker	fz(mm/t) 0.06 0.1 0.2 0.3 0.4
Gray cast iron	**CA420M**	170~**230**~300	GM★	0.25
	PR1810	120~**180**~250	GH ☆	0.3
	PR1825		GL	0.12
	PR1510	120~**180**~250	GH	0.3
	PR1525		GL	0.12
Nodular cast iron	**CA420M**	150~**200**~250	GM★	0.2
	PR1810	100~**150**~200	GH ☆	0.25
	PR1825		GL	0.1
	PR1510	100~**150**~200	GH	0.25
	PR1525		GL	0.1

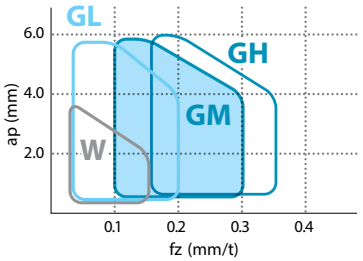
★: 1st Recommendation ☆: 2nd Recommendation

Recommended application range

Workpiece material: Gray cast iron



Workpiece material: Nodular cast iron



Notes:
1. When using W, please use together with GM or GH.
2. If machining fz=0.2 or over, insert corner will be damaged. The main cutting edge of W insert is receding from that of GM and GH.
Therefore, the feed rate for the insert next to W type is double of the other inserts.

How to adjust cutting edge height

1. Assemble all related parts into the cutter.

2. Make sure the back end of cartridge makes contact with adjustment screw (Fig. 1), and pull them lightly inwards (Fig. 2).
   Tighten the cartridge clamp screw temporary.

3. Install the insert (Fig. 3), and tighten the wedge screw temporary.
   Temporarily tighten the screw with a 40 to 45 degree rotation after the wedge contacts the insert.

4. Loosen the cartridge clamp screw. (Fig. 4)

5. Adjust the extruding amount with adjustment screw. (Fig. 5)

6. Tighten the wedge screw and firmly fix the insert.
   (Recommended tightening torque: 6N·m)

7. Tighten the cartridge clamp screw firmly.
   (Recommended tightening torque: 10N·m)

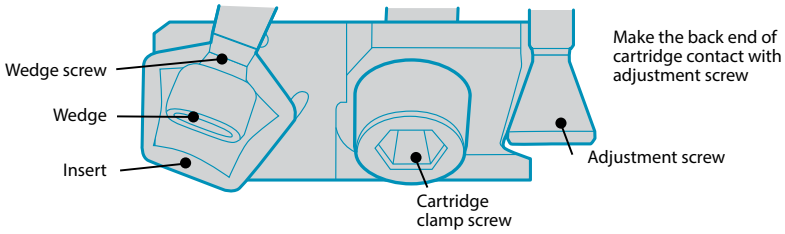
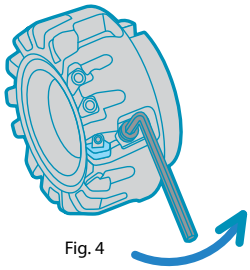


Fig. 1


Fig. 2


Fig. 3


Fig. 4

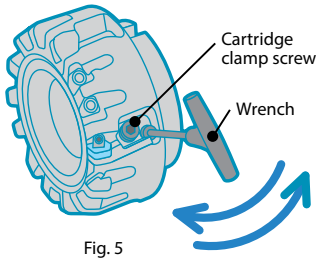


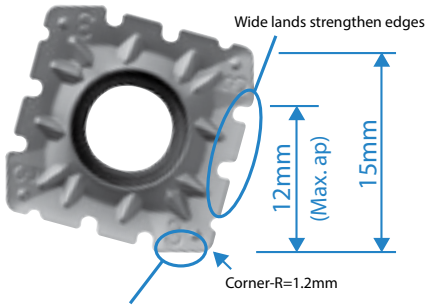
Fig. 5

Notes:
1. Follow steps 1 ~ 7 above for adjustment.
2. To adjust the edge height adjust the wedge screw and loosen the cartridge clamp screw.
   Tightening the adjustment screw with the clamp screw fixed firmly may damage the adjustment screw.
3. The adjusted edge height difference must be within 5μm.

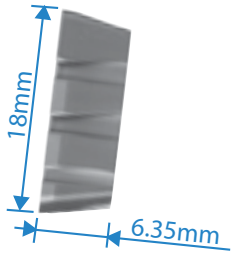
MSRS15 face mill for heavy milling

Large depth of cut and high feed rate achieves high efficiency machining

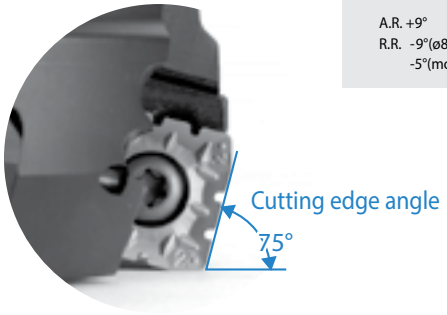
Recommended ap: 5 ~ 10mm



Large wiper edges achieve high feed rate.

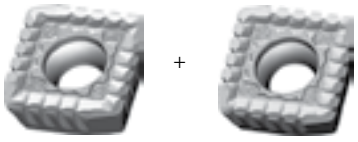
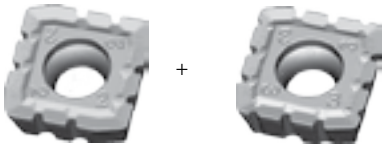
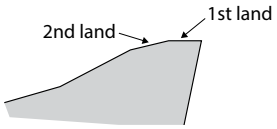
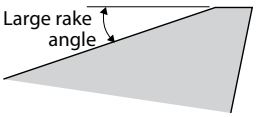
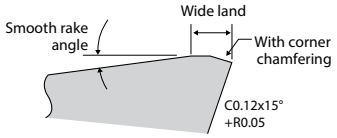


Inserts are strengthened with 6.35mm thickness.



A.R. +9°
R.R. -9°(ø80)
-5°(more than ø100)

Selection of chipbreaker

	Low cutting force	General purpose	Edge strength oriented
Insert type	 NB2P(4-Notched) + NB3P(5-Notched)	 NB2(2-Notched) + NB3(3-Notched)	 NB2T(2-Notched) + NB3T(3-Notched)
Applications	When using long arbor or for machining of thin-plate workpieces	General purpose type with good balance of strength and cutting force	For interrupted machining and high load machining When feed rate is increased or workpiece material is cast iron
Edge preparation	As many as four (or five) notches help to alleviate the shock when biting into the workpiece	Strength, edge and chip control are all well balance	Strength is increased by the edge shape and moderate rake angle of the chamfer edge
			

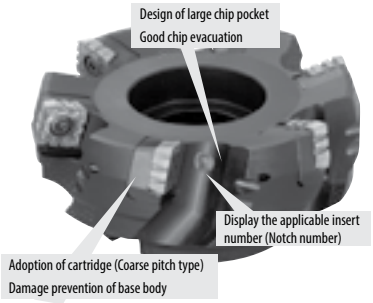
A supplemental chipbreaker is used when it is necessary to increase strength and bite while focusing on resistance, as when machining welded areas.



• About insert no. of NB2P (4-notched) and NB3P (5-notched)
In order to adjust applicable inserts on marked numbers on toolholders, "2+" is marked for NB2P (4-notched) and "3+" is marked on NB3P (5-notched).

Features of toolholder

Coarse pitch



Fine pitch

Higher productivity with fine pitch design



Insert replacement identification



Insert number is transcribed as a result of the cutting tool load.

* Depending on the cutting conditions, marks are not transcribed.

MSRS15



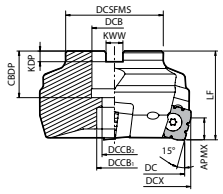


Fig. 1

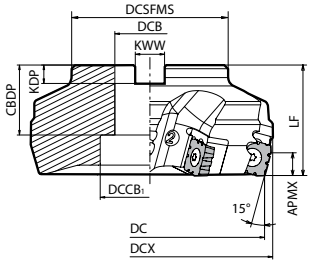


Fig. 2

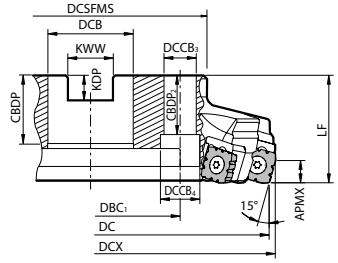


Fig. 3

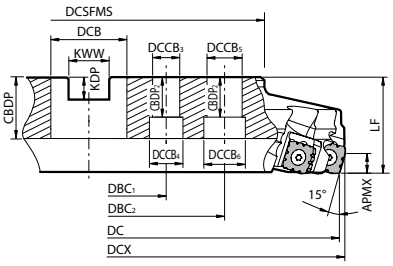


Fig. 4

Toolholder dimensions

Description				Availability	Inserts	Dimension (mm)																		A.R. (°)	R.R. (°)	Coolant hole	Weight (kg)	Fig.	Applicable inserts ⇒ M60
				R		DC	DCX	DCSFMS	DCB	$DCCB_1$	$DCCB_2$	$DCCB_3$	$DCCB_4$	$DCCB_5$	$DCCB_6$	DBC_1	DBC_2	LF	CBDP	KDP	KWW	APMX	$CBDP_2$						
Metric	Coarse pitch	MSRS	15080R-4T-M	●	4	80	87	70	27	20	13							50	24	7	12.4								
			15100R-4T-M	●		100	107	85	32	45		-	-			-			29	8	14.4		-						
			15125R-6T-M	●	6	125	132		40	55								60	33	9	16.4					3.6	2		
			15160R-8T-M	●	8	160	167	110		68	-	14	20	-	-	66.7	-					12	28	+9	-5	No	5	3	SPMT1806EDER... SPMT1806EDSR...
			15200R-10T-M	●	10	200	207	140	60	-									38	15	25.7					7.7	3	
			15250R-12T-M	●	12	250	257					18	26			101.6							32				12	3	
			15315R-14T-M	●	14	315	322	230						22	32		177.8										17	4	
	Fine pitch	MSRS	15080R-6T-M	●	6	80	87	70	27	20	13							50	24	7	12.4						1.3	1	
			15100R-6T-M	●		100	107	85	32	45		-	-			-			29	8	14.4		-				1.9	2	
			15125R-8T-M	●	8	125	132		40	55								60	33	9	16.4						3.5	2	
			15160R-10T-M	●	10	160	167	110		68	-	14	20	-	-	66.7	-					12	28	+9	-5	No	4.9	3	SPMT1806EDER... SPMT1806EDSR...
			15200R-12T-M	●	12	200	207	140	60	-									38	15	25.7					7.6	3	
			15250R-14T-M	●	14	250	257					18	26			101.6							32				11.9	3	
			15315R-16T-M	MTO	16	315	322	230						22	32		177.8										17	4	
Bore dia. inch spec	Coarse pitch	MSRS	15080R-4T	□	4	80	87	55	25.4	20	13							50	26	6	9.5						1.3	1	
			15100R-4T	□		100	107	70	31.75	42		-	-			-			32	8	12.7		-				2	2	
			15125R-6T	□	6	125	132	85	38.1	54								60		10	15.9					3.6	2	
			15160R-8T	□	8	160	167	100	50.8	68	-			-	-		-			11	19	12		+9	-5	No	5	2	SPMT1806EDER... SPMT1806EDSR...
			15200R-10T	□	10	200	207	130											38								7.7	3	
			15250R-12T	□	12	250	257		47.625	-		18	26			101.6				14	25.4		32				12	3	
			15315R-14T	□	14	315	322	220						22	32		177.8						25				17	4	
	Fine pitch	MSRS	15080R-6T	□	6	80	87	55	25.4	20	13							50	26	6	9.5						1.3	1	
			15100R-6T	□		100	107	70	31.75	42		-	-			-			32	8	12.7		-				1.9	2	
			15125R-8T	□	8	125	132	85	38.1	54								60		10	15.9						3.5	2	
			15160R-10T	□	10	160	167	100	50.8	68	-			-	-		-			11	19	12		+9	-5	No	4.9	2	SPMT1806EDER... SPMT1806EDSR...
			15200R-12T	□	12	200	207	130											38								7.6	3	
			15250R-14T	□	14	250	257		47.625	-		18	26			101.6				14	25.4		32				11.9	3	
			15315R-16T	MTO	16	315	322	220						22	32		177.8						25				17	4	

Mounting bolt (HH12X35) is included for MSRS15080R-○T(-M).
Cartridge is included in the coarse pitch type, but no cartridge in the fine pitch type.

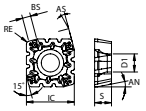
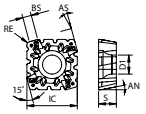
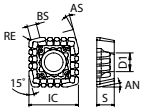
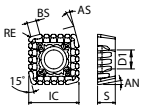
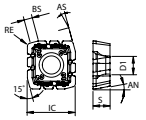
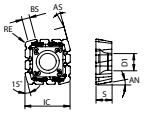
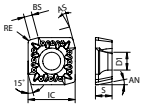
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

SPMT

Classification of usage

★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice
(In case hardness is 45HRC or under)

Carbon steel / Alloy steel		★	☆	P
Mold and die steel		★	☆	P
Austenitic stainless steel				M
Martensitic stainless steel				M
Precipitation hardening stainless steel				M
Gray cast iron	★			K
Nodular cast iron	★			K
Non-ferrous metals				N
Heat-resistant alloy			★	S
Titanium alloy			★	S
Hard materials				H

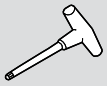
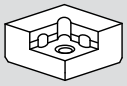
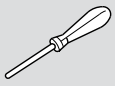
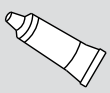
Insert		Description	No. of edges	Dimension (mm)					Angle (°)		Carbide			Applicable toolholder ➡ M59
				IC	S	D1	RE	BS	AN	AS	PVD			
											PR1810	PR1825	PR1835	
	 2-notch	SPMT 1806EDER-NB2	4	18	6.35	6.8	1.2	3.1	11	15	●	●	●	MSRS15...
	 3-notch	SPMT 1806EDER-NB3	4	18	6.35	6.8	1.2	3.1	11	15	●	●	●	MSRS15...
	 4-notch / Low cutting force	SPMT 1806EDER-NB2P	4	18	6.35	6.8	1.2	3.1	11	15	●	●	●	MSRS15...
	 5-notch / Low cutting force	SPMT 1806EDER-NB3P	4	18	6.35	6.8	1.2	3.1	11	15	●	●	●	MSRS15...
	 2-notch / Tough edge	SPMT 1806EDSR-NB2T	4	18	6.35	6.8	1.2	3.1	11	15	●		●	MSRS15...
	 3-notch / Tough edge	SPMT 1806EDSR-NB3T	4	18	6.35	6.8	1.2	3.1	11	15	●		●	MSRS15...
	 Without notch	SPMT 1806EDER-V	4	18	6.35	6.8	1.2	3.1	11	15	●	●	●	MSRS15...

Handed insert shows Right-hand

Recommended cutting conditions ➡ M61

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Spare parts (common to Metric / Inch spec)

Description		Spare parts						
		Clamp screw	Wrench	Cartridge	Clamp screw	Wrench	Anti-seize compound	Mounting bolt
								
Coarse pitch	MSRS 15080R-○○(M)	SB-60120TR	TT-25L	MAP-1806	SB-40140TR	DT-15	P-37	HH12X35
	MSRS 15100R-○○(M) ~ 15315R-○○(M)	Recommended tightening torque for insert clamp 7.5N·m		Recommended tightening torque for cartridge clamp 3.5N·m				-
Fine pitch	MSRS 15080R-○○(M)	SB-60120TR	TT-25L	-	-	-	P-37	HH12X35
	MSRS 15100R-○○(M) ~ 15315R-○○(M)	Recommended tightening torque for insert clamp 7.5N·m						-

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

Recommended cutting conditions

Workpiece material	fz (mm/t)			Recommended insert grades (Vc: m/min)		
	NB2P + NB3P	NB2 + NB3	NB2T + NB3T	MEGACOAT NANO EX		
				PR1810	PR1825	PR1835
Carbon steel	0.15	0.2	0.3	-	★ 120~**180**~250	☆ 120~**180**~220
Alloy steel	0.15	0.2	0.3	-	★ 120~**180**~250	☆ 120~**180**~220
Mold steel	0.1	0.15	0.2	-	★ 100~**160**~220	☆ 100~**160**~200
Gray cast iron	0.2	0.25	0.35	★ 120~**180**~250	-	-
Nodular cast iron	0.15	0.2	0.3	★ 100~**160**~220	-	-
Stainless steel	Not recommended					
Aluminum/Copper	Not recommended					

★: 1st Recommendation ☆: 2nd Recommendation

Tangential 90° end mill with 4-edge inserts

MA90

Original tangential 90° end mill with economical 4-edge inserts. New grade PR18 Series and unique insert cutting edge design creates high-quality machining with longer tool life

1 The MA90 tangential end mills provide a large variety of machining operations

Challenges

Conventional end mill
- Sudden fractures can cause damage to the holder
- Insert defects preventing use of all four corners

Tangential end mill
- Premature tool wear can quickly deteriorate the surface finish quality
- Poor wall accuracy

SOLUTION

Kyocera's MA90 tangential end mill solves these problems with a unique insert shape and PR18 Series grade technology.

Large web thickness
High rigidity

Peripheral grinding specifications
Excellent wall accuracy

Special wiper edge
Large relief angle suppresses wear
High-quality surface finish



Multifunctional (G-class insert)
Supports 3-dimensional machining (Excluding R4-R6)

Unique cutting edge design
Excellent fracture resistance and low cutting force design

Newls developed insert grade
MEGACOAT NANO EX
PR18 Series delivers longer tool life

2 New insert grade PR18 Series provides a significantly longer tool life

Extensive lineup of insert grades covers a variety of machining materials and applications

Workpiece material	P Steel					M Stainless steel					K Cast iron				
ISO	01	10	20	30	40	01	10	20	30	40	01	10	20	30	40
Lineup		1st recommendation PR1825					1st recommendation PR1835					1st recommendation PR1810			
		Wet PR1835					High-speed machining CA6535								

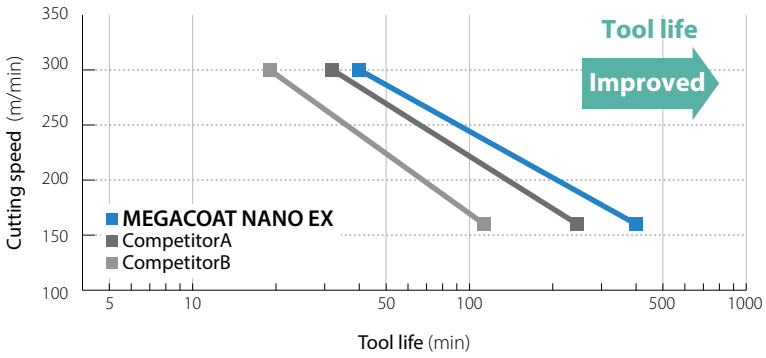
H Hard materials	PR015S (GH)	S Heat-resistant alloy	CA6535 (PR1835)	Titanium alloy	PR1835

PR1825 Wear resistance comparison (Internal evaluation)

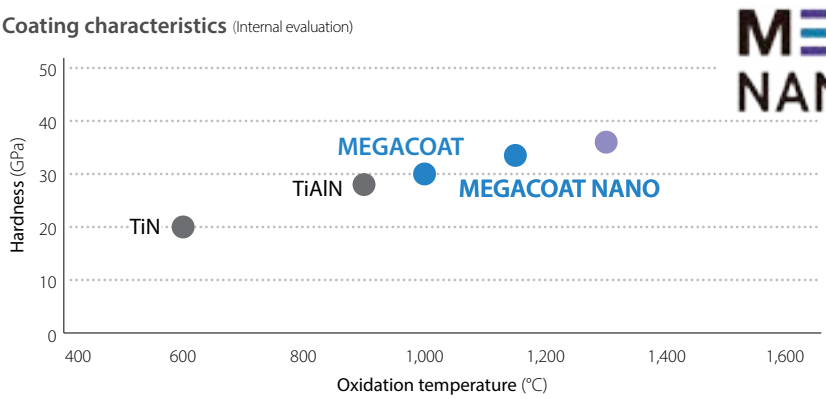
V-T graph

Life criteria:
Flank face wear = 0.10 mm

Cutting conditions:
Vc = 160 / 300 m/min
ap × ae = 2.0 × 110 mm, fz = 0.12 mm/t
42CrMo4 Dry
PNMU1205ANER-GM (MFPN)



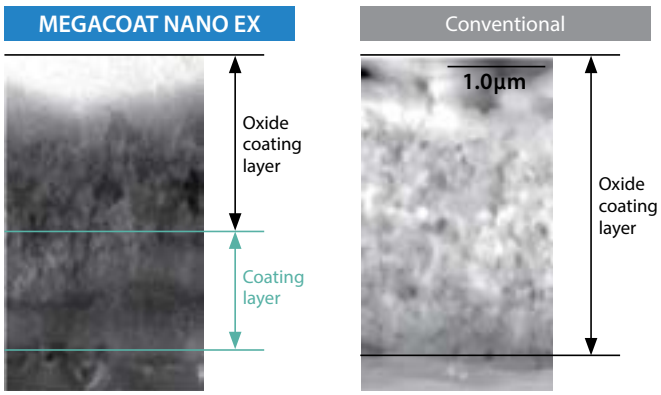
Coating characteristics (Internal evaluation)



MEGACOAT NANO EX | Milling

Oxidation progression comparison (Internal evaluation)

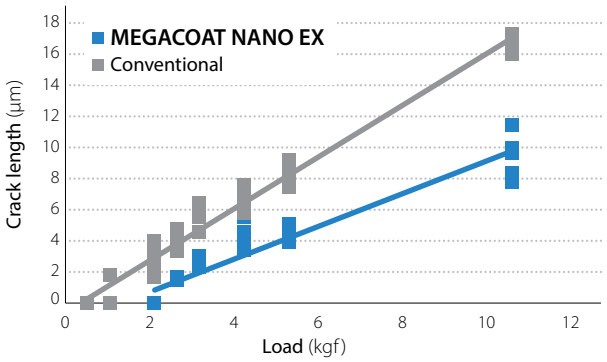
Suppresses oxidation progression with excellent oxidation resistance



*Section after holding at 1,200 degrees for 30 minutes in air

Coating layer toughness evaluation (Internal evaluation)

Excellent coating toughness with small crack length



*Micro-Vickers measurement

3 Achieve reliable results with an insert shape designed for high quality machining and long tool life

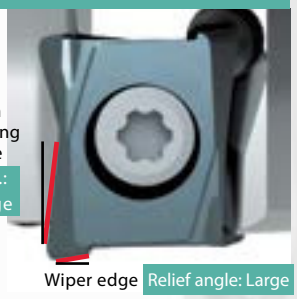
Unique cutting edge design delivers high fracture resistance and low cutting forces

Special wiper edge and peripheral grinding specifications provide high quality finish and long tool life

Advantage

Both the A.R. and the relief angle of the wiper edge are large.
Low resistance and excellent surface finish

MA90

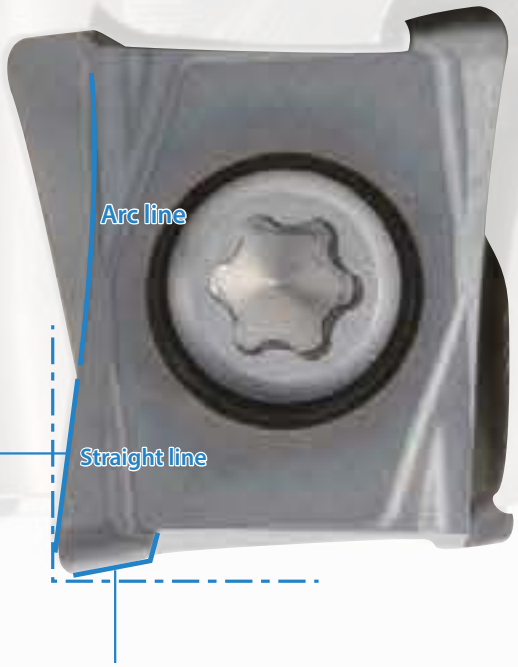


Conventional tangential type



Unique cutting edge design

Superior fracture resistance and low cutting force



Special wiper edge

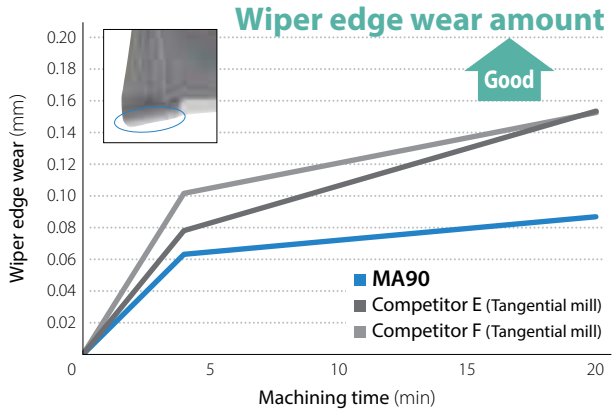
Large relief angle: Excellent surface finish and wear suppression
Stepped corners: Designed to prevent seat damage

Excellent Excellent surface finish

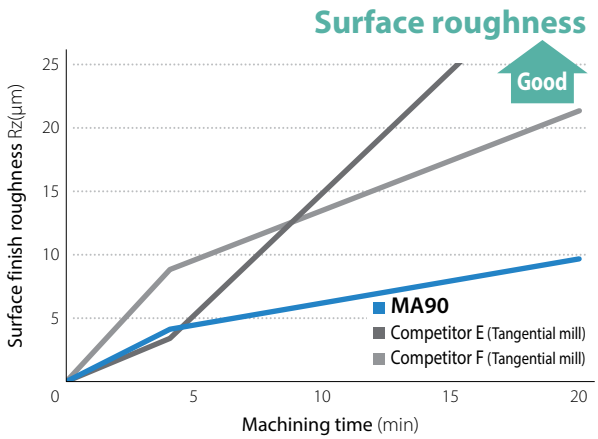
Special wiper edge design suppresses abrasion progress of the edge. Maintains high-quality finished surface

Wear and surface finish comparison (Internal evaluation)

Wiper edge wear



Surface finish roughness (Bottom surface)



Cutting conditions: Vc = 200 m/min, ap × ae = 1 × 37.5 mm, fz = 0.1/0.12 mm/t, Dry C50 ø50 (6/7 inserts) BT50

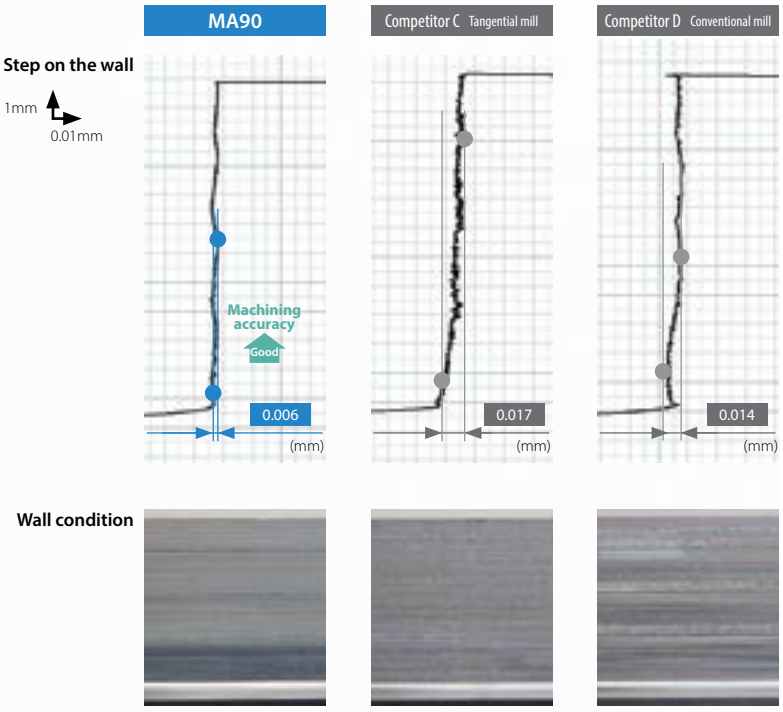
Excellent wall accuracy — Excellent

Peripheral grinding specifications

Unique, sloped, edge shape
Grounded peripheral provides higher precision



Wall accuracy comparison (Internal evaluation)



Cutting conditions: Vc = 150 m/min, ap × ae = 3 × 5 mm 4passes, fz = 0.1 mm/t, Dry C50 ø20 (3 inserts) BT50

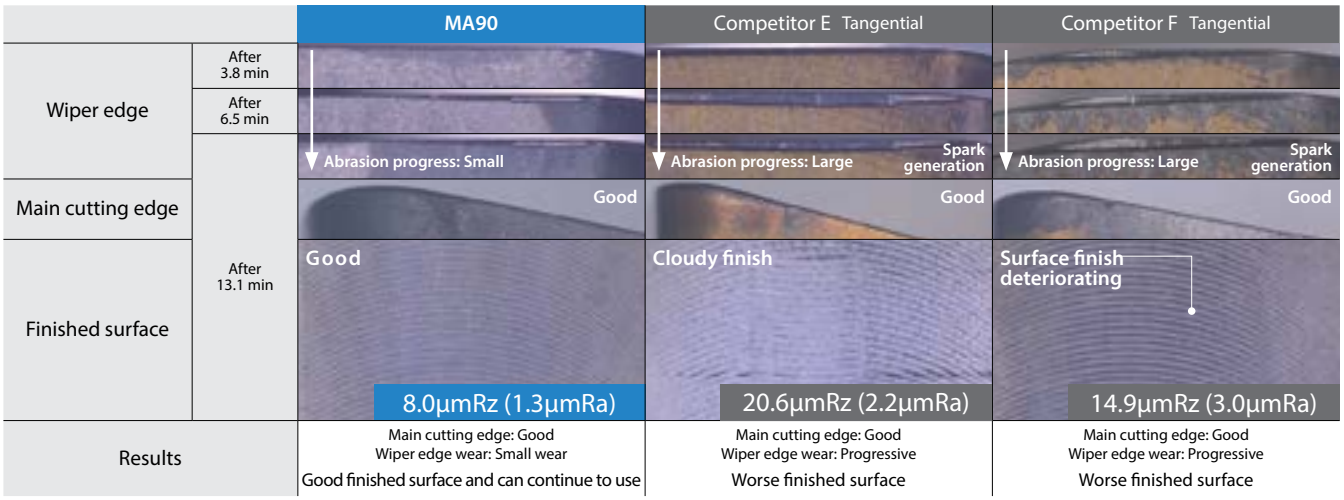
M
Milling

Long tool life and high-speed machining

CASE Even if the main cutting edge is in good condition, the tool reached the end of life due to deterioration of the finished surface. MA90

CASE Machined with reduced cutting speed because the surface finish deteriorated early. MA90

Edge condition and finished surface (Internal evaluation)



MA90 (End mill)



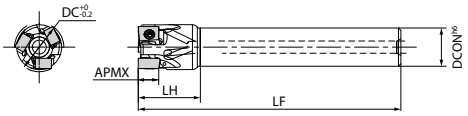


Fig. 1

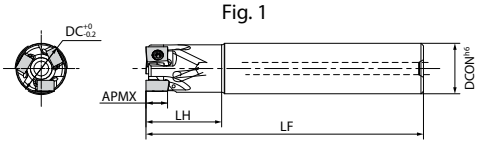


Fig. 2

Toolholder dimensions

		Description	Availability	Inserts	Dimension (mm) DC	DCON	LF	LH	APMX	Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Fig.	Spare parts: Anti-seize compound	Spare parts: Screw	Spare parts: Wrench	Applicable inserts
Cylindrical	Standard shank	MA90 -16S12-09T2C	●	2	16	12	100	23	8	Yes	29500	0.1	1	P-37	SB-44865UTRP	DTPM-8	LOGU0904...
		-18S16-09T2C	●	2	18	16	100	23	8	Yes	27900	0.1	1	P-37	SB-44865UTRP	DTPM-8	LOGU0904...
		-20S16-09T2C	●	2	20	16	110	26	8	Yes	26600	0.2	1	P-37	SB-44880UTRP	DTPM-8	LOGU0904...
		-20S16-09T3C	●	3	20	16	110	26	8	Yes	26600	0.2	1	P-37	SB-44880UTRP	DTPM-8	LOGU0904...
		-22S20-09T3C	●	3	22	20	120	29	8	Yes	25400	0.3	1	P-37	SB-44880UTRP	DTPM-8	LOGU0904...
		-25S20-09T3C	●	3	25	20	120	29	8	Yes	23900	0.3	1	P-37	SB-44880UTRP	DTPM-8	LOGU0904...
		-25S20-09T4C	●	4	25	20	120	29	8	Yes	23900	0.3	1	P-37	SB-44880UTRP	DTPM-8	LOGU0904...
		-28S25-09T3C	●	3	28	25	130	32	8	Yes	22600	0.5	1	P-37	SB-44880UTRP	DTPM-8	LOGU0904...
		-30S25-09T4C	●	4	30	25	130	32	8	Yes	21900	0.5	1	P-37	SB-44880UTRP	DTPM-8	LOGU0904...
		-32S25-09T4C	●	4	32	25	130	32	8	Yes	21200	0.5	1	P-37	SB-44880UTRP	DTPM-8	LOGU0904...
		-32S25-09T5C	●	5	32	25	130	32	8	Yes	21200	0.5	1	P-37	SB-44880UTRP	DTPM-8	LOGU0904...
		-35S32-09T4C	●	4	35	32	150	50	8	Yes	20300	0.9	1	P-37	SB-44880UTRP	DTPM-8	LOGU0904...
		-35S32-09T5C	●	5	35	32	150	50	8	Yes	20300	0.9	1	P-37	SB-44880UTRP	DTPM-8	LOGU0904...
		-40S32-09T4C	●	4	40	32	150	50	8	Yes	19000	1	1	P-37	SB-44880UTRP	DTPM-8	LOGU0904...
		-40S32-09T6C	●	6	40	32	150	50	8	Yes	19000	1	1	P-37	SB-44880UTRP	DTPM-8	LOGU0904...
		-50S32-09T5C	●	5	50	32	120	40	8	Yes	17000	0.9	1	P-37	SB-44880UTRP	DTPM-8	LOGU0904...
		-50S32-09T7C	●	7	50	32	120	40	8	Yes	17000	0.9	1	P-37	SB-44880UTRP	DTPM-8	LOGU0904...
	Same shank	MA90 -16S16-09T2C	●	2	16	16	100	26	8	Yes	29500	0.1	2	P-37	SB-44865UTRP	DTPM-8	LOGU0904...
		-20S20-09T2C	●	2	20	20	110	30	8	Yes	26600	0.2	2	P-37	SB-44880UTRP	DTPM-8	LOGU0904...
		-20S20-09T3C	●	3	20	20	110	30	8	Yes	26600	0.2	2	P-37	SB-44880UTRP	DTPM-8	LOGU0904...
		-25S25-09T3C	●	3	25	25	120	32	8	Yes	23900	0.4	2	P-37	SB-44880UTRP	DTPM-8	LOGU0904...
		-25S25-09T4C	●	4	25	25	120	32	8	Yes	23900	0.4	2	P-37	SB-44880UTRP	DTPM-8	LOGU0904...
		-32S32-09T4C	●	4	32	32	130	40	8	Yes	21200	0.7	2	P-37	SB-44880UTRP	DTPM-8	LOGU0904...
		-32S32-09T5C	●	5	32	32	130	40	8	Yes	21200	0.7	2	P-37	SB-44880UTRP	DTPM-8	LOGU0904...
	Long shank	MA90 -20S18-09T2CL	●	2	20	18	150	30	8	Yes	26600	0.3	1	P-37	SB-44880UTRP	DTPM-8	LOGU0904...
		-20S20-09T2CL	●	2	20	20	150	40	8	Yes	26600	0.3	2	P-37	SB-44880UTRP	DTPM-8	LOGU0904...
		-25S25-09T2CL	●	2	25	25	170	50	8	Yes	23900	0.6	2	P-37	SB-44880UTRP	DTPM-8	LOGU0904...
		-32S32-09T2CL	●	2	32	32	200	65	8	Yes	21200	1.1	2	P-37	SB-44880UTRP	DTPM-8	LOGU0904...

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Toolholder dimensions

Description				Availability	Inserts	Dimension (mm) DC	DCON	LF	LH	APMX	Coolant hole	Max. revolution (min^{-1})	Weight (kg)	Fig.	Spare parts: Anti-seize compound	Spare parts: Screw	Spare parts: Wrench	Applicable inserts
																		
Cylindrical	Standard shank	MA90	-25S20-12T2C	●	2	25	20	120	29	12	Yes	18300	0.3	1	P-37	SB-40104TRP	DTPM-15	LOGT1206... LOGU1206...
			-28S25-12T2C	●		28	25					17300	0.4					
			-30S25-12T2C	●		30		130	32			16800	0.5					
			-30S25-12T3C	●	3													
			-32S25-12T2C	●	2	32						16300						
			-32S25-12T3C	●	3													
			-35S32-12T3C	●		35	32	150	50			15600	0.9					
			-40S32-12T3C	●		40						14600						
			-40S32-12T4C	●	4													
			-50S32-12T4C	●		50		120	40			13100						
			-50S32-12T6C	●	6								0.8					
	Same shank	MA90	-25S25-12T2C	●	2	25	25	120	32	12	Yes	18300	0.4	2	P-37	SB-40104TRP	DTPM-15	LOGT1206... LOGU1206...
			-32S32-12T2C	●		32	32	130	40			16300	0.7					
			-32S32-12T3C	●	3													
	Long shank	MA90	-25S25-12T2CL	●	2	25	25	170	50	12	Yes	18300	0.6	2	P-37	SB-40104TRP	DTPM-15	LOGT1206... LOGU1206...
			-32S32-12T2CL	●		32	32	200	65			16300	1.1					

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

MA90 (Face mill)



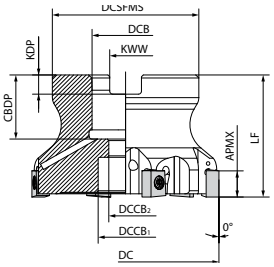


Fig. 1

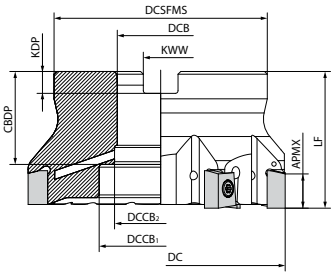


Fig. 2

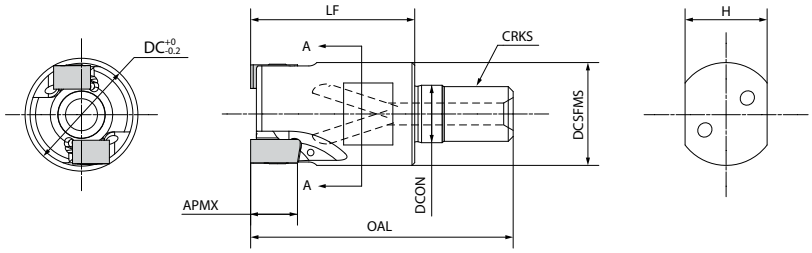
Toolholder dimensions

	Description		Availability	Inserts	Dimension (mm)										Coolant hole	Max. revolution (min^{-1})	Weight (kg)	Fig.	Spare parts			Applicable inserts
					DC	DCSFMS	DCB	DCCB1	DCCB2	LF	CBDP	KDP	KWW	APMX					Anti-seize compound	Screw	Wrench	
			R																			
Metric	MA90	-040R-09T4C-M	●	4	40	38	16	15	9	40	19	5.6	8.4	8	Yes	26600	0.2	1	P-37	SB-44880UTRP	DTPM-8	LOGU0904...
		-040R-09T6C-M	●	6																		
		-050R-09T5C-M	●	5	50	48	22	18	11		21	6.3	10.4			23900	0.4					
		-050R-09T7C-M	●	7																		
		-063R-09T6C-M	●	6	63											21200	0.5					
		-063R-09T9C-M	●	9													0.4					
	MA90	-040R-12T3C-M	●	3	40	38	16	14	9	40	19	5.6	8.4	12	Yes	14600	0.2	1	P-37	SB-40104TRP	DTPM-15	LOGT1206... LOGU1206...
		-040R-12T4C-M	●	4																		
		-050R-12T4C-M	●		50	48	22	18	11		21	6.3	10.4			13100	0.3					
		-050R-12T6C-M	●	6																		
		-063R-12T6C-M	●		63											11700	0.4					
		-063R-12T8C-M	●	8																		
		-080R-12T7C-M	●	7	80	70	27	20	13	50	24	7	12.4			10400	1.2					
		-080R-12T10C-M	●	10																		
		-100R-12T9C-M	●	9	100	78	32	45	-		30	8	14.4			9300	1.5	2				
		-100R-12T13C-M	●	13																		
		-125R-12T12C-M	●	12	125	89	40	55		63	33	9	16.4			8300	2.5					
		-125R-12T16C-M	●	16																		
Bore dia. inch spec	MA90	-080R-12T7C	●	7	80	70	25.4	20	13	50	27	6	9.5	12	Yes	10400	1.2	1	P-37	SB-40104TRP	DTPM-15	LOGT1206... LOGU1206...
		-080R-12T10C	●	10																		
		-100R-12T9C	●	9	100	78	31.75	45	-		34	8	12.7			9300	1.5	2				
		-100R-12T13C	●	13																		
		-125R-12T12C	●	12	125	89	38.1	55		63	38	10	15.9			8300	2.6					
		-125R-12T16C	●	16																		

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MA90 (Modular type)





Toolholder dimensions

Description		Availability	Inserts	Dimension (mm)								Coolant hole	Max. revolution (min^{-1})	Spare parts			Applicable inserts
				DC	DCON	DCSFMS	OAL	LF	APMX	CRKS	H			Anti-seize compound	Screw	Wrench	
MA90	-20M10-09T2C	●	2	20	10.5	18.8	48	30	8	M10×1.5	15	Yes	19000	P-37	SB-44880UTRP	DTPM-8	LOGU0904...
	-20M10-09T3C	●	3														
	-25M12-09T3C	●		25	12.5	23	56	35		M12×1.75	19		17000				
	-25M12-09T4C	●	4														
	-32M16-09T4C	●		32	17	30	62	40		M16×2.0	24		15100				
	-32M16-09T5C	●	5														
MA90	-25M12-12T2C	●	2	25	12.5	23	56	35	12	M12×1.75	19	Yes	18300	P-37	SB-40104TRP	DTPM-15	LOGT1206... LOGU1206...
	-32M16-12T2C	●		32	17	30	62	40		M16×2.0	24		16300				
	-32M16-12T3C	●	3														

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

LOGU

Classification of usage

★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice
(In case hardness is 45HRC or under)

Carbon steel / Alloy steel				★	☆	P
Mold and die steel				★	☆	P
Austenitic stainless steel				☆	★	M
Martensitic stainless steel	★				☆	M
Precipitation hardening stainless steel					★	M
Stainless steel						M
Gray cast iron			★			K
Nodular cast iron			★			K
Non-ferrous metals						N
Heat-resistant alloy	★				☆	S
Titanium alloy					★	S
Hard materials						H

Insert	Description	No. of edges	Dimension (mm) S	D1	RE	INSL	W1	BS	Carbide CVD CA6535	PVD PR015S	PVD PR1810	PVD PR1825	PVD PR1835	Applicable toolholder
 General purpose	LOGU 090404ER-GM	4	6.77	3.33	0.4	8.89	4.3	1.29	●		●	●	●	MA90-...-09T...
	LOGU 090408ER-GM	4	6.71	3.33	0.8	8.89	4.3	0.9	●		●	●	●	MA90-...-09T...
	LOGU 090412ER-GM	4	6.65	3.33	1.2	8.89	4.3	0.49	●		●	●	●	MA90-...-09T...
	LOGU 090416ER-GM	4	6.59	3.33	1.6	8.89	4.3	0.1	●		●	●	●	MA90-...-09T...
 Low cutting force	LOGU 090404ER-SM	4	6.77	3.33	0.4	8.89	4.3	1.29	●			●	●	MA90-...-09T...
	LOGU 090408ER-SM	4	6.71	3.33	0.8	8.89	4.3	0.89	●			●	●	MA90-...-09T...
	LOGU 090412ER-SM	4	6.65	3.33	1.2	8.89	4.3	0.49	●			●	●	MA90-...-09T...
	LOGU 090416ER-SM	4	6.59	3.33	1.6	8.89	4.3	0.1	●			●	●	MA90-...-09T...
 Tough edge	LOGU 090408ER-GH	4	6.71	3.33	0.8	8.89	4.3	0.9		●	●	●	●	MA90-...-09T...
 General purpose	LOGU 120604ER-GM	4	10.1	4.55	0.4	13.28	6.6	2.5	●		●	●	●	MA90-...-12T...
	LOGU 120608ER-GM	4	10.04	4.55	0.8	13.28	6.6	2.14	●		●	●	●	MA90-...-12T...
	LOGU 120612ER-GM	4	9.97	4.55	1.2	13.28	6.6	1.79	●		●	●	●	MA90-...-12T...
	LOGU 120616ER-GM	4	9.92	4.55	1.6	13.28	6.6	1.44	●		●	●	●	MA90-...-12T...
	LOGU 120620ER-GM	4	9.85	4.55	2	13.28	6.6	1.08	●		●	●	●	MA90-...-12T...
	LOGU 120624ER-GM	4	9.79	4.55	2.4	13.28	6.6	0.72	●		●	●	●	MA90-...-12T...
	LOGU 120630ER-GM	4	9.69	4.55	3	13.28	6.6	0.2	●		●	●	●	MA90-...-12T...
 General purpose (Single-sided)	LOGT 120640ER-GM	2	9.56	4.55	4	13.28	6.6	1.69	●		●	●	●	MA90-...-12T...
	LOGT 120650ER-GM	2	9.40	4.55	5	13.28	6.6	0.63	●		●	●	●	MA90-...-12T...
	LOGT 120660ER-GM	2	9.24	4.55	6	13.28	6.6	0.37	●		●	●	●	MA90-...-12T...
 Low cutting force	LOGU 120604ER-SM	4	10.1	4.55	0.4	13.28	6.6	2.5	●			●	●	MA90-...-12T...
	LOGU 120608ER-SM	4	10.04	4.55	0.8	13.28	6.6	2.14	●			●	●	MA90-...-12T...
	LOGU 120612ER-SM	4	9.97	4.55	1.2	13.28	6.6	1.79	●			●	●	MA90-...-12T...
	LOGU 120616ER-SM	4	9.92	4.55	1.6	13.28	6.6	1.44	●			●	●	MA90-...-12T...
	LOGU 120620ER-SM	4	9.85	4.55	2	13.28	6.6	1.08	●			●	●	MA90-...-12T...
	LOGU 120624ER-SM	4	9.79	4.55	2.4	13.28	6.6	0.72	●			●	●	MA90-...-12T...
	LOGU 120630ER-SM	4	9.69	4.55	3	13.28	6.6	0.2	●			●	●	MA90-...-12T...
 Tough edge	LOGU 120608ER-GH	4	10.16	4.55	0.8	13.25	6.6	2.26		●	●	●	●	MA90-...-12T...

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M
Milling
Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi-Function
Slot Mill
Ball-nose Radius
Others

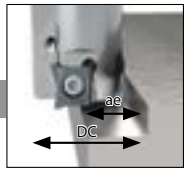
Recommended cutting conditions

Chipbreaker	Workpiece material	Toolholder description and Feed fz (mm/t)				Recommended insert grade (Cutting speed Vc: m/min)				
		09 Size (LOGU09...)		12 Size (LOG□12...)		CVD coated carbide	MEGACOAT HARD	MEGACOAT NANO EX		
		MA90-16~18	MA90-20~50 MA90-040~063	MA90-25~30	MA90-32~50 MA90-040~125	CA6535	PR015S	PR1810	PR1825	PR1835
GM	Carbon steel	0.05 ~ **0.1** ~ 0.14	0.05 ~ **0.1** ~ 0.16	0.05 ~ **0.1** ~ 0.18	0.06 ~ **0.15** ~ 0.23	-	-	-	★ 120 ~ **180** ~ 250	☆ 120 ~ **180** ~ 250
	Alloy steel	0.05 ~ **0.08** ~ 0.12	0.05 ~ **0.1** ~ 0.14	0.05 ~ **0.1** ~ 0.16	0.06 ~ **0.13** ~ 0.2	-	-	-	★ 100 ~ **160** ~ 220	☆ 100 ~ **160** ~ 220
	Mold steel	0.05 ~ **0.08** ~ 0.1	0.05 ~ **0.1** ~ 0.12	0.05 ~ **0.1** ~ 0.14	0.06 ~ **0.12** ~ 0.18	-	-	-	★ 80 ~ **140** ~ 180	☆ 80 ~ **140** ~ 180
	Stainless steel (Austenitic related)	0.05 ~ **0.08** ~ 0.1	0.05 ~ **0.1** ~ 0.12	0.05 ~ **0.1** ~ 0.14	0.06 ~ **0.12** ~ 0.18	-	-	-	☆ 100 ~ **160** ~ 200	★ 100 ~ **160** ~ 200
	Stainless steel (Martensitic related)	0.05 ~ **0.08** ~ 0.1	0.05 ~ **0.1** ~ 0.12	0.05 ~ **0.1** ~ 0.14	0.06 ~ **0.12** ~ 0.18	★ 180 ~ **240** ~ 300	-	-	-	☆ 150 ~ **200** ~ 250
	Stainless steel (Precipitation hardening)	0.05 ~ **0.08** ~ 0.1	0.05 ~ **0.1** ~ 0.12	0.05 ~ **0.1** ~ 0.14	0.06 ~ **0.12** ~ 0.18	-	-	-	-	★ 90 ~ **120** ~ 150
	Gray cast iron	0.05 ~ **0.1** ~ 0.14	0.05 ~ **0.1** ~ 0.16	0.05 ~ **0.1** ~ 0.18	0.06 ~ **0.15** ~ 0.23	-	-	☆ 120 ~ **180** ~ 250	-	-
	Nodular cast iron	0.05 ~ **0.08** ~ 0.1	0.05 ~ **0.1** ~ 0.12	0.05 ~ **0.1** ~ 0.14	0.06 ~ **0.12** ~ 0.18	-	-	☆ 100 ~ **150** ~ 200	-	-
	Ni-base heat-resistant alloys	0.05 ~ **0.06** ~ 0.08	0.05 ~ **0.08** ~ 0.1	0.05 ~ **0.08** ~ 0.12	0.06 ~ **0.1** ~ 0.15	★ 20 ~ **30** ~ 50	-	-	-	☆ 20 ~ **30** ~ 50
	Titanium alloys	0.05 ~ **0.08** ~ 0.1	0.05 ~ **0.09** ~ 0.12	0.05 ~ **0.09** ~ 0.12	0.06 ~ **0.1** ~ 0.15	-	-	-	-	☆ 30 ~ **50** ~ 70
SM	Carbon steel	0.05 ~ **0.08** ~ 0.11	0.05 ~ **0.1** ~ 0.14	0.05 ~ **0.1** ~ 0.14	0.06 ~ **0.1** ~ 0.18	-	-	-	★ 120 ~ **180** ~ 250	☆ 120 ~ **180** ~ 250
	Alloy steel	0.05 ~ **0.07** ~ 0.1	0.05 ~ **0.08** ~ 0.12	0.05 ~ **0.08** ~ 0.12	0.06 ~ **0.1** ~ 0.14	-	-	-	★ 100 ~ **160** ~ 220	☆ 100 ~ **160** ~ 220
	Mold steel	0.05 ~ **0.07** ~ 0.1	0.05 ~ **0.08** ~ 0.1	0.05 ~ **0.08** ~ 0.12	0.06 ~ **0.1** ~ 0.14	-	-	-	★ 80 ~ **140** ~ 180	☆ 80 ~ **140** ~ 180
	Stainless steel (Austenitic related)	0.05 ~ **0.08** ~ 0.11	0.05 ~ **0.08** ~ 0.12	0.05 ~ **0.08** ~ 0.12	0.06 ~ **0.1** ~ 0.14	-	-	-	☆ 100 ~ **160** ~ 200	★ 100 ~ **160** ~ 200
	Stainless steel (Martensitic related)	0.05 ~ **0.08** ~ 0.11	0.05 ~ **0.08** ~ 0.12	0.05 ~ **0.08** ~ 0.12	0.06 ~ **0.1** ~ 0.14	★ 180 ~ **240** ~ 300	-	-	-	☆ 150 ~ **200** ~ 250
	Stainless steel (Precipitation hardening)	0.05 ~ **0.08** ~ 0.11	0.05 ~ **0.08** ~ 0.12	0.05 ~ **0.08** ~ 0.12	0.06 ~ **0.1** ~ 0.14	-	-	-	-	★ 90 ~ **120** ~ 150
	Ni-base heat-resistant alloys	0.05 ~ **0.06** ~ 0.08	0.05 ~ **0.08** ~ 0.1	0.05 ~ **0.08** ~ 0.1	0.06 ~ **0.08** ~ 0.12	★ 20 ~ **30** ~ 50	-	-	-	☆ 20 ~ **30** ~ 50
	Titanium alloys	0.05 ~ **0.08** ~ 0.1	0.05 ~ **0.08** ~ 0.12	0.05 ~ **0.08** ~ 0.12	0.06 ~ **0.09** ~ 0.12	-	-	-	-	★ 30 ~ **50** ~ 70
GH	Carbon steel	0.05 ~ **0.1** ~ 0.14	0.05 ~ **0.1** ~ 0.16	0.05 ~ **0.1** ~ 0.18	0.06 ~ **0.15** ~ 0.23	-	-	-	★ 120 ~ **180** ~ 250	☆ 120 ~ **180** ~ 250
	Alloy steel	0.05 ~ **0.08** ~ 0.12	0.05 ~ **0.1** ~ 0.14	0.05 ~ **0.1** ~ 0.16	0.06 ~ **0.13** ~ 0.2	-	-	-	★ 100 ~ **160** ~ 220	☆ 100 ~ **160** ~ 220
	Mold steel	0.05 ~ **0.08** ~ 0.1	0.05 ~ **0.1** ~ 0.12	0.05 ~ **0.1** ~ 0.14	0.06 ~ **0.12** ~ 0.18	-	-	-	★ 80 ~ **140** ~ 180	☆ 80 ~ **140** ~ 180
	Stainless steel (Austenitic related)	0.05 ~ **0.08** ~ 0.1	0.05 ~ **0.1** ~ 0.12	0.05 ~ **0.1** ~ 0.14	0.06 ~ **0.12** ~ 0.18	-	-	-	☆ 100 ~ **160** ~ 200	☆ 100 ~ **160** ~ 200
	Stainless steel (Martensitic related)	0.05 ~ **0.08** ~ 0.1	0.05 ~ **0.1** ~ 0.12	0.05 ~ **0.1** ~ 0.14	0.06 ~ **0.12** ~ 0.18	-	-	-	-	☆ 150 ~ **200** ~ 250
	Stainless steel (Precipitation hardening)	0.05 ~ **0.08** ~ 0.1	0.05 ~ **0.1** ~ 0.12	0.05 ~ **0.1** ~ 0.14	0.06 ~ **0.12** ~ 0.18	-	-	-	-	☆ 90 ~ **120** ~ 150
	Gray cast iron	0.05 ~ **0.1** ~ 0.14	0.05 ~ **0.1** ~ 0.16	0.05 ~ **0.1** ~ 0.18	0.06 ~ **0.15** ~ 0.23	-	-	★ 120 ~ **180** ~ 250	-	-
	Nodular cast iron	0.05 ~ **0.08** ~ 0.1	0.05 ~ **0.1** ~ 0.12	0.05 ~ **0.1** ~ 0.14	0.06 ~ **0.12** ~ 0.18	-	-	★ 100 ~ **150** ~ 200	-	-
	Ni-base heat-resistant alloys	0.05 ~ **0.06** ~ 0.08	0.05 ~ **0.08** ~ 0.1	0.05 ~ **0.08** ~ 0.12	0.06 ~ **0.1** ~ 0.15	-	-	-	-	☆ 20 ~ **30** ~ 50
	Titanium alloys	0.05 ~ **0.08** ~ 0.1	0.05 ~ **0.09** ~ 0.12	0.05 ~ **0.09** ~ 0.12	0.06 ~ **0.1** ~ 0.15	-	-	-	-	☆ 30 ~ **50** ~ 70

★: 1st Recommendation ☆: 2nd Recommendation

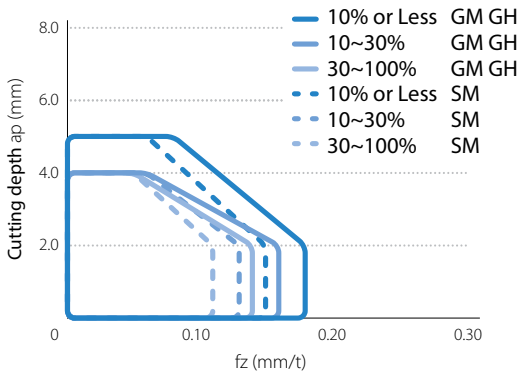
* The bold-faced number indicates a center value of recommended cutting condition. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.
* Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys. When choosing wet machining for other workpiece materials, reduce the cutting speed to 70% or less.
* Face milling does not recommend slotting or pocketing. We recommend setting the ae to 75% or less. We recommend the small number insert type for ae of 30% or more.
* Working above recommended conditions or long-term use can damage the screws. It is recommended to replace the screws regularly.
* Ramping and Helical milling are not recommended if the corner R is R4.0/R5.0/R6.0.

Cutting Performance

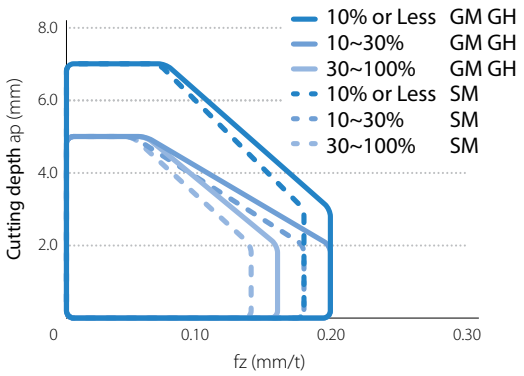


09 Size (LOGU09...) Machining for Steel (Dry)

Cutting Dia. DC : ø16 ~ ø18



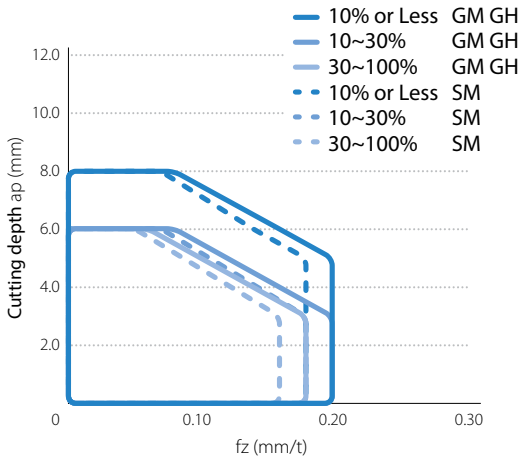
Cutting Dia. DC : ø20 ~ ø63



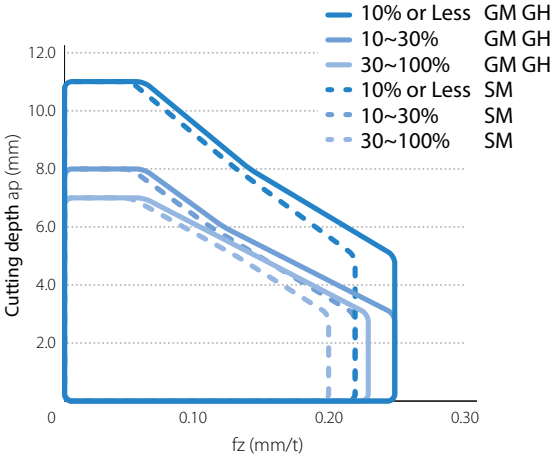
For other workpiece material, set ap and fz appropriately for each ae.

12 Size (LOG□12...) Machining for Steel (Dry)

Cutting Dia. DC : ø25 ~ ø30



Cutting Dia. DC : ø32 ~ ø125



For other workpiece material, set ap and fz appropriately for each ae.

Case studies

Brake parts GGG50

Vc = 135 m/min
n = 535 min^{-1}
ap x ae = 3.4 x 25 mm
fz = 0.15 mm/t
Vf = 560 mm/min
Wet
MA90-080R-12T7C-M
LOGU120616ER-GM (PR1810)



Number of Workpieces

Tool life x1.6

MA90 (7 inserts) **1,000 pcs**

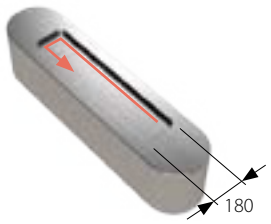
Competitor G (7 inserts) **600 pcs**

MA90 showed good cutting edge condition and stable machining. Achieved 1.6 times longer tool life.

(User evaluation)

Mold parts Stainless steel

Vc = 125 m/min
n = 1,600 min^{-1}
ap x ae = 1.0 x 25 mm
fz = 0.12 mm/t
Vf = 570 mm/min
Dry
MA90-25S20-09T3C
LOGU090408ER-GM (PR1835)



Machining efficiency

Machining efficiency x1.5

MA90 (3 inserts) **Q = 14.5 cc/min**

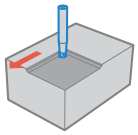
Competitor H (3 inserts) **Q = 9.5 cc/min**

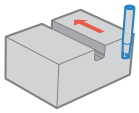
MA90 showed 1.5 times higher machining efficiency than its competitors. Improved tool life (3 to 4 pcs)

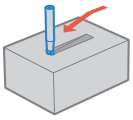
(User evaluation)

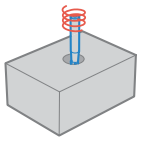
Notes

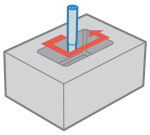
Applications

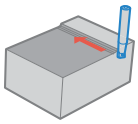

Face milling & Shouldering

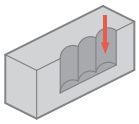

Slotting


Ramping


Helical milling


Pocketing


Contouring


Plunging

Ramping reference table

Description	Cutter diameter DC (mm)	16	20	25	32	40	50
MA… - 09 - …	Max. ramping angle RMPX	1.16°	0.97°	0.64°	0.4°	0.23°	0.11°
	tan RMPX	0.020	0.017	0.011	0.007	0.004	0.002
Description	Cutter diameter DC (mm)	25	28	30	32	35	40
MA… - 12 - …	Max. ramping angle RMPX	2°	1.7°	1.6°	1.5°	1.2°	1°
	tan RMPX	0.034	0.030	0.027	0.026	0.021	0.017

Decrease the angle of inclination when the chips extend longer.
Ramping is not recommended if the corner R is R4.0/R5.0/R6.0.

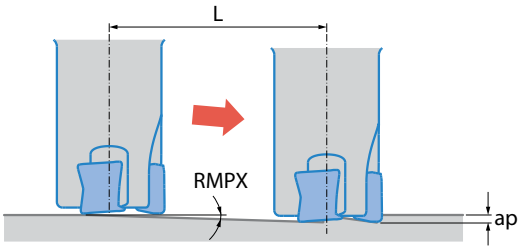
Guide for Ramping

Ramping angle should be under RMPX.
Reduce recommended feed rate by 70%

Formula of the cutting length "L" at Max. ramping angle

$$L = \frac{ap}{\tan RMPX}$$

Ramping is not recommended if the corner R is R4.0/R5.0/R6.0.

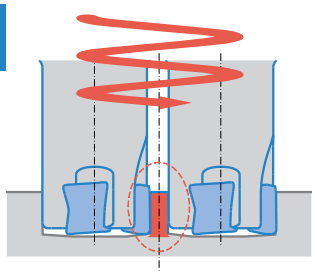


Guide for Helical milling

For helical milling, use between Min. cutting dia. and Max. cutting dia.

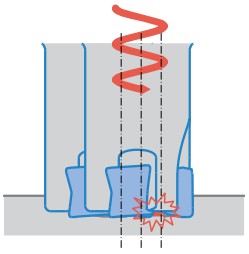
Exceeding Max. cutting dia.

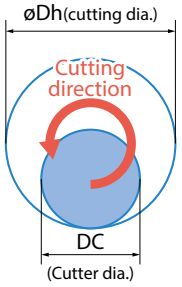
Center core part remains after machining



Under Min. cutting dia.

Center core part interferes with toolholder





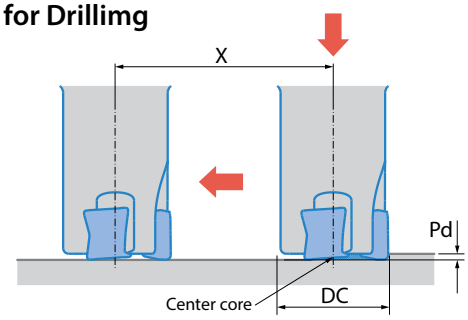
Unit : mm

Description	Min. cutting dia. øDh1	Max. cutting dia. øDh2
MA… - 09 - …	2×DC-4	2×DC-2
MA… - 12 - …	2×DC-6	2×DC-2

Helical milling is not recommended if the corner R is R4.0/R5.0/R6.0.

For helical milling, use between min. cutting dia. and max. cutting dia.
The cutter direction should be counterclockwise (down cut) (see above).
Please machining in a safe environment as long chips may be produced..

Guide for Drillimg

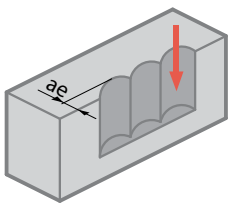


Unit : mm

Description	Max. cutting depth Pd	Min. cutting length X for flat bottom surface
MA… - 09 - …	0.25	DC-3
MA… - 12 - …	0.5	DC-5

It is recommended to reduce feed by 25% of recommendation until the center core is removed when traversing after drilling.

Guide for Plunging



Available for vertical milling (plunging)
Feed should be set within fz = 0.1 (mm/t) when plunging.

Unit : mm

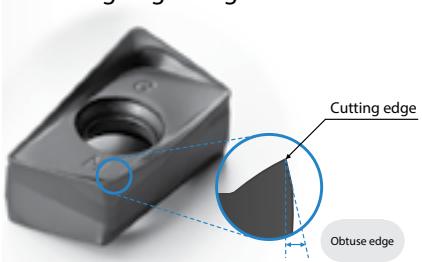
Description	Maximum width of cut (ae)
MA… - 09 - …	2
MA… - 12 - …	3

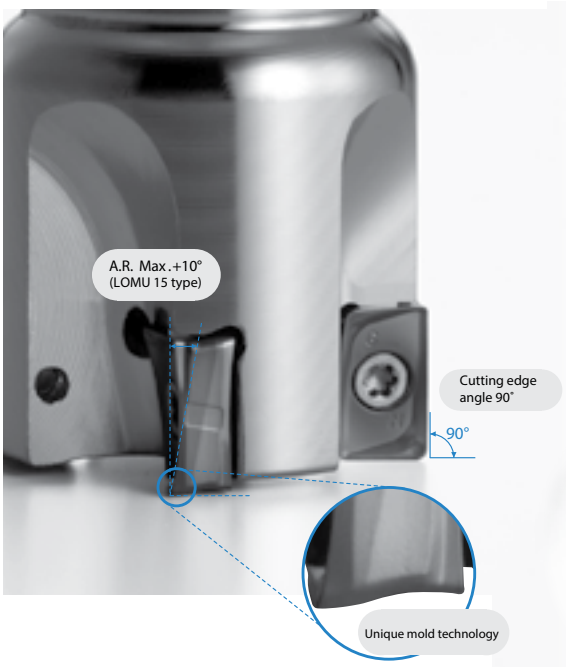
Double-sided 4-edge insert

MEW

Kyocera's unique mold technology reduces cutting force equivalent to positive inserts

Obtuse edge increases cutting edge toughness

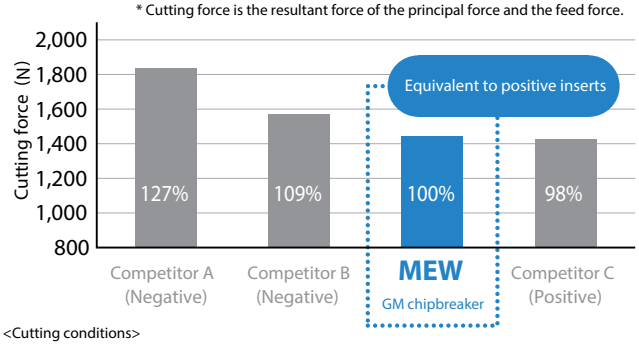




Low cutting force equivalent to positive inserts

Cutting force comparison (Internal evaluation)

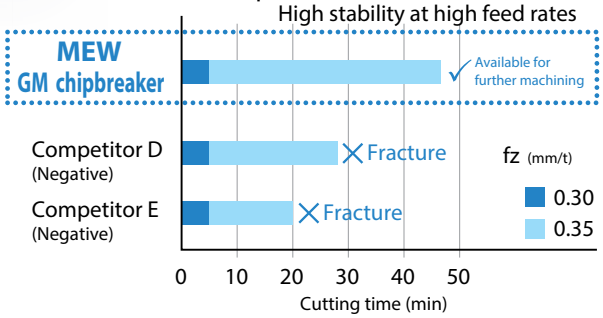
* Cutting force is the resultant force of the principal force and the feed force.



<Cutting conditions>
Vc=150m/min apxae=3x15mm fz=0.15mm/t C50 Cutting dia. ø20

Fracture resistance comparison (Internal evaluation)

High stability at high feed rates



<Cutting conditions>
Vc=120m/min apxae=3x10mm fz=0.3~0.35mm/t
42CrMo4 (37~39HS) Cutting dia. ø20

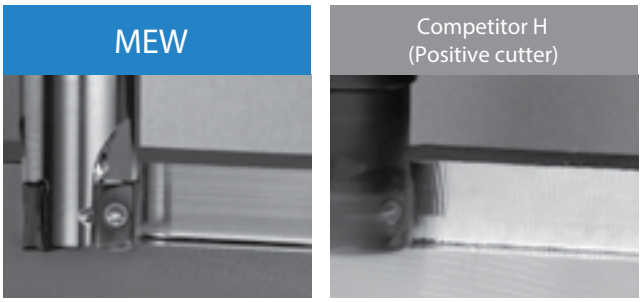
Improved surface finish, minimizing chattering

Sharp cutting and superior resistance to chattering and burrs with helical cutting edge and optimum axial rake design

MEW GM chipbreaker	Competitor F (Negative)	Competitor G (Positive)
+20°	+17°	+17°

Large actual rake angle lowers cutting force

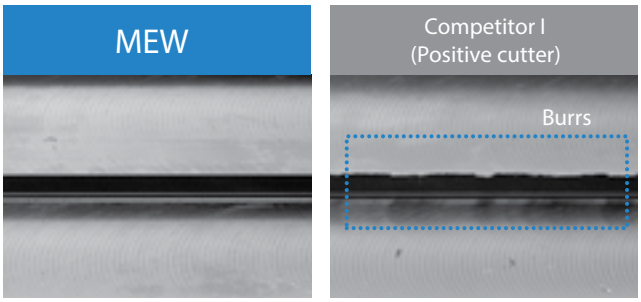
Surface of shoulder wall (Internal evaluation)



Smooth surface of MEW without chattering

<Cutting conditions>
Vc=240m/min apxae= 4 (3passes) x5mm fz=0.12mm/t Dry SS400 Cutting dia. ø20

Burr comparison with positive cutters (Internal evaluation)



Sharp cutting enables less burrs than positive cutters

<Cutting conditions>
Vc=250m/min apxae=4x5mm fz=0.1mm/t Dry C50 Cutting dia. ø20

Long tool life by MEGACOAT NANO technology

Stable and longer tool life by special nano coating layer "MEGACOAT NANO EX"

PR1825
For steel and stainless steel (austenitic related)

PR1810
For cast iron

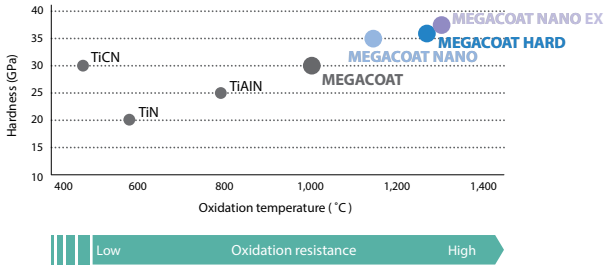
PR1835(PR1535)
For heat-resistant alloys, titanium and stainless steel (precipitation hardening)

CA6535
CVD coated carbide for heat-resistant alloys and stainless steel (martensitic)

PDL025
DLC coated carbide for non-ferrous metals

GW25
Carbide for non-ferrous metals

Properties of coating



Prevents wear and fracture with high hardness (35GPa) and superior oxidation resistance (Oxidation temperature: 1,150˚C)

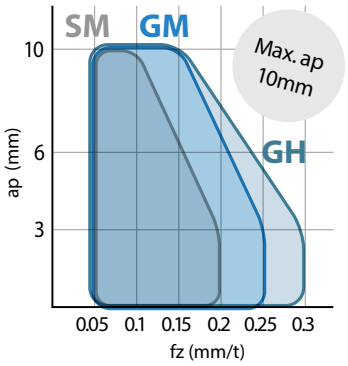
PR015S
MEGACOAT HARD for hard materials

Various chipbreaker lineup

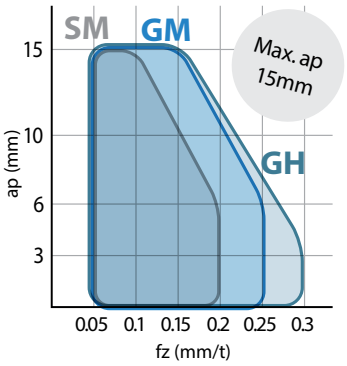
Newly developed 4 chipbreakers for various applications
Applicable to a wide range of application

Chipbreaker	Applications	Insert
GM	General purpose	
SM	Low cutting force	
GH	For heavy milling	
AM	For non-ferrous metals	

LOMU 10 type



LOMU 15 type



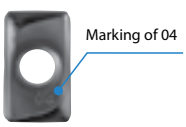
<Cutting conditions> Vc=150m/min ae=DC/2mm Workpiece material: C50


Chips (Slotting)

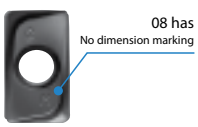

Chips (Shouldering)

Lineup of corner-R(RE)

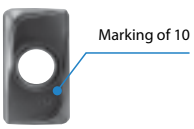
Corner-R(RE) 0.4 ,1.0 ,1.2 ,1.6 and 2.0 added to GM chipbreaker lineup



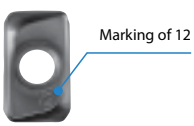
LOMU100404ER-GM
LOMU150504ER-GM



LOMU100408ER-GM
LOMU150508ER-GM



LOMU150510ER-GM



LOMU100412ER-GM
LOMU150512ER-GM



LOMU100416ER-GM
LOMU150516ER-GM



LOMU100420ER-GM
LOMU150520ER-GM

MEW



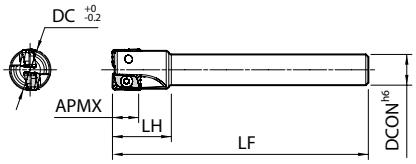


Fig. 1

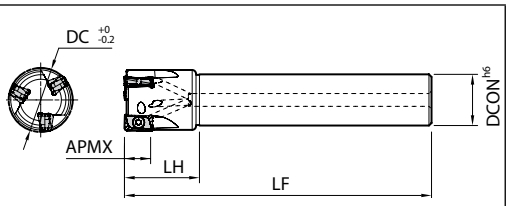


Fig. 2

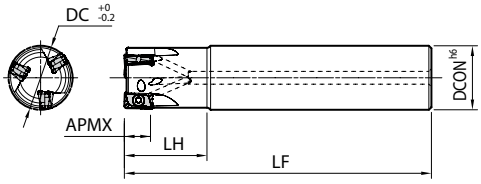


Fig. 3

Toolholder dimensions

		Description		Availability	Inserts	Dimension (mm) DC	DCON	LF	LH	APMX	A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Fig.	Spare parts: Anti-seize compound	Screw	Wrench	Applicable inserts ➡ M81
Cylindrical	Standard shank	MEW	16-S12-10-2T	●	2	16	12	100	23	10	+7	-22	No	43750	1	P-37	SB-3065TRP	DTPM-8	LOGT1004... LOMU1004...
			18-S16-10-2T	●		18	16		25			-21	Yes	43000	2				
			20-S16-10-2T	●		20		110	26			-20		41000	2				
			22-S20-10-3T	●	3	22	20							39600	2				
			25-S20-10-3T	●		25		120	29					37500	2				
			28-S25-10-3T	●		28	25							35800	2				
			30-S25-10-4T	●	4	30		130	32					34800	2				
			32-S25-10-4T	●		32								33900	2				
			40-S32-10-5T	●	5	40	32	150	50			-19		30000	2				
			50-S32-10-5T	●		50		120	40					22500	2				
	Same shank	MEW	16-S16-10-2T	●	2	16	16	100	26	10	+7	-22	Yes	43750	3	P-37	SB-3065TRP	DTPM-8	LOGT1004... LOMU1004...
			20-S20-10-2T	●		20	20	110	30			-20		41000	3				
			20-S20-10-3T	●	3										3				
			25-S25-10-2T	●	2	25	25	120	32					37500	3				
			25-S25-10-3T	●	3										3				
			32-S32-10-3T	●		32	32	130	40					33900	3				
			32-S32-10-4T	●	4										3				
	Long shank	MEW	20-S20-10-150-2T	●	2	20	20	150	40	10	+7	-20	Yes	41000	3	P-37	SB-3065TRP	DTPM-8	LOGT1004... LOMU1004...
			25-S25-10-170-2T	●		25	25	170	50					37500	3				
	Standard shank	MEW	25-S20-15-2T	●	2	25	20	120	29	15	+10	-22	Yes	35000	2	P-37	SB-4090TRP	DTPM-15	LOGT1505... LOMU1505...
			32-S25-15-2T	●		32	25	130	32					30000	2				
			40-S32-15-3T	●	3	40	32	150	50			-21		25000	2				
			40-S32-15-4T	●	4										2				
			50-S32-15-4T	●		50		120	40					17000	2				
	Same shank	MEW	25-S25-15-2T	●	2	25	25	120	32	15	+10	-22	Yes	35000	3	P-37	SB-4090TRP	DTPM-15	LOGT1505... LOMU1505...
			32-S32-15-2T	●		32	32	130	40					30000	3				
			32-S32-15-3T	●	3										3				

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MEW



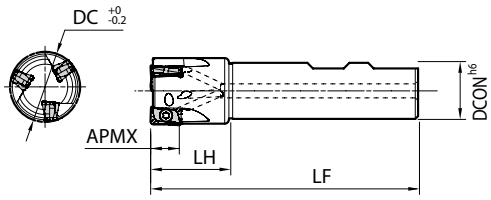


Fig. 1

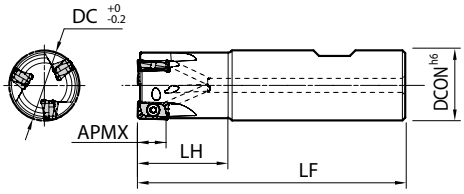


Fig. 2

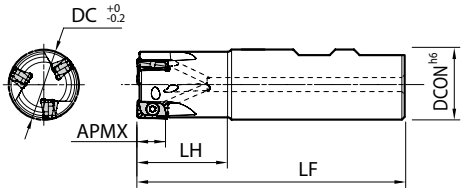


Fig. 3

Toolholder dimensions

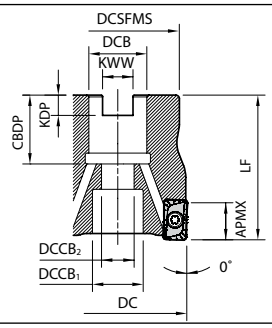
Description				Availability	Inserts	Dimension (mm)					A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Fig.	Spare parts			Applicable inserts ➡ M81
						DC	DCON	LF	LH	APMX						Anti-seize compound	Screw	Wrench	
Weldon	Standard shank	MEW	40-W32-10-5T	MTO	5	40	32	111	50	10	+7	-19	Yes	30000	1	P-37	SB-3065TRP	DTPM-8	LOGT1004... , LOMU1004...
		MEW	40-W32-15-4T	MTO	4	40	32	111	50	15	+10	-21	Yes	25000	1	P-37	SB-4090TRP	DTPM-15	LOGT1505... , LOMU1505...
	Same Shank	MEW	16-W16-10-2T	MTO	2	16	16	75	25	10	+7	-22	Yes	43750	2	P-37	SB-3065TRP	DTPM-8	LOGT1004... LOMU1004...
			20-W20-10-2T	MTO		20	20	77				-20		41000	2				
			20-W20-10-3T	MTO	3										2				
			25-W25-10-3T	MTO		25	25	90	32					37500	3				
			32-W32-10-4T	MTO	4	32	32	102	40					33900	3				
		MEW	25-W25-15-2T	MTO	2	25	25	90	32	15	+10	-22	Yes	35000	3	P-37	SB-4090TRP	DTPM-15	LOGT1505... LOMU1505...
			32-W32-15-3T	MTO	3	32	32	102	40					30000	3				

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

MEW





Toolholder dimensions

Description		Availability	Inserts	Dimension (mm)									A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Applicable inserts ⇒ M81
		R		DC	DCSFMS	DCB	$DCCB_1$	$DCCB_2$	LF	CBDP	KDP	KWW	APMX						
MEW	032R-10-4T-M	●	4	32	30	16	14	9	35	19	5.6	8.4	10	+7	-20	Yes	33900	0.1	LOGT1004... LOMU1004...
	040R-10-5T-M	●	5	40	34				40						-19		30000	0.2	
	050R-10-5T-M	●		50	45	22	18	11		21	6.3	10.4					22500	0.4	
	063R-10-6T-M	●	6	63	47												20500	0.5	
MEW	040R-15-4T-M	●	4	40	34	16	14	9	40	19	5.6	8.4	15	+10	-21	Yes	25000	0.2	LOGT1505... LOMU1505...
	050R-15-4T-M	●		50	45	22	18	11		21	6.3	10.4					17000	0.3	
	063R-15-5T-M	●	5	63	47												14500	0.5	
	080R-15-6T-M	●	6	80	60	27	20	13	50	25	7	12.4			-20		12000	1	
	080R-15-6T	●				25.4				27	6	9.5							

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Spare parts and applicable inserts (End mill/face mill)

Description		Spare parts				Applicable inserts ⇒ M81			
		Clamp screw	Wrench	Anti-seize compound	Mounting bolt	General purpose	Low cutting force	Tough edge (For heavy milling)	Non-ferrous metals
MEW	...-10-_T	SB-3065TRP	DTPM-8	P-37	-	LOMU10...-GM	LOMU10...-SM	LOMU10...-GH	LOGT10...-AM
MEW	032R-10_-M				HH8X25				
	040R-10_-M	Recommended tightening torque for insert clamp 1.2N·m							
	050R-10_-M				HH10X30				
	063R-10_-M								
MEW	...-15-_T	SB-4090TRP	DTPM-15	P-37	-	LOMU15...-GM	LOMU15...-SM	LOMU15...-GH	LOGT15...-AM
MEW	040R-15_-M				HH8X25				
	050R-15_-M	Recommended tightening torque for insert clamp 3.5N·m			HH10X30				
	063R-15_-M								
	080R-15_(-M)				HH12X35				

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

About wrench specifications

Wrenches and clamp screws are "Torx Plus".
1. Ref. to Fig. 1 for "Torx Plus" Wrench. (Purple grip)
2. Ref. to Fig. 2 for "Torx" Wrench. (Black grip)
A "Torx Plus" Wrench and a "Torx" Wrench have different top shapes.
Please use a "Torx Plus" Wrench.
* If a "Torx" Wrench is used to tighten, the screw head might become damaged and then the screw cannot be removed.

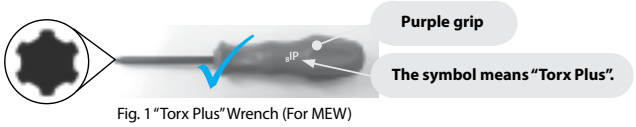


Fig. 1 "Torx Plus" Wrench (For MEW)

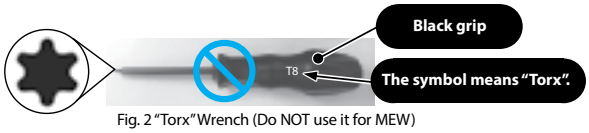
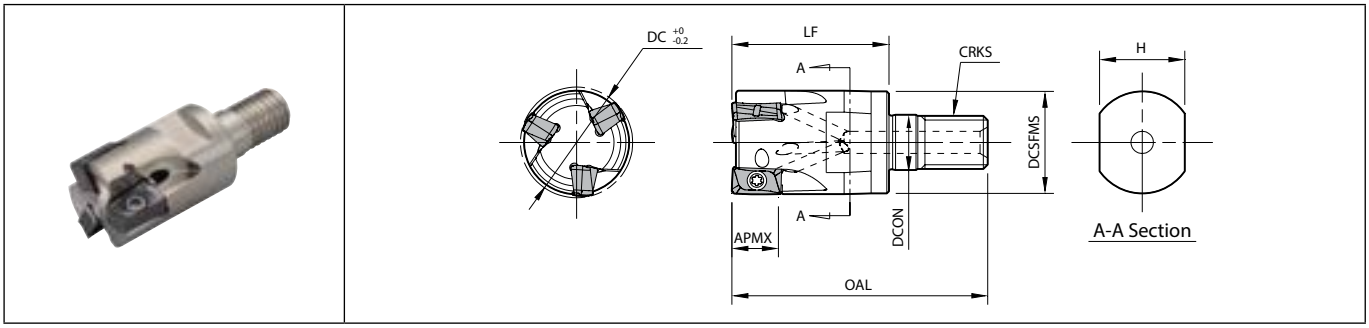


Fig. 2 "Torx" Wrench (Do NOT use it for MEW)

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MEW



Toolholder dimensions

Description		Availability	Inserts	Dimension (mm) DC	DCON	DCSFMS	OAL	LF	APMX	CRKS	H	A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Applicable inserts ➡ M81
MEW	16-M08-10-2T	●	2	16	8.5	14.7	42	25	10	M8x1.25	12	+7	-22	Yes	43750	LOGT1004... LOMU1004...
	20-M10-10-2T	●	2	20	10.5	18.7	48	30	10	M10x1.5	15	+7	-20	Yes	41000	LOGT1004... LOMU1004...
	20-M10-10-3T	●	3	20	10.5	18.7	48	30	10	M10x1.5	15	+7	-20	Yes	41000	LOGT1004... LOMU1004...
	25-M12-10-3T	●	3	25	12.5	23	56	35	10	M12x1.75	19	+7	-20	Yes	37500	LOGT1004... LOMU1004...
	32-M16-10-4T	●	4	32	17	30	62	40	10	M16x2.0	24	+7	-20	Yes	33900	LOGT1004... LOMU1004...
MEW	25-M12-15-2T	●	2	25	12.5	23	56	35	15	M12x1.75	19	+10	-22	Yes	35000	LOGT1505... LOMU1505...
	32-M16-15-3T	●	3	32	17	30	62	40	15	M16x2.0	24	+10	-22	Yes	30000	LOGT1505... LOMU1505...

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
See page **M82** for applicable arbor (BT arbor for exchangeable head / double-face clamping spindle)

Spare parts and applicable inserts (MEW modular type)

Description		Spare parts: Clamp screw	Wrench	Anti-seize compound	Applicable inserts ➡ M81: General purpose	Low cutting force	Tough edge (For heavy milling)	Non-ferrous metals
MEW	16-M08-10-2T	SB-3065TRP	DTPM-8	P-37	LOMU10...-GM	LOMU10...-SM	LOMU10...-GH	LOGT10...-AM
	20-M10-10-2T							
	20-M10-10-3T							
	25-M12-10-3T							
	32-M16-10-4T	Recommended tightening torque for insert clamp 1.2N·m						
MEW	25-M12-15-2T	SB-4090TRP	DTPM-15	P-37	LOMU15...-GM	LOMU15...-SM	LOMU15...-GH	LOGT15...-AM
	32-M16-15-3T	Recommended tightening torque for insert clamp 3.5N·m						

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

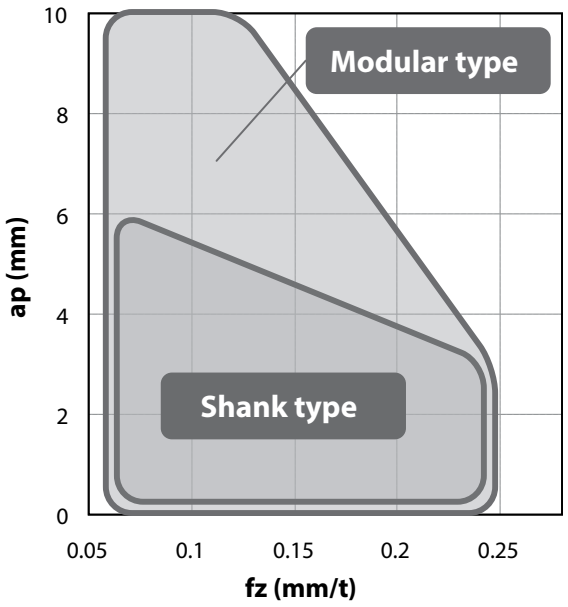
Modular end mill head identification system

MEW	16	-	M08	-	10	-	2T
Series	Cutting dia.		Thread size for clamping		Insert size		No. of inserts

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Feature of modular type

Applicable to a wide range of applications



<Cutting conditions>

- Cutting speed: Vc=150m/min (n=2,390min^{-1})
- Width of cut: ae=10mm (Shouldering)
- Workpiece material: C55,Dry
- **Machine: BT30 M/C**

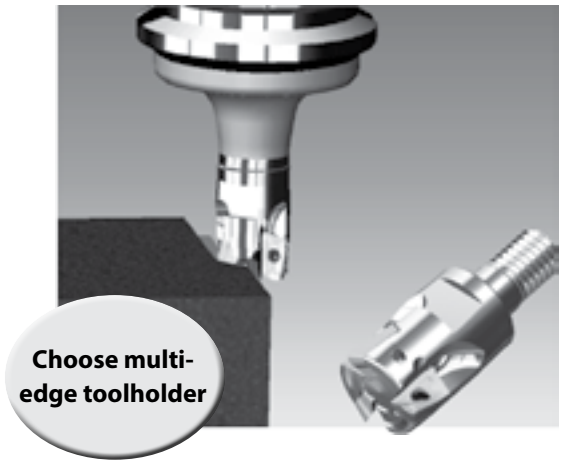
<Cutting tool>

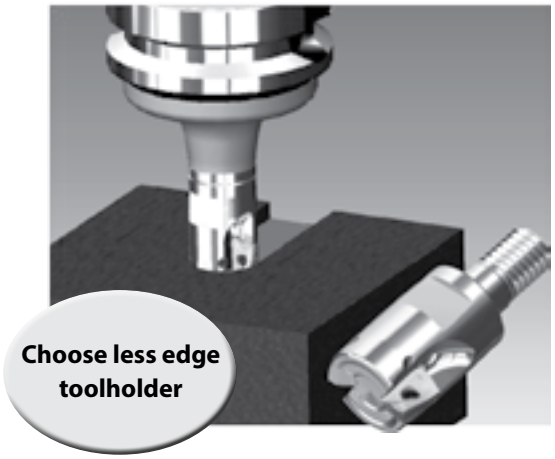
- Modular type
  - Head: MEW20-M10-10-3T
  - Arbor: BT30K-M10-45
  - Insert: LOMU100408ER-GM (PR1525)
- Shank type
  - Toolholder: MEW20-S20-10-3T
  - Arbor: BT30 Milling Chuck (Double-face clamping)
  - Insert: LOMU100408ER-GM (PR1525)

A wide range of applications even in BT30 M/C with the superior anti-chattering performance

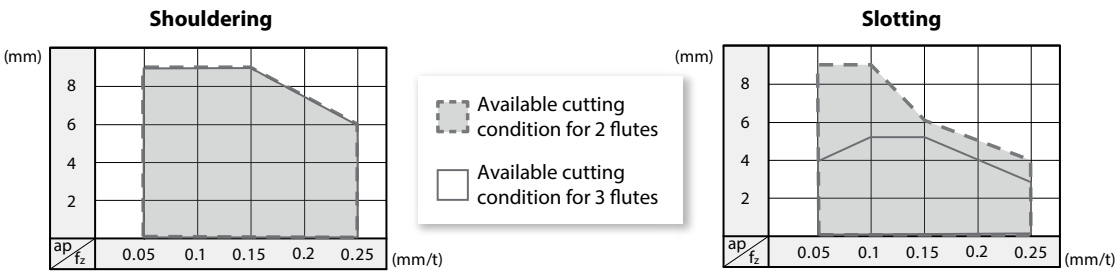
How to select multi-edge or less edge toolholder

Shouldering (ae=10mm)	Slotting





Available cutting condition of modular type



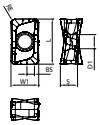
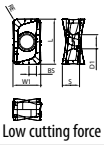
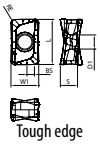
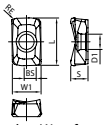
Choose multi-edge toolholder for shouldering; higher efficiency in machining by higher feed rate.
For grooving, choose less edge toolholder to lower cutting force.

LOMU/LOGT

Classification of usage

★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice
(In case hardness is 45HRC or under)

Carbon steel / Alloy steel					☆			★	☆		P
Mold and die steel					☆			★	☆		P
Austenitic stainless steel						☆		☆	★		M
Martensitic stainless steel	★								☆		M
Precipitation hardening stainless steel						☆			★		M
Gray cast iron				☆			★				K
Nodular cast iron				☆			★				K
Non-ferrous metals		★								☆	N
Heat-resistant alloy	★								☆		S
Titanium alloy						☆			★		S
Hard materials			★								H

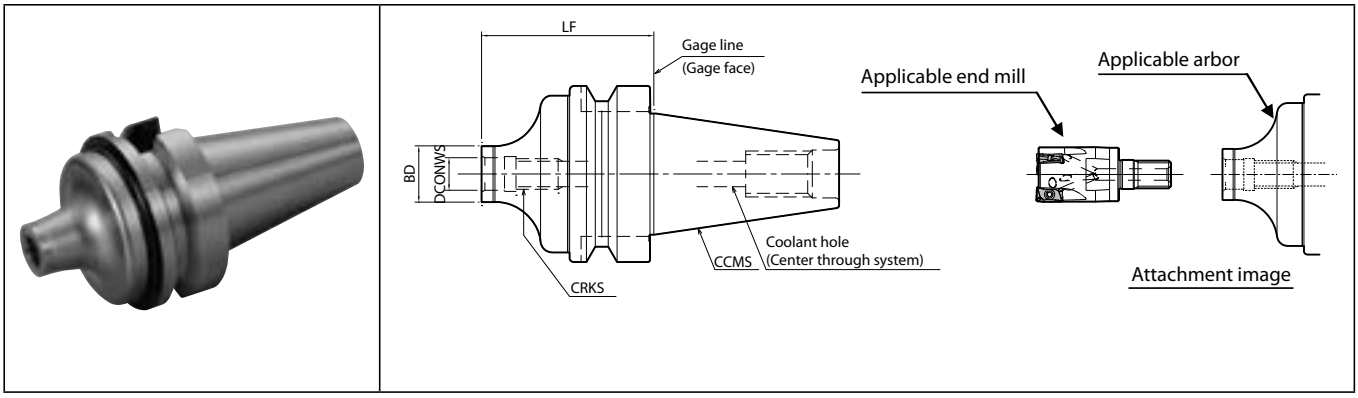
Insert		Description		No. of edges	Dimension (mm)						Carbide									Applicable toolholder ⇒ M76~M79
					S	D1	RE	L	W1	BS	CVD	DLC	PVD						-	
											CA6535	PDL025	PR015S	PR1510	PR1525	PR1535	PR1810	PR1825	PR1835	GW25	
	 General purpose	LOMU	100404ER-GM	4	4	3.4	0.4	10.9	6.6	2.1	●			●	●	●	●	●	●		MEW...-10-... MEWH...-10-...
		LOMU	100408ER-GM				0.8			1.7	●			●	●	●	●	●	●		
		LOMU	100412ER-GM				1.2			1.3	●			●	●	●	●	●	●		
		LOMU	100416ER-GM				1.6			1	●			●	●	●	●	●	●		
		LOMU	100420ER-GM				2			1	●			●	●	●	●	●	●		
		LOMU	150504ER-GM	4	5.6	4.8	0.4	15.7	9.2	2.2	●			●	●	●	●	●	●		MEW...-15-... MEWH...-15-...
		LOMU	150508ER-GM				0.8			1.8	●			●	●	●	●	●	●		
		LOMU	150510ER-GM				1			1.6					●			●			
		LOMU	150512ER-GM				1.2			1.4	●			●	●	●	●	●	●		
		LOMU	150516ER-GM				1.6			1	●			●	●	●	●	●	●		
		LOMU	150520ER-GM				2			0.6	●			●	●	●	●	●	●		
	 Low cutting force	LOMU	100408ER-SM	4	4	3.4	0.8	10.9	6.6	1.7	●			●	●	●	●	●	●		MEW...-10-... MEWH...-10-...
		LOMU	150508ER-SM	4	5.6	4.8	0.8	15.7	9.2	1.8	●			●	●	●	●	●	●		MEW...-15-... MEWH...-15-...
	 Tough edge	LOMU	100408ER-GH	4	4	3.4	0.8	10.9	6.6	1.7	●		●	●	●	●	●	●	●		MEW...-10-... MEWH...-10-...
		LOMU	150508ER-GH	4	5.6	4.8	0.8	15.7	9.2	1.8	●		●	●	●	●	●	●	●		MEW...-15-... MEWH...-15-...
	 2-edge / Non-ferrous metals	LOGT	100408FR-AM	2	4	3.6	0.8	11.2	6.8	2.8		●							●		MEW...-10-...
		LOGT	150508FR-AM	2	5.6	4.9	0.8	15.9	8.9	2.9		●							●		MEW...-15-...

Handed insert shows Right-hand

Recommended cutting conditions ⇒ M84

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

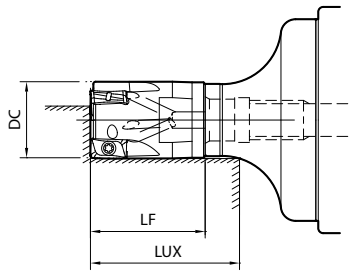
BT Arbor (for exchangeable head / double-face clamping spindle)



Dimensions

Description		Availability	Dimension (mm) LF	BD	DCONWS	CRKS	Coolant hole	Arbor (Double-face clamping) CCMS	Applicable end mill (Head) MA90, MEW, MEC, MEV, MFH Harrier, MFH Boost, MFH Mini, MFH Micro, MRX ➡ M69(MA90), M79(MEW), M90(MEC) M108(MEV), M202(MFH Harrier) M213(MFH Boost), M220(MFH Mini) M227(MFH Micro), M275(MRX)
BT30K-	M08-45	●	45	14.7	8.5	M8×1.25	Yes	BT30	(MEW/MEC/MFH/MRX)..-M08-..
	M10-45	●		18.7	10.5	M10×1.5			(MA90/MEW/MEC/MEV/MFH/MRX)..-M10-..
	M12-45	●		23	12.5	M12×1.75			(MA90/MEW/MEC/MEV/MFH/MRX)..-M12-..
BT40K-	M08-55	●	55	14.7	8.5	M8×1.25	Yes	BT40	(MEW/MEC/MFH/MRX)..-M08-..
	M10-60	●	60	18.7	10.5	M10×1.5			(MA90/MEW/MEC/MEV/MFH/MRX)..-M10-..
	M12-55	●	55	23	12.5	M12×1.75			(MA90/MEW/MEC/MEV/MFH/MRX)..-M12-..
	M16-65	●	65	30	17	M16×2.0			(MA90/MEW/MEC/MEV/MFH/MRX)..-M16-..

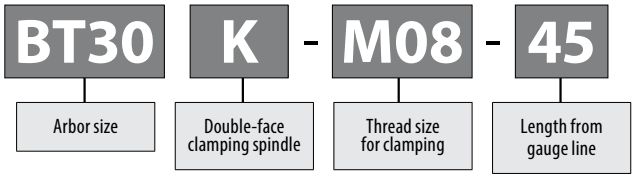
Actual end mill depth (See page **M227** for MFH Micro)



Arbor description		Applicable end mill (Head) Description	Cutting dia. (mm) DC	Dimension (mm) LF	Actual end mill depth (mm) LUX
BT30K-	M08-45	...16-M08-...	16	25	31.8
		...17-M08-...	17		33.2
		...18-M08-...	18		34.2
	M10-45	...20(-)M10-...	20	30	36.8
		...22-M10-...	22		39.2
	M12-45	...25(-)M12-...	25	35	42.8
		...28-M12-...	28		45.5
BT40K-	M08-55	...16-M08-...	16	25	31.7
		...17-M08-...	17		33.2
		...18-M08-...	18		34.3
	M10-60	...20(-)M10-...	20	30	38.7
		...22-M10-...	22		44.5
	M12-55	...25(-)M12-...	25	35	44.6
		...28-M12-...	28		47.6
	M16-65	...32(-)M16-...	32	40	51.2
		...35-M16-...	35		60.2
		...40-M16-...	40		64

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Arbor identification system



How to attach head

1. When clamping the head on the arbor, make sure there is no dust or chips inside (Fig. 1).
   Do NOT put lubricant on the clamping portion.

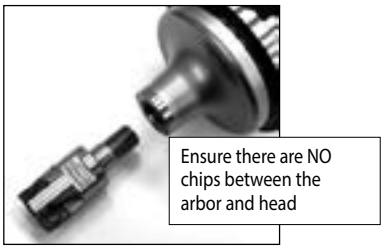


Fig. 1

2. Attach the head on the arbor and fix it using the wrench (Fig. 2).
   Ref. to the Table 1 for Recommended tightening torque.
   Note: The wrench is NOT included in the products.

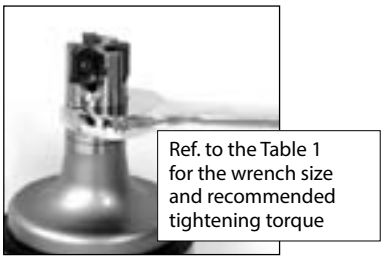


Fig. 2

Table 1 Recommended head tightening torque

Thread size for clamping	Wrench double width [mm]	Recommended tightening torque [N·m]
M8	12	23
M10	15	46
M12	19	80
M16	24	90

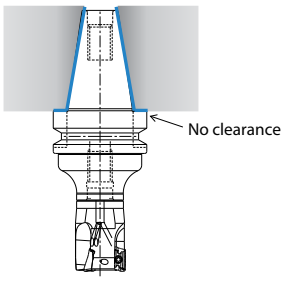
3. Confirm that the head is fixed firmly on the arbor. (Fig. 3)



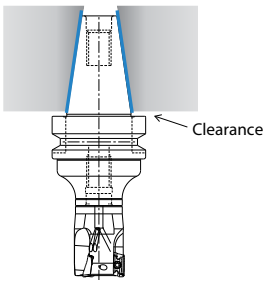
Fig. 3

Frequently asked question

Q: Can the double-face clamping arbor be mounted on a general BT spindle?
A: Yes. It can be used as a general BT arbor with a general BT spindle.



Double-face clamping arbor mounted on double-face clamping spindle



Double-face clamping arbor mounted on general spindle

It can be used as a general BT arbor, though the advantage of the double-face clamping will not be shown.

How to mount an insert

1. Be sure to remove dust and chips from the insert mounting pocket.
2. Clamp screw
   1. Apply anti-seize compound on portion of taper and thread of clamp screw.
   2. Attach the screw (magnetic head) to the front end of the wrench. While lightly pressing the insert against the constraint surfaces, put the screw into the hole of the insert and tighten. (Ref. to Fig. 1)
   Tighten M3 screws (SB-3065TRP) slightly inclined from the insert surface.(Ref. to Fig. 2)
3. When tightening the screw, make sure that the wrench is parallel to the screw.
4. After tightening the screw, make sure that there is no clearance between the insert seat surface and the bearing surface of the toolholder or between the insert side surfaces and the constraint surface of the toolholder. If there is any clearance, remove the insert and mount it again according to the above steps.

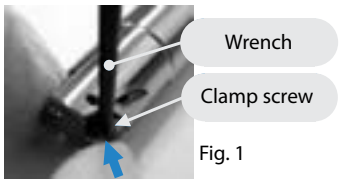


Fig. 1

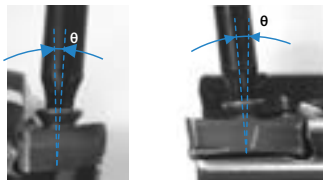


Fig. 2

Recommended cutting conditions

Chipbreaker	Workpiece material	fz (mm/t)		Recommended insert grades (Vc: m/min)				
		Toolholder description		MEGACOAT (PVD coated carbide)				CVD coated carbide
		MEW16~MEW18	MEW20~MEW40 MEW040R~MEW080R	PR1835 (PR1535)	PR1825 (PR1525)	PR1810 (PR1510)	PR015S	CA6535
GM	Carbon steel	0.06~**0.1**~0.2	0.08~**0.15**~0.25	☆ 120~**180**~250	★ 120~**180**~250	-	-	-
	Alloy steel	0.06~**0.1**~0.14	0.08~**0.15**~0.2	☆ 100~**160**~220	★ 100~**160**~220	-	-	-
	Mold steel	0.06~**0.08**~0.12	0.08~**0.12**~0.2	☆ 80~**140**~180	★ 80~**140**~180	-	-	-
	Stainless steel (Austenitic related)	0.06~**0.08**~0.12	0.08~**0.12**~0.15	☆ 100~**160**~200	★ 100~**160**~200	-	-	-
	Stainless steel (Martensitic related)	0.06~**0.08**~0.12	0.08~**0.12**~0.2	☆ 150~**200**~250	-	-	-	★ 180~**240**~300
	Stainless steel (Precipitation hardening)	0.06~**0.08**~0.12	0.08~**0.12**~0.2	★ 90~**120**~150	-	-	-	-
	Gray cast iron	0.06~**0.1**~0.17	0.08~**0.18**~0.25	-	-	★ 120~**180**~250	-	-
	Nodular cast iron	0.06~**0.08**~0.12	0.08~**0.15**~0.2	-	-	★ 100~**150**~200	-	-
	Ni-base heat-resistant alloys	0.06~**0.08**~0.12	0.08~**0.12**~0.15	☆ 20~**30**~50	-	-	-	★ 20~**30**~50
	Titanium alloys	0.06~**0.08**~0.12	0.08~**0.15**~0.2	☆ 40~**60**~80	-	☆ 30~**50**~70	-	-
SM	Carbon steel	0.06~**0.1**~0.17	0.08~**0.15**~0.2	☆ 120~**180**~250	★ 120~**180**~250	-	-	-
	Alloy steel	0.06~**0.08**~0.12	0.08~**0.12**~0.18	☆ 100~**160**~220	★ 100~**160**~220	-	-	-
	Mold steel	0.06~**0.08**~0.12	0.08~**0.1**~0.15	☆ 80~**140**~180	★ 80~**140**~180	-	-	-
	Stainless steel (Austenitic related)	0.06~**0.08**~0.12	0.08~**0.1**~0.15	☆ 100~**160**~200	★ 100~**160**~200	-	-	-
	Stainless steel (Martensitic related)	0.06~**0.08**~0.12	0.08~**0.1**~0.15	☆ 150~**200**~250	-	-	-	★ 180~**240**~300
	Stainless steel (Precipitation hardening)	0.06~**0.08**~0.12	0.08~**0.1**~0.15	☆ 90~**120**~150	-	-	-	-
	Ni-base heat-resistant alloys	0.06~**0.08**~0.1	0.08~**0.1**~0.12	☆ 20~**30**~50	-	-	-	★ 20~**30**~50
	Titanium alloys	0.06~**0.08**~0.12	0.08~**0.12**~0.15	★ 40~**60**~80	-	☆ 30~**50**~70	-	-
GH	Carbon steel	0.06~**0.1**~0.2	0.08~**0.2**~0.3	☆ 120~**180**~250	★ 120~**180**~250	-	-	-
	Alloy steel	0.06~**0.1**~0.14	0.08~**0.2**~0.25	☆ 100~**160**~220	★ 100~**160**~220	-	-	-
	Mold steel	0.06~**0.08**~0.12	0.08~**0.15**~0.22	☆ 80~**140**~180	★ 80~**140**~180	-	-	-
	Stainless steel (Austenitic related)	0.06~**0.08**~0.12	0.08~**0.12**~0.15	☆ 100~**160**~200	☆ 100~**160**~200	-	-	-
	Stainless steel (Martensitic related)	0.06~**0.08**~0.12	0.08~**0.12**~0.2	☆ 150~**200**~250	-	-	-	☆ 180~**240**~300
	Stainless steel (Precipitation hardening)	0.06~**0.08**~0.12	0.08~**0.12**~0.2	☆ 90~**120**~150	-	-	-	-
	Gray cast iron	0.06~**0.1**~0.2	0.08~**0.22**~0.3	-	-	☆ 120~**180**~250	-	-
	Nodular cast iron	0.06~**0.08**~0.15	0.08~**0.18**~0.25	-	-	☆ 100~**150**~200	-	-
	Ni-base heat-resistant alloys	0.06~**0.08**~0.12	0.08~**0.12**~0.15	☆ 20~**30**~50	-	-	-	☆ 20~**30**~50
	Titanium alloys	0.06~**0.08**~0.12	0.08~**0.15**~0.2	☆ 40~**60**~80	-	☆ 30~**50**~70	-	-
	Hard materials (60HRC or less)	0.06~**0.08**~0.12	0.08~**0.15**~0.22	-	-	-	★ 60~**80**~100	-

Chipbreaker	Workpiece material	fz (mm/t)		Recommended insert grades (Vc: m/min)	
		Toolholder description		DLC coated carbide	Carbide
		MEW16~MEW18	MEW20~MEW40 MEW040R~MEW080R	PDL025	GW25
AM	Aluminum alloys	0.06~**0.1**~0.2	0.08~**0.15**~0.25	★ 200~**600**~900	☆ 200~**500**~800

★: 1st Recommendation

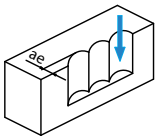
☆: 2nd Recommendation

* The bold-faced number indicates a center value of recommended cutting condition. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.
* Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.

Ramping, helical milling and vertical milling (Plunging)

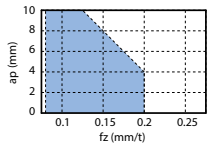
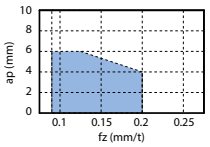
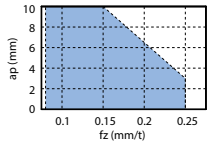
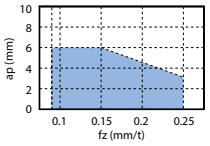
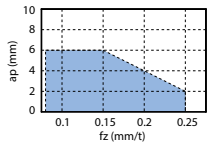
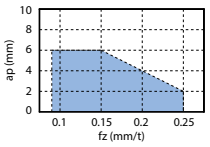
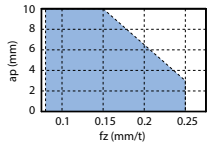
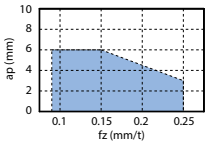
1. Available for vertical milling (plunging).
2. NOT available for ramping and helical milling, because interference between workpiece and insert may occur.

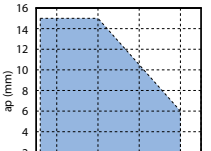
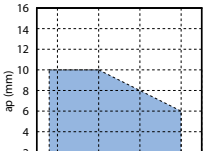
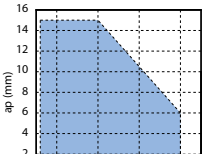
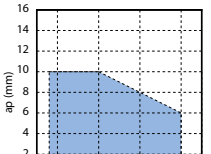
Vertical milling (Plunging)



Insert description	Max. width of cut
LOMU10 type	5mm
LOMU15 type	7mm

Cutting performance

Description	Shouldering (Cutting width ae=DC/2)	Slotting
MEW16...-10 MEW18...-10		
MEW20...-10 ~ MEW50...-10		
MEW20-S20 -10-150-2T MEW25-S25 -10-170-2T (Long shank)		
MEW032R...-10 ~ MEW063R...-10		

Description	Shouldering (Cutting width ae=DC/2)	Slotting
MEW25...-15 ~ MEW50...-15		
MEW040R...-15 ~ MEW080R...-15		

<Cutting conditions>
- Vc=180m/min
- GM chipbreaker
- Workpiece material: C50
- Overhang length
- 1 . End mill: Same length as LH of the dimension
- 2. Face mill: LF of the dimension + minimum overhang length of the arbor

Case studies

ST44-2

- Construction machine part
- Vc=250m/min
- apxae=4x20mm
- fz=0.14mm/t (Vf=1,350mm/min)
- Wet
- MEW32-S32-10-4T(4 flutes)
- LOMU100408ER-GM (PR1525)



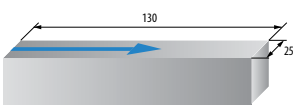
PR1525	Chip evacuation rate =108cc/min
Competitor A (Positive cutter)	Chip evacuation rate =72cc/min

MEW showed stable milling without chattering at higher feed, improving the machining efficiency by 150%.
Burrs are prevented and excellent surface finish is achieved.

(User Evaluation)

15-5PH (42HRC)

- Aircraft part
- Vc=180m/min
- apxae=2x25mm
- fz=0.1mm/t (Vf=716mm/min)
- Wet
- MEW32-S32-10-4T(4 flutes)
- LOMU100408ER-GM (PR1525)



PR1525	Chip evacuation rate = 35.8cc/min (Further machining possible)
Competitor B (Positive cutter)	Chip evacuation rate = 26.8cc/min (Unable to continue machining)

No chattering and more stable milling is possible with MEW.
Despite the milling difficulty because of the properties of the material (42HRC), PR1525 kept good cutting edge form, minimizing wear and adhesion.

(User evaluation)

M
Milling

MEC



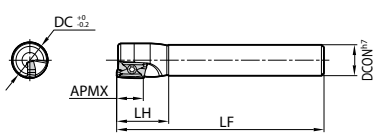


Fig. 1

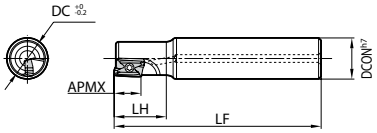


Fig. 2

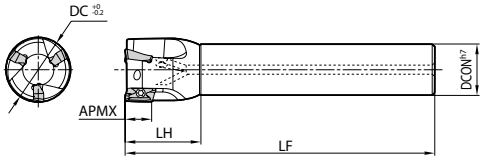


Fig. 3

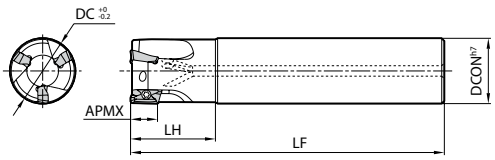


Fig. 4

Toolholder dimensions

		Description	Availability	Inserts	Dimension (mm) DC	DCON	LF	LH	APMX	A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Fig.	Spare parts: Anti-seize compound	Screw	Wrench	Applicable inserts ➡ M91
Cylindrical	Standard shank	MEC 10-S10-11	●	1	10	10	80	17	10	+10	-24	No	54800	1	P-37	SB-2545TR	DTM-8	BDMT1103...
		10-S16-11	●			16						Yes		2				
		12-S10-11	●		12	10		20		+12	-21	No	50800	1				
		12-S12-11	●			12								1				
		12-S16-11	●			16						Yes		2				
		13-S12-11	●		13	12					-19	No	49200	1				
		14-S12-11	●		14								47700	1				
		14-S16-11	●			16						Yes		2				
		MEC 16-S12-11T	●	2	16	12	100	23	10	+18	-14	No	43750	1	P-37	SB-2555TRG	DTM-8	BDGT11T3... BDMT11T3...
		17-S16-11T	●		17	16				+19	-13	Yes	43500	3				
		18-S16-11T	●		18								43000	3				
		19-S16-11T	●	3	19		110	26		+20	-10		42000	3				
		20-S16-11T	●		20								41000	3				
		21-S20-11T	●		21	20					-9		40300	3				
		22-S20-11T	●		22								39600	3				
		24-S20-11T	●		24		120	29		+21	-10		38200	3				
		25-S20-11T	●		25								37500	3				
		25-S20-11T-4	●	4										3				
		28-S25-11T	●	3	28	25				+22	-9		35800	3				
		30-S25-11T	●	4	30		130	32		+23			34800	3				
		32-S25-11T	●		32								33900	3				
		32-S25-11T-5	●	5										3				
		40-S32-11T	●		40	32	150	50			-8		30000	3				
		50-S32-11T	●		50						-7		22500	3				
	Same shank	MEC 16-S16-11T	●	2	16	16	100	30	10	+18	-14	Yes	43750	4	P-37	SB-2555TRG	DTM-8	BDGT11T3... BDMT11T3...
		20-S20-11T	●	3	20	20	110			+20	-10		41000	4				
		25-S25-11T	●		25	25	120	32		+21			37500	4				
		25-S25-11T-4	●	4										4				
		32-S32-11T	●		32	32	130	40		+23	-9		33900	4				
		32-S32-11T-5	●	5										4				

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
For more details, see „Warning“ on page **M93**.
Coat Anti-seize Compound(P-37) thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Toolholder dimensions

Description				Availability	Inserts	Dimension (mm)					A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Fig.	Spare parts			Applicable inserts ➡ M91
						DC	DCON	LF	LH	APMX						Anti-seize compound	Screw	Wrench	
Cylindrical	Long shank	MEC	20-S18-170-11T	●	2	20	18	170	30	10	+20	-10	Yes	41000	3	P-37	SB-2555TRG	DTM-8	BDGT11T3... BDMT11T3...
			20-S20-140-11T	●			20	140	60						4				
			20-S20-170-11T	●				170							4				
			22-S20-170-11T	●		22			30		+21			39600	3				
			25-S23-210-11T	●		25	23	210	32					37500	3				
			25-S25-160-11T	●			25	160	60						4				
			25-S25-210-11T	●				210							4				
			28-S25-210-11T	●		28			32		+22	-9		35800	3				
			32-S30-250-11T	●		32	30	250	40		+23			33900	3				
			32-S32-200-11T	●			32	200	65						4				
			32-S32-250-11T	●				250							4				
			35-S32-250-11T	●		35			40					32600	3				
			40-S32-240-11T	●		40		240	65			-8		30000	3				
		MEC	20-S20-150-11T-3	●	3	20	20	150	60	10	+20	-10	Yes	41000	4	P-37	SB-2555TRG	DTM-8	BDGT11T3... BDMT11T3...
			25-S25-170-11T-3	●		25	25	170			+21			37500	4				
			25-S25-170-11T-4	●	4										4				
			30-S25-180-11T-3	●	3	30		180	32		+23	-9		34800	3				
			32-S32-200-11T-3	●		32	32	200	65					33900	4				
			32-S32-200-11T-4	●	4										4				
			32-S32-200-11T-5	●	5										4				
	Standard shank	MEC	25-S20-17	●	2	25	20	120	36	15.7	+16	-11	Yes	35000	3	P-37	SB-4070TRN	DTM-15	BDGT1704... BDMT1704...
			32-S25-17	●	3	32	25	130	40		+17	-7		30000	3				
			40-S32-17	●	4	40	32	150	50		+19			25000	3				
			50-S32-17	●		50								17000	3				
	Same shank	MEC	25-S25-17	●	2	25	25	120	36	15.7	+16	-11	Yes	35000	4	P-37	SB-4070TRN	DTM-15	BDGT1704... BDMT1704...
			32-S32-17	●	3	32	32	130	40		+17	-7		30000	4				
	Long shank	MEC	25-S25-160-17	●	2	25	25	160	60	15.7	+16	-11	Yes	35000	4	P-37	SB-4070TRN	DTM-15	BDGT1704... BDMT1704...
			25-S25-210-17	●				210							4				
			28-S25-210-17	●		28			36					32500	3				
			32-S32-200-17	●		32	32	200	65		+17	-7		30000	4				
			32-S32-250-17	●				250							4				
			35-S32-250-17	●		35			40					27700	3				
			40-S32-240-17	●		40		240	65		+19			25000	3				
		MEC	32-S32-250-17-3	●	3	32	32	250	65	15.7	+17	-7	Yes	30000	4	P-37	SB-4070TRN	DTM-15	BDGT1704... BDMT1704...
			40-S32-250-17-3	●		40					+19			25000	3				
			40-S32-250-17-4	●	4										3				
			50-S42-250-17-4	●		50	42		64			-6		17000	3				

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
For more details, see „Warning“ on page **M93**.
Coat Anti-seize Compound(P-37) thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MEC



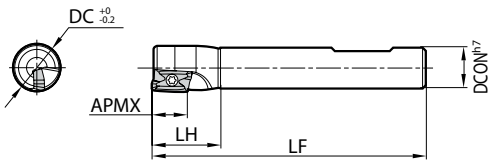


Fig. 1

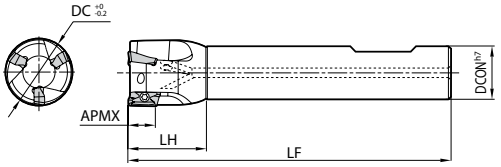


Fig. 2

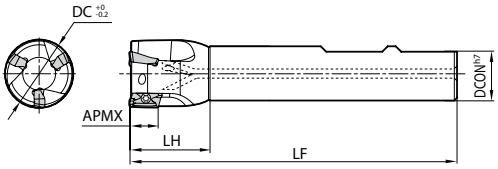


Fig. 3

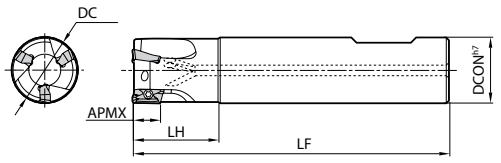


Fig. 4

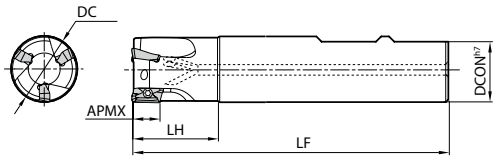


Fig. 5

Toolholder dimensions

Description				Availability	Inserts	Dimension (mm)					A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Fig.	Spare parts			Applicable inserts M91
						DC	DCON	LF	LH	APMX						Anti-seize compound	Screw	Wrench	
Weldon	Standard shank	MEC	16-W12-11T3	●	2	16	12	68	23	10	18	14	No	43750	1	P-37	SB-2555TRG	DTM-8	BDGT11T3... BDMT11T3...
			18-W16-11T3-H	●		18	16				19	13	Yes	43000	2				
			20-W16-11T3-H	●	3	20			25		20	10		41000	2				
			22-W20-11T3-H	●		22	20	81	26		21			39600	2				
			25-W20-11T3-H	●		25			29					37500	2				
			28-W25-11T3-H	●		28	25	88			22	9		35800	3				
			30-W25-11T3-H	●	4	30			32		23			34800	3				
			32-W25-11T3-H	●		32								33900	3				
	Same shank	MEC	16-W16-11T3-H	●	2	16	16	68	25	10	18	14	Yes	43750	4	P-37	SB-2555TRG	DTM-8	BDGT11T3... BDMT11T3...
			20-W20-11T3-H	●	3	20	20	81	30		20	10		41000	4				
			25-W25-11T3-H	●		25	25	88	32		21			37500	5				
			32-W32-11T3-H	●	4	32	32	100	40		23	9		33900	5				
	Standard shank	MEC	25-W20-1704-H	●	2	25	20	86	36	15.7	16	-11	Yes	35000	3	P-37	SB-4070TRN	DTM-15	BDGT1704... BDMT1704...
			32-W25-1704-H	●	3	32	25	92	36		17	7		30000	3				
			40-W32-1704-H	●	4	40	32	110	50		19			25000	3				
	Same shank	MEC	25-W25-1704-H	●	2	25	25	92	36	15.7	16	11	Yes	35000	5	P-37	SB-4070TRN	DTM-15	BDGT1704... BDMT1704...
			32-W32-1704-H	●	3	32	32	100	40		17	7		30000	5				

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
For more details, see „Warning“ on page **M93**.
Coat Anti-seize Compound(P-37) thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MEC



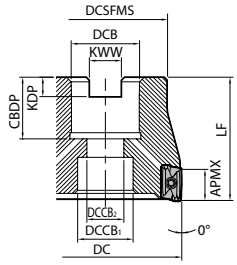


Fig. 1

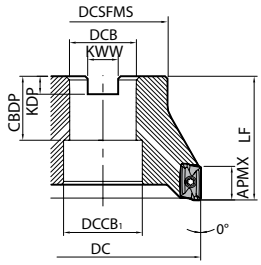


Fig. 2

Toolholder dimensions

Description			Availability	Inserts	Dimension (mm)										A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min-1)	Weight (kg)	Fig.	Spare parts			Applicable inserts M91
			R		DC	DCSFMS	DCB	DCCB1	DCCB2	LF	CBDP	KDP	KWW	APMX							Anti-seize compound	Screw	Wrench	
Metric Coarse pitch	MEC	040R-11-5T-M	●	5	40	34	16	14	8.5	40	20	5.6	8.5	10	+23	-7	Yes	30000	0.2	1	P-37	SB-2555TRG	DTM-8	BDGT11T3... BDMT11T3...
		050R-11-5T-M	●		50	40	22	18	12		22	6.3	10.4					22500	0.3	1				
		063R-11-6T-M	●	6	63													20500	0.7	1				
		080R-11-7T-M	●	7	80	52.5	27	20	14	50	26	7	12.4					18500	1	1				
		100R-11-9T-MN	●	9	100	65	32	26	17.6	55		8	14.4					17000	1.6	1				
		125R-11-11T-M	●	11	125	85	40	45	32	63	33	9.5	16.4					15000	3.1	1				
Fine pitch	MEC	032R-11-5T-M	●	5	32	30	16	11.5	8.5	35	20	5.6	8.4	10	+23	-7	Yes	33900	0.1	1	P-37	SB-2555TRG	DTM-8	BDGT11T3... BDMT11T3...
		040R-11-6T-M	●	6	40	34		14		40								30000	0.2	1				
		050R-11-7T-M	●	7	50	40	22	18	12	40	22	6.3	10.4					22500	0.4	1				
		063R-11-8T-M	●	8	63													20500	0.6	1				
		080R-11-10T-M	●	10	80	52.5	27	20	14	50	26.5	7	12.4					18500	0.9	1				
		100R-11-11T-M	●	11	100	65	32	26	17.6	55	26	8	14.4					17000	1.7	1				
Coarse pitch	MEC	040R-17-4T-M	●	4	40	34	16	14	8.5	40	20	5.6	8.5	15.7	+19	-7	Yes	25000	0.3	1	P-37	SB-4070TRN	DTM-15	BDGT1704... BDMT1704...
		050R-17-4T-M	●		50	40	22	18	12		22	6.3	10.4					17000	0.4	1				
		063R-17-5T-M	●	5	63													14500	0.6	1				
		080R-17-6T-M	●	6	80	52.5	27	20	14	50	26	7	12.4					12000	1	1				
		100R-17-7T-MN	●	7	100	65	32	26	17.6	55		8						10500	1.8	1				
		125R-17-9T-M	●	9	125	85	40	45	32	63	33	9.5	16.4					8900	3.1	1				
		160R-17-12T-M	●	12	160	110		68	-								No	7400	4.5	2				
Fine pitch	MEC	050R-17-5T-M	●	5	50	40	22	18	12	40	22	6.3	10.4	15.7	+19	-7	Yes	17000	0.4	1	P-37	SB-4070TRN	DTM-15	BDGT1704... BDMT1704...
		063R-17-6T-M	●	6	63													14500	0.6	1				

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
For more details, see „Warning“ on page **M93**.
Coat Anti-seize Compound(P-37) thinly on portion of taper and thread when insert is fixed.

When using center-through air/Coolant/Mist
If center through air (Coolant, Mist) is used, please use appropriate arbor and clamp with mounting bolt (Table1)

For good shoulder finishes by MEC multistage ap.
In order to obtain smooth machining wall surface by multiple passes of MEC milling cutter, please keep ap 5.5 mm or less for 11T3 type and also keep ap 9 mm or less for 1704 type.

Table 1

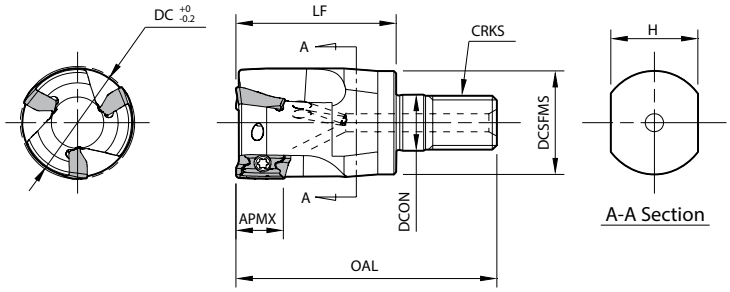
Description	Mounting bolt (Attachment)	Wrench
MEC032R·····M	SP8X35	LW-5 (Double width 5 mm)
MEC040R·····M	HH8X25H	LW-5 (Double width 5 mm)
MEC050R·····M MEC063R·····M	HH10X30H	LW-6 (Double width 6 mm)
MEC063R···· MEC080R····(-M)	HH12X35H	LW-8 (Double width 8 mm)
MEC100R····N/M	HH16X52H	LW-12 (Double width 12 mm)
MEC125R····	HF20X53H	LW-14 (Double width 14 mm)
MEC160R····	HF24X60H	LW-17 (Double width 17 mm)

Wrench is not attached. Please purchase it separately.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MEC





Toolholder dimensions

Description		Availability	Inserts	Dimension (mm)								A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Applicable inserts ➡ M91
				DC	DCON	DCSFMS	OAL	LF	APMX	CRKS	H					
MEC	16-M08-11T-2T	●	2	16	8.5	14.7	42	25	10	M8x1.25	12	+18	-14	Yes	43750	BDGT11T3... BDMT11T3...
	20-M10-11T-2T	●		20	10.5	18.7	48	30		M10x1.5	15	+20	-10		41000	
	20-M10-11T-3T	●	3													
	25-M12-11T-3T	●		25	12.5	23	56	35		M12x1.75	19	+21			37500	
	32-M16-11T-4T	●	4	32	17	30	62	40		M16x2.0	24	+23	-9		33900	
MEC	25-M12-17-2T	●	2	25	12.5	23	56	35	15.7	M12x1.75	19	+16	-11	Yes	35000	BDGT1704... BDMT1704...
	32-M16-17-3T	●	3	32	17	30	62	40		M16x2.0	24	+17	-7		30000	

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
For more details, see „Warning“ on page **M93**.
See page **M82** for applicable arbor (BT arbor for exchangeable head / double-face clamping spindle)

Spare parts (MEC modular type)

Description		Spare parts		
		Clamp screw	Wrench	Anti-seize compound
				
MEC	16-M08-11T-2T	SB-2555TRG	DTM-8	P-37
	20-M10-11T-2T			
	20-M10-11T-3T			
	25-M12-11T-3T	Recommended tightening torque for insert clamp 1.2N·m		
	32-M16-11T-4T			
MEC	25-M12-17-2T	SB-4070TRN	DTM-15	P-37
	32-M16-17-3T	Recommended tightening torque for insert clamp 3.5N·m		

 Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

BDGT/BDMT

Classification of usage

★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice
(In case hardness is 45HRC or under)

Carbon steel / Alloy steel					★	☆						P
Mold and die steel					★	☆						P
Austenitic stainless steel			☆		☆	★						M
Martensitic stainless steel	★					☆						M
Precipitation hardening stainless steel			☆			★						M
Gray cast iron				★								K
Nodular cast iron				★								K
Non-ferrous metals		★					☆		□	■		N
Heat-resistant alloy	★					☆						S
Titanium alloy			☆			★	☆		□	■		S
Hard materials												H

Insert		Description		No. of edges	Dimension (mm) S	D1	RE	L	INSL	LE	W1	Angle (°) AN	AS	Carbide CVD CA6535	DLC PDL025	PVD PR1535	PR1810	PR1825	PR1835	- GW25	Cermet - TN100M	PCD - KPD001	KPD230	Applicable toolholder ⇨ M86~M90
		BDMT	110302ER-JT 110304ER-JT 110308ER-JT	2	3	2.8	0.2 0.4 0.8	11	-	-	6.3	15	18	● ●		● ●	● ●	● ●	● ●					MEC...-11
		BDMT	11T302ER-JT 11T304ER-JT 11T308ER-JT 11T312ER-JT 11T316ER-JT 11T320ER-JT 11T324ER-JT 11T331ER-JT	2	3.8	2.8	0.2 0.4 0.8 1.2 1.6 2 2.4 3.1	11	-	-	6.7	13	18	 ● ● ● ● ● ● ●		● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ●		● ●			MEC...-11T(...) MEC...-11-...
		BDMT	170404ER-JT 170408ER-JT 170412ER-JT 170416ER-JT 170420ER-JT 170424ER-JT 170431ER-JT 170440ER-JT	2	4.9	4.4	0.4 0.8 1.2 1.6 2 2.4 3.1 4	17	-	-	9.6	13	18	● ● ● ● ● ● ● ●		● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ●		● ●			MEC...-17(...) MEC...-17-...
	Low cutting force / Stainless steel	BDMT	110302ER-JS 110304ER-JS 110308ER-JS	2	3	2.8	0.2 0.4 0.8	11	-	-	6.3	15	18	● ● ●		● ● ●		● ● ●	● ● ●					MEC...-11
		BDMT	11T302ER-JS 11T304ER-JS 11T308ER-JS	2	3.8	2.8	0.2 0.4 0.8	11	-	-	6.7	13	18	● ● ●		● ● ●		● ● ●	● ● ●					MEC...-11T(...) MEC...-11-...
		BDMT	170404ER-JS 170408ER-JS	2	4.9	4.4	0.4 0.8	17	-	-	9.6	13	18	● ●		● ●		● ●	● ●					MEC...-17(...) MEC...-17-...
	Non-ferrous metals	BDGT	11T302FR-JA 11T304FR-JA 11T308FR-JA	2	3.8	2.8	0.2 0.4 0.8	11	-	-	6.7	13	18		● ● ●					● ● ●				MEC...-11T(...) MEC...-11-...
		BDGT	170404FR-JA 170408FR-JA 170420FR-JA 170431FR-JA	2	4.9	4.4	0.4 0.8 2 3.1	17	-	-	9.6	13	18		● ● ● ●					● ● ● ●				MEC...-17(...) MEC...-17-...
		BDGT	11T302FR 11T304FR 11T308FR	1	3.8	2.8	0.2 0.4 0.8	-	11.5	3.8	6.7	13	18									● ● ●	● ● ●	MEC...-11T(...) MEC...-11-...
		BDGT	11T302FR-LE 11T304FR-LE 11T308FR-LE	1	3.8	2.8	0.2 0.4 0.8	-	11.5	5.2	6.7	13	18									● ● ●	● ● ●	MEC...-11T(...) MEC...-11-...
		BDMT	11T302FR 11T304FR	1	3.8	2.8	0.2 0.4	-	11	3.6	6.7	13	18									● ●	● ●	MEC...-11T(...) MEC...-11-...
		BDMT	170402FR 170404FR	1	4.9	4.4	0.2 0.4	-	17	4.4	9.6	13	18									● ●	● ●	MEC...-17(...) MEC...-17-...

Handed insert shows Right-hand

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

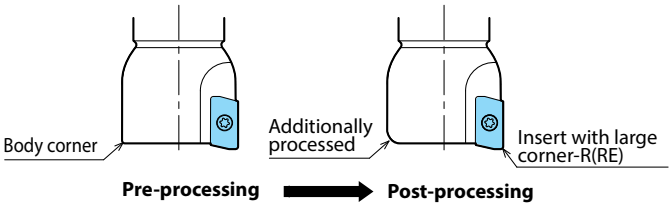
Recommended cutting conditions ⇨ M92, M93

CBN & PCD Inserts are sold in 1 piece boxes

When using inserts with corner-R(RE) 1.6 or larger, additional modifications of the cutter body will be necessary.
Ref. to the chart below for the recommended modifications. (Additional grind off is not necessary when corner-R(RE) is 1.2 mm or less.)

Insert corner-R(RE) (mm)	Additional processing dimension to body corner (mm)
1.6	R1.0
2.0	
2.4	R1.2
3.1	R1.6
4.0	R2.5

* Round- shaped additional processing is recommended.
When applying chamfer shaped additional processing, do not cut away too much.



Recommended cutting conditions

JT chipbreaker

Workpiece material	fz (mm/t)		Recommended insert grades (Vc: m/min)				
	Toolholder description		Cermet	MEGACOAT NONA EX (MEGACOAT NANO)			CVD coated carbide
	MEC10~MEC19	MEC20~MEC40 MEC032R~MEC160R	TN100M	PR1835 (PR1535)	PR1825	PR1810	CA6535
Carbon steel	0.06 ~ **0.1** ~ 0.15	0.08 ~ **0.15** ~ 0.25	☆ 120 ~ **160** ~ 200	☆ 120 ~ **180** ~ 250	★ 120 ~ **180** ~ 250	-	-
Alloy steel	0.06 ~ **0.1** ~ 0.12	0.08 ~ **0.15** ~ 0.2	☆ 100 ~ **140** ~ 180	☆ 100 ~ **160** ~ 220	★ 100 ~ **160** ~ 220	-	-
Mold steel	0.06 ~ **0.08** ~ 0.1	0.08 ~ **0.12** ~ 0.2	☆ 80 ~ **120** ~ 150	☆ 80 ~ **140** ~ 180	★ 80 ~ **140** ~ 180	-	-
Stainless steel (Austenitic related)	0.06 ~ **0.08** ~ 0.1	0.08 ~ **0.12** ~ 0.15	-	☆ 100 ~ **160** ~ 200	☆ 100 ~ **160** ~ 200	-	-
Stainless steel (Martensitic related)	0.06 ~ **0.08** ~ 0.1	0.08 ~ **0.12** ~ 0.2	-	☆ 150 ~ **200** ~ 250	-	-	★ 180 ~ **240** ~ 300
Stainless steel (Precipitation hardening)	0.06 ~ **0.08** ~ 0.1	0.08 ~ **0.12** ~ 0.2	-	★ 90 ~ **120** ~ 150	-	-	-
Gray cast iron	0.06 ~ **0.1** ~ 0.15	0.08 ~ **0.18** ~ 0.25	-	-	-	★ 120 ~ **180** ~ 250	-
Nodular cast iron	0.06 ~ **0.08** ~ 0.1	0.08 ~ **0.15** ~ 0.2	-	-	-	★ 100 ~ **150** ~ 200	-
Ni-base heat-resistant alloys	0.06 ~ **0.08** ~ 0.1	0.08 ~ **0.12** ~ 0.15	-	☆ 20 ~ **30** ~ 50	-	-	★ 20 ~ **30** ~ 50
Titanium alloys	0.06 ~ **0.08** ~ 0.1	0.08 ~ **0.15** ~ 0.2	-	☆ 40 ~ **60** ~ 80	-	-	-

* The bold-faced number indicates a center value of recommended cutting condition. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.
* Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.

★: 1st Recommendation ☆: 2nd Recommendation

JS chipbreaker

Workpiece material	fz (mm/t)		Recommended insert grades (Vc: m/min)			
	Toolholder description		MEGACOAT NONA EX (MEGACOAT NANO)			CVD coated carbide
	MEC10~MEC19	MEC20~MEC40 MEC032R~MEC160R	PR1835 (PR1535)	PR1825	PR1810	CA6535
Carbon steel	0.06~**0.1**~0.12	0.08~**0.15**~0.18	☆ 120~**180**~250	★ 120~**180**~250	-	-
Alloy steel	0.06~**0.08**~0.1	0.08~**0.12**~0.15	☆ 100~**160**~220	★ 100~**160**~220	-	-
Mold steel	0.06~**0.08**~0.1	0.08~**0.1**~0.12	☆ 80~**140**~180	★ 80~**140**~180	-	-
Stainless steel (Austenitic related)	0.06~**0.08**~0.1	0.08~**0.1**~0.12	★ 100~**160**~200	☆ 100~**160**~200	-	-
Stainless steel (Martensitic related)	0.06~**0.08**~0.1	0.08~**0.1**~0.12	☆ 150~**200**~250	-	-	★ 180~**240**~300
Stainless steel (Precipitation hardening)	0.06~**0.08**~0.1	0.08~**0.1**~0.12	☆ 90~**120**~150	-	-	-
Ni-base heat-resistant alloys	0.06~**0.08**~0.1	0.08~**0.1**~0.12	☆ 20~**30**~50	-	-	★ 20~**30**~50
Titanium alloys	0.06~**0.08**~0.1	0.08~**0.1**~0.12	★ 40~**60**~80	-	-	-

* The bold-faced number indicates a center value of recommended cutting condition. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.
* Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.

★: 1st Recommendation ☆: 2nd Recommendation

JA chipbreaker

Workpiece material	fz (mm/t)	Recommended insert grades (Vc: m/min)	
		DLC coated carbide	Carbide
		PDL025	GW25
Aluminum alloys (Si 13% or less)	0.05~0.3	200~1,000	200~800
Aluminum alloys (Si 13% and over)	0.05~0.2	200~300	200~300

PCD

Workpiece material	fz (mm/t)	Recommended insert grades (Vc: m/min)
		PCD
		KPD230 (KPD001)
Aluminum alloys (Si 13% or less)	0.05~0.2	500~1,500
Aluminum alloys (Si 13% and over)	0.05~0.15	300~1,000

⚠ Warning Please observe below precautions fully. Failure to observe the precautions may cause serious damage to human body.

Warning about Max. Revolution indicated on main body

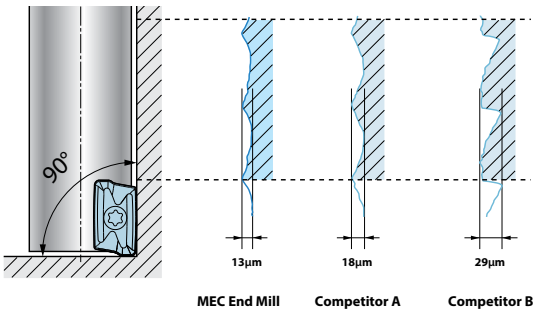
1. Do not use the end mill or cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter or the body may be damaged even under no load.
2. For actual practical revolution, please set within recommended cutting condition.
3. When using at a higher revolution (over 10,000min^{-1}), refer to the table to adjust the balance of MEC and suitable arbor.

Revolution (min^{-1})	Balance quality grade G ISO 1940-1/8821 (JIS B0905)
~20,000	G16
~30,000	G6.3
30,000~	G2.5

Features of MEC

Good squareness

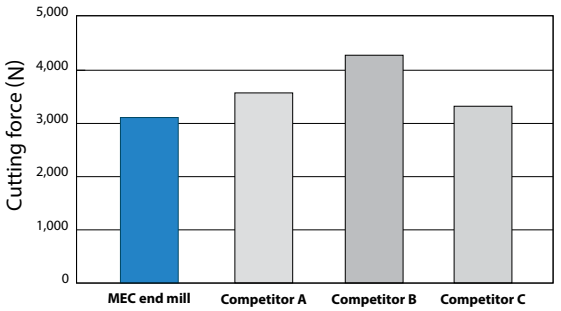
Cutting Surface Comparison



(Internal evaluation)

Low cutting force

Cutting force comparison

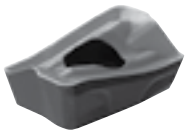


Tool dia. ø20 C50
Vc = 100 m/min Shouldering ap x ae = 9 x 10 mm
fz = 0.2 mm/t Dry

(Internal evaluation)

Chipbreaker

JT chipbreaker
(General purpose)

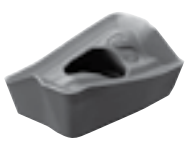


JA chipbreaker
(For aluminum)



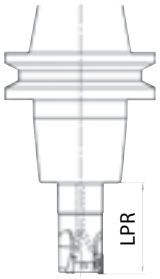
JS chipbreaker
(Low cutting force)

Cutting force
20% lower

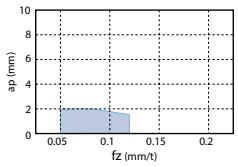
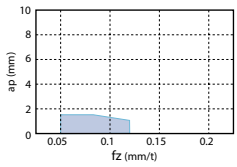
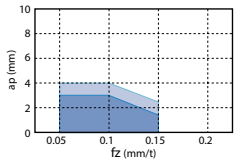
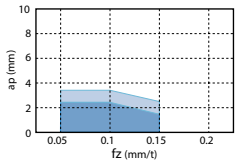
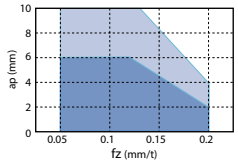
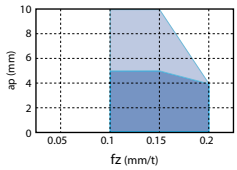
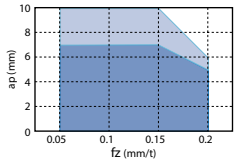
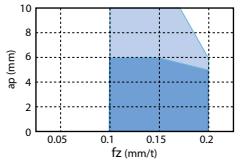
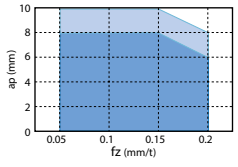
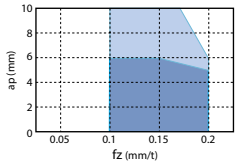
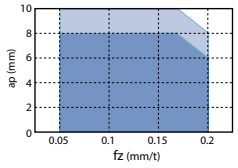
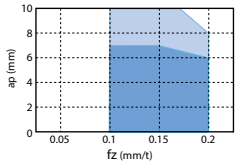


Cutting performance of mec end mill

1. Cutting edge length 10mm type (Standard/Same shank with JT chipbreaker)

Cutting dia.	Description	Overhang length LPR (mm)		Shape
ø10	MEC10-S10-11	17	-	
ø12	MEC12-S16-11	20	30	
ø16	MEC16-S16-11T	30	45	
ø20	MEC20-S20-11T	30	45	
ø25	MEC25-S25-11T	32	48	
ø32	MEC32-S32-11T	40	60	

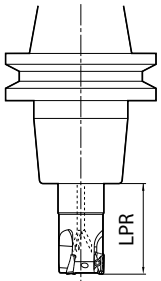
(Vc=120m/min Workpiece material: C50)

Description	Shouldering (Cutting width ae=DC/2)	Slotting Ramping and helical milling
MEC10-S10-11		
MEC12-S16-11		
MEC16-S16-11T		
MEC20-S20-11T		
MEC25-S25-11T		
MEC32-S32-11T		

2. Cutting edge length 10 mm type (Long shank with JT chipbreaker)

Cutting dia.	Description	Overhang length LPR (mm)	
ø20 Long shank	MEC20-S20-140-11T	60	90
ø25 Long shank	MEC25-S25-160-11T	60	100
ø32 Long shank	MEC32-S32-200-11T	100	130
ø40 Long shank	MEC40-S32-240-11T	100	130

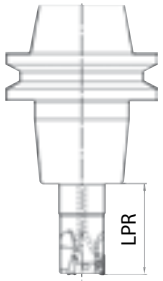
Shape



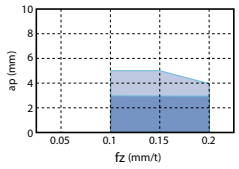
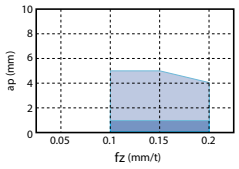
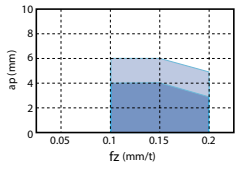
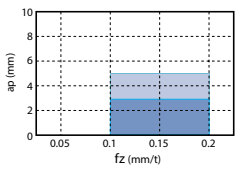
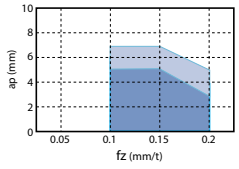
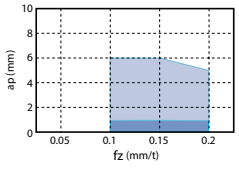
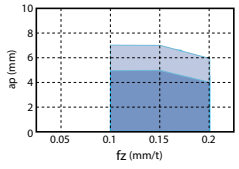
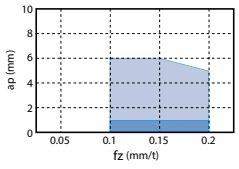
3. Cutting edge length 15.7 mm type (JT chipbreaker)

Cutting dia.	Description	Overhang length LPR (mm)	
ø25	MEC25-S25-17	36	54
ø32	MEC32-S32-17	40	60
ø40	MEC40-S32-17	50	75
ø25 Long shank	MEC25-S25-160-17	60	100
ø32 Long shank	MEC32-S32-200-17	100	130
ø40 Long shank	MEC40-S32-240-17	100	130

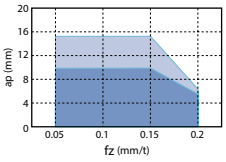
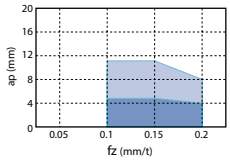
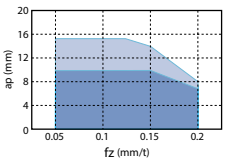
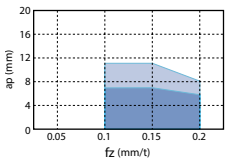
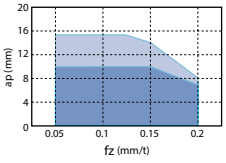
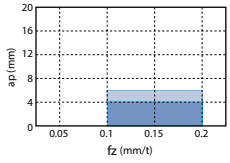
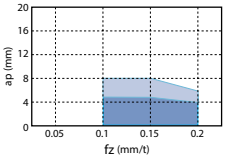
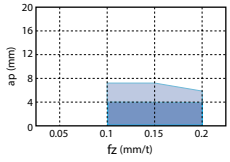
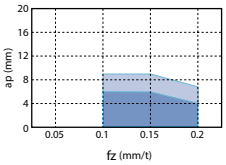
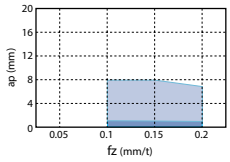
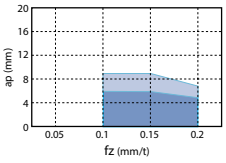
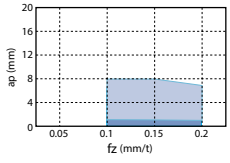
Shape



(Vc = 120 m/min Workpiece material: C50)

Description	Shouldering Cutting width ae = DC/2)	Slotting Ramping and helical milling
MEC20 -S20-140-11T Long shank		
MEC25 -S25-160-11T Long shank		
MEC32 -S32-200-11T Long shank		
MEC40 -S32-240-11T Long shank		

(Vc = 120 m/min Workpiece material: C50)

Description	Shouldering Cutting width ae = DC/2)	Slotting Ramping and helical milling
MEC25-S25-17		
MEC32-S32-17		
MEC40-S32-17		
MEC25 -S25-160-17 Long shank		
MEC32 -S32-200-17 Long shank		
MEC40 -S32-240-17 Long shank		

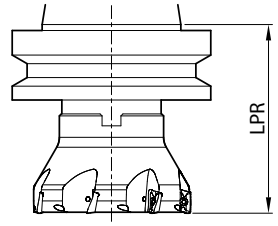
Cutting performance of MEC face mill

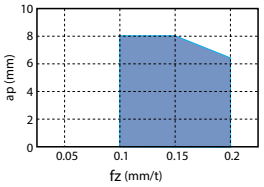
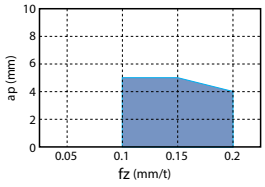
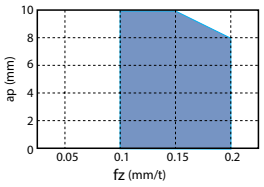
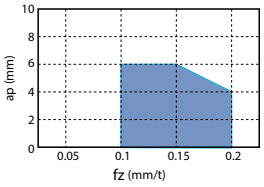
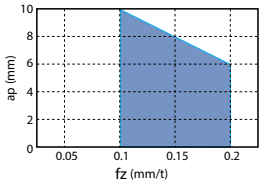
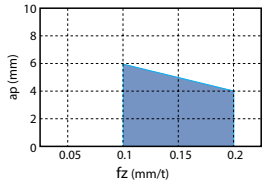
Cutting edge length 10 mm type (JT chipbreaker)

(Vc = 120 m/min Workpiece material: C50)

Cutting dia.	Description	Overhang length LPR (mm)
ø32	MEC032R-11-5T-M	110
ø40	MEC040R-11-T-○M	115
ø50	MEC050R-11-○T-M	100
ø63	MEC063R-11-○T	95
	MEC063R-11-○T-M	
ø80	MEC080R-11-○T	95
	MEC080R-11-○T-M	
ø100	MEC100R-11-9TN	108
	MEC100R-11-9T-MN	
ø125	MEC125R-11-11T	
	MEC125R-11-11T-M	

Shape



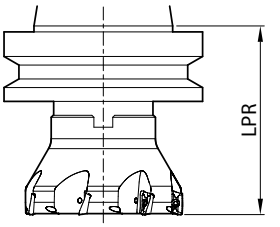
Description	Shouldering (Cutting width ae=DC/2)	Slotting
MEC040R -11-○T-M		
MEC050R-11 -○T-M ≀ MEC100R-11 -9TN(-MN)		
MEC125R -11-11T(-M)		

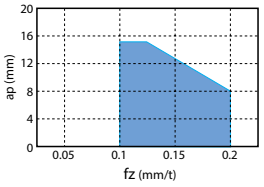
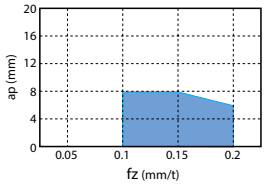
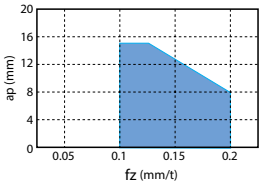
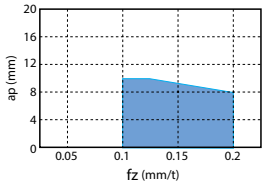
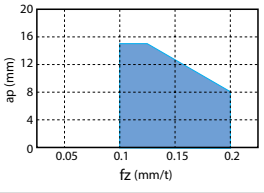
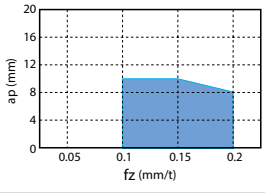
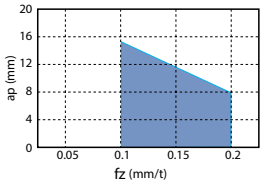
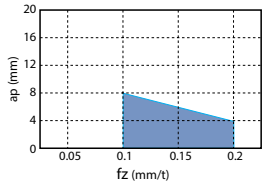
Cutting edge length 15.7 mm type (JT chipbreaker)

(Vc = 120 m/min Workpiece material: C50)

Cutting dia.	Description	Overhang length LPR (mm)
ø40	MEC040R-17-4T-M	115
ø50	MEC050R-17-○T-M	100
ø63	MEC063R-17-○T	95
	MEC063R-17-○T-M	
ø80	MEC080R-17-○T	95
	MEC080R-17-○T-M	
ø100	MEC100R-17-○TN	108
	MEC100R-17-○T-MN	
ø125	MEC125R-17-9T	
	MEC125R-17-9T-M	
ø160	MEC160R-17-12T	
	MEC160R-17-12T-M	

Shape



Description	Shouldering (Cutting width ae=DC/2)	Slotting
MEC040R -17-4T-M		
MEC050R -17-○T-M		
MEC063R -17-○T(-M) ≀ MEC100R -17-○TN(-MN)		
MEC125R -17-9T(-M) MEC160R -17-12T(-M)		

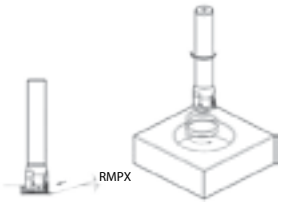
Ramping, helical milling and vertical milling (Plunging)

Ramping/Helical milling

Ramping angle is recommended under RMPX.

Refer to each tool's cutting performance list for sinking depth per revolution when helical milling.

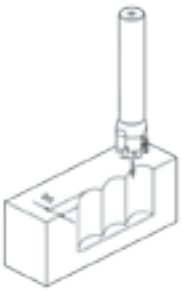
Use compressed air when during machining.



Cutting dia.	Applicable inserts	Max. ramping angle (RMPX)
ø16~ø18	BDMT11T3 type BDGT11T3 type	3°
ø19~ø21		5°
ø22~ø25		2.5°
ø28~ø32		1.5°
ø40		0.7°
ø50 and over		Not recommended
ø25	BDMT1704 type BDGT1704 type	8°
ø32		5°
ø40		2.5°
ø50 and over		Not recommended

BDMT1103 type is not recommended for ramping and helical milling.

Vertical milling (Plunging)



Cutting dia.	Applicable inserts	Max. width of cut (ae)
ø16 ~ ø19	BDMT11T3 type BDGT11T3 type	1.5 mm
ø20 ~ ø160	BDMT11T3 type BDGT11T3 type	5 mm
ø25 ~ ø160	BDMT1704 type BDGT1704 type	8 mm

BDMT1103 type is not recommended for vertical milling (plunging).

Guidance of minimum cutting dia. by helical milling

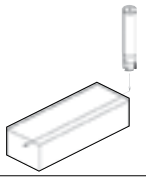
MEC	Cutting dia.	ø16	ø18	ø20	ø22	ø25	ø28	ø30	ø32	ø40	ø50
BD_T11T3 type	Guidance of minimum cutting dia. by helical milling	ø21	ø25	ø29	ø33	ø39	ø45	ø49	ø53	ø69	Helical milling is not recommended.
	Guidance of minimum cutting dia. in case of flatting bottom after helical milling.	ø28	ø32	ø36	ø40	ø46	ø52	ø56	ø60	ø76	

MEC	Cutting dia.	ø25	ø32	ø40	ø50
BD_T1704 type	Guidance of minimum cutting dia. by helical milling	ø34	ø48	ø64	Helical milling is not recommended.
	Guidance of minimum cutting dia. in case of flatting bottom after helical milling.	ø46	ø60	ø76	

Case studies

RC55 (Pre-hardened Tool Steel)

- Test piece (54~56HRC)
- Vc = 50 m/min (n = 800 min^{-1})
- ap x ae = 2 x 14 mm
- fz = 0.125 mm/t (Vf = 300 mm/min)
- Dry
- MEC20-S20-11T
- 3 flutes
- BDMT11T308ER-JT (PR830)



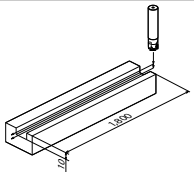
MEC	Chip removal amount =71.3cm^3 (Further machining possible)
Competitor's end mill A	Chip removal amount = 2.9 cm^3 (Chipping occurred)

Competitor's end mill A [ø25 (2 flutes) Vc = 40 m/min fz = 0.075 mm/t ap x ae = 2 x 3 mm] had chipping occurred in 10 minutes and had loud machining sound. MEC could increase the feed rate, and the cutting edge remained in extremely good condition and is still sustainable for further machining.

(User evaluation)

ST44-2

- Plate
- Vc = 88 m/min (n = 1,400min^{-1})
- ap = 5 mm x 2 passes
- fz = 0.12 mm/t (Vf = 500 mm/min)
- Dry
- MEC20-S20-11T
- 3 flutes
- BDMT11T308ER-JT (PR830)



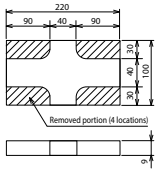
MEC	23 pcs/edge
Competitor's end mill B	10~11pcs/edge

MEC extended the tool life for more than twice.

(User evaluation)

X5CrNi18 10

- Plate
- Vc = 125 m/min (n = 1,600 min^{-1})
- ap = 9.0 mm
- fz = 0.1 mm/t (Vf = 320 mm/min)
- Dry
- MEC25-25-17
- 2 flutes
- BDMT170408ER-JT (PR830)



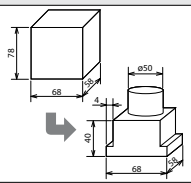
MEC	4pcs/edge or more
Competitor's end mill C	1pc/edge or less

Competitor's end mill C (indexable end mill) had high cutting force and had insert breakage, but MEC had no insert breakage and was still usable for further machining after machining 4 pieces (16 points).

(User evaluation)

DAC10 (Hot work tool steel)

- Mold
- Vc = 130 m/min (n = 1,040 min^{-1})
- ap × ae =(~3)×(~5) (Varies depending on machining point)
- fz = 0.18 mm/t(Vf = 936 mm/min)
- Dry (Air blow)
- MEC40-S32-11T • 5 flutes
- BDMT11T308ER-JT (PR830)



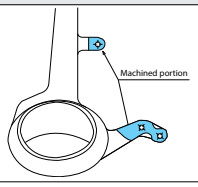
MEC	2 hours (Small wear: extendible)
Competitor's end mill D	2 hours (Halted due to insert breakage)

MEC had better cutting performance/insert life comparing to competitor's end mill D, and the insert had only small wear and was usable for further machining after used for machining of the same duration as competitor's end mill D. Competitor's end mill D (6 flutes type) was used with Vf = 936 mm/min (fz = 0.15 mm/t).

(User evaluation)

20CrMo5

- Knuckle Steering
- Vc = 150 m/min (n = 1,200 min^{-1})
- ap = 0.5~5 mm(Shouldering)
- fz = 0.1 mm/t (Vf = 478 mm/min)
- Dry
- MEC40-S32-17
- 4 flutes
- BDMT170408ER-JT (PR830)



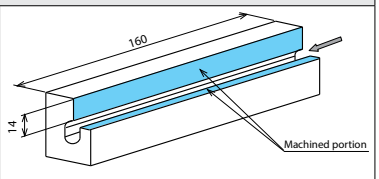
MEC	150 pcs/edge
Competitor's end mill E	40pcs/edge

MEC had a better finished surface comparing to competitor's end mill E and also improved the tool life by more than 3 times.

(User evaluation)

Ni-base heat-resistant alloys

- Turbine parts
- Vc = 15 m/min (n = 120 min^{-1})
- ap = 0.5 mm
- fz = 0.08 mm/t (Vf = 38 mm/min)
- Wet
- MEC040R-17-4T-M
- 4 flutes
- BDMT170408ER-JS (PR1025)



MEC	9pcs/edge
Competitor's end mill F	1pc/edge or less

Competitor's end mill F (Coated carbide Insert) could not finish machining of 1 workpiece, but MEC could cut 9pcs/edge and the finished surface was good.

