

V-WHIRLING

High Precision Whirling System for Medical
and Micromachining Applications

METRIC

V-WHIRLING

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Ordering Code

Holders

VWM	-	D12	-	37	46	-	163	-	Z6	-	3V
1		2		3	4		5		6		7

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

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

Inserts

3V	W	5.0	HA	VTX
1	2	3	4	5

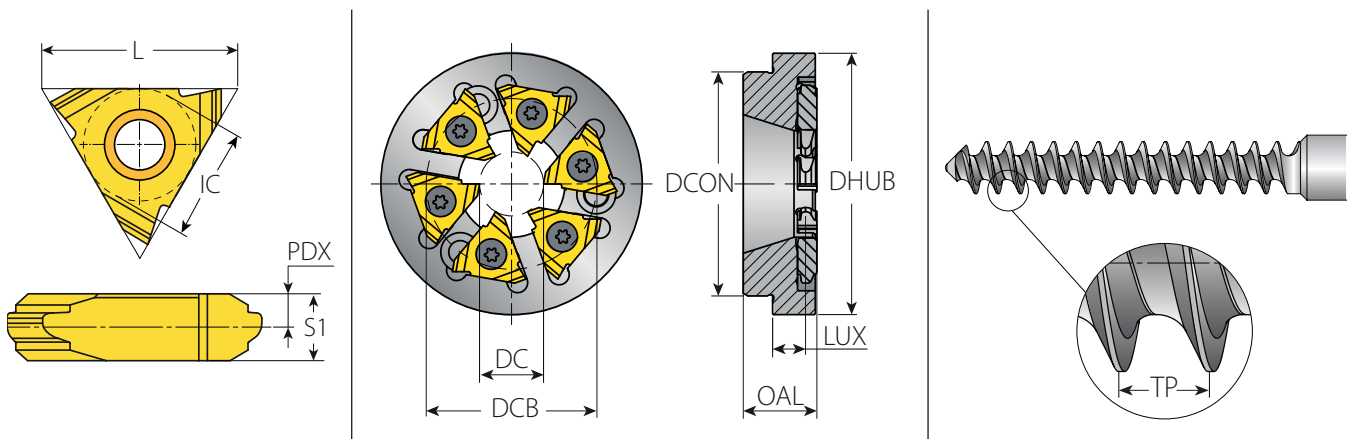
1 - Insert Style	2 - Application	3 - Major Diameter [mm]	4 - Standard	5 - Carbide Grade
2V 3V	W - Whirling	1.5-6.5	HA HB	VTX

Customized specials available upon request.

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.



