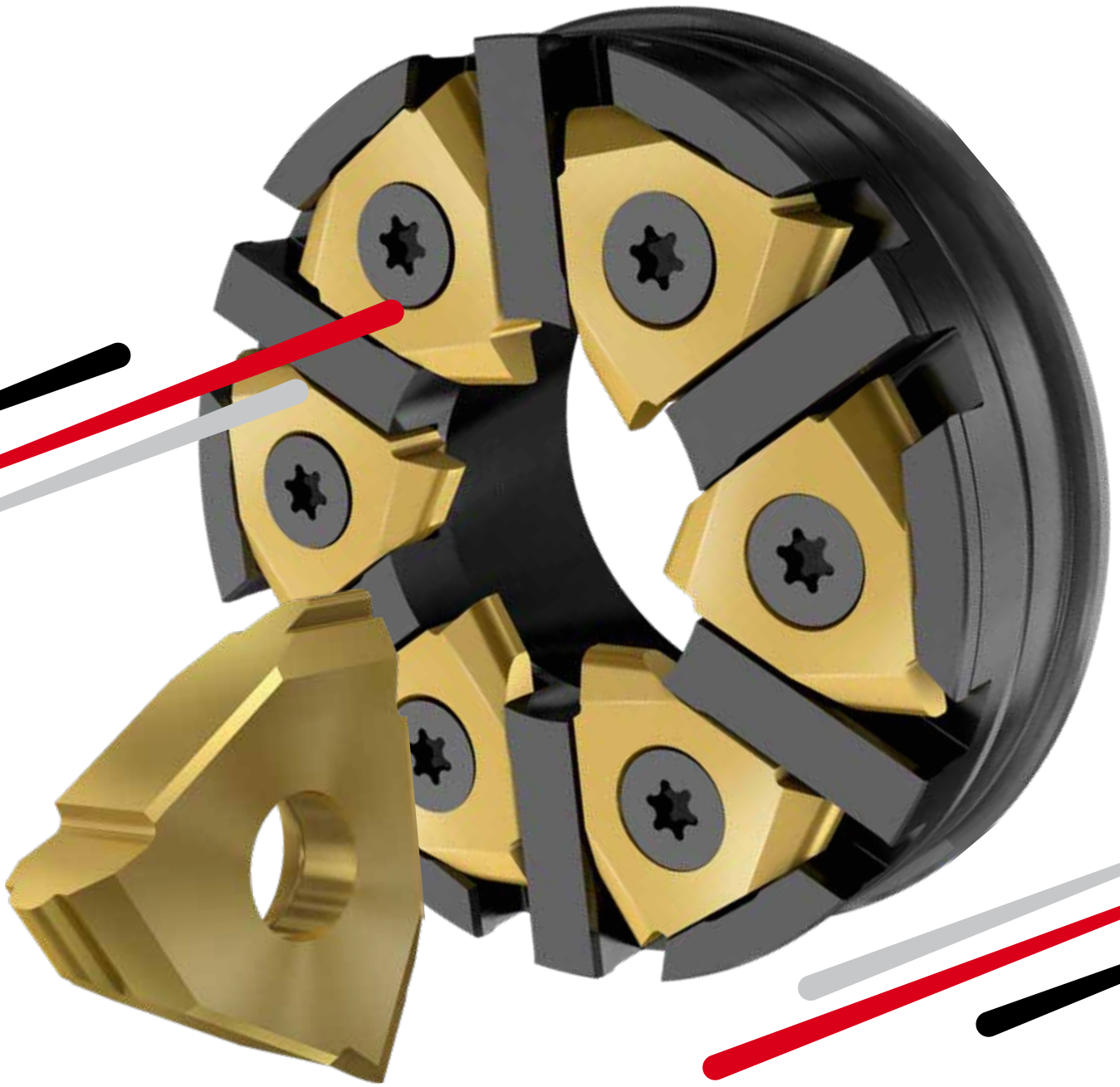




# V-WHIRLING

High Precision Whirling System for Medical  
and Micromachining Applications

METRIC

**VARDEX**  
Advanced Threading Solutions

|                                        |    |
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## Ordering Code

### Holders

|            |          |            |          |           |           |          |            |          |           |          |           |
|------------|----------|------------|----------|-----------|-----------|----------|------------|----------|-----------|----------|-----------|
| <b>VWM</b> | <b>-</b> | <b>D12</b> | <b>-</b> | <b>37</b> | <b>46</b> | <b>-</b> | <b>163</b> | <b>-</b> | <b>Z6</b> | <b>-</b> | <b>3V</b> |
| <b>1</b>   |          | <b>2</b>   |          | <b>3</b>  | <b>4</b>  |          | <b>5</b>   |          | <b>6</b>  |          | <b>7</b>  |

| 1 - Product Line                | 2 - DC - Cutting Dia. [mm] | 3 - DCON - Connection Dia. [mm] | 4 - DHUB - Hub Dia. [mm] |
|---------------------------------|----------------------------|---------------------------------|--------------------------|
| VWM - Vargus Whirling Monoblock | 6<br>12                    | 20-54                           | 35-56                    |

| 5 - OAL - Overall Length [mm] | 6 - NOF - Flute count | 7 - Insert Style |
|-------------------------------|-----------------------|------------------|
| 13.8-24.3                     | 5<br>6                | 2V<br>3V         |

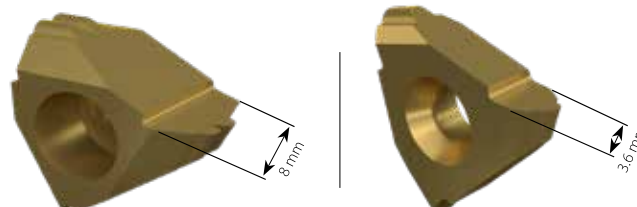
### Inserts

|           |          |            |           |            |
|-----------|----------|------------|-----------|------------|
| <b>3V</b> | <b>W</b> | <b>5.0</b> | <b>HA</b> | <b>VTX</b> |
| <b>1</b>  | <b>2</b> | <b>3</b>   | <b>4</b>  | <b>5</b>   |

| 1 - Insert Style | 2 - Application | 3 - Major Diameter [mm]           | 4 - Standard                                                                                    | 5 - Carbide Grade |
|------------------|-----------------|-----------------------------------|-------------------------------------------------------------------------------------------------|-------------------|
| 2V<br>3V         | W - Whirling    | 1.5-6.5                           | HA<br>HB<br>HC<br>HD<br>Partial Profile 60°<br>Partial Profile 55°<br>ISO Metric<br>American UN | VTX               |
|                  |                 | OR                                |                                                                                                 |                   |
|                  |                 | 3 - Pitch TP/TPI                  |                                                                                                 |                   |
|                  |                 | TP - 0.075 - 3.0<br>TPI - 508 - 8 |                                                                                                 |                   |
|                  |                 | OR                                |                                                                                                 |                   |
|                  |                 | 3 - Cutting Width [mm]            |                                                                                                 |                   |
|                  |                 | 3.2                               |                                                                                                 |                   |

### Customized specials available upon request

A new blank in width 8 mm is now available for specials with wide profiles and multiple starts



# V-WHIRLING

High Precision Whirling System for Medical and Micromachining Applications



## Features and Benefits

### VTX Grade

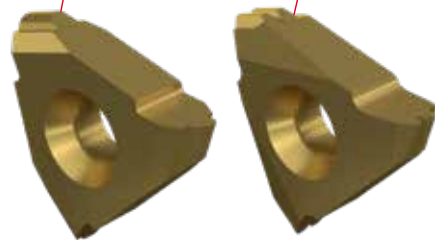
Multipurpose grade for exotic materials



Indexable inserts with 3 cutting edges and various threading profiles:

Single-tooth solution

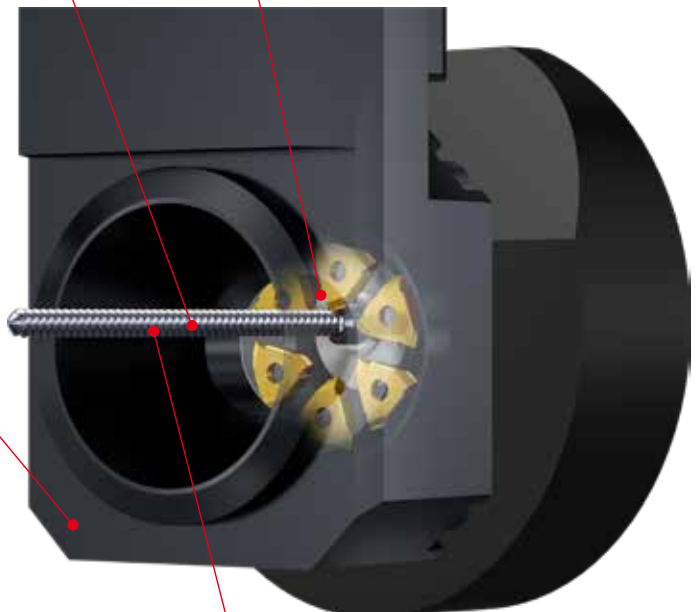
Double-tooth solution for two starts threading