(User evaluation)

MECX



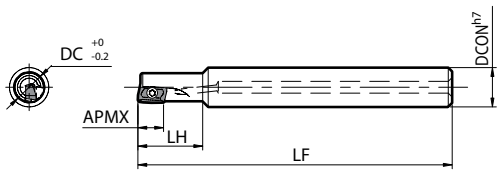


Fig. 1

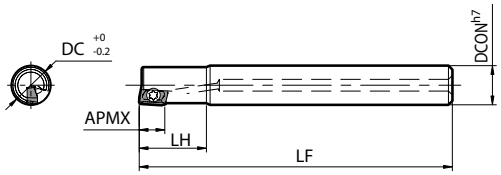


Fig. 2

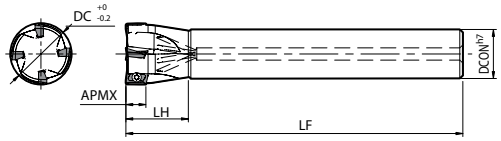


Fig. 3

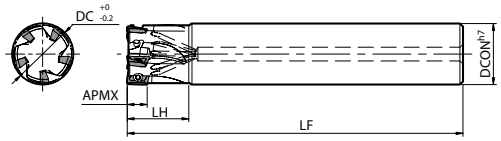


Fig. 4

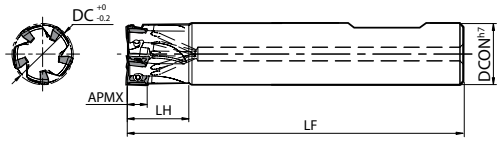


Fig. 5

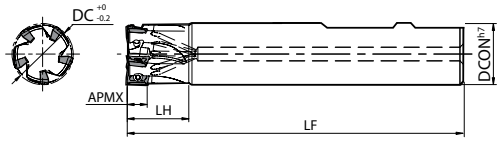


Fig. 6

Toolholder dimensions

Description				Availability	Inserts	Dimension (mm)					A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Fig.	Spare parts: Anti-seize compound	Spare parts: Screw	Spare parts: Wrench	Applicable inserts ➡ M100
						DC	DCON	LF	LH	APMX									
Standard shank	Standard	MECX	08-S10-07-1T	●	1	8	10	80	16	6	+11.7	-24	Yes	48100	1	P-37	SB-2035TRG	DTM-6	BDMT0703...-JT BDMT0703...-JS
			14-S12-07-2T	●	2	14	12		18		+16.3	-12.1		44800	3				
			17-S16-07-3T	●	3	17	16	100	20			-11		42400	3		SB-2042TRG		
			18-S16-07-3T	●		18						-10.9		41600	3				
			20-S16-07-4T	●	4	20		110				-10.4		40200	3				
			21-S20-07-4T	●		21	20					-10.1		39500	3				
			25-S20-07-5T	●	5	25		120	25			-9.7		37000	3				
			26-S25-07-5T	●		26	25					-9.5		36500	3				
			33-S32-07-6T	●	6	33	32	130	30			-8.8		33100	3				
	Fine pitch	MECX	20-S16-07-5T	●	5	20	16	110	20	6	+16.3	-10.4	Yes	40200	3	P-37	SB-2042TRG	DTM-6	BDMT0703...-JT BDMT0703...-JS
			25-S20-07-7T	●	7	25	20	120	25			-9.7		37000	3				
Same shank	Standard	MECX	10-S10-07-1T	●	1	10	10	80	17	6	+12.8	-18.7	Yes	47100	2	P-37	SB-2035TRG	DTM-6	BDMT0703...-JT BDMT0703...-JS
			12-S12-07-2T	●	2	12	12		18		+14.3	-13.7		46200	4				
			16-S16-07-3T	●	3	16	16	100	20		+16.3	-11.3		43200	4		SB-2042TRG		
			20-S20-07-4T	●	4	20	20	110				-10.4		40200	4				
			25-S25-07-5T	●	5	25	25	120	25			-9.7		37000	4				
	Fine pitch	MECX	16-S16-07-4T	●	4	16	16	100	20	6	+16.3	-11.3	Yes	43200	4	P-37	SB-2042TRG	DTM-6	BDMT0703...-JT BDMT0703...-JS
			20-S20-07-5T	●	5	20	20	110				-10.4		40200	4				
			25-S25-07-7T	●	7	25	25	120	25			-9.7		37000	4				
			32-S32-07-8T	●	8	32	32	130	30			-8.9		33600	4				
Long shank	Standard	MECX	17-S16-130-07-3T	●	3	17	16	130	20	6	+16.3	-11	Yes	42400	3	P-37	SB-2042TRG	DTM-6	BDMT0703...-JT BDMT0703...-JS
			21-S20-140-07-4T	●	4	21	20	140				-10.1		39500	3				
			26-S25-160-07-5T	●	5	26	25	160	25			-9.5		36500	3				
Weldon	Standard	MECX	16-W16-07-3T	●	3	16	16	68.5	20	6	+16.3	-11.3	Yes	43200	5	P-37	SB-2042TRG	DTM-6	BDMT0703...-JT BDMT0703...-JS
			20-W20-07-4T	●	4	20	20	81				-10.4		40200	5				
			25-W25-07-5T	●	5	25	25	88	25			-9.7		37000	6				
	Fine pitch	MECX	16-W16-07-4T	●	4	16	16	68.5	20	6	+16.3	-11.3	Yes	43200	5	P-37	SB-2042TRG	DTM-6	BDMT0703...-JT BDMT0703...-JS
			20-W20-07-5T	●	5	20	20	81				-10.4		40200	5				
			25-W25-07-7T	●	7	25	25	88	25			-9.7		37000	6				

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load. For more details, see „Warning“ on page **M101**.

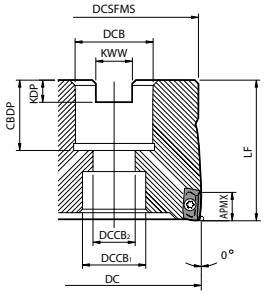
For good shoulder finishes by MECX multistage ap. In order to obtain smooth machining wall surface by MECX multistage ap set ap within 5mm for each cut.

Coat Anti-seize Compound(P-37) thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MECX





Toolholder dimensions

Description		Availability	Inserts	Dimension (mm)										A.R. MAX. (°)	R.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Spare parts			Applicable inserts M100
		R		DC	DCSFMS	DCB	$DCCB_1$	$DCCB_2$	LF	CBDP	KDP	KWW	APMX						Anti-seize compound	Screw	Wrench	
MECX	032R-07-8T-M	●	8	32	30	16	14	8.5	40	20	5.5	8.5	6	+7	-8.9	Yes	33600	0.15	P-37	SB-2042TRG	DTM-6	BDMT0703...-JT
	040R-07-10T-M	●	10	40	38	22	18	12		22	6.3	10.4			-8.4		30500	0.25				BDMT0703...-JS

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
For more details, see „Warning“ on page **M101**.
For good shoulder finishes by MECX multistage ap.
In order to obtain smooth machining wall surface by MECX multistage ap set ap within 5mm for each cut.
Coat Anti-seize Compound(P-37) thinly on portion of taper and thread when insert is fixed.
MECX032R comes with mounting bolt (HH8X25H) and MECX040R comes with mounting bolt (HH10X30H).

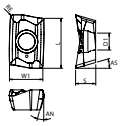
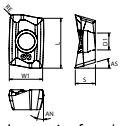
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

BDMT

Classification of usage

★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice
(In case hardness is 45HRC or under)

Carbon steel / Alloy steel				★	☆	P
Mold and die steel				★	☆	
Austenitic stainless steel		☆		☆	★	M
Martensitic stainless steel	★				☆	
Precipitation hardening stainless steel		☆			★	
Gray cast iron			★			K
Nodular cast iron			★			
Non-ferrous metals						N
Heat-resistant alloy	★				☆	S
Titanium alloy		☆			★	
Hard materials						H

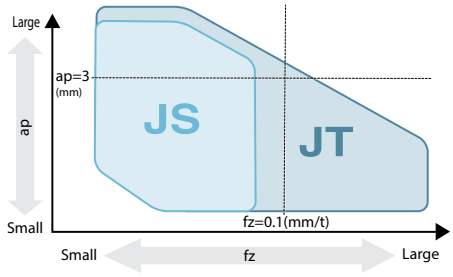
Insert		Description	No. of edges	Dimension (mm) S	D1	RE	L	W1	Angle (°) AN	AS	Carbide CVD CA6535	PVD PR1535	PR1810	PR1825	PR1835	Applicable toolholder ➡ M98 M99
		BDMT 070302ER-JT 070304ER-JT 070308ER-JT	2	2.6	2.3	0.2 0.4 0.8	6.7	4.6	15	16	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	MECX...-07-...
	 Low cutting force / Stainless steel	BDMT 070302ER-JS 070304ER-JS 070308ER-JS	2	2.6	2.3	0.2 0.4 0.8	6.7	4.6	15	16	● ● ●	● ● ●		● ● ●	● ● ●	MECX...-07-...

Handed insert shows Right-hand

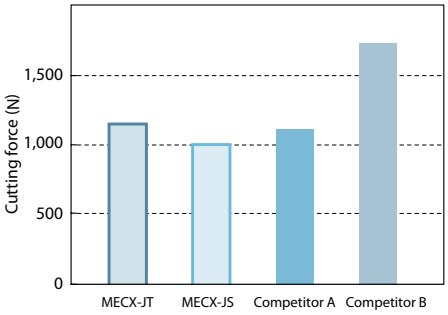
Recommended cutting conditions ➡ M101

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Chipbreaker selection



Cutting force comparison (Internal evaluation)



C45
Vc = 150 m/min
ap x ae = 5x5 mm
fz = 0.07 mm/t

Warning Please observe below precautions fully. Failure to observe the precautions may cause serious damage to human body.

Warning about max. revolution indicated on main body

1. Do not use the end mill or cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter or the body may be damaged even under no load.
2. For actual practical revolution, please set within recommended cutting condition.
3. When using at a higher revolution (over 10,000min^{-1}), refer to the table to adjust the balance of MECX and suitable arbor.

Revolution (min^{-1})	Balance quality grade G ISO 1940-1/8821 (JIS B0905)
~20,000	G16
~30,000	G6.3
30,000~	G2.5

Recommended cutting conditions

Workpiece material	fz (mm/t)		Recommended insert grades (Vc: m/min)			
	JS chipbreaker	JT chipbreaker	MEGACOAT NANO EX (MEGACOAT NANO)			CVD coated carbide
			PR1835 (PR1535)	PR1825	PR1810	CA6535
Carbon steel	0.04~**0.08**~0.1	0.06~**0.1**~0.12	☆ 120~**180**~250	★ 120~**180**~250	-	-
Alloy steel	0.04~**0.06**~0.08	0.06~**0.08**~0.1	☆ 100~**160**~220	★ 100~**160**~220	-	-
Mold steel	0.04~**0.06**~0.08	0.06~**0.08**~0.1	☆ 80~**140**~180	★ 80~**140**~180	-	-
Stainless steel (Austenitic related)	0.03~**0.04**~0.05	0.05~**0.06**~0.07	★ 100~**160**~200	☆ 100~**160**~200	-	-
Stainless steel (Martensitic related)	0.03~**0.04**~0.05	0.05~**0.06**~0.1	☆ 150~**200**~250	-	-	★ 180~**240**~300
Stainless steel (Precipitation hardening)	0.03~**0.04**~0.05	0.05~**0.06**~0.1	★ 90~**120**~150	-	-	-
Gray cast iron	0.04~**0.08**~0.1	0.08~**0.1**~0.15	-	-	★ 120~**180**~250	-
Nodular cast iron	0.04~**0.06**~0.08	0.08~**0.1**~0.12	-	-	★ 100~**150**~200	-
Ni-base heat-resistant alloys	0.03~**0.04**~0.05	0.05~**0.06**~0.07	☆ 20~**30**~50	-	-	★ 20~**30**~50
Titanium alloys	0.04~**0.06**~0.08	0.08~**0.1**~0.12	★ 40~**60**~80	-	-	-

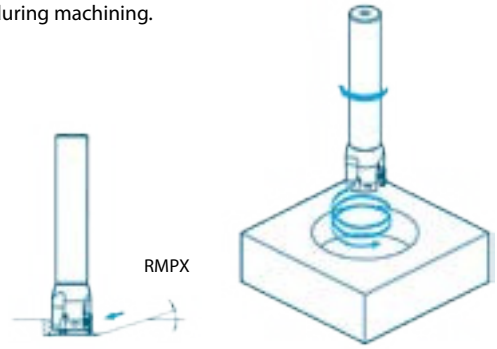
* Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.

★: 1st Recommendation ☆: 2nd Recommendation

Ramping/Helical milling

Ramping angle is recommended under RMPX.

Refer to each tool's cutting performance list for sinking depth per revolution when helical milling.
Use compressed air during machining.



Cutting dia.	Applicable inserts	Max. ramping angle (RMPX)
ø8	BDMT0703 type	Not recommended
ø10		1.5°
ø12,ø14		2°
ø16		3°
ø17,ø18		1.5°
ø20		2°
ø21		1.8°
ø25		1.3°
ø26		1.2°
ø32		0.8°
ø33		0.5°

Guidance of minimum cutting dia. by helical milling

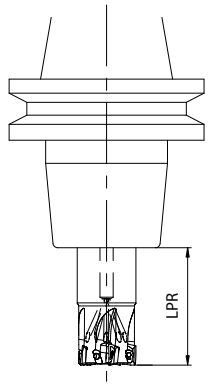
MECX	Cutting dia.	ø8	ø10	ø12	ø14	ø16	ø17	ø18	ø20
BDMT0703 type	Guidance of minimum cutting dia. by helical milling	Helical milling is not recommended	ø14	ø18	ø22	ø26	ø28	ø30	ø34
	Guidance of minimum cutting dia. in case of flatting bottom after helical milling		ø17	ø21	ø25	ø29	ø31	ø33	ø37

MECX	Cutting dia.	ø21	ø25	ø26	ø32	ø33
BDMT0703 type	Guidance of minimum cutting dia. by helical milling	ø36	ø44	ø46	ø58	ø60
	Guidance of minimum cutting dia. in case of flatting bottom after helical milling	ø39	ø47	ø49	ø61	ø63

Cutting performance of MECX end mill

Cutting dia.	Description	Overhang length LPR (mm)	
ø8	MECX08-S10-07-1T	16	-
ø10	MECX10-S10-07-1T	17	-
ø12	MECX12-S12-07-2T	18	30
ø16	MECX16-S16-07-3T	20	40
ø20	MECX20-S20-07-4T	20	40
ø25	MECX25-S25-07-5T	25	50
ø32	MECX32-S32-07-6T	30	50

Shape



* Machining with extended Overhang length is not recommended for ø8 and ø10.

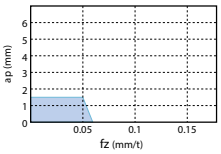
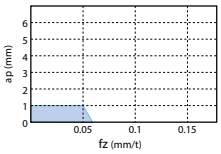
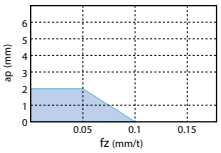
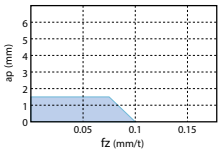
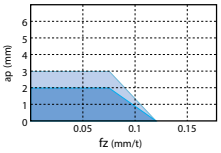
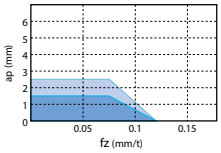
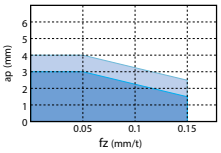
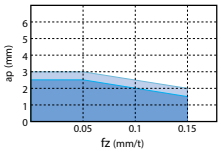
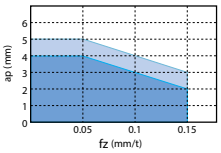
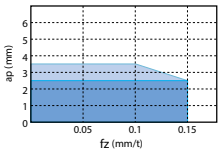
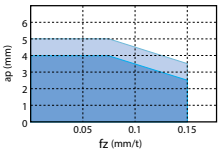
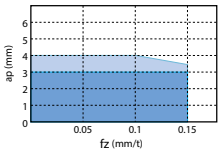
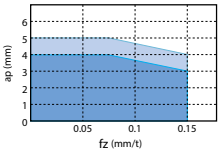
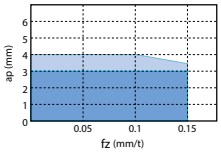
* The cutting performance list shows applicable range of JT chipbreaker with Standard flute-number type.

For multi-edge type, use with 70% or less of ap.

* Cutting conditions of JS chipbreaker

1. For MECX08~MECX12
   Decrease the feed rate by 25% according to cutting capability list.
2. For MECX16 and over
   Decrease the feed rate and ap by 30% according to cutting capability list.

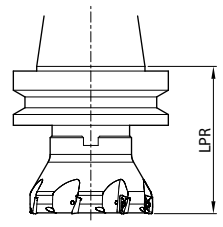
(Vc = 150 m/min Workpiece material: C50)

Description	Shouldering (Cutting width ae = DC/2)	Slotting Ramping and helical milling
MECX08-S10-07-1T		
MECX10-S10-07-1T		
MECX12-S12-07-2T		
MECX16-S16-07-3T		
MECX20-S20-07-4T		
MECX25-S25-07-5T		
MECX32-S32-07-6T		

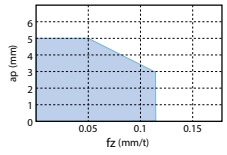
Cutting performance of MECX face mill

Cutting dia.	Description	Overhang length LPR (mm)
ø32	MECX032R-07-8T-M	100
ø40	MECX040R-07-10T-M	

Shape



(Vc = 150 m/min Workpiece material: C50)

Description	Shouldering (Cutting width ae=DC/2)
MECX032R-07-8T-M MECX040R-07-10T-M	

* Use JT chipbreaker.
* Slotting is not recommended.

High performance milling

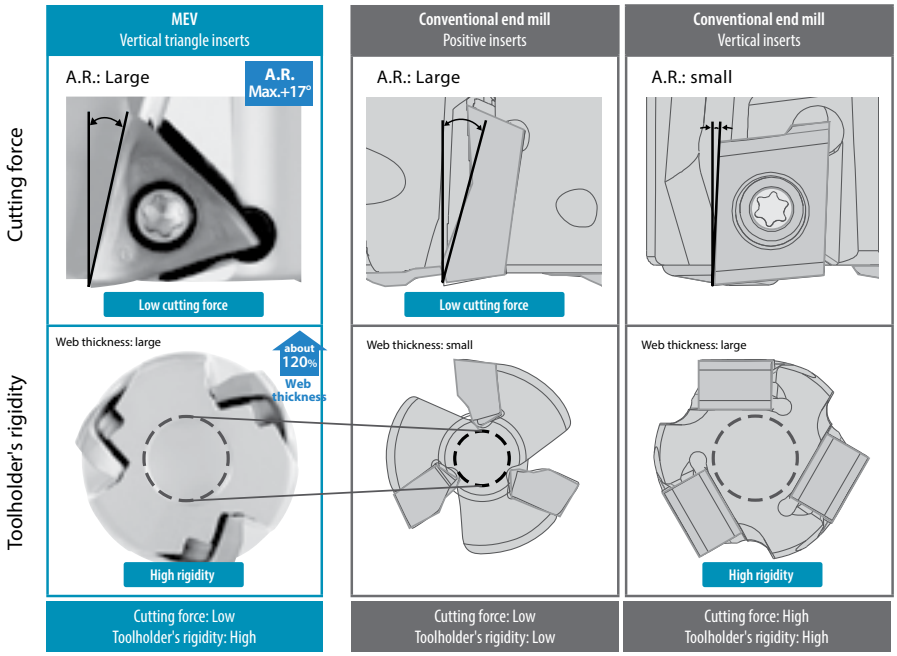
MEV

Newly developed triangular inserts providing low cutting force and increased toolholder rigidity. High performance, economical, and multi-functional milling solutions.

1 High performance: low cutting force and high rigidity

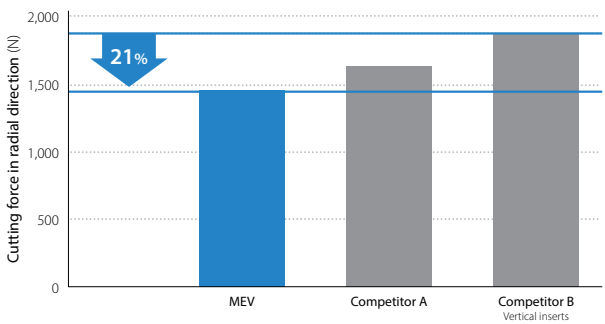
Newly developed vertical triangle inserts with 3 cutting edges achieve stable machining with reduced chattering.

MEV vs. competitor



Keeping A.R. max. at 17°, provides lower cutting force than the positive insert types of competitors

Cuttting force comparison (internal evaluation)

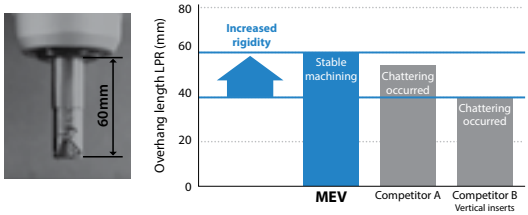


Cutting conditions: Vc = 200 m/min, ap × ae = 3 × 18 mm, fz = 0.10 mm/t, ø20 (3 inserts), Dry, Workpiece material: 42CrMo4

Low cutting force and large optimal web thickness provides excellent chattering resistance

Chattering resistance comparison (internal evaluation)

Shouldering



Cutting conditions: Vc = 200 m/min, ap × ae = 3 × 18 mm, fz = 0.10 mm/t, ø20 (3 inserts), Dry, Workpiece material: 42CrMo4

Slotting

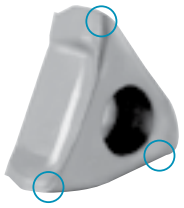


Cutting conditions: Vc = 220 m/min, ap = 3 mm (Slotting), fz = 0.10 mm/t, ø20 (3 inserts), Dry, Workpiece material: 42CrMo4

2 The economical choice: 3 cutting edge insert with long tool life

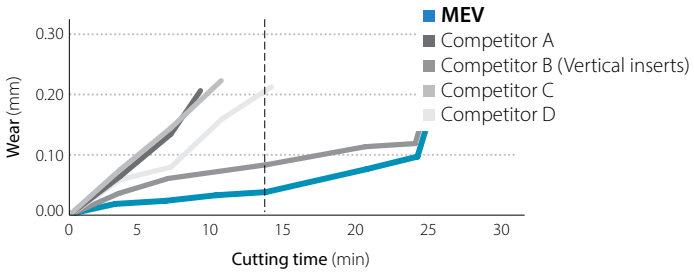
Insert

Unique triangle inserts with 3 cutting edges. PR15 series utilizes MEGACOAT NANO coating technology with excellent wear and adhesion resistance.



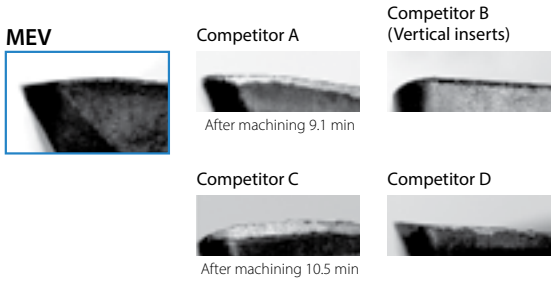
Long tool life with excellent wear resistance

Wear resistance comparison (internal evaluation)



Cutting conditions: Vc = 180 m/min, ap × ae = 3 × 10 mm, fz = 0.1 mm/t, ø20, Dry, Workpiece material: X153CrMoV12 (30~35HS)

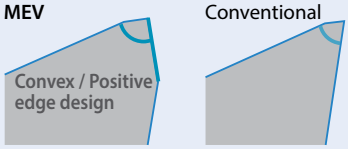
Cutting edge (after machining 14 min)



Improved stability with superior fracture resistance

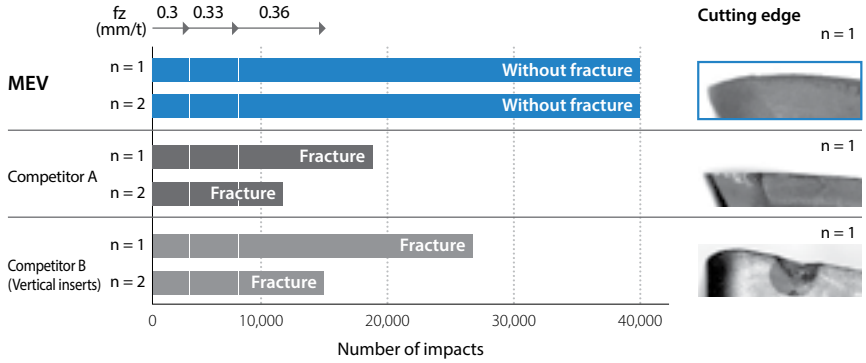


Cutting edge cross-section



The MEV features a larger cutting edge to increase strength

Wear resistance comparison (internal evaluation)



Cutting conditions: Vc = 120 m/min, ap × ae = 2 × 10 mm, fz = 0.3 - 0.36 mm/t, ø20 (1 insert), Dry, Workpiece material: 42CrMo4 (37~39HS)

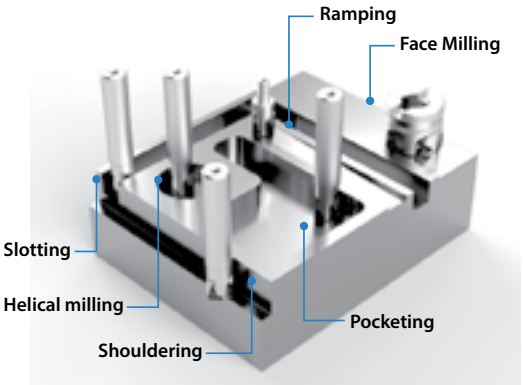
3 Multi-functional: The MEV can perform a wide variety of machining processes

Great performance in shouldering, slotting, and ramping applications (D.O.C. 6 mm or less)

Chip example (slotting)



Cutting conditions: Vc = 150 m/min, ap = 6 mm (Slotting) fz = 0.2 mm/t, ø20 (3 insert), Dry, Workpice material: ST44-2



MEV



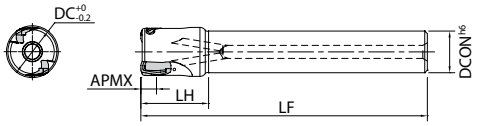


Fig. 1

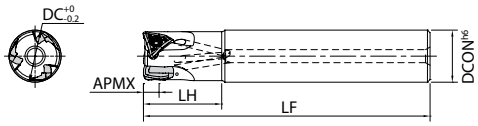


Fig. 2

Toolholder dimensions

Description				Availability	Inserts	Dimension (mm) DC	DCON	LF	LH	APMX	A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Fig.	Spare parts: Anti-seize compound	Screw	Wrench	Applicable inserts ➡ M109
Cylindrical	Standard shank	MEV	20-S16-06-2T	●	2	20	16	110	26	6	+17	-38	Yes	32000	0.2	1	P-37	SB-3076TRP	DTPM-10	TOMT0605...-GM TOMT0605...-SM
			22-S20-06-3T	●	3	22	20					-37		29000		1		Recommended tightening torque for insert clamp 2.0N-m		
			25-S20-06-3T	●		25		120	29					25000	0.3	1				
			28-S25-06-3T	●		28	25					-36		23000	0.4	1				
			30-S25-06-4T	●	4	30		130	32					21500	0.5	1				
			32-S25-06-4T	●		32								20000		1				
			40-S32-06-5T	●	5	40	32	150	50					16000	1	1				
			50-S32-06-5T	●		50		120	40		+16			13000	0.9	1				
	Same shank	MEV	20-S20-06-2T	●	2	20	20	110	30	6	+17	-38	Yes	32000	0.2	2	P-37	SB-3076TRP	DTPM-10	TOMT0605...-GM TOMT0605...-SM
			20-S20-06-3T	●	3											2		Recommended tightening torque for insert clamp 2.0N-m		
			25-S25-06-2T	●	2	25	25	120	32			-37		25000	0.4	2				
			25-S25-06-3T	●	3											2				
			32-S32-06-3T	●		32	32	130	40			-36		20000	0.7	2				
			32-S32-06-4T	●	4											2				
	Long shank	MEV	20-S18-06-150-2T	●	2	20	18	150	30	6	+17	-38	Yes	32000	0.3	1	P-37	SB-3076TRP	DTPM-10	TOMT0605...-GM TOMT0605...-SM
			20-S18-06-150-3T	●	3											1		Recommended tightening torque for insert clamp 2.0N-m		
			20-S20-06-150-2T	●	2		20		40							2				
			20-S20-06-150-3T	●	3											2				
			25-S25-06-170-2T	●	2	25	25	170	50			-37		25000	0.6	2				
			25-S25-06-170-3T	●	3											2				
			32-S32-06-200-2T	●	2	32	32	200	65			-36		20000	1.1	2				
			32-S32-06-200-3T	●	3							-35				2				

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MEV



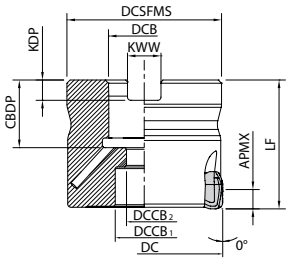


Fig. 1

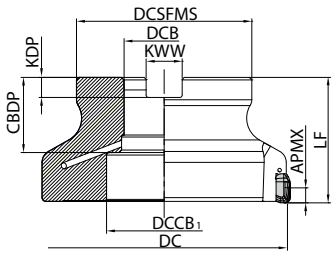


Fig. 2

Toolholder dimensions

Description		Availability	Inserts	Dimension (mm)										A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Fig.	Spare parts				Applicable inserts ➡ M109
																				Anti-seize compound	Mounting bolt	Screw	Wrench	
	R			DC	DCSFMS	DCB	$DCCB_1$	$DCCB_2$	LF	CBDP	KDP	KWW	APMX											
MEV	032R-06-4T-M	●	4	32	30	16	13.5	9	35	19	5.6	8.4	6	+17	-36	Yes	20000	0.1	1	P-37	HH8X25	SB-3076TRP	DTPM-10	TOMT0605...-GM TOMT0605...-SM
	040R-06-5T-M	●	5	40	38		15		40								16000	0.2	1					
	050R-06-5T-M	●		50	48	22	18	11		21	6.3	10.4		+16			13000	0.4	1		HH10X30			
	063R-06-6T-M	●	6	63													10000	0.6	1					
	080R-06-7T-M	●	7	80	60	27	20	13	50	24	7	12.4		+15	-35		7900	1.1	1		HH12X35			
	080R-06-7T	●				25.4				27	6	9.5							1			Recommended tightening torque for insert clamp 2.0N·m		
	100R-06-9T-M	●	9	100	70	32	46	-	50	30	8	14.4					6300	1.4	2		-			
	100R-06-9T	●				31.75			63	34		12.7							2					

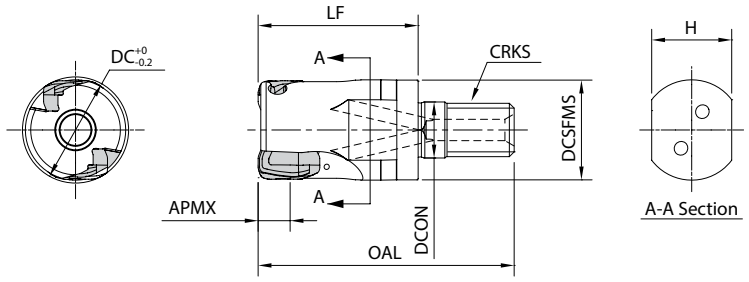
Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

M
Milling

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MEV





Toolholder dimensions

Description		Availability	Inserts	Dimension (mm) DC	DCON	DCSFMS	OAL	LF	APMX	CRKS	H	A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Spare parts: Anti-seize compound	Screw	Wrench	Applicable inserts ➡ M109
MEV	20-M10-06-2T	●	2	20	10.5	18.7	48	30	6	M10x1.5	15	+17	-38	Yes	32000	P-37	SB-3076TRP	DTPM-10	TOMT0605...-GM TOMT0605...-SM
	20-M10-06-3T	●	3																
	25-M12-06-3T	●		25	12.5	23	56	35		M12x1.75	19		-37		25000				
	32-M16-06-4T	●	4	32	17	30	62	40		M16x2.0	24		-36		20000				

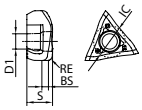
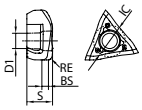
Recommended tightening torque for insert clamp 2.0N-m

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.
See page **M82** for applicable arbor (BT arbor for exchangeable head / double-face clamping spindle)

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

TOMT

Classification of usage						
★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)	Carbon steel / Alloy steel			★	☆	P
	Mold and die steel			★	☆	
	Austenitic stainless steel			☆	★	M
	Martensitic stainless steel	★			☆	
	Precipitation hardening stainless steel				★	
	Gray cast iron		★			K
	Nodular cast iron		★			
	Non-ferrous metals					N
	Heat-resistant alloy	★			☆	S
	Titanium alloy				★	
	Hard materials					H

Insert		Description		No. of edges	Dimension (mm)					Carbide				Applicable toolholder
					IC	S	D1	RE	BS	CVD	PVD			
										CA6335	PR1510	PR1525	PR1535	
	 General purpose	TOMT	060504ER-GM 060508ER-GM	3	7.2	5.7	3.4	0.4 0.8	1.9 1.5	● ●	● ●	● ●	● ●	MEV...-06-...
	 Low cutting force	TOMT	060508ER-SM	3	7.2	5.7	3.4	0.8	1.5	●		●	●	MEV...-06-...

Handed insert shows Right-hand

Recommended cutting conditions M110

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Recommended cutting conditions

Chipbreaker	Workpiece	Feed (fz: mm/t)	Recommended insert grade (Vc: m/min)			
			MEGACOAT NANO			CVD coating
			PR1535	PR1525	PR1510	CA6535
GM	Carbon steel	0.08 – **0.15** – 0.25	☆ 120 – **180** – 250	★ 120 – **180** – 250	–	–
	Alloy steel	0.08 – **0.15** – 0.2	☆ 100 – **160** – 220	★ 100 – **160** – 220	–	–
	Mold steel	0.08 – **0.12** – 0.2	☆ 80 – **140** – 180	★ 80 – **140** – 180	–	–
	Stainless steel (Austenitic related)	0.08 – **0.12** – 0.15	☆ 100 – **160** – 200	☆ 100 – **160** – 200	–	–
	Stainless steel (Martensitic related)	0.08 – **0.12** – 0.2	☆ 150 – **200** – 250	–	–	★ 180 – **240** – 300
	Stainless steel (Precipitation hardening)	0.08 – **0.12** – 0.2	★ 90 – **120** – 150	–	–	–
	Gray cast iron	0.08 – **0.18** – 0.25	–	☆ 120 – **180** – 250	★ 120 – **180** – 250	–
	Nodular cast iron	0.08 – **0.15** – 0.2	–	☆ 100 – **150** – 200	★ 100 – **150** – 200	–
	Ni-base heat-resistant alloy	0.08 – **0.12** – 0.15	☆ 20 – **30** – 50	–	–	★ 20 – **30** – 50
	Titanium alloy	0.08 – **0.15** – 0.2	☆ 40 – **60** – 80	–	☆ 30 – **50** – 70	–
SM	Carbon steel	0.08 – **0.15** – 0.2	☆ 120 – **180** – 250	★ 120 – **180** – 250	–	–
	Alloy steel	0.08 – **0.12** – 0.18	☆ 100 – **160** – 220	★ 100 – **160** – 220	–	–
	Mold steel	0.08 – **0.1** – 0.15	☆ 80 – **140** – 180	★ 80 – **140** – 180	–	–
	Stainless steel (Austenitic related)	0.08 – **0.1** – 0.15	★ 100 – **160** – 200	☆ 100 – **160** – 200	–	–
	Stainless steel (Martensitic related)	0.08 – **0.1** – 0.15	☆ 150 – **200** – 250	–	–	★ 180 – **240** – 300
	Stainless steel (Precipitation hardening)	0.08 – **0.1** – 0.15	☆ 90 – **120** – 150	–	–	–
	Ni-base heat-resistant alloy	0.08 – **0.1** – 0.12	☆ 20 – **30** – 50	–	–	★ 20 – **30** – 50
	Titanium alloy	0.08 – **0.12** – 0.15	★ 40 – **60** – 80	–	–	–

The number in **bold font** is recommended starting conditions. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.
Cutting with coolant is recommended for ni-base heat resistant alloy and titanium alloy.
Cutting with coolant is recommended to get good finished surface.

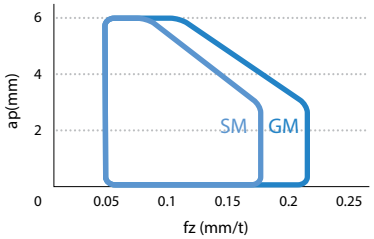
★ : 1st recommendation ☆ : 2nd recommendation

Recommended chipbreaker range

GM type for General purpose: Edge shape optimized for various machining applications
SM type with low cutting force design: Sharp cutting and large rake angle

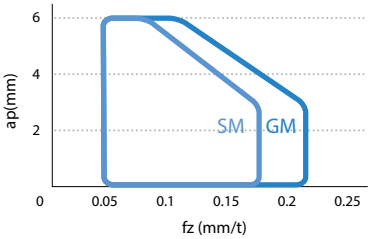
DC : ø20~ø50

Shouldering



Cutting conditions : Vc = 150 m/min, ae = DC/2 mm, Workpiece material : C50

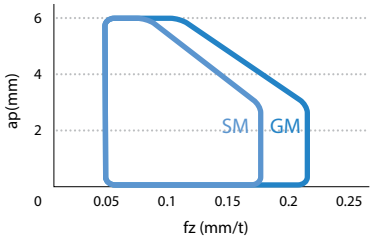
Slotting



Cutting conditions : Vc = 150 m/min, ae = DC mm, Workpiece material : C50

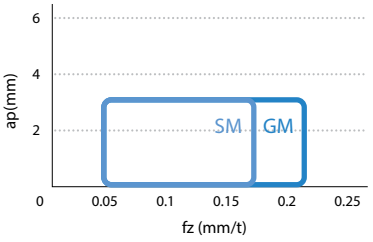
DC : ø63~ø100

Shouldering (ae≤DC/4)



Cutting conditions : Vc = 150 m/min, ae = DC/4 mm, Workpiece material : C50

Shouldering (ae>DC/4), Slotting



Cutting conditions : Vc = 150 m/min, ae = DC mm, Workpiece material : C50

Reference data for Ramping

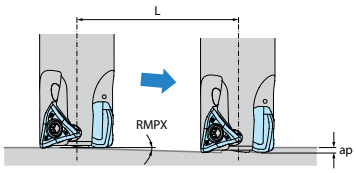
Description	Cutter Dia. DC (mm)	20	22	25	28	30	32	40	50
MEV··· -06- ···	Max. Ramping Angle RMPX	1.00°	0.80°	0.65°	0.60°	0.55°	0.50°	0.40°	0.30°
	tan RMPX	0.017	0.014	0.011	0.010	0.010	0.009	0.007	0.005

Decrease ramping angle if chips become excessively long.

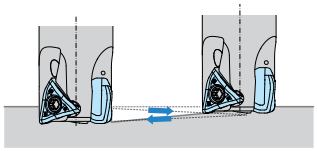
Guide for Ramping (Slant Milling)

Ramping angle should be RMPX (Maximum ramping angle) or under in the above cutting conditions.
Feed rate should be 70% or under of the above cutting conditions.

Formula of the cutting length "L" at Max. ramping angle $L = \frac{ap}{\tan RMPX}$



For two-way ramping, the ramping angle should be half of RMPX.

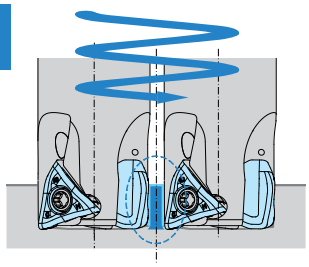


Guide for Helical milling

For helical milling, use between Min. cutting dia. and Max. cutting dia.

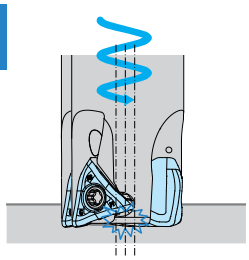
Exceeding Max. Cutting Dia.

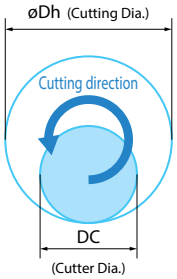
Center core part remains after machining



Under Min. Cutting Dia.

Center core part interferes with toolholder



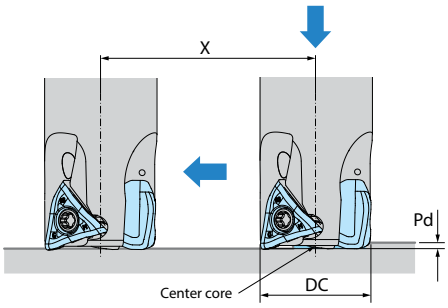


Unit : mm

Description	Min. Cutting Dia.	Max. Cutting Dia.
MEV··· -06- ···	2×DC−5	2×DC−2

For helical milling, use between Min. cutting dia. and Max. cutting dia. Keep machine depth (h) per rotation less than max. ap (S) in the cutter dimensions chart.
Use caution to eliminate incidences caused by producing long chips.

Guide for Drilling



Unit : mm

Description	Max. cutting depth Pd	Min. cutting length X for flat bottom surface
MEV··· -06- ···	0.25	DC−3

It is recommended to reduce feed by 25% of recommendation until the center core is removed when traversing after drilling. Axial feed rate recommendation per revolution is f < 0.1mm/rev.

MEWH



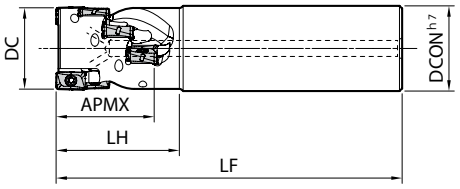


Fig. 1

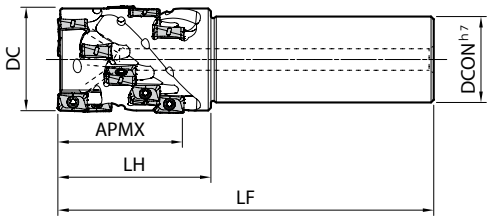


Fig. 2

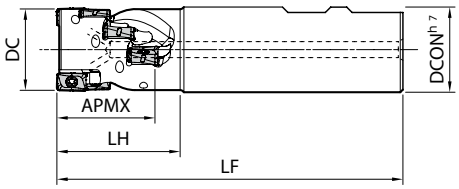


Fig. 3

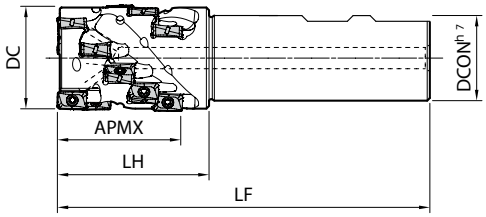


Fig. 4

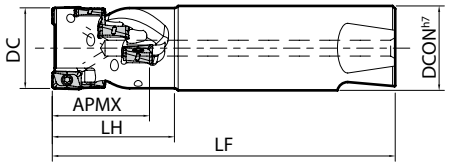


Fig. 5

Toolholder dimensions

Description		Availability	Inserts	Flutes	Stages	Dimension (mm)					A.R. max. (°)	R.R. (°)	Coolant hole	Fig.	Spare parts			Applicable inserts ➡ M114
						DC	DCON	LF	LH	APMX					Anti-seize compound	Screw	Wrench	
MEWH	025-S25-10-3-2T	●	6	2	3	25	25	120	37	28	+13	-20	Yes	1	P-37	SB-3065TRP	DTPM-8	LOMU1004...
	032-S32-10-4-2T	●	8		4	32	32	130	46	37				1		Recommended tightening torque for insert clamp 1.2N·m		
	040-S32-10-5-2T	●	10		5	40		140	57	46				2				
	040-S32-10-5-3T	●	15	3										2				
MEWH	040-S32-15-4-2T	●	8	2	4	40	32	160	63	53	+13	-20	Yes	2	P-37	SB-4090TRP	DTPM-15	LOMU1505...
	050-S42-15-4-2T	●				50	42							2		Recommended tightening torque for insert clamp 3.5N·m		
	050-S42-15-4-3T	●	12	3										2				
MEWH	025-W25-10-3-2T	●	6	2	3	25	25	95	37	28	+13	-20	Yes	3	P-37	SB-3065TRP	DTPM-8	LOMU1004...
	032-W32-10-4-2T	●	8		4	32	32	108	46	37				3		Recommended tightening torque for insert clamp 1.2N·m		
	040-W32-10-5-2T	●	10		5	40		119	57	46				4				
	040-W32-10-5-3T	●	15	3										4				
MEWH	040-W32-15-4-2T	●	8	2	4	40	32	125	63	53	+13	-20	Yes	4	P-37	SB-4090TRP	DTPM-15	LOMU1505...
	050-W40-15-4-2T	●				50	40	135						4		Recommended tightening torque for insert clamp 3.5N·m		
	050-W40-15-4-3T	●	12	3										4				
MEWH	025S25-10-3-2TXT	□	6	2	3	25	25	118	37	28	+13	-20	Yes	5	P-37	SB-3065TRP	DTPM-8	LOMU1004...
	032S32-10-4-2TXT	□	8		4	32	32	133	46	37				5		Recommended tightening torque for insert clamp 1.2N·m		

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.
MEWH...XT Shank (X-Treme Shank) is for NIKKEN X-Treme chuck.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MEWH



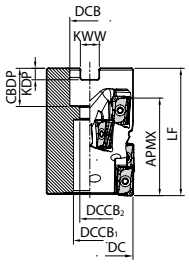


Fig. 1

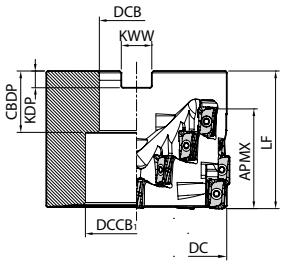


Fig. 2

Toolholder dimensions

Description		Availability	Inserts	Flutes	Stages	Dimension (mm)									A.R. max. (°)	R.R. (°)	Coolant hole	Fig.	Spare parts				Applicable inserts ⇨ M114
		R				DC	DCB	$DCCB_1$	$DCCB_2$	LF	CBDP	KDP	KWW	APMX					Anti-seize compound	Mounting bolt	Screw	Wrench	
MEWH	040R-10-4-3T-M	●	12	3	4	40	16	15	9	53	19	5.6	8.4	37	+13	-20	No	1	P-37	HH8X25	SB-3065TRP	DTPM-8	LOMU1004...
	050R-10-5-3T-M	●	15		5	50	22	18	11	64	21	6.3	10.4	46				1		HH10X30	Recommended tightening torque for insert clamp 1.2N·m		
MEWH	050R-15-4-3T-M	●	12	3	4	50	22	18	11	70	21	6.3	10.4	53	+13	-20	No	1	P-37	HH10X30	SB-4090TRP	DTPM-15	LOMU1505...
	063R-15-3-3T-M	●	9		3	63	27	20	13	58	24	7	12.4	41				1		HH12X35			
	080R-15-4-4T-M	●	16	4	4	80	32	26	18	70	28	8	14.4	53				1		HH16X45	Recommended tightening torque for insert clamp 3.5N·m		
	100R-15-4-5T-M	●	20	5		100	40	55	-	74	33	9	16.4					2		-			

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

Guidance of applicable inserts for MEWH

Insert location indication	Toolholder description											
	MEWH...10...					MEWH...15...						
	Corner-R(RE) (mm)					Corner-R(RE) (mm)						
Bottom inserts	0.4	0.8	1.2	1.6	2.0	0.4	0.8	1.0	1.2	1.6	2.0
*Middle inserts	0.4 / 0.8	0.4 / 0.8	0.4 / 0.8	0.4	0.4	0.4~1.6	0.4~1.6	0.4~1.6	0.4~1.6	0.4~1.6	0.4~1.6

* For middle inserts, it is not recommended to use the insert with larger corner-R(RE) than shown in the table, because it will make finished surface uneven.

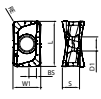
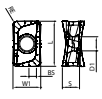
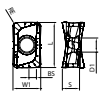
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

LOMU

Classification of usage

★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice
(In case hardness is 45HRC or under)

Carbon steel / Alloy steel				☆			★	☆	P
Mold and die steel				☆			★	☆	P
Austenitic stainless steel					☆		☆	★	M
Martensitic stainless steel	★							☆	M
Precipitation hardening stainless steel					☆			★	M
Gray cast iron			☆			★			K
Nodular cast iron			☆			★			K
Non-ferrous metals									N
Heat-resistant alloy	★							☆	S
Titanium alloy					☆			★	S
Hard materials		★							H

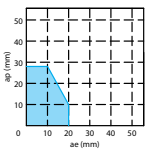
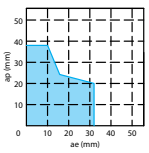
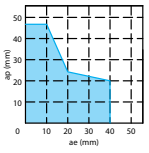
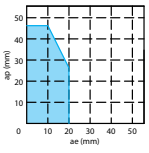
Insert		Description		Dimension (mm)						Carbide								Applicable toolholder ➡ M112 M113
				S	D1	RE	L	W1	BS	CVD	PVD							
										CA6535	PR015S	PR1510	PR1525	PR1535	PR1810	PR1825	PR1835	
	 General purpose	LOMU	100404ER-GM	4	3.4	0.4	10.9	6.6	2.1	●		●	●	●	●	●	●	MEWH...-10-.. MEW...-10-...
		LOMU	100408ER-GM			0.8			1.7	●		●	●	●	●	●	●	
		LOMU	100412ER-GM			1.2			1.3	●		●	●	●	●	●	●	
		LOMU	100416ER-GM			1.6			1	●		●	●	●	●	●	●	
		LOMU	100420ER-GM			2			1	●		●	●	●	●	●	●	
		LOMU	150504ER-GM	5.6	4.8	0.4	15.7	9.2	2.2	●		●	●	●	●	●	●	MEWH...-15-... MEW...-15-...
		LOMU	150508ER-GM			0.8			1.8	●		●	●	●	●	●	●	
		LOMU	150510ER-GM			1			1.6				●			●		
		LOMU	150512ER-GM			1.2			1.4	●		●	●	●	●	●	●	
		LOMU	150516ER-GM			1.6			1	●		●	●	●	●	●	●	
		LOMU	150520ER-GM			2			0.6	●		●	●	●	●	●	●	
	 Low cutting force	LOMU	100408ER-SM	4	3.4	0.8	10.9	6.6	1.7	●		●	●	●	●	●	●	MEWH...-10-... MEW...-10-...
		LOMU	150508ER-SM	5.6	4.8	0.8	15.7	9.2	1.8	●		●	●	●	●	●	●	MEWH...-15-... MEW...-15-...
	 Tough edge	LOMU	100408ER-GH	4	3.4	0.8	10.9	6.6	1.7	●	●	●	●	●	●	●	●	MEWH...-10-... MEW...-10-...
		LOMU	150508ER-GH	5.6	4.8	0.8	15.7	9.2	1.8	●	●	●	●	●	●	●	●	MEWH...-15-... MEW...-15-...

Handed insert shows Right-hand

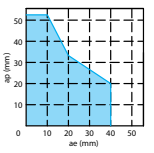
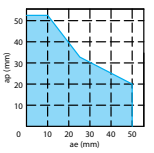
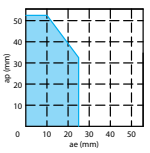
Recommended cutting conditions ➡ M115

Cutting performance

LOMU1004 type

Cutting dia.	Description	2 flute ap x ae	Description	3 flute ap x ae
ø25	MEWH025 -S25-10-3-2T		-	-
ø32	MEWH032 -S32-10-4-2T		-	-
ø40	MEWH040 -S32-10-5-2T		MEWH040 -S32-10-5-3T	

LOMU1505 type

Cutting dia.	Description	2 flute ap x ae	Description	3 flute ap x ae
ø40	MEWH040 -S32-15-4-2T		-	-
ø50	MEWH050 -S42-15-4-2T		MEWH050 -S42-15-4-3T	

Cutting conditions>
- Vc = 120 m/min
- fz = 0.08~0.12 mm/t
- GM chipbreaker
- Workpiece material: 34CrMo4
- Overhang length
  End mill: Overhang length is "LH" of the dimension list

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M
Milling
Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi-Function
Slot Mill
Ball-nose Radius
Others

Recommended cutting conditions

Chipbreaker	Workpiece material	fz (mm/t)	Recommended insert grades (Vc: m/min)			
		Toolholder description	MEGACOAT NANO EX (MEGACOAT NANO)			CVD coated carbide
		MEWH025~MEWH050 (Helical end mill)	PR1835 (PR1535)	PR1825 (PR1525)	PR1810 (PR1510)	CA6535
GM	Carbon steel	0.06~**0.1**~0.2	☆ 120~**180**~250	★ 120~**180**~250	-	-
	Alloy steel	0.06~**0.1**~0.14	☆ 100~**160**~220	★ 100~**160**~220	-	-
	Mold steel	0.06~**0.08**~0.12	☆ 80~**140**~180	★ 80~**140**~180	-	-
	Stainless steel (Austenitic related)	0.06~**0.08**~0.12	☆ 100~**160**~200	☆ 100~**160**~200	-	-
	Stainless steel (Martensitic related)	0.06~**0.08**~0.1	☆ 150~**200**~250	-	-	★ 180~**240**~300
	Stainless steel (Precipitation hardening)	0.06~**0.08**~0.1	★ 90~**120**~150	-	-	-
	Gray cast iron	0.06~**0.1**~0.17	-	-	★ 120~**180**~250	-
	Nodular cast iron	0.06~**0.08**~0.12	-	-	★ 100~**150**~200	-
	Ni-base heat-resistant alloys	0.06~**0.08**~0.1	☆ 20~**30**~50	-	-	★ 20~**30**~50
	Titanium alloys	0.06~**0.08**~0.12	☆ 40~**60**~80	-	☆ 30~**50**~70	-
SM	Carbon steel	0.06~**0.1**~0.17	☆ 120~**180**~250	★ 120~**180**~250	-	-
	Alloy steel	0.06~**0.08**~0.12	☆ 100~**160**~220	★ 100~**160**~220	-	-
	Mold steel	0.06~**0.08**~0.12	☆ 80~**140**~180	★ 80~**140**~180	-	-
	Stainless steel (Austenitic related)	0.06~**0.08**~0.12	★ 100~**160**~200	☆ 100~**160**~200	-	-
	Stainless steel (Martensitic related)	0.06~**0.08**~0.1	☆ 150~**200**~250	-	-	★ 180~**240**~300
	Stainless steel (Precipitation hardening)	0.06~**0.08**~0.1	☆ 90~**120**~150	-	-	-
	Ni-base heat-resistant alloys	0.06~**0.08**~0.1	☆ 20~**30**~50	-	-	★ 20~**30**~50
	Titanium alloys	0.06~**0.08**~0.12	★ 40~**60**~80	-	☆ 30~**50**~70	-
GH	Carbon steel	0.06~**0.1**~0.2	☆ 120~**180**~250	★ 120~**180**~250	-	-
	Alloy steel	0.06~**0.1**~0.14	☆ 100~**160**~220	★ 100~**160**~220	-	-
	Mold steel	0.06~**0.08**~0.12	☆ 80~**140**~180	★ 80~**140**~180	-	-
	Stainless steel (Austenitic related)	0.06~**0.08**~0.12	☆ 100~**160**~200	☆ 100~**160**~200	-	-
	Stainless steel (Martensitic related)	0.06~**0.08**~0.1	☆ 150~**200**~250	-	-	☆ 180~**240**~300
	Stainless steel (Precipitation hardening)	0.06~**0.08**~0.1	☆ 90~**120**~150	-	-	-
	Gray cast iron	0.06~**0.1**~0.2	-	-	☆ 120~**180**~250	-
	Nodular cast iron	0.06~**0.08**~0.15	-	-	☆ 100~**150**~200	-
	Ni-base heat-resistant alloys	0.06~**0.08**~0.1	☆ 20~**30**~50	-	-	☆ 20~**30**~50
	Titanium alloys	0.06~**0.08**~0.12	☆ 40~**60**~80	-	☆ 30~**50**~70	-

* The bold-faced number indicates a center value of recommended cutting condition. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.

* Machining with coolant is recommended for Stainless steel, Ni-base heat-resistant alloys and titanium alloys with MEWH.

★: 1st Recommendation

☆: 2nd Recommendation

MECH End Mill (with coolant hole for bottom insert)



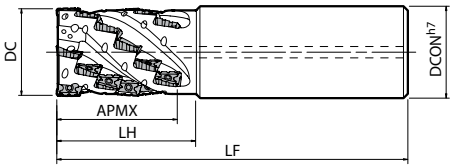


Fig. 1

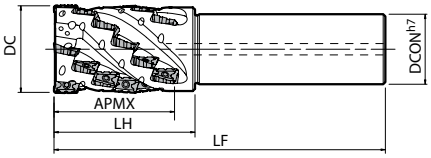


Fig. 2

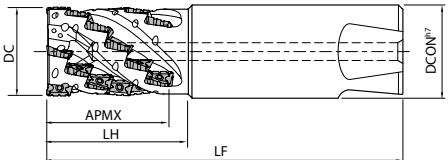


Fig. 3

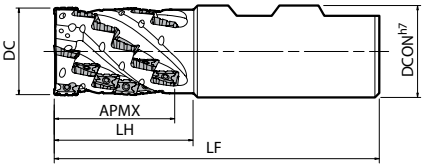


Fig. 4

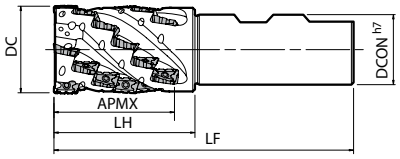


Fig. 5

Toolholder dimensions

Description		Availability	Inserts	Flutes	Stages	Dimension (mm)					A.R. max. (°)	R.R. (°)	Coolant hole	Fig.	Spare parts			Applicable inserts ➡ M121
						DC	DCON	LF	LH	APMX					Anti-seize compound	Screw	Wrench	
MECH	025-S25-11-4-2T	●	8	2	4	25	25	120	46	37	+21	-10		1	P-37	SB-2555TRG	DTM-8	BDMT11T3...-N2 + BDMT11T3...-N3
	032-S32-11-5-2T	●	10		5	32	32	140	55	46		-9		1				
	032-S32-11-5-4T	●	20	4										1				
	040-S32-11-6-4T	●	24		6	40		150	64	55	+23	-8	Yes	2				
	040-S42-11-6-4T	●					42	160						1				
	050-S42-11-7-4T	●	28		7	50		172	75	64		-7		2				
	050-S42-11-7-6T	●	42	6										2				
MECH	040-S32-17-4-2T	●	8	2	4	40	32	160	73	59	+19	-7	Yes	2	P-37	SB-4070TRN	DTM-15	BDMT1704...-N3 + BDMT1704...-N4
	040-S42-17-4-2T	●					42	170						1				
	050-S42-17-5-4T	●	20	4	5	50		185	88	74		-6		2				
MECH	025-W25-11-4-2T	●	8	2	4	25	25	104	46	37	+21	-10	Yes	4	P-37	SB-2555TRG	DTM-8	BDMT11T3...-N2 + BDMT11T3...-N3
	032-W32-11-5-2T	●	10	2	5	32	32	117	55	46	+23	-9		4				
	032-W32-11-5-4T	●	20	4										4				
	040-W32-11-6-4T	●	24	4	6	40	40	126	64	55		-8		5				
	050-W40-11-7-4T	●	28	4	7	50	50	147	75	64		-7		5				
MECH	040-W32-17-4-2T	●	8	2	4	40	32	136	73	59	+19	-7	Yes	5	P-37	SB-4070TRN	DTM-15	BDMT1704...-N3 + BDMT1704...-N4
	050-W40-17-5-4T	●	20	4	5	50	40	161	88	74				5				
MECH	025S25-11-4-2TXT	□	8	2	4	25	25	127	46	37	+21	-10	Yes	3	P-37	SB-2555TRG	DTM-8	BDMT11T3...-N2 + BDMT11T3...-N3
	032S32-11-5-2TXT	□	10		5	32	32	142	55	46	+23	-9		3				
	032S32-11-5-4TXT	□	20	4										3				

For installation of notched insert, see page **M122**.
MECH...XT Shank (X-Treme Shank) is for NIKKEN X-Treme chuck.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MECH Shell Mill (without coolant hole)



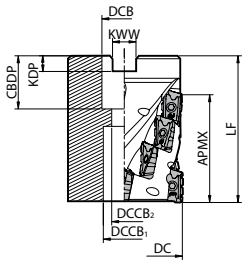


Fig. 1

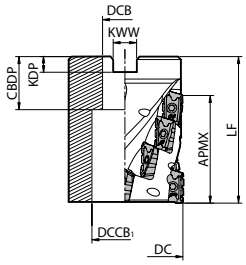


Fig. 2

Toolholder dimensions

Description		Availability	Inserts	Flutes	Stages	Dimension (mm)									A.R. max. (°)	R.R. (°)	Coolant hole	Fig.	Spare parts				Applicable inserts M121
																			Anti-seize compound	Mounting bolt	Screw	Wrench	
		R				DC	DCB	$DCCB_1$	$DCCB_2$	LF	CBDP	KDP	KWW	APMX									
MECH	040R-11-4-4T-M	●	16	4	4	40	16	15	9	50	19	5.6	8.4	37	+23	-8	No	1	P-37	HH8X25	SB-2555TRG	DTM-8	BDMT11T3...-N2 + BDMT11T3...-N3
	050R-11-5-6T-M	●	30	6	5	50	22	18	11	63	21	6.3	10.4	46				1		HH10X30			
MECH	050R-17-2-4T-M	●	8	4	2	50	22	18	11	52	21	6.3	10.4	30	+19	-7	No	1	P-37	HH10X30	SB-4070TRN	DTM-15	BDMT1704...-N3 + BDMT1704...-N4
	050R-17-4-4T-M	●	16		4					78				59				1		HH10X40			
	063R-17-3-4T-M	●	12		3	63	27	20	14	70	24	7	12.4	45				1		HH12X35			
	080R-17-4-6T-M	●	24	6	4	80	32	26	18	85	28	8	14.4	59				1		HH16X45			
	100R-17-4-6T-M	●				100	40	56	-		30	9	16.4					2		-			
MECH	063R-17-3-4T	□	12	4	3	63	25.4	20	14	70	26	6	9.5	45	+19	-7	No	1	P-37	HH12X35	SB-4070TRN	DTM-15	BDMT1704...-N3 + BDMT1704...-N4
	080R-17-4-6T	□	24	6	4	80	31.75	26	18	85	32	8	12.7	59				1		HH16X45			
	100R-17-4-6T	□				100	38.1	56	-		38	10	15.9					2		-			

For installation of notched insert, see page **M122**.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

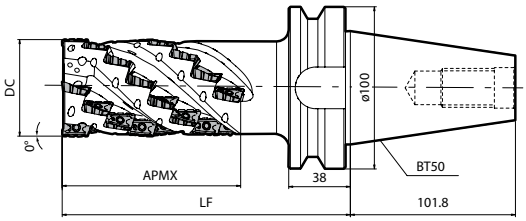
X-Treme Chuck [NIKKEN]

Description		See Page	Shank Dia. (DCON)	X-Treme Chuck			
				BT		HSK	
				BT40	BT50	HSK63A	HSK100A
MEWH	025S25-10-3-2TXT	M112	25.0	-	NBT50-C25EX-116	-	HSK100A-C25EX-116
	032S32-10-4-2TXT		32.0	-	NBT50-C32EX-121	-	HSK100A-C32EX-121
MECH	025S25-11-4-2TXT	M116	25.0	-	NBT50-C25EX-116	-	HSK100A-C25EX-116
	032S32-11-5-○TXT		32.0	-	NBT50-C32EX-121	-	HSK100A-C32EX-121

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MECH-BT50 (Integral Arbor type, without coolant hole)





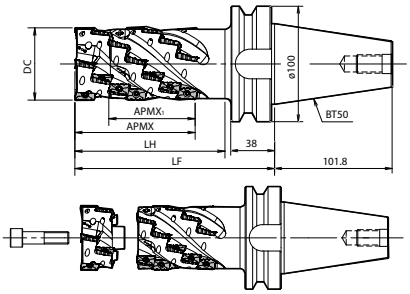
Toolholder dimensions

Description		Availability	Inserts	Flutes	Stages	Dimension (mm)			A.R. max. (°)	R.R. (°)	Coolant hole	Weight (kg)	Spare parts			Applicable inserts ➡ M121
		R				DC	LF	APMX					Anti-seize compound	Screw	Wrench	
MECH	050R11-8-4T-BT50	●	32	4	8	50	143	73	+23	-7	No	4.8	P-37	SB-2555TRG	DTM-8	BDMT11T3...-N2 + BDMT11T3...-N3
MECH	050R17-7-4T-BT50	●	28	4	7	50	173	104	+19	-7	No	4.9	P-37	SB-4070TRN	DTM-15	BDMT1704...-N3 + BDMT1704...-N4
	063R17-7-4T-BT50	●				63						5.9				
	080R17-7-4T-BT50	●				80						7.8				
	100R17-7-6T-BT50	●	42	6		100						10.2				

For installation of notched insert, see page **M122**.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

MECH-BT50SA (without coolant hole) Arbor Integral Type (Base unit + 1 Front piece + Clamp bolt)





Toolholder dimensions

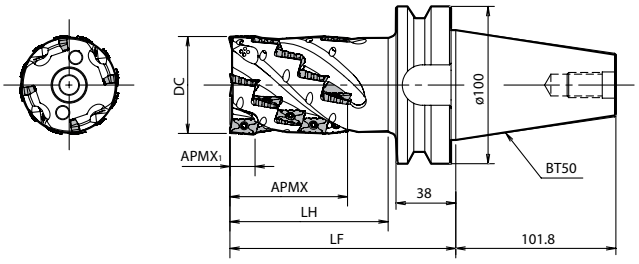
Description		Availability	Inserts	Flutes	Stages	Dimension (mm)					A.R. max. (°)	R.R. (°)	Coolant hole	Weight (kg)	Spare parts					Applicable inserts ➡ M121
		R				DC	LF	LH	APMX	APMX1					Anti-seize compound	Mounting bolt	Wrench (for Mounting bolt)	Screw	Wrench	
MECH	050R11-4T-BT50SA	MTO	32	4	8	50	143	99	73	55	+23	-7	No	4.8	P-37	HH12X35	LW-10	SB-2555TRG	DTM-8	BDMT11T3...-N2 + BDMT11T3...-N3
MECH	063R17-4T-BT50SA	MTO	28	4	7	63	173	130	104	75	+19	-7	No	5.8	P-37	HH12X40	LW-10	SB-4070TRN	DTM-15	BDMT1704...-N3 + BDMT1704...-N4
	080R17-4T-BT50SA	MTO				80								7.6		HH16X40	LW-14			
	100R17-6T-BT50SA	MTO	42	6		100								9.8		HH20X40	LW-17			

For installation of notched insert, see page **M122**.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

MECH-BT50-A (without coolant hole) Base unit





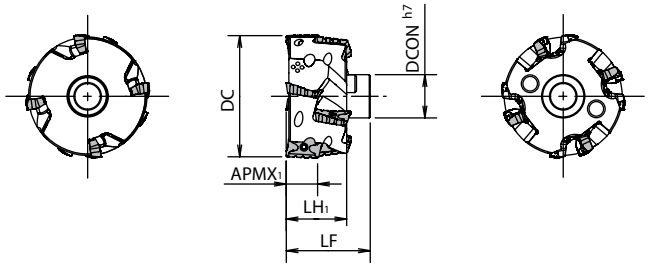
Toolholder dimensions

Description		Availability	Inserts	Flutes	Stages	Dimension (mm)					A.R. max. (°)	R.R. (°)	Coolant hole	Weight (kg)	Spare parts					Applicable inserts ⇒ M121
															Anti-seize compound	Mounting bolt	Wrench (for Mounting bolt)	Screw	Wrench	
		R				DC	LF	LH	APMX	APMX1										
MECH	050R11-4T-BT50-A	MTO	24	4	6	50	125	81	55	10	+23	-7	No	4.6	P-37	HH12X35	LW-10	SB-2555TRG	DTM-8	BDMT11T3...-N2 + BDMT11T3...-N3
MECH	063R17-4T-BT50-A	MTO	20	4	5	63	143	100	75	16	+19	-7	No	5.4	P-37	HH12X40	LW-10	SB-4070TRN	DTM-15	BDMT1704...-N3 + BDMT1704...-N4
	080R17-4T-BT50-A	MTO				80								6.8		HH16X40	LW-14			
	100R17-6T-BT50-A	MTO	30	6		100								8.5		HH20X40	LW-17			

For installation of notched insert, see page **M122**.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

MECH-F (without coolant hole) Front piece





Toolholder dimensions

Description		Availability	Inserts	Flutes	Stages	Dimension (mm)					A.R. max. (°)	R.R. (°)	Coolant hole	Weight (kg)	Spare parts		Applicable inserts ⇒ M121
															Anti-seize compound	Screw	
		R				DC	LF	LH	APMX1	DCON							
MECH	050R11-4T-F	●	8	4	2	50	32	18	10	22	+23	-7	No	0.2	P-37	SB-2555TRG	BDMT11T3...-N2 + BDMT11T3...-N3
MECH	063R17-4T-F	●	8	4	2	63	44	30	16	22	+19	-7	No	0.4	P-37	SB-4070TRN	BDMT1704...-N3 + BDMT1704...-N4
	080R17-4T-F	●				80				32				0.8			
	100R17-6T-F	●	12	6		100				45				1.3			

For installation of notched insert, see page **M122**.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

Toolholder structure

End Mill			Base Unit ➡ M119		Front Piece (1pc) ➡ M119		Clamp Bolt
MECH	050R11-4T-BT50SA	=	MECH050R11-4T-BT50-A	+	MECH050R11-4T-F	+	HH12X35
	063R17-4T-BT50SA		MECH063R17-4T-BT50-A		MECH063R17-4T-F		HH12X40
	080R17-4T-BT50SA		MECH080R17-4T-BT50-A		MECH080R17-4T-F		HH16X40
	100R17-6T-BT50SA		MECH100R17-6T-BT50-A		MECH100R17-6T-F		HH20X40

Applicable Inserts

End Mill		Base Unit ➡ M119	Front Piece ➡ M119	Applicable Inserts ➡ M121
MECH	050R11-4T-BT50SA	MECH050R11-4T-BT50-A	MECH050R11-4T-F	BDMT11T308ER-N2 + BDMT11T308ER-N3
	063R17-4T-BT50SA	MECH063R17-4T-BT50-A	MECH063R17-4T-F	BDMT170408ER-N3 + BDMT170408ER-N4
	080R17-4T-BT50SA	MECH080R17-4T-BT50-A	MECH080R17-4T-F	
	100R17-6T-BT50SA	MECH100R17-6T-BT50-A	MECH100R17-6T-F	

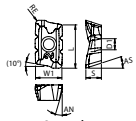
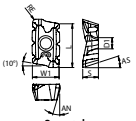
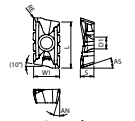
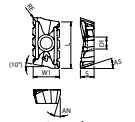
· For installation of notched insert, see page ➡ M122

BDMT

Classification of usage

★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice
(In case hardness is 45HRC or under)

Carbon steel / Alloy steel			★	☆	P
Mold and die steel			★	☆	P
Austenitic stainless steel					M
Martensitic stainless steel					M
Precipitation hardening stainless steel					M
Gray cast iron		★			K
Nodular cast iron		★			K
Non-ferrous metals					N
Heat-resistant alloy					S
Titanium alloy	☆			★	S
Hard materials					H

Insert		Description	No. of edges	Dimension (mm)					Angle (°)		Carbide PVD				Applicable toolholder ➡ M116~M119
				S	D1	RE	L	W1	AN	AS	PR1535	PR1810	PR1825	PR1835	
	 2-notch	BDMT 11T308ER-N2	2	3.8	2.8	0.8	11	6.7	13	18	●	●	●	●	MECH...11...
	 3-notch	BDMT 11T308ER-N3	2	3.8	2.8	0.8	11	6.7	13	18	●	●	●	●	MECH...11...
	 3-notch	BDMT 170408ER-N3	2	4.9	4.4	0.8	17	9.6	13	18	●	●	●	●	MECH...17...
	 4-notch	BDMT 170408ER-N4	2	4.9	4.4	0.8	17	9.6	13	18	●	●	●	●	MECH...17...

Handed insert shows Right-hand

Recommended cutting conditions ➡ M123

Applicable Inserts

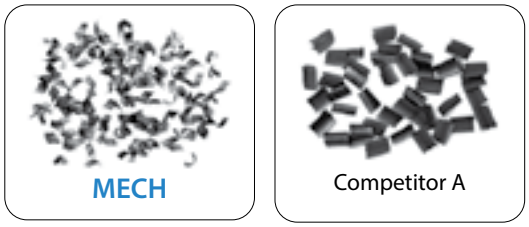
Description	Applicable Inserts					
	 2-Notched	+	 3-Notched	 3-Notched	+	 4-Notched
MECH...-11-	BDMT 11T308ER-N2	+	BDMT 11T308ER-N3	-		
MECH...-17-	-			BDMT 170408ER-N3	+	BDMT 170408ER-N4

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

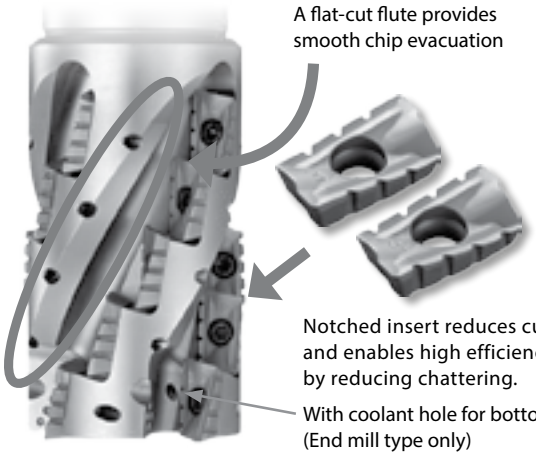
Smooth chip evacuation

Smooth chip evacuation

Notched insert breaks chips into small pieces



Workpiece material: ST44-2
Vc=120m/min
apxae=40mmx10mm
fz=0.12mm/t
MECH032-S32-11-5-4T



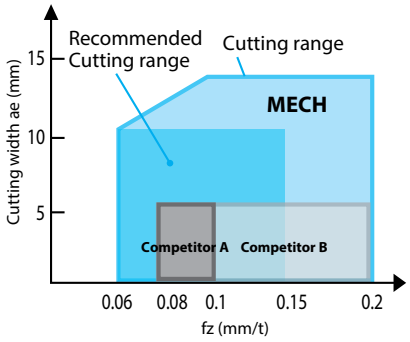
A flat-cut flute provides smooth chip evacuation

Notched insert reduces cutting force, and enables high efficiency machining by reducing chattering.

With coolant hole for bottom insert (End mill type only)

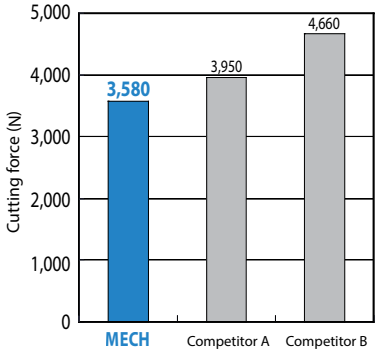
Low cutting force

Low cutting force due to notched inserts



Workpiece material: C50
Vc=120m/min
apxae=40 mmx5~13mm
fz=0.06 ~ 0.2mm/t
MECH032-S32-11-5-4T

Cutting force comparison (Principal force)



Workpiece material: C50
Vc = 120 m/min
ap x ae = 40 mm x 10 mm
fz = 0.1 mm/t
MECH032-S32-11-5-4T

(Internal evaluation)

Number of inserts installed

Description		No. of flutes	No. of inserts	No. of inserts			
				BDMT11T308ER-		BDMT170408ER-	
				N2	N3	N3	N4
MECH	025-S25-11-4-2T	2	8	4	4	-	-
	032-S32-11-5-2T		10	5	5		
	032-S32-11-5-4T	4	20	10	10		
	040-S32-11-6-4T		24	12	12		
	040-S42-11-6-4T						
	050-S42-11-7-4T		28	14	14		
	050-S42-11-7-6T	6	42	21	21		
MECH	040-S32-17-4-2T	2	8	-	-	4	4
	040-S42-17-4-2T						
	050-S42-17-5-4T	4	20			10	10
MECH	040R-11-4-4T-M	4	16	8	8	-	-
	050R-11-5-6T-M	6	30	15	15		
MECH	050R-17-2-4T-M	4	8	-	-	4	4
	050R-17-4-4T-M		16			8	8
	063R-17-3-4T-M		12			6	6
	080R-17-4-6T-M	6	24			12	12
	100R-17-4-6T-M						
MECH	063R-17-3-4T	4	12			6	6
	080R-17-4-6T	6	24			12	12
	100R-17-4-6T						

Description		No. of flutes	No. of inserts	No. of inserts			
				BDMT11T308ER-		BDMT170408ER-	
				N2	N3	N3	N4
MECH	050R11-8-4T-BT50	4	32	16	16	-	-
	050R17-7-4T-BT50		28	-	-	14	14
	063R17-7-4T-BT50						
	080R17-7-4T-BT50						
	100R17-7-6T-BT50	6	42			21	21
MECH	050R11-4T-BT50SA	4	32	16	16	-	-
	063R17-4T-BT50SA	4	28	-	-	14	14
	080R17-4T-BT50SA						
	100R17-6T-BT50SA	6	42	-	-	21	21
MECH	050R11-4T-BT50-A	4	24	12	12	-	-
	063R17-4T-BT50-A	4	20	-	-	10	10
	080R17-4T-BT50-A						
	100R17-6T-BT50-A	6	30	-	-	15	15
MECH	050R11-4T-F	4	8	4	4	-	-
	063R17-4T-F	4	8	-	-	4	4
	080R17-4T-F						
	100R17-6T-F	6	12	-	-	6	6

Caution when installing notched insert

1. Install notched inserts by cutting the insert with the number of marks on the toolholder body.

<Insert number and toolholder marks>

Insert size	11 type		17 type	
Insert no.	2	3	3	4
Marks				

* Using the cutter with the inserts installed incorrectly will damage the toolholder.

2. When installing notched inserts in flute line, ensure that the number on the insert is the same as the insert in first stage. (Ref. to Fig. 1, 2 and 3)

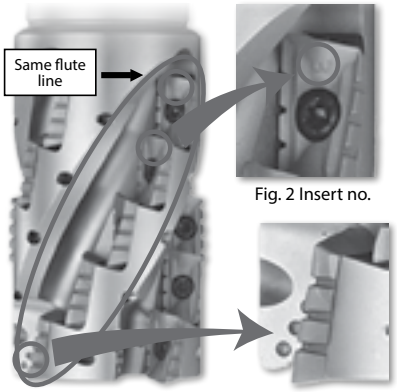


Fig. 1 Same flute line

Fig. 2 Insert no.

Fig. 3 Marks

Recommended cutting conditions (When using a notched insert)

Workpiece material	fz (mm/t)	Recommended insert grades (Vc: m/min)			
		MEGACOAT NANO	MEGACOAT NANO EX		
		PR1535	PR1810	PR1825	PR1835
Carbon steel	0.08~**0.1**~0.15	☆ 120~**180**~250	-	★ 120~**180**~250	☆ 120~**180**~250
Alloy steel	0.08~**0.1**~0.15	☆ 100~**160**~220	-	★ 100~**160**~220	☆ 100~**160**~220
Mold steel	0.08~**0.1**~0.15	☆ 80~**140**~180	-	★ 80~**140**~180	☆ 80~**140**~180
Gray cast iron	0.08~**0.15**~0.18	-	★ 120~**180**~250	-	-
Nodular cast iron	0.08~**0.15**~0.18	-	★ 100~**150**~200	-	-
*Titanium alloys	0.08~**0.1**~0.15	☆ 40~**60**~80	-	-	★ 40~**60**~80-

* Machining with coolant is recommended for titanium alloys.

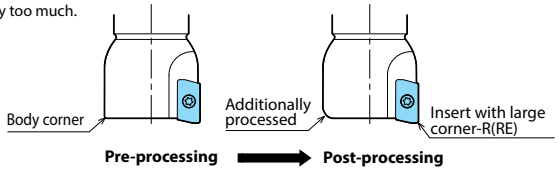
★: 1st Recommendation ☆: 2nd Recommendation

1. The recommended cutting conditions above are for notched inserts.
2. If using an insert without notch, the cutting depth (ap) and width (ae) should be 60% or less of those of a notched insert.

When using inserts with corner-R(RE) 1.6 or larger, additional modifications of the cutter body will be necessary.
Ref. to the chart below for the recommended modifications. (Additional grind off is not necessary when corner-R(RE) is 1.2mm or less.)

Insert Corner-R(RE) (mm)	Additional processing dimension to body corner (mm)
1.6	R1.0
2.0	
2.4	R1.2
3.1	R1.6
4.0	R2.5

* Round- shaped additional processing is recommended.When applying chamfer shaped additional processing, do not cut away too much.



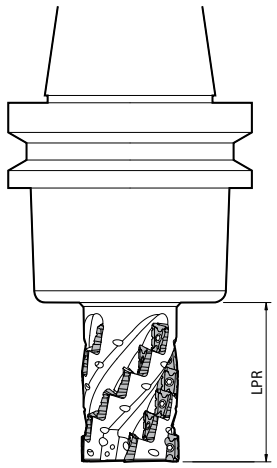
M
Milling

Cutting performance
(Used machine: Machining center equivalent to AC15/18.5kW)

MECH end mill

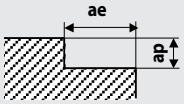
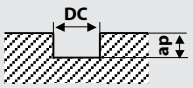
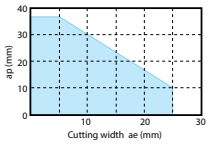
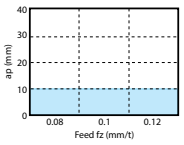
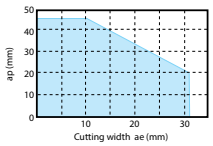
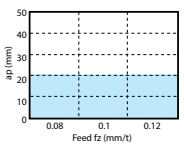
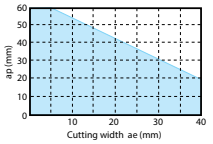
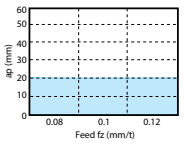
Cutting dia.	Description	Overhang length LPR (mm)
ø25	MECH025-S25-11-4-2T	48
ø32	MECH032-S32-11-5-2T	57
	MECH032-S32-11-5-4T	
ø40	MECH040-S32-11-6-4T	65
	MECH040-S42-11-6-4T	
ø50	MECH050-S42-11-7-4T	76
	MECH050-S42-11-7-6T	
ø40	MECH040-S32-17-4-2T	74
	MECH040-S42-17-4-2T	
ø50	MECH050-S42-17-5-4T	89

Shape

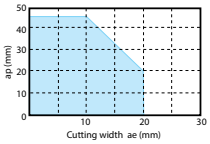
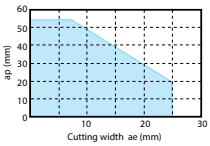
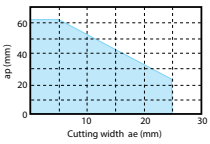
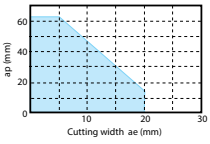
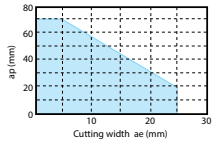


2 flute type

(Workpiece material: C50)

Description	Shouldering	Slotting
		
	Cutting speed: Vc = 100~180 m/min Feed: fz = 0.08~0.15 mm/t	Cutting speed: Vc = 100~120 m/min Feed: fz = 0.08~0.12 mm/t
MECH025-S25-11-4-2T		
MECH032-S32-11-5-2T		
MECH040-S32-17-4-2T MECH040-S42-17-4-2T		

4 flute/6 flute type

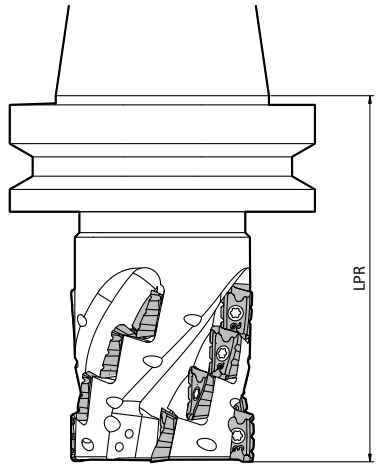
MECH032-S32-11-5-4T	
MECH040-S32-11-6-4T MECH040-S42-11-6-4T	
MECH050-S42-11-7-4T	
MECH050-S42-11-7-6T	
MECH050-S42-17-5-4T	

4 flute/6 flute type are not recommended for slotting.

MECH shell mill

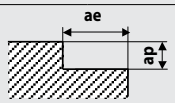
Cutting dia.	Description	Overhang length LPR (mm)
ø40	MECH040R-11-4-4T-M	125
ø50	MECH050R-11-5-6T-M	123
	MECH050R-17-2-4T-M	112
	MECH050R-17-4-4T-M	138
ø63	MECH063R-17-3-4T-□	115
ø80	MECH080R-17-4-6T-□	130
ø100	MECH100R-17-4-6T-□	130

Shape

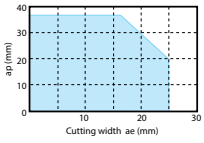
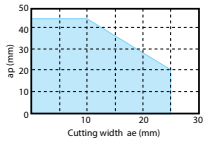
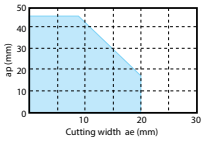
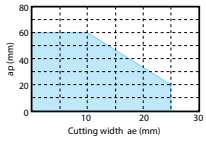
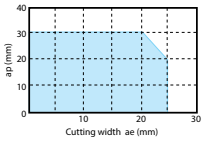
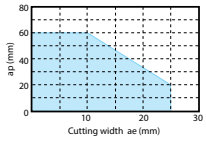
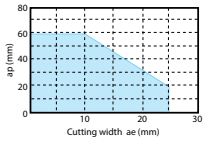


(Workpiece material: C50)

Shouldering



Cutting speed: Vc = 100~180 m/min
Feed: fz = 0.08~0.15 mm/t

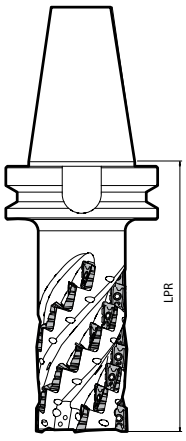
MECH040R -11-4-4T-M		MECH063R -17-3-4T-□	
MECH050R -11-5-6T-M		MECH080R -17-4-6T-□	
MECH050R -17-2-4T-M		MECH100R -17-4-6T-□	
MECH050R -17-4-4T-M			

Slotting is not recommended.

MECH-BT50 (Integral arbor type)
MECH-BT50SA (Head exchangeable type/Integral arbor type)

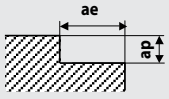
Cutting dia.	Description	Overhang length LPR (mm)
ø50	MECH050R11-8-4T-BT50 MECH050R11-4T-BT50SA	143
	MECH050R17-7-4T-BT50	173
ø63	MECH063R17-7-4T-BT50 MECH063R17-4T-BT50SA	
ø80	MECH080R17-7-4T-BT50 MECH080R17-4T-BT50SA	
ø100	MECH100R17-7-6T-BT50 MECH100R17-6T-BT50SA	

Shape

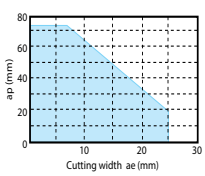
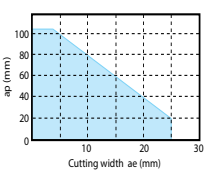
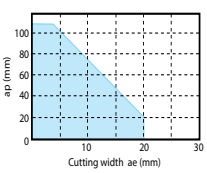
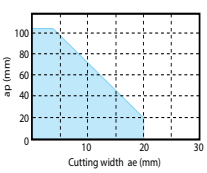
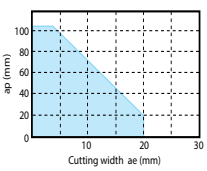


(Workpiece material: C50)

Shouldering



Cutting speed: Vc = 100~180 m/min
Feed: fz = 0.08~0.15 mm/t

MECH050R11 -8-4T-BT50 MECH050R11 -4T-BT50SA		MECH080R17 -7-4T-BT50 MECH080R17 -4T-BT50SA	
MECH050R17 -7-4T-BT50		MECH100R17 -7-6T-BT50 MECH100R17 -6T-BT50SA	
MECH063R17 -7-4T-BT50 MECH063R17 -4T-BT50SA			

Slotting is not recommended.

Helical end mill for titanium alloy machining

MECHT

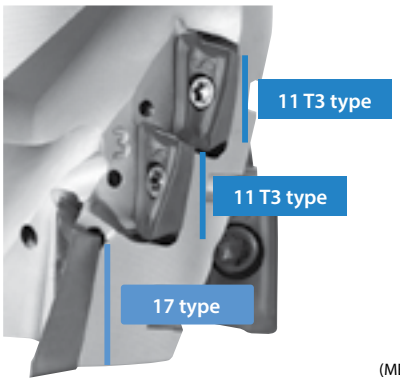
Insert size combination improves roughing capabilities
Maintains stable machining and long tool life

1 Developed to reduce chattering and chip recutting issues

Unique insert combination

The larger bottom inserts are positioned to handle larger cutting forces (excluding ø32)

Stable machining with improved fracture resistance



(MECHT50R-1711 type)

New design for higher reliability

Bottom inserts are held in place by double-faced contacts



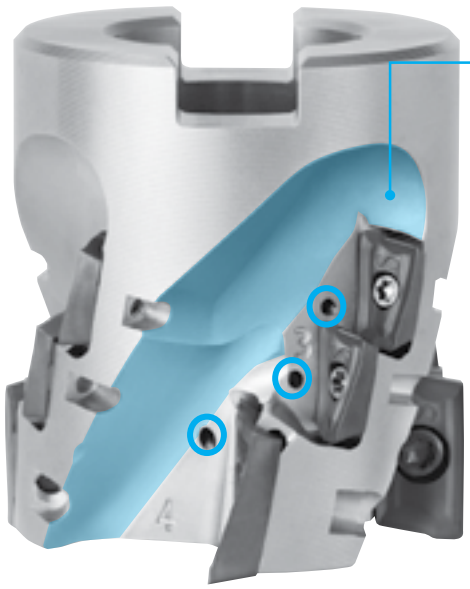
Bore dia.

Larger bore diameter improves fastening power and reduces chattering

ø50 mm cutter with a ø27 mm bore (conventional bore: ø22 mm)

Toolholder hardness Hardened 15% more than conventional holders

Toolholder spec Custom ordering available
Custom number of inserts and stages

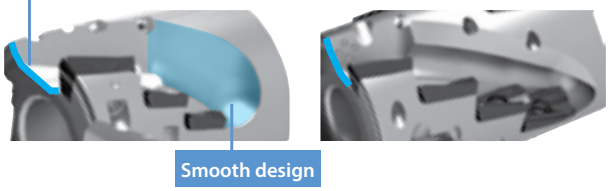


Excellent chip evacuation

New flute design

Large, smooth flutes prevent chip clogging

MECHT (ø50-4T 3 stages) Conventional (ø50-4T 4 stages)



All inserts have coolant holes

Optimized hole diameter controls flow amount and pressure

Smooth chip evacuation as well as superior cooling of the cutting edge



Chips example

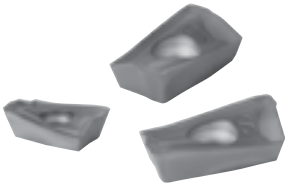
2 Longer tool life with low-resistance JS chipbreaker and tough PVD coating

Low cutting force **JS chipbreaker**

Heat at the cutting edge is suppressed due to sharp cutting performance. Long tool life

Greater toughness **PR1835**

Fracture resistant with a tough substrate and high heat-resistant MEGACOAT NANO EX coating technology



MECHT



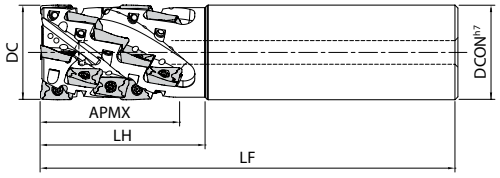


Fig. 1

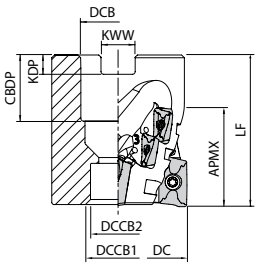


Fig. 2

Toolholder dimensions

Description		Availability	Inserts	Flutes	Stages	Dimension (mm)											A.R. max. (°)	R.R. max. (°)	Coolant hole	Fig.	Spare parts			Applicable inserts ⇒ M128	
						DC	DCON	DCB	DCB_1	DCB_2	LF	LH	CBDP	KDP	KWW	APMX					Mounting bolt	Screw	Wrench	Stages	
																								1st	2nd or higher
MECHT	32-S32-11-5-4T	●	20	4	5	32	32	-	-	-	140	55	-	-	-	46	+23	-9	Yes	1	-	SB-2555TRG	DTM-8	BDMT11T3..	BDMT11T308..
MECHT	50R-1711-3-4T-M	●	12	4	3	50	-	27	20	14	55	-	24	7	12.4	34	+19	-7	Yes	2	HH12X40	SB-2555TRG SB-4070TRN	DTM-8 DTM-15	BDMT1704..	BDMT11T308..
	50R-1711-4-5T-M	●	20	5							65					43				2	HH12X50				
	63R-17-4-5T-M	●			4	63					80					60				2	HH12X65	SB-4070TRN	DTM-15	BDMT1704..	BDMT170408..
	80R-17-4-6T-M	●	24	6		80		32	26	17			28	8	14.4					2	HH16X65				

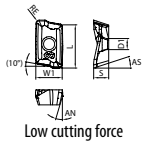
Use inserts with Corner-R of 0.8 or less for the 2nd or higher stages
Machining with coolant is recommended (Internal coolant pressure 1.5 MPa or higher)
Coat Anti-seize Compound(P-37) thinly on portion of taper and thread when insert is fixed.

M
Milling

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

BDMT

Classification of usage															
★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)															
															Carbon steel / Alloy steel
															Mold and die steel
															Austenitic stainless steel
															Martensitic stainless steel
															Precipitation hardening stainless steel
															Gray cast iron
															Nodular cast iron
															Non-ferrous metals
															Heat-resistant alloy
															Titanium alloy
															Hard materials

Insert		Description		No. of edges	Dimension (mm)					Angle (°)		Carbide		Applicable toolholder ➡ M127
					S	D1	RE	L	W1	AN	AS	PVD		
												PR1535	PR1835	
	 Low cutting force	BDMT 11T302ER-JS 11T304ER-JS 11T308ER-JS		2	3.8	2.8	0.2 0.4 0.8	11	6.7	13	18	● ● ●	● ● ●	MECHT...11...
		BDMT 170404ER-JS 170408ER-JS		2	4.9	4.4	0.4 0.8	17	9.6	13	18	● ●	● ●	MECHT...17...

Handed insert shows Right-hand

Recommended cutting conditions ➡ M129

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

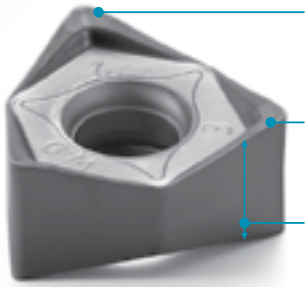
Recommended cutting conditions

Workpiece	Applications	Depth of cut (mm)		fz (mm/t)	Recommended insert grade (Vc: m/min)
					MEGACOAT NANO EX (MEGACOAT NANO)
		ap	ae		PR1835 (PR1535)
Titanium alloy (Ti6Al4V)	Shouldering	~Length of cut (APMX)	~0.5DC	0.10 ~ **0.12** ~ 0.16	30 ~ **40** ~ 60
	Slotting	~0.5DC	1DC	0.05 ~ **0.07** ~ 0.09	30 ~ **40** ~ 50

MFWN

Double-sided, 6-edge insert, 90°cutters
Low cutting force and reduced chattering





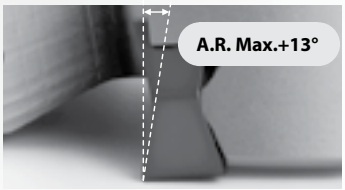
"Large slant edge" design

Economical
Double-sided
6-edge insert

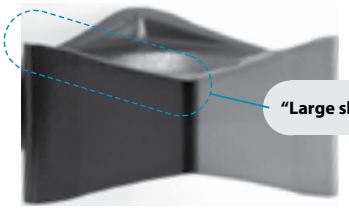
Tough cutting
Edge with
thick edge design

1 Sharp cutting with low cutting force

Sharp cutting by large rake angle



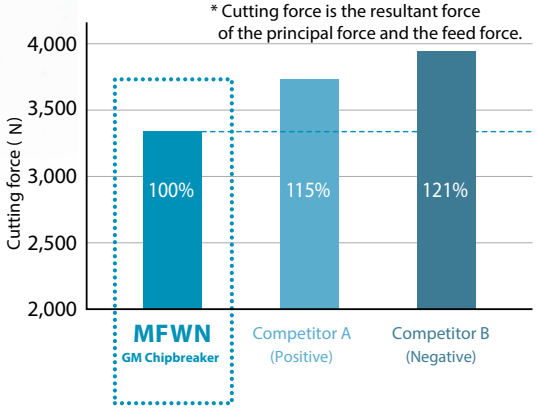
"Large slant edge" design reduces shock when cutting edge enters the workpiece



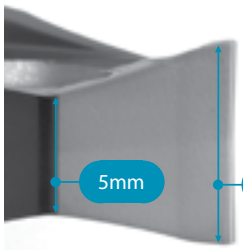
Cutting force comparison
(Internal evaluation)

<Cutting conditions>
Vc = 180m/min
apxae = 7× 110mm
fz = 0.2mm/t
Workpiece material: C50
ø125mm Cutter

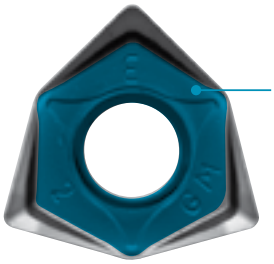
* Cutting force is the resultant force of the principal force and the feed force.



2 Superior fracture resistance with thick edge design



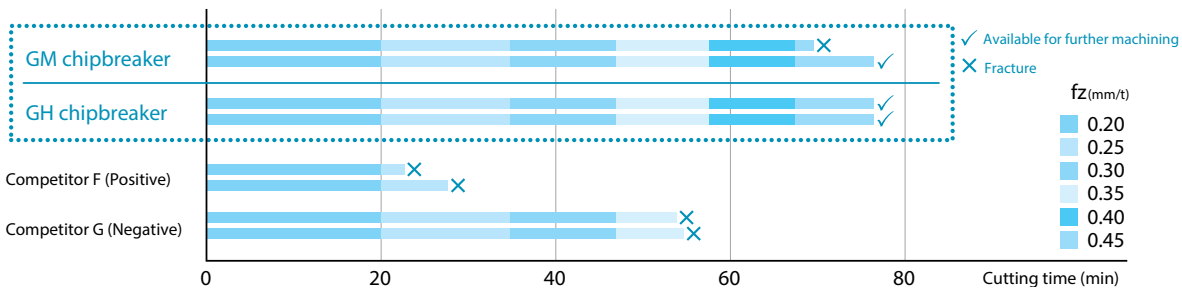
Cutting edge thickness 8.5 ~ 5mm



Stable clamping with the optimum insert face design

<Cutting conditions>
Workpiece material : 42CrMo4(38~42HS) Interruption with a slot on the workpiece
Vc = 100m/min apxae = 2×100mm fz = 0.2 ~0.45 mm/t Dry

Fracture resistance comparison (Internal evaluation)



MFWN



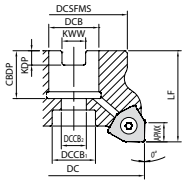


Fig. 1

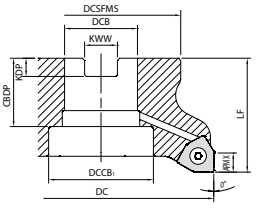


Fig. 2

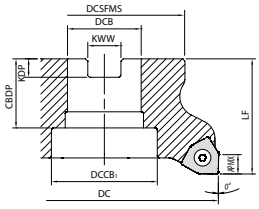


Fig. 3

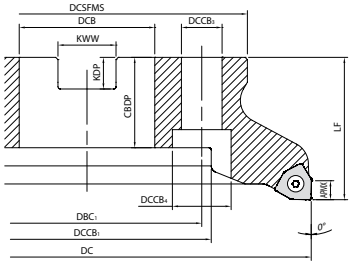


Fig. 4

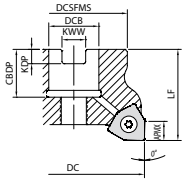


Fig. 5

Toolholder dimensions

Description				Availability	Inserts	Dimension (mm)														A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Fig.	Applicable inserts ➡ M135
				R		DC	DCSFMS	DCB	$DCCB_1$	$DCCB_2$	$DCCB_3$	$DCCB_4$	DBC_1	LF	CBDP	KDP	KWW	APMX								
Metric	Coarse pitch	MFWN	90050R-4T-MC-KUA	●	4	50	45	22	-	-				40	21	6.3	10.4		-6	-12		18500	0.35	5	
			90063R-3T-M	●	3	63	47	22	19	11				40	21	6.3	10.4			-10		14000	0.5	1	
			90080R-4T-M	●	4	80	60	27	20	13	-	-	-	50	24	7	12.4			-9	Yes	12000	1	1	
			90100R-5T-M	●	5	100	70	32	46						30	8	14.4			-8		10500	1.3	2	WNEU0806... WNGT0806... WNMU0806...
			90125R-6T-M	●	6	125	87	40	55					63	33	9	16.4	8	+13	-7.5		9500	2.5	2	
			90160R-8T-M	●	8	160	102		68	-	14	20	66.7		32							8000	3.8	4	
			90200R-10T-M	●	10	200	142	60	110		18	26	101.6		40	14	25.7			-7	No	7500	6	4	
			90250R-12T-M	●	12	250																6500	8.4	4	
	Fine pitch	MFWN	90063R-4T-M	●	4	63	47	22	19	11				40	21	6.3	10.4			-10		16000	0.5	1	
			90080R-5T-M	●	5	80	60	27	20	13	-	-	-	50	24	7	12.4			-9	Yes	13500	1	1	
			90100R-7T-M	●	7	100	70	32	46						30	8	14.4			-8		12000	1.3	2	
			90125R-8T-M	●	8	125	87	40	55					63	33	9	16.4	8	+13	-7.5		10500	2.6	2	WNEU0806... WNGT0806... WNMU0806...
			90160R-10T-M	●	10	160	102		68	-	14	20	66.7		32							9000	3.9	4	
			90200R-12T-M	●	12	200	142	60	110		18	26	101.6		40	14	25.7			-7	No	8000	6.3	4	
			90250R-14T-M	●	14	250																7000	8.7	4	
	Extra fine pitch	MFWN	90063R-5T-M	●	5	63	47	22	19	11				40	21	6.3	10.4			-10		16000	0.5	1	
			90080R-7T-M	●	7	80	60	27	20	13	-	-	-	50	24	7	12.4			-9	Yes	10500	1.1	1	
			90100R-9T-M	●	9	100	70	32	46						30	8	14.4	8	+13	-8		9500	1.3	2	WNEU0806... WNGT0806... WNMU0806...
			90125R-12T-M	●	12	125	87	40	55	-				63	33	9	16.4			-7.5		8000	2.6	2	
			90160R-14T-M	●	14	160	102		68		14	20	66.7		32					-7	No	7000	3.9	4	

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

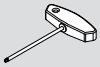
Toolholder dimensions

Description				Availability	Inserts	Dimension (mm)														A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Fig.	Applicable inserts ⇒ M135
				R		DC	DCSFMS	DCB	$DCCB_1$	$DCCB_2$	$DCCB_3$	$DCCB_4$	DBC_1	LF	CBDP	KDP	KWW	APMX								
Bore dia. inch spec	Coarse pitch	MFWN	90080R-4T	□	4	80	60	25.4	20	13	-	-	-	50	27	6	9.5	8	+13	-9	Yes	12000	1	1	WNEU0806... WNGT0806... WNMU0806...
			90100R-5T	□	5	100	70	31.75	46						34	8	12.7			-8		10500	1.3	2	
			90125R-6T	□	6	125	87	38.1	55					63	38	10	15.9			-7.5		9500	2.6	2	
			90160R-8T	□	8	160	102	50.8	72	-						11	19.1			-7	No	8000	3.9	3	
			90200R-10T	□	10	200	142	47.625	110		18	26	101.6		40	14	25.4					7500	6.3	4	
			90250R-12T	□	12	250																6500	8.7	4	
	Fine pitch	MFWN	90080R-5T	□	5	80	60	25.4	20	13	-	-	-	50	27	6	9.5	8	+13	-9	Yes	13500	1	1	WNEU0806... WNGT0806... WNMU0806...
			90100R-7T	□	7	100	70	31.75	46						34	8	12.7			-8		12000	1.4	2	
			90125R-8T	□	8	125	87	38.1	55					63	38	10	15.9			-7.5		10500	2.7	2	
			90160R-10T	□	10	160	102	50.8	72	-						11	19.1			-7	No	9000	4	3	
			90200R-12T	□	12	200	142	47.625	110		18	26	101.6		40	14	25.4					8000	6.6	4	
			90250R-14T	□	14	250																7000	8.9	4	
	Extra fine pitch	MFWN	90080R-7T	□	7	80	60	25.4	20	13	-	-	-	50	27	6	9.5	8	+13	-9	Yes	10500	1.1	1	WNEU0806... WNGT0806... WNMU0806...
			90100R-9T	□	9	100	70	31.75	46						34	8	12.7			-8		9500	1.3	2	
			90125R-12T	□	12	125	87	38.1	55					63	38	10	15.9			-7.5		8000	2.7	2	
			90160R-14T	□	14	160	102	50.8	72	-						11	19.1			-7	No	7000	4.1	3	
			90200R-16T	□	16	200	142	47.625	110		18	26	101.6		40	14	25.4					6500	6.7	4	
			90250R-18T	□	18	250																5500	9.1	4	

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

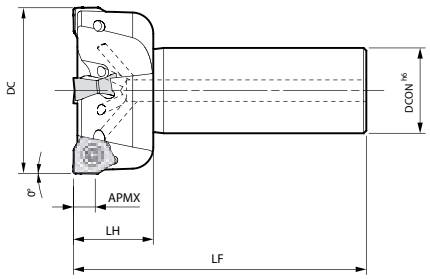
Spare parts

Description			Spare parts								
			Clamp screw	Wrench		Shim	Shim screw	Wrench	Anti-seize compound	Mounting bolt
				TTW	DTM					
										
Coarse pitch	MFWN	90063R-3T-M	SB-50140TR	TTW-15	-	MFWN-90	SPW-7050	LW-5	P-37	HH10X30
	MFWN	90080R-4T(-M)								HH12X35
	MFWN	90100R-5T(-M) ~ 90250R-12T(-M)	Recommended tightening torque for insert clamp 4.2N•m			Recommended tightening torque for shim clamp 6.0N•m				-
Fine pitch	MFWN	90063R-4T-M	SB-50140TR	TTW-15	-	-	-	-	P-37	HH10X30
	MFWN	90080R-5T(-M)								HH12X35
	MFWN	90100R-7T(-M) ~ 90250R-14T(-M)	Recommended tightening torque for insert clamp 4.2N•m							-
Extra fine pitch	MFWN	90063R-5T-M	SB-50140TR	TTW-15	-	-	-	-	P-37	HH10X30
	MFWN	90080R-7T(-M)	SB-40140TRN	-	DTM-15					HH12X35
	MFWN	90100R-9T(-M) ~ 90250R-18T	Recommended tightening torque for insert clamp 3.5N•m							-

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

MFWN





Toolholder dimensions

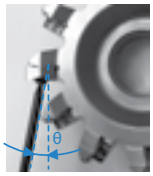
Description		Availability	Inserts	Dimension (mm)					A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Spare parts			Applicable inserts ➔ M135
		R		DC	DCON	LF	LH	APMX					Screw	Wrench	Anti-seize compound	
MFWN	90050R-S32-3T	●	3	50	32	110	30	8	+13	-12	Yes	18500	SB-50140TR	TTW-15	P-37	WNEU0806...
	90063R-S32-4T	●	4	63						-10		16000	Recommended tightening torque for insert clamp 4.2N•m			WNGT0806...
	90080R-S32-5T	●	5	80						-9		13500				WNMU0806...

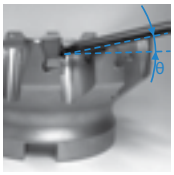
Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

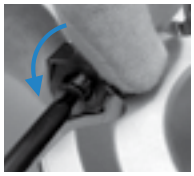
How to mount an insert

1. Be sure to remove dust and chips from the insert mounting pocket.
2. After applying anti-seize compound on portion of taper and thread, attach the screw to the front end of the wrench. While lightly pressing the insert against the constraint surfaces, put the screw into the hole of the insert and tighten. (Ref. to Fig. 1)
3. When tightening the screw, make sure that the wrench is parallel to the screw.
   Remember that the screw hole of the toolholder for Extra fine pitch is inclined to the bearing surface. (Ref. to Fig. 2 and Fig. 3)
4. Be careful not to tighten the screw with excessive torque.
   Recommended tightening torque is 4.2N·m for M5 screw (SB-50140TR) and 3.5N·m for M4 screw (SB-40140TRN).
5. After tightening the screw, make sure that there is no clearance between the insert seat surface and the bearing surface of the toolholder or between the insert side surfaces and the constraint surface of the toolholder. If there is any clearance, remove the insert and mount it again according to the above steps.
6. To change the cutting edge of the insert, turn the insert counterclockwise (Ref. to Fig. 4). The insert corner identification number is stamped on the top surface of the insert.


Fig. 1


Fig. 2


Fig. 3


Fig. 4

How to replace a shim (For coarse pitch)

1. Be sure to remove dust and chips from the insert mounting pocket.
2. The shim must be mounted in the proper direction. While aligning the surface of the shim with the mark on it to the corresponding constraint surface (Ref. to Fig. 1) and lightly pressing the shim toward the constraint surface (Ref. to Fig. 2), insert the screw into the hole of the shim and tighten (Ref. to Fig. 3). When tightening the screw, make sure that the screw is vertical to the bearing surface (Recommended tightening torque is 6.0N·m).
3. After tightening the screw, make sure that there is no clearance between the shim seat surface and the bearing surface. If there is any clearance, remove the insert and mount it again according to the above steps.

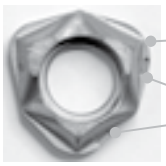


Fig. 1

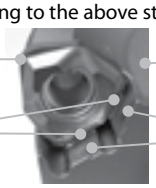


Fig. 2

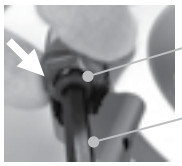


Fig. 3

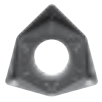
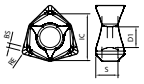
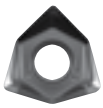
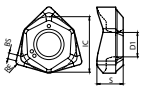
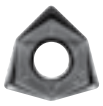
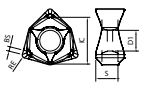
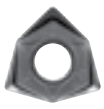
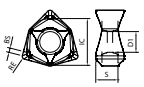
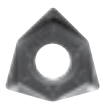
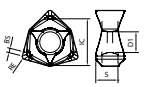
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

WNEU/WNMU/WNGT

Classification of usage

★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice
(In case hardness is 45HRC or under)

Carbon steel / Alloy steel					☆			★	☆		■	P
Mold and die steel					☆			★	☆		■	
Austenitic stainless steel						☆		☆	★			M
Martensitic stainless steel	★								☆			
Precipitation hardening stainless steel						☆			★			
Gray cast iron				☆			★					K
Nodular cast iron				☆			★					
Non-ferrous metals		★								☆		N
Heat-resistant alloy	★								☆			S
Titanium alloy						☆			★			
Hard materials			★									H

Insert		Description		No. of edges	Dimension (mm) IC	S	D1	RE	BS	Carbide CVD CA6535	DLC PDL025	PVD PR015S	PR1510	PR1525	PR1535	PR1810	PR1825	PR1835	- GW25	Cermet - TN620M	Applicable toolholder ➡ M131 M132 M134
	 Surface finish oriented	WNEU	080608EN-GL	6	14.02	6.65	6.2	0.8	1.5	●			●	●	●	●	●	●		●	MFWN90...
	 3-edge / Non-ferrous metals	WNGT	080608FN-AM	3	14.02	6.65	6.2	0.8	1.5		●								●		MFWN90...
	 Tough edge	WNMU	080608EN-GH	6	14.02	6.65	6.2	0.8	1.3	●		●	●	●	●	●	●	●			MFWN90...
	 General purpose	WNMU	080604EN-GM 080608EN-GM	6	14.02	6.65	6.2	0.4 0.8	1.7 1.3	● ●			●	●	●	●	●	●		● ●	MFWN90...
	 Low cutting force	WNMU	080608EN-SM	6	14.02	6.65	6.2	0.8	1.3	●			●	●	●	●	●	●			MFWN90...

Recommended cutting conditions ➡ M136

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Recommended cutting conditions

Chipbreaker	Workpiece material	fz (mm/t) ( ):TN620M	Recommended insert grades (Vc: m/min)							
			Cermet	MEGACOAT (PVD coated carbide)				CVD coated carbide	DLC coated carbide	Carbide
			TN620M	PR1835 (PR1535)	PR1825 (PR1525)	PR1810 (PR1510)	PR015S	CA6535	PDL025	GW25
GM	Carbon steel	0.1~**0.2**~0.3 (0.06~**0.10**~0.15)	★ 200~**250**~300	☆ 120~**180**~250	★ 120~**180**~250	-	-	-	-	-
	Alloy steel	0.1~**0.2**~0.3 (0.06~**0.10**~0.15)	★ 180~**220**~250	☆ 100~**160**~220	★ 100~**160**~220	-	-	-	-	-
	Mold steel	0.1~**0.15**~0.25 (0.06~**0.10**~0.13)	★ 150~**180**~220	☆ 80~**140**~180	☆ 80~**140**~180	-	-	-	-	-
	Stainless steel (Austenitic related)	0.1~**0.15**~0.25	-	☆ 100~**160**~200	☆ 100~**160**~200	-	-	-	-	-
	Stainless steel (Martensitic related)	0.1~**0.15**~0.25	-	☆ 150~**200**~250	-	-	-	☆ 180~**240**~300	-	-
	Stainless steel (Precipitation hardening)	0.1~**0.15**~0.25	-	★ 90~**120**~150	-	-	-	-	-	-
	Gray cast iron	0.1~**0.2**~0.3	-	-	-	★ 120~**180**~250	-	-	-	-
	Nodular cast iron	0.1~**0.15**~0.25	-	-	-	★ 100~**150**~200	-	-	-	-
	Ni-base heat-resistant alloys	0.1~**0.12**~0.2	-	☆ 20~**30**~50	-	-	-	★ 20~**30**~50	-	-
SM *1GL	Carbon steel	0.06~**0.12**~0.2 (0.06~0.08~0.12)	★ 200~**250**~300	☆ 120~**180**~250	☆ 120~**180**~250	-	-	-	-	-
	Alloy steel	0.06~**0.12**~0.2 (0.06~**0.08**~0.12)	★ 180~**220**~250	☆ 100~**160**~220	☆ 100~**160**~220	-	-	-	-	-
	Mold steel	0.06~**0.08**~0.15 (0.06~**0.08**~0.10)	★ 150~**180**~220	☆ 80~**140**~180	☆ 80~**140**~180	-	-	-	-	-
	Stainless steel (Austenitic related)	0.06~**0.12**~0.2	-	★ 100~**160**~200	☆ 100~**160**~200	-	-	-	-	-
	Stainless steel (Martensitic related)	0.06~**0.12**~0.2	-	☆ 150~**200**~250	-	-	-	☆ 180~**240**~300	-	-
	Stainless steel (Precipitation hardening)	0.06~**0.12**~0.2	-	☆ 90~**120**~150	-	-	-	-	-	-
	Gray cast iron	0.06~**0.12**~0.2	-	-	-	☆ 120~**180**~250	-	-	-	-
	Nodular cast iron	0.06~**0.08**~0.15	-	-	-	☆ 100~**150**~200	-	-	-	-
	Ni-base heat-resistant alloys	0.06~**0.1**~0.15	-	☆ 20~**30**~50	-	-	-	☆ 20~**30**~50	-	-
	Titanium alloys	0.06~**0.08**~0.15	-	★ 40~**60**~80	-	-	-	-	-	-
*2GH	Carbon steel	0.2~**0.3**~0.4	-	☆ 120~**180**~250	☆ 120~**180**~250	-	-	-	-	-
	Alloy steel	0.2~**0.3**~0.4	-	☆ 100~**160**~220	☆ 100~**160**~220	-	-	-	-	-
	Mold steel	0.15~**0.2**~0.3	-	☆ 80~**140**~180	☆ 80~**140**~180	-	-	-	-	-
	Stainless steel (Austenitic related)	0.2~**0.25**~0.3	-	☆ 100~**160**~200	☆ 100~**160**~200	-	-	-	-	-
	Stainless steel (Martensitic related)	0.2~**0.25**~0.3	-	☆ 150~**200**~250	-	-	-	☆ 180~**240**~300	-	-
	Stainless steel (Precipitation hardening)	0.2~**0.25**~0.3	-	☆ 90~**120**~150	-	-	-	-	-	-
	Gray cast iron	0.2~**0.3**~0.4	-	-	-	☆ 120~**180**~250	-	-	-	-
	Nodular cast iron	0.15~**0.2**~0.3	-	-	-	☆ 100~**150**~200	-	-	-	-
	Ni-base heat-resistant alloys	0.15~**0.2**~0.25	-	☆ 20~**30**~50	-	-	-	☆ 20~**30**~50	-	-
	Hard materials (60HRC or less)	0.05~**0.1**~0.2	-	-	-	-	★ 80~**100**~120	-	-	-
AM	Non-ferrous metals	0.1~**0.2**~0.3	-	-	-	-	-	-	★ 200~**600**~900	☆ 200~**500**~800

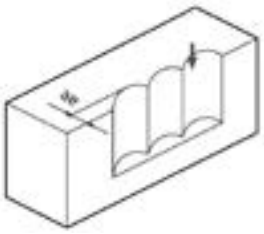
The bold-faced number indicates a center value of recommended cutting condition. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.
Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.
*1 . GL Chipbreaker is recommended for Surface finish oriented milling.
*2. GH Chipbreaker: Fine pitch → fz≤0.3 (mm/t)
Extra fine pitch → Not recommended

★: 1st Recommendation
☆: 2nd Recommendation

Applicable chipbreaker

Cutter type	Chipbreaker			
	GM	SM (GL)	GH	AM
Coarse pitch (With shim)	●	●	●	●
Fine pitch (Without shim)	●	●	△ (Feed rate is recommended fz=0.3mm/t or under)	●
Extra fine pitch (Without shim)	●	●	Not recommended	Not recommended

Vertical milling (Plunging)



Cutting dia.	Max. width of cut (ae)
All items	8mm

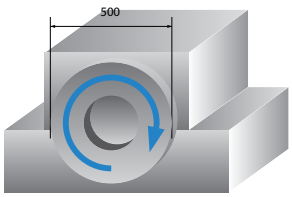
Cutter type and chipbreaker selection

Milling purpose	Cutter type			Chipbreaker				
	Coarse pitch	Fine pitch	Extra fine pitch	GM	SM	GH	GL	AM
General milling for steel and alloy steel		●		●				
Steel and alloy steel (At chattering due to low rigidity machine or poor clamping power)	●				●			
Productivity oriented (Running cost decrease) (ap=4 mm and over, fz=0.25 mm/t and over)	●					●		
Surface finish oriented	●	●					●	
General milling of stainless steel		●			●			
Stainless steel (At chattering due to low rigidity machine or poor clamping power)	●				●			
Cast iron (For processing efficiency improvement)			●	●				
Cast iron (ap=4 mm and over, fz=0.25 mm/t and over)	●					●		
General milling of aluminum alloys		●						●
Aluminum alloys (at chattering due to low rigidity machine or poor clamping power)	●							●

Case studies

GG30

Machine part
Vc=170m/min
apxae=2.5x130mm
fz=0.183mm/t (Vf=500mm/min)
Wet
MFWN90160R-8T (8 flutes)
WNMU080608EN-GM (PR1510)

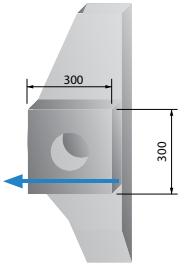


PR1510	Chip evacuation rate = 163cc/min
Competitor A (Positive cutter)	Chip evacuation rate = 68cc/min

Competitor A proceeded machining under low cutting conditions, as the workpiece was slipping because of the unstable chucking.
With MFWN, stable machining was possible at higher cutting conditions.
(User evaluation)

Manganese Steel

Construction machine part
Vc=150m/min
apxae=1x100mm
fz=0.2mm/t (Vf=668mm/min)
Dry
MFWN90100R-7T (7 flutes)
WNMU080608EN-GM (PR1525)



PR1525	Machining efficiency: 2 pcs/edge
Competitor B (Negative cutter) (Vertical inserts)	1 pc/edge

Despite instability with the long overhang of the workpiece, MFWN doubled tool life, improving the efficiency by 150%.
(User evaluation)

Low cutting force 90° milling cutter

MFWN Mini

Economical small diameter MFWN series milling cutters
Additional fine pitch, small diameter toolholders available

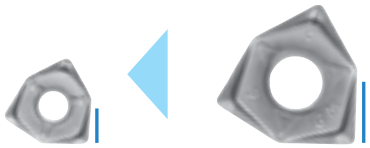
1 Cost-efficient 6-edge inserts

Smaller insert design technology maintains original MFWN cutting performance
Can be used up to 5 mm depth of cut.

Smaller insert size

MFWN Mini
05 size

MFWN
08 size



D.O.C. ~5 mm

D.O.C. ~8 mm

Increased versatility

Large small-diameter lineup

High-efficiency machining with fine pitch styles

1 ~ 3 additional flutes



Expanded lineup of smaller diameters

Face Mill ø50
End Mill ø25 ~ ø40

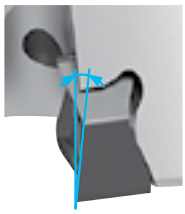


2 Inherits previous MFWN series design elements and features

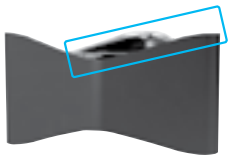
Low cutting force and high chattering-resistance

Sharp cutting by large rake angle
"Large slant edge" design reduces shock when cutting edge enters the workpiece

A.R. Max +11°



"Large slant edge" design

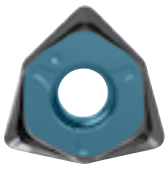


Superior fracture resistance with thick edge design

Stable clamping strength with unique insert face Design



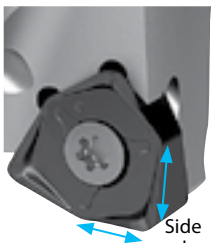
Cutting edge thickness: 5.2 mm
(3.1 mm at the thinnest point)



Optimized seating surface

Neutral inserts for various uses

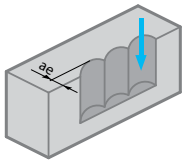
Symmetrical side and bottom cutting edges provide a wide range of machining applications



Bottom edge

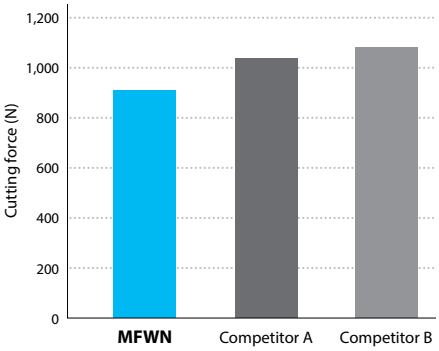
Side edge

Plunging possible



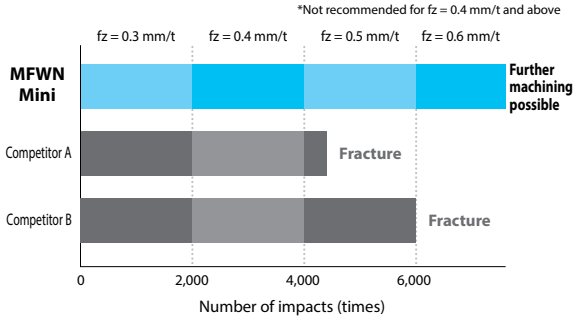
Left-handed toolholders are also available (Custom order)

Cutting force comparison (Internal evaluation)



Cutting conditions : Vc = 150 m/min, fz = 0.15 mm/t,
ap × ae = 1.5 × 35 mm, Dry, Cutting dia. ø63, Workpiece material: 42CrMo4

Fracture resistance comparison (Internal evaluation)



Cutting conditions : Vc = 120 m/min, ap × ae = 1.5 × 30 mm,
Dry, Cutting dia. ø63, Workpiece material: Mold steel 37~43HRC

MFWN Mini



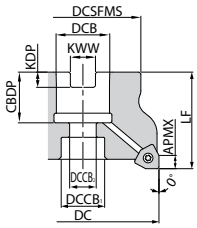


Fig. 1

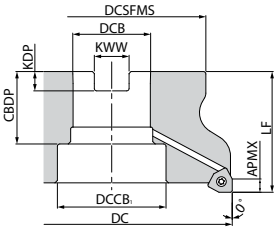


Fig. 2

Toolholder dimensions

Description				Availability	Inserts	Dimension (mm)										A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Fig.	Applicable inserts ➔ M141
				R		DC	DCSFMS	DCB	$DCCB_1$	$DCCB_2$	LF	CBDP	KDP	KWW	APMX							
Metric	Fine pitch	MFWN	90050R-05-5T-M	●	5	50	48	22	17.5	11	40	21	6.3	10.4	5	+11	-9	Yes	13800	0.4	1	WNMU0504...
			90063R-05-6T-M	●	6	63			18								-8		12300	0.5	1	
			90080R-05-7T-M	●	7	80	70	27	20	13	50	24	7	12.4			-7		10900	1.2	1	
			90100R-05-8T-M	●	8	100	78	32	45	-		30	8	14.4					9700	1.6	2	
			90125R-05-11T-M	●	11	125	89	40	55		63	33	9	16.4					8700	2.8	2	
	Extra fine pitch	MFWN	90050R-05-6T-M	●	6	50	48	22	17.5	11	40	21	6.3	10.4	5	+11	-9	Yes	13800	0.4	1	WNMU0504...
			90063R-05-7T-M	●	7	63			18								-8		12300	0.5	1	
			90080R-05-9T-M	●	9	80	70	27	20	13	50	24	7	12.4			-7		10900	1.2	1	
			90100R-05-11T-M	●	11	100	78	32	45	-		30	8	14.4					9700	1.5	2	
			90125R-05-14T-M	●	14	125	89	40	55		63	33	9	16.4					8700	2.7	2	
Bore dia. inch spec	Fine pitch	MFWN	90080R-05-7T	□	7	80	70	25.4	20	13	50	27	6	9.5	5	+11	-7	Yes	10900	1.3	1	WNMU0504...
			90100R-05-8T	□	8	100	78	31.75	45	-		34	8	12.7					9700	1.6	2	
			90125R-05-11T	□	11	125	89	38.1	55		63	38	10	15.9					8700	2.9	2	
	Extra fine pitch	MFWN	90080R-05-9T	□	9	80	70	25.4	20	13	50	27	6	9.5	5	+11	-7	Yes	10900	1.2	1	WNMU0504...
			90100R-05-11T	□	11	100	78	31.75	45	-		34	8	12.7					9700	1.6	2	
			90125R-05-14T	□	14	125	89	38.1	55		63	38	10	15.9					8700	2.8	2	

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Spare parts

Description			Clamp Screw	Wrench	Anti-seize Compound	Mounting bolt
						
Fine pitch	MFWN	90050R-05-5T-M	SB-3065TRP	DTPM-8	P-37	HH10X30
		90063R-05-6T-M				HH10X30
		90080R-05-7T(-M)	Recommended tightening torque for insert clamp 1.2N•m			HH12X35
		90100R-05-8T(-M)				-
		90125R-05-11T(-M)				
Extra fine pitch	MFWN	90050R-05-6T-M	SB-3065TRP	DTPM-8	P-37	HH10X30
		90063R-05-7T-M				HH10X30
		90080R-05-9T(-M)	Recommended tightening torque for insert clamp 1.2N•m			HH12X35
		90100R-05-11T(-M)				-
		90125R-05-14T(-M)				

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MFWN Mini



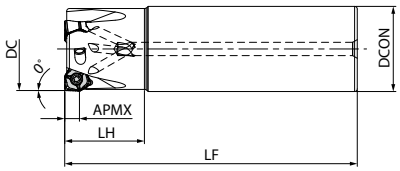


Fig. 1

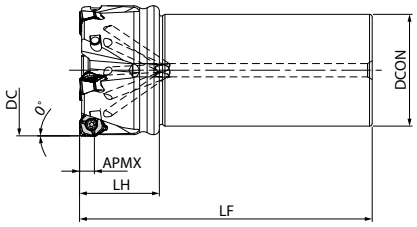


Fig. 2

Toolholder dimensions

Description		Availability	Inserts	Dimension (mm)					A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Fig.	Spare parts			Applicable inserts ➡ M141
														Screw	Wrench	Anti-seize compound	
		R		DC	DCON	LF	LH	APMX									
MFWN	90025R-S25-05-2T	●	2	25	25	120	32			-14.5		19500	1				
	90032R-S32-05-3T	●	3	32		130	40			-12		17200	1				
	90040R-S32-05-4T	●	4	40		150	50			-10		15400	2				
	90050R-S32-05-5T	●	5	50	32			5	+11	-9	Yes	13800	2	SB-3065TRP	DTPM-8	P-37	WNMU0504...
	90063R-S32-05-6T	●	6	63		110	30			-8		12300	2				
	90080R-S32-05-7T	●	7	80						-7		10900	2				

Recommended tightening torque for insert clamp 1.2N•m

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

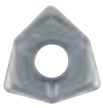
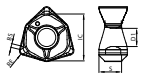
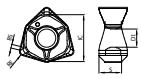
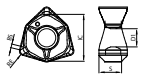
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

WNMU

Classification of usage

★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice
(In case hardness is 45HRC or under)

Carbon steel / Alloy steel			☆			★	☆	P
Mold and die steel			☆			★	☆	P
Austenitic stainless steel				☆		☆	★	M
Martensitic stainless steel							☆	M
Precipitation hardening stainless steel				☆			★	M
Gray cast iron		☆			★			K
Nodular cast iron		☆			★			K
Non-ferrous metals								N
Heat-resistant alloy							☆	S
Titanium alloy				☆			★	S
Hard materials	★							H

Insert		Description	No. of edges	Dimension (mm)					Carbide							Applicable toolholder ➡ M139 M140
				IC	S	D1	RE	BS	PVD							
									PR015S	PR1510	PR1525	PR1535	PR1810	PR1825	PR1835	
	 General purpose	WNMU 050408EN-GM	6	8.8	4.2	3.4	0.8	0.7		●	●	●	●	●	●	MFWN90...-05-...
	 Low cutting force	WNMU 050408EN-SM	6	8.8	4.2	3.4	0.8	0.7		●	●	●	●	●	●	MFWN90...-05-...
	 Tough edge	WNMU 050408EN-GH	6	8.8	4.2	3.4	0.8	0.7	●	●	●	●	●	●	●	MFWN90...-05-...

Recommended cutting conditions ➡ M142

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

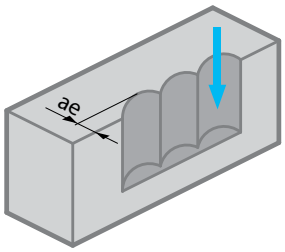
Recommended cutting conditions

Chipbreaker	Workpiece material	fz (mm/t)	Recommended insert grades (Vc : m/min)			
			MEGACOAT NANO EX (MEGACOAT NANO)			MEGACOAT HARD
			PR1835 (PR1535)	PR1825 (PR1525)	PR1810 (PR1510)	PR015S
GM	Carbon steel	0.1 – **0.2** – 0.25	☆ 120 – **180** – 250	★ 120 – **180** – 250	–	–
	Alloy steel		☆ 100 – **160** – 220	★ 100 – **160** – 220	–	–
	Mold steel	0.1 – **0.15** – 0.2	☆ 80 – **140** – 180	★ 80 – **140** – 180	–	–
	Stainless steel (Austenitic related)	0.1 – **0.15** – 0.2	☆ 100 – **160** – 200	☆ 100 – **160** – 200	–	–
	Stainless steel (Martensitic related)		☆ 150 – **200** – 250	–	–	–
	Stainless steel (Precipitation Hardening)		★ 90 – **120** – 150	–	–	–
	Gray cast iron	0.1 – **0.2** – 0.25	–	–	★ 120 – **180** – 250	–
	Nodular cast iron	0.1 – **0.15** – 0.2	–	–	★ 100 – **150** – 200	–
	Ni-base heat-resistant alloys	0.1 – **0.12** – 0.16	☆ 20 – **30** – 50	–	–	–
SM	Carbon steel	0.06 – **0.12** – 0.2	☆ 120 – **180** – 250	☆ 120 – **180** – 250	–	–
	Alloy steel		☆ 100 – **160** – 220	☆ 100 – **160** – 220	–	–
	Mold steel	0.06 – **0.08** – 0.15	☆ 80 – **140** – 180	☆ 80 – **140** – 180	–	–
	Stainless steel (Austenitic related)	0.06 – **0.12** – 0.2	★ 100 – **160** – 200	☆ 100 – **160** – 200	–	–
	Stainless steel (Martensitic related)		☆ 150 – **200** – 250	–	–	–
	Stainless steel (Precipitation Hardening)		☆ 90 – **120** – 150	–	–	–
	Gray cast iron	0.06 – **0.12** – 0.2	–	–	☆ 120 – **180** – 250	–
	Nodular cast iron	0.06 – **0.08** – 0.15	–	–	☆ 100 – **150** – 200	–
	Ni-base heat-resistant alloys	0.06 – **0.08** – 0.15	★ 20 – **30** – 50	–	–	–
	Titanium alloys	0.06 – **0.08** – 0.15	★ 40 – **60** – 80	–	☆ 40 – **60** – 80	–
GH	Carbon steel	0.15 – **0.2** – 0.3	☆ 120 – **180** – 250	☆ 120 – **180** – 250	–	–
	Alloy steel		☆ 100 – **160** – 220	☆ 120 – **160** – 220	–	–
	Mold steel	0.15 – **0.2** – 0.25	☆ 80 – **140** – 180	☆ 80 – **140** – 180	–	–
	Stainless steel (Austenitic related)	0.15 – **0.2** – 0.25	☆ 100 – **160** – 200	☆ 100 – **160** – 200	–	–
	Stainless steel (Martensitic related)		☆ 150 – **200** – 250	–	–	–
	Stainless steel (Precipitation Hardening)		☆ 90 – **120** – 150	–	–	–
	Gray cast iron	0.15 – **0.2** – 0.3	–	☆ 120 – **180** – 250	☆ 120 – **180** – 250	–
	Nodular cast iron	0.15 – **0.2** – 0.25	–	☆ 100 – **150** – 200	☆ 100 – **150** – 200	–
	Ni-base heat-resistant alloys	0.1 – **0.15** – 0.2	☆ 20 – **30** – 50	–	–	–
	Hardened Material (60 HRC or less)	0.05 – **0.08** – 0.16	–	–	–	★ 50 – **80** – 100

The bold-faced number indicates a center value of recommended cutting condition. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.
Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.
When using GH chipbreaker in fine pitch cutters, recommended feed is fz≤0.2 (mm/t).
GH chipbreaker is not recommended for extra fine pitch cutters.

★ : 1st Recommendation
☆ : 2nd Recommendation

Vertical milling (Plunging)



Available for vertical milling (Plunging)

Cutting Dia.	Maximum width of cut (ae)
All Description	5 mm

Ramping and helical milling are not recommended due to interference between workpiece and flank face

Applicable chipbreaker

Cutter type	Chipbreaker		
	GM	SM	GH
Fine pitch	✓	✓	✓
Extra fine pitch	✓	✓	(Feed rate is recommended fz=0.2 mm/t or under)

How to mount an insert

1. Completely eliminate chips and dust from the insert mounting side.
2. Clamp Screw
   ·Apply anti-seize compound on portion of taper and thread of clamp screw.
   ·After mounting a clamp screw on the top edge of wrench, tighten the screw while keeping the insert pushed against the shim seat surface and holder surface (Fig.1)
3. When tightening the screw, make sure that the wrench is parallel to the screw.
   Recommended tightening torque . . . 1.2N·m
4. After tightening, check that there is no gap between the insert and the surface of the shim, or between the side surface of insert and the holder surface.
   If there is a gap, remount the insert using the directions above.

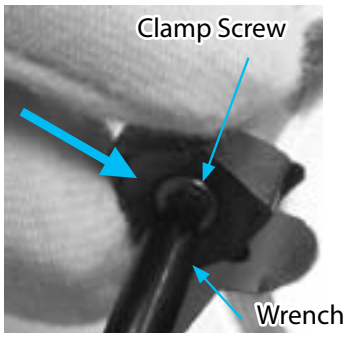


Fig. 1

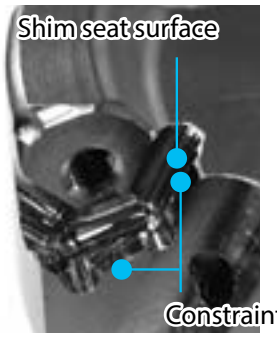


Fig. 2

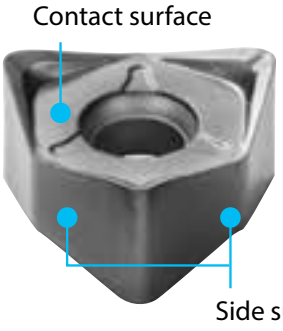


Fig. 3

Cutting edge angle 88˚, high efficiency cutter

MFSN88

Economical double-sided 8-edge insert suitable for shoulder roughing

Reduces chattering with a low cutting force design

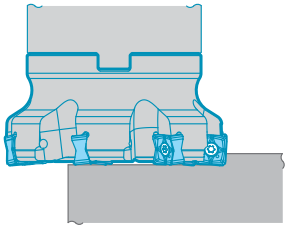
Applicable to various types of machining with product lineup from ø32

1 Economical double-sided 8-edge insert suitable for shoulder roughing

Cost reduction in approximately 90˚corner cutting

Shoulder roughing

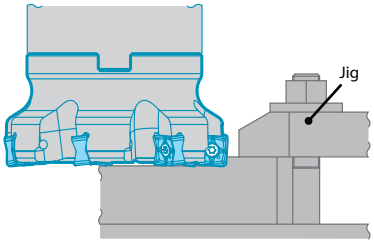
Cost reduction by switching from 90˚ cutter with positive inserts



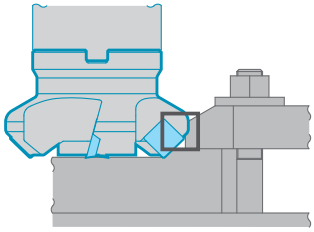
See page **M149** for unmachined corner portion

Facing without interfering with fixtures

MFSN88



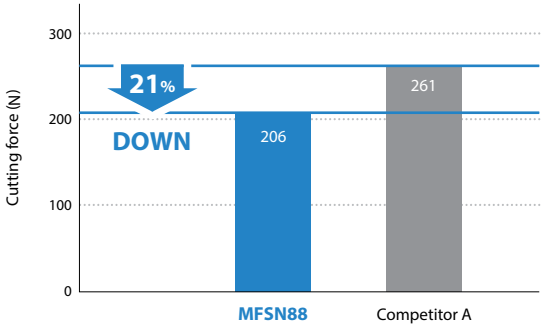
Conventional 45˚ cutter



2 Reduces chattering with a low cutting force design

Chatter resistant medium to roughing machining range

Cutting force comparison (Internal evaluation)



Cutting force is thrust force

Cutting conditions: Vc = 200 m/min, ap = 3mm, fz = 0.15mm/t
Cutter dia. ø63: Workpiece material: C50

3 Extended tool life by MEGACOAT NANO EX

Insert grade and chipbreaker lineup for various machining application



1st Recommendation
(General purpose)
GM chipbreaker



Tough edge

GH chipbreaker



For stainless steel

SM chipbreaker

MFSN88



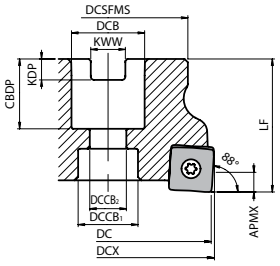


Fig. 1

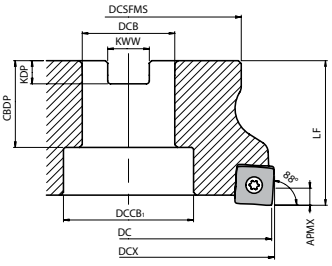


Fig. 2

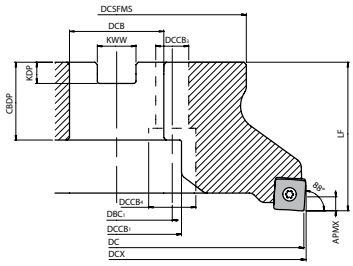


Fig. 3

Toolholder dimensions

Description				Availability	Inserts	Dimension (mm)														A.R. max. (°)	R.R. (°)	Coolant hole	Weight (kg)	Fig.	Applicable inserts M148
				R		DC	DCX	DCSFMS	DCB	DCCB1	DCCB2	DCCB3	DCCB4	DBC1	LF	CBDP	KDP	KWW							
Metric	Fine pitch	MFSN	88050R-4T-M-G	●	4	50	52	48	22	17.5	11				40	21	6.3	10.4	+10	-12	No	0.3	1	SNMU1305...
			88063R-5T-M-G	●	5	63	65			18										-10		0.4	1	
			88080R-6T-M-G	●	6	80	82	70	27	20	13	-	-	-	50	24	7	12.4		-9		1.1	1	
			88100R-7T-M-G	●	7	100	102	78	32	45	-					30	8	14.4		-8		1.4	2	
			88125R-9T-M-G	●	9	125	127	89	40	55					63	33	9	16.4		-7.5		2.4	2	
			88160R-11T-M-G	●	11	160	162	110				14	20	66.7						-7		4.2	3	
	Extra fine pitch	MFSN	88050R-5T-M-G	●	5	50	52	48	22	17.5	11				40	21	6.3	10.4	+10	-12	No	0.3	1	SNMU1305...
			88063R-7T-M-G	●	7	63	65			18										-10		0.4	1	
			88080R-9T-M-G	●	9	80	82	70	27	20	13	-	-	-	50	24	7	12.4		-9		1.1	1	
			88100R-11T-M-G	●	11	100	102	78	32	45	-					30	8	14.4		-8		1.4	2	
			88125R-13T-M-G	●	13	125	127	89	40	55					63	33	9	16.4		-7.5		2.5	2	
			88160R-15T-M-G	●	15	160	162	110				14	20	66.7						-7		4.3	3	
Bore dia. inch spec	Fine pitch	MFSN	88080R-6T-G	□	6	80	82	70	25.4	20	13				50	27	6	9.5		-9		1.1	1	
			88100R-7T-G	□	7	100	102	78	31.75	45	-	-	-	-		34	8	12.7	+10	-8	No	1.5	2	SNMU1305...
			88125R-9T-G	□	9	125	127	89	38.1	55					63	38	10	15.9		-7.5		2.5	2	
			88160R-11T-G	□	11	160	162	110	50.8	70							11	19.1		-7		4.1	2	
	Extra fine pitch	MFSN	88080R-9T-G	□	9	80	82	70	25.4	20	13				50	27	6	9.5		-9		1.1	1	
			88100R-11T-G	□	11	100	102	78	31.75	45	-	-	-	-		34	8	12.7	+10	-8	No	1.5	2	SNMU1305...
			88125R-13T-G	□	13	125	127	89	38.1	55					63	38	10	15.9		-7.5		2.6	2	
			88160R-15T-G	□	15	160	162	110	50.8	70							11	19.1		-7		4.3	2	

APMX : 5 mm (GM, SM, GH chipbreakers, Coated cabide), 3 mm (GM chipbreaker, Cermet)

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Spare parts (common to Metric / Inch spec)

Description			Clamp screw	Wrench	Anti-seize compound	Mounting bolt
						
Fine pitch	MFSN	88050R-4T-M-G	SB-4090TRP	DTPM-15	P-37	HH10X30
		88063R-5T-M-G				HH10X30
		88080R-6T(-M)-G				HH12X35
		88100R-7T(-M)-G	Recommended tightening torque for insert clamp 3.5N•m			-
		88125R-9T(-M)-G				
		88160R-11T(-M)-G				
Extra fine pitch	MFSN	88050R-5T-M-G	SB-4090TRP	DTPM-15	P-37	HH10X30
		88063R-7T-M-G				HH10X30
		88080R-9T(-M)-G				HH12X35
		88100R-11T(-M)-G	Recommended tightening torque for insert clamp 3.5N•m			-
		88125R-13T(-M)-G				
		88160R-15T(-M)-G				

 Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

MFSN88



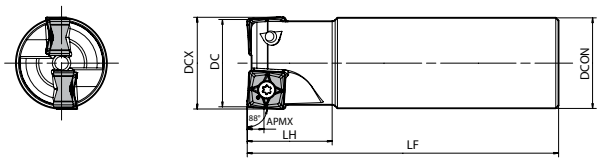


Fig. 1

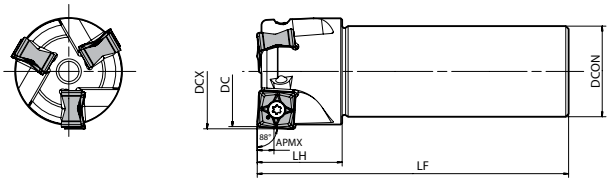


Fig. 2

Toolholder dimensions

Description		Availability	Inserts	Dimension (mm)					A.R. max. (°)	R.R. (°)	Coolant hole	Fig.	Spare parts			Applicable inserts ➡ M148
		R		DC	DCX	DCON	LF	LH					Screw	Wrench	Anti-seize compound	
MFSN	88032R-S32-2T-G	●	2	32	34	32	110	30	+10	-15.5	No	1	SB-4090TRP	DTPM-15	P-37	SNMU1305...
	88040R-S32-3T-G	●	3	40	42					-13		2				

APMX : 5 mm (GM, SM, GH chipbreakers, Coated cabide), 3 mm (GM chipbreaker, Cermet)
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.
Recommended tightening torque for insert clamp : 3.5N·m

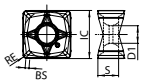
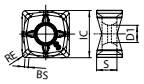
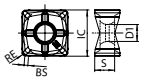
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SNMU

Classification of usage

★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice
(In case hardness is 45HRC or under)

Carbon steel / Alloy steel			☆			★	☆	■	P
Mold and die steel			☆			★	☆	■	
Austenitic stainless steel				☆		☆	★		M
Martensitic stainless steel							☆		
Precipitation hardening stainless steel				☆			★		
Gray cast iron		☆			★				K
Nodular cast iron		☆			★				
Non-ferrous metals									N
Heat-resistant alloy							☆		S
Titanium alloy				☆			★		
Hard materials	★								H

Insert		Description		IC	S	D1	RE	BS	Carbide PVD PR015S	PR1510	PR1525	PR1535	PR1810	PR1825	PR1835	Cermet - TN620M	Applicable toolholder M145 M147
	 General purpose	SNMU	130508EN-GM	13	5.51	4.7	0.8	1		●	●	●	●	●	●	●	MFSN88...
	 Low cutting force	SNMU	130508EN-SM	13	5.51	4.7	0.8	1		●	●	●	●	●	●		MFSN88...
	 Tough edge	SNMU	130508EN-GH	13	5.51	4.7	0.8	1	●	●	●	●	●	●	●		MFSN88...

Recommended cutting conditions M149

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Recommended cutting conditions

Coated carbide

Chipbreaker	Workpiece material	Feed (fz: mm/t)	Recommended insert grades (Vc: m/min) MEGACOAT (PVD Coated carbide) PR1835 (PR1535)	PR1825 (PR1525)	PR1810 (PR1510)	PR015S
GM	Carbon steel	0.1~**0.2**~0.3	☆ 120~**180**~250	★ 120~**180**~250	-	-
	Alloy steel	0.1~**0.2**~0.3	☆ 100~**160**~220	★ 100~**160**~220	-	-
	Mold steel	0.1~**0.15**~0.25	★ 80~**140**~180	★ 80~**140**~180	-	-
	Stainless steel (Austenitic related)	0.1~**0.15**~0.25	☆ 100~**150**~200	☆ 100~**150**~200	-	-
	Stainless steel (Martensitic related)	0.1~**0.15**~0.25	☆ 100~**150**~200	-	-	-
	Stainless steel (Precipitation hardening)	0.1~**0.15**~0.25	★ 90~**120**~150	-	-	-
	Gray cast iron	0.1~**0.2**~0.3	-	-	★ 120~**180**~250	-
	Nodular cast iron	0.1~**0.15**~0.25	-	-	★ 100~**150**~200	-
	Ni-base heat-resistant alloys	0.1~**0.12**~0.2	☆ 20~**30**~50	-	-	-
SM	Carbon steel	0.06~**0.12**~0.2	-	☆ 120~**180**~250	-	-
	Alloy steel	0.06~**0.12**~0.2	-	☆ 100~**160**~220	-	-
	Mold steel	0.06~**0.08**~0.15	-	☆ 80~**140**~180	-	-
	Stainless steel (Austenitic related)	0.06~**0.12**~0.2	★ 100~**150**~200	☆ 100~**150**~200	-	-
	Stainless steel (Martensitic related)	0.06~**0.12**~0.2	★ 100~**150**~200	-	-	-
	Stainless steel (Precipitation hardening)	0.06~**0.12**~0.2	☆ 90~**120**~150	-	-	-
	Gray cast iron	0.06~**0.12**~0.2	-	-	☆ 120~**180**~250	-
	Nodular cast iron	0.06~**0.1**~0.15	-	-	☆ 100~**150**~200	-
	Ni-base heat-resistant alloys	0.06~**0.08**~0.15	★ 20~**30**~50	-	-	-
	Titanium alloys	0.06~**0.08**~0.15	★ 40~**60**~80	-	-	-
GH	Carbon steel	0.15~**0.25**~0.35	-	☆ 120~**180**~250	-	-
	Alloy steel	0.15~**0.25**~0.35	-	☆ 100~**160**~220	-	-
	Mold steel	0.1~**0.2**~0.3	-	☆ 80~**140**~180	-	-
	Gray cast iron	0.15~**0.25**~0.35	-	-	☆ 120~**180**~250	-
	Nodular cast iron	0.1~**0.2**~0.3	-	-	☆ 100~**150**~200	-
	Hard materials (60HRC or less)	0.1~**0.2**~0.3	-	-	-	★ 50~**80**~100

* The bold-faced number indicates a center value of recommended cutting condition.
Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.
* Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.

★: 1st Recommendation
☆: 2nd Recommendation

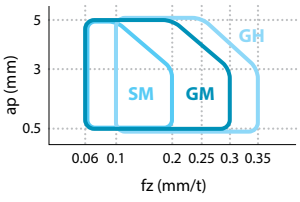
Cermet

Chipbreaker	Workpiece material	Feed (fz: mm/t)	Recommended insert grades (Vc: m/min) Cermet TN620M
GM	Carbon steel	0.06~**0.12**~0.15	★ 200~**250**~300
	Alloy steel	0.06~**0.12**~0.15	★ 180~**220**~250
	Mold steel	0.06~**0.1**~0.13	★ 150~**180**~220

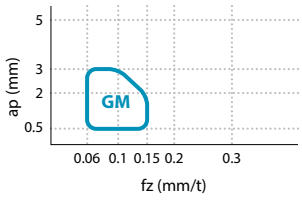
★: 1st Recommendation

Applicable chipbreaker range

Coated carbide



Cermet



Applicable chipbreaker

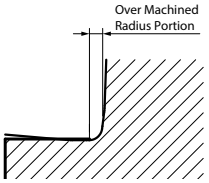
Cutter type	Chipbreaker GM	SM	GH
Fine pitch	✓	✓	✓
Extra fine pitch	✓	✓	△ (Feed rate is recommended fz=0.2mm/t or under)

Not available for vertical milling (plunging).

Reference data of Over Machined Radius Portion

ap	1 mm	2 mm	3 mm	4 mm	5 mm
Over Machined Radius Portion	0.12 mm	0.24 mm	0.27 mm	0.31 mm	0.34 mm

Over machined radius portion to 90°cutter



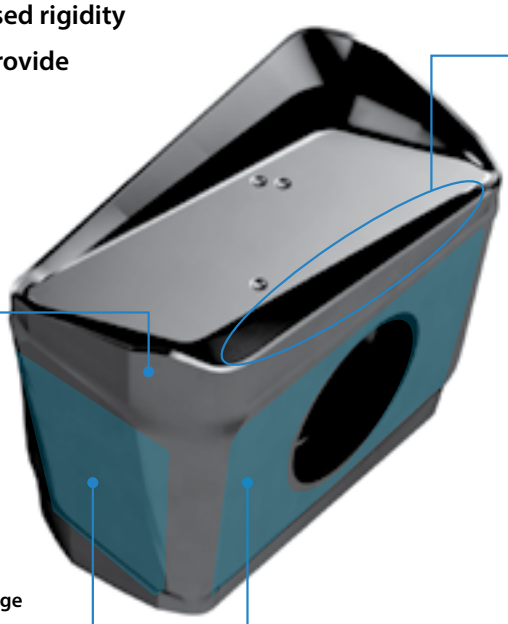
Face mills for heavy milling

MFLN

Tough 4-edge tangencial inserts provide high reliability on heavy milling at large depths of cut and high feed rates.
Three cutting edge angles (incl. MFLN45 and MFLN70) optimized for various machining applications.

1 Tough and reliable inserts for stable heavy milling

22 mm long inserts offer increased rigidity
Tangentially mounted inserts provide
2 cutting edges on both sides

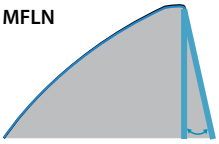


Obtuse edge design

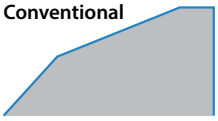
Increases the cutting edge angle only at the tip to maintain both strength and sharpness

Cross-section view of cutting edge

MFLN



Conventional

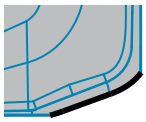


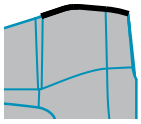
Corner chamfer

only available on MFLN90

Both general corner-R type and chamfered corner type available

Prevents chattering and insert fracturing





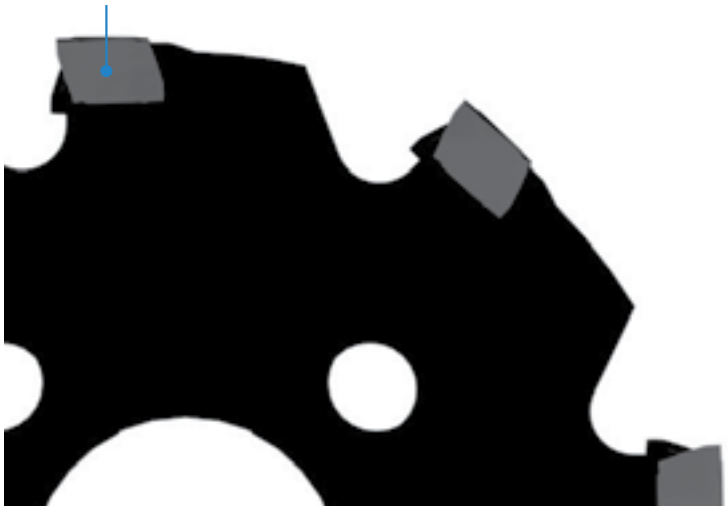
Convex cutting edge ridge

Reduced impact forces when entering the workpiece

Wide flat mounting surface

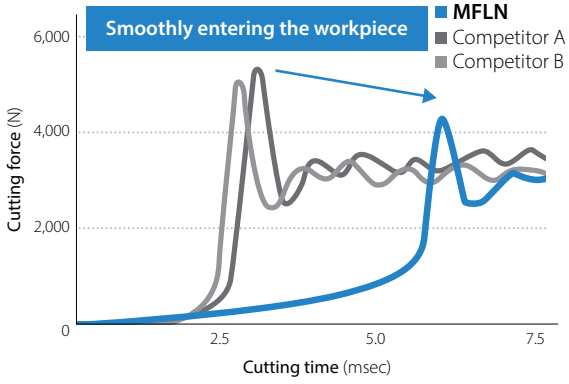
Hold an insert firmly in heavy milling

Tangentially mounted inserts increase rigidity



Cutting forces when entering the workpiece (internal evaluation)

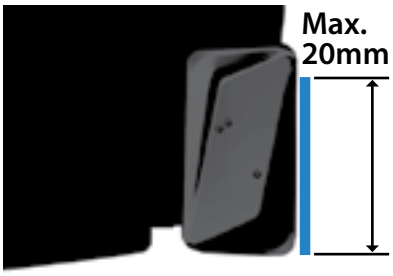
MFLN90: Insert - chamfered corner type



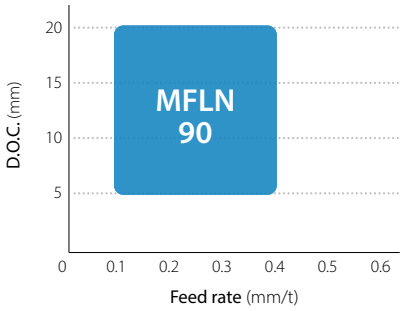
Cutting conditions: Vc = 150 m/min, ap × ae = 5 × 75 mm, fz = 0.3 mm/t
ø125 (1 insert), dry, workpiece: C50

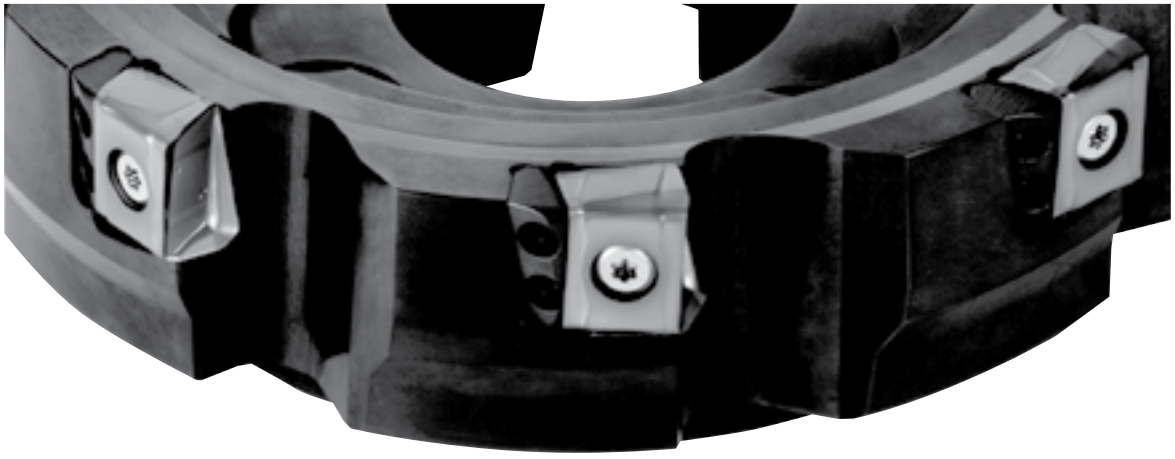
2 Large D.O.C. and high feed rates

MFLN90
Cutting edge angle 90°



Applicable range





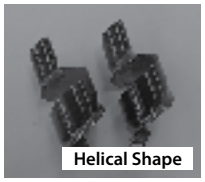
Chip comparison (Internal evaluation)

Helix-shaped chips prevent chip recutting and provide stable machining at high feed rates.

MFLN90 Stable



fz = 0.3 mm/t



fz = 0.4 mm/t

Competitor A Unstable



fz = 0.3 mm/t



fz = 0.4 mm/t

Competitor B Unstable



fz = 0.3 mm/t



fz = 0.4 mm/t

Cutting conditions: Vc = 150 m/min, ap × ae = 10 × 100 mm, fz = 0.3, 0.4 mm/t, ø125 (1 insert), dry, workpiece: C50

M
Milling

MFLN90



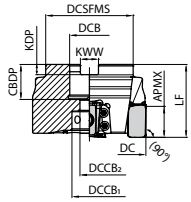


Fig. 1

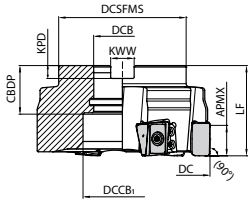


Fig. 2

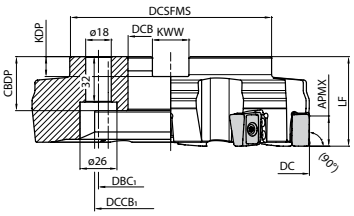


Fig. 3

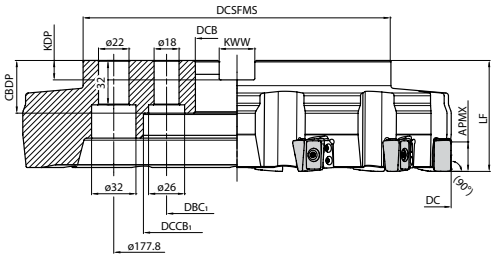


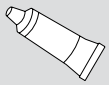
Fig. 4

Toolholder dimensions

Description			Availability	Inserts	Dimension (mm)											A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Fig.	Applicable inserts ⇒ M153
			R		DC	DCSFMS	DCB	DCCB1	DCCB2	DBC1	LF	CBDP	KDP	KWW	APMX							
Metric	MFLN	90080R-4T-M	●	4	80	60	27	24	13	-	50	24	7	12.4	20	+4.5	-16.5	Yes	5970	1	1	LOGU221616ER-GM LOGU2216PAER-GM
		90100R-4T-M	●		100	70	32	45	-			30	8	14.4			-14.5		4780	1.5	2	
		90125R-6T-M	●	6	125	89	40	55			63	33	9	16.4			-13.5	No	3820	2.9	2	
		90160R-7T-M	●	7	160	110		90	-	66.7									2990	4.5	3	
		90200R-8T-M	●	8	200	142	60	132				38	14	25.7					2390	6.9	3	
		90250R-10T-M	●	10	250			172		101.6							-13		1910	10.3	3	
		90315R-12T-M	MTO	12	315	222		205			80								1520	20.9	4	
Bore dia. inch spec	MFLN	90080R-4T	□	4	80	60	25.4	24	13	-	50	27	6	9.5	20	+4.5	-16.5	Yes	5970	1	1	LOGU221616ER-GM LOGU2216PAER-GM
		90100R-4T	□		100	70	31.75	45	-			34	8	12.7			-14.5		4780	1.6	2	
		90125R-6T	□	6	125	89	38.1	55			63	38	10	15.9			-13.5	No	3820	3	2	
		90160R-7T	□	7	160	110	50.8	90	-				11	19.1					2990	4.6	2	
		90200R-8T	□	8	200	142		132											2390	7.2	3	
		90250R-10T	□	10	250		47.625	172		101.6			14	25.4			-13		1910	10.5	3	
		90315R-12T	MTO	12	315	222		205			80								1520	21.8	4	

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Spare parts

Description		Parts						
		Clamp screw	Wrench	Shim	Clamp screw	Wrench	Coat anti-seize compound	Arbor bolt
								
MFLN	○○080R-4T(-M)	SB-60200TRP	TTP-20	MAP-2216	SB-40140TR	DTM-15	P-37	HH12X35
	○○100R-4T(-M) ～ ○○315R-12T(-M)	Tightening torque for clamping insert 6.0 N-m		Tightening torque for clamping shim 3.5 N-m				–

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

LOGU

Classification of usage

★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice
(In case hardness is 45HRC or under)

Carbon steel / Alloy steel	☆		★	☆	P
Mold and die steel	☆		★	☆	P
Austenitic stainless steel					M
Martensitic stainless steel					M
Precipitation hardening stainless steel					M
Gray cast iron	☆		★	☆	K
Nodular cast iron	☆		★	☆	K
Non-ferrous metals					N
Heat-resistant alloy					S
Titanium alloy					S
Hard materials					H

Insert		Description		Dimension (mm)						Carbide				Applicable toolholder ➡ M152 M44 M45
				S	D1	RE	W1	INSL	BS	PVD				
										PR1525	PR1535	PR1825	PR1835	
	 Corner-R	LOGU	221616ER-GM	16.6	6.8	1.6	12.5	22.8	6.3	●	●	●	●	MFLN90... MFLN45... MFLN70...
	 Corner Chamfer	LOGU	2216PAER-GM	16.9	6.8	-	12.5	22.8	4.8	●	●	●	●	MFLN90...

