

MFH Series



Stable machining with greater chatter resistance

Low cutting force with convex helical edge design

Long tool life across a wide range of materials

Compatible with small machining centres

Introducing MFH Harrier-D with 8-edge, double-sided insert

NEW

Micro: P6, P15
Mini: P7, P18
Harrier: P8, P22
Harrier-D: P9, P30
Boost: P10, P34



**KEEPS YOU
AHEAD**



High efficiency and high feed cutter

MFH Series

Convex cutting edge design reduces chatter for high-efficiency rough machining.
Large line-up from Ø8 to Ø160 mm for various applications.

1

Resistant to chatter and achieves stable high-feed machining

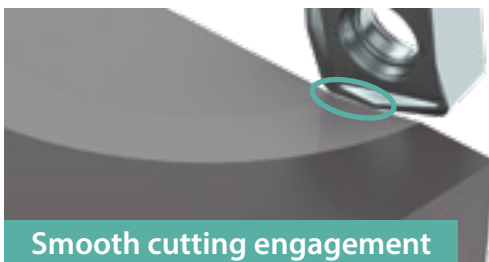
Proprietary technology of Kyocera, the »Convex Cutting Edge Geometry,« is implemented across the entire MFH series.

Reduces cutting force at initial impact and provides stable machining.



Initial contact with the workpiece (Image)

MFH series

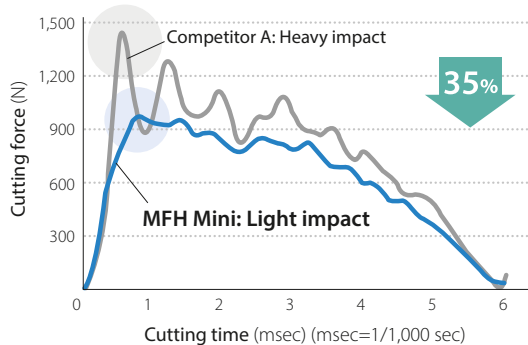


Conventional high feed cutter



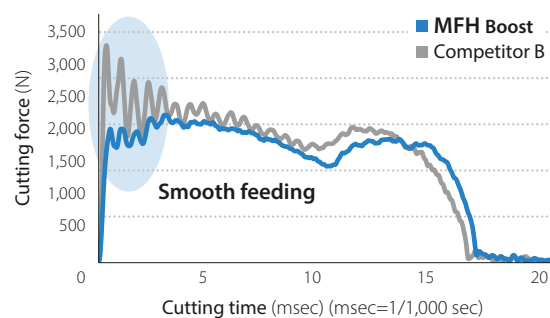
Cutting force when entering workpiece (Internal evaluation)

MFH Mini



Cutting conditions: $V_c = 150$ m/min., $a_p \times a_e = 0.5 \times 8$ mm, $f_z = 1.0$ mm/t, Dry.
Cutter diameter DC = Ø16 mm (1 insert). Workpiece: C50.

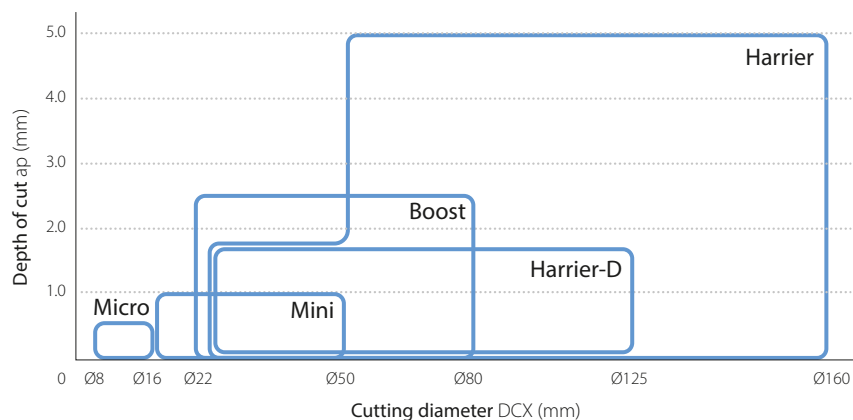
MFH Boost



Cutting conditions: $V_c = 150$ m/min., $a_p \times a_e = 2 \times 25$ mm, $f_z = 0.7$ mm/t, Dry.
Cutter diameter DC = Ø50 mm (1 insert). Workpiece: BT50.

Introducing MFH Harrier-D with 8-edge, double-sided inserts.

NEW



Harrier: High ap (2 – 5 mm) is only capable with LD chipbreaker.

Line-up and applications

	Micro P6, P15 	Mini P7, P18 	Harrier P8, P22 	Harrier-D P9, P30 	Boost P10, P34 
End mill	Ø8 – 16	Ø16 – 32	Ø25 – 80	Ø25 – 40	Ø22 – 40
Face mill	-	Ø40 – 50	Ø50 – 160	Ø50 – 125	Ø40 – 80
Modular	Ø8 – 16	Ø16 – 32	Ø25 – 40	Ø25 – 40	Ø22 – 42
Insert	 2-edge, single-sided	 4-edge, double-sided	 4-edge, single-sided	 8-edge, double-sided	 4-edge, double-sided
Face milling / Shouldering	○	○	○	○	○
Slotting	○	○	○	○	○
Ramping	○	○	○	-	○
Helical milling	○	○	○	-	○
Pocketing	○	○	○	-	○
Contouring	○	○	○	○	○
Features	Extra small cutting diameter range of Ø16 or less	Fine pitch for high efficiency	Suitable for roughing with diameter Ø50 or more	Suitable for roughing with diameter Ø50 or more	High efficiency with large depth of cut (Note the machine rigidity)
	Can be used in place of solid end mills to reduce costs	Suitable for Ø50 and smaller machining on small machining centres	Supports various applications with large insert line-up	Cost-efficient with 8-edge, double-sided inserts (Ramping is not recommended)	

3

New PVD coating MEGACOAT NANO EX provides long tool life

Next-generation PVD coating for milling

NEW

PR18 Series

Double lamination technology with special nano layer.
MEGACOAT NANO EX provides longer tool life.
Available for various machining environments.

PR1825

P

For steel (Wear resistance oriented)

PR1835

M

For steel (Stability oriented)
for Stainless Steel (1st recommendation)

PR1810

K

For cast iron



Double lamination technology
maintains longer tool life

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

Special NANO layer × Multilayer lamination

Nano-layer

High toughness
suppresses crack growth

AlCr-based coating
with excellent abrasion resistance

Nano-layer

High toughness
suppresses crack growth

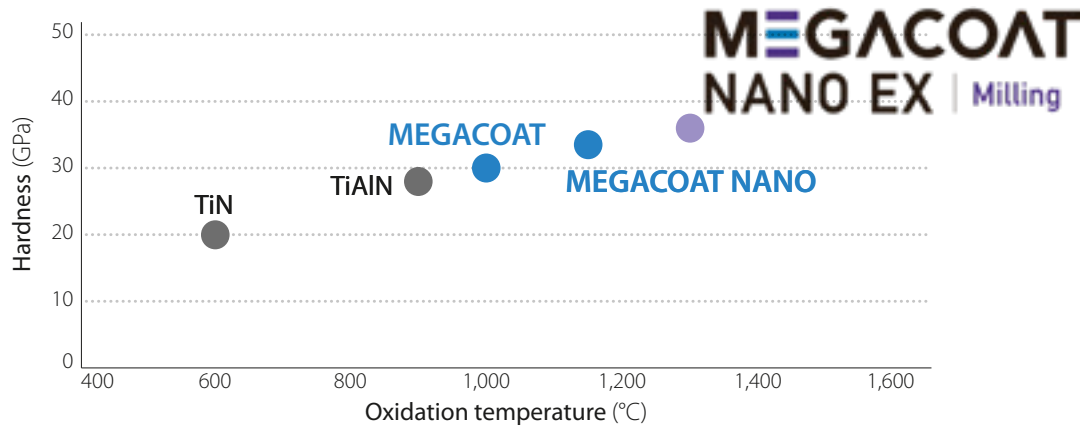
AlTi-based coating
with excellent heat resistance

Multi-layering of high-performance NANO layers

Increases toughness with the suppression of crack growth and optimization of internal stress

CG Image

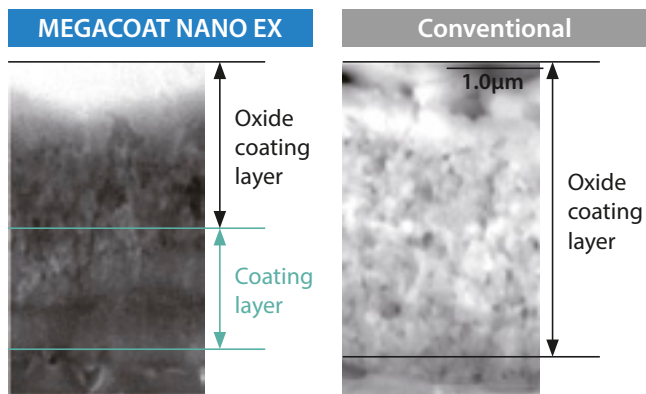
Coating characteristics (Internal evaluation)



Excellent oxidation resistance

Oxidation progression comparison (Internal evaluation)

Suppresses oxidation progression with excellent oxidation resistance

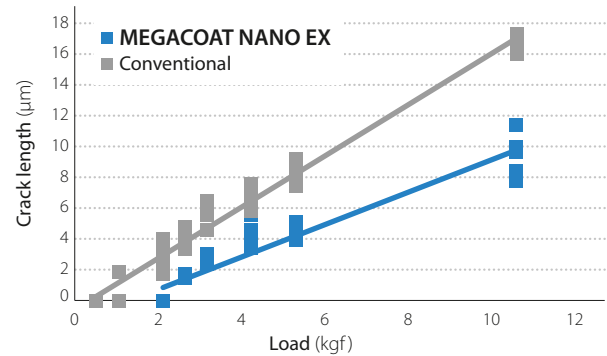


*Section after holding at 1,200 degrees for 30 minutes in air

High coating toughness

Coating layer toughness evaluation (Internal evaluation)

Excellent coating toughness with small crack length

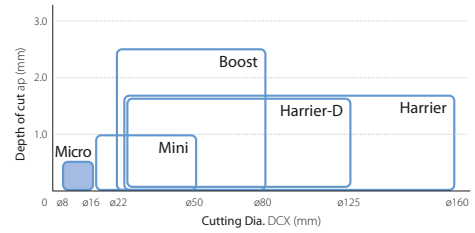


*Micro-Vickers measurement

Micro diameter cutter for high feed machining (Ø8 – 16 mm)

MFH Micro

Low resistance and durable against chatter for highly efficient machining. Maximum ap 0.5 mm. Stable high feed machining on a wide range of applications.

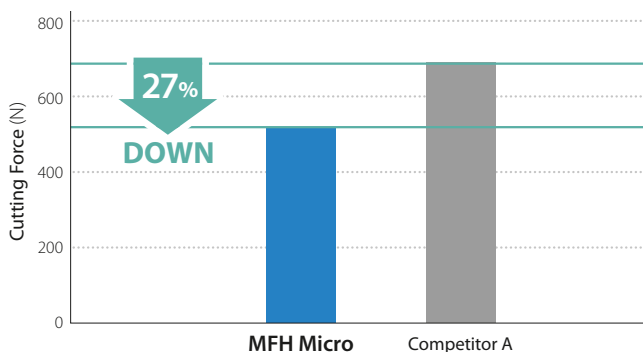


* With LD chipbreaker Harrier is capable of high ap = 2 – 5.0 mm (Ø50 – 160 mm). See page 3.

1 Low resistance and durable against chatter

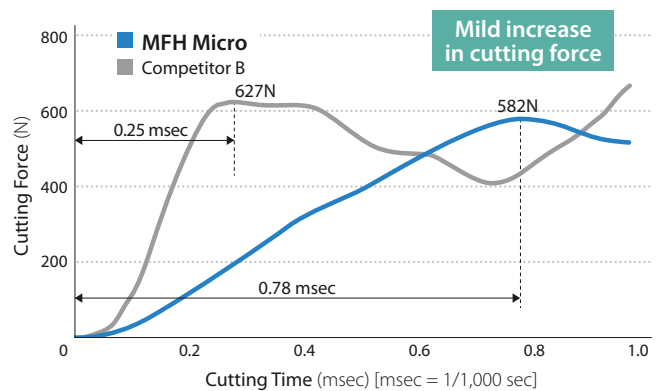
Moulded convex cutting edge controls initial impact when entering the workpiece.

Cutting force comparison (Internal evaluation)



Cutting conditions: $V_c = 120$ m/min., $a_p = 0.4$ mm, $f_z = 0.6$ mm/t. Cutter diameter DC = Ø10 (1 insert), slotting, dry. Workpiece: C50.

Cutting force when entering workpiece comparison (Internal evaluation)



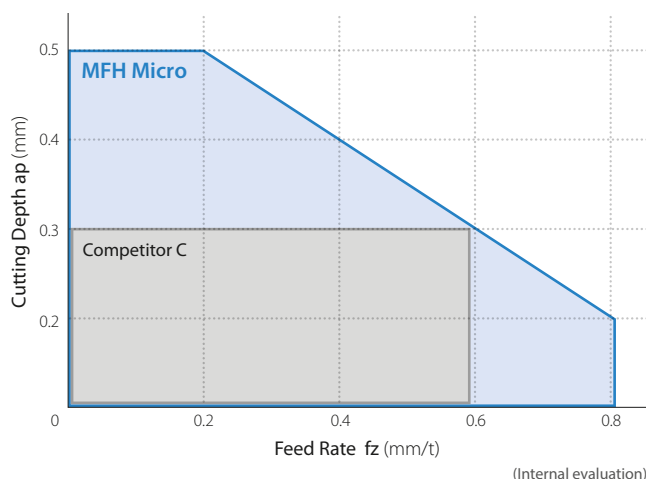
Cutting conditions: $V_c = 120$ m/min., $a_p \times a_e = 0.4 \times 5$ mm, $f_z = 0.6$ mm/t. Cutter diameter DC = Ø10 (1 insert), dry. Workpiece: C50.

2 Wide range of machining applications

Wide range of machining applications at a maximum depth of cut of 0.5 mm.

Stable machining even with small machining centre (BT30).

Cutting performance map (Cutter diameter Ø10 mm)



(Internal evaluation)

3 Replaces solid end mills to reduce machining costs

Suppresses chattering and increases milling efficiency

MFH Micro compared to solid end mills

(Mechanical parts, slotting, workpiece C50)

MFH Micro:

Q = 15.3 cc/min.

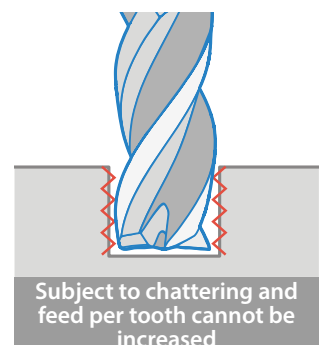
$V_c = 150$ m/min., $a_p \times a_e = 0.4 \times 10$ mm
 $f_z = 0.4$ mm/t. Dry
 MFH10-S10-01-2T (2 inserts)
 LPGT010210ER-GM

Solid end mill:

Q = 12.2 cc/min.

$V_c = 80$ m/min., $a_p \times a_e = 3 \times 10$ mm
 $f_z = 0.04$ mm/t. Dry
 Ø10 (4 flutes)

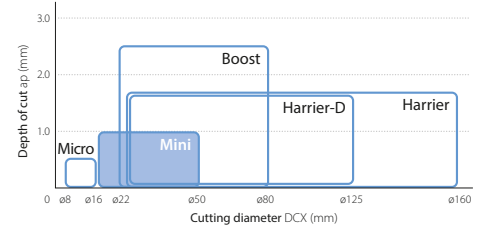
× 1.25
Efficiency



Small diameter cutter for high feed machining (Ø16 – 50 mm)

MFH Mini

Economical inserts with 4 cutting edges.
Small diameter fine pitch type for high efficiency and high feed machining.

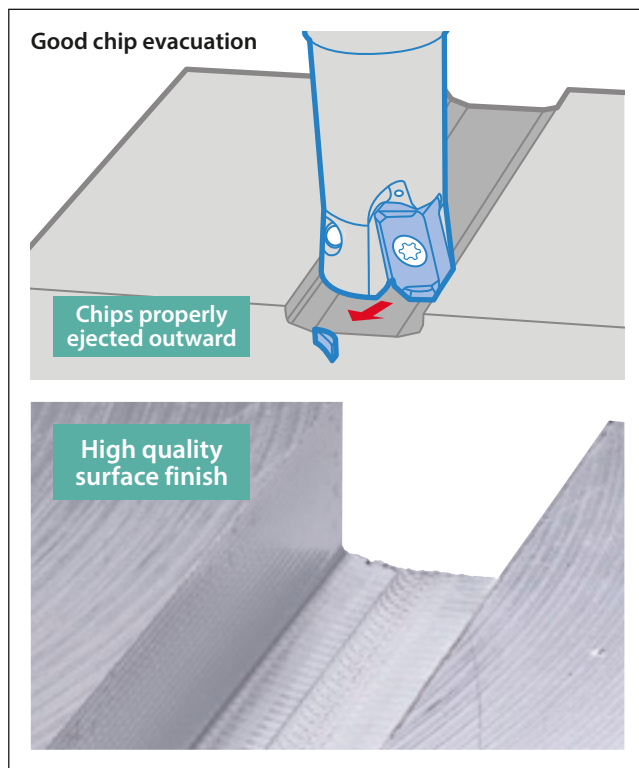


* With LD chipbreaker Harrier is capable of high ap = 2 – 5.0 mm (Ø50 – 160 mm). See page 3.

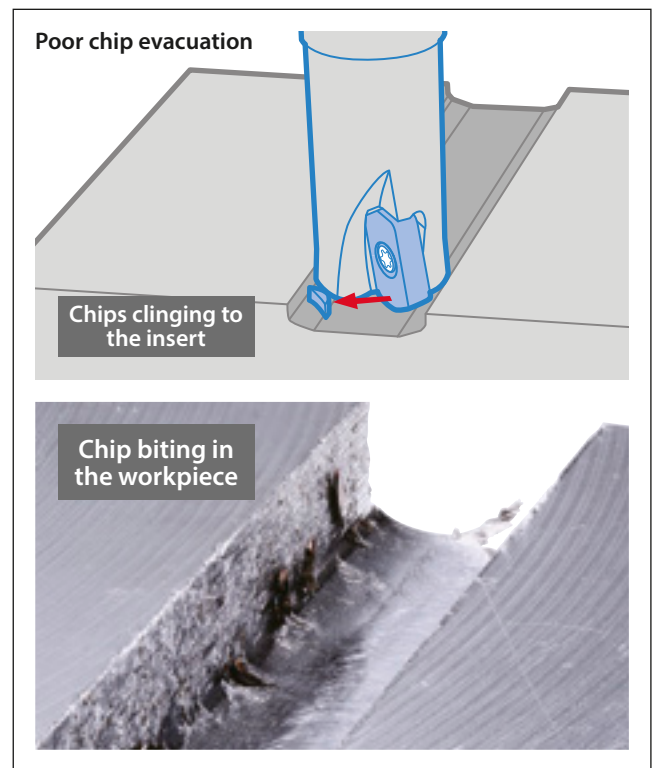
1 Good chip evacuation

MFH Mini controls chip biting with convex cutting edge

MFH Mini



Competitor high feed cutter

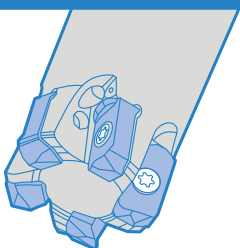


Cutting conditions: Cutter diameter DC = Ø16 mm (2 inserts), Vc = 150 m/min., ap = 0.5 mm (20 pass), fz = 0.6 mm/t: Total 10 mm × 16 mm. Dry. Workpiece: S235JR.

2 Fine pitch for efficient machining

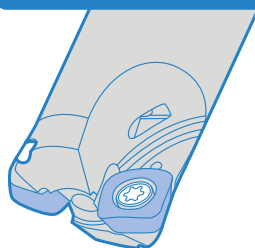
Cutter diameter 25 mm type

MFH Mini



5 inserts MFH25-S25-03-5T

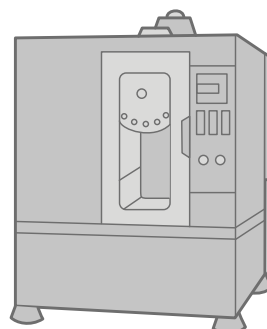
MFH Harrier



2 inserts MFH25-S25-10-2T

3 Suitable for roughing of moulds

High feed machining in small machining centres

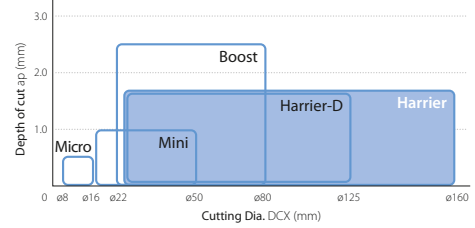


Applicable for BT30/BT40

Highly efficiency and high feed cutter (Ø25 – 160 mm)

MFH Harrier

Wide range of products for high feed machining.
Large depths of cut and low cutting forces.

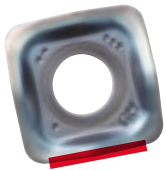


* With LD chipbreaker Harrier is capable of high ap = 2 – 5.0 mm (Ø50 – 160 mm). See page 3.

