

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

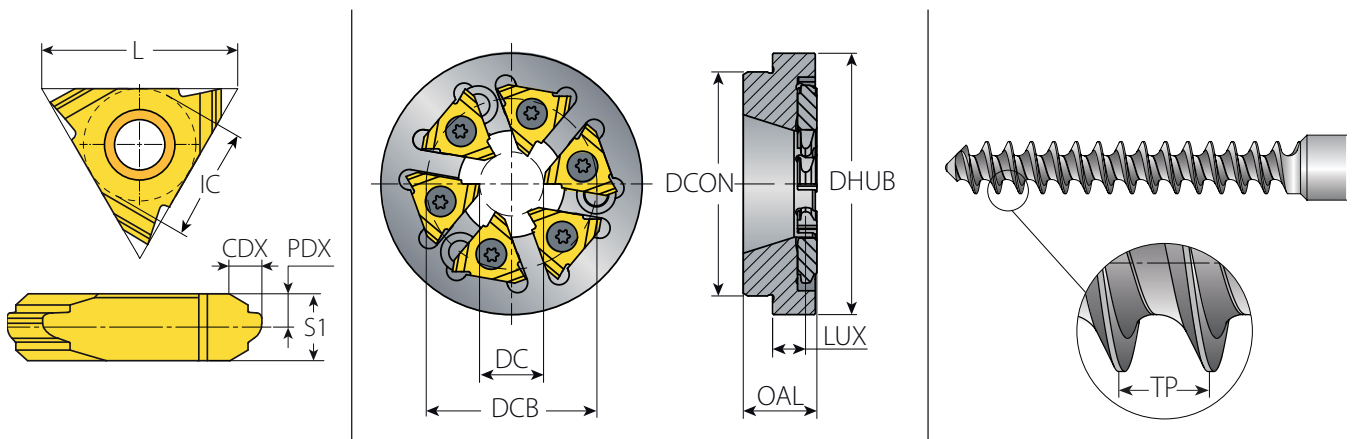
1 - Insert Style	2 - Application	3 - Major Diameter [mm]	4 - Standard	5 - Carbide Grade
2V 3V	W - Whirling	1.5-6.5	HA HB	VTX

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.



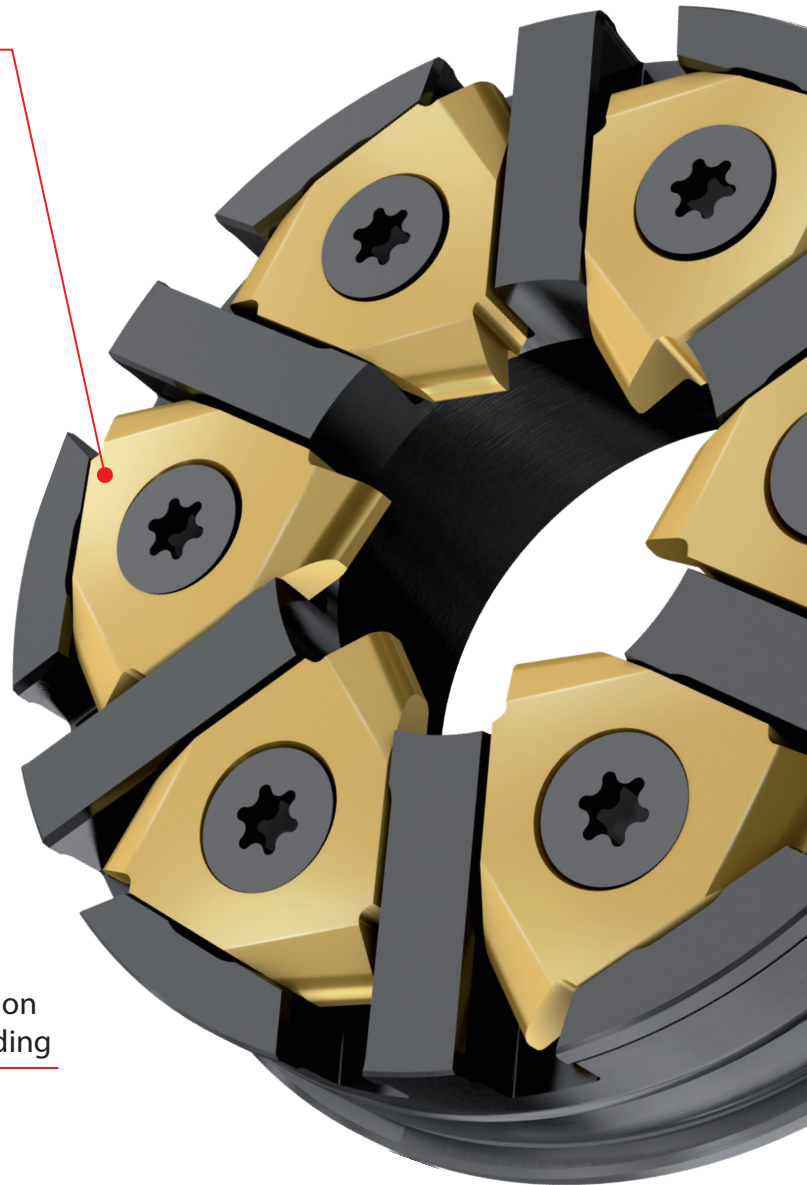
	ISO 13399 Dimension	Description
Insert	L	Cutting Edge Length
	IC	Insert Size
	CDX	Cutting Depth Maximum
	PDX	Profile Distance EX
	S1	Insert Thickness Total
Holder	DC	Cutting Diameter
	DCB	Connection Bore (screws) Diameter
	DCON	Connection Diameter
	OAL	Overall Length
	DHUB	Hub Diameter
	LUX	Usable Length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