### Close to Spindle Machining

- ✓ No Bending
- ✓ No Vibration
- ✓ No Chatter
- ✓ Excellent Surface Finish
- ✓ Fast Machining

Fits popular driven toolholders on Swiss-type machines



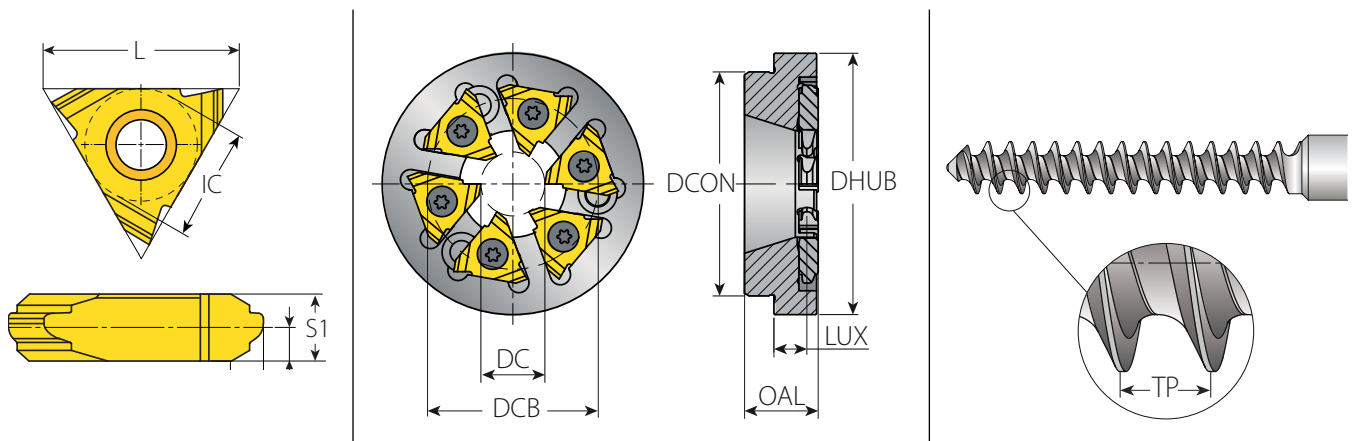
Ideal solution for long threads on small diameter components

## ISO 13399 Cutting Tool Dimensions

Vargus defines the **new V-Whirling Line according to the ISO 13399 standard**.

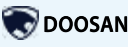
See the list below of the dimensions used in this catalog.

**ISO 13399** is an international technical standard for the computer-interpretable representation and exchange of cutting tools and toolholders. The objective of this standard is to provide a system that allows for a neutral file exchange, and a basis for implementing and sharing product databases and archiving.



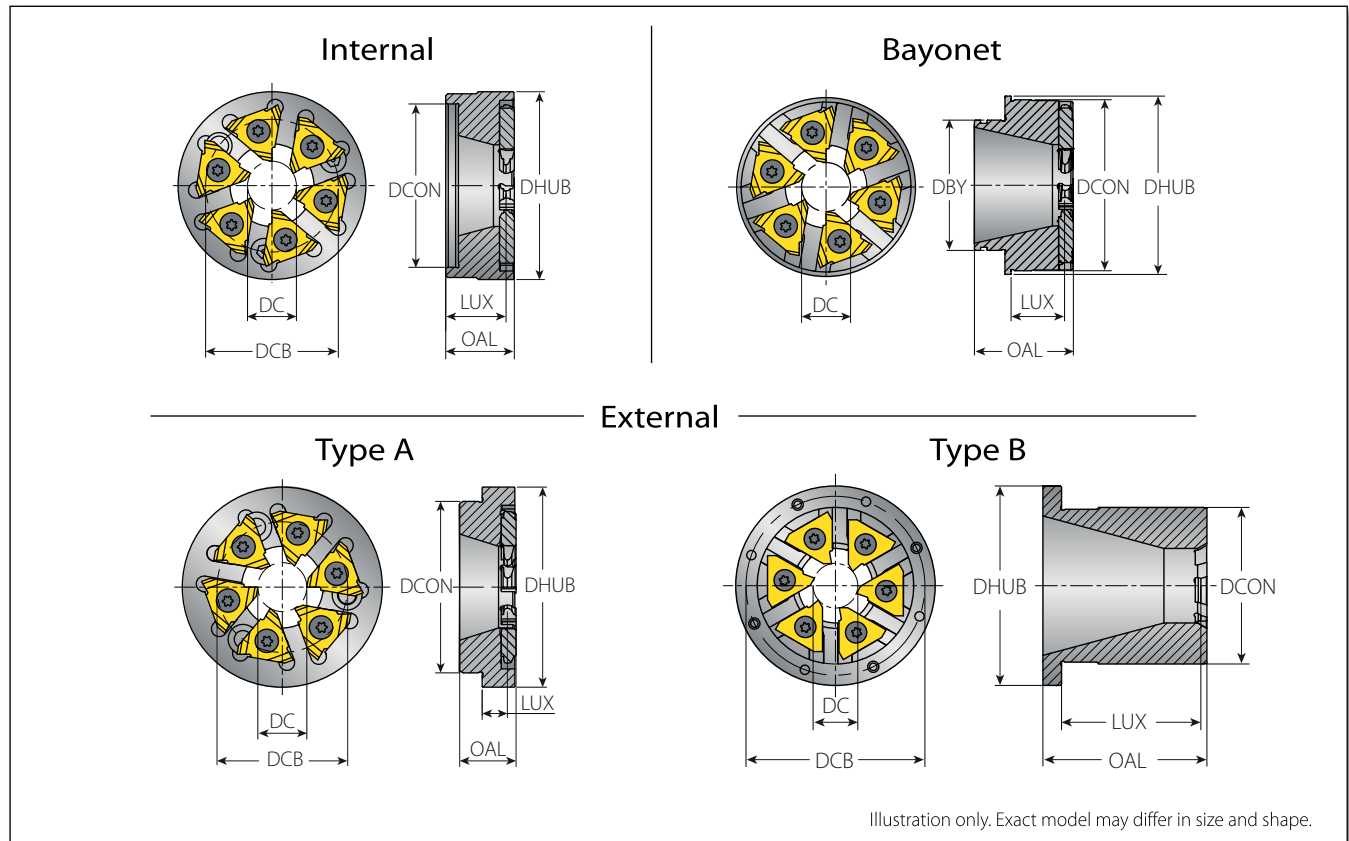
|        | ISO 13399 Dimension | Description                       |
|--------|---------------------|-----------------------------------|
| Insert | L                   | Cutting Edge Length               |
|        | IC                  | Insert Size                       |
|        | CDX                 | Cutting Depth Maximum             |
|        | PDX                 | Profile Distance EX               |
|        | S1                  | Insert Thickness Total            |
|        | RE                  | Corner Radius                     |
|        | CW                  | Cutting Width                     |
| Holder | DC                  | Cutting Diameter                  |
|        | DCB                 | Connection Bore (screws) Diameter |
|        | DCON                | Connection Diameter               |
|        | OAL                 | Overall Length                    |
|        | DHUB                | Hub Diameter                      |
|        | LUX                 | Usable Length Maximum             |
|        | NOF                 | Flute Count (No. of inserts)      |
| Thread | Connection Type     | Connection Type                   |
|        | TP                  | Thread Pitch                      |
|        | TPI                 | Thread Pitch TPI                  |