1

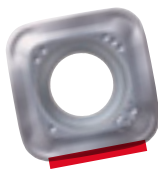
Large insert line-up for various applications

GM (General purpose) / GH (Tough edge)



First recommendation for general machining

Multiple metalworking processes.
Supports including face milling, ramping, and helical milling

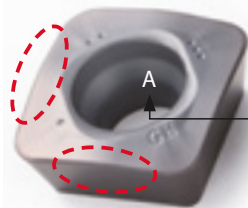


Excellent fracture resistance

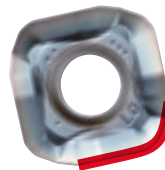
GH chipbreaker with excellent fracture resistance

Convex cutting edge design

Reduces impact force when entering workpiece.
Suppresses chattering and fracturing.



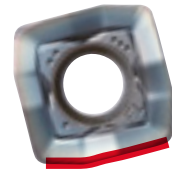
LP (Large ap)



Maximum ap = 5 mm

Available for scale removal
as well as high feed cutting

FL (Wiper edge)

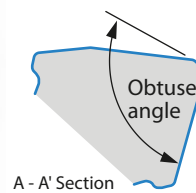


Wiper edge with low cutting forces

Excellent surface finish and reduced chattering

Tough edge design

Combining with PR015S is suitable for machining hardened material.
Improved fracture resistance.

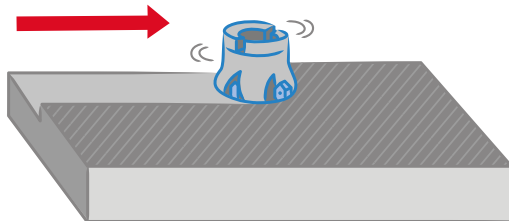


Featured product

LD chipbreaker can be used for both large ap and high feed machining

Large ap for scale removal

ap = 4.0 mm



(fz = 0.25 mm/t, ap = 4 mm)

MFH Harrier

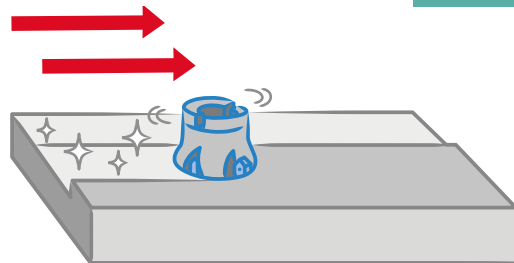
MFH063R-14-ST-22M
(Cutter Dia. 63 mm, 5 Inserts)

Roughing for scale removal (2 passes):
Large ap

Vc = 200 m/min., ap x ae = 4 x 40 mm.
fz = 0.25 mm/t, Vf = 1,264 mm/min.

High feed rates after scale removal

fz = 1.5 mm/t



(fz = 1.5 mm/t, ap = 2 mm)

Roughing (2 passes) after scale removal:
High feed rate

Vc = 200 m/min., ap x ae = 2 x 40 mm.
fz = 1.5 mm/t, Vf = 7,583 mm/min.
Workpiece: S235JR

Conventional 45° cutter

Cutter diameter 63 mm, 5 inserts.

Roughing (4 passes): Constant D.O.C. and feed rate

Vc = 200 m/min., ap x ae = 3 x 40 mm.
fz = 0.25 mm/t, Vf = 1,264 mm/min.
Workpiece: S235JR

Chip evacuation

MFH

404 cc/min

Conventional cutter

151 cc/min

Efficiency

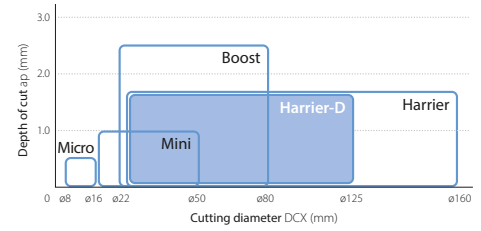
× 2.6

Large diameter cutter with double-sided insert (Ø25 – 125 mm)

MFH Harrier-D



Cost-efficient with 8-edge, double-sided inserts.
High efficiency face milling.



* With LD chipbreaker Harrier is capable of high $a_p = 2 - 5.0$ mm (Ø50 – 160 mm). See page 3.

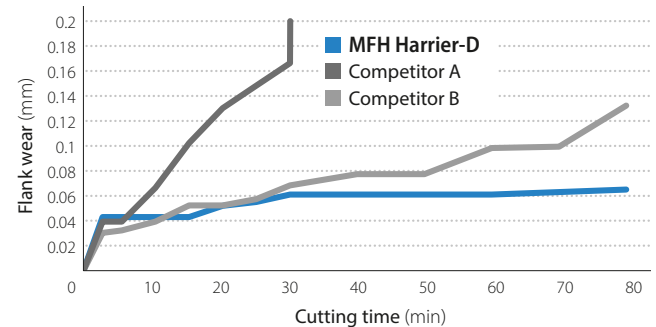
1

Double-sided, 8-edge design for economy.
Long tool life reduces overall machining costs.



8-edge, double-sided

Wear resistance comparison (Internal evaluation)

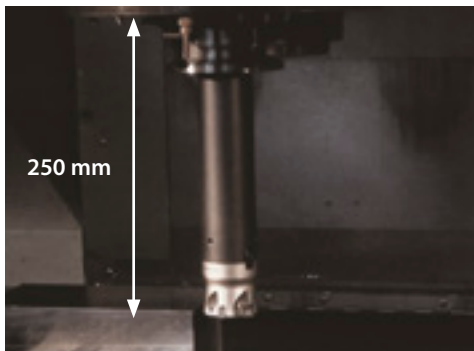


$V_c = 180$ m/min., $a_p \times a_e = 1 \times 37.7$ mm, $f_z = 1.0$ mm/t. Ø50 mm, 42CrMo4HT. Dry.

2

Low cutting force and excellent chatter resistance

Achieves stable machining without chatter even with long overhang



250 mm

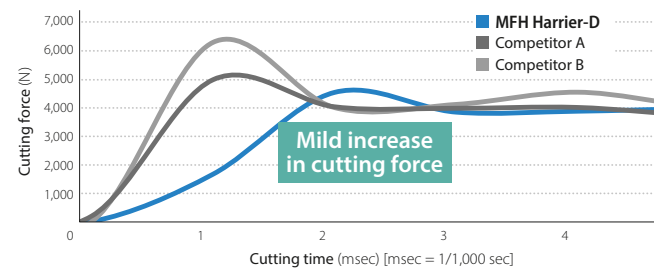
Video



Low cutting force with convex helical edge design

Cutting force and vibration when approaching the workpiece.
(a_p : Half of cutter diameter)

(internal evaluation)



$V_c = 150$ m/min., $a_p \times a_e = 1.5 \times 25$ mm, $f_z = 1.5$ mm/t. Dry. Ø50 mm (1 insert) C50.

3

High-efficiency rough face milling



$V_c = 180$ m/min., $a_p = 1$ mm.
 $f_z = 1.0$ mm/t. Dry. Ø125 mm (10 inserts) C50.

Efficiency simulation of face milling (Internal evaluation)

Roughing: MFH Harrier-D
Finishing: 45° cutter

Roughing 15 sec
Finishing 75 sec
 $V_f = 4,600$ mm/min.

33%
Cutting time

Roughing: 45° cutter
Finishing: 45° cutter

Roughing 60 sec
Finishing 75 sec
 $V_f = 1,400$ mm/min.

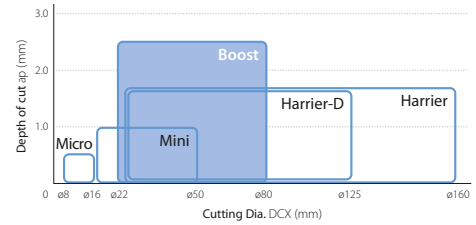
Improved roughing efficiency contributes to reduction in total cutting time.

High feed and large depth of cut milling

MFH Boost



Maximum D.O.C. of 2.5 mm - high feed plus large D.O.C for greater milling capabilities. Excellent performance in a wide range of applications, including automotive parts, difficult-to-cut materials and moulds.



* With LD chipbreaker Harrier is capable of high $a_p = 2 - 5.0$ mm ($\varnothing 50 - 160$ mm). See page 3.

1

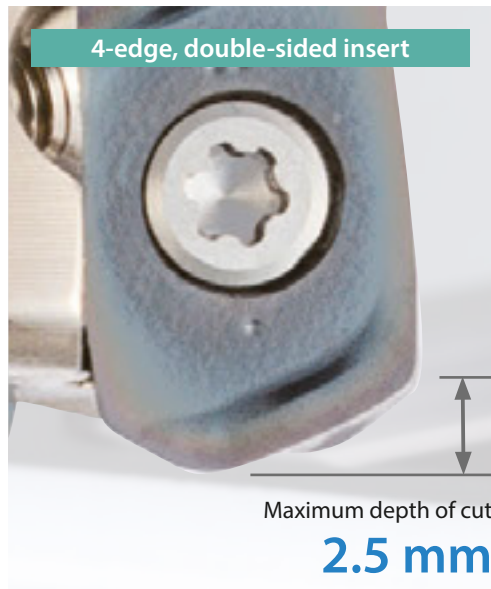
High feed milling with large depth of cut capabilities

Video

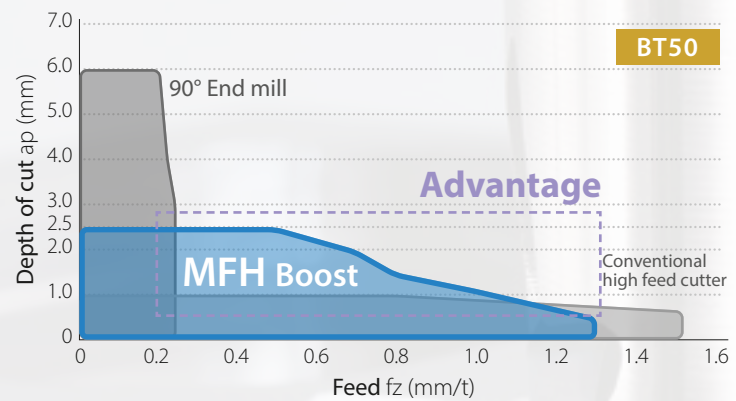


A small 04 size insert (4-edge, double-sided insert) supports depths of cut up to 2.5 mm with cutting diameter available from $\varnothing 22$ mm.

Achieves high efficiency machining in various shouldering, slotting, helical milling, and ramping applications.



MFH Boost advantage



$V_c = 150$ m/min., $a_e = 12.5$ mm ($a_e/DCX = 50\%$), C50. Dry. $\varnothing 25$ mm. Overhang length: 60 mm, BT50.

New value with 2.5 mm maximum depth of cut

Automotive parts

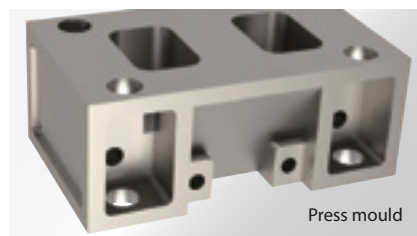
General steel machining.



- Increased productivity with high feed rates
- High reliability in unstable machining environments
Long overhang length and better clamping rigidity. Stable machining with low rigidity machines.
- High-efficiency ramping
Large ramping angle (Small diameter $\varnothing 25$ mm: 3°)
Dramatic efficiency improvement when ramping in pockets.
- Longer tool life with high-efficiency machining.

General parts / Mould (High roughing / Facing)

General parts, pressing and die casting.



- Higher productivity with large D.O.C.
- Long tool life and improved efficiency through the reduction of tool paths
Reduced machining time when machining workpieces with large variations in machining margins.
- Longer tool life with high-efficiency machining.

*MFH Mini/Harrier recommended for contouring with small depth of cut and high feed

Aircraft / Energy industry parts

Difficult-to-cut materials such as titanium alloy and stainless steel machining.



- High feed rates increase productivity
- Long tool life through the reduction of tool paths
- Good combination with heat-resistant grade PR1835
Long tool life and stable machining.

2

Available for a variety of machining applications and environments

1

Solutions for 90° end mills (Roughing to medium-finishing)

High feed rates dramatically improve machining efficiency

Machining efficiency simulation example

Pocketing: $V_c = 150$ m/min., $a_e = 12.5$ mm

MFH Boost

Ø25 mm (3 inserts)

100 cc/min

$A_p = 2.0$ mm, $f_z = 0.7$ mm/t

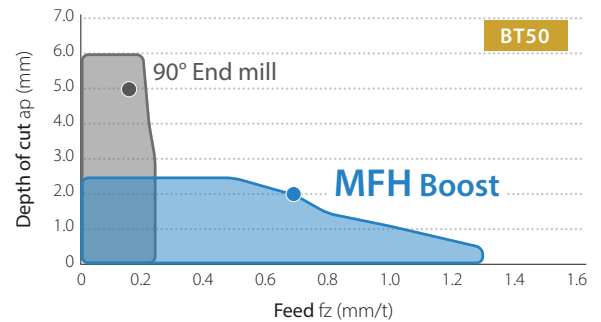
Machining
efficiency

× 1.8

Conventional 90°
End mill
Ø25 mm (3 inserts)

54 cc/min

$A_p = 5.0$ mm, $f_z = 0.15$ mm/t



High efficiency and good tool life

Machining efficiency and cutting edge condition comparison (Internal evaluation)

Cutting edge condition after 100 min. machining

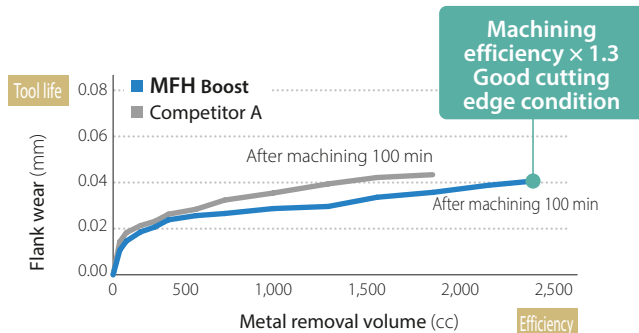
MFH Boost

$a_p = 1.6$ mm, $f_z = 0.6$ mm/t



Competitor A 90° end mill

$a_p = 5.0$ mm, $f_z = 0.15$ mm/t



$V_c = 150$ m/min., $a_e = 12.5$ mm. Dry. 42CrMo4 (H) Ø25 mm (1 insert) BT50.

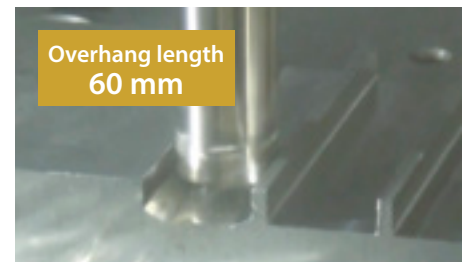
Machining
efficiency × 1.3
Good cutting
edge condition

High stability in unstable machining environment

Chatter resistance comparison (Internal evaluation)

Slotting

Ø25 mm (3 inserts)
External air
C50
BT50



Video



Machining efficiency

MFH Boost

103 cc/min

$V_c = 120$ m/min, $a_p = 1.5$ mm, $f_z = 0.6$ mm/t

Machining
efficiency

× 4.5

Competitor B

31 cc/min

Chattering (Machining was impossible)

90° End mill

$V_c = 80$ m/min., $a_p = 2$ mm, $f_z = 0.2$ mm/t

23 cc/min

$V_c = 80$ m/min., $a_p = 2$ mm, $f_z = 0.15$ mm/t

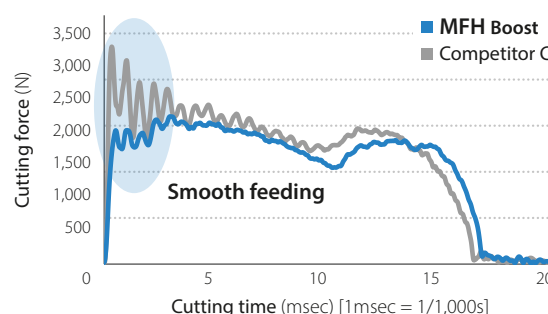
High efficiency and stable machining designs

Kyocera's original technology.

Convex cutting edge design reduces impact when entering workpiece.



Cutting force when entering workpiece (Internal evaluation)



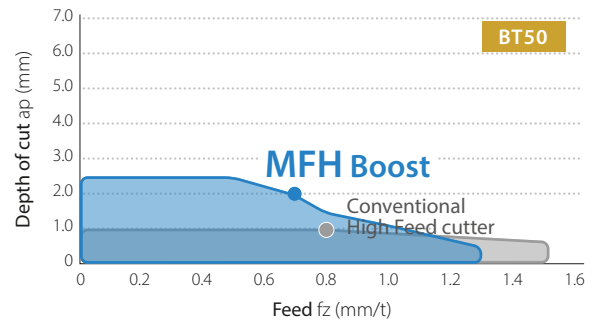
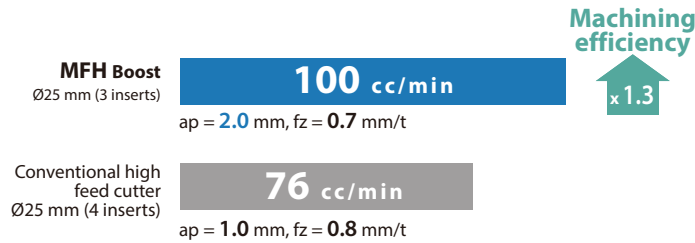
$V_c = 150$ m/min., $a_p = 2.0$ mm,
 $a_e = 25$ mm, $f_z = 0.7$ mm/t.
Dry, C50, Ø50 mm (1 insert) BT50.

2 Better solution to conventional high feed cutters

Large D.O.C. dramatically improves machining efficiency

Machining efficiency simulation example

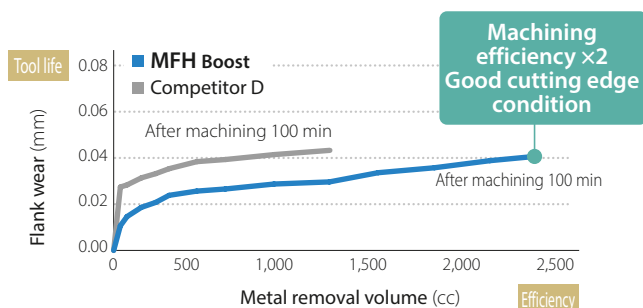
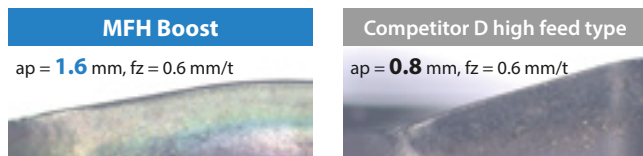
Multi-stage machining (Depth 30 mm): $V_c = 150$ m/min., $a_e = 12.5$ mm.



High efficiency and good tool life

Machining efficiency and cutting edge condition comparison (Internal evaluation)

Cutting edge condition after 100 min. machining



$V_c = 150$ m/min., $a_e = 12.5$ mm. Dry, 42CrMo4 (H) Ø25 mm (1 insert) BT50.

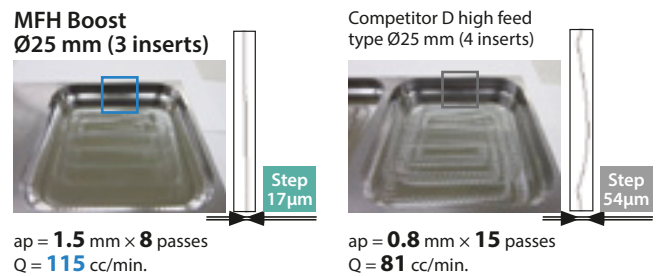
Excellent wall accuracy

Machining efficiency and wall accuracy comparison (Internal evaluation)

Video

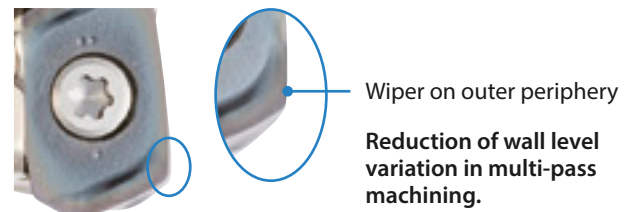


Pocketing (Depth 12 mm)



Cutting conditions: $V_c = 200$ m/min., $a_e = 12.5$ mm, $f_z = 0.8$ mm/t. Dry, C50, BT50.

Superior wall accuracy



Video

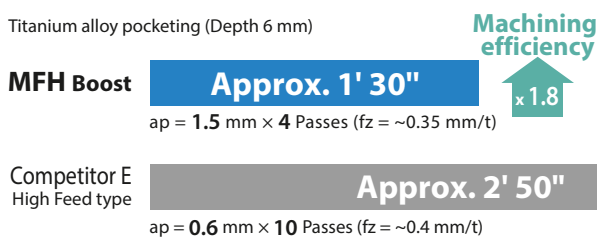


3 Solutions for machining difficult-to-cut materials

Dramatic improvement in machining efficiency with titanium alloy, stainless steel machining, etc.