Recommended cutting conditions ➡ M154

About applicable insert

	LOGU221616ER-GM (Corner-R)	LOGU2216PAER-GM (Corner chamfer)
MFLN 90	✓	✓

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Recommended cutting conditions

	Workpiece	D.O.C. (mm)		fz: mm/t	Recommended insert grades (Vc: m/min)	
		Width of cut ≦0.5×DC	Width of cut >0.5×DC		MEGACOAT NANO EX (MEGACOAT NANO)	
					PR1825 (PR1525)	PR1835 (PR1535)
MFLN 90	Carbon steel	~18	~15	0.1 – **0.2** – 0.4	★ 100 – **150** – 180	☆ 80 – **120** – 150
	Alloy steel				★ 100 – **150** – 180	☆ 80 – **120** – 150
	Mold steel				★ 80 – **120** – 150	☆ 70 – **100** – 120
	Gray cast iron	~20	~18	0.1 – **0.2** – 0.4	★ 100 – **150** – 180	☆ 80 – **120** – 150
	Nodular cast iron				★ 100 – **150** – 180	☆ 80 – **120** – 150

★ : 1st recommendation ☆ : 2nd recommendation

The table above provides recommendations based on product specifications.
Before using the product, check the machine's specifications such as power.
The number in bold font is recommended starting conditions. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.
Dry machining is recommended.

How to mount an insert

1 . Completely eliminate chips and dust from the insert mounting side.
2. After mounting a clamp screw on the top edge of wrench, tighten the screw while keeping the insert pushed against the shim seat surface and holder surface (Fig.1,2)
3. Make sure that the identification on the top of the insert is the same in each pocket.(Fig.3)
4. Tighten the wrench (TTP-20) in while holding parallel to the clamp screw.
5. Tighten the insert clamp screw at an appropriate torque. (Recommended torque: 6.0 N·m)
6. After tightening, check that there is no gap between the insert and the surface of the shim, or between the side surface of insert and the holder surface. If there is a gap, remount the insert using the directions above.

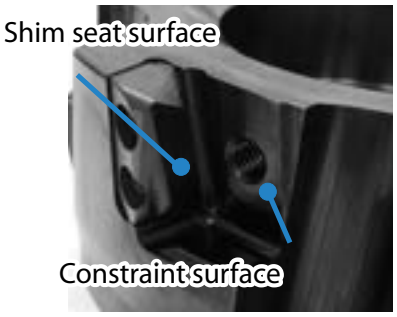


Fig.1

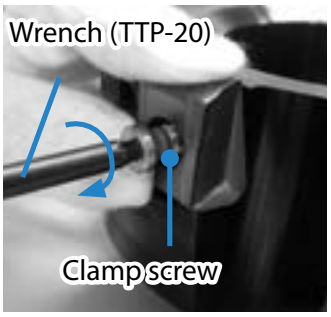
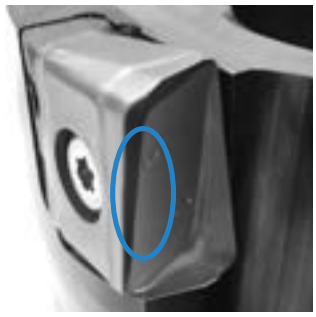


Fig.2


Fig.3

How to replace a shim

1. Completely eliminate chips and dust from the shim mounting side.
2. Coat medium strength screw locking adhesive on the screws.
3. Tighten the screw keeping the shim pushed against the pocket surface of toolholder.
4. After tightening both screws temporarily, tighten them with appropriate torque. (Recommended torque:3.5 N·m)
5. Please check that there is no gap between the shim and the pocket surfaces of toolholder.

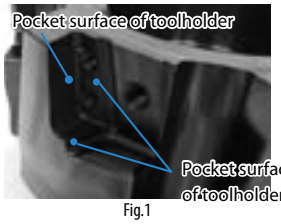


Fig.1

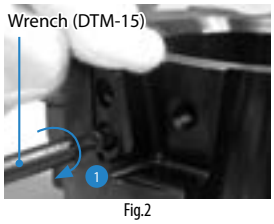


Fig.2

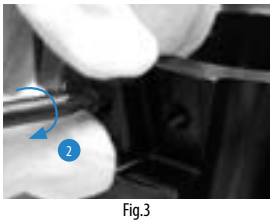
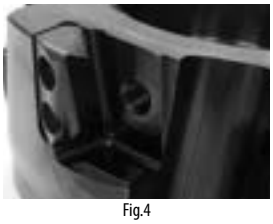


Fig.3


Fig.4

Face mill for heavy milling MSRS90





NB3

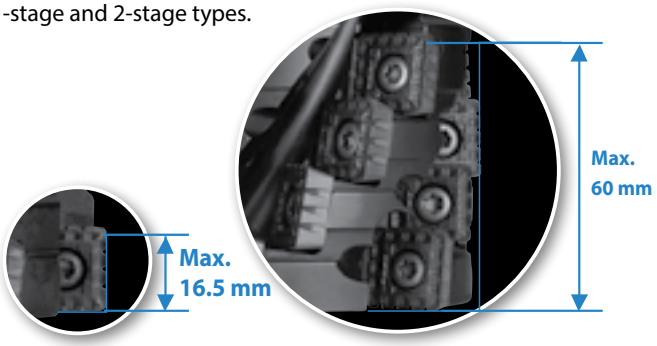
+



NB4

Wide selection of cutting edge length according to cutting conditions

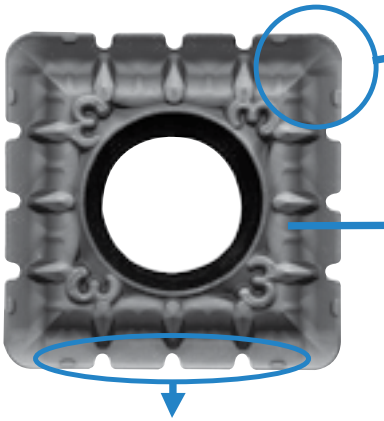
4-stage type (ø80, ø100) is added to the standard lineup as well as 1-stage and 2-stage types.



High efficiency, low cutting force and stable machining without chattering Neutral and corner-R insert

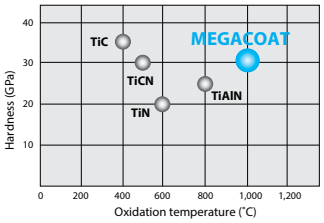
Applicable to shouldering (Cutting edge angle: 90˚),
high feed milling (Cutting edge angle: 30˚), plunging, and side cutter.

Custom-ordered milling cutter with high performance notched neutral inserts provides various applications



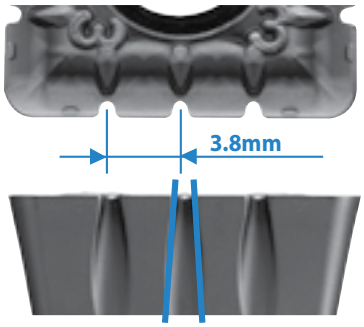
Neutral insert with corner-R is available to various applications

Long tool life: MEGACOAT



High hardness and high oxidation resistance long tool life: MEGACOAT

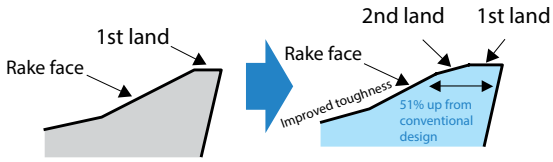
Notched insert SPMT180616EN



The notched insert breaks chips into small pieces and reduces cutting force.

The second land near the cutting edge improves edge strength.

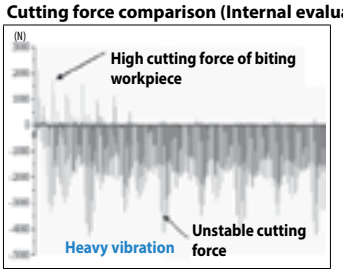
For neutral (Right/Left) hand
Applicable for various cutting edge angle.
Cutting edge length: 18mm



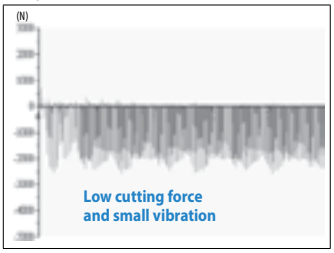
Edge preparation

Low cutting force (Notched insert benefit)

Cutting force comparison (Internal evaluation)



Competitor A



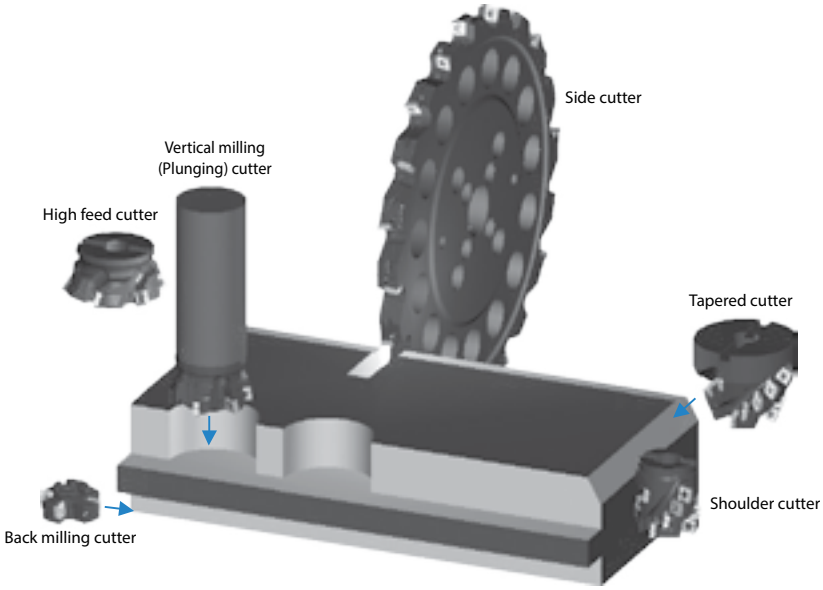
MSRS90

Notched insert realizes lower cutting force and smaller vibration

Applicable inserts: Available for various applications

Applications	Chipbreaker selection	3-notched	4-notched	Without notch
General purpose	Standard	NB3 +	NB4	
Low cutting force	Low cutting force	NB3P +	NB4P	
Edge strength oriented	Without notch (Usable with notched inserts)	(NB3 or	NB4) +	

Various expansive possibilities (Custom-ordered and standard milling cutter)



The custom-ordered milling cutter can be customized for your requirements such as diameter, Cutting edge angle, number of insert stages.

Shaft length determination




Tapered cutter


Vertical milling (Plunging) cutter


45° Face mill


High feed cutter


Shoulder cutter

MSRS90



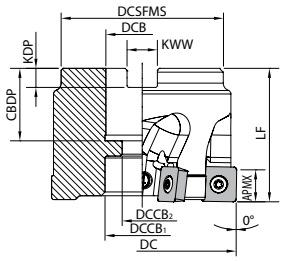


Fig. 1

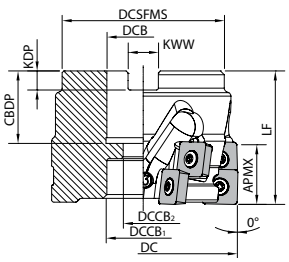


Fig. 2

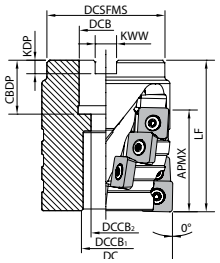


Fig. 3

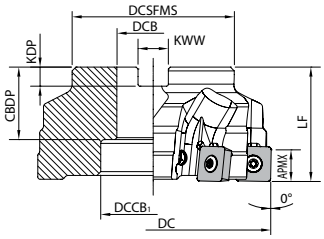


Fig. 4

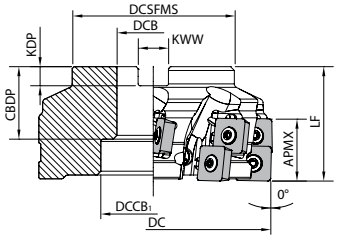


Fig. 5

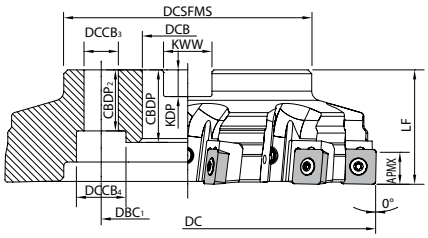


Fig. 6

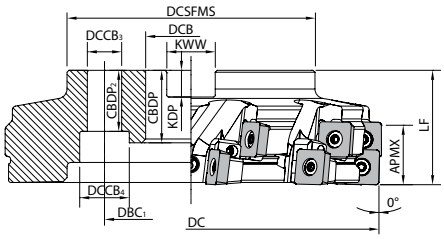


Fig. 7

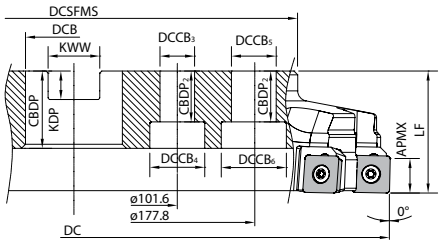


Fig. 8

Toolholder dimensions

	Description		Availability	Inserts	Flutes	Stages	Dimension (mm)																A.R. (°)	R.R. (°)	Coolant hole	Weight (kg)	Fig.	Applicable inserts M160
			R				DC	DCSFMS	DCB	$DCCB_1$	$DCCB_2$	$DCCB_3$	$DCCB_4$	$DCCB_5$	$DCCB_6$	DBC_1	LF	CBDP	$CBDP_2$	KDP	KWW	APMX						
Metric	MSRS	90080R-1-4T-M	●	4	4	1	80	70	27	20	13	-	-	-	-	-	60	24	-	7	12.4	16.5	+7	-10	No	1.3	1	SPMT180616EN-...
		90080R-2-4T-M	●	8		2																31				1.1	2	
		90080R-4-4T-M	●	16		4											85					60				1.4	3	
		90100R-1-6T-M	●	6	6	1	100	85	32	45							70	30		8	14.4	16.5				2.2	1	
		90100R-2-6T-M	●	12		2																31				2	2	
		90100R-4-6T-M	MTO	24		4											90					60				3.1	3	
		90125R-1-8T-M	●	8	8	1	125		40	55				-	-		60	33		9	16.4	16.5				2.6	4	
		90125R-2-8T-M	MTO	16		2																31				2.4	5	
		90160R-1-8T-M	●	8		1	160	110				14	20			66.7			28			16.5				4.2	6	
		90160R-2-8T-M	MTO	16		2																31				4	7	
		90200R-1-10T-M	●	10	10	1	200	140	60	-		18	26			101.6		40	32	14	25.7	16.5				6.7	6	
		90200R-2-10T-M	MTO	20		2																31				6.6	7	
		90250R-1-12T-M	●	12	12	1	250															16.5				12.6	6	
		90250R-2-12T-M	MTO	24		2																31				12.5	7	
		90315R-1-14T-M	●	14	14	1	315	220				17	27	22	32	-			25			16.5				16.1	8	
		90315R-2-14T-M	MTO	28		2																31				16		
Bore dia. inch spec	MSRS	90080R-1-4T	□	4	4	1	80	70	31.75	27	18	-	-	-	-	-	60	32	-	8	12.7	16.5	+7	-10	No	1.4	1	SPMT180616EN-...
		90080R-2-4T	□	8		2																31				1.2	2	
		90080R-4-4T	□	16		4											85					60				1.5	3	
		90100R-1-6T	□	6	6	1	100	85	38.1	39	21						70	38		10	15.9	16.5				2.3	1	
		90100R-2-6T	□	12		2																31				2.1	2	
		90100R-4-6T	MTO	24		4											90					60				3.2	3	
		90125R-1-8T	□	8	8	1	125			55				-	-		60			11	19.1	16.5				2.6	4	
		90125R-2-8T	MTO	16		2																31				2.4	5	
		90160R-1-8T	□	8		1	160	100	50.8	70												16.5				4.3	4	
		90160R-2-8T	MTO	16		2																31				4.1	5	
		90200R-1-10T	□	10	10	1	200	130	47.625	-	-	18	26			101.6			32	14	25.4	16.5				6.7	6	
		90200R-2-10T	MTO	20		2																31				6.6	7	
		90250R-1-12T	□	12	12	1	250															16.5				12.6	6	
		90250R-2-12T	MTO	24		2																31				12.5	7	
		90315R-1-14T	□	14	14	1	315	220				17	27	22	32	-			25			16.5				16.1	8	
		90315R-2-14T	MTO	28		2																31				16		

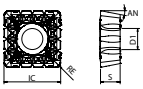
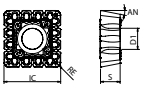
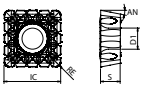
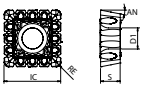
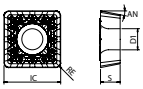
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

SPMT

Classification of usage

★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice
(In case hardness is 45HRC or under)

Carbon steel / Alloy steel		★	P
Mold and die steel		★	P
Austenitic stainless steel			M
Martensitic stainless steel			M
Precipitation hardening stainless steel			M
Gray cast iron	★		K
Nodular cast iron	★		K
Non-ferrous metals			N
Heat-resistant alloy			S
Titanium alloy			S
Hard materials			H

Insert		Description		No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide PVD PR1810	PVD PR1835	Applicable toolholder M159
	 3-notch	SPMT	180616EN-NB3	4	18	6.35	6.8	1.6	11	●	●	MSRS90...
	 3-notch / Low cutting force	SPMT	180616EN-NB3P	4	18	6.35	6.8	1.6	11	●	●	MSRS90...
	 4-notch	SPMT	180616EN-NB4	4	18	6.35	6.8	1.6	11	●	●	MSRS90...
	 4-notch / Low cutting force	SPMT	180616EN-NB4P	4	18	6.35	6.8	1.6	11	●	●	MSRS90...
	 Without notch	SPMT	180616EN-V	4	18	6.35	6.8	1.6	11	●	●	MSRS90...

Recommended cutting conditions M161

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

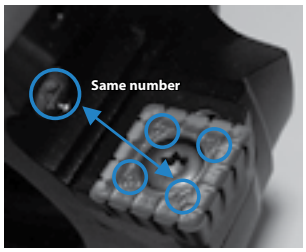
Caution when installing notched insert

It is important to install the appropriate notched insert into the correct position. If it is installed in incorrect position, the tool cannot cut the workpiece and it may damage the toolholder body. For MSRS90, notched insert location indicator is marked at insert installed pocket of the cutter body.

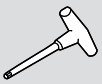
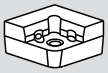
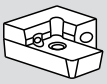
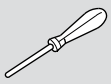
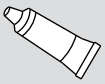
Description		No. of inserts	No. of flutes	No. of stages	No. of inserts	
					Notched	
					NB3(P)	NB4(P)
MSRS	90100R-1-6T	6	6	1	3	3
	90100R-2-6T	12		2	6	6
	90100R-4-6T	24		4	12	12

When installing the inserts, match the number on the top surface of insert to the number of the cutter body.





Spare parts

Description			Spare parts							
			Clamp screw	Wrench	Cartridge		Clamp screw	Wrench	Anti-seize compound	Mounting bolt
					MAP-1806M 	MAP-1806S  (Bottom edge only)				
Without cartridge	MSRS	90080R-○-4T-M	SB-60120TR	TT-25L	-	-	-	-	P-37	HH12X35
		90100R-○-6T-M								-
		90125R-○-8T-M								
With cartridge	MSRS	90160R-○-8T-M ~ 90315R-○-14T-M			MAP-1806M*1	MAP-1806S*2	SB-40140TR	DT-15		
					Recommended tightening torque for cartridge clamp 3.5N·m					
Without cartridge	MSRS	90080R-○-4T	Recommended tightening torque for insert clamp 7.5N·m		-	-	-	-		HH16X45
		90100R-○-6T								HH20X55
		90125R-○-8T								-
With cartridge	MSRS	90160R-○-8T ~ 90315R-○-14T			MAP-1806M*1	MAP-1806S*2	SB-40140TR	DT-15		
					Recommended tightening torque for cartridge clamp 3.5N·m					

Notes: *1: MAP-1806M is only for the bottom edge (1st stage) of MSRS90..R-1.

*2: MAP-1806S is only for the bottom edge (1st stage) of MSRS90..R-2... Use it only for the bottom edge (1st stage).

How to attach the cartridge: You need to tighten 2 clamp screws to fix the cartridge. Tighten the slant screw first and then tighten the other screw.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

Recommended cutting conditions

Workpiece material	fz (mm/t)		Vc (m/min)	
	Standard NB3+NB4	Low cutting force NB3P+NB4P	MEGACOAT NANO EX	
			PR1810	PR1835
Soft steel	0.1~**0.2**~0.25	0.1~**0.2**~0.25	-	★ 120~**150**~220
Carbon steel	0.1~**0.2**~0.25	0.1~**0.2**~0.25	-	★ 100~**150**~200
Alloy steel	0.1~**0.15**~0.2	0.1~**0.15**~0.2	-	★ 100~**150**~200
Mold steel	0.1~**0.15**~0.2	0.1~**0.12**~0.15	-	★ 100~**150**~180
Gray cast iron	0.1~**0.2**~0.3	0.1~**0.2**~0.25	★ 100~**180**~250	-
Nodular cast iron	0.1~**0.2**~0.25	0.1~**0.18**~0.2	★ 100~**180**~220	-
Stainless steel	Not recommended			
Aluminum/Copper	Not recommended			

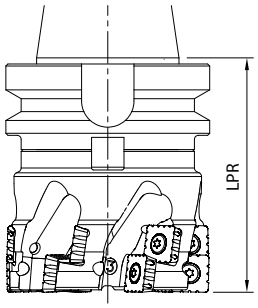
★: 1st Recommendation ☆: 2nd Recommendation

Cutting conditions (Shouldering)

In case of MSRS90100R-1-6T

Workpiece material	Overhang length LPR(mm)	Cutting conditions		(ap × ae)	Chip evacuation rate (cc/min)
		Cutting speed Vc (m/min)	Feed fz (mm/t)		
Cast iron	Less than 120mm	180	0.2	15 × 80	826
	120~200mm	180	0.2	15 × 40	413
	201mm and over	230	0.1	15 × 40	263
Carbon steel	Less than 120mm	150	0.2	15 × 80	689
	120~200mm	150	0.2	15 × 40	344
	201mm and over	200	0.1	15 × 40	229

Overhang length LPR(mm)



In case of MSRS90100R-2-6T

Workpiece material	Overhang length LPR(mm)	Cutting conditions		(ap × ae)	Chip evacuation rate (cc/min)
		Cutting speed Vc (m/min)	Feed fz (mm/t)		
Cast iron	Less than 120mm	180	0.2	30 × 50	1,032
	120~200mm	180	0.2	30 × 30	619
	201mm and over	230	0.1	30 × 25	329
Carbon steel	Less than 120mm	150	0.2	30 × 50	861
	120~200mm	150	0.2	30 × 30	517
	201mm and over	200	0.1	30 × 25	287

In case of MSRS90100R-4-6T

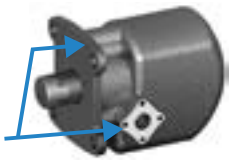
Workpiece material	Overhang length LPR(mm)	Cutting conditions		(ap × ae)	Chip evacuation rate (cc/min)
		Cutting speed Vc (m/min)	Feed fz (mm/t)		
Cast iron	Less than 140mm	180	0.2	60 × 20	826
	140~200mm	180	0.2	60 × 10	413
	201mm and over	230	0.1	60 × 10	263
Carbon steel	Less than 140mm	150	0.2	60 × 20	689
	140~200mm	150	0.2	60 × 10	344
	201mm and over	200	0.1	60 × 10	229

Case studies

Nodular Cast Iron

Industrial parts
- Vc=150m/min
- ap x ae=6 x 65mm
- fz=0.15mm/t
(Vf=430mm/min)

MSRS90100R-1-6T(ø100 -6 flutes)
SPMT180616EN-NB3/NB4
(PR1210)



MSRS90(PR1210)	Chip evacuation rate = 258cc/min
Competitor B	107cc/min

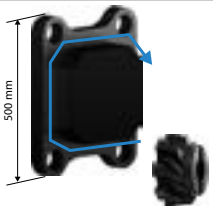
- MSRS90 more than doubled the machining efficiency compared with competitor B.
- Competitor B machined with 2 passes (ap x ae=3 x 65mm).
  MSRS90 machined with only 1 pass.
- Cutting time was reduced.

(User evaluation)

20CrM05

Construction machine part
- Vc=200m/min
- ap x ae=10 x 50mm
- fz=0.1mm/t
(Vf=400mm/min)

MSRS90125R-1-8T(ø125 -8 flutes)
SPMT180616EN-NB3/NB4
(PR1230)



MSRS90(PR1230)	Chip evacuation rate = 200cc/min
Competitor C	153cc/min

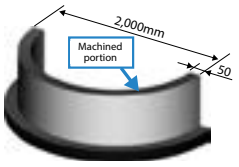
- MSRS90 improved the machining efficiency to 1.3 times that of competitor C.
- Competitor C machined with ap x ae=5 x 50mm
- Tool cost is reduced to 1/3 although competitor C is expensive using 2-corner insert.
  MSRS90 reduced machining cost as well as improved machining efficiency.

(User evaluation)

Mold steel

Shipbuilding parts
- Vc=150m/min
- ap x ae=10 x 10~50mm
- fz=0.1mm/t
(Vf=240mm/min)

MSRS90160R-1-8T(ø160 -8 flutes)
SPMT180616EN-NB3/NB4
(PR1230)



MSRS90(PR1230)	Chip evacuation rate = 120cc/min
Competitor D	60cc/min

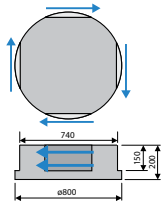
- MSRS90 more than doubled the machining efficiency compared with competitor D.
- Competitor D machined with ap x ae=5 x 10~50mm
  → Low cutting force of MSRS90 enabled twice as large ap as that of competitor.
- It can double the ap as well as increase the cutting speed (Vc=100 → 150).
  → Machining efficiency was improved by MSRS90 (by achieving reduction in cutting time).

(User evaluation)

Alloy steel

Power generation parts
- Vc=160m/min
- ap x ae=10 x 0~20mm
- fz=0.15mm/t
(Vf=500mm/min)

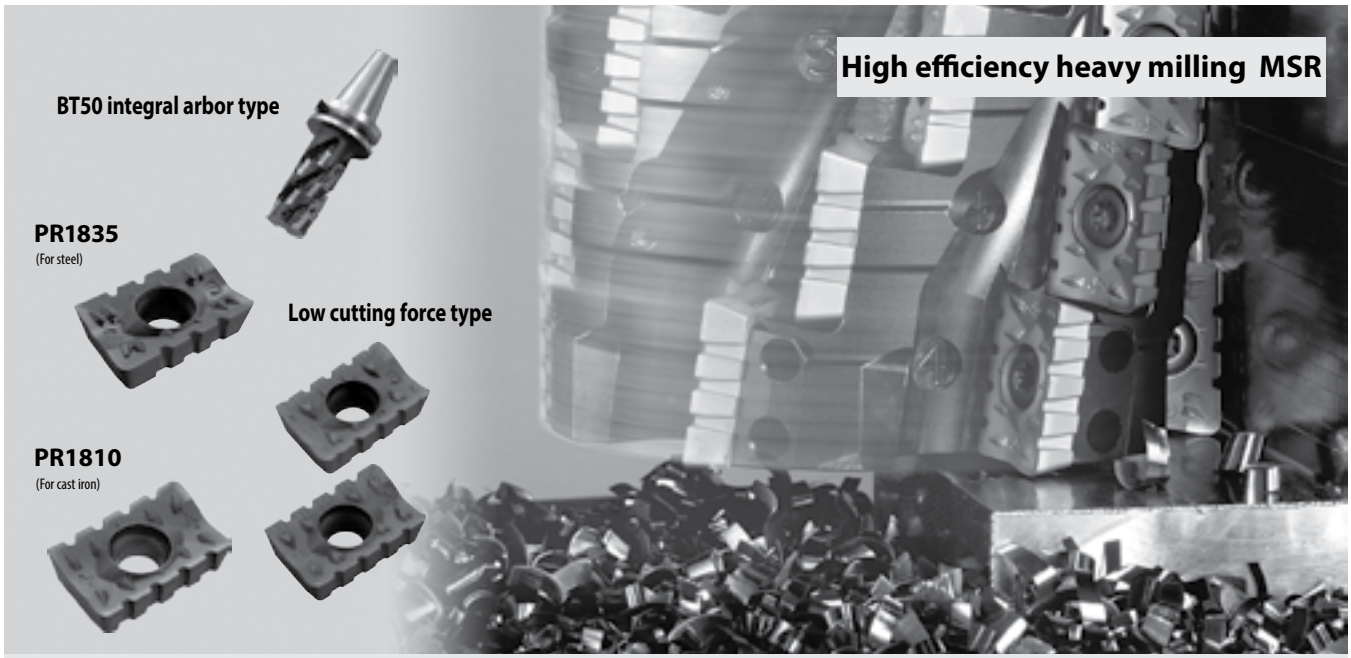
MSRS90125R-1-8T(ø125 -8 flutes)
SPMT180616EN-NB3/NB4
(PR1230)



MSRS90(PR1230)	12 surfaces/edge
Competitor E	8 surfaces/edge

- MSRS90 showed 1.5 times longer tool life than that of competitor E.
- Competitor E machined with 2 passes on a side (ap x ae=12 x 0 to 10mm).
- Competitor E was poor in feed rate (Vf=400mm/min).
  → Machining efficiency was improved by MSRS90 (by achieving reduction in cutting time).
- Although competitor E is load due to high cutting force. MSRS90 operates fairly quietly.

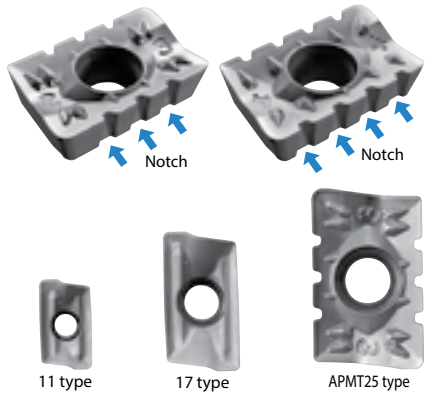
(User evaluation)



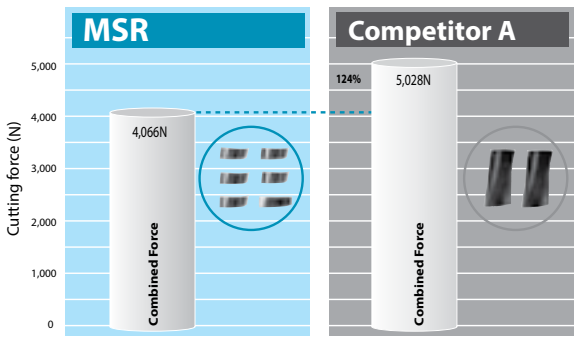
Notched insert reduces cutting force, and enables high feed rates by reducing chattering.
Improved chip evacuation and low cutting force with the special chipbreaker.
Enables heavy milling and deep cutting, and also drastically improves machining efficiency. (Reduction of cutting time)

Notched insert

Size comparison (full-scale)



Cutting force comparison



* The exclusive notched chipbreaker provides low cutting force and good chip evacuation. (Internal evaluation)

MSR



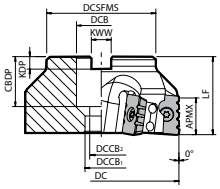


Fig. 1

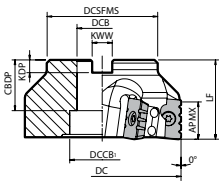


Fig. 2

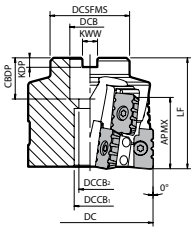


Fig. 3

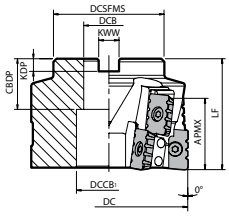


Fig. 4

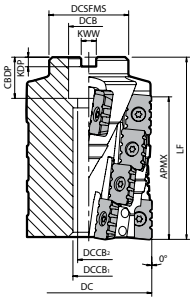


Fig. 5

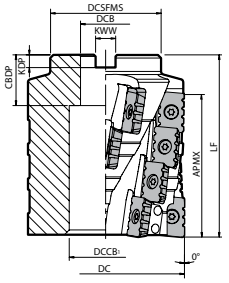


Fig. 6

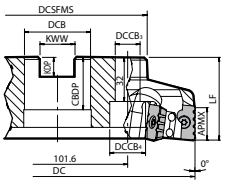


Fig. 7

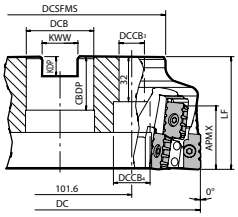


Fig. 8

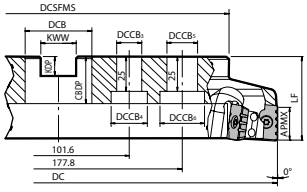


Fig. 9

Toolholder dimensions

	Description		Availability	Inserts	Flutes	Stages	Dimension (mm)														A.R. (°)	R.R. (°)	Coolant hole	Weight (kg)	Fig.	Applicable inserts ⇨ M167
			R				DC	DCSFMS	DCB	$DCCB_1$	$DCCB_2$	$DCCB_3$	$DCCB_4$	$DCCB_5$	$DCCB_6$	LF	CBDP	KDP	KWW	APMX						
Metric	MSR	063R-1M	●	4	4	1	63	50	27	20	14	-	-	-	-	65	22	7.2	12.4	23.5	+9	-8	No	0.7	1	APMT2506...
		063R-2M	●	8		2										85				45				0.9	3	
		080R-1M	●	4		1	80	55								50				23.5				1	1	
		080R-2M	●	8		2										70				45				1.5	3	
		080R-4M	●	16		4										115				90				2.5	5	
		100R-1M	●	6	6	1	100	70	32	42	-					50	28	8	14.4	23.5		-5		1.5	2	
		100R-2M	●	12		2										70				45				2	4	
		100R-4M	●	24		4										115				90				3.2	6	
		125R-1M	●	6		1	125	85	40	58				-	-	60	30	9	16.4	23.5				3.4	2	
		125R-2M	●	12		2										70				45				3.7	4	
		125R-4M	●	24		4										115				90				6	6	
		160R-1M	●	8	8	1	160	100		68						60		10		23.5				6.1	2	
		160R-2M	●	16		2										70				45				6.8	4	
		200R-1M	●	10	10	1	200	130	60	-		18	26			60	38	15	25.4	23.5				7	7	
		200R-2M	●	20		2										80				45				9.9	8	
		250R-1M	●	12	12	1	250									60				23.5				10.3	7	
		250R-2M	●	24		2										80				45				14.2	8	
		315R-1M	MTO	14	14	1	315	230				17	27	22	32	60	35			23.5				15.5	9	
Bore dia. inch spec	MSR	063R-1	□	4	4	1	63	50	25.4	20	14	-	-	-	-	65	26	6	9.5	23.5	+9	-8	No	0.8	1	APMT2506...
		063R-2	□	8		2										85				45				1	3	
		080R-1	□	4		1	80	55								50				23.5				1.1	1	
		080R-2	□	8		2										70				45				1.6	3	
		080R-2-31.75	□					70	31.75	27	18						32	8	12.7					1.7	3	
		080R-4	□	16		4		55	25.4	20	14					115	26	6	9.5	90				2.6	5	
		080R-4-31.75	□							27	18						32	8	12.7					2.7	5	
		100R-1	□	6	6	1	100	70	31.75	42						50				23.5		-5		1.6	2	
		100R-2	□	12		2										70				45				2.2	4	
		100R-4	□	24		4										115				90				3.6	6	
		125R-1	□	6		1	125	85	38.1	54				-	-	60	38	10	15.9	23.5				3.5	2	
		125R-2	□	12		2										70				45				3.8	4	
		125R-4	□	24		4										115				90				6.1	6	
		160R-1	□	8	8	1	160	100	50.8	68						60		11	19	23.5				5.8	2	
		160R-2	□	16		2										70				45				6.4	4	
		160R-4	□	32		4										115				90				10.7	6	
		200R-1	□	10	10	1	200	130	47.625	-		18	26			60		14	25.4	23.5				7.5	7	
		200R-2	□	20		2										80				45				10.4	8	
		250R-1	□	12	12	1	250									60				23.5				10.9	7	
		250R-2	□	24		2										80				45				14.7	8	
		315R-1	MTO	14	14	1	315	220				17	27	22	32	60	35			23.5				16	9	

Spare Parts (Bore Dia. : common to Metric type / Inch type)

Description	Spare Parts					
	Clamp Screw	Wrench	Shim	Clamp Screw	Wrench	Anti-seize Compound
MSR 063R-○□	SB-60120TR	TT-25L	-	-	-	P-37
MSR 080R-○□ ~ 315R-○□			MAP-2506	SB-40140TR	DT-15	
	for Insert Clamp		for Shim Clamp			

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

Shim is not available for MSR063R (DC=63).
Mounting bolt (HH12X35) is included for MSR063R / MSR080R (Metric).
Mounting bolt (HH12X40) is included for MSR063R / MSR080R (Bore dia. inch spec).
Mounting bolt (HH16X45) is included for MSR080R-○-31.75.
It is not recommended using only top edge part (under ap=30mm) for 4 stages type.
If ap is small, use 1 stage or 2 stages type.
Deep slotting is not recommended for this cutter.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

MSR



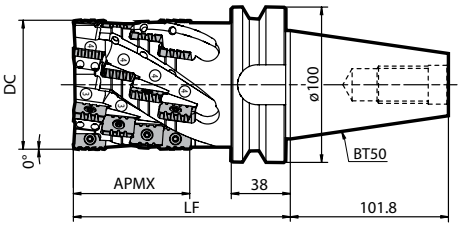


Fig. 1

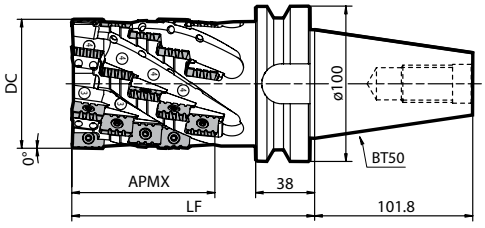
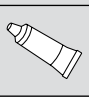
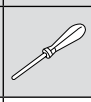


Fig. 2

Toolholder dimensions

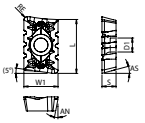
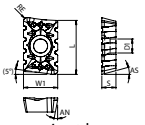
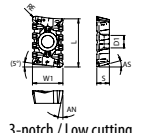
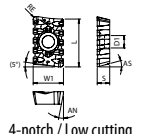
Description		Availability	Inserts	Flutes	Stages	Dimension (mm)			A.R. (°)	R.R. (°)	Coolant hole	Weight (kg)	Fig.	Spare parts						Applicable inserts M167
														Anti-seize compound	Cartridge	Screw	Wrench	Screw	Wrench	
		R				DC	LF	APMX												
MSR	063R-BT50-4	●	16	4	4	63	160	90	+9	-8	No	5.7	1	P-37	-	-	-	SB-60120TR	TT-25L	APMT2506...
	063R-BT50-5	●	20		5		180	111				6.2	2							
	080R-BT50-4	●	16		4	80	160	90				6.9	1		MAP-2506	SB-40140TR	DT-15	SB-60120TR		
	080R-BT50-5	●	20		5		180	111				7.4	2							
	100R-BT50-4	●	24	6	4	100	160	90		-5		9.6	1							
	100R-BT50-5	●	30		5		180	111				10.5	2							

Shim is not available for MSR063R (DC=63).
It is not recommended using only top edge part (under ap=30mm) for 4 stages / 5 stages type. If ap is small, use previous page's 1 stage type or 2 stages type.
Deep slotting is not recommended for this cutter.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

APMT

Classification of usage		
★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)	Carbon steel / Alloy steel	★ P
	Mold and die steel	★ P
	Austenitic stainless steel	M
	Martensitic stainless steel	M
	Precipitation hardening stainless steel	M
	Gray cast iron	★ K
	Nodular cast iron	★ K
	Non-ferrous metals	N
	Heat-resistant alloy	S
	Titanium alloy	S
	Hard materials	H

Insert		Description		No. of edges	Dimension (mm) S	D1	RE	L	W1	Angle (°) AN	AS	Carbide PVD PR1810	PR1835	Applicable toolholder ➡ M165 M166
	 3-notch	APMT	250608ER-NB3 250616ER-NB3 250640ER-NB3	2	6.35	6.5	0.8 1.6 4	25	15.875	11	15	● ●	● ● ●	MSR...
		APMT	250616EL-NB3	2	6.35	6.5	1.6	25	15.875	11	15		●	-
	 4-notch	APMT	250608ER-NB4 250616ER-NB4 250640ER-NB4	2	6.35	6.5	0.8 1.6 4	25	15.875	11	15	● ●	● ● ●	MSR...
		APMT	250616EL-NB4	2	6.35	6.5	1.6	25	15.875	11	15		●	-
	 3-notch / Low cutting force	APMT	250616ER-NB3P	2	6.35	6.5	1.6	25	15.875	11	15	●	●	MSR...
	 4-notch / Low cutting force	APMT	250616ER-NB4P	2	6.35	6.5	1.6	25	15.875	11	15	●	●	MSR...

Handed insert shows Right-hand

Recommended cutting conditions ➡ M168

Caution when installing notched insert (MSR)

It is important to install the appropriate notched insert into the correct position. If it is installed in incorrect position, the tool cannot cut the workpiece and it may damage the toolholder body. For MSR, notched insert location indicator is marked at insert installed area.

Please bear the following in mind when installing inserts to toolholders.

(Indication is marked near the insert pocket for MSR.)

1 . (3) is for APMT2506○○ER-NB3

2. (4) is for APMT2506○○ER-NB4

(No. of inserts – example)

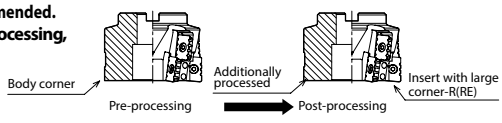
Description		No. of inserts	No. of flutes	No. of inserts Notched NB3	No. of inserts Notched NB4
MSR	100R-1	6	6	3	3
	100R-2	12		6	6
	100R-4	24		12	12

Caution when installing the insert with corner-R(RE) 4.0

When using inserts with corner-R(RE) 4.0mm, additional modifications of the cutter body will be necessary. Ref. to the table below for the recommended modifications.

Insert corner-R(RE) (mm)	Additional processing dimension to body corner (mm)
4.0	R2.0

*** Round- shaped additional processing is recommended. When applying chamfer shaped additional processing, do not cut away too much.**



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Recommended cutting conditions

Workpiece material	fz (mm/t)		Recommended insert grades (Cutting speed Vc: m/min)	
	Low cutting force	General purpose	MEGACOAT NANO EX	
	NB3P+NB4P	NB3+NB4	PR1810	PR1835
Carbon steel	0.15	0.2	-	★ 100~**150**~200
Cast iron	0.15	0.2	★ 100~**150**~200	-
Stainless steel	Not recommended			
Aluminum/Copper	Not recommended			

* For MSR, cutting speed should be carefully adjusted depending on the length of toolholder protruding from the end of machine spindle.
• When the overhang length of toolholder is small, → set the cutting speed to slightly higher than the recommended cutting conditions.
• When the overhang length of toolholder is long, → set the cutting speed to slightly lower than the recommended cutting conditions.

★: 1st Recommendation
☆: 2nd Recommendation

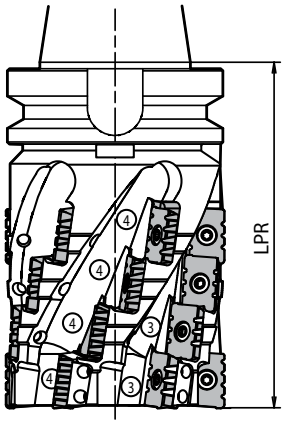
Cutting conditions

1. Shouldering

In case of MSR100R-1

Workpiece material	Overhang length LPR (mm)	Cutting conditions		ap x ae (mm)	Chip evacuation rate (cc/min)
		Cutting speed Vc (m/min)	Feed fz (mm/t)		
Carbon steel	Less than 100mm	150	0.2	20 x 80	920
	100~200mm	150	0.2	20 x 40	460
	201mm and over	100	0.2	20 x 30	228
Cast iron	Less than 100mm	180	0.2	20 x 80	1,100
	100~200mm	180	0.2	20 x 40	550
	201mm and over	120	0.2	20 x 30	276

Overhang length LPR (mm)



In case of MSR100R-2

Workpiece material	Overhang length LPR (mm)	Cutting conditions		ap x ae (mm)	Chip evacuation rate (cc/min)
		Cutting speed Vc (m/min)	Feed fz (mm/t)		
Carbon steel	Less than 130mm	150	0.2	40 x 40	920
	130~230mm	150	0.2	40 x 20	460
	231mm and over	100	0.2	40 x 20	304
Cast iron	Less than 130mm	180	0.2	40 x 40	1,100
	130~230mm	180	0.2	40 x 20	550
	231mm and over	120	0.2	40 x 20	368

In case of MSR100R-4

Workpiece material	Overhang length LPR (mm)	Cutting conditions		ap x ae (mm)	Chip evacuation rate (cc/min)
		Cutting speed Vc (m/min)	Feed fz (mm/t)		
Carbon steel	Less than 180mm	150	0.2	75 x 20	863
	180~280mm	150	0.2	75 x 10	431
	281mm and over	100	0.2	75 x 10	285
Cast iron	Less than 180mm	180	0.2	75 x 20	1,035
	180~280mm	180	0.2	75 x 10	518
	281mm and over	120	0.2	75 x 10	345

2. Slotting

In case of MSR100R-1

Workpiece material	Overhang length LPR (mm)	Cutting conditions		ap x ae (mm)	Chip evacuation rate (cc/min)
		Cutting speed Vc (m/min)	Feed fz (mm/t)		
Carbon steel	Less than 100mm	150	0.2	7 x 100	403
	100~200mm	120	0.2	4 x 100	184
	201mm and over	100	0.2	3 x 100	114
Cast iron	Less than 100mm	180	0.2	14 x 100	966
	100~200mm	150	0.2	7 x 100	403
	201mm and over	120	0.2	4 x 100	184

In case of MSR100R-2

Workpiece material	Overhang length LPR (mm)	Cutting conditions		ap x ae (mm)	Chip evacuation rate (cc/min)
		Cutting speed Vc (m/min)	Feed fz (mm/t)		
Carbon steel	Less than 130mm	150	0.2	7 x 100	403
	130~230mm	120	0.2	4 x 100	184
	231mm and over	100	0.2	3 x 100	114
Cast iron	Less than 130mm	180	0.2	14 x 100	966
	130~230mm	150	0.2	7 x 100	403
	231mm and over	120	0.2	4 x 100	184

In case of MSR160R-1

Workpiece material	Overhang length LPR (mm)	Cutting conditions		ap x ae (mm)	Chip evacuation rate (cc/min)
		Cutting speed Vc (m/min)	Feed fz (mm/t)		
Carbon steel	Less than 100mm	150	0.2	5 x 160	384
	100~200mm	120	0.2	3 x 160	182
	201mm and over	100	0.2	2 x 160	102
Cast iron	Less than 100mm	180	0.2	10 x 160	928
	100~200mm	150	0.2	5 x 160	384
	201mm and over	120	0.2	4 x 160	243

In case of MSR160R-2

Workpiece material	Overhang length LPR (mm)	Cutting conditions		ap x ae (mm)	Chip evacuation rate (cc/min)
		Cutting speed Vc (m/min)	Feed fz (mm/t)		
Carbon steel	Less than 130mm	150	0.2	5 x 160	384
	130~230mm	120	0.2	3 x 160	182
	231mm and over	100	0.2	2 x 160	102
Cast iron	Less than 130mm	180	0.2	10 x 160	928
	130~230mm	150	0.2	5 x 160	384
	231mm and over	120	0.2	4 x 160	243

Notes: MSR...-4 (No. of stage)
Slotting is not recommended.

DMC-SX



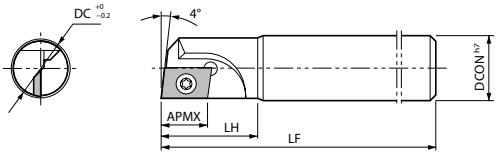


Fig. 1

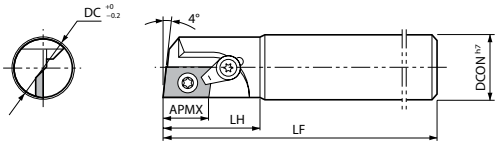


Fig. 2

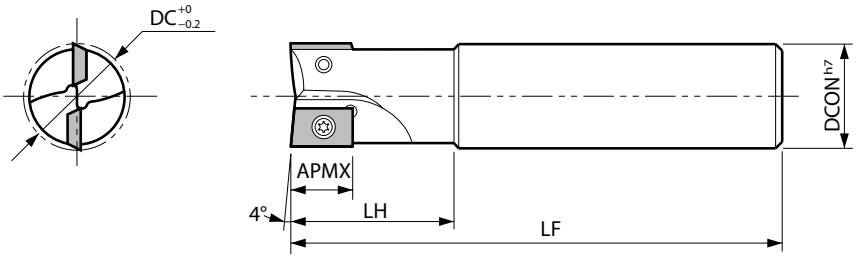
Toolholder dimensions

Description		Availability	Inserts	Dimension (mm)					A.R. (°)	R.R. (°)	Coolant hole	Fig.	Spare parts			Applicable inserts ➡ M172
				DC	DCON	LF	LH	APMX					Clamp set	Screw	Wrench	
DMC	316SXT	●	1	16	16	90	30	14	+3	-3	No	1	-	SB-4060TR	FT-15	NDCT1503... NDCW1503...
	320SX	●		20	20	110						2	CPS-2TR	SB-4065TR		
	325SX	●	2	25	25	120	40			-2		2				
	332SX	●		32	32	130				0		2				
	340SX	●		40		150						2				
DMC	320SX-200	●	1	20	20	200	50	14	+3	-3	No	1	-	SB-4065TR	FT-15	NDCT1503... NDCW1503...
	325SX-220	●	2	25	25	220	60			-2		1				
	332SX-250	●		32	32	250	80			0		1				

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DMC-H





Toolholder dimensions

Description		Availability	Inserts	Dimension (mm) DC	DCON	LF	LH	APMX	A.R. (°)	R.R. (°)	Coolant hole	Spare parts Screw	Wrench	Applicable inserts M172
DMC	316H	●	1	16	16	90	30	14	+5	-3.5	No	SB-4060TR	FT-15	NDCT1503...X NDCW1503...X...
	320H	●		20	20	110			+6	-2				
	325H	●	2	25	25	120	40		+8	0		SB-4065TR		
	332H	●		32	32	130								
	340H	●		40		150								

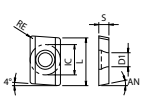
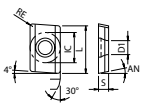
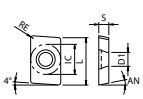
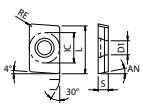
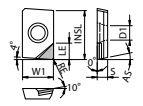
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

NDCT/NDCW

Classification of usage

★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice
(In case hardness is 45HRC or under)

Carbon steel / Alloy steel		■		P
Mold and die steel		■		
Austenitic stainless steel				M
Martensitic stainless steel				
Precipitation hardening stainless steel				
Gray cast iron	☆			K
Nodular cast iron				
Non-ferrous metals	★		□	N
Heat-resistant alloy				S
Titanium alloy	☆		□	
Hard materials				H

Insert		Description		No. of edges	Dimension (mm) IC	S	D1	RE	L	INSL	LE	W1	Angle (°) AN	AS	Carbide - KW10	Cermet - TN100M	PCD - KPD001	PCD - KPD010	Applicable toolholder M170 M171
		NDCT	150308FR	2	9.525	3.18	4.5	0.8	15	-	-	-	15	-	●				DMC...SX(...)
		NDCT	150308TR	2	9.525	3.18	4.5	0.8	15	-	-	-	15	-		●			
		NDCT	150308TRX	2	9.525	3.18	4.4	0.8	15	-	-	-	15	-		●			DMC...SX(...) DMC...H
		NDCW	150302TR 150304TR 150308TR 150320TR 150330TR 150340TR	2	9.525	3.18	4.5	0.2 0.4 0.8 2 3 4	15	-	-	-	15	-		● ● ● ● ● ●			DMC...SX(...)
		NDCW	150308TRX	2	9.525	3.18	4.4	0.8	15	-	-	-	15	-		●			DMC...SX(...) DMC...H
		NDCW	150308FRX	2	9.525	3.18	4.4	0.8	15	-	-	-	15	-	●				
		NDCW	150302FRX 150302FRX-NE	1	-	3.18	4.4	0.2	-	15	5.7 5.1	9.525	-	15			●	● ●	DMC...SX(...) DMC...H

Handed insert shows Right-hand

Recommended cutting conditions M173

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

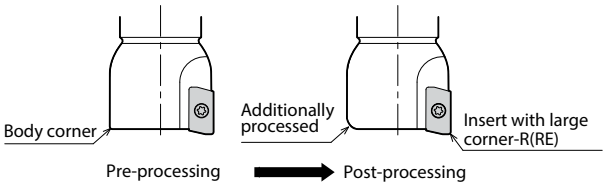
CBN & PCD Inserts are sold in 1 piece boxes

Recommended cutting conditions (DMC-SX)

Workpiece material	fz (mm/t)	Recommended insert grades (Vc: m/min)		Max. ap (mm)		
		Cermet	Carbide			
		TN100M	KW10	Cutting dia. (DC)	Slotting (ap)	Shouldering (apxae)
Carbon steel	~0.2	★ 120~200		ø16~	3	9x3
Alloy steel	~0.2	★ 100~180		ø16~	3	9x3
Mold steel	~0.15	★ 100~180		ø16~	3	9x3
Stainless steel	~0.15	☆ 120~200		ø16~	2	6x2
Cast iron	~0.2		★ 80~150	ø16~	3	9x3
Non-ferrous metals	~0.2		★ 100~300	ø16~	3	9x3

When using inserts with corner-R(RE) 2.0 or larger, additional modifications of the cutter body will be necessary.
Additional modifications for the body will be necessary. Ref. to the chart below for the recommended modifications.
(Additional grind off is not necessary when corner-R(RE) is 0.8 mm or less.)

Insert corner-R(RE) (mm)	Additional processing dimension to body corner (mm)
2.0	R1.0
3.0	R1.6
4.0	R2.0



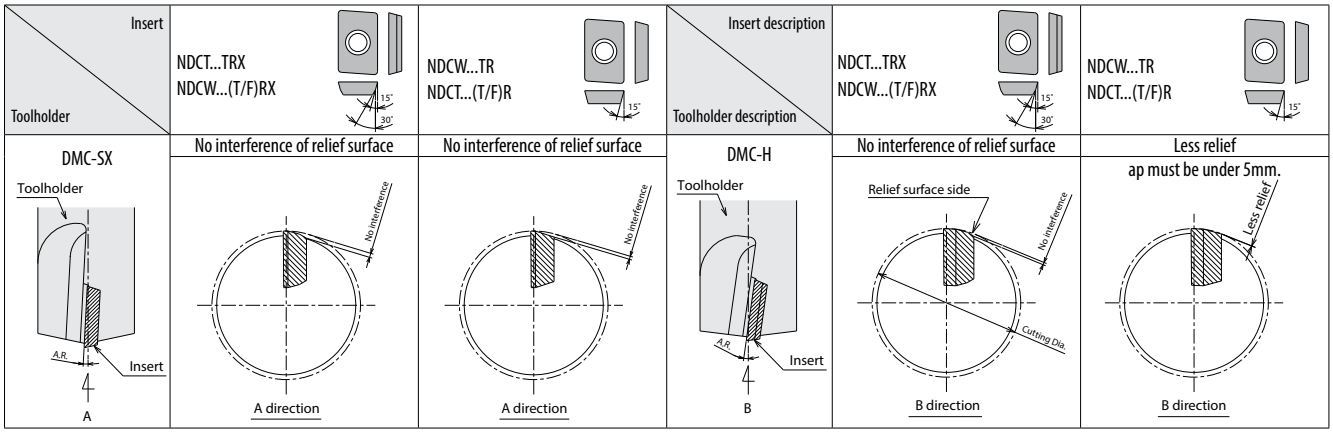
* Round- shaped additional processing is recommended.
When applying chamfer shaped additional processing, do not cut away too much.

Recommended cutting conditions (DMC-H)

Workpiece material	fz (mm/t)	Recommended insert grades (Vc: m/min)				Max. ap (mm)		
		Cermet	Carbide	PCD				
		TN100M	KW10	KPD230 (KPD001)	KPD010	Cutting Dia. (DC)	Slotting (ap)	Shouldering (apxae)
Carbon steel	~0.2	★ 120~200				~ø20	4	8x4
						ø25~	8	14x6
Alloy steel	~0.2	★ 100~180				~ø20	4	8x4
						ø25~	8	13x6
Mold steel	~0.15	★ 100~180				~ø20	3	5x2
						ø25~	6	10x3
Stainless steel	~0.15	☆ 120~200				~ø20	3	6x2
						ø25~	6	13x3
Cast iron	~0.2		★ 80~150			~ø20	4	8x4
						ø25~	6	14x6
Non-ferrous metals	~0.2		★ 100~300	★ 300~500	☆ 300~500	~ø20	4	8x4
						ø25~	6	14x6

★: 1st Recommendation ☆: 2nd Recommendation

NDCW1503○○TR and NDCT1503○○(T/F)R inserts are not applicable for DMC-H end mill.



High efficiency milling cutter for finishing aluminum alloys

MFAH

Low cutting force minimizes burrs and chipping for high quality machining

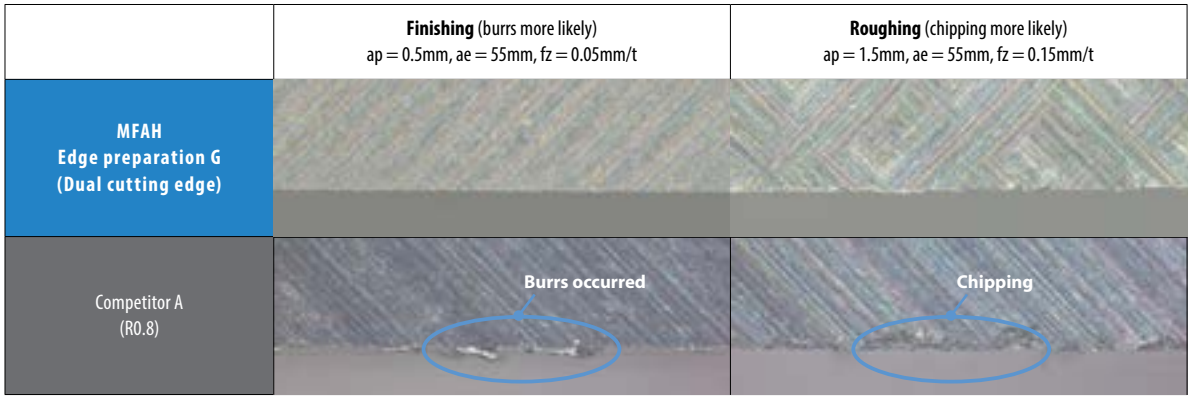
Easily adjust blade runout

2 body types and 3 inserts for a variety of milling applications

1 Low cutting force minimizes burrs for high quality machining

Large true rake angle and dual cutting edge insert designs

Burr and chipping comparison (Internal evaluation)

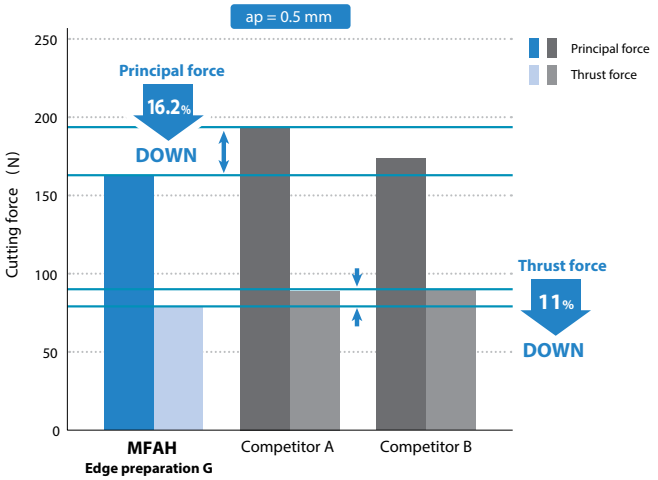


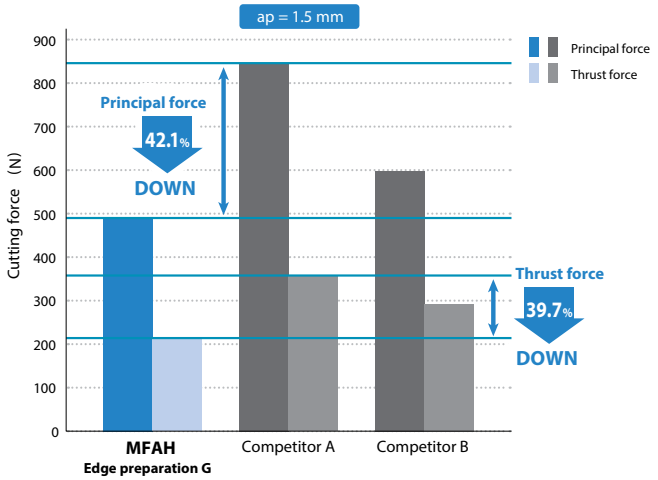
Cutting conditions: Vc = 2,500 m/min, Wet, Cutter dia. ø80
MFAH080RS-10T-SF, ENET0905PAER-G KPD001
Workpiece material: ADC12

2 Low cutting force design

Low cutting force, reduced chattering and high efficiency machining

Cutting force comparison (Internal evaluation)





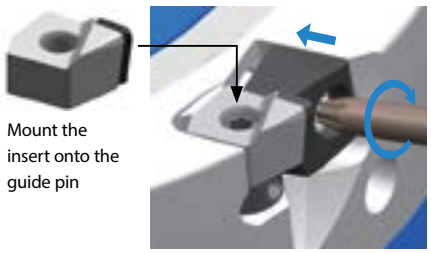
Cutting conditions: Vc = 2,500 m/min, ae = 55 mm, fz = 0.1 mm/t, Wet, Cutter dia. ø80
MFAH080RS-10T-SF, ENET0905PAER-G KPD001
Workpiece material: ADC12

3 Adjustable blade runout

Easily install inserts and adjust blade runout

Easy insert installment

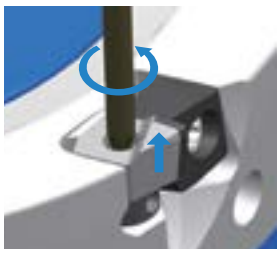
Guide pin allows for easier positioning



Mount the insert onto the guide pin

Easily adjust blade runout

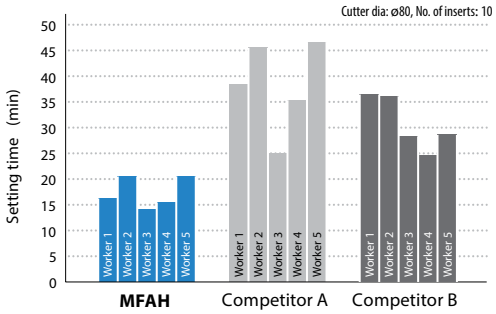
Adjustable froma both the front and outer periphery



Unique design for easily adjusting from the front

Blade runout setting time comparison (Internal evaluation)

* Operation Time of 5 Workers Comparison



The MFAH can drastically shorten the setting time

4 Large tooling lineup

Steel body and light-weight hybrid body with internal coolant available

3 different edge designs offer a variety of machining applications

Cutter body



Steel body

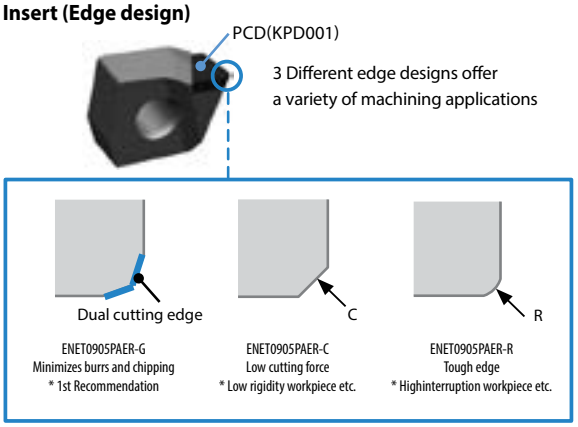
ø50~ø125



Light-weight hybrid body

ø80~ø315

Insert (Edge design)

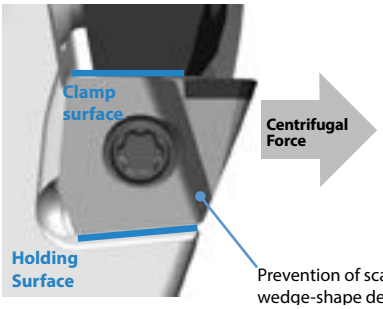


5 Safety enhancements during high-speed revolution

Scattering prevention mechanism

1 Prevention of scattering by wedge-shape design

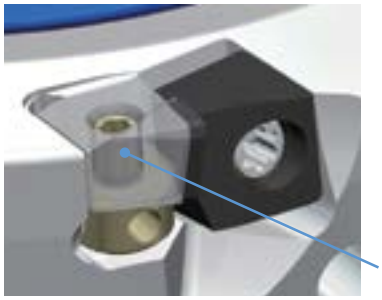
New wedge-shape feature holds insert
Firmly in place and reduces chattering



Prevention of scattering by wedge-shape design

2 Prevention of scattering with guide pin

Guide pins improve safety
During high-speed rotation



Prevention of scattering with guide pin

MFAH (Light-weight Hybrid body)



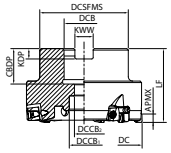


Fig. 1

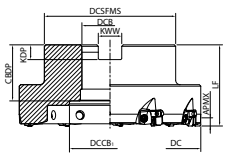


Fig. 2

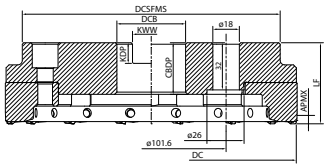


Fig. 3

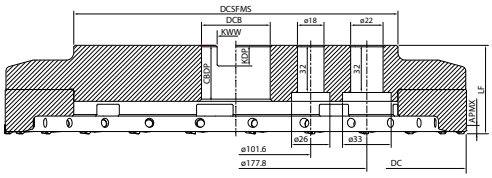


Fig. 4

Toolholder dimensions

Description			Availability	Inserts	Dimension (mm)										Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Fig.	Spare parts			Applicable inserts ➡ M179
			R		DC	DCSFMS	DCB	$DCCB_1$	$DCCB_2$	LF	CBDP	KDP	KWW	APMX					Mounting bolt (Attachment)	Coolant cover (Attachment)	Coolant cover (sold separately)	
Metric	MFAH	080RA-6T-M-SF	●	6	80	62	27	20	13	50	27	7	12.4	4.6	Yes	14600	0.82	1	HH12X35HC	-	-	ENET0905PAER-G ENET0905PAER-C ENET0905PAER-R
		080RA-10T-M-SF	●	10													0.78	1				
		100RA-8T-M27-SF	●	8	100	62	27	20	13		24	7	12.4			13000	1.2	1	HH12X35HC			
		100RA-8T-M-SF	●	8		85	32	42	-		30	8	14.4				1.32	2	HF16X48HC			
		100RA-12T-M27-SF	●	12		62	27	20	13		24	7	12.4				1.15	1	HH12X35HC			
		100RA-12T-M-SF	●	12		85	32	42	-		30	8	14.4				1.27	2	HF16X48HC			
		125RA-10T-M27-SF	●	10	125	60	27	20	13		24	7	12.4			11400	1.8	1	HH12X35H	CC-125-MFAH		
		125RA-10T-M-SF	●	10		94	40	55	-	55	33	9	16.4				2.1	2	HF20X53HA			
		125RA-16T-M27-SF	●	16		60	27	20	13	50	24	7	12.4				1.73	1	HH12X35H			
		125RA-16T-M-SF	●	16		94	40	55	-	55	33	9	16.4				2.1	2	HF20X53HA			
		160RA-12T-M-SF	●	12	160	125	40	57	-		33	9	16.4			8000	3.5	2	HF20X53HA	CC-160-MFAH		
		160RA-20T-M-SF	●	20													3.4	2				

Confirm the total weight of the cutter and the arbor is within the machine's acceptable range.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

Toolholder dimensions

Description			Availability	Inserts	Dimension (mm)										Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Fig.	Spare parts			Applicable inserts ➡ M179
			R		DC	DCSFMS	DCB	$DCCB_1$	$DCCB_2$	LF	CBDP	KDP	KWW	APMX					Mounting bolt (Attachment)	Coolant cover (Attachment)	Coolant cover (sold separately)	
Bore dia. inch spec	MFAH	080RA-6T-SF	□	6	80	62	25.4	20	13		27	6	9.5			14600	0.83	1	HH12X35HC			ENET0905PAER-G ENET0905PAER-C ENET0905PAER-R
		080RA-10T-SF	□	10													0.78	1				
		100RA-8T-254-SF	□	8	100	62	25.4	20	13	50	24	6	9.5	4.6	Yes	13000	1.21	1	HH12X35HC	-	-	
		100RA-8T-SF	□	8		85	31.75	42	-		34	8	12.7				1.33	2	HF16X44HC			
		100RA-12T-254-SF	□	12		62	25.4	20	13		24	6	9.5				1.16	1	HH12X35HC			
		100RA-12T-SF	□	12		85	31.75	42	-		34	8	12.7				1.29	2	HF16X44HC			
		125RA-10T-254-SF	□	10	125	60	25.4	20	13		24	6	9.5			11400	1.8	1	HH12X35H	CC-125-MFAH		
		125RA-10T-SF	□			89	38.1	55	-	55	38	10	15.9				2	2	HF20X53HA			
		125RA-16T-254-SF	□	16		60	25.4	20	13	50	24	6	9.5				1.74	1	HH12X35H			
		125RA-16T-SF	□			89	38.1	55				10	15.9				1.95	2	HF20X53HA			
		160RA-12T-SF	□	12	160	130	50.8	70			38	11	19.1			8000	3.4	2	HF24X60HA	CC-160-MFAH		
		160RA-20T-SF	□	20													3.3	2				
		200RA-16T-SF	MTO	16	200	175	47.625	126	-	55	35	14	25.4			5600	4.9	3	-	-	CC-200-MFAH	
		200RA-24T-SF	MTO	24													4.8	3				
		250RA-20T-SF	MTO	20	250	140		165								4500	7	3			CC-250-MFAH	
		250RA-32T-SF	MTO	32													6.9	3				
		315RA-24T-SF	MTO	24	315	220		220		60	38					3500	11.7	4			CC-315-MFAH	
		315RA-40T-SF	MTO	40													11.5	4				

Confirm the total weight of the cutter and the arbor is within the machine's acceptable range.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

MFAH (Steel body)



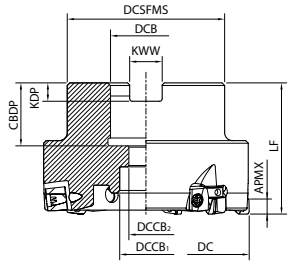


Fig. 1

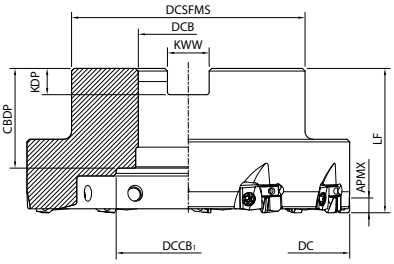
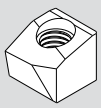
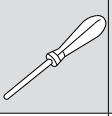
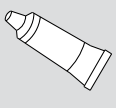


Fig. 2

Toolholder dimensions

Description			Availability	Inserts	Dimension (mm)										Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Fig.	Applicable inserts ➡ M179
			R		DC	DCSFMS	DCB	DCCB1	DCCB2	LF	CBDP	KDP	KWW	APMX					
Metric	MFAH	050RS-4T-M-SF	●	4	50	48	16	13.6	9	40	19	5.6	8.4	4.6	No	19200	0.44	1	ENET0905PAER-G ENET0905PAER-C ENET0905PAER-R
		050RS-5T-M-SF	●	5													0.43	1	
		063RS-5T-M-SF	●	5	63	61	22	23	11		21	6.3	10.4			16800	0.69	1	
		063RS-6T-M-SF	●	6													0.68	1	
		080RS-6T-M-SF	●	6	80	60	27	20	13	50	24	7	12.4			14600	1.16	1	
		080RS-10T-M-SF	●	10													1.11	1	
		100RS-8T-M-SF	●	8	100	70	32	45	-		30	8	14.4			13000	1.56	2	
		100RS-12T-M-SF	●	12													1.51	2	
		125RS-10T-M-SF	●	10	125	89	40	55		55	33	9	16.4			11400	2.6	2	
		125RS-16T-M-SF	●	16													2.5	2	
Bore dia. inch spec	MFAH	080RS-6T-SF	□	6	80	50	25.4	20	13	50	27	6	9.5	4.6	No	14600	1.02	1	
		080RS-10T-SF	□	10													0.98	1	
		100RS-8T-SF	□	8	100	70	31.75	45	-		34	8	12.7			13000	1.59	2	
		100RS-12T-SF	□	12													1.55	2	
		125RS-10T-SF	□	10	125	89	38.1	55		55	38	10	15.9			11400	2.63	2	
		125RS-16T-SF	□	16													2.56	2	

Spare parts

Description		Wedge	Wedge screw	Wrench	Adjust screw	Wrench	Anti-seize compound	Applicable inserts
								
Light-weight hybrid body	MFAH080RA- … ~ MFAH315RA- …	C08R	W5X13L	TTW-15	AJ-4170	DTPM-8	P-37	ENET0905…
Steel body	MFAH050RS- … ~ MFAH125RS- …							

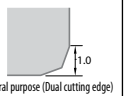
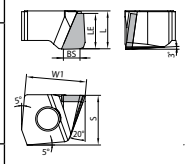
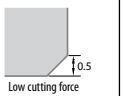
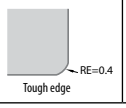
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

ENET

Classification of usage

★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice
(In case hardness is 45HRC or under)

Carbon steel / Alloy steel		P
Mold and die steel		
Austenitic stainless steel		M
Martensitic stainless steel		
Precipitation hardening stainless steel		
Gray cast iron		K
Nodular cast iron		
Non-ferrous metals	■	N
Heat-resistant alloy		S
Titanium alloy		
Hard materials		H

Insert			Description	Dimension (mm) S	L	LE	W1	BS	PCD -	PCD KPD001	Applicable toolholder ➡ M176~M178
	 1.0 General purpose (Dual cutting edge)		ENET 0905PAER-G	7.9	6.02	5.6	9.61	2.6	●		MFAH...RA...-SF MFAH...RS...-SF
	 0.5 Low cutting force		ENET 0905PAER-C	7.9	6.02	5.6	9.61	3	●		MFAH...RA...-SF MFAH...RS...-SF
	 RE=0.4 Tough edge		ENET 0905PAER-R	7.9	6.02	5.6	9.61	3.1	●		MFAH...RA...-SF MFAH...RS...-SF

Recommended cutting conditions ➡ M180

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

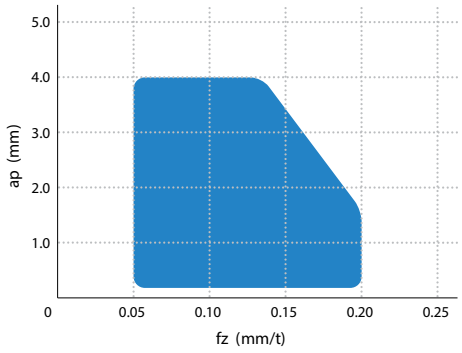
Recommended cutting conditions

Workpiece material	Property	Vc (m/min)	fz (mm/t)	Recommended insert grades
Aluminum alloys	Si Ratio 12.5% or less	1,000 - 2,500 - 3,000	0.05 - 0.10 - 0.20	KPD001
	Si Ratio 12.5% and over	400 - 600 - 800	0.05 - 0.10 - 0.20	

Recommended cutting conditions are reference values.
Please adjust cutting speed and feed rate according to actual machining conditions taking into account machine and workpiece rigidity.
Do not use the cutter at speeds exceeding the maximum cutting speed limit.

Cutting performance

BT50 M/C (Machine power 30kw)



Cutting conditions: Vc = 2,500 m/min, ae = 55mm, Wet, Cutter dia. ø80
MFAH080RS-10T-SF ENET0905PAER-G KPD001 Workpiece material: ADC12

Cautions

While in use

⚠ Caution

Please use within recommended cutting conditions

Do not run the cutter at revolutions exceeding the printed maximum revolution limit of the cutter body
Inserts or cutter body may be damaged due to the centrifugal force and cutting load

Please do not use under the following conditions:
When cutter is not fully loaded with inserts
If the body and/or clamp is damaged
If a clamp or clamp screw is removed
If inserts that have different regrind amounts are mounted

Please wear protective equipment such as protective glove when changing inserts or adjusting edge fluctuation
Injury can occur when touching the cutting edge

Dynamic balance

Balance adjustment on the cutter is completed before shipping
Balance adjustment has been made with special high precision inserts to be ISO balance quality grade (ISO 1940-1) G2.5

Do not operate the balance adjustment screw at the outer periphery of cutter
→ This could lead to improper dynamic balance
Do not completely remove clamp and clamp screw from cutter
→ This requires additional balance adjustment



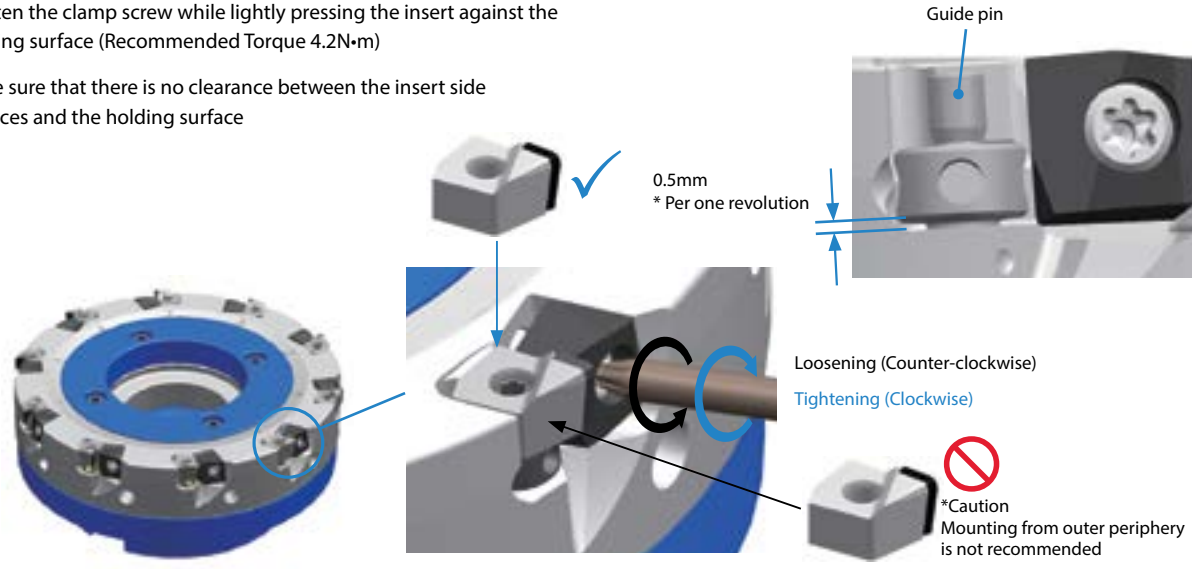


Balance adjustment screw is mounted at the necessary point

* Do not operate

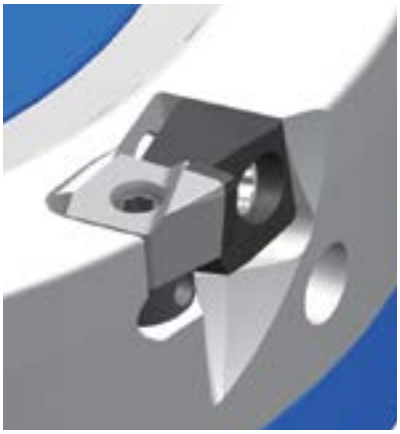
How to mount insert

1. Adjust the clearance between adjustment screw for cutting edge and the surface of insert to be 0.5mm
2. Mount insert on guide pin
(Be sure to install from the head. Mounting from outer periphery is not recommended)
3. Tighten the clamp screw while lightly pressing the insert against the holding surface (Recommended Torque 4.2N•m)
4. Make sure that there is no clearance between the insert side surfaces and the holding surface



How to adjust blade runout

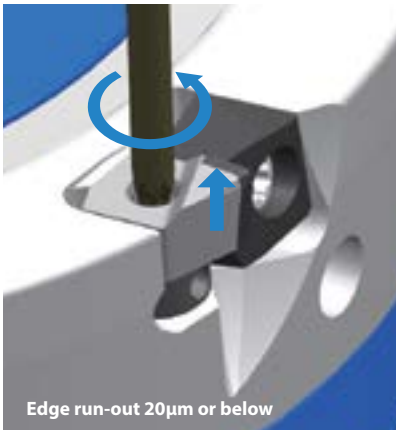
1 Install an insert



2 Partially tighten



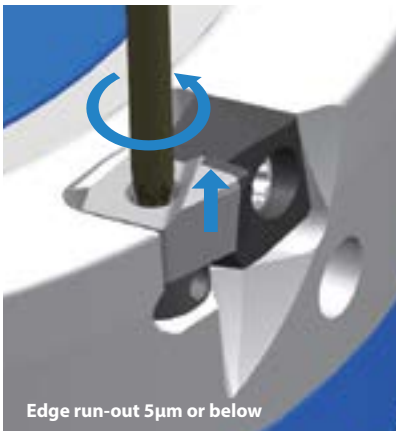
3 Adjustable blade runout

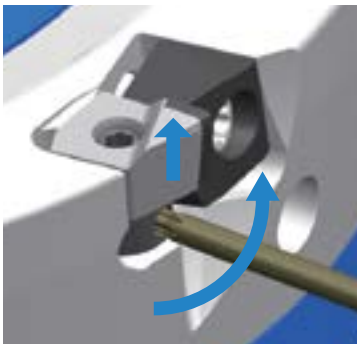


4 Fully tighten



5 Adjustable blade runout





Adjustment edge run-out from outer periphery is workable

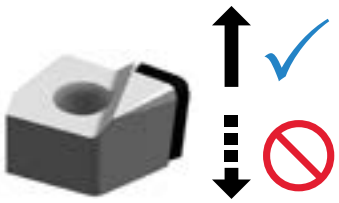
1 Install inserts into all pockets

2 Partially tighten the clamp screw (Recommended Torque 2.0N•m)

3 Turn the screw with the wrench to adjust and make sure that all screw heights are within 20μm of each other (Recommended)

4 Fully tighten the clamp screw with tightening torque 4.2 N•m

5 Slightly adjust position of cutting edge (Recommended position difference: 5μm or below)
* All inserts should be fine-tuned



* Caution
Do not adjust cutting edge to lower position

Precaution for changing clamp

How to mount a clamp on a holder

1 Attach clamp screw into clamp first



Attaching clamp screw into clamp
(about 1 revolution)

2 Mounting



Mount it to the holder

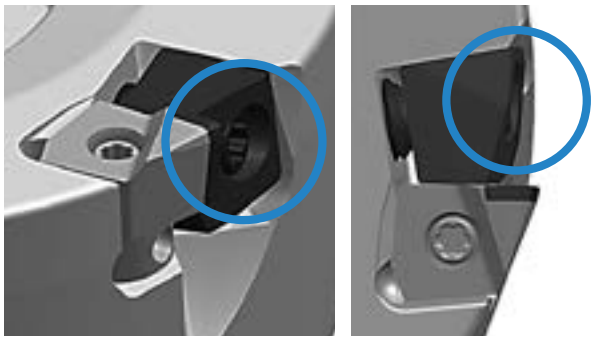
3 Fastening



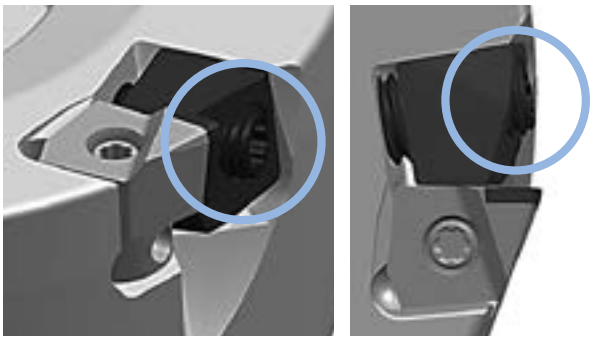
Fasten with recommended torque
(Completed)

Mount position of clamp screw

Right position
(Screw head does not come out)



Wrong position
(Screw head comes out)



Confirm if clamp screw is not coming out after fastening clamp screw with recommended torque
Re-mount if the clamp screw is coming out
Adjust the balance is needed after mounting in case removing a clamp screw completely such as clamp change

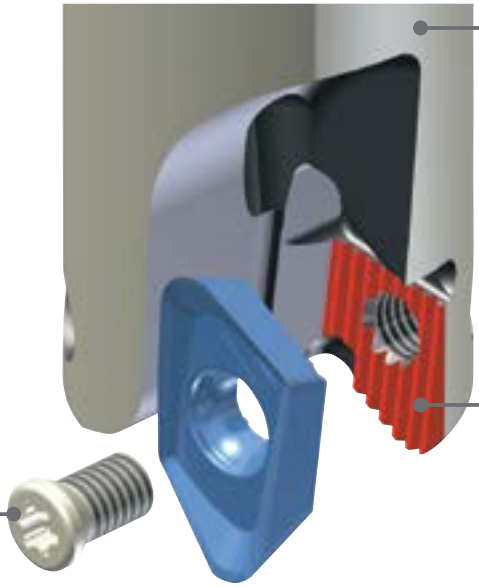
For aluminum alloys high efficiency end mill

MEAS

Excellent scatter prevention to ensure stable, high speed aluminum machining
Large ramping angle delivers a wide range of machining applications

1 High reliability and high efficiency machining

Grooved connection between the insert and holder
Provides high speed aluminum machining (ø32: Recommended max. cutting speed Vc = 3,000m/min)



ISO balance quality grade G6.3

Prevents vibration during high speed machining (ISO1940/1)

M4 Clamp screw

Unique grooved contact surface

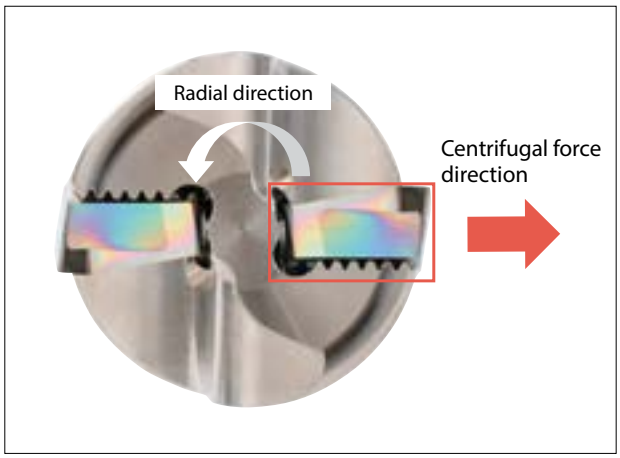
Prevents insert screw Breakage and ensures Greater safety

Back of the insert

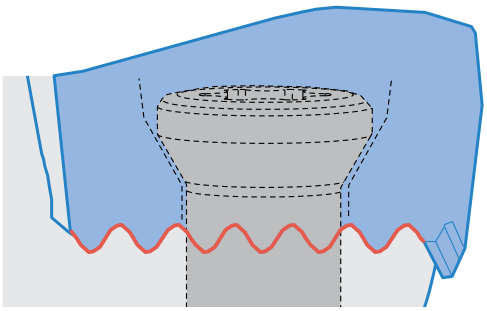


Grooved insert pocket

Centrifugal force is applied across the grooved surface to reduce pressure on the insert screw
Prevents insert screw breakage and safely secures the insert during high-speed revolutions

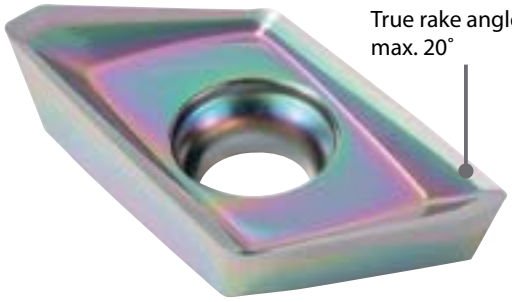


Grooved contact surface

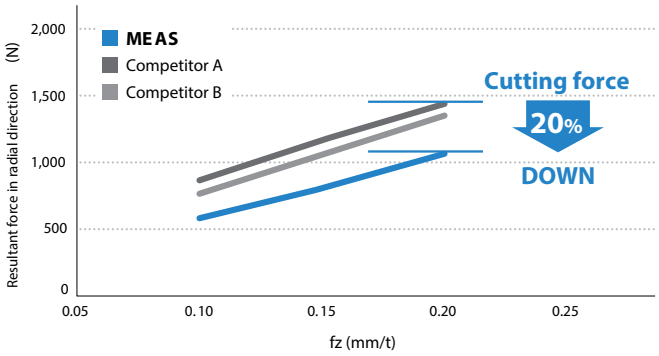


2 Low cutting force with sharp cutting edge

True rake angle max. 20°
Low cutting force and excellent chattering resistance



Cutting force comparison (Internal evaluation)

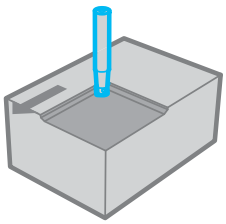


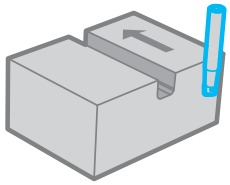
Cutting conditions: Vc = 390 m/min, ap × ae = 8 × 5mm, Dry
Cutter dia. ø25mm (2 Flutes) Workpiece material: AlZnMgCu1.5

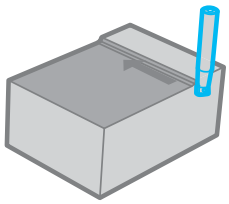
3 Applicable to a wide range of application

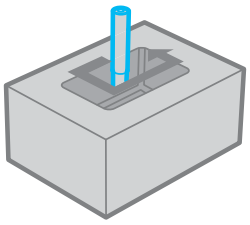
Max. ramping angle 20° (ø25)
The MEAS can be used for shouldering, slotting, ramping, and helical milling applications

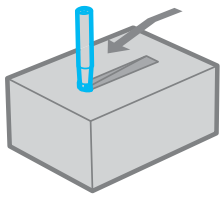


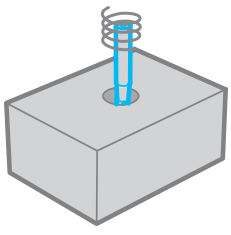

Facing, Shouldering

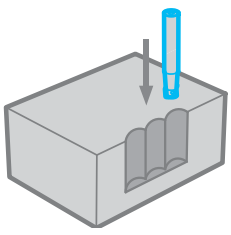

Slotting


Contouring


Pocketing


Ramping


Helical milling


Vertical milling (Plunging)

MEAS



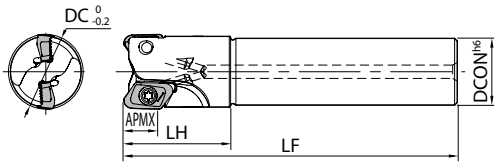


Fig. 1

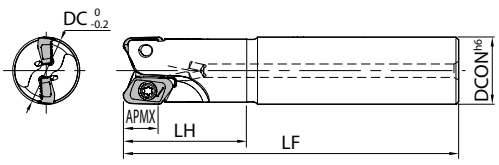


Fig. 2

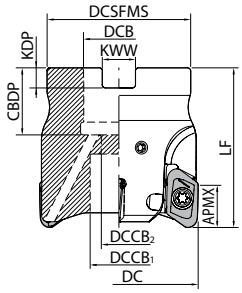
Toolholder dimensions

Description				Availability	Inserts	Dimension (mm)					A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Fig.	Spare parts			Applicable inserts M187
						DC	DCON	LF	LH	APMX							Anti-seize compound	Screw	Wrench	
Cylindrical	Standard shank	MEAS	28-S25-13-2T	●	2	28	25	125	40	12	+10	-13	Yes	54000	0.4	1	P-37	SB-4090TRP	DTPM-15	KCGT1305...
			35-S32-13-2T	●		35	32	150	50					46000	0.9	1				
			40-S32-13-3T	●	3	40						-12		42000		1				
	Same shank	MEAS	25-S25-13-2T	●	2	25	25	125	49	12	+10	-14	Yes	59000	0.4	2	P-37	SB-4075TRP	DTPM-15	KCGT1305...
			32-S32-13-2T	●		32	32	150	69			-13		49000	0.8	2		SB-4090TRP		
	Long shank	MEAS	25-S25-13-2T-170	●	2	25	25	170	89	12	+10	-14	Yes	49000	0.5	2	P-37	SB-4075TRP	DTPM-15	KCGT1305...
			32-S32-13-2T-200	●		32	32	200	119			-13		39000	1.1	2		SB-4090TRP		

When using inserts with a corner-R(RE) of 3.2 or larger, additional modifications (R3.5 mm or larger) on the corner of cutter body is necessary.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.
Recommended tightening torque for insert clamp : 3.5N·m

MEAS





Toolholder dimensions

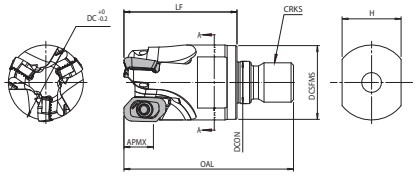
Description		Availability	Inserts	Dimension (mm)										A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Spare parts				Applicable inserts M187
		R		DC	DCSFMS	DCB	DCCB1	DCCB2	LF	CBDP	KDP	KWW	APMX						Anti-seize compound	Mounting bolt	Screw	Wrench	
MEAS	040R-13-3T-M-KUA	●	3	40	38	16	14	9	40	18	5.6	8.4	12	+10	-11	Yes	44000	0.3	P-37	HH10X30H	SB-4090TRP	DTPM-15	KCGT1305...
MEAS	050R-13-4T-M	●	4	50	45	22	18	11	50	21	6.3	10.4					36000	0.4					
MEAS	063R-13-5T-M-KUA	●	5	63	47												28000	0.6					
MEAS	080R-13-5T-M-KUA	●		80	60	27	20	13	63	22	7	12.4					22000	1.0					

When using inserts with a corner-R(RE) of 3.2 or larger, additional modifications (R3.5 mm or larger) on the corner of cutter body is necessary.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.
Recommended tightening torque for insert clamp : 3.5N·m

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MEAS



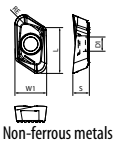
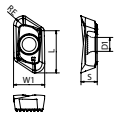


Toolholder dimensions

Description		Availability	Inserts	Dimension (mm)								A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min-1)	Spare parts			Applicable inserts M187
																Anti-seize compound	Screw	Wrench	
		R		DC	DCSFMS	DCON	OAL	LF	CRKS	H	APMX								
MEAS	25-M12-13-2T-KUA	●	2	25	23	12.5	63	40	M12xP1.75	19	12	+10	-11	Yes	49000	P-37	SB-4075TRP	DTPM-15	KCGT1305...
	32-M16-13-3T-KUA	●	3	32	30	17	69	46	M16xP2.0	24					39000		SB-4090TRP		

When using inserts with a corner-R (RE) of 3.2 or larger, additional modifications (R3.5 mm or larger) on the corner of cutter body is necessary.
If corner-radius is 3.0 mm or smaller, additional modifications are not needed. Recommended torque for insert clamp 3.5 N·m.
Coat Anti-seize compound (P-37) thinly on portion of taper and thread when insert is fixed.

KCGT

Classification of usage ★: Roughing / 1st Choice ☆: Roughing / 2nd Choice (In case hardness is 45HRC or under)			Non-ferrous metals						★	N
Insert		Description	No. of edges	Dimension (mm)					Carbide DLC PDL025	Applicable toolholder M186
				S	D1	RE	L	W1		
 Handed insert shows Right-hand	 Non-ferrous metals	KCGT 130504FR-AL	2	5.1	4.4	0.4	14.1	9.9	●	MEAS...
		130508FR-AL				0.8	13.9		●	
		130512FR-AL				1.2	13.8		●	
		130516FR-AL				1.6	13.3		●	
		130520FR-AL				2	13.3		●	
		130524FR-AL				2.4	13.3		●	
		130530FR-AL				3	13.3		●	
		130532FR-AL				3.2	12.8		●	
		130540FR-AL				4	12.8		●	
		130550FR-AL				5	12.8		●	
 Handed insert shows Right-hand	 Tough edge	KCGT 130504ER-AM	2	5.1	4.4	0.4	13.7	9.9	●	MEAS...
		130508ER-AM				0.8	13.7		●	
		130516ER-AM				1.6	13.3		●	
		130525ER-AM				2.5	13.3		●	
		130530ER-AM				3	13.3		●	
		130540ER-AM				4	12.8		●	

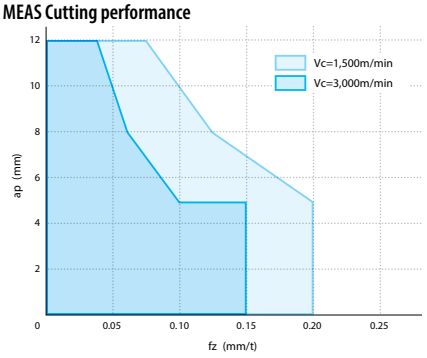
Recommended cutting conditions

Workpiece		Chipbreaker	Vc (m/min)	ae (mm)	fz (mm/t) ap = 0.5 mm (Reference value)	
				DC	Cutting Dia.ø28 or less	Cutting Dia.ø32 or more
Aluminum alloys	Si Ratio 12.5% or less	AL	200~**1,000**~3,000	≤ 0.5DC	0.05~**0.15**~0.25	
				0.5DC <		
		AM	200~**1,000**~5,000	≤ 0.5DC	0.05~**0.15**~0.3	0.05~**0.2**~0.35
				0.5DC <	0.05~**0.15**~0.25	0.05~**0.15**~0.3
	Si Ratio 12.5% and over	AL	200~**300**~400	≤ 0.5DC	0.05~**0.1**~0.2	
				0.5DC <		
		AM	200~**300**~800	≤ 0.5DC	0.05~**0.15**~0.3	0.05~**0.2**~0.35
				0.5DC <	0.05~**0.15**~0.25	0.05~**0.15**~0.3

- Recommended cutting conditions are reference values.
  Please adjust cutting speed and feed rate according to actual machining conditions taking into account machine and workpiece rigidity
- Do not use the cutter at speeds exceeding the maximum cutting speed limit (See page **M189**)
- Regularly changing the insert clamp screw is recommended
  Use appropriate safety covers to protect from tool breakage and chip scattering
- When using at a higher revolution (10,000min^{-1} or over), refer to the table below to adjust the balance of the MEAS and arbor

Revolution (min^{-1})	ISO balance quality grade | ISO 1940-1/8821 | (JIS B0905)
~20,000	G16
~30,000	G6.3
30,000~	G2.5

MEAS Cutting performance



ø50 (4 flutes)
Shouldering, ae = 25mm
Workpiecematerial: AlZnMgCu1.5

Reduce the feed rate when machining at high speeds

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Reference data for ramping

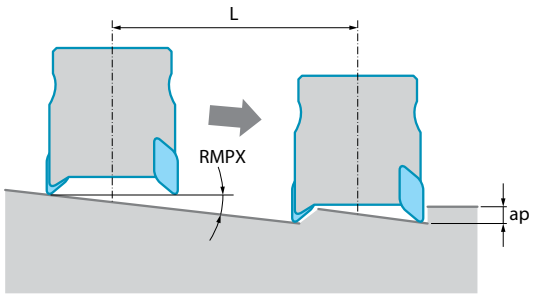
Cutter dia. DC (mm)	25	28	32	35	40	50
Max. ramping angle RMPX	20°	16°	12.5°	11°	8.5°	6°
tan RMPX	0.363	0.287	0.221	0.194	0.149	0.105

Guide for ramping (Slant milling)

Ramping angle should be RMPX (Maximum ramping angle) or under in the above cutting conditions.
Reduce recommended feed rate by 50%

Formula of the cutting length "L" at Max. ramping angle

$$L = \frac{ap}{\tan RMPX}$$



Vertical milling (Plunging)

* For vertical milling (plunging), reduce feed rate to fz=0.1mm/t or less.

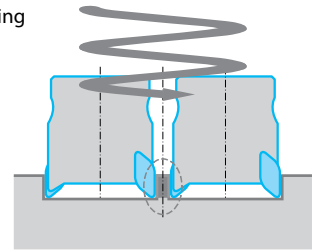
Insert description	Max. width of cut (ae)
KCGT13 type	8mm

Helical milling

For helical milling, use between min. cutting dia. and max. cutting dia.

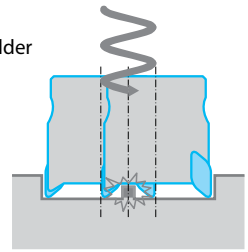
Over max. cutting dia.

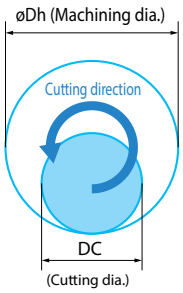
Center core part remains after machining



Under min. cutting dia.

Center core part interferes with toolholder



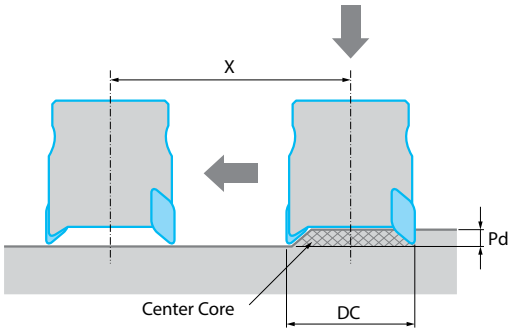


Description	Min. cutting dia.	Max. cutting dia.	Maximum ramping depth per cycle
MEAS…13…	2×DC-16	2×DC-3	3.5

Unit: mm

- Down-cut milling is recommended (refer to the figure above)
- Feed rate should be under 50% of the recommended cutting conditions
- Use caution to eliminate incidences caused by producing long chips

Guide for drilling



Drilling depth

Please refer to Pd (Max. drilling depth) in the chart.

Traversing after drilling

1. It is recommended to reduce feed by fz = 0.15 (mm/t) or less until the center core is removed.
2. When drilling, reduce feed rate per revolution to f=0.1mm/rev or under.

Description	Max. Cutting depth Pd	Min. cutting length X for flat bottom surface
MEAS…-13-…	3.5	DC-16

Unit: mm

How to mount inserts

1. Be sure to remove dust and chips from the insert mounting pocket.
2. Insert screw
   • Coat anti-seize compound thinly on portion of taper and thread.
   • Attach screw to the magnetized wrench tip and tighten while gently pressing the outside edge of the insert toward the insert pocket surface (grooved surface) (see the picture on the right) (Recommended Torque 3.5N•m)

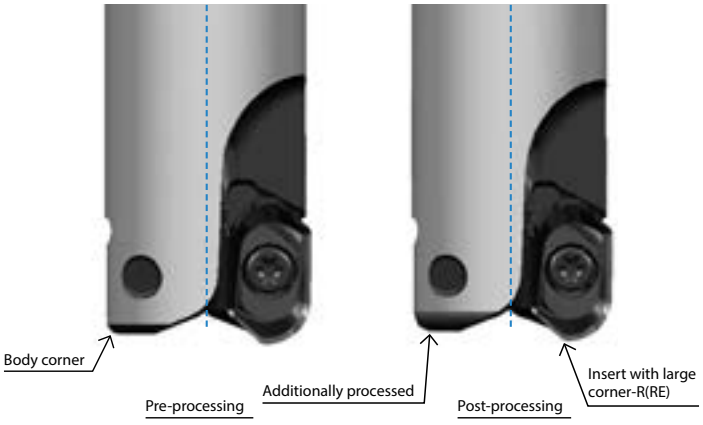


When using inserts with a corner-R(RE) of 3.2 or larger

When using inserts with corner-R(RE) 3.2 or larger, additional modifications of the cutter body will be necessary.
Additional modifications for the body will be necessary. Ref. to the chart below for the recommended modifications.
(If corner-R is 3.0 mm or smaller, additional modifications are not needed)

Insert Corner-R(RE) (mm)	Additional processing dimension to body corner (mm)
3.2	R2.0
4.0	R2.5
5.0	R3.0

* Round- shaped additional processing is recommended.
  When applying chamfer shaped additional processing, do not cut away too much.



Cautions

While in Use

⚠ Caution

Please use within recommended cutting conditions

Do not run the cutter at revolutions exceeding the printed maximum revolution limit of the cutter body
Do not use the end mill at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Please do not use under the following conditions :
When cutter is not fully loaded with inserts
If the body is damaged

Please wear protective equipment such as protective glove when changing inserts
Injury can occur when touching the cutting edge

Dynamic balance

Balance adjustment on the cutter is completed before shipping

Balance adjustment to be ISO balance quality grade (ISO 1940-1) G6.3
When using at a higher revolution (10,000min^{-1} or over), refer to the table below to adjust the balance of MEAS and arbor

Do not operate the balance adjustment screw on the outer periphery of the cutter. This could lead to improper dynamic balance

Revolution (min^{-1})	ISO balance quality grade ISO 1940-1/8821 (JIS B0905)
~20,000	G16
~30,000	G6.3
30,000~	G2.5

High-precision cutter for finishing applications

MFF

Cutter body design provides excellent reliability
Molded wiper inserts increases machining efficiency

1 Our solution for finishing operations

Designed with a unique insert combination of semi-finishing and finishing, the MFF drastically improves productivity by reducing quality issues.



SOLUTION

Increase feed to f = 5.0 mm/rev
Achieved 0.8 µm Ra surface finish
No grinding required
Achieved 5 µm flatness

The above is the result of a field test. Actual results will depend on machining environment, workpiece rigidity, machine, etc.

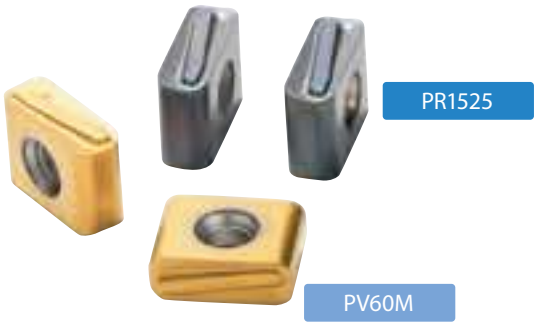
MFF Machining solutions

Can be used on a wide variety or parts and workpieces

Part name	Workpiece material	Industry
Plate / Frame / Case Cylinder pump / Rail Turbine housing Casing / Mold base	Rolled Steel for general structure / Gray cast iron / Spheroidal graphite cast iron Ni-resist cast iron Mold steel Carburized and hardened steel (60 HRC)	Industrial machining / Machine tools Shipbuilding / Automotive Construction machinery / Molds



2 Molded wiper insert for high-quality surface finish



Kyocera's unique molded insert technology realizes high feed rates and excellent surface finish



Low cutting force with special edge preparation

Micro-honing
Good sharpness

Wiper edge

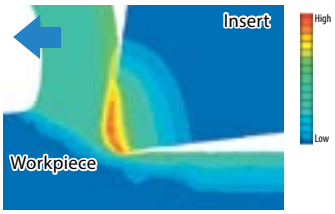
Large S-curve shape developed for higher feed rates

Edge temperature simulation comparison (Internal evaluation)

MFF

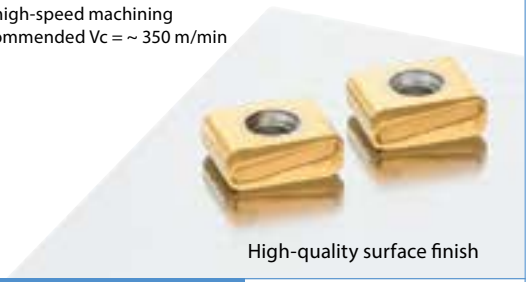


Conventional tool After 2 sec machining



MEGACOAT NANO Cermet PV60M

For high-speed machining
Recommended Vc = ~ 350 m/min



High-quality surface finish

Molded TT chipbreaker

Reduces chip clogging
High feed machining

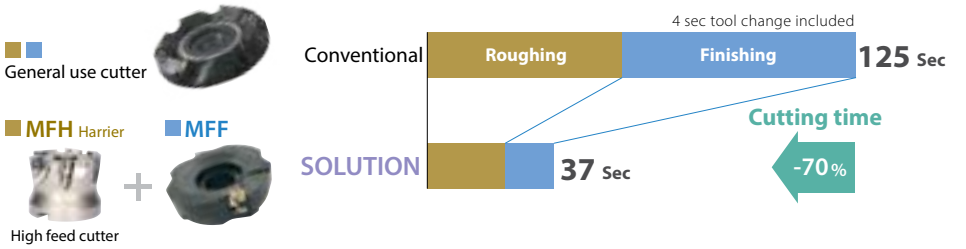




Comprehensive machining solutions

From roughing to finishing machining improvements (Internal evaluation)

Combine with Kyocera's MFH high feed cutter to improve quality and efficiency



Cutting Conditions
Conventional ø200 (6 inserts)
Vc = 200 m/min
Roughing : Vf = 286 mm/min (fz = 0.15 mm/t), ap = 1.2 mm
Finishing : Vf = 230 mm/min (fz = 0.12 mm/t), ap = 0.3 mm

SOLUTION
Roughing : MFH Harrier ø63 (6 inserts)
Vc = 200 m/min
Vf = 7,300 mm/min (fz = 1.2 mm/t), ap = 0.7 mm
Finishing : MFF ø200 (2 inserts)
Vc = 300 m/min
Vf = 2,400 mm/min (f = 5.0 mm/rev), ap = 0.1 mm

Surface finish quality after machining

SOLUTION



Excellent surface finish (0.27 µm Ra)

Conventional machining



Cloudy surface finish (1.01 µm Ra)

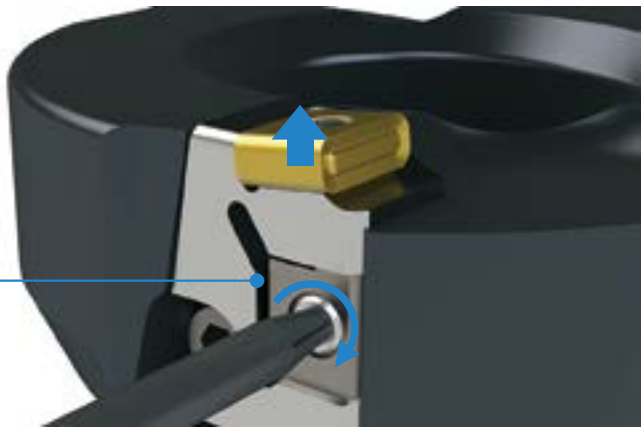
M
Milling

3 Adjustable cutting edge for increased usability

Cartridge height comes pre-adjusted and should not be necessary.

Adjustment is not required after replacing insert.

Easy-to-adjust cutting edge
Cutting edge height can be adjusted easily with one screw

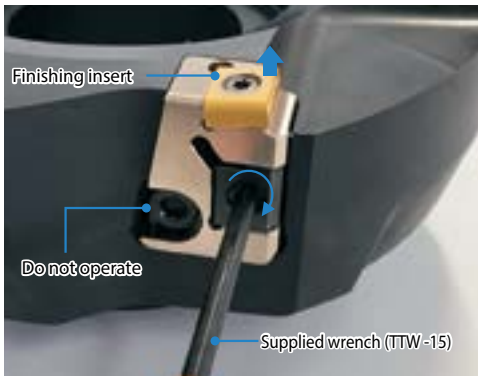


Included adjustment wrench

Edge adjustment

If D.O.C. is ap 0.1 ~ 0.2 mm, no adjustment is necessary (Pre-adjusted before holder is shipped).
Cutting edge adjustment is NOT required when replacing inserts.

If D.O.C. is less than 0.1 mm or if you prefer a different edge height, use the following method:



Adjusting the cutting edge

Use the supplied TTW-15 wrench to rotate the screw and easily adjust the cutting edge position.

Procedure

To adjust, start with the screw turned counterclockwise about two rotations (lowering the cutting edge).
Tighten the screw clockwise (raising the cutting edge) to adjust the amount of protrusion.
*Use a dial gauge to measure protrusion amount.

Precautions

Make sure to lower the cutting edge below the desired height first (turning screw counterclockwise) and then raise the edge up to the final height (turning screw clockwise).
If cutting edge is simply lowered to the final edge height, chattering or loosening of the screw may occur due to backlash.
Make sure the measurement position of the cutting edge is the same machining diameter.

Standard Cutting Edge Height

ap = 0.05 mm → protrusion against rough edge : 0.03 mm
ap = 0.10 mm ~ → protrusion against rough edge : 0.06 mm *Pre-adjusted before shipment

MFF



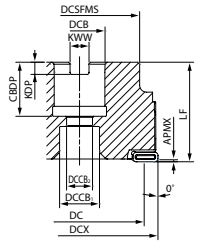


Fig. 1

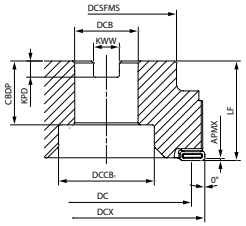


Fig. 2

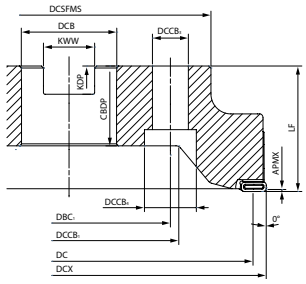


Fig. 3

Toolholder dimensions

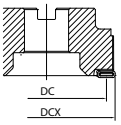
Description			Availability	Inserts	Dimension (mm)															A.R. (°)	R.R. (°) (Medium-Finishing Insert)	R.R. (°) (Finishing Insert)	Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Fig.	Applicable inserts ➔ M194
			R		DC	DCX	DCSFMS	DCB	$DCCB_1$	$DCCB_2$	$DCCB_3$	$DCCB_4$	DBC_1	LF	CBDP	KDP	KWW	APMX									
Metric	MFF	080R-M-SF	MT0	2	67.3	80	60	27	20	13	-	-	-	50	24	7	12.4	0.3	-8	-9	-20	No	2000	1.3	1	LNGX120916R-TT LNGX120916
		100R-M-SF	MT0		87.3	100	70	32	48						32	8	14.4						1600	1.8	2	
		125R-M-SF	MT0		112.3	125	87	40	55					63	33	9	16.4						1300	3.5	2	
		160R-M-SF	MT0		147.3	160	102		72	-													1000	5.9	2	
		200R-M-SF	MT0		187.3	200	142	60	110		18	26	101.6		40	14	25.7						800	7.7	3	
		250R-M-SF	MT0		237.3	250																		10.5	3	
Bore dia. inch spec	MFF	080R-SF	MT0	2	67.3	80	60	25.4	20	13	-	-	-	50	27	6	9.5	0.3	-8	-9	-20	No	2000	1.3	1	LNGX120916R-TT LNGX120916
		100R-SF	MT0		87.3	100	70	31.75	48						32	8	12.7						1600	1.8	2	
		125R-SF	MT0		112.3	125	87	38.1	58					63	38	10	15.9						1300	3.5	2	
		160R-SF	MT0		147.3	160	102	50.8	72	-						11	19.1						1000	5.9	2	
		200R-SF	MT0		187.3	200	142	47.625	110		18	26	101.6		40	14	25.4						800	8.1	3	
		250R-SF	MT0		237.3	250																		10.8	3	

*ø250 sizes have holes for lighter weight.

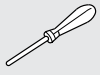
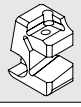
Max. Revolution

Set the number of revolutions per minute within the recommended cutting speed specified by the workpiece on page **M195**.
Do not use the end mill or cutter at the maximum revolution or higher since
the centrifugal force may cause inserts and parts to scatter even under no load.

Surface Finish
The surface will be finished flat within the range of DC shown on the right.

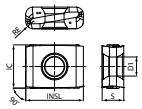
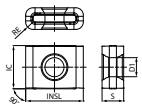


Spare parts

Spare Parts							
Clamp screw	Wrench	Wedge	Cartridge	Cartridge clamp screw	Wrench	Adjustment screw	Anti-seize Compound
							
SB-3592TR	DTM-10	AD-MFF	CR-MFF	HH5X15L	TTW-15	W6X18N	P-37
Recommended tightening torque for insert clamp 1.2N•m							

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MT0 : Made to order

LNGX

Insert		Description	No. of edges	Dimension (mm)					Cermet	Carbide		Applicable toolholder ➡ M193 M38
				IC	S	D1	RE	INSL	PVD	PVD		
									PV60M	PR1525	PR1825	
	 Low cutting force	LNGX 120916R-TT	4	9.525	4.76	4.2	1.6	12.7	MTO	MTO	MTO	MFF...-SF MFSE45...-W MFSE45...-W-M
		LNGX 120916	4	9.525	4.76	4.2	1.6	12.7	MTO	MTO	MTO	MFF...-SF MFSE45...-W MFSE45...-W-M

Recommended cutting conditions ➡ M195

M

Milling

Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi-Function
Slot Mill
Ball-nose Radius
Others

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

Recommended cutting conditions

Chipbreaker	Workpiece material	f (mm/rev)	ap (mm)	Recommended insert grades (Vc : m/min)	
				PV60M	PR1825 (PR1525)
TT	Structural steel	1.5 – **4.0** – 5.0	0.03 – **0.1** – 0.3	★ 230 – **280** – 350	☆ 230 – **280** – 350
	Carbon steel	1.0 – **4.0** – 5.0		★ 200 – **250** – 350	☆ 200 – **250** – 350
	Alloy steel	1.0 – **4.0** – 5.0		★ 200 – **250** – 350	☆ 200 – **250** – 350
	Mold steel	1.0 – **2.0** – 4.0	0.03 – **0.1** – 0.2	☆ 120 – **200** – 250	★ 120 – **200** – 250
	Mold steel (50HRC～)	0.6 – **1.0** – 1.2	0.03 – **0.05** – 0.1	-	★ 50 – **70** – 80
	Stainless steel (Austenitic related)*	1.0 – **2.0** – 4.0	0.03 – **0.1** – 0.2	☆ 120 – **200** – 250	★ 120 – **200** – 250
	Stainless steel (Martensitic related) *	1.0 – **3.0** – 4.0		☆ 150 – **200** – 300	★ 150 – **200** – 300
Standard	Gray cast iron	1.0 – **2.0** – 4.0	0.03 – **0.1** – 0.3	☆ 200 – **250** – 350	★ 200 – **250** – 350
	Nodular cast iron	1.5 – **2.0** – 4.0		☆ 150 – **250** – 300	★ 150 – **250** – 300

★: 1st Recommendation ☆: 2nd Recommendation

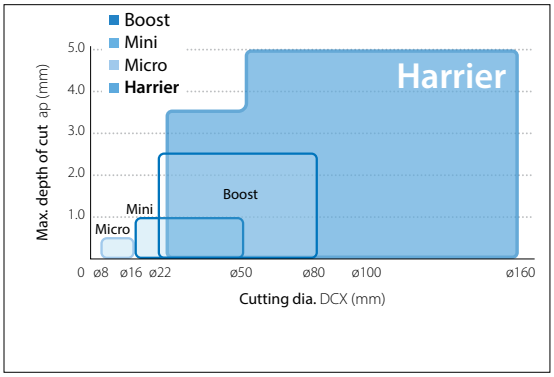
*Machining with coolant is recommended for stainless steel
The bold-faced number indicates a center value of recommended cutting condition.
Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.

MFH Harrier

Anti chattering

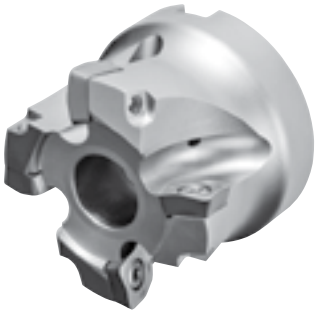
Applicable to various applications with 4 types of inserts

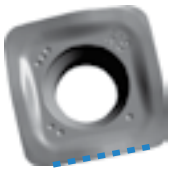
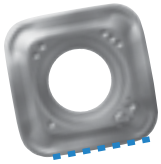
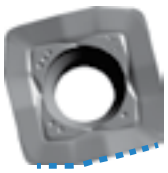
Increased chip evacuation and shortened cutting time



1 Large chipbreaker lineup for various machining applications

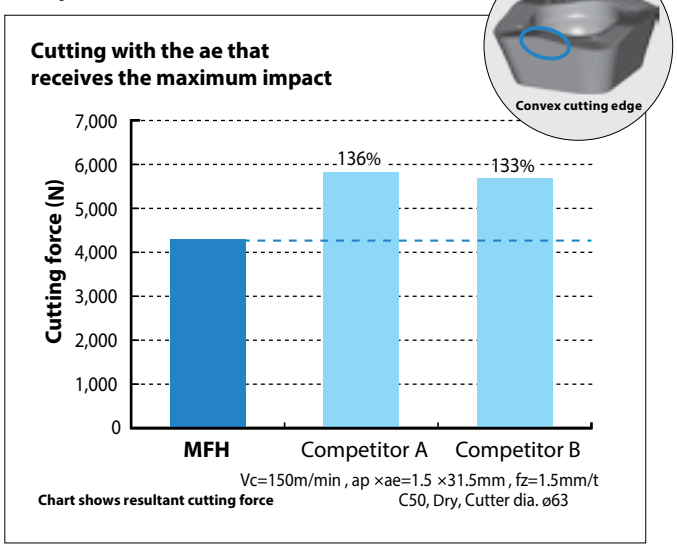
4 types of inserts according to your application



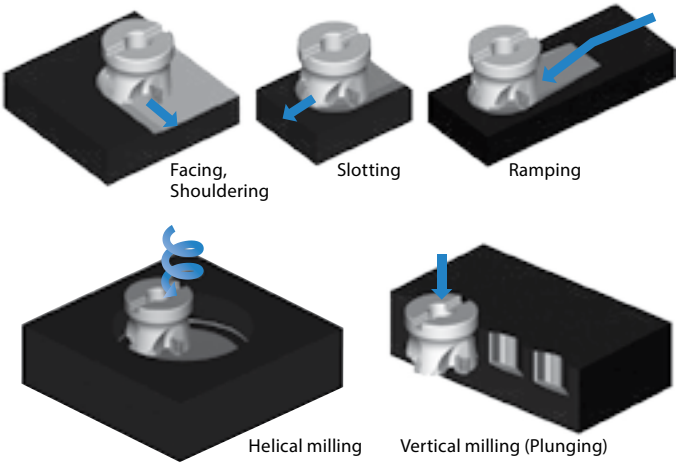
	GM type (General purpose)	GH type (Tough edge)	LD type (Large D.O.C.)	FL type (Low cutting force)
Shape				
Applications	1st recommendation for general purpose ➔ Facing, Pocketing, Helical milling	Excellent fracture resistance ➔ Available for facing, ramping and helical milling	Max. ap=5 mm ➔ Applicable for scale removal at high efficiency	Wiper edge with low cutting force ➔ Applicable for both roughing and finishing, for small machining center

2 3D convex cutting edge reduces shock of biting workpiece

Cutting force (Shock) comparison when biting workpiece (Internal evaluation)

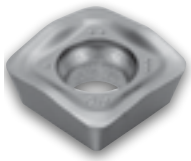


3 Multi-functional cutter



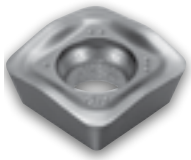
* GM type is applicable for all the above applications
* LD type and FL type are not applicable for helical milling, Plunging and contouring of rising wall (Please refer to **M206, M207**)

4 Applicable for variety of workpieces from steel to heat-resistant alloys



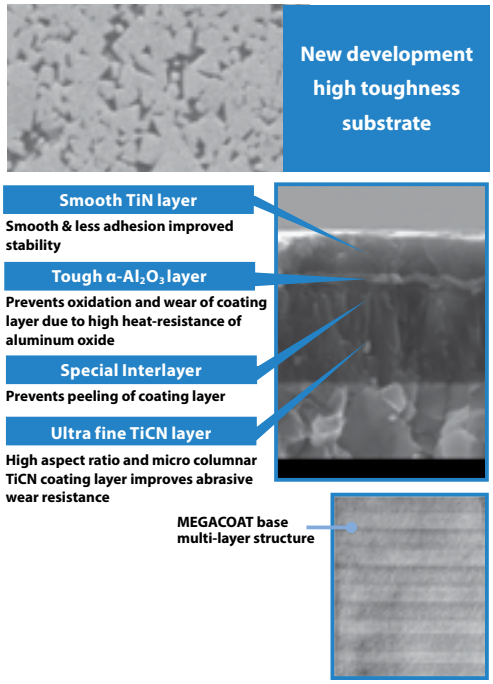
CA6535

For Martensitic stainless steel and Ni-base heat-resistant alloys high heat resistance and wear resistance with CVD coating
Improved stability due to thin layer coating technology



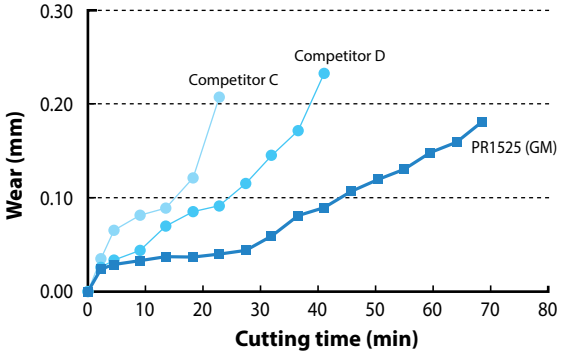
PR1835

For Ni-base heat-resistant alloys, titanium alloys and precipitation hardened stainless steel
Stable and longer tool life by special nano coating layer MEGACOAT NANO EX



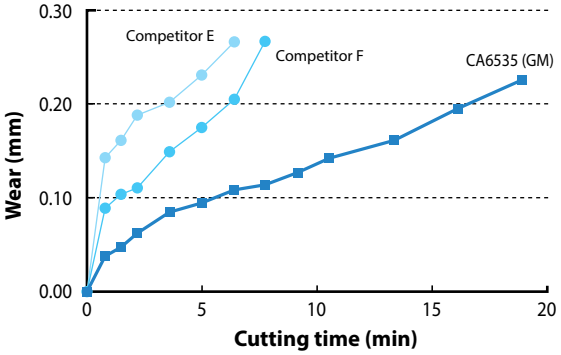
Wear resistance comparison (Internal evaluation)

X153CrMoV12



<Cutting conditions> Vc=150m/min, ap×ae=1.0×16mm, fz=1.5mm/t, Dry

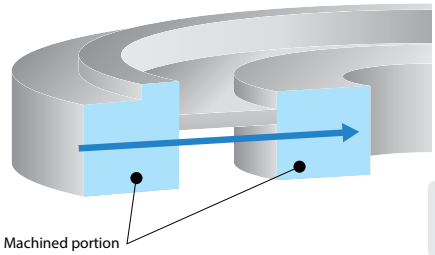
Ni-base heat-resistant alloys



<Cutting conditions> Vc=30m/min, ap×ae=1.0×40mm, fz=0.8mm/t, Wet

Case studies

SFVAF22B (Forged alloy steel)



Machining efficiency 3 times increase

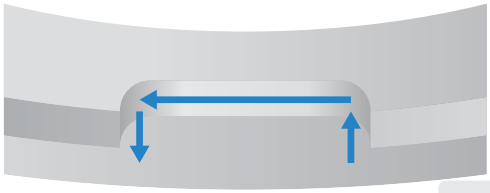
- Turbine parts • Vc=160m/min • ap×ae=1.5×max.160mm
- fz=1.17mm/t • Dry
- MFH160R-14-8T (8 Flutes) • SOMT140520ER-GM (PR1525)

PR1525	Chip evacuation rate = 720cc/min
Competitor G	Chip evacuation rate = 240cc/min

- Small machining noise even at 3 times higher feed rate
- Good edge condition without chipping and stable machining

(User evaluation)

X5CrNi18 10



Chattering reduced
Machining efficiency 1.6 times

- Clutch • Vc=120m/min • ap×ae=1.0×20mm
- fz=1.2mm/t • Dry
- MFH32-S32-10-2T (2 Flutes) • SOMT100420ER-GM (PR1535)

PR1535	Chip evacuation rate = 58cc/min
Competitor H	Chip evacuation rate = 36cc/min

- Competitor H caused chattering but MFH realized stable machining
- Good edge condition and long tool life

(User evaluation)

M
Milling

MFH Harrier



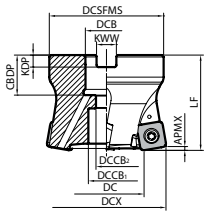


Fig. 1

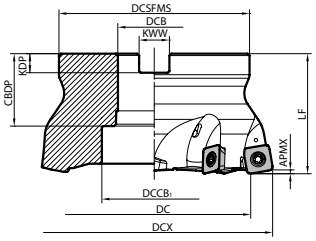


Fig. 2

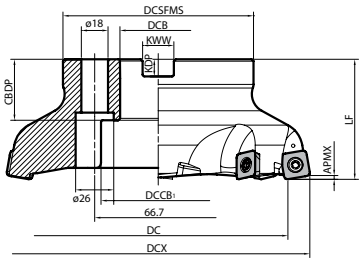


Fig. 3

Toolholder dimensions

Description			Availability	Inserts	Dimension (mm)															A.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Fig.	Applicable inserts ➡ M203
			R		DCX	DC (GM/GH)	DC (LD)	DC (FL)	DCSFMS	DCB	DCCB1	DCCB2	LF	CBDP	KDP	KWW	APMX	APMX2						
Metric	MFH	050R-10-4T-M	●	4	50	33	37.5	36.5	47	22	19	11	50	21	6.3	10.4	1.5 (3.5)	1.2	+10	Yes	10000	0.4	1	SOMT1004...
		050R-10-5T-M	●	5																				
		052R-10-4T-M	●	4	52	35	39.5	38.5																
		052R-10-5T-M	●																					
		063R-10-5T-22M	●	5	63	46	50.5	49.5	60												8800	0.7		
		063R-10-5T-27M	●							27	20	13		24	7	12.4								
		063R-10-6T-22M	●	6						22	19	11		21	6.3	10.4								
		063R-10-6T-27M	●							27	20	13		24	7	12.4								
		080R-10-7T-M	●	7	80	63	67.5	66.5	76				63								7600	1.6		
Bore dia. inch spec	MFH	050R-10-4T	□	4	50	33	37.5	36.5	47	22.225	19	11	50	19	5	8.4	1.5 (3.5)	1.2	+10	Yes	10000	0.4	1	SOMT1004...
		050R-10-5T	□	5																				
		063R-10-5T	□		63	46	50.5	49.5	60												8800	0.7		
		063R-10-6T	□	6																				
		080R-10-7T	□	7	80	63	67.5	66.5	76	31.75	26	17	63	32	8	12.7					7600	1.3		

For $APMX_2$, refer to the figure in **M199**
The values (APMX = 3.5) and ($APMX_2$ = 1.2) are valid in case of LD-Type usage.
Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Toolholder dimensions

	Description		Availability R	Inserts	Dimension (mm) DCX	DC (GM/GH)	DC (LD)	DC (FL)	DCSFMS	DCB	$DCCB_1$	$DCCB_2$	LF	CBDP	KDP	KWW	APMX	$APMX_2$	A.R. (°)	Coolant hole	Max. revolution (min^{-1})	Weight (kg)	Fig.	Applicable inserts ⇒ M203
Metric	MFH	050R-14-4T-M	●	4	50	27	33	32	47	22	12	-	50	21	6.3	10.4	2 (5)	2	+10	Yes	8800	0.4	1	SOMT1405...
		063R-14-4T-22M	●		63	40	46	45	60		19	11									7400	0.6	1	
		063R-14-4T-27M	●								27	20	13	24	7	12.4							1	
		063R-14-5T-22M	●	5							22	19	11	21	6.3	10.4							1	
		063R-14-5T-27M	●								27	20	13	24	7	12.4							1	
		066R-14-4T-22M	●	4	66	43	49	48			22	19	11	21	6.3	10.4						0.7	1	
		066R-14-4T-27M	●								27	20	13	24	7	12.4							1	
		066R-14-5T-22M	●	5							22	19	11	21	6.3	10.4							1	
		066R-14-5T-27M	●																				1	
		080R-14-5T-M	●		80	57	63	62	76	27	20	13		24	7	12.4					6400	1.4	1	
		080R-14-6T-M	●	6																			1	
		100R-14-6T-M	●		100	77	83	82	96	32	26	17	63	28	8	14.4					5600	2.4	2	
		100R-14-7T-M	●	7																			2	
		125R-14-7T-M	●		125	102	108	107	100	40	55	-		33	9	16.4					4800	2.8	2	
		160R-14-8T-M	●	8	160	137	143	142			68			32						No	4200	3.7	3	
Bore dia. inch spec	MFH	050R-14-4T	□	4	50	27	33	32	47	22.225	12	-	50	19	5	8.4	2 (5)	2	+10	Yes	8800	0.4	1	SOMT1405...
		063R-14-4T	□		63	40	46	45	60		19	11									7400	0.6	1	
		063R-14-5T	□	5																			1	
		080R-14-5T	□		80	57	63	62	76	31.75	26	17	63	32	8	12.7					6400	1.3	1	
		080R-14-6T	□	6																			1	
		100R-14-6T	□		100	77	83	82	96												5600	2.4	1	
		100R-14-7T	□	7																			1	
		125R-14-7T	□		125	102	108	107	100	38.1	55	-		38	10	15.9					4800	2.9	2	
		160R-14-8T	□	8	160	137	143	142		50.8	72				11	19.1				No	4200	3.9	2	

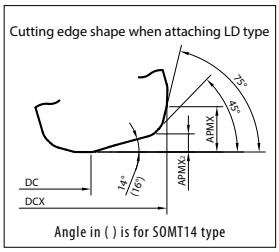
For $APMX_2$, refer to the figure below
The values (APMX = 5) and ($APMX_2$ = 2) are valid in case of LD-Type usage.
Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

Spare parts (MFH Harrier - Face mill)

Description		Spare parts: Clamp screw	Wrench: DTPM	Wrench: TTP	Anti-seize compound	Mounting bolt	Applicable inserts
MFH	050R-10-...	SB-4090TRPN	DTPM-15		P-37	HH10X30	SOMT100420ER-GM SOMT100420ER-LD SOMT100420ER-FL SOMT100420ER-GH
	050R-10-...-M						
	063R-10-...						
	063R-10-...-22M					HH12X35	
	063R-10-...-27M					HH16X40	
	080R-10-...					HH12X35	
	080R-10-...-M						
MFH	050R-14-...	SB-50120TRP	TTP-20		P-37	W10X31	SOMT140520ER-GM SOMT140520ER-LD SOMT140514ER-FL SOMT140520ER-GH
	050R-14-...-M					HH10X30	
	063R-14-...						
	063R-14-...-22M					HH12X35	
	063R-14-...-27M					HH16X40	
	080R-14-...					HH12X35	
	080R-14-...-M					HH16X40	
	100R-14-...					-	
	100R-14-...-M					-	
	125R-14-...					-	
	125R-14-...-M					-	
	160R-14-...					-	
	160R-14-...-M					-	

Recommended tightening torque for insert clamp 3.5N•m

Recommended tightening torque for insert clamp 4.5N•m



Max. revolution
Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MFH Harrier



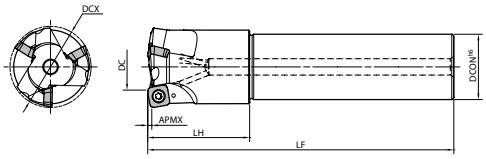


Fig. 1

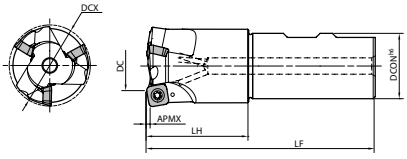


Fig. 2

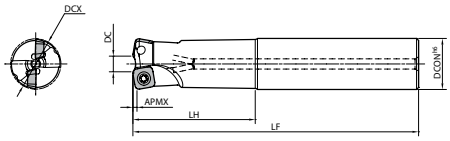


Fig. 3

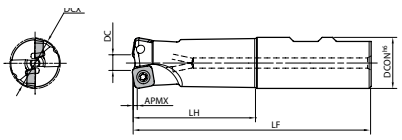


Fig. 4

Toolholder dimensions

Description			Availability	Inserts	Dimension (mm)									A.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Fig.	Spare parts			Applicable inserts ➡ M203
					DCX	DCON	DC (GM/GH)	DC (LD)	DC (FL)	LF	LH	APMX	$APMX_2$						Anti-seize compound	Screw	Wrench	
Cylindrical	MFH	25-S25-10-2T	●	2	25	25	8	12.5	11.5	140	60	1.5 (3.5)	1.2	+10	Yes	17000	0.4	3	P-37	SB-4075TRP	DTPM-15	SOMT1004...
		28-S25-10-2T	●		28		11	15.5	14.5		40					15500	0.5	1				
		32-S32-10-2T	●		32	32	15	19.5	18.5	150	70					14000	0.8	3				
		32-S32-10-3T	●	3														3				
		35-S32-10-2T	●	2	35		18	22.5	21.5		50					13000		1				
		35-S32-10-3T	●	3														1				
		40-S32-10-3T	●		40		23	27.5	26.5							11500	0.9	1				
		40-S32-10-4T	●	4														1				
Weldon	MFH	25-W25-10-2T	●	2	25	25	8	12.5	11.5	117	60	1.5 (3.5)	1.2	+10	Yes	17000	0.4	4	P-37	SB-4075TRP	DTPM-15	SOMT1004...
		32-W32-10-3T	●	3	32	32	15	19.5	18.5	131	70					14000	0.7	4				
		40-W32-10-3T	●		40		23	27.5	26.5	112	50					11500		2				
		40-W32-10-4T	●	4														2				
Long Shank	MFH	25-S25-10-2T-200	●	2	25	25	8	12.5	11.5	200	120	1.5 (3.5)	1.2	+10	Yes	17000	0.6	3	P-37	SB-4075TRP	DTPM-15	SOMT1004...
		28-S25-10-2T-200	●		28		11	15.5	14.5		40					15500	0.7	1				
		32-S32-10-2T-200	●		32	32	15	19.5	18.5		120					14000	1	3				
		35-S32-10-2T-200	●		35		18	22.5	21.5		50					13000	1.4	1				
		40-S32-10-4T-250	●	4	40		23	27.5	26.5	250						11500	1.5	1				
Extra Long Shank	MFH	25-S25-10-2T-300	●	2	25	25	8	12.5	11.5	300	180	1.5 (3.5)	1.2	+10	Yes	17000	1	3	P-37	SB-4075TRP	DTPM-15	SOMT1004...
		28-S25-10-2T-300	●		28		11	15.5	14.5		40					15500	1.1	1				
		32-S32-10-2T-300	●		32	32	15	19.5	18.5		180					14000	1.6	3				
		35-S32-10-2T-300	●		35		18	22.5	21.5		50					13000	1.7	1				
		40-S32-10-4T-300	●	4	40		23	27.5	26.5							11500	1.8	1				

Recommended tightening torque for insert clamp 3.5N•m

For $APMX_2$, refer to the figure in **M199**

The values (APMX = 3.5) and ($APMX_2$ = 1.2) are valid in case of LD-Type usage.

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MFH Harrier



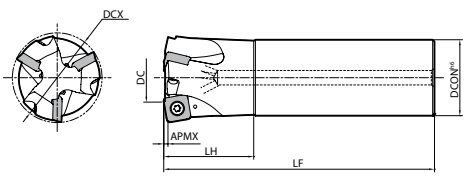


Fig. 1

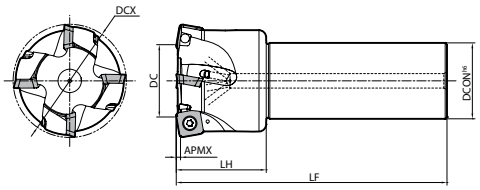


Fig. 2

Toolholder dimensions

Description		Availability	Inserts	Dimension (mm) DCX	DCON	DC (GM/GH)	DC (LD)	DC (FL)	LF	LH	APMX	$APMX_2$	A.R. (°)	Coolant hole	Max. revolution (min^{-1})	Weight (kg)	Fig.	Spare parts: Anti-seize compound	Screw	Wrench	Applicable inserts ▶ M203
MFH	50-S42-14-3T	●	3	50		27	33	32							8800	1.4	1	P-37	SB-50120TRP	TTP-20	SOMT1405...
	63-S42-14-4T	●	4	63	42	40	46	45	150	50	2 (5)	2	+10	Yes	7400	1.7	2	Recommended tightening torque for insert clamp 3.5N•m			
	80-S42-14-5T	●	5	80		57	63	62							6400	2.3	2				

For $APMX_2$, refer to the figure in **M199**

The values (APMX = 5) and ($APMX_2$ = 2) are valid in case of LD-Type usage.

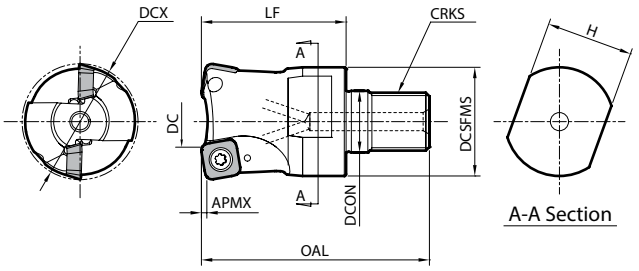
Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MFH Harrier





Toolholder dimensions

Description		Availability	Inserts	Dimension (mm) DCX	DCON	DC (GM/GH)	DC (LD)	DC (FL)	DCSFMS	OAL	LF	APMX	APMX2	CRKS	H	A.R. (°)	Coolant hole	Max. revolution (min-1)	Spare parts: Anti-seize compound	Screw	Wrench	Applicable inserts ➡ M203
MFH	25-M12-10-2T	●	2	25	12.5	8	12.5	11.5	23	57	35	1.5 (3.5)	1.2	M12x1.75	19	+10	Yes	17000	P-37	SB-4075TRP	DTPM-15	SOMT1004...
	28-M12-10-2T	●		28		11	15.5	14.5										15500				
	32-M16-10-2T	●		32	17	15	19.5	18.5	30	62	40			M16x2.0	24			14000				
	32-M16-10-3T	●	3																			
	35-M16-10-2T	●	2	35		18	22.5	21.5										13000				
	35-M16-10-3T	●	3																			
	40-M16-10-3T	●		40		23	27.5	26.5										11500				
	40-M16-10-4T	●	4																			

Recommended tightening torque for insert clamp 3.5N•m

For $APMX_2$, refer to the figure in **M199**
The values (APMX = 3.5) and ($APMX_2$ = 1.2) are valid in case of LD-Type usage.
Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.
See page **M82** for applicable arbor (BT arbor for exchangeable head / double-face clamping spindle)

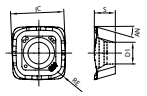
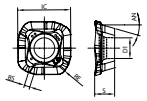
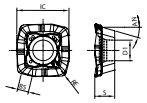
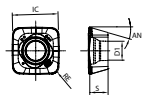
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SOMT

Classification of usage

★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice
(In case hardness is 45HRC or under)

Carbon steel / Alloy steel				☆			★	☆	P
Mold and die steel				☆			★	☆	P
Austenitic stainless steel					☆		☆	★	M
Martensitic stainless steel	★							☆	M
Precipitation hardening stainless steel					☆			★	M
Gray cast iron			☆			★			K
Nodular cast iron			☆			★			K
Non-ferrous metals									N
Heat-resistant alloy	★							☆	S
Titanium alloy					☆			★	S
Hard materials		★							H

Insert		Description	No. of edges	Dimension (mm) IC	S	D1	RE	BS	Angle (°) AN	Carbide CVD CA6535	PVD PR0155	PR1510	PR1525	PR1535	PR1810	PR1825	PR1835	Applicable toolholder ⇒ M198~M202
	 General purpose	SOMT 100420ER-GM	4	10.3	4.58	4.6	2	-	16	●		●	●	●	●	●	●	MFH...-10-..
		SOMT 140520ER-GM	4	14.14	5.56	5.8	2	-	16	●		●	●	●	●	●	●	MFH...-14-..
	 Large D.O.C.	SOMT 100420ER-LD	4	10.45	4.58	4.6	2	0.9	16	●		●	●	●	●	●	●	MFH...-10-..
		SOMT 140520ER-LD	4	14.76	5.56	5.8	2	1.6	16	●		●	●	●	●	●	●	MFH...-14-..
	 With wiper edge	SOMT 100420ER-FL	4	10.44	4.58	4.6	2	1.4	16	●		●	●	●	●	●	●	MFH...-10-..
		SOMT 140514ER-FL	4	14.57	5.56	5.8	1.4	3.1	16	●		●	●	●	●	●	●	MFH...-14-..
	 Tough edge	SOMT 100420ER-GH	4	10.43	4.57	4.55	2	-	16		●	●	●	●	●	●	●	MFH...-10-..
		SOMT 140520ER-GH	4	14.17	5.56	5.8	2	-	16		●	●	●	●	●	●	●	MFH...-14-..

Handed insert shows Right-hand

Recommended cutting conditions ⇒ **M204, M205**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Recommended cutting conditions

Insert type	Workpiece material	Toolholder description and feed rate (fz: mm/t)			Recommended insert grades (Vc: m/min)				
					MEGACOAT NANO EX (MEGACOAT NANO)			MEGACOAT HARD	CVD Coated carbide
		MFH25-...	MFH32-...	MFH40-...	PR1810 (PR1510)	PR1825 (PR1525)	PR1835 (PR1535)	PR015S	CA6535
GM GH	Carbon steel	0.5~**0.8**~1.0(ap≤1.0mm) 0.2~**0.4**~0.5(ap≤1.5mm)	0.5~**1.0**~1.5(ap≤1.0mm) 0.3~**0.7**~1.0(ap≤1.5mm)	0.5~**1.2**~1.8(ap≤1.0mm) 0.4~**1.0**~1.5(ap≤1.5mm)	-	★ 120~**180**~250	☆ 120~**180**~250		-
	Alloy steel	0.5~**0.8**~1.0(ap≤1.0mm) 0.2~**0.4**~0.5(ap≤1.5mm)	0.5~**1.0**~1.5(ap≤1.0mm) 0.3~**0.7**~1.0(ap≤1.5mm)	0.5~**1.2**~1.8(ap≤1.0mm) 0.4~**1.0**~1.5(ap≤1.5mm)	-	★ 100~**160**~220	☆ 100~**160**~220		-
	Mold steel (~ 40HRC)	0.5~**0.7**~0.8(ap≤1.0mm) 0.2~**0.3**~0.4(ap≤1.5mm)	0.5~**0.8**~1.2(ap≤1.0mm) 0.3~**0.6**~0.8(ap≤1.5mm)	0.5~**1.0**~1.6(ap≤1.0mm) 0.4~**0.8**~1.2(ap≤1.5mm)	-	☆ 80~**140**~180	☆ 80~**140**~180	GH★ 80~**140**~180	-
	Mold steel (40 ~ 50HRC)	0.15~**0.3**~0.5(ap≤1.0mm) 0.15~**0.2**~0.25(ap≤1.5mm)	0.2~**0.5**~0.8(ap≤1.0mm) 0.2~**0.3**~0.45(ap≤1.5mm)	0.2~**0.6**~0.9(ap≤1.0mm) 0.2~**0.5**~0.7(ap≤1.5mm)	-	☆ 60~**100**~130	-	GH★ 60~**100**~130	-
	Mold steel (50 ~ 55HRC)	0.15~**0.25**~0.4(ap≤1.0mm)	0.15~**0.35**~0.6(ap≤1.0mm)	0.15~**0.4**~0.7(ap≤1.0mm)	-	☆ 50~**70**~100	-	GH★ 50~**70**~100	-
	Mold steel (55 ~ 60HRC)	0.03~**0.06**~0.1(ap≤1.0mm) Recommended only for GH chipbreaker			-	-	-	GH☆ 50~**60**~70	-
	Stainless steel (Austenitic related)	0.5~**0.7**~0.8(ap≤1.0mm) 0.2~**0.3**~0.4(ap≤1.5mm)	0.5~**0.8**~1.2(ap≤1.0mm) 0.3~**0.6**~0.8(ap≤1.5mm)	0.5~**1.0**~1.6(ap≤1.0mm) 0.4~**0.8**~1.2(ap≤1.5mm)	-	GM☆ 100~**160**~200	GM☆ 100~**160**~200	-	-
	Stainless steel (Martensitic related)	0.5~**0.7**~0.8(ap≤1.0mm) 0.2~**0.3**~0.4(ap≤1.5mm)	0.5~**0.8**~1.2(ap≤1.0mm) 0.3~**0.6**~0.8(ap≤1.5mm)	0.5~**1.0**~1.6(ap≤1.0mm) 0.4~**0.8**~1.2(ap≤1.5mm)	-	-	☆ 150~**200**~250	-	★ 180~**240**~300
	Stainless steel (Precipitation hardening)	0.5~**0.7**~0.8(ap≤1.0mm) 0.2~**0.3**~0.4(ap≤1.5mm)	0.5~**0.8**~1.2(ap≤1.0mm) 0.3~**0.6**~0.8(ap≤1.5mm)	0.5~**1.0**~1.6(ap≤1.0mm) 0.4~**0.8**~1.2(ap≤1.5mm)	-	-	★ 90~**120**~150	-	-
	Gray cast iron	0.5~**0.8**~1.0(ap≤1.0mm) 0.2~**0.4**~0.5(ap≤1.5mm)	0.5~**1.0**~1.5(ap≤1.0mm) 0.3~**0.7**~1.0(ap≤1.5mm)	0.5~**1.2**~1.8(ap≤1.0mm) 0.4~**1.0**~1.5(ap≤1.5mm)	★ 120~**180**~250	-	-	-	-
	Nodular cast iron	0.5~**0.7**~0.8(ap≤1.0mm) 0.2~**0.3**~0.4(ap≤1.5mm)	0.5~**0.8**~1.2(ap≤1.0mm) 0.3~**0.6**~0.8(ap≤1.5mm)	0.5~**1.0**~1.6(ap≤1.0mm) 0.4~**0.8**~1.2(ap≤1.5mm)	★ 100~**150**~200	-	-	-	-
	Ni-base heat-resistant alloys	0.2~**0.4**~0.6(ap≤1.0mm) 0.15~**0.2**~0.3(ap≤1.5mm)	0.2~**0.5**~0.9(ap≤1.0mm) 0.2~**0.4**~0.6(ap≤1.5mm)	0.2~**0.6**~1.0(ap≤1.0mm) 0.2~**0.5**~0.8(ap≤1.5mm)	-	-	☆ 20~**30**~50	-	★ 20~**30**~50
	Titanium alloys	0.2~**0.4**~0.6(ap≤1.0mm) 0.15~**0.2**~0.3(ap≤1.5mm)	0.2~**0.5**~0.9(ap≤1.0mm) 0.2~**0.4**~0.6(ap≤1.5mm)	0.2~**0.6**~1.0(ap≤1.0mm) 0.2~**0.5**~0.8(ap≤1.5mm)	GM☆ 30~**50**~70	-	GM★ 40~**60**~80	-	-
LD	Carbon steel	0.5~**0.8**~1.0(ap≤1.0mm) 0.06~**0.1**~0.2(ap≤3.5mm)	0.5~**1.0**~1.5(ap≤1.0mm) 0.06~**0.15**~0.3(ap≤3.5mm)	0.5~**1.2**~1.8(ap≤1.0mm) 0.06~**0.2**~0.3(ap≤3.5mm)	-	★ 120~**180**~250	☆ 120~**180**~250	-	-
	Alloy steel	0.5~**0.8**~1.0(ap≤1.0mm) 0.06~**0.1**~0.2(ap≤3.5mm)	0.5~**1.0**~1.5(ap≤1.0mm) 0.06~**0.15**~0.3(ap≤3.5mm)	0.5~**1.2**~1.8(ap≤1.0mm) 0.06~**0.2**~0.3(ap≤3.5mm)	-	★ 100~**160**~220	☆ 100~**160**~220	-	-
	Mold steel (~ 40HRC)	0.5~**0.7**~0.8(ap≤1.0mm) 0.06~**0.08**~0.15(ap≤3.5mm)	0.5~**0.8**~1.2(ap≤1.0mm) 0.06~**0.1**~0.2(ap≤3.5mm)	0.5~**1.0**~1.6(ap≤1.0mm) 0.06~**0.15**~0.2(ap≤3.5mm)	-	★ 80~**140**~180	☆ 80~**140**~180	-	-
	Mold steel (40 ~ 50HRC)	0.2~**0.3**~0.5(ap≤1.0mm) 0.03~**0.05**~0.1(ap≤3.5mm)	0.2~**0.5**~0.8(ap≤1.0mm) 0.03~**0.08**~0.15(ap≤3.5mm)	0.2~**0.6**~0.9(ap≤1.0mm) 0.03~**0.1**~0.15(ap≤3.5mm)	-	★ 60~**100**~130	☆ 60~**100**~130	-	-
	Stainless steel (Austenitic related)	0.5~**0.7**~0.8(ap≤1.0mm) 0.06~**0.08**~0.15(ap≤3.5mm)	0.5~**0.8**~1.2(ap≤1.0mm) 0.06~**0.1**~0.2(ap≤3.5mm)	0.5~**1.0**~1.6(ap≤1.0mm) 0.06~**0.15**~0.2(ap≤3.5mm)	-	☆ 100~**160**~200	★ 100~**160**~200	-	-
	Stainless steel (Martensitic related)	0.5~**0.7**~0.8(ap≤1.0mm) 0.06~**0.08**~0.15(ap≤3.5mm)	0.5~**0.8**~1.2(ap≤1.0mm) 0.06~**0.1**~0.2(ap≤3.5mm)	0.5~**1.0**~1.6(ap≤1.0mm) 0.06~**0.15**~0.2(ap≤3.5mm)	-	-	☆ 150~**200**~250	-	★ 180~**240**~300
	Stainless steel (Precipitation hardening)	0.5~**0.7**~0.8(ap≤1.0mm) 0.06~**0.08**~0.15(ap≤3.5mm)	0.5~**0.8**~1.2(ap≤1.0mm) 0.06~**0.1**~0.2(ap≤3.5mm)	0.5~**1.0**~1.6(ap≤1.0mm) 0.06~**0.15**~0.2(ap≤3.5mm)	-	-	★ 90~**120**~150	-	-
	Gray cast iron	0.5~**0.8**~1.0(ap≤1.0mm) 0.06~**0.1**~0.2(ap≤3.5mm)	0.5~**1.0**~1.5(ap≤1.0mm) 0.06~**0.15**~0.3(ap≤3.5mm)	0.5~**1.2**~1.8(ap≤1.0mm) 0.06~**0.2**~0.3(ap≤3.5mm)	★ 120~**180**~250	-	-	-	-
	Nodular cast iron	0.5~**0.7**~0.8(ap≤1.0mm) 0.06~**0.08**~0.15(ap≤3.5mm)	0.5~**0.8**~1.2(ap≤1.0mm) 0.06~**0.1**~0.2(ap≤3.5mm)	0.5~**1.0**~1.6(ap≤1.0mm) 0.06~**0.15**~0.2(ap≤3.5mm)	★ 100~**150**~200	-	-	-	-
	Ni-base heat-resistant alloys	0.2~**0.4**~0.6(ap≤1.0mm) 0.03~**0.05**~0.1(ap≤3.5mm)	0.2~**0.5**~0.9(ap≤1.0mm) 0.03~**0.08**~0.15(ap≤3.5mm)	0.2~**0.6**~1.0(ap≤1.0mm) 0.03~**0.1**~0.15(ap≤3.5mm)	-	-	☆ 20~**30**~50	-	★ 20~**30**~50
	Titanium alloys	0.2~**0.4**~0.6(ap≤1.0mm) 0.03~**0.05**~0.1(ap≤3.5mm)	0.2~**0.5**~0.9(ap≤1.0mm) 0.03~**0.08**~0.15(ap≤3.5mm)	0.2~**0.6**~1.0(ap≤1.0mm) 0.03~**0.1**~0.15(ap≤3.5mm)	☆ 30~**50**~70	-	★ 40~**60**~80	-	-
FL	Carbon steel	0.5~**0.8**~1.0(ap≤1.0mm) 0.2~**0.4**~0.5(ap≤1.5mm)	0.5~**1.0**~1.5(ap≤1.0mm) 0.3~**0.7**~1.0(ap≤1.5mm)	0.5~**1.2**~1.8(ap≤1.0mm) 0.4~**1.0**~1.5(ap≤1.5mm)	-	★ 120~**180**~250	☆ 120~**180**~250	-	-
	Alloy steel	0.5~**0.8**~1.0(ap≤1.0mm) 0.2~**0.4**~0.5(ap≤1.5mm)	0.5~**1.0**~1.5(ap≤1.0mm) 0.3~**0.7**~1.0(ap≤1.5mm)	0.5~**1.2**~1.8(ap≤1.0mm) 0.4~**1.0**~1.5(ap≤1.5mm)	-	★ 100~**160**~220	☆ 100~**160**~220	-	-
	Mold steel (~ 40HRC)	0.5~**0.7**~0.8(ap≤1.0mm) 0.2~**0.3**~0.4(ap≤1.5mm)	0.5~**0.8**~1.2(ap≤1.0mm) 0.3~**0.6**~0.8(ap≤1.5mm)	0.5~**1.0**~1.6(ap≤1.0mm) 0.4~**0.8**~1.2(ap≤1.5mm)	-	★ 80~**140**~180	☆ 80~**140**~180	-	-
	Mold steel (40 ~ 50HRC)	0.15~**0.3**~0.5(ap≤1.0mm) 0.15~**0.2**~0.25(ap≤1.5mm)	0.2~**0.5**~0.8(ap≤1.0mm) 0.2~**0.3**~0.45(ap≤1.5mm)	0.2~**0.6**~0.9(ap≤1.0mm) 0.2~**0.5**~0.7(ap≤1.5mm)	-	★ 60~**100**~130	☆ 60~**100**~130	-	-
	Stainless steel (Austenitic related)	0.5~**0.7**~0.8(ap≤1.0mm) 0.2~**0.3**~0.4(ap≤1.5mm)	0.5~**0.8**~1.2(ap≤1.0mm) 0.3~**0.6**~0.8(ap≤1.5mm)	0.5~**1.0**~1.6(ap≤1.0mm) 0.4~**0.8**~1.2(ap≤1.5mm)	-	☆ 100~**160**~200	★ 100~**160**~200	-	-
	Stainless steel (Martensitic related)	0.5~**0.7**~0.8(ap≤1.0mm) 0.2~**0.3**~0.4(ap≤1.5mm)	0.5~**0.8**~1.2(ap≤1.0mm) 0.3~**0.6**~0.8(ap≤1.5mm)	0.5~**1.0**~1.6(ap≤1.0mm) 0.4~**0.8**~1.2(ap≤1.5mm)	-	-	☆ 150~**200**~250	-	★ 180~**240**~300
	Stainless steel (Precipitation hardening)	0.5~**0.7**~0.8(ap≤1.0mm) 0.2~**0.3**~0.4(ap≤1.5mm)	0.5~**0.8**~1.2(ap≤1.0mm) 0.3~**0.6**~0.8(ap≤1.5mm)	0.5~**1.0**~1.6(ap≤1.0mm) 0.4~**0.8**~1.2(ap≤1.5mm)	-	-	★ 90~**120**~150	-	-
	Gray cast iron	0.5~**0.8**~1.0(ap≤1.0mm) 0.2~**0.4**~0.5(ap≤1.5mm)	0.5~**1.0**~1.5(ap≤1.0mm) 0.3~**0.7**~1.0(ap≤1.5mm)	0.5~**1.2**~1.8(ap≤1.0mm) 0.4~**1.0**~1.5(ap≤1.5mm)	★ 120~**180**~250	-	-	-	-
	Nodular cast iron	0.5~**0.7**~0.8(ap≤1.0mm) 0.2~**0.3**~0.4(ap≤1.5mm)	0.5~**0.8**~1.2(ap≤1.0mm) 0.3~**0.6**~0.8(ap≤1.5mm)	0.5~**1.0**~1.6(ap≤1.0mm) 0.4~**0.8**~1.2(ap≤1.5mm)	★ 100~**150**~200	-	-	-	-
	Ni-base heat-resistant alloys	0.2~**0.4**~0.6(ap≤1.0mm) 0.15~**0.2**~0.3(ap≤1.5mm)	0.2~**0.5**~0.9(ap≤1.0mm) 0.2~**0.4**~0.6(ap≤1.5mm)	0.2~**0.6**~1.0(ap≤1.0mm) 0.2~**0.5**~0.8(ap≤1.5mm)	-	-	☆ 20~**30**~50	-	★ 20~**30**~50
	Titanium alloys	0.2~**0.4**~0.6(ap≤1.0mm) 0.15~**0.2**~0.3(ap≤1.5mm)	0.2~**0.5**~0.9(ap≤1.0mm) 0.2~**0.4**~0.6(ap≤1.5mm)	0.2~**0.6**~1.0(ap≤1.0mm) 0.2~**0.5**~0.8(ap≤1.5mm)	☆ 30~**50**~70	-	★ 40~**60**~80	-	-

★: 1st Recommendation ☆: 2nd Recommendation

* Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.
* The bold-faced number indicates a center value of recommended cutting condition.
Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.
* When finishing with LD type and FL type inserts, recommended feed rate for SOMT14 LD type: f=1.5(mm/rev) or less/for SOMT10 LD type: f=0.9(mm/rev) or less for SOMT14 FL type: f=3.0(mm/rev) or less/for SOMT10 FL type: f=1.4(mm/rev) or less
* For machining center equivalent to BT30, reduce feed rate to 25% or less of the recommended condition.
* For slotting, internal coolant is recommended.