Features and Benefits

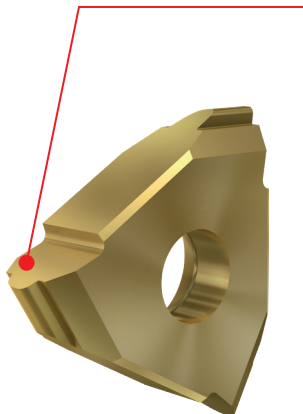
VTX Grade

Multipurpose grade for exotic materials

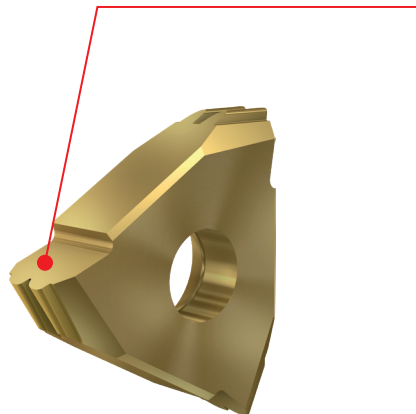


**Indexable inserts with 3
cutting edges and various
threading profiles:**

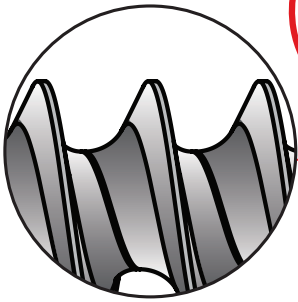
Single-tooth
solution