Machining efficiency comparison (Internal evaluation)

Titanium alloy pocketing (Depth 6 mm)

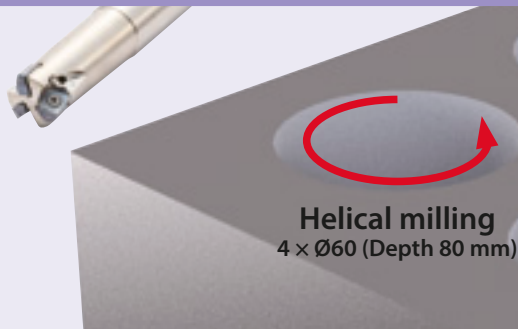


$V_c = 50$ m/min., $a_e = 12.5$ mm ($a_e/DCX = 50\%$). Ramping angle 3° Ti-6Al-4V. Wet, Ø25 mm (3 inserts), BT50.



Valve parts • SCM 440

$V_c = 180 \text{ m/min}$, $a_p \times a_e = 1.5 \times 32 \text{ mm}$, $f_z = 0.35 \text{ mm/t}$, BT50



MFH Boost
Ø32 (4 inserts)

Q = 132 cc/min

Machining efficiency
× 3.5

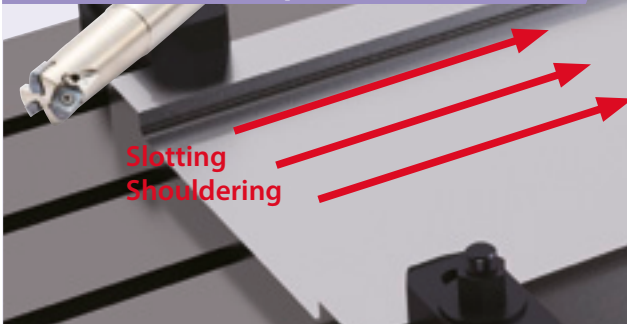
Conventional F
High Feed Type Ø 32
(3 inserts)

Q = 38 cc/min

The MFH boost achieved 3.5 times machining efficiency **by increasing the D.O.C. and number of inserts**. Even with 90mm overhang portion, $a_p = 1.5 \text{ mm}$ large D.O.C. machining is possible.

Industrial parts • C50

$V_c = 150 \text{ m/min}$, $a_p \times a_e = 1.0 \times \sim 20 \text{ mm}$, $f_z = 0.36 \text{ mm/t}$, BT40



MFH Boost
Ø25 (3 Inserts)

Q = 42 cc/min

Machining efficiency
× 3.2

Competitor G
90° end mill Ø25
(2 inserts)

Q = 13 cc/min

The MFH boost achieved 3.2 times machining efficiency **by increasing cutting speed, feed, and number of inserts**. There is no problem with the value of the load meter when increasing to the cutting conditions above.

Mould parts pre hardened steel

$V_c = 120 \text{ m/min}$, $a_p \times a_e = 1.5 \times 30 \text{ mm}$, $f_z = 0.7 \text{ mm/t}$, Internal air



MFH Boost
Ø50 (7 inserts)

Q = 192 cc/min

Machining efficiency
× 1.4

Competitor H
High Feed Type Ø50
(7 inserts)

Q = 140 cc/min

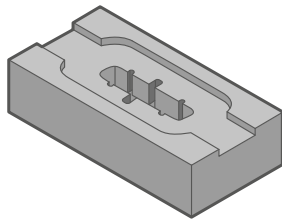
The MFH Boost provides a low cutting forces **even when the feed and a_p are increased**. Machining efficiency 1.4 times. Even when machining where the depth of cut is doubled, distortion is equivalent to competitor D.

(User evaluation)

Case studies

Mould • X40CrMoV5-1

Vc = 90 m/min. (n = 2,400 min⁻¹)
 ap × ae = 0.3 × ~0.7 mm
 fz = 0.27 mm/t (Vf = 1,930 mm/min.)
 Dry
 MFH12-S12-01-3T (3 inserts)
 LPGT010210ER-GM PR1835



Chip evacuation

MFH Micro

4.5 cc/min.

Efficiency
× 1.3

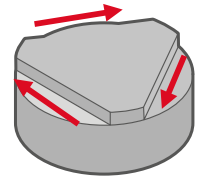
Competitor J
Ø12-3T

3.4 cc/min.

MFH Micro shows 1.3 times machining efficiency compared to Competitor J. Good cutting edge condition after machining almost doubling the tool life.
 (User evaluation)

Industrial machine parts • X105CrMo17

Vc = 180 m/min. (n = 3,580 min⁻¹)
 ap × ae = 0.4 × 8 mm
 fz = 0.4 mm/t (Vf = 5,730 mm/min.)
 Wet
 MFH16-S16-01-4T (4 inserts)
 LPGT010210ER-GM PR1835



Cutting time

MFH Micro

7 min.

35%
Cutting time

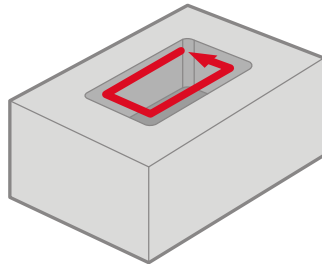
Competitor K

11 min.

MFH Micro shows 30% faster cycle time compared to competitor K.
 (User evaluation)

Mould parts • Pre-hardened steel

Vc = 220 m/min. (n = 3,500 min⁻¹)
 ap × ae = 0.5 × 14 mm
 fz = 0.05 mm/t (Vf = 700 mm/min.)
 Dry
 MFH20-S20-03-4T (4 inserts)
 LOGU030310ER-GM PR1835



Tool life

MFH Mini

2.0 h

Tool life
MAX
× 2

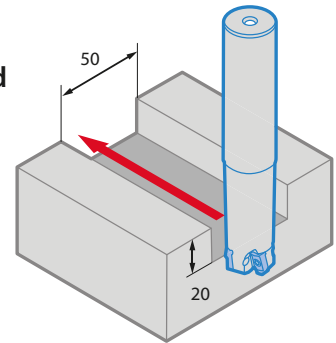
Competitor L
(4 inserts)

1.0 – 1.5 h

MFH Mini shows lower cutting load compared to competitor L and can extend the machining time.
 (User evaluation)

Airplane parts • Precipitation hardened stainless steel

Vc = 120 m/min. (n = 1,530 min⁻¹)
 ap × ae = 0.7 × ~25 mm
 fz = 0.6 mm/t (Vf = 3,670 mm/min.)
 Dry
 MFH25-S25-03-4T (4 inserts)
 LOGU030310ER-GM PR1835



Number of workpieces

MFH Mini

100 pcs

Tool life
× 1.8

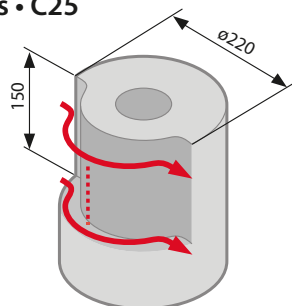
Competitor M
(5 inserts)

55 pcs

MFH Mini maintains good cutting edge condition after machining 100 pcs with stable machining.
 (User evaluation)

Construction machine parts • C25

Vc = 220 m/min. (n = 1,750 min⁻¹)
 ap × ae = 1.5 × 30 mm
 fz = 0.7 mm/t (Vf = 4,900 mm/min.)
 Dry
 MFH40-S32-10-4T (4 inserts)
 SOMT140520ER-GM PR1825



Cutting time

MFH Harrier

950 sec

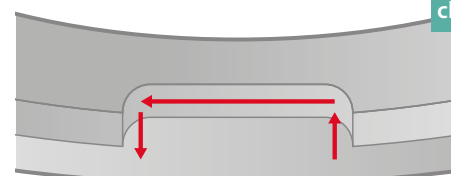
75%
Cutting time

Competitor N
(90° cutter)

3,800 sec

MFH Harrier features a higher number of passes compared to Competitor N, but the machining time was reduced by 75% because the feed rate can be increased by 7 times.
 (User Evaluation)

Clutch • X8CrNiS18-9



Reduced chattering

Vc = 120 m/min. (n = 1,190 min⁻¹), ap × ae = 1.0 × 20 mm.
 fz = 1.2 mm/t (Vf = 2,850 mm/min.) Dry.
 MFH32-S32-10-2T (2 inserts), SOMT100420ER-GM PR1835.

Chip evacuation

MFH Harrier

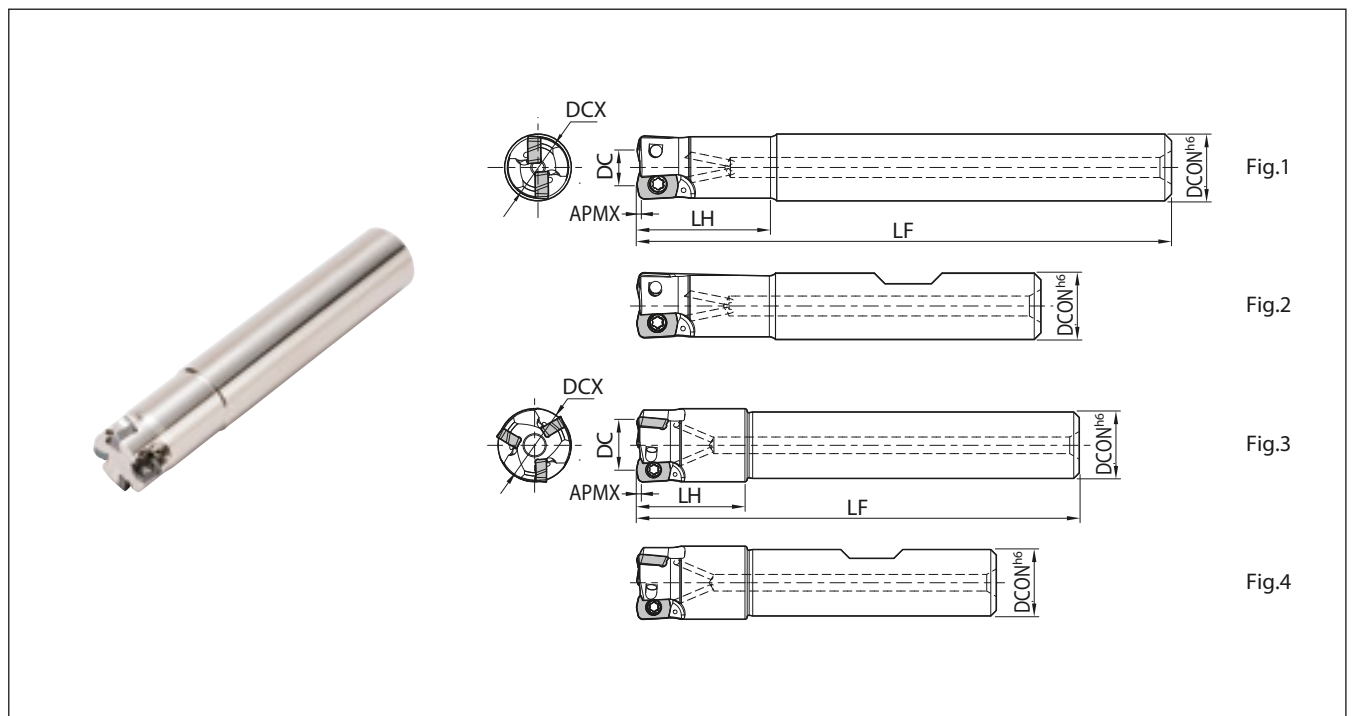
58 cc/min.

Efficiency
× 1.6

Competitor O

36 cc/min.

MFH Harrier shows stable machining while Competitor O generated chattering. MFH Harrier maintained a good cutting edge condition with stable machining.
 (User Evaluation)



Toolholder dimensions (Shank type)

Shank	Description	Availability	No. of inserts	Dimensions (mm)						Maximum ramping angle	Rake angle A.R.	Coolant hole	Drawing	Weight (kg)	Maximum revolution (min ⁻¹)
				DCX	DC	DCON	LF	LH	APMX						
Standard shank (Cylindrical)	MFH08-S10-01-1T	●	1	8	4.2	10	75	16	0.5	4°	+5°	Yes	Fig.1	0.04	20,000
	MFH10-S10-01-2T	●	2	10	6.2	10	80	20		3°				0.04	16,200
	MFH12-S12-01-3T	●	3	12	8.2	12	80	20		2°				0.06	14,000
	MFH16-S16-01-4T	●	4	16	12.2	16	90	25		1.2°				0.12	11,400
Over size shank (Cylindrical)	MFH14-S12-01-3T	●	3	14	10.2	12	80	20	0.5	1.5°	+5°	Yes	Fig.3	0.07	12,500
Standard (Weldon)	MFH08-W10-01-1T	●	1	8	4.2	10	58	16	0.5	4°	+5°	Yes	Fig.2	0.03	20,000
	MFH10-W10-01-2T	●	2	10	6.2	10	60	20		3°				0.03	16,200
	MFH12-W12-01-3T	●	3	12	8.2	12	65	20		2°				0.05	14,000
	MFH16-W16-01-4T	●	4	16	12.2	16	73	25		1.2°				0.1	11,400
Over size (Weldon)	MFH14-W12-01-3T	●	3	14	10.2	12	65	20	0.5	1.5°	+5°	Yes	Fig.4	0.05	12,500

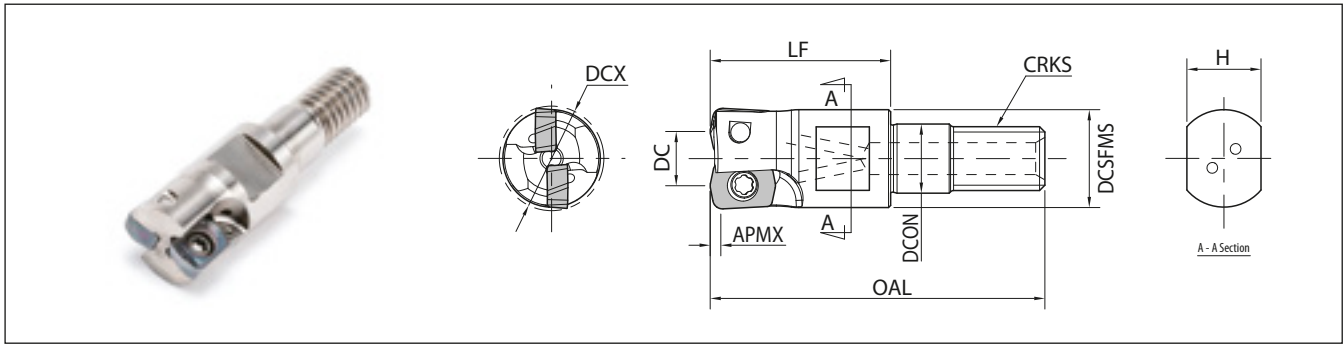
Caution with maximum revolution

Set the number of revolutions per minute within the recommended cutting speed for each workpiece material.
Do not use the end mill or cutter above the maximum revolution, as centrifugal force may cause inserts or components to be ejected even under no-load conditions.

● : Available

Spare parts and applicable inserts

Description	Spare parts		Applicable inserts
	Insert screw	Wrench	
			
MFH...-01-...	SB-1840TRP Recommended torque for insert clamp: 0.5 Nm	FTP-6	LPGT010210ER-GM



Toolholder dimensions

Description	Availability	No. of Inserts	Dimensions (mm)								Maximum ramping angle	Rake angle A.R.	Coolant hole	Maximum revolution (min ⁻¹)							
			DCX	DC	DCSFMS	DCON	OAL	LF	CRKS	H					APMX						
MFH08-M06-01-1T	●	1	8	4.2	9.2	6.5	30.5	17	M6×P1.0	7	0.5	4°	+5°	Yes	20,000						
MFH10-M06-01-2T	●	2	10	6.2								3°			16,200						
MFH12-M06-01-3T	●	3	12	8.2	11.2							2°			14,000						
MFH14-M06-01-3T	●	3	14	10.2								1.5°			12,500						
MFH16-M08-01-4T	●	4	16	12.2	14.7	8.5	39	22	M8×P1.25	12		1.2°					11,400				

Industry standard threads for adapting to common toolholders (For Ø8 – 14 mm screw size: M6 × P1.0)
Check screw specifications for the shank in use.

● : Available

Spare parts and applicable inserts

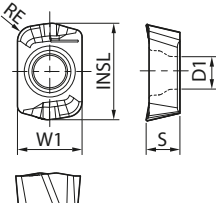
Description	Spare parts		Applicable inserts
	Insert screw	Wrench	
			
MFH...-01-...	SB-1840TRP Recommended torque for insert clamp: 0.5 Nm	FTP-6	LPGT010210ER-GM

Caution with maximum revolution

Set the number of revolutions per minute within the recommended cutting speed for each workpiece material.

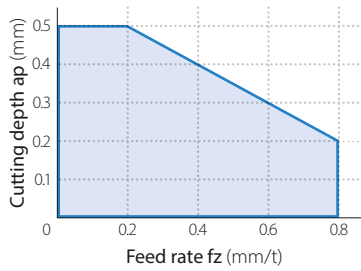
Do not use the end mill or cutter above the maximum revolution, as centrifugal force may cause inserts or components to be ejected even under no-load conditions.

Applicable inserts MFH Micro

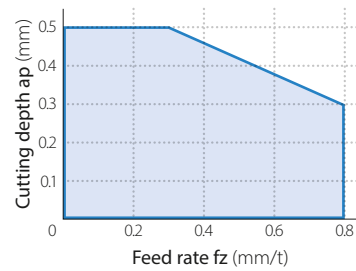
Classification of usage		P	Carbon steel / Alloy steel					★	☆	
			Mould steel					★	☆	
★ : Roughing / 1st choice ☆ : Roughing / 2nd choice ■ : Finishing / 1st choice □ : Finishing / 2nd choice		M	Austenitic stainless steel					☆	★	
			Martensitic stainless steel						☆	★
			Precipitation hardened stainless steel						★	
		K	Gray cast iron					★		
			Nodular cast iron					★		
		S	Ni-base heat-resistant alloy						☆	★
			Titanium alloy						★	
		H	High hardness steel							
Insert		Description	Dimensions (mm)					MEGACOAT NANO EX		CVD coated carbide
			W1	S	D1	INSL	RE	PR1825	PR1835	CA6535
		LPGT 010210ER-GM	4.19	2.19	2.1	6.26	1.0	●	●	●
General purpose										

● : Available

Cutting diameter: Ø8 – 12 mm

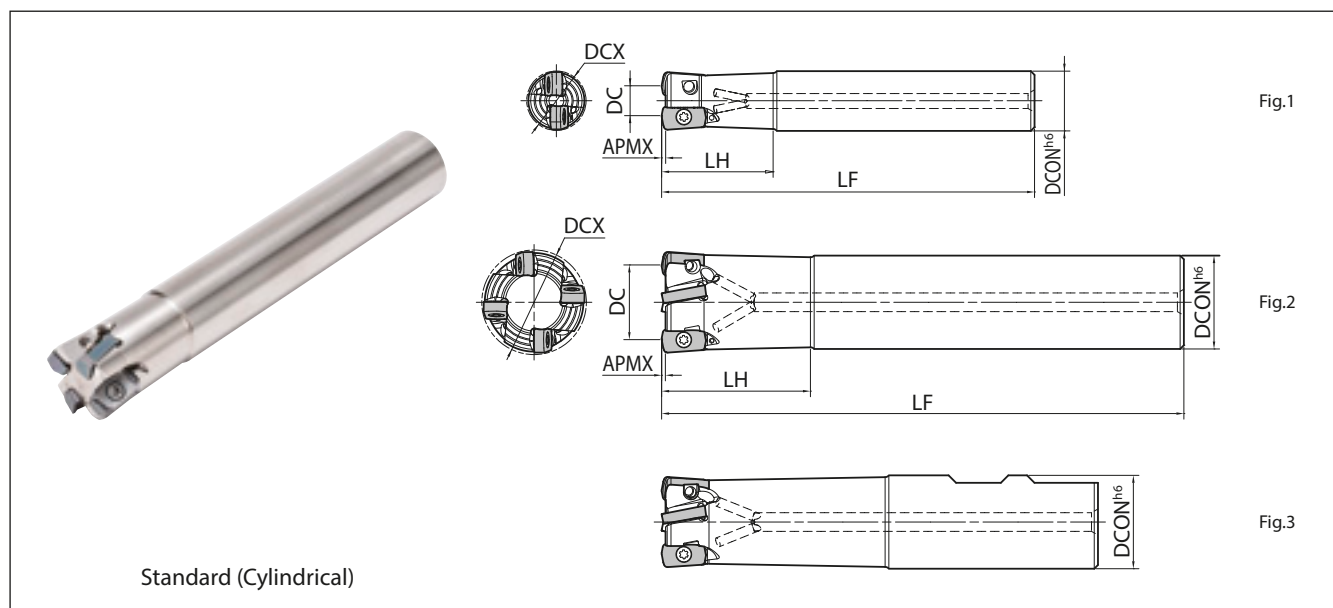


Cutting diameter: Ø14 – 16 mm


Recommended cutting conditions MFH Micro ★ 1st recommendation ☆ 2nd recommendation