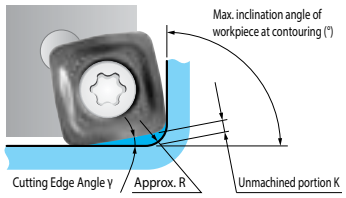
Recommended cutting conditions

Insert type	Workpiece material	Toolholder description and feed rate (fz: mm/t)		Recommended insert grades (Vc: m/min)				
		MFH...R-10-...	MFH...R-14-...	MEGACOAT NANO EX (MEGACOAT NANO)			MEGACOAT HARD	CVD Coated carbide
				PR1810 (PR1510)	PR1825 (PR1525)	PR1835 (PR1535)	PR015S	CA6535
GM GH	Carbon steel	0.5~**1.5**~2.0		-	★ 120~**180**~250	☆ 120~**180**~250		-
	Alloy steel	0.5~**1.5**~2.0		-	★ 100~**160**~220	☆ 100~**160**~220		-
	Mold steel (~ 40HRC)	0.5~**1.2**~1.8		-	☆ 80~**140**~180	☆ 80~**140**~180	GH★ 80~**140**~180	-
	Mold steel (40 ~ 50HRC)	0.2~**0.7**~1.0		-	☆ 60~**100**~130	-	GH★ 60~**100**~130	-
	Mold steel (50 ~ 55HRC)	0.2~**0.5**~0.8		-	☆ 50~**70**~100	-	GH★ 50~**70**~100	-
	Mold steel (55 ~ 60HRC)	0.03~**0.06**~0.1(ap≤1.0mm) Recommended only for GH chipbreaker		-	-	-	GH☆ 50~**60**~70	-
	Stainless steel (Austenitic related)	0.5~**1.2**~1.8		-	GM☆ 100~**160**~200	GM☆ 100~**160**~200	-	-
	Stainless steel (Martensitic related)	0.5~**1.2**~1.8		-	-	☆ 150~**200**~250	-	★ 180~**240**~300
	Stainless steel (Precipitation hardening)	0.5~**1.2**~1.8		-	-	★ 90~**120**~150	-	-
	Gray cast iron	0.5~**1.5**~2.0		★ 120~**180**~250	-	-	-	-
	Nodular cast iron	0.5~**1.2**~1.8		★ 100~**150**~200	-	-	-	-
	Ni-base heat-resistant alloys	0.2~**0.8**~1.2		-	-	☆ 20~**30**~50	-	★ 20~**30**~50
	Titanium alloys	0.2~**0.8**~1.2		GM☆ 30~**50**~70	-	GM★ 40~**60**~80	-	-
LD	Carbon steel	0.5~**1.5**~2.0(ap≤1.0mm) 0.06~**0.2**~0.3(ap≤3.5mm)	0.5~**1.5**~2.0(ap≤2.0mm) 0.06~**0.2**~0.4(ap≤5.0mm)	-	★ 120~**180**~250	☆ 120~**180**~250	-	-
	Alloy steel	0.5~**1.5**~2.0(ap≤1.0mm) 0.06~**0.2**~0.3(ap≤3.5mm)	0.5~**1.5**~2.0(ap≤2.0mm) 0.06~**0.2**~0.4(ap≤5.0mm)	-	★ 100~**160**~220	☆ 100~**160**~220	-	-
	Mold steel (~ 40HRC)	0.5~**1.2**~1.8(ap≤1.0mm) 0.06~**0.15**~0.2(ap≤3.5mm)	0.5~**1.2**~1.8(ap≤2.0mm) 0.06~**0.15**~0.3(ap≤5.0mm)	-	★ 80~**140**~180	☆ 80~**140**~180	-	-
	Mold steel (40 ~ 50HRC)	0.2~**0.7**~1.0(ap≤1.0mm) 0.03~**0.1**~0.15(ap≤3.5mm)	0.2~**0.7**~1.0(ap≤2.0mm) 0.03~**0.1**~0.2(ap≤5.0mm)	-	★ 60~**100**~130	☆ 60~**100**~130	-	-
	Stainless steel (Austenitic related)	0.5~**1.2**~1.8(ap≤1.0mm) 0.06~**0.15**~0.2(ap≤3.5mm)	0.5~**1.2**~1.8(ap≤2.0mm) 0.06~**0.15**~0.3(ap≤5.0mm)	-	☆ 100~**160**~200	★ 100~**160**~200	-	-
	Stainless steel (Martensitic related)	0.5~**1.2**~1.8(ap≤1.0mm) 0.06~**0.15**~0.2(ap≤3.5mm)	0.5~**1.2**~1.8(ap≤2.0mm) 0.06~**0.15**~0.3(ap≤5.0mm)	-	-	☆ 150~**200**~250	-	★ 180~**240**~300
	Stainless steel (Precipitation hardening)	0.5~**1.2**~1.8(ap≤1.0mm) 0.06~**0.15**~0.2(ap≤3.5mm)	0.5~**1.2**~1.8(ap≤2.0mm) 0.06~**0.15**~0.3(ap≤5.0mm)	-	-	★ 90~**120**~150	-	-
	Gray cast iron	0.5~**1.5**~2.0(ap≤1.0mm) 0.06~**0.2**~0.3(ap≤3.5mm)	0.5~**1.5**~2.0(ap≤2.0mm) 0.06~**0.2**~0.4(ap≤5.0mm)	★ 120~**180**~250	-	-	-	-
	Nodular cast iron	0.5~**1.2**~1.8(ap≤1.0mm) 0.06~**0.15**~0.2(ap≤3.5mm)	0.5~**1.2**~1.8(ap≤2.0mm) 0.06~**0.15**~0.3(ap≤5.0mm)	★ 100~**150**~200	-	-	-	-
	Ni-base heat-resistant alloys	0.2~**0.8**~1.2(ap≤1.0mm) 0.03~**0.1**~0.15(ap≤3.5mm)	0.2~**0.8**~1.2(ap≤2.0mm) 0.03~**0.1**~0.2(ap≤5.0mm)	-	-	☆ 20~**30**~50	-	★ 20~**30**~50
	Titanium alloys	0.2~**0.8**~1.2(ap≤1.0mm) 0.03~**0.1**~0.15(ap≤3.5mm)	0.2~**0.8**~1.2(ap≤2.0mm) 0.03~**0.1**~0.2(ap≤5.0mm)	☆ 30~**50**~70	-	★ 40~**60**~80	-	-
FL	Carbon steel	0.5~**1.5**~2.0		-	★ 120~**180**~250	☆ 120~**180**~250	-	-
	Alloy steel	0.5~**1.5**~2.0		-	★ 100~**160**~220	☆ 100~**160**~220	-	-
	Mold steel (~ 40HRC)	0.5~**1.2**~1.8		-	★ 80~**140**~180	☆ 80~**140**~180	-	-
	Mold steel (40 ~ 50HRC)	0.2~**0.7**~1.0		-	★ 60~**100**~130	☆ 60~**100**~130	-	-
	Stainless steel (Austenitic related)	0.5~**1.2**~1.8		-	☆ 100~**160**~200	★ 100~**160**~200	-	-
	Stainless steel (Martensitic related)	0.5~**1.2**~1.8		-	-	☆ 150~**200**~250	-	★ 180~**240**~300
	Stainless steel (Precipitation hardening)	0.5~**1.2**~1.8		-	-	★ 90~**120**~150	-	-
	Gray cast iron	0.5~**1.5**~2.0		★ 120~**180**~250	-	-	-	-
	Nodular cast iron	0.5~**1.2**~1.8		★ 100~**150**~200	-	-	-	-
	Ni-base heat-resistant alloys	0.2~**0.8**~1.2		-	-	☆ 20~**30**~50	-	★ 20~**30**~50
	Titanium alloys	0.2~**0.8**~1.2		☆ 30~**50**~70	-	★ 40~**60**~80	-	-

★: 1st Recommendation ☆: 2nd Recommendation

* Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.
* The bold-faced number indicates a center value of recommended cutting condition.
Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.
* When finishing with LD type and FL type inserts, recommended feed rate for SOMT14 LD type: f=1.5(mm/rev) or less/for SOMT10 LD type: f=0.9(mm/rev) or less for SOMT14 FL type: f=3.0(mm/rev) or less/for SOMT10 FL type: f=1.4(mm/rev) or less
* For machining center equivalent to BT30, reduce feed rate to 25% or less of the recommended condition.
* For slotting, internal coolant is recommended.

Note for machining program (Approx. R)

Shape	Description	Insert type	Cutting edge angle γ	Approx. R (mm)	Unmachined portion K (mm)	Max. inclination angle of workpiece at contouring
	MFH...-10-...	GM / GH	10°	3.0	0.85	90°
		FL	14°	3.0	0.89	80°
		LD	14°	3.5	0.69	65°
	MFH...-14-...	GM / GH	10°	3.5	1.37	90°
		FL	13°	3.0	1.36	80°
		LD	16°	5.0	1.06	65°

Reference data for ramping

MFH...-10-...

Cutter dia. DCX (mm)	25	28	32	35	40	50	63	80
Max. ramping angle RMPX	5°	4.5°	4°	3.5°	3°	2.5°	2°	1°
tan RMPX	0.087	0.078	0.070	0.061	0.052	0.043	0.035	0.017

MFH...-14-...

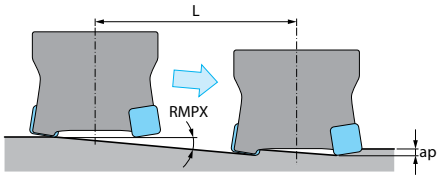
Cutter dia. DCX (mm)	50	63	80	100	125	160
Max. ramping angle RMPX	2°	1.8°	1°	0.5°	0.4°	0.2°
tan RMPX	0.035	0.031	0.017	0.009	0.007	0.003

Guide for ramping (Slant milling)

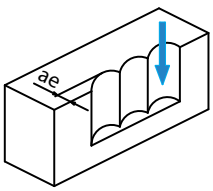
Ramping angle should be RMPX (Maximum ramping angle) or under in the above cutting conditions.
Feed rate should be 70% or under of the above cutting conditions.

Formula of the cutting length "L" at max. ramping angle

$$L = \frac{ap}{\tan RMPX}$$



Vertical milling (Plunging)



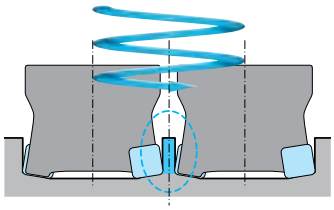
Insert description	Max. width of cut (ae)
SOMT10	8mm
SOMT14	11.5mm

*Vertical milling (Plunging) is available only with GM/GH type insert.
(LD type and FL type are not applicable)
For vertical milling (plunging), reduce feed rate to fz=0.2mm/t or less.

Guide for helical milling

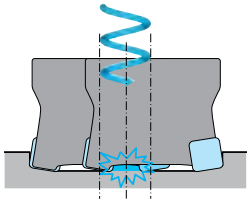
For helical milling, use between min. cutting dia. and max. cutting dia.

Over max. cutting dia.



Center core part remains after machining

Under min. cutting dia.

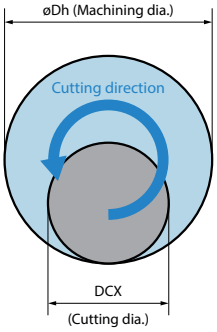


Center core part interferes with toolholder

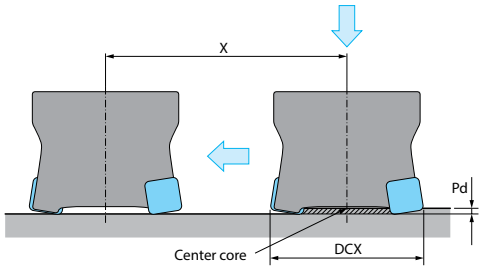
Description	Min. cutting dia.	Max. cutting dia.
MFH...-10-...	2×DCX-18	2×DCX-2
MFH...-14-...	2×DCX-25	2×DCX-2

Unit: mm

- Sinking depth (h) at helical milling should be under max. depth of cut (APMX) in the cutter dimension chart.
- Down-cut milling is recommended. (Ref. to the right figure)
- Feed rate should be under 50% of the recommended cutting conditions.
- Use caution to eliminate incidences caused by producing long chips.



Guide for drilling



3D machining

Insert type	Ramping	Contouring (Rising wall angle)	Vertical	Helical milling	Pocketing
GM / GH	✓	✓ (90°)	✓	✓	✓
LD	✓	△ (65°)	×	×	×
FL	✓	△ (80°)	×	×	×

- Some applications are not available depending on insert type.
- For FL and LD type, there is a limit of rising wall angle at contouring.

Description	GM type / GH type		LD type		FL type	
	Max. cutting depth Pd	Min. cutting length X for flat bottom surface	Max. cutting depth Pd	Min. cutting length X for flat bottom surface	Max. cutting depth Pd	Min. cutting length X for flat bottom surface
MFH...-10-...	1.5	DCX-18	1.5	DCX-14	1.5	DCX-15
MFH...-14-...	2	DCX-24	2	DCX-18	2	DCX-19

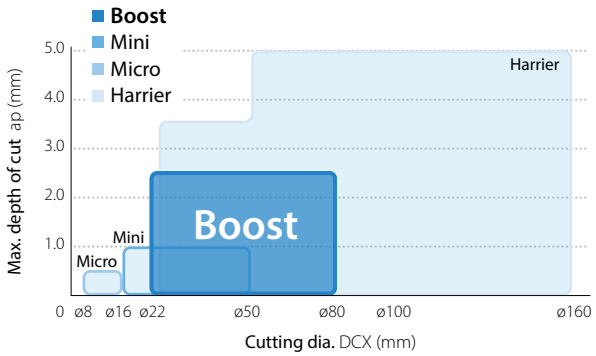
Unit: mm

[Drilling depth] Please refer to Pd (Max. cutting depth) in the chart.
[When traversing after drilling]
1. Reduce feed rate 25% or less of the recommended conditions until the center core part (Unmachined part) is removed.
2. When drilling, reduce feed rate per revolution to f=0.2mm/rev or under.

High feed and large depth of cut milling

MFH Boost

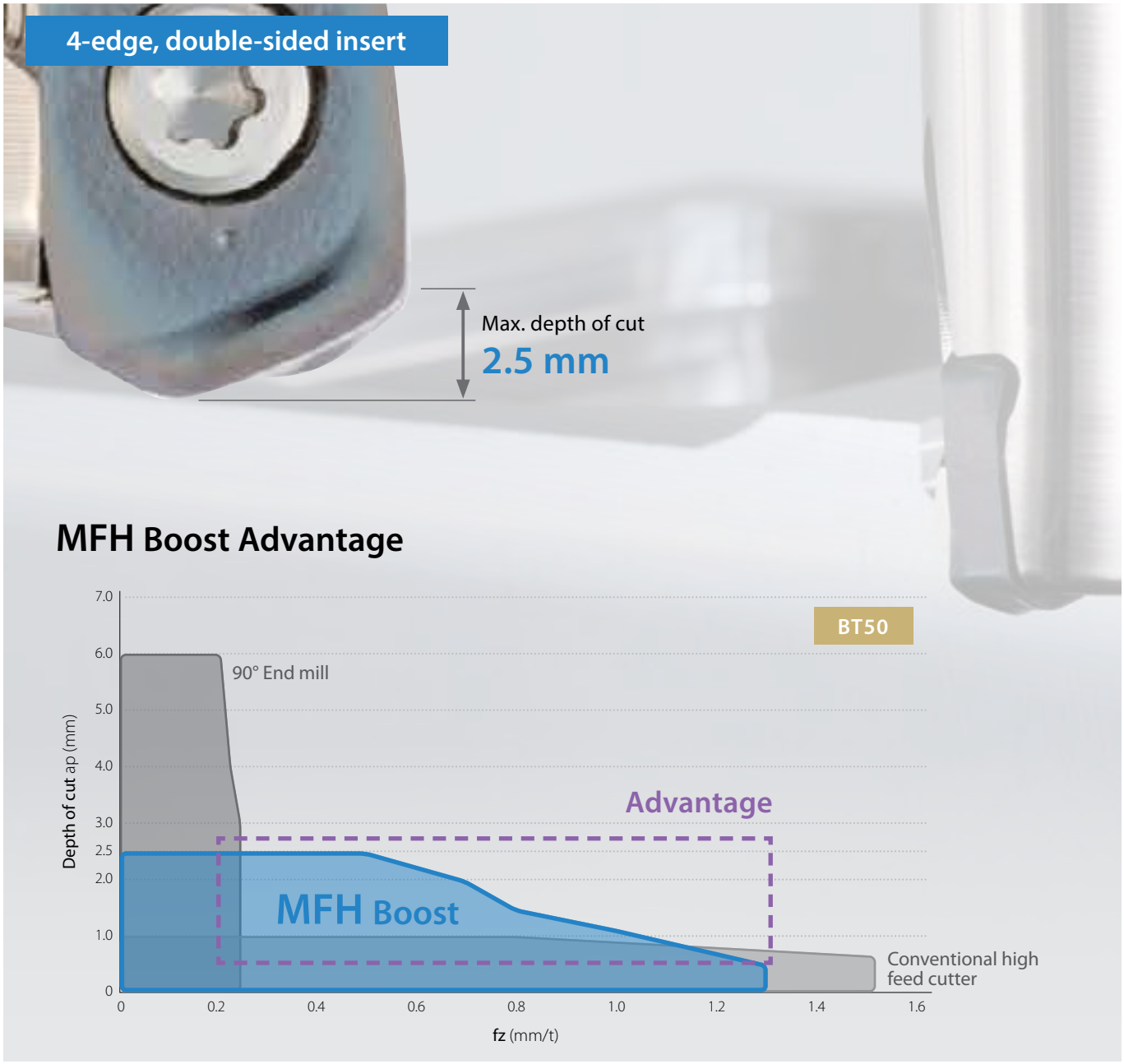
Large D.O.C. for greater milling capabilities
Excellent performance in a wide range of applications, including automotive parts, difficult-to-cut materials, and molds



1 High feed milling with large depth of cut capabilities

A small 04 size insert (4-edge, double-sided insert) supports depths of cut up to 2.5 mm with cutting dia. available from ø 22 mm.

Achieves high efficiency machining in various shouldering, slotting, helical milling, and ramping applications.



2 Available for a variety of machining applications and environments

1 Solutions for **90° end mills** (Rough to medium-finish machining)

High feed rates dramatically improve machining efficiency

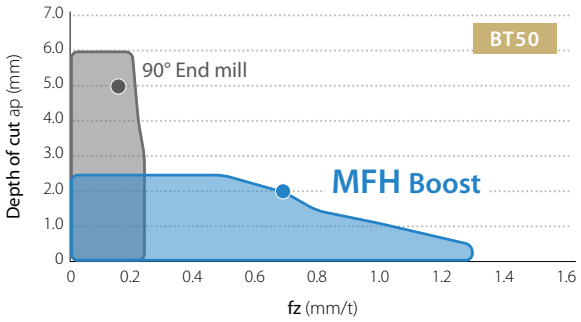
Machining efficiency simulation example

Pocketing: Vc = 150 m/min, ae = 12.5 mm

MFH Boost
ø 25 (3 Inserts)
100 cc/min
ap = **2.0** mm, fz = **0.7** mm/t

Conventional
90 ° end mill
ø 25 (3 Inserts)
54 cc/min
ap = **5.0** mm, fz = **0.15** mm/t

Machining efficiency x 1.8



High efficiency and good tool life

Machining efficiency and cutting edge condition comparison (Internal evaluation)

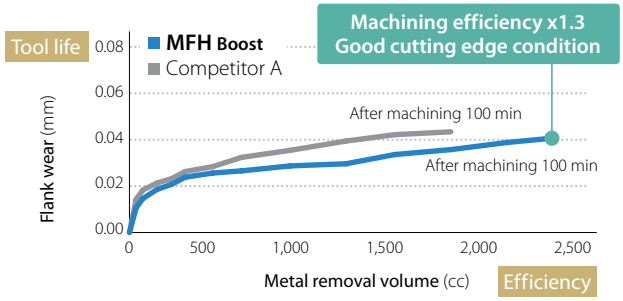
Cutting edge condition after 100 min machining

MFH Boost
ap = 1.6 mm, fz = **0.6** mm/t



Competitor A 90° end mill
ap = 5.0 mm, fz = **0.15** mm/t





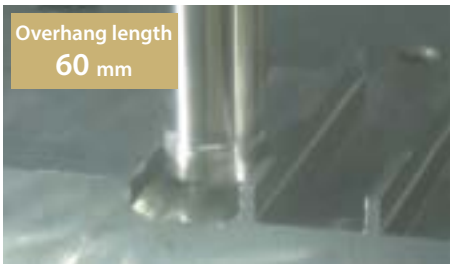
Cutting conditions: Vc = 150 m/min, ae = 12.5 mm, dry, 42CrMo4, ø 25 (1 Insert) BT50

High stability in unstable machining environment

Chatter resistance comparison (Internal evaluation)

Slotting
ø 25 (3 Inserts)
External air
C50
BT50

Video



Machining efficiency

MFH Boost
103 cc/min
Vc = 120 m/min, ap = 1.5 mm, fz = **0.6** mm/t

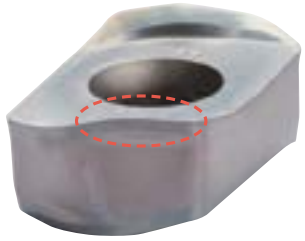
Machining efficiency x 4.5

Competitor A
90 ° End Mill
31 cc/min **Chattering (Machining was impossible)**
Vc = 80 m/min, ap = 2 mm, fz = 0.2 mm/t
23 cc/min
Vc = 80 m/min, ap = 2 mm, fz = 0.15 mm/t

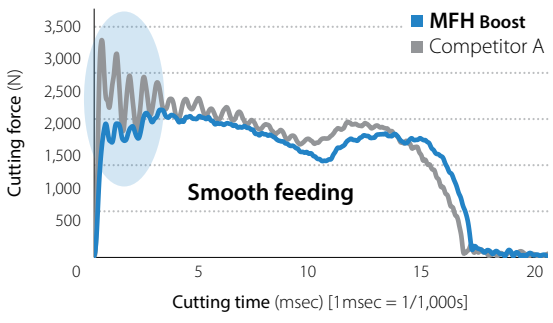
High efficiency and stable machining designs

Kyocera's original technology

Convex cutting edge design reduces impact when entering workpiece



Cutting force when entering workpiece (Internal evaluation)



Cutting conditions:
Vc = 150 m/min, ap = 2.0 mm,
ae = 25 mm, fz = 0.7 mm/t,
dry, C50, ø 50 (1 Insert), BT50

M
Milling

2 Better solution than conventional high feed cutters

Large D.O.C. dramatically improves machining efficiency

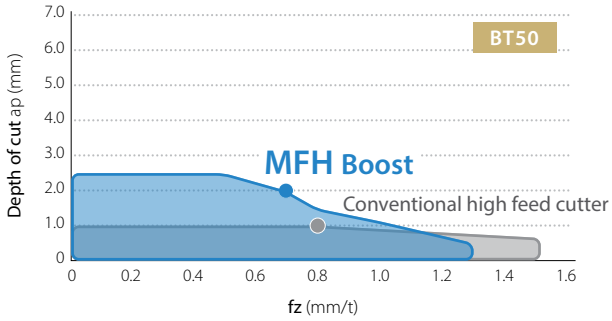
Machining efficiency simulation example

Multistage machining (Depth 30 mm): Vc = 150 m/min, ae = 12.5 mm

MFH Boost
ø 25 (3 Inserts)
100 cc/min
ap = 2.0 mm, fz = **0.7** mm/t

Machining efficiency x 1.3

Conventional high feed cutter
ø 25 (3 Inserts)
76 cc/min
ap = **1.0** mm, fz = **0.8** mm/t



High efficiency and good tool life

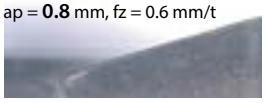
Machining efficiency and cutting edge condition comparison
(Internal evaluation)

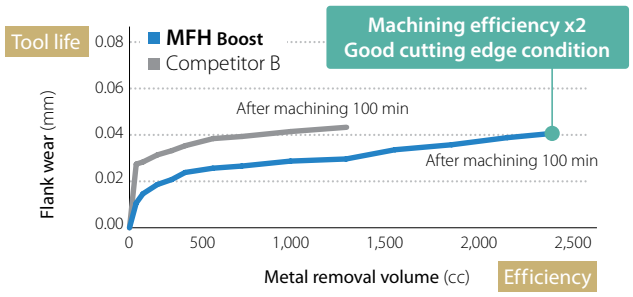
Cutting edge condition after 100 min machining

MFH Boost
ap = 1.6 mm, fz = 0.6 mm/t



Competitor B High feed type
ap = **0.8** mm, fz = 0.6 mm/t





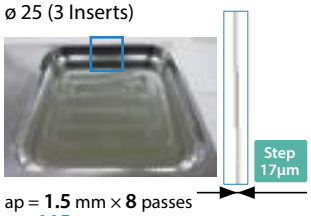
Cutting conditions: Vc = 150 m/min, ae = 12.5 mm, dry, 42CrMo4, ø 25 (1 Insert), BT50

Excellent wall accuracy

Machining efficiency and wall accuracy comparison
(Internal evaluation)

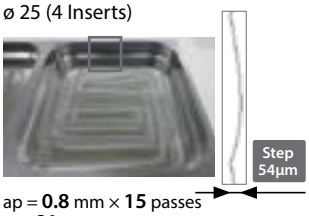
Pocketing (Depth 12mm)

MFH Boost
ø 25 (3 Inserts)



ap = **1.5** mm × **8** passes
Q = 115 cc/min

Competitor B High feed type
ø 25 (4 Inserts)



ap = **0.8** mm × **15** passes
Q = **81** cc/min

Cutting conditions: Vc = 200 m/min, ae = 12.5 mm, fz = 0.8 mm/t, dry, C50, BT50

Superior wall accuracy



Wiper on outer periphery

Reduction of wall level variation in multi-pass machining

3 Solutions for machining difficult-to-cut materials

Dramatic improvement in machining efficiency with titanium alloy, stainless steel machining, etc.

Machining efficiency comparison (Internal evaluation)

Titanium alloy pocketing (Depth 6 mm)

MFH Boost
Approx. 1' 30"
ap = **1.5** mm × **4** passes (fz = ~0.35 mm/t)

Machining efficiency x 1.8

Competitor C
High feed type
Approx. 2' 50"
ap = **0.6** mm × **10** passes (fz = ~0.4 mm/t)

Cutting conditions: Vc = 50 m/min, ae = 12.5 mm (ae/DCX = 50%), Ramping angle 3°, Ti-6Al-4V, wet, ø 25 (3 inserts), BT50



MFH Boost



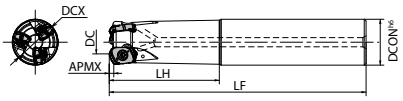


Fig. 1

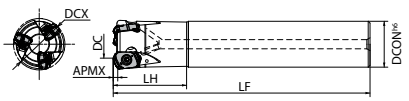


Fig. 2

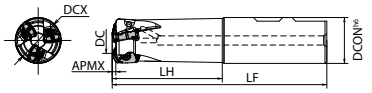


Fig. 3

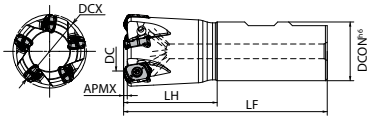


Fig. 4

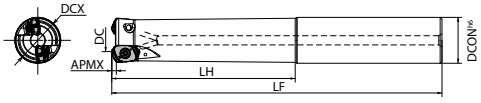


Fig. 5

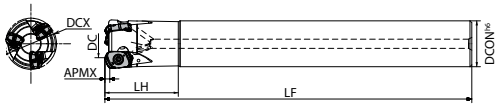


Fig. 6

Toolholder dimensions

Description			Availability	Inserts	Dimension (mm) DC	DCX	DCON	LF	LH	APMX	A.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Fig.	Spare parts: Anti-seize compound	Screw	Wrench	Applicable inserts M214
Cylindrical	Same shank	MFH 25-S25-04-2T	●	2	14	25	25	140	60	2.5	-10	Yes	12700	0.5	1	P-37	SB-3575TRP	DTPM-10	LOMU040410ER-GM
		25-S25-04-3T	●	3											1				
		32-S32-04-4T	●	4	21	32	32	150	70				11200	0.8	1				
		32-S32-04-5T	●	5											1				
	Standard shank	MFH 22-S20-04-2T	●	2	11	22	20	130	30	2.5	-10	Yes	13600	0.3	2	P-37	SB-3575TRP	DTPM-10	LOMU040410ER-GM
		28-S25-04-3T	●	3	17	28	25	140	40				12000	0.5	2				
		28-S25-04-4T	●	4											2				
		35-S32-04-4T	●		24	35	32	150	50				10700	0.8	2				
		35-S32-04-5T	●	5											2				
		40-S32-04-5T	●		29	40							10000	0.9	2				
		40-S32-04-6T	●	6											2				
	Long Shank	MFH 25-S25-04-2T-180	●	2	14	25	25	180	100	2.5	-10	Yes	12700	0.6	5	P-37	SB-3575TRP	DTPM-10	LOMU040410ER-GM
		25-S25-04-3T-180	●	3											5				
		28-S25-04-3T-200	●		17	28		200	40				12000	0.7	6				
		32-S32-04-4T-200	●	4	21	32	32		120				11200	1.1	5				
		35-S32-04-4T-200	●		24	35			50				10700		6				
		40-S32-04-5T-250	●	5	29	40		250					10000	1.5	6				
Weldon		MFH 25-W25-04-2T	●	2	14	25	25	117	60	2.5	-10	Yes	12700	0.4	3	P-37	SB-3575TRP	DTPM-10	LOMU040410ER-GM
		25-W25-04-3T	●	3											3				
		32-W32-04-4T	●	4	21	32	32	131	70				11200	0.7	3				
		32-W32-04-5T	●	5											3				
		40-W32-04-5T	●		29	40		111	50				10000		4				
		40-W32-04-6T	●	6											4				

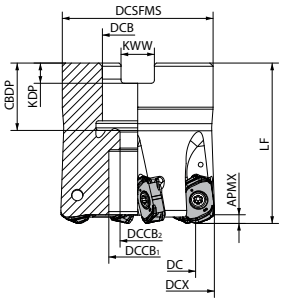
Recommended tightening torque for insert clamp 2.0N•m

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MFH Boost





Toolholder dimensions

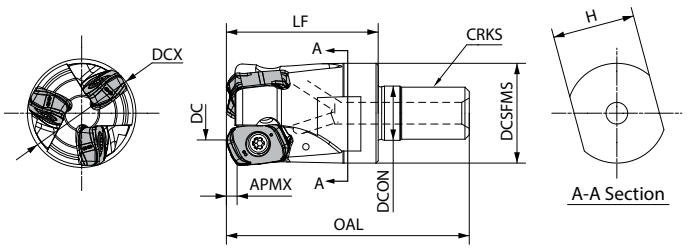
Description			Availability	Inserts	Dimension (mm)											A.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Spare parts			Applicable inserts ➡ M214
			R		DC	DCX	DCSFMS	DCB	DCCB1	DCCB2	LF	CBDP	KDP	KWW	APMX					Anti-seize compound	Screw	Wrench	
Metric	MFH	040R-04-5T-M	●	5	29	40	38	16	15	9	40	19	5.6	8.4	2.5	-10	Yes	10000	0.2	P-37	SB-3575TRP	DTPM-10	LOMU040410ER-GM
		040R-04-6T-M	●	6																			
		050R-04-6T-M	●		39	50	47	22	18	11	50	21	6.3	10.4				9000	0.4				
		050R-04-7T-M	●	7																			
		052R-04-6T-M	●	6	41	52												8800	0.5				
		052R-04-7T-M	●																0.4				
		063R-04-7T-M	●	7	52	63	60	22	18	11								8000	0.8	Recommended tightening torque for insert clamp 2.0N•m			
		063R-04-7T-27M	●					27	20	13		24	7	12.4									
		063R-04-9T-M	●	9				22	18	11		21	6.3	10.4									
		063R-04-9T-27M	●					27	20	13		24	7	12.4					0.7				
		080R-04-8T-M	●	8	69	80	76				63							7100	1.8				
		080R-04-10T-M	●	10															1.7				
Bore dia. inch spec	MFH	080R-04-8T	□	8	69	80	76	31.75	26	17	63	32	8	12.7	2.5	-10	Yes	7100	1.6	P-37	SB-3575TRP	DTPM-10	LOMU040410ER-GM
		080R-04-10T	□	10																Recommended tightening torque for insert clamp 2.0N•m			

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MFH Boost





Toolholder dimensions

Description		Availability	Inserts	Dimension (mm)									A.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Spare parts			Applicable inserts ➡ M214
				DC	DCX	DCON	DCSFMS	OAL	LF	APMX	CRKS	H				Anti-seize compound	Screw	Wrench	
MFH	22-M10-04-2T	●	2	11	22	10.5	18.7	48	30		M10X1.5	15			13600				
	25-M12-04-2T	●	2	14	25	12.5	23	56	35		M12X1.75	19			12700				
	25-M12-04-3T	●	3																
	28-M12-04-3T	●	3	17	28										12000				
	28-M12-04-4T	●	4																
	32-M16-04-4T	●	4	21	32	17	30	62	40	2.5	M16X2.0	24	-10	Yes	11200	P-37	SB-3575TRP	DTPM-10	LOMU040410ER-GM
	32-M16-04-5T	●	5																
	35-M16-04-4T	●	4	24	35										10700				
	35-M16-04-5T	●	5																
	40-M16-04-5T	●	5																
	40-M16-04-6T	●	6	29	40										10000				
	42-M16-04-5T	●	5	31	42										9800				
	42-M16-04-6T	●	6																

Recommended tightening torque for insert clamp 2.0N•m

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.
See page **M82** for applicable arbor (BT arbor for exchangeable head / double-face clamping spindle)

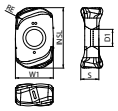
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

LOMU

Classification of usage

★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice
(In case hardness is 45HRC or under)

Carbon steel / Alloy steel			☆			★	☆	P
Mold and die steel			☆			★	☆	P
Austenitic stainless steel				☆		☆	★	M
Martensitic stainless steel	★						☆	M
Precipitation hardening stainless steel				☆			★	M
Gray cast iron		☆			★			K
Nodular cast iron		☆			★			K
Non-ferrous metals								N
Heat-resistant alloy	★						☆	S
Titanium alloy				☆			★	S
Hard materials								H

Insert		Description	No. of edges	Dimension (mm)					Carbide						Applicable toolholder
				S	D1	RE	W1	INSL	CVD	PVD					
									CA6535	PR1510	PR1525	PR1535	PR1810	PR1825	PR1835	
	 General purpose	LOMU 040410ER-GM	4	4.4	4.1	1	9.1	14.5	●	●	●	●	●	●	●	MFH...-04-..

Handed insert shows Right-hand

Recommended cutting conditions ➡ M215

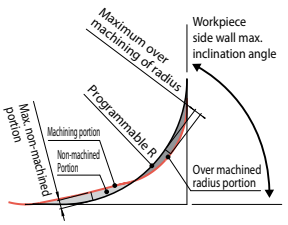
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Recommended cutting conditions ★ 1st recommendation ☆ 2nd recommendation

Chipbreaker	Workpiece		Toolholder description and feed (fz: mm/t)		Recommended insert grade (Vc: m/min)			
			ap(mm)	MFH…04…	MEGACOAT NANO EX (MEGACOAT NANO)			CVD Coating
					PR1810 (PR1510)	PR1825 (PR1525)	PR1835 (PR1535)	CA6535
GM	Carbon steel	(~ 280HB)	≤ 0.5	0.20 – **0.80** – 1.30	–	★ 120 – **160** – 220	☆ 120 – **160** – 220	–
			≤ 1.0	0.20 – **0.70** – 1.10				
			≤ 1.5	0.20 – **0.60** – 0.80				
			≤ 2.0	0.20 – **0.40** – 0.70				
			≤ 2.5	0.20 – **0.30** – 0.50				
	Alloy steel	(~ 350HB)	≤ 0.5	0.20 – **0.75** – 1.20	–	★ 100 – **150** – 200 (Dry machining recommended)	☆ 100 – **150** – 200 (Dry machining recommended)	–
			≤ 1.0	0.20 – **0.65** – 1.00				
			≤ 1.5	0.20 – **0.55** – 0.70				
			≤ 2.0	0.20 – **0.40** – 0.55				
			≤ 2.5	0.20 – **0.25** – 0.35				
	Mold steel	(~ 40HRC)	≤ 0.5	0.20 – **0.60** – 1.10	–	★ 80 – **120** – 160 (Dry machining recommended)	☆ 80 – **120** – 160 (Dry machining recommended)	–
			≤ 1.0	0.20 – **0.50** – 0.90				
			≤ 1.5	0.20 – **0.40** – 0.65				
			≤ 2.0	0.20 – **0.30** – 0.55				
			≤ 2.5	0.20 – **0.25** – 0.35				
		(40 ~ 50HRC)	≤ 0.5	0.10 – **0.30** – 0.50	–	★ 60 – **100** – 130 (Dry machining recommended)	–	–
			≤ 1.0	0.10 – **0.25** – 0.40				
			≤ 1.5	0.10 – **0.20** – 0.30				
			≤ 2.0	-				
			≤ 2.5					
		(50 ~ 55HRC)	≤ 0.5	0.10 – **0.20** – 0.40	–	★ 50 – **70** – 100 (Dry machining recommended)	–	–
			≤ 1.0	0.10 – **0.15** – 0.25				
			≤ 1.5	-				
			≤ 2.0					
			≤ 2.5					
	Austenitic stainless steel		≤ 0.5	0.20 – **0.60** – 1.00	–	☆ 100 – **140** – 180	★ 100 – **140** – 180	–
			≤ 1.0	0.20 – **0.50** – 0.90				
			≤ 1.5	0.20 – **0.45** – 0.60				
			≤ 2.0	0.20 – **0.30** – 0.50				
			≤ 2.5	0.20 – **0.25** – 0.40				
	Martensitic stainless steel		≤ 0.5	0.20 – **0.60** – 1.00	–	–	☆ 100 – **150** – 200	★ 150 – **200** – 300
			≤ 1.0	0.20 – **0.50** – 0.90				
			≤ 1.5	0.20 – **0.45** – 0.60				
			≤ 2.0	0.20 – **0.30** – 0.50				
			≤ 2.5	0.20 – **0.25** – 0.40				
	Precipitation hardened stainless steel		≤ 0.5	0.10 – **0.30** – 0.50	–	–	★ 90 – **120** – 150	–
			≤ 1.0	0.10 – **0.25** – 0.45				
			≤ 1.5	0.10 – **0.15** – 0.25				
			≤ 2.0	-				
			≤ 2.5					
	Gray cast iron		≤ 0.5	0.20 – **0.80** – 1.30	★ 120 – **160** – 220	–	–	–
			≤ 1.0	0.20 – **0.70** – 1.10				
			≤ 1.5	0.20 – **0.60** – 0.80				
			≤ 2.0	0.20 – **0.40** – 0.70				
			≤ 2.5	0.20 – **0.30** – 0.50				
	Nodular cast iron		≤ 0.5	0.20 – **0.60** – 1.00	★ 100 – **150** – 200	–	–	–
			≤ 1.0	0.20 – **0.50** – 0.90				
			≤ 1.5	0.20 – **0.40** – 0.70				
			≤ 2.0	0.20 – **0.30** – 0.60				
			≤ 2.5	0.20 – **0.25** – 0.40				
	Ni-base heat-resistant alloy		≤ 0.5	0.10 – **0.30** – 0.45	–	–	☆ 20 – **30** – 50	★ 20 – **30** – 50
			≤ 1.0	0.10 – **0.25** – 0.40				
			≤ 1.5	0.10 – **0.15** – 0.20				
			≤ 2.0	-				
			≤ 2.5					
	Titanium alloy		≤ 0.5	0.10 – **0.30** – 0.50	–	–	★ 40 – **60** – 80	–
			≤ 1.0	0.10 – **0.25** – 0.45				
			≤ 1.5	0.10 – **0.15** – 0.25				
			≤ 2.0	-				
			≤ 2.5					

- The number in bold font is recommended starting conditions. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.
- Machining with coolant is recommended for precipitation hardened stainless steel,Ni-base heat-resistant alloy and titanium alloy.
- Wet machining may have a lower tool life than dry machining. Set the cutting speed, feed rate and D.O.C. lower than recommended conditions.
- Machining with BT30 or equivalent, feed rate should be reduced to 80% or less of recommended cutting conditions. Slotting is not recommended.
- Center through air is recommended for slotting.
- Slotting or pocketing are not recommended for face mill type.
- For face mill type cutters, it is recommended that width of cut should be set to 75% or less of the cutting diameter.
- It is recommended to set the long shank to 75% or less of the recommended conditions for both ap and feed.

Approximate programming radius adjustment

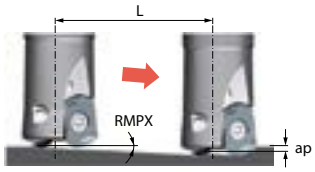
Shape	Programmable R (mm)	Over machined radius portion (mm)	Non-machined portion (mm)
	1.5	0	1.42
	2.0	0	1.24
	3.0 (Recommended)	0	0.87
	3.5	0.06	0.69

Ramping tips

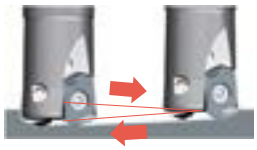
- Ramping angle should be under RMPX
- Reduce recommended feed rate in cutting conditions above by 70%

Formula for max. cutting Length (L) at max. ramping angle

$$L = \frac{ap}{\tan RMPX}$$



- When ramping both forth and back direction alternately, set the maximum ramping angle RMPX to 50%.



Reference data for ramping

Description	Cutter dia. DCX (mm)	22	25	28	32	35	40	42	50	52	63	80
MFH… -04- …	Max. ramping angle RMPX	3.9°	3.0°	2.4°	2.0°	1.7°	1.4°	1.3°	1.0°	1.0°	0.8°	0.6°
	tan RMPX	0.068	0.052	0.042	0.035	0.029	0.024	0.022	0.018	0.017	0.013	0.010

Guide for helical milling

For helical milling, use between min. cutting dia. and max. cutting dia.

⃠ Exceeding max. cutting dia.

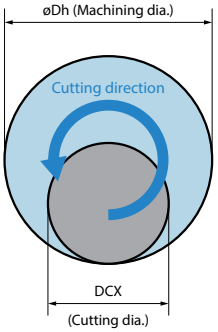
Center core part remains after machining



⃠ Under min. cutting dia.

Center core part interferes with toolholder

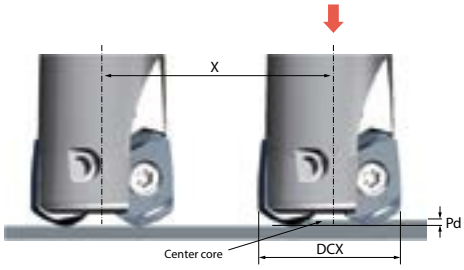




Description	Min. cutting dia. (mm)	Max. cutting dia. (mm)
MFH… -04- …	2×DCX-11	2×DCX-2

- Maximum ramping depth per cycle to be under maximum D.O.C. ap (2.5 mm)
- Use climb milling. (Refer to the above figure)
- Feed rates should be reduced to 50% of recommended cutting conditions
- Use caution to eliminate incidences caused by producing long chips

Guide for drilling

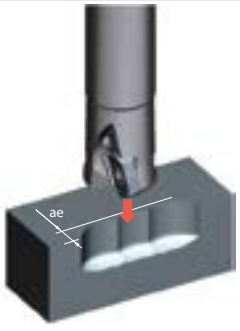


Description	GM type	
	Max. drilling depth Pd (mm)	Min. cutting length X for flat bottom surface (mm)
MFH… -04- …	0.6	DCX-12

- It is recommended to reduce feed by 25% of recommendation until the center core is removed
- Axial feed rate recommendation per revolution is f ≤ 0.2 mm/rev

Vertical milling (Plunging)

Vertical milling (Plunging)



Insert description	Maximum width of cut (ae)
LOMU04 Type	5.0 mm

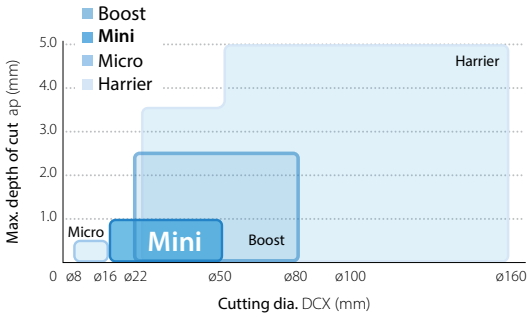
- Reduce feed rate to fz ≤ 0.2mm/t when plunging

MFH Mini

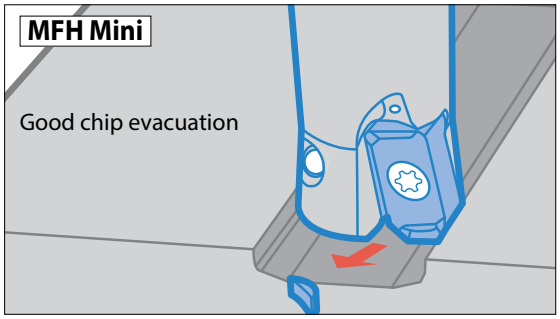
Cutter dia. ø16~ø50

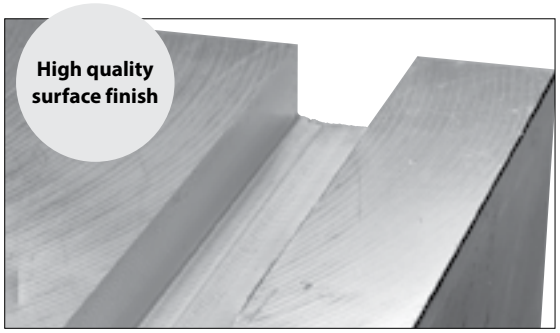
Economical double-sided 4-edge insert

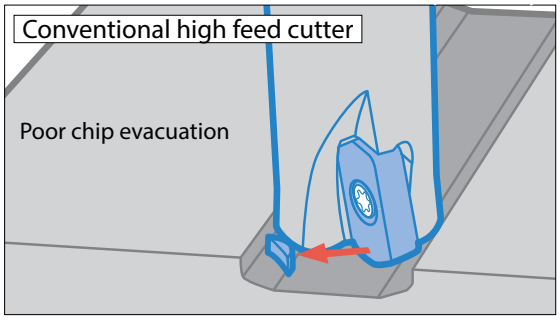
High efficiency and high feed machining at small dia. machining and small machining center



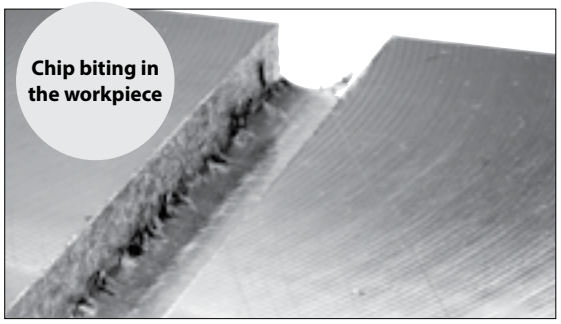
1 Excellent chip evacuation







Chips clings to the insert



(Internal evaluation)

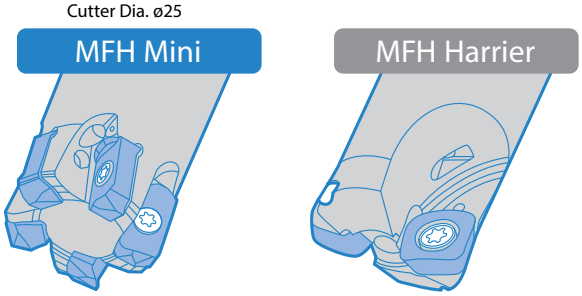
MFH Mini controls chip biting with 3D convex cutting edge



Cutting conditions: Workpiece material ST44-2 Cutter dia. ø16 Vc = 150 m/min ap x ae = 10 mm (0.5 mm x 20 passes) x16 mm fz = 0.6 mm/t Dry

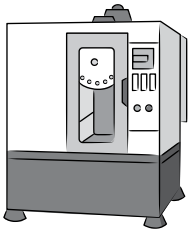
2 Multi edge design enables high efficiency machining

Cutter Dia. ø25



5 flutes	2 flutes
MFH25-S25-03-5T	MFH25-S25-10-2T

3 High efficiency and high feed machining at small machining center (BT30/BT40)



Suitable for roughing of mold

M

Milling

MFH Mini



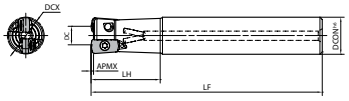


Fig. 1

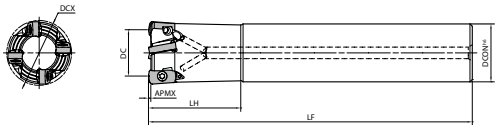


Fig. 2

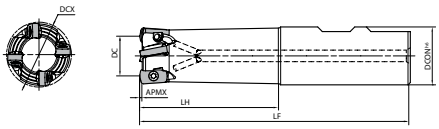


Fig. 3

Toolholder dimensions

Description				Availability	Inserts	Dimension (mm)						A.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Fig.	Spare parts			Applicable inserts M221
						DC	DCX	DCON	LF	LH	APMX						Anti-seize compound	Screw	Wrench	
Cylindrical	Same shank	MFH	16-S16-03-2T	●	2	8	16	16	100	30	1	-10	Yes	18800	0.1	1	P-37	SB-3065TRP	DTPM-8	LOGU030310ER-GM LOGU030310ER-GH
			20-S20-03-3T	●	3	12	20	20	130	50				15700	0.3	1				
			20-S20-03-4T	●	4											1				
			25-S25-03-4T	●		17	25	25	140	60				13400	0.5	1				
			25-S25-03-5T	●	5											1				
			32-S32-03-5T	●		24	32	32	150	70				11400	0.8	1				
			32-S32-03-6T	●	6											1				
	Standard shank	MFH	17-S16-03-2T	●	2	9	17	16	100	20	1	-10	Yes	17900	0.1	2	P-37	SB-3065TRP	DTPM-8	LOGU030310ER-GM LOGU030310ER-GH
			18-S16-03-2T	●		10	18							17000		2				
			22-S20-03-3T	●	3	14	22	20	130	30				14700	0.3	2				
			22-S20-03-4T	●	4											2				
			28-S25-03-4T	●		20	28	25	140	40				12400	0.5	2				
			28-S25-03-5T	●	5											2				
	Long Shank	MFH	16-S16-03-2T-150	●	2	8	16	16	150	50	1	-10	Yes	18800	0.2	1	P-37	SB-3065TRP	DTPM-8	LOGU030310ER-GM LOGU030310ER-GH
			20-S20-03-3T-160	●	3	12	20	20	160	80				15700	0.3	1				
			25-S25-03-4T-180	●	4	17	25	25	180	100				13400	0.6	1				
			32-S32-03-5T-200	●	5	24	32	32	200	120				11400	1.1	1				
Weldon		MFH	16-W16-03-2T	●	2	8	16	16	79	30	1	-10	Yes	18800	0.1	3	P-37	SB-3065TRP	DTPM-8	LOGU030310ER-GM LOGU030310ER-GH
			20-W20-03-3T	●	3	12	20	20	101	50				15700	0.2	3				
			20-W20-03-4T	●	4											3				
			25-W25-03-4T	●		17	25	25	117	60				13400	0.4	3				
			25-W25-03-5T	●	5											3				
			32-W32-03-5T	●		24	32	32	131	70				11400	0.7	3				
			32-W32-03-6T	●	6											3				

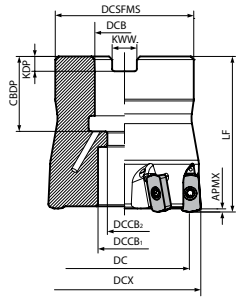
Recommended tightening torque for insert clamp 1.2N•m

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MFH Mini





Toolholder dimensions

Description		Availability	Inserts	Dimension (mm)											A.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Spare parts			Applicable inserts ➡ M221
		R		DC	DCX	DCSFMS	DCB	DCCB1	DCCB2	LF	CBDP	KDP	KWW	APMX					Anti-seize compound	Screw	Wrench	
MFH	040R-03-5T-M	●	5	32	40	38	16	15	9	40	19	5.6	8.4	1	-10	Yes	9900	0.2	P-37	SB-3065TRP	DTPM-8	LOGU030310ER-GM LOGU030310ER-GH
	040R-03-6T-M	●	6															0.24				
	040R-03-7T-M-KUA	●	7			34												0.27				
	042R-03-5T-M- KUA	●	5	34	42	38												0.26				
	042R-03-7T-M-KUA	●	7			34												0.39				
	050R-03-5T-M-KUA	●	5	42	50	47	22	19	11	50	21	6.3	10.4				8600	0.41				
	050R-03-8T-M-KUA	●	8															0.5				
	050R-03-8T-M	●	8															0.43				
	052R-03-5T-M-KUA	●	5	44	52					40								0.57				
	052R-03-8T-M-KUA	●	8	55	63			50.7										0.6				
	063R-03-8T-M-KUA	●		58	66			53.7														
	066R-03-8T-M-KUA	●																				

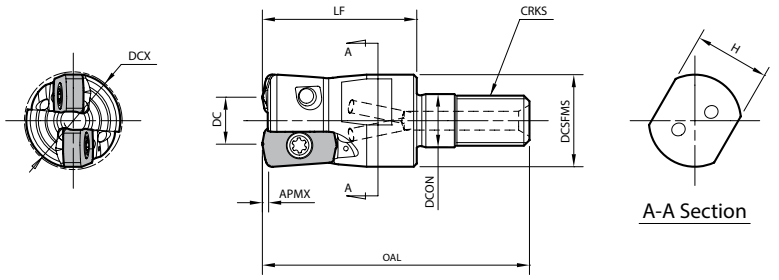
Recommended tightening torque for insert clamp 1.2N•m

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MFH Mini





Toolholder dimensions

Description		Availability	Inserts	Dimension (mm) DC	DCX	DCON	DCSFMS	OAL	LF	APMX	CRKS	H	A.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Spare parts: Anti-seize compound	Screw	Wrench	Applicable inserts ⇒ M221
MFH	16-M08-03-2T	●		8	16										18880	P-37	SB-3065TRP	DTPM-8	LOGU030310ER-GM LOGU030310ER-GH
	17-M08-03-2T	●	2	9	17	8.5	14.7	42	25	1	M8x1.25	12	-10	Yes	17900	Recommended tightening torque for insert clamp 1.2N•m			
	18-M08-03-2T	●		10	18										17000				
MFH	20-M10-03-3T	●	3	12	20										15700	P-37	SB-3065TRP	DTPM-8	LOGU030310ER-GM LOGU030310ER-GH
	20-M10-03-4T	●	4													Recommended tightening torque for insert clamp 1.2N•m			
	22-M10-03-3T	●	3	14	22	10.5	18.7	48	30	1	M10x1.5	15	-10	Yes	14700				
	22-M10-03-4T	●	4																
MFH	25-M12-03-4T	●	4	17	25										13400	P-37	SB-3065TRP	DTPM-8	LOGU030310ER-GM LOGU030310ER-GH
	25-M12-03-5T	●	5													Recommended tightening torque for insert clamp 1.2N•m			
	28-M12-03-4T	●	4	20	28	12.5	23	56	35	1	M12x1.75	19	-10	Yes	12400				
	28-M12-03-5T	●	5																
MFH	32-M16-03-5T	●	5	24	32						M16x2.0				11400	P-37	SB-3065TRP	DTPM-8	LOGU030310ER-GM LOGU030310ER-GH
	32-M16-03-6T	●	6													Recommended tightening torque for insert clamp 1.2N•m			
	35-M16-03-6T-KUA	●		27	24	17	30	62	40	1	M16x2.0	24	-10	Yes	9900				
	40-M16-03-5T-KUA	●	5	40															
	42-M16-03-5T-KUA	●		42															
	42-M16-03-7T-KUA	●	7																

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.
See page **M82** for applicable arbor (BT arbor for exchangeable head / double-face clamping spindle)

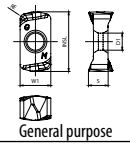
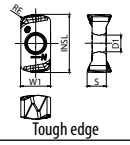
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

LOGU

Classification of usage

★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice
(In case hardness is 45HRC or under)

Carbon steel / Alloy steel				☆			★	☆	P
Mold and die steel				☆			★	☆	
Austenitic stainless steel					☆		☆	★	M
Martensitic stainless steel	★							☆	
Precipitation hardening stainless steel					☆			★	
Gray cast iron			☆			★			K
Nodular cast iron			☆			★			
Non-ferrous metals									N
Heat-resistant alloy	★							☆	S
Titanium alloy					☆			★	
Hard materials		★							H

Insert		Description		No. of edges	Dimension (mm) S	D1	RE	INSL	W1	Carbide CVD CA6535	PVD PR0155	PR1510	PR1525	PR1535	PR1810	PR1825	PR1835	Applicable toolholder M218~M220
	 General purpose	LOGU	030310ER-GM	4	3.96	3.45	1	11.9	6.2	●		●	●	●	●	●	●	MFH...-03-..
	 Tough edge	LOGU	030310ER-GH	4	3.96	3.45	1	11.9	6.2		●	●	●	●	●	●	●	MFH...-03-..

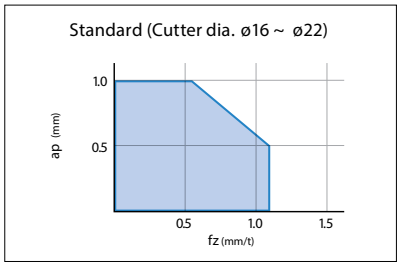
Handed insert shows Right-hand

Recommended cutting conditions ➡ M222

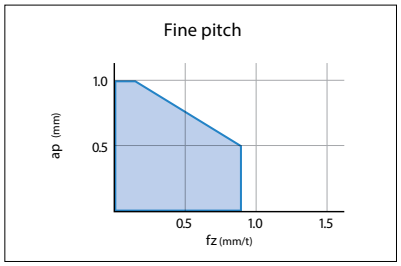
M
Milling

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

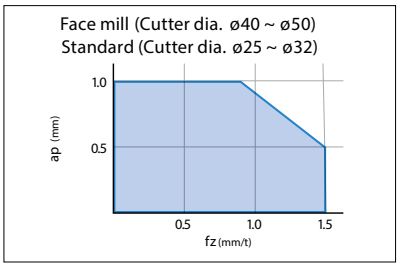
Cutting performance



MFH16-...-2T, MFH17-...-2T, MFH18-...-2T
MFH20-...-3T, MFH22-...-3T



MFH20-...-4T, MFH22-...-4T, MFH25-...-5T
MFH28-...-5T, MFH32-...-6T



MFH25-...-4T, MFH28-...-4T, MFH32-...-5T
MFH040R-..., MFH050R-...

When using fine pitch type, reduce the cutting conditions compared with standard type.

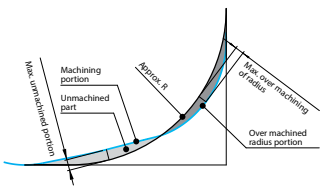
Recommended cutting conditions

Insert type	Workpiece material	Toolholder description and feed rate (fz: mm/t) * Recommended feed rate (Reference value): ap=0.5mm								Recommended insert grades (Vc: m/min)				
										MEGACOAT NANO EX (MEGACOAT NANO)			MEGACOAT HARD	CVD Coated carbide
		MFH16 -...-2T	MFH20 -...-3T	MFH20 -...-4T	MFH25 -...-4T	MFH25 -...-5T	MFH32 -...-5T	MFH32 -...-6T	MFH -...-R-03	PR1810 (PR1510)	PR1825 (PR1525)	PR1835 (PR1535)	PR015S	CA6535
GM GH	Carbon steel	0.2~**0.7**~1.2		0.2~**0.5**~0.8	0.2~**0.8**~1.5	0.2~**0.5**~0.8	0.2~**0.8**~1.5	0.2~**0.5**~0.8	0.2~**0.8**~1.5	-	★ 120~**180**~250	☆ 120~**180**~250	-	-
	Alloy steel									-	★ 100~**160**~220	☆ 100~**160**~220	-	-
	Mold steel (~ 40HRC)	0.2~**0.5**~0.9		0.2~**0.4**~0.6	0.2~**0.6**~1.2	0.2~**0.4**~0.6	0.2~**0.6**~1.2	0.2~**0.4**~0.6	0.2~**0.4**~1.2	-	☆ 80~**140**~180	☆ 80~**140**~180	GH★ 80~**140**~180	-
	Mold steel (40 ~ 50HRC)	0.2~**0.3**~0.5		0.2~**0.25**~0.3	0.2~**0.3**~0.6	0.2~**0.25**~0.3	0.2~**0.3**~0.6	0.2~**0.25**~0.3	0.2~**0.25**~0.6	-	☆ 60~**100**~130	-	GH★ 60~**100**~130	
	Mold steel (50 ~ 55HRC)	0.1~**0.3**~0.5		0.1~**0.2**~0.3	0.1~**0.3**~0.5	0.1~**0.2**~0.3	0.1~**0.3**~0.5	0.1~**0.2**~0.3	0.1~**0.3**~0.5	-	☆ 50~**70**~100	-	GH★ 50~**70**~100	-
	Mold steel (55 ~ 60HRC)	0.03~0.06~0.1(* Recommended only for GH chipbreaker)								-	-	-	GH☆ 50~**60**~70	-
	Stainless steel (Austenitic related)	0.2~**0.5**~0.9		0.2~**0.4** ~0.6	0.2~**0.6**~1.2	0.2~**0.4** ~0.6	0.2~**0.6**~1.2	0.2~**0.4** ~0.6	0.2~**0.4** ~0.6	-	GM☆ 100~**160**~200	GM★ 100~**160**~200	-	-
	Stainless steel (Martensitic related)									-	-	☆ 150~**200**~250	-	★ 180~**240**~300
	Stainless steel (Precipitation hardening)									-	-	★ 90~**120**~150	-	-
	Gray cast iron	0.2~**0.7**~1.2		0.2~**0.5**~0.8	0.2~**0.8**~1.5	0.2~**0.5**~0.8	0.2~**0.8**~1.5	0.2~**0.5**~0.8	0.2~**0.5**~0.8	★ 120~**180**~250	-	-	-	-
	Nodular cast iron	0.2~**0.5**~0.9		0.2~**0.4**~0.6	0.2~**0.6**~1.2	0.2~**0.4**~0.6	0.2~**0.6**~1.2	0.2~**0.4**~0.6	0.2~**0.4**~0.6	★ 100~**150**~200	-	-	-	-
	Ni-base heat-resistant alloys	0.2~**0.3**~0.6		0.2~**0.25**~0.4	0.2~**0.4**~0.8	0.2~**0.25**~0.4	0.2~**0.4**~0.8	0.2~**0.25**~0.4	0.2~**0.25**~0.4	-	-	☆ 20~**30**~50	-	★ 20~**30**~50
	Titanium alloys									GM☆ 30~**50**~70	-	GM★ 40~**60**~80	-	-

* Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.
The bold-faced number indicates a center value of recommended cutting condition.
Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.
For machining center equivalent to BT30, reduce feed rate to 25% or less of the recommended condition.
For slotting, internal coolant or center through coolant is recommended.
Slotting and pocketing are not recommended for face mill type.

Standard Fine pitch ★: 1st Recommendation ☆: 2nd Recommendation

Note for machining program (Approx. R)

Shape	Approx. R (mm)	Max. over machining of radius (mm)	Max. unmachined portion (mm)
	R1.0	0	0.51
	R1.5	0	0.41
	R1.6 (Recommended)	0	0.39
	R2.0	0.09	0.31

Cutting edge angle: 12°

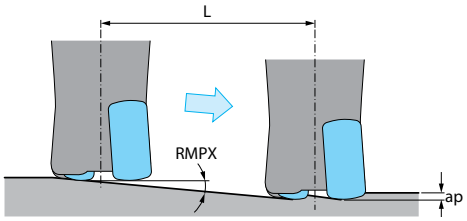
Reference data for ramping

Description	Cutter dia. DCX (mm)	16	17	18	20	22	25	28	32	40	50
MFH ...-03-...	Max. ramping angle RMPX	2.8°	2.5°	2.1°	1.7°	1.4°	1.2°	1°	0.8°	0.5°	0.4°
	tan RMPX	0.049	0.042	0.037	0.03	0.024	0.021	0.017	0.014	0.009	0.007

Guide for ramping (Slant milling)

Ramping angle should be RMPX (Maximum ramping angle) or under in the above cutting conditions.
Feed rate should be 70% or undear of the above cutting conditions.

Formula of the cutting length "L" at max. ramping angle $L = \frac{ap}{\tan RMPX}$

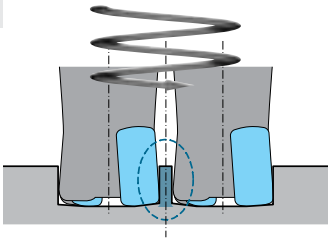


Guide for helical milling

For helical milling, use between min. cutting dia. and max. cutting dia.

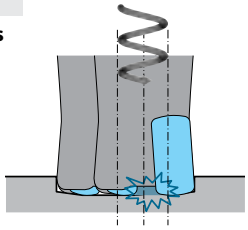
Over max. cutting dia.

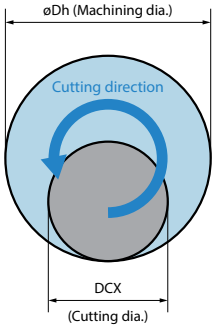
Center core part remains after machining



Under min. cutting dia.

Center core part interferes with toolholder



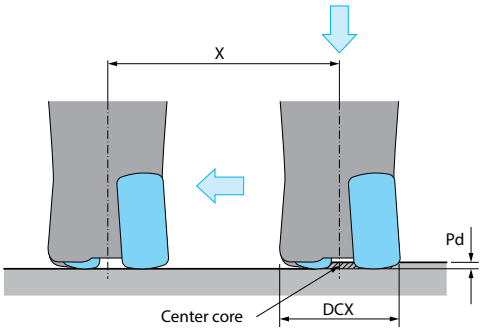


Description	Min. cutting dia.	Max. cutting dia.
MFH...-03-...	2×DCX-8	2×DCX-2

Unit: mm

- Sinking depth at helical milling should be max. ap (1mm) or under.
- Down-cut milling is recommended. (refer to the figure above)
- Feed rate should be under 50% of the recommended cutting conditions.
- Be careful to machine in a safe environment to avoid accident caused by long chips.

Guide for drilling



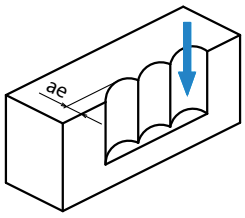
Description	GM type / GH type	
	Max. cutting depth Pd	Min. cutting length X for flat bottom surface
MFH...-03-...	1.0	DCX-9

Unit: mm

* When traversing directly after drilling, set the table feed at up to 25% of the recommended cutting conditions.
* When drilling, reduce feed rate per revolution to f=0.2 mm/rev or under.

Vertical milling (Plunging)

Vertical milling (Plunging)



Available for vertical milling (plunging).

Insert description	Max. width of cut
LOGU03 type	3.5mm

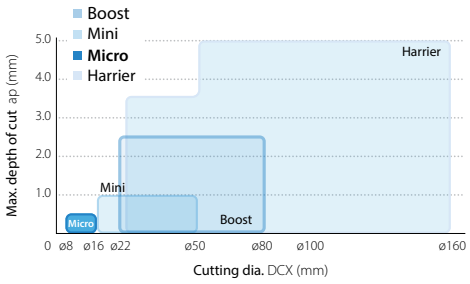
For vertical milling (plunging),
reduce feed rate to fz=0.2mm/t or less.

MFH Micro

Cutter dia. ø8~ø16

Low resistance and durable against chatter for highly efficient machining. Max. ap 0.5mm.

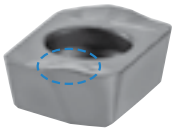
Stable high feed machining on a wide range of applications



1 Stable machining with chattering resistance

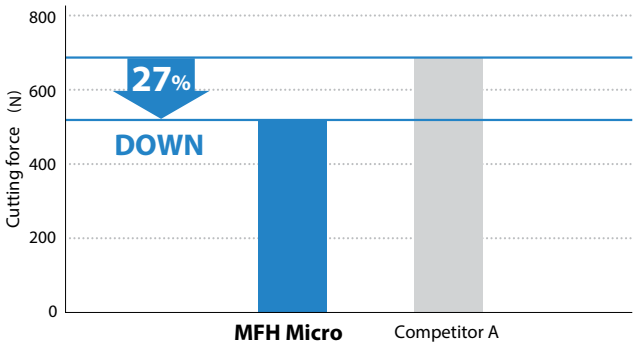
3D convex cutting edge controls initial impact when entering the workpiece

3D convex cutting edge



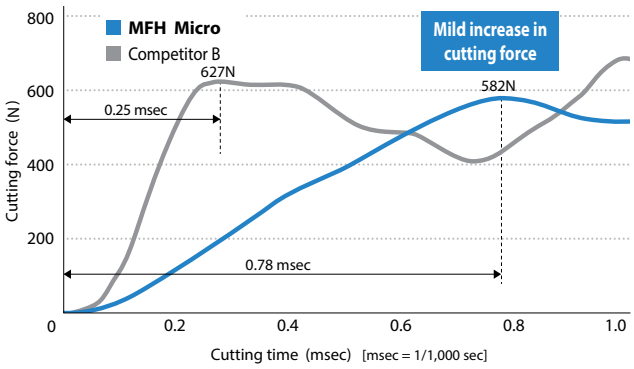
High precision G class insert

Cutting force comparison (Internal evaluation)



Cutting conditions: Vc = 120 m/min, ap = 0.4mm, fz = 0.6mm/t
Cutter dia. ø10mm, slotting, dry workpiece material: 50C

Increase in cutting force when entering workpiece (Internal evaluation)



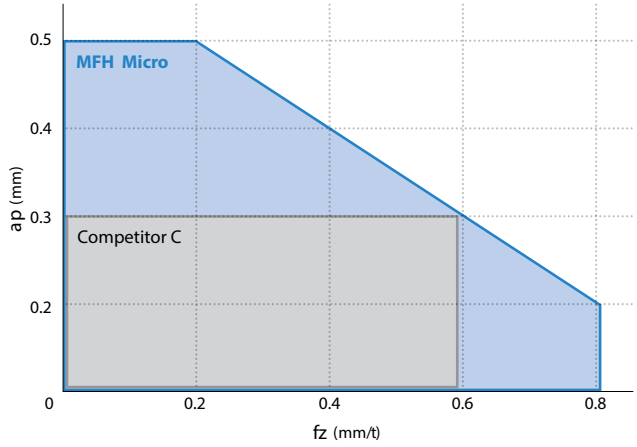
Cutting conditions: Vc = 120 m/min, ap × ae = 0.4 × 5mm, fz = 0.6mm/t
Cutter dia. ø10mm, dry workpiece material: 50C

2 Wide range of machining applications

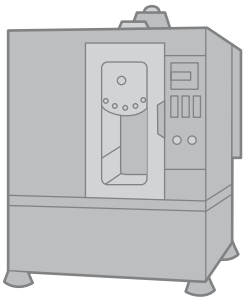
Wide range of machining applications at a maximum depth of cut of 0.5mm

Stable machining even with small machining centers

Cutting performance map (Cutter dia. ø10mm)



(Internal evaluation)

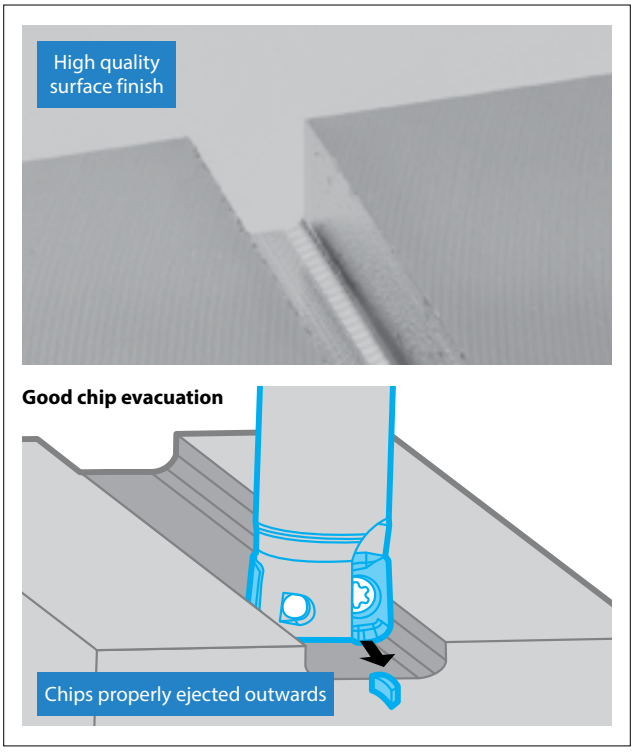


Applicable for BT30/ BT40

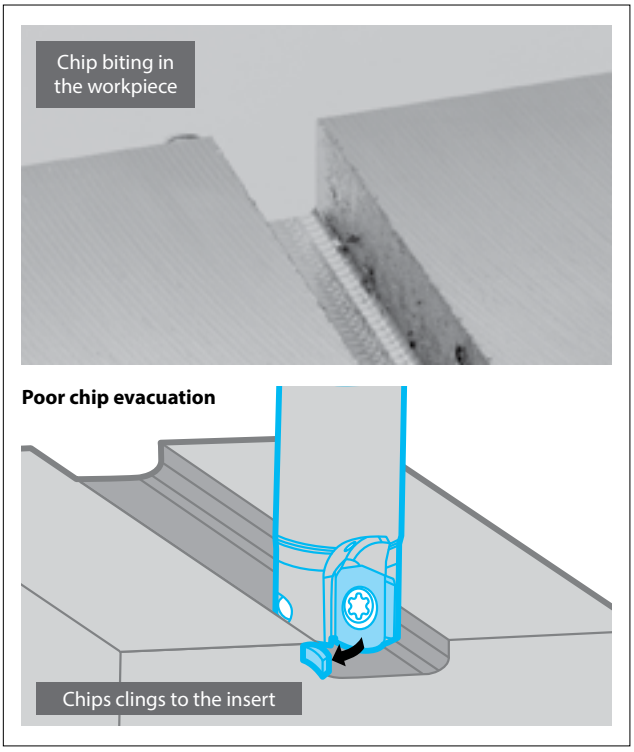
3 Excellent chip evacuation

Controls chip biting with convex cutting edge

MFH Micro



Competitor F



Cutting conditions: Cutter dia. DCX = ø10mm, Vc = 120 m/min, ap = 0.4mm (25pass), fz = 0.6mm/t Total 10mm, Dry workpiece material: ST44-2 (Internal evaluation)

4 Replaces solid end mills to reduce machining costs

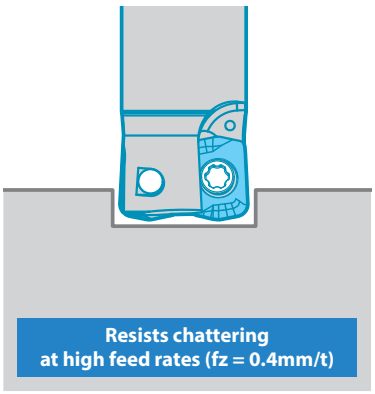
Suppresses chattering and increases milling efficiency

MFH Micro compared to solid end mills

MFH Micro Q = 15.3 cc/min

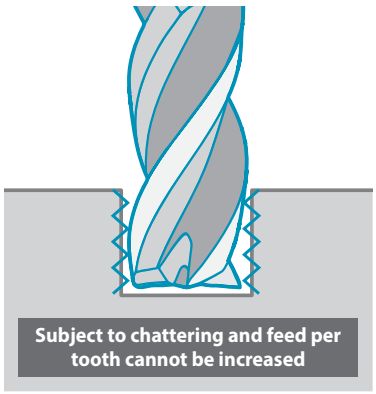
Vc = 150 m/min, fz = 0.4mm/t
ap × ae = 0.4 × 10mm, dry
MFH10-S10-01-2T (2 flutes)
LPGT010210ER-GM (PR1525)

1.25times Machining efficiency

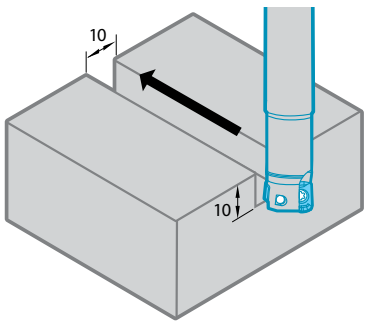


Solid end mill Q = 12.2 cc/min

Vc = 80 m/min, fz = 0.04mm/t
ap × ae = 3 × 10mm, dry
ø10 (4 flutes)



Machine part slotting workpiece material: 50C



(User evaluation)

MFH Micro



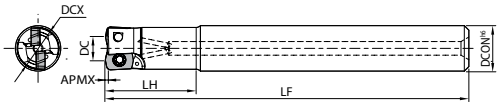


Fig. 1

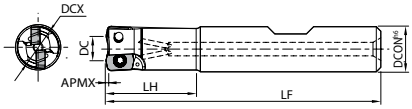


Fig. 2

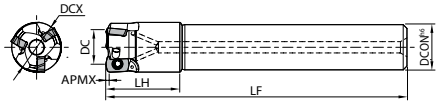


Fig. 3

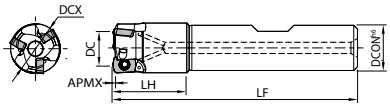


Fig. 4

Toolholder dimensions

Description			Availability	Inserts	Dimension (mm) DC	DCX	DCON	LF	LH	APMX	A.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Fig.	Spare parts: Anti-seize compound	Screw	Wrench	Applicable inserts ➡ M226
Cylindrical	MFH	08-S10-01-1T	●	1	4.2	8	10	75	16	0.5	+5	Yes	20000	0.04	1	P-37	SB-1840TRP	FTP-6	LPGT010210ER-GM
		10-S10-01-2T	●	2	6.2	10		80	20				16200		1				
		12-S12-01-3T	●	3	8.2	12	12						14000	0.06	1				
		16-S16-01-4T	●	4	12.2	16	16	90	25				11400	0.12	1				
	MFH	14-S12-01-3T	●	3	10.2	14	12	80	20	0.5	+5	Yes	12500	0.07	3	P-37	SB-1840TRP	FTP-6	
Weldon	MFH	08-W10-01-1T	●	1	4.2	8	10	58	16	0.5	+5	Yes	20000	0.03	2	P-37	SB-1840TRP	FTP-6	LPGT010210ER-GM
		10-W10-01-2T	●	2	6.2	10		60	20				16200		2				
		12-W12-01-3T	●	3	8.2	12	12	65					14000	0.05	2				
		16-W16-01-4T	●	4	12.2	16	16	73	25				11400	0.1	2				
	MFH	14-W12-01-3T	●	3	10.2	14	12	65	20	0.5	+5	Yes	12500	0.05	4	P-37	SB-1840TRP	FTP-6	

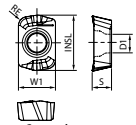
Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.
Recommended tightening torque for insert clamp : 0.5N·m

LPGT

Classification of usage

★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice
(In case hardness is 45HRC or under)

Carbon steel / Alloy steel		☆		★	☆	P
Mold and die steel		☆		★	☆	
Austenitic stainless steel			☆	☆	★	M
Martensitic stainless steel	★				☆	
Precipitation hardening stainless steel			☆		★	
Gray cast iron						K
Nodular cast iron						
Non-ferrous metals						N
Heat-resistant alloy	★				☆	S
Titanium alloy			☆		★	
Hard materials						H

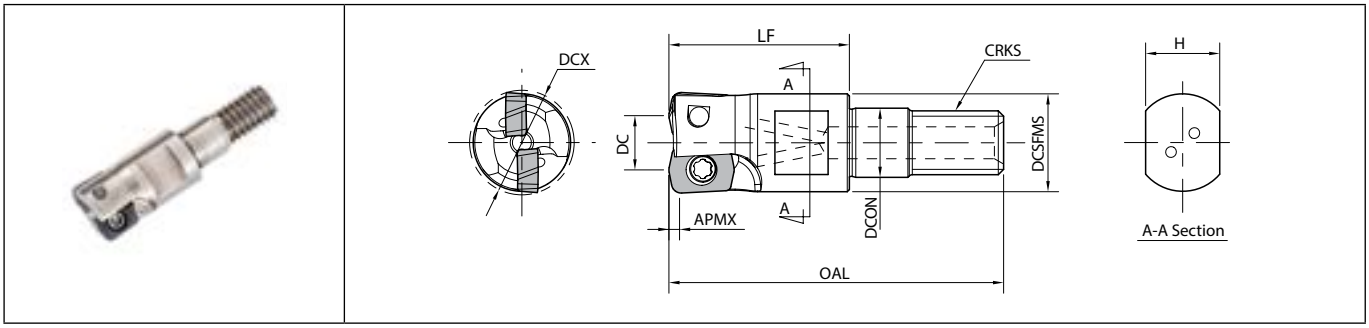
Insert	Description	Dimension (mm) S	D1	RE	W1	INSL	Carbide CVD CA6535	PVD PR1525	PR1535	PR1825	PR1835	Applicable toolholder ➡ M226 M227
  General purpose	LPGT 010210ER-GM	2.19	2.1	1	4.19	6.26	●	●	●	●	●	MFH...-01-..

Handed insert shows Right-hand

Recommended cutting conditions ➡ M228

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MFH Micro

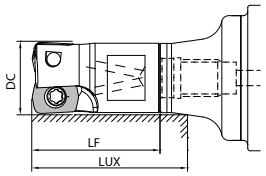


Toolholder dimensions

Description		Availability	Inserts	Dimension (mm)								A.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Spare parts			Applicable inserts M226
				DC	DCX	DCON	DCSFMS	OAL	LF	APMX	CRKS	H			Anti-seize compound	Screw	Wrench	
MFH	08-M06-01-1T	●	1	4.2	8	6.5	9.2	30.5	17	0.5	M6x1.0	7	+5	Yes	20000	P-37	SB-1840TRP	FTP-6	LPGT010210ER-GM
	10-M06-01-2T	●	2	6.2	10										16200				
	12-M06-01-3T	●	3	8.2	12		11.2								14000				
	14-M06-01-3T	●		10.2	14										12500				
MFH	16-M08-01-4T	●	4	12.2	16	8.5	14.7	39	22	0.5	M8x1.25	12	+5	Yes	11400	P-37	SB-1840TRP	FTP-6	

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.
Please use commercial shanks for cutting diameter from ø8 to ø14 (Screw size : M6 x 1.0)
Check screw specifications for the shank in use.
Recommended tightening torque for insert clamp : 0.5N·m

Actual End Mill depth **(MFH16-M08-01-4T)**

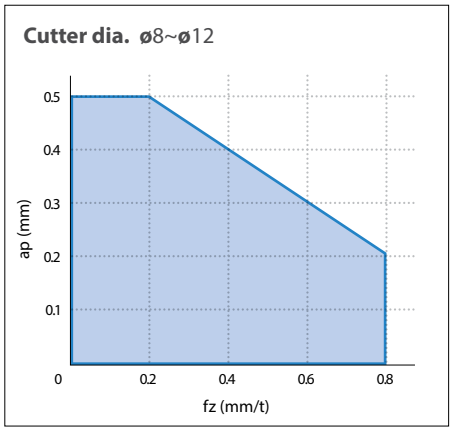


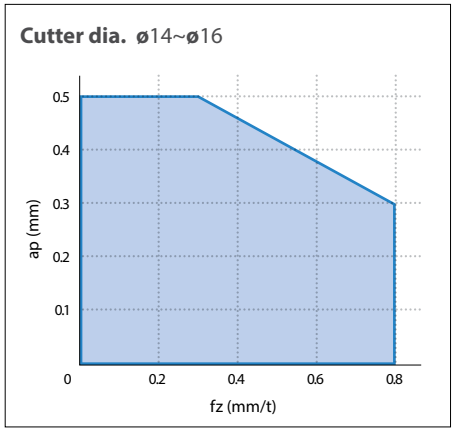
Arbor Description	Applicable End Mill (Head)			Actual End Mill depth (mm)
	Description	Cutting Dia.	Dimension	
		DC	LF	LUX
BT30K-M08-45	MFH16-M08-01-4T	16	22	28.8
BT40K-M08-55	MFH16-M08-01-4T	16	22	28.7

See page M82 for applicable arbor (BT arbor for exchangeable head / double-face clamping spindle)

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Cutting performance





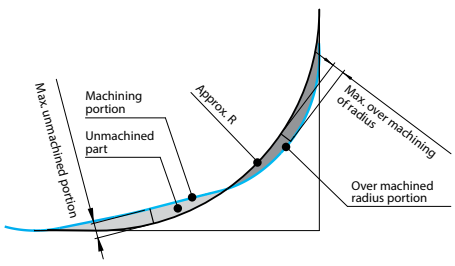
Recommended cutting conditions

Insert type	Workpiece material	Recommended feed rate (fz: mm/t): ap: 0.3mm (Reference value)					Recommended insert grades (Cutting speed Vc: m/min)		
		MFH08-...-1T	MFH10-...-2T	MFH12-...-3T	MFH14-...-3T	MFH16-...-4T	MEGACOAT NANO EX (MEGACOAT NANO) PR1825 (PR1525)	MEGACOAT NANO EX (MEGACOAT NANO) PR1835 (PR1535)	CVD Coated carbide CA6535
GM	Carbon steel	0.2~**0.4**~0.6			0.2~**0.5**~0.8		★ 120~**180**~250	☆ 120~**180**~250	-
	Alloy steel						★ 100~**160**~220	☆ 100~**160**~220	-
	Mold steel (~ 40HRC)	0.2~**0.3**~0.5			0.2~**0.4**~0.6		★ 80~**140**~180	☆ 80~**140**~180	-
	Mold steel (40 ~ 50HRC)	0.2~**0.25**~0.3			0.2~**0.25**~0.4		★ 60~**100**~130	☆ 60~**100**~130	-
	Stainless steel (Austenitic related)	0.2~**0.3**~0.5			0.2~**0.4**~0.6		☆ 100~**160**~200	★ 100~**160**~200	-
	Stainless steel (Martensitic related)						-	☆ 150~**200**~250	★ 180~**240**~300
	Stainless steel (Precipitation hardening)						-	★ 90~**120**~150	-
	Gray cast iron	0.2~**0.4**~0.6			0.2~**0.5**~0.8		★ 120~**180**~250	-	-
	Nodular cast iron	0.2~**0.3**~0.5			0.2~**0.4**~0.6		★ 100~**150**~200	-	-
	Ni-base heat-resistant alloys	0.2~**0.25**~0.3			0.2~**0.25**~0.4		-	☆ 20~**30**~50	★ 20~**30**~50
	Titanium alloys						-	★ 40~**60**~80	-

Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.
The bold-faced number indicates a center value of recommended cutting condition.
Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.
Internal coolant is recommended for slotting.

★: 1st Recommendation ☆: 2nd Recommendation

Note for machining program (Approx. R)

Shape	Approx. R (mm)	Max. over machining of radius (mm)	Max. unmachined portion (mm)
	R1.0	0	0.21
	R1.2 (Recommended)	0	0.17
	R1.5	0.08	0.1
	R2.0	0.28	0.01

Cutting edge angle:12°

Reference data for ramping

Description	Cutter dia. DCX (mm)	8	10	12	14	16
MFH...-01-...	Max. ramping angle RMPX	4.0°	3.0°	2.0°	1.5°	1.2°
	tan RMPX	0.070	0.052	0.035	0.026	0.021

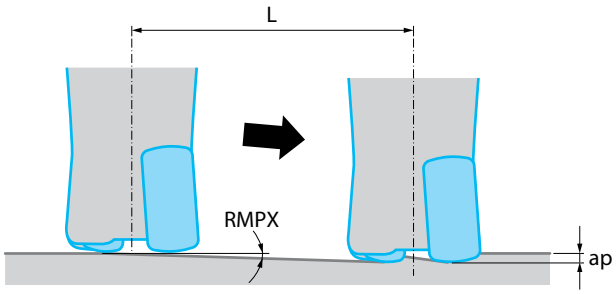
Decrease ramping angle if chips become excessively long.

Guide for ramping (Slant milling)

Ramping angle should be RMPX (Maximum ramping angle) or under in the above cutting conditions.
Feed rate should be 70% or under of the above cutting conditions.

Formula of the cutting length "L" at max. ramping angle

$$L = \frac{ap}{\tan RMPX}$$

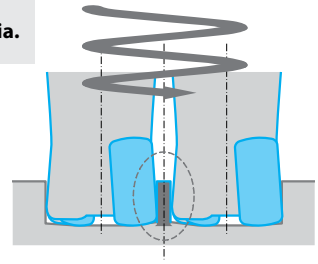


Guide for helical milling

For helical milling, use between min. cutting dia. and max. cutting dia.

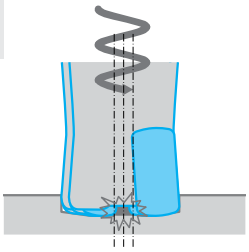
Exceeding max. cutting dia.

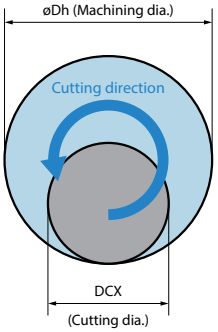
Center core part remains after machining



Under min. cutting dia.

Center core part interferes with toolholder



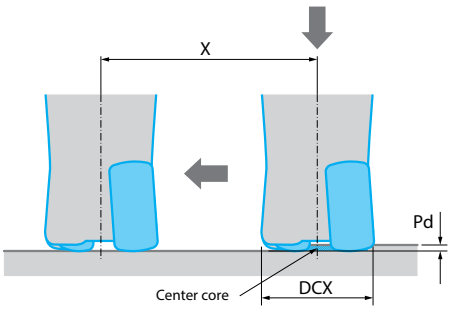


Description	Min. cutting dia.	Max. cutting dia.
MFH...-01-...	2×DCX-3.5	2×DCX-2

Unit: mm

- Sinking depth at helical milling should be max. ap (0.5mm) or under.
- Down-cut milling is recommended (refer to the figure above).
- Feed rate should be under 50% of the recommended cutting conditions.
- Be careful to machine in a safe environment to avoid accident caused by long chips.

Guide for drilling



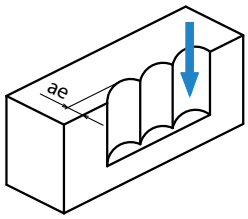
Description	GM type	
	Max. cutting depth	Min. cutting length X for flat bottom surface
MFH...-01-...	0.5	DCX-3.5

Unit: mm

* When traversing directly after drilling, set the table feed at up to 25% of the recommended cutting conditions.
* When drilling, reduce feed rate per revolution to under f=0.2mm/rev.

Vertical milling (Plunging)

Vertical milling (Plunging)



Available for vertical milling (plunging).

Insert description	Max. width of cut
LOGT01 type	1.7mm

For vertical milling (plunging), reduce feed rate to fz=0.2mm/t or less.

MEY



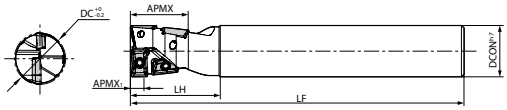


Fig. 1

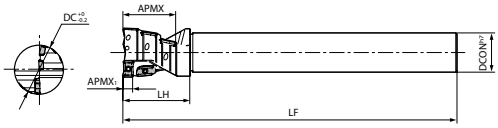


Fig. 2

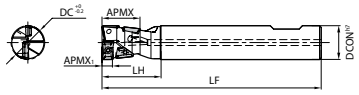


Fig. 3

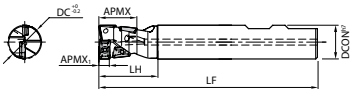


Fig. 4

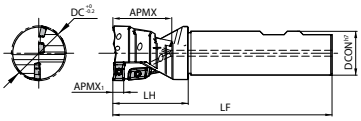


Fig. 5

Toolholder dimensions

Description			Availability	Inserts	Flutes	Dimension (mm)						A.R. (°)	R.R. (°)	Coolant hole	Fig.	Spare parts			Applicable inserts ➔ M232
						DC	DCON	LF	LH	APMX	APMX1					Anti-seize compound	Screw	Wrench	
Standard	MEY	16-S16	●	4	2	16	16	120	31	19	4.5	+11	-11	No	1	P-37	SB-2040TRG	DTM-6	Center Edge : GOMT08T208ER-D Side Edge : JOMT08T208ER-D
		17-S16	●			17									1				
		20-S20	●			20	20	130	35	22	6	+13	-9		1		SB-2555TRG	DT-8	Center Edge : GOMT100308ER-D Side Edge : JOMT100308ER-D
		21-S20	●			21									1				
		25-S25	●			25	25	140	40	28	7.5		-11		1		SB-3070TRG	DT-10	Center Edge : GOMT13T308ER-D Side Edge : JOMT13T308ER-D
		26-S25	●			26									1				
		32-S32	●			32	32	150	50	36	9.5		-9		1		SB-4070TRG	DT-15	Center Edge : GOMT160408ER-D Side Edge : JOMT160408ER-D
		33-S32	●			33									1				
		40-S32	●	7		40		160	55	42	7.5		-11		2		SB-3070TRG	DT-10	Center Edge : GOMT13T308ER-D Side Edge : JOMT13T308ER-D
		50-S42	●			50	42	170	70	54	9.5		-9		2		SB-4070TRG	DT-15	Center Edge : GOMT160408ER-D Side Edge : JOMT160408ER-D
Long head	MEY	16-S16-140H	●	4	2	16	16	140	51	19	4.5	+11	-11	No	1	P-37	SB-2040TRG	DTM-6	Center Edge : GOMT08T208ER-D Side Edge : JOMT08T208ER-D
		20-S20-150H	●			20	20	150	53	22	6	+13	-9		1		SB-2555TRG	DT-8	Center Edge : GOMT100308ER-D Side Edge : JOMT100308ER-D
		25-S25-170H	●			25	25	170	70	28	7.5		-11		1		SB-3070TRG	DT-10	Center Edge : GOMT13T308ER-D Side Edge : JOMT13T308ER-D
		32-S32-180H	●			32	32	180	80	36	9.5		-9		1		SB-4070TRG	DT-15	Center Edge : GOMT160408ER-D Side Edge : JOMT160408ER-D
Long shank	MEY	16-S16-190	●	4	2	16	16	190	61	19	4.5	+11	-11	No	1	P-37	SB-2040TRG	DTM-6	Center Edge : GOMT08T208ER-D Side Edge : JOMT08T208ER-D
		17-S16-190	●			17			31						1				
		20-S20-200	●			20	20	200	63	22	6	+13	-9		1		SB-2555TRG	DT-8	Center Edge : GOMT100308ER-D Side Edge : JOMT100308ER-D
		21-S20-200	●			21			35						1				
		25-S25-220	●			25	25	220	80	28	7.5		-11		1		SB-3070TRG	DT-10	Center Edge : GOMT13T308ER-D Side Edge : JOMT13T308ER-D
		26-S25-220	●			26			40						1				
		32-S32-230	●			32	32	230	90	36	9.5		-9		1		SB-4070TRG	DT-15	Center Edge : GOMT160408ER-D Side Edge : JOMT160408ER-D
		33-S32-230	●			33			50						1				
		40-S32-240	●	7		40		240	55	42	7.5		-11		2		SB-3070TRG	DT-10	Center Edge : GOMT13T308ER-D Side Edge : JOMT13T308ER-D
		50-S42-250	●			50	42	250	70	54	9.5		-9		2		SB-4070TRG	DT-15	Center Edge : GOMT160408ER-D Side Edge : JOMT160408ER-D

APMX1 shows the edge length of the complete 2-insert part.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Toolholder dimensions

Description			Availability	Inserts	Flutes	Dimension (mm)						A.R. (°)	R.R. (°)	Coolant hole	Fig.	Spare parts			Applicable inserts M232
						DC	DCON	LF	LH	APMX	APMX1					Anti-seize compound	Screw	Wrench	
																			
Weldon	MEY	16-S16-80W-H	●	4	2	16	16	80	31	19	4.5	+11	-11	No	3	P-37	SB-2040TRG	DTM-6	Center Edge : GOMT08T208ER-D Side Edge : JOMT08T208ER-D
		17-S16-80W-H	●			17									3				
		20-S20-85W-H	●			20	20	85	35	22	6	+13	-9		3		SB-2555TRG	DT-8	Center Edge : GOMT100308ER-D Side Edge : JOMT100308ER-D
		21-S20-85W-H	●			21									3				
		25-S25-95W-H	●			25	25	95	40	28	7.5		-11		4		SB-3070TRG	DT-10	Center Edge : GOMT13T308ER-D Side Edge : JOMT13T308ER-D
		32-S32-110W-H	●			32	32	110	50	36	9.5		-9		4		SB-4070TRG	DT-15	Center Edge : GOMT160408ER-D Side Edge : JOMT160408ER-D
		33-S32-110W-H	●			33									4				
		40-S32-130W-H	●	7		40		130	55	42	7.5		-11		5		SB-3070TRG	DT-10	Center Edge : GOMT13T308ER-D Side Edge : JOMT13T308ER-D

APMX1 shows the edge length of the complete 2-insert part.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

Applicable Inserts

Description		Applicable Inserts M232			
					
		Side Edge	No. of Inserts	Center Edge	No. of Inserts
MEY	16-S16(-....)	JOMT08T208ER-D	3	GOMT08T208ER-D	1
	17-S16(-....)				
	20-S20(-....)	JOMT100308ER-D		GOMT100308ER-D	
	21-S20(-....)				
	25-S25(-....)	JOMT13T308ER-D		GOMT13T308ER-D	
	26-S25(-....)				
	32-S32(-....)	JOMT160408ER-D		GOMT160408ER-D	
	33-S32(-....)				
	40-S32(-....)	JOMT13T308ER-D	6	GOMT13T308ER-D	
	50-S42(-....)	JOMT160408ER-D		GOMT160408ER-D	

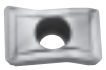
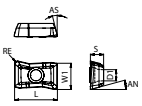
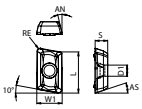
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GOMT/JOMT

Classification of usage

★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice
(In case hardness is 45HRC or under)

Carbon steel / Alloy steel		★	P
Mold and die steel		★	P
Austenitic stainless steel		☆	M
Martensitic stainless steel			M
Precipitation hardening stainless steel			M
Gray cast iron	★		K
Nodular cast iron	★		K
Non-ferrous metals			N
Heat-resistant alloy			S
Titanium alloy			S
Hard materials			H

Insert		Description	No. of edges	Dimension (mm)					Angle (°)		Carbide PVD		Applicable toolholder ⇒ M230 M231
				S	D1	RE	L	W1	AN	AS	PR1810	PR1825	
		GOMT 08T208ER-D	2	2.78	2.3	0.8	8.7	5.21	17	13	●	●	MEY16-S16(-...) MEY17-S16(-...)
		GOMT 100308ER-D	2	3.3	2.8	0.8	10.7	6.56	17	13	●	●	MEY20-S20(-...) MEY21-S20(-...)
		GOMT 13T308ER-D	2	3.85	3.4	0.8	13.2	8.36	17	13	●	●	MEY25-S25(-...) MEY26-S25(-...) MEY40-S32(-...)
		GOMT 160408ER-D	2	4.76	4.4	0.8	16.7	10.03	17	13	●	●	MEY32-S32(-...) MEY33-S32(-...) MEY50-S42(-...)
		JOMT 08T208ER-D	2	2.78	2.3	0.8	8.5	5.14	13	17	●	●	MEY16-S16(-...) MEY17-S16(-...)
		JOMT 100308ER-D	2	3.18	2.8	0.8	10.2	6.41	13	17	●	●	MEY20-S20(-...) MEY21-S20(-...)
		JOMT 13T308ER-D	2	3.7	3.4	0.8	13.2	8.07	13	17	●	●	MEY25-S25(-...) MEY26-S25(-...) MEY40-S32(-...)
		JOMT 160408ER-D	2	4.5	4.4	0.8	16.7	9.72	13	17	●	●	MEY32-S32(-...) MEY33-S32(-...) MEY50-S42(-...)

Handed insert shows Right-hand

Recommended cutting conditions ⇒ M233

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Recommended cutting conditions

Workpiece material	fz (mm/t)		Recommended insert grades (Vc: m/min)	
			MEGACOAT NANO EX	
	Drilling	Shouldering, slotting	PR1810	PR1825
Carbon steel	0.08~0.15	0.05~0.25	-	★ 120~250
Alloy steel	0.08~0.15	0.05~0.25	-	★ 100~220
Mold steel	0.08~0.12	0.05~0.15	-	★ 80~180
Stainless steel	0.08~0.12	0.05~0.15	-	★ 120~220
Cast iron	0.05~0.20	0.05~0.25	★ 100~220	-

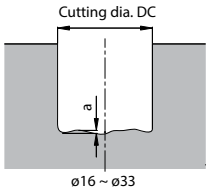
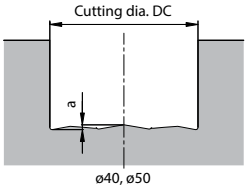
★: 1st Recommendation ☆: 2nd Recommendation

Caution of drilling

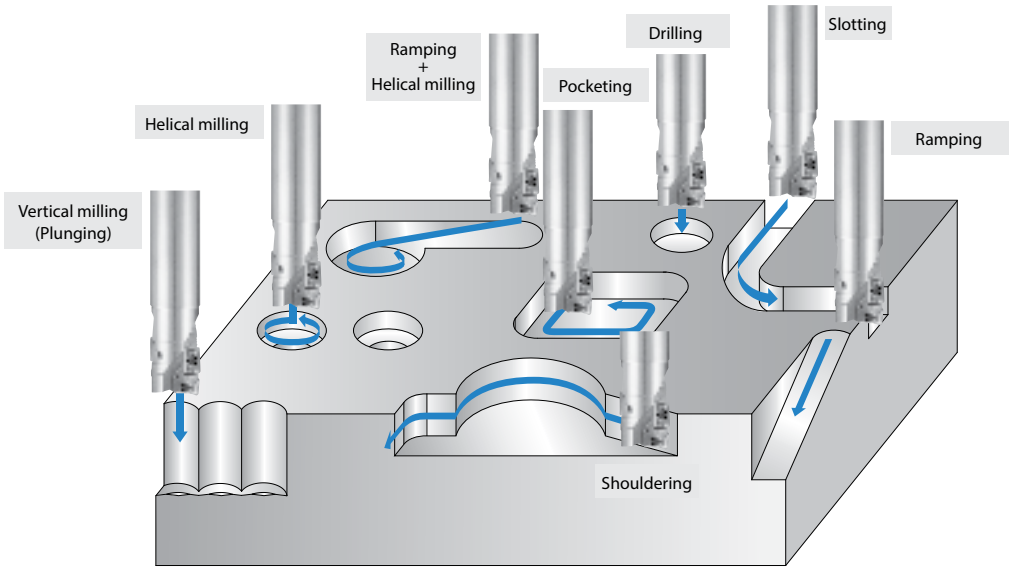
1. Drilling conditions should be calculated as one flute line.
2. Use compressed air during drilling.
3. Carbon steel other than low carbon steel can be drilled to a depth of 0.5D without step feeding. For soft steel or sticky material such as stainless steel, Step feed drilling (0.5 ~ 1.0mm) is recommended.
4. For stainless steel drilling, coolant is recommended.
5. Please refer to right list for maximum hole depth.

Cutting dia.(DC)	Max. hole depth (mm)
ø16	13
ø17	13
ø20	17
ø21	17
ø25	22
ø26	22
ø32	29
ø33	29
ø40	36
ø50	40

Shape of the bottom of the drilled hole

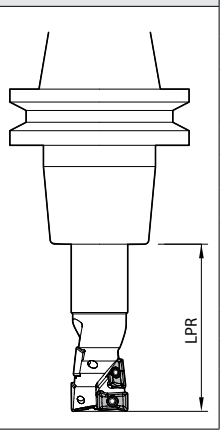
Cutting dia.	a (mm)	Shape of the bottom
ø16, ø17	0.5	
ø20, ø21	0.64	
ø25, ø26	0.85	
ø32, ø33	1.12	
ø40	1.54	
ø50	1.65	

Examples of MEY multi-function machining

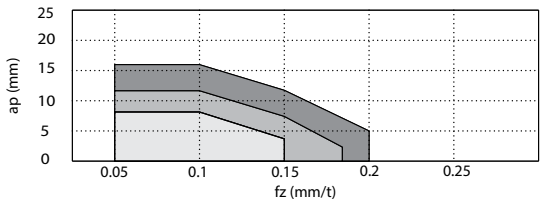
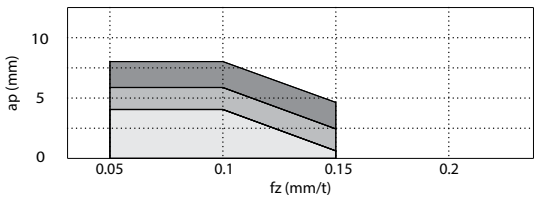
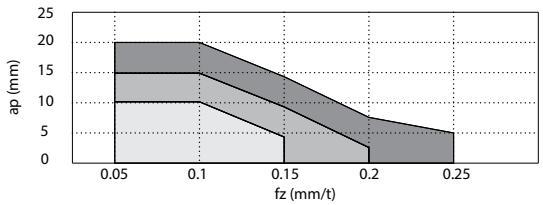
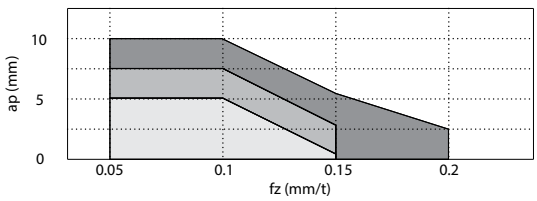
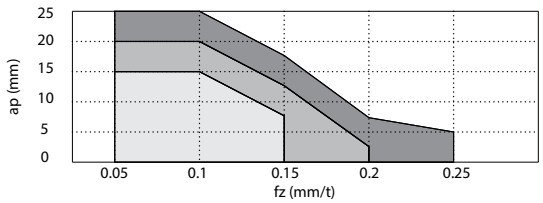
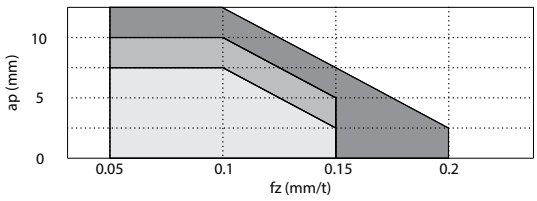
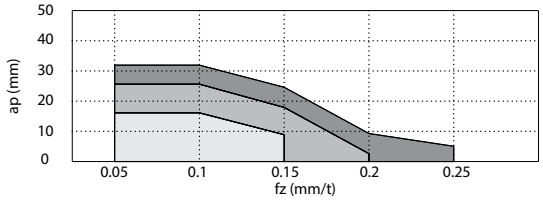
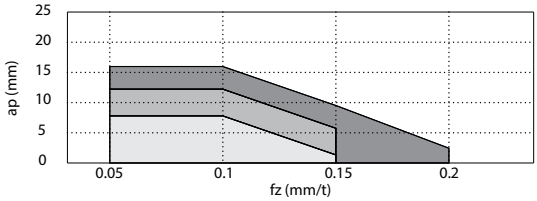
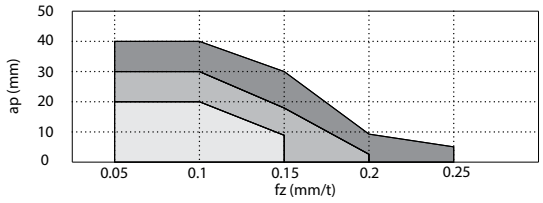
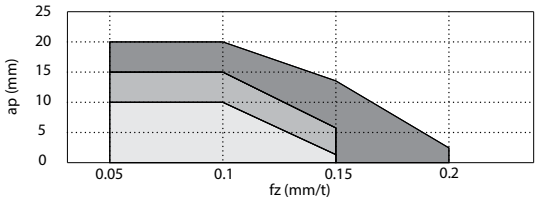
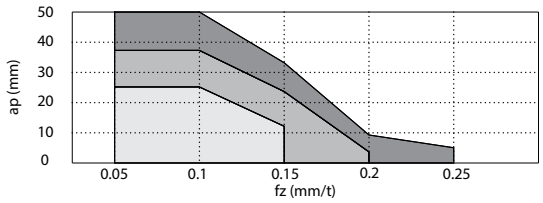
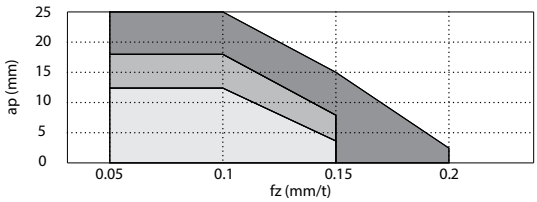


Cutting performance of MEY

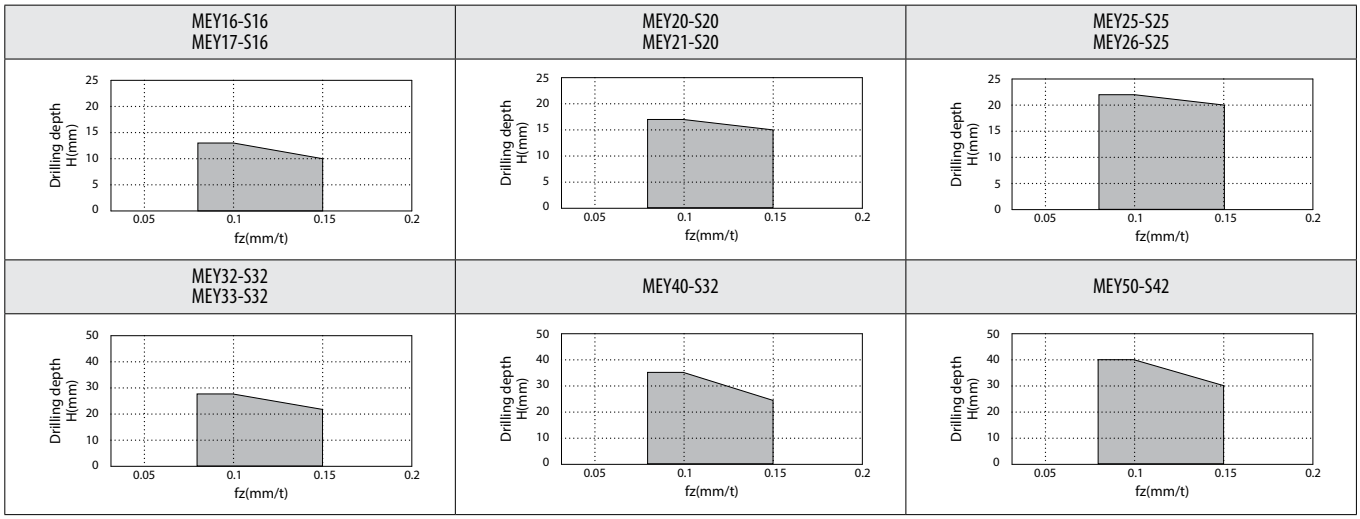
Workpiece material: C50

Cutting dia.	Description	Overhang length LPR (mm)			Cutting dia.	Description	Overhang length LPR (mm)			Shape
ø16	MEY16-S16	31	[~61]	(Not recommended)	ø25	MEY25-S25	40	[~70]	(Not recommended)	
	MEY16-S16-140H	-	~61	[~91]		MEY25-S25-170H	-	70	[~100]	
	MEY16-S16-190	-	61	~91		MEY25-S25-220	-	~80	~100	
ø17	MEY17-S16	31	[~61]	(Not recommended)	ø26	MEY26-S25	40	[~70]	(Not recommended)	
	MEY17-S16-190	31	~61	~91		MEY26-S25-220	40	~70	~100	
ø20	MEY20-S20	35	[~65]	(Not recommended)	ø32	MEY32-S32	50	[~80]	(Not recommended)	
	MEY20-S20-150H	-	~65	[~95]		MEY32-S32-180H	-	~80	[~110]	
	MEY20-S20-200	-	65	~95		MEY32-S32-230	-	90	~110	
ø21	MEY21-S20	35	[~65]	(Not recommended)	ø33	MEY33-S32	50	[~80]	(Not recommended)	
	MEY21-S20-200	35	~65	~95		MEY33-S32-230	50	~80	~110	
					ø40	MEY40-S32	55	[~85]	[~115]	
						MEY40-S32-240	55	~85	~115	
					ø50	MEY50-S42	70	[~100]	[~130]	
						MEY50-S42-250	70	~100	~130	

When using in [ ] dimension, be careful that the chucking length to the shank may get too short.

Description	• Shouldering (Cutting width ae = DC/2) Note: Part ae = DC/4	• Slotting & Ramping and helical milling
MEY16-S16 MEY17-S16		
MEY20-S20 MEY21-S20		
MEY25-S25 MEY26-S25		
MEY32-S32 MEY33-S32		
MEY40-S32		
MEY50-S42		

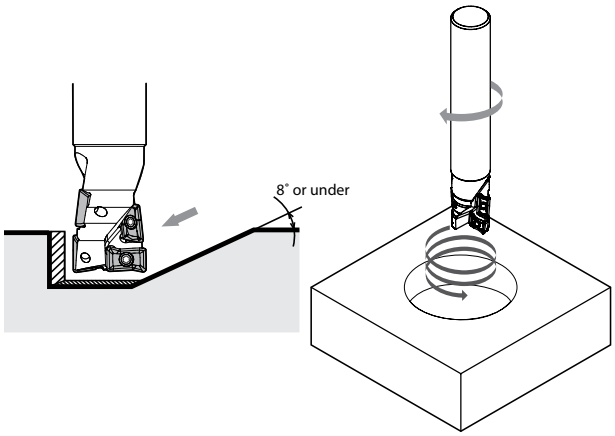
Drilling (Standard/long head/long shank: C50)



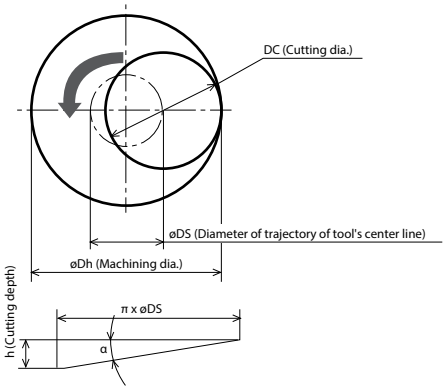
How to use MEY effectively

Ramping/Helical milling

- Ramping angle is recommended to be 8˚ or under. Sinking depth per revolution when helical milling should be 1/2DC or under.
- Use compressed air during machining.



Helical milling factors



øDS (How to find diameter of trajectory of tool's center line)

øDS = øDh - DC

h How to find "h"

h = π X ø DS X tan α

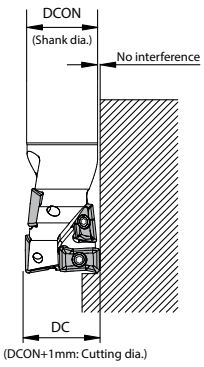
(α should be 8˚ or under)

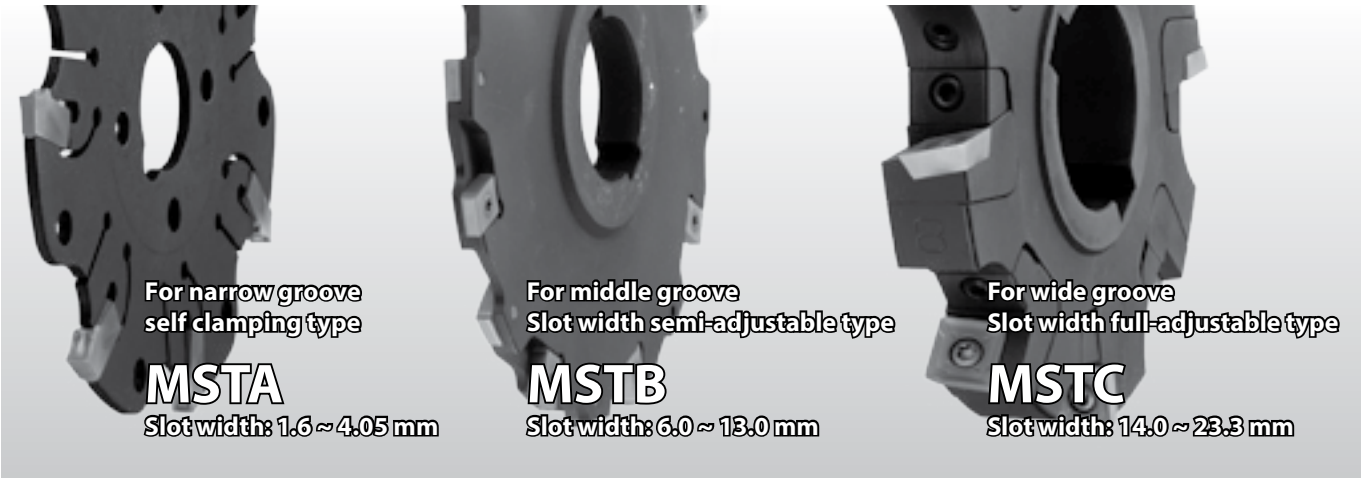
Shouldering

- Tools with 1mm larger cutting diameter than shank diameter are available. High wall shouldering is possible.

Lineup (mm)

Description	DC	DCON
MEY17-S16	17	16
MEY21-S20	21	20
MEY26-S25	26	25
MEY33-S32	33	32
MEY17-S16-190	17	16
MEY21-S20-200	21	20
MEY26-S25-220	26	25
MEY33-S32-230	33	32





Full range from 1.6 mm to 23.3 mm in 3 types

Lineup of MST series slot mills

Type	Applicable inserts	Features	Slot width (mm)													
			1.6	2.2 (2.25)	3.05	4.05	6	8	10	13	14	16	18	20	22	24
MSTA	SLT..	1.6 ~ 4.05 mm fixed	●	●	●	●										
MSTB	LNEU12..	6 ~ 13 mm semi-adjustable					←			→						
MSTC	SP..10T3..	14 ~ 18 mm full-adjustable									←		→			
	SD..1204...	18 ~ 23.3 mm full-adjustable												←		→

* Adjustable in 0.5mm increments between 6mm and 13mm with the combination of inserts
* Adjustable between 14mm and 18mm
*Adjustable between 18mm and 23.3mm

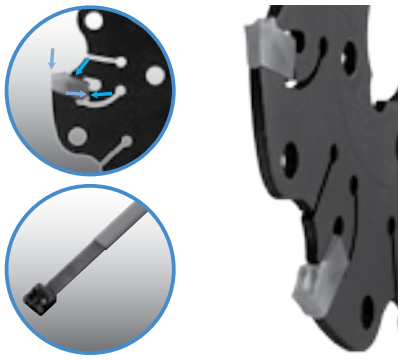
Slot mill MSTA (Slot width 1.6, 2.2(2.25), 3.05, 4.05 mm)

Self-clamping type slot mill
MSTA slot mills have simple self-clamping system to allow for easy attachment by just installing the insert.

High rigidity clamping system
Owing to the high rigidity clamping system – with an end – stopper, the toolholder enable high operability and stable slotting by maintaining an accurate edge position.

Double-prism clamping system
High replacement precision with the double-prism clamping system

Easy replacement
The replacement of inserts is easy and quick by using special wrench.



Wrench is not attached. Please purchase it separately.

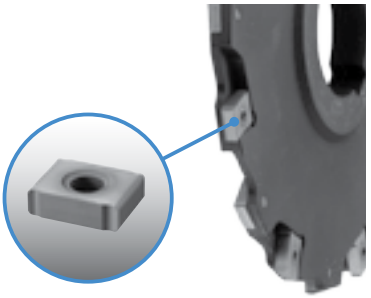
Slot mill MSTB (Slot width 6.0 ~ 13.0mm)

Up-right type/semi-adjustable slot width

Easy and secure screw holding
Inserts can be attached to the MSTB slot mills very easily by using clamp screws.

Economical inserts with 4 cutting edges

Applicable to a variety of slotting by choosing different inserts
By changing the thickness of inserts, it's a applicable to various slotting widths up to max 13mm in 0.5mm increments.



Slot mill MSTC (Slot width 14.0 ~ 23.3 mm)

Lay-down type/full-adjustable slot width

Applicable to various slotting needs. Slotting widths: 14.0mm to 23.3mm.
Cutter dia.: from 100mm to 160mm

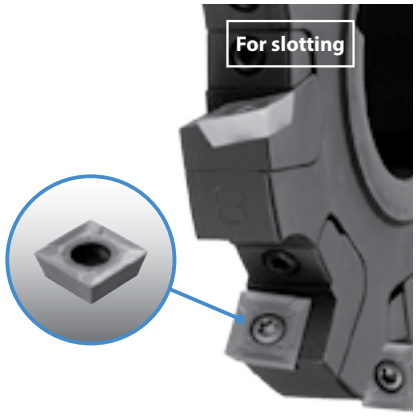
Smooth slotting width adjustment is possible owing to unique cam style adjustment mechanism.

Economical 4-edge Insert

A wide range of corner-R is suitable for various work.

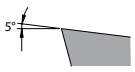
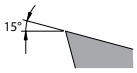
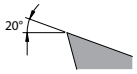
Owing to the wiper edge insert, an excellent surface finish can be expected.

Owing to numerous insert geometries and grades, they are applicable for various types of workpiece machining.



*Change to silver coating in sequence.

Features of insert grades

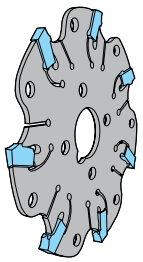
Insert shape			
Symbol	SB	SD	SE
Rake angle			
Shape			

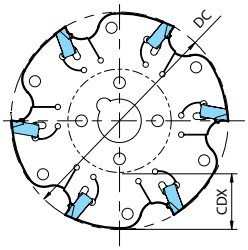
CA0835
- TiN+TiCN+Al_2O_3 based CVD coated carbide
- For carbon steel, alloy steel, stainless steel and nodular cast iron.
- For middle to high speed machining.

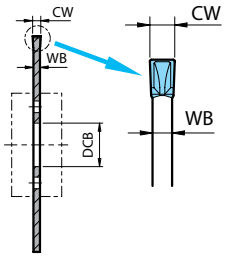
PR0725
- TiN+TiCN+TiN based multi-layer PVD coated carbide
- For carbon steel, alloy steel, stainless steel, heat-resistant alloys and cast iron.
- For middle speed machining.

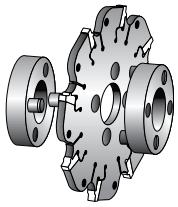
PR0110
- TiB_2 based PVD coated carbide
- For non-ferrous metals such as aluminum alloys (Si<10%) and titanium alloys.
- For high speed machining.

MSTA









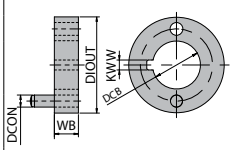
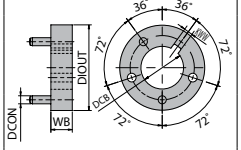
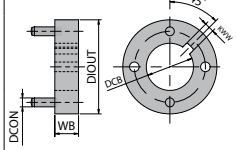
Drive ring (sold separately) assembly example

Toolholder dimensions (Metric)

Description		Availability	Inserts	Dimension (mm)					Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Applicable inserts ➡ M240
		N		DC	DCB	CDX	WB	CW				
MSTA	63N16-5T	●	5	63	16	15	1.3	1.6	No	5100	0.03	SLT..-..SKB SLT..-..SKD
	80N16-7T	●	7	80		21				4000	0.04	
	100N16-9T	●	9	100	22	27				3200	0.07	
	125N16-11T	●	11	125	32	35				2600	0.1	
MSTA	63N22-5T	●	5	63	16	15	1.8	2.2 (2.25)	No	5100	0.03	SLT..-..SKB SLT..-..SKD
	80N22-7T	●	7	80		21				4000	0.05	
	100N22-9T	●	9	100	22	27				3200	0.08	
	125N22-11T	●	11	125	32	35				2600	0.12	
	160N22-14T	●	14	160	40	40				2000	0.3	
MSTA	63N30-4T	●	4	63	16	15	2.4	3.05	No	5100	0.05	SLT..-..SKB SLT..-..SKD
	80N30-6T	●	6	80		21				4000	0.08	
	100N30-9T	●	9	100	22	27				3200	0.13	
	125N30-11T	●	11	125	32	35				2600	0.2	
	160N30-14T	●	14	160	40	40				2000	0.35	
MSTA	63N40-4T	●	4	63	16	15	3.4	4.05	No	5100	0.06	SLT..-..SKB SLT..-..SKD
	80N40-6T	●	6	80		21				4000	0.1	
	100N40-9T	●	9	100	22	27				3200	0.15	
	125N40-11T	●	11	125	32	35				2600	0.25	
	160N40-14T	●	14	160	40	40				2000	0.4	

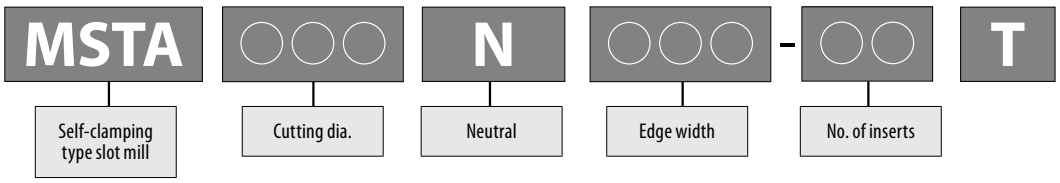
Attach the drive ring (sold separately) to MSTA slot mill to use. Drive ring is sold singularly.
Please purchase two drive rings per one MSTA slot mill.
Do not exceed the max. revolution.
Do not operate cutting on reverse revolution.
Wrench (MS-FRW1) is not attached. Please purchase it separately.

Drive ring (For Metric)

Shape	Description	Availability	Dimension (mm)					Drawing	Applicable toolholders
			DCB	DIOUT	WB	KWW	DCON		
 Fig. 1	DR16-32A	●	16	32	8	4.1	3	Fig. 2	MSTA 63N16-5T, 63N22-5T
 Fig. 2	DR16-32B	●					4	Fig. 1	MSTA 63N30-4T, 63N40-4T
 Fig. 3	DR16-38	●		38				Fig. 3	MSTA 80N○○-○T
	DR22-46	●	22	46	10	6.1	5		MSTA 100N○○-○T
	DR32-55	●	32	55		8.1	6		MSTA 125N○○-○○T
	DR40-80	●	40	80	12	10.1	12		MSTA 160N○○-○○T

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Identification system MSTA toolholder

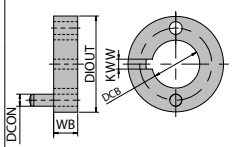
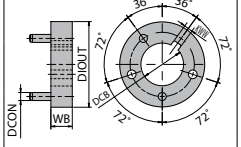
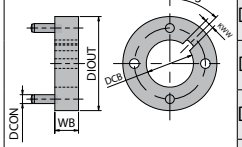


Toolholder dimensions (inch spec)

Description		Availability N	Inserts	Dimension (in , (mm)) DC	DCB	CDX	CW	WB	Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Applicable inserts ➡ M240
MSTA	02N063-5T	●	5	2.5 (63.5)	0.625 (15.875)	0.625 (15.875)	0.063 (1.6)	0.051 (1.3)	No	5100	0.03	SLT..-..SKB SLT..-..SKD
	03N063-7T	●	7	3 (76.2)		0.875 (22.225)				4000	0.04	
	04N063-9T	●	9	4 (101.6)	1 (25.4)	1.063 (27)				3200	0.07	
	05N063-11T	●	11	5 (127)	1.25 (31.75)	1.375 (34.925)				2600	0.1	
MSTA	03N089-7T	●	7	3 (76.2)	0.625 (15.875)	0.875 (22.225)	0.089 (2.2) (2.25)	0.071 (1.8)	No	4000	0.05	SLT..-..SKB SLT..-..SKD
	04N089-9T	●	9	4 (101.6)	1 (25.4)	1.063 (27)				3200	0.08	
	06N089-14T	●	14	6 (152.4)	1.25 (31.75)	1.438 (36.525)				2000	0.3	
MSTA	02N126-4T	●	4	2.5 (63.5)	0.625 (15.875)	0.625 (15.875)	0.120 (3.05)	0.095 (2.4)	No	5100	0.05	SLT..-..SKB SLT..-..SKD
	03N126-6T	●	6	3 (76.2)		0.875 (22.225)				4000	0.08	
	04N126-9T	●	9	4 (101.6)	1 (25.4)	1.063 (27)				3200	0.13	
	05N126-11T	●	11	5 (127)	1.25 (31.75)	1.375 (34.925)				2600	0.2	
	06N126-14T	●	14	6 (152.4)		1.438 (36.525)				2000	0.35	
MSTA	03N164-6T	●	6	3 (76.2)	0.625 (15.875)	0.875 (22.225)	0.160 (4.05)	0.134 (3.4)	No	4000	0.1	SLT..-..SKB SLT..-..SKD
	04N164-9T	●	9	4 (101.6)	1 (25.4)	1.063 (27)				3200	0.15	
	05N164-11T	●	11	5 (127)	1.25 (31.75)	1.375 (34.925)				2600	0.25	

Attach the drive ring (sold separately) to MSTA slot mill to use. Drive ring is sold singularly.
Please purchase two drive rings per one MSTA slot mill.
Do not exceed the max. revolution.
Do not operate cutting on reverse revolution.
Wrench (MS-FRW1) is not attached. Please purchase it separately.

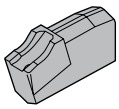
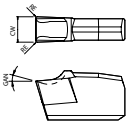
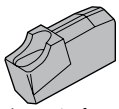
Drive ring (For Inch spec)

Shape	Description	Availability	Dimension (inch) DCB	DIOUT	WB	KWW	DCON	Drawing	Applicable toolholders
 Fig. 1	DR0625-1250A	●	.625 (15.875mm)	1.250 (31.75mm)	.315 (8mm)	.130 (3.3mm)	.158 (4mm)	Fig. 1	MSTA 02N126-4T
 Fig. 2	DR0625-1250B	●					.120 (3mm)	Fig. 2	MSTA 02N063-5T
 Fig. 3	DR0625-1250C	●						Fig. 3	MSTA 03N○○○-○T
	DR1000-1875	●	1.000 (25.4mm)	1.875 (47.625mm)	.394 (10mm)	.256 (6.5mm)	.200 (5mm)		MSTA 04N○○○-○T
	DR1250-2250	●	1.250 (31.75mm)	2.250 (57.15mm)		.319 (8.1mm)	.240 (6mm)		MSTA 05N○○○-○T
	DR1250-3125	●	1.250 (31.75mm)	3.125 (79.375mm)	.472 (12mm)	.319 (8.1mm)	.472 (12mm)		MSTA 06N○○○-○T

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SLT

Classification of usage				
● : 1st Choice	Carbon steel / Alloy steel	●	○	P
○ : 2nd Choice	Mold and die steel			P
	Stainless steel	○	●	M
	Gray cast iron	○		K
	Nodular cast iron	○		K
	Non-ferrous metals			N
	Heat-resistant alloy		●	S
	Titanium alloy			S
	Hard materials			H

Insert		Description		Dimension (mm)		Angle (°)	Tolerance (mm)		Carbide CVD CA0835	Carbide PVD PR0735	Applicable toolholder ➡ M238 M239
				CW	RE	GAN	CW min.	CW max.			
		SLT	16-15SKB	1.6	0.15	5	-0.1	0	●	●	MSTA...
		SLT	22-20SKB	2.2	0.2	5	-0.05	+0.08	●	●	
		SLT	30-20SKB	3.05	0.2	5	0	+0.15	●	●	
		SLT	40-20SKB	4.05	0.2	5	0	+0.15	●	●	
 Low cutting force		SLT	16-15SKD	1.6	0.15	15	-0.1	0	●	●	
		SLT	22-20SKD	2.25	0.2	15	0	+0.15	●	●	
		SLT	30-20SKD	3.05	0.2	15	0	+0.15	●	●	
		SLT	40-20SKD	4.05	0.2	15	0	+0.15	●	●	

Recommended cutting conditions ➡ M241

Inserts identification system

Edge width	
Symbol	Edge width
16	1.6mm
22	2.2(2.25)mm
30	3.05mm
40	4.05mm

Chipbreaker symbol	
Symbol	Rake angle
KB	5°
KD	15°

SLT **16** - **15** **S** **KB**

- SLT: Insert symbol
- 16-15: Corner-R (RE)

Corner-R (RE)	
Symbol	Corner-R (RE)
15	0.15mm
20	0.2mm

- S: Edge preparation

Edge preparation	
Symbol	Cutting edge spec.
S	Chamfered + R-horned

Selection of chipbreaker

KB chipbreaker ··· general purpose chipbreaker for steel and cast iron
KD chipbreaker ··· low cutting force chipbreaker for stainless steel

Features of insert grades

CA0835

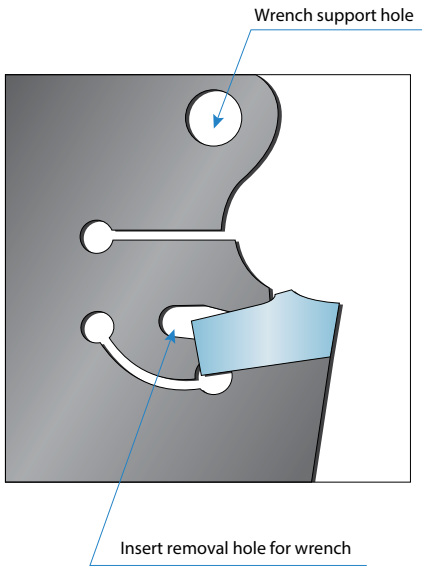
- TiN+TiCN+Al_2O_3 based CVD Coated carbide
- For carbon steel, alloy steel, stainless steel and cast iron
- For middle to high speed machining

PR0735

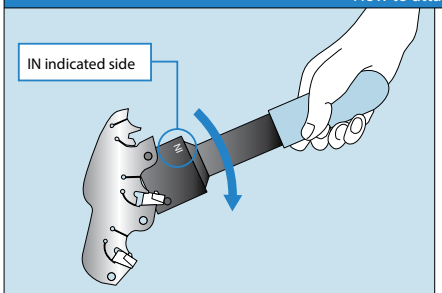
- TiN base PVD Coated carbide
- For stainless steel, heat-resistant alloys, etc.
- For low to middle speed machining

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Set up

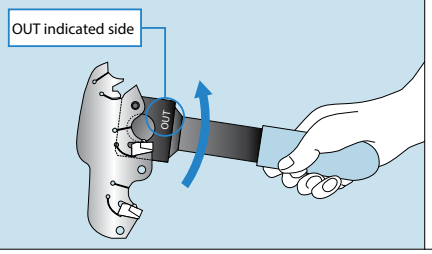


How to attach inserts



1. Put insert inside the slot mill.
2. Insert one of the pins on the wrench (on IN indicated side) into the wrench support hole.
3. Using the other pin, push the front relief surface of the insert.
4. Rotate the wrench until insert's back end makes contact with slot mill.

How to detach inserts



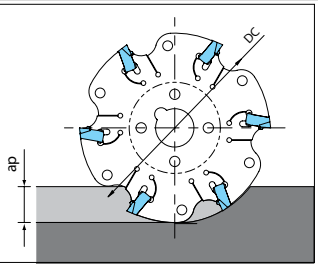
1. Insert one of the pins on the wrench (on OUT indicated side) into the wrench support hole, and insert other pin into the insert releasing hole.
2. Insert can be uninstalled by rotating the wrench counterclockwise. (A magnet is installed on OUT indicated side.)

Note: Use appropriate wrench for set up.

Recommended cutting conditions

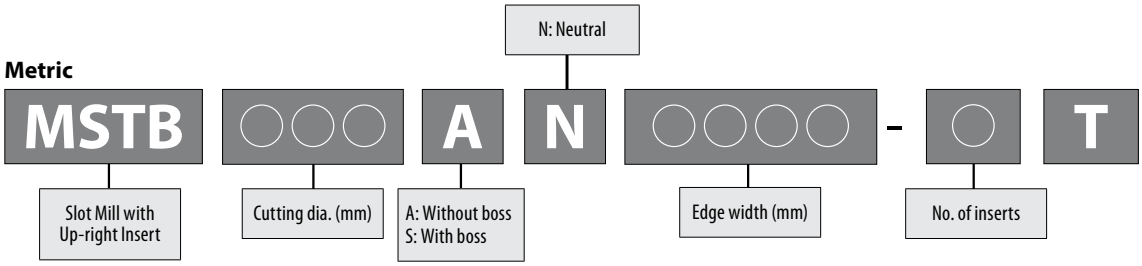
Workpiece material		Hardness (HB)	Recommended insert grades (Vc: m/min)		fz (mm/t)				Remarks
			CVD coated carbide	PVD coated carbide	Edge width (mm)				
			CA0835	PR0735	1.6	2.2(2.25)	3.05	4.05	
Low carbon steel	C10 ~ C25	125	250~310	200~250	0.03~0.12	0.04~0.14	0.06~0.18	0.08~0.20	Coolant
Carbon steel	C30 ~ C60 (Annealed)	190	160~190	130~160	0.03~0.12	0.04~0.14	0.06~0.18	0.08~0.20	
	C30 ~ C60 (Heat treated)	250	140~180	110~150	0.03~0.12	0.04~0.14	0.06~0.18	0.08~0.20	
Alloy steel	CrMo, Cr (Annealed)	180	140~180	110~150	0.03~0.12	0.04~0.14	0.06~0.18	0.08~0.20	
	CrMo, Cr (Heat treated)	275	120~160	100~130	0.03~0.10	0.04~0.12	0.06~0.16	0.08~0.18	
High carbon alloy	X153CrMoV12, X40CrMoV51, etc.	280	100~140	80~120	0.03~0.10	0.04~0.12	0.06~0.16	0.08~0.18	
Stainless steel	Austenitic related X5CrNi18 10, X5CrNiMo17 12 2, CrNi2520, etc.	220	150~190	80~120	0.03~0.10	0.04~0.12	0.06~0.16	0.08~0.18	
	Martensitic related X10Cr13, X6Cr17 etc.	300	140~180	60~80	0.03~0.10	0.04~0.12	0.06~0.16	0.08~0.18	
Gray cast iron	GG25 ~ GG35	260	160~200	-	0.03~0.12	0.04~0.14	0.06~0.18	0.08~0.20	Dry
Nodular cast iron	GGG40 ~ GGG50	160	130~160	-	0.03~0.12	0.04~0.14	0.06~0.18	0.08~0.20	
	GGG60 ~ GGG80	250	110~140	-	0.03~0.12	0.04~0.14	0.06~0.18	0.08~0.20	

Note: 1. Use down-cut machining.
2. If ap is 1/10 or under of cutter dia.(DC), it is possible to increase feed per tooth (fz) by 40%.

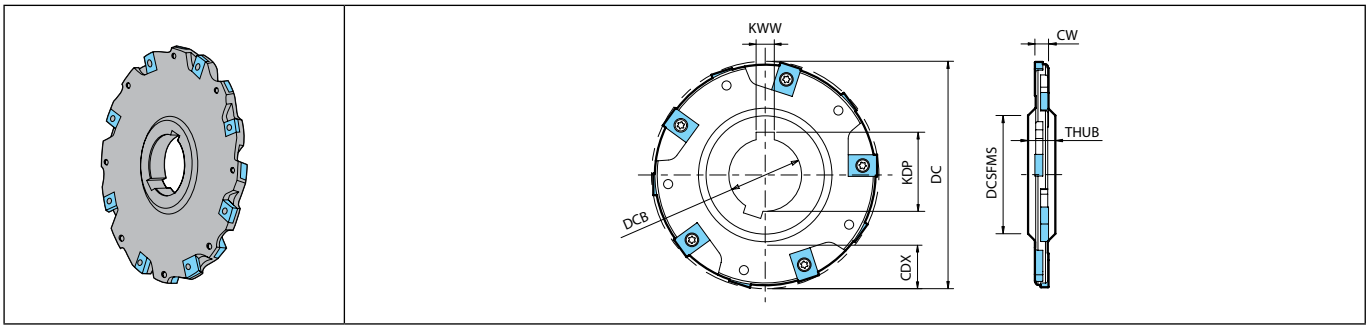


Identification system toolholder MSTB

Metric



MSTB (Without Boss, Metric)



In order to be used in combination with two or more mills, this slot mill has 2 key slots.

Toolholder dimensions

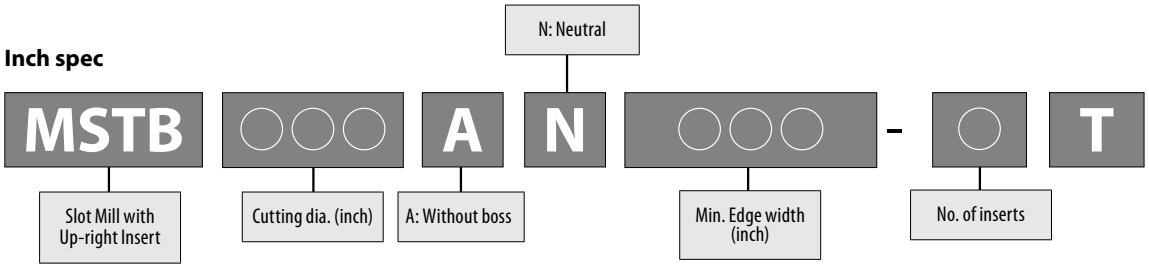
Description		Availability	Inserts	Edge line	Dimension (mm)								Coolant hole	Max. revolution (min^{-1})	Weight (kg)	Spare parts			Applicable inserts ⇒ M245
		N			DC	DCSFMS	DCB	KDP	KWW	CDX	THUB	CW min.	CW max.				Anti-seize compound	Screw	Wrench	
MSTB	80AN0607-4T	●	8	4	80	44	27	29.8	7	15	12	6	7	No	9240	0.3	P-37	SE-40050TRN	TT-15	LNEU12...
	100AN0607-5T	●	10	5	100	52	32	34.8	8	21					8270	0.4				
	125AN0607-6T	●	12	6	125	63	40	43.5	10	28					7390	0.7				
	160AN0607-8T	●	16	8	160					45.5					6540	1.1				
MSTB	80AN0809-4T	●	8	4	80	44	27	29.8	7	16	12	8	9	No	9240	0.4	P-37	SE-40068TR	TT-15	LNEU12...
	100AN0809-5T	●	10	5	100	52	32	34.8	8	22					8270	0.5				
	160AN0809-8T	●	16	8	160	63	40	43.5	10	45.5					6540	1.3				
MSTB	125AN1011-4T	●	12	4	125	63	40	43.5	10	30	12	10	11	No	7390	0.9	P-37	SE-40068TR	TT-15	LNEU12...
	160AN1011-5T	●	15	5	160					47.5					6540	1.6				
MSTB	160AN1213-5T	●	15	5	160	63	40	43.5	10	48.5	12	12	13	No	6540	1.6	P-37	SE-40090TR	TT-15	LNEU12...

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

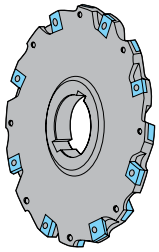
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

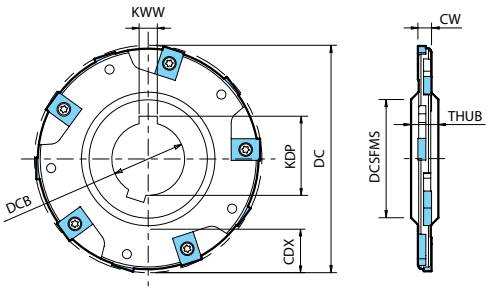
Identification system toolholder MSTB

Inch spec



MSTB (Without Boss, Inch spec)





In order to be used in combination with two or more mills, this slot mill has 2 key slots.

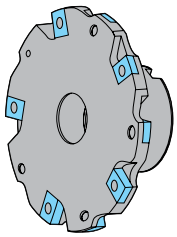
Toolholder dimensions

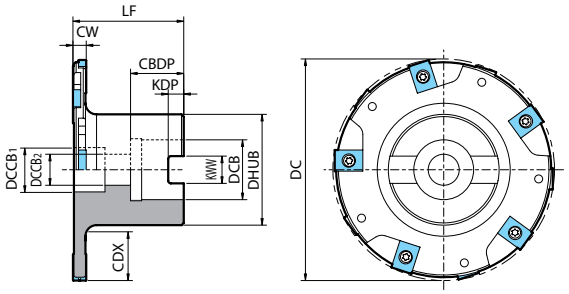
Description		Availability	Inserts	Edge line	Dimension (in , (mm))									Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Spare parts			Applicable inserts M245
		N			DC	DCSFMS	DCB	KDP	KWW	CDX	THUB	CW min.	CW max.				Anti-seize compound	Screw	Wrench	
MSTB	3000AN250-4T	●	8	4	3 (76.2)	1.5 (38.1)	1 (25.4)	1.106 (28.1)	0.25 (6.35)	0.625 (15.875)	0.5 (12.7)	0.25 (6.35)	0.289 (7.34)	No	9470	0.3	P-37	SE-40055TR	TT-15	LNEU12...
	4000AN250-5T	●	10	5	4 (101.6)	1.88 (47.8)	1.25 (31.75)	1.386 (35.2)	0.312 (7.92)	0.935 (23.8)					8200					
	5000AN250-6T	●	12	6	5 (127)					1.435 (36.4)					7300	0.7				
	6000AN250-8T	●	16	8	6 (152.4)	2.25 (57.2)	1.5 (38.1)	1.665 (42.3)	0.375 (9.52)	1.75 (44.45)					6700	1				
MSTB	4000AN312-5T	●	10	5	4 (101.6)	1.88 (47.8)	1.25 (31.75)	1.386 (35.2)	0.312 (7.92)	0.966 (24.5)	0.5 (12.7)	0.312 (7.92)	0.351 (8.91)	No	7400	0.5	P-37	SE-40068TR	TT-15	LNEU12...
	5000AN312-6T	●	12	6	5 (127)					1.466 (37.2)					6600	0.8				
	6000AN312-8T	●	16	8	6 (152.4)	2.25 (57.2)	1.5 (38.1)	1.665 (42.3)	0.375 (9.52)	1.781 (45.2)					6000	1.1				
MSTB	4000AN375-3T	●	9	3	4 (101.6)	1.88 (47.8)	1.25 (31.75)	1.386 (35.2)	0.312 (7.92)	1 (25.4)	0.5 (12.7)	0.375 (9.525)	0.414 (10.52)	No	7400	0.5	P-37	SE-40068TR	TT-15	LNEU12...
	5000AN375-4T	●	12	4	5 (127)					1.5 (38.1)					6600	0.8				
	6000AN375-5T	●	15	5	6 (152.4)	2.25 (57.2)	1.5 (38.1)	1.665 (42.3)	0.375 (9.52)	1.812 (46)					6000	1.3				
MSTB	4000AN500-3T	●	9	3	4 (101.6)	1.88 (47.8)	1.25 (31.75)	1.386 (35.2)	0.312 (7.92)	1.06 (26.9)	0.5 (12.7)	0.5 (12.7)	0.539 (13.69)	No	4900	0.6	P-37	SE-40090TR	TT-15	LNEU12...
	5000AN500-4T	●	12	4	5 (127)					1.56 (39.6)					4400	1.1				
	6000AN500-5T	●	15	5	6 (152.4)	2.25 (57.2)	1.5 (38.1)	1.665 (42.3)	0.375 (9.52)	1.875 (47.6)					4000	1.7				

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MSTB (With Boss, Metric)





Toolholder dimensions

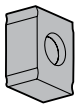
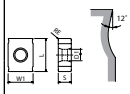
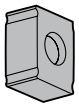
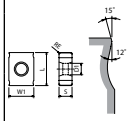
Description		Availability	Inserts	Edge line	Dimension (mm)												Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Spare parts				Applicable inserts ➡ M245
		N			DC	DCB	DCCB1	DCCB2	LF (min.)	CBDP	KDP	KWW	CDX	DHUB	CW min.	CW max.				Anti-seize compound	Mounting bolt	Screw	Wrench	
MSTB	80SN0607-4T	●	8	4	80	22	18	12	50	23	6.3	10.4	16	40	6	7	No	9240	0.7	P-37	HH10X35	SE-40050TRN	TT-15	LNEU12...
	100SN0607-5T	●	10	5	100	27	20	14		24	7	12.4	21	50				8270	1		HH12X35			
	160SN0607-8T	●	16	8	160	40	33	22		28	9	16.4	41	70				6540	1.9		HH20X40			
MSTB	80SN0809-4T	●	8	4	80	22	18	12	50	23	6.3	10.4	16	40	8	9	No	9240	0.8	P-37	HH10X35	SE-40068TR	TT-15	LNEU12...
	100SN0809-5T	●	10	5	100	27	20	14		24	7	12.4	21	50				8270	1.2		HH12X35			
	160SN0809-8T	●	16	8	160	40	33	22		28	9	16.4	41	70				6540	2.2		HH20X40			
MSTB	125SN1011-4T	●	12	4	125	40	33	22	50	28	9	16.4	26	70	10	11	No	7390	2	P-37	HH20X40	SE-40068TR	TT-15	LNEU12...
	160SN1011-5T	●	15	5	160								43					6540	2.5					

LF (min.) dimension shows in case of minimum of edge width (CW).
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

LNEU

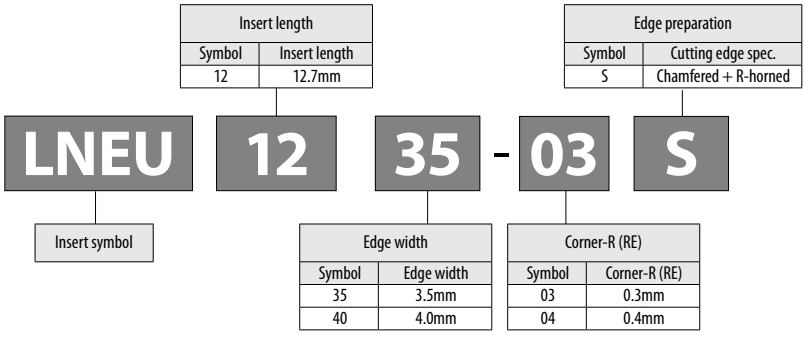
Classification of usage				
● : 1st Choice	Carbon steel / Alloy steel	●	P
○ : 2nd Choice	Mold and die steel		P
	Stainless steel	●	M
	Gray cast iron	○	K
	Nodular cast iron	○	K
	Non-ferrous metals		N
	Heat-resistant alloy	●	S
	Titanium alloy	○	S
	Hard materials		H

Insert		Description	No. of edges	Dimension (mm) S	D1	RE	Carbide PVD PR0725	Applicable toolholder ➡ M242~M244	Applicable clamp screw
	 With honing	LNEU 1235-03-4	4	3.5	4.4	0.3	●	MSTB...	SE-40050TRN
		LNEU 1240-08-4	4	4	4.4	0.8	●		SE-40055TR
		LNEU 1245-04 1245-08	4	4.5	4.2	0.4 0.8	● ●		SE-40068TR
		LNEU 1250-04 1250-08	4	5	4.2	0.4 0.8	● ●		SE-40080TR
		LNEU 1255-04 1255-08	4	5.5	4.2	0.4 0.8	● ●		SE-40090TR
		LNEU 1260-04	4	6	4.2	0.4	●		SE-40100TR
	 Tough edge	LNEU 1235-03S-4	4	3.5	4.4	0.3	●	MSTB...	SE-40050TRN
		LNEU 1240-03S-4	4	4	4.4	0.3	●		SE-40055TR
		LNEU 1245-04S 1245-08S	4	4.5	4.2	0.4 0.8	● ●		SE-40068TR
		LNEU 1250-04S 1250-08S	4	5	4.2	0.4 0.8	● ●		SE-40080TR

Please select the applicable clamp screw depending on each insert description.
See page **M246** for insert description and applicable clamp screw depending on edge width.

Recommended cutting conditions ➡ **M247**

Inserts identification system



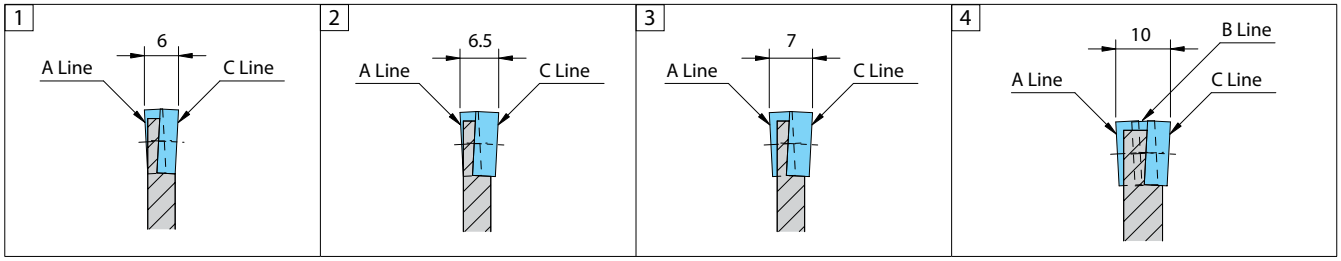
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Combination of applicable inserts

	Description		Clamp screw (Standard attachment parts)	Edge width		A Line		B Line		C Line		Wrench for clamp screw	Tightening torque (N·m)
				mm	inch (mm)	Applicable inserts	Clamp screw	Applicable inserts	Clamp screw	Applicable inserts	Clamp screw		
Metric	MSTB	○○○AN0607-○T	SE-40050TRN	6	-	LNEU1235..	SE-40050TRN	-	-	LNEU1235..	SE-40050TRN	TT-15	3
		○○○SN0607-○T		6.5						LNEU1240..	SE-40055TR		
				7		LNEU1240..	SE-40055TR						
	MSTB	○○○AN0809-○T	SE-40068TR	8	-	LNEU1245..	SE-40068TR	-	-	LNEU1245..	SE-40068TR		
		○○○SN0809-○T		8.5						LNEU1250..	SE-40080TR		
				9		LNEU1250..	SE-40080TR						
	MSTB	○○○AN1011-○T	SE-40068TR	10	-	LNEU1245..	SE-40068TR	LNEU1245..	SE-40068TR	LNEU1245..	SE-40068TR		
		○○○SN1011-○T		10.5						LNEU1250..	SE-40080TR		
				11		LNEU1250..	SE-40080TR	LNEU1250..	SE-40080TR				
	MSTB	○○○AN1213-○T	SE-40090TR	12	-	LNEU1255...	SE-40090TR	LNEU1255...	SE-40090TR	LNEU1255...	SE-40090TR		
				12.5						LNEU1260...	SE-40100TR		
				13		LNEU1260...	SE-40100TR	LNEU1260...	SE-40100TR				
Inch spec	MSTB	○○○○AN250-○T	SE-40055TR	-	.250 (6.35mm)	LNEU1240..	SE-40055TR	-	-	LNEU1240..	SE-40055TR		
					.270 (6.86mm)					LNEU1245..	SE-40068TR		
					.289 (7.34mm)	LNEU1245..	SE-40068TR						
	MSTB	○○○○AN312-○T	SE-40068TR	-	.312 (7.92mm)	LNEU1245..	SE-40068TR	-	-	LNEU1245..	SE-40068TR		
					.332 (8.43mm)					LNEU1250..	SE-40080TR		
					.351 (8.91mm)	LNEU1250..	SE-40080TR						
	MSTB	○○○○AN375-○T	SE-40068TR	-	.375 (9.525mm)	LNEU1245..	SE-40068TR	LNEU1245..	SE-40068TR	LNEU1245..	SE-40068TR		
					.395 (10.33mm)					LNEU1250..	SE-40080TR		
					.414 (10.52mm)	LNEU1250..	SE-40080TR	LNEU1250..	SE-40080TR				
	MSTB	○○○○AN500-○T	SE-40090TR	-	.500 (12.7mm)	LNEU1255...	SE-40090TR	LNEU1255...	SE-40090TR	LNEU1255...	SE-40090TR		
					.520 (13.21mm)					LNEU1260...	SE-40100TR		
					.539 (13.69mm)	LNEU1260...	SE-40100TR	LNEU1260...	SE-40100TR				

For clamp screw, above listed "Standard attachment parts" are attached. In case of necessity of another size of clamp screw by changing slotting width, please purchase separately.

Slot width (Edge width) adjustment



The slot width (Edge width) of MSTB slot mills is adjustable by a maximum of 1 mm with the combination of inserts.

1. In the case of MSTB○○○AN0607-○T the width (W) is 6mm by installing LNEU1235 on both A line and C line.
2. By replacing C line only with LNEU1240 the width (W) is 6.5 mm.
3. By replacing A line and C line with LNEU1240 the width (W) is 7 mm.
4. If the slotting width (Edge width) is 10 mm, the B line (Middle edge) is necessary.

* Caution
1. There is no description such as "A line", "B line", and "C line" on the actual slot mill. These are only for explanation of the combination of insert.
2. Use proper clamp screws for applicable inserts on the basis of the above chart.
3. Please do not use any slot mills, that have a difference of width of more than 1 mm.

Bottom cutting shape of MSTB slot mill

Slot bottom shape will be (Fig. 1) convex shape.

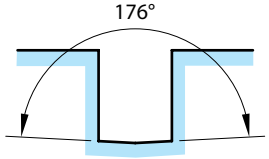
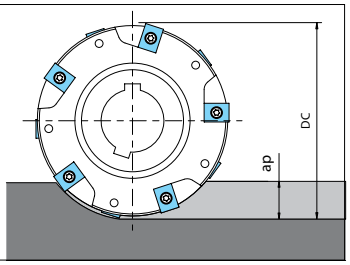


Fig. 1 Convex bottom shape

Recommended cutting conditions

Workpiece material		Hardness (HB)	Recommended insert grades (Vc: m/min)	fz (mm/t)		Remarks
			PVD Coated carbide	Insert thickness (mm)		
			PR0725	3.5~4.0	4.5~6.0	
Low carbon steel	C10 ~ C25	125	170~210	0.07~0.20	0.10~0.22	Dry
Carbon steel	C30 ~ C60 (Annealed)	190	100~140	0.07~0.20	0.10~0.22	
	C30 ~ C60 (Heat treated)	250	90~120	0.07~0.20	0.10~0.22	
Alloy steel	CrMo, Cr (Annealed)	180	90~120	0.07~0.20	0.10~0.22	
	CrMo, Cr (Heat treated)	275	80~110	0.05~0.18	0.08~0.20	
High carbon alloy	X153CrMoV12, X40CrMoV51, etc.	280	70~ 90	0.05~0.18	0.08~0.20	
Stainless steel	Austenitic related X5CrNi18 10, X5CrNiMo17 12 2, CrNi2520, etc.	220	110~140	0.05~0.18	0.08~0.20	Coolant
	Martensitic related X10Cr13, X6Cr17 etc.	300	100~120	0.05~0.18	0.08~0.20	
Heat-resistant alloys	Ni-base heat-resistant alloys	350	15~ 30	0.05~0.18	0.08~0.20	
Titanium alloys	Ti-6Al-4V, etc.	270	20~50	0.05~0.18	0.08~0.20	
Gray cast iron	GG25 ~ GG35	260	110~130	0.07~0.22	0.10~0.25	Dry
Nodular cast iron	GGG40 ~ GGG50	160	80~100	0.07~0.22	0.10~0.25	
	GGG60 ~ GGG80	250	70~ 90	0.07~0.22	0.10~0.25	

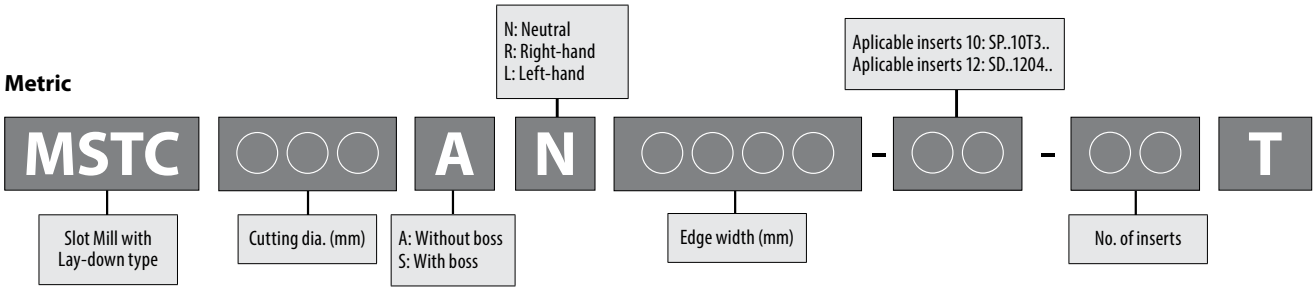
Note: 1. Use down-cut machining.
2. If ap is 1/10 or under of cutter dia.(DC), it is possible to increase feed per tooth (fz) by 40%.



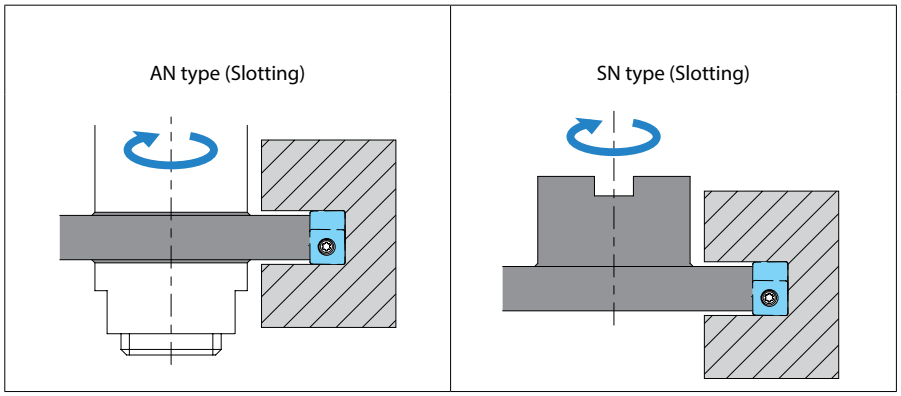
M
Milling

Identification system toolholder MSTC

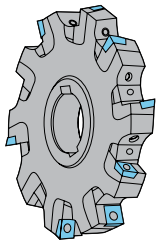
Metric

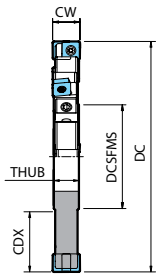


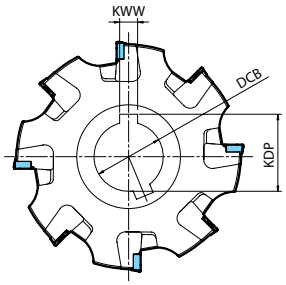
Cutting direction of MSTC slot mill



MSTC (Without Boss)







In order to be used in combination with two or more mills, this slot mill has 2 key slots.

Toolholder dimensions (Without Boss, Metric)

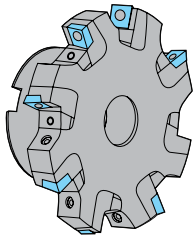
Description		Availability	Inserts	Edge line	Dimension (mm)									Coolant hole	Max. revolution (min^{-1})	Weight (kg)	Applicable inserts ➡ M252 M253
		N			DC	DCSFMS	DCB	KDP	KWW	CDX	THUB	CW min.	CW max.				
MSTC	100AN1416-10-3T	●	6	3	100	46.8	32	34.8	8	25.9	13.9	14	16	No	17250	0.5	SPCT10T3... SPET10T3...
	125AN1416-10-4T	●	8	4	125	54.8	40	43.5	10	34.4					15450	0.8	
	160AN1416-10-5T	●	10	5	160					51.9					13650	1.5	
MSTC	125AN1618-10-4T	●	8	4	125	54.8	40	43.5	10	34.4	15.9	16	18	No	15450	1	SPCT10T3... SPET10T3...
	160AN1618-10-5T	●	10	5	160					51.9					13650	1.8	
MSTC	125AN1820-12-4T	●	8	4	125	54.8	40	43.5	10	34	18.2	18	20.6	No	10350	1	SDCT1204... SDET1204...
	160AN1820-12-5T	●	10	5	160					51.5					9150	1.8	
MSTC	125AN2123-12-4T	●	8	4	125	54.8	40	43.5	10	34	20.8	20.6	23.3	No	10350	1.2	SDCT1204... SDET1204...
	160AN2123-12-5T	●	10	5	160					51.5					9150	2.1	

Spare parts ➡ **M251**

Slot width (Edge width) adjustment ➡ **M255 - M257**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MSTC (With Boss)



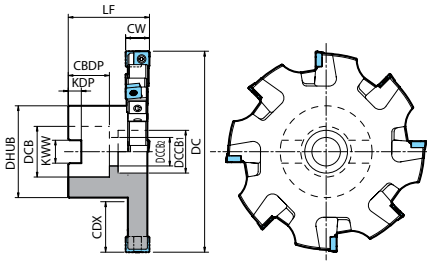


Fig. 1

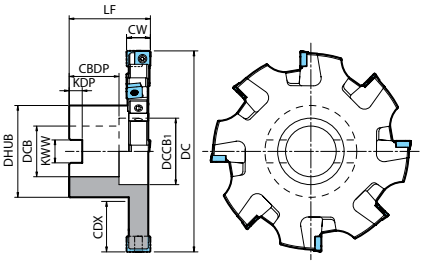


Fig. 2

Toolholder dimensions (With Boss, Metric)

Description		Availability	Inserts	Edge line	Dimension (mm)												Coolant hole	Max. revolution (min^{-1})	Weight (kg)	Fig.	Applicable inserts ➡ M252 M253
		N			DC	DCB	$DCCB_1$	$DCCB_2$	LF (min.)	CBDP	KDP	KWW	CDX	DHUB	CW min.	CW max.					
MSTC	100SN1416-10-3T	●	6	3	100	27	20	14	50.8	24	7	12.4	24.4	48	14	16	No	17250	1	1	SPCT10T3... SPET10T3...
	125SN1416-10-4T	●	8	4	125	32	27	18		26	8	14.4	31.9	58				15450	1.6	1	
	160SN1416-10-5T	●	10	5	160	40	56	-		30	9	16.4	43.4	70				13650	2	2	
MSTC	125SN1618-10-4T	●	8	4	125	32	27	18	50.8	26	8	14.4	31.9	58	16	18	No	15450	1.7	1	SPCT10T3... SPET10T3...
	160SN1618-10-5T	●	10	5	160	40	56	-		30	9	16.4	43.4	70				13650	2.3	2	
MSTC	125SN1820-12-4T	●	8	4	125	32	27	18	51	26	8	14.4	31.9	58	18	20.6	No	10350	1.6	1	SDCT1204... SDET1204...
	160SN1820-12-5T	●	10	5	160	40	56	-		30	9	16.4	43.4	70				9150	2.3	2	
MSTC	125SN2123-12-4T	●	8	4	125	32	27	18	51	26	8	14.4	31.9	58	20.6	23.3	No	10350	1.7	1	SDCT1204... SDET1204...
	160SN2123-12-5T	●	10	5	160	40	56	-		30	9	16.4	43.4	70				9150	2.6	2	

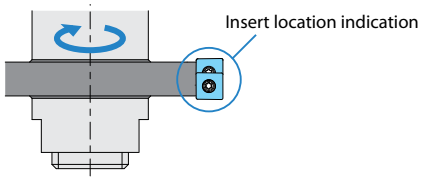
LF (min.) dimension shows in case of minimum of edge width (CW).