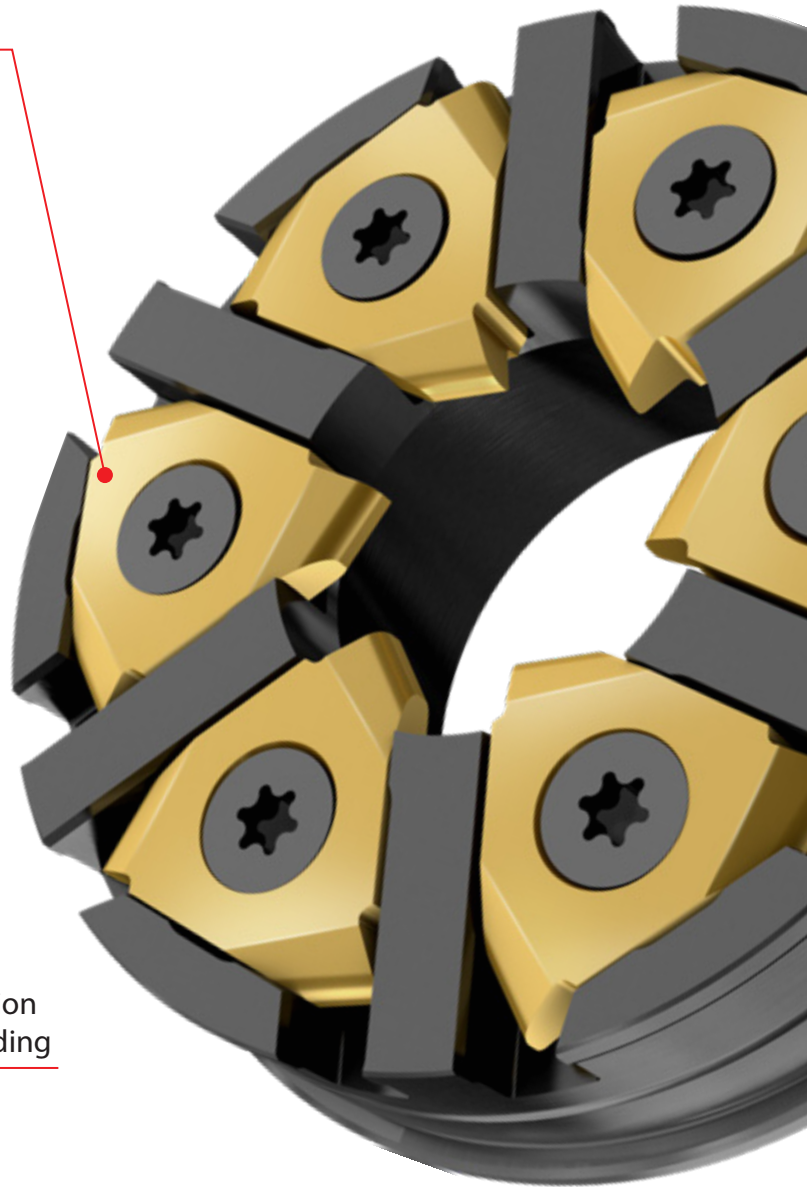
	ISO 13399 Dimension	Description
Insert	L	Cutting Edge Length
	IC	Insert Size
	PDX	Profile Distance EX
	S1	Insert Thickness Total
Holder	DC	Cutting Diameter
	DCB	Connection Bore (screws) Diameter
	DCON	Connection Diameter
	OAL	Overall Length
	DHUB	Hub Diameter
	LUX	Usable Length Maximum
	NOF	Flute Count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