Double-tooth solution
for two starts threading

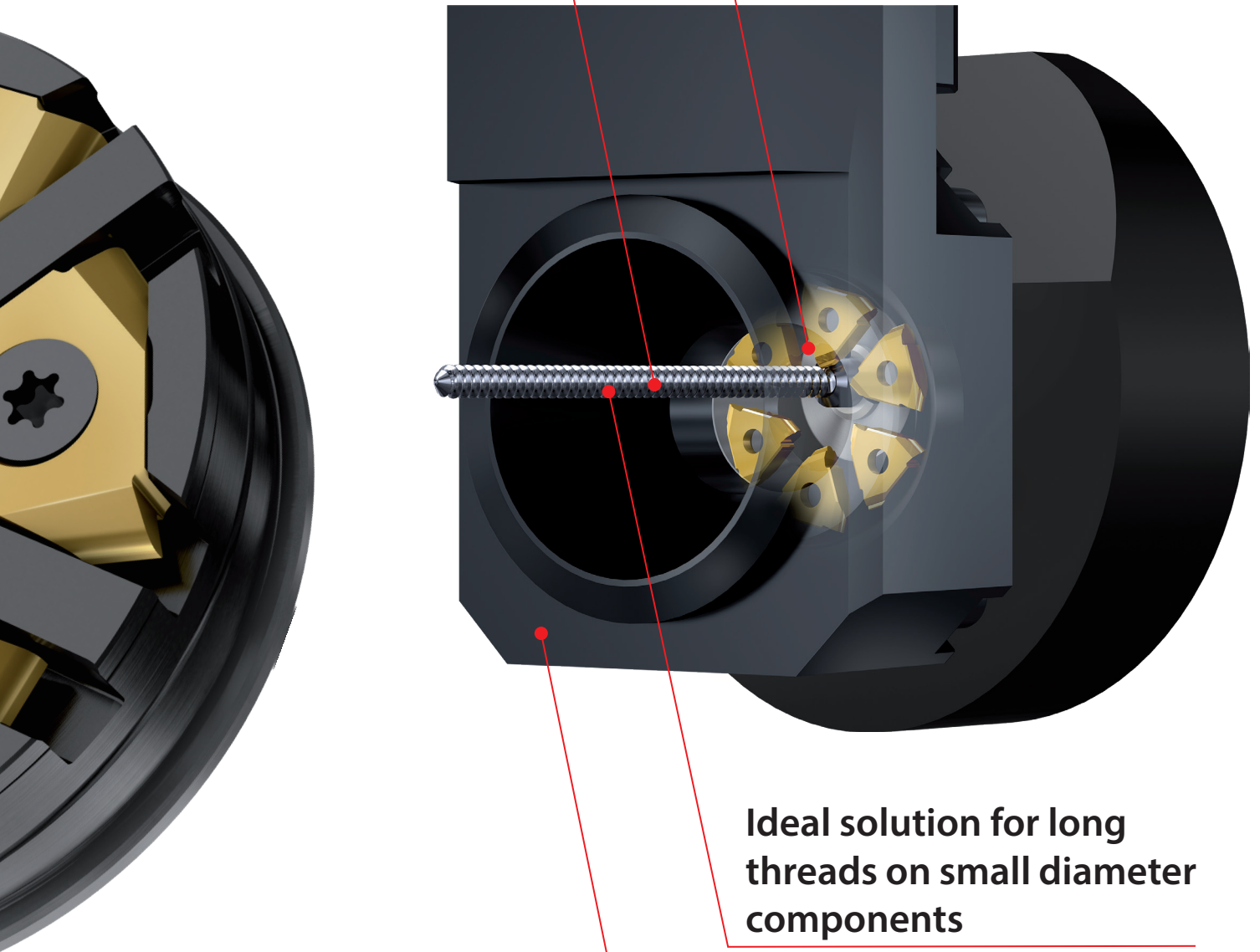


**VARGUS
THREADING
QUALITY**



Close to Spindle Machining

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



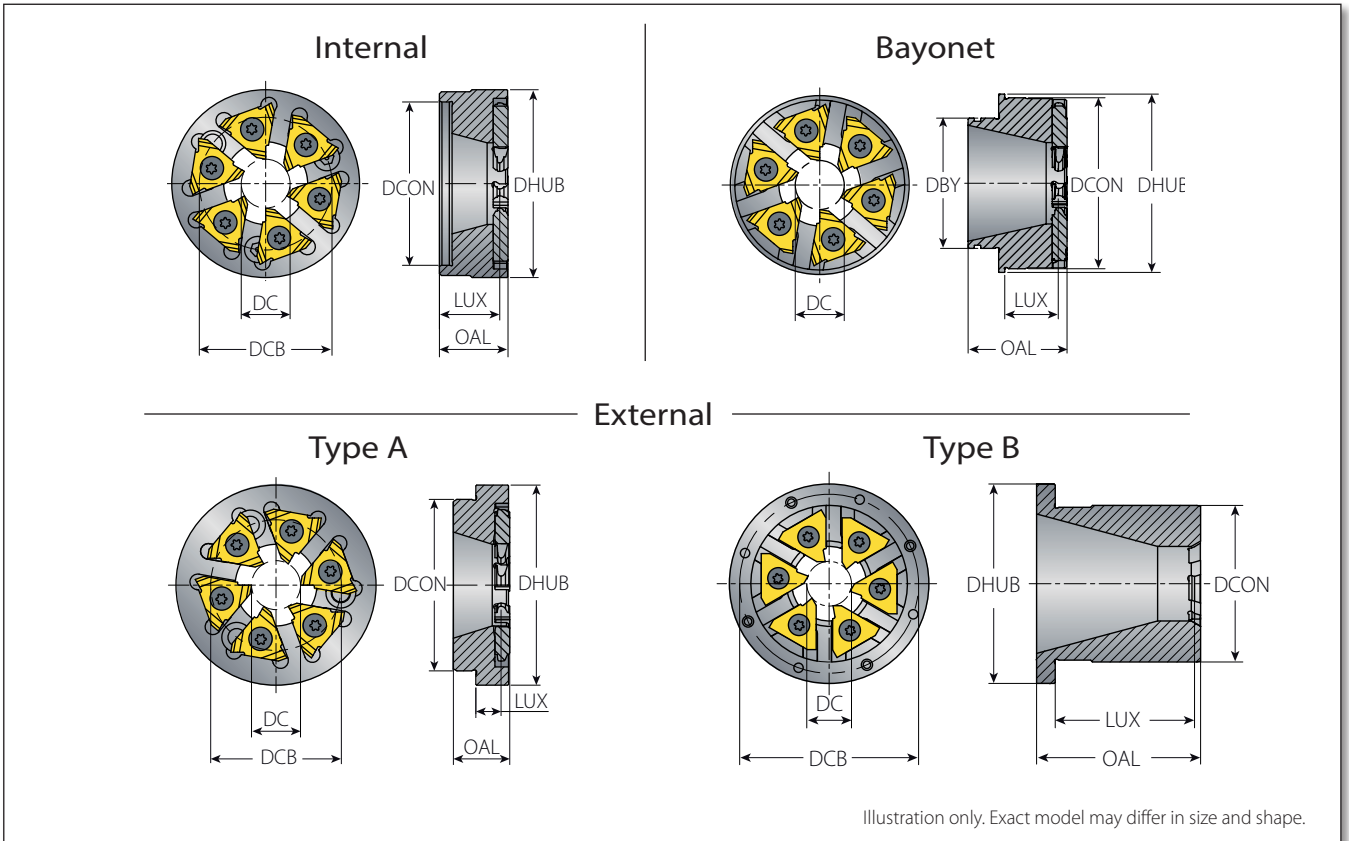
**Ideal solution for long
threads on small diameter
components**