Spare parts ➡ **M251**
Slot width (Edge width) adjustment ➡ **M255 - M257**

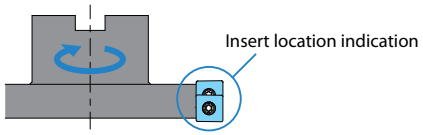
Applicable insert installation method

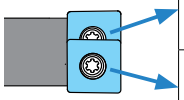
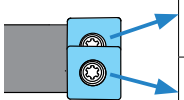
When installing handed inserts, it is necessary to equip same number of right-hand and left-hand inserts as shown in "No. of edge lines" respectively. Please Install as show in the figure below.

MSTC...AN...**(Without boss)**



MSTC...SN...**(With boss)**



Toolholder description	Insert location indication	Applicable inserts ➡ M252, M253	
		Handed	Neutral
MSTC...AN...10.. MSTC...SN...10..		SP..10T3...L...	SP..10T3...N...
		SP..10T3...R...	
MSTC...AN...12.. MSTC...SN...12..		SD..1204...L...	SD..1204...N...
		SD..1204...R...	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Spare parts (MSTC) (common to Metric / Inch spec)

Description			Spare parts										
			Cartridge		Wedge	Wedge screw	Cam pin	Clamp screw	Wrench			Anti-seize compound	Mounting bolt
			Right-hand	Left-hand					for wedge screw	for cam pin	for clamp screw		
													
Without boss	Metric	MSTC 100AN1416-10-3T	C90SP1416-10R	C90SP1416-10L	WC-14	W6X18	AP-1416	SE-3070TRP	TH-3L	LW-2.5	DTP-9	P-37	-
		MSTC 125AN1416-10-4T				W6X20							
		MSTC 160AN1416-10-5T											
		MSTC 125AN1618-10-4T	C90SP1618-10R	C90SP1618-10L	WC-16	W6X20							
		MSTC 160AN1618-10-5T											
		MSTC 125AN1820-12-4T	C90SD1820-12R	C90SD1820-12L	WC-18	W6X20	AP-1820	SB-3590TRP		LW-3	DTP-15		
		MSTC 160AN1820-12-5T											
		MSTC 125AN2123-12-4T	C90SD2023-12R	C90SD2023-12L	WC-20								
		MSTC 160AN2123-12-5T											
With boss	Metric	MSTC 100SN1416-10-3T	C90SP1416-10R	C90SP1416-10L	WC-14	W6X20	AP-1416	SE-3070TRP	TH-3L	LW-2.5	DTP-9	P-37	HH12X35
		MSTC 125SN1416-10-4T											HH16X35
		MSTC 160SN1416-10-5T											-
		MSTC 125SN1618-10-4T	C90SP1618-10R	C90SP1618-10L	WC-16								HH16X35
		MSTC 160SN1618-10-5T											-
		MSTC 125SN1820-12-4T	C90SD1820-12R	C90SD1820-12L	WC-18	W6X20	AP-1820	SB-3590TRP		LW-3	DTP-15	P-37	HH16X35
		MSTC 160SN1820-12-5T											-
		MSTC 125SN2123-12-4T	C90SD2023-12R	C90SD2023-12L	WC-20								HH16X35
		MSTC 160SN2123-12-5T											-

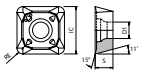
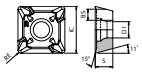
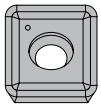
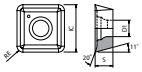
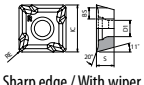
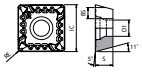
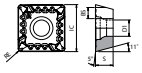
 Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

Tightening torque

Wrench	TH-3L	DTP-9	DTP-15
			
Tightening torque (N•m)	5~6	1.5	4

SPCT/SPET

Classification of usage				
● : 1st Choice	Carbon steel / Alloy steel	●	●	P
○ : 2nd Choice	Mold and die steel			
	Stainless steel	○	●	M
	Gray cast iron	○	●	K
	Nodular cast iron	○	●	
	Non-ferrous metals	●		N
	Heat-resistant alloy		●	S
	Titanium alloy	○	●	
	Hard materials			H

Insert		Description		No. of edges	Dimension (mm) IC	S	D1	RE	BS	Carbide CVD CA0835	PVD PR0110	PVD PR0725	Applicable toolholder ➡ M249, M250
		SPCT	10T316EN-SD	4	10	3.97	3.4	1.6	-			●	MSTC...-10-..
	 With wiper edge	SPCT	10T308ER-SD 10T308EL-SD 10T312ER-SD 10T312EL-SD	4	10	3.97	3.4	0.8 0.8 1.2 1.2	2.5 2.5 1.8 1.8			● ● ● ●	MSTC...-10-..
	 Sharp edge	SPCT	10T316FN-SE	4	10	3.97	3.4	1.6	-		●		MSTC...-10-..
	 Sharp edge / With wiper edge	SPCT	10T308FR-SE 10T308FL-SE 10T312FR-SE 10T312FL-SE	4	10	3.97	3.4	0.8 0.8 1.2 1.2	2.7 2.7 2.2 2.2		● ● ● ●		MSTC...-10-..
	 With wiper edge	SPET	10T308ER-SB 10T308EL-SB	4	10	3.97	3.4	0.8	2.7	● ●		● ●	MSTC...-10-..
	 Tough edge / With wiper edge	SPET	10T308SR-SB 10T308SL-SB	4	10	3.97	3.4	0.8	2.7	● ●		● ●	MSTC...-10-..

Handed insert shows Right-hand

Recommended cutting conditions ➡ M254

Inserts identification system

Shape	
Symbol	Shape
S	Square

Tolerance			
Symbol	Corner height	Thickness	I.C Size
C	±0.013mm	±0.025mm	±0.025mm
E	±0.025mm		

Edge length: S

Corner-R (RE)	
Symbol	Corner-R (RE)
16	1.6mm
12	1.2mm
08	0.8mm

Hand of tool	
Symbol	Hand of tool
N	Neutral
L	Left-hand
R	Right-hand

S P C T 10 T3 08 E R - SD

Relief angle	
Symbol	Relief angle
D	15°
P	11°

Hole/Chipbreaker	
Symbol	Shape
T	Single-sided chipbreaker, with hole

Thickness	
Symbol	Thickness
T3	3.97mm
04	4.76mm

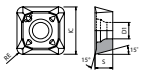
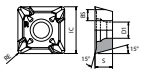
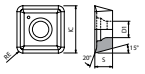
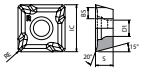
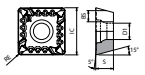
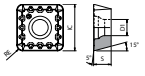
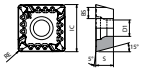
Edge Preparation	
Symbol	Cutting edge spec.
E	Honed
F	Sharp edge
S	Chamfered + R-honed

Chipbreaker symbol	
Symbol	Rake angle
SB	5°
SD	15°
SE	20°

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SDCT/SDET

Classification of usage		CVD		PVD	
● : 1st Choice	Carbon steel / Alloy steel	●		●	P
○ : 2nd Choice	Mold and die steel				
	Stainless steel	○		●	M
	Gray cast iron	○		●	K
	Nodular cast iron	○		●	
	Non-ferrous metals		●		N
	Heat-resistant alloy			●	S
	Titanium alloy		○	●	
	Hard materials				H

Insert		Description		No. of edges	Dimension (mm) IC	S	D1	RE	BS	Carbide CVD CA0835	PVD PR0110	PVD PR0725	Applicable toolholder ➡ M249, M250
		SDCT	120416EN-SD	4	12.7	4.76	4.4	1.6	-			●	MSTC...-12-..
	 With wiper edge	SDCT	120408ER-SD	4	12.7	4.76	4.4	0.8	2.5			●	MSTC...-12-..
			120408EL-SD					0.8	2.5			●	
			120412ER-SD					1.2	1.8			●	
			120412EL-SD					1.2	1.8			●	
	 Sharp edge	SDCT	120416FN-SE	4	12.7	4.76	4.4	1.6	-		●		MSTC...-12-..
	 Sharp edge / With wiper edge	SDCT	120408FR-SE	4	12.7	4.76	4.4	0.8	2.7		●		MSTC...-12-..
			120408FL-SE					0.8	2.7		●		
			120412FR-SE					1.2	1.9		●		
			120412FL-SE					1.2	1.9		●		
	 With wiper edge	SDET	120408ER-SB	4	12.7	4.76	4.4	0.8	2.5	●		●	MSTC...-12-..
			120408EL-SB					0.8	2.5	●		●	
			120412ER-SB					1.2	1.8	●		●	
			120412EL-SB					1.2	1.8	●		●	
	 Tough edge	SDET	120416SN-SB	4	12.7	4.76	4.4	1.6	-	●		●	MSTC...-12-..
	 Tough edge / With wiper edge	SDET	120408SR-SB	4	12.7	4.76	4.4	0.8	2.5	●		●	MSTC...-12-..
			120408SL-SB							●		●	

Handed insert shows Right-hand

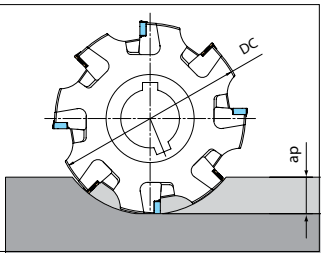
Recommended cutting conditions ➡ M254

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Recommended cutting conditions

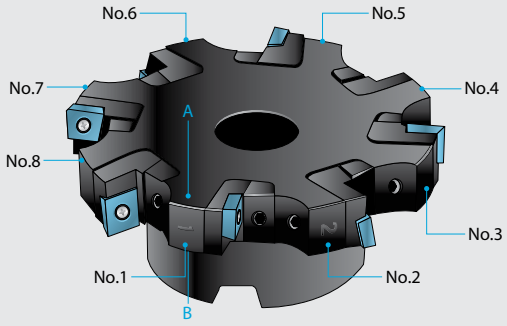
Workpiece material		Hardness (HB)	Recommended insert grades (Vc: m/min)			fz (mm/t)				Remarks
			CVD Coated carbide	PVD Coated carbide		Chipbreaker				
			CA0835	PR0725	PR0110	EN-SD ER-SD EL-SD	ER-SB EL-SB	SN-SB SR-SB SL-SB	FN-SE FR-SE FL-SE	
Low carbon steel	C10 ~ C25	125	250~310	170~210	-	0.07~0.20	0.10~0.22	0.15~0.3	-	Dry
Carbon steel	C30 ~ C60 (Annealed)	190	160~190	100~140	-	0.07~0.20	0.10~0.22	0.15~0.3	-	
	C30 ~ C60 (Heat treated)	250	140~180	90~120	-	0.07~0.20	0.10~0.22	0.15~0.3	-	
Alloy steel	CrMo, Cr (Annealed)	180	140~180	90~120	-	0.07~0.20	0.10~0.22	0.15~0.3	-	
	CrMo, Cr (Heat treated)	275	120~160	80~110	-	0.05~0.18	0.08~0.20	0.12~0.25	-	
High carbon alloy	X153CrMoV12, X40CrMoV51, etc.	280	110~130	70~ 90	-	0.05~0.18	0.08~0.20	0.12~0.25	-	
Stainless steel	Austenitic related X5CrNi18 10, X5CrNiMo17 12 2, CrNi2520, etc.	220	160~200	110~140	-	0.05~0.18	0.08~0.20	0.12~0.25	-	Coolant
	Martensitic related X10Cr13, X6Cr17 etc.	300	150~180	100~120	-	0.05~0.18	0.08~0.20	0.12~0.25	-	
Heat-resistant alloys	Ni-base heat-resistant alloys	350	-	15~ 30	-	0.05~0.18	0.08~0.20	0.12~0.25	-	
Titanium alloys	Ti-6Al-4V, etc.	270	-	20~ 50	-	0.05~0.18	0.08~0.20	0.12~0.25	-	
Gray cast iron	GG25 ~ GG35	260	160~200	110~130	-	0.07~0.22	0.10~0.25	0.15~0.35	-	Dry
Nodular cast iron	GGG40 ~ GGG50	160	130~160	80~100	-	0.07~0.22	0.10~0.25	0.15~0.35	-	
	GGG60 ~ GGG80	250	110~140	70~ 90	-	0.07~0.22	0.10~0.25	0.15~0.35	-	
Non-ferrous metals	AlZnMgCu1.5 etc.	-	-	-	750~950	-	-	-	0.07~0.20	Coolant

Note: 1. Use down-cut machining.
2. If ap is 1/10 or under of cutter dia.(DC), it is possible to increase feed per tooth (fz) by 40%.

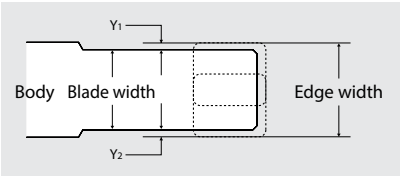


Slot width (Edge width) adjustment of MSTC slot mill

Slot width (Edge width) measurement and adjustment



"No.1-No.8" in the figure is for explanation. There are no indications on the slot mill body.



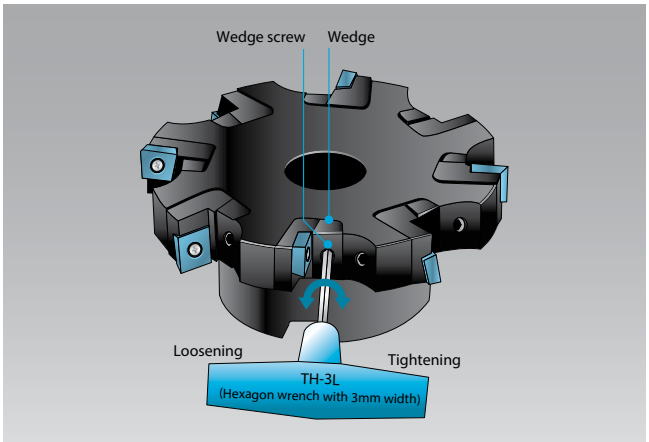
1. Set up the slot mill on length measuring equipment such as tool presetters.
2. Choose any one of the edges as a reference position. (No.1)
3. Measure the blade width of the slot mill body at position No.1. (between point A and B in the figure)
4. Move the length measuring equipment to the insert corner part and measure the step (Y_1) between the point A and the insert No.1.
5. Using the same procedure, measure (Y_2) dimension based on point B.

Edge width = Blade width + Y_1 + Y_2

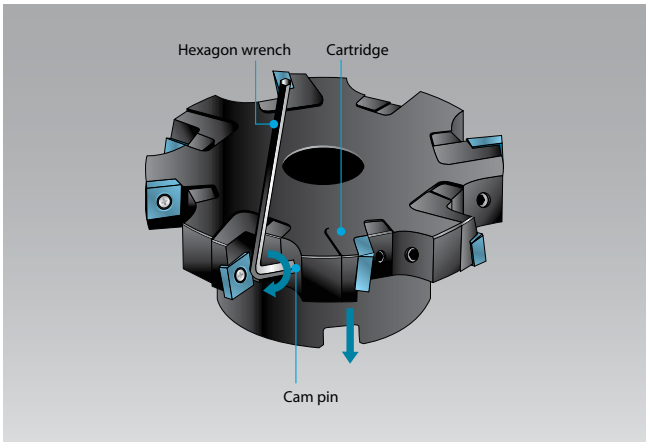
6. Place the point A of the slot mill body near the position No.1 to "0 (zero)" of the length measuring equipment.
7. Adjust the edge position of the inserts in odd numbered positions (No. 3, 5, 7) to "0 (zero)" with the length measuring equipment.
8. Adjust the edge position of the inserts in even numbered positions (No. 2, 4, 6, 8) to the required edge width.

For steps 7. and 8., see "In the case of changing the slot width (Edge width)" on next page.

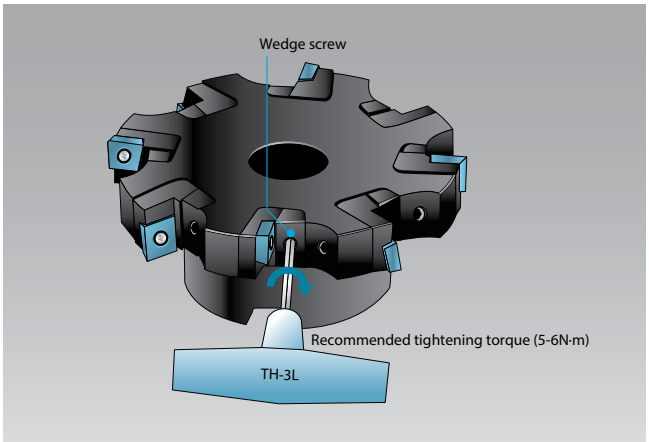
In the case of changing the slot width (Edge width)



1. Set up the slot mill on length measuring equipment such as tool presetters.
2. Insert a hexagon wrench with 3mm width (TH-3L) into the wedge screw.
3. Turn TH-3L counterclockwise to loosen the wedge.
4. Turn TH-3L clockwise by the torque of 1 N·m to tighten the wedge lightly and make the wedge contact the cartridge and the slot mill body.
   In doing so, some resistance occurs against the cartridge.

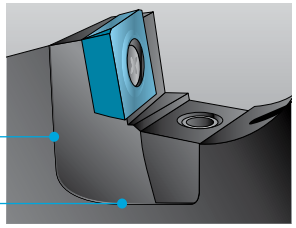


5. Insert a hexagon wrench (LW-2.5 OR LW-3) into the cam pin on the back of the cartridge.
6. Turn the wrench and adjust the position of the cartridge.
7. To secure the adjustment, back-turn the cam pin and make sure that it does not touch the groove surface of the back of the cartridge.
8. Remove the hexagon wrench from the cam pin.



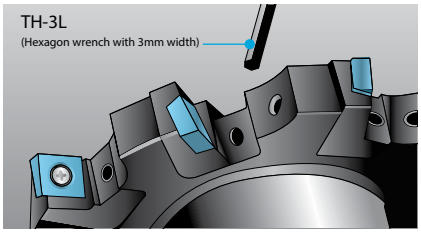
9. Insert TH-3L into the wedge screw.
10. Tighten the wedge screw by the torque of 5-6N·m.
    (Use a torque wrench to get the correct torque.)
11. Make sure there is no clearance between the cartridge and the slot mill body.

Make sure there is no clearance.

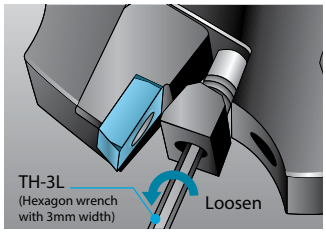


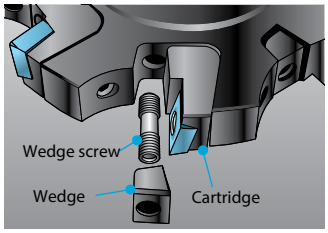
Replacement of the cartridge

Follow the instruction below to replace the cartridge.

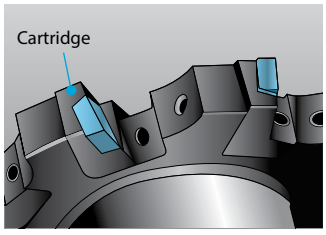


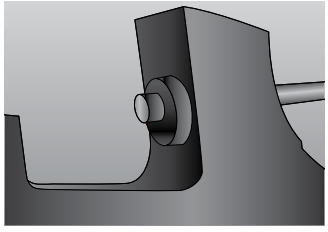
1. Insert hexagon wrench with 3mm width (TH-3L) into the wedge screw.



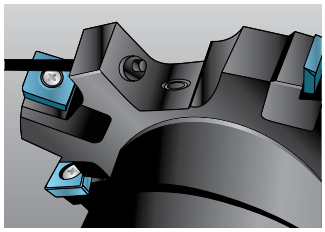


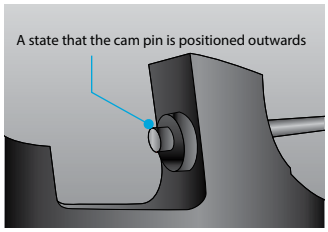
2. Loosen the wedge screw.
3. Remove the wedge screw and wedge.



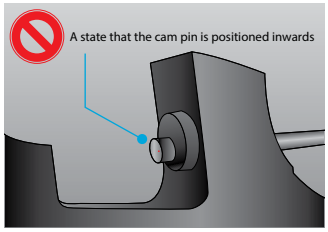


4. Remove the cartridge.

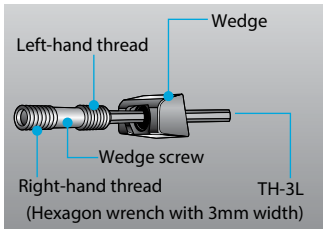


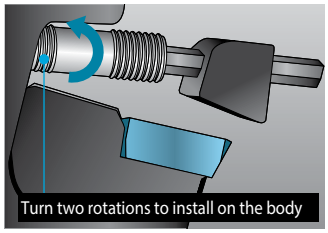


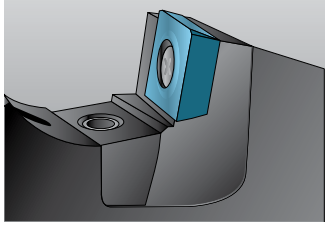
5. Before replacing the cartridge, make sure that the cam pin is positioned radially-outwards.



6. If the cam pin is in the position shown in the left diagram, assembling the cartridge is not possible.







7. Place the wedge so that its larger slant surface faces toward the cartridge.
8. Turn the wedge screw two rotations to install the wedge to the body.
9. When installing the wedge screw to the body, keep the wedge from rotating and screw it in.
10. Tighten the wedge screw by the torque of 5-6N·m.
    Keep the screw head and the wedge even
    (Prevent either of those from sticking out).

MRF



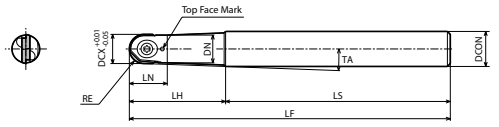


Fig. 1

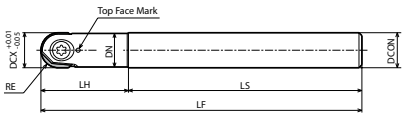


Fig. 2

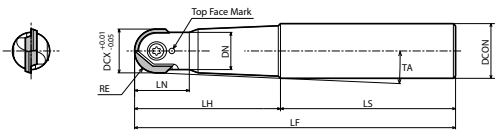


Fig. 3

Top Face Shown

Toolholder dimensions

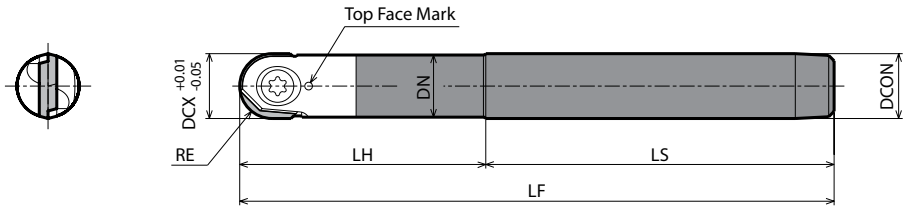
	Description		Availability	Inserts	Dimension (mm)								TA	Coolant hole	Fig.	Spare parts				Applicable inserts ➡ M260
					RE	DCX	DCON	LF	LH	DN	LN	LS				Anti-seize compound	Screw	Wrench	Wrench	
Standard Neck	MRF	08-S12	●	1	4	8	12	100	22	7.5	10	78	6°20′	No	1	P-37	SC-30067	DT-8	-	RDFG08FR
		10-S12	●		5	10			25	9.5	13	75	3°00′		1		SC-35085	DT-10		RDFG10FR
		12-S12	●		6	12		110	30	11.5	-	80	-		2		SC-40100	DT-15		RDFG12FR
		16-S20	●		8	16	20	130	50	14	20		2°50′		1		SC-50130	DT-20		RDFG16FR
		20-S25	●		10	20	25	140	60	17	25		3°00′		3		SC-60160	-	TT-25	RDFG20FR
		25-S32	●		12.5	25	32	150	70	22	31		3°30′		3		SC-60210		TT-30	RDFG25FR
Long Neck	MRF	08-S12-130	●	1	4	8	12	130	50	7.5	10	80	2°30′	No	1	P-37	SC-30067	DT-8	-	RDFG08FR
		10-S16-150	●		5	10	16	150		9.5	15	100	3°50′		1		SC-35085	DT-10		RDFG10FR
		12-S16-160	●		6	12		160	60	11.5	16		2°10′		1		SC-40100	DT-15		RDFG12FR
		16-S20-160	●		8	16	20		65	14	20	95	2°00′		1		SC-50130	DT-20		RDFG16FR
		20-S25-180	●		10	20	25	180	80	17	25	100	2°10′		3		SC-60160	-	TT-25	RDFG20FR
		25-S32-200	●		12.5	25	32	200	90	22	31	110	2°40′		3		SC-60210		TT-30	RDFG25FR

TA (Toolholder's interference angle) is the angle formed by the tangential line from insert dia. to toolholder's shank dia.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MRFW (Carbide Shank)





Top Face Shown

Toolholder dimensions

	Description		Availability	Inserts	Dimension (mm) RE	DCX	DCON	LF	LH	DN	LS	Coolant hole	Spare parts: Anti-seize compound	Screw	Wrench	Applicable inserts ➔ M260
Carbide Standard	MRFW	08-S08	●	1	4	8	8	100	30	7.4	70	No	P-37	SC-30067	DT-8	RDFG08FR
		10-S10	●		5	10	10		35	9.5	65			SC-35085	DT-10	RDFG10FR
		12-S12	●		6	12	12	110	45	11.5				SC-40100	DT-15	RDFG12FR
Carbide Long Neck	MRFW	08-S08-130	●	1	4	8	8	130	65	7.4	65	No	P-37	SC-30067	DT-8	RDFG08FR
		10-S10-140	●		5	10	10	140	75	9.5				SC-35085	DT-10	RDFG10FR
		12-S12-150	●		6	12	12	150	85	11.5				SC-40100	DT-15	RDFG12FR

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

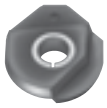
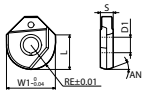
M

Milling

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

RDFG

Classification of usage ● : 1st Choice ○ : 2nd Choice			
Carbon steel / Alloy steel	●	P
Mold and die steel	●	P
Stainless steel	○	M
Gray cast iron	○	K
Nodular cast iron	○	K
Non-ferrous metals		N
Heat-resistant alloy		S
Titanium alloy		S
Hard materials		H

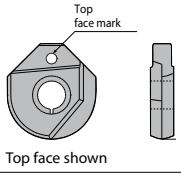
Insert		Description		Dimension (mm)					Angle (°)	Carbide		Applicable toolholder ➡ M258 M259
				S	D1	RE	L	W1	AN	PVD	PR915	
		RDFG	08FR	2.1	3.1	4	6.6	8	15	●		MRF(W)08...
			10FR	2.7	3.6	5	8	10	15	●		MRF(W)10...
			12FR	3.2	4.1	6	9.4	12	15	●		MRF(W)12...
			16FR	4.2	5.1	8	11.3	16	10	●		MRF16...
			20FR	5.2	6.1	10	14.1	20	10	●		MRF20...
			25FR	6.2	6.1	12.5	15.5	25	10	●		MRF25...

Handed insert shows Right-hand

Recommended cutting conditions ➡ M261

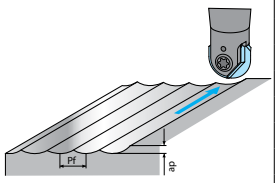
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts

Insert		Description	
		RDFG	08FR
			10FR
			12FR
			16FR
			20FR
			25FR

Check the top face mark of both insert and toolholder.

Recommended depth of cut

Description		Depth of cut (mm)		Applications
		ap	Pf	
Standard neck	MRF08-S12	0.2 (Max0.3)	0.8	
	MRF10-S12	0.2	1	
	MRF12-S12	0.5	1.2	
	MRF16-S20	0.5	1.6	
	MRF20-S25	1	2	
	MRF25-S32	1	2.5	
Long neck	MRF08-S12-130	0.2 (Max0.3)	0.8	
	MRF10-S12-150	0.2	1	
	MRF12-S12-160	0.5	1.2	
	MRF16-S20-160	0.5	1.6	
	MRF20-S25-180	1	2	
	MRF25-S32-200	1	2.5	
Carbide standard neck	MRFW08-S08	0.2 (Max0.3)	0.8	
	MRFW10-S10	0.2	1	
	MRFW12-S12	0.5	1.2	
Carbide long Neck	MRFW08-S08-130	0.2 (Max0.3)	0.8	
	MRFW10-S10-140	0.2	1	
	MRFW12-S12-150	0.5	1.2	

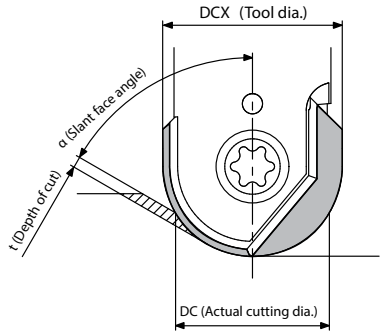
For ø8, holder may be broken because of over load if ap exceeds 0.3mm.

Recommended cutting conditions (At cutting dia. DCX)

Workpiece material	Insert grades	Vc (m/min)	fz (mm/t)	ø8		ø10		ø12	
				Vc(m/min) (n:min^{-1})	fz(mm/t) (Vf:mm/min)	Vc(m/min) (n:min^{-1})	fz(mm/t) (Vf:mm/min)	Vc(m/min) (n:min^{-1})	fz(mm/t) (Vf:mm/min)
Carbon steel	PR915	100~200	0.1~0.3	150 (5,970)	0.2 (2,390)	150 (4,770)	0.2 (1,910)	150 (3,980)	0.2 (1,590)
Alloy steel	PR915	80~180	0.1~0.3	130 (5,170)	0.2 (2,070)	130 (4,140)	0.2 (1,660)	130 (3,450)	0.2 (1,380)
Mold steel	PR915	50~150	0.1~0.2	100 (3,980)	0.15 (1,190)	100 (3,180)	0.15 (950)	100 (2,650)	0.15 (800)
Stainless steel	PR915	50~150	0.1~0.2	100 (3,980)	0.15 (1,190)	100 (3,180)	0.15 (950)	100 (2,650)	0.15 (800)
Cast iron	PR915	100~200	0.2~0.4	150 (5,970)	0.3 (3,580)	150 (4,770)	0.3 (2,860)	150 (3,980)	0.3 (2,390)
Workpiece material	Insert grades	Vc (m/min)	fz (mm/t)	ø16		ø20		ø25	
				Vc(m/min) (n:min^{-1})	fz(mm/t) (Vf:mm/min)	Vc(m/min) (n:min^{-1})	fz(mm/t) (Vf:mm/min)	Vc(m/min) (n:min^{-1})	fz(mm/t) (Vf:mm/min)
Carbon steel	PR915	100~200	0.1~0.3	150 (2,980)	0.2 (1,190)	150 (2,390)	0.2 (950)	150 (1,910)	0.2 (760)
Alloy steel	PR915	80~180	0.1~0.3	130 (2,590)	0.2 (1,030)	130 (2,070)	0.2 (830)	130 (1,660)	0.2 (660)
Mold steel	PR915	50~150	0.1~0.2	100 (1,990)	0.15 (600)	100 (1,590)	0.15 (480)	100 (1,270)	0.15 (380)
Stainless steel	PR915	50~150	0.1~0.2	100 (1,990)	0.15 (600)	100 (1,590)	0.15 (480)	100 (1,270)	0.15 (380)
Cast iron	PR915	100~200	0.2~0.4	150 (2,980)	0.3 (1,790)	150 (2,390)	0.3 (1,430)	150 (1,910)	0.3 (1,150)

Actual cutting speed (Vd) conversion coefficient table

- Vd varies depending on ap and slant face angle.
- Vd can be obtained by dividing the conversion coefficient into the recommended cutting speed.

Model	Tool dia. (DCX)		ø8		ø10		ø12	
	Depth of cut (t:mm)		0.1	0.2	0.1	0.2	0.2	0.5
	Slant face angle (α)	15°	1.00	1.00	1.00	1.00	1.00	1.00
		30°	1.05	1.02	1.05	1.03	1.04	1.01
		45°	1.18	1.12	1.20	1.14	1.16	1.07
		60°	1.47	1.34	1.51	1.38	1.42	1.24
		75°	2.15	1.82	2.24	1.92	2.02	1.60
		90°(Horizontal plane)	4.48	3.22	5.06	3.57	3.92	2.50
	Tool dia. (DCX)		ø16		ø20		ø25	
	Depth of cut (t:mm)		0.2	0.5	0.5	1	0.5	1
	Slant face angle (α)	15°	1.00	1.00	1.00	1.02	1.00	1.01
		30°	1.05	1.01	1.02	1.00	1.03	1.00
		45°	1.18	1.10	1.12	1.06	1.14	1.08
		60°	1.47	1.30	1.34	1.21	1.38	1.25
		75°	2.14	1.73	1.83	1.53	1.93	1.62
		90°(Horizontal plane)	4.48	2.87	3.20	2.29	3.57	2.55

e.g.) Suppose tool dia. 8mm, ap=0.1mm, slant face angle 90˚: The actual Cutting speed Vd for carbon steel machining, when Vc is 150m/min at the biggest diameter, Vd can be obtained as Vd=150 / 4.48=33.5m/min



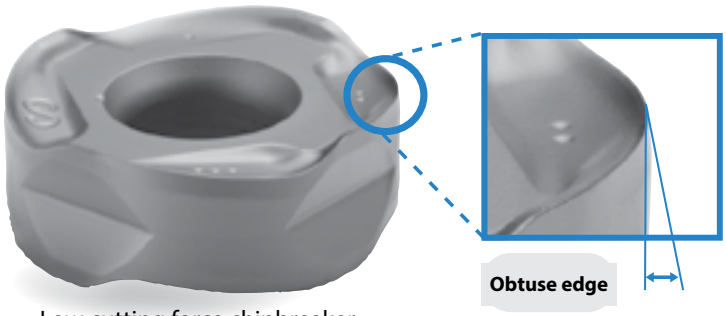
MRW

Economical and high efficiency radius cutter
with double-sided insert for various types of workpieces

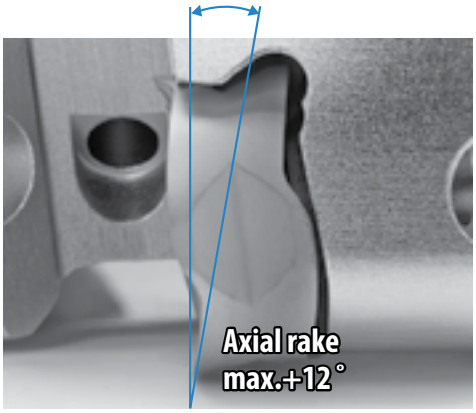
Economical double-sided 8-edge insert
Combine sharpness and cutting edge strength

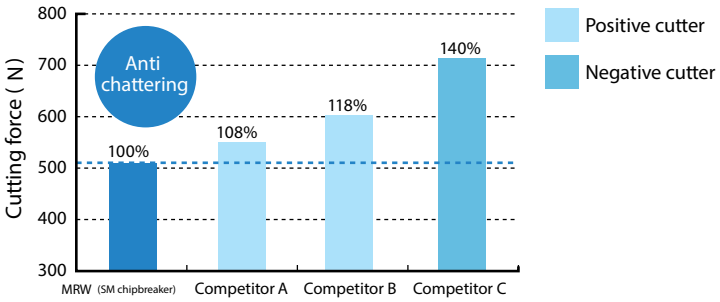
Obtuse edge increases cutting edge toughness

Helical cutting edge design with maximum axial rake 12˚ reduces cutting force, equivalent to positive inserts.



Low cutting force chipbreaker

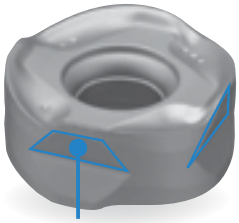




<Cutting conditions>
Vc=120m/min, ap × ae=1× 40mm, fz=0.2mm/t
X5CrNi18 10, cutter ø50

1 Flat lock structure to hold insert firmly

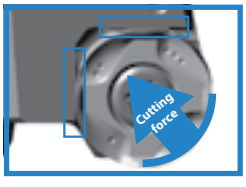
Prevent insert rotation during machining and realizes stable machining



Wide and flat constraint surface

Flat lock structure

Wide flat constraint surface
- Receives even cutting forces
- Controls insert rotation



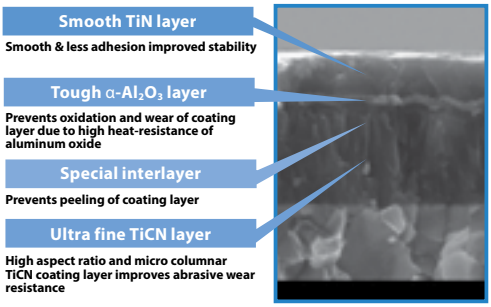
Long tool life by wide lineup with 4 grades and 3 chipbreakers, available for steel, stainless steel and heat-resistant alloys

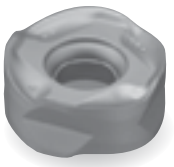
Workpiece material		Applicable insert grades	Applicable chipbreaker
P Carbon steel/Alloy steel/Mold steel		PR1825	GM/SM/GH chipbreaker
K Cast iron		PR1810	GH/GM chipbreaker
S Ni-base heat-resistant alloys	M Stainless steel (Martensitic related)	CA6535	SM/GM chipbreaker
S Ni-base heat-resistant alloys S Titanium alloys	M Stainless steel (Austenitic related) M Stainless steel (Precipitation hardening)	PR1835	SM/GM chipbreaker

2 Insert grades for difficult-to-cut material

Controls sudden fracture and realizes stable machining
Suitable for high efficiency machining

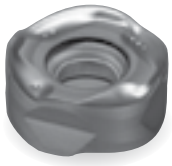






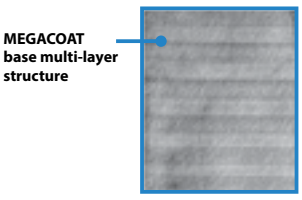
CA6535

for martensitic stainless steel and Ni-base heat-resistant alloys
High heat resistance and wear resistance with CVD coating
Improved stability with thin layer coating technology



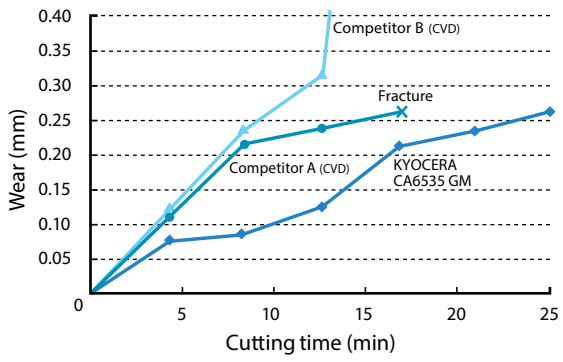
PR1835

For Ni-base heat-resistant alloys, titanium alloys and precipitation hardened stainless steel
Stable and longer tool life by special nano coating layer
MEGACOAT NANO EX



Tool life comparison (Internal evaluation)

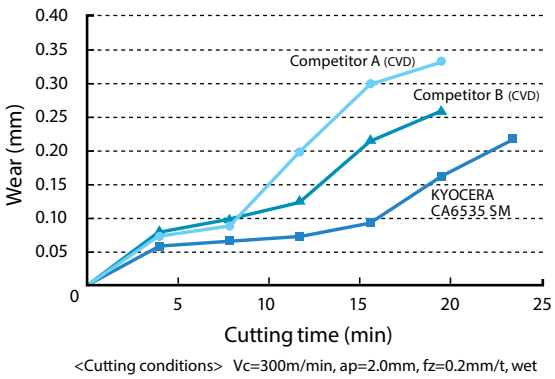
Ni-base heat-resistant alloys



<Cutting conditions> Vc=50m/min, ap=1.0mm, fz=0.15mm/t, wet

1st choice GM chipbreaker

Stainless steel (Martensitic related)



<Cutting conditions> Vc=300m/min, ap=2.0mm, fz=0.2mm/t, wet

1st choice SM chipbreaker

M
Milling

MRW



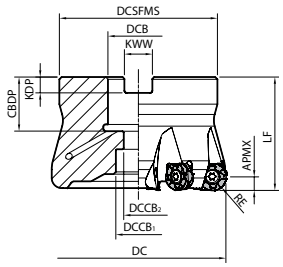


Fig. 1

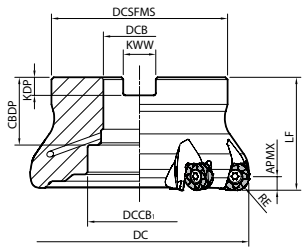


Fig. 2

Toolholder dimensions

	Description		Availability	Inserts	Dimension (mm)											A.R. (°)	R.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Fig.	Applicable inserts M267
			R		RE	DC	DCSFMS	DCB	DCCB1	DCCB2	LF	CBDP	KDP	KWW	APMX							
Metric	MRW	050R-12-5T-M	●	5	6	50	48	22	18	11	40	21	6.3	10.4	6	+12	-15.5	Yes	16000	0.3	1	ROMU1204M0ER-..
		050R-12-6T-M	●	6																	1	
		063R-12-6T-M	●			63	60		19										14000	0.6	1	
		063R-12-7T-M	●	7																	1	
		080R-12-6T-M	●	6		80	70	27	20	13	50	24	7	12.4					12000	1.1	1	
		080R-12-8T-M	●	8																	1	
		100R-12-7T-M	●	7		100	78	32	46	-		30	8	14.4					10600	1.5	2	
		100R-12-9T-M	●	9																1.4	2	
	MRW	063R-16-5T-M	●	5	8	63	60	22	19	11	40	21	6.3	10.4	8	+11	--16.5	Yes	12800	0.5	1	ROMU1605M0ER-..
		063R-16-6T-M	●	6																	1	
		080R-16-6T-M	●			80	70	27	20	13	50	24	7	12.4					11000	1.1	1	
		080R-16-7T-M	●	7																1	1	
		100R-16-6T-M	●	6		100	78	32	46	-		30	8	14.4					9600	1.4	2	
		100R-16-8T-M	●	8																1.3	2	
		125R-16-8T-M	●	8		125	89	40	55		63	33	9	16.4					8500	2.6	2	
		125R-16-10T-M	●	10																2.5	2	
Bore dia. inch spec	MRW	080R-12-6T	□	6	6	80	70	25.4	20	13	50	27	6	9.5	6	+12	-15.5	Yes	12000	1.2	1	ROMU1204M0ER-..
		080R-12-8T	□	8																1.1	1	
		100R-12-7T	□	7		100	78	31.75	46	-		34	8	12.7					10600	1.5	2	
		100R-12-9T	□	9																1.4	2	
	MRW	080R-16-6T	□	6	8	80	70	25.4	20	13	50	27	6	9.5	8	+11	-16.5	Yes	11000	1.1	1	ROMU1605M0ER-..
		080R-16-7T	□	7																	1	
		100R-16-6T	□	6		100	78	31.75	46	-		34	8	12.7					9600	1.4	2	
		100R-16-8T	□	8																	2	
		125R-16-8T	□	8		125	89	38.1	55		63	38	10	15.9					8560	2.6	2	
		125R-16-10T	□	10																	2	

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.
APMX is Maximum ap. For more details, see page **M268** below.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Spare parts and applicable inserts (MRW face mill)

Description		Spare parts					Applicable Inserts M267		
		Clamp screw	Wrench		Anti-seize compound	Mounting bolt			
			DTPM-15 	TTP-20 			 General purpose	 Low cutting force	 Tough Edge (For Heavy Milling)
MRW	050R-12...	SB-4085TRP	DTPM-15 Recommended tightening torque for insert clamp 3.5N•m		P-37	HH10X30	ROMU1204M0ER-GM	ROMU1204M0ER-SM	ROMU1204M0ER-GH
	063R-12...					HH12X35			
	080R-12...					-			
	100R-12...								
MRW	063R-16...	SB-50140TRP	TTP-20 Recommended tightening torque for insert clamp 4.5N•m		P-37	HH10X30	ROMU1605M0ER-GM	ROMU1605M0ER-SM	ROMU1605M0ER-GH
	080R-16...					HH12X35			
	100R-16...					-			
	125R-16...								

MRW



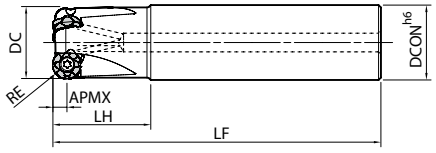


Fig. 1

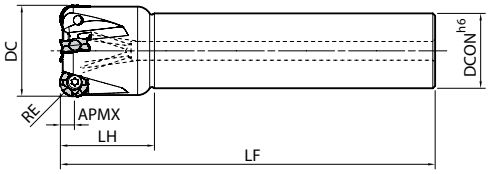


Fig. 2

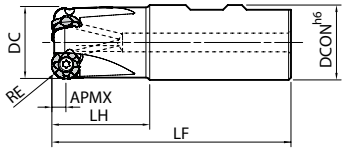


Fig. 3

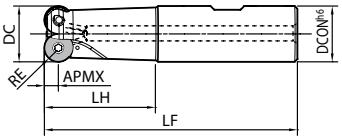


Fig. 4

Toolholder dimensions

	Description		Availability	Inserts	Dimension (mm) RE	DC	DCON	LF	LH	APMX	A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Fig.	Applicable inserts M267
Cylindrical	MRW	32-S32-12-3T	●	3	6	32	32	140	40	6	+12	-20	Yes	22000	1	ROMU1204M0ER-..
		40-S32-12-4T	●	4		40		160				-16.5		18800	2	
		50-S42-12-5T	●	5		50	42	170				-15.5		16000	2	
	MRW	40-S32-16-3T	●	3	8	40	32	160	40	8	+11	-18	Yes	17200	2	ROMU1605M0ER-..
		50-S42-16-4T	●	4		50	42	170				-16.5		14800	2	
		63-S42-16-5T	●	5		63			50					12800	2	
Long Shank	MRW	32-S32-12-2T-200	●	2	6	32	32	200	40	6	+12	-20	Yes	22000	1	ROMU1204M0ER-..
		40-S32-12-3T-200	●	3		40						-16.5		18800	2	
		50-S42-12-4T-300	●	4		50	42	300				-15.5		16000	2	
	MRW	40-S32-16-2T-200	●	2	8	40	32	200	40	8	+11	-18	Yes	17200	2	ROMU1605M0ER-..
		50-S42-16-3T-300	●	3		50	42	300				-16.5		14800	2	
		63-S42-16-4T-300	●	4		63			50					12800	2	
Weldon	MRW	32-W32-12-3T	●	3	6	32	32	102	40	6	+12	-20	Yes	22000	3	ROMU1204M0ER-..
		40-W32-12-4T	●	4		40		100				-16.5		18800	4	
		50-W40-12-5T	●	5		50	40	110				-15.5		16000	4	
	MRW	40-W32-16-3T	●	3	8	40	32	100	40	8	+11	-18	Yes	17200	4	ROMU1605M0ER-..
		50-W40-16-4T	●	4		50	40	110				-16.5		14800	4	
		63-W40-16-5T	●	5		63		120	50					12800	4	

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.
APMX is Maximum ap. For more details, see page **M268** below.

Spare parts and applicable inserts (MRW end mill)

Description	Spare parts				Applicable Inserts M267		
	Clamp screw	Wrench		Anti-seize compound	General purpose	Low cutting force	Tough Edge (For Heavy Milling)
		DTPM-15 	TTP-20 				
MRW ...-12...	SB-4085TRP	DTPM-15		P-37	ROMU1204M0ER-GM	ROMU1204M0ER-SM	ROMU1204M0ER-GH
	Recommended tightening torque for insert clamp 3.5N•m						
MRW ...-16...	SB-50140TRP	TTP-20		P-37	ROMU1605M0ER-GM	ROMU1605M0ER-SM	ROMU1605M0ER-GH
	Recommended tightening torque for insert clamp 4.5N•m						

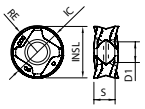
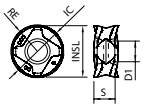
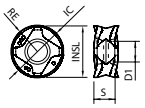
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

ROMU

Classification of usage

★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice
(In case hardness is 45HRC or under)

Carbon steel / Alloy steel			☆			★	☆	P
Mold and die steel			☆			★	☆	
Austenitic stainless steel				☆		☆	★	M
Martensitic stainless steel	★						☆	
Precipitation hardening stainless steel				☆			★	
Gray cast iron		☆			★			K
Nodular cast iron		☆			★			
Non-ferrous metals								N
Heat-resistant alloy	★						☆	S
Titanium alloy				☆			★	
Hard materials								H

Insert	Description	Dimension (mm)					Carbide							Applicable toolholder
							CVD	PVD						
		IC	S	D1	RE	INSL	CA6535	PR1510	PR1525	PR1535	PR1810	PR1825	PR1835	
  General purpose	ROMU 1204M0ER-GM	12	4.75	4.6	6	11.8	●	●	●	●	●	●	●	MRW...-12-..
	ROMU 1605M0ER-GM	16	5.48	6.2	8	15.8	●	●	●	●	●	●	●	MRW...-16-..
  Low cutting force	ROMU 1204M0ER-SM	12	4.75	4.6	6	11.8	●		●	●		●	●	MRW...-12-..
	ROMU 1605M0ER-SM	16	5.48	6.2	8	15.8	●		●	●		●	●	MRW...-16-..
  Tough edge	ROMU 1204M0ER-GH	12	4.75	4.6	6	11.8	●	●	●	●	●	●	●	MRW...-12-..
	ROMU 1605M0ER-GH	16	5.48	6.2	8	15.8	●	●	●	●	●	●	●	MRW...-16-..

Applicable toolholder ➡ **M264 M266**

Handed insert shows Right-hand

Recommended cutting conditions ➡ **M268**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Recommended cutting conditions

Workpiece material	Recommended chipbreaker (fz: mm/t) *Recommended feed rate (Reference value) for ROMU12 type: ap=3 mm/for ROMU16 type: ap=4 mm			Recommended insert grades (Vc: m/min)			
				MEGACOAT NANO EX (MEGACOAT NANO)			CVD Coated carbide
	GM	SM	GH	PR1810 (PR1510)	PR1825 (PR1525)	PR1835 (PR1535)	CA6535
Carbon steel	★ 0.1~**0.2**~0.3	☆ 0.06~**0.15**~0.2	☆ 0.15~**0.3**~0.35	-	★ 120~**180**~250	☆ 120~**180**~250	-
Alloy steel	★ 0.1~**0.2**~0.3	☆ 0.06~**0.15**~0.2	☆ 0.15~**0.3**~0.35	-	★ 100~**160**~220	☆ 100~**160**~220	-
Mold steel	★ 0.1~**0.15**~0.25	☆ 0.06~**0.12**~0.2	☆ 0.15~**0.2**~0.3	-	★ 80~**140**~180	☆ 80~**140**~180	-
Stainless steel (Austenitic related)	☆ 0.1~**0.15**~0.2	★ 0.06~**0.12**~0.2	☆ 0.15~**0.2**~0.25	-	☆ 100~**160**~200	★ 100~**160**~200	-
Stainless steel (Martensitic related)	☆ 0.1~**0.15**~0.2	★ 0.06~**0.12**~0.2	☆ 0.15~**0.2**~0.25	-	-	☆ 150~**200**~250	★ 180~**240**~300
Stainless steel (Precipitation Hardening)	★ 0.1~**0.15**~0.2	☆ 0.06~**0.12**~0.2	☆ 0.15~**0.2**~0.25	-	-	★ 90~**120**~150	-
Gray cast iron	★ 0.1~**0.2**~0.3	-	☆ 0.15~**0.3**~0.35	★ 120~**180**~250	-	-	-
Nodular cast iron	★ 0.1~**0.15**~0.25	-	☆ 0.15~**0.2**~0.3	★ 100~**150**~200	-	-	-
Ni-base heat-resistant alloys	★ 0.1~**0.12**~0.15	☆ 0.06~**0.1**~0.15	☆ 0.12~**0.15**~0.2	-	-	☆ 20~**30**~50	★ 20~**30**~50
Titanium alloys	☆ 0.1~**0.12**~0.15	★ 0.06~**0.1**~0.15	-	☆ 30~**50**~70	-	★ 40~**60**~80	-

★: 1st Recommendation ☆: 2nd Recommendation

* Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.
* The bold-faced number indicates a center value of recommended cutting condition. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.
* Recommended feed rate is the reference value when ap is RE/2 (3mm for ROMU12, 4mm for ROMU16).
  For lower ap than the above conditions, the conversion factor in the following table is recommended.

Insert	ap (Recommended)	Max. ap	Conversion factor for feed per tooth fz				
			ap=0.5mm	ap=1mm	ap=2mm	ap=3mm	ap=4mm
ROMU12 type	3mm or less	6mm	2.1	1.5	1.1	1.0 (Standard)	-
ROMU16 type	4mm or less	8mm	2.4	1.7	1.3	1.1	1.0 (Standard)

* Example (ROMU12 type, carbon steel, GM chipbreaker, ap=1mm)

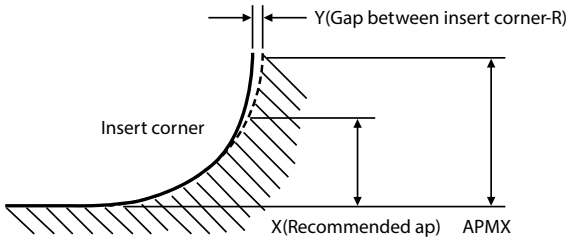
fz=0.2mm/t (Reference value for carbon steel and GM chipbreaker)	×	1.5 (Conversion factor for ROMU12 type, ap=1mm)	=	fz = 0.3 mm/t (Recommended feed rate)

* Recommended ap: 3mm or less for ROMU12, 4mm or less for ROMU16
  Except the case that ap temporally surpass the recommended ap, machining under the recommended ap is recommended.

Corner-R shape during processing

Corner-R shape during processing with MRW (Ref. to the right figure)

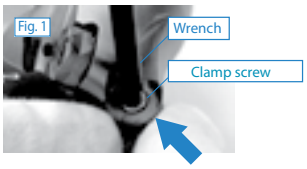
Insert	APMX	X	Y
ROMU12 type	6 mm	3 mm	0.1 mm
ROMU16 type	8 mm	4 mm	0.1 mm

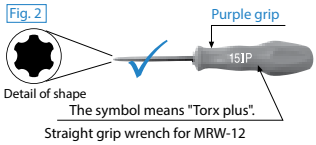


* When machining with larger ap than recommended ap (X), there is a gap (Y) between the workpiece corner and Insert corner-R(RE).
* The above figure is estimation. There would be ±0.2mm variation depending on the cutting conditions.

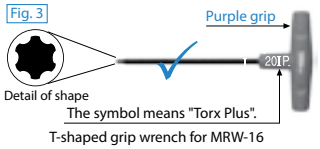
How to mount an insert

1. Be sure to remove dust and chips from the insert mounting pocket.
2. Clamp screw
   1. Apply anti-seize compound on portion of taper and thread of clamp screw.
   2. Attach the screw to the front end of the wrench. While lightly pressing the insert against the constraint surfaces, put the screw into the hole of the insert and tighten. (Ref. to Fig. 1)
3. Wrenches and clamp screws are "Torx Plus".
   1. Fig. 2 wrench is for MRW-12. (Straight grip)
   2. Fig. 3 wrench is for MRW-16. (T-shaped grip)
   Please use a "Torx Plus" Wrench for tightening cramp screw.
   * If a "Torx" wrench (Fig. 4) is used to tighten, the screw head might become damaged and then the screw cannot be removed.
4. When tightening the screw, make sure that the wrench is parallel to the screw.
   Recommended Tightening torque, See spare parts table.
5. After tightening the screw, make sure that there is no clearance between the insert seat surface and the bearing surface of the toolholder or between the insert side surfaces and the constraint surface of the toolholder. If there is any clearance, remove the insert and mount it again according to the above steps.

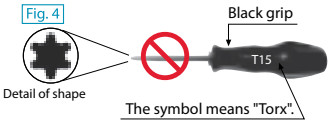




Straight grip wrench for MRW-12



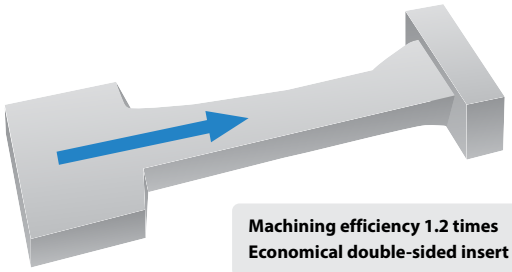
T-shaped grip wrench for MRW-16



Torx wrench (Do NOT use it for MRW)

Case studies

12Cr Steel



Machining efficiency 1.2 times
Economical double-sided insert

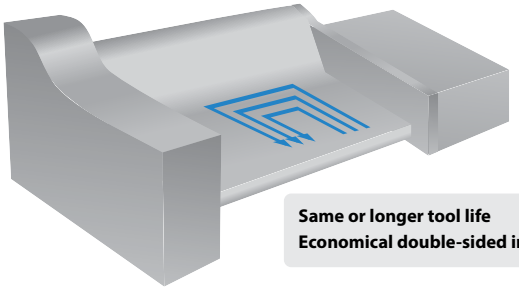
- Turbine blade • Vc=270m/min • fz=0.278mm/t
- ap=0.5~1.0mm ae=max.35mm • Dry
- MRW050R-12-6T-M (6 flutes) • ROMU1204M0ER-SM (CA6535)

CA6535	Stable machining
Competitor A (Positive cutter)	Unstable machining with large noise

- MRW improved machining efficiency by 1.2 times with same tool life compared with competitor A.
- MRW has cost advantage due to double-sided inserts.

(User evaluation)

12Cr Steel



Same or longer tool life
Economical double-sided insert

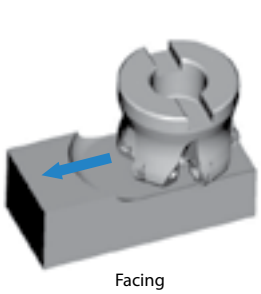
- Turbine Blade • Vc=250m/min • fz=0.16mm/t
- ap=2.0mm ae=5~30mm • Wet
- MRW050R-12-5T-M (5 flutes) • ROMU1204M0ER-SM (CA6535)

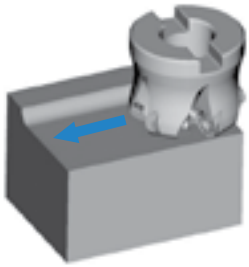
CA6535	Stable, available for further machining
Competitor B (Positive cutter)	Unstable machining with large noise

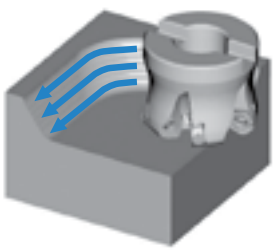
- MRW showed less damage on the cutting edge and reduced machining noise.
- MRW has equal or longer tool life and cost advantage due to double sided inserts.

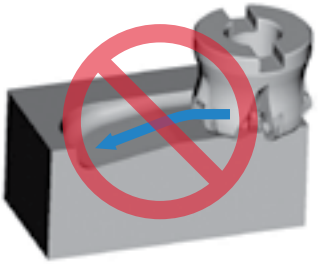
(User evaluation)

Applications


Facing


Shouldering


Contouring


Plunging/Profiling

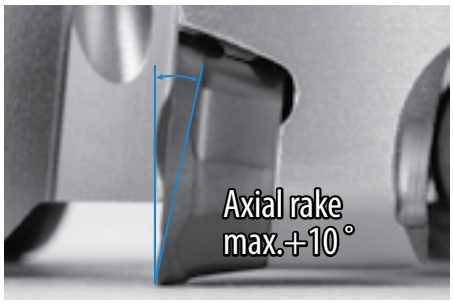
MRX

Excellent cutting performance with low cutting force design

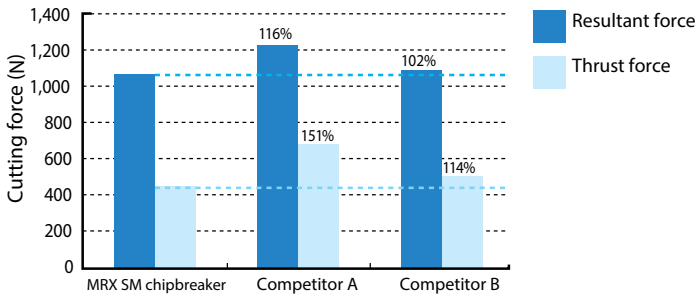
High efficiency radius cutter



1 Low cutting force design with helical cutting-edge design



Cutting force comparison (Internal evaluation)



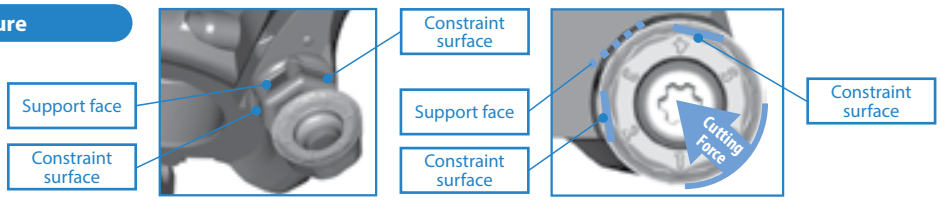
<Cutting conditions>
Vc=120m/min, ap×ae=2×25mm, fz=0.2mm/t, X5CrNi18 10, Cutterø50

2 Flat lock structure to hold insert firmly

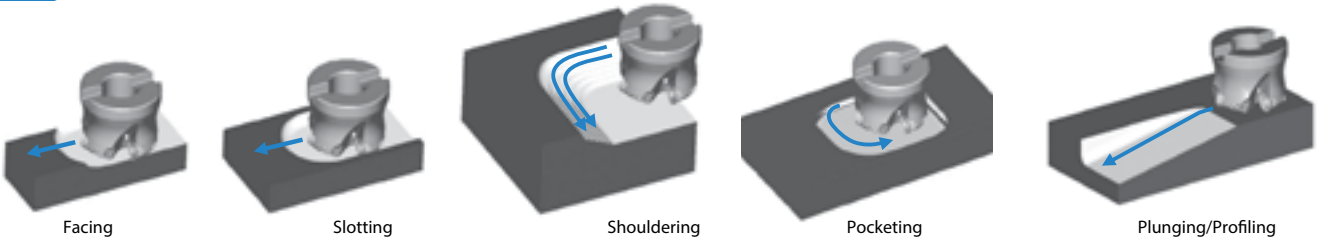
Prevent insert rotation during machining and realizes stable machining

Flat lock structure

Wide flat constraint surface
- Receives even cutting forces
- Controls insert rotation



3 Various applications



4 Machining of various materials possible

Insert grades **CA6535/PR1835(PR1535)** for difficult-to-cut material are available.
Long tool life by wide lineup with 4 grades and 3 chipbreakers, available for steel, stainless steel and heat-resistant alloys.

Cost-effective M class inserts are available

MRX



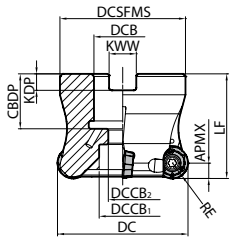


Fig. 1

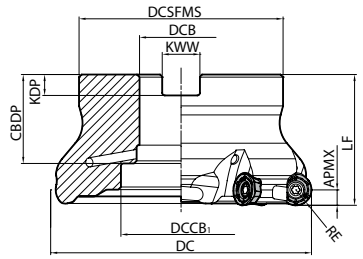


Fig. 2

Toolholder dimensions

Description			Availability	Inserts	Dimension (mm)											A.R. (°)	R.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Weight (kg)	Fig.	Applicable inserts M276
			R		RE	DC	DCSFMS	DCB	DCCB1	DCCB2	LF	CBDP	KDP	KWW	APMX							
Metric	MRX	040R-10-5T-M	●	5	5	40	38	16	15	9	40	19	5.6	8.4	5	+10	-5.5	Yes	20000	0.2	1	RPGT10T3... RPMT10T3...
		050R-10-6T-M	●	6		50	48	22	18	11		21	6.3	10.4					17500	0.3	1	
		063R-10-7T-M	●	7		63	60												15000	0.6	1	
	MRX	040R-12-4T-M	●	4	6	40	38	16	13.5	9	40	19	5.6	8.4	6	+10	-5.5	Yes	21000	0.2	1	RPGT1204... RPMT1204...
		050R-12-4T-M	●			50	48	22	18	11		21	6.3	10.4					18000	0.3	1	
		050R-12-5T-M	●	5																	1	
		052R-12-4T-M	●	4		52													17500		1	
		052R-12-5T-M	●	5																	1	
		063R-12-5T-M	●			63	60												15500	0.6	1	
		063R-12-6T-M	●	6																	1	
		066R-12-5T-M	●	5		66													15000		1	
		066R-12-6T-M	●	6																	1	
		080R-12-6T-M	●			80	70	27	20	13	50	24	7	12.4					13500	1.2	1	
		080R-12-8T-M	●	8																1.1	1	
		100R-12-7T-M	●	7		100	78	32	46	-		30	8	14.4					12000	1.4	2	
		100R-12-9T-M	●	9																	2	
	MRX	063R-16-4T-M	●	4	8	63	60	22	18	11	40	21	6.3	10.4	8	+10	-5.5	Yes	13500	0.5	1	RPGT1605... RPMT1605...
		063R-16-5T-M	●	5																	1	
		066R-16-4T-M	●	4		66													13000	0.6	1	
		066R-16-5T-M	●	5																0.5	1	
		080R-16-5T-M	●			80	70	27	20	13	50	24	7	12.4					11500	1.1	1	
		080R-16-6T-M	●	6																	1	
		100R-16-6T-M	●			100	78	32	46	-		30	8	14.4					10000	1.4	2	
		100R-16-7T-M	●	7																	2	
		125R-16-6T-M	●	6		125	89	40	55		63	33	9	16.4					9000	2.6	2	
		125R-16-8T-M	●	8																	2	
Bore dia. inch spec	MRX	080R-12-6T	□	6	6	80	70	25.4	20	13	50	27	6	9.5	6	+10	-5.5	Yes	13500	1.2	1	RPGT1204... RPMT1204...
		080R-12-8T	□	8																1.1	1	
		100R-12-7T	□	7		100	78	31.75	46	-		34	8	12.7					12000	1.5	2	
		100R-12-9T	□	9																	2	
	MRX	080R-16-5T	□	5	8	80	70	25.4	20	13	50	27	6	9.5	8	+10	-5.5	Yes	11500	1.1	1	RPGT1605... RPMT1605...
		080R-16-6T	□	6																	1	
		100R-16-6T	□			100	78	31.75	46	-		34	8	12.7					10000	1.4	2	
		100R-16-7T	□	7																	2	
		125R-16-6T	□	6		125	89	38.1	55		63	38	10	15.9					9000	2.7	2	
		125R-16-8T	□	8																	2	

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Spare parts and applicable inserts (MRW face mill)

Description		Spare parts: Clamp screw	Wrench: DTPM	Wrench: TTP	Anti-seize compound	Mounting bolt	Applicable inserts (M276)
MRX	040R-10...	SB-3070TRP	DTPM-10		P-37	HH8X25	RPMT10T3M0ER-GM RPGT10T3M0ER-GM RPGT10T3M0ER-SM RPMT10T3M0EN-GH *1
	050R-10...					HH10X30	
	063R-10...	Recommended tightening torque for insert clamp 2.0N•m					
MRX	040R-12...	SB-4090TRPN	DTPM-15		P-37	HH8X25	RPMT1204M0ER-GM RPGT1204M0ER-GM RPGT1204M0ER-SM RPMT1204M0EN-GH *2
	050R-12...					HH10X30	
	063R-12...						
	080R-12...	Recommended tightening torque for insert clamp 3.5N•m				HH12X35	
	100R-12...					-	
MRX	063R-16...	SB-50120TRP	TTP-20		P-37	HH10X30	RPMT1605M0ER-GM RPGT1605M0ER-GM RPGT1605M0ER-SM RPMT1605M0EN-GH *3
	080R-16...					HH12X35	
	100R-16...					-	
	125R-16...	Recommended tightening torque for insert clamp 4.5N•m					

Max. Revolution
Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

*1··· Not compatible with the conventional RPMT10T3M0.
*2··· Not compatible with the conventional RPMT1204M0 and RPMT1204M0-H.
*3··· Not compatible with the conventional RPMT1606M0-H.

MRX



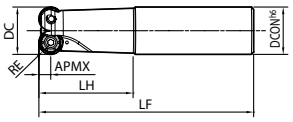


Fig. 1

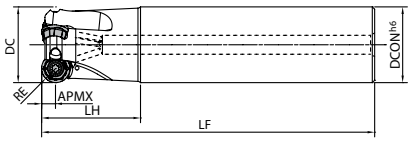


Fig. 2

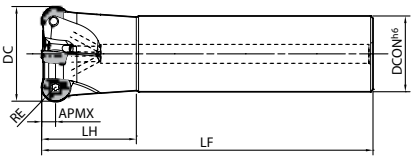


Fig. 3

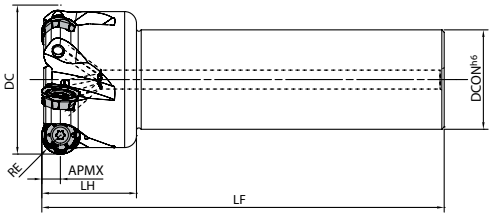


Fig. 4

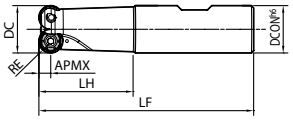


Fig. 5

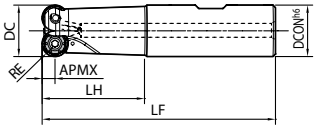


Fig. 6

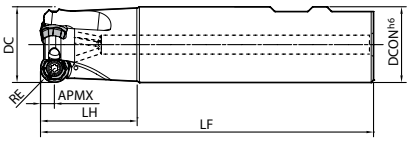


Fig. 7

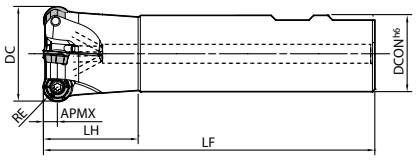


Fig. 8

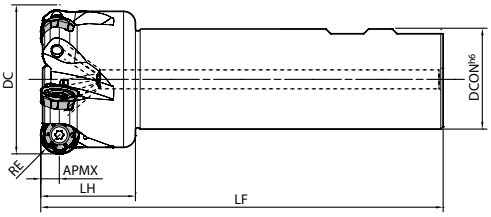


Fig. 9

Toolholder dimensions

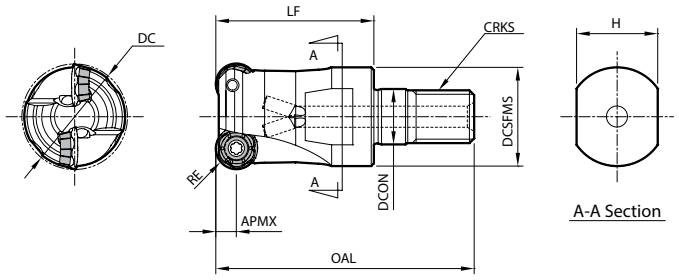
	Description		Availability	Inserts	RE	DC	DCON	LF	LH	APMX	A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Fig.	Applicable inserts ⇨ M276
Cylindrical	MRX	16-S16-08-2T	●	2	4	16	16	110	40	4	+3	-5.5	No	38000	1	RDGT0803... RDMT0803...
		20-S20-08-2T	●			20	20	120			+10		Yes	32000	2	
		25-S25-08-4T	●	4		25	25							28000	2	
	MRX	20-S20-10-2T	●	2	5	20	20	120	40	5	+5	-8	No	30000	1	RPGT10T3... RPMT10T3...
		25-S25-10-3T	●	3		25	25				+10	-5.5	Yes	28000	2	
		32-S32-10-4T	●	4		32	32	140						22500	2	
	MRX	32-S32-12-3T	●	3	6	32	32	140	40	6	+10	-5.5	Yes	24500	2	RPGT1204... RPMT1204...
		40-S32-12-4T	●	4		40								21000	3	
		50-S42-12-5T	●	5		50	42	170						18000	3	
	MRX	40-S32-16-2T	●	2	8	40	32	140	40	8	+10	-5.5	Yes	18000	3	RPGT1605... RPMT1605...
		50-S42-16-4T	●	4		50	42	170						15500	3	
		63-S42-16-5T	●	5		63								13500	4	
Weldon	MRX	16-W16-08-2T	●	2	4	16	16	89	40	4	+3	-5.5	No	38000	5	RDGT0803... RDMT0803...
		20-W20-08-2T	●			20	20	91			+10		Yes	32000	6	
		25-W25-08-4T	●	4		25	25	97						28000	7	
	MRX	20-W20-10-2T	●	2	5	20	20	91	40	5	+5	-8	No	30000	5	RPGT10T3... RPMT10T3...
		25-W25-10-3T	●	3		25	25	97			+10	-5.5	Yes	28000	7	
		32-W32-10-4T	●	4		32	32	101						22500	7	
	MRX	32-W32-12-3T	●	3	6	32	32	101	40	6	+10	-5.5	Yes	24500	7	RPGT1204... RPMT1204...
		40-W32-12-4T	●	4		40								21000	8	
		50-W40-12-5T	●	5		50	40	111						18000	8	
	MRX	40-W32-16-2T	●	2	8	40	32	101	40	8	+10	-5.5	Yes	18000	8	RPGT1605... RPMT1605...
		50-W40-16-4T	●	4		50	40	111						15500	8	
		63-W40-16-5T	●	5		63		112						13500	9	
Long Shank	MRX	16-S16-08-2T-160	●	2	4	16	16	160	70	4	+3	-5.5	No	38000	1	RDGT0803... RDMT0803...
		20-S20-08-2T-180	●			20	20	180	80		+10		Yes	32000	2	
		25-S25-08-4T-180	●	4		25	25							28000	2	
	MRX	20-S20-10-2T-180	●	2	5	20	20	180	80	5	+5	-8	No	30000	1	RPGT10T3... RPMT10T3...
		25-S25-10-2T-180	●			25	25				+10	-5.5	Yes	28000	2	
		32-S32-10-4T-200	●	4		32	32	200						22500	2	
	MRX	32-S32-12-2T-200	●	2	6	32	32	200	80	6	+10	-5.5	Yes	24500	2	RPGT1204... RPMT1204...
		40-S32-12-4T-200	●	4		40			40					21000	3	
		50-S42-12-4T-300	●			50	42	300						18000	3	
	MRX	40-S32-16-2T-200	●	2	8	40	32	200	40	8	+10	-5.5	Yes	18000	3	RPGT1605... RPMT1605...
		50-S42-16-4T-300	●	4		50	42	300						15500	3	
		63-S42-16-4T-300	●			63								13500	4	

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MRX





Toolholder dimensions

Description		Availability	Inserts	Dimension (mm) RE	DC	DCON	DCSFMS	OAL	LF	APMX	CRKS	H	A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min⁻¹)	Applicable inserts M276
MRX	16-M08-08-2T	●	2	4	16	8.5	14.7	42	25	4	M8x1.25	12	+3	-5.5	No	38000	RDGT0803... RDMT0803...
	20-M10-08-2T	●			20	10.5	18.7	48	30		M10x1.5	15	+10		Yes	32000	
	25-M12-08-4T	●	4		25	12.5	23	56	35		M12x1.75	19				28000	
MRX	20-M10-10-2T	●	2	5	20	10.5	18.7	48	30	5	M10x1.5	15	+5	-8	No	30000	RPGT10T3... RPMT10T3...
	25-M12-10-3T	●	3		25	12.5	23	56	35		M12x1.75	19	+10	-5.5	Yes	28000	
	32-M16-10-4T	●	4		32	17	30	62	40		M16x2.0	24				22500	
MRX	32-M16-12-3T	●	3	6	32	17	30	62	40	6	M16x2.0	24	+10	-5.5	Yes	24500	RPGT1204... RPMT1204...
	40-M16-12-4T	●	4		40											21000	
MRX	40-M16-16-2T	●	2	8	40	17	30	62	40	8	M16x2.0	24	+10	-5.5	Yes	18000	RPGT1605... RPMT1605...

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.
See page **M82** for applicable arbor (BT arbor for exchangeable head / double-face clamping spindle)

Spare parts and applicable inserts

Description	Clamp screw	Wrench DTPM	Wrench TTP	Anti-seize compound	Applicable inserts M276
MRX ...-08...	SB-2555TRP	DTPM-8		P-37	RDMT0803M0ER-GM RDGT0803M0ER-GM RDGT0803M0ER-SM RDMT0803M0EN-GH *1
	Recommended tightening torque for insert clamp 1.2N•m				
MRX ...-10...	SB-3070TRP	DTPM-10		P-37	RPMT10T3M0ER-GM RPGT10T3M0ER-GM RPGT10T3M0ER-SM RPMT10T3M0EN-GH *2
	Recommended tightening torque for insert clamp 2.0N•m				
MRX ...-12...	SB-4090TRPN	DTPM-15		P-37	RPMT1204M0ER-GM RPGT1204M0ER-GM RPGT1204M0ER-SM RPMT1204M0EN-GH *3
	Recommended tightening torque for insert clamp 3.5N•m				
MRX ...-16...	SB-50120TRP	TTP-20		P-37	RPMT1605M0ER-GM RPGT1605M0ER-GM RPGT1605M0ER-SM RPMT1605M0EN-GH *4
	Recommended tightening torque for insert clamp 4.5N•m				

Max. Revolution
Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

*1··· Not compatible with the conventional RDMT08T2M0-H.
*2··· Not compatible with the conventional RPMT10T3M0.
*3··· Not compatible with the conventional RPMT1204M0 and RPMT1204M0-H.
*4··· Not compatible with the conventional RPMT1606M0-H.

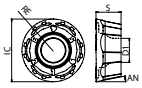
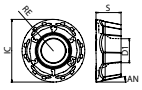
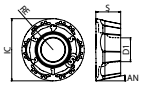
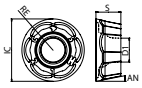
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

RDMT/RDGT/RPMT/RPGT

Classification of usage

★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice
(In case hardness is 45HRC or under)

Carbon steel / Alloy steel			☆			★	☆	P
Mold and die steel			☆			★	☆	
Austenitic stainless steel				☆		☆	★	M
Martensitic stainless steel	★						☆	
Precipitation hardening stainless steel				☆			★	
Gray cast iron		☆			★			K
Nodular cast iron		☆			★			
Non-ferrous metals								N
Heat-resistant alloy	★						☆	S
Titanium alloy				☆			★	
Hard materials								H

Insert		Description		Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide CVD CA6535	PVD PR1510	PR1525	PR1535	PR1810	PR1825	PR1835	Applicable toolholder ➡ M271 M274 M275
	 General purpose	RDGT	0803M0ER-GM	8	3.18	3	4	15	●	●	●	●	●	●	●	MRX...-08-..
		RPGT	10T3M0ER-GM	10	3.97	3.5	5	11	●	●	●	●	●	●	●	MRX...-10-..
		RPGT	1204M0ER-GM	12	4.76	4.6	6	11	●	●	●	●	●	●	●	MRX...-12-..
		RPGT	1605M0ER-GM	16	5.56	5.8	8	11	●	●	●	●	●	●	●	MRX...-16-..
	 General purpose	RDMT	0803M0ER-GM	8	3.18	3	4	15	●	●	●	●	●	●	●	MRX...-08-..
		RPMT	10T3M0ER-GM	10	3.97	3.5	5	11	●	●	●	●	●	●	●	MRX...-10-..
		RPMT	1204M0ER-GM	12	4.76	4.6	6	11	●	●	●	●	●	●	●	MRX...-12-..
		RPMT	1605M0ER-GM	16	5.56	5.8	8	11	●	●	●	●	●	●	●	MRX...-16-..
	 Low cutting force	RDGT	0803M0ER-SM	8	3.18	3	4	15	●		●	●		●	●	MRX...-08-..
		RPGT	10T3M0ER-SM	10	3.97	3.5	5	11	●		●	●		●	●	MRX...-10-..
		RPGT	1204M0ER-SM	12	4.76	4.6	6	11	●		●	●		●	●	MRX...-12-..
		RPGT	1605M0ER-SM	16	5.56	5.8	8	11	●		●	●		●	●	MRX...-16-..
	 Tough edge	RDMT	0803M0EN-GH	8	3.18	3	4	15	●	●	●	●	●	●	●	MRX...-08-..
		RPMT	10T3M0EN-GH	10	3.97	3.5	5	11	●	●	●	●	●	●	●	MRX...-10-..
		RPMT	1204M0EN-GH	12	4.76	4.6	6	11	●	●	●	●	●	●	●	MRX...-12-..
		RPMT	1605M0EN-GH	16	5.56	5.8	8	11	●	●	●	●	●	●	●	MRX...-16-..

Handed insert shows Right-hand

Recommended cutting conditions ➡ M277

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Recommended cutting conditions

Workpiece material	Recommended chipbreaker (fz: mm/t) * RD**08 type: ap=2mm, RP**10 type: ap=2.5mm RP**12 type: ap=3mm, RP**16 type: ap=4mm				Recommended insert grades (Vc: m/min)			
					MEGACOAT NANO EX (MEGACOAT NANO)			CVD Coated carbide
	RDMT-GM RPMT-GM	RDGT-GM RPGT-GM	RDGT-SM RPGT-SM	RDMT-GH RPMT-GH	PR1810 (PR1510)	PR1825 (PR1525)	PR1835 (PR1535)	(CA6535)
Carbon steel	★ 0.1~**0.2**~0.3	☆ 0.1~**0.2**~0.3	☆ 0.06~**0.15**~0.2	☆ 0.15~**0.3**~0.35	-	★ 120~**180**~250	☆ 120~**180**~250	-
Alloy steel	★ 0.1~**0.2**~0.3	☆ 0.1~**0.2**~0.3	☆ 0.06~**0.15**~0.2	☆ 0.15~**0.3**~0.35	-	★ 100~**160**~220	☆ 100~**160**~220	-
Mold steel	★ 0.1~**0.15**~0.25	☆ 0.1~**0.15**~0.25	☆ 0.06~**0.12**~0.2	☆ 0.15~**0.2**~0.3	-	★ 80~**140**~180	☆ 80~**140**~180	-
Stainless steel (Austenitic related)	☆ 0.1~**0.15**~0.2	☆ 0.1~**0.15**~0.2	★ 0.06~**0.12**~0.2	☆ 0.15~**0.2**~0.25	-	☆ 100~**160**~200	★ 100~**160**~200	-
Stainless steel (Martensitic related)	☆ 0.1~**0.15**~0.2	☆ 0.1~**0.15**~0.2	★ 0.06~**0.12**~0.2	☆ 0.15~**0.2**~0.25	-	-	☆ 150~**200**~250	★ 180~**240**~300
Stainless steel (Precipitation Hardening)	☆ 0.1~**0.15**~0.2	★ 0.1~**0.15**~0.2	☆ 0.06~**0.12**~0.2	☆ 0.15~**0.2**~0.25	-	-	★ 90~**120**~150	-
Gray cast iron	★ 0.1~**0.2**~0.3	☆ 0.1~**0.2**~0.3	-	☆ 0.15~**0.3**~0.35	★ 120~**180**~250	-	-	-
Nodular cast iron	★ 0.1~**0.15**~0.25	☆ 0.1~**0.15**~0.25	-	☆ 0.15~**0.2**~0.3	★ 100~**150**~200	-	-	-
Ni-base heat-resistant alloys	☆ 0.1~**0.12**~0.15	★ 0.1~**0.12**~0.15	☆ 0.06~**0.1**~0.15	☆ 0.12~**0.15**~0.2	-	-	☆ 20~**30**~50	★ 20~**30**~50
Titanium alloys	☆ 0.1~**0.12**~0.15	☆ 0.1~**0.12**~0.15	★ 0.06~**0.1**~0.15	-	☆ 30~**50**~70	-	★ 40~**60**~80	-

* Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.
* RDGT/RPGT are recommended for stainless steel, Ni-base heat-resistant alloys and titanium alloy.
* The bold-faced number indicates a center value of recommended cutting condition. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.
* Recommended feed rate in the table is the reference value when ap is RE/2. (2 mm for RD**08/2.5 mm for RP**10/3mm for RP**12/4 mm for RP**16)
  For other ap, calculate the recommended feed rate based on the conversion factor below.
* For MRX16-S16-08-2T(-160), MRX16-W-08-2T, MRX20-S20-10-2T(-180) and MRX20-W20-10-2T, set the feed rate not higher than 50% of the recommended cutting conditions.

★: 1st Recommendation ☆: 2nd Recommendation

Conversion factor for feed per tooth by depth of cut (ap)

Insert	Max. ap	Conversion factor for feed per tooth fz									
		ap=0.5 mm	ap=1 mm	ap=1.5 mm	ap=2 mm	ap=2.5 mm	ap=3 mm	ap=4 mm	ap=5 mm	ap=6 mm	ap=8 mm
RD**08 type (GM/SM/GH chipbreaker)	4mm	1.7	1.3	1.1	1 (Standard)	0.9	0.8	0.8	-	-	-
RP**10 type (GM/SM/GH chipbreaker)	5mm	1.9	1.4	1.2	1	1 (Standard)	0.9	0.8	0.8	-	-
RP**12 type (GM/SM/GH chipbreaker)	6mm	2.1	1.5	1.3	1.1	1	1 (Standard)	0.9	0.8	0.8	-
RP**16 type (GM/SM/GH chipbreaker)	8mm	2.4	1.7	1.4	1.3	1.1	1.1	1 (Standard)	0.9	0.8	0.8

* Example (ROMU12 type, carbon steel, GM chipbreaker, ap=1mm)

fz=0.2 mm/t (Reference value for carbon steel and GM chipbreaker) × 1.5 (Conversion factor for ROMU12 type, ap=1mm) = fz=0.3 mm/t (Recommended feed rate)

Recommended cutting conditions for drilling/ramping/helical milling

Tool spec.		Max. ap	Drilling		Ramping (Slant milling)			Helical milling		
Insert	Tool dia.	ap	Max. cutting depth Pd	Min. Cutting length X for flat bottom surface	Max. ramping angle RMPX	tan RMPX	Cutting length L at max. ramping angle	Min. cutting dia. øDh1	Min. cutting dia. for flat bottom facing øDh2	Max. cutting dia. øDh3
RD**08 type	16	4	0.7	9	8°	0.141	28	20	24	30
	20		1.4	13	9°	0.158	25	26	32	38
	25			18	5°	0.087	45	36	42	48
RP**10 type	20	5	0.6	11	5°	0.087	57	26	30	38
	25		1.9	16	10°	0.176	28	33	40	48
	32			23	6°	0.105	47	47	54	62
	40			31	4°	0.070	71	63	70	78
	50			41	3°	0.052	95	83	90	98
	63			54	2°	0.035	143	109	116	124
RP**12 type	32	6	2.4	21	9°	0.158	37	43	52	62
	40			29	5°	0.087	68	59	68	78
	50			39	4°	0.070	85	79	88	98
	63			52	2°	0.035	171	105	114	124
	80			69				139	148	158
	100			89	1°	0.017	343	179	188	198
RP**16 type	40	8	3.4	25	11°	0.194	41	51	64	78
	50			35	7°	0.123	65	71	84	98
	63			48	4°	0.070	114	97	110	124
	80			65	3°	0.052	152	131	144	158
	100			85	2°	0.035	229	171	184	198
	125			110	1°	0.017	458	221	234	248

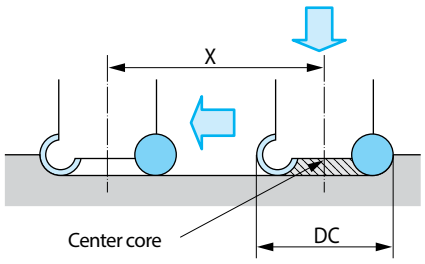
* Above is the value considering the clearance 1mm between the tool body and the workpiece.

Unit: mm

Guide for drilling

Depth of drilling
Refer to max. cutting depth (Pd) shown in the lower table of **M277**.
(Pd Shows the maximum plunge depth.)

When traversing after drilling
1. Reduce the table feed by 50% until the center core part (do not forget to grind) is completely cut off.
   (The internal cutting edge's radial rake angle is large in the negative direction)
2. The min. cutting length "X" for flat bottom surface is as follows **M277**.

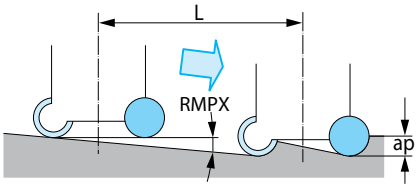


Guide for ramping (Slant milling)

- Ramping angle should be RMPX (Maximum ramping angle) or under in the above cutting conditions.
- Feed rate should be 70% or under of the above cutting conditions.

Formula of the cutting length "L" at max. ramping angle

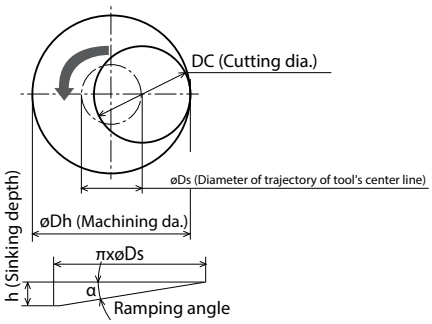
$$L = \frac{ap}{\tan RMPX}$$



Guide for helical milling

- Sinking depth (h) per revolution when helical milling should be max. ap or under in the above cutting conditions.
  Ramping angle (with trajectory of the center line of tool) should be RMPX (Maximum ramping angle) or under in the above cutting conditions.
- Feed rate should be 70% or under of the above cutting conditions.
- Down-cut machining is recommended.

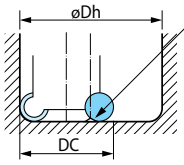
Helical milling factors



øDs **(How to find diameter of trajectory of tool's center line)**
øDs=øDh-DC

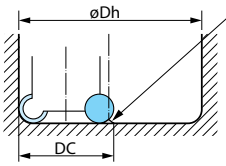
Formula for sinking depth (h)
h=π x øDs x tan α
(h should be ap or under)
(α should be RMPX or under)

[When cutting dia. øDh1≤øDh<øDh2]



Center core part remains after machining. (Not removable with the same cutter)

[When cutting dia. øDh2≤øDh≤øDh3]



Center core part remains after machining. (Removable by traversing with the same cutter)

Please refer to **M277** the list for øDh1 ~ Dh3.

Max. ap and usable edges

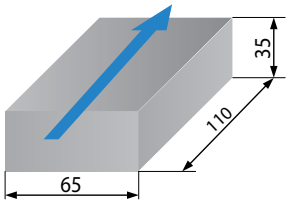
(mm)

Usable edges	Insert corner-R			
	R4	R5	R6	R8
3 edges	ap=2.0~4.0	ap=2.5~5.0	ap=3.0~6.0	ap=4.0~8.0
6 edges	ap=2.0 Less than	ap=2.5 Less than	ap=3.0 Less than	ap=4.0 Less than

Case studies

X5CrNi18 10

- Nozzle parts
- Vc = 113m/min
- ap x ae = 1.0 x 65mm
- fz = 0.14mm/t
- Dry
- MRX100R-12-9T-M (9 flutes)
- RPGT1204M0ER-SM (PR1535)



4.5 times longer tool life

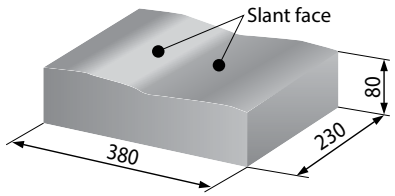
PR1535	450 pcs/edge
Conventional	100 pcs/edge

- High cost efficiency with 4.5 times longer tool life and 1.5 times more insert edges.
- MRX prevented burr formation and improved surface finish.

(User evaluation)

X40CrMoV51 (47~49HRC)

- Mold part
- Vc = 125m/min
- ap x ae = 1.0~2.0x 10mm
- fz = 0.25mm/t
- Dry
- MRX20-S20-08-2T (2 flutes)
- RDGT0803M0ER-GM (PR1525)



More than double tool life

PR1525	2 pcs and more Stable tool life
Conventional	1 pc unstable tool life

- Conventional tool machined only 1 pc of workpiece due to unstable tool life, but MRX doubled the tool life with stable machining.

(User evaluation)

MCSE



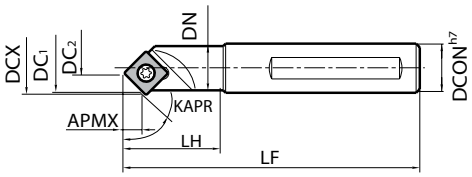


Fig. 1

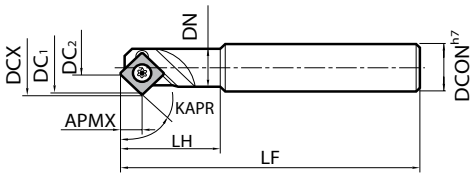


Fig. 2

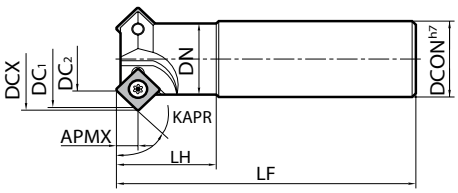


Fig. 3

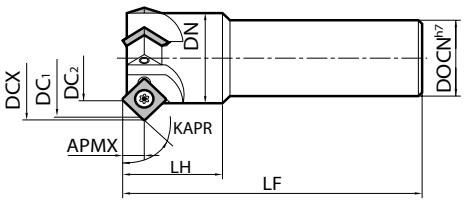


Fig. 4

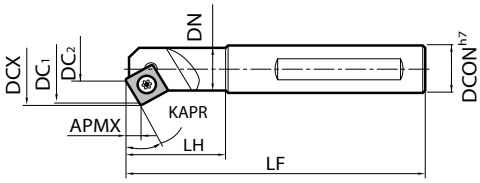


Fig. 5

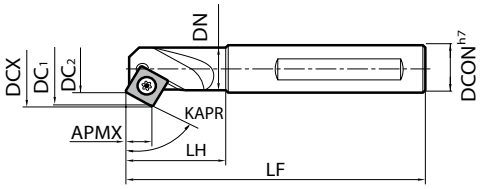


Fig. 6

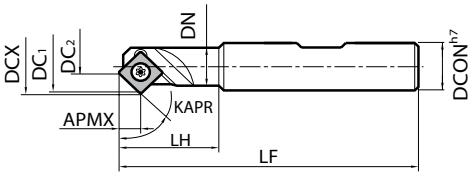


Fig. 7

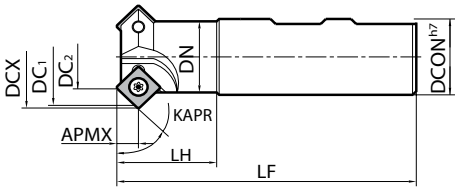


Fig. 8

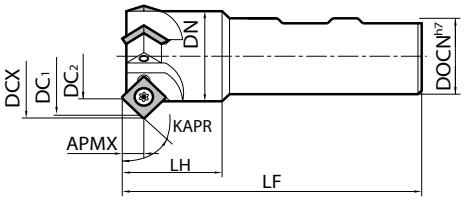


Fig. 9

Toolholder dimensions

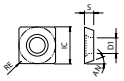
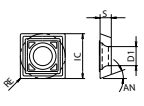
Description		Availability	Inserts	Dimension (mm) DCX	DC1	DC2	DCON	LF	LH	APMX	DN	Standard corner-R(RE)	KAPR (°)	A.R. (°)	R.R. (°)	Coolant hole	Fig.	Spare parts Screw	Wrench	Wrench	Applicable inserts ➔ M281
MCSE	104	●	1	16	15	4	16	85	31	6.5	15	0.4	45	0	-4.5	No	1	SB-3060TR	DT-10	-	SDKW09T2... SDMT09T204C
	106	●	1	22	21	6	20	121	41	8.6	16	0.8	45	0	-1	No	2	SB-5090TR	-	LTW-20	SEKW1203... SEMT120304C
	115	●	1	31	30	15	20	121	41	8.6	18	0.8	45	0	+5	No	2	SB-5090TR	-	LTW-20	SEKW1203... SEMT120304C
	227	●	2	43	42	27	32	121	41	8.6	30	0.8	45	0	+8	No	3	SB-5090TR	-	LTW-20	SEKW1203... SEMT120304C
	336	●	3	52	51	36	32	121	41	8.6	38	0.8	45	0	+10	No	4	SB-5090TR	-	LTW-20	SEKW1203... SEMT120304C
MCSE	106-W	□	1	22	21	6	20	92	40	8.6	16	0.8	45	0	-1	No	7	SB-5090TR	-	LTW-20	SEKW1203... SEMT120304C
	115-W	□	1	31	30	15	20	92	40	8.6	18	0.8	45	0	+5	No	7	SB-5090TR	-	LTW-20	SEKW1203... SEMT120304C
MCSE	104-30D	●	1	19	18	4	16	85	31	4.7	15	0.4	30	0	-4	No	5	SB-3060TR	DT-10	-	SDKW09T2... SDMT09T204C
	108-30D	●	1	28	27	8	20	110	41	6.3	19	0.8	30	0	-2.5	No	5	SB-5090TR	-	LTW-20	SEKW1203... SEMT120304C
	110-30D	●	1	30	28	10	20	120	40	6.3	18	0.8	30	0	0	No	5	SB-5090TR	-	LTW-20	SEKW1203... SEMT120304C
MCSE	108-60D	●	1	19.5	19	8	20	110	41	10	19	0.8	60	0	-3.5	No	6	SB-5070TR	-	LTW-20	SEKW1203... SEMT120304C
	120-60D	●	1	31	30	20	20	120	40	10	18	0.8	60	0	0	No	6	SB-5090TR	-	LTW-20	SEKW1203... SEMT120304C

SDKW/SDMT/SEKW/SEMT

Classification of usage

★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice
(In case hardness is 45HRC or under)

Carbon steel / Alloy steel	★		■	P
Mold and die steel	★		■	P
Austenitic stainless steel	★			M
Martensitic stainless steel				M
Precipitation hardening stainless steel				M
Gray cast iron		☆		K
Nodular cast iron		☆		K
Non-ferrous metals		★		N
Heat-resistant alloy				S
Titanium alloy		☆		S
Hard materials				H

Insert		Description		Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide PVD PR1825	Carbide - KW10	Cermet - TN100M	Applicable toolholder ➔ M281
		SDKW	09T204FN	9.525	2.78	3.4	0.4	15		●		MCSE104-30D MCSE104
		SDKW	09T204TN	9.525	2.78	3.4	0.4	15	●		●	MCSE104-30D MCSE104
		SEKW	120304FN 120308FN	12.7	3.18	5.5	0.4 0.8	20		● ●		MCSE106(-W) , MCSE108-..D MCSE110-30D , MCSE115(-W) MCSE120-60D , MCSE227(-W) MCSE336(-W)
		SEKW	120304TN 120308TN	12.7	3.18	5.5	0.4 0.8	20	● ●		● ●	MCSE106(-W) , MCSE108-..D MCSE110-30D , MCSE115(-W) MCSE120-60D , MCSE227(-W) MCSE336(-W)
	 Low cutting force	SDMT	09T204C	9.525	2.78	3.4	0.4	15	●	●	●	MCSE104-30D MCSE104
		SEMT	120304C	12.7	3.18	5.5	0.4	20	●	●		MCSE106(-W) , MCSE108-..D MCSE110-30D , MCSE115(-W) MCSE120-60D , MCSE227(-W) MCSE336(-W)

Recommended cutting conditions ➔ M282

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

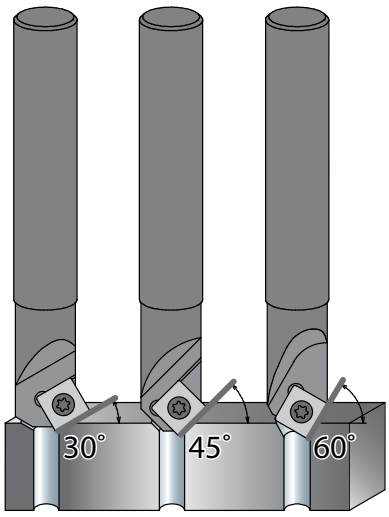
Applicable inserts

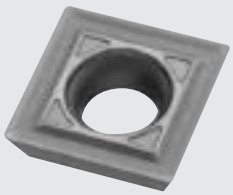
Description		Applicable inserts M281		
				
MCSE	104 104-30D	SDKW 09T204TN	SDKW 09T204FN	SDMT 09T204C
MCSE	106(-W) 115(-W) 227(-W) 336(-W)	SEKW 120304TN 120308TN	SEKW 120304FN 120308FN	SEMT 120304C
MCSE	108-30D 110-30D			
MCSE	108-60D 120-60D			

Recommended cutting conditions

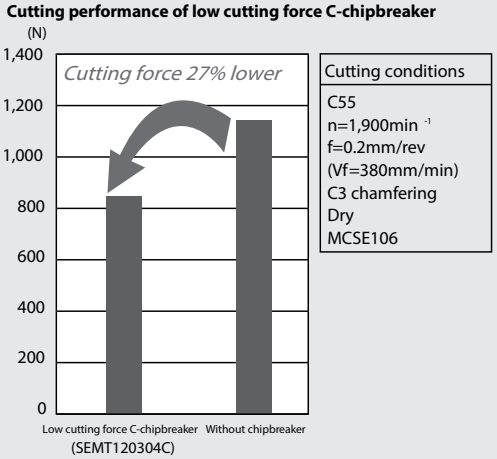
Workpiece material	fz (mm/t)		Recommended insert grades (Vc: m/min)		
			MEGACOAT	Carbide	Cermet
	DC_2 (ø4~ø20)	DC_2 (ø27~ø36)	PR1825	KW10	TN100M
Carbon steel	0.05~0.25	0.2~0.4	★ 120~250	-	★ 100~180
Alloy steel	0.05~0.25	0.2~0.4	★ 100~220	-	★ 100~180
Mold steel	0.05~0.25	0.2~0.4	★ 80~180	-	★ 100~150
Stainless steel	0.05~0.2	0.1~0.3	★ 120~220	-	☆ 100~180
Cast iron	0.1~0.3	0.3~0.5	-	☆ 80~150	-
Non-ferrous metals	0.1~0.3	0.3~0.5	-	★ 100~300	-

★: 1st Recommendation ☆: 2nd Recommendation





Cutting performance of low cutting force C-chipbreaker



Cutting conditions
C55 n=1,900min $^{-1}$ f=0.2mm/rev (Vf=380mm/min) C3 chamfering Dry MCSE106

Cutting force is reduced by 27% with low cutting force C-chipbreaker

High efficiency bolt countersink end mill

MEF Expanded Offering

For countersinking and boring of bolts with hexagon holes (M6 to M30)
Economical inserts with 4 cutting edges

1 New GM chipbreaker provides high-efficiency and stable machining

Excellent chip control for a wide range of machining. Provides stable machining with a low cutting force design

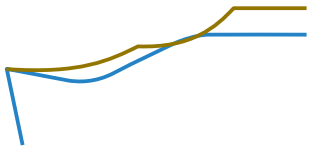
NEW



General purpose
1st recommendation
GM Chipbreaker



Tough edge
Z Chipbreaker

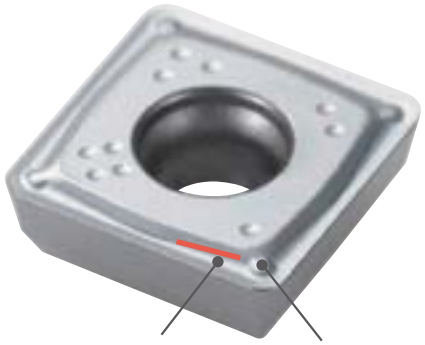


GM / Z Chipbreaker
(2mm from the tip of the insert)

Conventional challenges

. Poor chip evacuation can lead to entaglement.
. Feed rate cannot increase due to high cutting force.
. Chatter occurs when deep hole making.

GM Chipbreaker

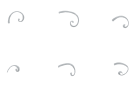


Variable chipbreaker width considering speed difference of inner and outer periphery
⇒Stable chip control at high D.O.C.

Bump at corners
⇒Stable chip control at low D.O.C.

Chip samples by GM chipbreaker

10mm

Case1 Vc = 120 m/min ap = 4.5 mm fz = 0.10 mm/t ø26 C45	Case2 Vc = 80m/min ap = 3.5 mm fz = 0.15 mm/t ø30 C45
	
Case3 Vc = 120 m/min ap = 1.0 mm fz = 0.10 mm/t ø26 C50	**Case4 Vc = 120 m/min ap = 1.0 mm fz = 0.15 mm/t ø26 C50**
	

Achieves excellent chip control under various machining conditions

(User/internal evaluation)

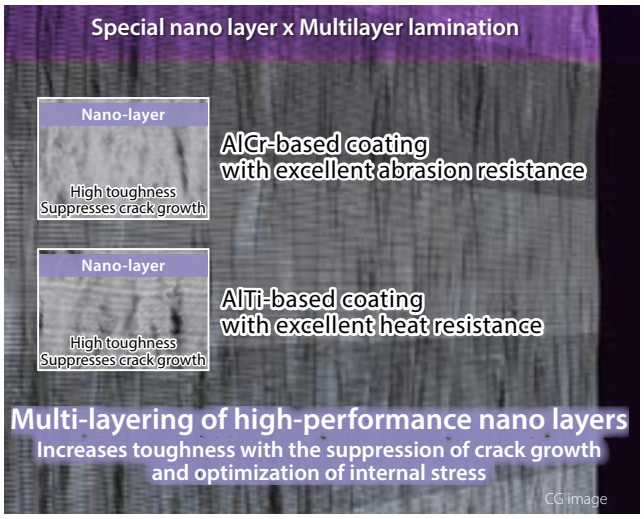
2 New Grade PR18 series Provides extended tool life

NEW

MEGACOAT NANO EX Milling

Double lamination technology maintains longer tool life

Multi-layer structure with two unique nano layers
Superior abrasion resistance and fracture resistance

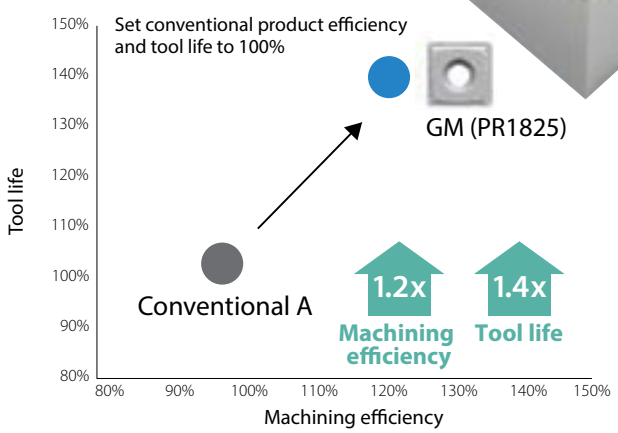


Case study

Alloy steel/Copper alloy Block

Vc =100m/min
ap × H = 0.8×75mm
Vf = 225mm/min
Wet(Internal and external)
SPMT090308EN-GM PR1825
Custom-made toolholder





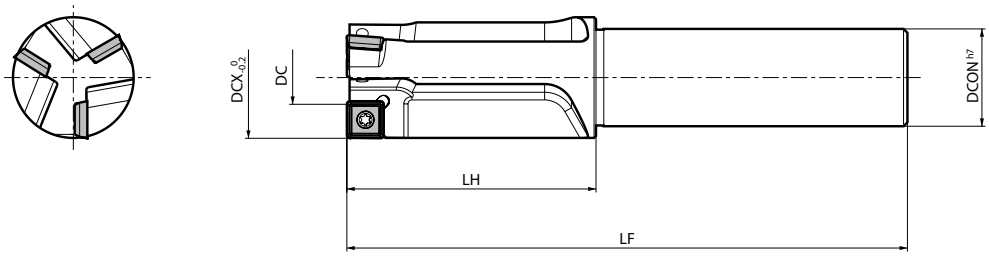
GM chipbreaker (PR1825) provided stable machining with increased cutting speed and feed rate. Reduced chip clogging and extended tool life.

(User evaluation)

M
Milling

MEF



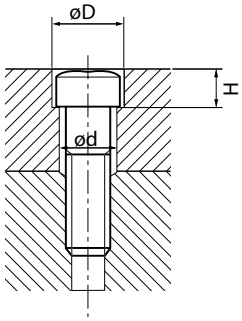


Toolholder dimensions

Description		Availability	Inserts	Dimension (mm) DC	DCX	DCON	LF	LH	Standard corner-R(RE)	A.R. (°)	R.R. (°)	Objective bolt size	Coolant hole	Spare parts Screw	Wrench	Applicable inserts ➔ M285
MEF	11-S10	●	1	3	11	10	103	23	0.4	+5	-13	M6	No	SB-2250TR	DT-7	SPMT060204EN-GM SPMT060208EN-GM SPMT060204E-Z SPMT060208E-Z
	14-S12	●		4.5	14	12	108	28				M8		SB-2260TR		
	17-S16	●	2	7.3	17.5	16	115	35				M10				
	18-S16	●		7.7	18		117	38				-				
	20-S16	●	3	9.5	20		120	40			-12	M12				
	22-S20	●		11.4	22	20	124	44				-				
	23-S20	●		12.4	23		126	46				M14				
	24-S20	●		13.4	24		128	48				-				
	25-S20	●		14.4	25		130	50				-				
MEF	26-S25	●	3	9.8	26	25	132	52	0.8	+5	-13	M16	No	SB-3080TR	DT-10	SPMT090304EN-GM SPMT090308EN-GM SPMT090304E-Z SPMT090308E-Z
	27-S25	●		10.6	27		134	54				-				
	28-S25	●		11.5	28		136	56				-				
	29-S25	●		12.6	29		138	58				M18				
	30-S25	●		13.5	30		140	60				-				
	32-S25	●		15.5	32		144	64				M20				
	35-S32	●		18.4	35	32	150	70				M22				
	39-S32	●	4	22.5	39		158	78				M24				
	43-S32	●		26.2	43		166	86			-12	M27				
	48-S32	●		31.3	48		176	96				M30				

Although Corner-R(RE) pertains to MEF11-S10, DC = 3.0 mm.

Bolt countersink (Hexagon socket head cap screw)



Nominal screw size	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24	M27	M30
øD (mm)	11	14	17.5	20	23	26	29	32	35	39	43	48
H (mm)	6.5	8.6	10.8	13	15.2	17.5	19.5	21.5	23.5	25.5	29	32
ød (mm)	6.6	9	11	14	16	18	20	22	24	26	30	33
Applicable end mill	MEF11	MEF14	MEF17	MEF20	MEF23	MEF26	MEF29	MEF32	MEF35	MEF39	MEF43	MEF48

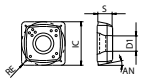
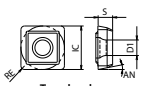
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SPMT

Classification of usage

★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice
(In case hardness is 45HRC or under)

Carbon steel / Alloy steel		★	☆		P
Mold and die steel		★	☆		P
Austenitic stainless steel		☆	★		M
Martensitic stainless steel			☆		M
Precipitation hardening stainless steel			★		M
Gray cast iron	★			☆	K
Nodular cast iron	★				K
Non-ferrous metals				★	N
Heat-resistant alloy			☆		S
Titanium alloy			★	☆	S
Hard materials					H

Insert		Description		Dimension (mm)				Angle (°)	Carbide				Applicable toolholder ➡ M284
				IC	S	D1	RE	AN	PVD			-	
									PR1810	PR1825	PR1835	KW10	
	 General purpose	SPMT	060204EN-GM 060208EN-GM	6.35	2.38	2.5	0.4 0.8	11	● ●	● ●	● ●		MEF(11~25)-S..
		SPMT	090304EN-GM 090308EN-GM	9.525	3.18	3.4	0.4 0.8	11	● ●	● ●	● ●		MEF(26~48)-S..
	 Tough edge	SPMT	060204E-Z 060208E-Z	6.35	2.38	2.5	0.4 0.8	11	● ●	● ●		● ●	MEF(11~25)-S..
		SPMT	090304E-Z 090308E-Z	9.525	3.18	3.4	0.4 0.8	11	● ●	● ●		● ●	MEF(26~48)-S..

Recommended cutting conditions ➡ M285

Recommended cutting conditions

Workpiece material	fz (mm/t)	Recommended insert grades (Vc: m/min)			
		MEGACOAT NANO EX			Carbide
		PR1810	PR1825	PR1835	KW10
Carbon steel	0.1~**0.12**~0.15	-	★ 120~**180**~220	☆ 120~**180**~220	-
Alloy steel	0.1~**0.12**~0.15	-	★ 120~**180**~220	☆ 120~**180**~220	-
Mold steel	0.05~**0.08**~0.1	-	★ 100~**150**~180	☆ 100~**150**~180	-
Stainless steel	0.05~**0.08**~0.1	-	-	★ 80~**120**~180	-
Cast iron	0.1~**0.15**~0.2	★ 100~**180**~220	-	-	☆ 80~**100**~120
Non-ferrous metals	0.1~**0.15**~0.2	-	-	-	★ 100~**200**~300

★: 1st Recommendation ☆: 2nd Recommendation

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Points at bolt countersinking

1. Carbon steel
Increase the feed rate to **fz=0.1 ~ 0.15 (mm/t)** for preventing long chips at low feed rates.
Chip control is good when setting **(Vc=80m/min)** for **MEF11~MEF25**, and **(Vc=120m/min)** for **MEF26~MEF48**.

Toolholder description	Vc(m/min)	fz(mm/t)
MEF11~MEF25	80	0.1~0.15
MEF26~MEF48	120	0.1~0.15

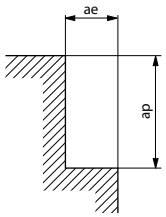
2. Sticky materials
Step feed is recommended for good chip control
Increase the feed rate to **fz=0.1 ~ 0.15 (mm/t)** for preventing long chips at low feed rate **(fz=0.05mm/t)**.
Use cover to prevent accidents or injury by thick chips at higher feed rates.

Toolholder description	Vc(m/min)	fz(mm/t)	Step feed (mm)
MEF11~MEF48	80~150	0.1~0.15	0.5~1.5

3. Stainless steel
Use a lower cutting speed. high cutting speeds cause chattering.

Cutting performance when shouldering

MEF bolt countersink end mill is also recommended of shouldering.



Vc=80~120m/min
C55
Dry
Overhang length:
Same as LH in the dimension table

- When shouldering, both side edge and bottom edges function.
- Both edges wear at the same time depending on ap. The insert uses 2 edges instead of 4. (Fig. 1)

- MEF type's side edge is designed to have a slight clearance for the countersinking.
Therefore, worked side wall is approx. 1˚ inclined against the vertical face. (Fig. 2)

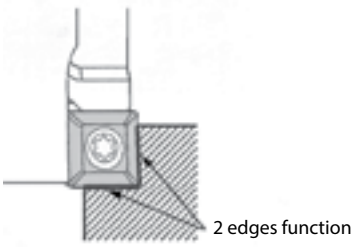


Fig. 1

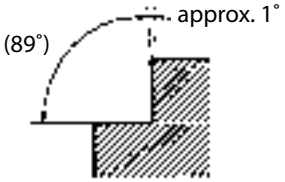
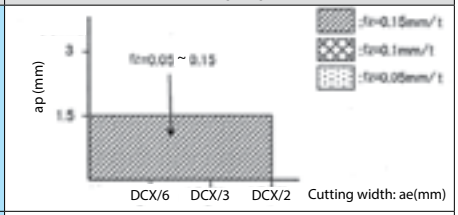
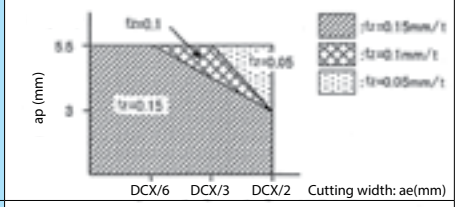
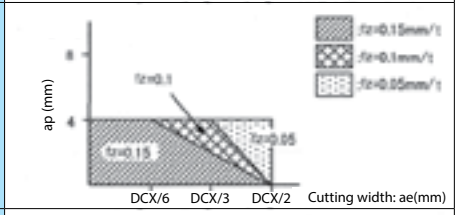
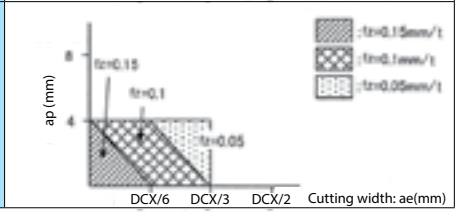


Fig. 2

Description	Cutting range
MEF11-S12 MEF14-S12 MEF17-S16 MEF18-S16	
MEF20-S16 MEF22-S20 ~ MEF25-S20	
MEF26-S25 ~ MEF32-S25 MEF35-S32	
MEF39-S32 MEF43-S32 MEF48-S32	

METS



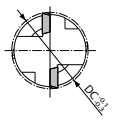


Fig. 1

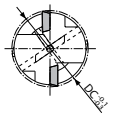


Fig. 2

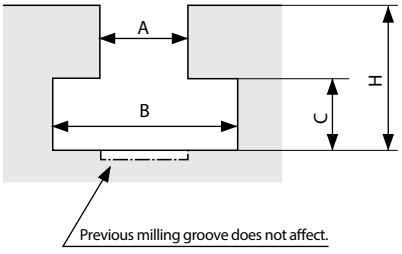
Toolholder dimensions

Description		Availability	Inserts	Flutes	Dimension (mm)						A.R. (°)	R.R. (°)	Coolant hole	Fig.	Spare parts		Applicable inserts M288
					DC	DCON	LF	LU	CW	DN					Screw	Wrench	
METS	21-S25	●	2	1	21	25	109	29	9	10.5				1	SB-2560TR	DT-8	SDMT060304E-K
	25-S25	●	4	2	25		112	32	11	12.5		-10		1			
	32-S32	●			32	32	120	38	14	15.5	+9		No	1	SB-3060TR	DT-10	SDMT080308E-K
	40-S32	●			40		130	50	18	20.5		-12		1	SB-4085TR	DT-15	SDMT120408E-K
	50-S32	●			50		140	60	22	26.5				1			
METS	21-S25-H	●	2	1	21	25	109	29	9	10.5				2	SB-2560TR	DT-8	SDMT060304E-K
	25-S25-H	●	4	2	25		112	32	11	12.5		-10		2			
	32-S32-H	●			32	32	120	38	14	15.5	+9		Yes	2	SB-3060TR	DT-10	SDMT080308E-K
	40-S32-H	●			40		130	50	18	20.5		-12		2	SB-4085TR	DT-15	SDMT120408E-K
	50-S32-H	●			50		140	60	22	26.5				2			

METS...-H has air holes

JIS standard of T-slot (Extracted from B0952) (Unit: mm)

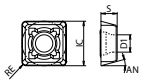
A (Nominal size)	B	C	H	
			Max.	Min.
12	19 $^{+2}_{0}$	8 $^{+1}_{0}$	25	20
14	23 $^{+2}_{0}$	9 $^{+2}_{0}$	28	23
18	30 $^{+2}_{0}$	12 $^{+2}_{0}$	36	30
22	37 $^{+3}_{0}$	16 $^{+2}_{0}$	45	38
28	46 $^{+4}_{0}$	20 $^{+2}_{0}$	56	48



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SDMT

Classification of usage					
★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)	Carbon steel / Alloy steel		★		P
	Mold and die steel		★		
	Austenitic stainless steel				M
	Martensitic stainless steel				
	Precipitation hardening stainless steel				
	Gray cast iron	★		☆	K
	Nodular cast iron	★			
	Non-ferrous metals			★	N
	Heat-resistant alloy				S
	Titanium alloy				
	Hard materials				H

Insert		Description	Dimension (mm)				Angle (°)	Carbide			Applicable toolholder ➡ M287
			IC	S	D1	RE	AN	PVD PR1810	PVD PR1835	- KW10	
		SDMT 060304E-K	6.35	3.18	2.8	0.4	15	●	●	●	METS21-S25(-H) METS25-S25(-H)
		SDMT 080308E-K	8	3.18	3.4	0.8	15	●	●	●	METS32-S32(-H)
		SDMT 120408E-K	12.7	4.76	4.4	0.8	15	●	●	●	METS40-S32(-H) METS50-S32(-H)

Recommended cutting conditions ➡ M289

M

Milling

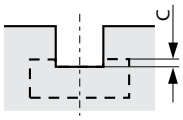
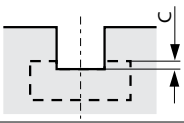
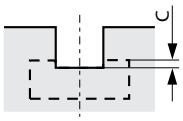
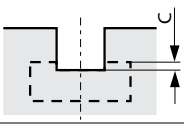
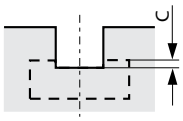
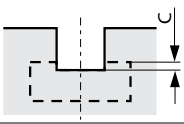
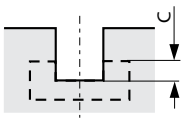
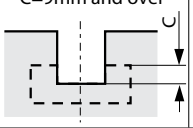
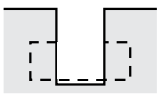
Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi-Function
Slot Mill
Ball-nose Radius
Others

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Recommended cutting conditions

Workpiece material	fz (mm/t)	Recommended insert grades (Vc: m/min)		
		MEGACOAT NANO EX		Carbide
		PR1810	PR1830	KW10
Carbon steel	0.1~0.15	-	★ 100~200	-
Alloy steel	0.08~0.12	-	★ 100~200	-
Mold steel	0.05~0.1	-	★ 80~150	-
Cast iron	0.1~0.15	★ 100~200	-	☆ 80~120
Non-ferrous metals	0.1~0.15	-	-	★ 100~300

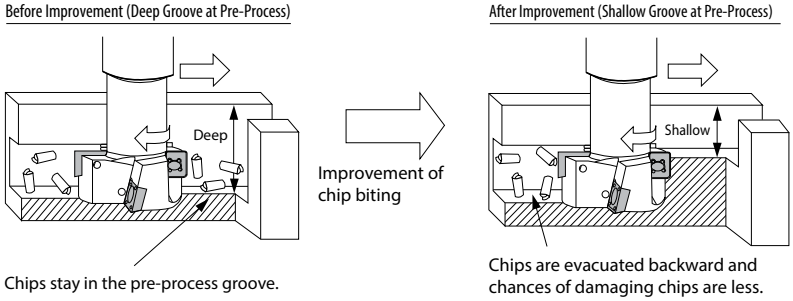
★: 1st Recommendation ☆: 2nd Recommendation

Description (T-Slot nominal size)	Steel			Cast iron		
	Groove shape at pre-process	T-Slotting conditions	Conditions to prevent chattering	Groove shape at pre-process	T-Slotting conditions	Conditions to prevent chattering
METS21-S25(-H) (Nominal size 12)	C=1~3mm 	Vc= 120 fz= 0.1 (n= 1,820) (Vf= 182)	Vc= 60 fz= 0.15 (n= 920) (Vf= 137)	C=1mm and over 	Vc= 120 fz= 0.12 (n= 1,820) (Vf= 218)	Vc= 80 fz= 0.15 (n= 1,210) (Vf= 182)
METS25-S25(-H) (Nominal size 14)	C=1~3mm 	Vc= 120 fz= 0.1 (n= 1,530) (Vf= 306)	Vc= 60 fz= 0.15 (n= 760) (Vf= 228)	C=1mm and over 	Vc= 120 fz= 0.12 (n= 1,530) (Vf= 367)	Vc= 80 fz= 0.15 (n= 1,020) (Vf= 306)
METS32-S32(-H) (Nominal size 18)	C=1~3mm 	Vc= 100 fz= 0.1 (n= 1,000) (Vf= 200)	Vc= 60 fz= 0.15 (n= 600) (Vf= 180)	C=1mm and over 	Vc= 120 fz= 0.12 (n= 1,190) (Vf= 286)	Vc= 80 fz= 0.15 (n= 800) (Vf= 240)
METS40-S32(-H) (Nominal size 22)	C=9mm 	Vc= 80 fz= 0.15 Chattering is likely when set to shallower than C=9mm.	Vz= 60 fz= 0.15 (n= 480) (Vf= 144)	C=9mm and over 	Vc= 120 fz= 0.15 (n= 960) (Vf= 228)	Vc= 80 fz= 0.15 (n= 640) (Vf= 192)
METS50-S32(-H) (Nominal size 28)	Not recommended for steel because of chattering				Vc= 120 fz= 0.15 (n= 760) (Vf= 228)	Vc= 80 fz= 0.15 (n= 510) (Vf= 153)

Cutting speed: Vc(m/min), Revolution: n(min^{-1}), Feed rate fz(mm/t), Table feed Vf(mm/min)

Chattering is likely when fz is less than fz=0.1mm/t. Keep feed rate between fz=0.1 ~ 0.15mm/t.

How to prevent damaging chips when steel machining



Make pre-process groove shallower to prevent the tool damage from chips.
Use compressed air to aid in chip evacuation.

MGI



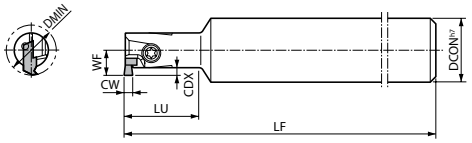


Fig. 1

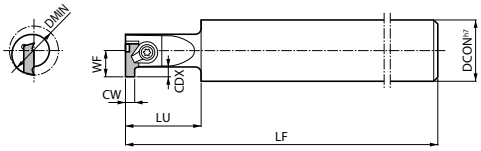
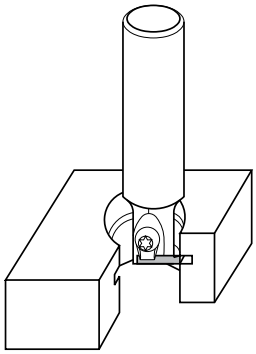


Fig. 2



Toolholder dimensions

Description		Availability	Dimension (mm)								Coolant hole	Fig.	Spare parts					Applicable inserts ➡ M291
			DMIN	DCON	LF	LU	CDX	WF	CW min.	CW max.			Clamp set	Clamp set	Screw	Wrench	Wrench	
MGI	1420-1SS	●	14	20	100	20	2.2	6.8	1	3	No	1	-	-	SB-4065TR	-	FT-15	GVR...-020SS
MGI	1620-1S	●	16	20	110	25	2.2	7.8	1	3.4	No	1	-	-	SB-4085TR	-	FT-15	GVR...-020S
MGI	2020-1A	●	20	20	110	30	2.2	9.8	1	3.4	No	2	CPS-5F	-	-	-	FT-15	GVR...-020A , GVR...-...AR
MGI	2220-1B	●	22	20	110	30	2.8	11	1.45	4	No	2	CPS-5F	-	-	-	FT-15	GVR...-020B , GVR...-...BR
MGI	3225-1C	●	32	25	120	35	5.5 (4.5)	16	2.8	4	No	2	-	CPS-6F	-	LW-3	-	GVR...-020C

CDX shows available grooving depth.
GVR280-020C, GVR300-020C is available to the groove depth up to 4.5mm.
GVR430 ~ 500-020C can be installed to MGI3225-1C, but not recommended for steel machining because of toolholder's rigidity.

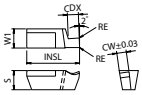
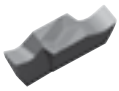
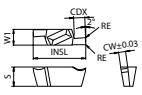
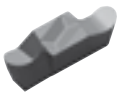
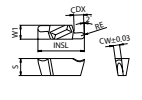
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GVR

Classification of usage

● : Continuous ~Light interruption / 1st Choice
◔ : Continuous ~Light interruption / 2nd Choice
● : Continuous / 1st Choice
○ : Continuous / 2nd Choice

Carbon steel / Alloy steel	● ◔	P
Stainless steel	● ◔	M
Gray cast iron	●	K
Non-ferrous metals	●	N
Titanium alloy	●	S
Hard materials (~ 40HRC)	● ○	H
Hard materials (40HRC ~)		

Insert		Description		No. of edges	Dimension (mm)						Tolerance (mm)		Carbide		Cer-met		Applicable toolholder ➡ M290
					CW	CDX	S	RE	INSL	W1	CW min.	CW max.	PVD PR1225	PVD PR930	- KW10	- TC40	- TC60	
	 1-edge	GVR	100-020SS 125-020SS 145-020SS 200-020SS 250-020SS 300-020SS	1	1 1.25 1.45 2 2.5 3	2.3	3	0.2	9	3.6	- 0.03	+ 0.03	● ● ● ● ● ●	● ● ● ● ● ●	● ● ● ● ● ●		● ● ● ● ● ●	MGI1420-1SS
		GVR	100-020S 125-020S 145-020S 185-020S 200-020S 250-020S 340-020S	1	1 1.25 1.45 1.85 2 2.5 3.4	2.3	4	0.2	11	4	- 0.03	+ 0.03	● ● ● ● ● ● ●	● ● ● ● ● ● ●	● ● ● ● ● ● ●	● ● ● ● ● ● ●	● ● ● ● ● ● ●	MGI1620-1S
	 2-edge	GVR	100-020A 125-020A 145-020A 185-020A 200-020A 250-020A 300-020A 340-020A	2	1 1.25 1.45 1.85 2 2.5 3 3.4	2.3	5	0.2	12	4	- 0.03	+ 0.03	● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ●	MGI2020-1A
		GVR	145-020B 185-020B 200-020B 230-020B 250-020B 280-020B 300-020B 340-020B 400-020B	2	1.45 1.85 2 2.3 2.5 2.8 3 3.4 4	2.8 2.8 3.2 3.2 3.2 3.2 4.2 4.2 4.2	5.5	0.2	15	4.5	- 0.03	+ 0.03	● ● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ● ●	MGI2220-1B
		GVR	280-020C 300-020C 340-020C 400-020C (430-020C) (460-020C) (500-020C)	2	2.8 3 3.4 4 4.3 4.6 5	4.5 4.5 5.5 5.5 6.3 6.3 6.3	6.5	0.2	21	5.8	- 0.03	+ 0.03	● ● ● ● ● ● ●	● ● ● ● ● ● ●	● ● ● ● ● ● ●	● ● ● ● ● ●	● ● ● ● ● ● ●	MGI3225-1C
	 2-edge / Full R / Copying	GVR	200-100AR 250-125AR 300-150AR	2	2 2.5 3	2.3	5	1 1.25 1.5	12	4	- 0.03	+ 0.03	● ● ●	● ● ●	● ● ●		● ● ●	MGI2020-1A
		GVR	200-100BR 300-150BR	2	2 3	3.2 4.2	5.5	1 1.5	15	4.5	- 0.03	+ 0.03	● ●	● ●	● ●		● ●	MGI2220-1B

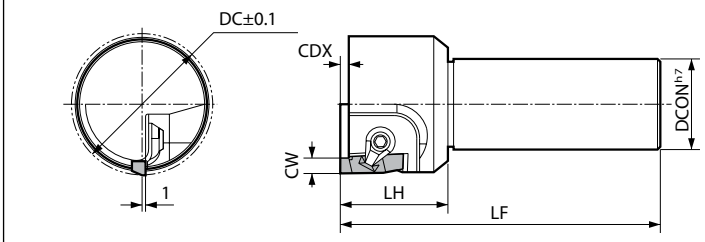
CDX shows available grooving depth.
Right-hand shown

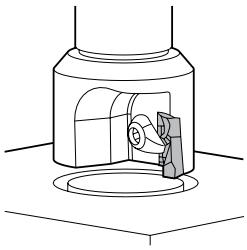
Recommended cutting conditions ➡ M293

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MVG







Toolholder dimensions

Description		Availability	Dimension (mm) DC	DCON	LF	LH	CDX	CW min.	CW max.	Coolant hole	Spare parts: Clamp set	Spare parts: Wrench	Applicable inserts M292
MVG	3032	●	30	32	120	40	5.2	4	4.9	No	CPS-6V	LW-3	GVFR400-020B GVFR430-020B GVFR460-020B GVFR490-020B
	3532	●	35										
	4032	●	40										
	4532	●	45										
	5032	●	50										
	5532	●	55										
	6032	●	60										

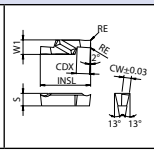
CDX shows available grooving depth.

GVFR

Classification of usage

● : Continuous ~Light interruption / 1st Choice
◔ : Continuous ~Light interruption / 2nd Choice
● : Continuous / 1st Choice
○ : Continuous / 2nd Choice

Carbon steel / Alloy steel	●	◔	P
Stainless steel	●	◔	M
Gray cast iron		●	K
Non-ferrous metals		●	N
Titanium alloy		●	S
Hard materials (~ 40HRC)	●	○	H
Hard materials (40HRC ~)			

Insert		Description	No. of edges	Dimension (mm) CW	CDX	S	RE	INSL	W1	Tolerance (mm) CW min.	CW max.	Carbide PVD PR1225	Carbide PVD PR930	Carbide - KW10	Cer-met - TC40	Cer-met - TC60	Applicable toolholder M292
		GVFR 400-020B 430-020B 460-020B 490-020B	2	4 4.3 4.6 4.9	5.3	5	0.2	20	5.8	-0.03	+0.03	●	●	●	●	●	MVG....
														●	●	●	
														●			
												●	●	●	●	●	

CDX shows available grooving depth.
Right-hand shown

Recommended cutting conditions M293

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MGI

Recommended cutting conditions

Workpiece material	fz (mm/t)	Recommended insert grades (Vc: m/min)				
		MEGACOAT	PVD Coated carbide	Carbide	Cermet	
		PR1225	PR930	KW10	TC40	TC60
Carbon steel	0.05~0.15	★ 80~150	☆ 80~150	-	☆ 120~200	☆ 100~180
Alloy steel	0.05~0.15	★ 80~150	☆ 80~150	-	☆ 120~200	☆ 100~180
Mold steel	0.03~0.12	★ 60~130	☆ 60~130	-	☆ 100~180	☆ 80~150
Stainless steel	0.03~0.12	★ 60~130	☆ 60~130	-	☆ 100~180	★ 80~150
Cast iron	0.05~0.2	-	-	★ 80~150	☆ 100~150	-
Non-ferrous metals	0.05~0.2	-	-	★ 100~300	-	-

Use down-cut machining.

★: 1st Recommendation ☆: 2nd Recommendation

MVG

Recommended cutting conditions

Workpiece material	fz (mm/t)	Recommended insert grades (Vc: m/min)				
		MEGACOAT	PVD coated carbide	Carbide	Cermet	
		PR1225	PR930	KW10	TC40	TC60
Carbon steel	0.05~0.15	★ 80~170	☆ 80~150	-	★ 120~200	☆ 100~180
Alloy steel	0.05~0.15	★ 80~170	☆ 80~150	-	★ 120~200	☆ 100~180
Mold steel	0.03~0.12	★ 60~150	☆ 60~130	-	★ 100~180	☆ 80~150
Stainless steel	0.03~0.12	★ 60~150	☆ 60~130	-	☆ 100~180	☆ 80~150
Cast iron	0.05~0.2	-	-	★ 80~150	-	-
Non-ferrous metals	0.05~0.2	-	-	★ 100~300	-	-

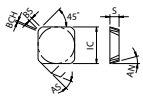
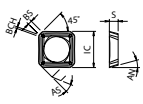
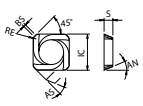
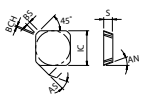
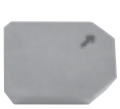
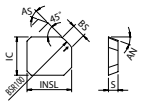
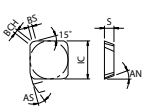
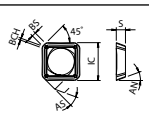
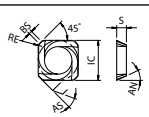
★: 1st Recommendation ☆: 2nd Recommendation

S-type inserts

Classification of usage

★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice
(In case hardness is 45HRC or under)

Carbon steel / Alloy steel			☆	★		■	P
Mold and die steel			☆	★		■	P
Austenitic stainless steel			☆	★			M
Martensitic stainless steel							M
Precipitation hardening stainless steel							M
Gray cast iron	★	☆			☆		K
Nodular cast iron	★	☆					K
Non-ferrous metals					★		N
Heat-resistant alloy							S
Titanium alloy							S
Hard materials							H

Insert		Description		No. of edges	Dimension (mm) IC	S	BCH	INSL	RE	BS	Angle (°) AN	AS	Carbide CVD CA420M	PVD PR1210	PVD PR1225	PVD PR1825	Carbide - KW10	Cermet - TN100M	Applicable toolholder
		SDKN	1203AUFN	4	12.7	3.18	0.5	-	-	1.2	15	23					●		-
		SDKN	1203AUTN	4	12.7	3.18	0.5	-	-	1.2	15	23		●	●			●	
		SDKN	1504AUTN	4	15.875	4.76	0.5	-	-	1.2	15	23			●			●	
		SDKR	1203AUEN-S	4	12.7	3.18	0.5	-	-	1.7	15	23			●			●	-
		SDMR	1203AUER-H	4	12.7	3.18	-	-	1	0.8	15	23				●			-
		SEEN	1203AFTN	4	12.7	3.18	0.5	-	-	1.4	20	25						●	-
		SEKN	1203AFFN	4	12.7	3.18	0.5	-	-	1.4	20	25					●		
		SEKN	1203AFTN	4	12.7	3.18	0.5	-	-	1.4	20	25		●	●			●	
		SEKN	1204AFTN	4	12.7	4.76	0.5	-	-	1.4	20	25			●				
		SEKN	1504AFTN	4	15.875	4.76	0.5	-	-	1.4	20	25			●				
	 1-edge / With wiper edge	SEEN	1203AFFR-W	1	12.7	3.18	-	14.56	-	3.5	20	25					●		-
		SEEN	1203AFTR-W	1	12.7	3.18	-	14.56	-	3.5	20	25						●	
		SEKN	1203EFTR	4	12.7	3.18	1.2	-	-	1.4	20	25						●	-
		SEKR	1203AFEN-S	4	12.7	3.18	0.5	-	-	1.7	20	25			●			●	-
		SEMR	1203AFER-H	4	12.7	3.18	-	-	1	1	20	25				●			-

Handed insert shows Right-hand

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

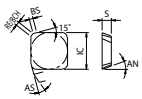
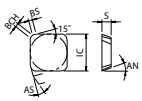
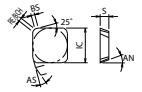
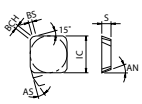
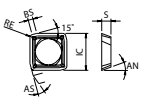
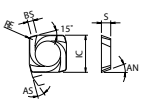
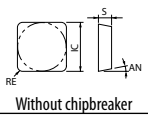
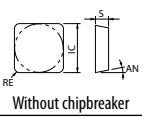
SEEN-W inserts are sold in 5 piece boxes

S-type inserts

Classification of usage

★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice
(In case hardness is 45HRC or under)

Carbon steel / Alloy steel			☆		★		■		P
Mold and die steel			☆		★		■		P
Austenitic stainless steel			☆		★				M
Martensitic stainless steel									M
Precipitation hardening stainless steel									M
Gray cast iron	★	☆		☆		☆			K
Nodular cast iron	★	☆		☆					K
Non-ferrous metals					★				N
Heat-resistant alloy									S
Titanium alloy									S
Hard materials									H

Insert		Description		Dimension (mm)					Angle (°)		Carbide						Cer-met		Applicable toolholder
				IC	S	BCH	RE	BS	AN	AS	CVD	PVD			-		-		
											CA420M	PR1210	PR1225	PR1810	PR1825	KW10	TN100M	TN60	
		SPCN	1203EDTR	12.7	3.18	-	1	2	11	15							●		-
		SPKN	1203EDER	12.7	3.18	1	-	1.6	11	15	●								
		SPKN	1203EDFR	12.7	3.18	1	-	1.6	11	15						●			
		SPKN	1203EDTR 1203EDTL	12.7	3.18	- 1 -	1 - 1	2	11	15		●	●				● ●		
		SPKN	1504EDFR	15.875	4.76	1	-	2.2	11	15						●			
		SPKN	1504EDTR	15.875	4.76	1	-	2.2	11	15		●	●				●		
		SPEN	1203EEER	12.7	3.18	1	-	1.4	11	20	●								-
		SPEN	1203EESR	12.7	3.18	1	-	1.4	11	20				●					
		SPCN	1203XPTR	12.7	3.18	-	1	2	11	11							●		-
		SPKN	1203XPFR	12.7	3.18	1	-	2	11	11						●			
		SPKN	1203XPTR	12.7	3.18	-	1	2	11	11							●		
		SPKN	1504XETR	15.875	4.76	1	-	2	11	20							●		
		SPCN	1904EETR1	19.05	4.76	0.7	-	1.2	11	20							●		-
		SPKR	1203EDER-S	12.7	3.18	-	2	1	11	15			●						-
		SPMR	1203EDER-H	12.7	3.18	-	1	2	11	15				●					-
	 Without chipbreaker	SPGN	090304 090308	9.525	3.18	-	0.4 0.8	-	11	-						● ●			-
		SPGN	120304 120308	12.7	3.18	-	0.4 0.8	-	11	-						● ●			
	 Without chipbreaker	SPMN	120308 120312	12.7	3.18	-	0.8 1.2	-	11	-							● ●	● ●	-
		SPMN	120408 120412	12.7	4.76	-	0.8 1.2	-	11	-	● ●								

Handed insert shows Right-hand

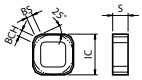
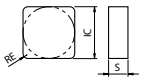
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-type inserts

Classification of usage

★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice
(In case hardness is 45HRC or under)

Carbon steel / Alloy steel		■	P
Mold and die steel		■	
Austenitic stainless steel			M
Martensitic stainless steel			
Precipitation hardening stainless steel			
Gray cast iron	★		K
Nodular cast iron	★		
Non-ferrous metals			N
Heat-resistant alloy			S
Titanium alloy			
Hard materials			H

Insert		Description		No. of edges	Dimension (mm) IC	S	RE	BCH	BS	Angle (°) AN	AS	Carbide CVD CA420M	Cermet - TN100M	Applicable toolholder
		SNCN	1204XNTN	8	12.7	4.76	-	2	2	-	-		●	-
		SNKN	1204XNTN	8	12.7	4.76	-	2	2	-	-		●	
		SNMF	1204XNTN	8	12.7	4.76	-	2	2	-	-		●	-
	 Without chipbreaker	SNMN	120412 120424	8	12.7	4.76	1.2 2.4	-	-	-	-	● ●		-

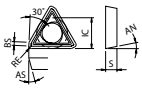
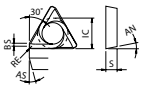
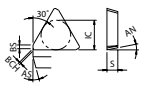
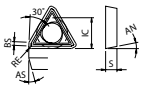
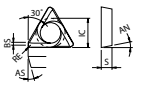
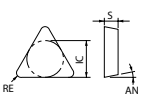
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

T type inserts

Classification of usage

★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice
(In case hardness is 45HRC or under)

Carbon steel / Alloy steel		☆	★		■		P
Mold and die steel		☆	★		■		
Austenitic stainless steel		☆	★				M
Martensitic stainless steel							
Precipitation hardening stainless steel							
Gray cast iron	★			☆			K
Nodular cast iron	★						
Non-ferrous metals				★			N
Heat-resistant alloy							S
Titanium alloy							
Hard materials							H

Insert	Description	No. of edges	Dimension (mm) IC	S	BCH	RE	BS	Angle (°) AN	AS	Carbide PVD PR1210	PVD PR1225	PVD PR1825	- KW10	Cer-met - TN100M	- TN60	Applicable toolholder
 	TEKN 1603PTFR	3	9.525	3.18	0.7	-	1.4	20	22				●			-
	TEKN 1603PTTR	3	9.525	3.18	0.7 -	- 0.8	1.4	20	22	●		●			●	
	TEEN 2204PTTR	3	12.7	4.76	-	1	1.4	20	22						●	
	TEKN 2204PTFR	3	12.7	4.76	0.7	-	1.4	20	22				●			
	TEKN 2204PTTR	3	12.7	4.76	0.7 -	- 1	1.4	20	22	●		●			●	
 	TEKR 2204PTER-S	3	12.7	4.76	-	1	1.4	20	22			●				-
 	TEMR 1603PTER-H	3	9.525	3.18	-	0.8	1.2	20	22			●				-
	TEMR 2204PTER-H	3	12.7	4.76	-	1	1.4	20	22			●				
 	TPKN 1603PDFR	3	9.525	3.18	0.7	-	1.2	11	15				●			-
	TPKN 1603PDTR	3	9.525	3.18	0.7	-	1.2	11	15	●	●				●	
	TPKN 2204PDFR	3	12.7	4.76	0.7	-	1.6	11	15				●			
	TPKN 2204PDTR	3	12.7	4.76	0.7	-	1.6	11	15	●	●				●	
 	TPKR 2204PDER-S	3	12.7	4.76	-	1	1.4	11	15			●				-
 	TPMR 1603PDER-H	3	9.525	3.18	-	0.8	1.2	11	15			●				-
	TPMR 2204PDER-H	3	12.7	4.76	-	1	1.4	11	15			●				
  Without chipbreaker	TPGN 090204	3	5.56	2.38	-	0.4	-	11	-				●		●	-
	TPGN 110304 110308	3	6.35	3.18	-	0.4 0.8	-	11	-				● ●		● ●	
	TPGN 160304 160308	3	9.525	3.18	-	0.4 0.8	-	11	-				● ●		● ●	
  Without chipbreaker	TPMN 110304 110308	3	6.35	3.18	-	0.4 0.8	-	11	-				● ●			-
	TPMN 160304 160308 160312	3	9.525	3.18	-	0.4 0.8 1.2	-	11	-				● ● ●		● ● ●	
	TPMN 220408	3	12.7	4.76	-	0.8	-	11	-						●	

Handed insert shows Right-hand

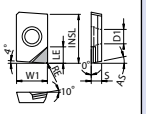
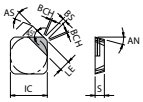
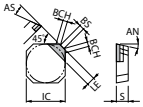
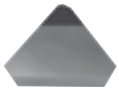
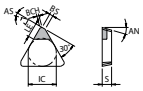
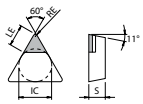
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

PCD inserts

Classification of usage

★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice
(In case hardness is 45HRC or under)

Carbon steel / Alloy steel			P
Mold and die steel			
Austenitic stainless steel			M
Martensitic stainless steel			
Precipitation hardening stainless steel			
Gray cast iron			K
Nodular cast iron			
Non-ferrous metals	■	□	N
Heat-resistant alloy			S
Titanium alloy	■	□	
Hard materials			H

Insert		Description		No. of edges	Dimension (mm) IC	W1	S	D1	RE	INSL	LE	BCH	BS	Angle (°) AN	AS	PCD - KPD001	PCD - KPD010	Applicable toolholder
		NDCW	150302FRX 150302FRX-NE	1	-	9.525	3.18	4.4	0.2	15	5.7 5.1	-	-	-	15	● ●	●	DMC...SX(...) DMC...H
		SDKN	1203AUFN-NE	1	12.7	-	3.18	-	-	-	3.1	0.5	1.2	15	23	●		-
		SEEN	1203AFFN 1203AFFN-NE	1	12.7	-	3.18	-	-	-	3.5 3	0.5	1.4	20	25	● ●	●	-
		TEEN	1603PTFR 1603PTFR-NE	1	9.525	-	3.18	-	-	-	4.7 4.1	0.6	1.4	20	22	● ●		-
		TPGN	110302 110304	1	6.35	-	3.18	-	0.2 0.4	-	3.9 3.7	-	-	11	-	● ●	●	-

Handed insert shows Right-hand

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

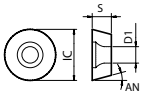
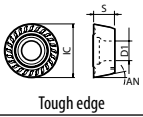
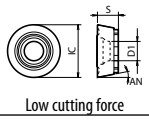
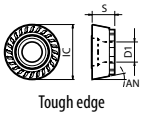
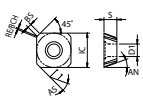
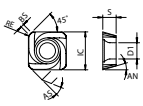
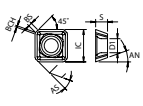
CBN & PCD Inserts are sold in 1 piece boxes

Available geometries

Classification of usage

★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice
(In case hardness is 45HRC or under)

Carbon steel / Alloy steel		☆		★	☆		■	P
Mold and die steel		☆		★	☆		■	P
Austenitic stainless steel		☆		☆	★			M
Martensitic stainless steel					☆			M
Precipitation hardening stainless steel					★			M
Gray cast iron	☆		★			☆		K
Nodular cast iron	☆		★					K
Non-ferrous metals						★		N
Heat-resistant alloy					☆			S
Titanium alloy					★			S
Hard materials								H

Insert		Description		Dimension (mm)							Angle (°)		Carbide						Cermet		Applicable toolholder
				IC	S	D1	RE	BCH	BS	L	AN	AS	PVD					-	-		
													PR1210	PR1225	PR1810	PR1825	PR1835	KW10	TN100M		
		RDHX	0702M0T	7	2.39	2.8	-	-	-	-	15	-					●				-
		RDHX	1003M0T	10	3.18	3.8	-	-	-	-	15	-					●				
		RDHX	12T3M0T	12	3.97	3.8	-	-	-	-	15	-					●				
	 Tough edge	RDMT	08T2M0-H	8	2.78	3.4	-	-	-	-	15	-			●		●	●			-
	 Low cutting force	RPMT	10T3M0	10	3.97	3.4	-	-	-	-	11	-			●		●	●			-
		RPMT	1204M0	12	4.76	4.4	-	-	-	-	11	-			●		●	●			
	 Tough edge	RPMT	1204M0-H	12	4.76	4.4	-	-	-	-	11	-			●		●	●	●		-
		RPMT	1606M0-H	16	6.35	5.5	-	-	-	-	11	-			●		●	●	●		
		RPMT	2006M0-H	20	6.35	6.5	-	-	-	-	11	-			●		●	●			
		SDKW	1204AESN	12.7	4.76	5.5	1	-	1.5	-	15	20		●							-
		SDKW	1204AETN	12.7	4.76	5.5	1	-	1.5	-	15	20	●								
		SEKW	1204AFTN	12.7	4.76	5.5	-	0.5	1.7	-	20	25	●	●							
		SDMT	1204AESR-H	12.7	4.76	5.5	1	-	0.8	-	15	20				●					-
		SEKT	1204AFEN-S	12.7	4.76	5.5	-	0.5	1.7	-	20	25		●							-

Handed insert shows Right-hand

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

R



General information	R2~R19
ISO13399 compliant dimension markings	R2
SI unit conversion table / Cutting symbol	R6
Surface roughness	R7
Heat treatment and hardness expression	R8
Vickers hardness conversion chart	R9
Material list (JIS)	R10
Material cross reference table	R11
Various cross reference tables	R20~R29
Insert grades cross reference table	R20
Molded chipbreaker cross reference table	R26
Milling insert description cross reference table	R28
Terms and angles of toolholder	R30~R35
Turning toolholder	R30
Milling cutter	R31
Solid end mills	R32
Solid drills	R33
Precautions when using wiper inserts	R34
Trouble shooting	R38~R41
Cutting edges figuration and countermeasures	R38
Turning	R39
Milling	R40
Drilling	R41
Basic formulas	R42~R45
Turning	R42
Milling	R44
Drilling	R45
Tooling examples of small parts machining	R46~R55
Tooling example	R46
Automatic lathe list by manufacturer	R48
List of instruments and applicable small parts machining and toolholders	R54
Parts compatibility of lever lock toolholders	R55

All dimension markings in the catalog are complied with ISO13399. Symbol, detail and previous symbol are shown below.

1. Insert

Symbol	Detail	Previous symbol
AN	Relief angle	α
D1	Hole diameter	ød
IC	I.C. Size	A
RE	Corner-R	rε
S	Insert thickness	T

2. Toolholder for external

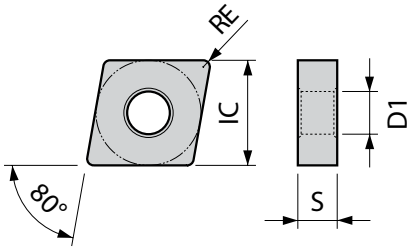
Symbol	Detail	Previous symbol
B	Shank width	B
H	Shank height	H1
HF	Edge height	h
LF	Overall length	L1
LH	Head length	L2
WF	Functional width	F1

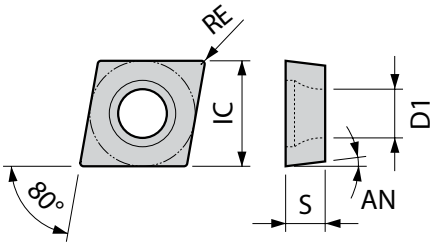
3. Small parts machining

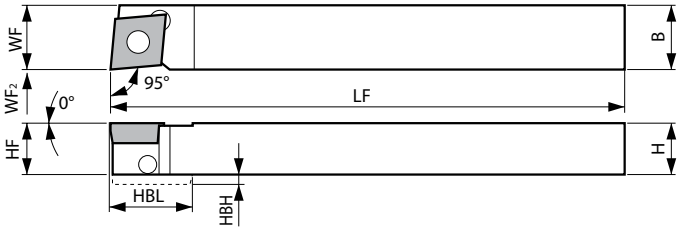
Symbol	Detail	Previous symbol
B	Shank width	B
H	Shank height	H1
HF	Edge height	h
LF	Overall length	L1
LH	Head length	L2
LU	Usable length	L2
WF	Functional width	F1

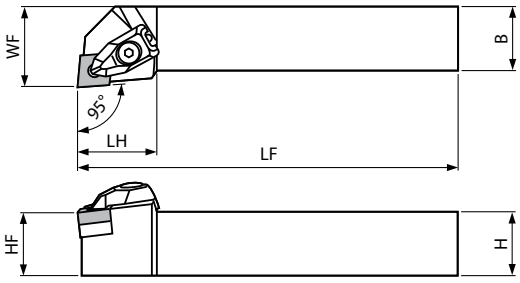
4. Boring bars

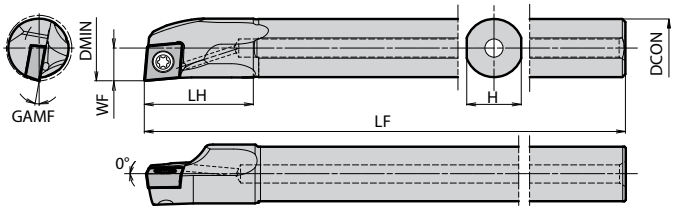
Symbol	Detail	Previous symbol
DMIN	Min. bore dia.	øA
DCON	Shank dia.	øD, øD1
GAMF	Radial rake angle	θ
H	Shank width	H
LF	Overall length	L1
LH	Head length	L2
LPR	Overall length	L1
LU	Usable length	L2
RE	Corner-R	rε
WF	Functional width	F









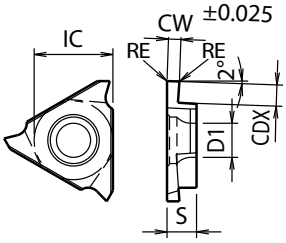


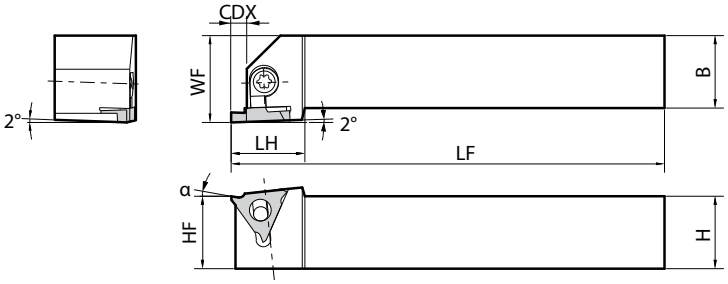
5. Grooving / Cut-off inserts

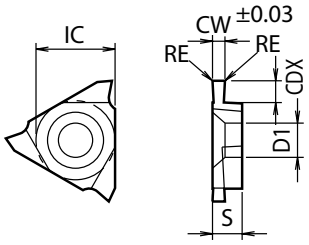
Symbol	Detail	Previous symbol
IC	I.C. Size	A
BCH	Chamfer width	C
CDX	Max. cutting depth	B
CW	Edge width	W
D1	Hole diameter	ød
DAXN	External dia. of the groove (max.)	øD
DAXX	External dia. of the groove (min.)	øD
INSL	Insert length	L
PSIR$^{R}_{L}$	Lead angle	θ
RE	Corner-R	rε
S	Insert thickness	H, T
W1	Insert width	A

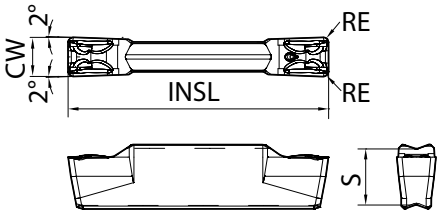
6. Grooving / Cut-off toolholders

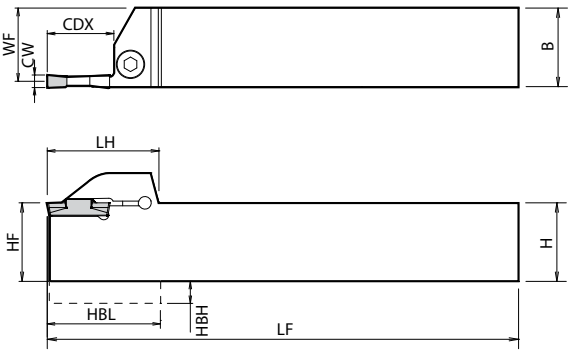
Symbol	Detail	Previous symbol
B	Shank width	B
CDX	Max. cutting depth	T
CUTDIA	Max. cut-off dia.	øDmax
DAXN	External dia. of the groove (max.)	øD
DAXX	External dia. of the groove (min.)	øD
DCB	Connection bore dia. (Sleeve)	ød1
DMIN	Min. Bore dia.	øA
DCON	Shank dia.	øD, øD1
H	Shank height	H1
HF	Edge height	h
LF	Overall length	L1
LH	Head length	L2
WF	Functional width	F1

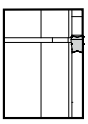


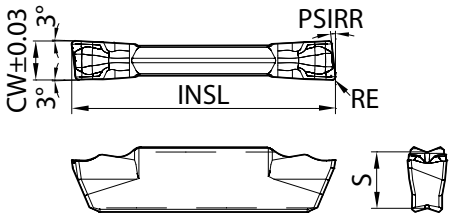












7. Threading inserts

Symbol	Detail	Previous symbol
IC	I.C. S ize	A
D1	Hole diameter	ød
PNA	Thread angle	θ
PDX	Profile distance	S
S	Insert thickness	T
RE	Corner-R	rε

8. Threading toolholders

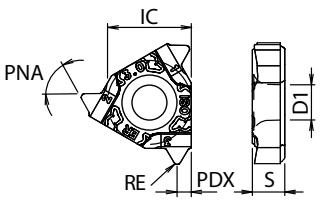
Symbol	Detail	Previous symbol
B	Shank width	B
DMIN	Min. Bore dia.	øA
DCON	Shank dia.	øD
H	Shank height	H1
HF	Edge height	h
LF	Overall length	L1
LH	Head length	L2
LU	Usable length	L2
WF	Functional width	F, F1

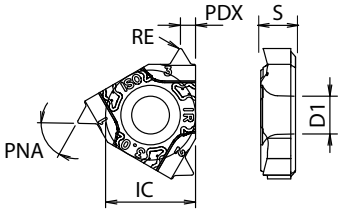
9. Inserts for drill

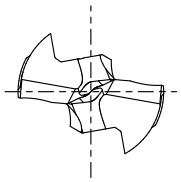
Symbol	Detail	Previous symbol
IC	I.C. Size	A
D1	Hole diameter	ød
DC	Drill dia.	øDc
PL	Drill head point length	Lp
RE	Corner-R	rε
S	Insert thickness	T
INSL	Insert length	A
W1	Insert width	W

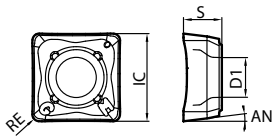
10. Drill holder

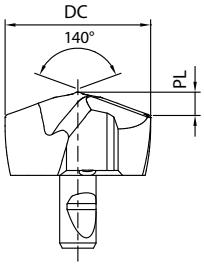
Symbol	Detail	Previous symbol
DC	Drill dia.	øDc
DCON	Shank dia.	øDs
OAL	Overall length	L
LU	Usable length (Drilling depth)	L3
PL	Drill head point length	Lp
LS	Shank length	Ls
DCSFMS	Flange dia.	ød1
LFS	Functional length	L1
LCF	Flute length	L2

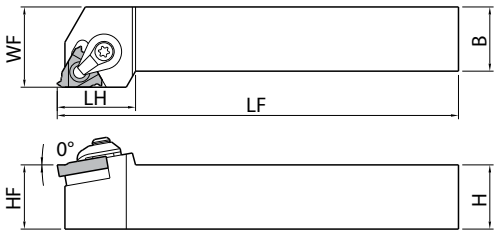


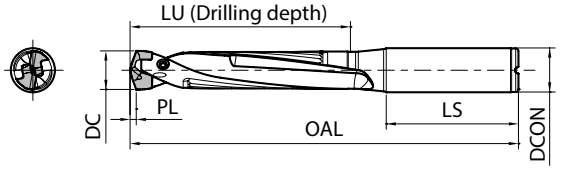


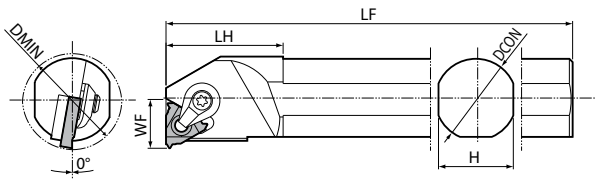


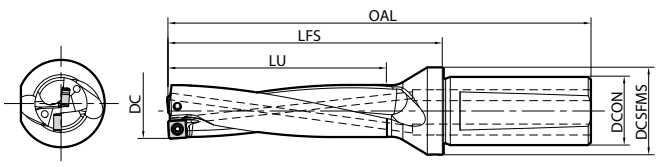












11. Solid end mill

Symbol	Detail	Previous symbol
APMX	Max. depth of cut	ℓ
CHW	Chamfer width	C
DC	Cutting dia.	øDc
DCON	Shank dia.	øDs
DN	Neck dia.	øD1
LF	Overall length	L
LU	Under neck length	ℓ2
RE	Corner-R	rε, r
ZEFP	No. of inserts	Z

12. Solid drill

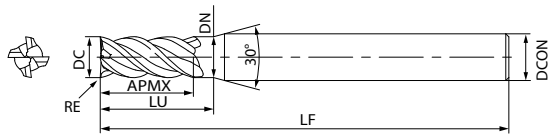
Symbol	Detail	Previous symbol
OAL	Overall length	L
DC	Cutting dia.	øDc
DCON	Shank dia.	øDs
LCF	Flute length	ℓ
LN	Under neck length	ℓ2
LS	Shank length	Ls
LU	Usable length	ℓe

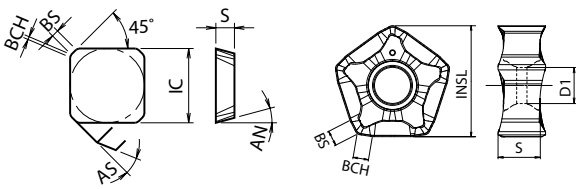
13. Milling inserts

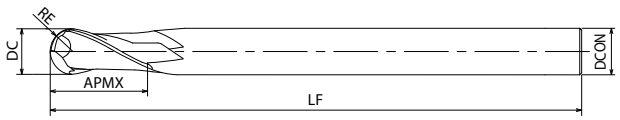
Symbol	Detail	Previous symbol
BCH	Corner chamfer length	X
BS	Wiper edge width	Z
D1	Hole diameter	ød
IC	I.C. Size	A
INSL	Insert length	W
L	Cutting edge length	W
RE	Corner-R	rε
S	Insert thickness	T

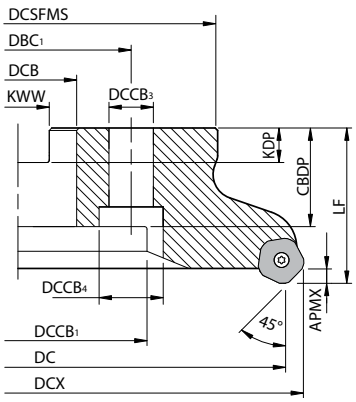
14. Toolholder for milling

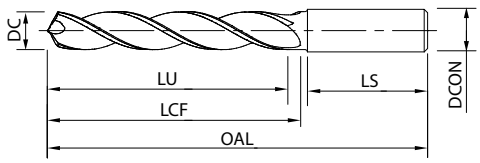
Symbol	Detail	Previous symbol
APMX	Max. depth of cut	S
CBDP	Connection bore depth	E
DC	Cutting dia.	øD
DCB	Bore dia.	ød
DCON	Shank dia.	øDs
DCSFMS	Contact surface dia.	øD2
DCX	Maximum cutting dia.	øD1
KDP	Keyway depth	a
KWW	Keyway width	b
LF	Toolholder height	H
LH	Head length	ℓ

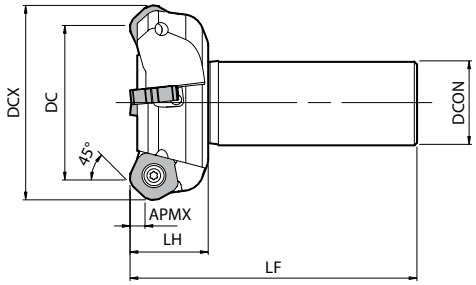


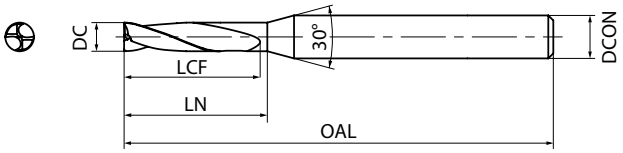












SI derived units conversion chart

Bold units are the ones by SI derived unit.