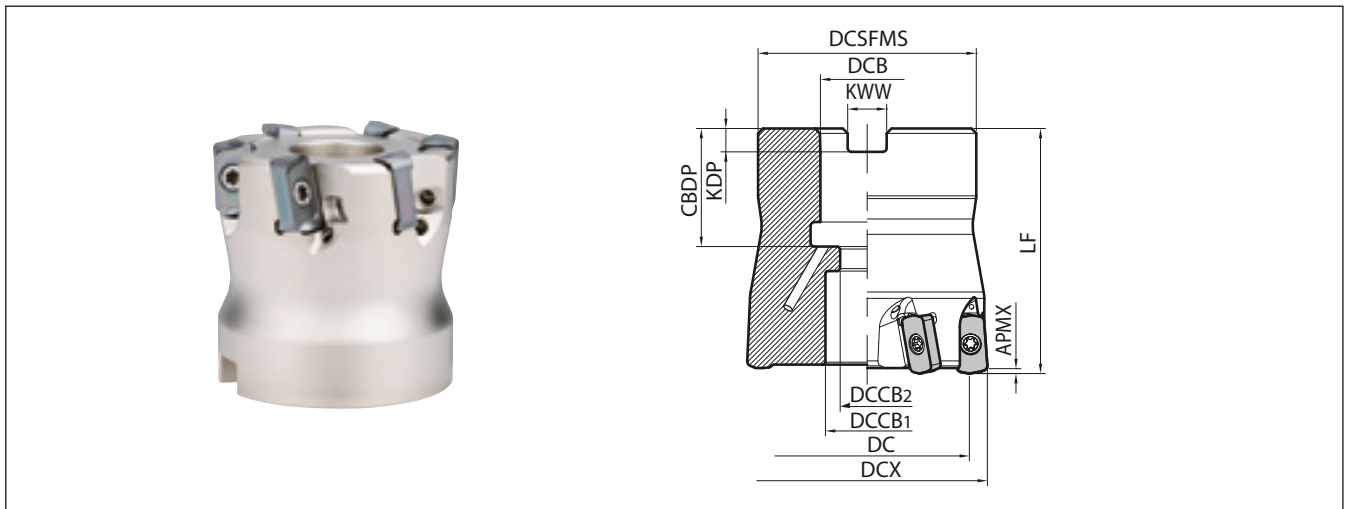
Chipbreaker	Workpiece	Holder description and feed rate (fz: mm/t) • Recommended feed ap = 0.3 mm (reference value)					Recommended insert grade (Vc: m/min.)		
		MFH08-... -1T	MFH10-... -2T	MFH12-... -3T	MFH14-... -3T	MFH16-... -4T	MEGACOAT NANO EX		CVD coated carbide
							PR1825	PR1835	CA6535
GM	Carbon 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	–
	Mould steel (~40HRC)	0.2 – 0.3 – 0.5			0.2 – 0.4 – 0.6		★ 80 – 140 – 180	☆ 80 – 140 – 180	–
	Mould steel (40~50HRC)	0.2 – 0.25 – 0.3			0.2 – 0.25 – 0.4		☆ 60 – 100 – 130	–	–
	Austenitic stainless steel	0.2 – 0.3 – 0.5			0.2 – 0.4 – 0.6		☆ 100 – 160 – 200	★ 100 – 160 – 200	–
	Martensitic stainless steel						–	☆ 150 – 200 – 250	★ 180 – 240 – 300
	Precipitation hardened Stainless steel						–	★ 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 alloy	0.2 – 0.25 – 0.3			0.2 – 0.25 – 0.4		–	☆ 20 – 30 – 50	★ 20 – 30 – 50
	Titanium alloy						–	★ 40 – 60 – 80	–

- The numbers shown in **bold font** indicate the recommended standard cutting conditions. Adjust the cutting speed and feed rate within the specified range according to the actual machining conditions.
- Machining with coolant is recommended for precipitation hardened stainless steel, Ni-base heat-resistant alloy, and titanium alloy.
- Machining with coolant may have a lower tool life than dry machining. Set the cutting speed, feed rate and D.O.C. lower than recommended conditions.
- Centre-through coolant is recommended for slotting.


Toolholder dimensions

Shank	Description	Availability	No. of inserts	Dimensions (mm)						Rake angle		Coolant hole	Drawing	Weight (kg)	Maxi mum revolution (min ⁻¹)
				DCX	DC	DCON	LF	LH	APMX	A.R.					
Standard Shank (Cylindrical)	MFH 16-S16-03-2T	●	2	16	8	16	100	30	1	—10°	Yes	Fig. 1	0.1	18,800	
	MFH 20-S20-03-3T	●	3	20	12	20	130	50					0.3	15,700	
	20-S20-03-4T	●	4	20	12	20	130	50					0.3	15,700	
	MFH 25-S25-03-4T	●	4	25	17	25	140	60					0.5	13,400	
	25-S25-03-5T	●	5	25	17	25	140	60					0.5	13,400	
	MFH 32-S32-03-5T	●	5	32	24	32	150	70					0.8	11,400	
	32-S32-03-6T	●	6	32	24	32	150	70					0.8	11,400	
Over Size Shank (Cylindrical)	MFH 17-S16-03-2T	●	2	17	9	16	100	20				Fig. 2	0.1	17,900	
	MFH 18-S16-03-2T	●	2	18	10	16	100	20					0.1	17,000	
	MFH 22-S20-03-3T	●	3	22	14	20	130	30					0.3	14,700	
	22-S20-03-4T	●	4	22	14	20	130	30					0.3	14,700	
	MFH 28-S25-03-4T	●	4	28	20	25	140	40					0.5	12,400	
	28-S25-03-5T	●	5	28	20	25	140	40					0.5	12,400	
Standard Shank (Weldon)	MFH 16-W16-03-2T	●	2	16	8	16	79	30				Fig. 3	0.1	18,800	
	MFH 20-W20-03-3T	●	3	20	12	20	101	50					0.2	15,700	
	20-W20-03-4T	●	4	20	12	20	101	50					0.2	15,700	
	MFH 25-W25-03-4T	●	4	25	17	25	117	60					0.4	13,400	
	25-W25-03-5T	●	5	25	17	25	117	60					0.4	13,400	
	MFH 32-W32-03-5T	●	5	32	24	32	131	70					0.7	11,400	
	32-W32-03-6T	●	6	32	24	32	131	70					0.7	11,400	
Long Shank (Cylindrical)	MFH 16-S16-03-2T-150	●	2	16	8	16	150	50				Fig. 1	0.2	18,800	
	MFH 20-S20-03-3T-160	●	3	20	12	20	160	80					0.3	15,700	
	MFH 25-S25-03-4T-180	●	4	25	17	25	180	100					0.6	13,400	
	MFH 32-S32-03-5T-200	●	5	32	24	32	200	120					1.1	11,400	

● : Available



Toolholder dimensions

Description		Availability	No. of inserts	Dimensions (mm)											Rake angle	Coolant hole	Weight (kg)	Maximum revolution (min ⁻¹)
				DCX	DC	DCSFMS	DCB	DCCB1	DCCB2	LF	CBDP	KDP	KWW	APMX	A.R.			
MFH	040R-03-5T-M	●	5	40	32	38	16	15	9	40	19	5.6	8.4	1	—10°	Yes	0.2	9,900
	040R-03-6T-M	●	6			0.2												
	040R-03-7T-M-KUA	●	7			0.24												
	042R-03-5T-M-KUA	●	5	42	34	38	22	19	11	40	21	6.3	10.4	1	—10°	Yes	0.27	8,600
	042R-03-7T-M-KUA	●	7			34											0.26	
	050R-03-5T-M-KUA	●	5	50	42	47	22	19	11	50	21	6.3	10.4	1	—10°	Yes	0.39	8,600
	050R-03-8T-M-KUA	●	8														0.41	
	050R-03-8T-M	●															0.5	
	052R-03-5T-M-KUA	●	5	52	44	47	22	50.7	53.7	40	21	6.3	10.4	1	—10°	Yes	0.43	8,600
	052R-03-8T-M-KUA	●															0.43	
	063R-03-8T-M-KUA	●	8	63	55	47	22	50.7	53.7	40	21	6.3	10.4	1	—10°	Yes	0.57	8,600
	066R-03-8T-M-KUA	●		66	58												0.6	

Caution with maximum revolution

Set the number of revolutions per minute within the recommended cutting speed for each workpiece material.

Do not use the end mill or cutter above the maximum revolution, as centrifugal force may cause inserts or components to be ejected even under no-load conditions.

● : Available

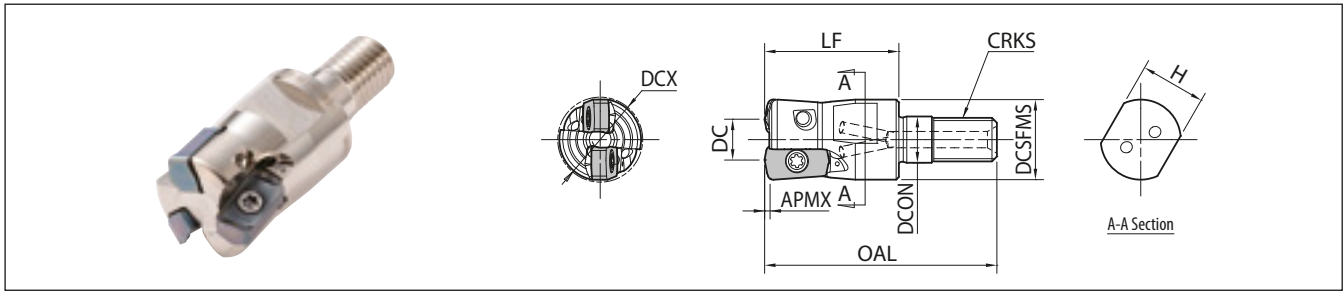
Spare parts and applicable inserts

Description	Spare parts			Applicable inserts
	Insert screw	Wrench	Arbor clamp bolt	
MFH...-03-...				LOGU030310ER-GM LOGU030310ER-GH
MFH040R-03-...-M	SB-3065TRP	DTPM-8	HH8×25	
MFH050R-03-8T-M	Recommended torque for insert clamp: 1.2 Nm		HH10×30	

Caution with maximum revolution

Set the number of revolutions per minute within the recommended cutting speed for each workpiece material.

Do not use the end mill or cutter above the maximum revolution, as centrifugal force may cause inserts or components to be ejected even under no-load conditions.


Toolholder dimensions

Description	Availability	No. of inserts	Dimensions (mm)										Rake angle	Coolant hole	Maximum revolution (min ⁻¹)							
			DCX	DC	DCSFMS	DCON	OAL	LF	CRKS	H	APMX	A.R.										
MFH	16-M08-03-2T	●	2	16	8	14.7	8.5	42	25	M8×P1.25	12	1	—10°	Yes	18,880							
	17-M08-03-2T	●		17	9						1				17,900							
	18-M08-03-2T	●		18	10						17,000											
	20-M10-03-3T	●	3	20	12	18.7	10.5	48	30	M10×P1.5	15				15,700							
	20-M10-03-4T	●	4												15,700							
	22-M10-03-3T	●	3												22	14	14,700					
	22-M10-03-4T	●	4	14,700																		
	25-M12-03-4T	●		13,400																		
	25-M12-03-5T	●		5	25	17	23	12.5	56	35	M12×P1.75				19	13,400						
	28-M12-03-4T	●	4	28												20	12,400					
	28-M12-03-5T	●	5														32	24	12,400			
	32-M16-03-5T	●			6	30													17	62	40	M16×P2.0
	32-M16-03-6T	●																				
	35-M16-03-6T-KUA	●																				
	40-M16-03-5T-KUA	●	5	24			40	9,900														
	42-M16-03-5T-KUA	●																				
	42-M16-03-7T-KUA	●	7	42																		

Caution with maximum revolution

Set the number of revolutions per minute within the recommended cutting speed for each workpiece material.

Do not use the end mill or cutter above the maximum revolution, as centrifugal force may cause inserts or components to be ejected even under no-load conditions.

● : Available

Applicable inserts MFH Mini

Classification of usage		P	Carbon steel / Alloy steel	★	☆								
			Mould steel	★	☆								
		M	Austenitic stainless steel	☆	★								
			Martensitic stainless steel		☆								★
			Precipitation hardened stainless steel		★								
		K	Gray cast iron			★							
			Nodular cast iron			★							
		S	Ni-base heat-resistant alloy		☆								★
			Titanium alloy		★								
		H	Hardened materials									★	
Insert		Description		Dimensions (mm)					MEGACOAT NANO EX			MEGACOAT HARD	CVD coated carbide
				W1	S	D1	INSL	RE	PR1825	PR1835	PR1810	PR0155	CA6535
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

Recommended cutting conditions MFH Mini ★ 1st recommendation ☆ 2nd recommendation

Chipbreaker	Workpiece	Holder description and feed rate (fz: mm/t) • Recommended feed ap = 0.5 mm (reference value)								Recommended insert grade (Vc: m/min.)				
		MFH16 -...-2T	MFH20 -...-3T	MFH20 -...-4T	MFH25 -...-4T	MFH25 -...-5T	MFH32 -...-5T	MFH32 -...-6T	MFH -...-R-03	MEGACOAT NANO EX			MEGACOAT HARD	CVD coated carbide
										PR1825	PR1835	PR1810	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	0.2 – 0.8 – 1.5	★ 120 – 180 – 250	☆ 120 – 180 – 250	–	–	–
	Alloy steel									★ 100 – 160 – 220	☆ 100 – 160 – 220	–	–	–
	(- 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 – 0.6 – 1.2	0.2 – 0.6 – 1.2	☆ 80 – 140 – 180	☆ 80 – 140 – 180	–	GH★ 80 – 140 – 180	–
	(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 – 0.3 – 0.6	0.2 – 0.3 – 0.6	☆ 60 – 100 – 130	–	–	GH★ 60 – 100 – 130	–
	(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 – 0.3 – 0.5	0.1 – 0.2 – 0.3	0.1 – 0.3 – 0.5	☆ 50 – 70 – 100	–	–	GH★ 50 – 70 – 100	–
	(55 - 60HRC)	0.03 – 0.06 – 0.1 (* Recommended only for GH chipbreaker)								–	–	–	GH☆ 50 – 60 – 70	–
	Austenitic stainless steel	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	0.2 – 0.4 – 0.6	GM☆ 100 – 160 – 200	GM★ 100 – 160 – 200	–	–	–
	Martensitic stainless steel									–	☆ 150 – 200 – 250	–	–	★ 180 – 240 – 300
	Precipitation hardened stainless steel									–	★ 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	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	0.2 – 0.4 – 0.6	–	–	★ 100 – 150 – 200	–	–
	Ni-base heat-resistant alloy	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	0.2 – 0.25 – 0.4	–	☆ 20 – 30 – 50	–	–	★ 20 – 30 – 50
	Titanium alloy									–	GM★ 40 – 60 – 80	GM☆ 30 – 50 – 70	–	–

The numbers shown in **bold font** indicate the recommended standard cutting conditions.

Adjust the cutting speed and feed rate within the specified range according to the actual machining conditions.

Machining with coolant is recommended for Precipitation Hardened Stainless Steel, Ni-base Heat-Resistant Alloy, and Titanium Alloy.

Machining with coolant 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 25% of recommended cutting conditions. Slotting is not recommended in this situation.

Slotting or pocketing are not recommended for face mill types.

For face milling, it is recommended that width of cut should be set to 75% or less of the cutting diameter.

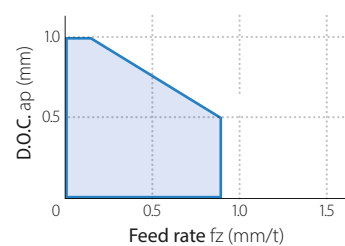
For long shank end mills, 75% or less of the recommended conditions is recommended for both D.O.C. and feed rate.

Standard pitch

Fine pitch

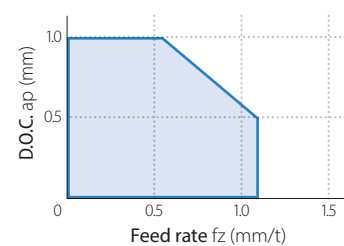
Cutting performance MFH Mini

Fine pitch end mill



MFH20-...-4T, MFH22-...-4T,
MFH25-...-5T, MFH28-...-5T,
MF32-...-6T

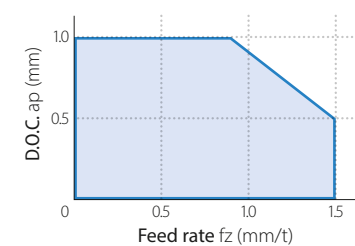
Standard pitch end mill (Cutter diameter Ø16 – 22 mm)



MFH16-...-2T, MFH17-...-2T,
MFH18-...-2T, MFH20-...-3T,
MFH22-...-3T

Face mill (cutter diameter Ø40 – 50 mm)

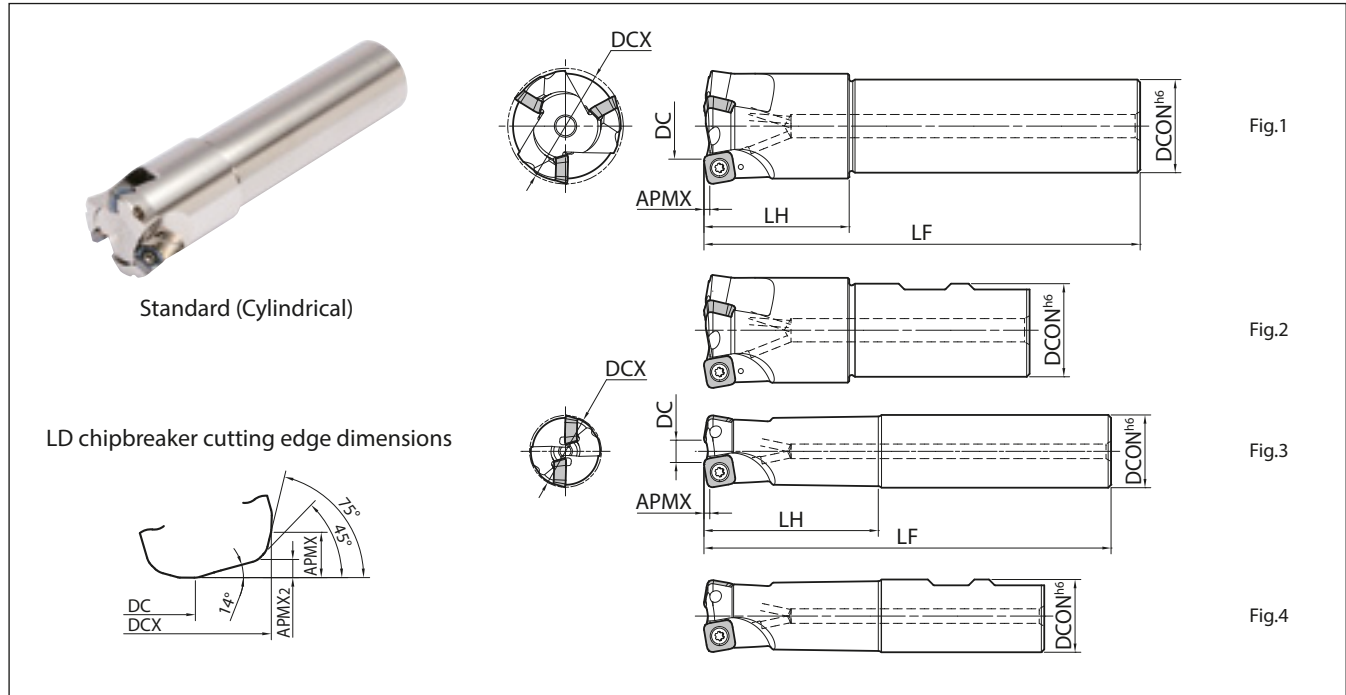
Standard pitch end mill (Cutter diameter Ø25 – 32 mm)



MFH25-...-4T, MFH28-...-4T,
MFH32-...-5T, MFH040R-...,
MFH050R-...

Caution:

When using fine pitch, reduce the cutting conditions compared with standard type.



Toolholder dimensions (SOMT10 type)

Shank	Description	Availability	No. of inserts	Dimensions (mm)								Rake angle	Coolant hole	Drawing	Weight (kg)	Maximum revolution (min ⁻¹)	
				DCX	DC			DCON	LF	LH	APMX	APMX2					A.R.
					GM-GH	LD	FL										
Standard shank (Cylindrical)	MFH 25-S25-10-2T	●	2	25	8	12.5	11.5	25	140	60	1.5 (3.5) *	1.2	+10°	Yes	Fig.3	0.4	17,000
	MFH 28-S25-10-2T	●	2	28	11	15.5	14.5	25	140	40					Fig.1	0.5	15,500
	MFH 32-S32-10-2T	●	2	32	15	19.5	18.5	32	150	70					Fig.3	0.8	14,000
	MFH 32-S32-10-3T	●	3	32	15	19.5	18.5	32	150	70						0.8	14,000
	MFH 35-S32-10-2T	●	2	35	18	22.5	21.5	32	150	50					Fig.1	0.8	13,000
	MFH 35-S32-10-3T	●	3	35	18	22.5	21.5	32	150	50						0.8	13,000
	MFH 40-S32-10-3T	●	3	40	23	27.5	26.5	32	150	50						0.9	11,500
	MFH 40-S32-10-4T	●	4	40	23	27.5	26.5	32	150	50						0.9	11,500
Standard shank (Weldon)	MFH 25-W25-10-2T	●	2	25	8	12.5	11.5	25	117	60	1.5 (3.5) *	1.2	+10°	Yes	Fig.4	0.4	17,000
	MFH 32-W32-10-3T	●	3	32	15	19.5	18.5	32	131	70						0.7	14,000
	MFH 40-W32-10-3T	●	3	40	23	27.5	26.5	32	112	50					Fig.2	0.7	11,500
	MFH 40-W32-10-4T	●	4	40	23	27.5	26.5	32	112	50						0.7	11,500
Long shank (Cylindrical)	MFH 25-S25-10-2T-200	●	2	25	8	12.5	11.5	25	200	120	1.5 (3.5) *	1.2	+10°	Yes	Fig.3	0.6	17,000
	MFH 28-S25-10-2T-200	●	2	28	11	15.5	14.5	25	200	40					Fig.1	0.7	15,500
	MFH 32-S32-10-2T-200	●	2	32	15	19.5	18.5	32	200	120					Fig.3	1.0	14,000
	MFH 35-S32-10-2T-200	●	2	35	18	22.5	21.5	32	200	50					Fig.1	1.4	13,000
	MFH 40-S32-10-4T-250	●	4	40	23	27.5	26.5	32	250	50						1.5	11,500
Extra long shank (Cylindrical)	MFH 25-S25-10-2T-300	●	2	25	8	12.5	11.5	25	300	180	1.5 (3.5) *	1.2	+10°	Yes	Fig.3	1.0	17,000
	MFH 28-S25-10-2T-300	●	2	28	11	15.5	14.5	25	300	40					Fig.1	1.1	15,500
	MFH 32-S32-10-2T-300	●	2	32	15	19.5	18.5	32	300	180					Fig.3	1.6	14,000
	MFH 35-S32-10-2T-300	●	2	35	18	22.5	21.5	32	300	50					Fig.1	1.7	13,000
	MFH 40-S32-10-4T-300	●	4	40	23	27.5	26.5	32	300	50						1.8	11,500

* Dimension in () is when mounting LD type.