# Holder Selection Guide

| Optional Machines                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                        | Driven Tool |                                                                                                                               | Whirling Holder        |
|---------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------|------------------------|
| Brand                                                                                                                     | Models                                                                                                                                                                                                                                                                                                                                                                                                                 | Brand       | Models                                                                                                                        | Ordering Code          |
| <b>CITIZEN</b>                                                                                                            | L12-1M7                                                                                                                                                                                                                                                                                                                                                                                                                | PCM         | LSW-515                                                                                                                       | VWM-D06-2035-151-Z5-2V |
|                                                                                                                           | L20/ M20 / M32                                                                                                                                                                                                                                                                                                                                                                                                         | Jarvis      | LTR0131/162/169/170/187                                                                                                       | VWM-D12-3746-163-Z6-3V |
|                                                                                                                           | L20/ M20 / M32                                                                                                                                                                                                                                                                                                                                                                                                         | Jarvis      | LTR0128/132/139/168/183                                                                                                       | VWM-D12-4046-168-Z6-3V |
|                                                                                                                           | L20                                                                                                                                                                                                                                                                                                                                                                                                                    | WTO         | 42BJ                                                                                                                          | VWM-D12-4244-243-Z6-3V |
|                                                                                                                           | A20                                                                                                                                                                                                                                                                                                                                                                                                                    | Madaula     | P.535.00007                                                                                                                   | VWM-D12-3345-237-Z6-3V |
|                                                                                                                           | A20   A20-3F7N   A232-VII   A32-VII   K16E-VII   L12-1M7   L12-2M10   L20E-2M10   L20E-2M12   L20E-2M8   L20E-IX   L20-V   L20-VII   L20-VIII   L20-X   L32-1M10   L32-1M12   L32-1M8   M16-4M5   M16-4M8   M212-C   M212-V   M216-C   M216-V   M220-III   M220-V   M232-III   M232-V   M312-C   M312-III   M312-V   M316-III   M316-V   M320-III   M320-V   M32-3M3   M32-3M5   M32-4M5   M32-4M8   M332-III   M332-V | W&F         | MPU...M*8... (d1=55 mm)                                                                                                       | VWM-D12-3855-380-Z6-3V |
| <b>DMG MORI</b>                                                                                                           | SPEED20/11linear   SPEED20/8   SPEED20/8linear   SPRINT20/5   SPRINT20/8   SPRINT20/8linear                                                                                                                                                                                                                                                                                                                            | W&F         | MPU...M*8... (d1=55 mm)                                                                                                       | VWM-D12-3855-380-Z6-3V |
|  <b>DOOSAN</b>                           | ST20G/GS   ST32G/GS   ST35G/GS                                                                                                                                                                                                                                                                                                                                                                                         | WTO         | 42BJ                                                                                                                          | VWM-D12-4244-243-Z6-3V |
|                                                                                                                           | ST20G/GS   ST32G/GS   ST35G/GS                                                                                                                                                                                                                                                                                                                                                                                         | WTO         | 54BJ                                                                                                                          | VWM-D12-5456-138-Z6-3V |
|  <b>GILDEMEISTER</b>                     | Speed 12-7 / 20-11                                                                                                                                                                                                                                                                                                                                                                                                     | PCM         | SPW-1220-000                                                                                                                  | VWM-D12-4046-163-Z6-3V |
|  <b>WOODWAY</b>                          | SW32/SW42                                                                                                                                                                                                                                                                                                                                                                                                              | WTO         | 42BJ                                                                                                                          | VWM-D12-4244-243-Z6-3V |
|  <b>Hanwha</b>                         | XD12II   XD20H   XD26H   XD20II   XD26II   XDI20   XD32H   XD35H/II   XD38H/II   STL32H   STL35H   STL38H                                                                                                                                                                                                                                                                                                              | WTO         | 42BJ                                                                                                                          | VWM-D12-4244-243-Z6-3V |
|                                                                                                                           | XD20H   XD26H   XD20II   XD26II   XDI20   XD32H   XD35H/II   XD38H/II                                                                                                                                                                                                                                                                                                                                                  | WTO         | 54BJ                                                                                                                          | VWM-D12-5456-138-Z6-3V |
|                                                                                                                           | STL32H(Y3)   STL35H(Y3)   STL38H   STL38H(Y3)   STL42H   STL42NH   XD12   XD12II   XD12IIH   XD12IIJ   XD16H   XD16II   XD16IIH   XD16IIJ   XD16V   XD20   XD20IIH   XD20IIM   XD20IIN   XD20IINH   XD20M   XD20V   XD26H   XD26II   XD26IIM   XD26IIN   XD26IINH   XE12J   XE16J   XE20H   XE20J   XE20Ne   XE20NH   XE26J   XE26Ne   XE26NH   XE35H   XE35J   XE35Ne   XE35NH                                        | W&F         | MPU...M*8... (d1=55 mm)                                                                                                       | VWM-D12-3855-380-Z6-3V |
|  <b>MAIER</b><br>MACHINES + ROBOTICS   | ML 20 D                                                                                                                                                                                                                                                                                                                                                                                                                | PCM         | MK-20-W1-15                                                                                                                   | VWM-D12-4046-163-Z6-3V |
|                                                                                                                           | MLF2   MLF4   ML26 Revolver                                                                                                                                                                                                                                                                                                                                                                                            | W&F         | MPU...M*8... (d1=55 mm)                                                                                                       | VWM-D12-3855-380-Z6-3V |
|  <b>NEXTTURN</b><br>SWISS TURN LEADER  | SA20/SA26/SA32/SA20XII                                                                                                                                                                                                                                                                                                                                                                                                 | WTO         | 42BJ                                                                                                                          | VWM-D12-4244-243-Z6-3V |
|                                                                                                                           | SA20/SA26/SA32/SA20XII                                                                                                                                                                                                                                                                                                                                                                                                 | WTO         | 54BJ                                                                                                                          | VWM-D12-5456-138-Z6-3V |
|  <b>NOMURADS</b>                       | SA20/32                                                                                                                                                                                                                                                                                                                                                                                                                | PCM         | NESA-32-000                                                                                                                   | VWM-D12-4046-163-Z6-3V |
|                                                                                                                           | NN20                                                                                                                                                                                                                                                                                                                                                                                                                   | PCM         | NN20-W15                                                                                                                      | VWM-D12-4046-163-Z6-3V |
|  <b>star</b><br>CNC Machine Tool Corp. | NN20J3                                                                                                                                                                                                                                                                                                                                                                                                                 | W&F         | MPU...M*8... (d1=55 mm)                                                                                                       | VWM-D12-3855-380-Z6-3V |
|                                                                                                                           | ECAS-12/20   ECAS-32T   SR20RII   SV12/20/32                                                                                                                                                                                                                                                                                                                                                                           | Star        | 0M171-00   101-72-00   421-73-00   431-72-00   541-78-00   581-71   591-72-00   661-72-00   681-72-00   7.074.191   7.076.225 | VWM-D12-4049-158-Z6-3V |
|                                                                                                                           | SR20RIV                                                                                                                                                                                                                                                                                                                                                                                                                | Star        | 7.172.380                                                                                                                     | VWM-D12-4253-445-Z6-3V |
|                                                                                                                           | SR20R   SR32J   Goodway SW20   SV20   SV32JII   ECAS20T   SV32   ECAS32T                                                                                                                                                                                                                                                                                                                                               | WTO         | 42BJ                                                                                                                          | VWM-D12-4244-243-Z6-3V |
|                                                                                                                           | SR20R   SR32J   Goodway SW20   SV32   SV32   ECAS32T                                                                                                                                                                                                                                                                                                                                                                   | WTO         | 54BJ                                                                                                                          | VWM-D12-5456-138-Z6-3V |
|                                                                                                                           | ECAS-12/20   SB-12R   SB-20R   SR-20JI   SR-20JII   SR-20RI   SR-20RII   SR-20RIII   SR-20RIV   SR-32J   SR-32JII-A   SR-32JII-B   SR-32JN   SW-20                                                                                                                                                                                                                                                                     | W&F         | MPU...M*8... (d1=55 mm)                                                                                                       | VWM-D12-3855-380-Z6-3V |
| <b>TORNOS</b>                                                                                                             | Gamma 20/6                                                                                                                                                                                                                                                                                                                                                                                                             | Tornos      | Tornos                                                                                                                        | VWM-D12-4249-138-Z6-3V |
|                                                                                                                           | DECO10   DECO13   DECO20   DECO26   EvoDECO10/10   EvoDECO10/8   EvoDECO16/10   EvoDECO16/8   EvoDECO20   EvoDECO32   Gamma20/5   Gamma20/6   SwissDT26   SwissGT13   SwissGT26   SwissGT32   SwissST26                                                                                                                                                                                                                | W&F         | MPU...M*8... (d1=55 mm)                                                                                                       | VWM-D12-3855-380-Z6-3V |
|                                                                                                                           | B0265-326 / SS20-32 / S205/206                                                                                                                                                                                                                                                                                                                                                                                         | WTO         | 42BJ                                                                                                                          | VWM-D12-4244-243-Z6-3V |
|  <b>TSUGAMI</b><br>Lathe/Router        | B0265-326 / SS20-32 / S205/206                                                                                                                                                                                                                                                                                                                                                                                         | WTO         | 54BJ                                                                                                                          | VWM-D12-5456-138-Z6-3V |
|                                                                                                                           | S205E   S206E   SS207                                                                                                                                                                                                                                                                                                                                                                                                  | W&F         | MPU...M*8... (d1=55 mm)                                                                                                       | VWM-D12-3855-380-Z6-3V |

The above machine list is optional. The leading criterion for selection is the driven tool brand and model.

