



# V-WHIRLING

High Precision Whirling System for Medical  
and Micromachining Applications

METRIC

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## Ordering Code

### Holders

<b>VWM</b>	-	<b>D12</b>	-	<b>37</b>	<b>46</b>	-	<b>163</b>	-	<b>Z6</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>

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

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

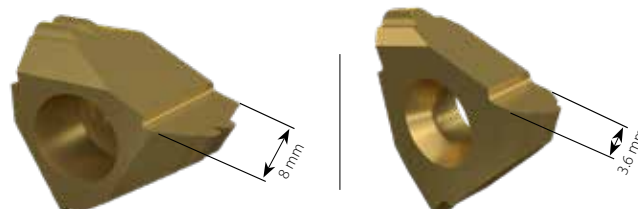
### Inserts

<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>

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

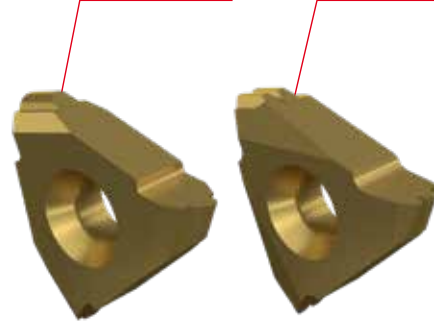
Multipurpose grade for exotic materials



### Indexable inserts with 3 cutting edges and various threading profiles:

Single-tooth solution

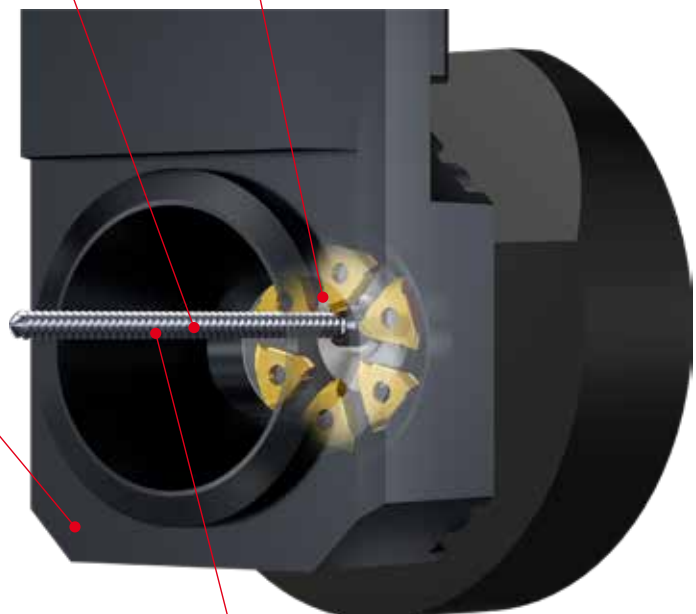
Double-tooth solution for two starts threading