● : Available

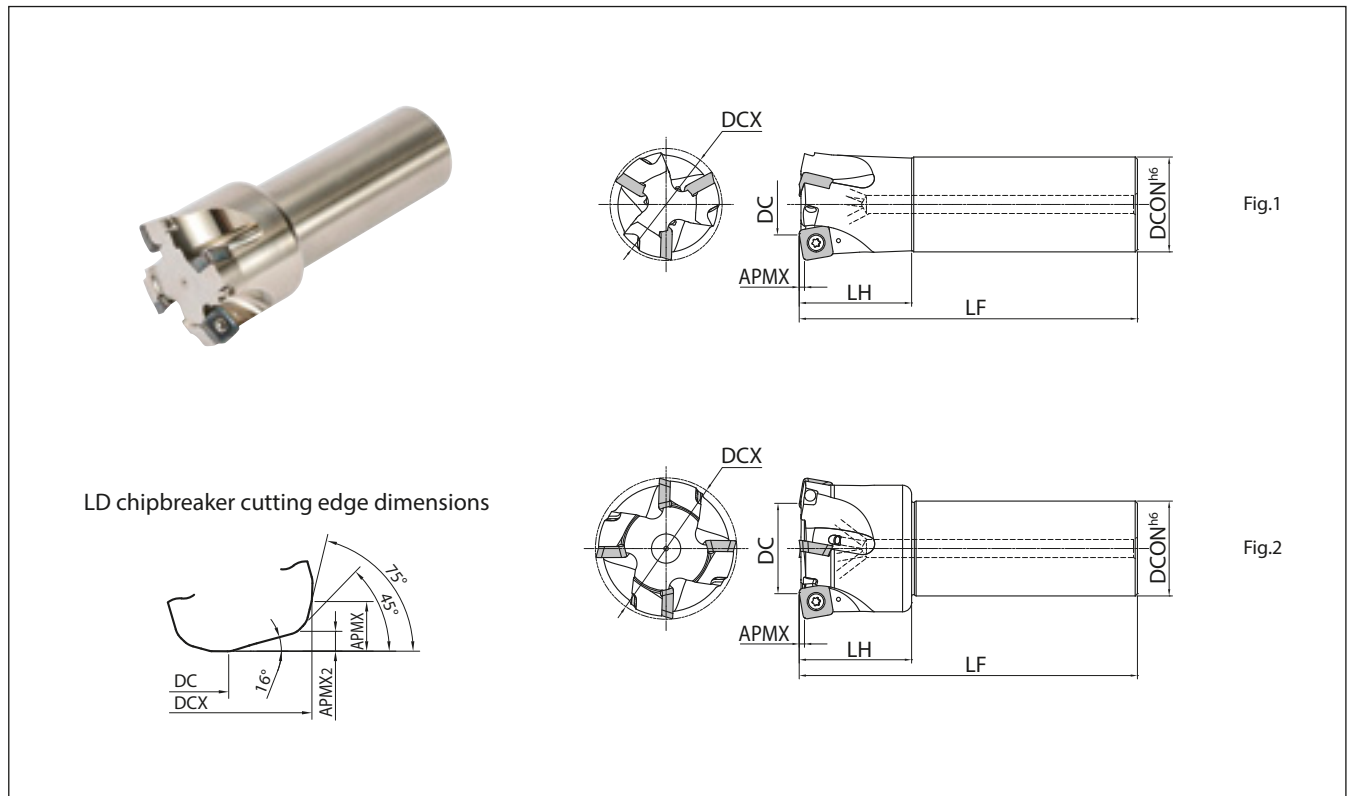
Spare parts and applicable inserts

Description	Spare parts		Applicable inserts
	Insert screw	Wrench	
			
MFH...-10-...	SB-4075TRP	DTPM-15	SOMT100420ER-GM SOMT100420ER-GH SOMT100420ER-LD SOMT100420ER-FL
	Recommended torque for insert clamp: 3.5 Nm		

Caution with maximum revolution

Set the number of revolutions per minute within the recommended cutting speed for each workpiece material.

Do not use the end mill or cutter above the maximum revolution, as centrifugal force may cause inserts or components to be ejected even under no-load conditions.



Toolholder dimensions (SOMT14 type)

Description	Availability	No. of inserts	Dimensions (mm)									Rake angle A.R.	Coolant hole	Drawing	Weight (kg)	Maximum revolution (min ⁻¹)
			DCX	GM-GH	LD	FL	DCON	LF	LH	APMX	APMX2					
MFH50-S42-14-3T	●	3	50	27	33	32	42	150	50	2 * (5)	2	+10°	Yes	Fig. 1	1.4	8,800
MFH63-S42-14-4T	●	4	63	40	46	45	42	150	50					Fig. 2	1.7	7,400
MFH80-S42-14-5T	●	5	80	57	63	62	42	150	50						2.3	6,400

* Dimension in () is when mounting LD type

● : Available

Spare parts and applicable inserts

Description	Spare parts		Applicable inserts
	Insert screw	Wrench	
			
MFH...-14-...	SB-50120TRP Recommended torque for insert clamp: 4.5 Nm	TTP-20	SOMT140S20ER-GM SOMT140S20ER-GH SOMT140S20ER-LD SOMT140S14ER-FL

Caution with maximum revolution

Set the number of revolutions per minute within the recommended cutting speed for each workpiece material.
Do not use the end mill or cutter above the maximum revolution, as centrifugal force may cause inserts or components to be ejected even under no-load conditions.

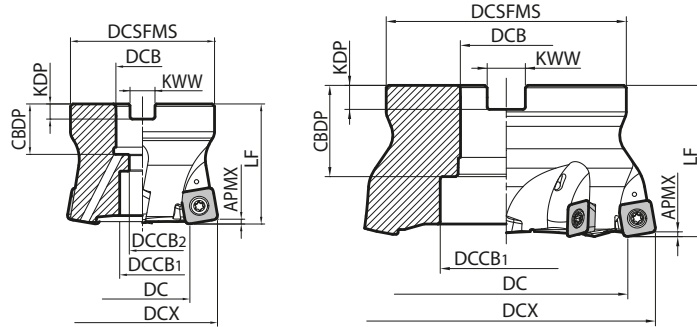


Fig.1

Fig.2

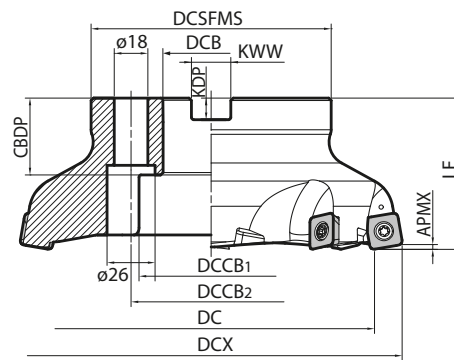


Fig.3

Toolholder dimensions (SOMT10 type)

Description	Availability	No. of inserts	Dimensions (mm)													Rake angle	Coolant hole	Drawing	Weight (kg)	Maximum revolution (min ⁻¹)	
			DCX	DC			DCSFMS	DCB	DCCB1	DCCB2	LF	CBDP	KDP	KWW	APMX	APMX2 *1					A.R.
				GM-GH	LD	FL															
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) *2	1.2	+10°	Yes	Fig. 1	0.4	10,000
050R-10-5T-M	●	5	50	33	37.5	36.5	47	22	19	11	50	21	6.3	10.4						0.4	10,000
MFH 063R-10-5T-22M	●	5	63	46	50.5	49.5	60	22	19	11	50	21	6.3	10.4						0.7	8,800
063R-10-6T-22M	●	6	63	46	50.5	49.5	60	22	19	11	50	21	6.3	10.4						0.7	8,800
063R-10-5T-27M	●	5	63	46	50.5	49.5	60	27	20	13	50	24	7	12.4						0.7	8,800
063R-10-6T-27M	●	6	63	46	50.5	49.5	60	27	20	13	50	24	7	12.4						0.7	8,800
MFH 080R-10-7T-M	●	7	80	63	67.5	66.5	76	27	20	13	63	24	7	12.4						1.6	7,600

*1 Refer to APMX₂ on page 25 *2 Dimension in () is when mounting LD type

● : Available

Caution with maximum revolution

Set the number of revolutions per minute within the recommended cutting speed for each workpiece material.
Do not use the end mill or cutter above the maximum revolution, as centrifugal force may cause inserts or components to be ejected even under no-load conditions.

Toolholder dimensions (SOMT14 type)

Description		Availability	No. of inserts	Dimensions (mm)												Rake angle	Coolant hole	Drawing	Weight (kg)	Maximum revolution (min ⁻¹)		
				DCX	DC			DCSFMS	DCB	DCCB1	DCCB2	LF	CBDP	KDP	KWW	APMX					APMX2 *1	A.R.
					GM-GH	LD	FL															
MFH	050R-14-4T-M	●	4	50	27	33	32	47	22	12	—	50	21	6.3	10.4	2 (5) *2	2	+10°	Yes	Fig. 1	0.4	8,800
MFH	063R-14-4T-22M	●	4	63	40	46	45	60	22	19	11	50	21	6.3	10.4						0.6	7,400
	063R-14-5T-22M	●	5	63	40	46	45	60	22	19	11	50	21	6.3	10.4						0.6	7,400
	063R-14-4T-27M	●	4	63	40	46	45	60	27	20	13	50	24	7	12.4						0.6	7,400
	063R-14-5T-27M	●	5	63	40	46	45	60	27	20	13	50	24	7	12.4						0.6	7,400
MFH	080R-14-5T-M	●	5	80	57	63	62	76	27	20	13	63	24	7	12.4						1.4	6,400
	080R-14-6T-M	●	6	80	57	63	62	76	27	20	13	63	24	7	12.4						1.4	6,400
MFH	100R-14-6T-M	●	6	100	77	83	82	96	32	26	17	63	28	8	14.4				Fig. 2	2.4	5,600	
	100R-14-7T-M	●	7	100	77	83	82	96	32	26	17	63	28	8	14.4					2.4	5,600	
MFH	125R-14-7T-M	●	7	125	102	108	107	100	40	55	—	63	33	9	16.4					2.8	4,800	
MFH	160R-14-8T-M	●	8	160	137	143	142	100	40	68	66.7	63	32	9	16.4				No	Fig. 3	3.7	4,200

* 1 Refer to the figure below for the APMX2. * 2 Dimension in () is when mounting LD type

● : Available

MFH050R-14-4T and MFH050R-14-4T-M have double screws.

Read the instruction manual attached to the toolholder for handling method.

Caution with maximum revolution

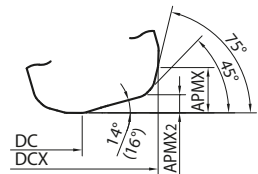
Set the number of revolutions per minute within the recommended cutting speed for each workpiece material.

Do not use the end mill or cutter above the maximum revolution, as centrifugal force may cause inserts or components to be ejected even under no-load conditions.

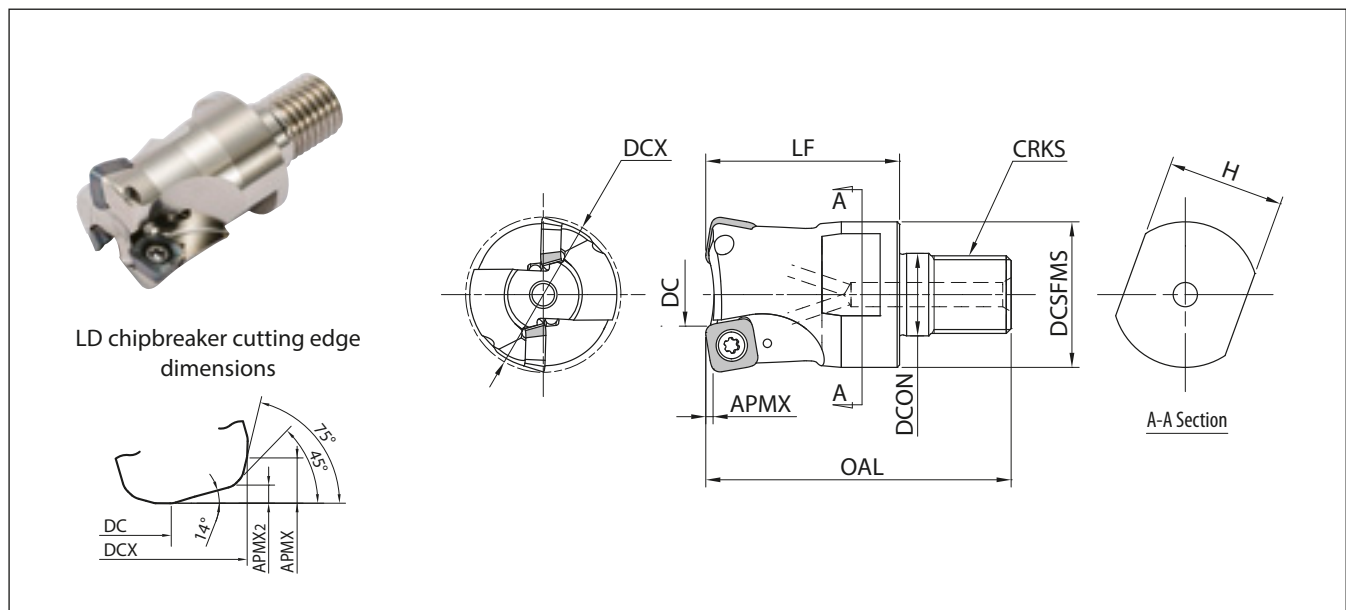
Spare parts and applicable inserts

Description	Spare parts				Applicable inserts
	Insert screw	Wrench		Arbor clamp bolt	
		DTPM 	TTP 		
MFH050R-10-...(-M)	SB-4090TRPN	DTPM-15	Recommended torque for insert clamp: 4.5 Nm	HH10×30	SOMT100420ER-GM SOMT100420ER-GH SOMT100420ER-LD SOMT100420ER-FL
MFH063R-10-...(-22M)				HH10×30	
MFH063R-10-...-27M				HH12×35	
MFH080R-10-...				HH16×40	
MFH080R-10-...-M	SB-50120TRP	TTP-20	Recommended torque for insert clamp: 3.5 Nm	HH12×35	
MFH050R-14-...(-M)				W10×31	SOMT140520ER-GM SOMT140520ER-GH SOMT140520ER-LD SOMT140514ER-FL
MFH063R-14-...(-22M)				HH10×30	
MFH063R-14-...-27M				HH12×35	
MFH080R-14-...				HH16×40	
MFH080R-14-...-M				HH12×35	
MFH100R-14-...				HH16×40	
MFH100R-14-...-M				-	
MFH125R-14-...				-	
MFH160R-14-...				-	

LD chipbreaker cutting edge dimensions



Angle in () is for SOMT14 type.



Toolholder dimensions

Description	Availability	No. of inserts	Dimensions (mm)												Rake angle	Coolant hole	Maximum revolution (min ⁻¹)
			DCX	DC			DCSFMS	DCON	OAL	LF	CRKS	H	APMX	APMX2	A.R.		
MFH 25-M12-10-2T	●	2	25	8	12.5	11.5	23	12.5	56	35	M12×P1.75	19	1.5 (3.5) *	1.2	+10°	Yes	17,000
MFH 28-M12-10-2T	●	2	28	11	15.5	14.5	23	12.5	56	35	M12×P1.75	19					15,500
MFH 32-M16-10-2T	●	2	32	15	19.5	18.5	30	17	62	40	M16×P2.0	24					14,000
MFH 32-M16-10-3T	●	3	32	15	19.5	18.5	30	17	62	40	M16×P2.0	24					14,000
MFH 35-M16-10-2T	●	2	35	18	22.5	21.5	30	17	62	40	M16×P2.0	24					13,000
MFH 35-M16-10-3T	●	3	35	18	22.5	21.5	30	17	62	40	M16×P2.0	24					13,000
MFH 40-M16-10-3T	●	3	40	23	27.5	26.5	30	17	62	40	M16×P2.0	24					11,500
MFH 40-M16-10-4T	●	4	40	23	27.5	26.5	30	17	62	40	M16×P2.0	24					11,500

* Dimension in () is when mounting LD type

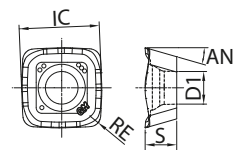
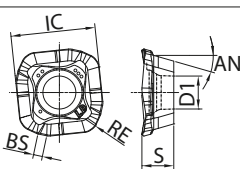
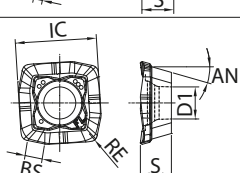
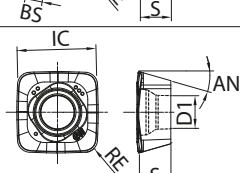
● : Available

Caution with maximum revolution

Set the number of revolutions per minute within the recommended cutting speed for each workpiece material. Do not use the end mill or cutter above the maximum revolution, as centrifugal force may cause inserts or components to be ejected even under no-load conditions.

Spare parts and applicable inserts

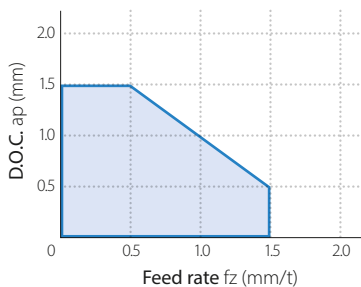
Description	Spare parts		Applicable inserts
	Insert screw	Wrench	
			
MFH...-10-...	SB-4075TRP Recommended torque for insert clamp: 3.5 Nm	DTPM-15	SOMT100420ER-GM SOMT100420ER-GH SOMT100420ER-LD SOMT100420ER-FL

Classification of usage		P	Carbon steel / Alloy steel						★	☆				
			Mould steel						★	☆				
★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice		M	Austenitic stainless steel						☆	★				
			Martensitic stainless steel							☆				★
			Precipitation hardened stainless steel							★				
		K	Gray cast iron									★		
			Nodular cast iron									★		
		S	Ni-base heat-resistant alloy							☆				★
			Titanium alloy							★				
		H	High hardness steel										★	
Insert		Description	Dimensions (mm)					Angle (°)	MEGACOAT NANO			MEGACOAT HARD	CVD coated carbide	
			IC	S	D1	BS	RE		AN	PR1825	PR1835	PR1810	PR0155	CA6535
		SOMT100420ER-GM	10.30	4.58	4.6	-	2.0	16	●	●	●	-	●	
General purpose		SOMT140520ER-GM	14.14	5.56	5.8	-	2.0	16	●	●	●	-	●	
		SOMT100420ER-LD	10.45	4.58	4.6	0.9	2.0	16	●	●	●	-	●	
Large ap		SOMT140520ER-LD	14.76	5.56	5.8	1.6	2.0	16	●	●	●	-	●	
		SOMT100420ER-FL	10.44	4.58	4.6	1.4	2.0	16	●	●	●	-	●	
Wiper edge		SOMT140514ER-FL	14.57	5.56	5.8	3.1	1.4	16	●	●	●	-	●	
		SOMT100420ER-GH	10.43	4.57	4.55	-	2.0	16	●	●	●	●	-	
Tough edge		SOMT140520ER-GH	14.17	5.56	5.8	-	2.0	16	●	●	●	●	-	

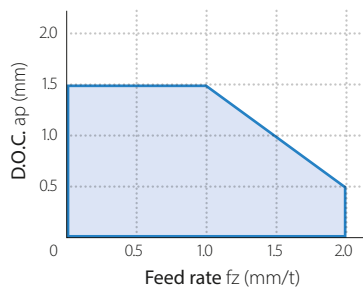
● : Available

Cutting performance MFH Harrier

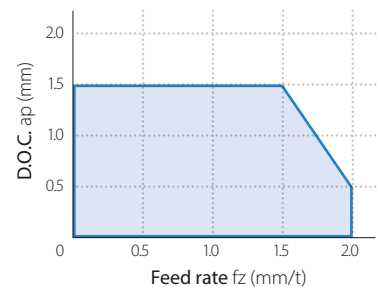
MFH25...