# Whirling Holders



|              |                         |                 |                |               |                 |          |                |                             |                               |                         | Spare Parts                                                                           |                                                                                       |                                                                                       |
|--------------|-------------------------|-----------------|----------------|---------------|-----------------|----------|----------------|-----------------------------|-------------------------------|-------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Insert Style | Ordering Code           | Connection Type | No. of Inserts | Dimensions mm |                 |          |                |                             |                               |                         |  |  |  |
|              |                         |                 |                | Cutting Dia.  | Connection Dia. | Hub Dia. | Overall Length | Clamping Surface to Profile | Connection Bore Dia. (Screws) | Connection Bayonet Dia. |                                                                                       |                                                                                       |                                                                                       |
| IC           |                         |                 | NOF            | DC            | DCON            | DHUB     | OAL            | LUX                         | DCB                           | DBY                     | Insert Screw                                                                          | Torx Key                                                                              | Holder Screw                                                                          |
| 2V           | VWM-D06-2035-151-Z5-2V* | Int             | 5              | 6             | 20              | 35       | 15.1           | 13.5                        | 26                            | -                       | SN2TM                                                                                 | K2T                                                                                   | M4.0x13                                                                               |
| 3V           | VWM-D12-3345-237-Z6-3V  | Ext A           | 6              | 12            | 33              | 45       | 23.7           | 15.5                        | 40                            | -                       | SN3TM                                                                                 | K3T                                                                                   | M3.0x8                                                                                |
|              | VWM-D12-3746-163-Z6-3V  | Int             |                |               | 37              | 46       | 16.3           | 14.5                        | 30.5                          | -                       |                                                                                       |                                                                                       | M3.0x15                                                                               |
|              | VWM-D12-3855-380-Z6-3V  | Ext A           |                |               | 38.5            | 55       | 38.0           | 15.5                        | -                             | -                       |                                                                                       |                                                                                       |                                                                                       |
|              | VWM-D12-4046-163-Z6-3V  | Int             |                |               | 40              | 46       | 16.3           | 14.5                        | 32.5                          | -                       |                                                                                       |                                                                                       | M4.0x13                                                                               |
|              | VWM-D12-4046-168-Z6-3V  | Int             |                |               | 40              | 46       | 16.8           | 15                          | 32.5                          | -                       |                                                                                       |                                                                                       | M4.0x13                                                                               |
|              | VWM-D12-4049-158-Z6-3V  | Ext A           |                |               | 40              | 49       | 15.8           | 7.5                         | 33                            | -                       | SN3T                                                                                  |                                                                                       | M4.0x13                                                                               |
|              | VWM-D12-4244-243-Z6-3V  | Byo             |                |               | 42              | 44       | 24.3           | 13.5                        | -                             | 32                      |                                                                                       |                                                                                       | -                                                                                     |
|              | VWM-D12-4249-138-Z6-3V  | Ext A           |                |               | 42              | 49       | 13.8           | 6.5                         | 32                            | -                       | SN3TM                                                                                 |                                                                                       | M4.0x13                                                                               |
|              | VWM-D12-4253-445-Z6-3V  | Ext B           |                |               | 42              | 53       | 44.5           | 37.8                        | 48                            | -                       |                                                                                       |                                                                                       | M3.0x15                                                                               |
|              | VWM-D12-5456-138-Z6-3V  | Byo             |                |               | 54              | 56       | 13.8           | 10.5                        | -                             | 43.8                    | SN3T                                                                                  | -                                                                                     |                                                                                       |

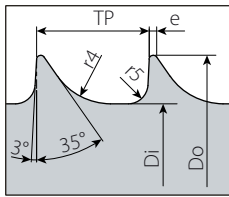


\* Only special inserts are suitable for this holder

# Whirling Inserts

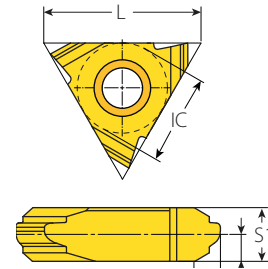
## HA

### External



Defined by: ISO 5835

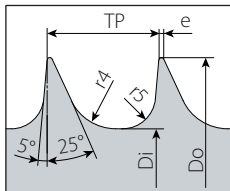
HA Shallow Thread



| Insert Style |      | Thread Pitch | Thread | Ordering Code | Dimension mm |                 |                 |     |     |     |                       |                        |                     | Helix Angle ° | Grade | Toolholder |
|--------------|------|--------------|--------|---------------|--------------|-----------------|-----------------|-----|-----|-----|-----------------------|------------------------|---------------------|---------------|-------|------------|
|              |      |              |        |               | Cutting Dia. | Screw Maj. Dia. | Screw Min. Dia. |     |     |     | Cutting Depth Maximum | Insert Thickness Total | Profile Distance EX |               |       |            |
| IC           | L mm | TP mm        |        |               | DC           | Do              | Di              | r4  | r5  | e   | CDX                   | S1                     | PDX                 | β °           | VTX   |            |
| 3V           | 16   | 0.5          | HA1.5  | 3VW1.5HA...   | 12           | 1.5             | 1.1             | 0.3 | 0.1 | 0.1 | 2.75                  | 3.6                    | 1.8                 | 7.3           | ●     | VW...-3V   |
|              |      | 0.6          | HA2.0  | 3VW2.0HA...   |              | 2.0             | 1.3             | 0.4 | 0.1 |     |                       |                        |                     | 6.9           | ●     |            |
|              |      | 1.0          | HA2.7  | 3VW2.7HA...   |              | 2.7             | 1.9             | 0.6 | 0.2 |     |                       |                        |                     | 8.1           | ●     |            |
|              |      | 1.25         | HA3.5  | 3VW3.5HA...   |              | 3.5             | 2.4             | 0.8 | 0.2 |     |                       |                        |                     | 7.9           | ●     |            |
|              |      | 1.5          | HA4.0  | 3VW4.0HA...   |              | 4.0             | 2.9             | 0.8 | 0.2 |     |                       |                        |                     | 8.1           | ●     |            |
|              |      | 1.75         | HA4.5  | 3VW4.5HA...   |              | 4.5             | 3.0             | 1.0 | 0.3 |     |                       |                        |                     | 8.6           | ●     |            |
|              |      | 1.75         | HA5.0  | 3VW5.0HA...   |              | 5.0             | 3.5             | 1.0 | 0.3 |     |                       |                        |                     | 7.6           | ●     |            |

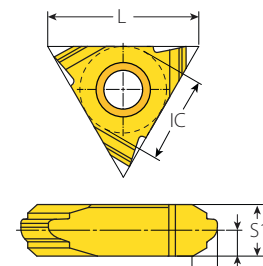
## HB

### External



Defined by: ISO 5835

HB Deep Thread

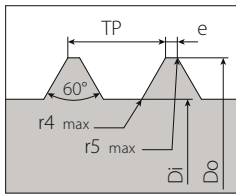


| Insert Style |      | Thread Pitch | Thread | Ordering Code | Dimension mm |                 |                 |     |     |     |                       |                        | Helix Angle ° | Grade | Toolholder |                     |
|--------------|------|--------------|--------|---------------|--------------|-----------------|-----------------|-----|-----|-----|-----------------------|------------------------|---------------|-------|------------|---------------------|
|              |      |              |        |               | Cutting Dia. | Screw Maj. Dia. | Screw Min. Dia. |     |     |     | Cutting Depth Maximum | Insert Thickness Total |               |       |            | Profile Distance EX |
| IC           | L mm | TP mm        |        |               | DC           | Do              | Di              | r4  | r5  | e   | CDX                   | S1                     | PDX           | β °   | VTX        |                     |
| 3V           | 16   | 1.75         | HB4    | 3VW4.0HB      | 12           | 4.0             | 1.9             | 0.8 | 0.3 | 0.1 | 2.75                  | 3.6                    | 1.8           | 11.0  | •          | VW...-3V            |
|              |      | 2.75         | HB6.5  | 3VW6.5HB      |              | 6.5             | 3.0             | 1.2 | 0.8 | 0.2 |                       |                        |               | 10.6  | •          |                     |

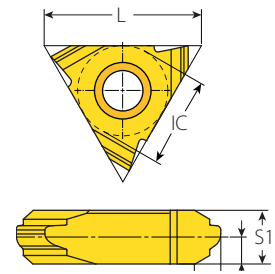
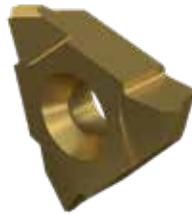
# Whirling Inserts