Extracted from JIS handbook "Iron & steel"

Force

N	kgf	dyn
1	$1.019\,72 \times 10^{-1}$	1×10^{5}
9.806 65	1	$9.806\,65 \times 10^{5}$
1×10^{-5}	$1.019\,72 \times 10^{-6}$	1

Stress

1Pa=1N/m^2,1MPa=1N/mm^2

Pa or N/m^2	**MPa or N/mm^2**	kgf/mm^2	kgf/cm^2	kgf/m^2
1	**1×10^{-6}**	$1.019\,72 \times 10^{-7}$	$1.019\,72 \times 10^{-5}$	$1.019\,72 \times 10^{-1}$
1×10^{6}	**1**	$1.019\,72 \times 10^{-1}$	$1.019\,72 \times 10$	$1.019\,72 \times 10^{5}$
$9.806\,65 \times 10^{6}$	**9.806 65**	1	1×10^{2}	1×10^{6}
$9.806\,65 \times 10^{4}$	**$9.806\,65 \times 10^{-2}$**	1×10^{-2}	1	1×10^{4}
9.806 65	**$9.806\,65 \times 10^{-6}$**	1×10^{-6}	1×10^{-4}	1

Pressure

1Pa=1N/m^2

Pa	**kPa**	**MPa**	bar	kgf/cm^2
1	**1×10^{-3}**	**1×10^{-6}**	1×10^{-5}	$1.019\,72 \times 10^{-5}$
1×10^{3}	**1**	**1×10^{-3}**	1×10^{-2}	$1.019\,72 \times 10^{-2}$
1×10^{6}	**1×10^{3}**	**1**	1×10	$1.019\,72 \times 10$
1×10^{5}	**1×10^{2}**	**1×10^{-1}**	1	1.019 72
$9.806\,65 \times 10^{4}$	**$9.806\,65 \times 10$**	**$9.806\,65 \times 10^{-2}$**	$9.806\,65 \times 10^{-1}$	1

Cutting symbol

Cutting conditions below are indicated by the new symbols listed in 2nd column.

1. Turning

Cutting conditions	Symbol	Previous symbol	Unit
Cutting speed	Vc	V	m/min
Feed rate	f	f	mm/rev
Depth of cut	ap	d	mm
Edge width	CW	W	mm
Workpiece dia.	Dm	D	mm
Required power	Pc	Pkw	kW
Specific cutting force	kc	Ks	MPa
Theoretical surface roughness	h	Rz	µm
Corner radius	RE	R	mm
Revolution	n	N	min^{-1}

2. Milling

Cutting conditions	Symbol	Previous symbol	Unit
Cutting speed	Vc	V	m/min
Feed speed	Vf	F	mm/min
Feed per tooth	fz	f	mm/t
Feed rate	f	f	mm/rev
No. of inserts	Z	Z	teeth
Depth of cut	ap	d	mm
Width of cut	ae	w	mm
Pick feed	Pf	Pf	mm
Required power	Pc	Pkw	kW
Specific cutting force	kc	Ks	MPa
Chip removal volume	Q	Q	cm^3/min
Revolution	n	N	min^{-1}

3. Drilling

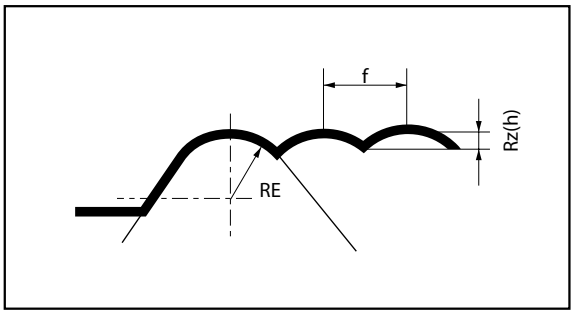
Cutting conditions	Symbol	Previous symbol	Unit
Cutting speed	Vc	V	m/min
Feed speed	Vf	F	mm/min
Feed rate	f	f	mm/rev
Drill dia.	DC	D (Ds)	mm
Required power	Pc	Pkw	kW
Specific cutting force	kc	Ks	MPa
Drilling depth	H	d	mm
Revolution	n	N	min^{-1}

Theoretical (Geometrical) surface roughness

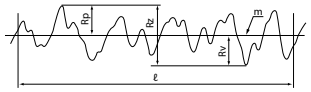
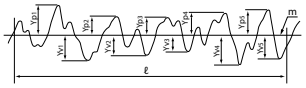
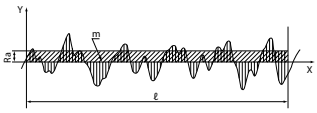
Theoretical surface roughness for turning indicates the minimum roughness value from the cutting conditions and it is shown by the formula as follows.

$$Rz(h) = \frac{f^2}{8RE} \times 10^3$$

Rz(h): Theoretical surface roughness [µm]
f: Feed rate [mm/rev]
RE: Corner radius of insert [mm]



How to obtain surface roughness values

Type	Symbol	How to obtain	Explanation
Max. height roughness	Rz	Rz is a mean value in micron meter obtained from the distance of the highest peaks and the lowest valleys within the range of sampled reference length (" ℓ ") in the direction of the center line of the roughness curve. Note) When calculating Rz, extraordinarily high or low threads are considered as damages and excluded from the calculation, and only standard lengths are used. Rz=Rp+Rv	
Ten points mean roughness	RzJIS	RzJIS is a mean value in micron meter obtained from the distance of 5 highest peaks (Yp) and the 5 lowest valleys (Yv) measured from the center line of the roughness curve within the range of sampled reference length " ℓ ". $RzJIS = \frac{(Yp1+Yp2+Yp3+Yp4+Yp5)+(Yv1+Yv2+Yv3+Yv4+Yv5)}{5}$	 *Yp1,Yp2,Yp3,Yp4,Yp5:* Distance from the mean line to the highest 5 peaks in the range of sampled reference length " ℓ " *Yv1,Yv2,Yv3,Yv4,Yv5:* Distance from the mean line to the lowest 5 valleys in the range of sampled reference length " ℓ "
Arithmetical mean roughness	Ra	Ra is obtained from the following formula in micron meter, the roughness curve is expressed by y=f(x), the X-axis is in the direction of the center line and the Y-axis is the vertical magnification of the roughness curve in the range of sampled reference length " ℓ ". $Ra = \frac{1}{\ell}\int_0^{\ell}\{f(x)\}\,dx$	

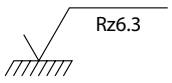
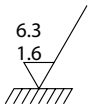
Relationship with triangle symbol

Arithmetical mean roughness Ra(µm)	Max. height roughness Rz(µm)	Ten points mean roughness RzJIS(µm)	*(Triangle symbol)
0.025 0.05 0.1 0.2	0.1 0.2 0.4 0.8	0.1 0.2 0.4 0.8	▽▽▽▽
0.4 0.8 1.6	1.6 3.2 6.3	1.6 3.2 6.3	▽▽▽
3.2 6.3	12.5 25	12.5 25	▽▽
12.5 25	50 100	50 100	▽

* Triangle symbol was removed from JIS standard in the 1994 revision.

· How to indicate
1. When Ra is 1.6µm ⟶ 1.6µmRa
2. When Rz is 6.3µm ⟶ 6.3µmRz
3. When RzJIS is 6.3µm ⟶ 6.3µmRzJIS

Indication in JIS standard

Example of Ra indication		Example of Rz indication	
1. When indicating the upper limit only (when upper limit is 6.3µmRa)		1. When indicating the upper limit only indicate surface roughness following the parameter symbol.	
2. When indicating both lower and upper limit (when upper limit is 6.3µmRa, lower limit is 1.6µmRa)		2. When indicating both lower and upper limit indicate surface roughness as (upper limit ~ lower limit) following the parameter symbol.	

Note: The indications of Ra and Rz are different.

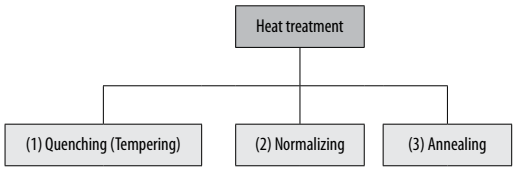
Caution-symbols for surface roughness

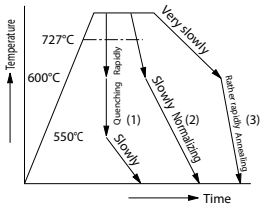
The above information is based on JIS B 0601-2001.
However, some symbols were revised as shown in the right table in accordance with ISO Standard from JIS B 0601-2001 version.
Ten Points Mean Roughness (Rz) was eliminated from 2001 version but it still remains as RzJIS reference, since it was popular in Japan.

Type	Symbol of JIS B 0601-1994		Symbol of JIS B 0601-2001
Max. height roughness	Ry	→	Rz
Ten points mean roughness	Rz	→	(RzJIS)
Arithmetical mean roughness	Ra	→	Ra

Heat treatment

One of the ways to determine the hardness of steel is the heat treatment and it is classified to 3 types.



Heat treatment method		Detail	Effect
	· Quenching (Tempering)	After heating to 727˚C or over, cool rapidly down to 550˚C in water or oil.	Quenching makes steel hard. Because it cools down red-hot steel very rapidly in water or oil, but it may promote internal stress. In order to remove such internal stress, tempering is used. (After cooled down once, reheat it to 200˚C ~ 600˚C)
	· Normalizing	After heating to 727˚C or over, cool down rapidly to 600˚C and then to normal temperature.	It miniaturizes the crystals. (Steel is also composed of small cells.) It is used to improve the mechanical character or machinability.
	· Annealing	After heating to 727˚C or over, cool down very slowly to 600˚C, then to normal temperature.	It miniaturizes the crystals like the process of normalizing, but the crystal size is bigger than that of normalizing. It targets machinability improvement and distortion correction.

Hardness expression

Hardness	Reference standard	Example	Explanation of example
Brinell hardness	JIS Z 2243: 1992	250HB	Hardness value: 250, Hardness symbol: HB
		200 ~ 250HB	When the hardness has the range
Vickers hardness	JIS Z 2244: 1998	640HV	Hardness value: 640, Hardness symbol: HV
Rockwell hardness	JIS Z 2245: 1992	60HRC	Hardness value: 60, Hardness symbol: HRC
Shore hardness	JIS Z 2246: 1992	50HS	Hardness value: 50, Hardness symbol: HS

Vickers hardness conversion chart

Vickers hardness (HV)	Brinell hardness 10mm dia. ball Load: 3,000kgf (HB)		Rockwell hardness [2]			Shore hardness (HS)	Tensile strength MPa[1]
	Standard ball	Tungsten carbide ball	A scale Load: 60kgf Diamond point (HRA)	B scale Load: 100kgf 1.6mm (1/16in) dia. ball (HRB)	C scale Load: 150kgf Diamond point (HRC)		
940	-	-	85.6	-	68.0	97	
920	-	-	85.3	-	67.5	96	
900	-	-	85.0	-	67.0	95	
880	-	(767)	84.7	-	66.4	93	
860	-	(757)	84.4	-	65.9	92	
840	-	(745)	84.1	-	65.3	91	
820	-	(733)	83.8	-	64.7	90	
800	-	(722)	83.4	-	64.0	88	
780	-	(710)	83.0	-	63.3	87	
760	-	(698)	82.6	-	62.5	86	
740	-	(684)	82.2	-	61.8	84	
720	-	(670)	81.8	-	61.0	83	
700	-	(656)	81.3	-	60.1	81	
690	-	(647)	81.1	-	59.7	-	
680	-	(638)	80.8	-	59.2	80	
670	-	630	80.6	-	58.8	-	
660	-	620	80.3	-	58.3	79	
650	-	611	80.0	-	57.8	-	
640	-	601	79.8	-	57.3	77	
630	-	591	79.5	-	56.8	-	
620	-	582	79.2	-	56.3	75	
610	-	573	78.9	-	55.7	-	
600	-	564	78.6	-	55.2	74	
590	-	554	78.4	-	54.7	-	2055
580	-	545	78.0	-	54.1	72	2020
570	-	535	77.8	-	53.6	-	1985
560	-	525	77.4	-	53.0	71	1950
550	505	517	77.0	-	52.3	-	1905
540	496	507	76.7	-	51.7	69	1860
530	488	497	76.4	-	51.1	-	1825
520	480	488	76.1	-	50.5	67	1795
510	473	479	75.7	-	49.8	-	1750
500	465	471	75.3	-	49.1	66	1705
490	456	460	74.9	-	48.4	-	1660
480	448	452	74.5	-	47.7	64	1620
470	441	442	74.1	-	46.9	-	1570
460	433	433	73.6	-	46.1	62	1530
450	425	425	73.3	-	45.3	-	1495
440	415	415	72.8	-	44.5	59	1460
430	405	405	72.3	-	43.6	-	1410
420	397	397	71.8	-	42.7	57	1370
410	388	388	71.4	-	41.8	-	1330
400	379	379	70.8	-	40.8	55	1290
390	369	369	70.3	-	39.8	-	1240
380	360	360	69.8	(110.0)	38.8	52	1205
370	350	350	69.2	-	37.7	-	1170
360	341	341	68.7	(109.0)	36.6	50	1130
350	331	331	68.1	-	35.5	-	1095
340	322	322	67.6	(108.0)	34.4	47	1070
330	313	313	67.0	-	33.3	-	1035

Vickers hardness (HV)	Brinell hardness 10mm dia. ball Load: 3,000kgf (HB)		Rockwell hardness [2]			Shore hardness (HS)	Tensile strength MPa[1]
	Standard ball	Tungsten carbide ball	A scale Load: 60kgf Diamond point (HRA)	B scale Load: 100kgf 1.6mm (1/16in) dia. ball (HRB)	C scale Load: 150kgf Diamond point (HRC)		
320	303	303	66.4	(107.0)	32.2	45	1005
310	294	294	65.8	-	31.0	-	980
300	284	284	65.2	(105.5)	29.8	42	950
295	280	280	64.8	-	29.2	-	935
290	275	275	64.5	(104.5)	28.5	41	915
285	270	270	64.2	-	27.8	-	905
280	265	265	63.8	(103.5)	27.1	40	890
275	261	261	63.5	-	26.4	-	875
270	256	256	63.1	(102.0)	25.6	38	855
265	252	252	62.7	-	24.8	-	840
260	247	247	62.4	(101.0)	24.0	37	825
255	243	243	62.0	-	23.1	-	805
250	238	238	61.6	99.5	22.2	36	795
245	233	233	61.2	-	21.3	-	780
240	228	228	60.7	98.1	20.3	34	765
230	219	219	-	96.7	(18.0)	33	730
220	209	209	-	95.0	(15.7)	32	695
210	200	200	-	93.4	(13.4)	30	670
200	190	190	-	91.5	(11.0)	29	635
190	181	181	-	89.5	(8.5)	28	605
180	171	171	-	87.1	(6.0)	26	580
170	162	162	-	85.0	(3.0)	25	545
160	152	152	-	81.7	(0.0)	24	515
150	143	143	-	78.7	-	22	490
140	133	133	-	75.0	-	21	455
130	124	124	-	71.2	-	20	425
120	114	114	-	66.7	-	-	390
110	105	105	-	62.3	-	-	-
100	95	95	-	56.2	-	-	-
95	90	90	-	52.0	-	-	-
90	86	86	-	48.0	-	-	-
85	81	81	-	41.0	-	-	-

Extracted from JIS handbook "Iron & steel" (SAE J 417)

Note:

1. 1 MPa = 1 N/mm^2
2. Value in ( ) is not in practical use, but reference only.

Ferrous materials

Classification		Name of JIS standard	Symbol
Structural steel		Rolled steel for welded structure	SM
		Re-rolled steel	SRB
		Rolled steel for general structure	SS
		Light gauge steel for general structure	SSC
		Hot-rolled steel plate, sheet and strip for automobile structural use	SAPH
Steel sheet		Cold-rolled steel plate, sheet and strip	SPC
		Hot-rolled soft steel plate, sheet and strip	SPH
Steel pipe		Carbon steel pipe for ordinary piping	SGP
		Carbon steel pipe for boiler / heat exchanger	STB
		Seamless steel pipe for high pressure gas cylinder	STH
		Carbon steel pipe for general structural use	STK
		Carbon steel pipe for machine structural use	STKM
		Alloy steel pipe for structural use	STKS
		Stainless steel pipe for machine structural use	SUS-TK
		Steel square pipe for general structural use	STKR
		Alloy steel pipe for ordinary piping	STPA
		Carbon steel pipe for pressure service	STPG
		Carbon steel pipe for high-temperature service	STPT
		Carbon steel pipe for high-pressure service	STS
		Stainless steel pipe for ordinary piping	SUS-TP
Machine structural steel		Carbon steel for machine structural use	SxxC, SxxCK
		Aluminum chromium molybdenum steel	SACM
		Chromium molybdenum steel	SCM
		Chromium steel	SCr
		Nickel chromium steel	SNC
		Nickel chromium molybdenum steel	SNCM
		Manganese steel and manganese chromium steel for machine structural use	SMn, SMnC
Special steel	Tool steel	Carbon tool steel	SK
		Hollow drill steel	SKC
		Alloy tool steel	SKS, SKD, SKT
		High speed tool steel	SKH
	Special steel	Free cutting carbon steel	SUM
		High carbon chromium bearing steel	SUJ
		Spring steel	SUP
	Stainless steel	Stainless steel bar	SUS-B
		Hot-rolled stainless steel plate, sheet and strip	SUS-HP, SUS-HS
		Cold-rolled stainless steel plate, sheet and strip	SUS-CP, SUS-CS
	Heat-resisting steel	Heat-resisting steel bar	SUH-B, SUH-CB
		Heat-resisting steel plate and sheet	SUH-HP, SUH-CP
	Superalloy	Corrosion-resisting and heat-resisting superalloy bar	NCF-B
		Corrosion-resisting and heat-resisting superalloy plate and sheet	NCF-P

Classification	Name of JIS standard	Symbol
Forged steel	Carbon steel forging	SF
	Chromium molybdenum steel forging	SFCM
	Nickel chromium molybdenum steel forging	SFNCM
Cast iron	Gray cast iron	FC
	Spheroidal graphite cast iron	FCD
	Blackheart malleable cast iron	FCMB
	Whiteheart malleable cast iron	FCMW
	Pearlitic malleable cast iron	FCMP
Cast steel	Carbon cast steel	SC
	High tensile strength carbon cast steel & low alloy cast steel	SCC
	Stainless cast steel	SCS
	Heat-resisting cast steel	SCH
	High manganese cast steel	SCMnH
	Cast steel for high temperature and high pressure service	SCPH

Non-ferrous metals

Classification	Name of JIS standard	Symbol
Copper	Copper and copper alloy sheet / strip	CxxxxP CxxxxPP CxxxxR
	Copper and copper alloy rod and bar	CxxxxBD CxxxxBDS CxxxxBE
Aluminum alloys and aluminum alloys expanded material	Aluminum and Al. alloy sheet / strip	AxxxxP AxxxxPC
	Aluminum and Al. alloy rod, bar, and wire	AxxxxBE AxxxxBES AxxxxBD AxxxxBDS AxxxxW AxxxxWS
	Aluminum and Al. alloy extruded shape	AxxxxS
	Aluminum and Al. alloy forging	AxxxxFD AxxxxFH
Magnesium alloy expanded material	Magnesium alloy sheet and plate	MP
	Magnesium alloy rod and bar	MB
Nickel alloy	Nickel copper alloy sheet and plate	NCuP
	Nickel copper alloy rod and bar	NCuB
Titanium expanded material	Titanium rod and bar	TB
Casting	Brass casting	CAC20x
	High strength brass casting	CAC30x
	Bronze casting	CAC40x
	Phosphoric bronze casting	CAC50x
	Aluminum bronze casting	CAC70x
	Aluminum alloy casting	AC
	Magnesium alloy casting	MC
	Zinc alloy die casting	ZDCx
	Aluminum alloy die casting	ADC
	Magnesium alloy die casting	MD
	White metal	WJ

Steel

Classification	Germany	UK	France	Japan	China	USA	Russia
	DIN	BS	NF	JIS	GB	AISI/SAE	ГОСТ
Carbon steel for machine structural use	C10E C10R	040A10 045A10 045M10	XC10	S10C	08 10	1010	
		040A12	XC12	S12C		1012	
	C15E C15R	055M15		S15C	15	1015	
			XC18	S17C		1017	
	C22 C22E C22R	070M20 C22 C22E C22R	C22 C22E C22R	S20C	20	1020	
				S22C		1023	
	C25 C25E C25R	C25 C25E C22R	C25 C25E C25R	S25C	25	1025	
				S28C		1029	25Г
	C30 C30E C30R	080A30 080M30 C30 C30E C30R	C30 C30E C30R	S30C	30	1030	30Г
				S33C			30Г
	C35 C35E C35R	C35 C35E C35R	C35 C35E C35R	S35C	35	1035	35Г
				S38C		1038	35Г
	C40 C40E C40R	080M40 C40 C40E C40R	C40 C40E C40R	S40C	40	1039 1040	40Г
		080A42		S43C		1042 1043	40Г
	C45 C45E C45R	C45 C45E C45R	C45 C45E C45R	S45C	45	1045 1046	45Г
		080A47		S48C			45Г
	C50 C50E C50R	080M50 C50 C50E C50R	C50 C50E C50R	S50C	50	1049	50Г
				S53C		1050 1053	50Г
	C55 C55E C55R	070M55 C55 C55E C55R	C55 C55E C55R	S55C	55	1055	
	C60 C60E C60R	C60 C60E C60R	C60 C60E C60R	S58C	60	1059 1060	60Г
	C10E	045A10 045M10	XC10	S09CK			
	C15E		XC12	S15CK	15F		
			XC18	S20CK			

Steel

Classification	Germany	UK	France	Japan	China	USA	Russia
	DIN	BS	NF	JIS	GB	AISI/SAE	ГОСТ
Nickel chromium steel	36NiCr6			SNC236			40XH
	14NiCr10			SNC415	12CrNi2		
	36NiCr10			SNC631	30CrNi3		30XH3A
	15NiCr13	655M13		SNC815	12Cr2Ni4		
	31NiCr14			SNC836	37CrNi3		
Nickel chromium molybdenum steel	20NiCrMo2 20NiCrMoS2	805A20 805M20 805A22 805M22	20NCD 2	SNCM220	20CrNiMo	8615 8617 8620 8622	
	40NiCrMo2-2			SNCM240		8637 8640	
				SNCM415			
	17NiCrMo6-4			SNCM420	18CrNiMnMoA	4320	20XH2M (20XHM)
	30CrNiMo8			SNCM431			
	40NiCrMo6			SNCM439	40CrNiMoA	4340	
	34CrNiMo6			SNCM447			
				SNCM616			
				SNCM625			
				SNCM630			
				SNCM815			
Chromium steel	17Cr3 17CrS3			SCr415	15Cr 15CrA		15X 15XA
				SCr420	20Cr	5120	20X
	34Cr4 34CrS4	34Cr4 34CrS4	34Cr4 34CrS4	SCr430	30Cr	5130 5132	30X
	37Cr4 37CrS4	37Cr4 37CrS4	37Cr4 37CrS4	SCr435	35Cr	5132	35X
	41Cr4 41CrS4	530M40 41Cr4 41CrS4	41Cr4 41CrS4	SCr440	40Cr	5140	40X
				SCr445	45Cr 50Cr		45X
Chromium molybdenum steel	15CrMo4			SCM415	15CrMo		
	18CrMo4 18CrMoS4			SCM418	20CrMo		20XM
	20CrMo5	708M20		SCM420			20XM
				SCM421			
				SCM430	30CrMo 30CrMoA	4130	30XM 30XMA
				SCM432			
	34CrMo4 34CrMoS4	34CrMo4 34CrMoS4	34CrMo4 34CrMoS4	SCM435	35CrMo	4137	35XM
	42CrMo4 42CrMoS4	708M40 709M40 42CrMo4 42CrMoS4	42CrMo4 42CrMoS4	SCM440	42CrMo	4140 4142	
				SCM445		4145 4147	
				SCM822			

Steel

Classification	Germany	UK	France	Japan	China	USA	Russia
	DIN	BS	NF	JIS	GB	AISI/SAE	ГОСТ
Manganese steel Manganese chromium steel	20Mn5	150M19		SMn420	20Mn2	1522	
	34Mn5	150M36		SMn433	30Mn2 35Mn2	1536	30Г2 35Г2
	36Mn5	150M36		SMn438	40Mn2	1541	35Г2 40Г2
				SMn443	45Mn2	1541	40Г2 45Г2
	16MnCr5			SMnC420	15CrMn	5115	
				SMnC443	40CrMn	5140	
Structural steel with specified hardenability band				SMn420H		1522H	
				SMn433H			
				SMn438H		1541H	
				SMn443H		1541H	
				SMnC420H			
				SMnC443H			
	17Cr3 17CrS3			SCr415H	15CrH		15Х
	17Cr3			SCr420H	20Cr1H	5120H	20Х
	34Cr4 34CrS3	34Cr4 34CrS4	34Cr4 34CrS4	SCr430H		5130H 5132H	30Х
	37Cr4 34CrS4	37Cr4 37CrS4	37Cr4 37CrS4	SCr435H		5135H	35Х
	41Cr4 41CrS4	41Cr4 41CrS4	41Cr4 41CrS4	SCr440H	40CrH	5140H	40Х
	15CrMo5			SCM415H	15CrMoH	4118H	
	18CrMo4 18CrMoS4			SCM418H			
	18CrMo4	708H20		SCM420H	20CrMoH	4118H	
	34CrMo4 34CrMoS4	34CrMo4 34CrMoS4	34CrMo4 34CrMoS4	SCM435H		4135H 4137H	
	42CrMo4 42CrMoS4	42CrMo4 42CrMoS4	42CrMo4 42CrMoS4	SCM440H	42CrMoH	4140H 4142H	
				SCM445H		4145H 4147H	
				SCM822H			
				SNC415H			
				SNC631H			
	15NiCr13	655H13		SNC815H	12Cr2Ni4H		
	21NiCrMo2	805H17 805H20 805H22	20N CD 2	SNCM220H	20CrNiMoH	8617H 8620H 8622H	
	20NiCrMoS6-4			SNCM420H	20CrNi2MoH	4320H	

Steel

Classification	Germany	UK	France	Japan	China	USA		Russia
	DIN	BS	NF	JIS	GB	UNS	AISI	ГОСТ
Stainless steel			Z12CMN17-07Az	SUS 201	1Cr17Mn6Ni5N	S20100	201	
		284S16		SUS 202	1Cr18Mn8Ni5N	S20200	202	12Х17Г9АН4
	X12CrNi17 7	301S21	Z11CN17-08	SUS 301	1Cr18Mn10Ni5Mo3N 1Cr17Ni7	S30100	301	07Х16Н6
	X2CrNiN18-7			SUS 301L		S30153		
	X12CrNi17 7			SUS 301J1				
		302S25	Z12CN18-09	SUS 302	1Cr18Ni9	S30200	302	12Х18Н9
				SUS 302B		S30215	302B	
	X10CrNiS18 9	303S21	Z8CNF18-09	SUS 303	Y1Cr18Ni9	S30300	303	
		303S41		SUS 303Se	Y1Cr18Ni9Se	S30323	303Se	12Х18Н10Е
	X5CrNi18 10	304S31	Z7CN18-09	SUS 304	0Cr18Ni9	S30400	304	08Х18Н10
	X2CrNi19 11	304S11	Z3CN19-11	SUS 304L	00Cr18Ni10	S30403	304L	03Х18Н11
			Z6CN19-09Az	SUS 304N1	0Cr18Ni9N	S30451	304N	
				SUS 304N2	0Cr19Ni10NbN	S30452		
	X2CrNiN18 10		Z3CN18-10Az	SUS 304LN	00Cr18Ni10N	S30453	304LN	
				SUS 304J1				
				SUS 304J2				
				SUS 304J3		S30431	S30431	
	X5CrNi18 12	305S19	Z8CN18-12	SUS 305	1Cr18Ni12	S30500	305	06Х18Н11
				SUS 305J1				
			Z10CN24-13	SUS 309S	0Cr23Ni13	S30908	309S	
		310S31	Z8CN25-20	SUS 310S	0Cr25Ni20	S31008	310S	10Х23Н18
	X5CrNiMo17 12 2	316S31	Z7CND17-12-02	SUS 316	0Cr17Ni12Mo2	S31600	316	
	X5CrNiMo17 13 3		Z6CND18-12-03	SUS 316F				
	X2CrNiMo17 13 2	316S11	Z3CND17-12-02	SUS 316L	00Cr17Ni14Mo2	S31603	316L	
	X2CrNiMo17 14 3		Z3CND17-13-03					03Х17Н14М3
				SUS 316N	0Cr17Ni12Mo2N	S31651	316N	
	X2CrNiMoN17 12 2		Z3CND17-11Az	SUS 316LN	00Cr17Ni13Mo2N	S31653	316LN	
	X2CrNiMoN17 13 3		Z3CND17-12Az					
	X6CrNiMoTi17 12 2		Z6CNDT17-12	SUS 316Ti		S31635		08Х17Н13М2Т
				SUS 316J1	0Cr18Ni12Mo2Cu2			
				SUS 316J1L	00Cr18Ni14Mo2Cu2			
		317S16		SUS 317	0Cr19Ni13Mo3	S31700	317	
	X2CrNiMo18 16 4	317S12	Z3CND19-15-04	SUS 317L	00Cr19Ni13Mo3	S31703	317L	
			Z3CND19-14Az	SUS 317LN		S31753		
				SUS 317J1	0Cr18Ni16Mo5			
				SUS 317J2				
				SUS 317J3L				
				SUS 836L		N08367		
		904S14	Z2NCDU25-20	SUS 890L		N08904	N08904	
	X6CrNiTi18 10	321S31	Z6CNT18-10	SUS 321	1Cr18Ni9Ti 0Cr18Ni10Ti	S32100	321	08Х18Н10Т
	X6CrNiNb18 10	347S31	Z6CNNb18-10	SUS 347	0Cr18Ni11Nb	S34700	347	08Х18Н12Б
			Z6CN18-16	SUS 384		S38400	384	
		394S17	Z2CNU18-10	SUS XM7	0Cr18Ni9Cu3	S30430	304Cu	
			Z15CNS20-12	SUS XM15J1	0Cr18Ni13Si4	S38100		
				SUS 329J1	0Cr26Ni5Mo2	S32900	329	
			Z3CNDU22-05Az	SUS 329J3L		S39240	S31803	08Х21Н6М2Т
			Z3CNDU25-07Az	SUS 329J4L		S39275	S31260	

Steel

Classification	Germany	UK	France	Japan	China	USA		Russia
	DIN	BS	NF	JIS	GB	UNS	AISI	ГОСТ
Stainless steel	X6CrAl13	405S17	Z8CA12	SUS 405	0Cr13Al 0Cr13	S40500	405	
			Z3C14	SUS 410L	00Cr12			
				SUS 429		S42900	429	
	X6Cr17	430S17	Z8C17	SUS 430	1Cr17	S43000	430	12X17
	X7CrMoS18		Z8CF17	SUS 430F	Y1Cr17	S43020	430F	
	X6CrTi17		Z4CT17	SUS 430LX		S43035		
	X6CrNb17		Z4CNb17	SUS 430J1L				
	X6CrMo17 1	434S17	Z8CD17-01	SUS 434	1Cr17Mo	S43400	434	
				SUS 436L		S43600	436	
				SUS 436J1L				
			Z3CDT18-02	SUS 444		S44400	444	
				SUS 447J1	00Cr30Mo2	S44700		
			Z1CD26-01	SUS XM27	00Cr27Mo	S44627		
				SUS 403	1Cr12	S40300	403	
	X10Cr13	410S21	Z13C13	SUS 410	1Cr13	S41000	410	
	X6Cr13	403S17	Z8C12	SUS 410S		S41008	410S	08X13
				SUS 410F2				
	X12CrS13			SUS 410J1	1Cr13Mo 1Cr12Mo	S41025		
		416S21	Z11CF13	SUS 416	Y1Cr13	S41600	416	
	X20Cr13	420S29	Z20C13	SUS 420J1	2Cr13	S42000	420	20X13
	X30Cr13	420S37	Z33C13	SUS 420J2	3Cr13	S42000	420	30X13
			Z30CF13	SUS 420F	Y3Cr13	S42020	420F	
				SUS 420F2				
				SUS 429J1				
	X20CrNi17 2	431S29	Z15CN16-02	SUS 431	1Cr17Ni2	S43100	431	20X17H2
			Z70C15	SUS 440A	7Cr17	S44002	440A	
				SUS 440B	8Cr17	S44003	440B	
			Z100CD17	SUS 440C	9Cr18 11Cr17 9Cr18Mo	S44004	440C	95X18
				SUS 440F	Y11Cr17	S44020	S44020	
	X5CrNiCuNb16-4		Z6CNU17-04	SUS 630	0Cr17Ni4CuNb	S17400	S17400	
	X7CrNiAl17 7		Z9CNA17-07	SUS 631	0Cr17Ni7Al	S17700	S17700	09X17H7 Ю
				SUS 632J1				

Representative classification of stainless steel

Stainless steel (Austenitic related)

JIS	
SUS201	SUS309S
SUS202	SUS310S
SUS301	SUS316
SUS302	SUS316L
SUS302B	SUS316N
SUS303	SUS317
SUS303Se	SUS317L
SUS304	SUS321
SUS304L	SUS347
SUS304N1	SUS384
SUS304N2	SUSXM7
SUS305	SUSXM15J1
SUS308	

Stainless steel (Ferritic related)

JIS
SUS405
SUS429
SUS430
SUS430F
SUS434
SUSXM27

Stainless steel (Martensitic related)

JIS
SUS403
SUS410
SUS410S
SUS416
SUS420J1
SUS420F
SUS431
SUS440A
SUS440B
SUS440C
SUS440F

Stainless steel (Precipitation hardening)

JIS
SUS630
SUS631

Steel

Classification	Germany	UK	France	Japan	China	USA		Russia
	DIN	BS	NF	JIS	GB	UNS	AISI	ГОСТ
Heat-resisting steel		331S42	Z35CNWS14-14	SUH 31				45Х14Н14В2М
		349S52	Z52CMN21-09Az	SUH 35				
	X53CrMnNi21 9	349S54	Z55CMN21-09Az	SUH 36	5Cr21Mn9Ni4N	S63008		55Х20 Г 9АН4
		381S34		SUH 37	2Cr21Ni12N	S63017		
				SUH 38				
		309S24	Z15CN24-13	SUH 309	2Cr23Ni13	S30900	309	
	CrNi2520	310S24	Z15CN25-20	SUH 310	2Cr25Ni20	S31000	310	20Х25Н20С2
			Z12NCS35-16	SUH 330	1Cr16Ni35	N08330	N08330	
			Z6NCTV25-20	SUH 660	0Cr15Ni25Ti2MoAlVB	S66286		
				SUH 661		R30155		
	CrAl1205			SUH 21				
	X6CrTi12	409S19	Z6CT12	SUH 409		S40900	409	
			Z3CT12	SUH 409L				
			Z12C25	SUH 446	2Cr25N	S44600	446	15Х28
	X45CrSi9 3	401S45	Z45CS9	SUH 1	4Cr9Si2	S65007		
			Z40CSD10	SUH 3	4Cr10Si2Mo			40Х10С2М
		443S65	Z80CSN20-02	SUH 4	8Cr20Si2Ni			
				SUH 11				40Х 9С2
				SUH 600	2Cr12MoVNbN			20Х12ВНМБФР
				SUH 616	2Cr12NiMoWV	S42200		

Representative classification of heat-resisting steel

Heat-resisting steel (Austenitic related)

JIS
SUH31
SUH35
SUH36
SUH37
SUH38
SUH309
SUH310
SUH330
SUH660
SUH661

Heat-resisting steel (Ferritic related)

JIS
SUH21
SUH409
SUH446

Heat-resisting steel (Martensitic related)

JIS
SUH1
SUH3
SUH4
SUH11
SUH600
SUH616

Steel

Classification	Germany	UK	France	Japan	China	USA	Russia
	DIN	BS	NF	JIS	GB	AISI/ASTM	ГОСТ
Carbon tool steel			C140E3U	SK140 (SK1)	T13		Y13
			C120E3U	SK120 (SK2)	T12	W1-11$^{1}/_{2}$	Y12
	C105W1		C105E2U	SK105 (SK3)	T11	W1-10	Y11
			C90E2U	SK95 (SK4)	T10	W1-9	Y10
	C80W1		C90E2U C80E2U	SK85 (SK5)	T8Mn T9	W1-8	Y8Г Y9
	C80W1		C80E2U C70E2U	SK75 (SK6)	T8		Y8
	C70W2		C70E2U	SK65 (SK7)	T7		Y7
High speed tool steel		BT1	HS18-0-1	SKH2	W18Cr4V	T1	P18
	S18-1-2-5	BT4	HS18-1-1-5	SKH3	W18Cr4VCo5	T4	P18K5Ф2
		BT5	HS18-0-2-9	SKH4	W18Cr4V2Co8	T5	P18K5Ф
	S12-1-4-5	BT15	HS12-1-5-5	SKH10	W12Cr4V5Co5	T15	
	S6-5-2	BM2	HS6-5-2	SKH51	W6Mo5Cr4V2	M2	P6M5
				SKH52	CW6Mo5Cr4V2 W6Mo5Cr4V3	M3-1	P6M5Ф3
	S6-5-3		HS6-5-3	SKH53	CW6Mo5Cr4V3	M3-2	P6M5Ф3
		BM4	HS6-5-4	SKH54		M4	
	S6-5-2-5	BM35	HS6-5-2-5HC	SKH55	W6Mo5Cr4V2Co5 W7Mo5Cr4V2Co5	M35 M41	P6M5K5
				SKH56		M36	
	S10-4-3-10	BT42	HS10-4-3-10	SKH57			
			HS2-9-2	SKH58	W2Mo9Cr4V2	M7	
	S2-10-1-8	BM42	HS2-9-1-8	SKH59	W2Mo9Cr4VCo8	M42	
Alloy tool steel				SKS11		F2	XB4
	105WCr6		105WCr5	SKS2			XBГ
				SKS21	W		
				SKS5			
				SKS51		L6	
				SKS7			
			C140E3UCr4	SKS8	Cr06		13X
				SKS4	5CrW2Si 6CrW2Si	S1	6XB2C 5XB2CФ
				SKS41	4CrW2Si	S1	4XB2C
		BW2	100V2	SKS43		W2-9$^{1}/_{2}$	
				SKS44		W2-8	
				SKS3	9CrWMn		9XBГ
	105WCr6		105WCr5	SKS31	CrWMn		XBГ
				SKS93			
				SKS94			
				SKS95	8MnSi		
	X210Cr12	BD3	X200Cr12	SKD1	Cr12	D3	X12
	X153CrMoV12			SKD10	Cr12Mo1V1	D2	X12МФ
	X153CrMoV12	BD2	X160CrMoV12	SKD11	Cr12MoV	D2	
		BA2	X100CrMoV5	SKD12	Cr5Mo1V	A2	
			X32WCrV3	SKD4			
	X30WCrV9-3	BH21	X30WCrV9	SKD5	3Cr2W8V	H21	
	X38CrMoV51	BH11	X38CrMoV5	SKD6	4Cr5MoSiV	H11	4X5МФС
	X40CrMoV51	BH13	X40CrMoV5	SKD61	4Cr5MoSiV1	H13	4X5МФ1С
		BH12	X35CrWMoV5	SKD62		H12	3X3M3Ф
	X32CrMoV33	BH10	32CrMoV12-18	SKD7	4Cr3Mo3SiV	H10	
		BH19		SKD8		H19	
			55CrNiMoV4	SKT3			
	55NiCrMoV6	BH224/5	55NiCrMoV7	SKT4	5CrNiMo		5XHM

Steel

Classification	Germany	UK	France	Japan	China	USA	Russia
	DIN	BS	NF	JIS	GB	AISI/ASTM	ГОСТ
Spring steel				SUP3		1075 1078	75 80 85
	56SiCr7		60Si7	SUP6	55Si2Mn		60C2
	61SiCr7		60Si7	SUP7	60Si2Mn 60Si2MnA	9260	60C2Г
	55Cr3		55Cr3	SUP9	55CrMnA	5155	
	55Cr3		60Cr3	SUP9A	60CrMnA	5160	
	50CrV4	735A51, 735H51	51CrV4	SUP10	50CrVA	6150	ХФА50ХГФА
	51CrV4			SUP11A	60CrMnBA	51B60	50ХГР
	54SiCr6	685A57, 685H57	54SiCr6	SUP12		9254	
	60CrMn3-2	705A60, 705H60	60CrMo4	SUP13	60CrMnMoA	4161	
Free cutting carbon steel				SUM11		1110	
				SUM12	Y12	1108	
				SUM21		1212	
	9SMn28	(230M07)	S250	SUM22	Y15	1213	
	9SMnPb28		S250Pb	SUM22L	Y12Pb	12L13	
				SUM23		1215	
				SUM23L			
	9SMnPb28		S250Pb	SUM24L	Y15Pb	12L14	
	9SMn36		S300	SUM25			
	15S10			SUM31		1117	
				SUM31L			
		210M15, 210A15	(13MF4)	SUM32	Y20		
			(35MF6)	SUM41	Y30 Y35	1137	
			(45MF6.1)	SUM42	Y40Mn	1141	
		(226M44)	(45MF6.3)	SUM43		1144	
High carbon chromium bearing steel				SUJ1	GCr4	51100	
	100Cr6		100Cr6	SUJ2	GCr15	52100	ШХ15
				SUJ3	GCr15SiMn	ASTM A 485 Grade 1	
				SUJ4	GCr15SiMo		
				SUJ5	GCr18Mo		

Cast iron

Classification	Germany	UK	France	Japan	China	USA	Russia
	DIN	BS	NF	JIS	GB	AISI/SAE	ГОСТ
Gray cast iron	GG10	100		FC100	HT100	NO.20	СЧ10
	GG15	150	FGL150	FC150	HT150	NO.30	СЧ15
	GG20	200	FGL200	FC200	HT200	NO.35	СЧ20
	GG25	250	FGL250	FC250	HT250	NO.45	СЧ25
	GG30	300	FGL300	FC300	HT300	NO.50	СЧ30
	GG35	350	FGL350	FC350	HT350	NO.60	СЧ35
	GG40		FGL400				СЧ40
Nodular cast iron	GGG40	400/17	FGS370-17	FCD400	QT400-18	60-40-18	ВЧ40
		420/12	FGS400-12	FCD450	QT450-10	65-45-12	ВЧ45
	GGG50	500/7	FGS500-7	FCD500	QT500-7	70-50-05	ВЧ50
	GGG60	600/7	FGS600-2	FCD600	QT600-3	80-60-03	ВЧ60
	GGG70	700/2	FGS700-2	FCD700	QT700-2	100-70-03	ВЧ70
	GGG80	800/2	FGS800-2	FCD800	QT800-2	120-90-02	ВЧ80
		900/2			QT900-2		ВЧ100

Non-ferrous metals

Classification	Germany	UK	France	Japan	China	USA	Russia
	DIN	BS	NF	JIS	GB	ASTM	ГОСТ
Aluminum alloys	A199.99R				1A99	1199	А99
	A199.98R				1A97		А97
					1A95		А95
	A199.90	1080(1A)	1080A	A1080	1A80		А8
	A199.50	1050(1B)	1050A	A1050	1A50	1050	А5
	AlMg2.5	NS4	5052	A5052	5A02	5052	Амг
		NS5			5A03		АМг3
	AlMg5	NB6		A5056	5A05	5056	АМг5В
		NG61	5957	A5556	5A30	5456	
	AlCu2.5Mg0.5		2117	A2117	2A01	2036	Д18
	AlCuMg1	HF15	2017S	A2017	2A11		Д1
	AlCuMg2		2024	A2024	2A12	2124	Д16АВТВ
					2B16	2319	
				A2N01	2A80		АК4
				A2018	2A90	2218	АК2
	AlCuSiMn		2014	A2014	2A14	2014	АК8
	AlZnMgCu1.5		7075	A7075	7A09	7175	В95Р
Aluminum alloy casting	G-AlSi7Mg	LM25		AC4C	ZAlSi7Mn	356.2	
	G-Al12	LM6	A-S12-Y4	AC3A	ZAlSi12	413.2	АЛ2
					ZAlSi5Cu1Mg	355.2	АЛ5
	G-Al12(Cu)			AC8A	ZAlSi2Cu2Mg1	413.0	
					ZAlCu5Mn		АЛ19
					ZAlCu5MnCdVA	201.0	
	G-AlMg10	LM10	AG11		ZAlMg10	520.2	АЛ8
	G-AlMg5Si				ZAlMg5Si		АЛ13

CVD Coated Carbide (Turning)

This table is Kyocera's own estimation based on publications and is not authorized by companies mentioned in it.

Classification		Kyocera	Dijet	MOLDINO (Mitsubishi Hitachi Tool)	Mitsubishi	NTK Cutting Tools	Sandvik	Seco	Sumitomo	Tungaloy	Kennametal	Iscar
	Symbol											
P (Steel)	P01	CA510	JC110V	HG8010 HG3305	MC6115 MC6015		GC4405 GC4305 GC4315	TP0501	AC8015P AC810P	T9205 T9105	KCP05B KCP05 KCPK05	IC8150 IC5005
	P10	CA115P CA510 CA515	JC110V JC215V	GM8015 HG8010	MC6115 MC6015 MY5015 MC6125	CP7	GC4405 GC4415 GC4305 GC4315 GC4325	TP0501 TP1501	AC8015P AC8020P AC810P	T9205 T9105 T9215 T9115	KCP05B KCP05 KCPK05 KCP10B KCP10	IC8150 IC8250 IC5005
	P20	CA125P CA025P CA525 CR9025	JC110V JC215V	GM8020 HG8025	MC6115 MC6015 MY5015 MC6125 MC6025 UE6020	CP7	GC4415 GC4315 GC4425 GC4325 GC4335	TP1501 TP2501 TP3501 TP25 TP40	AC8020P AC8025P AC820P	T9215 T9115 T9225 T9125	KCP10B KCP10 KCP25B KCP25	IC8150 IC8250 IC8350
	P30	CA125P CA025P CA525 CA530 CR9025	JC215V JC325V JC450V	GM25 GM8035 HG8025	MC6125 MC6025 UE6020 MC6035 UH6400	CP7	GC4425 GC4325 GC4335	TP2501 TP3501 TP25 TP40	AC8035P AC830P AC6030M AC630M	T9225 T9125 T9235 T9135	KCP25B KCP25 KCP30B KCP30	IC8250 IC8350
	P40	CA530	JC325V JC450V	GX30	MC6035 UH6400		GC4335 GC4325	TP3501 TP40	AC8035P AC830P AC6030M AC630M	T9235 T9135 T6215	KCP30B KCP30 KCP40B KCP40	IC8350
M (Stainless steel)	M10	CA6515	JC605X JC110V	HG8025	MC7015 US7020		GC2015 GC1515	TM1501	AC6020M	T6215 T6120	KCM15B KCM15	IC6015 IC8150
	M20	CA6515 CA6525	JC605X JC110V	HG8025 GM8020	MC7015 US7020 MC7025		GC1515 GC2015 GC2025 GC2220	TM1501 TM2501	AC6020M AC6030M AC630M	T6215 T6120 T6130	KCM15B KCM15 KCM25B KCM25	IC6015 IC6025 IC8150 IC8250
	M30	CA6525	JC110V JC525X	HG8025 GM25 GM8035	MC7025 US7020 US735		GC2025 GC2220 GC235	TM1501 TM2501 TM3501	AC6030M AC630M AC8035P AC830P	T6215 T6130	KCM25B KCM25 KCM35B KCM35	IC6025 IC8350
	M40		JC525X	GX30 GM8035	MC7025 US735		GC235	TP40 TM2501 TM3501	AC6030M AC630M		KCM35B KCM35	
K (Cast iron)	K01	CA310 CA4505	JC050W JC105V JC605W	HX3505 HX3515	MC5105 MC5005		GC3210 GC3005 GC4305	TK0501	AC4010K	T5105 T505	KCK05B KCK05	IC5005 IC428
	K10	CA310 CA315 CA4505 CA4515	JC050W JC105V JC110V JC108W	HX3305 HX3515 HG8010 HG8025 GM8020	MC5105 MC5115 MC5005 MC5015 MY5015 MH515	CP1	GC3210 GC3005 GC4305 GC4315	TK0501 TK1501	AC4010K AC4015K	T5105 T5115 T505 T515	KCK05B KCK05 KCK15B KCK15	IC5005 IC5010 IC418 IC428 IC8150
	K20	CA315 CA320 CA4515	JC110V JC108W JC215V	HX3515 HG8010 GM8020 HG8025	MC5115 MC5125 MC5015 MY5015 MH515	CP1	GC3210 GC3225 GC4315 GC4325	TK0501 TK1501	AC4015K AC420K AC425K AC8025P	T5115 T5125 T515	KCK15B KCK15 KCK20B KCK20	IC5005 IC5010 IC418 IC428 IC8150
	K30	CA320	JC108W JC215V	GM8020 HG8025	MC5125		GC3225 GC4325	TK1501		T5125	KCP25B KCK20	

PVD Coated Carbide (Turning)

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Classification		Kyocera	Dijet	MOLDINO (Mitsubishi Hitachi Tool)	Mitsubishi	NTK Cutting Tools	Sandvik	Seco	Sumitomo	Tungaloy	Kennametal	Iscar
	Symbol											
P (Steel)	P01	PR1705										
	P10	PR1705 PR1215 PR1725 PR2015		IP2000	MS6015 VP10MF VP10RT	VM1 DT4 DM4		TS2000 CP200	AC1030U ACZ150 AC5005S AC5015S AC5025S AC520U	AH8005	KCS10 KCU10 KC5010	IC807 IC907 IC1007
	P20	PR1215 PR1225 PR1625 PR1725 PR2015 PR2025		IP2000	MS6015 VP10MF VP10RT VP15TF	VM1 QM3 DT4 TM4 DM4	GC1125 GC15	TS2000 TS2500 CP200	AC1030U AC5025S AC520U AC530U	AH8015 AH6225 AH120 AH725 SH725	KCS10 KCU10 KC5010 KCU25 KC5025	IC807 IC808 IC907 IC908 IC1007
	P30	PR1225 PR1535 PR2025		IP2000 IP3000	MS6015 MS7025 VP15TF VP20MF VP20RT	QM3 TM4	GC1125	TS2500 CP500 CP600	AC1030U AC530U	AH8015 AH6225 AH7025 SH730 J740	KCU25 KC5025	IC808 IC908 IC830 IC1008 IC228 IC528
	P40	PR1535 PR2025		IP3000	VP15TF VP20MF VP20RT	QM3 TM4		CP500 CP600	AC1030U	AH6225		IC830 IC228 IC528 IC3028
M (Stainless steel)	M10	PR1215 PR1225 PR2025 PR120S	JC5003 JC8015	IP050S IP100S	VP10MF VP10RT	VM1 DT4 DM4	GC1115 GC1125 GC15	TS2000 TS2050 TS2500 CP200	AC5005S AC5015S AC510U AC520U ACZ150	AH8005 AH6225	KCS10 KCU10 KC5010	IC806 IC807 IC907 IC1007
	M20	PR1215 PR1725 PR1225 PR1515 PR2025 PR120S	JC5003 JC8015 JC5015 JC5118	IP100S	MS7025 MS9025 VP10MF VP10RT VP15TF	VM1 QM3 DT4 TM4 DM4 ZM3 ST4	GC1115 GC1125 GC15	TS2000 TS2500 CP200 CP500	AC5015S AC5025S AC1030U AC520U	AH8015 AH6225 AH7025 AH120 AH725	KCS10 KCU10 KC5010 KCU25 KC5025	IC808 IC908 IC1008
	M30	PR1125 PR1535 PR2025	JC5015 JC5118	IP100S	MS7025 MS9025 VP15TF VP20MF VP20RT	QM3 DT4 TM4 DM4 ZM3 ST4	GC2035 GC1125	TS2500 CP500 CP600	AC5025S AC6040M AC1030U AC520U AC530U	AH6235 SH725 SH730 J740	KCU25 KC5025	IC908 IC830 IC1008
	M40	PR1535	JC5118		MP7035 VP15TF VP20MF VP20RT	QM3 TM4 ST4	GC2035	CP500 CP600	AC6040M AC1030U AC530U	AH6235		IC830 IC3028
K (Cast iron)	K01	PR2015								AH110	KCS10 KCU10 KC5010	
	K10	PR1215 PR2015			VP10RT		GC15	TS2000 CP200	AC1030U AC510U ACZ150 AC5015S	AH110 GH110	KCS10 KCU10 KC5010	
	K20	PR1215 PR2015			VP10RT VP15TF VP20RT			TS2000 TS2500 CP200	AC1030U AC510U ACZ150 AC5015S AC5025S	AH8015 AH6225 AH7025 AH120	KCS10 KCU10 KC5010 KCU25 KC5025	IC807 IC907 IC908 IC1007 IC1008
	K30	PR2015			VP15TF VP20RT			TS2000 TS2500 CP200 CP500	AC1030U AC530U	AH120 GH130	KCU25 KC5025	IC807 IC907 IC908 IC1007 IC1008
S (Difficult-to-cut material)	S01	PR005S PR115S	JC5003		MV9005 MP9005 VP05RT			TH1000		AH8005		IC804
	S10	PR005S PR015S PR115S PR120S	JC8015 JC5015 JC5118	HS9105 JP9105	MP9005 MP9015 VP10RT		GC1105	TH1000 TS2000 TS2050 CP200	AC5005S AC5015S AC510U ACZ150	AH8005 AH8015 AH6225	KCS10 KCU10 KC5010	IC806 IC807 IC907 IC1007
	S20	PR015S PR115S PR120S PR1535	JC5015 JC5118	HS9115 JP9115	MP9015 MP9025 MS9025 VP15TF		GC1105 GC1115 GC1125 GC15	TS2000 TS2050 TS2500 CP200	AC5015S AC5025S AC1030U AC520U	AH8015 AH7025 AH6225	KCS10 KCU10 KCU25	IC907 IC908 IC1007 IC1008
	S30	PR1535			MP9025 MS9025 VP20RT		GC1125			AH7025 AH6235	KCU25 KC5025	IC908 IC1008

Cermet (Turning)

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Classification		Kyocera	Dijet	MOLDINO (Mitsubishi Hitachi Tool)	Mitsubishi	NTK Cutting Tools	Sandvik	Seco	Sumitomo	Tungaloy	Kennametal	Iscar
	Symbol											
P (Steel)	P01	TN610 **PV710**	LN10		**AP25N** **VP25N**	T15 **Q15**	CT5015 CT525		T1000A **T1500Z**	NS520	**KT315** **KTP10**	IC20N **IC520N**
	P10	TN610 TN620 TN60 **PV710** **PV720** **PV7040** **CCX**	LN10 NIT		NX2525 **AP25N** **VP25N**	T15 **Q15** **Z15**	CT5015 CT525 **GC1525**	TP1020 TP1030	T1000A T1500A **T1500Z**	**AT9530** **GT9530** **J9530**	**KT315** **KTP10**	IC20N IC30N **IC520N** **IC530N**
	P20	TN620 TN90 **PV720** **PV730**	NIT CX75 **PX90**	**CZ25**	NX2525 NX3035 **MP3025** **AP25N** **VP45N**	C7X N40 **C7Z**	CT5015 **GC1525**	TP1020 TP1030	T1500A T2500A **T1500Z** **T2500Z**	NS9530 **AT9530** **GT9530** **J9530**		IC20N IC30N **IC520N** **IC530N**
	P30	**PV730**	CX75 **PX90**	**CZ25**	NX3035 **MP3025** **VP45N**	C7x N40 **C7Z**	**GC1525**		T2500A **T2500Z**	NS9530		IC30N **IC530N**
M (Stainless steel)	M10	TN610 TN620 **PV710** **PV720**	LN10 NIT CX75		**AP25N** **VP25N**	T15 **Z15** **Q15**	CT525 **GC1525**		T1000A	NS520	**KT315** **KTP10**	IC20N **IC520N**
	M20	TN620 TN90 **PV720** **PV730**	LN10 NIT CX75 **PX90**		NX2525 **AP25N** **VP25N**	**Q15**	**GC1525**	TP1030	T1000A T1500A	NS9530 **AT9530** **GT9530** **J9530**		IC20N IC30N **IC520N** **IC530N**
	M30	**PV730**	**PX90**	**CZ25**					T1500A	NS9530		IC30N **IC530N**
K (Cast iron)	K01	**PV7005** **CCX**	LN10 NIT		**AP25N** **VP25N**	T15 **Q15**	CT5015			NS520	**KT315** **KTP10**	
	K10	TN60 **CCX** **PV7005** **PV7040**	LN10 NIT	**CZ25**	NX2525 **AP25N** **VP25N**	T15 **Q15** **Z15**	CT5015		T1000A	NS9530 **AT9530** **GT9530** **J9530**	**KT315** **KTP10**	
	K20		NIT	**CZ25**	NX2525 **AP25N** **VP25N**					NS9530		

Boldface grade shows PVD Coated Cermet. (CCX is CVD Coated Cermet grade)

Carbide

Classification		Kyocera	Dijet	MOLDINO (Mitsubishi Hitachi Tool)	Mitsubishi	NTK Cutting Tools	Sandvik	Seco	Sumitomo	Tungaloy	Kennametal	Iscar
	Symbol											
K (Cast iron)	K01	KW10	KG03	WH01 WH05	HTi05T				H2 H1	TH03	K313 K68 GH1 K115M	
	K10	KW10 GW15	KG10 KT9 CR1	WH10	HTi05T HTi10		H13A	HX 890	H1 EH510	TH10	K313 K68 K110M	IC20
	K20	GW15 GW25	KT9 CR1 KG20	WH20	HTi10 UTi20T		H13A	HX 890 883	G10E H10E EH520	KS15F KS20	K313 K68 GH2	IC20
	K30		KG30		UTi20T		H13A	HX 883	G10E H10E			
N (Non-ferrous metals)	N01	GW05			HTi10 MT2010		H10	H15		KS05F	GH1 K115M	
	N10	KW10 GW15 GW25	KT9 CR1	WH10	HTi10 MT2010	KM1	H10 H13A	KX HX 890 H15 H25		TH10	K313 K68 K110M	IC4 IC20 IC28
	N20	GW15 GW25	KT9 CR1		HTi10 MT2010 TF15		H10 H13A	KX HX 890 883 H15 H25		KS15F	K313 K68 GH2	IC20 IC28
	N30				TF15			KX HX 883 H25				IC28
S (Difficult-to-Cut Material)	S01	SW05			MT9005 RT9005		H10A					
	S10	KW10 SW10 GW15 GW25	KG10	WH10	MT9005 RT9005 MT9015 RT9010		H10A H10F H13A	HX 890 883	EH510 EH520	KS05F TH10	K313 K68 K110M	IC20
	S20	SW10 SW25 GW25	KG20		MT9015 RT9010 TF15 RT9020	KM1	H10A H10F H13A	HX 890 883 H25	EH510 EH520	KS15F TH10	K313 K68 GH2	IC20 IC28
	S30	SW25			TF15 RT9020		H10F H13A	HX 883				

Coated carbide (Milling / Drill)

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Classification		Kyocera	Dijet	MOLDINO (Mitsubishi Hitachi Tool)	Mitsubishi	NTK Cutting Tools	Sandvik	Seco	Sumitomo	Tungaloy	Kennametal	Iscar
	Symbol											
P (Steel)	P10	PR1825 PR1525	DH108 DH110 DH111 DH115	PCA12M PN15M PN208 JP4105	**MV1020**		GC1010	F40M MK2050 **MP1501** **MP2501**	ACP200 **ACP2000** **ACP100**	AH120 AH725	KC505M KC510M KC515M	IC608 IC902 **IC5400**
	P20	PR1825 PR1835 PR1525 **CA520D**	DH111 DH115 JC8015 JC8118	CY150 CY9020 JP4120	MP6120 VP15TF **MC7020** **FH7020** **F7030**	TM1 DT4 DM4	GC1130 **GC4220** **GC4330** **GC3040**	F40M MP3000 **MP1501** **MP2501** **MP3501**	ACP3000 ACU2500 ACP200 **XCU2500** **ACP2000**	AH3135 AH9030 AH3225 **T3225**	KC522M KC525M	IC808 IC810 IC900 IC908 IC910 **IC5500**
	P30	PR1825 PR1835 PR1525 PR1535	JC8118 JC8050 JC7550 JC7560	HC844 CY25 CY250 JS4045 **GF30**	MP6130 VP15TF VP20RT UP20M **F7030**	ZM3	GC1130 GC2030 **GC4330** **GC3040**	F40M F25M MP3000 **MP2501** **MP3501**	ACP3000 ACU2500 ACP300 **XCU2500**	AH3225 AH6030 AH130 **T3130** **T3225**	KC530M KC725M KC735M KCPM40 **KCPK30**	IC300 IC830 IC845 IC908 IC910
	P40	PR1835 PR1535	JC5240 JC8050 JC7550 JC7560	PTH30E PTH40H JS4060 GX2140 **GX2160**	VP30RT		**GC2040** **GC4340**	F40M MP2050 **MP2501** **MP3501**	ACP3000 ACU2500 ACP300	AH140	KC725M KC735M KCPM40 **KCPK30**	IC328 IC330 IC830 IC928 IC4050
M (Stainless steel)	M10	PR1835 PR1535 **CA6535**	DH108 DH111 DS108 JC8015	PN15M PN215	**MC7020**		GC1010 GC1130	F40M F25M	ACM100 ACK300 **XCS2000** **ACM200**	AH725	KC515M	IC608 IC902 **IC5400**
	M20	PR1835 PR1525 PR1535 **CA6535**	DH108 DH111 DS108 JC8015 JC8118	JP4120	VP15TF **MC7020** **F7030**	DT4 DM4	GC2030 S30T GC1130	F40M MS2050	ACS2500 ACU2500 ACP300 **XCU2500** **ACM200**	AH3135 AH3225 AH6030 AH725 **T3225**	KC522M KC525M	IC300 IC808 IC900 IC908 **IC5820**
	M30	PR1835 PR1525 PR1535 **CA6535**	JC8118 JC8050 JC7550 JC7560	HC844 CY250 JS4045 PTH30E	MP7130 MP7030 VP20RT UP20M	ZM3	GC1040 S30T **GC2040** **GC4230** **GC4240**	F40M MS2050 **T25M** **MM4500**	ACM300 ACS2500 ACS3000 **XCU2500** **ACM200**	AH3135 AH130 **T3225** **T3130**	KC530M KC725M KC735M KCPM40 KCSM30	IC330 IC830 IC882 IC928 **IC5820**
	M40	PR1835 PR1525 PR1535 **CA6535**	JC8050 JC7550 JC7560	PTH40H JM4160 AX2040 **GX2160**	MP7140 VP30RT		GC1040 **S40T** **GC2040** **GC4240**	F40M MP2050 **MM4500**	ACM300 ACS3000	AH140	KC725M KCPM40 KCSM40	IC328 IC882
K (Cast iron)	K01	PR1810 PR1510 **CA415D**	DH102 DH103	ATH80D ATH08M TH308	MP8010 **MV1020** **MC5020**		GC1010	MK2050 MH1000 **MK1500**	ACK3000	AH110		IC902
	K10	PR1810 PR1510 **CA415D** **CA420M**	DH108 DH110 DH111 JC8015	ATH10E TH315 CY100H	MP8010 **MV1020** **MC5020**		GC1020 **GC3220** **K15W**	MK2050 MH1000 **MK1500**	ACK3000 **XCK2000** **ACK2000** **ACK200**	AH110 AH120 **T1215** **T1115**	KC514M KCK15 KCK20	IC608 IC903 **IC5100**
	K20	PR1810 PR1510 **CA415D** **CA420M**	DH115 JC8015 JC8118	CY9020 CY150 PTH13S JP4120 **GX2120**	VP15TF **MV1020** **MC5020** **MC520**		**GC3330** **GC3040** **K15W** **K20W** **K20D**	MK2050 **MK1500** **MP3501**	ACK3000 ACU2500 **XCK2000** **XCU2500** **ACK2000**	AH120 AH9030 **T1215**	KC520M KC524M KCK20	IC808 IC810 IC908 IC910 **DT7150**
	K30	PR1810 PR1510	JC8118 JC5240	CY250 JS4045 GX2040 **GX2160**	VP20RT **MC5020**		GC3330 GC3040 K20W	MK2050 F40M **MK1500** **MP3501**	ACK3000 ACU2500 ACK300	AH120	KC522M KC524M **KCPK30**	IC808 IC810 IC908 IC910
S (Difficult-to-Cut Material)	S10	PR1535 **CA6535**	DS108 DS118 JC8015 JC8118	JP4120 JS1025	MP9120 VP15TF		GC1010 GC1130	F40M MS2050 **MS2500**	ACM100 ACU2500 ACK300 ACP300	AH120 AH725	KC510M	IC380 IC902 IC908 IC928
	S20	PR1535 **CA6535**	DS150 JC8050 JC8118	PTH30H	MP9120 MP9130 VP15TF		S30T GC2030 GC1130	F40M MS2050 **MS2500**	ACS2500 ACU2500 ACP300	AH725 AH130 AH6030	KC522M KC525M KCSM30	IC840 IC882 IC900 **IC5280**
	S30	PR1535	JC7550 JC7560	JM4160	MP9140		GC1040 **S40T** **GC2040**	MS2050	ACM300 ACS2500 ACS3000	AH130	KC522M KC725M KCSM40	IC328 IC330 IC830 IC928

Cermet (Milling)

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Classification		Kyocera	Dijet	MOLDINO (Mitsubishi Hitachi Tool)	Mitsubishi	NTK Cutting Tools	Sandvik	Seco	Sumitomo	Tungaloy	Kennametal	Iscar
	Symbol											
P (Steel)	P10	TN620M TN100M **PV60M**	CX75	CH550 **MZ1000**	NX2525 **VP25N**		CT530			NS740	KTPK20	IC30N
	P20	TN620M TN100M **PV60M**	CX75 CX90	CH7000	NX2525 MX3020 **VP25N**		CT530			NS740	KTPK20	IC30N
	P30	TN620M TN100M	CX90		MX3030 NX4545				T2500A T250A T4500A			IC30N
M (Stainless steel)	M10	TN100M	CX75		NX2525 **VP25N**		CT530			NS740		IC30N
	M20	TN100M	CX75	CH550	NX2525 MX3020 **VP25N**		CT530			NS740	KTPK20	IC30N
	M30				MX3030 NX4545							
K (Cast Iron)	K01		CX75									
	K10		CX75		NX2525 **VP25N**					NS740	KTPK20	
	K20		CX75		NX2525 MX3020 MX3030 **VP25N**						KTPK20	

Boldface grade shows PVD Coated Cermet.

Ceramic

Classification		Kyocera	Dijet	Nippon Tungsten	Mitsubishi	NTK Cutting Tools	Sandvik	Seco	Sumitomo	Tungaloy	Kennametal	Iscar
	Symbol											
K (Cast Iron)	K01	KA30 A65 KS6015 **A66N** **PT600M** **CS7050**		NPC-H2 NPC-A2		HC1 HC2 HC6 HW2 WA1 WA5	CC6190 CC620 CC650		NB90S	TZ120 LX21	KYK10	IN110 IN22 IN23 IS6 IS8 **IS80**
	K10	A65 KS6015 KS6050 **A66N** **PT600M** **CS7050**		NX **NXA** Whiskal WIN		HC1 HC2 HC6 HW2 WA1 WA5 SX6 **SP9**	CC6190			FX105 CX710	KYK10 KY3500 **KYK25**	IN110 IN22 IN23 IS6 IS8 **IS420** **IS80**
	K20	KS6050				SX6 SX9				FX105 CX710	KY3500	IS8 **IS80**
S (Difficult-to-cut material)	S01	KS6030				JX1 JX3 **JP2 120**	CC6060 CC6160 CC6065 CC670	CS100	WX120	WG300 FX510 TS300		IN110 IS25
	S10	KS6030 KS6040	CA200	Whiskal WIN		JX1 JX3 WA1 WA5 SX3 SX7 **JP2 120**	CC6060 CC6160 CC6065 CC670	CS100 CS300 CW100	WX120		KYS30 KYSP30 **KYS25**	IS25 IS35 IS9 IW7
	S20	KS6040				JX1 JX3 SX9 **JP2 120**			WX120		KYSP30	IS9 IW7
H (Hard materials)	H01	A65 **A66N** **PT600M**		NPC-A2		HC2 HC7 **450 ZC7**	CC6050 CC650		**NB100C**	LX10 **LX11**		
	H10	A65 **A66N** **PT600M**		NPC-A2 Whiskal WIN		**450**	CC670		**NB100C**	WG300	KY1615	IN22 IN23 IW7 **IN420**

Boldface grade shows PVD Coated Ceramic.

CBN

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Classification		Kyocera	Dijet	MOLDINO (Mitsubishi Hitachi Tool)	Mitsubishi	NTK Cutting Tools	Sandvik	Seco	Sumitomo	Tungaloy	Kennametal	Iscar
	Symbol											
K (Cast iron)	K01	KBN475 **KBN60M** **KBN900**	JBN795 JBN330 JBN500		MB710 **BC5110**	B23 B30 B52	CB7925 CB50 **CB7525**	CBN300	BN7125 BN500 NCB100 **BNC500**	BX910 BX930 BX870	KB1630 **KB5630**	IB50
	K10	**KBN60M** **KBN900**	JBN795 JBN300 JBN330 JBN500 JBN245	BH200	MB730 MB4120	B23 B30 B52	CB7925 CB50 **CB7525**	CBN200 CBN300 CBN600 **CK2065** **CH3515** **CBN160C** **CBN300P** **CBN400C**	BN7125 BN500 **BNC500**	BX470 BX480	KB1630 KB1340 **KB5630**	IB50 IB55 IB90
	K20	**KBN900**	JBN245	BH250	MB730 MB4120 MBS140	B16	CB50	CBN200 CBN300 CBN500 CBN600 **CK2065** **CH3515** **CBN160C** **CBN300P** **CBN400C**	BN7125 BNS8125 **BNC8115**	BX90S **BXC90**	KB1630 KB1340 KB1345 **KB5630** **KBK45**	
H (Hard materials)	H01	KBN510 **KBN010** **KBN05M** **KBN10M**	JBN245 JBN795 JBN500		**BC8105**	B52 **B5K**	CB20 CB50 **CB7105**	CBN010 **CH0550**	BN1000 BN2000 BNX10 **BNC2105** **BNC2010** **BNC2115**	BX310 **BXM10**	KBH10	IB50 IB10H **IB10HC**
	H10	KBN510 KBN525 **KBN010** **KBN020** **KBN05M** **KBN10M** **KBN25M** **KBN900**	JBN795 JBN500	BH200	MB8110 MB8120 **BC8110** **BC8120** **BC8210** **BC8220**	B36 **B6K**	CB50 **CB7105** **CB7015**	CBN010 CBN150 **CH0550** **CH1050** **CBN060K**	BN2000 **BNC2010** **BNC2020** **BNC2115** **BNC2125** **BNC160** **BNC200**	BX330 BX530 **BXA10** **BXM10**	KBH10 **KB5610**	IB50 IB55 IB10H **IB10HC**
	H20	**KBN020** **KBN25M** **KBN35M** **KBN900**		BH250	MB8120 **BC8120** **BC8220**	B36 B40	CB7025 **CB7125** **CB7525**	CBN150 **CH1050** **CBN060K** **CH2540** **CH2581** **CH3515**	BN2000 BNX20 **BNC2020** **BNC2125** **BNC200**	BX360 BX850 **BXA20** **BXM20**	KBH10 KBH20 **KB5625**	IB55 IB20H **IB25HA** **IB25HC**
	H30	**KBN020** **KBN35M** **KBN900**		BH250	MB8130 **BC8220** **BC8130**	B40 B22	CB7135 **CB7525**	**CH2540** **CH2581** **CH3515**	BN350 **BNC300**	BX380 **BXC50** **BR35F**	KBH20 KB1630 **KB5625** **KB5630**	IB55 IB20H **IB25HA** **IB25HC**
Sintered steel	-	KBN570 **KBN70M**	JBN795 JBN330		MB4120	B23 B30	CB7135 **CB7125**	CBN200	BN7115 BN7125	BX470 BX480	**KB5630**	IB05S IB10S IB90

Boldface grade shows PVD Coated CBN.

PCD

Classification		Kyocera	Dijet	MOLDINO (Mitsubishi Hitachi Tool)	Mitsubishi	NTK Cutting Tools	Sandvik	Seco	Sumitomo	Tungaloy	Kennametal	Iscar
	Symbol											
N (Non-ferrous metals)	N01	KPD001 KPD230 KPD250	JDA30 JDA735			UC1 PD1 PD2	CD05 CD10	PCD05	DA90 DA150 DA1000	DX160 DX180	KD1400 KD1405	ID5
	N10	KPD001 KPD010 KPD230 KPD250	JDA735 JDA10		MD220	PD1 PD2	CD05 CD10	PCD05 PCD20 PCD30	DA150 DA1000	DX140 DX160	KD1400 KD1405 KD1410 KD1415 KD1425	ID5
	N20	KPD001 KPD010 KPD230 KPD250	JDA10 JDA715		MD220 MD2030	PD1 PD2		PCD05 PCD20 PCD30 PCD30M	DA1000 DA2200	DX110 DX120	KD1400 KD1425	

Molded chipbreaker cross reference table

Negative inserts

This table is Kyocera's own estimation based on publications and is not authorized by companies mentioned in it.

Cutting range		Kyocera		Dijet	MOLDINO (Mitsubishi Hitachi Tool)	Mitsubishi	NTK Cutting Tools	Sandvik	Seco	Sumitomo	Tungaloy	Kennametal	Iscar
		General chip-breaker	Chipbreaker for sticky material /Soft steel										
Carbon steel / Alloy steel	Finishing (with wiper edge)	WF WP	-	-	-	SW	-	WL WF	W-FF2 W-MF2	SEW LUW	AFW FW	FW	WF
	Finishing - Medium (with wiper edge)	WE WQ	-	-	-	MW	-	WM WMX	W-M3 W-M5	GUW	ASW SW	MW	WG
	Finishing	DP GP PP	XF XP	F1 FA FT PF	BE BH FE	F FH FS FY PK FP	UL WM ZF1	XF QF	FF1	FP FB FE SP FA FL LU	TF 01 AS TSF	FF UF FS LF	F3P SF PF
	Finishing - Medium	HQ PQ CQ CJ VC VF	XQ	UA UT	AB B CE CT	SH C SA LP SY	WV WR	LC PF	FF2 MF2	SU EX SJ SX UJ SE	TS NS CB 11 17 27 ZF	K RP FN FM	NF SM
	Medium - Roughing	PMG PG GS PS	XS	UR UB	AE DE AH	MV MP MA MH	Z5 ZW1	XM QM SM SMC PM PMC	M3 MF3	UA UG GE GU	AM DM NM TM ZM	MN	M3P TF PP
	Medium - Roughing High feed rate	PT GT	-	GC PQ	AR AY	GH RP Standard	GS	MR XMR	M5 MR5 MR6	MU UX ME	TH 32Y 32 37	RP RN	R3P NR
	Roughing	Standard PH	-	GG LG GQ	RE	MT Standard	G	Standard 23 HM	MR7	MC MU MX UZ	31 33 F-K THS	PR MG	GN
	Roughing Single-sided High feed rate	PX	-	GS RM UC UP UD	H HX HE TE UE	HV HR HX HZ HL HM	-	QR PR HR	R4 R5 R6 R7 RR6 R57 RP	HG HP MP HF	TU TRS 57 65 TUS	RP RH RM RW	TNM NM
Stainless steel, Difficult-to-cut material	Finishing	MQ SQ	-	SF	BH MP	FS SH FJ LM LS	ZF1	MF	M1	SU EF	SF SS	FP	F3M VL F3S
	Medium - Roughing	MS MU TK SG SX	-	GP SZ	DE SE PV VI	MS MA GM MJ MM ES MH GH GJ RM RS	ZP WS	MM MMC MR XMR SM SMR SF SGF SMC MRR	MF1 MF3 A3 A5 M5 56 R8 RR9 MF4	EG EX MU UP EM	HMM SM SA S SH HRM HPF	P MP MS UP	TF PP M3M R3M
Cast iron	Medium	KQ KG C Standard	-	-	AH VA V	LK MK Standard	-	KF KM	-	UZ UX UJ	Standard 33 CF	FN	GN
	Roughing	KH GC ZS	-	-	-	GH RK	-	KR KRR	MR9	GZ	CM CH	RP UN	NR
Non-ferrous metals	Medium - Roughing	AH	-	-	-	-	-	AL	95	AG	P	GP MS	PP

Positive inserts

Cutting range		Kyocera		Dijet	MOLDINO (Mitsubishi Hitachi Tool)	Mitsubishi	NTK Cutting Tools	Sandvik	Seco	Sumitomo	Tungaloy	Kennametal	Iscar
		General chipbreaker	Chipbreaker for sticky material / Soft steel										
Carbon steel / Alloy steel	Minute ap	CF	-	-	-	-	-	-	-	-	01	-	-
	Finishing (with wiper edge)	WP	-	-	-	SW	-	WF WK WM	W-F1 W-F2	LUW SDW	SW	FW	WF
	Finishing	PF DP GP PP VF	XP	ASF	-	FV SQ FP SMG	AZ3 AMX AZ7 FG	PF UF XF	FF1	FB GU FC FK FP LU	PF PSF 23	11 GF UF FP	PF SM
	Finishing - Medium (1)	HQ	XQ	ACB FT	JE	MQ MV LP	AF1	PM UM SMC	F1 M3	LB SF SU SS	PS PSS 24	LF	14
	Finishing - Medium (2)	GK	-	BM	JQ	No Indication	QD CL	PF PMC XM	MF2 M5	US GU	-	-	F3P
	Medium	Standard	-	-	J	MP Standard	AM5 AM3 AZ8	PR UR KM XR	F2	MU SC	PM	GM MP MR	Standard
Stainless steel, Difficult-to-cut material	Finishing - Medium	MQ	-	-	MP	FM FV SV LM LS MS	-	MF MMC SM MR MM	-	LU	PSS JS PF PSF PS PM	FW FP MW	PF WF F2M
Non-ferrous metals	Finishing - Medium	AP AH	-	ALU	-	AZ	-	AL	AL	AG AW	AL	HP	AF AS

Positive inserts (for automatic lathe)

Cutting range		Kyocera	Dijet	MOLDINO (Mitsubishi Hitachi Tool)	Mitsubishi	NTK Cutting Tools	Sandvik	Seco	Sumitomo	Tungaloy	Kennametal	Iscar
Carbon steel / Alloy steel	Minute ap	CF	-	-	-	-	-	-	-	01	-	-
	Finishing	PF CK GF SKS	ASF	JQ	FP FV SMG LS-P	AZ7 AMX ZR	PF XF	FF1	SI FC	PF	11 UF FP	PF SM
	Finishing - Medium	GQ SK	ACB FT	JE	LP AM MV	AM3 YL	PM XM	F1 MF2	SU	PS	LF	14
	Medium	GK	-	J	MP Standard	QD CL	PR	F2	SC	PM	MF MP	Standard
Stainless steel	Finishing	MQ	-	MP	FM FV SV LM	-	MF	-	LU	JS PF PSF	FW FP MW	WF
Non-ferrous metals	Finishing - Medium	AP AH	ALU AWI	-	AZ	-	AL	AL	AG AW	AL	HP	AF AS

Milling insert description cross reference table

This table is Kyocera's own estimation based on publications and is not authorized by companies mentioned in it.

Kyocera	Class	Applications	MOLDINO (Mitsubishi Hitachi Tool)	Mitsubishi	Sandvik	Sumitomo	Tungaloy	Iscar
SDMR1203AUER-H SDKR1203AUEN-S	M K	Steel	SDKR42TN	(SDNR1203AEEN-JS)		SDMR1203AEEN SDMR1203AETN	SDMR1203AETN-MJ SDKR1203AESR-MJ SDKR1203AETN-MJ SDKR1203AEPN-MS SDKR42ZSR-MJ SDKR42ZPN-MS	SDKR1203AUTR-HS SDKR1203AUN-76
SDKN1203AUTN	K		SDK42TN-C9	SDKN1203AEN SDKN1203AETN (SDNN1203AETN1)		SDKN42MT (SDNN1203AETN)	SDKN1203AETN-12 SDKN42ZTN	SDKN1203AETN
SDKN1203AUFN	K	Cast Iron	SDK42FN-C9			SDKN42M (SDNN1203AEEN)	SDKN1203AEFN-12 SDKN42ZFN	
		Non-ferrous metals				SDKN42M	(SDCN1203AEFN-D) (SDCN42ZFN-DIA)	
SDKN1504AUTN	K	Steel	SDK53TN-C9	SDKN1504AEN SDKN1504AETN		SDKN53MT	SDKN1504AETN SDKN53ZTN	SDKN1504AETN
SEMR1203AFER-H SEKR1203AFEN-S	M K	Steel	SEKR42TN	(SEER1203AFEN-JS)	SEKR1203AZ-WM (SEER1203AZ-WL)	SEMR1203AFEN (SEER1203AFEN)	SEMR1203AFTN-MJ SEKR1203AFSR-MJ SEKR1203AFTN-MJ SEKR1203AFPN-MS	SEKR1203AFTR-HS SEKR1203AFR-HS SEKR1203AFN-76 SEKR1203AF-N-42
SEEN1203AFTN	E		SEE42TN-C9	SEEN1203AFTN1		SEEN42MT	SEEN1203AFTNCR-14	
SEKN1203AFTN	K		SEK42TN-C9	SEKN1203AFTN1 (SENN1203AFTN1)	SEKN1203AZ (SEMN1203AZ)	SEKN42MT (SENN1203AFTN)	SEKN1203AFTN SEKN1203AFTN-16 SEKN42AFTN SEKN42AFTN16	
SEKN1203AFFN	K	Cast Iron	SEK42FN-C9	(SEEN1203AFFN1)	SEKN1203AZ (SEMN1203AZ)	SEKN42M (SENN1203AFEN)	SEKN1203AFFN SEKN42AFFN	
SEEN1203AFFN	E	Non-ferrous metals	SEE42FN-C9	(SECN1203AFFR1)				
SEKN1203EFTR	K	Steel	SEK42TR-G3	SEKN1203EFTR1	(SECN1203EER)		SEKN1203EFTR (SECN1203EFTR) (SEEN1203EFTR) (SECN42EFTRCR) (SEEN42EFTRCR)	
SEKN1504AFTN	K	Steel	SEK53TN-C9		SEKN1504AZ	SEKN53MT		SEKN1504AFTN
SPEN1203EESR	E	Cast iron	(SPK42FR-A3E)	SPEN42EFSR1 SPEN1203EESR1 SPEN1203EEER1 (SPNN1203EEER1)				
SPMR1203EDER-H SPKR1203EDER-S	M K	Steel		(SPER1203EDER-JS)	SPKN1203EDR-WH		SPKR1203EDSR-MJ SPKR42SSR-MJ	SPKR1203EDR-76 SPKR1203EDTR-HS
SPCN1203EDTR	C			(SPEN1203EDR)	(SPAN1203EDR)	SPCH42TR-R	SPCN1203EDTR SPCN42STR	
SPKN1203EDTR	K		SPK42TR-A3	SPKN1203EDR	SPKN1203EDR	(SPCH42TR) (SPCH42TR-R)	SPKN1203EDTR SPKN42STR (SPEN1203EDTR) (SPEN42STR)	SPKN1203EDTR SPKN1203EDTR-42
SPKN1203EDFR	K	Cast iron	SPK42FR-A3		SPKN1203EDR	(SPCH42R)	SPKN1203EDFR SPKN42SFR	SPKN1203EDFR
SPKN1504EDTR	K	Steel	SPK53TR-A3	SPKN1504EDR	SPKN1504EDR	(SPCH53TR-R)	SPKN1504EDTR SPKN53STR (SPCN1504EDTR) (SPCN53STR)	SPKN1504EDTR
SPKN1504EDFR	K	Cast iron	SPK53FR-A3			(SPCH53R-R) (SPCH53TR-R)	SPKN1504EDFR SPKN53SFR	SPKN1504EDFR

Note 1. Tolerance class is different for description in ( ).

2. Since edge shape of milling insert is slightly different by each maker, please adjust edges (Z-axis direction) during operation.

Milling insert description cross reference table

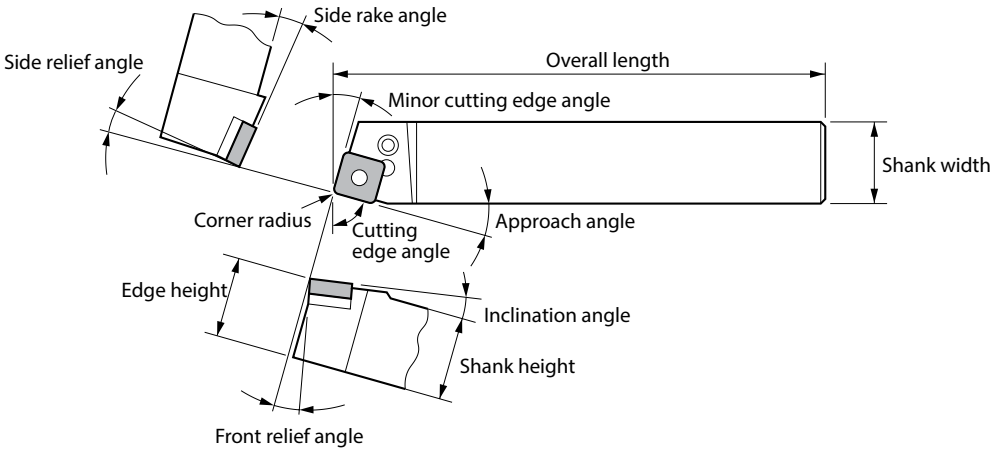
This table is Kyocera's own estimation based on publications and is not authorized by companies mentioned in it.

Kyocera	Class	Applications	MOLDINO (Mitsubishi Hitachi Tool)	Mitsubishi	Sandvik	Sumitomo	Tungaloy	Iscar
SPCN1203XPTR	C	Steel	SPC42TR-A5				SPCN1203ZPTR SPCN42ZTR	
SPKN1203XPTR	K		SPK42TR-A5				SPKN1203ZPTR SPKN42ZTR (SPEN1203ZPTR) (SPEN42ZTR)	
SPKN1203XPFR	K	Cast iron	SPK42FR-A5				SPKN1203ZPFR SPKN42ZFR	
SPKN1504XETR	K	Steel		SPK53C2SR				
TPMR1603PDER-H	M	Steel		(TPER1603PPER-JS)	(TPKN1603PPR-WH)			(TPKR1603PPTR-HS)
TPKN1603PDTR	K		TPK32TR-E0 TPK32TR-G0	TPKN1603PPR (TPEN1603PPR)	TPKN1603PPR	TPKN32TR		TPKN1603PPTR
TPKN1603PDFR	K	Cast iron	TPK32FR-E0		TPKN1603PPR	TPKN32R		TPKN1603PPFR
TPMR2204PDER-H TPKR2204PDER-S	M K	Steel		(TPER2204PDER-JS)	TPKN2204PDR-WH		TPMR2204PDSR-MJ TPKR2204PDSR-MJ TPKR43ZSR-MJ	TPKR2204PDTR-HS TPKR2204PD-R-76
TPKN2204PDTR	K		TPK43TR-E0 TPK43TR-G0	TPKN2204PDR (TPEN2204PDR)	TPKN2204PDR	(TPCH43TR)	TPKN2204PPTR TPKN43ZTR (TPCN2204PPTR) (TPCN43ZTR)	TPKN2204PDTR TPKN2204PDTR-42
TPKN2204PDFR	K	Cast iron	TPK43FR-E0			(TPCH43R)	TPKN2204PPFR TPKN43ZFR (TPCN2204PPFR) (TPCN43ZFR) (TPEN2204PPTR-16) (TPEN43ZTR)	TPKN2204PDFR
TEMR1603PTER-H	M	Steel		(TEER1603PEER-JS)			(TEKR1603PEPR-MS)	
TEKN1603PTTR	K		TEK32TR-G0 (TEE32TR-G0)	(TEEN1603PETR1)		TEKN32TR	(TECN1603PETR) (TEEN1603PETR) (TECN32ZTR) (TEEN32ZTR)	
TEKN1603PTFR	K	Cast iron	TEK32FR-G0 (TEE32FR-G0)	(TEEN1603PEFR1)		TEKN32R	(TEEN1603PEFR) (TEEN32ZFR)	
TEEN1603PTFR	E	Non-ferrous metals		(TECN1603PEFR1)		TEEN32R	(TECN1603PEFR-D) (TECN32ZFR-DIA)	
TEMR2204PTER-H TEKR2204PTER-S	M K	Steel		(TEER2204PEER-JS)			TEKR2204PEPR-MS	
TEEN2204PTTR	E		TEE43TR-G0E (TEK43TR-G0E)	TEEN2204PETR1		TEEN43TR	TEEN2204PETR (TECN2204PETR) TEEN43ZTR (TECN43ZTR)	
TEKN2204PTTR	K		TEK43TR-G0E	TEKN2204PETR1		TEKN43TR	(TEEN2204PETR) (TECN2204PETR) (TEEN43ZTR) (TECN43ZTR)	
TEKN2204PTFR	K	Cast iron	TEK43FR-G0E	(TEEN2204PEFR1)		TEKN43R	(TEEN2204PEFR) (TEEN43ZFR)	
		Non-ferrous metals		(TECN2204PEFR1)		(TEEN43R)	(TECN2204PEFR-D) (TECN43ZFR-DIA)	
SNCN1204XNTN	C	Steel	SNC43TN-D5	SNC43B2S		(CSN43MT)	SNCN1204ZNTN SNCN43ZTN	
SNKN1204XNTN	K		SNK43TN-D5	SNK43B2S		(CSN43MT)	SNKN1204ZNTN SNKN43ZTN	
SNMF1204XNTN	M	Steel	(SNKF43TN-D5)	(SNKF43B2S)		(CSNB43MT)	(SNKF1204ZNTN) (SNKF43ZFN)	

Note 1. Tolerance class is different for description in ( ).

2. Since edge shape of milling insert is slightly different by each maker, please adjust edges (Z-axis direction) during operation.

Terms and angles of turning toolholder



Function of tool angle

Tool angle	Name	Function	Effect
Rake angle	Side rake angle	· Affects cutting force, cutting heat, chip evacuation and tool life.	· If it is positive (+) angle, sharper cutting performance is obtained. (less cutting force, less edge strength) · Positive (+) angle is recommended for easy to machine workpieces or thin workpieces. · Smaller rake angle or negative (-) angle is recommended when a stronger edge is required like scale machining or interrupted machining.
	Inclination angle		
Relief angle	Front relief angle Side relief angle	· Prevents the tool's contact to the workpiece surface, except the cutting edge.	· When it is small, the cutting edge becomes strong, but the wear at relief faces may shorten the tool life.
Cutting edge angle	Cutting edge angle	· Affects chip control and the direction of cutting force.	· When it is large, chip thickness becomes thick and chip control improves.
	Approach angle	· Affects chip control and the direction of cutting force.	· When it is large, chip thickness becomes thin and chip control worsens, but cutting force is dispersed and edge strength improves. · When it is small, chip control ability improves.
	Minor cutting edge angle	· Prevents friction between cutting edge and workpiece surface.	· When it is large, edge strength deteriorates.

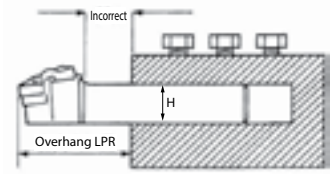
R

Technical information

Toolholder rigidity

1. Flexure of toolholder

$$\delta = \frac{4 \times F \times (LPR)^3}{E \times B \times (H^3)} = \frac{4 \times k \times ap \times f \times (LPR)^3}{E \times B \times (H^3)}$$



Symbol	Name	Unit
δ (Delta)	Deflection	mm
B	Shank width	mm
H	Shank height	mm
E	Young ratio	N/mm²
ap	Depth of cut	mm
f	Feed rate	mm/rev
k	Specific cutting force	N/mm²
LPR	Overhang	mm
F	Cutting force	N

(F = k x ap x f)

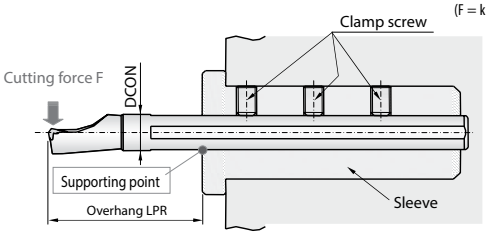
The flexural strength of toolholder will decrease by increasing of shank height by third root and will decrease of reducing overhang by third root. Minimizing toolholder shank overhang as much as possible is important as well as shank's sectional square measure.

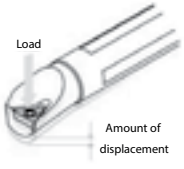
2. Flexure of boring bar

$$\delta = \frac{64 \times F \times (LPR)^3}{3 \times E \times \pi \times (DCON)^4} = \frac{64 \times k \times ap \times f \times (LPR)^3}{3 \times E \times \pi \times (DCON)^4}$$

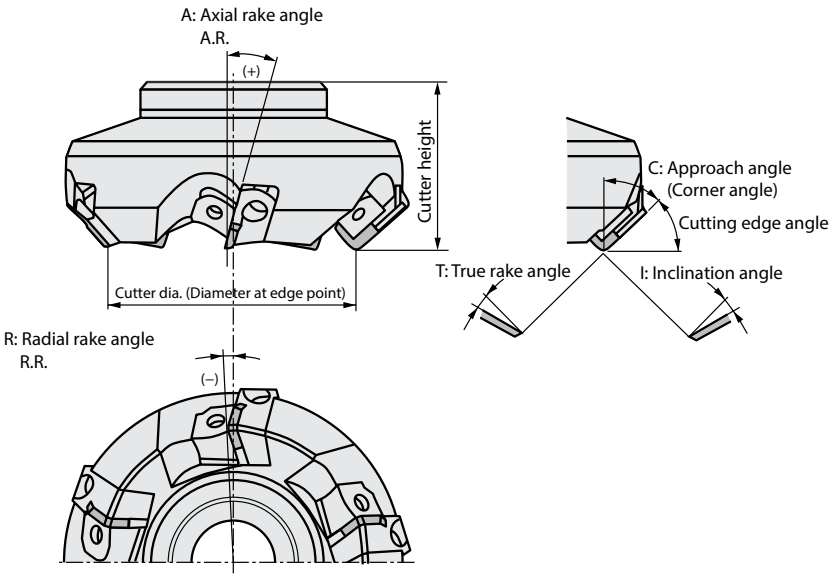
Symbol	Name	Unit
δ (Delta)	Deflection	mm
DCON	Shank dia.	mm
E	Young ratio	N/mm²
ap	Depth of cut	mm
f	Feed rate	mm/rev
k	Specific cutting force	N/mm²
LPR	Overhang	mm
F	Cutting force	N

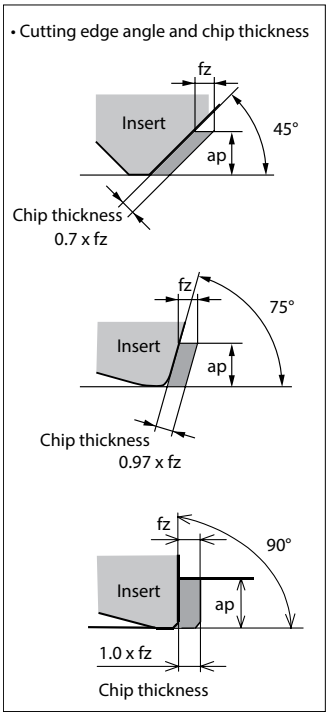
(F = k x ap x f)





Terms and angles of milling cutter





Function of tool angle

Symbol	Name	Function	Effect
A	Axial rake angle (A.R.)	Controls chip flow direction and cutting force	When it is positive ··· Good cutting performance and less chip welding
R	Radial rake angle (R.R.)	Controls chip flow direction and cutting force	When it is negative ··· Good chip evacuation
C	Approach angle	Controls chip thickness and chip flow direction	When it is large ··· Thinner chip thickness Lower cutting load
T	True rake angle	Actual rake angle	When it is positive ··· Good cutting performance and less chip welding, but lower edge strength When it is negative ··· Higher edge strength but easier to weld
I	Inclination angle	Controls chip flow direction	When it is positive ··· Good chip evacuation Less cutting force Lower edge stability of the corner part

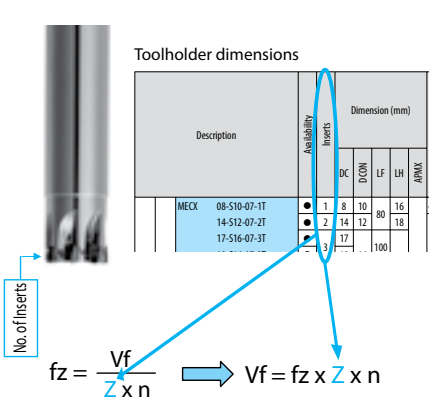
The formula for true rake angle: $\tan T = \tan R \times \cos C + \tan A \times \sin C$

The formula for inclination angle: $\tan I = \tan A \times \cos C - \tan R \times \sin C$

No. of Inserts (Z)

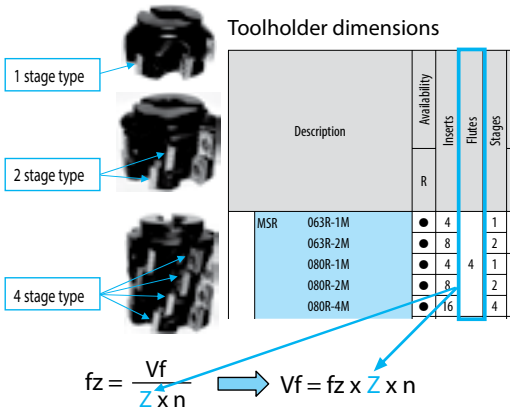
1) If the number of stages is one

If the number of stages is one, it is not indicated on the catalogue.
Please use "No. of inserts" of the catalogue for "Z" of the formula to calculate cutting conditions.



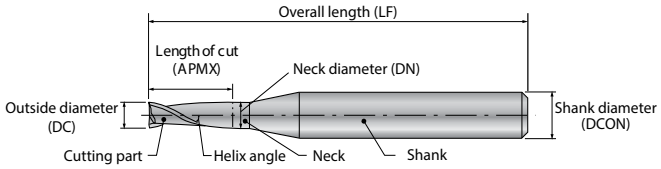
2) If the number of stages is more than two

If the number of stages is more than two, it is indicated on the catalogue.
Please use "No. of flutes" of the catalogue for "Z" of the formula to calculate cutting conditions.

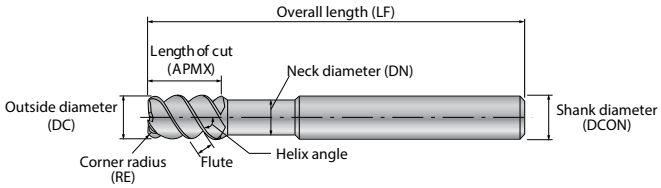


Terms of solid end mill

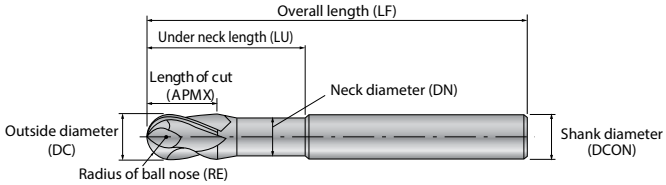
Square



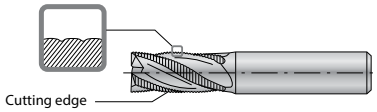
Radius



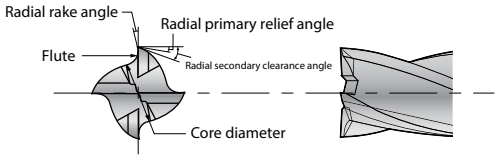
Ball-nose



Cutting edge shape



Cutting edge profile

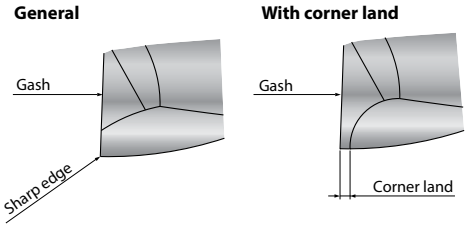


* The illustration shows squared 4 flutes tool

Core diameter rate (%) = Core diameter ÷ Outside dia. x 100

Cutting edge with corner land

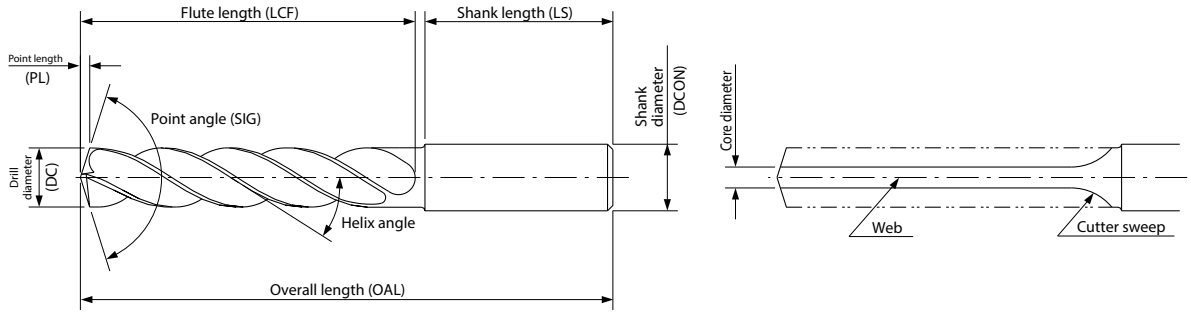
Advanced fracture resistance with corner land

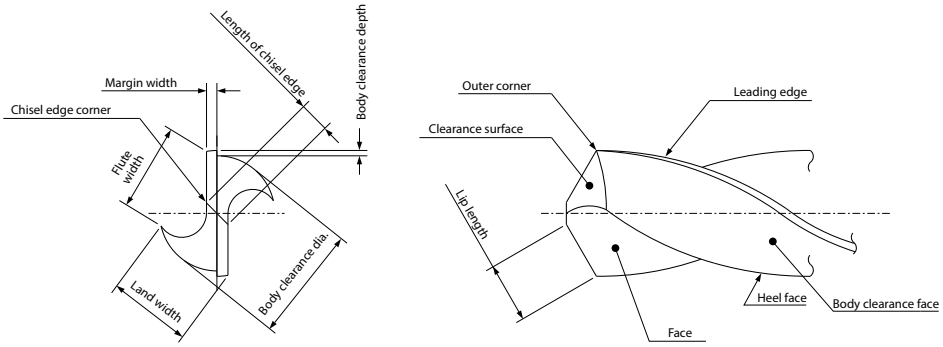


Trouble shooting of solid end mill

Trouble	Trouble item	Countermeasures	Cutting conditions: Vc	fz	ap	Cutting direction	Low pick feed	Compressed air	Coolant: Increase volume	Oil based coolant	Wet working	Tool geometry: Helix angle	No. of blades	Diameter	Tool rigidity enhancement	Large chip pocket	Setting: Workpiece / tool installation	Shorten tool overhang	Machine: Power, rigidity
		Check item	Higher (larger) ↑ Lower (smaller) ↓									Larger ↑ more smaller ↓ less							
Edge damage	Cutting edge wear	Unsuitable cutting conditions	● ↓							●									
		Less number of blades											● ↑						
		Up cut				Down-cut													
	Chipping of cutting edge	Unsuitable cutting conditions		● ↓	● ↓														
		Lack of cutting edge strength													●				
		Insufficient clamping force															●	●	●
	Fracture occurs	Unsuitable cutting conditions			● ↓														
		Lack of tool rigidity												● ↑	●				
		Chip packing							●							●			
Cutting accuracy	Poor finished surface on walls	Unsuitable cutting conditions	● ↓		● ↓														
		Chip jamming						●	●		●								
		Cutting edge wear	● ↓																
	Poor finished surface on faces	Large pick feed					●												
	Out of vertical	Unsuitable cutting conditions		● ↓	● ↓														
		Lack of tool rigidity										● ↑	● ↑	● ↑	●				
		Cutting edge wear	● ↓																
	Poor dimensional accuracy	Unsuitable cutting conditions	● ↓	● ↓	● ↓														
		Insufficient clamping force															●	●	●
Others	Heavy chattering, vibration	Unsuitable cutting conditions	● ↓	● ↓															
		Lack of tool rigidity										● ↑	● ↑	● ↑	●				
		Insufficient clamping force															●	●	●
	Chip jamming	Unsuitable cutting conditions		● ↓	● ↓														
		Improper tool geometry											● ↓			●			

Terms of solid drill



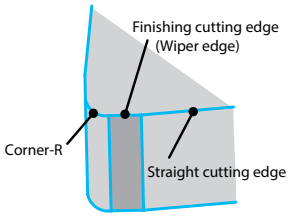


Trouble shooting of solid drill

Trouble	Trouble item	Countermeasures	Vc	fz	Lower feed at initial cutting	Lower feed when breaking through	Step feed	Coolant: Increase volume	Coolant: Increase pressure	Chisel width	Honing width	Core diameter	Shorten flute length	Use internal coolant type tool	Improve tool installation accuracy	Flat workpiece face	Shorten tool overhang	Power, rigidity
		Check item	Cutting conditions							Tool geometry					Setting			Machine
			Higher (larger)↑ Lower (smaller)↓							Larger ↑ more Smaller ↓ less								
Edge damage	Fracture occurs	Unsuitable cutting conditions		●↓														
		Poor rigidity of drill										●↑	●					
		Sloping machine face														●		
	Large peripheral cutting edge and margin land wear	Unsuitable cutting conditions	●↓															
		High cutting heat at the cutting edge point						●						●				
		Poor run-out accuracy													●			
	Chipping on peripheral cutting edge	Unsuitable cutting conditions		●↓			●											
		Large deflection of tool holder													●			●
		Chattering occurs (vibration)									●↓						●	●
	Chipping on chisel	Too wide chisel width								●↓								
		Poor entry			●													
		Chattering occurs (vibration)									●↓						●	●
Cutting accuracy	Enlarge hole diameter	Unsuitable cutting conditions	●↑															
		Poor rigidity of drill										●↑	●					
	Reduce hole diameter	Unsuitable cutting conditions	●↓															
		High cutting heat at cutting edge point						●						●				
	Poor straightness	Poor rigidity of drill										●↑	●					
		Large deflection of tool holder													●			●
	Poor hole position accuracy, roundness, straightness, surface roughness	Unsuitable cutting conditions			●													
		Poor rigidity of drill										●↑	●					
		Large deflection of tool holder													●			●
		Insufficient clamping force																
Burr	Large burrs at hole exit	Unsuitable cutting conditions				●												
		Improper tool geometry									●↓							
Chip control	Long chips	Unsuitable cutting conditions		●↑														
		Poor chip disposal						●	●			●↓		●				
	Chip packing	Unsuitable cutting conditions	●↓	●↓														
		Poor chip disposal						●	●					●				

About wiper inserts

A wiper insert is designed with a wiper edge that is located between corner radius and straight cutting edge shown as right figure.

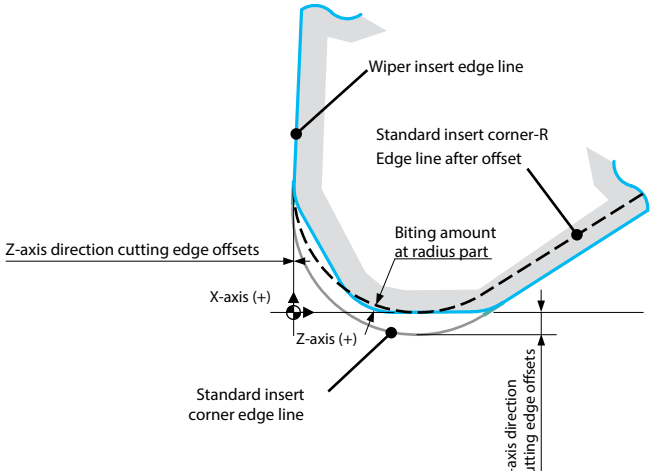


Advantages

- A wiper edge geometry provides improved surface finish quality even at increased feed rate
- Improved machining efficiency : Reduced cutting time with higher feed rate as well as consolidation of roughing and finishing provide high machining efficiency
- Longer tool life : Reduced cutting time with higher feed rate leads to increase part production
- Excellent chip control : Higher feed rate makes chips thicker, which provides easier-to-break chips

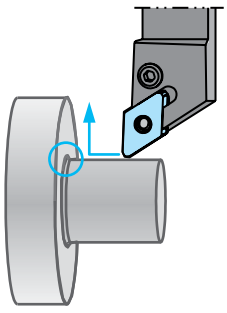
Precautions when using WF / WE chipbreaker (negative insert)

Tip of corner-R (DNMX, TNMX)



Cautions when machining inside corner-R

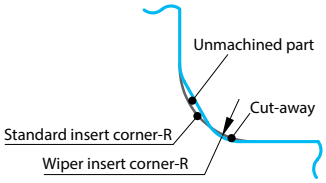
Do not use this wiper insert if a precise inside corner-R is required when such a machining in the figure below.



* From external turning to up facing without arc complement
(A wiper edge does not work during up facing)

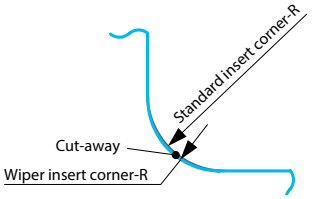
DNMX / TNMX
WF chipbreaker

- More incomplete cutting and excessive cutting during machining with this chipbreaker than the machining with a standard insert
- The inside corner-R dimension become smaller than the requirement.



CNMG / WNMG
WF / WE chipbreaker

- The inside corner-R dimension would be smaller than the requirement (Cutting excessively).



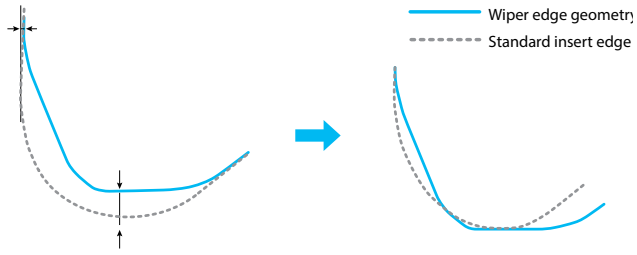
WF / WE chipbreaker edge position offset adjustment

WF / WE chipbreaker (Negative Insert) edge position offset adjustment

For D type and T type, cutting edge offsets are required.

Cutting edge offsets (mm)					
DNMX150404WF DNMX150604WF		DNMX150408WF DNMX150608WF		DNMX150412WF DNMX150612WF	
X-axis direction	Z-axis direction	X-axis direction	Z-axis direction	X-axis direction	Z-axis direction
0.24	0.02	0.14	0.01	0.11	0.01

Cutting edge offsets (mm)					
TNMX160404WF		TNMX160408WF		TNMX160412WF	
X-axis direction	Z-axis direction	X-axis direction	Z-axis direction	X-axis direction	Z-axis direction
0.24	0.01	0.16	0.00	0.11	0.00

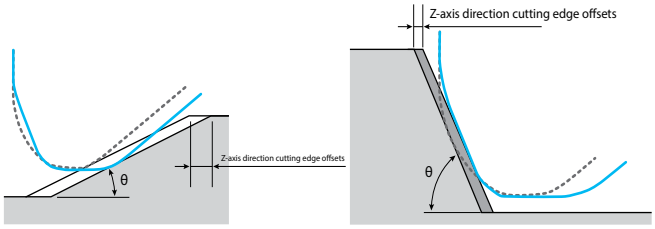


For D type and T type inserts, program corrections are required for ramping and up facing.

Program corrections for tapered part of workpiece (Z-axis direction cutting edge offsets)

DNMX1504 / DNMX1506 type

Corner-R(RE) (mm)	Ramping angle θ					
	0°	5°	10°	15°	20°	25°
0.4	0.00	-0.34	-0.35	-0.36	-0.36	-0.36
0.8	0.00	-0.26	-0.26	-0.25	-0.24	-0.22
1.2	0.00	-0.15	-0.17	-0.16	-0.15	-0.15



Corner-R(RE) (mm)	Up facing angle θ																		
	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°
0.4	0.00	-0.02	-0.03	-0.03	-0.04	-0.05	-0.06	-0.07	-0.08	-0.09	-0.10	-0.11	-0.12	-0.10	-0.08	-0.06	-0.04	-0.02	0.00
0.8	0.00	0.13	0.12	0.11	0.09	0.07	0.05	0.04	0.02	0.00	-0.02	-0.05	-0.07	-0.06	-0.04	-0.02	-0.01	-0.01	0.00
1.2	0.00	0.36	0.34	0.31	0.27	0.24	0.20	0.16	0.13	0.09	0.05	0.00	-0.04	-0.04	-0.03	-0.02	-0.01	-0.01	0.00

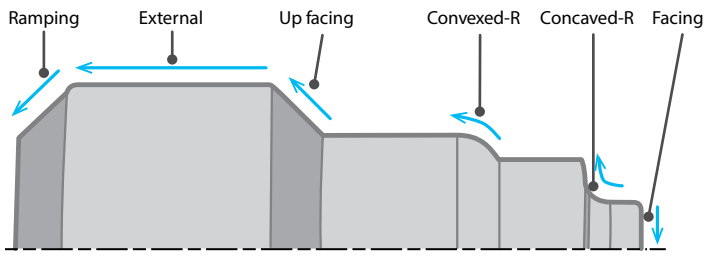
TNMX1604 type

Corner-R(RE) (mm)	Ramping angle θ					
	0°	5°	10°	15°	20°	25°
0.4	0.00					
0.8	0.00					
1.2	0.00					

Do not use TNMX1604 type insert for ramping.

Corner-R(RE) (mm)	Up facing angle θ																		
	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°
0.4	0.00	-0.06	-0.05	-0.05	-0.06	-0.07	-0.08	-0.08	-0.09	-0.10	-0.11	-0.12	-0.13	-0.12	-0.10	-0.07	-0.05	-0.02	0.00
0.8	0.00	0.11	0.11	0.10	0.08	0.06	0.04	0.02	0.00	-0.02	-0.04	-0.06	-0.08	-0.08	-0.06	-0.04	-0.02	-0.01	0.00
1.2	0.00	0.34	0.32	0.29	0.25	0.22	0.19	0.15	0.14	0.08	0.04	0.00	-0.05	-0.05	-0.03	-0.01	0.00	0.00	0.00

Caution (Finished edge line)

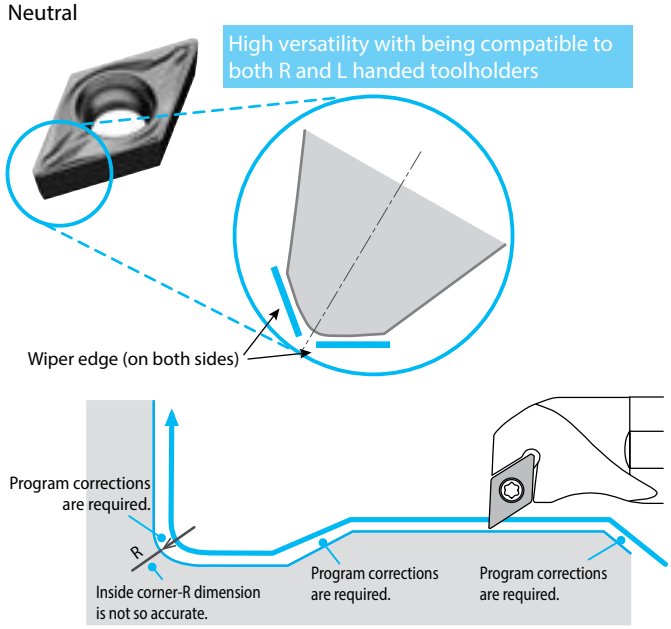


Applications	Notes
External / Facing	Toolholders for D type and T type would not be able to provide sufficient performance depending on a toolholder. Please use an applicable toolholder.
Up facing Ramping	For D type and T type inserts, program corrections on Z-axis direction are required.
Convexed-R / Concaved-R	Do not use wiper insert if a precise R shape is needed.

Precautions when using WP chipbreaker (Positive insert)

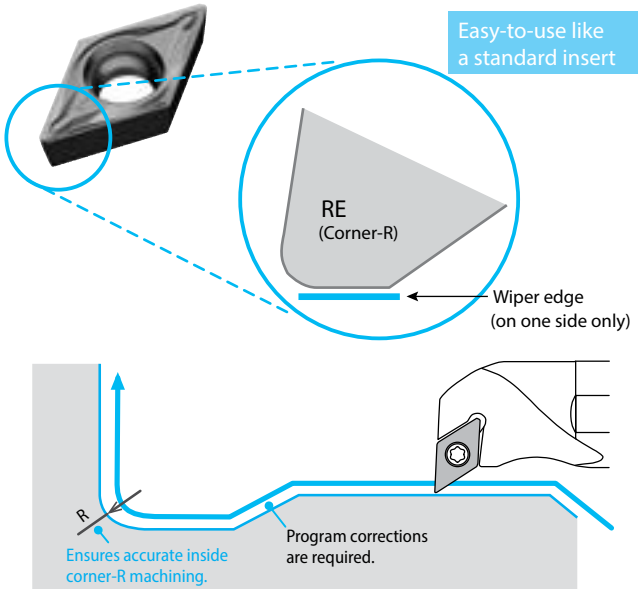
Proper use for a neutral insert and a handed insert

Neutral



When use a neutral type insert,
· you need to correct programs for three areas.
· it should be used for machining which does not require inside corner-R accuracy.

Handed (Left-hand shown)

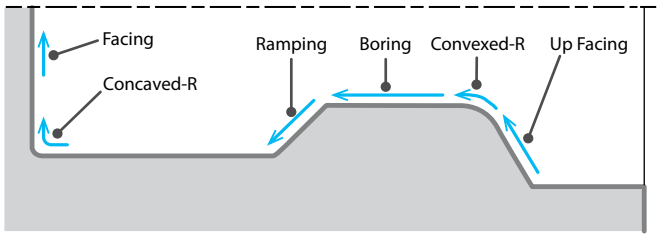


When use a handed insert,
· you need to correct program for ramping.
· it provides accurate inside corner-R machining.

Less program correction is required as well as easy-to-use like a standard insert

* Position of cutting edge differs from a standard insert. Cutting edge adjustment is required.

Caution (Finished edge line)



Neutral

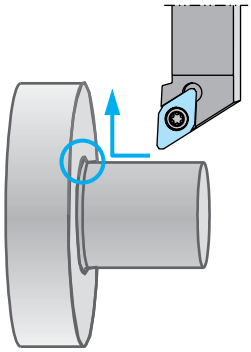
Applications	Caution
Boring / Facing	Toolholders for D type and T type would not be able to provide sufficient performance depending on a toolholder. Please use an applicable toolholder.
Up Facing / Ramping	For D type and T type inserts, program corrections on Z-axis direction are required.
Convexed-R / Concaved-R	Do not use wiper inserts if a precise R shape is needed.

Handed

Applications	Caution
Boring	Toolholders for D type and TP type would not be able to provide sufficient performance depending on a toolholder. Please use an applicable toolholder.
Ramping	For D type and TP type inserts, program corrections on Z-axis direction are required.
Convexed-R / Concaved-R	Surface finish quality is as standard insert is.
Up Facing	Surface finish quality is as standard insert is.
Facing	Surface finish quality is as standard insert is.

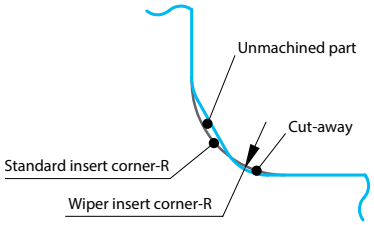
Cautions when machining inside corner-R

Do not use this wiper insert if a precise inside corner-R is required when such a machining in the figure below.



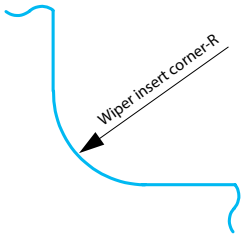
DCMX / TC(P)MX * Neutral
WP chipbreaker

· More incomplete cutting and excessive cutting during machining with this chipbreaker than the machining with a standard insert
· The inside corner-R dimension become smaller



CCMT * Neutral
DCMX / TPMX * Handed
WP chipbreaker

· No problem in the finished line on workpiece (Adjustments are required)



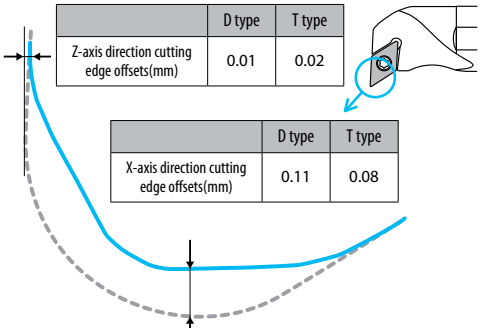
WP chipbreaker (Positive insert) Edge position offset adjustment

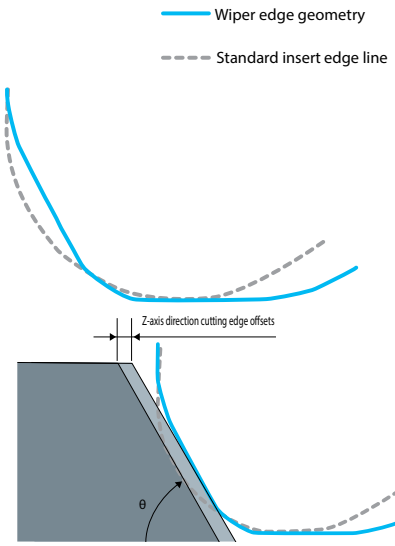
Neutral

For D type and T type, cutting edge offsets are required.

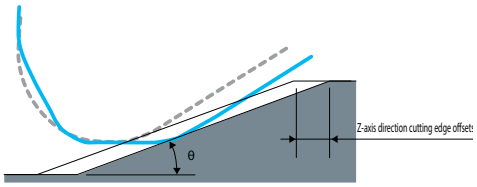
	D type	T type
Z-axis direction cutting edge offsets(mm)	0.01	0.02

	D type	T type
X-axis direction cutting edge offsets(mm)	0.11	0.08

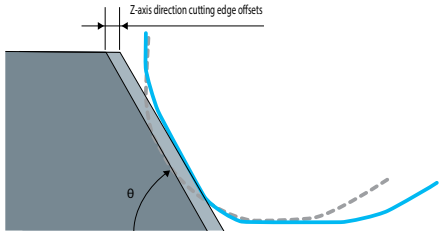




For D type and T type inserts, program corrections are required for ramping and up facing.



Ramping angle θ	0°	5°	10°	15°	20°	25°
Z-axis direction cutting edge offsets (mm) D type	0	-0.14	-0.15	-0.16	-0.16	-0.17
Z-axis direction cutting edge offsets (mm) T type	0	-0.16	-0.17	-0.17	-0.17	-



Profiling angle θ	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°
Z-axis direction cutting edge offsets (mm) D type	0.00	0.07	0.06	0.04	0.03	0.02	0.01	0.00	-	-	-
Z-axis direction cutting edge offsets (mm) T type	0.00	0.07	0.06	0.05	0.05	0.04	0.03	0.02	0.01	0.01	0.00

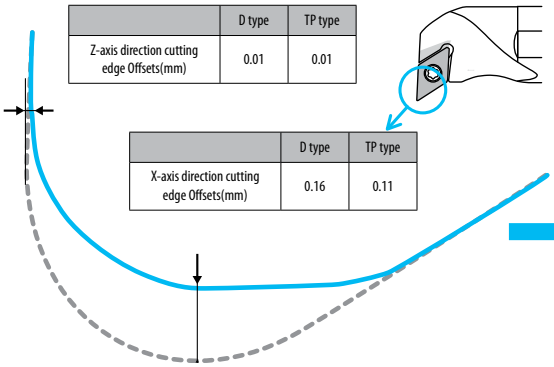
Profiling angle θ	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°
Z-axis direction cutting edge offsets (mm) D type	-0.01	-0.02	-0.03	-0.04	-0.05	-0.05	-0.04	-0.03	-0.02	-0.01	0.00
Z-axis direction cutting edge offsets (mm) T type	-	-	-	-0.01	-0.02	-0.03	-0.04	-0.03	-0.02	-0.01	0.00

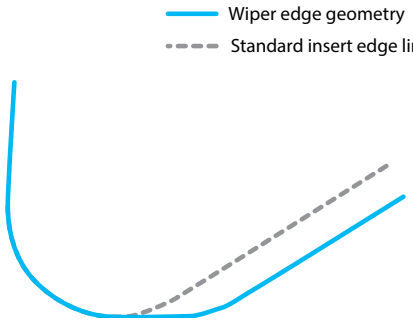
Handed

For D type and TP type, cutting edge offsets are required.

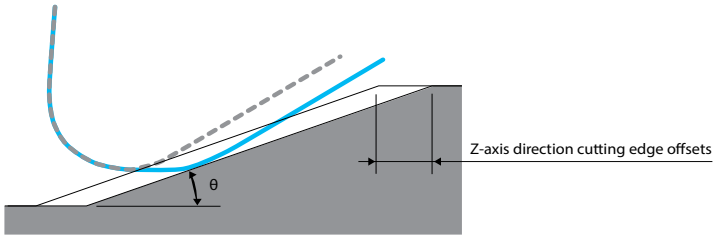
	D type	TP type
Z-axis direction cutting edge Offsets(mm)	0.01	0.01

	D type	TP type
X-axis direction cutting edge Offsets(mm)	0.16	0.11



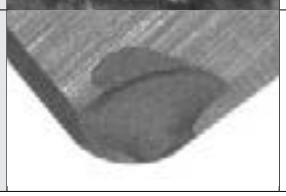


For D type and TP type inserts, program corrections are required for ramping.



Ramping angle θ	0°	5°	10°	15°	20°	25°
Z-axis direction cutting edge offsets (mm) D type	0	-0.22	-0.24	-0.24	-0.25	-0.25
Z-axis direction cutting edge offsets (mm) TP type	0	-0.24	-0.24	-0.25	-0.24	-

Cutting edges figuration and countermeasures

Typical cutting edge figuration		Observation	Causes	Countermeasures
Nose wear		• Deterioration of surface roughness and dimensional accuracy	• Too high Vc • End of tool life	• Reduce Vc • Change to higher wear resistant grade
Notching		• Burr formation • Cutting force increase	• Too high f and Vc	• Sharper cutting performance • Reduce Vc • Change to higher heat resistant grade
Crater wear		• Chip control deterioration • Surface finish deterioration (peeled surface)	• Too high Vc	• Reduce Vc • Change to high speed type like Cermet or Al_2O_3 coated insert grade
Plastic deformation		• Workpiece dimension changes • Crack at nose	• Too high cutting load • Inappropriate insert grade	• Change to harder grade • Reduce f and ap
Crack from wear		• Surface finish's sudden deterioration • Workpiece dimension changes	• Too high Vc	• Change the tool earlier • Change to higher wear resistant grade
Chipping		• Cutting force increase • Surface roughness deterioration	• Too high f • Chattering • Lack of insert toughness	• Reduce f and ap • Change to more rigid toolholder • Change to tougher grade
Crack from welding or built-up edge		• Surface finish deterioration • Cutting force increase	• Too low Vc	• Increase Vc • Improve sharp cutting performance (rake angle, chamfer)
Mechanical fracture		• Sudden cracking • Unstable tool life	• Too high f and ap • Chattering	• Change to tougher grade • Enlarge chamfer • Enlarge Corner-R(RE) • Change to more rigid toolholder
Fracture from thermal crack		• Cracking by heat cycle • Possible in interrupted machining and milling	• Too high Vc and f	• Reduce f • Reduce Vc • Change to dry cutting
Flaking		• Possible in hard materials machining • Possible in machining with chattering	• Lack of insert toughness • Poor rigidity of toolholder	• Change to tougher grade (TiC-base ceramic to CBN.) • Change to more rigid toolholder • Change edge preparation

Turning

Trouble	Trouble item	Countermeasures: Change to harder grade	Change to tougher grade	Change to more thermal shock resistant grade	Change to more welding resistant grade	Vc (Higher (Larger) ↑ Lower (Smaller) ↓)	f (Higher (Larger) ↑ Lower (Smaller) ↓)	ap (Higher (Larger) ↑ Lower (Smaller) ↓)	Tool path review	Coolant: Wet	Coolant: Dry	Chipbreaker review	Rake angle (Larger ↑ Smaller ↓)	Corner-R(RE) (Larger ↑ Smaller ↓)	Approach angle (Larger ↑ Smaller ↓)	Edge strength / Honing (Larger ↑ Smaller ↓)	Change to higher tolerance (M→G)	Toolholder rigidity	Workpiece / Tool Installation	Overhang length	Power, rigidity
Unstable dimension	Unstable workpiece dimension	Unsuitable insert tolerance															●				
		Tool and workpiece evacuation										●	●↑	●↓	●↓			●	●	●	●
	Frequent offset during machining	Flank wear increase	●											●↑							
		Unsuitable cutting conditions					●↓	●↑													
		Built-up edge				●	●↑														
Surface roughness deterioration	Poor surface roughness	Poor cutting by tool wear	●			●	●↓				●		●	●↑	●↑		●↓	●				
		Chipping		●				●↓	●↓				●		●↑		●↑			●	●	●
		Welding, built-up edge				●	●↑				●		●	●↑			●↓	●				
		Unsuitable cutting conditions					●↑	●↓	●↓		●											
		Unsuitable tool geometry											●		●↑		●↓	●				
		Vibration, chattering		●			●↓	*1 ●↓	●↓				●	●↑	●↓	●↓	●↓		●	●	●	●
Heat	Deterioration of accuracy or tool life by cutting heat	Unsuitable cutting conditions					●↓	●↓	●↓		●											
		Unsuitable insert grades and tool geometry	●										●	●↑			●↓					
Burr, workpiece chip off and scuffing	Burr	Unsuitable cutting conditions					●↓	●↑		●	●											
		Unsuitable insert grades and tool geometry	●										●	●↑	●↓	●↓	●↓					
	Workpiece chip off	Unsuitable cutting conditions						●↓	●↓	●												
		Unsuitable insert grades and tool geometry	●										●	●↑	●↑	●↑	●↓		●	●	●	●
	Scuffing	Unsuitable cutting conditions					●↑	*2 ●↓			●											
		Unsuitable insert grades and tool geometry	●			●							●	●↑			●↓					
Edge damage	Wear increase at relief face, rake face	Flank wear	●				●↓				●		●	●↑	●↑		●↓					
		Rake face wear	●				●↓	●↓	●↓		●		●	●↑		●↑						
	Notching	Notching				●	●↓				●											
	Chipping	Vibration, chattering		●				●↓	●↓				●			●↑	●↑		●	●	●	●
	Crack	Unsuitable insert grades and cutting conditions		●	●			●↓	●↓				●		●↑	●↑	●↑		●	●	●	●
	Thermal crack	Work hardness, unsuitable insert grades and cutting conditions			●		●↓	●↓	●↓			●	●	●↑			●↓					
	Edge nose deformation	Edge nose deformation during interrupted machining	●				●↓	●↓	●↓				●	●↓	●↑	●↑	●↑					
	Built-up edge	Work hardness, unsuitable insert grades and cutting conditions				●	●↑	●↑			●		●	●↑			●↓	●				
Chip control	Long, tangling chips	Unsuitable cutting conditions					*3 ●↓	●↑	●↑	●		●										
		Unsuitable tool geometry											●		●↓	●↓						
	Chips scattering	Unsuitable cutting conditions						●↓	●↓			●										
		Unsuitable tool geometry											●		●↑	●↑						

*1. To prevent chattering, the higher f may be suitable.

*2. To prevent scuffing, the higher f may be suitable.

*3. When using X chipbreaker insert for soft steel and low carbon steel, the higher Vc cuts chips short.

Milling

Trouble	Trouble item	Countermeasures	Change to harder grade	Change to tougher grade	Change to more thermal shock resistant grade	Change to more welding resistant grade	Vc	fz	ap	Cutter dia. cutting width review	Tool path review	Coolant: Usage of mist	Coolant: Dry	Insert with chipbreaker	Relief angle	Corner angle	Edge strength / Honing	No. of inserts	Chip pocket	Wiper edge (Relief angle) review	Insert runout check	Cutter rigidity	Workpiece / Tool installation	Overhang length	Power, rigidity
		Check item	Insert grades				Cutting conditions							Tool geometry									Setting		Machine
							Higher (Larger)↑ Lower (Smaller)↓								Larger ↑ Smaller ↓			More↑ Less↓	Larger↑ Smaller↓						
Edge damage	Flank wear increase	Unsuitable cutting conditions					●↓					●													
		Unsuitable tool geometry	●												●↑		●↓			●					
	Rake face wear increase	Unsuitable cutting conditions					●↓	●↓	●↓			●													
		Unsuitable tool geometry	●												●↑	●↑	●↓								
	Chipping, cracking	Unsuitable cutting conditions						●↓	●↓	●	●														
		Unsuitable tool geometry		●											●↓	●↑	●↑			●	●	●	●	●	●
	Edge breakage by thermal shock	Unsuitable cutting conditions					●↓	●↓	●↓				●												
		Unsuitable tool geometry			●										●↑		●↓								
	Built-up edge	Unsuitable cutting conditions					●↑	●↑				●													
		Unsuitable tool geometry				●									●↑		●↓								
Cutting accuracy	Poor surface finish	Unsuitable cutting conditions					●↑	●↓	●↓			●													
		Unsuitable tool geometry	●			●											●↓	●↓		●	●		●	●	●
	Burr formation	Unsuitable cutting conditions					●↓	●↓	●↓	●	●														
		Unsuitable tool geometry													●↑	●↓	●↓			●					
	Workpiece chip off	Unsuitable cutting conditions						●↓	●↓		●														
		Unsuitable tool geometry													●↑	●↑	●↓	●↑		●					
	Poor planeness / parallelism	Tool and workpiece evacuation						●↓	●↓			*5 ●		●	●↑	●↓	●↓	●↓		●	●	●	●	●	●
Others	Heavy chattering, vibration	Unsuitable cutting conditions, installation					●↓	*1 ●↓	*2 ●↓	●	*4 ●			●	●↑	●↓	●↓	●↓				●	●	●	●
	Chip jamming	Unsuitable cutting conditions					●↑	*3 ●↓		●		*6 ●	●												
		Unsuitable tool geometry												●	●↑			●↓	●↑						

*1. To prevent chattering, the higher fz may be suitable.
*2. To prevent chattering, the larger ap may be suitable.
*3. Higher fz may be suitable.
*4. Down-cut method is recommended for helical end milling.
*5. If the surface is warped by cutting heat.
*6. Compressed air is recommended.

Drilling (MagicDrill series)

Trouble	Trouble item	Check item / Countermeasures	Insert grades: Change to harder grade	Insert grades: Change to tougher grade	Cutting conditions: Vc (Higher (Larger)↑ Lower (Smaller)↓)	Cutting conditions: fz (Higher (Larger)↑ Lower (Smaller)↓)	Cutting conditions: Coolant discharge condition	Tool geometry: Chipbreaker review	Tool geometry: Inner edge's center height check (Core dia. check) (Larger ↑ Smaller ↓)	Tool geometry: Toolholder rigidity improvement (Short type)	Setting: Workpiece / Tool installation	Setting: Insert installation	Setting: Offset check	Setting: Adjustable sleeve usage	Machine: Power, rigidity
Edge damage	Unusual wear	Unsuitable cutting speed (too high)	●		●↓										
		Unsuitable cutting speed (too low)		●	●↑										
		Unsuitable coolant discharge					●								
		Poor rigidity of machine / workpiece									●				●
		Small hole dia.											*1 ●	●	
		Unsuitable insert grade	●												
	Inner edge cracking	No core, too small core							●↑						
		Poor rigidity of machine / workpiece								●	●				●
		Unstable drilling start				●↓									
		High hardness workpiece	●		●↓	●↓									
		Clogged chips			●↑				●↓						
		Unstable insert installation										●			
	Outer edge cracking	Poor rigidity of machine / workpiece									●				●
		Unstable drilling start				●↓									
		High hardness workpiece	●		●↓	●↓									
		Poor chip control		●	●↑										
		Unstable insert installation										●			
Toolholder, others	Scratches on tool body	Poor rigidity of machine / workpiece									●				●
		Inaccurate tool installment											*1 ●	●	
		Clogged chips			●↑	●↓									
		Unstable drilling start				●↓									
	Poor hole dia. accuracy / Surface finish	Poor rigidity of machine / workpiece									●				●
		Poor rigidity of toolholder								●		●			
		Inaccurate tool installment											*1 ●	●	
		Clogged chips			●↑	●↓			●↓						
		Large core dia.							●↓						
		Unstable drilling start				●↓									
		Unsuitable coolant discharge					●								
	Large vibration / chattering	Unsuitable cutting conditions, installation			●↑	●↓				●	●				●
	Long chips	Unsuitable cutting conditions			●↑										
		Unsuitable chipbreaker						●							
	Machine failure	Lack of machine power			●↓	●↓		●							●

*1. For lathe operation

Turning

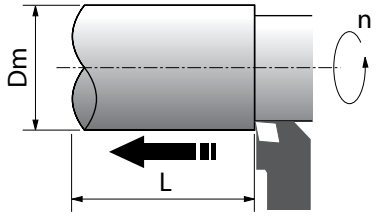
Cutting speed

$$Vc = \frac{\pi \times Dm \times n}{1{,}000}$$

Vc : Cutting speed [m/min]

Dm : Workpiece dia. [mm]

n : Spindle revolution [min^{-1}]



Power requirement

$$Pc = \frac{Ks \times Vc \times ap \times f}{6{,}120 \times \eta}$$

$$P_{HP} = \frac{Ks \times Vc \times ap \times f}{4{,}500 \times \eta}$$

Pc : Power requirement [kW]

P_{HP} : Power requirement (Horse power) [HP]

Vc : Cutting speed [m/min]

ap : Depth of cut [mm]

f : Feed rate [mm/rev]

Ks : Specific cutting force [kgf/mm^2]

η : Mechanical efficiency (0.7 ~ 0.8)

Ks [kgf/mm^2]	
Low carbon steel	190
Medium carbon steel	210
High carbon steel	240
Low alloy steel	190
High alloy steel	245
Cast iron	93
Malleable cast iron	120
Bronze, brass	70

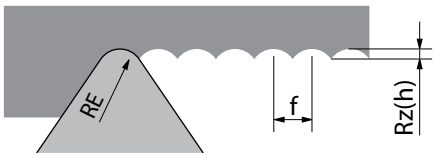
Theoretical surface roughness

$$Rz(h) = \frac{f^2}{8 \times RE} \times 1{,}000$$

Rz(h): Theoretical surface roughness [μm]

f : Feed rate [mm/rev]

RE : Corner radius of insert [mm]



Chip removal volume

$$Q = Vc \times ap \times f$$

Q : Chip removal volume [$cm^3/min=cc/min$]

Vc : Cutting speed [m/min]

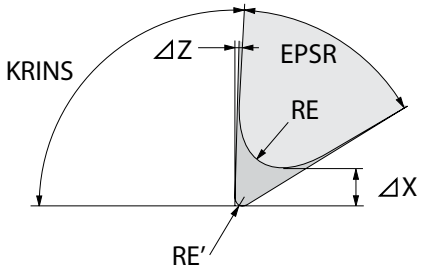
ap : Depth of cut [mm]

f : Feed rate [mm/rev]

Edge position compensation when changing corner-R(RE)

$$\Delta X = (RE - RE') \times \left\{ \frac{\cos\left(\frac{EPSR}{2} + (KRINS - 90°)\right)}{\sin\frac{EPSR}{2}} - 1 \right\}$$

$$\Delta Z = (RE - RE') \times \left\{ \frac{\sin\left(\frac{EPSR}{2} + (KRINS - 90°)\right)}{\sin\frac{EPSR}{2}} - 1 \right\}$$



ΔX : X-axis direction cutting edge offsets [mm]

ΔZ : Z-axis direction cutting edge offsets [mm]

RE : Corner-R before change [mm]

RE': Corner-R after change [mm]

EPSR : Insert corner angle [°]

KRINS : Toolholder's cutting edge angle [°]

Toolholder type	Insert corner angle EPSR	Cutting edge angle KRINS	ΔX	ΔZ
DCLN / PCLN	80°	95°	0.100 x (RE-RE')	0.100 x (RE-RE')
DTGN / PTGN	60°	91°	0.714 x (RE-RE')	0.030 x (RE-RE')
DDJN / PDJN	55°	93°	0.866 x (RE-RE')	0.099 x (RE-RE')
DDHN / PDHN	55°	107.5°	0.531 x (RE-RE')	0.531 x (RE-RE')
DVLN / PVLN	35°	95°	2.072 x (RE-RE')	0.273 x (RE-RE')
DVPN / PVPN	35°	117.5°	1.351 x (RE-RE')	1.351 x (RE-RE')
DSBN / PSBN	90°	75°	0.225 x (RE-RE')	-0.293 x (RE-RE')

Example: Compensation when changing corner-R from 0.8 to 0.4, using PCLN toolholder,

ΔX=0.100 x (0.8-0.4)=0.04(mm)

ΔZ=0.100 x (0.8-0.4)=0.04(mm)

Turning (Cutting time)

Cutting time (External turning case 1: 1 pass machining)

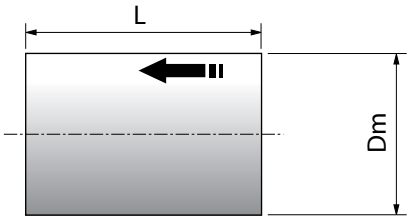
At constant revolution

$$T = \frac{60 \times L}{f \times n}$$

At constant cutting speed

$$T = \frac{60 \times \pi \times L \times Dm}{1{,}000 \times f \times Vc}$$

T : Cutting time [sec]
L : Cutting length [mm]
f : Feed rate [mm/rev]
n : Spindle revolution [min^{-1}]
Dm : Workpiece dia. [mm]
Vc : Cutting speed [m/min]



Cutting time (External turning case 2: multi-pass machining)

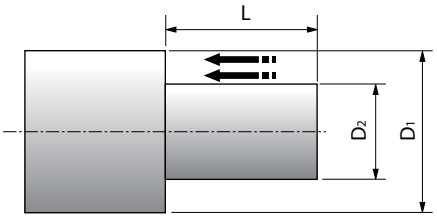
At constant revolution

$$T = \frac{60 \times L}{f \times n} \times N$$

At constant cutting speed

$$T = \frac{60 \times \pi \times L \times (D_1 + D_2)}{2 \times 1{,}000 \times f \times Vc} \times N$$

T : Cutting time [sec]
L : Cutting length per pass [mm]
ap : Depth of cut per pass [mm]
f : Feed rate [mm/rev]
n : Spindle revolution [min^{-1}]
D_1 : Max. dia. of workpiece [mm]
D_2 : Min. dia. of workpiece [mm]
Vc : Cutting speed [m/min]
N : Number of passes = (D1 - D2) / ap / 2 (if it is indivisible, obtain integer by rounding up one place of decimals.)



Cutting time (Facing)

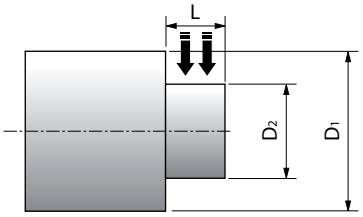
At constant revolution

$$T = \frac{60 \times (D_1 - D_2)}{2 \times f \times n} \times N$$

At constant cutting speed

$$T_1 = \frac{60 \times \pi \times (D_1 + D_2) \times (D_1 - D_2)}{4{,}000 \times f \times Vc} \times N$$

T : Cutting time [sec]
T_1 : Cutting time before reaching Max. spindle revolution [sec]
L : Cutting length [mm]
ap : Depth of cut per pass [mm]
f : Feed rate [mm/rev]
n : Spindle revolution [min^{-1}]
D_1 : Max. dia. of workpiece [mm]
D_2 : Min. dia. of workpiece [mm]
Vc : Cutting speed [m/min]
N : Number of passes = L / ap (if it is indivisible, obtain integer by rounding up one place of decimals.)



Cutting time (Grooving)

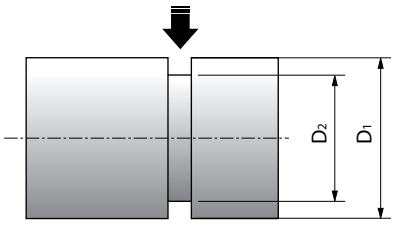
At constant revolution

$$T = \frac{60 \times (D_1 - D_2)}{2 \times f \times n}$$

At constant cutting speed

$$T_1 = \frac{60 \times \pi \times (D_1 + D_2) \times (D_1 - D_2)}{4{,}000 \times f \times Vc}$$

T : Cutting time [sec]
T_1 : Cutting time before reaching Max. spindle revolution [sec]
L : Cutting length [mm]
f : Feed rate [mm/rev]
n : Spindle revolution [min^{-1}]
D_1 : Max. dia. of workpiece [mm]
D_2 : Min. dia. of workpiece [mm]
Vc : Cutting speed [m/min]



Cutting time (Cut-off)

At constant revolution

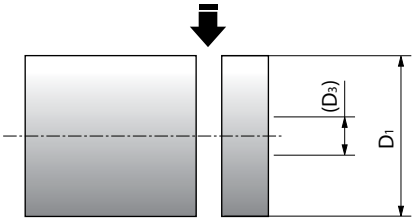
$$T = \frac{60 \times D_1}{2 \times f \times n}$$

At constant cutting speed

$$T_1 = \frac{60 \times \pi \times (D_1 + D_3) \times (D_1 - D_3)}{4{,}000 \times f \times Vc}$$

$$T_3 = T_1 + \frac{60 \times D_3}{2 \times f \times n_{max}}$$

T : Cutting time [sec]
T_1 : Cutting time before reaching Max. spindle revolution [sec]
T_3 : Cutting time when reaching Max. spindle revolution [sec]
f : Feed rate [mm/rev]
n : Spindle revolution [min^{-1}]
n_{max} : Max. spindle revolution [min^{-1}]
D_1 : Max. dia. of workpiece [mm]
D_3 : Diameter when reaching max. spindle revolution [mm]
Vc : Cutting speed [m/min]



Milling

Cutting speed

$$Vc = \frac{\pi \times DC \times n}{1{,}000}$$

Vc : Cutting speed [m/min]

DC : Cutter dia. [mm]

n : Spindle revolution [min^{-1}]

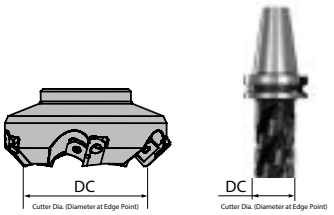


Table feed & feed per tooth

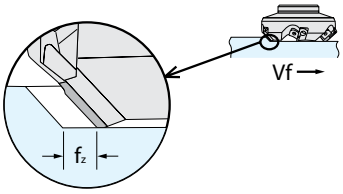
$$f_z = \frac{Vf}{Z \times n}$$

f_z : Feed per tooth [mm/t]

Vf : Table feed [mm/min]

Z : No. of inserts

n : Spindle revolution [min^{-1}]



Power requirement

$$Pc = \frac{K_s \times Q}{6{,}120 \times \eta} = \frac{K_s \times ae \times Vf \times ap}{6{,}120{,}000 \times \eta}$$

$$= \frac{K_s \times ae \times f_z \times Z \times n \times ap}{6{,}120{,}000 \times \eta}$$

$$P_{HP} = \frac{6{,}120}{4{,}500} \times Pc$$

Pc : Power requirement [kW]

P_{HP} : Power requirement (Horse power) [HP]

ae : Width of cut [mm]

Vf : Table feed [mm/min]

f_z : Feed per tooth [mm/t]

Z : No. of inserts

n : Spindle revolution [min^{-1}]

ap : Depth of cut [mm]

K_s : Specific cutting force [kgf/mm^2]

η : Mechanical efficiency (0.7 ~ 0.8)

Q : Chip removal volume [cm^3/min=cc/min]

Ks [kgf/mm^2]	
Low carbon steel	190
Medium carbon steel	210
High carbon steel	240
Low alloy steel	190
High alloy steel	245
Cast iron	93
Malleable cast iron	120
Bronze, Brass	70

Chip removal volume

$$Q = \frac{ae \times Vf \times ap}{1{,}000} = \frac{ae \times f_z \times Z \times n \times ap}{1{,}000}$$

Q : Chip removal volume [cm^3/min=cc/min]

ae : Width of cut [mm]

Vf : Table feed [mm/min]

f_z : Feed per tooth [mm/t]

Z : No. of inserts

n : Spindle revolution [min^{-1}]

ap : Depth of cut [mm]

Cutting time

$$T = \frac{60 \times L'}{Vf} = \frac{60 \times L'}{f_z \times Z \times n}$$

T : Cutting time [sec]

L' : Total table transfer length [mm]
(= L+DC+2α)

L : Workpiece length [mm]

DC : Cutter dia. [mm]

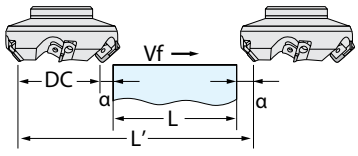
α : Idling distance [mm]

Vf : Table feed [mm/min]

f_z : Feed per tooth [mm/t]

Z : No. of inserts

n : Spindle revolution [min^{-1}]



True rake angle

$$\tan T = \tan R \times \cos C + \tan A \times \sin C$$

Inclination angle

$$\tan I = \tan A \times \cos C - \tan R \times \sin C$$

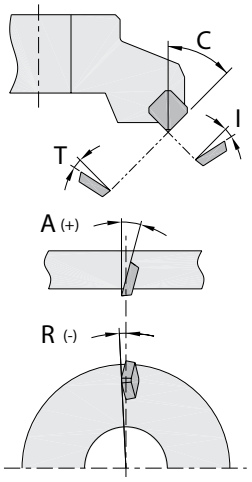
A (GAMP) : Axial rake angle (A.R.) [°] (-90° < A < 90°)

R (GAMF) : Radial rake angle (R.R.) [°] (-90° < R < 90°)

C (KAPR) : Approach angle [°] (0° < C < 90°)

T (GAMN) : True rake angle [°] (-90° < T < 90°)

I (GAMO) : Inclination angle [°] (-90° < I <90°)



Ball-nose end mill cutting speed & revolution

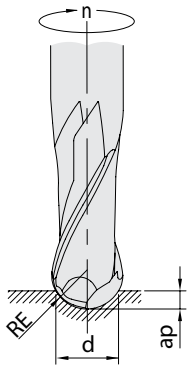
$$n = \frac{1{,}000 \times V_a}{2 \times \pi \times \sqrt{ap(2RE-ap)}}$$

n : Revolution [min^{-1}]

RE : Radius of ball-nose end mill (Ball part's radius) [mm]

ap : Depth of cut [mm]

V_a : Cutting speed at actual dia. d [m/min]



Drilling (MagicDrill series)

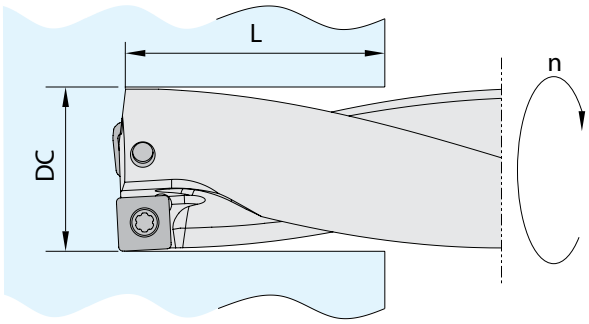
Cutting speed

$$Vc = \frac{\pi \times DC \times n}{1{,}000}$$

Vc : Cutting speed [m/min]

DC : Drill dia. [mm]

n : Spindle revolution [min^{-1}]



Feed rate (Milling)

$$Vf = fz \times Z \times n$$

Vf : Table feed [mm/min]

fz : Feed per tooth [mm/t]

Z : No. of inserts (No. of insert = 1)

n : Spindle revolution [min^{-1}]

Cutting time

$$T = \frac{60 \times L}{f \times n} = \frac{60 \times \pi \times DC \times L}{1{,}000 \times Vc \times f}$$

T : Cutting time [sec]

L : Drilling depth [mm]

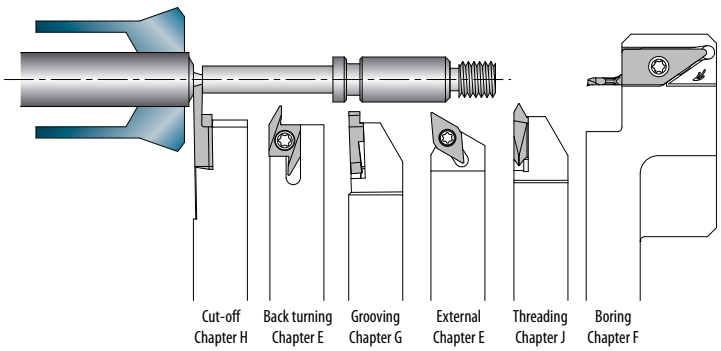
f : Feed rate [mm/rev]

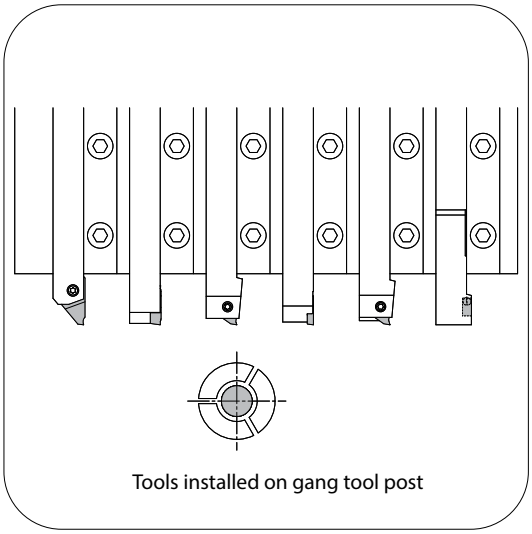
n : Spindle revolution [min^{-1}]

DC : Drill dia. [mm]

Vc : Cutting speed [m/min]

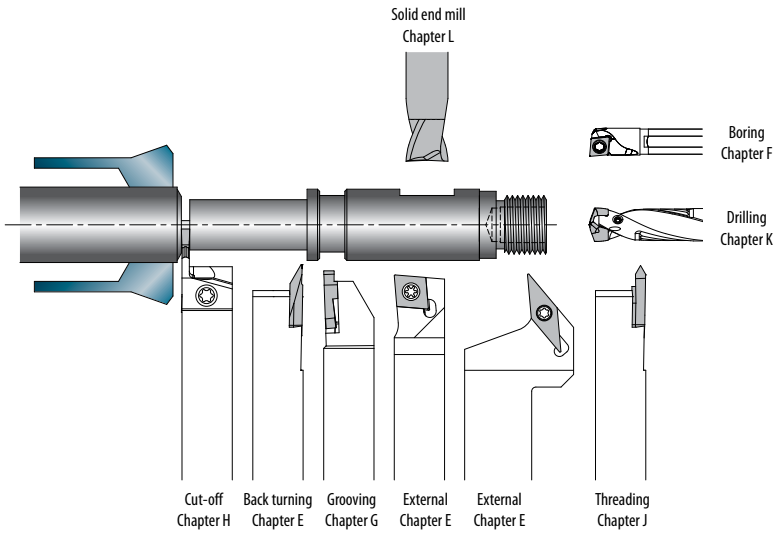
Tooling example1: CNC automatic lathe (Gang type)

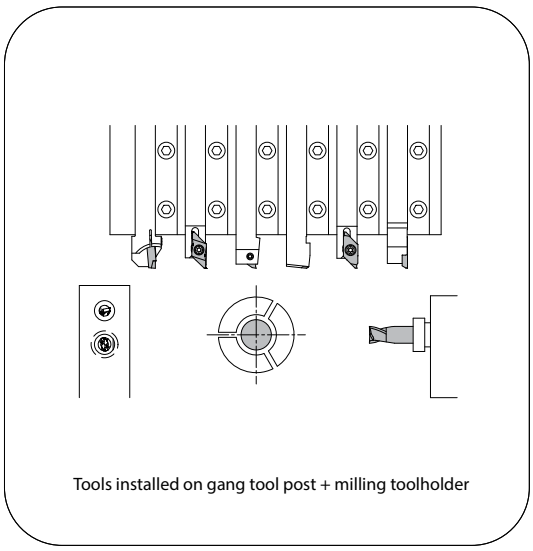




Tools installed on gang tool post

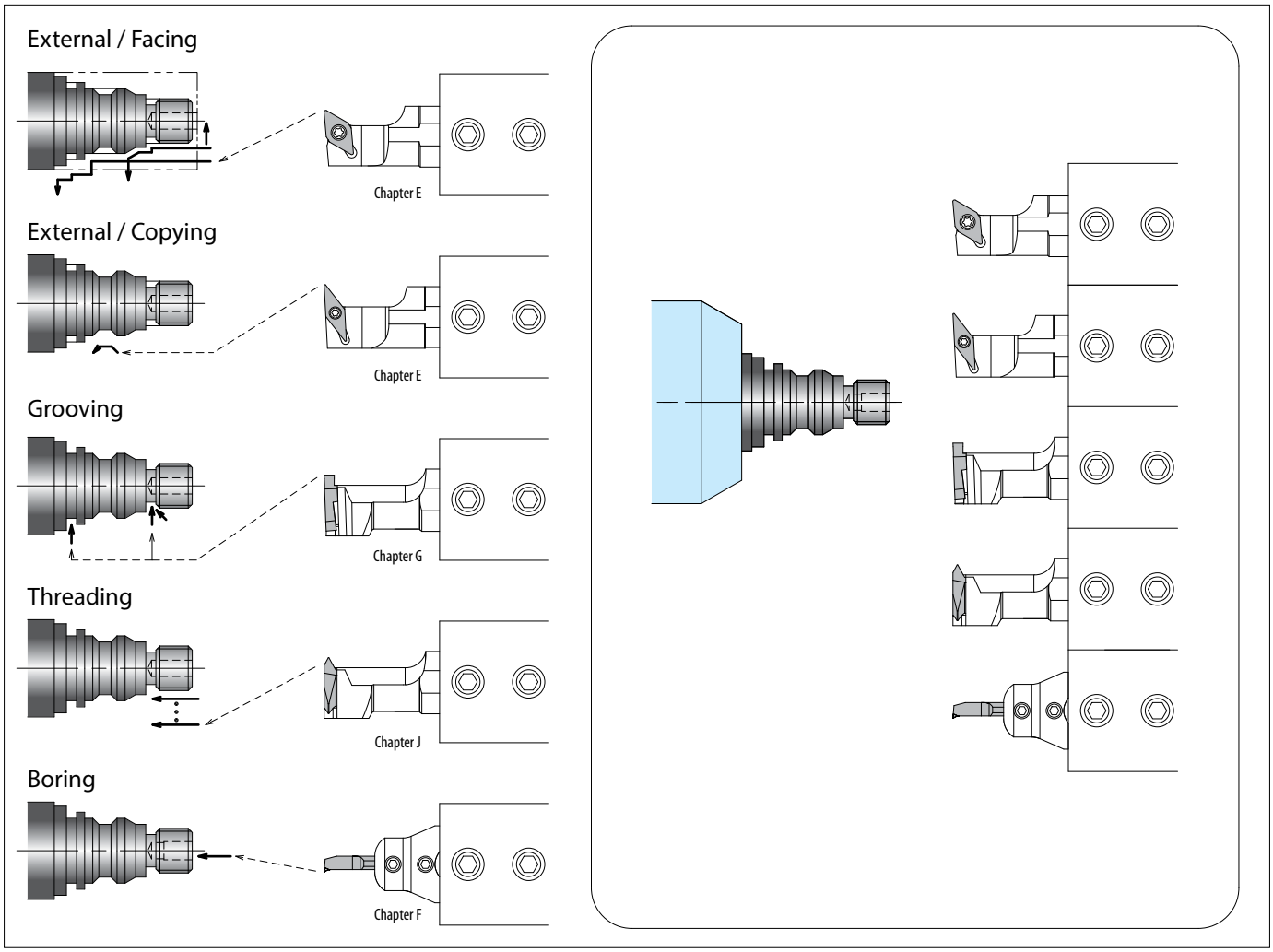
Tooling example 2: CNC automatic lathe (Gang type)



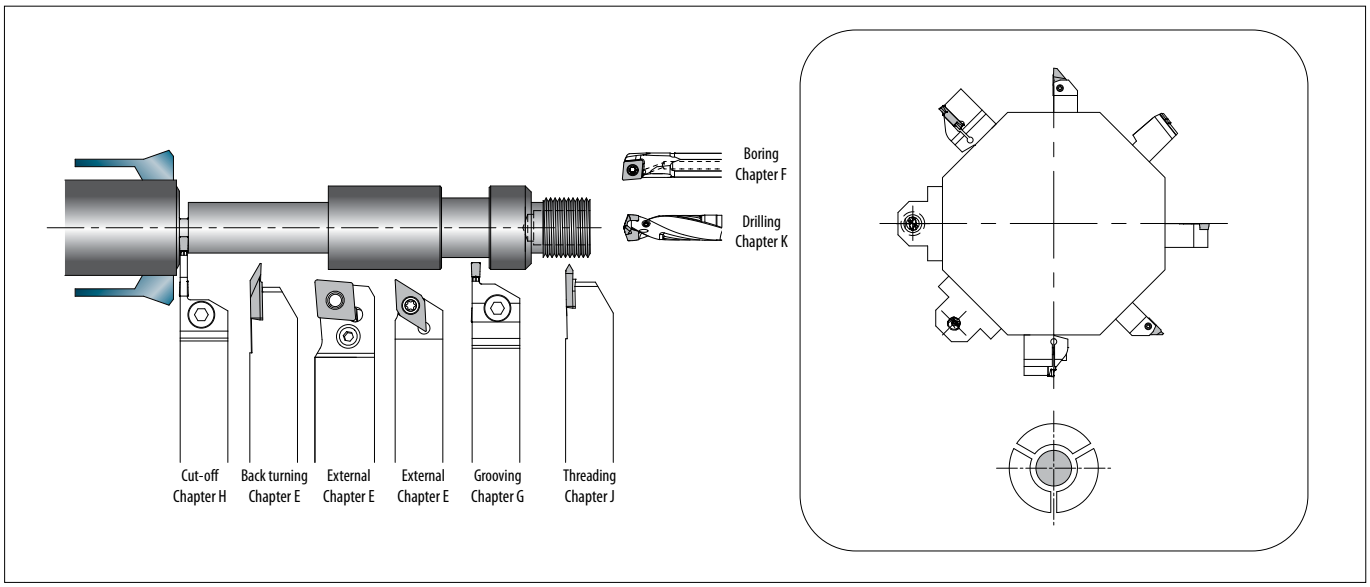


Tools installed on gang tool post + milling toolholder

Tooling example 3: CNC automatic lathe (Opposed gang type)



Tooling example 4: CNC automatic lathe (Turret type)



For Tooling Layout and Automatic Lathe List by Manufacturer, See Page **R46~R54**

Citizen machinery (Cincom Products)

Model	Toolholder dimensions (Gang tool post)	Number of tools	Toolholder dimensions (Turret tool post)	Number of tools	Sleeve dia. (Horizontal/Opposed)	Max. cutting dia.	Remarks
A12/16	10 x 10 x 100	5			ø19.05/ø20	ø12/ø16	
A20	12(13) x 12(13) x 120 * Cut-off toolholder : □16mm	6			ø25.4	ø20	
A20 Ⅶ	12(13) x 12(13) x 120 * Cut-off toolholder : □16mm	6			ø25.4	ø20	
A32	16 x 16 x 150	6			ø25.4	ø32	
B12	10 x 10 x 100	5			ø19.05/ø20	ø12	
B12E/B16E	10 x 10 x 120(60)	5			ø19.05(ø20^{OP})	ø12/ø16	
B20	12(13) x 12(13) x 120	6			ø19.05/ø20	ø20	
BL12	10 x 10 x 60 ~ 120	5			ø20(ø19.05)	ø12	
BL20/25	12(13) x 12(13) x 120	4 ~ 7			ø20(ø19.05)	ø20/ø25	
C12/16	10 x 10 x 120	6			ø19.05	ø12/ø16	
C32	16 x 16 x 130	5			ø25.4	ø32	
D25	16 x 16 x 150 * Cut-off toolholder : □19mm				ø25.4	ø25	
F10			10 x 10 x 60	10	ø19.05	ø10	
F12			10 x 10 x 60	10	ø19.05	ø12	
F16			10 x 10 x 60	10	ø19.05	ø16	
F20			16(19) x 16(13) x 90	10	ø25.4	ø20	
F25			16(19) x 16(13) x 90	10	ø25.4	ø25	
FL25			16 x 16 x 90	12		ø25	
FL42			16 x 16 x 90	12		ø42	
G32			16(19) x 16(19) x 90	10	-	ø32	
K12/16	12(10) x 12(10) x 100	6(7)			ø19.05/ø20	ø12/ø16	
K12E/K16E	12 x 12 x 120	6			ø19.05/ø20	ø12/ø16	
L10	8 x 8 x 100 ~ 130	5			ø15.875	ø10	
L12	10 x 10 x 100	6			ø19.05	ø12	
L16	12(10) x 12(10) x 130	5			ø19.05	ø16	
L20,L20E	12 x 12 x 130 * Cut-off toolholder : □16mm	5			ø19.05	ø20	
L20X,L220	12(13,16) x 12(13,16) x 120 * Cut-off toolholder : □16mm	5 ~ 7			ø19.05	ø20	
L25	16 x 16 x 130	5			ø25.4	ø25	
L32	16 x 16 x 130	5			ø25.4	ø32	
M12	10 x 10 x 120	5	10 x 10 x 60	10 + α	ø19.05	ø12	
M16	10 x 10 x 120	5	10 x 10 x 60	10 + α	ø19.05	ø16	
M20	16 x 16 x 130	5	16 x 16 x 90	10 + α	ø25.4	ø20	
M32	16 x 16 x 130	5	16 x 16 x 90	10 + α	ø25.4	ø32	
MC20	13 x 13 x 120	2 + 2 + 2			ø19.05/ø20.0	ø20.0	
MSL12	10 x 10 x 120				-	ø12	
R04	8 x 8 x 120	5			ø15.875	ø4	
R07	8 x 8 x 120	5			ø15.875	ø7	
RL01	10(8) x 10(8) x 90				ø16(ø20)	ø10	
RL02	16 x 16 x 90				ø20	ø20	
RL21	10(12) x 10(12) x 90				ø19.05	ø35	

Manufacturers are in no particular order.