Features and Benefits

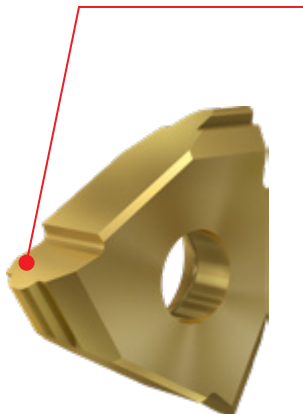
VTX Grade

Multipurpose grade for exotic materials

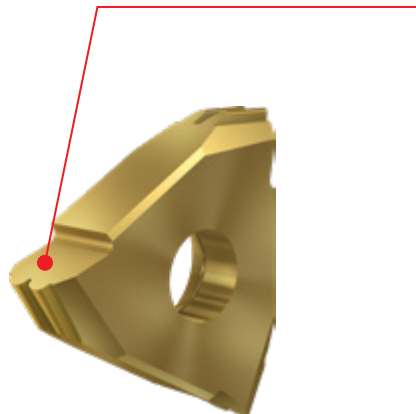


**Indexable inserts with 3
cutting edges and various
threading profiles:**

Single-tooth
solution



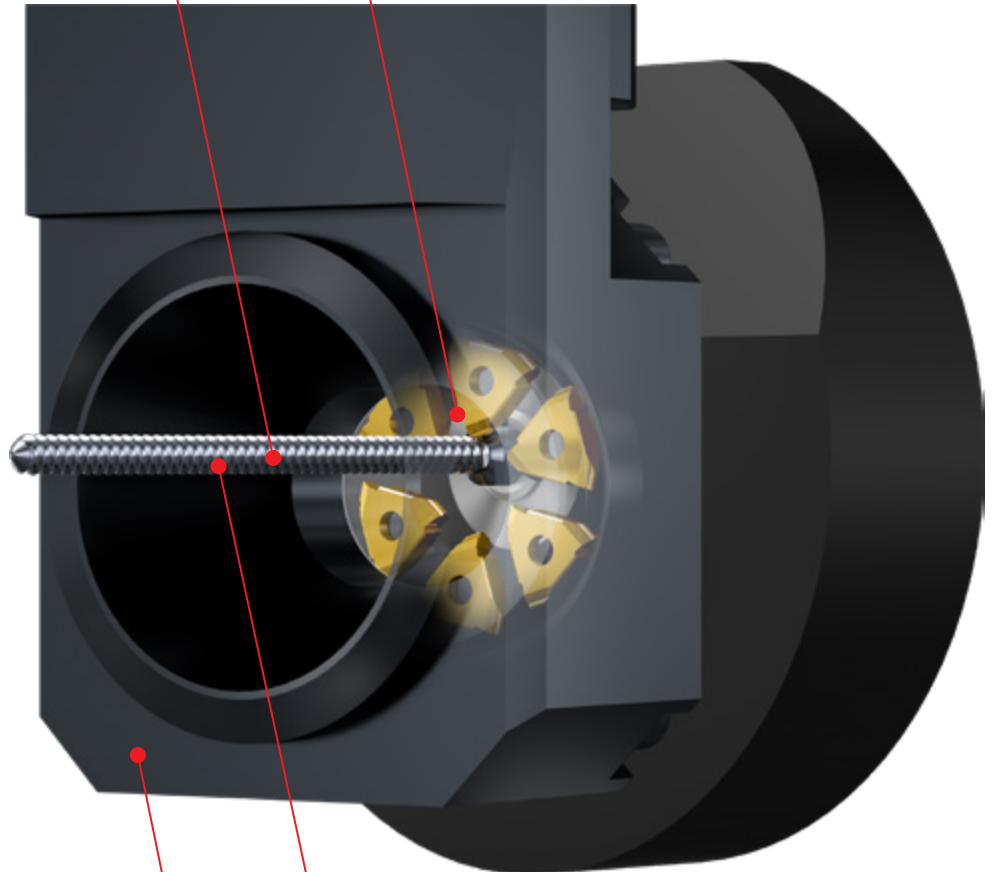
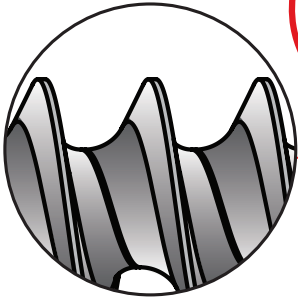
Double-tooth solution
for two starts threading