### Close to Spindle Machining

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

Fits popular driven toolholders on Swiss-type machines

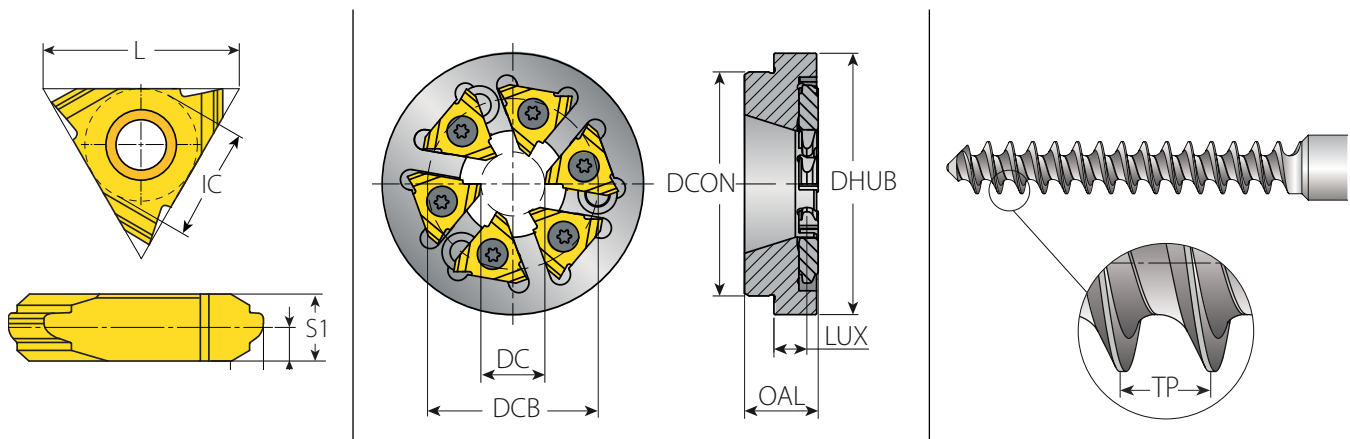


Ideal solution for long threads on small diameter components

## 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.



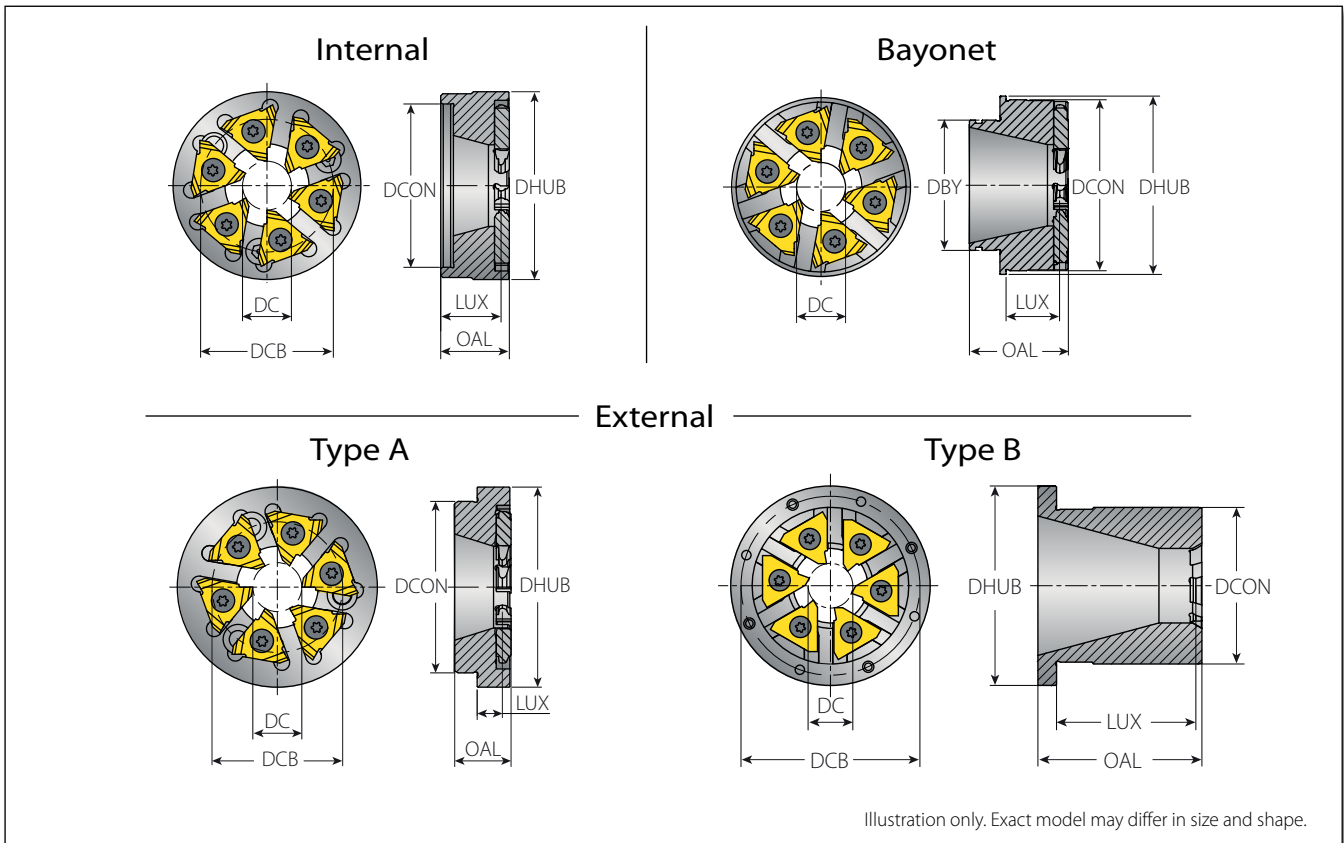
	ISO 13399 Dimension	Description
Insert	L	Cutting Edge Length
	IC	Insert Size
	CDX	Cutting Depth Maximum
	PDX	Profile Distance EX
	S1	Insert Thickness Total
	RE	Corner Radius
	CW	Cutting Width
Holder	DC	Cutting Diameter
	DCB	Connection Bore (screws) Diameter
	DCON	Connection Diameter
	OAL	Overall Length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