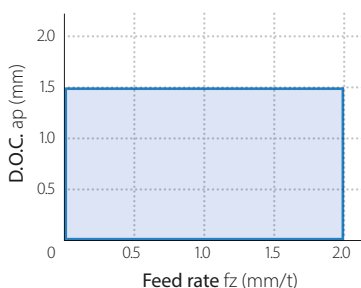
MFH32.../MFH35...



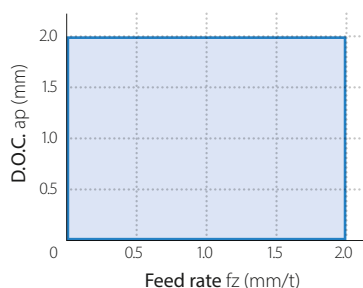
MFH40...



MFH050...~MFH080...



SOMT14 type



LD chipbreaker:

- MAX D.O.C. for LD chipbreaker is 5 mm. (3.5 mm for SOMT10 type)
- Refer to the recommended cutting conditions table for the feed rate
- End mill: Please refer to the application map above.
- Face mill: Maximum feed rate (feed per tooth) $fz = 2.0 \text{ mm/t}$.

Recommended cutting conditions MFH Harrier ★ 1st recommendation ☆ 2nd recommendation

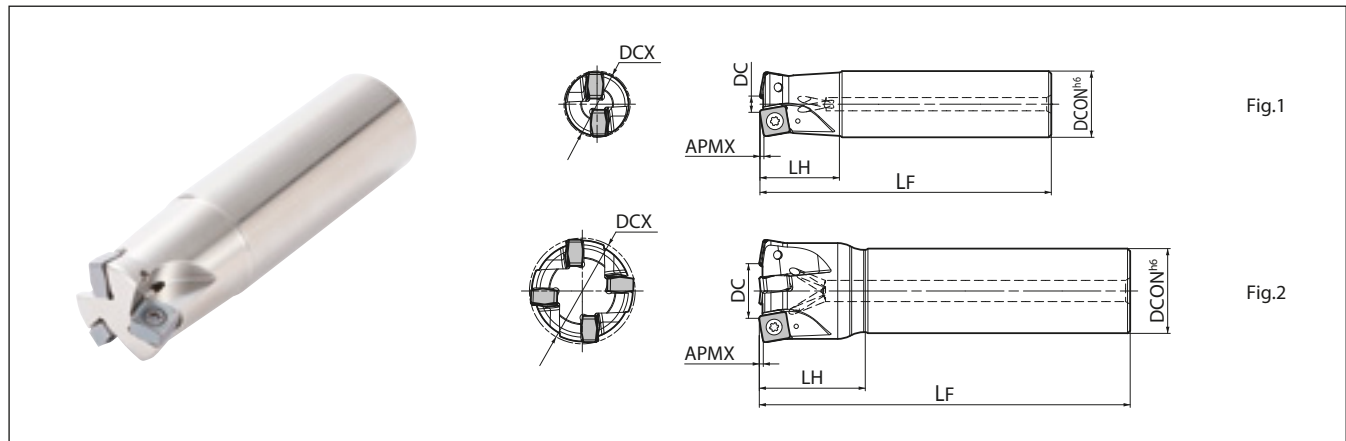
Chipbreaker	Workpiece	ap (mm)	Holder description and feed rate (fz: mm/t)					Recommended insert grade (Vc: m/min.)					
			MFH25-	MFH32-	MFH40-	MFH...R-10	MFH...-14	MEGACOAT NANO			MEGACOAT HARD	CVD coated carbide	
								PR1825	PR1835	PR1810	PR015S	CA6535	
GM GH	Carbon steel	≤1.0	0.5 – 0.8 – 1.0	0.5 – 1.0 – 1.5	0.5 – 1.2 – 1.8	0.5 – 1.5 – 2.0		★	☆	–	–	–	
	Alloy steel	≤1.5	0.2 – 0.4 – 0.5	0.3 – 0.7 – 1.0	0.4 – 1.0 – 1.5			120 – 180 – 250	120 – 180 – 250	–	–	–	
	Mould steel (- 40HRC) (40 – 50HRC) (50 – 55HRC) (55 – 60HRC)	≤1.0	0.5 – 0.8 – 1.0	0.5 – 1.0 – 1.5	0.5 – 1.2 – 1.8	0.5 – 1.5 – 2.0		★	☆	–	–	–	
		≤1.5	0.2 – 0.4 – 0.5	0.3 – 0.7 – 1.0	0.4 – 1.0 – 1.5			100 – 160 – 220	100 – 160 – 220	–	–	–	
		≤1.0	0.5 – 0.7 – 0.8	0.5 – 0.8 – 1.0	0.5 – 1.0 – 1.6	0.5 – 1.2 – 1.8		☆	☆	–	★	–	
		≤1.5	0.2 – 0.3 – 0.4	0.3 – 0.6 – 0.8	0.4 – 0.8 – 1.2			80 – 140 – 180	80 – 140 – 180	–	80 – 140 – 180	–	
	Austenitic stainless steel	≤1.0	0.15 – 0.3 – 0.5	0.2 – 0.5 – 0.8	0.2 – 0.6 – 0.9	0.2 – 0.7 – 1.0		☆	–	–	★	–	
	≤1.5	0.15 – 0.2 – 0.25	0.2 – 0.3 – 0.45	0.2 – 0.5 – 0.7	60 – 100 – 130			–	–	60 – 100 – 130	–		
	Precipitation hardened stainless steel	≤1.0	0.15 – 0.25 – 0.4	0.15 – 0.35 – 0.6	0.15 – 0.4 – 0.7	0.2 – 0.5 – 0.8		☆	–	–	★	–	
	≤1.5	0.15 – 0.25 – 0.4	0.15 – 0.35 – 0.6	0.15 – 0.4 – 0.7	50 – 70 – 100			–	–	50 – 70 – 100	–		
Gray cast iron	≤1.0	0.03 – 0.06 – 0.1 (ap ≤ 1.0mm) (* Recommended only for GH chipbreaker)					–	–	–	★	–		
Nodular cast iron	≤1.0	0.5 – 0.7 – 0.8	0.5 – 0.8 – 1.2	0.5 – 1.0 – 1.6	0.5 – 1.2 – 1.8		GM☆	GM☆	–	–	–		
Ni-base heat-resistant alloy	≤1.5	0.2 – 0.3 – 0.4	0.3 – 0.6 – 0.8	0.4 – 0.8 – 1.2			100 – 160 – 200	100 – 160 – 200	–	–	–		
Titanium alloy	≤1.0	0.5 – 0.7 – 0.8	0.5 – 0.8 – 1.2	0.5 – 1.0 – 1.6	0.5 – 1.2 – 1.8		–	☆	–	–	★		
Carbon steel	≤1.5	0.2 – 0.3 – 0.4	0.3 – 0.6 – 0.8	0.4 – 0.8 – 1.2			–	150 – 200 – 250	–	–	180 – 240 – 300		
LD	Alloy steel	≤1.0	0.5 – 0.7 – 0.8	0.5 – 0.8 – 1.2	0.5 – 1.0 – 1.6	0.5 – 1.2 – 1.8		–	★	–	–	–	
	≤1.5	0.2 – 0.3 – 0.4	0.3 – 0.6 – 0.8	0.4 – 0.8 – 1.2	–			90 – 120 – 150	–	–	–		
	Mould steel (- 40HRC)	≤1.0	0.5 – 0.8 – 1.0	0.5 – 1.0 – 1.5	0.5 – 1.2 – 1.8	0.5 – 1.5 – 2.0		–	–	★	–	–	
	≤1.5	0.2 – 0.3 – 0.4	0.3 – 0.6 – 0.8	0.4 – 0.8 – 1.2	–			–	120 – 180 – 250	–	–		
	Mould steel (40 – 50HRC)	≤1.0	0.5 – 0.8 – 1.0	0.5 – 1.0 – 1.5	0.5 – 1.2 – 1.8	0.5 – 1.2 – 1.8		–	–	★	–	–	
	≤1.5	0.2 – 0.4 – 0.5	0.3 – 0.7 – 1.0	0.4 – 1.0 – 1.5	–			–	100 – 150 – 200	–	–		
	Austenitic stainless steel	≤1.5	0.2 – 0.3 – 0.4	0.3 – 0.6 – 0.8	0.4 – 0.8 – 1.2	0.2 – 0.8 – 1.2		–	☆	–	–	–	
	≤1.0	0.2 – 0.4 – 0.6	0.2 – 0.5 – 0.9	0.2 – 0.6 – 1.0	–			20 – 30 – 50	–	–	20 – 30 – 50		
	Gray cast iron	≤1.5	0.15 – 0.2 – 0.3	0.2 – 0.4 – 0.6	0.2 – 0.5 – 0.8	0.2 – 0.8 – 1.2		–	GM★	GM☆	–	–	
	Ni-base heat-resistant alloy	≤1.0	0.2 – 0.4 – 0.6	0.2 – 0.5 – 0.9	0.2 – 0.6 – 1.0			–	40 – 60 – 80	30 – 50 – 70	–	–	
	Titanium alloy	≤1.5	0.15 – 0.2 – 0.3	0.2 – 0.4 – 0.6	0.2 – 0.5 – 0.8	0.5 – 1.5 – 2.0		–	–	–	–	–	
	Carbon steel	≤1.0	0.5 – 0.8 – 1.0	0.5 – 1.0 – 1.5	0.5 – 1.2 – 1.8			0.5 – 1.5 – 2.0	120 – 180 – 250	120 – 180 – 250	–	–	–
		≤2.0	0.06 – 0.1 – 0.2	0.06 – 0.15 – 0.3	0.06 – 0.2 – 0.3			0.06 – 0.2 – 0.3					
		≤3.5	–	–	–			–					
≤5.0		–	–	–	–								
Alloy steel	≤1.0	0.5 – 0.8 – 1.0	0.5 – 1.0 – 1.5	0.5 – 1.2 – 1.8	0.5 – 1.5 – 2.0	100 – 160 – 220	100 – 160 – 220	–	–	–			
	≤2.0	0.06 – 0.1 – 0.2	0.06 – 0.15 – 0.3	0.06 – 0.2 – 0.3	0.06 – 0.2 – 0.3								
	≤3.5	–	–	–	–								
	≤5.0	–	–	–	–								
Mould steel (- 40HRC)	≤1.0	0.5 – 0.7 – 0.8	0.5 – 0.8 – 1.2	0.5 – 1.0 – 1.6	0.5 – 1.2 – 1.8	80 – 140 – 180	80 – 140 – 180	–	–	–			
	≤2.0	0.06 – 0.08 – 0.15	0.06 – 0.1 – 0.2	0.06 – 0.15 – 0.2	0.06 – 0.15 – 0.2								
	≤3.5	–	–	–	–								
	≤5.0	–	–	–	–								
Mould steel (40 – 50HRC)	≤1.0	0.2 – 0.3 – 0.5	0.2 – 0.5 – 0.8	0.2 – 0.6 – 0.9	0.2 – 0.7 – 1.0	60 – 100 – 130	60 – 100 – 130	–	–	–			
	≤2.0	0.03 – 0.05 – 0.1	0.03 – 0.08 – 0.15	0.03 – 0.1 – 0.15	0.03 – 0.1 – 0.15								
	≤3.5	–	–	–	–								
	≤5.0	–	–	–	–								
Austenitic stainless steel	≤1.0	0.5 – 0.7 – 0.8	0.5 – 0.8 – 1.2	0.5 – 1.0 – 1.6	0.5 – 1.2 – 1.8	100 – 160 – 200	100 – 160 – 200	–	–	–			
	≤2.0	0.06 – 0.08 – 0.15	0.06 – 0.1 – 0.2	0.06 – 0.15 – 0.2	0.06 – 0.15 – 0.2								
	≤3.5	–	–	–	–								
	≤5.0	–	–	–	–								
Martensitic stainless steel	≤1.0	0.5 – 0.7 – 0.8	0.5 – 0.8 – 1.2	0.5 – 1.0 – 1.6	0.5 – 1.2 – 1.8	–	150 – 200 – 250	–	–	★			
	≤2.0	0.06 – 0.08 – 0.15	0.06 – 0.1 – 0.2	0.06 – 0.15 – 0.2	0.06 – 0.15 – 0.2								
	≤3.5	–	–	–	–								
	≤5.0	–	–	–	–								
Precipitation hardened stainless steel	≤1.0	0.5 – 0.7 – 0.8	0.5 – 0.8 – 1.2	0.5 – 1.0 – 1.6	0.5 – 1.2 – 1.8	–	90 – 120 – 150	–	–	–			
	≤2.0	0.06 – 0.08 – 0.15	0.06 – 0.1 – 0.2	0.06 – 0.15 – 0.2	0.06 – 0.15 – 0.2								
	≤3.5	–	–	–	–								
	≤5.0	–	–	–	–								
Gray cast iron	≤1.0	0.5 – 0.8 – 1.0	0.5 – 1.0 – 1.5	0.5 – 1.2 – 1.8	0.5 – 1.5 – 2.0	–	–	★	–	–			
	≤2.0	0.06 – 0.1 – 0.2	0.06 – 0.15 – 0.3	0.06 – 0.2 – 0.3	0.06 – 0.2 – 0.3								
	≤3.5	–	–	–	–								
	≤5.0	–	–	–	–								
Nodular cast iron	≤1.0	0.5 – 0.7 – 0.8	0.5 – 0.8 – 1.2	0.5 – 1.0 – 1.6	0.5 – 1.2 – 1.8	–	–	★	–	–			
	≤2.0	0.06 – 0.08 – 0.15	0.06 – 0.1 – 0.2	0.06 – 0.15 – 0.2	0.06 – 0.15 – 0.2								
	≤3.5	–	–	–	–								
	≤5.0	–	–	–	–								
Ni-base heat-resistant alloy	≤1.0	0.2 – 0.4 – 0.6	0.2 – 0.5 – 0.9	0.2 – 0.6 – 1.0	0.2 – 0.8 – 1.2	–	☆	–	–	★			
	≤2.0	0.03 – 0.05 – 0.1	0.03 – 0.08 – 0.15	0.03 – 0.1 – 0.15	0.03 – 0.1 – 0.15								
	≤3.5	–	–	–	–								
	≤5.0	–	–	–	–								
Titanium alloy	≤1.0	0.2 – 0.4 – 0.6	0.2 – 0.5 – 0.9	0.2 – 0.6 – 1.0	0.2 – 0.8 – 1.2	–	★	☆	–	–			
	≤2.0	0.03 – 0.05 – 0.1	0.03 – 0.08 – 0.15	0.03 – 0.1 – 0.15	0.03 – 0.1 – 0.15								
	≤3.5	–	–	–	–								
	≤5.0	–	–	–	–								

Recommended cutting conditions MFH Harrier ★ 1st recommendation ☆ 2nd recommendation

Chipbreaker	Workpiece	Holder description and feed rate (fz: mm/t)					Recommended insert grade (Vc: m/min.)					
		ap (mm)	MFH25-	MFH32-	MFH40-	MFH...R-10	MFH...-14	MEGACOAT NANO EX			MEGACOAT HARD	CVD coated carbide
								PR1825	PR1835	PR1810	PR015S	CA6535
FL	Carbon steel (SxxC)	≤1.0	0.5 – 0.8 – 1.0	0.5 – 1.0 – 1.5	0.5 – 1.2 – 1.8	0.5 – 1.5 – 2.0	☆ 120 – 180 – 250	★ 120 – 180 – 250	–	–	–	
		≤1.5	0.2 – 0.4 – 0.5	0.3 – 0.7 – 1.0	0.4 – 1.0 – 1.5		–	–	–			
	Alloy steel (SCM)	≤1.0	0.5 – 0.8 – 1.0	0.5 – 1.0 – 1.5	0.5 – 1.2 – 1.8	0.5 – 1.5 – 2.0	☆ 100 – 160 – 220	★ 100 – 160 – 220	–	–	–	
		≤1.5	0.2 – 0.4 – 0.5	0.3 – 0.7 – 1.0	0.4 – 1.0 – 1.5		–	–	–			
	Mould steel (SKD) (- 40 HRC)	≤1.0	0.5 – 0.7 – 0.8	0.5 – 0.8 – 1.2	0.5 – 1.0 – 1.6	0.5 – 1.2 – 1.8	☆ 80 – 140 – 180	★ 80 – 140 – 180	–	–	–	
		≤1.5	0.2 – 0.3 – 0.4	0.3 – 0.6 – 0.8	0.4 – 0.8 – 1.2		–	–	–			
	Die steel (SKD) (40 - 50 HRC)	≤1.0	0.15 – 0.3 – 0.5	0.2 – 0.5 – 0.8	0.2 – 0.6 – 0.9	0.2 – 0.7 – 1.0	☆ 60 – 100 – 130	★ 60 – 100 – 130	–	–	–	
		≤1.5	0.15 – 0.2 – 0.25	0.2 – 0.3 – 0.45	0.2 – 0.5 – 0.7		–	–	–			
	Austenitic stainless steel	≤1.0	0.5 – 0.7 – 0.8	0.5 – 0.8 – 1.2	0.5 – 1.0 – 1.6	0.5 – 1.2 – 1.8	★ 100 – 160 – 200	☆ 100 – 160 – 200	–	–	–	
		≤1.5	0.2 – 0.3 – 0.4	0.3 – 0.6 – 0.8	0.4 – 0.8 – 1.2		–	–	–			
	Martensitic stainless steel	≤1.0	0.5 – 0.7 – 0.8	0.5 – 0.8 – 1.2	0.5 – 1.0 – 1.6	0.5 – 1.2 – 1.8	☆ 150 – 200 – 250	–	–	–	★ 180 – 240 – 300	
		≤1.5	0.2 – 0.3 – 0.4	0.3 – 0.6 – 0.8	0.4 – 0.8 – 1.2		–	–	–			
	Precipitation hardened stainless steel	≤1.0	0.5 – 0.7 – 0.8	0.5 – 0.8 – 1.2	0.5 – 1.0 – 1.6	0.5 – 1.2 – 1.8	★ 90 – 120 – 150	–	–	–	–	
		≤1.5	0.2 – 0.3 – 0.4	0.3 – 0.6 – 0.8	0.4 – 0.8 – 1.2		–	–	–			
	Gray cast iron	≤1.0	0.5 – 0.8 – 1.0	0.5 – 1.0 – 1.5	0.5 – 1.2 – 1.8	0.5 – 1.5 – 2.0	–	–	★ 120 – 180 – 250	–	–	
		≤1.5	0.2 – 0.4 – 0.5	0.3 – 0.7 – 1.0	0.4 – 1.0 – 1.5		–	–	–			
	Nodular cast iron	≤1.0	0.5 – 0.7 – 0.8	0.5 – 0.8 – 1.2	0.5 – 1.0 – 1.6	0.5 – 1.2 – 1.8	–	–	★ 100 – 150 – 200	–	–	
		≤1.5	0.2 – 0.3 – 0.4	0.3 – 0.6 – 0.8	0.4 – 0.8 – 1.2		–	–	–			
Ni-base heat-resistant alloy	≤1.0	0.2 – 0.4 – 0.6	0.2 – 0.5 – 0.9	0.2 – 0.6 – 1.0	0.2 – 0.8 – 1.2	☆ 20 – 30 – 50	–	–	–	★ 20 – 30 – 50		
	≤1.5	0.15 – 0.2 – 0.3	0.2 – 0.4 – 0.6	0.2 – 0.5 – 0.8		–	–	–				
Titanium alloy	≤1.0	0.2 – 0.4 – 0.6	0.2 – 0.5 – 0.9	0.2 – 0.6 – 1.0	0.2 – 0.8 – 1.2	★ 40 – 60 – 80	–	☆ 30 – 50 – 70	–	–		
	≤1.5	0.15 – 0.2 – 0.3	0.2 – 0.4 – 0.6	0.2 – 0.5 – 0.8		–	–	–				

- The numbers shown in **bold font** indicate the recommended standard cutting conditions. Adjust the cutting speed and feed rate within the specified range according to the actual machining conditions.
- Machining with coolant is recommended for precipitation hardened stainless steel, Ni-base heat-resistant alloy, and titanium alloy.
- Machining with coolant 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 25% of recommended cutting conditions.
- Centre-through coolant is recommended for slotting.
- For long shank end mills, 75% or less of the recommended conditions is recommended for both D.O.C. and feed rate.