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

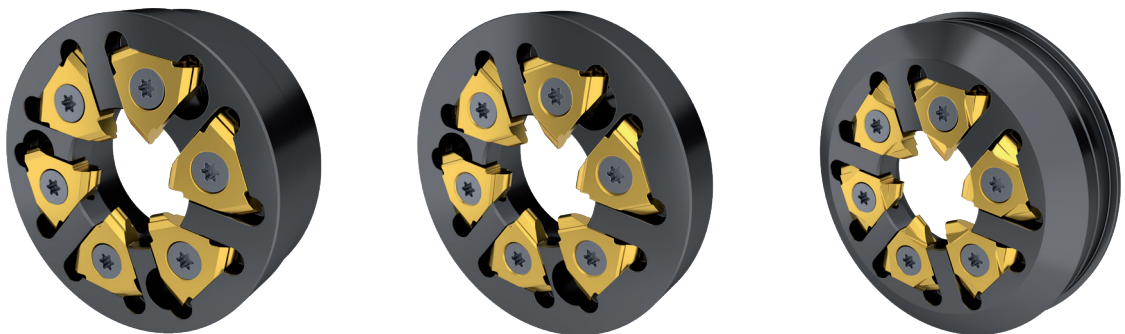
Holder Selection Guide

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=55mm)	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=55mm)	VWM-D12-3855-380-Z6-3V
	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
	SW32/SW42	WTO	42BJ	VWM-D12-4244-243-Z6-3V
	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 XD12IIH XD12IIJ XD16H XD16II XD16IIH XD16IIJ XD16V XD20 XD20IH 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=55mm)	VWM-D12-3855-380-Z6-3V
	ML 20 D	PCM	MK-20-W1-15	VWM-D12-4046-163-Z6-3V
	MLF2 MLF4 ML26 Revolver	W&F	MPU...M*8... (d1=55mm)	VWM-D12-3855-380-Z6-3V
	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
	NN20	PCM	NN20-W15	VWM-D12-4046-163-Z6-3V
	NN20J3	W&F	MPU...M*8... (d1=55mm)	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=55mm)	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=55mm)	VWM-D12-3855-380-Z6-3V
	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
	S205E S206E SS207	W&F	MPU...M*8... (d1=55mm)	VWM-D12-3855-380-Z6-3V

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



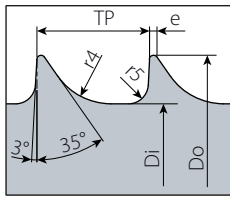
Insert Style	Ordering Code	Connection Type	No. of Inserts	Dimensions mm							Spare Parts			
				Cutting Dia.	Connection Dia.	Hub Dia.	Overall Length	Clamping Surface to Profile	Connection Bore Dia. (Screws)	Connection Bayonet Dia.				
IC			NOF	DC	DCON	DHUB	OAL	LUX	DCB	DBY	Insert Screw	Torx Key	Holder Screw	
2V	VWM-D06-2035-151-Z5-2V*	Int	5	6	20	35	15.1	13.5	26	-	SN2TM	K2T	M4.0x13	
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	-	-			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			-	-
	VWM-D12-4249-138-Z6-3V	Ext A			42	49	13.8	6.5	32	-			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			-	-



* Only special inserts are suitable for this holder

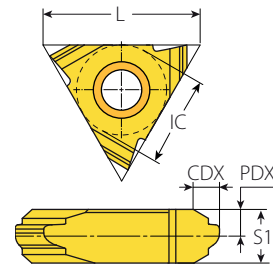
HA

External



Defined by: ISO 5835

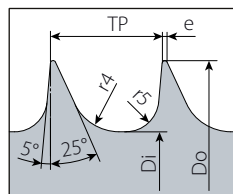
HA Shallow Thread



Insert Style	Thread Pitch	Thread	Ordering Code	Dimension mm									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	•	

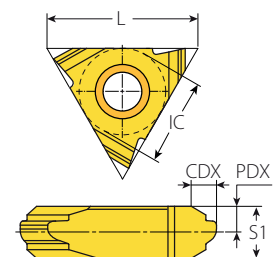
HB

External



Defined by: ISO 5835

HB Deep Thread



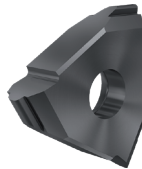
Insert Style	Thread Pitch	Thread	Ordering Code	Dimension mm									Helix Angle °	Grade	Toolholder	
				Cutting Dia.	Screw Maj. Dia.	Screw Min Dia	r4	r5	e	Cutting Depth Maximum	Insert Thickness Total	Profile Distance EX				
IC	L mm	TP mm		DC	Do	Di	r4	r5	e	CDX	S1	PDX	β °	VTX		
3V	16	1.75	HB4	3VW4.0HB	12	4.0	1.9	0.8	0.3	0.1	2.75	3.6	1.8	11	•	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.