## HC

### External



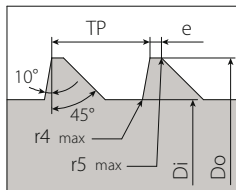
Defined by: ISO 9268



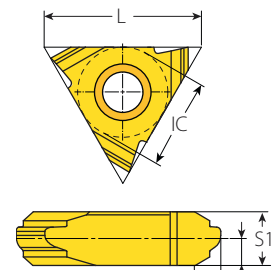
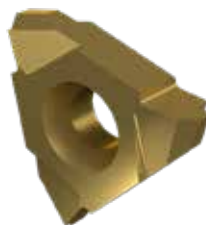
| Insert Style |      | Thread Pitch | Thread | Ordering Code | Dimension mm |                 |                 |      |      |     |                       |                        | Helix Angle ° | Grade | Toolholder |                     |
|--------------|------|--------------|--------|---------------|--------------|-----------------|-----------------|------|------|-----|-----------------------|------------------------|---------------|-------|------------|---------------------|
|              |      |              |        |               | Cutting Dia. | Screw Maj. Dia. | Screw Min. Dia. |      |      |     | Cutting Depth Maximum | Insert Thickness Total |               |       |            | Profile Distance EX |
| IC           | L mm | TP mm        |        |               | DC           | Do              | Di              | r4   | r5   | e   | CDX                   | S1                     | PDX           | β °   | VTX        |                     |
| 3V           | 16   | 1.06         | HC2.9  | 3VW2.9HC...   | 12           | 2.85            | 2.1             | 0.05 | 0.05 | 0.1 | 2.75                  | 3.6                    | 1.0           | 6.64  | •          | VW...-3V            |
|              |      | 1.27         | HC3.5  | 3VW3.5HC...   |              | 3.48            | 2.6             |      |      |     |                       |                        | 1.1           | 6.72  | •          |                     |
|              |      | 1.27         | HC3.9  | 3VW3.9HC...   |              | 3.85            | 2.8             |      |      |     |                       |                        |               | 5.9   | •          |                     |
|              |      | 1.27         | HC4.2  | 3VW4.2HC...   |              | 4.1             | 3.1             |      |      |     |                       |                        |               | 5.64  | •          |                     |

## HD

### External



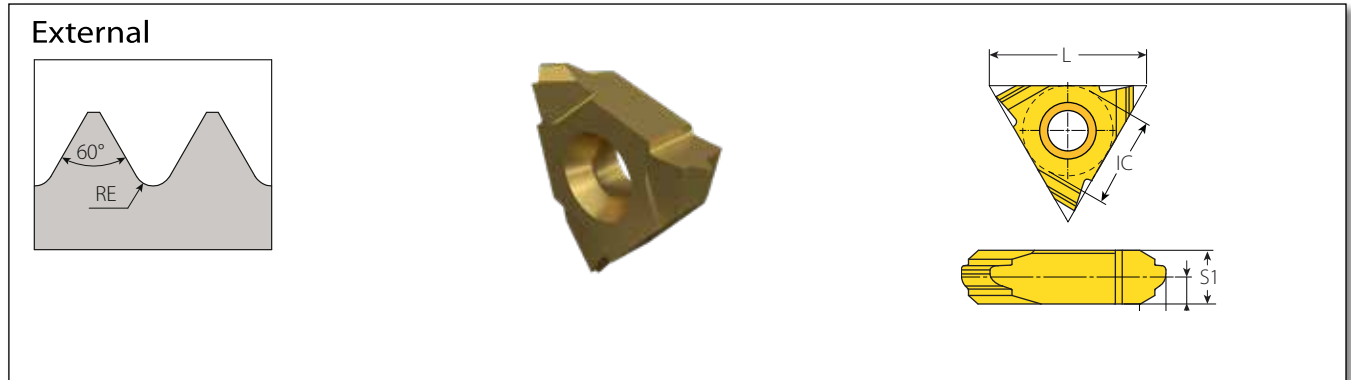
Defined by: ISO 9268



| Insert Style |      | Thread Pitch | Thread | Ordering Code | Dimension mm |                 |                 |      |      |     |                       |                        | Helix Angle ° | Grade | Toolholder |                     |
|--------------|------|--------------|--------|---------------|--------------|-----------------|-----------------|------|------|-----|-----------------------|------------------------|---------------|-------|------------|---------------------|
|              |      |              |        |               | Cutting Dia. | Screw Maj. Dia. | Screw Min. Dia. |      |      |     | Cutting Depth Maximum | Insert Thickness Total |               |       |            | Profile Distance EX |
| IC           | L mm | TP mm        |        |               | DC           | Do              | Di              | r4   | r5   | e   | CDX                   | S1                     | PDX           | β °   | VTX        |                     |
| 3V           | 16   | 1.59         | HD4.0  | 3VW4.0HD...   | 12           | 4.0             | 2.92            | 0.05 | 0.05 | 0.1 | 2.75                  | 3.6                    | 1.3           | 7.15  | •          | VW...-3V            |
|              |      | 2.18         | HD4.5  | 3VW4.5HD...   |              | 4.5             |                 |      |      |     |                       |                        | 1.55          | 8.71  | •          |                     |

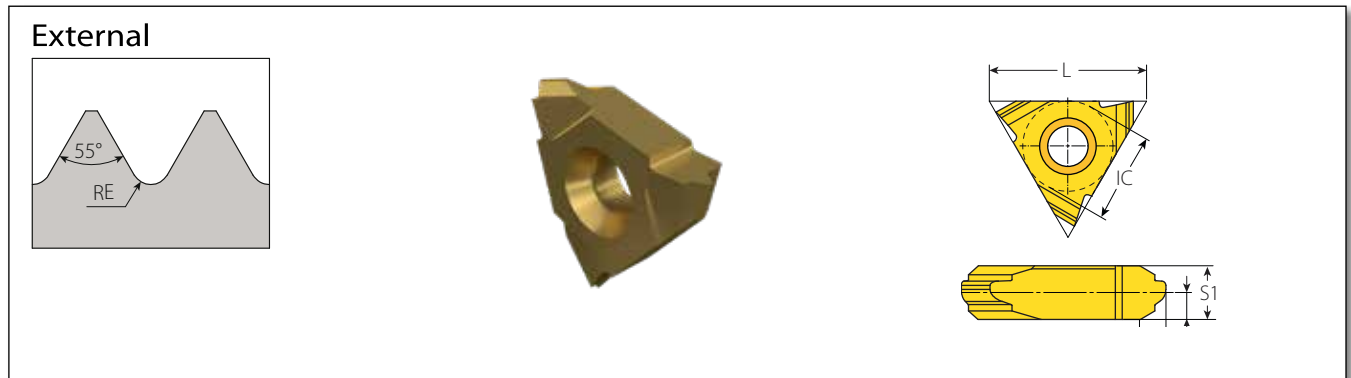
## Whirling Inserts

### Partial Profile 60°



| Insert Style |      | Thread Pitch |         | Ordering Code | Dimension mm |      |                       |                        |                     | Grade | Toolholder |
|--------------|------|--------------|---------|---------------|--------------|------|-----------------------|------------------------|---------------------|-------|------------|
|              |      |              |         |               | Cutting Dia. |      | Cutting Depth Maximum | Insert Thickness Total | Profile Distance EX |       |            |
| IC           | L mm | TP           | TPI     |               | DC           | RE   | CDX                   | S1                     | PDX                 | VTX   |            |
| 3V           | 16   | 0.075-0.25   | 508-100 | 3VWAA60...    | 12           | 0    | 2.75                  | 3.6                    | 0.6                 | •     | VW...-3V   |
|              |      | 0.25-0.5     | 80-46   | 3VWAB60...    |              | 0.02 |                       |                        | 0.7                 | •     |            |
|              |      | 0.5-1.5      | 48-16   | 3VWA60...     |              | 0.05 |                       |                        | 1.0                 | •     |            |
|              |      | 0.5-3.0      | 48-8    | 3VWAG60...    |              | 0.08 |                       |                        | 1.2                 | •     |            |
|              |      | 0.8-3.0      | 32-8    | 3VWBG60...    |              | 0.13 |                       |                        | 1.2                 | •     |            |
|              |      | 1.75-3.0     | 14-8    | 3VWG60...     |              | 0.27 |                       |                        | 1.8                 | •     |            |