MFH Harrier-D End mill



Toolholder dimensions

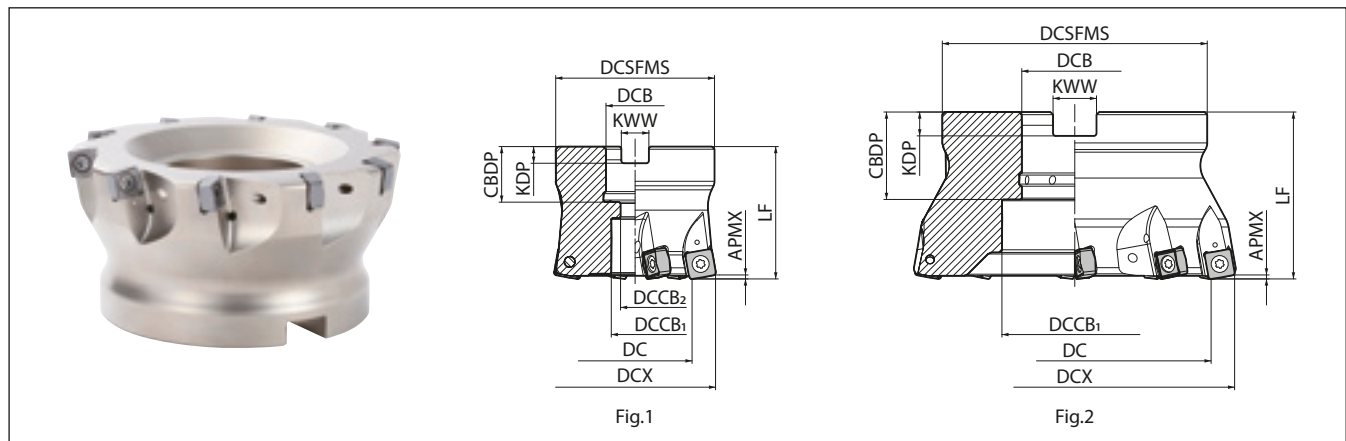
Description		Availability	No. of inserts	Dimensions (mm)					Rake angle	Coolant hole	Drawing	Weight (kg)	Maximum revolution (min ⁻¹)	
				DCX	DC	DCON	LF	LH	APMX					A.R.
MFH	25-S25-10-2T-D	●	2	25	8.5	25	110	30	1.5	—6°	Yes	Fig.1	0.4	10,800
	32-S32-10-3T-D	●	3	32	15	32	120	40					0.6	9,600
	40-S32-10-4T-D	●	4	40	22.5		140						0.8	8,500

Caution with maximum revolution

Set the number of revolutions per minute within the recommended cutting speed for each workpiece material.
Do not use the end mill or cutter above the maximum revolution, as centrifugal force may cause inserts or components to be ejected even under no-load conditions.

● : Available

MFH Harrier-D Face mill



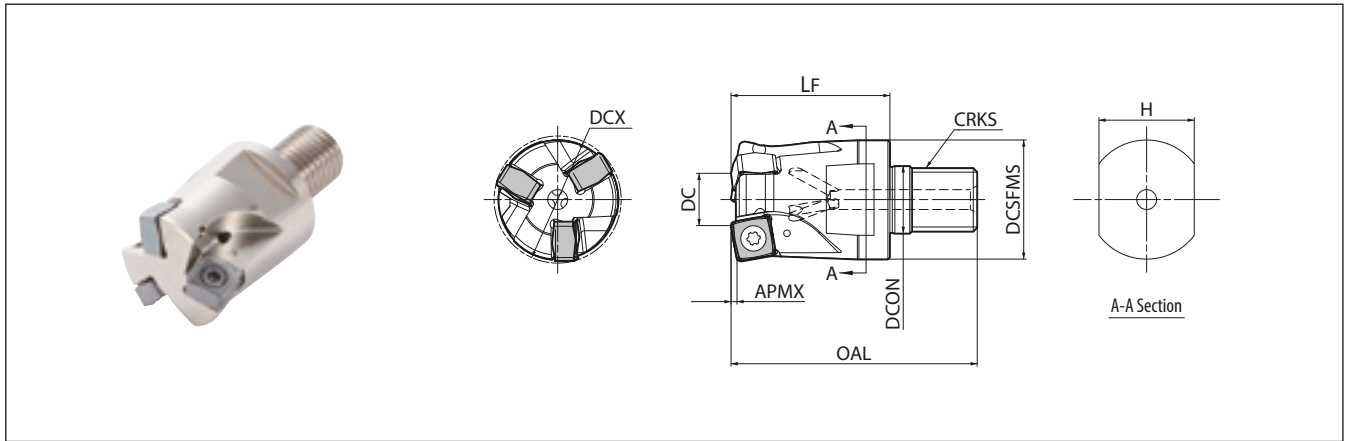
Toolholder dimensions

Description	Availability	No. of inserts	Dimensions (mm)											Rake angle A.R.	Coolant hole	Drawing	Weight (kg)	Maximum revolution (min ⁻¹)
			DCX	DC	DCSFMS	DCB	DCCB2	DCCB2	LF	CBDP	KDP	KWW	APMX					
MFH 050R-10-5T-D-M	●	5	50	32.5	48	22	18	11	50	21	6.3	10.4	1.5	-6°	Yes	Fig.1	0.4	7,600
063R-10-6T-D-M	●	6	63	45.5	60												0.8	6,800
080R-10-7T-D-M	●	7	80	62.5	76	27	20	13	63	24	7	12.4					1.5	6,000
100R-10-8T-D-M	●	8	100	82.5	96	32	26	17		28	8	14.4					2.5	5,400
125R-10-10T-D-M	●	10	125	107.5	100	40	55	-		33	9	16.4				Fig.2	3.1	4,800

Caution with maximum revolution

Set the number of revolutions per minute within the recommended cutting speed for each workpiece material.
Do not use the end mill or cutter above the maximum revolution, as centrifugal force may cause inserts or components to be ejected even under no-load conditions.

● : Available



Toolholder dimensions

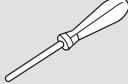
Description		Availability	No. of inserts	Dimensions (mm)								Rake angle	Coolant hole	Weight (kg)	Maximum revolution (min ⁻¹)	
				DCX	DC	DCSFMS	DCON	OAL	LF	CRKS	H	APMX				A.R.
MFH	25-M12-10-2T-D	●	2	25	8.5	23	12.5	56	35	M12×P1.75	19	1.5	−6°	Yes	0.1	10,800
	32-M16-10-3T-D	●	3	32	15	30	17	62	40	M16×P2.0	24				0.2	9,600
	35-M16-10-3T-D	●	3	35	17.5										0.2	9,100
	40-M16-10-4T-D	●	4	40	22.5										0.2	8,500

Caution with maximum revolution

Set the number of revolutions per minute within the recommended cutting speed for each workpiece material.
Do not use the end mill or cutter above the maximum revolution, as centrifugal force may cause inserts or components to be ejected even under no-load conditions.

● : Available

Spare parts

Description	Insert screw	Wrench	Arbor clamp bolt
			
MFH 050R-10-ST-D-M	SB-4090TRP	DTPM-15	HH10×30
063R-10-6T-D-M			HH12×35
080R-10-7T-D-M			HH16×40
100R-10-8T-D-M			-
125R-10-10T-D-M			HH16×40
080R-10-7T-D			-
100R-10-8T-D			-
125R-10-10T-D			-

Recommended torque for insert clamp: 3.5 Nm

Applicable inserts MFH Harrier-D

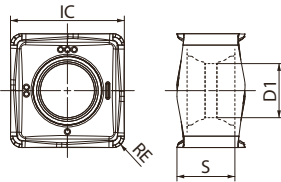
Usage classification	P	Carbon steel/Alloy steel	★	☆	
		Mould steel	★	☆	
	M	Austenitic stainless steel	☆	★	
		Martensitic stainless steel		☆	
		Precipitation hardened stainless steel		★	
	K	Gray cast iron			★
		Nodular cast iron			★
	S	Ni-base heat-resistant alloy		☆	
Titanium alloy			★	☆	
H	Hardened materials				

★ : Roughing / 1st choice

☆ : Roughing / 2nd choice

■ : Finishing / 1st choice

□ : Finishing / 2nd choice

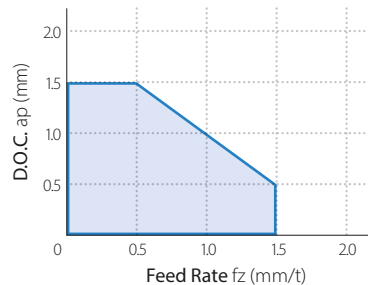
Insert		Description	Dimensions (mm)					MEGACOAT NANO EX		
			IC	S	D1	BS	RE	PR1825	PR1835	PR1810
		SNMU100410ER-GM	10.0	5.09	4.72	-	1.0	●	●	●

General purpose

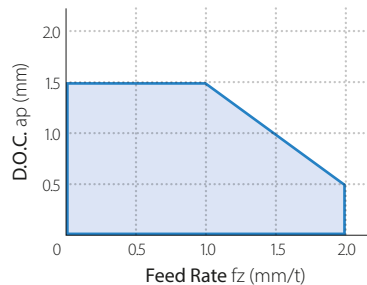
● : Available

Cutting performance MFH Harrier-D

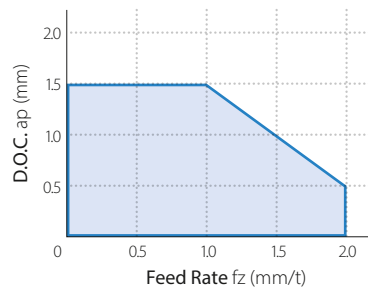
MFH25...



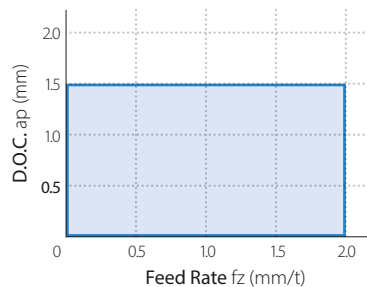
MFH32.../MFH35...



MFH40...



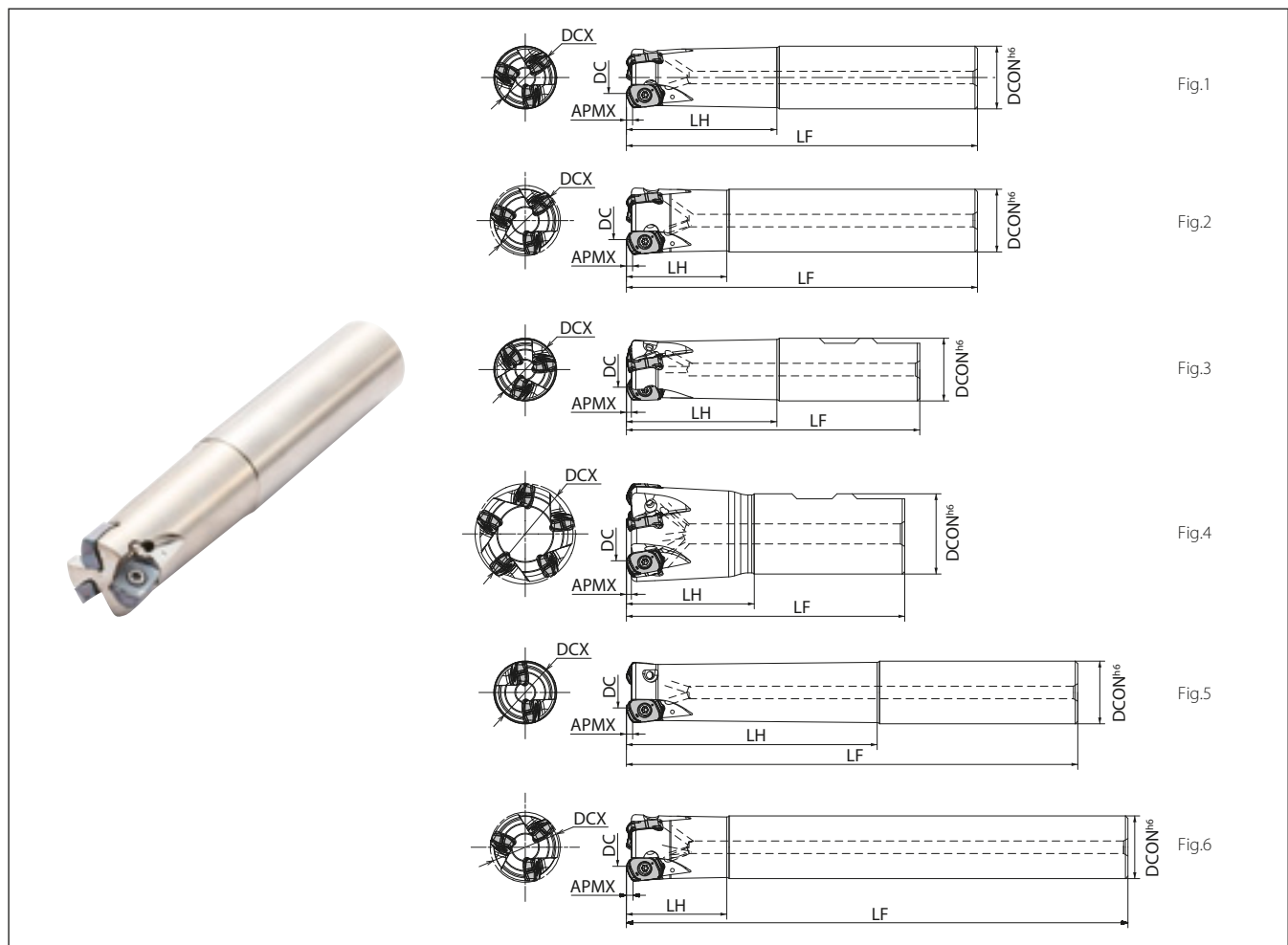
Face mill



- End Mill: Please refer to the application map above.
- Face Mill: Maximum feed rate (feed per tooth)
 $f_z = 2.0 \text{ mm/t}$

Chipbreaker	Workpiece	Holder description and feed rate (fz: mm/t)					Recommended insert grade (vc: m/min.)		
		ap (mm)	MFH25...D	MFH32...D	MFH40...D	MFH...R...	MEGACOAT NANO EX		
							PR1825	PR1835	PR1810
GM	Carbon steel	≤1.0	0.5 – 0.8 – 1.0	0.5 – 1.0 – 1.5	0.5 – 1.2 – 1.8	0.5 – 1.5 – 2.0	★	☆	–
		≤1.5	0.2 – 0.4 – 0.5	0.3 – 0.7 – 1.0	0.4 – 1.0 – 1.5	0.5 – 1.5 – 2.0	120 – 180 – 250	120 – 180 – 250	–
	Alloy steel	≤1.0	0.5 – 0.8 – 1.0	0.5 – 1.0 – 1.5	0.5 – 1.2 – 1.8	0.5 – 1.5 – 2.0	★	☆	–
		≤1.5	0.2 – 0.4 – 0.5	0.3 – 0.7 – 1.0	0.4 – 1.0 – 1.5	0.5 – 1.5 – 2.0	100 – 160 – 220	100 – 160 – 220	–
	Mould steel (- 40HRC)	≤1.0	0.5 – 0.7 – 0.8	0.5 – 0.8 – 1.2	0.5 – 1.0 – 1.6	0.5 – 1.2 – 1.8	★	☆	–
		≤1.5	0.2 – 0.3 – 0.4	0.3 – 0.6 – 0.8	0.4 – 0.8 – 1.2	0.5 – 1.2 – 1.8	80 – 140 – 180	80 – 140 – 180	–
	Mould steel (40 – 50HRC)	≤1.0	0.15 – 0.3 – 0.5	0.2 – 0.5 – 0.8	0.2 – 0.6 – 0.9	0.2 – 0.7 – 1.0	★	–	–
		≤1.5	0.15 – 0.2 – 0.25	0.2 – 0.3 – 0.45	0.2 – 0.5 – 0.7	0.2 – 0.7 – 1.0	60 – 100 – 130	–	–
	Mould steel (50 – 55HRC)	≤1.0	0.15 – 0.25 – 0.4	0.15 – 0.35 – 0.6	0.15 – 0.4 – 0.7	0.2 – 0.5 – 0.8	★	–	–
							50 – 70 – 100	–	–
	Austenitic stainless steel	≤1.0	0.5 – 0.7 – 0.8	0.5 – 0.8 – 1.2	0.5 – 1.0 – 1.6	0.5 – 1.2 – 1.8	☆	★	–
		≤1.5	0.2 – 0.3 – 0.4	0.3 – 0.6 – 0.8	0.4 – 0.8 – 1.2	0.5 – 1.2 – 1.8	100 – 160 – 200	100 – 160 – 200	–
	Martensitic stainless steel	≤1.0	0.5 – 0.7 – 0.8	0.5 – 0.8 – 1.2	0.5 – 1.0 – 1.6	0.5 – 1.2 – 1.8	–	★	–
		≤1.5	0.2 – 0.3 – 0.4	0.3 – 0.6 – 0.8	0.4 – 0.8 – 1.2	0.5 – 1.2 – 1.8	–	150 – 200 – 250	–
	Precipitation hardened stainless steel	≤1.0	0.5 – 0.7 – 0.8	0.5 – 0.8 – 1.2	0.5 – 1.0 – 1.6	0.5 – 1.2 – 1.8	–	★	–
		≤1.5	0.2 – 0.3 – 0.4	0.3 – 0.6 – 0.8	0.4 – 0.8 – 1.2	0.5 – 1.2 – 1.8	–	90 – 120 – 150	–
	Gray cast iron	≤1.0	0.5 – 0.8 – 1.0	0.5 – 1.0 – 1.5	0.5 – 1.2 – 1.8	0.5 – 1.5 – 2.0	–	–	★
		≤1.5	0.2 – 0.4 – 0.5	0.3 – 0.7 – 1.0	0.4 – 1.0 – 1.5	0.5 – 1.5 – 2.0	–	–	120 – 180 – 250
	Nodular cast iron	≤1.0	0.5 – 0.7 – 0.8	0.5 – 0.8 – 1.2	0.5 – 1.0 – 1.6	0.5 – 1.2 – 1.8	–	–	★
		≤1.5	0.2 – 0.3 – 0.4	0.3 – 0.6 – 0.8	0.4 – 0.8 – 1.2	0.5 – 1.2 – 1.8	–	–	100 – 150 – 200
	Ni-base heat-resistant alloy	≤1.0	0.2 – 0.4 – 0.6	0.2 – 0.5 – 0.9	0.2 – 0.6 – 1.0	0.2 – 0.8 – 1.2	–	★	–
		≤1.5	0.15 – 0.2 – 0.3	0.2 – 0.4 – 0.6	0.2 – 0.5 – 0.8	0.2 – 0.8 – 1.2	–	20 – 30 – 50	–
	Titanium alloy	≤1.0	0.2 – 0.4 – 0.6	0.2 – 0.5 – 0.9	0.2 – 0.6 – 1.0	0.2 – 0.8 – 1.2	–	★	–
		≤1.5	0.15 – 0.2 – 0.3	0.2 – 0.4 – 0.6	0.2 – 0.5 – 0.8	0.2 – 0.8 – 1.2	–	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.
- 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 25% of recommended cutting conditions. Slotting is not recommended in this situation.
- Centre-through coolant is recommended for slotting.
- Slotting or pocketing are not recommended for face mill types.
- For face milling, it is recommended that width of cut should be set to 75% or less of the cutting diameter.


Toolholder dimensions

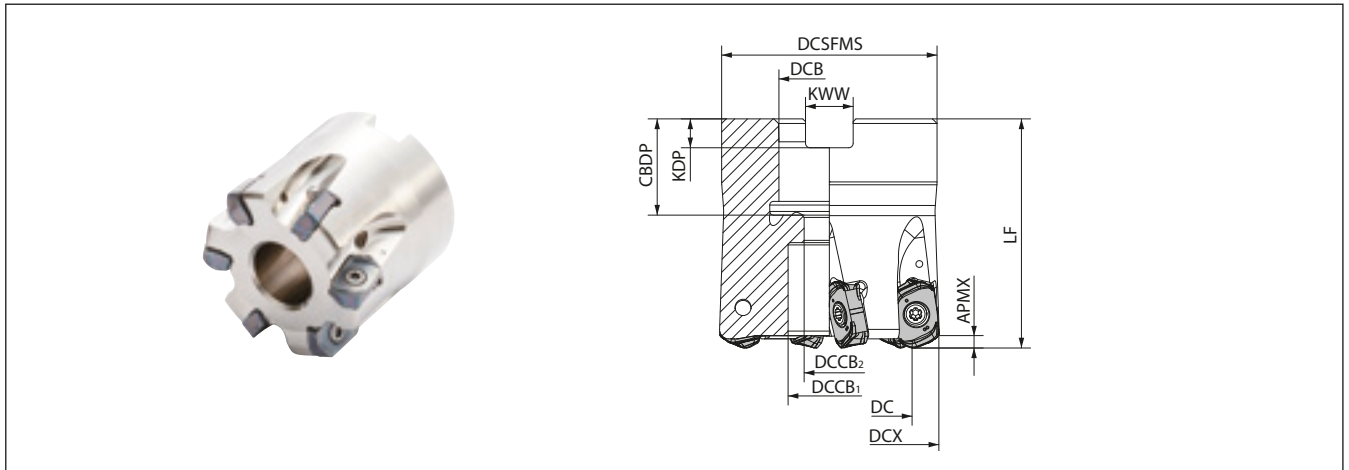
Shank	Description		Availability	No. of inserts	Dimensions (mm)						Rake angle	Coolant Hole	Shape	Weight (kg)	Maximum revolution (Min ⁻¹)	
					DCX	DC	DCON	LH	LF	APMX	A.R.					
Standard shank (Cylindrical)	MFH	25-S25-04-2T	●	2	25	14	25	60	140	2.5	-10°	Yes	Fig. 1	0.5	12,700	
		25-S25-04-3T	●	3										0.5		
		32-S32-04-4T	●	4	32	21	32	70	150					0.8		11,200
		32-S32-04-5T	●	5										0.8		
		Over size shank (Cylindrical)	MFH	22-S20-04-2T	●	2	22	11	20					30		130
28-S25-04-3T	●			3	28	17	25	40	140	0.5	12,000					
28-S25-04-4T	●			4						35		24	32	50	150	0.5
35-S32-04-4T	●				0.8	10,700										
35-S32-04-5T	●			5	40		29	0.8								
40-S32-04-5T	●					0.9		10,000								
40-S32-04-6T	●			6	0.9											
Standard shank (Weldon)	MFH			25-W25-04-2T	●	2	25	14	25	60	117	2.5	-10°	Yes	Fig. 3	0.4
		25-W25-04-3T	●	3	0.4											
		32-W32-04-4T	●	4	32	21	32	70	131	0.7	11,200					
		32-W32-04-5T	●	5						40						29
		40-W32-04-5T	●		6	Fig. 4	0.7	10,000								
		40-W32-04-6T	●	0.7												
		Long shank (Cylindrical)	MFH	25-S25-04-2T-180	●	2	25	14	25	100	180				2.5	-10°
25-S25-04-3T-180	●			3	0.6											
28-S25-04-3T-200	●			4	28	17	32	40	200	Fig. 6	0.7	12,000				
32-S32-04-4T-200	●										1.1		11,200			
35-S32-04-4T-200	●			4	35	24	32	50	250	Fig. 6	1.1					
40-S32-04-5T-250	●										5	40	29	1.5		

Caution with maximum revolution

Set the number of revolutions per minute within the recommended cutting speed for each workpiece material.