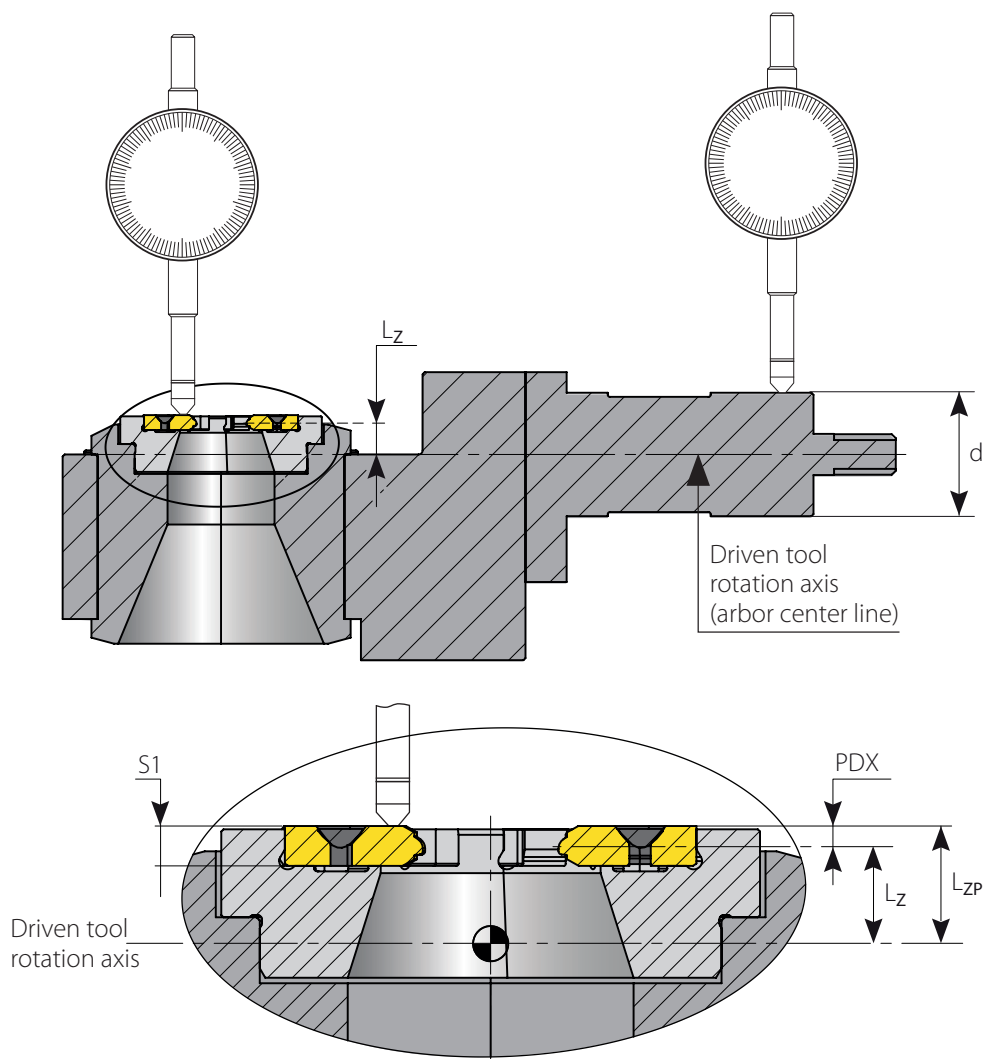


Measuring the Profile Center to Rotation Axis (Lz)

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 (see value in inserts tables, page 8).