# Holder Selection Guide

Optional Machines		Driven Tool		Whirling Holder
Brand	Models	Brand	Models	Ordering Code
CITIZEN	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
DMG MORI	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
DOOSAN	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
GILDEMEISTER	Speed 12-7 / 20-11	PCM	SPW-1220-000	VWM-D12-4046-163-Z6-3V
WOODWY	SW32/SW42	WTO	42BJ	VWM-D12-4244-243-Z6-3V
Hanwha	XD12II   XD20H   XD26H   XD20II   XD26II   XD120   XD32H   XD35H/II   XD38H/II   STL32H   STL35H   STL38H	WTO	42BJ	VWM-D12-4244-243-Z6-3V
	XD20H   XD26H   XD20II   XD26II   XD120   XD32H   XD35H/II   XD38H/II	WTO	54BJ	VWM-D12-5456-138-Z6-3V
	STL32H(Y3)   STL35H(Y3)   STL38H   STL38H(Y3)   STL42H   STL42NH   XD12   XD12II   XD12IIIH   XD12IIUJ   XD16H   XD16II   XD16IIIH   XD16IIUJ   XD16V   XD20   XD20IIH   XD20IIM   XD20IIN   XD20IINH   XD20M   XD20V   XD26H   XD26II   XD26IIM   XD26IIN   XD26IINH   XD26IINH   XE12J   XE16J   XE20H   XE20J   XE20Ne   XE20NH   XE26H   XE26J   XE26Ne   XE26NH   XE35H   XE35J   XE35Ne   XE35NH	W&F	MPU...M*8... (d1=55 mm)	VWM-D12-3855-380-Z6-3V
MAIER 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
NEXTURN 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
NOMURADS	SA20/32	PCM	NESA-32-000	VWM-D12-4046-163-Z6-3V
	NN20	PCM	NN20-W15	VWM-D12-4046-163-Z6-3V
star CNC Machine Tool Corp.	NN20J3	W&F	MPU...M*8... (d1=55 mm)	VWM-D12-3855-380-Z6-3V
	ECAS-12/20   ECAS-32T   SR20R   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-20J   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	
TORNOS	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 / S520-32 / S205/206	WTO	42BJ	VWM-D12-4244-243-Z6-3V
TSUGAMI Laser Swiss	B0265-326 / S520-32 / 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



Insert Style	Ordering Code	Connection Type	No. of Inserts	Dimensions mm							Spare Parts			
				Cutting Dia.	Connection Dia.	Hub Dia.	Overall Length	Clamping Surface to Profile	Connection Bore Dia. (Screws)	Connection Bayonet Dia.	Insert Screw	Torx Key	Holder Screw	
IC			NOF	DC	DCON	DHUB	OAL	LUX	DCB	DBY	SN2TM	K2T	M4.0x13	
3V	VWM-D06-2035-151-Z5-2V*	Int	6	12	6	20	35	15.1	13.5	26	-	SN3TM	K3T	M3.0x8
	VWM-D12-3345-237-Z6-3V	Ext A			33	45	23.7	15.5	40	-	M3.0x15			
	VWM-D12-3746-163-Z6-3V	Int			37	46	16.3	14.5	30.5	-	M4.0x13			
	VWM-D12-3855-380-Z6-3V	Ext A			38.5	55	38.0	15.5	-	-	M4.0x13			
	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	-	M4.0x13			
	VWM-D12-4244-243-Z6-3V	Byo			42	44	24.3	13.5	-	32	SN3T			-
	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.	r4	r5	e	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

