vargus
NEUMO Ehrenberg Group

VARDEX
Advanced Threading Solutions

MAIN CATALOG **SUPPLEMENT**

2021 | METRIC

VARDEX
Advanced Threading Solutions

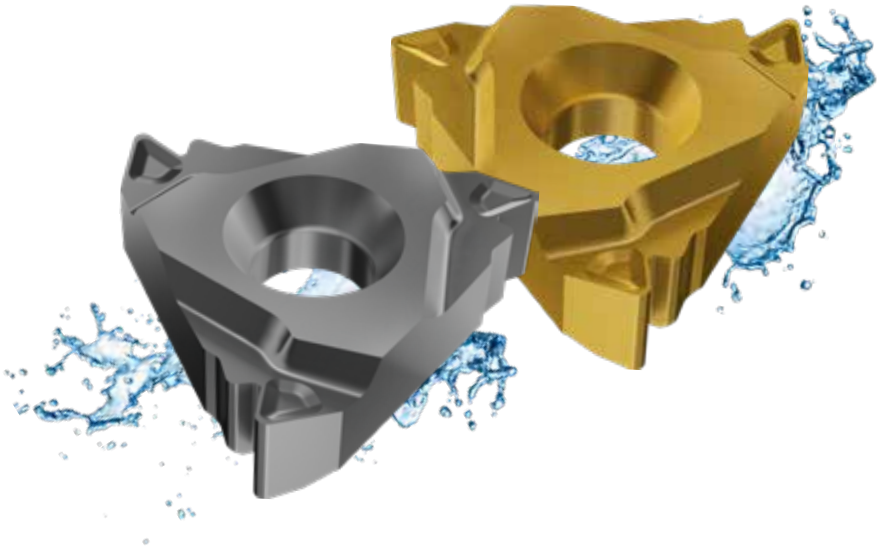
MAIN CATALOG **SUPPLEMENT** 2021

Thread Turning

Thread Milling

FS LINE NEW

Fully Sintered Inserts



Features and Benefits:

- Economical solution for all industries
- The program offers 62 of the most popular profiles for external and internal inserts
- IC range: 1/4" (11), 3/8" (16), 1/2" (22)
- Threading standards: Partial Profile 60°, Partial Profile 55°, ISO Metric, American UN, Whitworth, NPT & API Round
- FS Line inserts are suitable with all standard Thread Turning Holders

Grades:

- **FSK Grade** - TiN coated, recommended for steel and general use
- **FST Grade** - TiAlN coated, for stainless steel and general use

Ordering Code:

- New FS Line insert designation is marked as "FS". For example: 3**FS**ER3.0ISOFSK

Insert Marking:

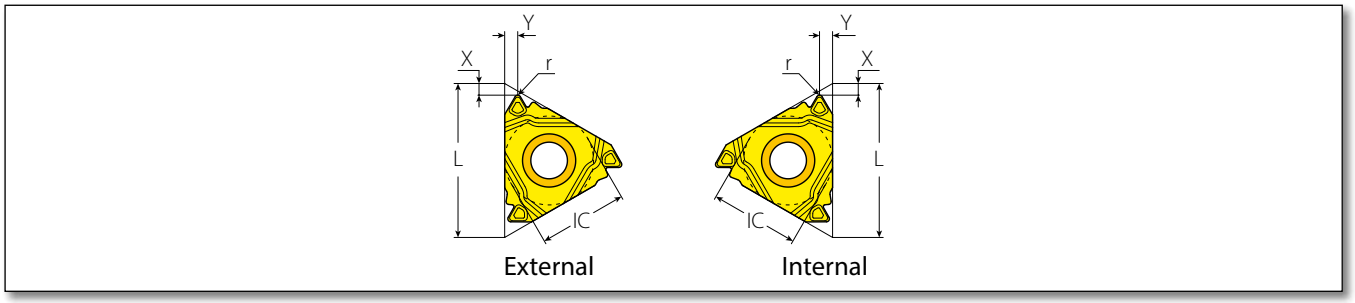
- Insert designation on the bottom of the insert

Packaging:

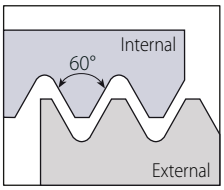
- **NEW** 10-piece packaging

The NEW **FS LINE** is now included in the **VARGUS GENius™**, the most advanced Tool Selector and CNC Program Generator in the metal cutting tools industry.