Citizen machinery (Miyano Products)

Model	Toolholder dimensions (Gang tool post)	Number of tools	Toolholder dimensions (Turret tool post)	Number of tools	Sleeve dia. (Horizontal/Opposed)	Number of tools	Max. cutting dia.	Remarks
ABX-51SY2			20 x 20 x 125(100)	24	ø25	48	ø51	
ABX-51SYY2			20 x 20 x 125(100)	24	ø25	48	ø51	
ABX-51TH5			20 x 20 x 125(100)	36	ø25	72	ø51	
ABX-51THY2			20 x 20 x 125(100)	36	ø25	72	ø51	
ABX-64SY2			20 x 20 x 125(100)	24	ø25	48	ø64	
ABX-64SYY2			20 x 20 x 125(100)	24	ø25	48	ø64	
ABX-64TH5			20 x 20 x 125(100)	36	ø25	72	ø64	
ABX-64THY2			20 x 20 x 125(100)	36	ø25	72	ø64	
ANX-42SYY			20 x 20 x 125(100)	24(48)	ø25	48	ø42	
BNA-34C			20 x 20 x 125(100)	8(16)	ø25	24	ø34	
BNA-34DHY			20 x 20 x 125(100)	14(22)	ø25	27	ø34	
BNA-34S			20 x 20 x 125(100)	8(16)	ø25	24	ø34	
BNA-42C/S			20 x 20 x 125(100)	8(16)	ø25	24	ø42	
BNA-42DHY			20 x 20 x 125(100)	14(22)	ø25	27	ø42	
BNA-42DHY2			20 x 20 x 125(100)	14(22)	ø25	27	ø42	
BNA-42DHY3			20 x 20 x 125(100)	14(22)	ø25	27	ø42	
BNA-42GTY	20 x 20 x 125(100)	3	20 x 20 x 125(100)	8(16)	ø25	24(7)	ø42	
BNA-42MSY2			20 x 20 x 125(100)	8(16)	ø25	24	ø42	
BNA-42S2			20 x 20 x 125(100)	8(16)	ø25	24	ø42	
BNA-42CY5/SY5			20 x 20 x 125(100)	12(24)	ø25	24	ø42	
BNC-42C7			20 x 20 x 125(100)	8(16)	ø25	24	ø42	
BND-51C2			20 x 20 x 125(100)	12	ø25	24	ø51	
BND-51S2			20 x 20 x 125(100)	12	ø25	24	ø51	
BND-51SY2			20 x 20 x 125(100)	12	ø25	24	ø51	
BNE-42S6			20 x 20 x 125(100)	24	ø25	48	ø42	
BNE-42SY6			20 x 20 x 125(100)	24	ø25	48	ø42	
BNE-51S6			20 x 20 x 125(100)	24	ø25	48	ø51	
BNE-51SY6			20 x 20 x 125(100)	24	ø25	48	ø51	
BNE-51MSY			20 x 20 x 125(100)	24	ø25	48	ø51	
BNE-51MYY			20 x 20 x 125(100)	24	ø25	48	ø51	
BNE-65MYY			20 x 20 x 125(100)	24	ø25	48	ø65	
BNJ-34S3/S5			20 x 20 x 125(100)	18	ø25	30	ø34	
BNJ-34SY3/SY5			20 x 20 x 125(100)	18	ø25	30	ø34	
BNJ-42S3/S5			20 x 20 x 125(100)	18	ø25	30	ø42	
BNJ-42S6			20 x 20 x 125(100)	20	ø25	40	ø42	
BNJ-42SY3/SY5			20 x 20 x 125(100)	18	ø25	30	ø42	
BNJ-42SY5			20 x 20 x 125(100)	18	ø25	30	ø42	
BNJ-42SY6			20 x 20 x 125(100)	20	ø25	40	ø42	
BNJ-51S3/S5			20 x 20 x 125(100)	18	ø25	30	ø51	
BNJ-51SY3/SY5			20 x 20 x 125(100)	18	ø25	30	ø51	
BNJ-51SY6			20 x 20 x 125(100)	20	ø25	40	ø51	
GN-3200	12(16) x 12(16) x 70 ~ 120	4 ~ 5			ø20		ø40	
GN-3200W	12(16) x 12(16) x 70 ~ 120	4 ~ 5			ø20		ø40	"Number of tools" is per turret.
GN-4200	12(16) x 12(16) x 70 ~ 120	6 ~ 7			ø20		ø40	
LX-06E2			20 x 20 x 125(100)	8	ø32	8		6 inch power chuck
LX-06E3			20 x 20 x 125(100)	8	ø32	8		6 inch power chuck
LX-08C			25 x 25 x 150	10	ø40	10		8 inch power chuck
LX-08E2			25 x 25 x 150	8	ø40	8		8 inch power chuck
LX-08E3			25 x 25 x 150	8	ø40	8		8 inch power chuck
LX-08R			20 x 20 x 125(100)	10	ø25	20		8 inch power chuck
LZ-01R2			20 x 20 x 125(100)	12	ø25	24		6 inch power chuck
LZ-01RY2			20 x 20 x 125(100)	12	ø25	24		6 inch power chuck
LZ-02R2			20 x 20 x 125(100)	10	ø25	20		8 inch power chuck
LZ-02RY2			20 x 20 x 125(100)	10	ø25	20		8 inch power chuck
RL01Ⅲ	10 x 10 x 70 ~ 120	2 ~ 3			ø16		ø10	
RL01Ⅴ	10 x 10 x 70 ~ 120	2 ~ 3			ø16		ø10	
RL03	12(16) x 12(16) x 70 ~ 120	4 ~ 5			ø20		ø40	
VC03	12(16) x 12(16) x 70 ~ 120	4 ~ 5			ø20		ø40	

* Number of tools shown in parentheses is the maximum number of toolholder mountable including ø25 sleeves.

Manufacturers are in no particular order.

Star Micronics

Model	Toolholder dimensions (Gang tool post)	Number of tools	Toolholder dimensions (Turret tool post)	Number of tools	Sleeve dia. (Front/Rear)	Number of tools	Max. cutting dia.	Remarks
SB-16 (A/C/D/E)	12 x 12 x 95 ~ 130	5			ø22/ø22	4/4	ø16	Only D/E for rear-end sleeves
	12(10) x 12(10) x 95 ~ 130	6			ø22/ø22	4/4	ø16	
SB-12Ⅱ (C/E)	12 x 12 x 95 ~ 130	6			ø22/ø22	4/4	ø13	Only E for rear-end sleeves
SB-16Ⅱ (C/E)	12(10) x 12(10) x 95 ~ 130	6			ø22/ø22	4/4	ø16	
SB-20 A/C/E	12 x 12 x 95 ~ 130	6			ø22/ø22	4/4	ø20	
SB-12R typeG	12 x 12 x 95 ~ 130	6			ø22/ø22	4/4	ø13	
	10 x 10 x 95 ~ 130	7			ø22/ø22	4/4		
SB-16Ⅲ	12 x 12 x 95 ~ 130	5			ø22/ø22	4/4	ø16	
	10 x 10 x 95 ~ 130	6			ø22/ø22	4/4		
SB-16R/20R typeN	12 x 12 x 95 ~ 130	6			ø22/ø22	4/4	ø16/ø23	
	10 x 10 x 95 ~ 130	7			ø22/ø22	4/4		
SB-16R/20R typeG	12 x 12 x 95 ~ 130	6			ø22/ø22	4/4	ø16/ø23	
	10 x 10 x 95 ~ 130	7			ø22/ø22	4/4		
SB-16R/20R typeGB	12 x 12 x 95 ~ 130	6			ø22/ø22	4/4	ø16/ø23	
	10 x 10 x 95 ~ 130	7			ø22/ø22	4/4		
SP-20	12 x 12 x 100 ~ 130	8			ø22 or ø22+ø32/ø22	5 or 4/4	ø25.4	
	12×12×100 ~ 130 + 16×16×100 ~ 130	7						
SC20	12 x 12 x 95 ~ 130	5			ø22/-	4/-	ø20	
	10 x 10 x 95 ~ 130	6			ø22/-	4/-		
SG-42			16 x 16 x 84 ~ 88(71 ~ 82)		ø22+ø32/-		ø42	
			20 x 20 x 84 ~ 88					
SL-7/10	10 x 10 x 95 ~ 115	6			ø16+ø22/ø16+ø22	4~6/6	ø10	
	8 x 8 x 68 ~ 115	6						
SR-10J	8 x 8 x 67 ~ 110 (Spacer is needed)	6			ø16/ø16+ø22	4/4	ø10	
SR-20RⅡ	12 x 12 x 100 ~ 135	6			ø22/ø22	4/4	ø23	
SR-20RⅢ	12 x 12 x 95 ~ 135	6			ø22/ø22	6/4	ø23	Toolpost for 2 toolholders (deep boring) on the front side
SR-20J typeC	12 x 12 x 95 ~ 135	6			ø22/ø22	6/4	ø23	
SR-20J typeN	12 x 12 x 95 ~ 135	6			ø22/ø22	6/4	ø23	
SR-20JⅡ typeA	12 x 12 x 100 ~ 135	6			ø22/ø22	7/4	ø23	
SR-20JⅡ typeB	12 x 12 x 100 ~ 135	6			ø22/ø22	7/8	ø23	
SR-20Ⅳ typeA	12 x 12 x 100 ~ 130	7			ø22/ø22	6/8	ø23	
SR-20Ⅳ typeB	12 x 12 x 100 ~ 130	7			ø22/ø22	6/8	ø23	
SR-25J/32J	16 x 16 x 95 ~ 155	6			ø22+ø32/ø22	4/4	ø32	
SR-32JⅡ typeA	16 x 16 x 95 ~ 165	6			ø22+ø32/ø22	5/6	ø34	
SR-32JⅡ typeB	16 x 16 x 95 ~ 165	6			ø22+ø32/ø22	5/8	ø34	
SB-32JⅢ typeA	16 x 16 x 95 ~ 165	6			ø22+ø32/ø22	5/6	ø34	
SB-32JⅢ typeB	16 x 16 x 95 ~ 165	6			ø22+ø32/ø22	5/8	ø34	
SD-26 typeS	16 x 16 x 95 ~ 135	7			ø22+ø32/ø22	5/8	ø26	Toolpost for 2 toolholders (deep boring) on the front side
SD-26 typeG	16 x 16 x 95 ~ 135	7			ø22+ø32/ø22	5/8	ø26	
SD-26 typeE	16 x 16 x 95 ~ 135	7			ø22+ø32/ø22	5/8	ø26	
SD-26 typeC	16 x 16 x 95 ~ 135	7			ø22+ø32/ø22	5/8	ø26	
SR-38 typeA	16 x 16 x 95 ~ 135	4			ø22+ø32/ø22	5/8	ø38	
	16 x 16 x 100	2						
	20 x 20 x 105 ~ 135 (Cut-off)	1						
SR-38 typeB	16 x 16 x 95 ~ 135	4			ø22+ø32/ø22	5/8	ø38	
	16 x 16 x 100	2						
	20 x 20 x 105 ~ 135 (Cut-off)	1						
SR-38J	16 x 16 x 95 ~ 135	4			ø22+ø32/ø22	5/4	ø38	
	16 x 16 x 95 ~ 135 (Optional)	3						
	20 x 20 x 105 ~ 135 (Cut-off)	1						
ST-20			12 x 12 x 73 ~ 79		ø22+ø32/ø22+ø32		ø20	
			12 x 12 x 65 ~ 73 (Cut-off)					
			16 x 16 x 64 ~ 73					
			16 x 16 x 65 ~ 73 (Cut-off)					
ST-38			16 x 16 x 83 ~ 88		ø22+ø32/ø22+ø32		ø38	
			16 x 16 x 71 ~ 82					
			16 x 16 x 84 ~ 88 (Cut-off)					
			20 x 20 x 84 ~ 88					
			20 x 20 x 84 ~ 88 (Cut-off)					
SV-12/20	12 x 12 x 95 ~ 135	5	12 x 12 x 70 ~ 78		ø22+ø32/-		ø12/ø20	
	16 x 16 x 95 ~ 135	4	16 x 16 x 65 ~ 70					
SV-20R	12 x 12 x 95 ~ 135	7	12 x 12 x 70 ~ 78		ø22+ø32/ø22	- / 8	ø23	
	16 x 16 x 95 ~ 135	6	16 x 16 x 65 ~ 70					
SV-32	16 x 16 x 95 ~ 135	4	16 x 16 x 60 ~ 78(80 ~ 88)		ø22+ø32/-		ø32	
SV-38R	16 x 16 x 105 ~ 135	4	16 x 16 x 84 ~ 88		ø22+ø32/ø34	- / 8	ø38	
	20 x 20 x 115 ~ 135 (Cut-off)	1	16 x 16 x 71 ~ 82					
			20 x 20 x 84 ~ 88					
SW-12RⅡ	10x 10 x 95 ~ 115	7			ø16/ø22	4/8	ø13	
SW-20	12 x 12 x 80 ~ 150	6			ø22/ø22	4/8	ø23	
	16 x 16 x 80 ~ 144							
SX-38 typeA	16 x 16 x 95 ~ 135	4	16 x 16 x 84 ~ 88		ø22+ø32/ø34	- / 8	ø38	
	20 x 20 x 105 ~ 135 (Cut-off)	1	16 x 16 x 71 ~ 82					
			20 x 20 x 84 ~ 88					
SX-38 typeB	16 x 16 x 95 ~ 135	4	16 x 16 x 84 ~ 88		ø22+ø32/ø34	- / 8	ø38	
	20 x 20 x 105 ~ 135 (Cut-off)	1	16 x 16 x 71 ~ 82					
			20 x 20 x 84 ~ 88					

Manufacturers are in no particular order.

Eguro

Model	Toolholder dimensions (Gang tool post)	Number of tools	Toolholder dimensions (Turret tool post)	Number of tools	Sleeve dia. (Horizontal/Opposed)	Number of tools	Max. cutting dia.	Remarks
NUCBOY-8EX	12 x 12	6			ø20 or ø25 or ø30	5	ø20	
NUCLET-10EX/EL	16 x 16	6			ø20 or ø25 or ø30	5	ø25.5	
NUCPAL-10EX/EL	16 x 16	10			ø20 or ø25 or ø30	8	ø25.5	
NUCLET-10vv	16 x 16	6			ø20 or ø25 or ø30	5	ø25.5	
NUCBOY-8LL	12 x 12	2			ø20 or ø25 or ø30	2	ø20	
NUCLET-10LL	16 x 16	2			ø20 or ø25 or ø30	2	ø25.5	
NUCROBO-8EX	12 x 12	6			ø20 or ø25 or ø30	5	ø20	
NUCROBO-101	16 x 16	6			ø20 or ø25 or ø30	5	ø25.5	
NUCROBO-202	16 x 16	10			ø20 or ø25 or ø30	8	ø25.5	
SANAX-6	12 x 12	10			ø12 or ø16/ø30	3~6/2	ø15	
SANAX-10	16 x 16	10			ø20 or ø30/ø30	5~8/3	ø25.5	
SANATURN-6	12 x 12	5			ø16/ø30	3~5/2	ø15	
SANATURN-10	16 x 16	6			ø20/ø30	7/3	ø25.5	
EBN-10EX	12 x 12	5			ø20 or ø25 or ø30	4	ø25.5	
GL-120	12 x 12	4			-		ø20	
EB-6	8 x 8	2			-		ø15	
EB-8	10 x 10	2			-		ø20	
EB-10	10 x 10	2			-		ø25.5	

Manufacturers are in no particular order.

Tsugami

Model	Toolholder dimensions (Gang tool post)	Number of tools	Toolholder dimensions (Turret tool post)	Number of tools	Sleeve dia. (Horizontal/Opposed)	Number of tools	Max. cutting dia.	Remarks
B073C	8 x 8 x 85	9	-	-	ø20/-	4/-	ø7	
B073-VR	8 x 8 x 85	9	-	-	ø20/-	4/-	ø7	
B075C	8 x 8 x 85	9	-	-	ø20/ø20	4/4(8)	ø7	
B075-VR	8 x 8 x 85	9	-	-	ø20/ø20	4/4(8)	ø7	
B0123C	12 x 12 x 85	9	-	-	ø20/-	4/-	ø12	
B0123-VR	12 x 12 x 85	9	-	-	ø20/-	4/-	ø12	
B0125C	12 x 12 x 85	9	-	-	ø20/ø20	4/4(8)	ø12	
B0126C	12 x 12 x 85	9	-	-	ø20/ø20	4/4(8)	ø12	
B0125-VR	12 x 12 x 85	9	-	-	ø20/ø20	4/4(8)	ø12	
B0126-VR	12 x 12 x 85	9	-	-	ø20/ø20	4/4(8)	ø12	
B0128W	12 x 12 x 85	9	-	-	ø20/ø20	4/4(8)	ø12	
B0203-VR	12 x 12 x 85	9	-	-	ø20/-	4/-	ø20	
B0205-VR	12 x 12 x 85	9	-	-	ø20/ø20	4/4(8)	ø20	
B0206-VR	12 x 12 x 85	9	-	-	ø20/ø20	4/4(8)	ø20	
B0208W	12 x 12 x 85	9	-	-	ø20/ø20	4/4(8)	ø20	
BM163-VR	12 x 12 x 85	9	-	-	ø20/-	4/-	ø16	
BM165-VR	12 x 12 x 85	9	-	-	ø20/ø20	4/4(8)	ø16	
BW127J-II	12 x 12 x 85	7	-	-	ø20/ø20	3/4(9)	ø12	
BW128J-II	12 x 12 x 85	7	-	-	ø20/ø20	3/4(9)	ø12	
BW128ZJ-I / II	12 x 12 x 85	7	-	-	ø20/ø20	3/4(9)	ø12	
BW129ZJ-I / II	12 x 12 x 85	7	-	-	ø20/ø20	3/4(9)	ø12	
BW207J-II	12 x 12 x 85/16 x 16 x 85	5/2	-	-	ø20/ø20	3/4(9)	ø20	
BW208J-II	12 x 12 x 85/16 x 16 x 85	5/2	-	-	ø20/ø20	3/4(9)	ø20	
BW208ZJ-I / II	12 x 12 x 85/16 x 16 x 85	5/2	-	-	ø20/ø20	3/4(9)	ø20	
BW209ZJ-I / II	12 x 12 x 85/16 x 16 x 85	5/2	-	-	ø20/ø20	3/4(9)	ø20	
B0265-III	16 x 16 x 100	12	-	-	ø25/ø25	7/4(9)	ø26	
B0266-III	16 x 16 x 100	12	-	-	ø25/ø25	7/8(13)	ø26	
B0265V-III	16 x 16 x 100	6	-	-	ø25/ø25	7/4(9)	ø26	
B0266V-III	16 x 16 x 100	6	-	-	ø25/ø25	7/8(13)	ø26	
B0325-III	16 x 16 x 100	12	-	-	ø25/ø25	7/4(9)	ø32	
B0326-III	16 x 16 x 100	12	-	-	ø25/ø25	7/8(13)	ø32	
B0325V-III	16 x 16 x 100	6	-	-	ø25/ø25	7/4(9)	ø32	
B0326V-III	16 x 16 x 100	6	-	-	ø25/ø25	7/8(13)	ø32	
B0385(L)-III	16 x 16 x 100/20 x 20 x 125	11/1	-	-	ø32,ø25/ø32	3,2/5(10)	ø38	
B0386(L)-III	16 x 16 x 100/20 x 20 x 125	11/1	-	-	ø32,ø25/ø32	3,2/5(13)	ø38	
B0385(L)V-III	16 x 16 x 100/20 x 20 x 125	5/1	-	-	ø32,ø25/ø32	3,2/5(10)	ø38	
B0386(L)V-III	16 x 16 x 100/20 x 20 x 125	5/1	-	-	ø32,ø25/ø32	3,2/5(13)	ø38	
B038T	16 x 16 x 125/20 x 20 x 125	2 ~ 5/1	20 x 20 x 125	St.8	ø32/ø25		ø38	
C150	12 x 12 x 60 ~ 100	4 ~ 6	-	-	-		ø80	
C180	12 x 12 x 60 ~ 100	4 ~ 6	-	-	-		ø120	
C220/220T	12 x 12 x 60 ~ 100	6 ~ 8	-	-	-		ø120	
C200	12 x 12 x 60 ~ 100	4 ~ 6	-	-	-		ø120	
P013	8 x 8 x 100 ~ 120	6	-	-	ø16/-	3/-	ø1	
P014	8 x 8 x 100 ~ 120	6	-	-	ø16/ø16	3/(3)	ø1	
P033	8 x 8 x 100 ~ 120	6	-	-	ø16/-	3/-	ø3	
P034	8 x 8 x 100 ~ 120	6	-	-	ø16/ø16	3/(3)	ø3	
P036W	8 x 8 x 100 ~ 120	6	-	-	ø16/ø16	4/(4)	ø3	
P053	8 x 8 x 100 ~ 120	6	-	-	ø16/-	3/-	ø5	
P054	8 x 8 x 100 ~ 120	6	-	-	ø16/ø16	3/(3)	ø5	
S205-II	12 x 12 x 100	9	-	-	ø25/ø25	7/4(9)	ø20	
S206-II	12 x 12 x 100	9	-	-	ø25/ø25	7/8(13)	ø20	
S205A-II	12 x 12 x 100	9	-	-	ø25/ø25	5/4(9)	ø20	
S206A-II	12 x 12 x 100	9	-	-	ø25/ø25	5/8(13)	ø20	
SS207-II (-5AX)	12 x 12 x 100	8	-	-	ø22/ø20	6/8(12)	ø20	
SS267-III (-5AX)	16 x 16 x 100	8	-	-	ø25/ø25	6/8(12)	ø26	
SS327-III (-5AX)	16 x 16 x 100	8	-	-	ø25/ø25	6/8(12)	ø32	
BW269ZJ	16 x 16 x 100	7	-	-	ø25/ø25	7/8(13)	ø26	
BW329ZJ	16 x 16 x 100	7	-	-	ø25/ø25	7/8(13)	ø32	
MB25	-	-	20 x 20 x 90	2 x St.8	ø20/ø32	5/4	ø25	
M06JC-II		-	20 x 20 x 125	St.8	ø25		ø220/ø42	
M06J-II		-	25 x 25 x 150	St.8	ø32/ø40		ø260/ø51	
M08J-II		-	25 x 25 x 150	St.8	ø32/ø40		ø280/ø65	
M08JL5-II		-	25 x 25 x 150	St.8	ø32/ø40		ø280/ø65	
M08JL8-II		-	25 x 25 x 150	St.8	ø32/ø40		ø280/ø65	
M06D-II		-	25 x 25 x 150	St.12	ø40		ø260/ø51	
M08D-II		-	25 x 25 x 150	St.12	ø40		ø280/ø65	
M06DY-II		-	25 x 25 x 150	St.12	ø40		ø260/ø51	
M08DY-II		-	25 x 25 x 150	St.12	ø40		ø280/ø65	
M06SJ-II		-	25 x 25 x 150	St.12	ø40		ø260/ø51	
M08SJ-II		-	25 x 25 x 150	St.12	ø40		ø280/ø65	
M06SD-II		-	25 x 25 x 150	St.12	ø40		ø260/ø51	
M08SD-II		-	25 x 25 x 150	St.12	ø40		ø280/ø65	
M06SY-II		-	25 x 25 x 150	St.12	ø40		ø260/ø51	
M08SY-II		-	25 x 25 x 150	St.12	ø40		ø280/ø65	
M10J		-	25 x 25 x 150	St.12	ø40		ø400/ø80	
M10JL10		-	25 x 25 x 150	St.12	ø40		ø400/ø80	
M10D		-	25 x 25 x 150	St.12	ø40		ø400/ø80	
B020M-III	12 x 12 x 100	1	-	-	ø25/ø25	1/6	ø20	
SS20MH-III-5AX	12 x 12 x 100	1	-	-	ø25/ø25	1/6	ø20	
B026M-III	20 x 20 x 100 ~ 125	1	-	-	ø32/ø25	1/10	ø26	
SS26MH-III-5AX	20 x 20 x 100 ~ 125	1	-	-	ø32/ø25	1/10	ø26	
B038M	20 x 20 x 100 ~ 125	1	-	-	ø32/ø25	1/10	ø38	
SS38MH-5AX	20 x 20 x 100 ~ 125	1	-	-	ø32/ø25	1/10	ø38	
TMA8F	20 x 20 x 100 ~ 125	1			ø32/ø32		ø220/ø65	
TMA8J	20 x 20 x 100 ~ 125	1			ø32/ø32		ø220/ø65	
TMA8H	20 x 20 x 100 ~ 125	1			ø32/ø32		ø220/ø65	

Manufacturers are in no particular order.

Nomura DS

Model	Toolholder dimensions (Gang tool post)	Number of tools	Toolholder dimensions (Turret tool post)	Number of tools	Sleeve dia. (Horizontal/Opposed)	Number of tools	Max. cutting dia.	Remarks
NN-10C	10 x 10 x 130	6			ø17		ø10	
NN-10CS	10 x 10 x 130	5			ø17	4	ø10	
NN-10SII	10 x 10 x 130	5			ø23		ø10	
NN-10T	10 x 10 x 130	7			ø23		ø10	
NN-10SB5	10 x 10 x 130	5			ø23		ø13	
NN-10EX2	10 x 10 x 120	6			ø16	4	ø10	
NN-10EX2	10 x 10 x 80	7			ø16	4	ø10	
NN-10EX3	10 x 10 x 80	7			ø16	4	ø10	
NN-16SB5	10 x 10 x 130	5			ø23		ø16	
NN-16SB6 Type1	12 x 12 x 130*	7			ø17(ø22)	4	ø16	
NN-16SB6 Type2	12 x 12 x 130*	5			ø17(ø22)	4	ø16	
NN-16SB6 Type2.5	12 x 12 x 130*	6			ø17(ø22)	5	ø16	
NN-16SB6 Type3	12 x 12 x 130*	5			ø17(ø22)	4	ø16	
NN-16SB7	12 x 12 x 130*	5			ø16	4	ø16	
NN-16SB7-M8	12 x 12 x 130*	5			ø16	4	ø16	
NN-20SB	12 x 12 x 130*	5			ø16	3	ø20	
					ø22	2	ø20	
NN-16HIII	12 x 12 x 130	6			ø23		ø16	
NN-20HIII	12 x 12 x 130	6			ø23		ø20	
NN-16UIII	12 x 12 x 130	5			ø23		ø16	
NN-20UIII	12 x 12 x 130	5			ø23		ø20	
NN-20CS	12 x 12 x 130*	5(6)			ø22	4	ø20(ø25)	
NN-20U5	12 x 12 x 150*	5(6)			ø22	4	ø20(ø25)	
NN-32U5	12 x 12 x 150*	3(4)			ø32	1	ø32	
	16 x 16 x 130	2			ø22	3		
NN-16UB5	12 x 12 x 130	5			ø23		ø16	
NN-20UB5	12 x 12 x 130	5			ø23		ø20	
NN-20UB7	12 x 12 x 130	6			ø23		ø20	
NN-20UB8	12 x 12 x 150*	5(6)			ø22	4	ø20(ø25)	
NN-20UB10	12 x 12 x 150*	5(6)			ø22	4	ø20(ø25)	
NN-32UB8	12 x 12 x 150*	3(4)			ø32	1	ø32	
	16 x 16 x 130	2			ø22	3		
NN-32UB10W	12 x 12 x 150*	3(4)			ø32	1	ø32	
	16 x 16 x 130	2			ø22	3		
NN-20YB	12 x 12 x 130	6			ø23		ø20	
NN-25YB/32YB	16 x 16 x 130	5			ø23/ø32		ø25/ø32	
NN-32YB5	16 x 16 x 130	5			ø22/ø32	4	ø32	
NN-32YB5 XB	16 x 16 x 130	6			ø22/ø32	5/1	ø32	
NN-16J	12 x 12 x 130*	6			ø23		ø16	
NN-20J	12 x 12 x 130*	6			ø23		ø20	
NN-20J2	12 x 12 x 130*	6			ø22	4	ø20	
NN-20J5	12 x 12 x 130*	6			ø22	4	ø20	
NN-20J5 XB	12 x 12 x 130*	5			ø22	4	ø20	
NN-32J	16 x 16 x 130	6			ø25	2	ø32	
					ø32	3		
NN-32DB	16 x 16 x 130	8			ø22	4	ø32	
					ø32	1		
NN-38DB	20 x 20 x 130	7			ø22	4	ø38	
					ø32	1		
NN-38KM	16 x 16 x 130	5			ø25	3	ø38	
					ø32	2		

* 12.7 x 12.7 toolholder mountable

Manufacturers are in no particular order.

List of instruments and applicable small parts machining and toolholders

Models of major machine tool manufacturers				Applicable toolholders
Manufacturer	Model (Automatic lathe)	Toolholder size	Total length of attached toolholder (Max.)	
Citizen Machinery	A12, A16, B12, L12, RL01, RL21	10 x 10	100	…1010F-..
	K12, K16	12 x 12		…1212F-..
	RL02	16 x 16		…1616H-..
	B12E, B16E, BL12, C12, C16, M12, M16 MSL12	10 x 10	120	…1010JX-..
	A20, A20Ⅵ, B20, BL20, BL25, K12E, K16E L20X, L220, MC20	12 x 12		…1212JX-..
	L16, L20, L20E	12 x 12	130	…1212JX-..
	C32, L25, L32, M20, M32	16 x 16		…1616JX-..
	A32, D25		150	
Star Micronics	SW-12RⅡ	10 x 10	120	…1010JX-..
	SB-16A, SB-16C, SB-16D, SB-12Ⅱ, SB-16Ⅱ SB-12R/16R/20R, SR-20Ⅳ, SB-20A/C/E, SC20	12 x 12	130	…1212JX-..
	SR-20RⅡ, SR-20Ⅲ, SV-12, SV-20, SR-20J	12 x 12	135	…1212JX-..
	SV-20R, SV-32, SV-38R, SR-38J, SX-38	16 x 16		…1616JX-..
	SR-25J, SR-32J, SW-20	16 x 16	150	…1616JX-..
Tsugami	B0, BH20, BM, BW2	12 x 12	85	…1212F-..
	C150, C180, C220, S205, S206, SS207	12 x 12	100	…1212F-..
	BH38, B0265, B0266, B0325, B0326 SS26, SS32/32L, SS267, SS327	16 x 16		…1616H-..
Nomura DS	NN-10C, NN-10CS, NN-10EX2, NN-10SⅡ NN-10SB5, NN-10T, NN-16SB5	10 x 10	130	…1010JX-..
	NN-16HⅢ, NN-16J, NN-16SB6/7, NN-16UB5, NN-16UⅢ, NN-20CS, NN-20HⅢ, NN-20J/J2/J5, NN-20SB, NN-20UⅢ, NN-20U5, NN-20UB5/7, NN-20YB	12 x 12		…1212JX-..
	NN-25YB, NN-32DB, NN-32YB/YB5, NN-32J, NN-38KM	16 x 16		…1616JX-..

Manufacturers are in no particular order.

Parts compatibility of lever lock toolholders

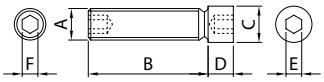
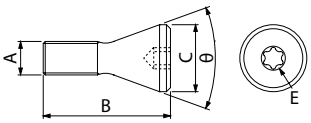
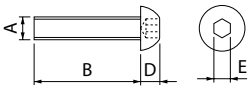
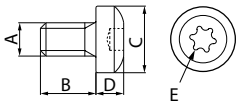
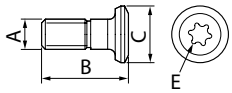
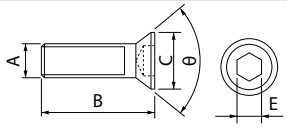
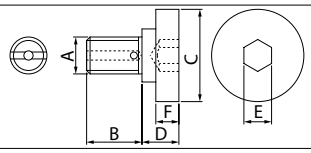
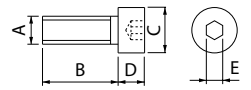
1) For better usability of lever lock toolholders, some levers, lock screws and shims are modified.
2) It is highly recommended to use only new parts. However, they are compatible with conventional parts and can be used together with them.
3) It is possible to use new parts only with a toolholder which has been in use.
4) When purchasing replacements, order them stating the new numbers.
5) Some of the shims remain unmodified.

Classification	Toolholder description			Spare parts					
				Lever		Lock screw		Shim	
				New No.	Conventional	New No.	Conventional	New No.	Conventional
External turning toolholders	PCLN$^{R}_{L}$		.....-09	LL-1N	LL-1	LS-1N	LS-1	LC-32N	LC-32
			.....-12	LL-2N	LL-2	LS-2N	LS-2	LC-42N	LC-42
			.....-16	LL-5N	LL-5	LS-4N	LS-4	LC-53N	LC-53
	PDJN$^{R}_{L}$		.....-11	LL-1DN	LL-1D	LS-1N	LS-1	LD-32N	LD-32
			.....-15	LL-3N	LL-3	LS-2N	LS-2	LD-42	
	PSBN$^{R}_{L}$		.....-09	LL-1N	LL-1	LS-1N	LS-1	LS-32	
			.....-12	LL-2N	LL-2	LS-2N	LS-2	LS-42	
	PSKN$^{R}_{L}$		.....-09	LL-1N	LL-1	LS-1N	LS-1	LS-32	
			.....-12	LL-2N	LL-2	LS-2N	LS-2	LS-42	
	PSSN$^{R}_{L}$		.....-09	LL-1N	LL-1	LS-1N	LS-1	LS-32	
			.....-12	LL-2N	LL-2	LS-2N	LS-2	LS-42	
	PSDNN		.....-09	LL-1N	LL-1	LS-1N	LS-1	LS-32	
			.....-12	LL-2N	LL-2	LS-2N	LS-2	LS-42	
	PTGN$^{R}_{L}$		1212F-11	LL-03N	LL-03	LS-03N	LS-03	-	
			.....-11	LL-03TN	LL-03T	LS-03SN	LS-03S	-	
			.....-16	LL-1N	LL-1	LS-1N	LS-1	LT-32N	LT-32
			.....-22	LL-2N	LL-2	LS-2N	LS-2	LT-42N	LT-42
	PTFN$^{R}_{L}$		1212F-11	LL-03N	LL-03	LS-03N	LS-03	-	
			.....-11	LL-03TN	LL-03T	LS-03SN	LS-03S	-	
			.....-16	LL-1N	LL-1	LS-1N	LS-1	LT-32N	LT-32
			.....-22	LL-2N	LL-2	LS-2N	LS-2	LT-42N	LT-42
	PRGC$^{R}_{L}$		.....-12	LL-1CN	LL-1C	LS-1N	LS-1	LR-12C	
	PRXC$^{R}_{L}$		.....-12						
	PRGN$^{R}_{L}$		.....-09	LL-1N	LL-1	LS-1N	LS-1	LR-80	
			.....-12	LL-2N	LL-2	LS-2N	LS-2	LR-81	
	PWLN$^{R}_{L}$		.....-06	LL-1N	LL-1	LS-1N	LS-1	LW-32N	LW-32
			.....-08	LL-2N	LL-2	LS-2N	LS-2	LW-42N	LW-42
Boring bars	□16M-	PCLN$^{R}_{L}$	09-20	LL-03SN	LL-03S	LS-03SN	LS-03S	-	
	□20Q-		09-27	LL-1N	LL-1	LS-1SN	LS-1S	LC-32N	LC-32
	□25R-		09-32						
	....-	PCLN$^{R}_{L}$	12-..	LL-2N	LL-2	LS-2N	LS-2	LC-42N$^{R}_{L}$	LC-42$^{R}_{L}$
	....-	PDUN$^{R}_{L}$	11-..	LL-1DN	LL-1D	LS-1SN	LS-1S	LD-32N	LD-32
	....-	PTUN$^{R}_{L}$	11-..	LL-03TN	LL-03T	LS-03SN	LS-03S	-	
	S25R-	PTUN$^{R}_{L}$	16-30	LL-03SN	LL-03S	LS-03SN	LS-03S	-	
	S32S-		16-40	LL-1N	LL-1	LS-1N	LS-1	LT-32N	LT-32
	S40T-		16-50						
	□16M-	PWLN$^{R}_{L}$	06-20	LL-03SN	LL-03S	LS-03SN	LS-03S	-	
	□20Q-		06-27	LL-1N	LL-1	LS-1SN	LS-1S	LW-32N	LW-32
	□25R-		06-32						
	....-	PWLN$^{R}_{L}$	08-..	LL-2N	LL-2	LS-2N	LS-2	LW-42N$^{R}_{L}$	LW-42$^{R}_{L}$
Turning mill	T63H-	PCLN$^{R}_{L}$	-DX12	LL-2N	LL-2	LS-2N	LS-2	LC-42N	LC-42
	T63H-	PCMNN	-□12						
	T63H-	PDJN$^{R}_{L}$	-DX15	LL-3N	LL-3	LS-2N	LS-2	LD-42	
	T63H-	PDNNN	-□15						
	T63H-	PTGN$^{R}_{L}$	-DX16	LL-1N	LL-1	LS-1N	LS-1	LT-32N	LT-32
	T63H-	PWLN$^{R}_{L}$	-DX08	LL-2N	LL-2	LS-2N	LS-2	LW-42N	LW-42

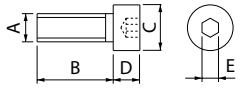
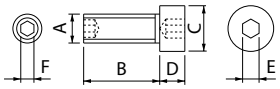
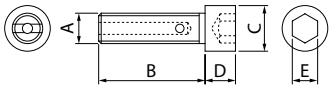
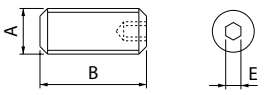
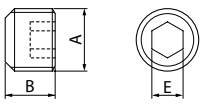
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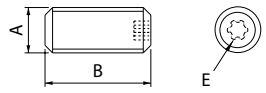
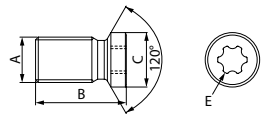
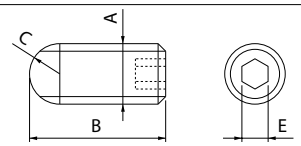
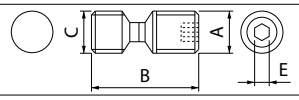
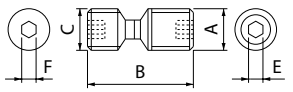
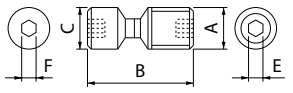
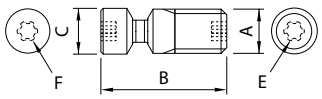
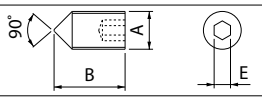
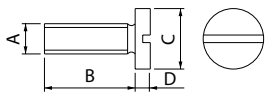
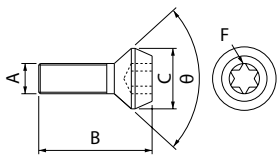
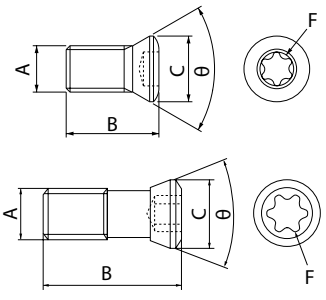
Screws	P2
Pins	P7
Shims	P8
Cartridges	P12
Clamp sets	P13
Clamps	P15
Chipbreakers	P16
Wrenches	P17
Springs / Nuts / Punches / Others	P18
Former parts list	P20

Shape	Description		Availability	Dimension (mm)						Angle		Torque (N·m)	Remarks
				A	B	C	D	E	F	α	θ		
	AJ	-6X38	⊙	M6X1.0	38.0	6.0	10.0	3.0	3.0	-	-	-	
		-8X44-9.5	⊙	M8X1.25	44.0	9.5	6.0	4.0	4.0	-	-		
		-10X46	⊙	M10X1.5	46.0	11.5	8.0	5.0	5.0	-	-		
	AJ	-519TR	⊙	M5X0.8	19.0	10.0	-	T15	-	-	40°	-	
	BH	3X6	⊙	M3X0.5	6.0	-	2.0	2.0	-	-	-	-	
		3X12	⊙	M3X0.5	12.0	-	2.0	2.0	-	-	-		
		6X25	⊙	M6X1.0	25.0	-	4.0	4.0	-	-	-		
	BH	6X10TR	⊙	M6X1.0	10.0	12.0	5.0	T25	-	-	-	6.5	
	CP	8X15TL	⊙	M8X1.25	15.0	15.0	-	T25	-	-	-	6.0	L... shows Left-hand thread
		8X23TL	⊙		23.0								
	CS	-2D	⊙	M4X0.7	21.5	6.4	3.5	2.5	2.0	-	-	1.7	
		-3D	⊙	M5X0.8	22.0	8.0	4.0	3.0	2.5	-	-	3.9	
		-5D	⊙	M5X0.8	28.0	8.0	4.0	3.0	2.5	-	-	3.0	
	CS	-3D-TR	⊙	M5X0.8	22.0	8.0	4.0	T15	T15	-	-	3.9	
	GS	-50	⊙	M5X0.8	13.0	7.5	-	3.0	-	-	82°	-	
	HF	20X53H	⊙	M20X2.5	35.0	43.0	18.0	14.0	14.0				With Coolant Hole
		20X53HA	⊙		33.0	50.0	20.0						
		24X60H	⊙	M24X3.0	40.5	65.0	19.5	17.0					
		24X60HA	⊙		36.0		24.0						
	HH	3X6	●	M3X0.5	6.0	5.5	3.0	2.5	-	-	-	-	
		3X10S	●		10.0	5.0							
		3X12	●		12.0	5.5							
	HH	3.5X10S	●	M3.5X0.6	10.0	5.5	3.0	2.5	-	-	-		
	HH	4X12S	●	M4X0.7	12.0	7.0	4.0	3.0	-	-	-		
		4X16	●		16.0								
	HH	5X12	●	M5X0.8	12.0	8.5	5.0	4.0	-	-	-		
		5X15	●		15.0								L... shows Left-hand thread
		5X15L	●										
		5X16	●		16.0								
		5X20	●		20.0								
		5X25	●		25.0								
		5X30	●		30.0								

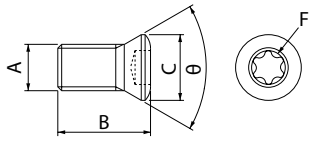
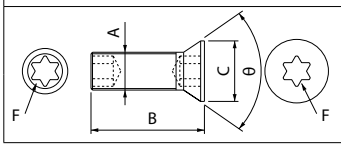
⊙: Available

Shape	Description		Availability	Dimension (mm)						Angle		Torque (N·m)	Remarks
				A	B	C	D	E	F	α	θ		
	HH	6X12	⊙	M6X1.0	12.0	10.0	6.0	5.0	-	-	-	-	
		6X16	⊙		16.0								
		6X16A	⊙										
		6X18	⊙		18.0								
		6X18A	⊙										
		6X20	⊙		20.0								
		6X25	⊙		25.0								
		6X30	⊙		30.0								
	HH	8X20	⊙	M8X1.25	20.0	13.0	8.0	6.0	-	-	-		
		8X25	⊙		25.0								
	HH	10X25	⊙	M10X1.5	25.0	16.0	10.0	8.0	-	-	-		
		10X30	⊙		30.0								
		10X35	⊙		35.0								
		10X40	⊙		40.0								
	HH	12X35	⊙	M12X1.75	35.0	18.0	12.0	10.0	-	-	-		
		12X40	⊙		40.0								
	HH	16X35	⊙	M16X2.0	35.0	24.0	16.0	14.0	-	-	-		
		16X40	⊙		40.0								
		16X45	⊙		45.0								
	HH	20X40	⊙	M20X2.5	40.0	30.0	20.0	17.0	-	-	-		
		20X55	⊙		55.0								
	HH	4X12	⊙	M4X0.7	10.0	7.0	4.0	3.0	2.0	-	-	-	
	HH	8X25H	⊙	M8X1.25	25.0	13.0	8.0	5.0	-	-	-	-	With coolant hole
		10X30H	⊙	M10X1.5	30.0	16.0	10.0	6.0					
		10X35HK	⊙		35.0								
		12X35H	⊙	M12X1.75	35.0	18.0	12.0	8.0					
		12X35HK	⊙										
		16X52H	⊙	M16X2.0	36.0	24.0	16.0	12.0					
	HS	3X3P	⊙	M3X0.5	2.9	-	-	1.5	-	-	-	1.0	HS4X4P and HS6X4P have a flat edge Clamp screw equivalent to JIS B-1177
		3X4P	⊙		3.9								
		3X4	⊙		4.0								
	HS	4X4P	⊙	M4X0.7	3.9	-	-	2.0	-	-	-	2.0	
		4X4	⊙		4.0								
	HS	5X5	⊙	M5X0.8	5.0	-	-	2.5	-	-	-	3.0	
	HS	6X4P	⊙	M6X0.75	3.9	-	-	3.0	-	-	-	4.0	
		6X6	⊙	M6X1.0	6.0								
		6X8T	⊙		8.0								
		6X14	⊙		14.0								
		6X22	⊙		22.0								
	HS	8X10	⊙	M8X1.25	10.0	-	-	4.0	-	-	-	-	
		8X12	⊙		12.0								
	HS	10X10	⊙	M10X1.5	10.0	-	-	5.0	-	-	-		
		10X16	⊙		16.0								
	HS	12X12	⊙	M12X1.75	12.0	-	-	6.0	-	-	-		
		12X16	⊙		16.0								
		12X18	⊙		18.0								
		12X20	⊙		20.0								
		12X25	⊙		25.0								
		12X30	⊙		30.0								
		12X35	⊙		35.0								
	HS	16X12	⊙	M16X2.0	12.0	-	-	8.0	-	-	-		
		16X18	⊙		18.0								
		16X20	⊙		20.0								
	HS	5X4LP	⊙	M5X0.8	4.0	-	-	2.5	-	-	-	-	

⊙: Available

Shape	Description		Availability	Dimension (mm)						Angle		Torque (N·m)	Remarks
				A	B	C	D	E	F	α	θ		
	HS	-2524TRP	⊙	M2.5X0.35	2.4	-	-	5IP	-	-	-	0.5	IP shows Torx Plus
		-2534TRP	⊙		3.4								
		-3048TRP	⊙	M3X0.5	4.8			6IP				0.8	
		-4067TRP	⊙	M4X0.7	6.7			7IP				1.2	
	HS	-50100TRP	⊙	M5X0.8	10	6.0	1.6	15IP	-	-	-	3.5	IP shows Torx Plus
	HSB	4X8R/L	⊙	M4X0.7	8.0	R2.0	-	2.0	-	-	-	2.0	R... shows Right-hand thread L... shows Left-hand thread
	LS	-03N	⊙	M5X0.8	9.7	M5X0.8	-	2.0	-	-	-	2.0	N: Silver coated
		-03SN	⊙		12.0			2.5				3.0	
	LS	-05	⊙	M5X0.8	15.5	M5X0.8	-	2.0	2.0	-	-	2.0	
	LS	-1N	⊙	M6X1.0	17.0	6.0	-	2.5	2.5	-	-	3.0	N: Silver coated
		-1SN	⊙		14.2								
		-1T	⊙		21.0								
	LS	-2N	⊙	M8X1.0	20.0	8.0	-	3.0	3.0	-	-	4.0	
		-3	⊙		22.0								
		-4N	⊙		24.0								
		-5	⊙	M10X1.0	29.0	10.0	-	4.0	4.0	-	-	-	
	LS	-1P	⊙	M6X1.0	16.5	6.0	-	10IP	10IP	-	-	2.0	IP shows Torx Plus
		-2P	⊙	M8X1.0	18.2	8.0		15IP	15IP			3.5	
		-3P	⊙		21.8								
	LS	-11	⊙	M6X1.0	9.5	-	-	3.0	-	-	-	-	
		-15	⊙		12.5								
	M	3X8	⊙	M3X0.5	8.0	5.5	2.0	-	-	-	-	-	Flat fillister head screw equivalent to JIS B-1101
		3X12	⊙		12.0								
		4X10	⊙	M4X0.7	10.0	7.0	2.6						
	SB	-1TR	⊙	M2X0.4	5.3	3.8	-	-	T6	-	82°	0.5	R... shows right-hand thread
		-2TR	⊙	M2.5X0.45	6.2	4.5			T8			1.2	
		-3TR	⊙	M3X0.5	7.2	4.8			T10			2.0	
		-3STR	⊙		6.4	5.2							
		-3.5TR	⊙	M3.5X0.6	9.3	5.6			T15			3.5	
		-4TR	⊙	M4X0.7	7.7	5.8							
		-5TR	⊙	M5X0.8	20.0	8.7			T20		90°	4.5	
		-2290TR	⊙	M2.2X0.45	9.2	2.8			T6		60°	0.5	
		-25100TR	⊙	M2.5X0.45	10.0	3.5			T7			0.8	
		-40115TR	⊙	M4X0.7	11.5	5.5			T15			3.5	
		-5070TR	⊙	M5X0.8	7.0	6.8			T20			4.5	
		-5090TR	⊙		9.0								
		-50120TR	⊙		12.0								
 SB-40125TRN	SB	-1STR	⊙	M2X0.4	5.0	3.1			T6		60°	0.5	R... shows right-hand thread L... shows left-hand thread IP shows Torx Plus
		-1635TR	⊙	M1.6X0.35	3.3	2.6						0.4	
		-1840TRP	⊙	M1.8X0.35	4.0	2.5			6IP		55°		
	SB	-2035TR	⊙	M2X0.4	3.7	3.0			T6		60°		
		-2035TRG	⊙		3.5	2.7							
		-2037TRP	⊙		3.7				6IP		55°		
		-2040TR	⊙		3.8	3.0			T6		60°		
		-2040TRG	⊙		4.0								
		-2041TRP	⊙		4.1	2.7			6IP				
		-2042TRG	⊙										
		-2045TR	⊙		4.3				T6				
		-2045TRN	⊙			2.8					37°		
		-2050TR	⊙		4.8	3.0					60°		
		-2060TR	⊙		5.8	3.5			T8			1.2	
		-2080TR	⊙		8.3	2.8			T6			0.5	

⊙: Available

Shape	Description		Availability	Dimension (mm) A	B	C	D	E	F	Angle α	θ	Torque (N·m)	Remarks
	SB	-2250TR	⊙	M2.2X0.45	5.1	3.1	-	-	T7	-	60°	0.8	R… shows right-hand thread L… shows left-hand thread IP shows Torx Plus
		-2255TR	⊙		5.5	3.5							
		-2260TR	⊙		5.8	3.1							
		-2270TR/L	⊙		6.8	3.2							
	SB	-2545TR	⊙	M2.5X0.45	4.6	3.5	-	-	T8	-	60°	1.2	
		-2555TRG	⊙		5.4								
		-2555TRP	⊙		5.5				8IP				
		-2560TR	⊙		5.7				T8				
		-2570TR	⊙		6.8								
	SB	-3060TR	⊙	M3X0.5	5.3	4.2	-	-	T10	-	60°	2.0	
		-3060TRP	⊙		6.0				10IP				
		-3065TRP	⊙		6.5	4.0			8IP			1.2	
		-3070TRG	⊙		7.0	4.2			T10			2.0	
		-3070TR/L	⊙			4.0			T8			1.2	
		-3070TRP	⊙			4.2			10IP			2.0	
		-3076TRP	⊙		7.6	3.9					55°		
		-3080TR	⊙		8.0	4.2			T10		60°		
	SB	-3573TRP	⊙	M3.5X0.6	7.3	5.0	-	-	10IP	-	60°	2.0	
		-3575TRP	⊙		7.5	4.9							
		-3580TR	⊙		8.0	5.3			T15			3.5	
		-3590TRP	⊙		9.0				15IP			4.0	
		-3592TR	⊙		9.2	5.1			T10			2.0	
		-35120TRP	⊙		12.0	5.2			15IP			4.0	
	SB	-4050TRN	⊙	M4X0.5	4.6	5.1	-	-	T10	-	57°	2.0	
		-4060TR	⊙	M4X0.7	5.9	5.5			T15		60°	3.5	
		-4065TR	⊙		6.7								
		-4070TRG	⊙		7.0								
		-4070TRN	⊙		7.7	5.4							
		-4070TRS	⊙		6.7	5.5			T10			2.0	
		-4075TRP	⊙		7.5				15IP			3.5	
		-4082TPR	⊙		8.2								
		-4085TR	⊙		8.5				T15				
		-4085TRP	⊙						15IP				
		-4086TRP	⊙		8.6								
		-4090TRP	⊙		9.0	5.7							
		-4090TRPN	⊙			5.5							
		-40104TRP	⊙		10.4	5.7							
		-40120TR	⊙		12.0	5.1			T15				
		-40125TRN	⊙		12.5	5.2					50°		
		-40140TR	⊙		14.0	5.5					60°		
		-40140TRN	⊙			6.7					75°		
	SB	-44865UTRP	⊙	UNF No.4-48	6.5	3.8	-	-	8IP	-	60°	1.2	
		-44880UTRP	⊙		8.0								
	SB	-4570TRN	⊙	M4.5X0.5	6.8	6.0	-	-	T10	-	57°	2.0	
		-45130TR	⊙	M4.5X0.75	13.0	6.6			20IP		55°	4.5	
	SB	-5085TR	⊙	M5X0.8	8.5	6.8	-	-	T20	-	50°	4.5	
		-50110TRP	⊙		11.0	7.0			20IP		60°		
		-50120TRP	⊙		12.0	6.8							
		-50120TRPH	⊙										
		-50120TRS	⊙			7.2			15IP			3.5	
		-50137K	⊙		13.7	9.7			T20		70°	4.5	
		-50140TR	⊙		14.0	7.3			T15		50°	4.2	
		-50140TRP	⊙						20IP		60°	4.5	
	SB	-60120TR	⊙	M6X1.0	12.0	8.5	-	-	T25	-	60°	6.0	
		-60130TRP	⊙		13.0				20IP			4.5	
		-60200TRP	⊙		20.0							6.0	
	SB	-4070TRW	⊙	M4X0.7	6.7	5.5	-	-	T8	-	60°	1.2	R… shows right-hand thread
		-4590TRWN	⊙	M4.5X0.75	9.3	5.6			T10		57°	2.0	

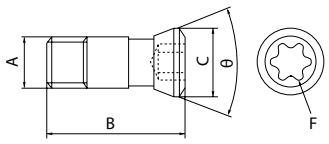
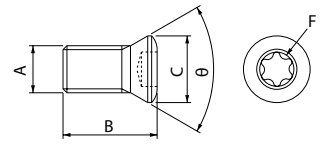
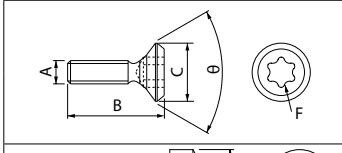
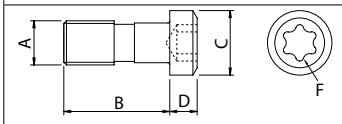
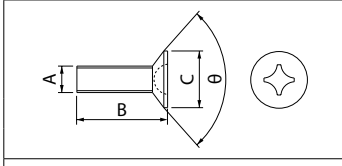
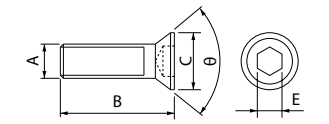
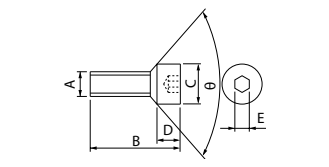
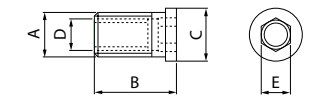
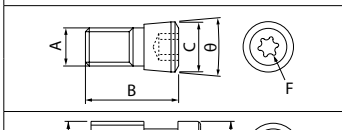
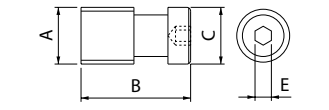
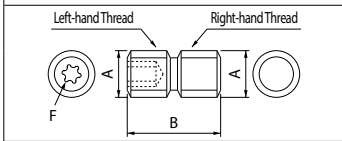
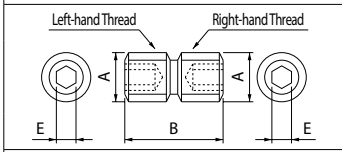
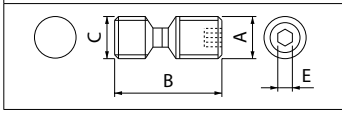
⊙: Available

Reference

Torx and Torx Plus have different cross-sections.

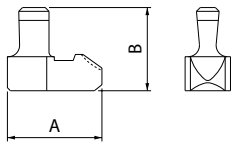
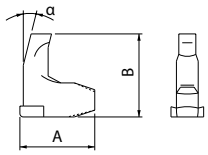
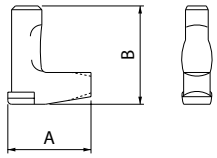
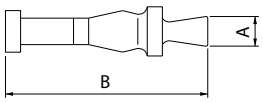
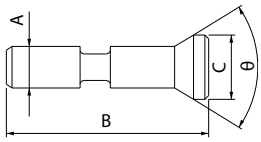
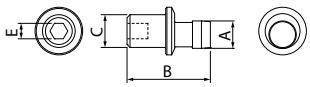
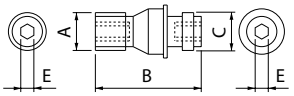
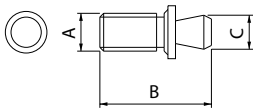
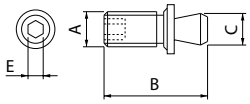
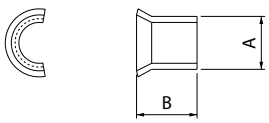
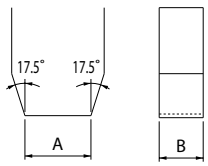


Torx Torx Plus

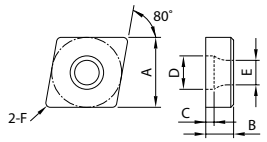
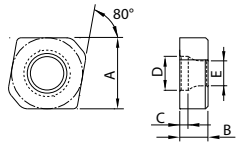
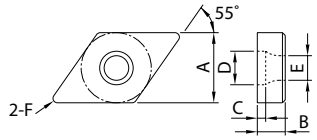
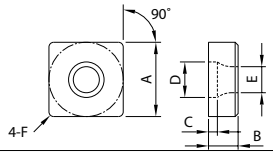
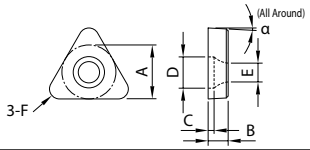
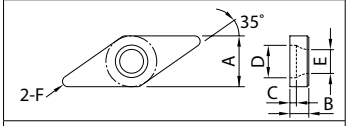
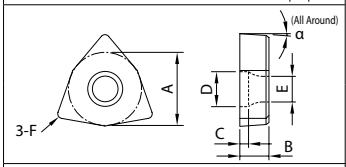
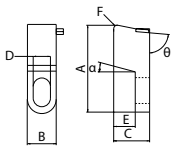
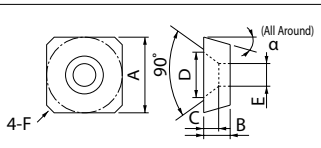
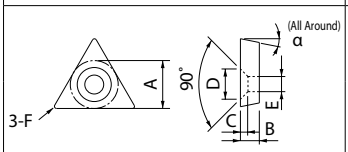
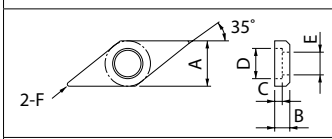
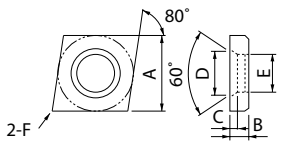
Shape	Description		Availability	Dimension (mm)						Angle		Torque (N·m)	Remarks
				A	B	C	D	E	F	α	θ		
	SC	-30067	⊙	M3X0.35	6.7	4.4	-	-	T8	-	60°	1.2	
		-35085	⊙	M3.5X0.35	8.5	5.7			T10			2.0	
		-40100	⊙	M4X0.5	10.0	6.0			T15			3.5	
		-50130	⊙	M5X0.5	13.0	6.6			T20		40°	4.5	
		-60160	⊙	M6X0.75	16.0	8.0			T25			6.0	
		-60210	⊙		21.0	9.6			T30			8.0	
	SE	-3070TRP	⊙	M3X0.5	7.0	4.3	-	-	9IP	-	43°	1.7	IP shows Torx Plus
		-40050TRN	⊙	M4X0.7	5.0	5.0			T15			3.5	
		-40055TR	⊙		5.5						44°		
		-40068TR	⊙		6.8								
		-40080TR	⊙		8.0								
		-40090TR	⊙		9.0								
		-40100TR	⊙		10.0								
	SE	-40120TR	⊙	M4X0.7	12.0	5.6	-	-	T15	-	60°	3.5	
		-50125TR	⊙	M5X0.8	12.5	6.8			T20			4.5	
	SH	-50150TR	⊙	M5X0.8	15.1	7.3	3.1	-	T20	-	-	4.5	
	SP	3X4	⊙	M3X0.5	4.0	4.0	-	-	-	-	90°	-	With additional machining below the flat head screw
		3X6	⊙		6.0	6.0							Cross recessed flat head screw equivalent to JIS...B-1111
		3X8	⊙		8.0								
		3X10	⊙		10.0								
	SP	4X9	⊙	M4X0.7	9.0	5.6	-	2.0	-	-	90°	-	
	SP	8X35	⊙	M8X1.25	35.0	11.0	4.4	5.0	-	-	90°	-	
	SPW	-5035	⊙	M5X0.5	7.0	6.3	M3.5X0.6	3.5	-	-	-	-	A shows External, D shows Internal. External and Internal threads are both Right-hand threads.
		-6045	⊙	M6X0.75	9.0	7.5	M4.5X0.75	4.5					
		-7050	⊙	M7X0.75	9.0	8.8	M5X0.8	5.0					
	SS	-4N	⊙	M5.5X0.5	8.5	6.6	M4X0.7	4.0	-	-	-	-	
	SV	-60136R	⊙	M6X1.0	13.6	6.3	-	-	T25	-	6°	-	Torx
		-60136TR	⊙						T20			4.5	
	TH	8X15	⊙	M8X1.25	20.0	8.5	-	4.0	-	-	-	-	
	W	6X17	⊙	M6X1.0	17.0	-	-	-	T20	-	-	4.5	
		6X18N	⊙		18.0				T15			3.5	
		8X16	⊙	M8X1.0	16.0				T25			6.0	
	W	6X18	⊙	M6X1.0	17.5	-	-	3.0	-	-	-	-	
		6X20	⊙	M6X1.0	20.5								
		8X18	⊙	M8X1.25	18.0			4.0					
		*8X21	⊙	M8X1.0	21.0								
	W	10X31	⊙	M10X1.0	31.0	M10X1.5	-	5.0	-	-	-	-	

* No socket on right-hand thread side

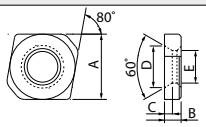
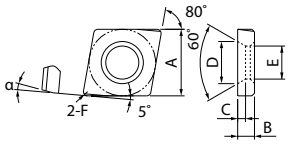
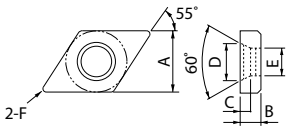
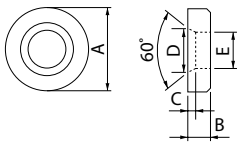
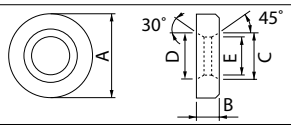
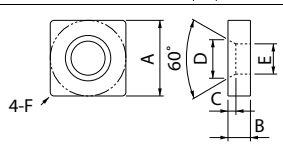
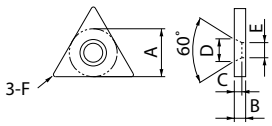
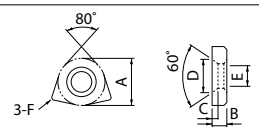
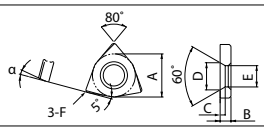
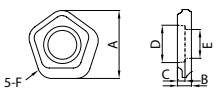
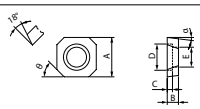
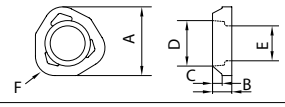
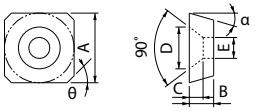
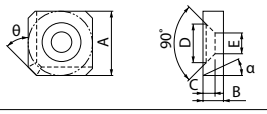
⊙: Available

Shape	Description		Availability	Dimension (mm)						Angle		Remarks
				A	B	C	D	E	F	α	θ	
	LL	-03N	○	7.8	6.3	-	-	-	-	-	-	
		-03SN	○	11.1	8.9							
		-03TN	○	8.3	8.9							
	LL	-05C	○	10.7	11.7	-	-	-	-	12°	-	
		-1CN	○	13.0	13.3					14°		
		-2C	○	18.8	17.6					14°		
	LL	-1K	○	10.0	12.0	-	-	-	-	-	-	
		-1N	○	10.3	12.0							
		-1DN	○	12.3	12.0							
		-2K	○	13.3	13.2							
		-2N	○	13.5	13.0							
		-3K	○	16.0	14.8							
		-3N	○	16.4	13.0							
		-4N	○	16.4	14.7							
		-5N	○	17.1	16.7							
		-6	○	20.7	21.0							
	LP	-2S	○	3.65	20.0	-	-	-	-	-	-	
		-6S	○	3.65	25.0	-	-	-	-	-	-	
	LPA	-11	○	2.8	11.0	4.2	-	-	-	-	60°	
		-13	○		13.0							
		-17	○		17.0							
	LPF	-11	○	2.5	11.0	3.5	-	-	-	-	60°	
		-1113	○		13.0							
		-1117	○		17.0							
		-13	○	3.8	13.0	5.5						
		-17	○		17.0							
	PP	-4	○	4.6	14.0	5.5	-	3.0	-	-	-	
	TS	-3S	○	M5X0.8	15.0	3.60	-	2.0	-	-	-	
	WP	-1S	○	M5X0.8	18.0	3.65	-	-	-	-	-	
		5X15	○		15.0	5.0						
	WP	5X11	○	M5X0.8	10.5	5.0	-	2.0	-	-	-	
	LSP	-1	○	5.0	5.3	-	-	-	-	-	-	
		-2	○	6.5	5.6							
		-3	○	8.25	7.9							
		-4	○	9.5	10.0							
	LSP	-2K	○	5.1	5.2							
		-3K	○	6.7	5.7							
	P	-03	○	2.8	1.95	-	-	-	-	-	-	
		-03S	○	3.5	1.95	-	-	-	-	-	-	

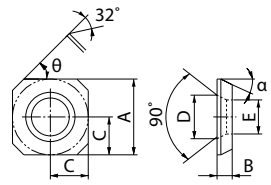
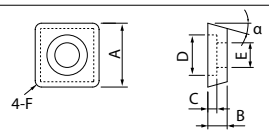
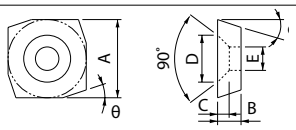
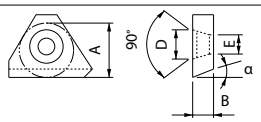
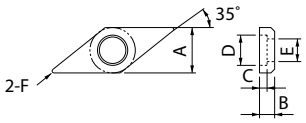
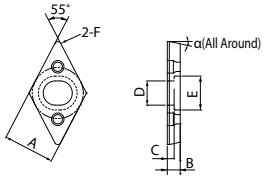
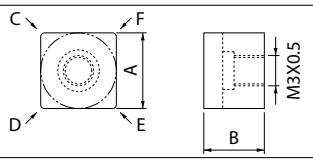
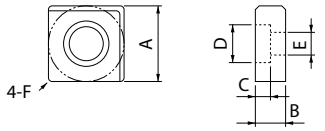
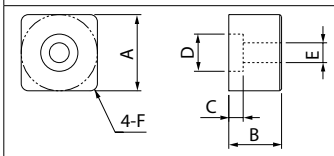
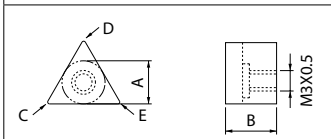
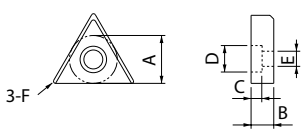
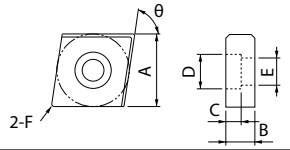
○: Available

Shape Handed spare parts show right-hand	Description		Availability	Dimension (mm)						Angle		Remarks
				A	B	C	D	E	F	α	θ	
	DC	-42	○	12.0	3.2	1.2	6.0	4.4	R1.2	-	-	Shim screw: SB-4085TR
		-44	○	12.55	5.0	1.5			R0.8			
	DC	-44-C	○	12.55	5.0	1.5	6.0	4.4	-	-	-	Shim screw: SB-4085TR
	DD	-42	○	12.55	3.2	1.2	6.0	4.4	R1.2	-	-	Shim screw: SB-4085TR
		-42-16	○						R1.6			
		-43	○		3.4	1.3			R0.8			
		-44	○		5.0	1.5						
	DS	-42	○	12.0	3.2	1.2	6.0	4.4	R1.2	-	-	Shim screw: SB-4085TR
		-44	○	12.55	5.0	1.5			R0.8			
	DT	-32	○	8.63	3.2	0.95	5.0	3.4	R1.6	3°	-	Shim screw: SB-3080TR
		-42	○	12.46		1.2	6.0	4.4	R1.2	-		Shim screw: SB-4085TR
	DV	-33	○	9.40	3.5	1.2	6.0	4.4	R1.0	-	-	Shim screw: SB-4085TR
	DW	-42	○	11.5	3.2	1.2	6.0	4.4	R1.2	4°	-	Shim screw: SB-4085TR
		-44	○	12.65	5.0	1.5			R0.8	-		
	556	C⁵/L	○	34.0	10.0	12.7	5.6	5.0	R1.6	0°	55°	R…shows Right-hand L…shows Left-hand Shim screw: HH5X16
	KPS	-42	○	11.5	3.2	2.0	7.2	3.2	C1.0	7°	-	Shim screw: SP3X8
	KPT	-32	○	8.0	3.2	1.9	7.0	3.2	R0.4	11°	-	Shim screw: SP3X8 SP3X10
		-42	○	10.5	3.2	1.9	7.0	3.2	R0.8	11°	-	
	KVN	-32	○	9.52	3.2	2.1	7.6	5.5	R0.8	-	-	Lock pin: LP-2S LP-6S
	LC	-32N	○	9.47	2.4	1.3	6.18	4.68	R0.8	-	-	Shim pin: LSP-1
		-4K	○	11.7	3.2	1.4	8.1	6.73	R0.8	-	-	Shim pin: LSP-3K
		-42N	○	12.65	3.2	1.5	8.01	6.28	R0.8	-	-	Shim pin: LSP-2
		-42N-20	○						R2.0			
		-53N	○	15.9	4.8	1.7	10.0	8.0	R1.2	-	-	Shim pin: LSP-3
		-63	○	19.0	4.8	2.0	11.61	9.3	R1.6	-	-	Shim pin: LSP-4

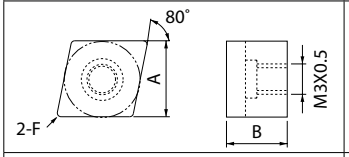
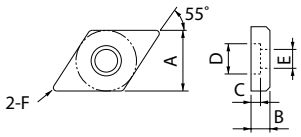
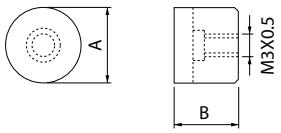
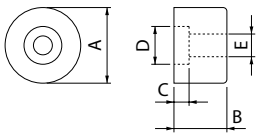
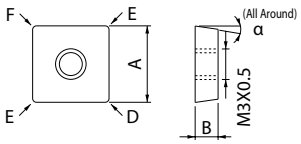
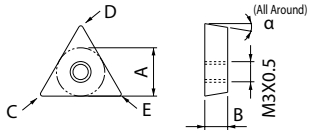
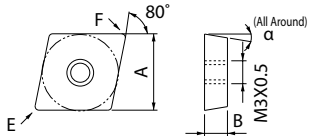
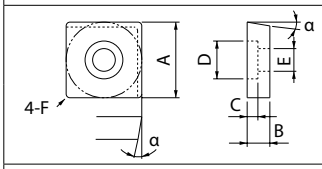
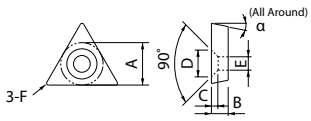
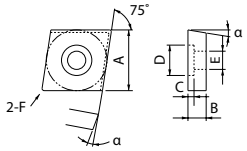
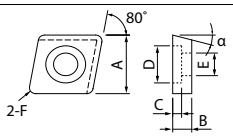
○: Available

Shape Handed spare parts show right-hand	Description		Availability	Dimension (mm)						Angle		Remarks
				A	B	C	D	E	F	α	θ	
	LC	-42N-C	○	12.65	3.2	1.5	8.01	6.28	-	-	-	Shim pin: LSP-2
		-53N-C	○	15.9	4.8	1.7	10.0	8.0	-	-	-	Shim pin: LSP-3
		-63-C	○	19.0	4.8	2.0	11.61	9.3	-	-	-	Shim pin: LSP-4
	LC	-42N$^{R}_{L}$	○	12.65	3.2	1.5	8.01	6.28	R0.8	10°	-	R... shows right-hand L... shows left-hand Shim pin: LSP-2
	LD	-32N	○	9.47	2.4	1.3	6.18	4.68	R0.8	-	-	Shim pin: LSP-1
		-4K	○	11.7	3.2	1.4	8.1	6.73	R0.8	-	-	Shim pin: LSP-3K
		-4K43	○		4.8	3.0	8.3	6.60	R1.2			
		-42	○	12.65	3.2	1.5	8.01	6.28	R0.8	-	-	Shim pin: LSP-2
		-42-20	○						R2.0			
		-43	○	12.65	4.8	3.1	8.5	6.28	R0.8	-	-	
		-43-20	○						R2.0			
	LR	-80	○	9.47	3.2	1.3	6.25	4.75	-	-	-	Shim pin: LSP-1
		-81	○	12.65	3.2	1.5	8.01	6.28	-	-	-	Shim pin: LSP-2
	LR	-10C	○	8.5	3.2	6.3	6.3	4.7	-	-	-	Shim pin: LSP-1
		-12C	○	10.0	3.2	6.3	6.3	4.7	-	-	-	
		-16C	○	13.6	3.2	7.9	8.01	6.28	-	-	-	Shim pin: LSP-2
	LS	-32	○	9.47	3.2	1.3	6.18	4.68	R0.8	-	-	Shim pin: LSP-1
		-42	○	12.65	3.2	1.5	8.01	6.28	R0.8	-	-	Shim pin: LSP-2
	LT	-3K	○	8.53	2.7	1.0	6.1	5.13	R0.8	-	-	Shim pin: LSP-2K
		-32N	○	9.47	2.7	1.3	6.18	4.68	R0.8	-	-	Shim pin: LSP-1
		-32N-20	○						R2.0			
		-42N	○	12.65	3.2	1.5	8.01	6.28	R0.8	-	-	Shim pin: LSP-2
		-42N-20	○						R2.0			
	LW	-32N	○	9.47	2.4	1.3	6.18	4.68	R0.8	-	-	Shim pin: LSP-1
		-42N	○	12.65	3.2	1.5	8.01	6.28	R0.8	-	-	Shim pin: LSP-2
	LW	-42N$^{R}_{L}$	○	12.65	3.2	1.5	8.01	6.28	R0.8	10°	-	R... shows right-hand L... shows left-hand shim pin: LSP-2
	MFPN	-45	○	17.07	3.5	1.95	9.8	7.18	R3.5	-	-	Shim screw: SPW-7050
	MFSE	-105	○	10.5	3.0	1.4	7.0	5.3	-	7°	45°	Shim screw: SPW-5035
	MFWN	-90	○	15.25	4.0	2.5	9.44	7.25	R3.0 R4.0	-	-	Shim screw: SPW-7050
	MSD	-42	○	10.7	3.2	1.85	7.0	3.3	-	20°	45°	Shim screw: SP3X8
	MSE	-4245S	○	10.3	3.2	2.0	6.0	5.0	-	20°	45°	Shim screw: SP4X9
	MSE	-4215	○	10.53	3.2	1.5	6.4	3.4	-	25°	15°	Shim screw: SP3X8
		-4245	○	10.53	3.2	1.5	6.4	3.4	-	25°	45°	Shim screw: SP3X8

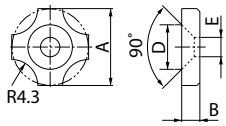
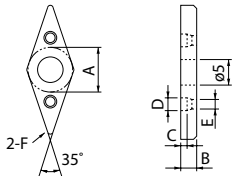
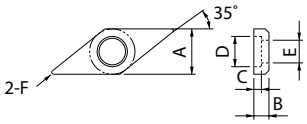
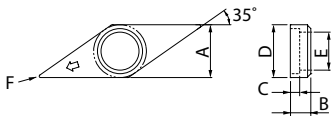
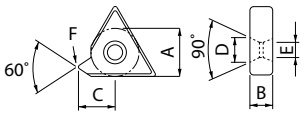
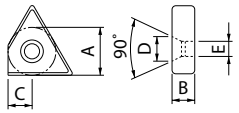
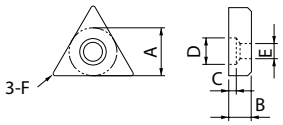
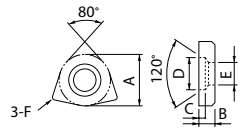
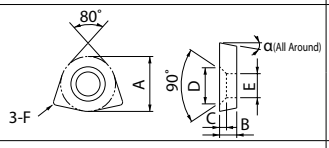
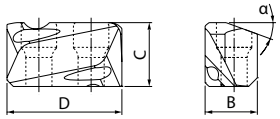
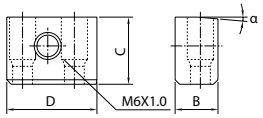
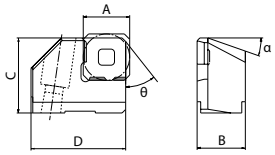
○: Available

Shape	Description	Availability	Dimension (mm)						Angle		Remarks
			A	B	C	D	E	F	α	θ	
	MSO -4T245	⊙	10.0	2.0	4.7	6.4	4.8	-	27°	45°	Shim screw: SP3X6
	MSO -5200	⊙	12.6	3.18	1.8	8.27	6.66	R0.8	15°	-	Shim screw: SPW-6045
	MSP -42	⊙	11.3	3.2	1.85	7.0	3.3	-	15°	15°	Shim screw: SP3X8
	MTE -42	⊙	9.8	3.2	-	6.4	3.4	-	25°	-	Shim screw: SP3X8
	MVN -32	⊙	9.52	3.2	2.1	7.4	6.5	R0.8	-	-	Lock pin: TS-3S
	PD -42	⊙	12.7	3.2	1.7	6.0	8.4	0.8	12°	-	Shim screw: SB-2050TR
	SP -129	⊙	9.52	9.52	R0.8	R1.6	R1.2	R1.6	-	-	Shim screw: HH3X12
	SP -141	⊙	12.7	4.0	2.4	6.2	3.3	R1.2	-	-	Shim screw: M3X8
	-143	⊙	12.7	7.2	2.4	6.2	3.3	R1.2	-	-	Shim screw: M3X12
	-162	⊙	15.8	6.0	3.4	8.0	4.4	R1.5	-	-	Shim screw: M4X10
	SP -148	⊙	12.7	8.8	2.4	6.2	3.3	R1.2	-	-	Shim screw: BH3X12
	SP -219	⊙	6.35	9.52	R0.8	R1.2	R1.6	-	-	-	Shim screw: HH3X12
	SP -221	⊙	9.52	4.0	2.5	6.5	3.5	R1.2	-	-	Shim screw: M3X8
	-223	⊙	9.52	7.2	2.5	6.5	3.5	R1.2	-	-	Shim screw: M3X12
	SP -342	⊙	12.7	6.0	2.5	6.5	3.5	R1.2	-	75°	Shim screw: M3X8
	-441	⊙	12.7	4.0	2.5	6.2	3.3	R0.8	-	80°	Shim screw: M3X8
	-443	⊙	12.7	7.2	2.5	6.2	3.3	R0.8	-	80°	Shim screw: M3X12
	-454	⊙	15.7	8.0	3.4	8.0	4.5	R1.6	-	80°	Shim screw: M4X10

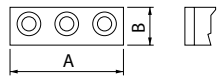
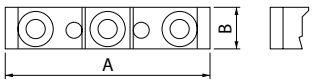
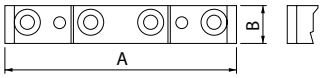
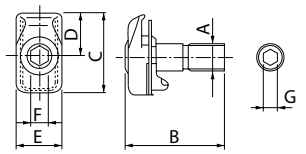
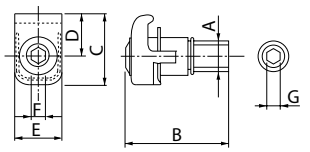
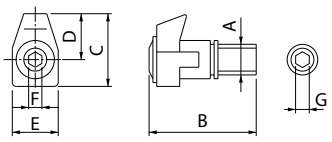
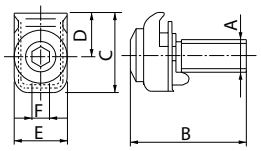
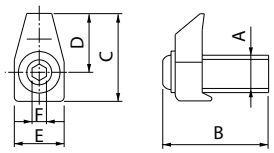
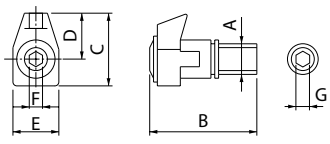
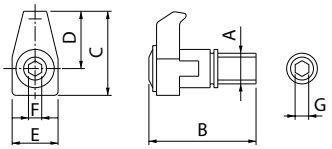
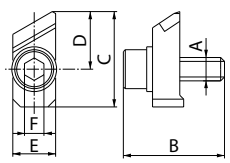
⊙: Available

Shape	Description	Availability	Dimension (mm)						Angle		Remarks
			A	B	C	D	E	F	α	θ	
	SP -429	⊙	9.52	9.52	-	-	-	R1.2	-	-	Shim Screw : HH3X12
	SP -541	⊙	12.7	4.0	2.5	6.2	3.3	R1.2	-	-	Shim Screw : M3X8
	-543	⊙		7.2							Shim Screw : M3X12
	SP -826	⊙	9.52	7.9	-	-	-	-	-	-	Shim Screw : HH3X12
	-829	⊙	9.52	9.52	-	-	-	-	-	-	
	SP -841	⊙	12.7	4.0	2.4	6.2	3.3	-	-	-	Shim Screw : M3X8
	-843	⊙	12.7	7.2	2.4	6.2	3.3	-	-	-	Shim Screw : M3X12
	-849	⊙	12.7	8.8	2.4	6.2	3.3	-	-	-	Shim Screw : BH3X12
	-861	⊙	15.8	6.0	3.4	8.0	4.4	-	-	-	Shim Screw : M4X10
	SP -130A	⊙	9.52	3.2	-	R0.4	R0.8	R1.2	8°	-	Shim Screw : BH3X12
	SP -210A	⊙	6.35	3.2	R0.4	R0.8	R1.2	-	8°	-	Shim Screw : BH3X6
	SP -420A	⊙	9.52	3.2	-	-	R0.8	R1.2	8°	-	Shim Screw : BH3X6
	SP -141P	⊙	12.7	4.0	2.4	6.2	3.3	R1.2	7°	-	Shim Screw : M3X8
	-143P	⊙	12.7	7.2	2.4	6.2	3.3	R1.2	7°	-	Shim Screw : M3X12
	SP -230P	⊙	8.3	3.2	2.0	7.2	3.2	R0.5	7°	-	Shim Screw : SP3X10
	SP -341P	⊙	12.6	4.0	2.5	6.5	3.5	R1.2	7°	-	Shim Screw : M3X8
	SP -441P	⊙	12.7	4.0	2.5	6.2	3.3	R1.2	11°	-	Shim Screw : M3X8
	-443P	⊙		7.2							Shim Screw : M3X12

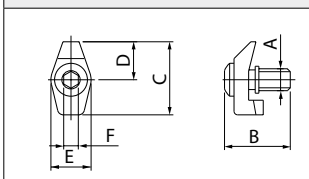
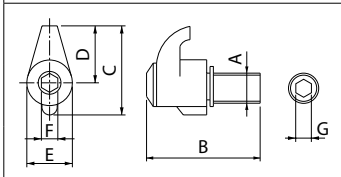
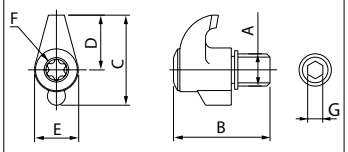
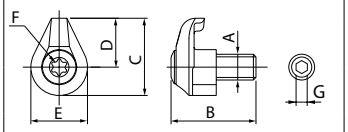
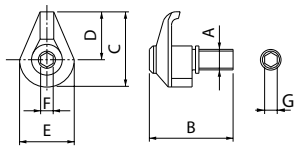
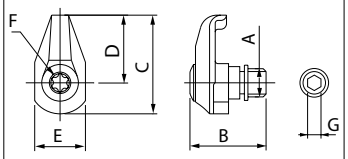
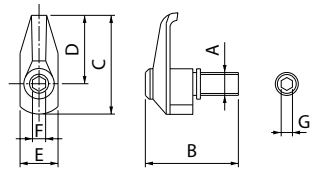
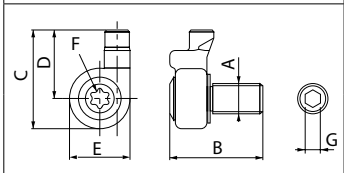
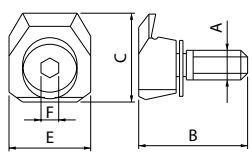
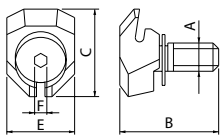
⊙ : Available

Shape Handed spare parts show right-hand	Description		Availability	Dimension (mm)						Angle		Remarks
				A	B	C	D	E	F	α	θ	
	SP	-RC	●	12.6	3.0	-	7.35	3.35	-	-	-	Shim screw: SP3X8
	SVN	-32	●	8.0	3.2	1.5	3.1	2.3	R0.4	-	-	Shim screw: SB-2050TR
	SVN	-32N	●	8.2	3.2	1.5	7.0	5.9	R0.6	-	-	Shim screw: SS-4N
	SVN	-32S	●	8.2	3.2	1.5	7.0	5.9	R0.2	-	-	Shim screw: SS-4N 1-edge
	TN	-32	●	9.52	3.2	6.5	7.0	4.2	R0.4	-	-	Shim screw: SP3X8
		-43	●	12.70	3.2	8.1	7.0	4.2	R0.5	-	-	
	TNW	-32	●	9.52	3.2	4.8	7.0	4.2	-	-	-	Shim screw: SP3X8
	WTN	-33	●	9.52	4.76	2.5	7.0	5.3	R0.8	-	-	Shim pin: WP-1S
		-33-20	●						R2.0			
	WWN	-42	●	12.7	3.0	1.4	7.0	5.3	R1.2	-	-	Shim pin: WP5X15
	WWP	-42	●	12.7	3.0	1.5	8.3	5.3	R1.2	11°	-	Shim pin: WP5X11
		-42-16	●						R1.6			
	MAP	-2216	●	-	9.0	11.0	19.8	-	-	20°	-	Clamp screw SB-40140TR
	MAP	-2506	●	-	9.5	14.9	20	-	-	5°	-	Clamp screw SB-40140TR
	LSE	-445R	●	12.7	13.0	19.5	26.0	-	-	20°	45°	Dimension A shows insert I.C.
	LSO	-445R	●	13.494	12.0	21.3	23.5	-	-	27°	45°	

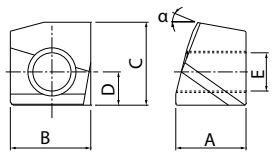
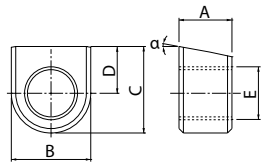
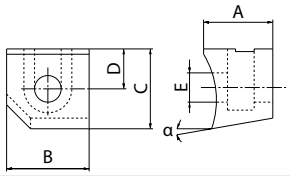
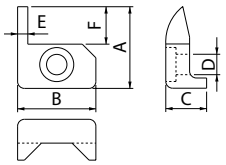
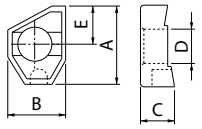
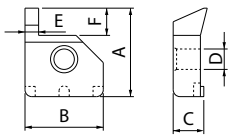
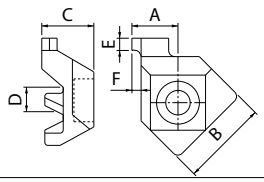
●: Available

Shape Handed spare parts show right-hand	Description		Availability	Dimension (mm)							Remarks
				A	B	C	D	E	F	G	
	BCS	-1	⊙	64.0	13.0	-	-	-	-	-	
		-5	⊙	48.0	16.5	-	-	-	-	-	
	BCS	-2	⊙	74.0	15.0	-	-	-	-	-	
		-3	⊙	88.0	16.0	-	-	-	-	-	
	BCS	-4	⊙	98.0	16.0	-	-	-	-	-	
	CE	-010	⊙	M8X1.25	28.0	24.0	12.8	13.0	4.0	4.0	G: Indicates hexagon hole two side widths of back side of bolts
		-220	⊙			27.0	15.8	15.0			
	CE	-020	⊙	M8X1.25	30.0	17.0	10.5	12.7	4.0	4.0	G: Indicates hexagon hole two side widths of back side of bolts
	CE	-030	⊙	M8X1.25	30.0	19.0	12.5	12.7	4.0	4.0	G: Indicates hexagon hole two side widths of back side of bolts
		-040	⊙			22.5	16.0				
	CE	-320	⊙	M6X1.0	24.5	18.2	9.7	12.7	4.0	-	
	CE	-360S	⊙	M6X1.0	16.0	18.0	10.55	12.4	4.0	-	
	CE	-030A	⊙	M8X1.25	30.0	20.0	13.7	12.7	4.0	-	G: Indicates hexagon hole two side widths of back side of bolts
	CE	-410	⊙	M8X1.25	30.0	26.0	19.5	12.7	4.0	4.0	G: Indicates hexagon hole two side widths of back side of bolts
		-430	⊙			29.0	22.5				
	CP	-RC$^{R}_{L}$	⊙	M6X1.0	20.0	24.5	14.8	11.0	5.0	-	R...shows right-hand L...shows left-hand

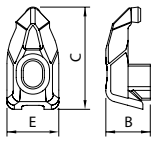
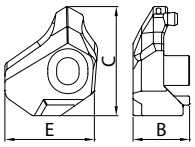
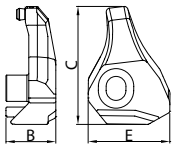
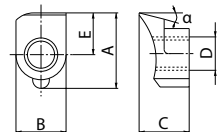
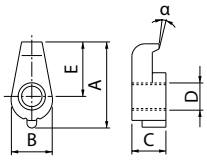
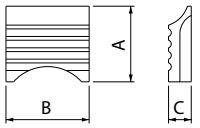
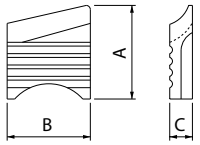
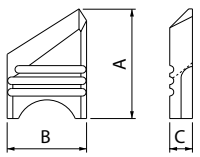
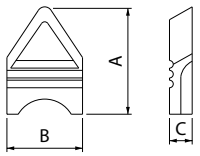
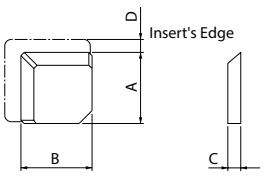
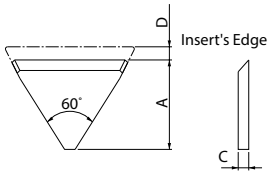
⊙: Available

Shape Handed Spare Parts show Right-hand	Description		Availability	Dimension (mm)							Remarks
				A	B	C	D	E	F	G	
	CPS	-1	⊙	M3X0.5	9.0	10.0	5.2	5.5	2.0	-	
	CPS	-2	⊙	M5X0.8	14.5	14.0	8.5	6.8	2.5	2.5	G: Indicates hexagon hole two side widths of back side of bolts
		-2P	⊙		18.0						
		-3	⊙	M6X1.0	19.0	16.5	10.0	8.8	3.0	3.0	
	CPS	-2S	⊙	M5X0.8	13.5	14.0	8.5	6.8	T15	2.0	G: Indicates hexagon hole two side widths of back side of bolts
		-2TR	⊙		15.0						
	CPS	-4V	⊙	M4X0.7	8.9	11.3	7.3	8.0	T10	-	G: Indicates hexagon hole two side widths of back side of bolts
		-5F	⊙	M5X0.8	11.3	12.7	7.5	10.3	T15	2.5	
		-5S	⊙		18.0	15.0	9.5	11.0		2.0	
		-5V	⊙		13.5	12.7	7.5	10.3		2.5	
	CPS	-6F	⊙	M6X1.0	16.5	15.6	9.5	12.2	3.0	-	G: Indicates hexagon hole two side widths of back side of bolts
		-6M	⊙		18.5	17.5	11.0	13.0		3.0	
		-6S	⊙			18.0	12.0	12.0			
		-6V	⊙			15.6	9.5	12.2			
		-8V	⊙	M8X1.25	24.0	20.8	13.0	15.5	4.0	4.0	
	CPS	-5E	⊙	M5X0.8	13.5	17.5	12.0	9.0	T15	2.5	G: Indicates hexagon hole two side widths of back side of bolts
	CPS	-5R/L	⊙	M5X0.8	18.0	17.5	12.0	9.0	2.5	2.5	G: Indicates hexagon hole two side widths of back side of bolts R...shows Right-hand Thread L...shows Left-hand Thread
	LGBA	-16R/L S	⊙	M5X0.8	15.0	16.1	11.2	9.85	T15	2.0	G: Indicates hexagon hole two side widths of back side of bolts R...shows right-hand L...shows left-hand
		-22R/L S	⊙			17.6	12.7				
	WCS	-1N	⊙	M6X1.0	21.0	15.7	-	15.0	3.0	-	
	WCS	-8	⊙	M6X1.0	21.0	19.4	-	15.0	3.0	-	

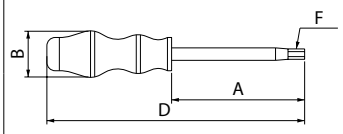
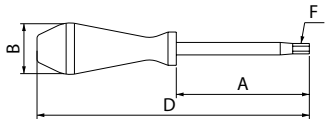
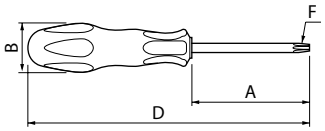
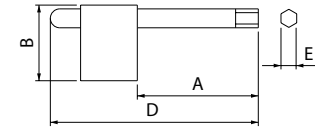
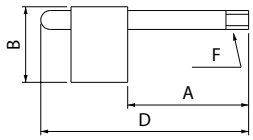
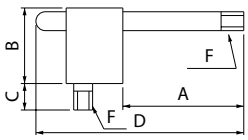
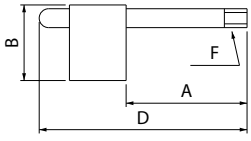
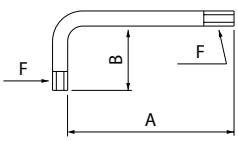
⊙: Available

Shape Handed spare parts show right-hand	Description		Availability	Dimension (mm)						Angle		Remarks
				A	B	C	D	E	F	α	θ	
	C	08R	⊙	7.6	8.7	8.9	3.6	M5X0.8 (Left-hand Thread)	-	10°	-	
	C	09N	⊙	6.0	9.0	9.8	5.3	M6X1.0 (Left-hand Thread)	-	10°	-	Clamp screw: W6X18N
	CH	-20R	⊙	13.1	15.5	14.8	7.5	5.3	-	10°	-	Clamp screw: TH8X15
	CGA	-3R/L	⊙	24.0	17.66	12.0	6.2	1.9	11.0	-	-	R...shows right-hand L...shows left-hand
		-4R/L	⊙	24.0	17.66	12.0	6.2	2.9	11.0	-	-	
		-5R/L	⊙	27.5	18.66	12.0	6.2	3.9	14.5	-	-	
	CGB	R/L	⊙	19.0	14.0	8.2	6.35	9.5	-	-	-	R...shows right-hand L...shows left-hand
	CGH	-1R/L	⊙	25.0	22.0	8.0	6.05	3.0	5.5	-	-	R...shows right-hand L...shows left-hand
		-2R/L	⊙					5.0				
		-3R/L	⊙	30.0	23.0	8.5		6.0	7.0			
	CGIA	-3R	⊙	10.7	17.0	10.5	5.2	1.8	2.0	-	-	
		-4R	⊙			11.5		2.5				
		-5R	⊙	15.7		10.5		3.5	7.0			

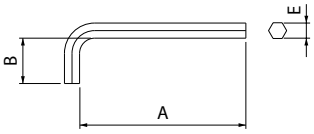
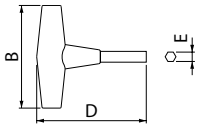
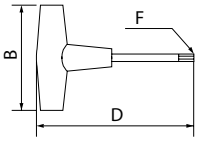
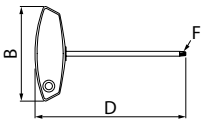
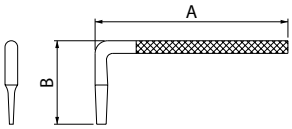
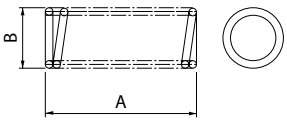
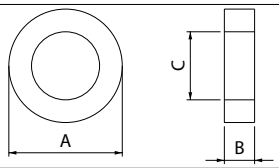
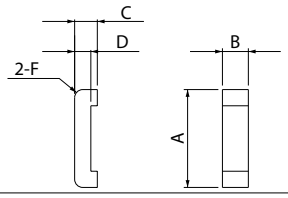
⊙: Available

Shape Handed spare parts show right-hand	Description		Availability	Dimension (mm)						Angle		Remarks
				A	B	C	D	E	F	α	θ	
	CP	-2D	●	-	10.0	21.6	-	10.4	-	-	-	
		-3D	●		12.0	27.6		14.0				
		-5D	●		13.0	32.0						
	CP	-2D-R/L-JCT	●	-	13.5	25.3	-	21.5	-	-	-	
	CP	-3D-R/L-JCT	●	-	13.1	26.4	-	17.9	-	-	-	
		-4D-R/L-JCT	●			28.4		18.2				
		-5D-JCT	●			31.9		21.5				
	CP	-8TE	●	17.9	12.0	12.0	M8X1.25 (Left-hand Thread)	10.0	-	15°	-	
	CP	-8W	●	20.9	12.0	8.0	M8X1.25 (Left-hand Thread)	13.0	-	3°	-	
	CB	-11	●	11.5	12.7	3.5	-	-	-	-	-	
		-51	●	16.0	15.6	3.5	-	-	-	-	-	
	CB	-12	●	14.0	12.7	3.5	-	-	-	-	-	Right-hand
		-13	●	14.0	12.7	3.5	-	-	-	-	-	Left-hand
	CB	-14	●	18.51	12.7	3.5	-	-	-	-	-	Right-hand
		-15	●	18.51	12.7	3.5	-	-	-	-	-	Left-hand
	CB	-16	●	18.0	12.7	3.5	-	-	-	-	-	
		-17	●	21.0	15.6	3.5	-	-	-	-	-	
	CB	-S3220	●	7.94	7.94	1.0	2.0	-	-	-	-	
		-S4220	●	11.12	11.12	2.0	2.0	-	-	-	-	
	CB	-T2212	●	7.48	-	1.5	1.2	-	-	-	-	
		-T3220	●	10.87	-	2.0	2.0	-	-	-	-	

●: Available

Shape	Description		Availability	Dimension (mm)						Angle		Remarks
				A	B	C	D	E	F	α	θ	
	DT	-7	○	44	16	-	114	-	T7	-	-	Torx
		-8	○	70	26		150		T8			
	DT	-10	○	70	29	-	160	-	T10	-	-	Torx
		-15	○	70	32		170		T15			
		-20	○	90	32		190		T20			
		-25	○	82	36		190		T25			
	DTM	-6	○	40	17	-	115	-	T6	-	-	Torx Top of wrench is magnetized
		-7	○	44	17		119		T7			
		-8	○	70	24		150		T8			
		-10	○	70	28		167		T10			
		-15	○	70	31		174		T15			
	DTP	-6	○	73	23	-	150	-	6IP	-	-	IP shows Torx Plus
		-7	○						7IP			
		-9	○	61	30		174		9IP			
		-15	○	81	33		186		15IP			
		-20	○	100			206		20IP			
	DTPM	-8	○	70	24	-	150	-	8IP	-	-	IP shows Torx Plus Top of wrench is magnetized
		-10	○	70	28		165		10IP			
		-15	○	70	31		174		15IP			
	FH	-2	○	40	20	-	71	2.0	-	-	-	Hexagon
		-2.5	○	45	20		76	2.5				
	FT	-6	○	35	15	-	65	-	T6	-	-	Torx
		-7	○	34	15		62		T7			
		-8	○	40	20		74		T8			
		-10	○	40	20		74		T10			
	FT	-15	○	45	25	10	80	-	T15	-	-	Torx
	FTP	-5	○	35	15	-	65	-	5IP	-	-	IP shows Torx Plus
		-6	○	34			62		6IP			
	LTW	-8SS	○	43	6	-	-	-	T8	-	-	Torx
		-10S	○	62	10				T10			
		-10SS	○	47	7				T10			
		-15S	○	62	10				T15			
		-20	○	58	19				T20			
		-25	○	65	20				T25			

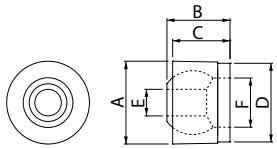
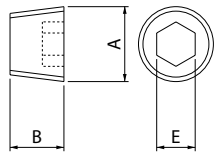
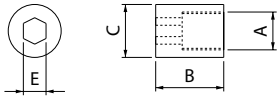
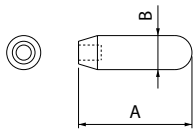
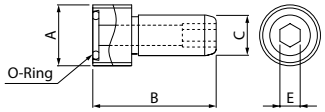
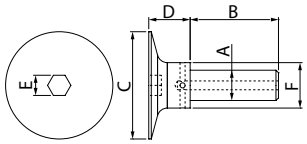
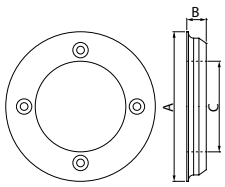
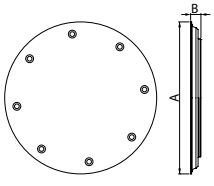
○: Available

Shape	Description		Availability	Dimension (mm)						Angle		Remarks
				A	B	C	D	E	F	α	θ	
	LW	-1.5	○	45	14			1.5				Hexagon
		-2	○	50	16			2.0				
		-2.5	○	56	18			2.5				
		-3	○	63	20			3.0				
		-4	○	70	25			4.0				
		-4.5	○	78	26			4.5				
		-5	○	80	28	-	-	5.0	-	-	-	
		-6	○	90	32			6.0				
		-8	○	109	36			8.0				
		-10	○	112	40			10.0				
		-14	○	140	56			14.0				
		-17	○	160	63			17.0				
		-19	○	180	70			19.0				
	TH	-4	○	-	80	-	83	4.0	-	-	-	Hexagon
	TT	-15	○	-	70	-	118	-	T15	-	-	Torx
		-25	○		70		69		T25			
		-25L	○		80		145		T25			
		-30	○		80		110		T30			
	TTC	-20	○	-	98	-	130	-	T20	-	-	
		-25	○						T25			
	TTP	-20	○	-	70	-	138	-	20IP	-	-	IP shows Torx Plus
	TTW	-15	○	-	80	-	125	-	T15	-	-	Torx
	LTK	-5	○	70	30	-	-	-	-	-	-	
	SP	-2D	○	8.5	5.6	-	-	-	-	-	-	Spring
		-3D	○	12.0	7.2							
		-5	○	12.0	6.7							
		-5D	○	12.0	7.2							
		-6	○	12.0	7.7							
	W	-6	○	11.5	1.6	6.4	-	-	-	-	-	Washer
		6-14	○	11.5	1.4	6.4						
	WB	-5	○	10.0	1.0	5.3	-	-	-	-	-	Washer (Brass)
		-6	○	11.5	1.6	6.4						
		-8	○	15.5	1.6	8.4						
	WSP	-1	○	15.1	4.0	3.5	2.5	-	R1.25	-	-	Spacer

○: Available

P

Spare parts

Shape	Description		Availability	Dimension (mm)						Angle		Remarks
				A	B	C	D	E	F	α	θ	
	DN	10	⊙	6.2	5.1	4.5	5.7	2.6	4.0	-	-	Nozzle
		20	⊙	10.1	7.7	7.0	9.6	M4X0.7	6.0			
	GP	-1	⊙	PT1/8	7.0	-	-	5.0	-	-	-	Plug
		-2	⊙	PT1/4	9.0			6.0				
	WN	-1	⊙	M5X8	10.0	7.0	-	3.0	-	-	-	Nut
	PC	-1	⊙	60.0	8.5	-	-	-	-	-	-	Punch
		-2	⊙	62.2	10.0							
	CL	63-1	⊙	M18X1.0	36.5	12	-	6.0	-	-	-	Coolant pipe
		100-1	⊙	M24X1.5	44.0	16.0		8.0				
	HH	12X35HC	⊙	M12X1.75	35.0	42.5	16.4	8.0	18.0	-	-	Arbor bolt
	HF	16X48HC	⊙	M16X2.0	30.0	62.5	18.4	12.0	40.0	-	-	
	CC	-125-MFAH	⊙	87.5	11.4	53.0	-	-	-	-	-	Coolant cover
		-160-MFAH	⊙	122.5	12.4	70.0						
	CC	-200-MFAH	⊙	162.5	14.4	-	-	-	-	-	-	Coolant cover
		-250-MFAH	⊙	212.5								
		-315-MFAH	⊙	277.5								

⊙: Available

External toolholders

Description			Spare Parts					
			Lever	Lock screw	Shim	Shim Pin	Punch	Wrench
PSBN$^{R}/_{L}$	1616H	-09	LL-1N	LS-1N	LS-32	LSP-1	PC-1	FH-2.5
PSKN$^{R}/_{L}$	1616H	-09	LL-1N	LS-1N	LS-32	LSP-1	PC-1	FH-2.5

External toolholders

Description			Spare Parts			
			Lever	Lock screw	Shim Pin	Wrench
PTGN$^{R}/_{L}$	1212F	-11	LL-03N	LS-03N	P-03	FH-2
	.....	-11	LL-03TN	LS-03SN	P-03S	FH-2.5
PTFN$^{R}/_{L}$	1212F	-11	LL-03N	LS-03N	P-03	FH-2
	.....	-11	LL-03TN	LS-03SN	P-03S	FH-2.5

Toolholders for ceramic tools

Description			Spare parts				
			Chipbreaker	Clamp set	Wrench	Shim	Shim screw
CCLNR	2525M	-16	CB-17	CE-220	LW-4	SP-454	M4X10
CS-N$^{R}/_{L}$	.....	-12	CB-11	CE-020	LW-4	SP-141 *(SP-143)	M3X8 *(M3X12)
CSKN$^{R}/_{L}$	.....	-12	CB-11	CE-020	LW-4	SP-141 *(SP-143)	M3X8 *(M3X12)
CSYN$^{R}/_{L}$	.....	-12	CB-11	CE-020	LW-4	SP-141 *(SP-143)	M3X8 *(M3X12)
CSSN$^{R}/_{L}$	.....	-12	CB-11	CE-020	LW-4	SP-141 *(SP-143)	M3X8 *(M3X12)

* Shim & shim screw: When using SN□□1204 Insert, purchase spare parts in ( ) separately.

Toolholders for ceramic tools

Description			Spare parts			
			Clamp set	Wrench	Shim	Shim screw
CCLN$^{R}/_{L}$	.....	-12GX	CE-410	LW-4	SP-441	M3X8
CDHN$^{R}/_{L}$	.....	-12GX	CE-410	LW-4	SP-521	M3X8
	.....	-15GX	CE-430		SP-541	
CDJN$^{R}/_{L}$	.....	-12GX	CE-410	LW-4	SP-521	M3X8
	.....	-15GX	CE-430		SP-541	
CSRN$^{R}/_{L}$	.....	-12GX	CE-410	LW-4	SP-141	M3X8
	.....	-15GX			SP-162	M4X10
CSDNN	.....	-12GX	CE-410	LW-4	SP-141	M3X8
	.....	-15GX			SP-162	M4X10
CSSN$^{R}/_{L}$	.....	-12GX	CE-410	LW-4	SP-141	M3X8
	.....	-15GX			SP-162	M4X10
CS-N$^{R}/_{L}$	.....	-12GX	CE-410	LW-4	SP-141	M3X8
	.....	-15GX			SP-162	M4X10
CSKN$^{R}/_{L}$	.....	-12GX	CE-410	LW-4	SP-141	M3X8
	.....	-15GX			SP-162	M4X10
CSYN$^{R}/_{L}$	.....	-12GX	CE-410	LW-4	SP-141	M3X8
	.....	-15GX			SP-162	M4X10

Toolholders for solid CBN tools

Description			Spare parts			
			Clamp set	Wrench	Shim	Shim screw
CCLN R/L	.....	-09A	CE-030A	LW-4	SP-429	HH3X12
CSRN R/L	2525M	-09A	CE-030A	LW-4	SP-129	HH3X12
	2525M	-12A			SP-148 *(SP-143)	BH3X12
CSKN R/L	2525M	-09A	CE-030A	LW-4	SP-129	HH3X12
	2525M	-12A			SP-148 *(SP-143)	BH3X12
CSYN R/L	2525M	-09A	CE-030A	LW-4	SP-129	HH3X12
	2525M	-12A			SP-148 *(SP-143)	BH3X12
CSDNN	.....	-09A	CE-040	LW-4	SP-129	HH3X12
	2525M	-12A			SP-148 *(SP-143)	BH3X12
CTUN R/L	.....	-11A	CE-030A	LW-4	SP-219	HH3X12

* Shim for-12A type toolholder : When using SN□□1204 insert, purchase spare parts in ( ) separately.

Toolholders for bearing machining

Description			Spare parts					
			Lever	Lock screw	Shim	Shim pin	Punch	Wrench
PRGC R/L	.....	-12BE	LL-1CN	LS-1N	LR-12C	LSP-1	PC-1	FH-2.5
	.....	-16BE	LL-2C	LS-1T	LR-16C	LSP-2	PC-2	FH-2.5
PRGC R/L	.....	-12BF	LL-1CN	LS-1N	LR-12C	LSP-1	PC-1	FH-2.5
	.....	-16BF	LL-2C	LS-1T	LR-16C	LSP-2	PC-2	FH-2.5

Toolholders for back turning

Description			Spare parts			
			Anchor pin	Lock screw	Clamp screw	Wrench
AABSR	0810K	-40F	LPA-11	HSB4X8R	-	FH-2
	1010..	-40F				
	1212..	-40F	LPA-13			
	1616..	-40F	LPA-17			
SABSR	.....	-40F	-	-	SB-3080TR	FT-10
AABWR	0810K	-40F	LPA-11	HSB4X8R	-	FH-2
	1010..	-40F				
	1212..	-40F	LPA-13			
	1616..	-40F	LPA-17			
SABWR	.....	-40F	-	-	SB-3080TR	FT-10
AABWR	0810K	-50F	LPA-11	HSB4X8R	-	FH-2
	1010..	-50F				
	1212..	-50F	LPA-13			
	1616..	-50F	LPA-17			
SABWR	.....	-50F	-	-	SB-3080TR	FT-10

KTKF

Description			Spare parts	
			Clamp screw	Wrench
KTKF R/L	.....	-12	SB-4590TRWN	LTW-10S
	.....	-16		

External toolholders (back clamp)

Description			Spare Parts		
			Anchor Pin	Lock Screw	Wrench
ACLC$^{R}_{L}$	0810K	-06F	LPF-11	HSB4X8$^{R}_{L}$	FH-2
	1010K	-06F			
	1010K	-09F	LPF-13		
	1212M	-09F			
	1616M	-09F	LPF-17		
ADJC$^{R}_{L}$	0810K	-07F	LPF-11	HSB4X8$^{R}_{L}$	FH-2
	1010K	-07F			
	1010K	-11F	LPF-13		
	1212M	-11F			
	1616M	-11F	LPF-17		
ADNCR	0810K	-07F	LPF-11	HSB4X8R	FH-2
	1010K	-07F			
	1010K	-11F	LPF-13		
	1212M	-11F			
	1616M	-11F	LPF-17		
AVJB$^{R}_{L}$	1010K	-11F	LPF-11	HSB4X8$^{R}_{L}$	FH-2
	1212M	-11F	LPF-1113		
	1616M	-11F	LPF-1117		
AVVBR	1010K	-11F	LPF-11	HSB4X8R	FH-2
	1212M	-11F	LPF-1113		
	1616M	-11F	LPF-1117		

* Lock screw: HSB4X8R for R-hand toolholder, HSB4X8L for L-hand toolholder.

External toolholders (screw clamp)

Description			Spare parts	
			Clamp screw	Wrench
SCLC$^{R}_{L}$	.....	-06	SB-2570TR	FT-8
	.....	-09	SB-4085TR	FT-15
	.....	-12	SB-5090TR	LTW-20
SCAC$^{R}_{L}$	.....	-06	SB-2570TR	FT-8
	.....	-09	SB-4085TR	FT-15
	1212F	-09FF		
SDJC$^{R}_{L}$	.....	-07F	SB-2570TR	FT-8
	.....	-11F	SB-4085TR	FT-15
SDLC$^{R}_{L}$	.....	-07FF	SB-2570TR	FT-8
	.....	-11FF	SB-4085TR	FT-15
SDXC$^{R}_{L}$	.....	-07	SB-2570TR	FT-8
	.....	-11	SB-4085TR	FT-15
SDNC$^{R}_{L}$	.....	-07F	SB-2570TR	FT-8
	.....	-11F	SB-4085TR	FT-15
SDNCN	.....	-07	SB-2570TR	FT-8
	.....	-11	SB-4085TR	FT-15
SDLP$^{R}_{L}$	.....	-07F	SB-2570TR	FT-8
	.....	-11F	SB-4085TR	FT-15
STGC$^{R}_{L}$	.....	-08	SB-2050TR	FT-6
STGP$^{R}_{L}$	.....	-08	SB-2050TR	FT-6
	.....	-11	SB-3080TR	FT-10
SVJB$^{R}_{L}$	.....	-11F	SB-2570TR	FT-8
SVLP$^{R}_{L}$	.....	-08FF	SB-2050TR	FT-6
	.....	-11FF	SB-2570TR	FT-8
	.....	-11F		
SVPP$^{R}_{L}$	.....	-08FF	SB-2050TR	FT-6
	.....	-11FF	SB-2570TR	FT-8
	.....	-11		
SYXP$^{R}_{L}$	.....	-06F	SB-2050TR	FT-6

External toolholders (screw clamp)

Description			Spare parts		
			Clamp screw	Wrench	Plug
SCLCR	.....	-09FFJCT	SB-4085TR	FT-15	GP-1
SDJCR	.....	-11..JCT	SB-4085TR	FT-15	GP-1
SVJBR	.....	-11FFJCT	SB-2570TR	FT-8	GP-1
SVJPR	.....	-11FFJCT	SB-2570TR	FT-8	GP-1

External toolholders (screw clamp)

Description			Spare parts				
			Clamp screw	Wrench	Shim	Shim screw	Wrench
SVPB$^{R/L}$	.....	-11	SB-2570TR	FT-8	-	-	-
	.....	-16N	SB-40125TRN	FT-15	SVN-32N	SS-4N	LW-4
SVVBN	.....	-11	SB-2570TR	FT-8	-	-	-
	.....	-16N	SB-40125TRN	FT-15	SVN-32N	SS-4N	LW-4

External toolholders (top clamp)

Description			Spare Parts				
			Clamp Set	Wrench	Shim	Shim Screw	Chipbreaker
CSBP$^{R/L}$	.....	-09N	CPS-2P	LW-2.5	-	-	CB-S3220
CSKP$^{R/L}$	.....	-09N	CPS-2P	LW-2.5	-	-	CB-S3220
	.....	-12N	CPS-3	LW-3	KPS-42	SP3X8	CB-S4220
CSSP$^{R/L}$	.....	-09N	CPS-2P	LW-2.5	-	-	CB-S3220
	.....	-12N	CPS-3	LW-3	KPS-42	SP3X8	CB-S4220
CSDPN	.....	-12N	CPS-3	LW-3	KPS-42	SP3X8	CB-S4220
CTGP$^{R/L}$	.....	-11N	CPS-2P	LW-2.5	-	-	CB-T2212
	.....	-16N	CPS-3	LW-3	KPT-32	SP3X8	CB-T3220
CTFP$^{R/L}$	.....	-11N	CPS-2P	LW-2.5	-	-	CB-T2212
	.....	-16N	CPS-3	LW-3	KPT-32	SP3X8	CB-T3220
CTTP$^{R/L}$	.....	-11N	CPS-2P	LW-2.5	-	-	CB-T2212
	.....	-16N	CPS-3	LW-3	KPT-32	SP3X8	CB-T3220

EZ Bar PLUS

Description	Spare parts	
	Clamp screw	Wrench
S045X-SCLCR03-050EZ	SB-1635TR	FT-6
S060X-SCLCR04-070EZ	SB-2035TR	
C045X-SCLCR03-050EZ	SB-1635TR	FT-6
C060X-SCLCR04-070EZ	SB-2035TR	

Twin-bars

Description			Spare parts	
			Clamp screw	Wrench
STW$^{R}_{L}$	.....	-15	SB-3080TR	LTW-10S
STWSR	.....	-15T	SB-3080TR	LTW-10S

System tip-bars

Description			Spare parts			
			Clamp screw	Wrench	Screw (Side stopper)	Wrench
SVNR	1010H	-12	SB-3080TR	FT-10	HS3X4	LW-1.5
	1212K	-12				
	1616K	-12			HS3X8	
	2020K	-12			HS3X12	
	2525M	-12			HS3X16	
SVNSR	.....	-12-..	SB-3080TR	LTW-10S	HS3X4	LW-1.5
S12F-	SVNR	12	SB-3080TR	FT-10	HS3X4	LW-1.5
S14G-	SVNR	12				
S16H-	SVNR	12			HS3X8	
S19H-	SVNR	12				
S19N-	SVNR	12				
S20H-	SVNR	12				
S25H-	SVNR	12			HS3X12	
S25Q-	SVNR	12				
S....	SVNR	12S	SB-3080TR	FT-10	HS3X4	LW-1.5

System tip-bars (S-SVN-XN)

Description			Spare Parts		
			Clamp screw	Wrench	Clamp screw
S...-	SVNR	12XN	SB-3080TR	FT-10	SP3X4

PSH Sleeve

Description			Spare parts	
			Clamp screw	Wrench
PSH	02..	-..	HS3X4P	LW-1.5
	03..	-..		
PSH	04..	-..	HS4X4P	LW-2
	05..	-..		
	06..	-..		
	07..	-..		

Boring bars (screw clamp)

Description		Spare parts	
		Clamp screw	Wrench
S10H-	SCLC$^{R}_{L}$06-..E	SB-1635TR	FT-6
S10J-	SCLC$^{R}_{L}$04-..E	SB-2035TR	
S08X-	SCLC$^{R}_{L}$06-10E	SB-2545TR	FT-8
S08X-	SCLC$^{R}_{L}$06-10	SB-2545TR	FT-8
C...-	SCLC$^{R}_{L}$03-..	SB-1635TR	FT-6
C...-	SCLC$^{R}_{L}$04-..	SB-2035TR	
C08L-	SCLC$^{R}_{L}$06-10	SB-2545TR	FT-8
A08H-	SCLC$^{R}_{L}$06-10E	SB-2545TR	FT-8
E...-	SCLC$^{R}_{L}$06-..	SB-2545TR	FT-8
S..M-	SCLP$^{R}_{L}$08-..E	SB-3STR	FT-10
S...-	SCLP$^{R}_{L}$09-..E	SB-4TR	FT-15
S..M-	SCLP$^{R}_{L}$08-..	SB-3STR	FT-10
S...-	SCLP$^{R}_{L}$09-..	SB-4TR	FT-15
C10N-	SCLP$^{R}_{L}$08-..	SB-3STR	FT-10
C...-	SCLP$^{R}_{L}$09-..	SB-4TR	FT-15
A..X-	SCLP$^{R}_{L}$08-..E	SB-3STR	FT-10
A...-	SCLP$^{R}_{L}$09-..E	SB-4TR	FT-15
E10N-	SCLP$^{R}_{L}$08-12	SB-3STR	FT-10
E10N-	SCLP$^{R}_{L}$08-12A-..	SB-3060TR	
E...-	SCLP$^{R}_{L}$09-..	SB-4TR	FT-15
S...-	SDUC$^{R}_{L}$07-..E	SB-2560TR	FT-8
S...-	SDUC$^{R}_{L}$11-..E	SB-4085TR	FT-15
S...-	SDUC$^{R}_{L}$07-..	SB-2560TR	FT-8
S...-	SDUC$^{R}_{L}$11-..	SB-4085TR	FT-15
C...-	SDUC$^{R}_{L}$07-..	SB-2560TR	FT-8
C...-	SDUC$^{R}_{L}$11-..	SB-4085TR	FT-15
S...-	SDZC$^{R}_{L}$07-..E	SB-2560TR	FT-8
S...-	SDZC$^{R}_{L}$11-..E	SB-4085TR	FT-15
S...-	SDZC$^{R}_{L}$07-..	SB-2560TR	FT-8
S...-	SDZC$^{R}_{L}$11-..	SB-4085TR	FT-15
C06J-	STLB$^{R}_{L}$06-08A	SB-2035TR	FT-6
E08L-	STLP$^{R}_{L}$08-10A	SB-1TR	
E08L-	STLP$^{R}_{L}$09-10A	SB-2545TR	FT-8
E10N-	STLP$^{R}_{L}$09-..		
E10N-	STLP$^{R}_{L}$11-..	SB-3060TR	FT-10
S06H-	STUB$^{R}_{L}$06-08E	SB-1STR	FT-6
S08K-	STUP$^{R}_{L}$08-10E	SB-1TR	
S..M-	STUP$^{R}_{L}$09-..E	SB-2TR	FT-8
S...-	STUP$^{R}_{L}$11-..E	SB-3TR	FT-10
S..X-	STUP$^{R}_{L}$16-..E	SB-4TR	FT-15
S06H-	STUB$^{R}_{L}$06-08	SB-1STR	FT-6
S08K-	STUP$^{R}_{L}$08-10	SB-1TR	
S..M-	STUP$^{R}_{L}$09-..	SB-2TR	FT-8
S...-	STUP$^{R}_{L}$11-..	SB-3TR	FT-10
S25X-	STUP$^{R}_{L}$16-32	SB-4TR	FT-15
C10L-	STUB$^{R}_{L}$06-08	SB-1STR	FT-6
C08L-	STUP$^{R}_{L}$08-10	SB-1TR	
C...-	STUP$^{R}_{L}$09-..	SB-2TR	FT-8
C...-	STUP$^{R}_{L}$11-..	SB-3TR	FT-10
C20S-	STUP$^{R}_{L}$16-..	SB-4TR	FT-15
A08H-	STUP$^{R}_{L}$08-10E	SB-1TR	FT-6
A..X-	STUP$^{R}_{L}$09-..E	SB-2TR	FT-8
A...-	STUP$^{R}_{L}$11-..E	SB-3TR	FT-10
A...-	STUP$^{R}_{L}$16-..E	SB-4TR	FT-15
E08L-	STUP$^{R}_{L}$08-10	SB-1TR	FT-6
E...-	STUP$^{R}_{L}$09-..	SB-2TR	FT-8
E...-	STUP$^{R}_{L}$11-..	SB-3TR	FT-10
E20S-	STUP$^{R}_{L}$16-25	SB-4TR	FT-15

Boring bars (screw clamp)

Description		Spare parts	
		Clamp screw	Wrench
S...-	SWUB[R/L]08-..E	SB-2050TR	FT-6
S12M-	SWUP[R/L]11-14E	SB-2545TR	FT-8
S...-	SWUP[R/L]11-..E	SB-2560TR	
S...-	SWUP[R/L]16-..E	SB-4065TR	FT-15
S...-	SWUB[R/L]06-..	SB-2040TR	FT-6
S10J-	SWUB[R/L]08-..	SB-2035TR	
C...-	SWUB[R/L]06-..	SB-2035TR	FT-6
C07K-	SWUB[R/L]08-..		
C08L-	SWUB[R/L]08-..	SB-2050TR	
C10N-	SWUB[R/L]08-..		
C12Q-	SWUP[R/L]11-14(-./.)	SB-2545TR	FT-8
C12Q-	SWUP[R/L]11-16(-./.)	SB-2560TR	
C16X-	SWUP[R/L]11-18(-./.)		
C...-	SWUP[R/L]16-..	SB-4065TR	FT-15
E...-	SWUB[R/L]08-..	SB-2050TR	FT-6
S16Q-	SSKPR09-20	SB-4TR	FT-15
S20R-	SSKPR09-25		
S25X-	SSKPR12-32	GS-50S	LW-3
S32S-	SSKPR12-40	GS-50	
S12M-	SYXP[R/L]06-12E	SB-2040TR	FT-6
S16Q-	SYXP[R/L]06-16E	SB-2045TR	

Boring bars (screw clamp)

Description		Spare parts				
		Clamp screw	Wrench	Shim	Shim screw	Wrench (For shim screw)
S12M-	SVJP[R/L]08-16E	SB-2050TR	FT-6	-	-	-
S...-	SVJC[R/L]08-..E					
S...-	SVJB[R/L]11-..E	SB-2570TR	FT-8			
S...-	SVJB[R/L]16-..EN	SB-40125TRN	FT-15	SVN-32N	SS-4N	LW-4
S32S-	SVJB[R/L]16-40E	SB-40115TR	FT-15	SVN-32	SB-2050TR	FT-6
S40T-	SVJB[R/L]16-50E					
S10M-	SVPC[R/L]08-16E	SB-2050TR	FT-6	-	-	-
S...-	SVPB[R/L]11-..E	SB-2570TR	FT-8			
S...-	SVPB[R/L]16-..EN	SB-40125TRN	FT-15	SVN-32N	SS-4N	LW-4
S25X-	SVPB[R/L]16-34E	SB-40115TR	FT-15	SVN-32	SB-2050TR	FT-6
S32S-	SVPB[R/L]16-40E					
S12M-	SVUC[R/L]08-16E	SB-2050TR	FT-6	-	-	-
S...-	SVUB[R/L]11-..E	SB-2570TR	FT-8			
S...-	SVUB[R/L]16-..EN	SB-40125TRN	FT-15	SVN-32N	SS-4N	LW-4
S25X-	SVUB[R/L]16-34E	SB-40115TR	FT-15	SVN-32	SB-2050TR	FT-6
S32S-	SVUB[R/L]16-40E					
S12M-	SVZC[R/L]08-16E	SB-2050TR	FT-6	-	-	-
S...-	SVZB[R/L]11-..E	SB-2570TR	FT-8			
S...-	SVZB[R/L]16-..EN	SB-40125TRN	FT-15	SVN-32N	SS-4N	LW-4
S25X-	SVZB[R/L]16-34E	SB-40115TR	FT-15	SVN-32	SB-2050TR	FT-6
S32S-	SVZB[R/L]16-40E					

Boring bars (top clamp)

Description		Spare Parts				
		Chipbreaker	Clamp Set	Wrench	Shim	Shim Screw
S12L-	CTUP[R/L]09-16	-	CPS-1	FH-2	-	-
S...-	CTUP[R/L]11-..	-	CPS-2	FH-2.5	-	-
S25X-	CTUP[R/L]16-34	-	CPS-3	LW-3	-	-
S32S-	CTUP[R/L]16-43				KPT-32	SP3X10
S40X-	CTUP[R/L]16-50					
S32S-	CTUC[R/L]16-40	*CB-13/12	CE-320	LW-4	SP-230P	SP3X10
S...-	CCLN[R/L]09-..A	-	CE-360S	LW-4	SP-420A	BH3X6
S...-	CSKN[R/L]09-..A	-	CE-360S	LW-4	SP-130A	BH3X12
S32S -	CSKPR12-43	CPS-3	-	LW-3	KPS-42	SP3X10

* CB-13 for Right-hand Toolholder, CB-12 for Left-hand Toolholder.

AD bars, interchangeable head (lever lock)

Description			Spare parts					
			Lever	Lock screw	Punch	Shim Pin	Shim	Wrench
HA32	PCLN$^{R}_{L}$	12-40	LL-2K	LS-2P	PC-2K	LSP-3K	LC-4K	DTPM-15
HA40	PCLN$^{R}_{L}$	12-50						
HA50	PCLN$^{R}_{L}$	12-63						
HA32	PDUN$^{R}_{L}$	15-43	LL-3K	LS-3P	PC-2K	LSP-3K	LD-4K43 (LD-4K*)	DTPM-15
HA40	PDUN$^{R}_{L}$	15-50						
HA50	PDUN$^{R}_{L}$	15-63						
HA32	PTFN$^{R}_{L}$	16-40	LL-1K	LS-1P	PC-2K	LSP-2K	LT-3K	DTPM-10
HA40	PTFN$^{R}_{L}$	16-50						
HA50	PTFN$^{R}_{L}$	16-63						

Shim : LD-4K43 is attached to Toolholder. When using DN□□1506 Insert, purchase LD-4K separately.

AD bars, interchangeable head (screw clamp)

Description			Spare parts	
			Screw	Wrench
HA32	SCLC$^{R}_{L}$	09-40	SB-3580TR	FT-15
HA32	SDUC$^{R}_{L}$	11-40	SB-3580TR	FT-15

Boring adapter (AD bars)

Description		Spare parts		
		Clamp bolt		Wrench
AD	32U	HH5X20 (3 pcs)	HH5X30 (1 pcs)	LW-4
AD	40V	HH5X20 (3 pcs)	HH5X30 (1 pcs)	LW-4
AD	50W	HH6X20 (3 pcs)	HH6X30 (1 pcs)	LW-5

Combination of boring adapter and interchangeable head

Interchangeable head description			Boring adapter			
			Base description	Clamp bolt		Wrench
HA32	PCLN$^{R}_{L}$	12-40	AD32U	HH5X20	HH5X30	LW-4
HA32	PDUN$^{R}_{L}$	15-43				
HA32	PTFN$^{R}_{L}$	16-40				
HA32	SCLC$^{R}_{L}$	09-40		HH5X20		
HA32	SDUC$^{R}_{L}$	11-40				
HA40	PCLN$^{R}_{L}$	12-50	AD40V	HH5X20	HH5X30	LW-4
HA40	PDUN$^{R}_{L}$	15-50				
HA40	PTFN$^{R}_{L}$	16-50				
HA50	PCLN$^{R}_{L}$	12-63	AD50W	HH6X20	HH6X30	LW-5
HA50	PDUN$^{R}_{L}$	15-63				
HA50	PTFN$^{R}_{L}$	16-63				

Boring bars for ceramic tools (top clamp)

Description	Spare parts				
	Chipbreaker	Clamp set	Wrench	Shim	Shim screw
S32S- CCLN$^{R}_{L}$ -12-40GX	-	CE-410	LW-4	-	-
S40T- CCLN$^{R}_{L}$ -12-50GX				SP-441P	M3X8
S32S- CDUN$^{R}_{L}$ -12-40GX	-	CE-410	LW-4	-	-
S40T- CDUN$^{R}_{L}$ -12-50GX				SP-521P	M3X8
S32S- CSKN$^{R}_{L}$ -12-40GX	-	CE-410	LW-4	-	-
S40T- CSKN$^{R}_{L}$ -12-50GX				SP-141P	M3X8
S40T- CSKN$^{R}_{L}$ -12-50	*1 CB-13/12	CE-320	LW-4	SP-141P *2 (SP-143P)	M3X8 *2 (M3X12)

*1 CB-13 for right-hand toolholder, CB-12 for left-hand toolholder.
*2 When using SN□□1204 Insert, please purchase spare parts in ( ) separately.

Boring toolholders for bearing machining (Square shank) (Boring)

Description	Spare parts	
	Clamp screw	Wrench
SRCP$^{R}_{L}$ 2020B-12 -A20	SB-4TR	FT-15
2525B-16 -A32	SB-5090TR	LTW-20

Boring toolholders for bearing machining (Square shank) (Internal round chamfering)

Description	Spare parts	
	Clamp set	Wrench
CBSN$^{R}_{L}$ ....B-12 -A20	CP-RC$^{R}_{L}$	LW-5

Sleeves for tip-bars

Description	Spare parts	
	Screw	Wrench
PH 02 ..-..	HS3X4	LW-1.5
03 ..-..		
04 ..-..	HS4X4	LW-2
05 ..-..		
06 ..-..		
07 ..-..		

KTGF

Description	Spare parts	
	Clamp screw	Wrench
KTGF$^{R}_{L}$ ..... -16F	SB-4070TRW	FT-8
KTGF$^{R}_{L}$ ..... -16	SB-4070TRS	FT-10

S-KTGF

Description	Spare parts	
	Clamp screw	Wrench
S.... -KTGFL16	SB-4070TRS	FT-10

KTG

Description	Spare parts	
	Clamp screw	Wrench
KTG$^{R}_{L}$ .... -16	SB-4TR	FT-15
.... 22-..	GS-50	LW-3

KN91

Description	Spare parts				
	Clamp	Clamp bolt	Washer	Spring	Wrench
KN91$^{R}_{L}$ 44 -4	*CE-111/121	BH8X30	W-8	SP-8	LW-5
44 -5					
44 -7	*CE-131/141				

* KN91$^{R}_{L}$44-4/5 ... CE-111 for right-hand toolholder, and CE-121 for left-hand toolholder.
KN91$^{R}_{L}$44-7 ... CE-131 for right-hand toolholder, and CE-141 for left-hand toolholder.

KGHS

Description	Spare parts				
	Clamp	Clamp bolt	Washer	Spring	Wrench
KGHS$^{R}_{L}$ ..... -4	CGH-1$^{L}_{R}$	HH6X25	W-6	SP-6	LW-5
..... -5					
..... -7	CGH-2$^{L}_{R}$				

Clamp: KGHS$^{R}_{L}$ ... CGH-○L for right-hand toolholder, and CGH-○R for left-hand toolholder.

KGA

Description		Spare parts			
		Clamp	Clamp bolt	Spring	Wrench
KGA R/L	.... -3	CGA-3 R/L	HH6X20	SP-6	LW-5
	.... -4	CGA-4 R/L			
	.... -5	CGA-5 R/L			

Clamp: CGA-○R for right-hand toolholder and CGA-○L for left-hand toolholder.

KGD R/L....-S

Description		Spare parts		
		Clamp bolt (for insert clamp)	Clamp screw (for blade)	Wrench
KGD R/L	....-S	BH6X10TR	SB-60120TR	LTW-25

KGD-JCT (for automatic lathe)

Description		Spare parts		
		Clamp screw	Wrench	Plug
KGD R/L	..... - ... JCT	SB-40120TR	LTW-15S	GP-1

KGDF R/L....-S

Description		Spare Parts		
		Clamp bolt (for insert clamp)	Clamp screw (for blade)	Wrench
KGDF R/L	....-S	BH6X10TR	SB-60120TR	LTW-25

KGM

Description		Spare parts	
		Screw	Wrench
KGM R/L	1212H -3	SB-5TR	LTW-20
	1616H -3	HH5X16	LW-4
	2020K -3		
	2525M -3	HH5X25	
KGM R/L	2020K -4	HH5X16	LW-4
	2525M -4	HH5X25	
KGM R/L	2020K -5	HH5X16	LW-4
	2525M -5	HH5X25	
	3232P -5		
KGM R/L	2525M -8	HH6X25	LW-5
	3232P -8		

KGM-T

Description		Spare parts	
		Screw	Wrench
KGM R/L	2012K-2T17	SB-5TR	LTW-20
	2020K-2T17	HH5X16	LW-4
	2525M-2T17	HH5X25	
KGM R/L	1616H-3T20	HH5X16	LW-4
	2012K-3T20	SB-5TR	LTW-20
	2020K-3T20	HH5X16	LW-4
	2525M-3T20	HH5X25	
KGM R/L	2020K-4T20	HH5X16	LW-4
	2525M-4T20	HH5X25	
	2525M-4T25		
KGM R/L	2525M-5T25	HH5X25	LW-4
	3232P-5T25		
KGM R/L	2525M-6T30	HH5X25	LW-4

KGM (for automatic lathe)

Description		Spare parts	
		Clamp screw	Wrench
KGM R/L	0810K - ...	SE-40120TR	LTW-15S
	1010.. - ...		
	1212.. - 1.5-...		
	1212.. - 2-...		
	1212.. - 2.5-...		
	1616.. - 2-...	SE-50125TR	LTW-20
	1616.. - 2.5-...		
	1616.. - 3-...		