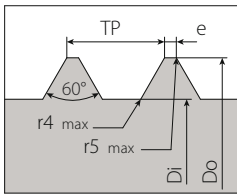
HB Deep Thread

Insert Style	Thread Pitch	Thread	Ordering Code	Dimension mm									Helix Angle °	Grade	Toolholder	
				Cutting Dia.	Screw Maj. Dia.	Screw Min. Dia.	r4	r5	e	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	•	

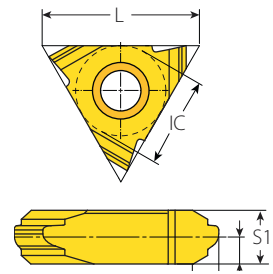
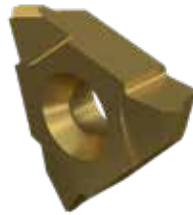
# Whirling Inserts

## HC

### External



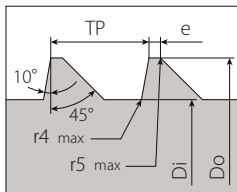
Defined by: ISO 9268



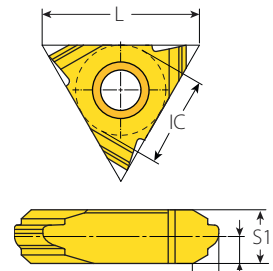
Insert Style	Thread Pitch	Thread	Ordering Code	Dimension mm									Helix Angle °	Grade	Toolholder	
				Cutting Dia.	Screw Maj. Dia.	Screw Min. Dia.	r4	r5	e	Cutting Depth Maximum	Insert Thickness Total	Profile Distance EX				
IC	L mm	TP mm		DC	Do	Di				CDX	S1	PDX	β °	VTX		
3V	16	1.06	HC2.9	3VW2.9HC...	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						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

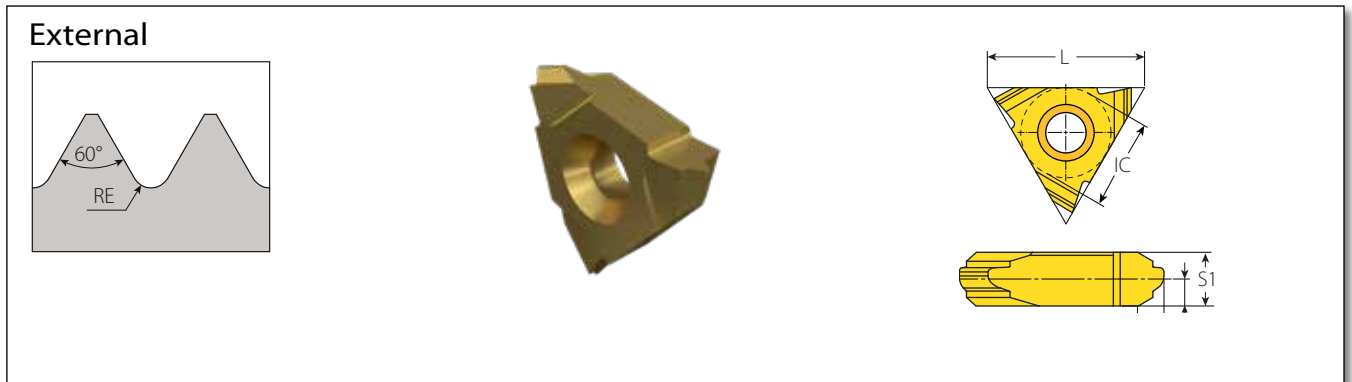


Insert Style	Thread Pitch	Thread	Ordering Code	Dimension mm									Helix Angle °	Grade	Toolholder	
				Cutting Dia.	Screw Maj. Dia.	Screw Min. Dia.	r4	r5	e	Cutting Depth Maximum	Insert Thickness Total	Profile Distance EX				
IC	L mm	TP mm		DC	Do	Di				CDX	S1	PDX	β °	VTX		
3V	16	1.59	HD4.0	3VW4.0HD...	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	•	