$$L_Z = L_{ZP} - PDX$$





Application Parameters

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

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

$$f_R = f_z \times NOF$$

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

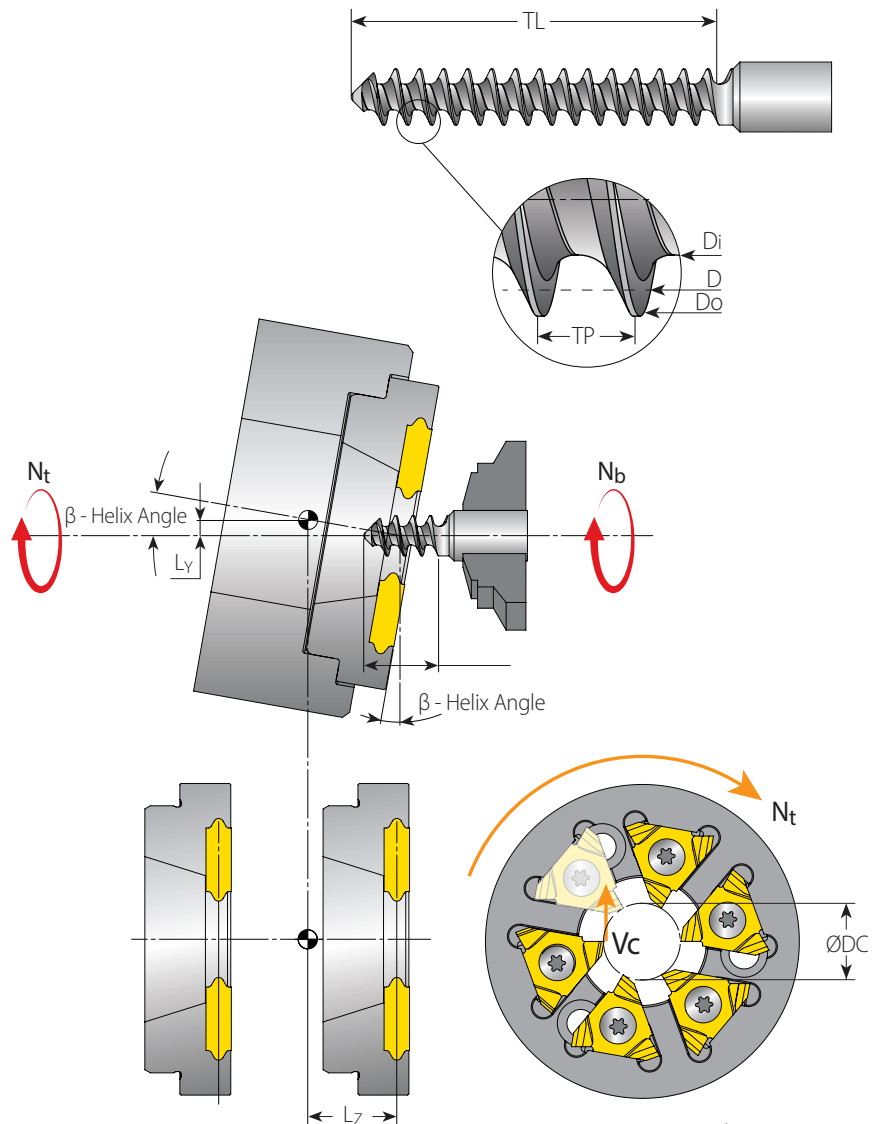
$$C_R = \frac{TL}{TP} \times 360^\circ$$

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

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

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

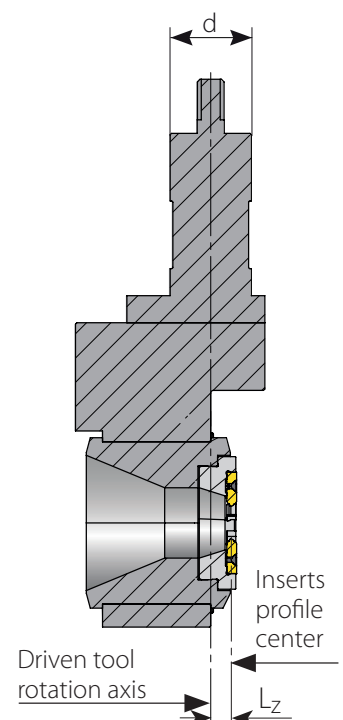
$$t = \frac{TL}{TP \times N_b}$$



Explanation

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 [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