### Partial Profile 55°

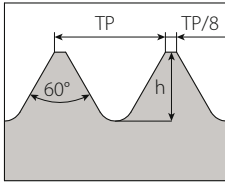


| Insert Style |      | Thread Pitch |       | Ordering Code | Dimension mm |      |                       |                        |                     | Grade | Toolholder |
|--------------|------|--------------|-------|---------------|--------------|------|-----------------------|------------------------|---------------------|-------|------------|
|              |      |              |       |               | Cutting Dia. |      | Cutting Depth Maximum | Insert Thickness Total | Profile Distance EX |       |            |
| IC           | L mm | TP           | TPI   |               | DC           | RE   | CDX                   | S1                     | PDX                 | VTX   |            |
| 3V           | 16   | 0.5-1.5      | 46-16 | 3VWA55...     | 12           | 0    | 2.75                  | 3.6                    | 1.0                 | •     | VW...-3V   |
|              |      | 1.75-3.0     | 14-8  | 3VWG55...     |              | 0.02 |                       |                        | 1.8                 | •     |            |

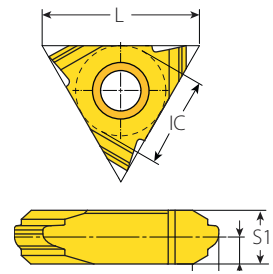
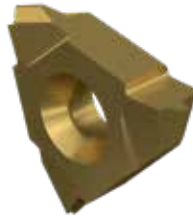
# Whirling Inserts

## ISO Metric

### External



Defined by: ISO965 (DIN13)  
Tolerance class: 6g/6H

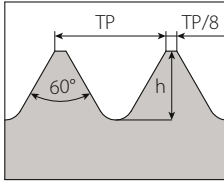


| Insert Style |      | Thread Pitch | Ordering Code | Dimension mm |      |                       |                        |                     | Grade | Toolholder |
|--------------|------|--------------|---------------|--------------|------|-----------------------|------------------------|---------------------|-------|------------|
|              |      |              |               | Cutting Dia. |      | Cutting Depth Maximum | Insert Thickness Total | Profile Distance EX |       |            |
| IC           | L mm | TP           |               | DC           | h    | CDX                   | S1                     | PDX                 | VTX   |            |
| 3V           | 16   | 0.25         | 3VW0.25ISO... | 12           | 0.14 | 2.75                  | 3.6                    | 0.4                 | •     | VW...-3V   |
|              |      | 0.3          | 3VW0.3ISO...  |              | 0.17 |                       |                        | 0.45                | •     |            |
|              |      | 0.35         | 3VW0.35ISO... |              | 0.21 |                       |                        | 0.5                 | •     |            |
|              |      | 0.4          | 3VW0.4ISO...  |              | 0.25 |                       |                        | 0.55                | •     |            |
|              |      | 0.45         | 3VW0.45ISO... |              | 0.28 |                       |                        | 0.6                 | •     |            |
|              |      | 0.5          | 3VW0.5ISO...  |              | 0.31 |                       |                        | 0.65                | •     |            |
|              |      | 0.6          | 3VW0.6ISO...  |              | 0.37 |                       |                        | 0.7                 | •     |            |
|              |      | 0.7          | 3VW0.7ISO...  |              | 0.43 |                       |                        | 0.8                 | •     |            |
|              |      | 0.75         | 3VW0.75ISO... |              | 0.46 |                       |                        | 0.85                | •     |            |
|              |      | 0.8          | 3VW0.8ISO...  |              | 0.49 |                       |                        | 0.9                 | •     |            |
|              |      | 1            | 3VW1.0ISO...  |              | 0.61 |                       |                        | 1.1                 | •     |            |
|              |      | 1.25         | 3VW1.25ISO... |              | 0.77 |                       |                        | 1.25                | •     |            |
|              |      | 1.5          | 3VW1.5ISO...  |              | 0.92 |                       |                        | 1.35                | •     |            |

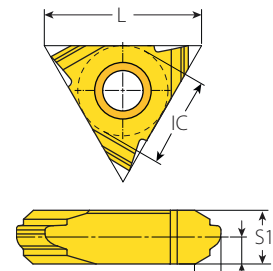
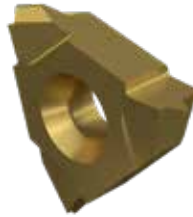
# Whirling Inserts

## American UN

### External



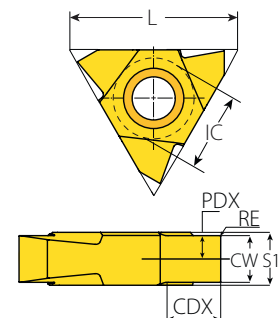
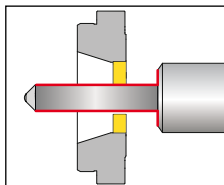
Defined by: ISO5864 (ANSI B1.1)  
Tolerance class: 2A/2B



| Insert Style |      | Thread Pitch | Ordering Code | Dimension mm |      |                       |                        |                     | Grade | Toolholder |
|--------------|------|--------------|---------------|--------------|------|-----------------------|------------------------|---------------------|-------|------------|
|              |      |              |               | Cutting Dia. |      | Cutting Depth Maximum | Insert Thickness Total | Profile Distance EX |       |            |
| IC           | L mm | TPI          |               | DC           | h    | CDX                   | S1                     | PDX                 | VTX   |            |
| 3V           | 16   | 80           | 3VW80UN...    | 12           | 0.18 | 2.75                  | 3.6                    | 0.45                | •     | VW...-3V   |
|              |      | 72           | 3VW72UN...    |              | 0.22 |                       |                        | 0.5                 | •     |            |
|              |      | 64           | 3VW64UN...    |              | 0.24 |                       |                        | 0.55                | •     |            |
|              |      | 56           | 3VW56UN...    |              | 0.28 |                       |                        | 0.6                 | •     |            |
|              |      | 48           | 3VW48UN...    |              | 0.32 |                       |                        | 0.7                 | •     |            |
|              |      | 44           | 3VW44UN...    |              | 0.35 |                       |                        | 0.8                 | •     |            |
|              |      | 40           | 3VW40UN...    |              | 0.39 |                       |                        | 0.85                | •     |            |
|              |      | 36           | 3VW36UN...    |              | 0.43 |                       |                        | 0.9                 | •     |            |
|              |      | 32           | 3VW32UN...    |              | 0.49 |                       |                        | 0.95                | •     |            |
|              |      | 28           | 3VW28UN...    |              | 0.56 |                       |                        | 1.0                 | •     |            |
|              |      | 24           | 3VW24UN...    |              | 0.65 |                       |                        | 1.1                 | •     |            |
|              |      | 20           | 3VW20UN...    |              | 0.78 |                       |                        | 1.2                 | •     |            |
|              |      | 18           | 3VW18UN...    |              | 0.87 |                       |                        | 1.3                 | •     |            |
|              |      | 16           | 3VW16UN...    |              | 0.97 |                       |                        | 1.4                 | •     |            |

## Cylindrical Whirling

### External



| Insert Style |      | Ordering Code | Dimension mm |     |      |                          |                              |                           | Grade | Toolholder |
|--------------|------|---------------|--------------|-----|------|--------------------------|------------------------------|---------------------------|-------|------------|
|              |      |               | Cutting Dia. |     |      | Cutting Depth<br>Maximum | Insert<br>Thickness<br>Total | Profile<br>Distance<br>EX |       |            |
| IC           | L mm |               | DC           | CW  | RE   | CDX                      | S1                           | PDX                       | VTX   |            |
| 3V           | 16   | 3VW3.2R005... | 12           | 3.2 | 0.05 | 2.75                     | 3.6                          | 1.8                       | •     | VW...-3V   |

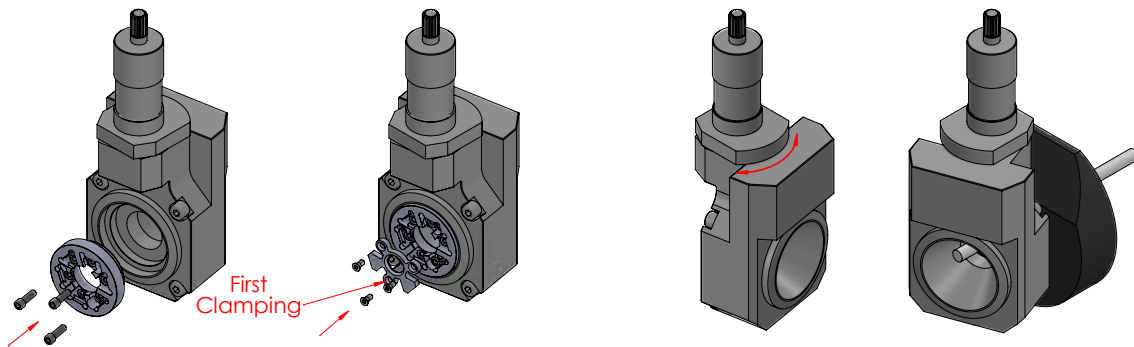
## Whirling Accessories

### Manual Centering Adjustment Device

| Item No.  | Ordering Code      | Dimensions mm |                     | Number of Inserts | For Holder Type |
|-----------|--------------------|---------------|---------------------|-------------------|-----------------|
|           |                    | Cutting Dia.  | Profile Distance EX |                   |                 |
| IC        |                    | DC            | PDX                 | NOF               |                 |
| 078-00086 | MAD-D06-1.60-Z5-2V | 6             | 1.6                 | 5                 | VW...-2V        |
| 078-00085 | MAD-D12-1.80-Z6-3V | 12            | 1.8                 | 6                 | VW...-3V        |