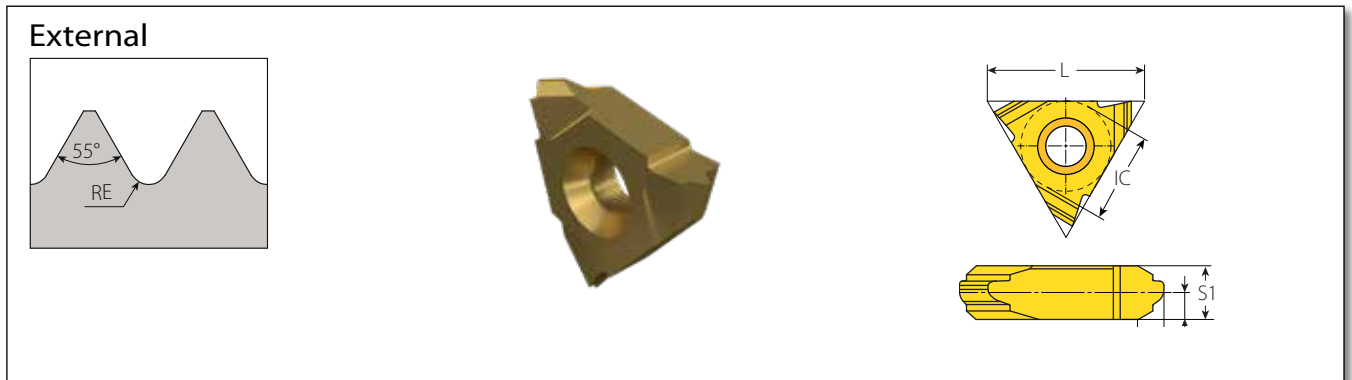
## Whirling Inserts

### Partial Profile 60°



Insert Style		Thread Pitch		Ordering Code	Dimension mm					Grade	Toolholder
					Cutting Dia.	RE	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°

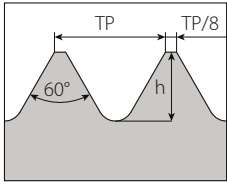


Insert Style		Thread Pitch		Ordering Code	Dimension mm					Grade	Toolholder
					Cutting Dia.	RE	Cutting Depth Maximum	Insert Thickness Total	Profile Distance EX		
IC	L mm	TP	TPI		DC	RE	CDX	S1	PDX	VTX	
3V	16	0.5-1.5	46-16	3VWA55...	12	0	2.75	3.6	1.0	•	VW...-3V
		1.75-3.0	14-8	3VWG55...		0.02			1.8	•	

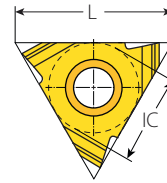
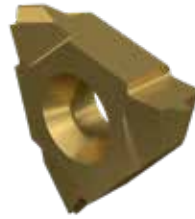
# Whirling Inserts

## ISO Metric

### External



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

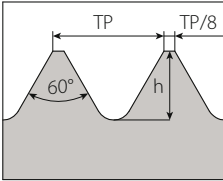
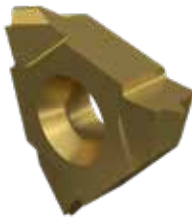
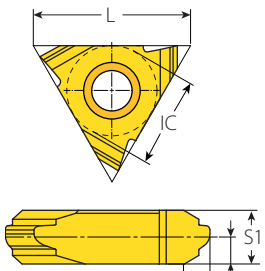