Close to Spindle Machining

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

**VARGUS
THREADING
QUALITY**

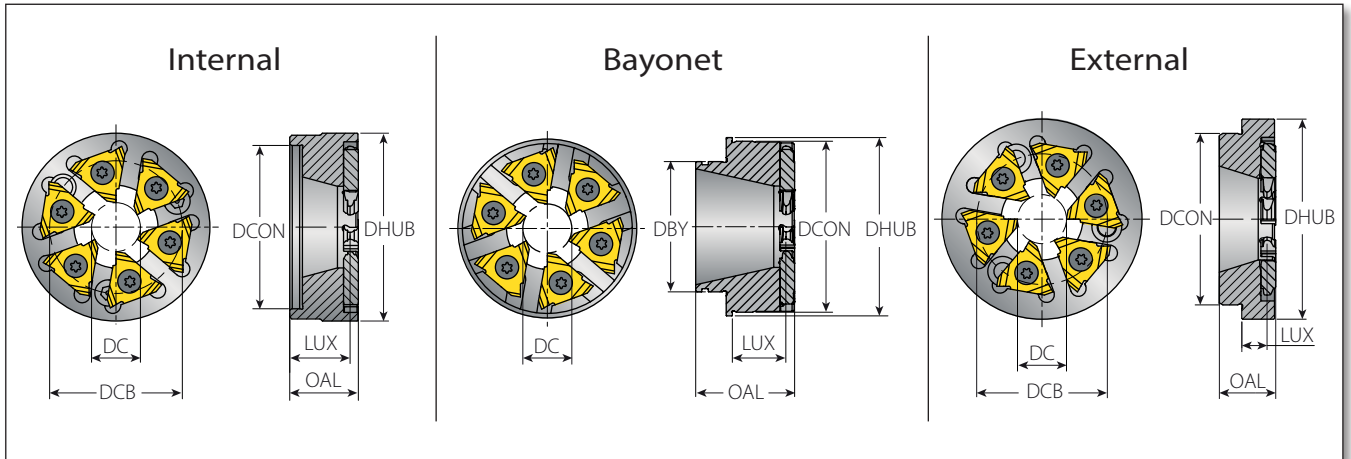


**Ideal solution for long
threads on small diameter
components**

**Fits popular driven
toolholders on Swiss-type
machines**

Holder Selection Guide

Machine		Drive Unit		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
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 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
MAIER MACHINES • ROBOTICS	ML 20 D	PCM	MK-20-W1-15	VWM-D12-4046-163-Z6-3V
NEXTURN SWISS TURN LEASER	SA20/SA26/SA32/SA20XII	WTO	42BJ	VWM-D12-4244-243-Z6-3V
	SA20/SA26/SA32/SA20XII	WTO	54BJ	VWM-D12-5456-138-Z6-3V
	SA20/32	PCM	NESA-32-000	VWM-D12-4046-163-Z6-3V
NOMURADS	NN20	PCM	NN20-W15	VWM-D12-4046-163-Z6-3V
star CNC Machine Tool Corp.	SR20RII / ECAS-12/20/ SV12/20/32/ ECAS-32T	Star	68172 / 54178 / 42173 / 43172 / 58171	VWM-D12-4049-158-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
TORNOS	Gamma 20/6	Tornos	Tornos	VWM-D12-4249-138-Z6-3V
TSUGAMI Leadwires	B0265-326 / SS20-32 / S205/206	WTO	42BJ	VWM-D12-4244-243-Z6-3V
	B0265-326 / SS20-32 / S205/206	WTO	54BJ	VWM-D12-5456-138-Z6-3V



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.			
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
	VWM-D12-3746-163-Z6-3V	Int	6	12	37	46	16.3	14.5	30.5	-			M3.0x15
	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
3V	VWM-D12-4049-158-Z6-3V	Ext			40	49	15.8	7.5	33	-	SN3	K3T	M4.0x13
	VWM-D12-4244-243-Z6-3V	Byo	42	44	24.3	13.5	-	32	-	-			
	VWM-D12-4249-138-Z6-3V	Ext	42	49	13.8	6.5	32	-	M4.0x13				
	VWM-D12-5456-138-Z6-3V	Byo	54	56	13.8	10.5	-	43.8	-	-			

* Only special inserts are suitable for this holder

HA

External

Defined by: ISO 5835

HA Shallow Thread

Insert Style		Thread Pitch	Thread	Ordering Code	Dimension mm						Insert Thickness Total	Profile Distance EX	Helix Angle °	Grade	Toolholder
IC	L mm	TP mm			Cutting Dia.	Screw Maj. Dia.	Screw Min Dia	r4	r5	e	S1	PDX	β°	VTX	
3V	16	0.5	HA1.5	3VW1.5HA...	12	1.5	1.1	0.3	0.1	0.1	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						Insert Thickness Total	Profile Distance EX	Helix Angle °	Grade	Toolholder
IC	L mm	TP mm			Cutting Dia.	Screw Maj. Dia.	Screw Min Dia	r4	r5	e	S1	PDX	β°	VTX	
3V	16	1.75	HB4	3VW4.0HB	12	4.0	1.9	0.8	0.3	0.1	3.6	1.8	11	•	VW...-3V
		2.75	HB6.5	3VW6.5HB		6.5	3.0	1.2	0.8				0.2	10.6	

Recommended Grades and Cutting Speeds Vc [m/min]

Material Group	Vargus No.	Material	Hardness Brinell HB	Vc [m/min]	Feed f [mm/tooth]	
				VTX		
P 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
M 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
N 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
S 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
H 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.