### Centering Procedure\*

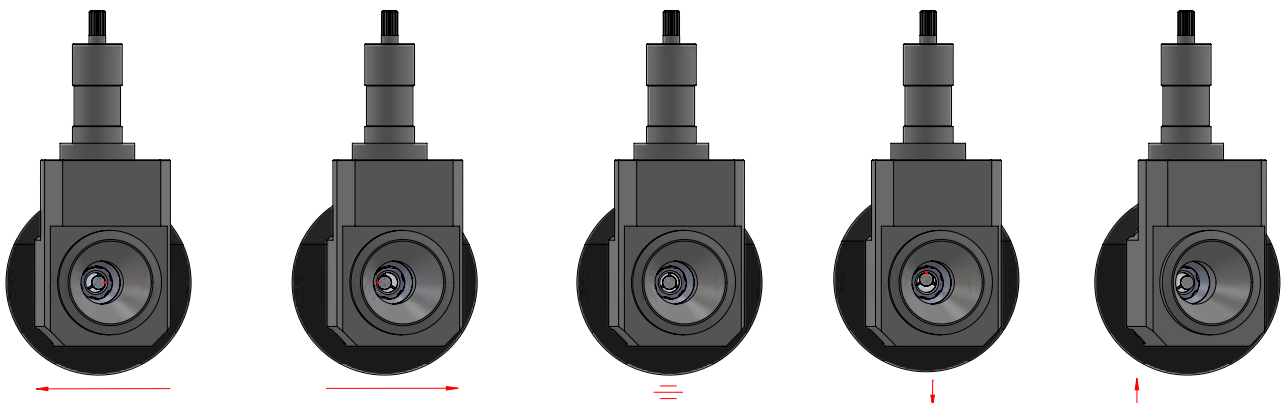


**1.** Clamp the whirling holder into driven tool.

**2.** Clamp the manual adjustment device. For accurate positioning, tighten the first screw according to the laser marking on the device.

**3.** Set the driven tool to the required Helix angle.

**4.** Extend the bar just after the whirling position.



**5.** Move the whirling tool to the left until bar contact.

**6.** Move the whirling tool to the right until bar contact.

**7.** Calculate mid-horizontal point and move the whirling tool to the designated position.

**8.** Move the whirling tool towards cutting point, until bar contact.

**9.** Set the whirling tool to the X position as bar diameter.

\* If the holder can be inserted to the **driven tool from the back**, the order of steps is as follows:

1. Clamp whirling holder into driven tool.
2. Clamp the manual adjustment device. For accurate positioning, tighten the first screw according to the laser marking on the device.
3. Set Driven tool in the required Helix angle in the machine.

## Whirling Accessories

### Torque Limiters for Secure Clamping

Selecting the Correct Tools:

| Insert Style | Nm Max | Handle | Adapter      | Bit        |
|--------------|--------|--------|--------------|------------|
| 2V           | 1.2    | VTRF   | TSD-12-1.2Nm | BIT25-TX8  |
| 3V           | 2.0    | VTRF   | TSD-12-2.0Nm | BIT25-TX10 |

#### Torque Limiting Handles:

|                                                                                   | Ordering Code | Item Number | Range            |
|-----------------------------------------------------------------------------------|---------------|-------------|------------------|
|  | VTRF          | 013-01038   | 0.6 Nm to 3.0 Nm |

#### Torque Limiting Adapters:

|                                                                                   | Ordering Code | Item Number | Torque Max (Nm) |
|-----------------------------------------------------------------------------------|---------------|-------------|-----------------|
|  | TSD-12-1.2Nm  | 013-01170   | 1.2             |
|                                                                                   | TSD-12-2.0Nm  | 013-01083   | 2.0             |

#### Torque Limiting Bits:

|                                                                                   | Ordering Code | Item Number | Bit Type                                                                                 |
|-----------------------------------------------------------------------------------|---------------|-------------|------------------------------------------------------------------------------------------|
|  | BIT25-TX8     | 013-01085   |  Torx |
|                                                                                   | BIT25-TX10    | 013-01094   |                                                                                          |

### Recommended Grades and Cutting Speeds Vc [m/min]

| Material Group                      | Vargus No. | Material                                  |                              | Hardness Brinell HB | Vc [m/min] | Feed f [mm/tooth] |
|-------------------------------------|------------|-------------------------------------------|------------------------------|---------------------|------------|-------------------|
|                                     |            |                                           |                              |                     | VTX        |                   |
| <b>P</b><br>Steel                   | 1          | Unalloyed Steel                           | Low Carbon (C=0.1-0.25%)     | 125                 | 70-190     | 0.005-0.14        |
|                                     | 2          |                                           | Medium Carbon (C=0.25-0.55%) | 150                 | 70-190     | 0.005-0.14        |
|                                     | 3          |                                           | High Carbon (C=0.55-0.85%)   | 170                 | 70-190     | 0.005-0.14        |
|                                     | 4          | Low Alloy Steel (alloying elements ≤ 5%)  | Non Hardened                 | 180                 | 40-170     | 0.005-0.14        |
|                                     | 5          |                                           | Hardened                     | 275                 | 40-170     | 0.005-0.14        |
|                                     | 6          |                                           | Hardened                     | 350                 | 40-170     | 0.005-0.14        |
|                                     | 7          | High Alloy Steel (alloying elements > 5%) | Annealed                     | 200                 | 40-150     | 0.005-0.14        |
|                                     | 8          |                                           | Hardened                     | 325                 | 40-150     | 0.005-0.14        |
| <b>M</b><br>Stainless Steel         | 11         | Stainless Steel Ferritic                  | Non Hardened                 | 200                 | 40-110     | 0.005-0.1         |
|                                     | 12         |                                           | Hardened                     | 330                 | 40-110     | 0.005-0.1         |
|                                     | 13         | Stainless Steel Austenitic                | Austenitic                   | 180                 | 70-150     | 0.005-0.1         |
|                                     | 14         |                                           | Super Austenitic             | 200                 | 70-150     | 0.005-0.1         |
| <b>N</b><br>Non-Ferrous Metals      | 39         | Copper and Copper Alloys                  | Brass                        | 90                  | 40-140     | 0.005-0.14        |
|                                     | 40         |                                           | Bronze And Non Lead Copper   | 100                 | 40-140     | 0.005-0.14        |
| <b>S</b><br>Heat Resistant Material | 23         | Titanium Alloys                           | Pure 99.5 Ti                 | 400Rm               | 70-130     | 0.005-0.08        |
|                                     | 24         |                                           | α+β Alloys                   | 1050Rm              | 20-50      | 0.005-0.08        |
| <b>H</b><br>Hardened Material       | 25         | Extra Hard Steel                          | Hardened & Tempered          | 45-50HRc            | 15-45      | 0.005-0.08        |
|                                     | 26         |                                           |                              | 51-55HRc            | 15-40      | 0.005-0.08        |

## VTX

General purpose grade with tough submicron substrate.  
Provides good fracture toughness in non-rigid cutting conditions. TiAlN coated.