Insert Style		Thread Pitch	Ordering Code	Dimension mm					Grade	Toolholder
				Cutting Dia.	h	Cutting Depth Maximum	Insert Thickness Total	Profile Distance EX		
IC	L mm	TP		DC	h	CDX	S1	PDX	VTX	
3V	16	0.25	3VW0.25ISO...	12	0.14	2.75	3.6	0.4	•	VW...-3V
		0.3	3VW0.3ISO...		0.17			0.45	•	
		0.35	3VW0.35ISO...		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
IC	L mm	TPI		Cutting Dia.	h	Cutting Depth Maximum	Insert Thickness Total	Profile Distance EX	VTX	
				DC		CDX	S1	PDX		
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**





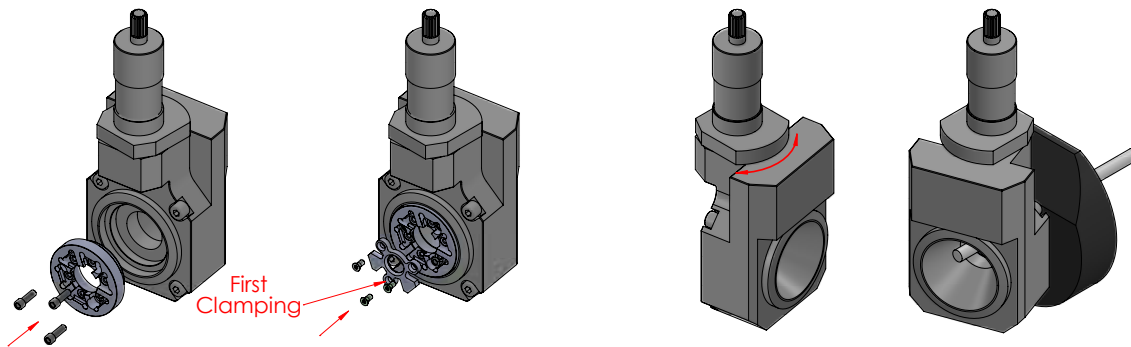
Insert Style		Ordering Code	Dimension mm						Grade	Toolholder
IC	L mm		Cutting Dia.	CW	RE	Cutting Depth Maximum	Insert Thickness Total	Profile Distance EX	VTX	
			DC			CDX	S1	PDX		
3V	16	3VW3.2R005...	12	3.2	0.05	2.75	3.6	1.8	•	VW...-3V

## 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\*

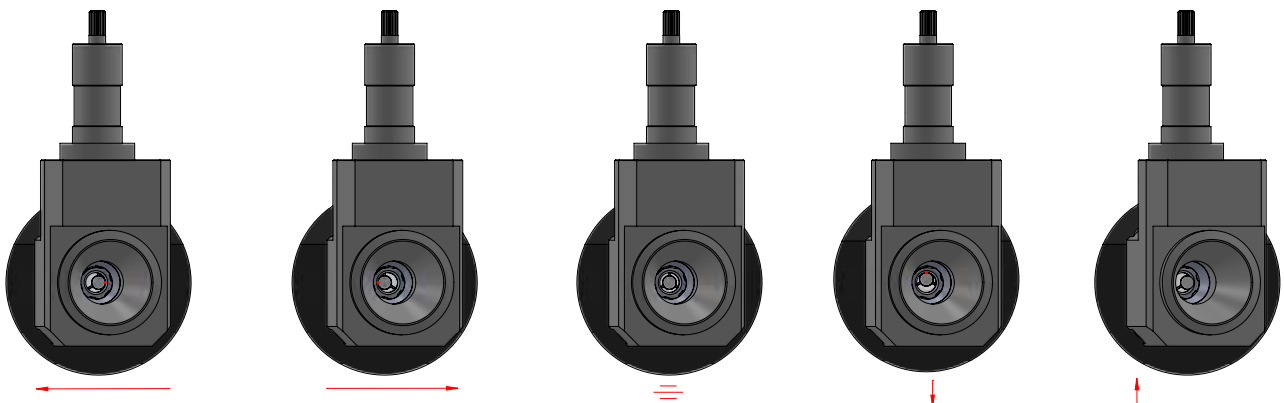


**1.** Clamp the whirling holder into driven tool.

**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	
	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> 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> 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> Non-Ferrous Metals	39	Copper and Copper Alloys	Brass	90	40-140	0.005-0.14
	40		Bronze And Non Leaded Copper	100	40-140	0.005-0.14
<b>S</b> 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> 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.