Do not use the end mill or cutter above the maximum revolution, as centrifugal force may cause inserts or components to be ejected even under no-load conditions.

● : Available



Toolholder dimensions

Description		Availability	No. of Inserts	Dimensions (mm)										Rake angle		Coolant hole	Weight (kg)	Maximum revolution (Min ⁻¹)	
				DCX	DC	DCSFMS	DCB	DCCB1	DCCB2	LF	CBDP	KDP	KWW	APMX	A.R.				
MFH	040R-04-ST-M	●	5	40	29	38	16	15	9	40	19	5.6	8.4	2.5	−10°	Yes	0.2	10,000	
	040R-04-6T-M	●	6														50		39
	050R-04-6T-M	●		7	52	41	63	52	60	27	20	13	24					7.0	
	050R-04-7T-M	●	6														52		41
	052R-04-6T-M	●		7	63	52	60	27	20	13	24	7.0	12.4					0.5	
	052R-04-7T-M	●	9														63	52	60
	063R-04-7T-M	●		7	63	52	60	27	20	13	24	7.0	12.4						
	063R-04-9T-M	●	9														63	52	60
	063R-04-7T-27M	●		7	63	52	60	27	20	13	24	7.0	12.4						
	063R-04-9T-27M	●	9														63	52	60
	080R-04-8T-M	●		8	80	69	76	27	20	13	24	7.0	12.4						
	080R-04-10T-M	●	10	80													69	76	27

Caution with maximum revolution

Set the number of revolutions per minute within the recommended cutting speed for each workpiece material.
Do not use the end mill or cutter above the maximum revolution, as centrifugal force may cause inserts or components to be ejected even under no-load conditions.

● : Available

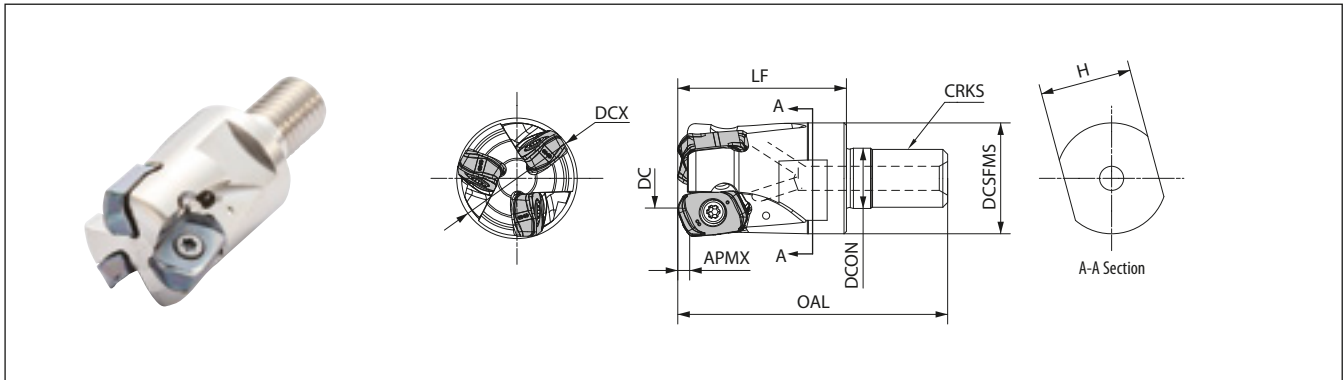
Spare parts

Description	Parts		
	Insert screw	Wrench	Arbor clamp bolt
MFH...S...-04...			-
MFH...W...-04...			-
MFH040R-04...-M			HH8×25
MFH050R-04...-M			HH10×30
MFH052R-04...-M			HH10×30
MFH063R-04...-M			HH12×35
MFH063R-04...-27M			HH12×35
MFH080R-04...-M			HH16×40
MFH080R-04...			HH16×40
MFH...M...-04...			-

SB-3575TRP

DTPM-10

Recommended torque for insert clamp: 2.0 Nm


Toolholder dimensions

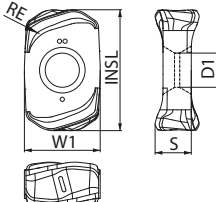
Description		Availability	No. of inserts	Dimensions (mm)								Rake angle		Coolant hole	Maximum revolution (Min ⁻¹)
				DCX	DC	DCSFMS	DCON	OAL	LF	CRKS	H	APMX	A.R.		
MFH	22-M10-04-2T	●	2	22	11	18.7	10.5	48	30	M10XP1.5	15	2.5	-10°	Yes	13,600
	25-M12-04-2T	●		25	14	23	12.5	56	35	M12XP1.75	19				12,700
	25-M12-04-3T	●	3	28	17										12,000
	28-M12-04-3T	●													4
	28-M12-04-4T	●	30	17	62										
	32-M16-04-4T	●				5	35	24	10,000						
	32-M16-04-5T	●							40	29	10,000				
	35-M16-04-4T	●				5	42	31			9,800				
	35-M16-04-5T	●							9,800						
	40-M16-04-5T	●				10,000									
	40-M16-04-6T	●				10,000									
	42-M16-04-5T	●				10,000									
42-M16-04-6T	●	10,000													

Caution with maximum revolution

Set the number of revolutions per minute within the recommended cutting speed for each workpiece material.
Do not use the end mill or cutter above the maximum revolution, as centrifugal force may cause inserts or components to be ejected even under no-load conditions.

● : Available

Applicable inserts MFH Boost

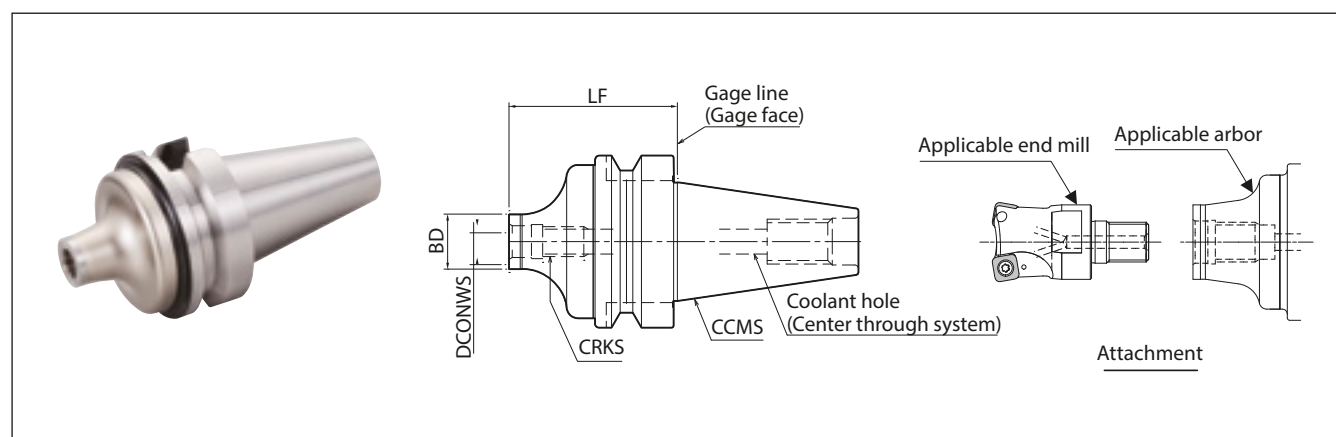
Usage classification		P	Carbon steel / Alloy steel					★	☆		
		P	Mould steel					★	☆		
★ : Roughing / 1st choice ☆ : Roughing / 2nd choice ■ : Finishing / 1st choice □ : Finishing / 2nd choice		M	Austenitic stainless steel					☆	★		
			Martensitic stainless steel						☆		★
			Precipitation hardened stainless steel						★		
		K	Gray cast iron							★	
			Nodular cast iron							★	
		S	Ni-base heat-resistant alloy						☆		★
			Titanium alloy						★		
		H	Hardened materials								
Shape		Description	Dimensions (mm)					MEGACOAT NANO EX			CVD coated carbide
			W1	S	D1	INSL	RE	PR1825	PR1835	PR1810	CA6535
 4-edge, double-sided insert		LOMU 040410ER-GM	9.1	4.4	4.1	14.5	1.0	●	●	●	●

● : Available

Chipbreaker	Workpiece	Toolholder description and feed (fz: mm/t)		Recommended insert grade (Vc: m/min.)			
		ap(mm)	MFH...04...	MEGACOAT NANO EX			CVD coated carbide
				PR1825	PR1835	PR1810	CA6535
GM	Carbon steel alloy 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				
	Carbon steel alloy steel (- 350HB)	≤0.5	0.20 – 0.75 – 1.20	★ 100 – 140 – 200 (Dry machining recommended)	☆ 100 – 140 – 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				
	(- 40HRC)	≤0.5	0.20 – 0.60 – 1.10	★ 80 – 140 – 180 (Dry machining recommended)	☆ 80 – 140 – 180 (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				
	Mould steel (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 numbers shown in **bold font** indicate the recommended standard cutting conditions. Adjust the cutting speed and feed rate within the specified range according to the actual machining conditions.
- Machining with coolant is recommended for precipitation hardened stainless steel, Ni-base heat-resistant alloy, and titanium alloy.
- Machining with coolant 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 25% of recommended cutting conditions. Slotting is not recommended in this situation.
- Centre-through coolant is recommended for slotting.
- Slotting or pocketing are not recommended for face mill types.
- For face milling, it is recommended that width of cut should be set to 75% or less of the cutting diameter.
- For long shank end mills, 75% or less of the recommended conditions is recommended for both D.O.C. and feed rate.

BT Arbor (For exchangeable head / Two-face clamping)



Dimension

Description	Availability	Dimensions (mm)				Coolant hole	Arbor (Two-face clamping)	Applicable end mill (Modular)
		LF	BD	DCONWS	CRKS		CCMS	
BT30K-	M08-45	●	45	14.7	8.5	Yes	BT30	MFH..-M08-..
	M10-45	●	45	18.7	10.5			MFH..-M10-..
	M12-45	●	45	23	12.5			MFH..-M12-..
BT40K-	M08-55	●	55	14.7	8.5	Yes	BT40	MFH..-M08-..
	M10-60	●	60	18.7	10.5			MFH..-M10-..
	M12-55	●	55	23	12.5			MFH..-M12-..
	M16-65	●	65	30	17			MFH..-M16-..

● : Available

Effective depth of assembled tool

Arbor description		Applicable screw on type		Effective depth of assembled tool (mm)	
		Description	Cutting diameter (mm)	Dimension (mm)	LUX
			DC	LF	
BT30K-	M08-45	MFH16-M08-01...	16	22	28.8
		MFH16-M08-03...	16	25	31.8
		MFH17-M08-03...	17	25	33.2
		MFH18-M08-03...	18	25	34.2
	M10-45	MFH20-M10-03...	20	30	36.8
		MFH22-M10-03...	22	30	39.2
		MFH22-M10-04...	22	30	39.2
	M12-45	MFH25-M12-...	25	35	42.8
		MFH28-M12-...	28	35	45.5
BT40K-	M08-55	MFH16-M08-01...	16	22	28.7
		MFH16-M08-03...	16	25	31.7
		MFH17-M08-03...	17	25	33.2
		MFH18-M08-03...	18	25	34.3
	M10-60	MFH20-M10-03...	20	30	38.7
		MFH22-M10-03...	22	30	44.5
		MFH22-M10-04...	22	30	44.5
	M12-55	MFH25-M12-...	25	35	44.6
		MFH28-M12-...	28	35	47.6
	M16-65	MFH32-M16-...	32	40	51.2
		MFH35-M16-...	35	40	60.2
		MFH40-M16-...	40	40	64.0
		MFH42-M16-04...	42	40	64.0

Arbor identification system

BT30

Arbor size

K

Two-face
clamping spindle

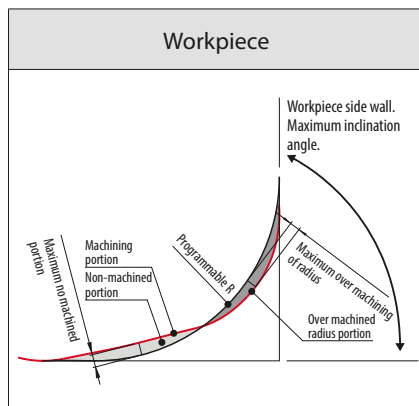
M12

Thread size
for clamping

45

Length from
the gage

Approximate programming radius adjustment



MFH Micro			MFH Mini		
Programmable R. (mm)	Maximum over machining of radius (mm)	Maximum no machined portion (mm)	Programmable R. (mm)	Maximum over machining of radius (mm)	Maximum no machined portion (mm)
R1.0	0	0.21	R1.6 (Recommended)	0	0.39
R1.2 (Recommended)	0	0.17	R2.0	0.09	0.35
R1.5	0.08	0.1	R2.5	0.26	0.26
R2.0	0.28	0.01	R3.0	0.46	0.17

*Cutting edge angle for MFH Micro / MFH Mini = 12°. Workpiece side wall maximum inclination angle = 90°

MFH Harrier (GM • GH)						
Description	Insert	Cutting edge angle γ	Programmable R. (mm) (Recommended)	Max. over machining of radius (mm)	Max. no machined portion (mm)	Workpiece side wall max. inclination angle
MFH...-10-...	GM • GH	10°	R3.0	0	0.85	90°
	LD	14°	R3.5	0	0.69	65°
	FL	14°	R3.0	0	0.89	80°
MFH...-14-...	GM • GH	10°	R3.5	0	1.37	90°
	LD	16°	R5.0	0	1.06	65°
	FL	13°	R3.0	0	1.36	80°

MFH Harrier-D		
Programmable R. (mm)	Maximum over machining of radius (mm)	Maximum no machined portion (mm)
R1.0	0	1.12
R2.5 (Recommended)	0	1.02
R3.0	0.09	0.92

MFH Boost		
Programmable R. (mm)	Maximum over machining of radius (mm)	Maximum no machined portion (mm)
R1.5	0	1.42
R2.0	0	1.24
R3.0 (Recommended)	0	0.87
R3.5	0.06	0.69

Ramping reference data

Description	Cutting diameter DCX (mm)	8	10	12	14	16
MFH Micro	Maximum ramping angle RMPX	4°	3°	2°	1.5°	1.2°
	tan RMPX	0.070	0.052	0.035	0.026	0.021

Description	Cutting diameter DCX (mm)	16	17	18	20	22	25	28	32	40	50
MFH Mini	Maximum 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	0.030	0.024	0.021	0.017	0.014	0.009	0.007

Description	Cutting diameter DCX (mm)	25	28	32	35	40	50	63	80
MFH Harrier (MFH...-10-...)	Maximum 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

Description	Cutting diameter DCX (mm)	50	63	80	100	125	160
MFH Harrier (MFH...-14-...)	Maximum 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

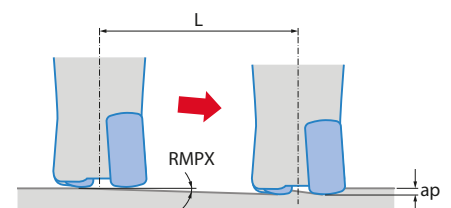
Description	Cutting diameter DCX (mm)	22	25	28	32	35	40	42	50	52	63	80
MFH Boost	Maximum ramping angle RMPX	3.9°	3.0°	2.4°	2.0°	1.7°	1.4°	1.3°	1.0°	1.0°	0.8°	0.6°
	tan RMPX	0.068	0.052	0.042	0.035	0.029	0.024	0.022	0.018	0.017	0.013	0.010

Ramping tips

Ramping angle should be under RMPX (maximum ramping angle) in the above cutting conditions. Reduce recommended feed rate in cutting conditions above by 70%.

Formula for maximum cutting Length (L) at maximum ramping angle

$$L = \frac{ap}{\tan RMPX}$$

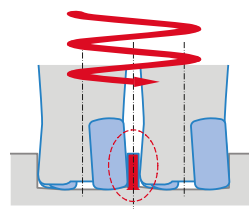


Helical milling tips

For helical milling, use between minimum drilling diameter and maximum drilling diameter.

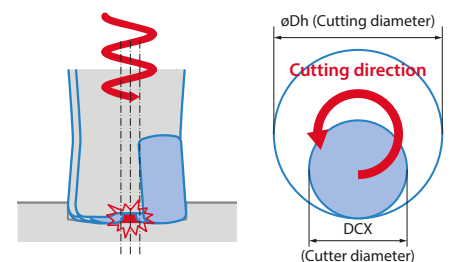
Exceeding maximum machining diameter

Centre core remains after machining



Under minimum machining diameter

Centre core hits holder body



Description	Min. cutting diameter øDh1	Max. cutting diameter øDh2	Max. ramping depth per cycle
MFH Micro	2×DCX-3.5	2×DCX-2	0.5 mm
MFH Mini	2×DCX-8	2×DCX-2	1 mm
MFH Harrier (MFH...-10-...)	2×DCX-18	2×DCX-2	GM = 1.5 mm
MFH Harrier (MFH...-14-...)	2×DCX-25	2×DCX-2	GM = 2 mm
MFH Boost	2×DCX-11	2×DCX-2	2.5 mm

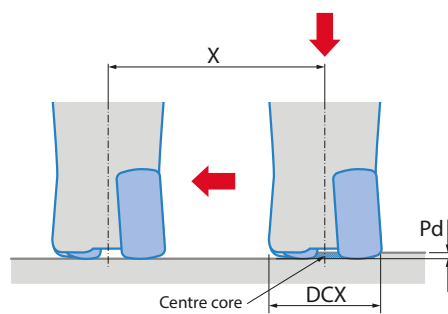
Keep machine depth per rotation less than maximum D.O.C. in cutter dimensions chart. Use climb milling. Refer to the figure above. Feed rates should be reduced to 50% of recommended cutting conditions. Use caution to eliminate incidences caused by producing long chips.

Peck milling tips

Description	Maximum drilling depth Pd	Minimum cutting length X for flat bottom surface
MFH Micro	0.5	DCX-3.5
MFH Mini	1.0	DCX-9
MFH Boost	0.6	DCX-12

Description	GM • GH		LD		FL	
	Maximum drilling depth Pd	Minimum cutting length X for flat bottom surface	Maximum drilling depth Pd	Minimum cutting length X for flat bottom surface	Maximum drilling depth Pd	Minimum cutting length X for flat bottom surface
MFH Harrier (MFH...-10-...)	1.5	DCX-18	1.5	DCX-14	1.5	DCX-15
MFH Harrier (MFH...-14-...)	2.0	DCX-24	2.0	DCX-18	2.0	DCX-19

Unit: mm

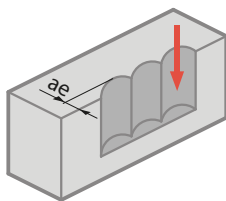


It is recommended to reduce feed by 25% of recommendation until the centre core is removed.
Axial feed rate recommendation per revolution is $f < 0.2 \text{ mm/rev}$.

Plunging

Reduce feed rate to $fz \leq 0.2 \text{ mm/t}$ when plunging.

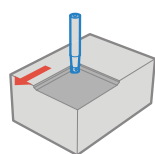
Unit: mm



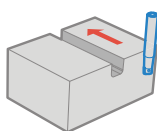
Description	Maximum width of cut (ae)
MFH Micro	1.7
MFH Mini	3.5
MFH Harrier (MFH...-10-...)	8 (GM • GH)
MFH Harrier (MFH...-14-...)	11.5 (GM • GH)
MFH Harrier-D	8
MFH Boost	5

3D Machining (MFH Harrier)

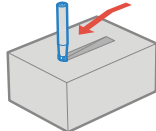
GM and GH chipbreakers are available for all the applications.



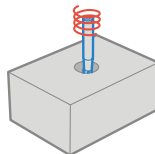
Face milling /
shouldering



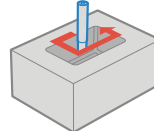
Slotting



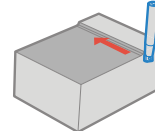
Ramping



Helical milling

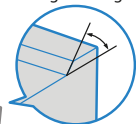


Pocketing



Contouring

Rising wall angle



For using MFH Harrier

Insert	Ramping	Contouring (Rising wall angle)	Plunging	Helical milling	Pocketing
GM • GH	✓	✓ (90°)	✓	✓	✓
LD	✓	Limit (65°)	—	—	—
FL	✓	Limit (80°)	—	—	—

* For FL and LD type, there is a limit of rising wall angle during contouring.