## Measuring the Profile Center to Rotation Axis (Lz)

Use the following method to measure Lz:

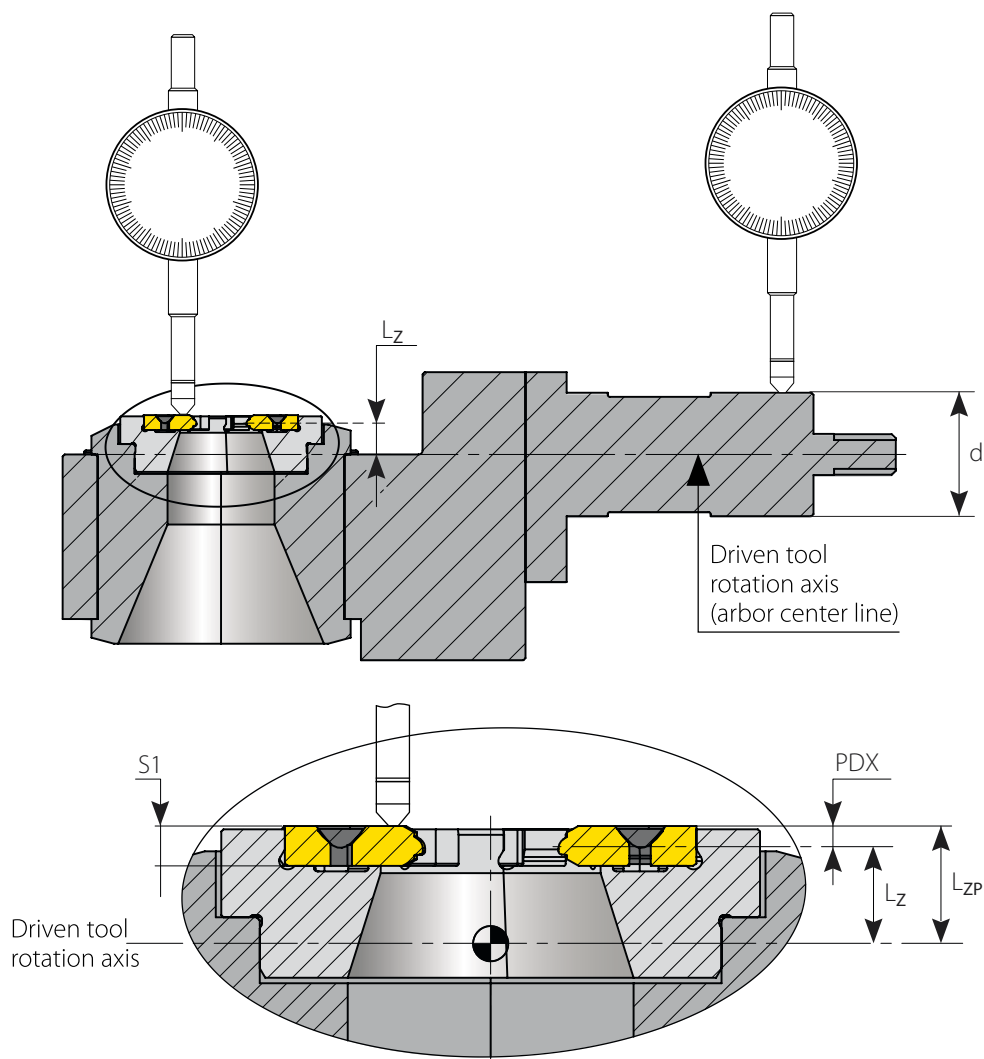
Measure the diameter of the whirling driven tool arbor - d.

The driven tool rotation axis is at the arbor centerline.

Then measure the distance from the driven tool's rotation axis to the upper surface of the inserts  $L_{zp}$ .

Dimension PDX shows the center of the profile (see value in inserts tables, page 7).

$$L_z = L_{zp} - PDX$$





## Application Parameters

$$\beta = \arctan \frac{TP \times N}{\pi \times D}$$

$$N_t = \frac{1000 \times V_c}{\pi \times DC}$$

$$f_R = f_Z \times NOF$$

$$L_Y = L_Z \times \sin(\beta)$$

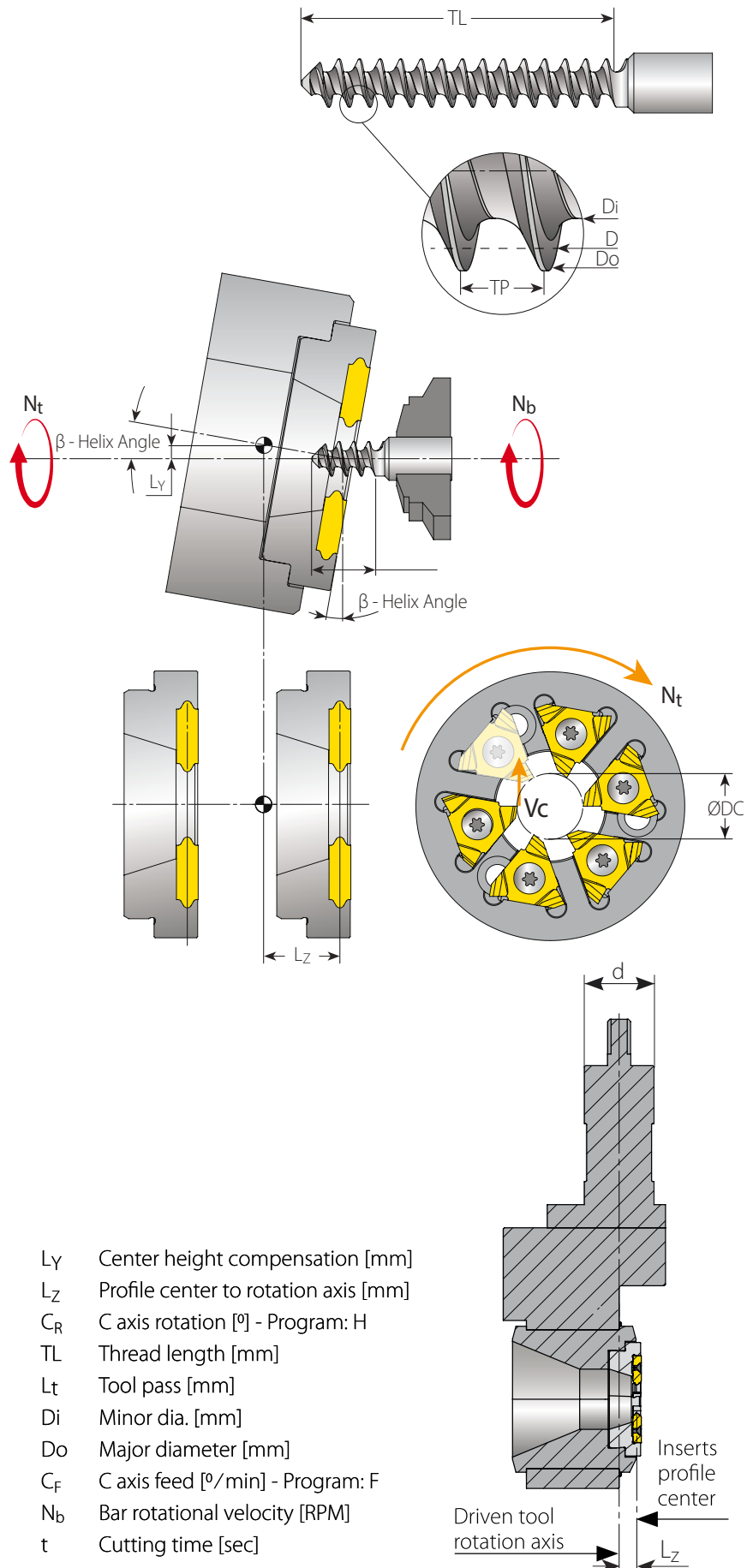
$$C_R = \frac{TL}{TP} \times 360^\circ$$

$$L_t = \frac{TL}{TP} \times \pi \times Di$$

$$C_F = \frac{f_R \times N_t \times C_R}{L_t}$$

$$N_b = \frac{C_F \times TL}{C_R \times TP}$$

$$t = \frac{TL}{TP \times N_b}$$



## Explanation

|         |                                |
|---------|--------------------------------|
| $\beta$ | Helix angle [°]                |
| TP      | Thread pitch [mm]              |
| N       | Number of starts               |
| D       | Pitch diameter [mm]            |
| $N_t$   | Tool rotational velocity [RPM] |
| $V_c$   | Cutting speed [m/min]          |
| DC      | Cutting diameter [mm]          |
| $f_R$   | Feed per revolution [mm/rev]   |
| $f_Z$   | Feed per tooth [mm/tooth]      |
| NOF     | Flute count (No. of inserts)   |

|       |                                      |
|-------|--------------------------------------|
| $L_Y$ | Center height compensation [mm]      |
| $L_Z$ | Profile center to rotation axis [mm] |
| $C_R$ | C axis rotation [°] - Program: H     |
| TL    | Thread length [mm]                   |
| $L_t$ | Tool pass [mm]                       |
| Di    | Minor dia. [mm]                      |
| Do    | Major diameter [mm]                  |
| $C_F$ | C axis feed [°/min] - Program: F     |
| $N_b$ | Bar rotational velocity [RPM]        |
| t     | Cutting time [sec]                   |



# V-WHIRLING

High Precision Whirling System for Medical  
and Micromachining Applications