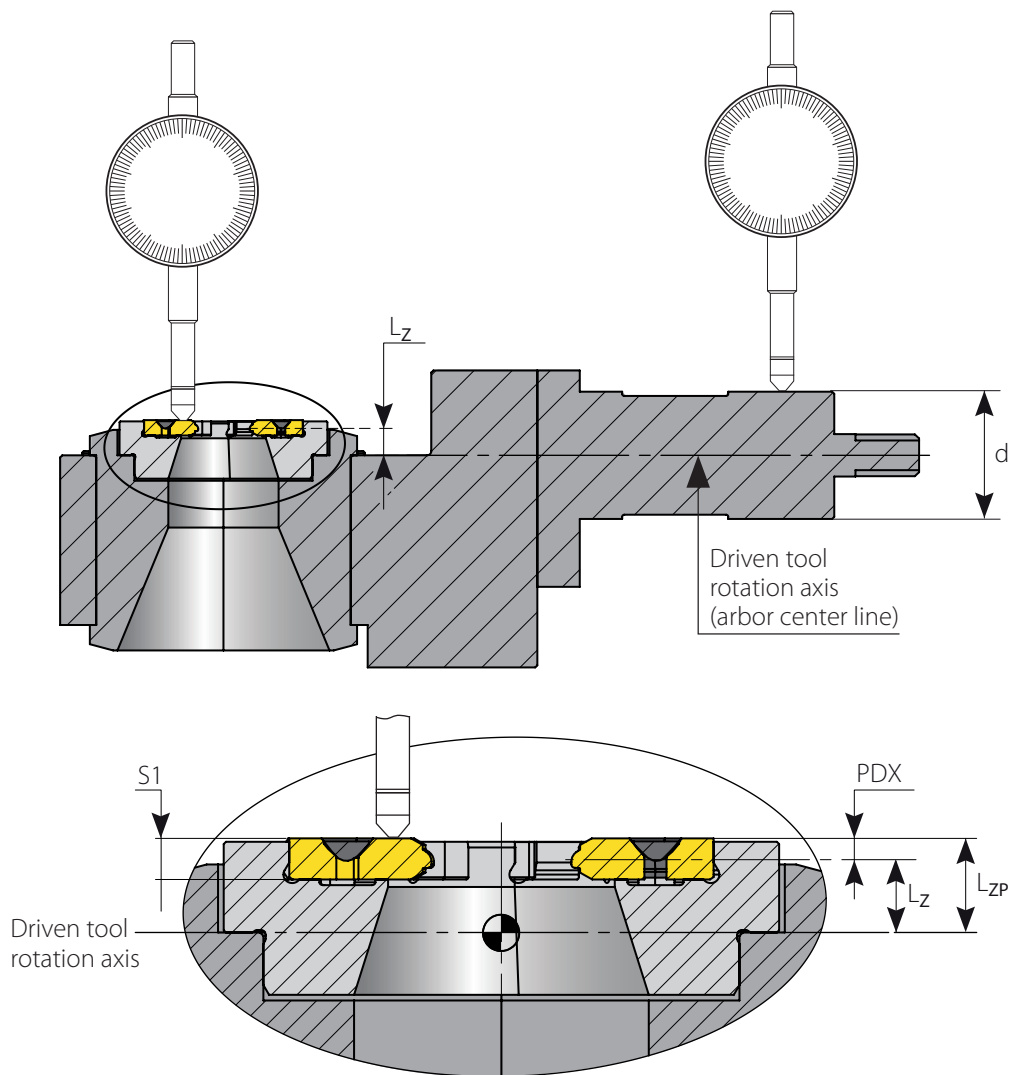
Measuring the Profile Center to Rotation Axis (Lz)

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:

Insert Style		Profile Distance EX
IC	L mm	PDX mm
2V	11	1.6
3V	16	1.8

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





Application Parameters

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

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

$$f_R = f_Z \times NOF$$

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

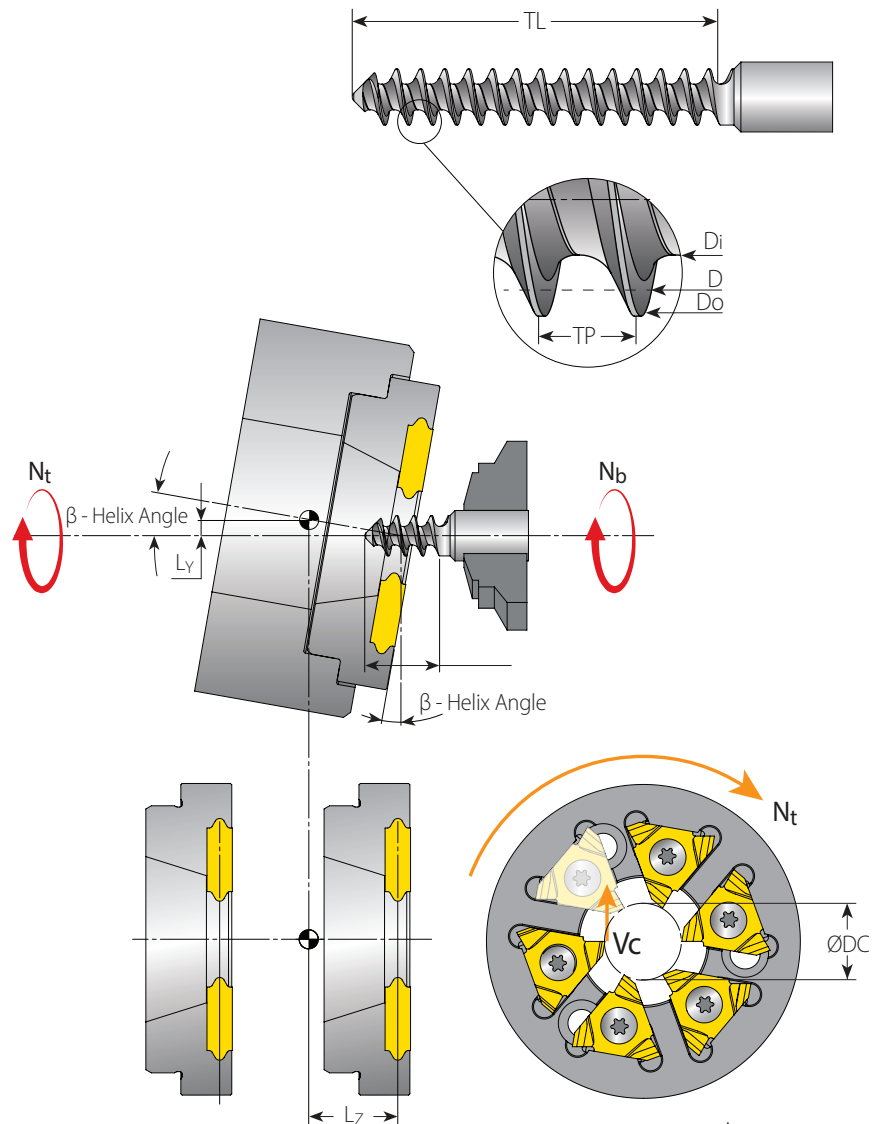
$$C_R = \frac{TL}{TP} \times 360^\circ$$

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

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

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

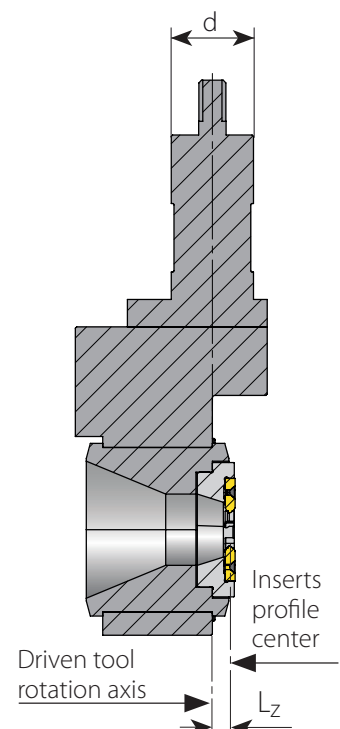
$$t = \frac{TL}{TP \times N_b}$$



Explanation

β	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
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]





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