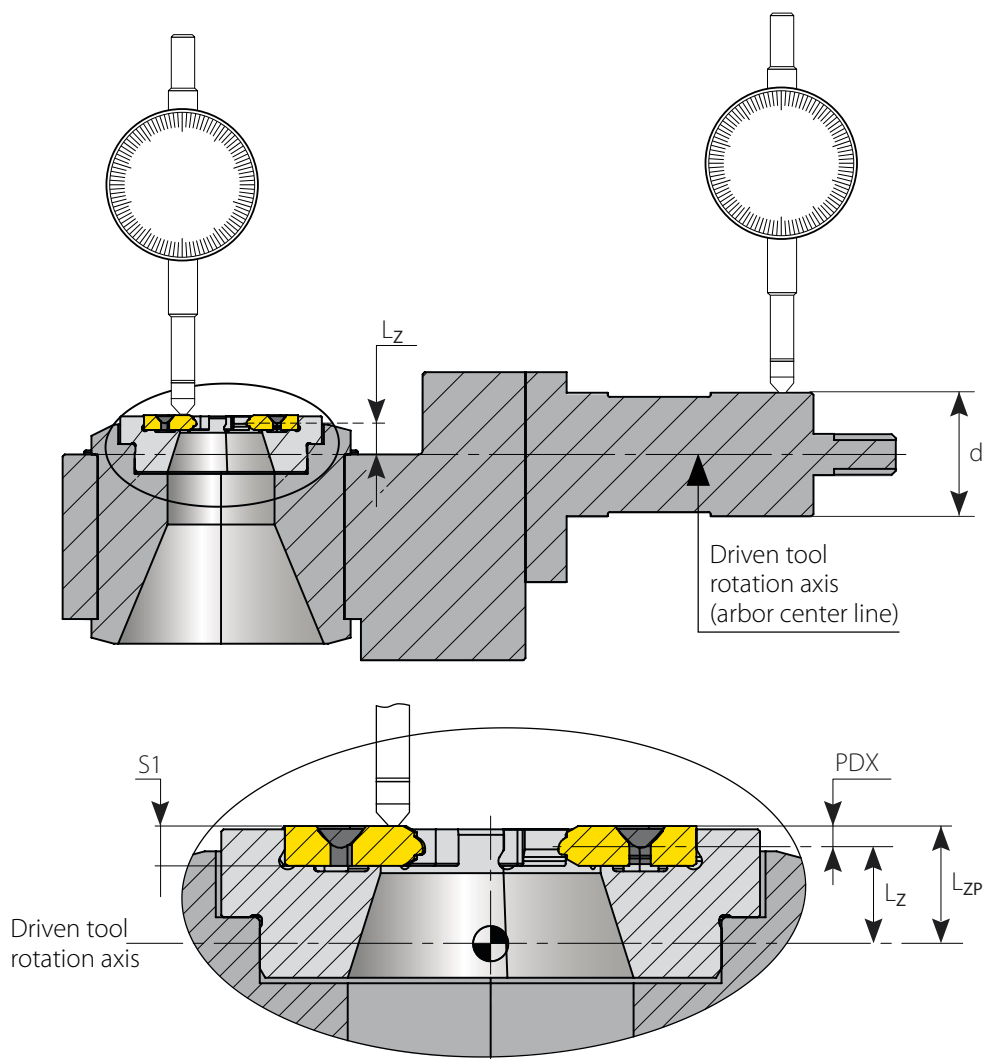


## Measuring the Profile Center to Rotation Axis (Lz)

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

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

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

$$f_R = f_z \times NOF$$

$$L_y = L_z \times \sin(\beta)$$

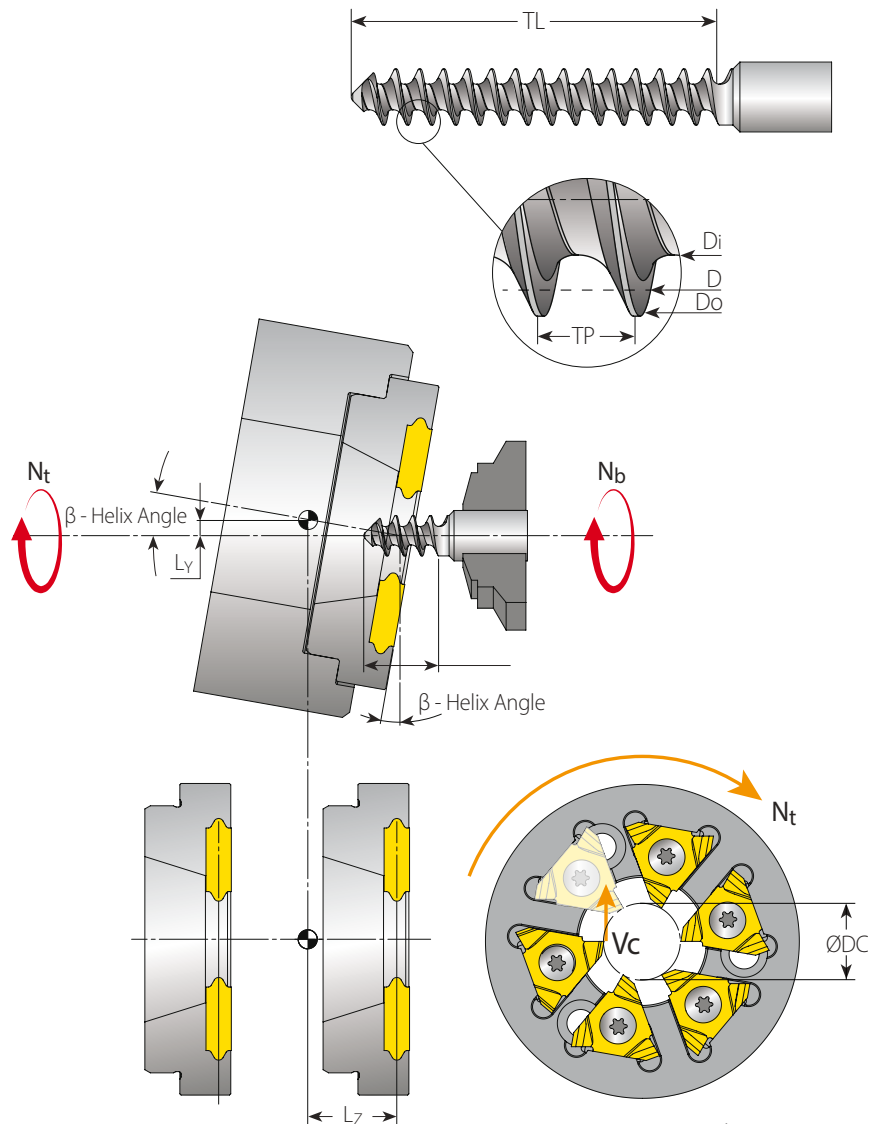
$$C_R = \frac{TL}{TP} \times 360^\circ$$

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

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

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

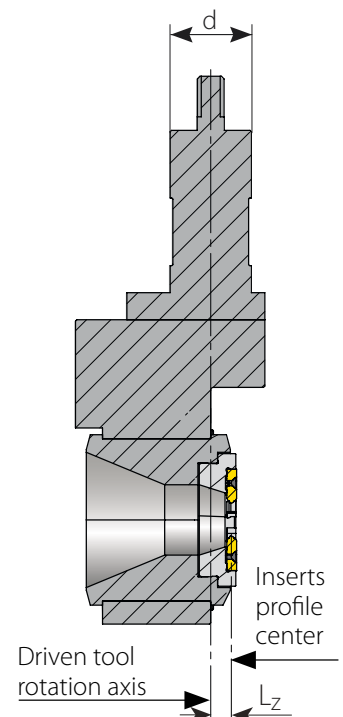
$$t = \frac{TL}{TP \times N_b}$$



## 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]
$D_i$	Minor dia. [mm]
$D_o$	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