KGMM / KGMS

Description		Spare parts	
		Screw	Wrench
KGMM R/L	1212H-3	SB-5TR	LTW-20
	1616H-3	HH5X16	LW-4
	2020K-3		
	2525M-3	HH5X25	
KGMS R/L	1212H-3	SB-5TR	LTW-20
	1616H-3	GS-50	LW-3
	2020K-3	HH5X16	LW-4
	2525M-3	HH5X25	

KGMU

Description		Spare parts	
		Clamp bolt	Wrench
KGMU$^{R}_{L}$	2020K	HH5X16	LW-4
	2525M	HH5X25	

KIGH

Description		Spare parts				
		Clamp	Clamp bolt	Washer	Spring	Wrench
KIGHR	....-4	CGH-1L	HH6X25	W-6	SP-6	LW-5
	....-5					
	....-7	CGH-2L				

KIGM-V

Description		Spare parts	
		Clamp screw	Wrench
KIGM$^{R}_{L}$	2016B-3V	GS-50	LW-3
	2520B-3V		
	3225B-3V	SB-5TR	LTW-20
	3225B-4V	SB-5TR	LTW-20
	4032B-4V		

GFVS-AA / GFVT-AA

Description		Spare parts	
		Clamp set	Wrench
GFVS$^{R}_{L}$	..... -08AA	CPS-5V	FT-15
GFVT$^{R}_{L}$	..... -08AA	CPS-5V	FT-15

GIFV

Description		Spare parts	
		Clamp set	Wrench
GIFV$^{R}_{L}$	5032B-502B	CPS-6V	LW-3

KTKF-JCT

Description		Spare parts		
		Clamp screw	Wrench	Plug
KTKF$^{R}_{L}$	..... - ... JCT	SB-4590TRWN	FT-10	GP-1

KTKFS (for sub spindle tooling)

Description		Spare parts	
		Clamp screw	Wrench
KTKFS$^{R}_{L}$	..... - ...	SB-4050TRN	LTW-10S

KTKH-S

Description		Spare parts
		Releasing wrench
KTKH$^{R}_{L}$	..... - ...S	LTK-5

KTKH-B

Description			Spare parts	
			Clamp screw	Wrench
KTKH$^{R}_{L}$	0808K	- ...B	SE-40120TR	FT-15
	1010K	- ...B		
	1212M	- ...B		
	1414M	- ...B		
	1616M	- ...B	SE-50125TR	LTW-20

KTTX

Description		Spare parts	
		Clamp screw	Wrench
KTTXR	..... -16F	SB-4070TRW	FT-8

DRS

Description			Spare parts	
			Clamp screw	Wrench
S20	-DRS	10...	SB-2080TR	FT-6
	-DRS	11...	SB-2290TR	FT-6
	-DRS	12...	SB-25100TR	DT-7

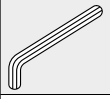
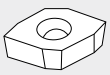
DRX

Description			Spare parts	
			Clamp screw	Wrench
S..	-DRX	- . -03	SB-2042TRG	DTM-6
	-DRX	- . -04	SB-2042TRG	DTM-6
	-DRX	- . -05	SB-2045TR	DTM-6
	-DRX	- . -06	SB-2250TR	DTM-7
	-DRX	- . -07	SB-2570TR	DTM-8
	-DRX	- . -09	SB-3080TR	DTM-10
	-DRX	- . -11	SB-4085TR	DTM-15
	-DRX	- . -14	SB-5090TR	DT-20
	-DRX	- . -17	SB-60120TR	DT-25

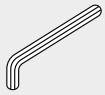
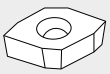
MFPN45 (Face mill)

Description	Spare parts		
	Clamp screw	Wrench	Anti-seize compound
MFPN 45100R-10T-M ~ 45200R-20T-M	SB-40140TRN	DTM-15	P-37

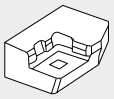
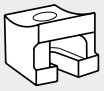
MSE45 (End mill)

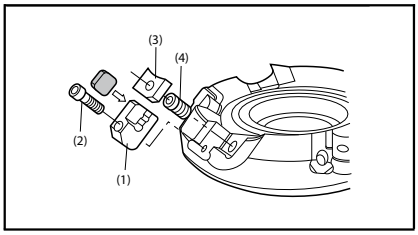
Description	Spare parts			
	Clamp set	Wrench	Shim	Shim screw
				
MSE 4550 / 4563 / 4580-32	CPS-6M	LW-3	MSE-4245	SP3X8

MSD45 (End mill)

Description	Spare parts			
	Clamp set	Wrench	Shim	Shim screw
				
MSD 4550 / 4563 / 4580-32	CPS-6M	LW-3	MSD-42	SP3X8

MSO45 (Face mill)

Description	(1) Cartridge	(2) Cartridge clamp screw	(3) Clamp	(4) Clamp screw	Wrench
					
MSO 45...R	LSO-445R	HH4X16	CH-20R	TH8X15	TH-4



MSO45-S (End mill)

Description	Spare parts				
	Shim	Shim screw	Clamp	Clamp screw	Wrench
MSO 45..-S	MSO-4T245	SP3X6	CH-20R	TH8X15	TH-4

MSO45-09 (Face mill)

Description	Spare parts	
	Clamp screw	Wrench
MSO 45...R-09	SB-3060TR	DT-10

MSO45-S-09 (End mill)

Description	Spare parts	
	Clamp screw	Wrench
MSO 45..-S32-09	SB-3060TR	DT-10

MSP15 / MSE15 (End mill)

Description	Clamp set	Wrench	Shim	Shim screw
				
MSP 15..	CPS-6M	LW-3	MSP-42	SP3X8
MSE 15..	CPS-6M	LW-3	MSE-4215	SP3X8

MEC (Face mill)

Description		Spare parts	
		Clamp screw	Wrench
MEC	...R-11-..T(-M)	SB-2555TRG	DTM-8
	...R-17-..T(-M)	SB-4070TRN	DTM-15

MEC (End mill)

Description		Spare parts	
		Clamp screw	Wrench
MEC	..-W..-1103(-H)	SB-2545TR	DTM-8
	..-W..-11T3(-H)	SB-2555TRG	DTM-8
	..-W..-1704-H	SB-4070TRN	DTM-15

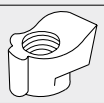
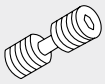
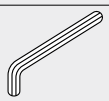
MECX (Face Mill)

Description		Spare parts	
		Clamp screw	Wrench
MECX	050R-07-12T-M	SB-2042TRG	DTM-6
	063R-07-14T-M		

MECX (End mill)

Description		Spare parts	
		Clamp screw	Wrench
MECX	32-S32-07-6T	SB-2042TRG	DTM-6
	33-S32-200-07-6T		

MTE90 (End mill)

Description		Spare parts				
		Clamp	Clamp screw	Wrench	Shim	Shim screw
						
MTE	9050	CP-8TE	W8X18	LW-4	MTE-42	SP3X8
	9063					
	9080-32					

MFWN (Face Mill)

Description		Spare parts		
		Clamp screw	Wrench	Anti-seize compound
MFWN	90100R-9T-M ~ 90250R-18T-M	SB-40140TRN	DTM-15	P-37

MSO90-S (End mill)

Description		Spare parts	
		Clamp screw	Wrench
MSO	90..-S32-09	SB-3080TR	DT-10
	90..-S32-15	SB-5085TR	DT-20

MSO90-09 (Face mill)

Description		Spare parts	
		Clamp screw	Wrench
MSO	90...R-09	SB-3080TR	DT-10

MEA / MEB

Description		Spare parts	
		Clamp screw	Wrench
MEA	.. -S..(- ...)	SB-2560TR	DT-8
MEB	.. -S..	SB-4085TR	DT-15

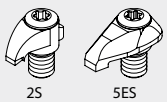
DMC

Description		Spare parts	
		Clamp screw	Wrench
DMC	8.. (- S..)	SB-2545TR	FT-8
DMC	0..	SB-3060TR	FT-10

MTP

Description		Spare parts				
		Clamp	Clamp screw	Wrench	Shim	Shim screw
MTP	90..	CP-8W	W8X18	LW-4	KPT-42	SP3X8

MTPS / MTES

Description		Clamp Set	Wrench
		 2S 5ES	
MTPS	...	CPS-2S	FT-15
MTES	...	CPS-5ES	

MEAL

Description		Spare parts	
		Clamp screw	Wrench
MEAL	.. -S..	SB-5085TR	DT-20

MSTC (Slot mill)

Description				Spare parts										
				Cartridge		Wedge	Wedge screw	Cam pin	Clamp screw	Wrench			Anti-seize compound	Mounting bolt
				Right-hand	Left-hand					for wedge screw	for cam pin	for clamp screw		
														
Without Boss	Inch spec	MSTC	400AN551-630-10	C90SP1416-10R	C90SP1416-10L	WC-14	W6X18	AP-1416	SE-3070TRP	TH-3L	LW-2.5	DTP-9	P-37	-
			500AN551-630-10				W6X20							
			600AN551-630-10											
		MSTC	500AN630-709-10	C90SP1618-10R	C90SP1618-10L	WC-16	W6X20							
			600AN630-709-10											
		MSTC	500AN709-813-12	C90SD1820-12R	C90SD1820-12L	WC-18	W6X20	AP-1820	SB-3590TRP		LW-3	DTP-15		
			600AN709-813-12											
		MSTC	500AN813-917-12	C90SD2023-12R	C90SD2023-12L	WC-20								
			600AN813-917-12											
	Metric	MSTC	100AR1416-10-6T	C90SP1416-10R	-	WC-14	W6X18	AP-1416	SE-3070TRP	TH-3L	LW-2.5	DTP-9	P-37	-
			125AR1416-10-8T				W6X20							
			160AR1416-10-10T											
		MSTC	125AR1618-10-8T	C90SP1618-10R		WC-16	W6X20							
			160AR1618-10-10T											
		MSTC	125AR1820-12-8T	C90SD1820-12R		WC-18	W6X20	AP-1820	SB-3590TRP		LW-3	DTP-15		
			160AR1820-12-10T											
		MSTC	125AR2123-12-8T	C90SD2023-12R		WC-20								
			160AR2123-12-10T											
		MSTC	100AL1416-10-6T	-	C90SP1416-10L	WC-14	W6X18	AP-1416	SE-3070TRP	TH-3L	LW-2.5	DTP-9	P-37	-
			125AL1416-10-8T				W6X20							
			160AL1416-10-10T											
		MSTC	125AL1618-10-8T		C90SP1618-10L	WC-16	W6X20							
			160AL1618-10-10T											
		MSTC	125AL1820-12-8T		C90SD1820-12L	WC-18	W6X20	AP-1820	SB-3590TRP		LW-3	DTP-15		
			160AL1820-12-10T											
		MSTC	125AL2123-12-8T		C90SD2023-12L	WC-20								
			160AL2123-12-10T											
	Inch spec	MSTC	400AR551-630-10	C90SP1416-10R	-	WC-14	W6X18	AP-1416	SE- 3070TRP	TH-3L	LW-2.5	DTP-9	P-37	-
			500AR551-630-10				W6X20							
			600AR551-630-10											
		MSTC	500AR630-709-10	C90SP1618-10R		WC-16	W6X20							
			600AR630-709-10											
		MSTC	500AR709-813-12	C90SD1820-12R		WC-18	W6X20	AP-1820	SB- 3590TRP		LW-3	DTP-15		
			600AR709-813-12											
		MSTC	500AR813-917-12	C90SD2023-12R		WC-20								
			600AR813-917-12											
		MSTC	400AL551-630-10	-	C90SP1416-10L	WC-14	W6X18	AP-1416	SE- 3070TRP	TH-3L	LW-2.5	DTP-9	P-37	-
			500AL551-630-10				W6X20							
			600AL551-630-10											
		MSTC	500AL630-709-10		C90SP1618-10L	WC-16	W6X20							
			600AL630-709-10											
		MSTC	500AL709-813-12		C90SD1820-12L	WC-18	W6X20	AP-1820	SB- 3590TRP		LW-3	DTP-15		
			600AL709-813-12											
		MSTC	500AL813-917-12		C90SD2023-12L	WC-20								
			600AL813-917-12											

MSTC (Slot mill)

Description				Spare Parts									
				Cartridge		Wedge	Wedge Screw	Cam Pin	Clamp Screw	Wrench			Anti-seize Compound	Mounting bolt
				Right-hand	Left-hand					for Wedge Screw	for Cam Pin	for Clamp Screw		
														
With Boss	Metric	MSTC	100SR1416-10-6T	C90SP1416-10R	-	WC-14	W6X20	AP-1416	SE-3070TRP	TH-3L	LW-2.5	DTP-9	P-37	HH12X35
			125SR1416-10-8T											HH16X35
			160SR1416-10-10T											-
		MSTC	125SR1618-10-8T	C90SP1618-10R		WC-16								HH16X35
			160SR1618-10-10T											-
		MSTC	125SR1820-12-8T	C90SD1820-12R		WC-18	W6X20	AP-1820	SB-3590TRP		LW-3	DTP-15		HH16X35
			160SR1820-12-10T											-
		MSTC	125SR2123-12-8T	C90SD2023-12R		WC-20								HH16X35
			160SR2123-12-10T											-
		MSTC	100SL1416-10-6T	-	C90SP1416-10L	WC-14	W6X20	AP-1416	SE-3070TRP	TH-3L	LW-2.5	DTP-9	P-37	HH12X35
			125SL1416-10-8T											HH16X35
			160SL1416-10-10T											-
		MSTC	125SL1618-10-8T		C90SP1618-10L	WC-16								HH16X35
			160SL1618-10-10T											-
		MSTC	125SL1820-12-8T		C90SD1820-12L	WC-18	W6X20	AP-1820	SB-3590TRP		LW-3	DTP-15		HH16X35
			160SL1820-12-10T											-
		MSTC	125SL2123-12-8T		C90SD2023-12L	WC-20								HH16X35
			160SL2123-12-10T											-

MRP-S (End mill)

Description			Spare parts	
			Clamp screw	Wrench
MRP	...-S..	-08(-...)	SB-3060TR	DT-10
	...-S..	-10-.T(-...)	SB-3080TR	DT-10
	...-S..	-12(-.T)(-...)	SB-4085TR	DT-15
	050-S42	-12(-300)	SB-40115TR	
	...-S..	-16(-...)	SB-50120TR	DT-20

MRP (Face mill)

Description			Spare parts	
			Clamp screw	Wrench
MRP	...R	-10- .T	SB-3080TR	DT-10
MRP	050R	-12	SB-40115TR	DT-15
	063R	-12		
	080R	-12	SB-4085TR	
	080R	-12-7T		
MRP	...R	-16(- .T)	SB-50120TR	DT-20
MRP	...R	-20	SB-60120TR	DT-25

MHD (Helical end mill)

Description			Spare parts				
			Clamp screw	Wrench	Clamp bolt		Wrench
					1 Front piece	2 Front pieces	
MHD	32-S32	-SA	SB-2560TR	DT-8	-	HH8X50	LW-6
	40-S32	-SA	SB-3080TR	DT-10		HH8X65	
	40-S42	-SA					
	50-S42	-SA				HH12X65	LW-10
MHD	40-S42	-SB	SB-3080TR	DT-10	HH8X40	-	LW-6
	50-S42	-SB			HH12X40		LW-10
MHD	20S-S20	-C	SB-2560TR	DT-8	-	-	-
	25-S25	-C					
	32-S32	-C					
	40-S42	-C	SB-3080TR	DT-10			
	50-S42	-C					
MHD	32-S32	-A	SB-2560TR	DT-8	HH8X35	HH8X50	LW-6
	40-S32	-A	SB-3080TR	DT-10	HH8X40	HH8X65	
	40-S42	-A					
	50-S42	-A			HH12X40	HH12X65	LW-10
MHD	32-S32	-A-130	SB-2560TR	DT-8	HH8X35	HH8X50	LW-6
	40-S32	-A-150	SB-3080TR	DT-10	HH8X40	HH8X65	
	50-S42	-A-150			HH12X40	HH12X65	LW-10
MHD	40-S42	-B	SB-3080TR	DT-10	HH8X40	-	LW-6
	50-S42	-B			HH12X40		LW-10
MHD	32	-F	SB-2560TR	DT-8	-	-	-
	40	-F	SB-3080TR	DT-10			
	50	-F					

MHD (face mill and integral arbor type)

Description			Spare parts			
			Clamp screw	Wrench	Clamp bolt	Wrench
MHD	63-FMA	-SA	SB-3080TR	DT-10	HH16X90	LW-14
	80-FMA	-SA			HH20X110	LW-17
	100-FMA	-SA			HH24X110	LW-19
MHD	63-FMA	-A			HH16X90	LW-14
	80-FMA	-A			HH20X110	LW-17
	100-FMA	-A			HH24X110	LW-19
MHD	63-BT50	-SA			HH16X65	LW-14
	80-BT50	-SA			HH20X90	LW-17
	100-BT50	-SA			HH24X90	LW-19
MHD	63-BT50	-A			HH16X65	LW-14
	80-BT50	-A			HH20X90	LW-17
	100-BT50	-A			HH24X90	LW-19
MHD	63	-F			-	-
	80	-F				
	100	-F				

MHD (Radius)

Description			Spare parts						
			Clamp screw		Wrench		Clamp bolt		Wrench
			For bottom insert	For middle insert	For bottom insert	For middle insert	1 Front piece	2 Front pieces	
MHD	32-S32	-4RSA	SB-2560TR	SB-2560TR	DT-8	DT-8	-	HH8X50	LW-6
	40-S32	-5RSA	SB-3080TR	SB-3080TR	DT-10	DT-10		HH8X55	
	40-S42	-5RSA							
	50-S42	-6RSA	SB-4085TR		DT-15			HH12X55	LW-10
MHD	32-S32	-A	SB-2560TR		DT-8		-	HH8X50	LW-6
	40-S32	-A	SB-3080TR		DT-10			HH8X65	
	40-S42	-A							
	50-S42	-A						HH12X65	LW-10
MHD	32	-F	SB-2560TR		DT-8		-	-	-
	40	-F	SB-3080TR		DT-10				
	50	-F							
MHD	32	-4RF	SB-2560TR	SB-2560TR	DT-8	DT-8	-	-	-
	40	-5RF	SB-3080TR	SB-3080TR	DT-10	DT-10			
	50	-6RF	SB-4085TR		DT-15				

MEZ

Description		Spare parts	
		Clamp screw	Wrench
MEZ	16-S16....	SB-2040TRG	DTM-6
	20-S20....	SB-2555TRG	DT-8
	25-S25....	SB-3070TRG	DT-10
	32-S32....	SB-4070TRG	DT-15
	40-S32....	SB-3070TRG	DT-10
	50-S42....	SB-4070TRG	DT-15

MGI

Description		Spare parts	
		Clamp set	Wrench
MGI	....-1C	CPS-6F	LW-3

MVG

Description		Spare parts	
		Clamp set	Wrench
MVG	....	CPS-6V	LW-3

Blank tool

Description		Spare parts
		Coolant pipe
T63H	-BL...-...	CL63-1

Flange holder

Description			Spare parts					
			Screw	Wrench	Mounting bolt	Wrench	Adjustment screw	Wrench
SF22F	-SCLCL09	-40P	SB-4085TR	FT-15	HH5X30	LW-4	HS3X4	LW-1.5
	-SDUCL11	-40P	SB-4085TR	FT-15	HH5X30	LW-4	HS3X4	LW-1.5
	-SVUBL11	-40P	SB-2570TR	FT-8	HH5X30	LW-4	HS3X4	LW-1.5
	-KTGFL16	-40P	SB-4070TRS	FT-10	HH5X30	LW-4	HS3X4	LW-1.5
	-KTTXL16	-40P	SB-4070TRW	FT-8	HH5X30	LW-4	HS3X4	LW-1.5

Flange holder (Sleeve type)

Description			Spare parts					
			Mounting bolt	Wrench	Adjustment screw	Wrench	Screw (for fixing toolholder)	Wrench
SF22F	-SH..	-40P	HH5X30	LW-4	HS3X4	LW-1.5	HS6X4P	LW-3



T

○: Figure, □: Alphabet

Numeric (Threading Insert)

Description		Page	Category
06IR	○○○○(○)	J17, J19	Insert (Threading)
08IR	○○○○(○)	J17, J19	Insert (Threading)
11IR	○○BSPT	J13	Insert (Threading)
11IR	○○BSPT-TF	J13	Insert (Threading)
11IR	○○BSPT-TQ	J13	Insert (Threading)
11IR/L	○○○ISO	J7	Insert (Threading)
11IR	○○○ISO-TF	J7	Insert (Threading)
11IR	○○○ISO-TQ	J7	Insert (Threading)
11IR	○○○○○	J17, J19	Insert (Threading)
11IR	A○○	J17, J19	Insert (Threading)
16ER	○○BSPT	J12	Insert (Threading)
16ER	○○BSPT-TF	J12	Insert (Threading)
16ER	○○BSPT-TQ	J12	Insert (Threading)
16ER	○○(.○)NPT	J14	Insert (Threading)
16ER	○○UN	J8	Insert (Threading)
16ER	○○UN-TF	J8	Insert (Threading)
16ER	○○UN-TQ	J8	Insert (Threading)
16ER	○○W	J10	Insert (Threading)
16ER	○○W-TF	J10	Insert (Threading)
16ER	○○W-TQ	J10	Insert (Threading)
16ER/L	○○○ISO	J6	Insert (Threading)
16ER	○○○ISO-TF	J6	Insert (Threading)
16ER	○○○ISO-TQ	J6	Insert (Threading)
16ER	○○○TR	J20	Insert (Threading)
16ER	○○○○	J16, J18	Insert (Threading)
16ER	A○○	J16, J18	Insert (Threading)
16ER	AG○○	J16, J18	Insert (Threading)
16ER	G○○	J16, J18	Insert (Threading)
16ER	A○○-TF	J16, J18	Insert (Threading)
16ER	A○○-TQ	J16, J18	Insert (Threading)
16ER	AG○○-TF	J16, J18	Insert (Threading)
16ER	AG○○-TQ	J16, J18	Insert (Threading)
16ER	G○○-TF	J16, J18	Insert (Threading)
16ER	G○○-TQ	J16, J18	Insert (Threading)
16IR	○○BSPT	J13	Insert (Threading)
16IR	○○BSPT-TF	J13	Insert (Threading)
16IR	○○BSPT-TQ	J13	Insert (Threading)
16IR	○○(.○)NPT	J15	Insert (Threading)
16IR	○○UN	J9	Insert (Threading)
16IR	○○UN-TF	J9	Insert (Threading)
16IR	○○UN-TQ	J9	Insert (Threading)
16IR	○○W	J11	Insert (Threading)
16IR	○○W-TF	J11	Insert (Threading)
16IR	○○W-TQ	J11	Insert (Threading)
16IR/L	○○○ISO	J7	Insert (Threading)
16IR	○○○ISO-TF	J7	Insert (Threading)
16IR	○○○ISO-TQ	J7	Insert (Threading)
16IR	○○○TR	J21	Insert (Threading)
16IR	○○○○(○)	J17, J19	Insert (Threading)
16IR	A○○	J17, J19	Insert (Threading)
16IR	AG○○	J17, J19	Insert (Threading)
16IR	G○○	J17, J19	Insert (Threading)
22ER	○○UN	J8	Insert (Threading)
22ER	○○○ISO	J6	Insert (Threading)
22ER	○○○TR	J20	Insert (Threading)
22ER	N○○	J16, J18	Insert (Threading)
22IR	○○UN	J9	Insert (Threading)
22IR	○○○ISO	J7	Insert (Threading)
22IR	○○○TR	J21	Insert (Threading)
22IR	N○○	J17, J19	Insert (Threading)

Numeric

556C R/L		P8	Spare parts (Shim)

A

A○○□-	DCLNR/L○○-○○	F131	Boring bars
A○○□-	DDUNR/L○○-○○	F136	Boring bars
A○○□-	DSKNR/L○○-○○	F142	Boring bars
A○○□-	DTFNR/L○○-○○	F143	Boring bars
A○○□-	DWLNR/L○○-○○	F148	Boring bars
A○○□-	PCLNR○○-○○	F132	Boring bars
A○○□-	PDUNR○○-○○	F134	Boring bars
A○○□-	PTUNR○○-○○	F144	Boring bars
A○○□-	PWLNR○○-○○	F146	Boring bars
A○○□-	SCLCR/L○○-○○AE	F60	Boring bars
A○○□-	SCLCR/L○○-○○E	P25	Boring bars (Discontinued description)
A○○□-	SCLPR/L○○-○○AE	F64	Boring bars
A○○□-	SCLPR/L○○-○○E	P25	Boring bars (Discontinued description)
A○○□-	SDQCR/L○○-○○AE	F70	Boring bars
A○○□-	SDUCR/L○○-○○AE	F66	Boring bars
A○○□-	SDZCR/L○○-○○AE	F74	Boring bars
A○○□-	STLCR/L○○-○○AE	F88	Boring bars
A○○□-	STLPR/L○○-○○AE	F80	Boring bars
A○○□-	STUPR/L○○-○○E	P25	Boring bars (Discontinued description)
A○○□-	SVJBR/L○○-○○AE	F90	Boring bars
A○○□-	SVJCR/L○○-○○AE	F90	Boring bars
A○○□-	SVJPR/L○○-○○AE	F90	Boring bars
A○○□-	SVPBR/L○○-○○AE	F94	Boring bars
A○○□-	SVPCR/L○○-○○AE	F94	Boring bars
A○○□-	SVUBR/L○○-○○AE	F96	Boring bars
A○○□-	SVUCR/L○○-○○AE	F96	Boring bars
A○○□-	SVZBR/L○○-○○AE	F98	Boring bars
A○○□-	SVZCR/L○○-○○AE	F98	Boring bars
A○○□-	SWUBR/L○○-○○AE	F100	Boring bars
A○○□-	SWUPR/L○○-○○AE	F100	Boring bars
A○○□-	SZJBR/L○○-○○AE	F106	Boring bars
A○○□-	SZLBR/L○○-○○AE	F109	Boring bars
A○○□-	SZQBR/L○○-○○AE	F108	Boring bars
A○○□-	SZXBR/L○○-○○AE	F107	Boring bars
A○○□-	SZZBR/L○○-○○AE	F110	Boring bars
AABSR	○○○○□(□)-○○F	E20, P21	Toolholder (Back turning)
AABWR	○○○○□(□)-○○F	E21, E22, P21	Toolholder (Back turning)
ABS	○○R○○○○	B112	Insert (Back turning)
ABS	○○R○○○○M	B112	Insert (Back turning)
ABW	○○R○○○○	B112	Insert (Back turning)
ABW	○○R○○○○M	B112	Insert (Back turning)
ACLCR/L	○○○○□-○○F	P22	Toolholder (Turning / Discontinued description)
ACLCR/L	○○○○JX-○○FF	E26	Toolholder (Turning)
AJ-	○(○)X○○(-○.○)	P2	Spare parts (Screw)
AJ-	519TR	P2	Spare parts (Screw)
AD	○○U	P27	Boring adapter (Discontinued description)
AD	○○V	P27	Boring adapter (Discontinued description)
AD	○○W	P27	Boring adapter (Discontinued description)
ADJCR/L	○○○○□-○○F	P22	Toolholder (Turning / Discontinued description)
ADJCR/L	○○○○JX-○○FF	E29	Toolholder (Turning)
ADNCR	○○○○□-○○F	P22	Toolholder (Turning / Discontinued description)
APMT	○○○○○○ER/L-NB○	M167	Insert (Milling)
APMT	○○○○○○ER-NB○P	M167	Insert (Milling)
AVJBR/L	○○○○□-○○F	P22	Toolholder (Turning / Discontinued description)
AVJBR/L	○○○○JX-○○FF	E40	Toolholder (Turning)
AVVBR/L	○○○○□-○○F	P22	Toolholder (Turning / Discontinued description)

B

BB-	G1/8	D12,G37,H66	Spare parts (Banjo bolt)
BB-	M10X1.5	D12,G37,H66	Spare parts (Banjo bolt)
BCS-	○	P13	Spare parts (Clamp set)

○: Figure, □: Alphabet

Description	Page	Category
BDGT ○○T○○○FR	C64, M91	Insert (Milling)
BDGT ○○T○○○FR-JA	M91	Insert (Milling)
BDGT ○○T○○○FR-LE	C64, M91	Insert (Milling)
BDGT ○○○○○○FR-JA	M91	Insert (Milling)
BDMT ○○T○○○ER-JS	M91, M128	Insert (Milling)
BDMT ○○T○○○ER-JT	M91	Insert (Milling)
BDMT ○○T○○○ER-N○	M121	Insert (Milling)
BDMT ○○T○○○FR	C64, M91	Insert (Milling)
BDMT ○○○○○○ER-JS	M91, M100, M128	Insert (Milling)
BDMT ○○○○○○ER-JT	M91, M100	Insert (Milling)
BDMT ○○○○○○ER-N○	M121	Insert (Milling)
BDMT ○○○○○○FR	C64, M91	Insert (Milling)
BGIAR ○○-○	G97	Blade (Grooving)
BH○X○(○)	P2	Spare parts (Screw)
BH○X○○TR	P2	Spare parts (Screw)
BT○○K- M○○-○○	M82	BT arbor (for modular end mill)

C

C○○□- SCLC$^{5}/_{L}$○○-○○(A)	P25	Boring bars (Discontinued description)
C○○□- SCLC$^{5}/_{L}$○○-○○AN	F62	Boring bars
C○○○□- SCLCR○○-○○○EZ	P24	Boring bars (Discontinued description)
C○○○□- SCLCR○○-○○○EZP	F32	Boring bars
C○○□- SCLP$^{5}/_{L}$○○-○○(-○/○)	P25	Boring bars (Discontinued description)
C○○□- SDUC$^{5}/_{L}$○○-○○	P25	Boring bars (Discontinued description)
C○○□- SJLC$^{5}/_{L}$○○-○○○	F78	Boring bars
C○○□- SJZC$^{5}/_{L}$○○-○○○	F79	Boring bars
C○○□- STLB$^{5}/_{L}$○○-○○A	P25	Boring bars (Discontinued description)
C○○□- STLB$^{5}/_{L}$○○-○○AN	F82	Boring bars
C○○○□- STLBR○○-○○○EZP	F34	Boring bars
C○○○□- STLPR○○-○○○EZP	F34	Boring bars
C○○□- STUB$^{5}/_{L}$○○-○○	P25	Boring bars (Discontinued description)
C○○□- STUP$^{5}/_{L}$○○-○○(-○/○)	P25	Boring bars (Discontinued description)
C○○□- STXB$^{5}/_{L}$○○-○○○	F86	Boring bars
C○○□- STXP$^{5}/_{L}$○○-○○	F86	Boring bars
C○○□- STZB$^{5}/_{L}$○○-○○○	F87	Boring bars
C○○□- SWUB$^{5}/_{L}$○○-○○(A)	P26	Boring bars (Discontinued description)
C○○□- SWUB$^{5}/_{L}$○○-○○AN	F102	Boring bars
C○○□- SWUB$^{5}/_{L}$○○-○○(-○/○)	P26	Boring bars (Discontinued description)
C○○○□- SWUBR○○-○○○EZP	F36	Boring bars
C○○□- SWUP$^{5}/_{L}$○○-○○(-○/○)	P26	Boring bars (Discontinued description)
C○○N	P15	Spare parts (Clamp)
C○○R	P15	Spare parts (Clamp)
CB-○○	P16	Spare parts (Chipbreaker)
CB- S○○○○	P16	Spare parts (Chipbreaker)
CB- T○○○○	P16	Spare parts (Chipbreaker)
CBSN$^{5}/_{L}$ ○○○○□-○○	D68	Toolholder (Turning)
CBSNR ○○○○B-○○-A○○	F115, P28	Boring bars
CC- -○○○-MFAH	P19	Spare parts (Coolant cover)
CCET ○○T○○○(○)F$^{5}/_{L}$-USF	B63	Insert (Turning)
CCET ○○T○○○(○)MF$^{5}/_{L}$-J	B65	Insert (Turning)
CCET ○○T○○○(○)MF$^{5}/_{L}$-U	B63	Insert (Turning)
CCET ○○T○○○(○)MF$^{5}/_{L}$-U	B63	Insert (Turning)
CCET ○○T○○○(○)MF$^{5}/_{L}$-USF	B63	Insert (Turning)
CCET ○○T○○○M$^{5}/_{L}$-P	B63	Insert (Turning)
CCET ○○○○○○(○)F$^{5}/_{L}$-USF	B63	Insert (Turning)
CCET ○○○○○○(○)MF$^{5}/_{L}$-J	B65	Insert (Turning)
CCET ○○○○○○(○)MF$^{5}/_{L}$-U	B63	Insert (Turning)
CCET ○○○○○○(○)MF$^{5}/_{L}$-USF	B63	Insert (Turning)
CCET ○○○○○○(○)M$^{5}/_{L}$-F	B62	Insert (Turning)
CCET ○○○○○○(○)M$^{5}/_{L}$-FSF	B61	Insert (Turning)
CCET ○○○○○○(○)$^{5}/_{L}$-FSF	B61	Insert (Turning)
CCGT ○○T○○○	B60	Insert (Turning)
CCGT ○○T○○○AH	B66	Insert (Turning)

Description	Page	Category
CCGT ○○T○○○AP	B66	Insert (Turning)
CCGT ○○T○○○E$^{5}/_{L}$-U	B65	Insert (Turning)
CCGT ○○T○○○(○)F$^{5}/_{L}$-U	B64	Insert (Turning)
CCGT ○○T○○○L-A○	B66	Insert (Turning)
CCGT ○○T○○○ME$^{5}/_{L}$-U	B65	Insert (Turning)
CCGT ○○T○○○(○)MF	B61	Insert (Turning)
CCGT ○○T○○○(○)MF$^{5}/_{L}$-U	B64	Insert (Turning)
CCGT ○○T○○○MFP-GF	B58	Insert (Turning)
CCGT ○○T○○○MFP-GQ	B59	Insert (Turning)
CCGT ○○T○○○MFP-SK	B59	Insert (Turning)
CCGT ○○T○○○(○)MFP-SKS	B59	Insert (Turning)
CCGT ○○T○○○MP-CK	B59	Insert (Turning)
CCGT ○○T○○○R-A○	B66	Insert (Turning)
CCGT ○○○○○○	B60	Insert (Turning)
CCGT ○○○○○○AP	B66	Insert (Turning)
CCGT ○○○○○○E$^{5}/_{L}$-U	B65	Insert (Turning)
CCGT ○○○○○○(○)F$^{5}/_{L}$-U	B64	Insert (Turning)
CCGT ○○○○○○ME$^{5}/_{L}$-U	B65	Insert (Turning)
CCGT ○○○○○○(○)MF	B61	Insert (Turning)
CCGT ○○○○○○MFP-GF	B58	Insert (Turning)
CCGT ○○○○○○MFP-GQ	B59	Insert (Turning)
CCGT ○○○○○○MFP-PF	B58	Insert (Turning)
CCGT ○○○○○○MFP-SK	B59	Insert (Turning)
CCGT ○○○○○○(○)MFP-SKS	B59	Insert (Turning)
CCGT ○○○○○○(○)MF$^{5}/_{L}$-U	B64	Insert (Turning)
CCGT ○○○○○○MP-CF	B58	Insert (Turning)
CCGT ○○○○○○MP-CK	B59	Insert (Turning)
CCGT ○○○○○○(○)M$^{5}/_{L}$-F	B62	Insert (Turning)
CCGT ○○○○○○$^{5}/_{L}$-A○	B66	Insert (Turning)
CCGT ○○○○○○(○)$^{5}/_{L}$-F	B62	Insert (Turning)
CCGW ○○T○○○	B66, C39	Insert (Turning)
CCGW ○○T○○○NE	C39	Insert (Turning)
CCGW ○○T○○○SE	C39	Insert (Turning)
CCGW ○○○○○○	B66, C39	Insert (Turning)
CCGW ○○○○○○NE	C39	Insert (Turning)
CCGW ○○○○○○SE	C39	Insert (Turning)
CCLN$^{5}/_{L}$ ○○○○□-○○	D49, P20	Toolholder (Turning)
CCLN$^{5}/_{L}$ ○○○○□-○○A	D60, P21	Toolholder (Turning)
CCLN$^{5}/_{L}$ ○○○○□-○○GX	P20	Toolholder (Turning / Discontinued description)
CCMT ○○T○○○	B60, C39	Insert (Turning)
CCMT ○○T○○○APD	C40	Insert (Turning)
CCMT ○○T○○○GK	B60	Insert (Turning)
CCMT ○○T○○○HQ	B60	Insert (Turning)
CCMT ○○T○○○MQ	B61	Insert (Turning)
CCMT ○○T○○○NE	C39	Insert (Turning)
CCMT ○○T○○○PP	B60	Insert (Turning)
CCMT ○○T○○○SE	C39	Insert (Turning)
CCMT ○○T○○○WP	B60	Insert (Turning)
CCMT ○○○○○○	C39	Insert (Turning)
CCMT ○○○○○○GK	B60	Insert (Turning)
CCMT ○○○○○○HQ	B60	Insert (Turning)
CCMT ○○○○○○NE	C39	Insert (Turning)
CCMT ○○○○○○PP	B60	Insert (Turning)
CCMT ○○○○○○SE	C39	Insert (Turning)
CCMT ○○○○○○WP	B60	Insert (Turning)
CCMW ○○T○○○MEF	C20	Insert (Turning)
CCMW ○○T○○○S○○○○○MES	C20	Insert (Turning)
CCMW ○○T○○○S○○○○○MET	C20	Insert (Turning)
CCMW ○○T○○○S○○○○○SET	C20	Insert (Turning)
CCMW ○○T○○○T○○○○○ME	C20	Insert (Turning)
CCMW ○○T○○○T○○○○○SE	C20	Insert (Turning)
CCMW ○○○○○○S○○○○○MES	C20	Insert (Turning)
CCMW ○○○○○○S○○○○○SET	C20	Insert (Turning)
CCMW ○○○○○○T○○○○○ME	C20	Insert (Turning)

○: Figure, □: Alphabet

Description	Page	Category
CCMW ○○○○○○T○○○○○SE	C20	Insert (Turning)
CCN-5	H66	Spare parts (Coolant supply pipe)
CCRN$^{R}_{L}$ ○○○○M-○○A	D60	Toolholder (Turning)
CDHN$^{R}_{L}$ ○○○○□-○○GX	P20	Toolholder (Turning / Discontinued description)
CDJN$^{R}_{L}$ ○○○○□-○○	D50	Toolholder (Turning)
CDJN$^{R}_{L}$ ○○○○□-○○GX	P20	Toolholder (Turning / Discontinued description)
CE -○○○(□)	P13	Spare parts (Clamp set)
CELN$^{R}_{L}$ ○○○○M-○○	D51	Toolholder (Turning)
CELN$^{R}_{L}$ ○○○○M-○○	D51	Toolholder (Turning)
CGA-○$^{R}_{L}$	P15	Spare parts (Clamp set)
CGB$^{R}_{L}$	P15	Spare parts (Clamp set)
CGH-○$^{R}_{L}$	P15	Spare parts (Clamp)
CGIA-○R	P15	Spare parts (Clamp)
CH0503-45	K67	Insert (Drilling, Chamfering)
CH-20R	P15	Spare parts (Clamp)
CIN$^{R}_{L}$ ○○○○S-○○	J27	Toolholder (Threading)
CL ○○(○)-1	P19	Spare parts (Coolant pipe)
CNGA ○○○○○○	B22	Insert (Turning)
CNGA ○○○○○○MEF	C8	Insert (Turning)
CNGA ○○○○○○ME○	C8	Insert (Turning)
CNGA ○○○○○○S○○○○○	B113	Insert (Turning)
CNGA ○○○○○○S○○○○○ME	C8	Insert (Turning)
CNGA ○○○○○○S○○○○○MEH	C8	Insert (Turning)
CNGA ○○○○○○S○○○○○MEP	C8	Insert (Turning)
CNGA ○○○○○○S○○○○○MET	C8	Insert (Turning)
CNGA ○○○○○○S○○○○○MEW	C8	Insert (Turning)
CNGA ○○○○○○T○○○○○	B113	Insert (Turning)
CNGA ○○○○○○T○○○○○ME	C8	Insert (Turning)
CNGG ○○○○○○AH	B23	Insert (Turning)
CNGG ○○○○○○FP-TK	B20	Insert (Turning)
CNGG ○○○○○○HQ	B17	Insert (Turning)
CNGG ○○○○○○MFP-SK	B20	Insert (Turning)
CNGG ○○○○○○$^{R}_{L}$	B23	Insert (Turning)
CNGG ○○○○○○$^{R}_{L}$-A○	B23	Insert (Turning)
CNGG ○○○○○○$^{R}_{L}$-S	B23	Insert (Turning)
CNGG ○○○○○○$^{R}_{L}$-○○R	B23	Insert (Turning)
CNGG ○○○○○○TK	B20	Insert (Turning)
CNGG ○○○○○○Z	B23	Insert (Turning)
CNGM ○○○○○○ME-HD	C9	Insert (Turning)
CNGM ○○○○○○ME-HH	C9	Insert (Turning)
CNGM ○○○○○○ME-HL	C9	Insert (Turning)
CNGN ○○○○○○S○○○○○	B113	Insert (Turning)
CNGN ○○○○○○T○○○○○	B113	Insert (Turning)
CNGU ○○○○○○MFP-SK	B54	Insert (Turning)
CNGU ○○○○○○(○)MFR-F	B54	Insert (Turning)
CNGU ○○○○○○(○)MFR-U	B54	Insert (Turning)
CNMA ○○○○○○	B22	Insert (Turning)
CNMA ○○○○○○S○○○○○	B113	Insert (Turning)
CNMG ○○○○○○	B18	Insert (Turning)
CNMG ○○○○○○AH	B23	Insert (Turning)
CNMG ○○○○○○C	B22	Insert (Turning)
CNMG ○○○○○○CJ	B17	Insert (Turning)
CNMG ○○○○○○CQ	B17	Insert (Turning)
CNMG ○○○○○○GC	B22	Insert (Turning)
CNMG ○○○○○○GP	B16	Insert (Turning)
CNMG ○○○○○○GS	B17	Insert (Turning)
CNMG ○○○○○○GT	B18	Insert (Turning)
CNMG ○○○○○○HQ	B17	Insert (Turning)
CNMG ○○○○○○KG	B22	Insert (Turning)
CNMG ○○○○○○KH	B22	Insert (Turning)
CNMG ○○○○○○KQ	B22	Insert (Turning)
CNMG ○○○○○○MQ	B20	Insert (Turning)
CNMG ○○○○○○MS	B21	Insert (Turning)
CNMG ○○○○○○MU	B21	Insert (Turning)

Description	Page	Category
CNMG ○○○○○○PG	B18	Insert (Turning)
CNMG ○○○○○○PH	B19	Insert (Turning)
CNMG ○○○○○○PMG	B17	Insert (Turning)
CNMG ○○○○○○PP	B16	Insert (Turning)
CNMG ○○○○○○PQ	B16	Insert (Turning)
CNMG ○○○○○○PS	B18	Insert (Turning)
CNMG ○○○○○○PT	B18	Insert (Turning)
CNMG ○○○○○○SG	B21	Insert (Turning)
CNMG ○○○○○○SQ	B20	Insert (Turning)
CNMG ○○○○○○TK	B20	Insert (Turning)
CNMG ○○○○○○WE	B16	Insert (Turning)
CNMG ○○○○○○WF	B16	Insert (Turning)
CNMG ○○○○○○WP	B16	Insert (Turning)
CNMG ○○○○○○WQ	B16	Insert (Turning)
CNMG ○○○○○○XF	B19	Insert (Turning)
CNMG ○○○○○○XP	B19	Insert (Turning)
CNMG ○○○○○○XQ	B19	Insert (Turning)
CNMG ○○○○○○XS	B20	Insert (Turning)
CNMG ○○○○○○ZS	B22	Insert (Turning)
CNMM ○○○○X$^{R}_{L}$-SX	B21	Insert (Turning)
CNMM ○○○○○○M	C34	Insert (Turning)
CNMM ○○○○○○M-NE	C34	Insert (Turning)
CNMM ○○○○○○M-SE	C34	Insert (Turning)
CNMM ○○○○○○PX	B19	Insert (Turning)
CNMN ○○○○○○S○○○○○	C16	Insert (Turning)
CNMN ○○○○○○T○○○○○	B113	Insert (Turning)
CNMU ○○○○○○E-GK	B54	Insert (Turning)
CP- ○D	P16	Spare parts (Clamp)
CP- ○D(-$^{R}_{L}$)-JCT	P16	Spare parts (Clamp)
CP-8TE	P16	Spare parts (Clamp)
CP-8W	P16	Spare parts (Clamp)
CP8X15TL	P2	Spare parts (Screw)
CP8X23TL	P2	Spare parts (Screw)
CPGB ○○○○○○S○○○○○MES	C21	Insert (Turning)
CPGB ○○○○○○S○○○○○MET	C21	Insert (Turning)
CPGB ○○○○○○T○○○○○ME	C21	Insert (Turning)
CPGB ○○○○○○T○○○○○SE	C21	Insert (Turning)
CPMB ○○○○○○	B67	Insert (Turning)
CPMH ○○○○○○	B67, C41	Insert (Turning)
CPMH ○○○○○○HQ	B67	Insert (Turning)
CPMH ○○○○○○NE	C41	Insert (Turning)
CPMH ○○○○○○$^{R}_{L}$-Y	B67	Insert (Turning)
CPMH ○○○○○○SE	C41	Insert (Turning)
CPMT ○○○○○○GP	B67	Insert (Turning)
CPMT ○○○○○○PP	B67	Insert (Turning)
CPMT ○○○○○○XP	B67	Insert (Turning)
CPMT ○○○○○○XQ	B67	Insert (Turning)
CP-RC$^{R}_{L}$	P13	Spare parts (Clamp set)
CPS- ○(□)	P14	Spare parts (Clamp set)
CPS- 2TR	P14	Spare parts (Clamp set)
CP-ST-R1/8	H17	Spare parts (Coupling)
CRDNN ○○○○□-○○	D58	Toolholder (Turning)
CRDNN ○○○○□-○○A	D61	Toolholder (Turning)
CRSN$^{R}_{L}$ ○○○○□-○○	D58	Toolholder (Turning)
CRSN$^{R}_{L}$ ○○○○□-○○A	D61	Toolholder (Turning)
CS-N$^{R}_{L}$ ○○○○□-○○	D52, P20	Toolholder (Turning)
CS-N$^{R}_{L}$ ○○○○□-○○GX	P20	Toolholder (Turning / Discontinued description)
CS- ○D(-TR)	P2	Spare parts (Screw / Discontinued description)
CSBP$^{R}_{L}$ ○○○○□-○○N	P23	Toolholder (Turning / Discontinued description)
CSDNN ○○○○□-○○GX	P20	Toolholder (Turning / Discontinued description)
CSDNN ○○○○□-○○	D54	Toolholder (Turning)
CSDNN ○○○○□-○○A	D64, P21	Toolholder (Turning)
CSDPN ○○○○□-○○N	P23	Toolholder (Turning / Discontinued description)
CSKN$^{R}_{L}$ ○○○○□-○○GX	P20	Toolholder (Turning / Discontinued description)

○: Figure, □: Alphabet

Description	Page	Category
CSKN$^{R}/_{L}$ ○○○○□-○○	D53, P20	Toolholder (Turning)
CSKNR ○○○○□-○○A	D63, P21	Toolholder (Turning)
CSKP$^{R}/_{L}$ ○○○○□-○○N	P23	Toolholder (Turning / Discontinued description)
CSRN$^{R}/_{L}$ ○○○○□-○○	D52	Toolholder (Turning)
CSRN$^{R}/_{L}$ ○○○○□-○○A	D63, P21	Toolholder (Turning)
CSRN$^{R}/_{L}$ ○○○○□-○○GX	P20	Toolholder (Turning / Discontinued description)
CSSN$^{R}/_{L}$ ○○○○□-○○GX	P20	Toolholder (Turning / Discontinued description)
CSSN$^{R}/_{L}$ ○○○○□-○○	D54, P20	Toolholder (Turning)
CSSN$^{R}/_{L}$ ○○○○□-○○A	D64	Toolholder (Turning)
CSSP$^{R}/_{L}$ ○○○○□-○○N	P23	Toolholder (Turning / Discontinued description)
CSYN$^{R}/_{L}$ ○○○○□-○○A	P21	Toolholder (Turning / Discontinued description)
CSYN$^{R}/_{L}$ ○○○○□-○○GX	P20	Toolholder (Turning / Discontinued description)
CSYN$^{R}/_{L}$ ○○○○□-○○	D53, P20	Toolholder (Turning)
CT ○○T○-45A	K39	Insert (Drilling, Chamfering)
CT ○○T○-45DA	K20	Insert (Drilling, Chamfering)
CTFP$^{R}/_{L}$ ○○○○□-○○N	P23	Toolholder (Turning / Discontinued description)
CTGP$^{R}/_{L}$ ○○○○□-○○N	P23	Toolholder (Turning / Discontinued description)
CTJN$^{R}/_{L}$ ○○○○□-○○	D56	Toolholder (Turning)
CTJN$^{R}/_{L}$ ○○○○□-○○A	D66	Toolholder (Turning)
CTTP$^{R}/_{L}$ ○○○○□-○○N	P23	Toolholder (Turning / Discontinued description)
CTUN$^{R}/_{L}$ ○○○○□-○○A	P21	Toolholder (Turning / Discontinued description)

D

DA	○○○○M-FTP / FTP-H	K9, K10	Drill heads
DA	○○○○M-GM	K6, K7, K8, K9	Drill heads
DA	○○○○M-HQP	K12, K13, K14	Drill heads
DA	○○○○M-HQS	K15	Drill heads
DC	-○○(-□)	P8	Spare parts (Shim)
DC	○○○○M-SC	K32, K33, K34	Drill heads
DCET	○○T○○○(○)FL-USF	B74	Insert (Turning)
DCET	○○T○○○(○)FR-JSF	B76	Insert (Turning)
DCET	○○T○○○(○)FR-USF	B74	Insert (Turning)
DCET	○○T○○○L-FSF	B72	Insert (Turning)
DCET	○○T○○○MFL-J	B77	Insert (Turning)
DCET	○○T○○○MFL-JSF	B76	Insert (Turning)
DCET	○○T○○○MFL-U	B74	Insert (Turning)
DCET	○○T○○○MFL-USF	B74	Insert (Turning)
DCET	○○T○○○(○)MFR-J	B77	Insert (Turning)
DCET	○○T○○○(○)MFR-JSF	B76	Insert (Turning)
DCET	○○T○○○(○)MFR-U	B74	Insert (Turning)
DCET	○○T○○○(○)MFR-USF	B74	Insert (Turning)
DCET	○○T○○○ML-F	B72	Insert (Turning)
DCET	○○T○○○ML-FSF	B72	Insert (Turning)
DCET	○○T○○○(○)MR-F	B72	Insert (Turning)
DCET	○○T○○○(○)MR-FSF	B72	Insert (Turning)
DCET	○○T○○○(○)R-FSF	B72	Insert (Turning)
DCET	○○○○○○(○)F$^{R}/_{L}$-USF	B74	Insert (Turning)
DCET	○○○○○○(○)L-FSF	B72	Insert (Turning)
DCET	○○○○○○MFL-J	B77	Insert (Turning)
DCET	○○○○○○MFL-U	B74	Insert (Turning)
DCET	○○○○○○MFL-USF	B74	Insert (Turning)
DCET	○○○○○○(○)MFR-J	B77	Insert (Turning)
DCET	○○○○○○(○)MFR-U	B74	Insert (Turning)
DCET	○○○○○○(○)MFR-USF	B74	Insert (Turning)
DCET	○○○○○○(○)ML-F	B72	Insert (Turning)
DCET	○○○○○○(○)ML-FSF	B72	Insert (Turning)
DCET	○○○○○○(○)MR-F	B72	Insert (Turning)
DCET	○○○○○○(○)MR-FSF	B72	Insert (Turning)
DCET	○○○○○○(○)R-FSF	B72	Insert (Turning)
DCET	○○○○○○○FR-U	B74	Insert (Turning)
DCGT	○○T○○○	B70	Insert (Turning)
DCGT	○○T○○○AH	B78	Insert (Turning)

Description	Page	Category
DCGT ○○T○○○AP	B78	Insert (Turning)
DCGT ○○T○○○CF	B68	Insert (Turning)
DCGT ○○T○○○CK	B68	Insert (Turning)
DCGT ○○T○○○EL-J	B77	Insert (Turning)
DCGT ○○T○○○EL-U	B76	Insert (Turning)
DCGT ○○T○○○(○)ER-J	B77	Insert (Turning)
DCGT ○○T○○○ER-U	B76	Insert (Turning)
DCGT ○○T○○○FL-J	B77	Insert (Turning)
DCGT ○○T○○○(○)FL-U	B75	Insert (Turning)
DCGT ○○T○○○FR-J	B77	Insert (Turning)
DCGT ○○T○○○(○)FR-U	B75	Insert (Turning)
DCGT ○○T○○○L-A○	B78	Insert (Turning)
DCGT ○○T○○○(○)L-F	B73	Insert (Turning)
DCGT ○○T○○○(○)M	B70	Insert (Turning)
DCGT ○○T○○○MEL-J	B77	Insert (Turning)
DCGT ○○T○○○MEL-U	B76	Insert (Turning)
DCGT ○○T○○○(○)MER-J	B77	Insert (Turning)
DCGT ○○T○○○MER-U	B76	Insert (Turning)
DCGT ○○T○○○(○)MF	B70	Insert (Turning)
DCGT ○○T○○○MFL-J	B77	Insert (Turning)
DCGT ○○T○○○MFL-U	B75	Insert (Turning)
DCGT ○○T○○○MFP-GF	B68	Insert (Turning)
DCGT ○○T○○○MFP-GQ	B69	Insert (Turning)
DCGT ○○T○○○MFP-SK	B68	Insert (Turning)
DCGT ○○T○○○(○)MFP-SKS	B68	Insert (Turning)
DCGT ○○T○○○(○)MFR-J	B77	Insert (Turning)
DCGT ○○T○○○(○)MFR-U	B75	Insert (Turning)
DCGT ○○T○○○ML-F	B73	Insert (Turning)
DCGT ○○T○○○MP-CF	B68	Insert (Turning)
DCGT ○○T○○○MP-CK	B68	Insert (Turning)
DCGT ○○T○○○(○)MR-F	B73	Insert (Turning)
DCGT ○○T○○○R-A○	B78	Insert (Turning)
DCGT ○○T○○○(○)R-F	B73	Insert (Turning)
DCGT ○○○○○○	B70	Insert (Turning)
DCGT ○○○○○○AP	B78	Insert (Turning)
DCGT ○○○○○○CF	B68	Insert (Turning)
DCGT ○○○○○○CK	B68	Insert (Turning)
DCGT ○○○○○○E$^{R}/_{L}$-U	B76	Insert (Turning)
DCGT ○○○○○○(○)F$^{R}/_{L}$-U	B75	Insert (Turning)
DCGT ○○○○○○(○)L-F	B73	Insert (Turning)
DCGT ○○○○○○(○)M	B70	Insert (Turning)
DCGT ○○○○○○ME$^{R}/_{L}$-U	B76	Insert (Turning)
DCGT ○○○○○○(○)MF	B70	Insert (Turning)
DCGT ○○○○○○(○)MFL-U	B75	Insert (Turning)
DCGT ○○○○○○MFP-GF	B68	Insert (Turning)
DCGT ○○○○○○MFP-GQ	B69	Insert (Turning)
DCGT ○○○○○○MFP-SK	B68	Insert (Turning)
DCGT ○○○○○○(○)MFP-SKS	B68	Insert (Turning)
DCGT ○○○○○○(○)MFR-U	B75	Insert (Turning)
DCGT ○○○○○○(○)ML-F	B73	Insert (Turning)
DCGT ○○○○○○MP-CF	B68	Insert (Turning)
DCGT ○○○○○○MP-CK	B68	Insert (Turning)
DCGT ○○○○○○(○)MR-F	B73	Insert (Turning)
DCGT ○○○○○○(○)R-F	B73	Insert (Turning)
DCGW ○○T○○○	B78	Insert (Turning)
DCGW ○○○○○○	B78	Insert (Turning)
DCLN$^{R}/_{L}$ ○○○○□-○○	D8	Toolholder (Turning)
DCLN$^{R}/_{L}$ ○○○○□-○○JCT	D9	Toolholder (Turning)
DCMT ○○T○○○	B70, C42	Insert (Turning)
DCMT ○○T○○○APD	C42	Insert (Turning)
DCMT ○○T○○○GK	B70	Insert (Turning)
DCMT ○○T○○○GP	B69	Insert (Turning)
DCMT ○○T○○○HQ	B70	Insert (Turning)
DCMT ○○T○○○L-NE	C42	Insert (Turning)

○: Figure, □: Alphabet

Description	Page	Category
DCMT ○○T○○○MQ	B71	Insert (Turning)
DCMT ○○T○○○NE	C42	Insert (Turning)
DCMT ○○T○○○PP	B69	Insert (Turning)
DCMT ○○T○○○R-NE	C42	Insert (Turning)
DCMT ○○T○○○SE	C42	Insert (Turning)
DCMT ○○T○○○XP	B71	Insert (Turning)
DCMT ○○T○○○XQ	B71	Insert (Turning)
DCMT ○○○○○○	C42	Insert (Turning)
DCMT ○○○○○○GK	B70	Insert (Turning)
DCMT ○○○○○○GP	B69	Insert (Turning)
DCMT ○○○○○○HQ	B70	Insert (Turning)
DCMT ○○○○○○L-NE	C42	Insert (Turning)
DCMT ○○○○○○MQ	B71	Insert (Turning)
DCMT ○○○○○○NE	C42	Insert (Turning)
DCMT ○○○○○○PP	B69	Insert (Turning)
DCMT ○○○○○○R-NE	C42	Insert (Turning)
DCMT ○○○○○○SE	C42	Insert (Turning)
DCMT ○○○○○○XP	B71	Insert (Turning)
DCMW ○○T○○○MEF	C22	Insert (Turning)
DCMW ○○T○○○S○○○○○MES	C22	Insert (Turning)
DCMW ○○T○○○S○○○○○MET	C22	Insert (Turning)
DCMW ○○T○○○S○○○○○SET	C22	Insert (Turning)
DCMW ○○T○○○T○○○○○ME	C22	Insert (Turning)
DCMW ○○T○○○T○○○○○SE	C22	Insert (Turning)
DCMW ○○○○○○S○○○○○MET	C22	Insert (Turning)
DCMW ○○○○○○S○○○○○SET	C22	Insert (Turning)
DCMW ○○○○○○T○○○○○ME	C22	Insert (Turning)
DCMW ○○○○○○T○○○○○SE	C22	Insert (Turning)
DCMX ○○T○○○$^{5}/_{L}$-WP	B69	Insert (Turning)
DCMX ○○T○○○WP	B69	Insert (Turning)
DCMX ○○○○○○$^{5}/_{L}$-WP	B69	Insert (Turning)
DCMX ○○○○○○WP	B69	Insert (Turning)
DD -○○(-○○)	P8	Spare parts (Shim)
DDHN$^{5}/_{L}$ ○○○○□-○○○○	D15	Toolholder (Turning)
DDJN$^{5}/_{L}$ ○○○○□-○○JCT	D14	Toolholder (Turning)
DDJN$^{5}/_{L}$ ○○○○□-○○○○	D13	Toolholder (Turning)
DMC ○○○	P33	End mill (Milling / Discontinued description)
DMC ○○○H	M171	End mill (Milling)
DMC ○○○-S○○	P33	End mill (Milling / Discontinued description)
DMC ○○○SX	M170	End mill (Milling)
DMC ○○○SX-○○○	M170	End mill (Milling)
DMC ○○○SXT	M170	End mill (Milling)
DN ○○	P19	Spare parts (Nozzle)
DNGA ○○○○○○MEF	C10	Insert (Turning)
DNGA ○○○○○○ME○	C10	Insert (Turning)
DNGA ○○○○○○S○○○○○	B114	Insert (Turning)
DNGA ○○○○○○S○○○○○ME	C10	Insert (Turning)
DNGA ○○○○○○S○○○○○MEH	C10	Insert (Turning)
DNGA ○○○○○○S○○○○○MEP	C10	Insert (Turning)
DNGA ○○○○○○S○○○○○MET	C10	Insert (Turning)
DNGA ○○○○○○T○○○○○	B114	Insert (Turning)
DNGA ○○○○○○T○○○○○ME	C10	Insert (Turning)
DNGG ○○○○○○AH	B31	Insert (Turning)
DNGG ○○○○○○FP-TK	B28	Insert (Turning)
DNGG ○○○○○○$^{5}/_{L}$	B31	Insert (Turning)
DNGG ○○○○○○$^{5}/_{L}$-A○	B31	Insert (Turning)
DNGG ○○○○○○$^{5}/_{L}$-S	B31	Insert (Turning)
DNGG ○○○○○○MFP-SK	B28	Insert (Turning)
DNGG ○○○○○○TK	B28	Insert (Turning)
DNGM ○○○○○○ME-HD	C11	Insert (Turning)
DNGM ○○○○○○ME-HH	C11	Insert (Turning)
DNGM ○○○○○○ME-HL	C11	Insert (Turning)
DNGN ○○○○○○S○○○○○	B114	Insert (Turning)
DNGN ○○○○○○T○○○○○	B114	Insert (Turning)

Description	Page	Category
DNGU ○○○○○○MER-U	B55	Insert (Turning)
DNGU ○○○○○○MFP-SK	B55	Insert (Turning)
DNGU ○○○○○○MFR-F	B55	Insert (Turning)
DNGU ○○○○○○MFR-U	B55	Insert (Turning)
DNMA ○○○○○○	B31	Insert (Turning)
DNMG ○○○○○○	B27	Insert (Turning)
DNMG ○○○○○○AH	B31	Insert (Turning)
DNMG ○○○○○○C	B30	Insert (Turning)
DNMG ○○○○○○CJ	B25	Insert (Turning)
DNMG ○○○○○○CQ	B25	Insert (Turning)
DNMG ○○○○○○GC	B30	Insert (Turning)
DNMG ○○○○○○GP	B24	Insert (Turning)
DNMG ○○○○○○GS	B25	Insert (Turning)
DNMG ○○○○○○GT	B26	Insert (Turning)
DNMG ○○○○○○HQ	B25	Insert (Turning)
DNMG ○○○○○○KG	B30	Insert (Turning)
DNMG ○○○○○○KH	B30	Insert (Turning)
DNMG ○○○○○○KQ	B30	Insert (Turning)
DNMG ○○○○○○MQ	B28	Insert (Turning)
DNMG ○○○○○○MS	B29	Insert (Turning)
DNMG ○○○○○○MU	B29	Insert (Turning)
DNMG ○○○○○○PG	B26	Insert (Turning)
DNMG ○○○○○○PH	B27	Insert (Turning)
DNMG ○○○○○○PMG	B25	Insert (Turning)
DNMG ○○○○○○PP	B24	Insert (Turning)
DNMG ○○○○○○PQ	B24	Insert (Turning)
DNMG ○○○○○○PS	B26	Insert (Turning)
DNMG ○○○○○○PT	B26	Insert (Turning)
DNMG ○○○○○○R-LD	B28	Insert (Turning)
DNMG ○○○○○○SG	B29	Insert (Turning)
DNMG ○○○○○○SQ	B29	Insert (Turning)
DNMG ○○○○○○TK	B28	Insert (Turning)
DNMG ○○○○○○TN-V	B25	Insert (Turning)
DNMG ○○○○○○XF	B27	Insert (Turning)
DNMG ○○○○○○XP	B27	Insert (Turning)
DNMG ○○○○○○XQ	B27	Insert (Turning)
DNMG ○○○○○○XS	B27	Insert (Turning)
DNMG ○○○○○○ZS	B30	Insert (Turning)
DNMM ○○○○○○M	C35	Insert (Turning)
DNMM ○○○○○○M-NE	C35	Insert (Turning)
DNMM ○○○○○○M-SE	C35	Insert (Turning)
DNMM ○○○○○○PX	B27	Insert (Turning)
DNMU ○○○○○○E-GK	B55	Insert (Turning)
DNMX ○○○○○○WF	B24	Insert (Turning)
DPET ○○T○○○(○)F$^{5}/_{L}$-USF	B79	Insert (Turning)
DPET ○○T○○○L-FSF	B79	Insert (Turning)
DPET ○○T○○○(○)MFR-USF	B79	Insert (Turning)
DPET ○○T○○○(○)MR-FSF	B79	Insert (Turning)
DPET ○○T○○○(○)R-FSF	B79	Insert (Turning)
DPET ○○○○○○(○)F$^{5}/_{L}$-USF	B79	Insert (Turning)
DPET ○○○○○○L-FSF	B79	Insert (Turning)
DPET ○○○○○○(○)MFR-USF	B79	Insert (Turning)
DPET ○○○○○○M$^{5}/_{L}$-FSF	B79	Insert (Turning)
DPET ○○○○○○(○)R-FSF	B79	Insert (Turning)
DR ○○-○○(□)	M238	Spare parts (Drive ring)
DR ○○○○-○○○○(□)	M239	Spare parts (Drive ring)
DRV -CH○○	K66	Toolholder (Chamfering Attachment / DRV)
DS -○○	P8	Spare parts (Shim)
DSBN$^{5}/_{L}$ ○○○○□-○○	D19	Toolholder (Turning)
DT -○	P17	Spare parts (Wrench)
DT -○○	P8, P17	Spare parts (Shim / Wrench)
DTGN$^{5}/_{L}$ ○○○○□-○○	D22	Toolholder (Turning)
DTGN$^{5}/_{L}$ ○○○○□-○○JCT	D23	Toolholder (Turning)
DTM -○(○)	P17	Spare parts (Wrench)

○: Figure, □: Alphabet

Description		Page	Category
DTP	-○(○)	P17	Spare parts (Wrench)
DTPM	-○(○)	P17	Spare parts (Wrench)
DV	-33	P8	Spare parts (Shim)
DVLN$^{R}/_{L}$	○○○○□-○○	D30	Toolholder (Turning)
DVLN$^{R}/_{L}$	○○○○□-○○JCT	D31	Toolholder (Turning)
DVPN$^{R}/_{L}$	○○○○□-○○	D32	Toolholder (Turning)
DVPN$^{R}/_{L}$	○○○○□-○○JCT	D33	Toolholder (Turning)
DVVNN	○○○○□-○○	D34	Toolholder (Turning)
DVVNN	○○○○□-○○JCT	D35	Toolholder (Turning)
DW	-○○	P8	Spare parts (Shim)
DWLN$^{R}/_{L}$	○○○○□-○○	D43	Toolholder (Turning)
DWLN$^{R}/_{L}$	○○○○□-○○JCT	D44	Toolholder (Turning)

E

E○○□-	SCLC$^{R}/_{L}$○○-○○	P25	Boring bars (Discontinued description)
E○○□-	SCLC$^{R}/_{L}$○○-○○A	F62	Boring bars
E○○□-	SCLCR○○-○○A-○/○	F62	Boring bars
E○○□-	SCLC$^{R}/_{L}$-○○AN	F62	Boring bars
E○○□-	SCLCR-○○AN○/○	F62	Boring bars
E○○□-	SCLP$^{R}/_{L}$○○-○○	P25	Boring bars (Discontinued description)
E○○□-	SCLP$^{R}/_{L}$○○-○○A	F65	Boring bars
E○○□-	SCLPR○○-○○A-○/○	F65, P25	Boring bars
E○○□-	SCLP$^{R}/_{L}$○○-○○AN	F65	Boring bars
E○○□-	SCLPR○○-○○AN○/○	F65	Boring bars
E○○□-	SDQC$^{R}/_{L}$○○-○○A	F72	Boring bars
E○○□-	SDQCR○○-○○A-○/○	F72	Boring bars
E○○□-	SDUC$^{R}/_{L}$○○-○○A	F68	Boring bars
E○○□-	SDUCR○○-○○A-○/○	F68	Boring bars
E○○□-	SDZCR○○-○○A	F76	Boring bars
E○○□-	STLP$^{R}/_{L}$○○-○○	P25	Boring bars (Discontinued description)
E○○□-	STLP$^{R}/_{L}$○○-○○A	F82, P25	Boring bars
E○○□-	STLPR○○-○○A-○/○	F82	Boring bars
E○○□-	STLP$^{R}/_{L}$○○-○○AN	F82	Boring bars
E○○□-	STLPR○○-○○AN○/○	F82	Boring bars
E○○□-	STUP$^{R}/_{L}$○○-○○	P25	Boring bars (Discontinued description)
E○○□-	SVPBR○○-○○A	F95	Boring bars
E○○□-	SVPCR○○-○○A	F95	Boring bars
E○○□-	SVUBR○○-○○A	F97	Boring bars
E○○□-	SVUCR○○-○○A	F97	Boring bars
E○○□-	SWUB$^{R}/_{L}$○○-○○A(-○/○)	P26	Boring bars (Discontinued description)
E○○□-	SWUB$^{R}/_{L}$○○-○○AN	F102	Boring bars
E○○□-	SWUBR○○-○○AN○/○	F102	Boring bars
E○○□-	SWUP$^{R}/_{L}$○○-○○A	F102	Boring bars
E○○□-	SWUPR○○-○○A-○/○	F102	Boring bars
ENET	○○○○PAER-C	M179	Insert (Milling)
ENET	○○○○PAER-G	M179	Insert (Milling)
ENET	○○○○PAER-R	M179	Insert (Milling)
ENGN	○○○○○○S○○○○○	B115	Insert (Turning)
ENGN	○○○○○○T○○○○○	B115	Insert (Turning)
EZB$^{R}/_{L}$	○○○○○○HP-○○○H	F16	EZ Bars (Boring)
EZBCR	○○○○○○-○○○-○○	F27	EZ Bars (Boring)
EZBFR	○○○○○○-○○○	F24	EZ Bars (Boring)
EZBPR	○○○○○○-○○○	F26	EZ Bars (Boring)
EZBPR	○○○○○○-○○○-○○	F26	EZ Bars (Boring)
EZBR	○○○○○○-○○○NB	C32, C60, F22	EZ Bars (Boring)
EZBR	○○○○○○HP-○○○F	F19	EZ Bars (Boring)
EZBR	○○○○○○HP-○○○G	F18	EZ Bars (Boring)
EZBR	○○○○○○HP-○○○H-LT	F17	EZ Bars (Boring)
EZBR	○○○○○○ST-○○○F	F21	EZ Bars (Boring)
EZBR	○○○○○○ST-○○○H	F20	EZ Bars (Boring)
EZBTR	○○○○○○-○○○	F30	EZ Bars (Boring)
EZFG$^{R}/_{L}$	○○○○○○-○○○	G102	EZ Bars (Grooving)
EZGR	○○○○○○-○○○	G70	EZ Bars (Grooving)
EZGR	○○○○○○-○○○S	G70	EZ Bars (Grooving)
EZH	○○○○○(.○)CT-○○○	F38, F39	Sleeve
EZH	○○○○○(.○)HP-○○○	F40, F41	Sleeve
EZH	○○○○○(.○)ST-○○(○)	F42, F43	Sleeve
EZTR	○○○○○○-○○-○○○	J40	EZ Bars (Threading)
EZVBR	○○○○○○-○○○	F28	EZ Bars (Boring)

F

FGG$^{R}/_{L}$	○○○○-○○	G50	Insert (Grooving)
FH-2		P17	Spare parts (Hexagon wrench / Flag type)
FH-2.5		P17	Spare parts (Hexagon wrench / Flag type)
FMM	○○-○○	G134	Insert (Grooving)
FMN	○	G134	Insert (Grooving)
FT	-○(○)	P17	Spare parts (Torx wrench / Flag type)
FTK	○	G139	Insert (Grooving)
FTP	-○	P17	Spare parts (Torx plus wrench / Flag type)

G

GA	○○	G61	Insert (Grooving)
GBA32$^{R}/_{L}$	○○○-○○○	C54, G6, G7	Insert (Grooving)
GBA32$^{R}/_{L}$	○○○-○○○F	G7	Insert (Grooving)
GBA32R	○○○-○○○R	G7	Insert (Grooving)
GBA43$^{R}/_{L}$	○○○-○○○	C29, C54, G8, G9, G12	Insert (Grooving)
GBA43$^{R}/_{L}$	○○○-○○○F	G10	Insert (Grooving)
GBA43$^{R}/_{L}$	○○○-○○○GM	G11	Insert (Grooving)
GBA43$^{R}/_{L}$	○○○-○○○R	G12	Insert (Grooving)
GBA43$^{R}/_{L}$	○○○-○○○RF	G12	Insert (Grooving)
GBF32$^{R}/_{L}$	○○○-○○○	G21, G22	Insert (Grooving)
GBF32$^{R}/_{L}$	○○○-○○○F	G20	Insert (Grooving)
GBF32R	○○○-○○○GL	G20	Insert (Grooving)
GC08$^{R}/_{L}$	○○○-○○○	G75	Insert (Grooving)
GC08R	○○○-○○○R	G75	Insert (Grooving)
GC10$^{R}/_{L}$	○○○-○○○	G75	Insert (Grooving)
GC10R	○○○-○○○R	G75	Insert (Grooving)
GC12$^{R}/_{L}$	○○○-○○○	G75	Insert (Grooving)
GC12R	○○○-○○○R	G75	Insert (Grooving)
GDFG	○○○○N-○○○GS	G111	Insert (Grooving)
GDFM	○○○○N-○○○DM	G111	Insert (Grooving)
GDFM	○○○○N-○○○GH	G111	Insert (Grooving)
GDFM	○○○○N-○○○GM	G111	Insert (Grooving)
GDFM	○○○○N-○○○R-CM	G111	Insert (Grooving)
GDFMS	○○○○N-○○○DM	G111	Insert (Grooving)
GDG	○○○○N-○○○AM	G31	Insert (Grooving)
GDG	○○○○N-○○○GS	G31, G90	Insert (Grooving)
GDG	○○○○N-○○○PG	H32	Insert (Cut-off)
GDG	○○○○R-○○○PG-○○D	H32	Insert (Cut-off)
GDGS	○○○○N-○○○NB	C30, C56, G33	Insert (Grooving)
GDM	○○○○L-○○○PF-○○D	H32	Insert (Cut-off)
GDM	○○○○N-○○○GL	G31	Insert (Grooving)
GDM	○○○○N-○○○GM	G30	Insert (Grooving)
GDM	○○○○N-○○○GMI	G90	Insert (Grooving)
GDM	○○○○N-○○○PF	H32	Insert (Cut-off)
GDM	○○○○N-○○○PH	G32, H33	Insert (Grooving / Cut-off)
GDM	○○○○N-○○○PM	H33	Insert (Cut-off)
GDM	○○○○N-○○○PQ	H32	Insert (Cut-off)
GDM	○○○○N-○○○R-CM	G32, G90	Insert (Grooving)
GDM	○○○○R-○○○PF-○○D	H32	Insert (Cut-off)
GDM	○○○○R-○○○PM-○D	H33	Insert (Cut-off)
GDM	○○○○R-○○○PQ-○○D	H32	Insert (Cut-off)
GDMS	○○○○N-○○○GM	G30	Insert (Grooving)
GDMS	○○○○N-○○○PH	G32, H33	Insert (Grooving / Cut-off)
GDMS	○○○○N-○○○PM	H33	Insert (Cut-off)

○: Figure, □: Alphabet

Description		Page	Category
GDMS	○○○○R-○○○PM-○D	H33	Insert (Cut-off)
GE$^{R}/_{L}$	○○○-○○○A	G78	Insert (Grooving)
GER	○○○-○○○AR	G78	Insert (Grooving)
GE$^{R}/_{L}$	○○○-○○○B	G78	Insert (Grooving)
GER	○○○-○○○BR	G78	Insert (Grooving)
GE$^{R}/_{L}$	○○○-○○○C	G79	Insert (Grooving)
GER	○○○-○○○CM	G78	Insert (Grooving)
GER	○○○-○○○CR	G79	Insert (Grooving)
GE$^{R}/_{L}$	○○○-○○○D	G79	Insert (Grooving)
GER	○○○-○○○DM	G78	Insert (Grooving)
GER	○○○-○○○DR	G79	Insert (Grooving)
GE$^{R}/_{L}$	○○○-○○○E	G80	Insert (Grooving)
GER	○○○-○○○EM	G80	Insert (Grooving)
GFV$^{R}/_{L}$	○○○○□-○○○A	G127	Toolholder (Grooving)
GFV$^{R}/_{L}$	○○○○□-○○○B	G127	Toolholder (Grooving)
GFV$^{R}/_{L}$	○○○○M-○○○(○)C	G127	Toolholder (Grooving)
GFVS$^{R}/_{L}$	○○○○□-○○AA	G125, P30	Toolholder (Grooving)
GFVS$^{R}/_{L}$	○○○○□-○○○B	G129	Toolholder (Grooving)
GFVS$^{R}/_{L}$	○○○○M-○○○(○)C	G129	Toolholder (Grooving)
GFVS$^{R}/_{L}$	○○○○□-H□	G131	Toolholder (Grooving)
GFVT$^{R}/_{L}$	○○○○□-○○AA	G125, P30	Toolholder (Grooving)
GFVT$^{R}/_{L}$	○○○○□-○○○B	G130	Toolholder (Grooving)
GFVT$^{R}/_{L}$	○○○○M-○○○(○)C	G130	Toolholder (Grooving)
GFVT$^{R}/_{L}$	○○○○□-H□	G131	Toolholder (Grooving)
GH	○○○○(○)-○○	B124, G61,	Insert (Grooving)
GHU	○○-○○	G61, G92	Insert (Grooving)
GIA	○○	G96	Insert (Grooving)
GIFV$^{R}/_{L}$	○○○○B-○○○A	G133	Toolholder (Grooving)
GIFV$^{R}/_{L}$	○○○○B-○○○B	G133, P30	Toolholder (Grooving)
GIFV$^{R}/_{L}$	○○○○B-○○○C	G133	Toolholder (Grooving)
GIV$^{R}/_{L}$	○○○○-○A	G86	Toolholder (Grooving)
GIV$^{R}/_{L}$	○○○○-○AE	G87	Toolholder (Grooving)
GIV$^{R}/_{L}$	○○○○-○AW	G88	Toolholder (Grooving)
GIV$^{R}/_{L}$	○○○○-○B	G86	Toolholder (Grooving)
GIV$^{R}/_{L}$	○○○○-○BE	G87	Toolholder (Grooving)
GIV$^{R}/_{L}$	○○○○-○BW	G88	Toolholder (Grooving)
GIV$^{R}/_{L}$	○○○○-○C	G86	Toolholder (Grooving)
GIV$^{R}/_{L}$	○○○○-○CE	G87	Toolholder (Grooving)
GIV$^{R}/_{L}$	○○○○-○CW	G88	Toolholder (Grooving)
GIV$^{R}/_{L}$	○○○○-○S	G86	Toolholder (Grooving)
GIV$^{R}/_{L}$	○○○○-○SE	G87	Toolholder (Grooving)
GIV$^{R}/_{L}$	○○○○-○SS	G86	Toolholder (Grooving)
GMG	○○○○-○○○MG	G49, G94, G137	Insert (Grooving)
GMG	○○○○-○○○MS	G48	Insert (Grooving)
GMG	○○○○-○○○R	G49	Insert (Grooving)
GMG	○○○○-○○○RU	G49	Insert (Grooving)
GMGA	○○○○-○○○R	G50, G94, G137	Insert (Grooving)
GMGW	○○○○-○○R	C58, G66	Insert (Grooving)
GMGW	○○○○-○○R-HR	C58, G66	Insert (Grooving)
GML	○(.○)-○D	G52, H47	Insert (Grooving / Cut-off)
GMM	○○○○-MT	G51, H46	Insert (Grooving / Cut-off)
GMM	○○○○-NB	G51, H46	Insert (Grooving / Cut-off)
GMM	○○○○-TK	G51, H46	Insert (Grooving / Cut-off)
GMM	○○○○-TMR	H46	Insert (Cut-off)
GMM	○○○○-○○	G50	Insert (Grooving)
GMM	○○○○-○○R	G50	Insert (Grooving)
GMM	○○○○-○○○MS	G48	Insert (Grooving)
GMM	○○○○-○○○MW	G48, G94, G137	Insert (Grooving)
GMM	○○○○-○○○R	G49	Insert (Grooving)
GMM	○○○○-○○○V	G98	Insert (Grooving)
GMM	○○○○$^{R}/_{L}$-MT-○○D	G52, H47	Insert (Grooving / Cut-off)
GMM	○○○○R-TK-○D	G52, H47	Insert (Grooving / Cut-off)
GMM	○○○○R-TMR-○D	H47	Insert (Cut-off)
GMN	○	C31, C57, G51, G53, H46	Insert (Grooving / Cut-off)
GMN	○-TK	G51, H46	Insert (Grooving / Cut-off)
GMN	○.○	G51, H46	Insert (Grooving / Cut-off)
GMR	○-TK-○D	G52, H47	Insert (Grooving / Cut-off)
GMR	○(.○)-○(○)D	G52, H47	Insert (Grooving / Cut-off)
GOMT	○○T○○○ER-D	M232	Insert (Milling)
GOMT	○○○○○○ER-D	M232	Insert (Milling)
GP	-○	P19	Spare parts (Plug)
GS-50		P2	Spare parts (Screw)
GVF$^{R}/_{L}$	○○○-○○○A	G126	Insert (Grooving)
GVF$^{R}/_{L}$	○○○-○○○AA	G124	Insert (Grooving)
GVF$^{R}/_{L}$	○○○-○○○AR	G126	Insert (Grooving)
GVF$^{R}/_{L}$	○○○-○○○B	C55, G126	Insert (Grooving)
GVF$^{R}/_{L}$	○○○-○○○BR	G126	Insert (Grooving)
GVF$^{R}/_{L}$	○○○-○○○C	C55, G126	Insert (Grooving)
GV$^{R}/_{L}$	○○○-○○○A	C55, G84, G85	Insert (Grooving)
GV$^{R}/_{L}$	○○○-○○○AR	G85	Insert (Grooving)
GV$^{R}/_{L}$	○○○-○○○B	C55, G85	Insert (Grooving)
GVR	○○○-○○○BR	G85	Insert (Grooving)
GV$^{R}/_{L}$	○○○-○○○C	G85	Insert (Grooving)
GV$^{R}/_{L}$	○○○-○○○S	G84	Insert (Grooving)
GV$^{R}/_{L}$	○○○-○○○SS	G84	Insert (Grooving)
GZG	○○○○N-○○○PG	H25	Insert (Cut-off)
GZG	○○○○R-○○○PG-○○D	H25	Insert (Cut-off)
GZM	○○○○L-○○○PF-○○D	H24	Insert (Cut-off)
GZM	○○○○N-○○○PF	H24	Insert (Cut-off)
GZM	○○○○N-○○○PH	H25	Insert (Cut-off)
GZM	○○○○N-○○○PM	H24	Insert (Cut-off)
GZM	○○○○R-○○○PF-○○D	H24	Insert (Cut-off)
GZM	○○○○R-○○○PM-○D	H24	Insert (Cut-off)
GZMS	○○○○N-○○○PH	H25	Insert (Cut-off)

H

HA○○	PCLN$^{R}/_{L}$○○-○○	P27	Boring bars (Discontinued description)
HA○○	PDUN$^{R}/_{L}$○○-○○	P27	Boring bars (Discontinued description)
HA○○	PTFN$^{R}/_{L}$○○-○○	P27	Boring bars (Discontinued description)
HA32	SCLC$^{R}/_{L}$○○-○○	P27	Boring bars (Discontinued description)
HA32	SDUC$^{R}/_{L}$○○-○○	P27	Boring bars (Discontinued description)
HF16X48HC		P19	Spare parts (Screw with coolant hole)
HF20X53H		P2	Spare parts (Screw with coolant hole)
HF20X53HA		P2	Spare parts (Screw with coolant hole)
HF24X60H		P2	Spare parts (Screw with coolant hole)
HF24X60HA		P2	Spare parts (Screw with coolant hole)
HH3X6		P2	Spare parts (Screw)
HH3X10S		P2	Spare parts (Screw)
HH3X12		P2	Spare parts (Screw)
HH3.5X10S		P2	Spare parts (Screw)
HH4X12		P3	Spare parts (Screw)
HH4X12S		P2	Spare parts (Screw)
HH4X16		P2	Spare parts (Screw)
HH5	X○○	P2	Spare parts (Screw)
HH5X15L		P2	Spare parts (Screw)
HH6	X○○	P3	Spare parts (Screw)
HH6	X○○A	P3	Spare parts (Screw)
HH8	X○○	P3	Spare parts (Screw)
HH8X25H		P3	Spare parts (Screw with coolant hole)
HH10	X○○	P3	Spare parts (Screw)
HH10X30H		P3	Spare parts (Screw with coolant hole)
HH10X35HK		P3	Spare parts (Screw with coolant hole)
HH12	X○○	P3	Spare parts (Screw)

○: Figure, □: Alphabet

Description	Page	Category
HH12X35H	P3	Spare parts (Screw with coolant hole)
HH12X35HC	P19	Spare parts (Screw with coolant hole)
HH12X35HK	P3	Spare parts (Screw with coolant hole)
HH16 X○○	P3	Spare parts (Screw)
HH16X52H	P3	Spare parts (Screw with coolant hole)
HH20 X○○	P3	Spare parts (Screw)
HS -○○○○(○)TRP	P4	Spare parts (Screw)
HS ○X○	P3	Spare parts (Screw)
HS ○X○□(□)	P3	Spare parts (Screw)
HS ○X○○	P3	Spare parts (Screw)
HS ○○X○○	P3	Spare parts (Screw)
HS -AN-AN-○○○	D12,G37,H66	Spare parts (Hose)
HSB4X8R/L	P4	Spare parts (Lock screw)
HS -G1/8-G1/8-○○○	H17	Spare parts (Hose)
HS -ST-AN-○○○	D12,G37,H66	Spare parts (Hose)
HS -ST-ST-○○○	D12,G37,H66	Spare parts (Hose)

J

J	-AN-R1/8-G1/8	H17	Spare parts (Joint)
JCET	○○○○○○ML-F	B80	Insert (Turning)
JCET	○○○○○○ML-FSF	B80	Insert (Turning)
JCET	○○○○○○MR-F	B80	Insert (Turning)
JCET	○○○○○○MR-FSF	B80	Insert (Turning)
J	-G1/8-UNF3/8	D12,G37,H66	Spare parts (Joint)
J	-M10X1.5-UNF3/8	D12,G37,H66	Spare parts (Joint)
J	-ST-G1/2-G3/8	F129	Spare parts (Joint)
J	-ST-G1/4-G1/8	F129	Spare parts (Joint)
J	-ST-G3/8-G1/4	F129	Spare parts (Joint)
J	-ST-NPT1/8-G1/8	H17	Spare parts (Joint)
J	-ST-NPT1/8-RC1/8	H17	Spare parts (Joint)
J	-ST-R1/4-G1/8	H17	Spare parts (Joint)
J	-ST-R1/4-RC1/8	H17	Spare parts (Joint)
J	-ST-R1/8-G1/8	H17	Spare parts (Joint)
J	-ST-R1/8-RC1/8	H17	Spare parts (Joint)
JCGT	○○○○○○R/L-F	B80	Insert (Turning)
JOMT	○○T○○○ER-D	M232	Insert (Milling)
JOMT	○○○○○○ER-D	M232	Insert (Milling)

K

KAV	-D○○-○(○)D	F128	Boring shank
KAV	-G○○-○○D	F128	Boring shank
KAVH	○○-PCLNR/L○○	F118	Boring heads
KAVH	○○-PDUNR/L○○	F120	Boring heads
KAVH	○○-PTFNR/L○○	F122	Boring heads
KAVH	○○-SCLCR/L○○	F124	Boring heads
KAVH	○○-SDUCR/L○○	F125	Boring heads
KAVH	○○-STLPR/L○○	F126	Boring heads
KAVH	○○-SVUBR/L○○	F127	Boring heads
KCGT	○○○○○○ER-AM	M187	Insert (Milling)
KCGT	○○○○○○FR-AL	M187	Insert (Milling)
KFMSR/L	○○○○□○○(○)○○(○)-8	G138	Toolholder (Grooving)
KFMSR/L	○○○○□○○(○)○○(○)-○	G135,G136	Toolholder (Grooving)
KFTBR/L	○○(○)○○○-○S	G140	Blade (Grooving)
KGAR/L	○○○○□-○	G64, P29	Toolholder (Grooving)
KGBR/L	○○○○□-○○	G16	Toolholder (Grooving)
KGBR/L	○○○○□○○-○○	G16	Toolholder (Grooving)
KGBAR/L	○○○○□-○○	G13	Toolholder (Grooving)
KGBAR/L	○○○○K-○○JCT	G15	Toolholder (Grooving)
KGBAR/L	○○○○□○○-○○	G13	Toolholder (Grooving)
KGBAR/L	○○○○K○○-○○JCT	G15	Toolholder (Grooving)
KGBAR/L	○○○○□○○-○○T○	G13	Toolholder (Grooving)
KGBASR/L	○○○○□-○○	G14	Toolholder (Grooving)
KGBASR/L	○○○○□○○-○○	G14	Toolholder (Grooving)
KGBASR/L	○○○○□○○-○○T○	G14	Toolholder (Grooving)

Description	Page	Category
KGBFR/L ○○○○JX-○○F	G23	Toolholder (Grooving)
KGBFR ○○○○JX-○○FJCTM	G24	Toolholder (Grooving)
KGBFSR/L ○○○○JX-○○	G25	Toolholder (Grooving)
KGBSR/L ○○○○□-○○	G17	Toolholder (Grooving)
KGBSR/L ○○○○□○○-○○	G17	Toolholder (Grooving)
KGDFR/L -○○(○)-○□-C	G114, G115, G116, G117, G119, G120, G121	Blade (Grooving)
KGDFR/L ○○○○□○○(○)-○B-Z	G118	Toolholder (Grooving)
KGDFR/L ○○○○X○○(○)-○□S	P29	Toolholder (Grooving / Discontinued description)
KGDIR/L ○○○○B-○	G91	Toolholder (Grooving)
KGDR/L ○○○○□(□)-○(.○)	G35, H34	Toolholder (Grooving / Cut-off)
KGDR/L ○○○○□(□)-○(.○)D○○	G35, H34	Toolholder (Grooving / Cut-off)
KGDR/L ○○○○□(□)-○(.○)T○○	G34, H40	Toolholder (Grooving / Cut-off)
KGDR/L ○T○○-C	G40, G41, G42, H41	Blade (Grooving / Cut-off)
KGDR/L ○○○○-C	G40, G42, G114, G115, G116, G117, H41	Toolholder body (Grooving / Cut-off)
KGDR/L ○○○○H-○JCT	P29	Toolholder (Grooving / Discontinued description)
KGDR/L ○○○○K-○T○○JCT	G36, H43	Toolholder (Grooving / Cut-off)
KGDR/L ○○○○□(□)-○(.○)JCTM	G39, H39	Toolholder (Grooving / Cut-off)
KGDR/L ○○○○X-○T○○S	G40,H41,P29	Toolholder (Grooving / Cut-off)
KGDSR/L ○○○○-C	G41, G42, G119, G120	Toolholder body (Grooving / Cut-off)
KGDSR/L ○○○○JX-○(.○)B	H36	Toolholder (Cut-off)
KGDSR/L ○○○○X-○T○○S	G41	Toolholder (Grooving)
KGHR/L ○○○○□-○(○)	G62	Toolholder (Grooving)
KGHSR/L ○○○○□-○	G63, P28	Toolholder (Grooving)
KGIAR ○○H	G97	Toolholder body (Grooving)
KGIAR ○○○○B-○	G97	Toolholder (Grooving)
KGMR/L ○○○○□(□)-○(.○)(-○○)	G55, G56, H50, H51, P29	Toolholder (Grooving / Cut-off)
KGMR/L ○○○○□-○T○○	G57, H52, P29	Toolholder (Grooving / Cut-off)
KGMMR/L ○○○○□-○	G58, P29	Toolholder (Grooving)
KGMSR/L ○○○○□-○	G58, P29	Toolholder (Grooving)
KGMUR/L ○○○○□	G60, P30	Toolholder (Grooving)
KGMWR/L ○○○○M-○	G67	Toolholder (Grooving)
KGZR/L ○○○○□(□)-○(.○)	H28	Toolholder (Cut-off)
KGZR/L ○○○○□(□)-○(.○)D○○	H28	Toolholder (Cut-off)
KGZR/L ○○○○□□-○(.○)JCTM	H26	Toolholder (Cut-off)
KGZSR/L ○○○○□(□)-○(.○)□	H29	Toolholder (Cut-off)
KIGBAR/L ○○○○-○○	G89	Toolholder (Grooving)
KIGHR ○○○○B-○	G93, P30	Toolholder (Grooving)
KIGMR/L ○○○○B-○	G95	Toolholder (Grooving)
KIGMR/L ○○○○B-○V	P30	Toolholder (Grooving / Discontinued description)
KIGMUR ○○○○B-○	G95	Toolholder (Grooving)
KITGR/L ○○○○T-○○	J39	Toolholder (Grooving / Threading)
KN91R/L 44-○	P28	Toolholder (Grooving / Discontinued description)
KPKB ○○-○	H61	Blade (Cut-off)
KPKB ○○-○JCT	H60	Blade (Cut-off)
KPKHR/L ○○○○□-○	H68	Toolholder (Cut-off)
KPKHR/L ○○○○□-○D○○	H68	Toolholder (Cut-off)
KPKHR/L ○○○○K-○JCT	H67	Toolholder (Cut-off)
KPKTB ○○-○○JCT	H62	Toolblock
KPS-42	P8	Spare parts (Shim)
KPT -○○	P8	Spare parts (Shim)
KTGR/L ○○○○□-○○	P28	Toolholder (Grooving / Discontinued description)
KTGR/L ○○○○□22-○○	P28	Toolholder (Grooving / Discontinued description)
KTGFR/L ○○○○□(□)-○○□	P28	Toolholder (Grooving / Discontinued description)
KTKB ○○-○S	H72	Blade (Cut-off)
KTKB ○○-○SS	H72	Blade (Cut-off)
KTKBR/L ○○-○S	H72	Blade (Cut-off)

○: Figure, □: Alphabet

Description		Page	Category
KTKF[R/L]	○○○○H-○○JCT	P30	Toolholder (Cut-off / Discontinued description)
KTKF[R/L]	○○○○□(□)-○○	E15, E16, H9, H10, J29, J30, P21	Toolholder (Back Turning / Cut-off / Threading)
KTKF[R/L]	○○○○□(□)-○○S□	H18	Toolholder (Cut-off)
KTKF[R/L]	○○○○JX-○○JCTM	H15	Toolholder (Cut-off)
KTKFR	○○○○JX-○○-Y	E16, H12, J31	Toolholder (Back Turning / Cut-off / Threading)
KTKFS[R/L]	○○○○□-○○□	P30	Toolholder (Cut-off / Discontinued description)
KTKH[R/L]	○○○○□-○S	H73, P30	Toolholder (Cut-off)
KTKH[R/L]	○○○○□-○T○○S	H73	Toolholder (Cut-off)
KTKH[R/L]	○○○○□-○(.○)-○○○B	P30	Toolholder (Cut-off / Discontinued description)
KTKTB	○○-○○	H63	Toolblock
KTKTBF	○○-○○	H63	Toolblock
KTN[R/L]	○○○○□-○○	J22	Toolholder (Threading)
KTN[R/L]	○○○○JX-○○F	J22	Toolholder (Threading)
KTNR	○○○○□-○○JCT	J23	Toolholder (Threading)
KTNSR	○○○○□-○○	J24	Toolholder (Threading)
KTT[R/L]	○○○○□-○○	J37	Toolholder (Threading)
KTTXR	○○○○□(□)-○○F	J35, P30	Toolholder (Threading)
KVN-32		P8	Spare parts (Shim)

L

LC-4K		P8	Spare parts (Shim)
LC	-○○N	P8	Spare parts (Shim)
LC-42N-20		P8	Spare parts (Shim)
LC	-○○N-C	P9	Spare parts (Shim)
LC-42N[R/L]		P9	Spare parts (Shim)
LC-63		P8	Spare parts (Shim)
LC-63-C		P9	Spare parts (Shim)
LCMT	○○○○○○-GH-E	K50	Insert (Drilling)
LCMT	○○○○○○-GH-I	K52	Insert (Drilling)
LCMT	○○○○○○-GM-E	K50	Insert (Drilling)
LCMT	○○○○○○-GM-I	K52	Insert (Drilling)
LCMT	○○○○○○-SM-E	K50	Insert (Drilling)
LCMT	○○○○○○-SM-I	K52	Insert (Drilling)
LD-4K		P9	Spare parts (Shim)
LD-4K43		P9	Spare parts (Shim)
LD-32N		P9	Spare parts (Shim)
LD	-○○	P9	Spare parts (Shim)
LD	-○○-20	P9	Spare parts (Shim)
LGBA	-○○[R/L]S	P14	Spare parts (Clamp set)
LL	-○○□	P7	Spare parts (Lock Pin)
LL	-03□N	P7	Spare parts (Lock Pin)
LL	-1□N	P7	Spare parts (Lock Pin)
LL	-○□	P7	Spare parts (Lock Pin)
LL	-○	P7	Spare parts (Lock Pin)
LNEU	○○○○-○○	M245	Insert (Milling)
LNEU	○○○○-○○-○	M245	Insert (Milling)
LNEU	○○○○-○○S	M245	Insert (Milling)
LNEU	○○○○-○○S-○	M245	Insert (Milling)
LNGX	○○○○○○	M40, M194	Insert (Milling)
LNGX	○○○○○○R-TT	M40, M194	Insert (Milling)
LOGT	○○○○○○ER-GM	M70	Insert (Milling)
LOGT	○○○○○○FR-AM	M81	Insert (Milling)
LOGU	○○○○PAER-GM	M153	Insert (Milling)
LOGU	○○○○○○ER-GH	M70, M221	Insert (Milling)
LOGU	○○○○○○ER-GM	M46, M70, M153, M221	Insert (Milling)
LOGU	○○○○○○ER-SM	M70	Insert (Milling)
LOMU	○○○○○○ER-GH	M81, M114	Insert (Milling)
LOMU	○○○○○○ER-GM	M81, M114, M214	Insert (Milling)
LOMU	○○○○○○ER-SM	M81, M114	Insert (Milling)
LP	-○S	P7	Spare parts (Lock pin)

Description		Page	Category
LPA	-○○	P7	Spare parts (Anchor pin)
LPF	-○○	P7	Spare parts (Anchor pin)
LPF	-○○○○	P7	Spare parts (Anchor pin)
LPGT	○○○○○○ER-GM	M226	Insert (Milling)
LR	-○○	P9	Spare parts (Shim)
LR	-○○C	P9	Spare parts (Shim)
LS-03N		P4	Spare parts (Lock screw)
LS-03SN		P4	Spare parts (Lock screw)
LS	-○□(□)	P4	Spare parts (Lock screw)
LS-1SN		P4	Spare parts (Lock screw)
LS	-○	P4	Spare parts (Lock screw)
LS	-○○	P4, P9	Spare parts (Lock screw / Shim)
LSE-445R		P12	Spare parts (Cartridge)
LSO-445R		P12	Spare parts (Cartridge)
LSP	-○	P7	Spare parts (Shim pin)
LSP	-○K	P7	Spare parts (Shim pin)
LT-3K		P9	Spare parts (Shim)
LT	-○○N	P9	Spare parts (Shim)
LT	-○○N-20	P9	Spare parts (Shim)
LTK-5		P18	Spare parts (Releasing wrench)
LTW	-○○	P17	Spare parts (Torx wrench / L-shaped type)
LTW	-○(○)S(S)	P17	Spare parts (Torx wrench / L-shaped type)
LW	-○(.○)	P18	Spare parts (Hexagon wrench / L-shaped type)
LW	-○○	P18	Spare parts (Hexagon wrench / L-shaped type)
LW	-○○N	P9	Spare parts (Shim)
LW-42N[R/L]		P9	Spare parts (Shim)

M

M3X8		P4	Spare parts (Screw)
M	○X○○	P4	Spare parts (Screw)
MA90	-○○M○○-○○T○C	M69	Modular type head
MA90	-○○S○○-○○T○C(L)	M66, M67	End mill
MA90	-○○○R-○○T○(○)C	M68	Face mill
MA90	-○○○R-○○T○(○)C-M	M68	Face mill
MAP	-○○○○	P12	Spare parts (Shim)
MB45	-○○S○○-○○T○C	M18	End mill
MB45	-○○○R-○○T○(○)	M17	Face mill
MB45	-○○○R-○○T○(○)C	M17	Face mill
MB45	-○○○R-○○T○(○)C-(○○)M	M16	Face mill
MB45	-○○○R-○○T○(○)-M	M16	Face mill
MCSE	○○○	M281	End mill
MCSE	○○○-○○D	M281	End mill
MCSE	○○○-○○W	M281	End mill
MEA	○○-S○○(-○○○)	P33	End mill (Discontinued description)
MEAL	○○-S○○	P33	End mill (Discontinued description)
MEAS	○○-S○○-○○-○T	M186	End mill
MEAS	○○-S○○-○○-○T-○○○	M186	End mill
MEAS	○○○R-○○-○T-M / -KUA	M186	Face mill
MEAS	○○-M○○-○○-○T-KUA	M187	Modular type head
MEB	○○-S○○	P33	End mill (Discontinued description)
MEC	○○-M○○-○○-○T	M90	Modular type head
MEC	○○-M○○-○○T-○T	M90	Modular type head
MEC	○○-S○○-○○	M86, M88	End mill
MEC	○○-S○○-○○T	M86	End mill
MEC	○○-S○○-○○T-○	M86	End mill
MEC	○○-S○○-○○○-○○	M88	End mill
MEC	○○-S○○-○○○-○○-○	M88	End mill
MEC	○○-S○○-○○○-○○T	M87	End mill
MEC	○○-S○○-○○○-○○T-○	M87	End mill
MEC	○○-W○○-○○T○	M89	End mill
MEC	○○-W○○-○○T○-H	M89	End mill
MEC	○○-W○○-○○○○(-H)	M89	End mill
MEC	○○○R-○○-○(○)T	M89, P33	Face mill
MEC	○○○R-○○-○(○)T-M	M89, P33	Face mill

○: Figure, □: Alphabet

Description		Page	Category
MEC	○○○R-○○-○TN	M89	Face mill
MECH	○○○-S○○-○○-○-○T	M116	End mill
MECH	○○○R-○○-○-○T	M117	Shell mill
MECH	○○○R-○○-○-○T-M	M117	Shell mill
MECH	○○○R○○-○-○T-BT○○	M118	End mill
MECH	○○○R○○-○T-BT○○-A	M119	End mill
MECH	○○○R○○-○T-BT○○SA	M118	End mill
MECH	○○○R○○-○T-F	M119	End mill
MECH	○○○W○○-○○-○T	M116	End mill
MECH	○○○S○○-○○-○-○TXT	M116	End mill
MECHT	○○-S○○-○○-○-○T	M127	End mill
MECHT	○○R-○○-○-○T-M	M127	Face mill
MECHT	○○R-○○○○-○-○T-M	M127	Face mill
MECX	○○-S○○-○○-○T	M98, P33	End mill
MECX	○○-S○○-○○○-○○-○T	M98, P33	End mill
MECX	○○○R-○○-○(○)T-M	M99, P33	Face mill
MECX	○○-W○○-○○-○T	M98, P33	End mill
MEF	○○-S○○	M284	End mill
METS	○○-S○○	M287	End mill
METS	○○-S○○-H	M287	End mill
MEV	○○-M○○-○○-○T	M108	Modular type head
MEV	○○-S○○-○○-○T	M106	End mill
MEV	○○-S○○-○○-○○○-○T	M106	End mill
MEV	○○○R-○○-○T	M107	Face mill
MEV	○○○R-○○-○T-M	M107	Face mill
MEW	○○-M○○-○○-○T	M79	Modular type head
MEW	○○-S○○-○○-○T	M76	End mill
MEW	○○-S○○-○○-○○○-○T	M76	End mill
MEW	○○○R-○○-○T	M78	Face mill
MEW	○○○R-○○-○T-M	M78	Face mill
MEW	○○-W○○-○○-○T	M77	End mill
MEWH	○○○-S○○-○○-○-○T	M112	End mill
MEWH	○○○-W○○-○○-○-○T	M112	End mill
MEWH	○○○R-○○-○-○T-M	M113	Face mill
MEWH	○○○S○○-○○-○-○TXT	M112	End mill
MEY	○○-S○○	M230	End mill
MEY	○○-S○○-○○○	M230	End mill
MEY	○○-S○○-○○W-○○○H	M231	End mill
MEY	○○-S○○-○○○H	M230	End mill
MEZ	○○-S○○-○○○	P37	End mill (Discontinued description)
MFAH	○○○RA-○(○)T(-○○○)-SF	M177	Face mill
MFAH	○○○RA-○(○)T-M(○○)-SF	M176	Face mill
MFAH	○○○RS-○(○)T-M-SF	M178	Face mill
MFAH	○○○RS-○(○)T-SF	M178	Face mill
MFF	○○○R(-M)-SF	M193	Face mill
MFH	○○-M○○-○○-○T	M202, M213, M220, M227	Modular type head
MFH	○○-M○○-○○-○T-KUA	M220	Modular type head
MFH	○○-S○○-○○-○T	M200, M201, M211, M218, M226	End mill
MFH	○○-S○○-○○-○T-○○○	M200, M211, M218	End mill
MFH	○○-W○○-○○-○T	M200, M211, M218, M226	End mill
MFH	○○○R-○○-○(○)T	M212	Face mill
MFH	○○○R-○○-○(○)T-M	M212	Face mill
MFH	○○○R-○○-○T-○○M	M212	Face mill
MFH	○○○R-○○-○T	M198, M199	Face mill
MFH	○○○R-○○-○T-M	M198, M199, M219	Face mill
MFH	○○○R-○○-○T-M-KUA	M219	Face mill
MFH	○○○R-○○-○T-○○M	M198, M199	Face mill
MFK	○○○R-○○-○(○)T	M50	Face mill

Description		Page	Category
MFK	○○○R-○○-○(○)T-M	M50	Face mill
MFK	○○○R-○○-○(○)T-M-SF	M52	Face mill
MFK	○○○R-○○-○(○)T-SF	M52	Face mill
MFLN	○○○○○R-○(○)T	M44, M45, M152	Face mill
MFLN	○○○○○R-○(○)T-M	M44, M45, M152	Face mill
MFPN-45		P9	Spare parts (Shim)
MFPN	○○○○○^{5}/$_{8}$-○(○)T	M23	Face mill
MFPN	○○○○○R-○(○)T-G	M31	Face mill
MFPN	○○○○○R-○(○)T-M	M22, P32	Face mill
MFPN	○○○○○R-○(○)T-M-G	M31	Face mill
MFPN	○○○○○R-S○○-○T	M25	End mill
MFPN	○○○○○R-S○○-○T-G	M33	End mill
MFSE-10S		P9	Spare parts (Shim)
MFSE	○○○○○^{5}/$_{8}$-○(○)T	M38	Face mill
MFSE	○○○○○R-○(○)T-M	M38	Face mill
MFSE	○○○○○R-○(○)T-W	M38	Face mill
MFSE	○○○○○R-○(○)T-W-M	M38	Face mill
MFSN	○○○○○R-S○○-○T-G	M147	End mill
MFSN	○○○○○R-○(○)T-G	M145	Face mill
MFSN	○○○○○R-○(○)T-M-G	M145	Face mill
MFWN-90		P9	Spare parts (Shim)
MFWN	○○○○○R-S○○-○T	M134	End mill
MFWN	○○○○○R-S○○-○○-○T	M140	End mill
MFWN	○○○○○R-○(○)T	M132	Face mill
MFWN	○○○○○R-○(○)T-M (-KUA)	M131, P33	Face mill
MFWN	○○○○○R-○○-○(○)T	M139	Face mill
MFWN	○○○○○R-○○-○(○)T-M	M139	Face mill
MGI	○○○○-○A	M290	End mill
MGI	○○○○-○B	M290	End mill
MGI	○○○○-○C	M290, P37	End mill
MGI	○○○○-○S	M290	End mill
MGI	○○○○-○SS	M290	End mill
MHD	○○-○RF	P37	Helical radius end mill (Discontinued description)
MHD	○○(○)-BT50-A	P36	Helical end mill (Discontinued description)
MHD	○○(○)-BT50-SA	P36	Helical end mill (Discontinued description)
MHD	○○(○)-F	P36, P37	Helical end mill (Discontinued description)
MHD	○○(○)-FMA-A	P36	Helical end mill (Discontinued description)
MHD	○○(○)-FMA-SA	P36	Helical end mill (Discontinued description)
MHD	○○-S○○-○RSA	P37	Helical radius end mill (Discontinued description)
MHD	○○-S○○-A(-○○○)	P36, P37	Helical end mill (Discontinued description)
MHD	○○-S○○-B	P36	Helical end mill (Discontinued description)
MHD	○○(S)-S○○-C	P36	Helical end mill (Discontinued description)
MHD	○○-S○○-SA	P36	Helical end mill (Discontinued description)
MHD	○○-S○○-SB	P36	Helical end mill (Discontinued description)
MRF	○○-S○○	M258	End Mill (Ball-nose)
MRF	○○-S○○-○○○	M258	End Mill (Ball-nose)
MRFW	○○-S○○	M259	End Mill (Ball-nose)
MRFW	○○-S○○-○○○	M259	End Mill (Ball-nose)
MRP	○○○R-○○	P35	Face mill (Discontinued description)
MRP	○○○R-○○-○T	P35	Face mill (Discontinued description)
MRP	○○○-S○○-○○	P35	End mill (Discontinued description)
MRP	○○○-S○○-○○-○T	P35	End mill (Discontinued description)
MRP	○○○-S○○-○○-○T-○○○	P35	End mill (Discontinued description)
MRP	○○○-S○○-○○-○○○	P35	End mill (Discontinued description)
MRW	○○-S○○-○○-○T	M266	End mill
MRW	○○-S○○-○○-○T-○○○	M266	End mill
MRW	○○-W○○-○○-○T	M266	End mill
MRW	○○○R-○○-○(○)T	M264	Face mill
MRW	○○○R-○○-○(○)T-M	M264	Face mill
MRX	○○-M○○-○○-○T	M275	Modular type head
MRX	○○-S○○-○○-○T	M274	End mill

○: Figure, □: Alphabet

Description		Page	Category
MRX	○○-S○○-○○-○T-○○○	M274	End mill
MRX	○○-W○○-○○-○T	M274	End mill
MRX	○○○R-○○-○T	M271	Face mill
MRX	○○○R-○○-○T-M	M271	Face mill
MSD-42		P9	Spare parts (Shim)
MSD	45○○	P32	Face mill (with Shank / Discontinued description)
MSD	45○○-32	P32	Face mill (with Shank / Discontinued description)
MSE	15○○(-32)	P32	Face mill (with Shank / Discontinued description)
MSE	-○○○○(□)	P9	Spare parts (Shim)
MSE	45○○	P32	Face mill (with Shank / Discontinued description)
MSE	45○○-32	P32	Face mill (with Shank / Discontinued description)
MS-FRW1		M238,M239	Spare parts (Wrench / for MSTA)
MSO	45○○-S	P32	Face mill (with Shank / Discontinued description)
MSO	45○○-S32-09	P32	Face mill (with Shank / Discontinued description)
MSO	45○○○R	P32	Face mill (Discontinued description)
MSO	45○○○R-09	P32	Face mill (Discontinued description)
MSO	90○○-S32-○○	P33	Face mill (with Shank / Discontinued description)
MSO	90○○○R-○○	P33	Face mill (Discontinued description)
MSO-4T245		P10	Spare parts (Shim)
MSO-5200		P10	Spare parts (Shim)
MSP	15○○	P32	Face mill (with Shank / Discontinued description)
MSP-42		P10	Spare parts (Shim)
MSR	○○○R-BT○○-○	M166	Face mill
MSR	○○○R-○	M165	Face mill
MSR	○○○R-○-○○.○○	M165	Face mill
MSR	○○○R-○M	M165	Face mill
MSRS	○○○○○R-○-○(○)T	M159	Face mill
MSRS	○○○○○R-○-○(○)T-M	M159	Face mill
MSRS	○○○○○R-○(○)T	M59	Face mill
MSRS	○○○○○R-○(○)T-M	M59	Face mill
MSTA	○○(○)N○○-○(○)T	M238	Slot mill
MSTA	○○N○○○-○(○)T	M239	Slot mill
MSTB	○○○AN○○○○-○T	M242	Slot mill
MSTB	○○○SN○○○○-○T	M244	Slot mill
MSTB	○○○○AN○○○-○T	M243	Slot mill
MSTC	○○○AL○○○-○○○-○○	P34	Slot mill (Discontinued description)
MSTC	○○○AL○○○○-○○-○(○)T	P34	Slot mill (Discontinued description)
MSTC	○○○AN○○○-○○○-○○	P34	Slot mill (Discontinued description)
MSTC	○○○AN○○○○-○○-○T	M249	Slot mill
MSTC	○○○AR○○○-○○○-○○	P34	Slot mill (Discontinued description)
MSTC	○○○AR○○○○-○○-○(○)T	P34	Slot mill (Discontinued description)
MSTC	○○○SL○○○○-○○-○(○)T	P35	Slot mill (Discontinued description)
MSTC	○○○SN○○○○-○○-○T	M250	Slot mill
MSTC	○○○SR○○○○-○○-○(○)T	P35	Slot mill (Discontinued description)
MTE-42		P10	Spare parts (Shim)
MTE	90○○	P33	Face mill (with Shank / Discontinued description)
MTE	90○○-32	P33	Face mill (with Shank / Discontinued description)
MTES	○○○	P33	End mill (Discontinued description)
MTP	90○○	P33	Face mill (with Shank / Discontinued description)
MTPS	○○○	P33	End mill (Discontinued description)
MVG	○○○○	M292, P37	End mill
MVLN$^{R}/_{L}$	○○○○□-○○	D36	Toolholder (Turning)
MVN-32		P10	Spare parts (Shim)
MVVNN	○○○○□-○○	D37	Toolholder (Turning)

N

NDCT	○○○○○○FR	M172	Insert (Milling)
NDCT	○○○○○○TR	M172	Insert (Milling)
NDCT	○○○○○○TRX	M172	Insert (Milling)
NDCW	○○○○○○FRX	C64, M172, M298	Insert (Milling)
NDCW	○○○○○○FRX-NE	C64, M172, M298	Insert (Milling)
NDCW	○○○○○○TR	M172	Insert (Milling)
NDCW	○○○○○○TRX	M172	Insert (Milling)

P

P-03		P7	Spare parts (Shim pin)
P-03S		P7	Spare parts (Shim pin)
PC	-○	P19	Spare parts (Punch)
PCLN$^{R}/_{L}$	○○○○□-○○	D10	Toolholder (Turning)
PCLNR	○○○○JX-○○FF	E63	Toolholder (Turning)
PD-42		P10	Spare parts (Shim)
PDHN$^{R}/_{L}$	○○○○□-○○	D17	Toolholder (Turning)
PDJN$^{R}/_{L}$	○○○○□-○○	D16	Toolholder (Turning)
PDJN$^{R}/_{L}$	○○○○□-○○U	D16	Toolholder (Turning)
PH	○○○○-○○	P28	Sleeve (for Tip-bars / Discontinued description)
PKM	○○$^{R}/_{L}$-○○○PM-○D	H58	Insert (Cut-off)
PKM	○○N-○○○PH	H58	Insert (Cut-off)
PKM	○○N-○○○PM	H58	Insert (Cut-off)
PNEA	○○○○XNTN-T○○○○○	M54	Insert (Milling)
PNEG	○○○○XNEN-GL	M54	Insert (Milling)
PNEG	○○○○XNER-W	M54	Insert (Milling)
PNEG	○○○○XNTR-T○○○○○	M54	Insert (Milling)
PNEG	○○○○XNTR-T○○○○○W	M54	Insert (Milling)
PNEU	○○○○ANEL-GL	M26	Insert (Milling)
PNEU	○○○○ANER-GL	M26	Insert (Milling)
PNEU	○○○○ANER-W	M26	Insert (Milling)
PNMG	○○○○XNEN-GH	M54	Insert (Milling)
PNMG	○○○○XNEN-GM	M54	Insert (Milling)
PNMU	○○○○ANEL-GM	M26	Insert (Milling)
PNMU	○○○○ANER-GH	M26	Insert (Milling)
PNMU	○○○○ANER-GM	M26	Insert (Milling)
PNMU	○○○○ANER-SM	M26	Insert (Milling)
PNMU	○○○○XNER-GH	M34	Insert (Milling)
PNMU	○○○○XNER-GM	M34	Insert (Milling)
PNMU	○○○○XNER-SM	M34	Insert (Milling)
PP-4		P7	Spare parts (Lock pin)
PR07	-ST-UNF3/8	F129	Spare parts (Joint)
PRGC$^{R}/_{L}$	○○○○□-○○	D40	Toolholder (Turning)
PRGC$^{R}/_{L}$	○○○○□-○○BE	D67, P21	Toolholder (Turning)
PRGC$^{R}/_{L}$	○○○○□-○○BF	P21	Toolholder (Turning / Discontinued description)
PRGN$^{R}/_{L}$	○○○○□-○○	D42	Toolholder (Turning)
PRXC$^{R}/_{L}$	○○○○□-○○	D40	Toolholder (Turning)
PSBN$^{R}/_{L}$	○○○○□-○○	D19, P20	Toolholder (Turning)
PSDNN	○○○○□-○○	D21	Toolholder (Turning)
PSH	○○○○(,○)-○○(○)	P24	Sleeve (for 2-Edge tip-bars / Discontinued description)
PSKN$^{R}/_{L}$	○○○○□-○○	D20, P20	Toolholder (Turning)
PSSN$^{R}/_{L}$	○○○○□-○○	D20	Toolholder (Turning)
P-ST-RC1/8		H17	Spare parts (Coupling)
PTFN$^{R}/_{L}$	○○○○□-○○	D25, P20	Toolholder (Turning)
PTGN$^{R}/_{L}$	○○○○□-○○	D24, P20	Toolholder (Turning)
PTLNR	○○○○JX-○○FF	E64	Toolholder (Turning)
PVLN$^{R}/_{L}$	○○○○□-○○Q	D38	Toolholder (Turning)
PVPN$^{R}/_{L}$	○○○○□-○○Q	D38	Toolholder (Turning)
PVVNN	○○○○□-○○Q	D39	Toolholder (Turning)
PWLN$^{R}/_{L}$	○○○○□-○○	D45	Toolholder (Turning)

R

RBG	○○K○○○○○	B123	Insert (Turning)
RCGX	○○○○M○-AQ	B81	Insert (Turning)
RCGX	○○○○○○E○○○	B123	Insert (Turning)
RCGX	○○○○○○P○○○○○	B123	Insert (Turning)
RCGX	○○○○○○T○○○○○	B123	Insert (Turning)
RCMT	○○○○M○-BB	B109	Insert (Turning)
RCMX	○○○○M○	B81	Insert (Turning)
RDFG	○○FR	M260	Insert (Milling)

T

Index

○: Figure, □: Alphabet

Description	Page	Category
RDGT ○○○○M0ER-GM	M276	Insert (Milling)
RDGT ○○○○M0ER-SM	M276	Insert (Milling)
RDHX ○○T○M○T	M299	Insert (Milling)
RDHX ○○○○M○T	M299	Insert (Milling)
RDMT ○○T○M○-H	M299	Insert (Milling)
RDMT ○○○○M0EN-GH	M276	Insert (Milling)
RDMT ○○○○M0ER-GM	M276	Insert (Milling)
RNGN ○○○○○○E○○○	B116	Insert (Turning)
RNGN ○○○○○○K○○○○○	B116	Insert (Turning)
RNGN ○○○○○○S○○○○○	B116	Insert (Turning)
RNGN ○○○○○○T○○○○○	B116	Insert (Turning)
RNMG ○○○○○○	B32	Insert (Turning)
RNMN ○○○○○○S○○○○○	C17	Insert (Turning)
ROMU ○○○○M○ER-GH	M267	Insert (Milling)
ROMU ○○○○M○ER-GM	M267	Insert (Milling)
ROMU ○○○○M○ER-SM	M267	Insert (Milling)
RPGN ○○○○○○E○○○	B120	Insert (Turning)
RPGN ○○○○○○T○○○○○	B120	Insert (Turning)
RPGT ○○T○M0ER-GM	M276	Insert (Milling)
RPGT ○○T○M0ER-SM	M276	Insert (Milling)
RPGT ○○○○M0ER-GM	M276	Insert (Milling)
RPGT ○○○○M0ER-SM	M276	Insert (Milling)
RPGX ○○○○○○E○○○	B123	Insert (Turning)
RPGX ○○○○○○T○○○○○	B123	Insert (Turning)
RPMT ○○T○M○	M299	Insert (Milling)
RPMT ○○T○M0EN-GH	M276	Insert (Milling)
RPMT ○○T○M0ER-GM	M276	Insert (Milling)
RPMT ○○○○M○	M299	Insert (Milling)
RPMT ○○○○M○-BB	B109	Insert (Turning)
RPMT ○○○○M○-H	M299	Insert (Milling)
RPMT ○○○○M0EN-GH	M276	Insert (Milling)
RPMT ○○○○M0ER-GM	M276	Insert (Milling)

S

S○○- CH○○	K38	Toolholder (Chamfering attachment / DRC)
S○○- CH○○-DRA	K20	Toolholder (Chamfering attachment / DRA)
S○○- DRS○○○○○	P31	Toolholder („MagicDrill"/Discontinued description)
S○○- DRV○○○M-○-○○	K54, K55, K56, K57, K58, K59, K60, K61, K62	Toolholder („MagicDrill")
S○○- DRW○○○○○M-○-06	K90, K91, K92, K93	Toolholder („MagicDrill")
S○○- DRZ○○○○(○○)-○○	K76, K77, K78, K79, K80, K81, K82	Toolholder ("MagicDrill")
S○○- DRZ○○○○○-○○CR	K83	Toolholder ("MagicDrill")
S○○□- CCLN^{R}/$_{L}$○○-○○A	P26	Boring bars (Discontinued description)
S○○□- CCLN^{R}/$_{L}$○○-○○GX	P28	Boring bars (Discontinued description)
S○○□- CDUN^{R}/$_{L}$○○-○○GX	P28	Boring bars (Discontinued description)
S○○□- CELNR○○-○○	F151	Boring bars
S○○□- CSKN^{R}/$_{L}$○○-○○	P28	Boring bars (Discontinued description)
S○○□- CSKN^{R}/$_{L}$○○-○○A	P26	Boring bars (Discontinued description)
S○○□- CSKN^{R}/$_{L}$○○-○○GX	P28	Boring bars (Discontinued description)
S○○□- CSKPR○○-○○	F112, P26	Boring bars
S○○□- CTUC^{R}/$_{L}$○○-○○	P26	Boring bars (Discontinued description)
S○○□- CTUNR○○-○○A	F152	Boring bars
S○○□- CTUP^{R}/$_{L}$○○-○○	F113, P26	Boring bars
S○○(.○)□- KGBFL16	G26	Toolholder (Grooving)
S○○□- KTGFL16	P28	Toolholder (Grooving / Discontinued description)
S○○(.○)□- KTNL16	J25	Toolholder (Threading)
S○○(.○)□- KTTXL16	J35	Toolholder (Threading)
S○○□- PCLN^{R}/$_{L}$○○-○○	F132	Boring bars
S○○□- PDQN^{R}/$_{L}$○○-○○	F139	Boring bars
S○○□- PDUN^{R}/$_{L}$○○-○○	F134, F138	Boring bars
S○○□- PDZN^{R}/$_{L}$○○-○○	F140	Boring bars
S○○□- PTUN^{R}/$_{L}$○○-○○	F144	Boring bars
S○○□- PWLN^{R}/$_{L}$○○-○○	F146	Boring bars
S○○(.○)□- SCLCL○○	E54	Toolholder (Turning)
S○○□- SCLC^{R}/$_{L}$○○-○○	P25	Boring bars (Discontinued description)
S○○□- SCLC^{R}/$_{L}$○○-○○A	F61	Boring bars
S○○□- SCLC^{R}/$_{L}$○○-○○E	P25	Boring bars (Discontinued description)
S○○□- SCLC^{R}/$_{L}$○○-○○AE	F60	Boring bars
S○○□- SCLCR○○-○○○EZ	P24	Boring bars (EZ Bar PLUS / Discontinued description)
S○○□- SCLCR○○-○○○EZP	F31	Boring bars
S○○□- SCLP^{R}/$_{L}$○○-○○	P25	Boring bars (Discontinued description)
S○○□- SCLP^{R}/$_{L}$○○-○○A	F64	Boring bars
S○○□- SCLP^{R}/$_{L}$○○-○○E	P25	Boring bars (Discontinued description)
S○○(.○)□- SDLCL○○	E56	Toolholder (Turning)
S○○□- SDQC^{R}/$_{L}$○○-○○A	F71	Boring bars
S○○(.○)□- SDUCL○○	E55	Toolholder (Turning)
S○○□- SDUC^{R}/$_{L}$○○-○○	P25	Boring bars (Discontinued description)
S○○□- SDUC^{R}/$_{L}$○○-○○A	F67	Boring bars
S○○□- SDUC^{R}/$_{L}$○○-○○E	P25	Boring bars (Discontinued description)
S○○□- SDZC^{R}/$_{L}$○○-○○	P25	Boring bars (Discontinued description)
S○○□- SDZC^{R}/$_{L}$○○-○○A	F75	Boring bars
S○○□- SDZC^{R}/$_{L}$○○-○○E	P25	Boring bars (Discontinued description)
S○○□- SSKPR○○-○○	F111, P26	Boring bars
S○○□- STLB^{R}/$_{L}$○○-○○A	F81	Boring bars
S○○□- STLB^{R}/$_{L}$○○-○○AE	F80	Boring bars
S○○○□- STLBR○○-○○○EZP	F33	Boring bars
S○○□- STLC^{R}/$_{L}$○○-○○A	F89	Boring bars
S○○□- STLP^{R}/$_{L}$○○-○○A	F81	Boring bars
S○○○□- STLPR○○-○○○EZP	F33	Boring bars
S○○□- STUB^{R}/$_{L}$○○-○○	P25	Boring bars (Discontinued description)
S○○□- STUB^{R}/$_{L}$○○-○○E	P25	Boring bars (Discontinued description)
S○○□- STUP^{R}/$_{L}$○○-○○	P25	Boring bars (Discontinued description)
S○○□- STUP^{R}/$_{L}$○○-○○E	P25	Boring bars (Discontinued description)
S○○□- STWPR○○-○○	F85, J47	Toolholder (Boring / Threading)
S○○□- STWP^{R}/$_{L}$○○-○○E	F84, J47	Toolholder (Boring / Threading)
S○○(.○)□- STWL○○	G107	Toolholder (Grooving)
S○○(.○)□- STWR○○	F57	Boring bars
S○○□- SVJB^{R}/$_{L}$○○-○○A	F91	Boring bars
S○○□- SVJB^{R}/$_{L}$○○-○○E	P26	Boring bars (Discontinued description)
S○○□- SVJB^{R}/$_{L}$○○-○○EN	P26	Boring bars (Discontinued description)
S○○□- SVJC^{R}/$_{L}$○○-○○A	F91	Boring bars
S○○□- SVJC^{R}/$_{L}$○○-○○E	P26	Boring bars (Discontinued description)
S○○□- SVJP^{R}/$_{L}$○○-○○A	F91	Boring bars
S○○□- SVJP^{R}/$_{L}$○○-○○E	P26	Boring bars (Discontinued description)
S○○□- SVNR12	P24	Toolholder (for System Tip-bars / Discontinued description)
S○○□- SVNR○○N	F50	Boring bars
S○○(.○)□- SVNR12S	P24	Toolholder (for System Tip-bars / Discontinued description)
S○○(.○)□- SVNR○○SN	F51	Boring bars
S○○(.○)□- SVNR○○SXN	F55	Boring bars
S○○□- SVNR○○XN	F54, P24	Boring bars
S○○□- SVPB^{R}/$_{L}$○○-○○A	F94	Boring bars
S○○□- SVPB^{R}/$_{L}$○○-○○E	P26	Boring bars (Discontinued description)
S○○□- SVPB^{R}/$_{L}$○○-○○EN	P26	Boring bars (Discontinued description)
S○○□- SVPC^{R}/$_{L}$○○-○○A	F94	Boring bars
S○○□- SVPC^{R}/$_{L}$○○-○○E	P26	Boring bars (Discontinued description)
S○○(.○)□- SVUBL○○	E58	Toolholder (Turning)
S○○(.○)□- SVUCL○○	E59	Toolholder (Turning)

○: Figure, □: Alphabet

Description	Page	Category
S○○□- SVUB$^{R}/_{L}$○○-○○A	F96	Boring bars
S○○□- SVUB$^{R}/_{L}$○○-○○E	P26	Boring bars (Discontinued description)
S○○□- SVUB$^{R}/_{L}$○○-○○EN	P26	Boring bars (Discontinued description)
S○○□- SVUC$^{R}/_{L}$○○-○○A	F96	Boring bars
S○○□- SVUC$^{R}/_{L}$○○-○○E	P26	Boring bars (Discontinued description)
S○○□- SVZB$^{R}/_{L}$○○-○○A	F99	Boring bars
S○○□- SVZB$^{R}/_{L}$○○-○○E	P26	Boring bars (Discontinued description)
S○○□- SVZB$^{R}/_{L}$○○-○○EN	P26	Boring bars (Discontinued description)
S○○□- SVZC$^{R}/_{L}$○○-○○A	F99	Boring bars
S○○□- SVZC$^{R}/_{L}$○○-○○E	P26	Boring bars (Discontinued description)
S○○□- SWUB$^{R}/_{L}$○○-○○	P26	Boring bars (Discontinued description)
S○○□- SWUB$^{R}/_{L}$○○-○○A	F101	Boring bars
S○○□- SWUB$^{R}/_{L}$○○-○○AE	F100	Boring bars
S○○□- SWUB$^{R}/_{L}$○○-○○E	P26	Boring bars (Discontinued description)
S○○□- SWUB$^{R}/_{L}$○○-○○-○○	P26	Boring bars (Discontinued description)
S○○○□- SWUBR○○-○○○EZP	F36	Boring bars
S○○□- SWUP$^{R}/_{L}$○○-○○A	F101	Boring bars
S○○□- SWUP$^{R}/_{L}$○○-○○E	P26	Boring bars (Discontinued description)
S○○□- SYXP$^{R}/_{L}$○○-○○E	P26	Boring bars (Discontinued description)
S○○□- WWLN$^{R}/_{L}$○○-○○E	F149	Boring bars
SABSR ○○○○□(□)-○○F	E20, P21	Toolholder (Turning)
SABWR ○○○○□(□)-○○F	E21, E22, P21	Toolholder (Turning)
SB -○STR	P4	Spare parts (Screw)
SB -○(.○)TR	P4	Spare parts (Screw)
SB -○○○○○K	P5	Spare parts (Screw)
SB -○○○○(○)TR	P4, P5	Spare parts (Screw)
SB -○○○○T$^{R}/_{L}$	P5	Spare parts (Screw)
SB -○○○○TRG	P4, P5	Spare parts (Screw)
SB -○○○○(○)TRN	P4, P5	Spare parts (Screw)
SB -○○○○(○)TRP	P4, P5	Spare parts (Screw)
SB -○○○○○TRPH	P5	Spare parts (Screw)
SB -○○○○TRPN	P5	Spare parts (Screw)
SB -○○○○(○)TRS	P5	Spare parts (Screw)
SB -○○○○TRW	P5	Spare parts (Screw)
SB -○○○○TRWN	P5	Spare parts (Screw)
SB -○○○○○UTRP	P5	Spare parts (Screw)
SC -○○○○○	P6	Spare parts (Screw)
SCAC$^{R}/_{L}$ ○○○○□-○○	P22	Toolholder (Turning / Discontinued description)
SCAC$^{R}/_{L}$ ○○○○□-○○FF	P22	Toolholder (Turning / Discontinued description)
SCLC$^{R}/_{L}$ ○○○○□-○○	E28, P22	Toolholder (Turning)
SCLC$^{R}/_{L}$ ○○○○F-○○FF	E26	Toolholder (Turning)
SCLC$^{R}/_{L}$ ○○○○JX-○○FF	E26	Toolholder (Turning)
SCLCR ○○○○H-○○FFJCT	P23	Toolholder (Turning / Discontinued description)
SCLCR ○○○○JX-○○FFJCTM	E27	Toolholder (Turning)
SCLNR ○○○○□-○○FF	E60	Toolholder (Turning)
SCMT ○○T○○○HQ	B82	Insert (Turning)
SCMT ○○○○○○-GH-E	K51	Insert (Drilling)
SCMT ○○○○○○-GH-I	K53	Insert (Drilling)
SCMT ○○○○○○-GM-E	K51	Insert (Drilling)
SCMT ○○○○○○-GM-I	K53	Insert (Drilling)
SCMT ○○○○○○-SM-E	K51	Insert (Drilling)
SCMT ○○○○○○-SM-I	K53	Insert (Drilling)
SCMT ○○○○○○-XM-E	K51	Insert (Drilling)
SCMT ○○○○○○-XM-I	K53	Insert (Drilling)
SDCT ○○○○○○EN-SD	M253	Insert (Milling)
SDCT ○○○○○○FN-SE	M253	Insert (Milling)
SDCT ○○○○○□$^{R}/_{L}$-□□	M253	Insert (Milling)
SDET ○○○○○○SN-SB	M253	Insert (Milling)
SDET ○○○○○○□$^{R}/_{L}$-SB	M253	Insert (Milling)
SDJC$^{R}/_{L}$ ○○○○□-○○	E31	Toolholder (Turning)
SDJC$^{R}/_{L}$ ○○○○F-○○FF	E29	Toolholder (Turning)
SDJC$^{R}/_{L}$ ○○○○JX-○○FF	E29	Toolholder (Turning)
SDJC$^{R}/_{L}$ ○○○○□-○○F	P22	Toolholder (Turning / Discontinued description)
SDJCR ○○○○H-○○FFJCT	P23	Toolholder (Turning / Discontinued description)

Description	Page	Category
SDJCR ○○○○H-○○-F05JCT	P23	Toolholder (Turning / Discontinued description)
SDJCR ○○○○JX-○○-F○○	E23	Toolholder (Turning)
SDJCR ○○○○JX-○○FF-Y	E32	Toolholder (Turning)
SDJCR ○○○○JX-○○FFJCTM	E30	Toolholder (Turning)
SDJCR ○○○○JX○○F○○JCTM	E30	Toolholder (Turning)
SDKN ○○○○AUFN	C64, M294, M298	Insert (Milling)
SDKN ○○○○AUFN-NE	C64, M298	Insert (Milling)
SDKN ○○○○AUTN	M294	Insert (Milling)
SDKR ○○○○AUEN-S	M294	Insert (Milling)
SDKW ○○T○○○FN	M281	Insert (Milling)
SDKW ○○T○○○TN	M281	Insert (Milling)
SDKW ○○○○AESN	M299	Insert (Milling)
SDKW ○○○○AETN	M299	Insert (Milling)
SDLC$^{R}/_{L}$ ○○○○□(□)-○○FF	E34, P22	Toolholder (Turning)
SDLNR ○○○○□-○○FF	E61	Toolholder (Turning)
SDLP$^{R}/_{L}$ ○○○○□-○○F	P22	Toolholder (Turning / Discontinued description)
SDLP$^{R}/_{L}$ ○○○○□(□)-○○FF	E37	Toolholder (Turning)
SDMR ○○○○AUER-H	M294	Insert (Milling)
SDMT ○○T○○○C	M281	Insert (Milling)
SDMT ○○○○AESR-H	M299	Insert (Milling)
SDMT ○○○○○○E-K	M288	Insert (Milling)
SDNC$^{R}/_{L}$ ○○○○□(□)-○○F	E35, P22	Toolholder (Turning)
SDNCN ○○○○□(□)-○○	E35, P22	Toolholder (Turning)
SDXC$^{R}/_{L}$ ○○○○□(□)-○○	E34, P22	Toolholder (Turning)
SE -○○○○TRP	P6	Spare parts (Screw)
SE -○○○○○TRN	P6	Spare parts (Screw)
SE -○○○○○TR	P6	Spare parts (Screw)
SEEN ○○○○AFFN	C64, M298	Insert (Milling)
SEEN ○○○○AFFN-NE	C64, M298	Insert (Milling)
SEEN ○○○○AFFR-W	M294	Insert (Milling)
SEEN ○○○○AFTN	M294	Insert (Milling)
SEEN ○○○○AFTR-W	M294	Insert (Milling)
SEET ○○T○AGFN-AL	M40	Insert (Milling)
SEET ○○T○AGSN-GL	M40	Insert (Milling)
SEET ○○T○AGSN-SL	M40	Insert (Milling)
SEKN ○○○○AFFN	M294	Insert (Milling)
SEKN ○○○○AFTN	M294	Insert (Milling)
SEKN ○○○○EFTR	M294	Insert (Milling)
SEKR ○○○○AFEN-S	M294	Insert (Milling)
SEKT ○○○○AFEN-S	M299	Insert (Milling)
SEKW ○○○○AFTN	M299	Insert (Milling)
SEKW ○○○○○○FN	M281	Insert (Milling)
SEKW ○○○○○○TN	M281	Insert (Milling)
SEMR ○○○○AFER-H	M294	Insert (Milling)
SEMT ○○○○○○C	M281	Insert (Milling)
SF○○- DRA○○○M-○(.○)(○)	K22, K23, K24, K25, K26	Toolholder ("MagicDrill")
SF○○- DRC○○○M-○	K40, K41, K42	Toolholder ("MagicDrill")
SF22F- SCLCL09-40P	P37	Flange holder (Discontinued description)
SF22F- SDUCL11-40P	P37	Flange holder (Discontinued description)
SF22F- SH○○-40P	P37	Flange holder (Discontinued description)
SF22F- SVUBL11-40P	P37	Flange holder (Discontinued description)
SF22F- KTGFL16-40P	P37	Flange holder (Discontinued description)
SF22F- KTTXL16-40P	P37	Flange holder (Discontinued description)
SF$^{R}/_{L}$- ○○○(○)□	G132	Blade (Grooving)
SH ○○○○-○○○	F156	Sleeve (for Boring bars)
SH -50150TR	P6	Spare parts (Screw)
SHA ○○○○(.○)-○○○	F155	Sleeve (for Automatic lathe SIGE)
SHC ○○○○-○○	F156	Coolant sleeve (for Boring bars)
SHE ○○○○-○○	K70	Adjustment sleeve
SIGC$^{R}/_{L}$ ○○○○-EH	G76	Toolholder (Grooving)
SIGC$^{R}/_{L}$ ○○○○-WH	G77	Toolholder (Grooving)
SIGC$^{R}/_{L}$ ○○○○-WH-L○○(○)	G77	Toolholder (Grooving)

○: Figure, □: Alphabet

Description		Page	Category
SIGE$^{R}/_{L}$	○○○○A-EH	G81	Toolholder (Grooving)
SIGE$^{R}/_{L}$	○○○○A-WH	G82	Toolholder (Grooving)
SIGE$^{R}/_{L}$	○○○○B-EH	G81	Toolholder (Grooving)
SIGE$^{R}/_{L}$	○○○○B-WH	G82	Toolholder (Grooving)
SIGE$^{R}/_{L}$	○○○○C-EH	G81	Toolholder (Grooving)
SIGE$^{R}/_{L}$	○○○○C-WH	G82	Toolholder (Grooving)
SIGE$^{R}/_{L}$	○○○○D-EH	G81	Toolholder (Grooving)
SIGE$^{R}/_{L}$	○○○○E-EH	G81	Toolholder (Grooving)
SIGER	○○○○B-WH-○○	G83	Toolholder (Grooving)
SIGER	○○○○C-WH-○○	G83	Toolholder (Grooving)
SIN$^{R}/_{L}$	○○○○S-○○	J26	Toolholder (Threading)
SIN$^{R}/_{L}$	○○○○S-○○E	J26	Toolholder (Threading)
SJS-	○	F157	Coolant joint
SLT	○○-○○SKB	M240	Insert (Milling)
SLT	○○-○○SKD	M240	Insert (Milling)
SNCN	○○○○XNTN	M296	Insert (Milling)
SNEU	○○○○ANEN-W	M20	Insert (Milling)
SNEU	○○○○ANER-GM	M20	Insert (Milling)
SNEU	○○○○ANER-SM	M20	Insert (Milling)
SNEU	○○○○ANFR-AM	M20	Insert (Milling)
SNGA	○○○○○○	B36	Insert (Turning)
SNGA	○○○○○○MEF	C12	Insert (Turning)
SNGA	○○○○○○S○○○○○	B117	Insert (Turning)
SNGA	○○○○○○S○○○○○ME	C12	Insert (Turning)
SNGA	○○○○○○S○○○○○MEH	C12	Insert (Turning)
SNGA	○○○○○○S○○○○○MEP	C12	Insert (Turning)
SNGA	○○○○○○S○○○○○MET	C12	Insert (Turning)
SNGA	○○○○○○T○○○○○	B117	Insert (Turning)
SNGA	○○○○○○T○○○○○ME	C12	Insert (Turning)
SNGG	○○○○○○$^{R}/_{L}$-B	B36	Insert (Turning)
SNGG	○○○○○○$^{R}/_{L}$-C	B36	Insert (Turning)
SNGG	○○○○○○$^{R}/_{L}$-○○R	B36	Insert (Turning)
SNGN	○○○○○○S○○○○○	B117	Insert (Turning)
SNGN	○○○○○○T○○○○○	B117	Insert (Turning)
SNKN	○○○○XNTN	M296	Insert (Milling)
SNMA	○○○○○○	B36	Insert (Turning)
SNMA	○○○○○○S○○○○○	B117	Insert (Turning)
SNMF	○○○○XNTN	M296	Insert (Milling)
SNMF	○○○○○○-○○	B109	Insert (Turning)
SNMG	○○○○○○	B33	Insert (Turning)
SNMG	○○○○○○C	B35	Insert (Turning)
SNMG	○○○○○○GC	B36	Insert (Turning)
SNMG	○○○○○○HQ	B33	Insert (Turning)
SNMG	○○○○○○KG	B35	Insert (Turning)
SNMG	○○○○○○KH	B35	Insert (Turning)
SNMG	○○○○○○L-C	B36	Insert (Turning)
SNMG	○○○○○○MQ	B35	Insert (Turning)
SNMG	○○○○○○MS	B35	Insert (Turning)
SNMG	○○○○○○MU	B35	Insert (Turning)
SNMG	○○○○○○PG	B33	Insert (Turning)
SNMG	○○○○○○PH	B34	Insert (Turning)
SNMG	○○○○○○PMG	B33	Insert (Turning)
SNMG	○○○○○○PQ	B33	Insert (Turning)
SNMG	○○○○○○PS	B33	Insert (Turning)
SNMG	○○○○○○PT	B33	Insert (Turning)
SNMG	○○○○○○R-C	B36	Insert (Turning)
SNMG	○○○○○○SG	B35	Insert (Turning)
SNMG	○○○○○○XP	B34	Insert (Turning)
SNMG	○○○○○○XQ	B34	Insert (Turning)
SNMG	○○○○○○XS	B34	Insert (Turning)
SNMG	○○○○○○ZS	B36	Insert (Turning)
SNMM	○○○○○○PX	B34	Insert (Turning)
SNMN	○○○○○○	B37, M296	Insert (Turning / Milling)
SNMN	○○○○○○S○○○○○	C18	Insert (Turning)
SNMN	○○○○○○T○○○○○	B117	Insert (Turning)
SNMU	○○○○ANER-GH	M20	Insert (Milling)
SNMU	○○○○ANER-GM	M20	Insert (Milling)
SNMU	○○○○○○EN-GH	M148	Insert (Milling)
SNMU	○○○○○○EN-GM	M148	Insert (Milling)
SNMU	○○○○○○EN-SM	M148	Insert (Milling)
SOMT	○○○○○○ER-FL	M203	Insert (Milling)
SOMT	○○○○○○ER-GH	M203	Insert (Milling)
SOMT	○○○○○○ER-GM	M203	Insert (Milling)
SOMT	○○○○○○ER-LD	M203	Insert (Milling)
SP-	-○(D)	P18	Spare parts (Spring)
SP	○X○(○)	P6	Spare parts (Screw)
SP	-○○○(□)	P10, P11	Spare parts (Shim)
SP	-RC	P12	Spare parts (Shim)
SPCN	○○○○EDTR	M295	Insert (Milling)
SPCN	○○○○EETR○	M295	Insert (Milling)
SPCN	○○○○XPTR	M295	Insert (Milling)
SPCT	○○T○○○EN-SD	M252	Insert (Milling)
SPCT	○○T○○○FN-SE	M252	Insert (Milling)
SPCT	○○T○○○□$^{R}/_{L}$-□□	M252	Insert (Milling)
SPEN	○○○○EEER	M295	Insert (Milling)
SPEN	○○○○EESR	M295	Insert (Milling)
SPET	○○T○○○□$^{R}/_{L}$-SB	M252	Insert (Milling)
SPGH	○○○○○○L	B82	Insert (Turning)
SPGN	○○○○○○	B83, C43, M295	Insert (Turning / Milling)
SPGN	○○○○○○NE	C43	Insert (Turning)
SPGN	○○○○○○S○○○○○	B121	Insert (Turning)
SPGN	○○○○○○T○○○○○	B121	Insert (Turning)
SPGR	○○○○○○$^{R}/_{L}$	B83	Insert (Turning)
SPKN	○○○○EDER	M295	Insert (Milling)
SPKN	○○○○EDFR	M295	Insert (Milling)
SPKN	○○○○EDT$^{R}/_{L}$	M295	Insert (Milling)
SPKN	○○○○XETR	M295	Insert (Milling)
SPKN	○○○○XPFR	M295	Insert (Milling)
SPKN	○○○○XPTR	M295	Insert (Milling)
SPKR	○○○○EDER-S	M295	Insert (Milling)
SPMN	○○○○○○	B83, M295	Insert (Turning / Milling)
SPMR	○○○○EDER-H	M295	Insert (Milling)
SPMR	○○○○○○	B83	Insert (Turning)
SPMR	○○○○○○G	B83	Insert (Turning)
SPMT	○○○○EDER-NB○	M60	Insert (Milling)
SPMT	○○○○EDER-NB○P	M60	Insert (Milling)
SPMT	○○○○EDER-V	M60	Insert (Milling)
SPMT	○○○○EDSR-NB○T	M60	Insert (Milling)
SPMT	○○○○○○E-Z	M285	Insert (Milling)
SPMT	○○○○○○EN-GM	M285	Insert (Milling)
SPMT	○○○○○○EN-NB○	M160	Insert (Milling)
SPMT	○○○○○○EN-NB○P	M160	Insert (Milling)
SPMT	○○○○○○EN-V	M160	Insert (Milling)
SPW	-○○○○	P6	Spare parts (Screw)
SRCP$^{R}/_{L}$	○○○○B-○○-A○○	F114, P28	Boring bars
SS	-4N	P6	Spare parts (Screw)
SS○○-	DRA○○○M-○(.○)	K16, K17, K18, K19	Toolholder ("MagicDrill")
SS○○-	DRC○○○M-○	K35, K36, K37	Toolholder ("MagicDrill")
STGC$^{R}/_{L}$	○○○○□-○○	E38, P22	Toolholder (Turning)
STGP$^{R}/_{L}$	○○○○□-○○	E39, P22	Toolholder (Turning)
STLNR	○○○○□-○○FF	E62	Toolholder (Turning)
STWL	○○○○□-○○	G106, P24	Toolholder (for Twin bars)
STWR	○○○○□-○○	F56, P24	Toolholder (for Twin bars)
STWSR	○○○○□(□)-○○T	F59, G109, P24	Toolholder (for Twin bars)
SV	-60136(T)R	P6	Spare parts (Screw)

○: Figure, □: Alphabet

Description		Page	Category
SVJB$^{R}_{L}$	○○○○□-○○F	P22	Toolholder (Turning / Discontinued description)
SVJB$^{R}_{L}$	○○○○JX-○○FF	E40	Toolholder (Turning)
SVJB$^{R}_{L}$	○○○○□-○○	E41	Toolholder (Turning)
SVJB$^{R}_{L}$	○○○○□-○○N	E41	Toolholder (Turning)
SVJBR	○○○○H-○○FFJCT	P23	Toolholder (Turning / Discontinued description)
SVJBR	○○○○JX-○○FFJCTM	E41	Toolholder (Turning)
SVJC$^{R}_{L}$	○○○○□(□)-○○FF	E44	Toolholder (Turning)
SVJP$^{R}_{L}$	○○○○□(□)-○○FF	E47	Toolholder (Turning)
SVJPR	○○○○H-○○FFJCT	P23	Toolholder (Turning / Discontinued description)
SVJPR	○○○○JX-○○FFJCTM	E47	Toolholder (Turning)
SVLC$^{R}_{L}$	○○○○□(□)-○○FF	E44	Toolholder (Turning)
SVLP$^{R}_{L}$	○○○○□-○○F	P22	Toolholder (Turning / Discontinued description)
SVLP$^{R}_{L}$	○○○○□(□)-○○FF	E48, P22	Toolholder (Turning)
SVLPR	○○○○JX-○○-F○○	E24	Toolholder (Turning)
SVNR	○○○○□-12	P24	Toolholder (for System Tip-bars / Discontinued description)
SVNR	○○○○□-○○N	F48	Toolholder (for System Tip-Bars)
SVN	-○○(□)	P12	Spare parts (Shim)
SVNSR	○○○○□-12-○○	P24	Toolholder (for System Tip-bars / Discontinued description)
SVNSR	○○○○□-○○-○○N	F49	Toolholder (for System Tip-Bars)
SVNSR	○○○○□-○○-○○XN	F53	Toolholder (for System Tip-Bars)
SVPB$^{R}_{L}$	○○○○□(□)-○○	E42, P23	Toolholder (Turning)
SVPB$^{R}_{L}$	○○○○□-○○N	E42, P23	Toolholder (Turning)
SVPCR	○○○○□(□)-○○FF	E45	Toolholder (Turning)
SVPP$^{R}_{L}$	○○○○□-○○	P22	Toolholder (Turning / Discontinued description)
SVPP$^{R}_{L}$	○○○○□(□)-○○FF	E49, P22	Toolholder (Turning)
SVVBN	○○○○□(□)-○○	E43, P23	Toolholder (Turning)
SVVBN	○○○○□-○○N	E43, P23	Toolholder (Turning)
SVVCN	○○○○JX-○○	E46	Toolholder (Turning)
SZLB$^{R}_{L}$	○○○○□-○○C	E52	Toolholder (Turning)
SZPB$^{R}_{L}$	○○○○□-○○C	E52	Toolholder (Turning)
SZVBN	○○○○□-○○C	E53	Toolholder (Turning)
SYXP$^{R}_{L}$	○○○○□-○○F	P22	Toolholder (Turning / Discontinued description)

T

T63H-	BL○○○-○○○	P37	Toolholder (HSK tooling / Discontinued description)
T63H-	C○○-○○(○)	N33	Toolholder (HSK tooling)
T63H-	KGBA$^{R}_{L}$-○○(-○○)	N32	Toolholder (HSK tooling)
T63H-	KTNR-○○	N32	Toolholder (HSK tooling)
T63H-	N○○-○○(○)	N33	Toolholder (HSK tooling)
T63H-	PCLN$^{R}_{L}$-DX○○	N22	Toolholder (HSK tooling)
T63H-	PCMNN-H○○	N22	Toolholder (HSK tooling)
T63H-	PCMNN-L○○	N22	Toolholder (HSK tooling)
T63H-	PDJN$^{R}_{L}$-DX○○	N24	Toolholder (HSK tooling)
T63H-	PDNNN-H○○	N24	Toolholder (HSK tooling)
T63H-	PDNNN-L○○	N24	Toolholder (HSK tooling)
T63H-	PTGN$^{R}_{L}$-DX○○	N26	Toolholder (HSK tooling)
T63H-	PWLN$^{R}_{L}$-DX○○	N28	Toolholder (HSK tooling)
T63H-	SVLB$^{R}_{L}$-DX○○N	N30	Toolholder (HSK tooling)
T63H-	SVVBN-H○○N	N30	Toolholder (HSK tooling)
T63H-	SVVBN-L○○N	N30	Toolholder (HSK tooling)
T63H-	S○○○○$^{R}_{L}$-○○○	N20	Toolholder (HSK tooling)
T63H-	S○○○○-○○(○)F	N21	Toolholder (HSK tooling)
T63H-	S○○○○R-○○○T	N20	Toolholder (HSK tooling)
T63H-	WTENN-H○○	N26	Toolholder (HSK tooling)
T63H-	WTENN-L○○	N26	Toolholder (HSK tooling)
T63H-	WWMNN-H○○	N28	Toolholder (HSK tooling)
T63H-	WWMNN-L○○	N28	Toolholder (HSK tooling)
T100H-	C○○-○○(○)	N33	Toolholder (HSK tooling)
T100H-	N○○-○○(○)	N33	Toolholder (HSK tooling)
T100H-	S○○○○$^{R}_{L}$-○○○	N20	Toolholder (HSK tooling)
T100H-	S○○○○-○○○F	N21	Toolholder (HSK tooling)
T100H-	S○○○○R-○○○T	N20	Toolholder (HSK tooling)

Description		Page	Category
TBET	○○○○○○(○)M$^{R}_{L}$	B84	Insert (Turning)
TBGN	○○○○○○S○○○○○	B122	Insert (Turning)
TBGN	○○○○○○T○○○○○	C25	Insert (Turning)
TBGT	○○○○○○CF	B84	Insert (Turning)
TBGT	○○○○○○(○)L	B84	Insert (Turning)
TBGT	○○○○○○MFP-PF	B84	Insert (Turning)
TBGT	○○○○○○MP-CF	B84	Insert (Turning)
TBGT	○○○○○○R	B84	Insert (Turning)
TBGW	○○○○○○	B84, C44	Insert (Turning)
TBGW	○○○○○○NE	C44	Insert (Turning)
TBMT	○○○○○○	C44	Insert (Turning)
TBMT	○○○○○○DP	B84	Insert (Turning)
TBMT	○○○○○○NE	C44	Insert (Turning)
TCET	○○○○○○(○)F$^{R}_{L}$-USF	B85	Insert (Turning)
TCET	○○○○○○(○)MFR-USF	B85	Insert (Turning)
TCGT	○○○○○○E$^{R}_{L}$-U	B86	Insert (Turning)
TCGT	○○○○○○(○)F$^{R}_{L}$-U	B86	Insert (Turning)
TCGT	○○○○○○L-A○	B87	Insert (Turning)
TCGT	○○○○○○ME$^{R}_{L}$-U	B86	Insert (Turning)
TCGT	○○○○○○(○)MF$^{R}_{L}$-U	B86	Insert (Turning)
TCGT	○○○○○○R-A○	B87	Insert (Turning)
TCGW	○○○○○○	B87	Insert (Turning)
TCGW	○○○○○○NE	C45	Insert (Turning)
TCGW	○○○○○○SE	C45	Insert (Turning)
TCMT	○○T○○○HQ	B85	Insert (Turning)
TCMT	○○○○○○	C45	Insert (Turning)
TCMT	○○○○○○HQ	B85	Insert (Turning)
TCMT	○○○○○○NE	C45	Insert (Turning)
TCMT	○○○○○○SE	C45	Insert (Turning)
TCMX	○○○○○○WP	B85	Insert (Turning)
TEEN	○○○○PTFR(-NE)	C64, M298	Insert (Milling)
TEEN	○○○○PTTR	M297	Insert (Milling)
TEKN	○○○○PTFR	M297	Insert (Milling)
TEKN	○○○○PTFR(-NE)	C64, M298	Insert (Milling)
TEKN	○○○○PTTR	M297	Insert (Milling)
TEKR	○○○○PTER-S	M297	Insert (Milling)
TEMR	○○○○PTER-H	M297	Insert (Milling)
TH	-4	P18	Spare parts (Hexagon wrench / T-shaped type)
TH	8X15	P6	Spare parts (Screw)
TKF	○○R○○○-GTP	B111, E12	Insert (Grooving / Turning)
TKF12R	○○○-AGT	C59, E14	Insert (Grooving / Turning)
TKF12$^{R}_{L}$	○○○-AS	C59, E14	Insert (Grooving / Turning)
TKF12$^{R}_{L}$	○○○-NB	C59, E14, H6	Insert (Grooving / Turning)
TKF12$^{R}_{L}$	○○○-NB-○○DR	H7	Insert (Cut-off)
TKF12$^{R}_{L}$	○○○-S	H6	Insert (Cut-off)
TKF12$^{R}_{L}$	○○○-S-○○DR	H6	Insert (Cut-off)
TKF12$^{R}_{L}$	○○○-T	H6	Insert (Cut-off)
TKF12$^{R}_{L}$	○○○-T-○○DR	H6	Insert (Cut-off)
TKF16$^{R}_{L}$	○○○-AS	C59, E14	Insert (Grooving / Turning)
TKF16$^{R}_{L}$	○○○-NB	H8	Insert (Cut-off)
TKF16$^{R}_{L}$	○○○-NB-○○DR	H8	Insert (Cut-off)
TKF16$^{R}_{L}$	○○○-S	H8	Insert (Cut-off)
TKF16$^{R}_{L}$	○○○-S-○○DR	H8	Insert (Cut-off)
TKF16$^{R}_{L}$	○○○-T	H8	Insert (Cut-off)
TKF16$^{R}_{L}$	○○○-T-○○DR	H8	Insert (Cut-off)
TKFB	○○L○○○○○MR	B110, E12	Insert (Back turning)
TKFB	○○R○○○○○-GQ	B110, E12	Insert (Back turning)
TKFB	○○R○○○○○M	B110, E12	Insert (Back turning)
TKFB	○○R○○○○○P-GQ	B110, E12	Insert (Back turning)
TKFT12	LA○○○○(○)	J28	Insert (Threading)
TKFT12	LB○○○○(○)	J28	Insert (Threading)
TKFT12	LN○○○○	J28	Insert (Threading)
TKFT12	RA○○○○(○)	J28	Insert (Threading)
TKFT12	RB○○○○(○)	J28	Insert (Threading)

○: Figure, □: Alphabet

Description	Page	Category
TKFT12 RN○○○○	J28	Insert (Threading)
TK□/L ○(.○)	H70	Insert (Cut-off)
TK□/L ○(.○)-P	H70	Insert (Cut-off)
TKN ○(.○)	H70	Insert (Cut-off)
TKN ○(.○)-P	H70	Insert (Cut-off)
TN -○○	P12	Spare parts (Shim)
TKN ○(.○)	H70	Insert (Cut-off)
TKN ○(.○)-P	H70	Insert (Cut-off)
TNEG ○○○○○□/L-SSF	B44	Insert (Turning)
TNGA ○○○○○○	B43	Insert (Turning)
TNGA ○○○○○○MEF	C13	Insert (Turning)
TNGA ○○○○○○ME○	C13	Insert (Turning)
TNGA ○○○○○○S○○○○○	B118	Insert (Turning)
TNGA ○○○○○○S○○○○○ME	C13	Insert (Turning)
TNGA ○○○○○○S○○○○○MEH	C13	Insert (Turning)
TNGA ○○○○○○S○○○○○MEP	C13	Insert (Turning)
TNGA ○○○○○○S○○○○○MET	C13	Insert (Turning)
TNGA ○○○○○○T○○○○○	B118	Insert (Turning)
TNGA ○○○○○○T○○○○○ME	C13	Insert (Turning)
TNGG ○○○○○○AH	B43	Insert (Turning)
TNGG ○○○○○○FP-TK	B41	Insert (Turning)
TNGG ○○○○○○L	B45	Insert (Turning)
TNGG ○○○○○○L-A○	B43	Insert (Turning)
TNGG ○○○○○○L-B	B44	Insert (Turning)
TNGG ○○○○○○L-C	B45	Insert (Turning)
TNGG ○○○○○○L-S	B44	Insert (Turning)
TNGG ○○○○○○L-○○R	B45	Insert (Turning)
TNGG ○○○○○○M-SK	B41	Insert (Turning)
TNGG ○○○○○○MFP-SK	B41	Insert (Turning)
TNGG ○○○○○○R	B45	Insert (Turning)
TNGG ○○○○○○R-A○	B43	Insert (Turning)
TNGG ○○○○○○R-B	B44	Insert (Turning)
TNGG ○○○○○○R-C	B45	Insert (Turning)
TNGG ○○○○○○R-S	B44	Insert (Turning)
TNGG ○○○○○○R-○○R	B45	Insert (Turning)
TNGG ○○○○○○TK	B41	Insert (Turning)
TNGN ○○○○○○S○○○○○	B118	Insert (Turning)
TNGN ○○○○○○T○○○○○	B118	Insert (Turning)
TNGU ○○○○○○MER-U	B56	Insert (Turning)
TNGU ○○○○○○(○)MFR-F	B56	Insert (Turning)
TNGU ○○○○○○MFR-U	B56	Insert (Turning)
TNMA ○○○○○○	B43	Insert (Turning)
TNMG ○○○○○○	B40	Insert (Turning)
TNMG ○○○○○○AH	B43	Insert (Turning)
TNMG ○○○○○○C	B43	Insert (Turning)
TNMG ○○○○○○CQ	B38	Insert (Turning)
TNMG ○○○○○○GC	B43	Insert (Turning)
TNMG ○○○○○○GP	B38	Insert (Turning)
TNMG ○○○○○○GS	B39	Insert (Turning)
TNMG ○○○○○○GT	B39	Insert (Turning)
TNMG ○○○○○○HQ	B38	Insert (Turning)
TNMG ○○○○○○KG	B42	Insert (Turning)
TNMG ○○○○○○KH	B42	Insert (Turning)
TNMG ○○○○○○KQ	B42	Insert (Turning)
TNMG ○○○○○○L-C	B45	Insert (Turning)
TNMG ○○○○○○L-ST	B42	Insert (Turning)
TNMG ○○○○○○MQ	B42	Insert (Turning)
TNMG ○○○○○○MS	B42	Insert (Turning)
TNMG ○○○○○○MU	B42	Insert (Turning)
TNMG ○○○○○○PG	B39	Insert (Turning)
TNMG ○○○○○○PH	B40	Insert (Turning)
TNMG ○○○○○○PMG	B39	Insert (Turning)
TNMG ○○○○○○PP	B38	Insert (Turning)
TNMG ○○○○○○PQ	B38	Insert (Turning)

Description	Page	Category
TNMG ○○○○○○PS	B39	Insert (Turning)
TNMG ○○○○○○PT	B39	Insert (Turning)
TNMG ○○○○○○R-C	B45	Insert (Turning)
TNMG ○○○○○○R-LD	B41	Insert (Turning)
TNMG ○○○○○○R-ST	B42	Insert (Turning)
TNMG ○○○○○○SG	B42	Insert (Turning)
TNMG ○○○○○○TK	B41	Insert (Turning)
TNMG ○○○○○○XF	B40	Insert (Turning)
TNMG ○○○○○○XP	B41	Insert (Turning)
TNMG ○○○○○○XQ	B41	Insert (Turning)
TNMG ○○○○○○XS	B41	Insert (Turning)
TNMG ○○○○○○ZS	B43	Insert (Turning)
TNMM ○○○○○○M	C36	Insert (Turning)
TNMM ○○○○○○M-NE	C36	Insert (Turning)
TNMM ○○○○○○M-SE	C36	Insert (Turning)
TNMM ○○○○○○PX	B40	Insert (Turning)
TNMN ○○○○○○S○○○○○	C19	Insert (Turning)
TNMX ○○○○○○WF	B38	Insert (Turning)
TNW -32	P12	Spare parts (Shim)
TOMT ○○○○○○ER-GM	M109	Insert (Milling)
TOMT ○○○○○○ER-SM	M109	Insert (Milling)
TPEH ○○○○○○M□/L-P	B92	Insert (Turning)
TPET ○○○○○○F□/L-USF	B94	Insert (Turning)
TPET ○○○○○○(○)L-FSF	B92	Insert (Turning)
TPET ○○○○○○MF□/L-USF	B94	Insert (Turning)
TPET ○○○○○○(○)ML-FSF	B92	Insert (Turning)
TPET ○○○○○○MR-FSF	B92	Insert (Turning)
TPET ○○○○○○(○)R-FSF	B92	Insert (Turning)
TPGB ○○○○○○(○)	B94, C46, J46	Insert (Turning / Threading)
TPGB ○○○○○○MEF	C23	Insert (Turning)
TPGB ○○○○○○NE	C46	Insert (Turning)
TPGB ○○○○○○SE	C46	Insert (Turning)
TPGB ○○○○○○S○○○○○MES	C23	Insert (Turning)
TPGB ○○○○○○S○○○○○MET	C23	Insert (Turning)
TPGB ○○○○○○S○○○○○SET	C23	Insert (Turning)
TPGB ○○○○○○T○○○○○ME	C23	Insert (Turning)
TPGB ○○○○○○T○○○○○SE	C23	Insert (Turning)
TPGH ○○○○○○L	B90	Insert (Turning)
TPGH ○○○○○○L-H	B93	Insert (Turning)
TPGH ○○○○○○ML	B91	Insert (Turning)
TPGH ○○○○○○ML-H	B93	Insert (Turning)
TPGH ○○○○○○MR	B91	Insert (Turning)
TPGH ○○○○○○R	B90	Insert (Turning)
TPGH ○○○○○○R-H	B93	Insert (Turning)
TPGN ○○○○○○	B96, C48, M297, M298	Insert (Turning / Milling)
TPGN ○○○○○○NE	C48	Insert (Turning)
TPGN ○○○○○○SE	C48	Insert (Turning)
TPGN ○○○○○○S○○○○○	B122	Insert (Turning)
TPGN ○○○○○○S○○○○○SET	C25	Insert (Turning)
TPGN ○○○○○○T○○○○○	B122	Insert (Turning)
TPGN ○○○○○○T○○○○○ME	C25	Insert (Turning)
TPGN ○○○○○○T○○○○○SE	C25	Insert (Turning)
TPGR ○○○○○○L-A	B96	Insert (Turning)
TPGR ○○○○○○L-B	B96	Insert (Turning)
TPGR ○○○○○○L-C	B96	Insert (Turning)
TPGR ○○○○○○L-F	B96	Insert (Turning)
TPGR ○○○○○○R-A	B96	Insert (Turning)
TPGR ○○○○○○R-B	B96	Insert (Turning)
TPGR ○○○○○○R-C	B96	Insert (Turning)
TPGR ○○○○○○R-F	B96	Insert (Turning)
TPGT ○○○○○○AP	B94	Insert (Turning)
TPGT ○○○○○○CF	B88	Insert (Turning)
TPGT ○○○○○○L-H	B93	Insert (Turning)

○: Figure, □: Alphabet

Description	Page	Category
TPGT ○○○○○○MFP-PF	B88	Insert (Turning)
TPGT ○○○○○○MP-CF	B88	Insert (Turning)
TPGW ○○○○○○S○○○○○MET	C24	Insert (Turning)
TPGW ○○○○○○T○○○○○ME	C24	Insert (Turning)
TPGW ○○○○○○T○○○○○SE	C24	Insert (Turning)
TPKN ○○○○PDFR	M297	Insert (Milling)
TPKN ○○○○PDTR	M297	Insert (Milling)
TPKR ○○○○PDER-S	M297	Insert (Milling)
TPMH ○○○○○○	C47	Insert (Turning)
TPMH ○○○○○○L-NE	C47	Insert (Turning)
TPMH ○○○○○○NE	C47	Insert (Turning)
TPMH ○○○○○○SE	C47	Insert (Turning)
TPMN ○○○○○○	B96, M297	Insert (Turning / Milling)
TPMR ○○○○PDER-H	M297	Insert (Milling)
TPMR ○○○○○○	B95	Insert (Turning)
TPMR ○○○○○○DP	B95	Insert (Turning)
TPMR ○○○○○○G	B95	Insert (Turning)
TPMR ○○○○○○GP	B95	Insert (Turning)
TPMR ○○○○○○HQ	B95	Insert (Turning)
TPMT ○○○○○○APD	C47	Insert (Turning)
TPMT ○○○○○○GP	B89	Insert (Turning)
TPMT ○○○○○○HQ	B89	Insert (Turning)
TPMT ○○○○○○PP	B88	Insert (Turning)
TPMT ○○○○○○XP	B89	Insert (Turning)
TPMT ○○○○○○XQ	B89	Insert (Turning)
TPMX ○○○○○○5/L-WP	B88	Insert (Turning)
TPMX ○○○○○○WP	B88	Insert (Turning)
TS -3S	P7	Spare parts (Lock pin)
TT -○○(□)	P18	Spare parts (Torx wrench / T-shaped type)
TT32 5/L ○○○○	J36, J38	Insert (Threading)
TT43ER ○○○M	J36	Insert (Threading)
TT43 5/L ○○○○	J36, J38	Insert (Threading)
TTC -○○	P18	Spare parts (Torx wrench / T-shaped type)
TTP -20	P18	Spare parts (Torx plus wrench / T-shaped type)
TTW -15	P18	Spare parts (Torx wrench / T-shaped type)
TTX32R ○○○○(○)	J34	Insert (Threading)
TTX32R ○○○○(○)S	J34	Insert (Threading)
TWBR ○○○○○-○○○	F56	Toolholder (for Twin bars)
TWBTR ○○○○○-○○○	F58	Toolholder (for Twin bars)
TWFGL ○○○	G106	Toolholder (for Twin bars)
TWFGTR ○○○	G108	Toolholder (for Twin bars)

V

Description	Page	Category
VBET ○○○○○○(○)L-FSF	B98	Insert (Turning)
VBET ○○○○○○(○)ML-F	B98	Insert (Turning)
VBET ○○○○○○(○)ML-FSF	B98	Insert (Turning)
VBET ○○○○○○(○)ML-Y	B99	Insert (Turning)
VBET ○○○○○○(○)MR-F	B98	Insert (Turning)
VBET ○○○○○○(○)MR-FSF	B98	Insert (Turning)
VBET ○○○○○○(○)MR-Y	B99	Insert (Turning)
VBET ○○○○○○(○)R-FSF	B98	Insert (Turning)
VBGT ○○○○○○(○)L-F	B98	Insert (Turning)
VBGT ○○○○○○(○)L-Y	B99	Insert (Turning)
VBGT ○○○○○○(○)ML-F	B98	Insert (Turning)
VBGT ○○○○○○(○)ML-Y	B99	Insert (Turning)
VBGT ○○○○○○(○)MR-F	B98	Insert (Turning)
VBGT ○○○○○○(○)MR-Y	B99	Insert (Turning)
VBGT ○○○○○○(○)R-F	B98	Insert (Turning)
VBGT ○○○○○○(○)R-Y	B99	Insert (Turning)
VBGW ○○○○○○MEF	C26	Insert (Turning)
VBGW ○○○○○○S○○○○○MES	C26	Insert (Turning)
VBGW ○○○○○○S○○○○○MET	C26	Insert (Turning)
VBGW ○○○○○○S○○○○○SET	C26	Insert (Turning)
VBGW ○○○○○○T○○○○○ME	C26	Insert (Turning)
VBGW ○○○○○○T○○○○○SE	C26	Insert (Turning)
VBMT ○○○○○○	C49	Insert (Turning)
VBMT ○○○○○○GP	B97	Insert (Turning)
VBMT ○○○○○○HQ	B97	Insert (Turning)
VBMT ○○○○○○NE	C49	Insert (Turning)
VBMT ○○○○○○PP	B97	Insert (Turning)
VBMT ○○○○○○SE	C49	Insert (Turning)
VBMT ○○○○○○VF	B97	Insert (Turning)
VCET ○○○○○○ML-F	B101	Insert (Turning)
VCET ○○○○○○(○)ML-Y	B101	Insert (Turning)
VCET ○○○○○○MR-F	B101	Insert (Turning)
VCET ○○○○○○(○)MR-Y	B101	Insert (Turning)
VCGT ○○○○○○AH	B101	Insert (Turning)
VCGT ○○○○○○AP	B101	Insert (Turning)
VCGT ○○○○○○L-A○	B101	Insert (Turning)
VCGT ○○○○○○MFP-GF	B100	Insert (Turning)
VCGT ○○○○○○MFP-SK	B100	Insert (Turning)
VCGT ○○○○○○MFP-SKS	B100	Insert (Turning)
VCGT ○○○○○○MP-CF	B100	Insert (Turning)
VCGT ○○○○○○R-A○	B101	Insert (Turning)
VCGW ○○○○○○S○○○○○MET	C27	Insert (Turning)
VCGW ○○○○○○S○○○○○SET	C27	Insert (Turning)
VCGW ○○○○○○T○○○○○ME	C27	Insert (Turning)
VCGW ○○○○○○T○○○○○SE	C27	Insert (Turning)
VCMT ○○○○○○	C50	Insert (Turning)
VCMT ○○○○○○HQ	B100	Insert (Turning)
VCMT ○○○○○○NE	C50	Insert (Turning)
VCMT ○○○○○○PP	B100	Insert (Turning)
VCMT ○○○○○○SE	C50	Insert (Turning)
VCMT ○○○○○○VF	B100	Insert (Turning)
VNBR ○○○○-○○(○)	F45	Toolholder (for System Tip-Bars)
VNBR ○○○○-○○(○)NB	C61, F46	Toolholder (for System Tip-Bars)
VNBR ○○○○-○○(○)S	F44	Toolholder (for System Tip-Bars)
VNBR ○○○○○-○○(○)S	F44	Toolholder (for System Tip-Bars)
VNBR ○○○○○○-○○(○)S	F44	Toolholder (for System Tip-Bars)
VNBTR ○○○○-○○(○)	F47	Toolholder (for System Tip-Bars)
VNBXR ○○○○-○○(○)S	F52	Toolholder (for System Tip-Bars)
VNBXR ○○○○○-○○(○)S	F52	Toolholder (for System Tip-Bars)
VNFGR ○○○○-○○(NB)	C63, G104	Toolholder (for System Tip-Bars)
VNGA ○○○○○○	B48	Insert (Turning)
VNGA ○○○○○○MEF	C14	Insert (Turning)
VNGA ○○○○○○ME○	C14	Insert (Turning)
VNGA ○○○○○○S○○○○○	B119	Insert (Turning)
VNGA ○○○○○○S○○○○○ME	C14	Insert (Turning)
VNGA ○○○○○○S○○○○○MEH	C14	Insert (Turning)
VNGA ○○○○○○S○○○○○MEP	C14	Insert (Turning)
VNGA ○○○○○○S○○○○○MET	C14	Insert (Turning)
VNGA ○○○○○○T○○○○○	B119	Insert (Turning)
VNGA ○○○○○○T○○○○○ME	C14	Insert (Turning)
VNGG ○○○○○○L	B48	Insert (Turning)
VNGG ○○○○○○L-S	B48	Insert (Turning)
VNGG ○○○○○○M-SK	B47	Insert (Turning)
VNGG ○○○○○○MFP-SK	B47	Insert (Turning)
VNGG ○○○○○○R	B48	Insert (Turning)
VNGG ○○○○○○R-S	B48	Insert (Turning)
VNGR ○○○○-○○(NB)	C62, G72, G73	Toolholder (for System Tip-Bars)
VNMG ○○○○○○	B46	Insert (Turning)
VNMG ○○○○○○GP	B46	Insert (Turning)
VNMG ○○○○○○HQ	B46	Insert (Turning)
VNMG ○○○○○○KG	B47	Insert (Turning)
VNMG ○○○○○○KH	B47	Insert (Turning)
VNMG ○○○○○○L-VC	B46	Insert (Turning)

○: Figure, □: Alphabet

Description		Page	Category
VNMG	○○○○○○MQ	B47	Insert (Turning)
VNMG	○○○○○○MS	B47	Insert (Turning)
VNMG	○○○○○○MU	B47	Insert (Turning)
VNMG	○○○○○○PP	B46	Insert (Turning)
VNMG	○○○○○○PQ	B46	Insert (Turning)
VNMG	○○○○○○R-VC	B46	Insert (Turning)
VNMG	○○○○○○SG	B47	Insert (Turning)
VNMG	○○○○○○TN-V	B46	Insert (Turning)
VNMG	○○○○○○VF	B46	Insert (Turning)
VNMM	○○○○○○M	C37	Insert (Turning)
VNMM	○○○○○○M-NE	C37	Insert (Turning)
VNMM	○○○○○○M-SE	C37	Insert (Turning)
VNTR	○○○-○○	J44	Toolholder (for System Tip-Bars)
VPET	○○○○○○(○)F$^{R}/_{L}$-USF	B104	Insert (Turning)
VPET	○○○○○○L-FSF	B103	Insert (Turning)
VPET	○○○○○○MFL-J	B104	Insert (Turning)
VPET	○○○○○○(○)MFL-U	B104	Insert (Turning)
VPET	○○○○○○MFL-USF	B104	Insert (Turning)
VPET	○○○○○○(○)MFR-J	B104	Insert (Turning)
VPET	○○○○○○(○)MFR-U	B104	Insert (Turning)
VPET	○○○○○○(○)MFR-USF	B104	Insert (Turning)
VPET	○○○○○○ML-F	B103	Insert (Turning)
VPET	○○○○○○ML-FSF	B103	Insert (Turning)
VPET	○○○○○○(○)MR-F	B103	Insert (Turning)
VPET	○○○○○○(○)MR-FSF	B103	Insert (Turning)
VPET	○○○○○○(○)R-FSF	B103	Insert (Turning)
VPGT	○○○○○○CF	B102	Insert (Turning)
VPGT	○○○○○○CK	B102	Insert (Turning)
VPGT	○○○○○○MFP-GF	B102	Insert (Turning)
VPGT	○○○○○○MFP-SKS	B102	Insert (Turning)
VPGT	○○○○○○MP-CF	B102	Insert (Turning)
VPGT	○○○○○○MP-CK	B102	Insert (Turning)

W

W	-6	P18	Spare parts (Washer)
W	6-14	P18	Spare parts (Washer)
W	○(○)X○○(□)	P6	Spare parts (Screw)
WB	-○	P18	Spare parts (Washer)
WBET	○○○○○○(○)ML-F	B105	Insert (Turning)
WBET	○○○○○○ML-P	B106	Insert (Turning)
WBET	○○○○○○MR-F	B105	Insert (Turning)
WBET	○○○○○○MR-P	B106	Insert (Turning)
WBGT	○○○○○○L-F	B106	Insert (Turning)
WBGT	○○○○○○MFP$^{R}/_{L}$-PF	B105	Insert (Turning)
WBGT	○○○○○○MP$^{R}/_{L}$-CF	B105	Insert (Turning)
WBGT	○○○○○○(○)$^{R}/_{L}$-F	B106	Insert (Turning)
WBGW	○○○○○○L	B106	Insert (Turning)
WBGW	○○○○○○S○○○○○LSET	C28	Insert (Turning)
WBGW	○○○○○○T○○○○○L-SE	C28	Insert (Turning)
WBMT	○○○○○○L	C51	Insert (Turning)
WBMT	○○○○○○L-DP	B105	Insert (Turning)
WBMT	○○○○○○L-NE	C51	Insert (Turning)
WBMT	○○○○○○L-SE	C51	Insert (Turning)
WBMT	○○○○○○R-DP	B105	Insert (Turning)
WCMT	○○T○○○	K89	Insert (Drilling)
WCMT	○○○○○○	K89	Insert (Drilling)
WCS	-○(N)	P14	Spare parts (Clamp set)
WDRC	○(○)	K43	Spare parts (Wrench)
WN	-1	P19	Spare parts (Shim nut)
WNEU	○○○○○○EN-GL	M135	Insert (Milling)
WNGA	○○○○○○MEF	C15	Insert (Turning)
WNGA	○○○○○○S○○○○○ME	C15	Insert (Turning)
WNGA	○○○○○○S○○○○○MET	C15	Insert (Turning)
WNGA	○○○○○○T○○○○○ME	C15	Insert (Turning)

Description		Page	Category
WNGG	○○○○○○AH	B53	Insert (Turning)
WNGG	○○○○○○$^{R}/_{L}$	B53	Insert (Turning)
WNGG	○○○○○○$^{R}/_{L}$-S	B53	Insert (Turning)
WNGG	○○○○○○TK	B51	Insert (Turning)
WNGT	○○○○○○FN-AM	M135	Insert (Milling)
WNMA	○○○○○○	B53	Insert (Turning)
WNMG	○○T○○○HQ	B50	Insert (Turning)
WNMG	○○○○○○	B51	Insert (Turning)
WNMG	○○○○○○C	B53	Insert (Turning)
WNMG	○○○○○○CJ	B50	Insert (Turning)
WNMG	○○○○○○CQ	B50	Insert (Turning)
WNMG	○○○○○○GC	B53	Insert (Turning)
WNMG	○○○○○○GP	B49	Insert (Turning)
WNMG	○○○○○○GS	B50	Insert (Turning)
WNMG	○○○○○○GT	B51	Insert (Turning)
WNMG	○○○○○○HQ	B50	Insert (Turning)
WNMG	○○○○○○KG	B52	Insert (Turning)
WNMG	○○○○○○KH	B52	Insert (Turning)
WNMG	○○○○○○KQ	B52	Insert (Turning)
WNMG	○○○○○○MQ	B52	Insert (Turning)
WNMG	○○○○○○MS	B52	Insert (Turning)
WNMG	○○○○○○MU	B52	Insert (Turning)
WNMG	○○○○○○PG	B50	Insert (Turning)
WNMG	○○○○○○PH	B51	Insert (Turning)
WNMG	○○○○○○PMG	B50	Insert (Turning)
WNMG	○○○○○○PP	B49	Insert (Turning)
WNMG	○○○○○○PQ	B49	Insert (Turning)
WNMG	○○○○○○PS	B50	Insert (Turning)
WNMG	○○○○○○PT	B51	Insert (Turning)
WNMG	○○○○○○SG	B52	Insert (Turning)
WNMG	○○○○○○TK	B51	Insert (Turning)
WNMG	○○○○○○WE	B49	Insert (Turning)
WNMG	○○○○○○WF	B49	Insert (Turning)
WNMG	○○○○○○WP	B49	Insert (Turning)
WNMG	○○○○○○WQ	B49	Insert (Turning)
WNMG	○○○○○○XP	B51	Insert (Turning)
WNMG	○○○○○○XQ	B51	Insert (Turning)
WNMG	○○○○○○XS	B51	Insert (Turning)
WNMG	○○○○○○ZS	B53	Insert (Turning)
WNMM	○○○○○○M-NE	C38	Insert (Turning)
WNMM	○○○○○○M-SE	C38	Insert (Turning)
WNMU	○○○○○○EN-GH	M135, M141	Insert (Milling)
WNMU	○○○○○○EN-GM	M135, M141	Insert (Milling)
WNMU	○○○○○○EN-SM	M135, M141	Insert (Milling)
WPGT	○○○○○○L-Y	B107	Insert (Turning)
WPGT	○○○○○○ML-Y	B107	Insert (Turning)
WP	-1S	P7	Spare parts (Shim pin)
WP	○X○○	P7	Spare parts (Shim pin)
WPGT	○○○○○○MR-Y	B107	Insert (Turning)
WPGT	○○○○○○R-Y	B107	Insert (Turning)
WPGW	○○○○○○	B107	Insert (Turning)
WPMT	○○○○○○	C52	Insert (Turning)
WPMT	○○○○○○GP	B107	Insert (Turning)
WPMT	○○○○○○HQ	B107	Insert (Turning)
WPMT	○○○○○○NE	C52	Insert (Turning)
WPMT	○○○○○○SE	C52	Insert (Turning)
WS	-10	D12,G37,H66	Spare parts (Washer)
WSP	-1	P18	Spare parts (Spacer)
WTENN	○○○○□-○○N	D28	Toolholder (Turning)
WTJN$^{R}/_{L}$	○○○○□-○○N	D27	Toolholder (Turning)
WTKN$^{R}/_{L}$	○○○○□-○○N	D27	Toolholder (Turning)
WTN	-33(-○○)	P12	Spare parts (Shim)
WWLN$^{R}/_{L}$	○○○○□-○○	D46	Toolholder (Turning)
WWN	-42	P12	Spare parts (Shim)

○: Figure, □: Alphabet

Description		Page	Category
WWP	-42(-○○)	P12	Spare parts (Shim)

Z

ZBMT	○○T○○○GF	B108	Insert (Turning)
ZBMT	○○T○○○NE	C53	Insert (Turning)
ZBMT	○○T○○○R-GF-○○D	B108	Insert (Turning)
ZCMT	○○T○○○	K74	Insert (Drilling)
ZCMT	○○T○○○SP	K74	Insert (Drilling)
ZCMT	○○T○○○SU	K74	Insert (Drilling)
ZCMT	○○○○○○	K74	Insert (Drilling)
ZCMT	○○○○○○SP	K74	Insert (Drilling)
ZCMT	○○○○○○SU	K74	Insert (Drilling)



INTRODUCING OUR NEW ALL-TASK

HYDRO CHUCKS

UNI

UNIVERSAL HYDRAULIC CHUCK

Get the best price/performance ratio for direct clamping from Ø6-32 mm.

Suitable for most of your machining tasks whether it is drilling, countersinking, reaming or light milling.

Available in almost all diameters with extreme accurate run-out accuracy of ≤ 0.003 mm at 2.5×D.

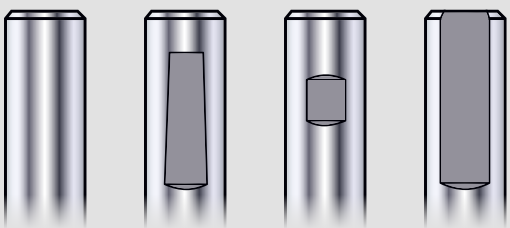


APPLICATIONS

Milling				Drilling	Reaming
HPC	Roughing	Medium	Finishing		
○	○	◑	●	●	●

● Excellent ◑ Suitable ○ Not suitable

Applies to both hydro chuck toolholders



Can be used with all types of shanks without the need of any special sleeves or adaptors.



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HD

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A high-performance toolholder used in precision machining. Offering up to 3 times longer tool life compared to a standard solution.

The right choise for extreme tasks like milling (roughing/finishing), drilling, tapping, reaming and high-performance cutting (HPC).

Available in the most common diameters with extreme accurate run-out accuracy of ≤ 0.003 mm at 2.5×D.

APPLICATIONS

Milling				Drilling	Reaming
HPC	Roughing	Medium	Finishing		
●	●	●	●	●	●

● Excellent ◗ Suitable ○ Not suitable

CHANGE TOOLS IN SECONDS

No need for special equipment or a torque wrench to change tools. Just one screw needs to be tightened using an Allen key.





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