VARGUS GENius™ Tool Selector and CNC Program Generator

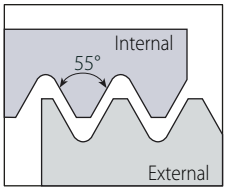


Partial Profile 60°



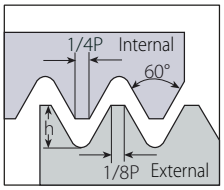
	Insert Size		Pitch		Ordering Code	Market Description	Dimensions mm			Anvil	
	IC	L mm	mm	TPI	RH		r	X	Y	RH	Toolholder
External	3/8"	16	0.5-1.5	48-16	3FSERA60...	*16FSERA60...*	0.06	0.8	0.9	YE3	AL...-3
			1.75-3.0	14-8	3FSERG60...	*16FSERG60...*	0.27	1.3	1.7		
			0.5-3.0	48-8	3FSERAG60...	*16FSERAG60...*	0.08	1.2	1.7		
	1/2"	22	3.5-5.0	7-5	4FSERN60...*	*22FSERN60...*	0.54	1.7	2.5	YE4	AL...-4
Internal	1/4"	11	0.5-1.5	48-16	2FSIRA60...*	*11FSIRA60...*	0.05	0.8	0.9	-	NVR...-2
	3/8"	16	0.5-1.5	48-16	3FSIRA60...*	*16FSIRA60...*	0.05	0.8	1.0	YI3	A/NVR...-3
			1.75-3.0	14-8	3FSIRG60...	*16FSIRG60...*	0.16	1.1	1.5		
			0.5-3.0	48-8	3FSIRAG60...	*16FSIRAG60...*	0.05	1.1	1.6		
	1/2"	22	3.5-5.0	7-5	4FSIRN60...*	*22FSIRN60...*	0.32	1.7	2.5	YI4	A/NVR...-4

Partial Profile 55°



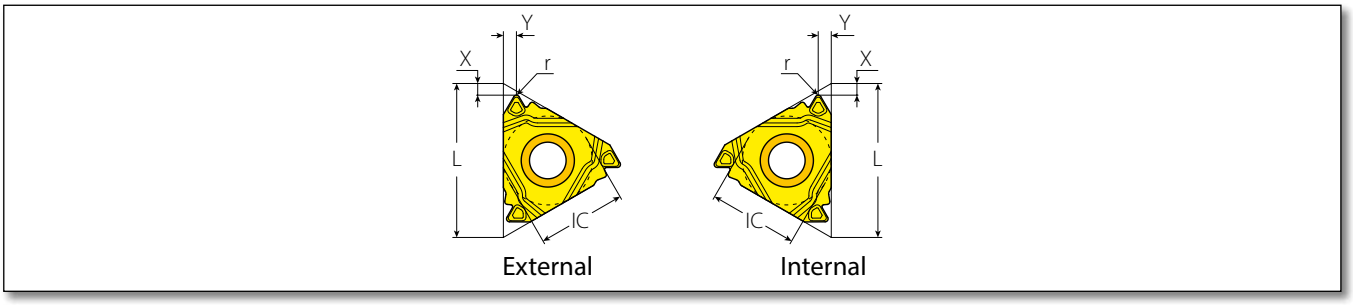
	Insert Size		Pitch		Ordering Code	Market Description	Dimensions mm			Anvil	
	IC	L mm	mm	TPI	RH		r	X	Y	RH	Toolholder
External	3/8"	16	1.75-3.0	14-8	3FSERG55...*	*16FSERG55...*	0.22	1.2	1.7	YE3	AL...-3
			0.5-3.0	48-8	3FSERAG55...	*16FSERAG55...*	0.07	1.1	1.7		
Internal	3/8"	16	1.75-3.0	14-8	3FSIRG55...*	*16FSIRG55...*	0.22	1.1	1.7	YI3	A/NVR..-3
			0.5-3.0	48-8	3FSIRAG55...	*16FSIRAG55...*	0.07	1.1	1.7		

ISO Metric | Defined by: R262 (DIN 13) | Tolerance class: 6g/6H

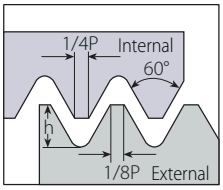


	Insert Size		Pitch	Ordering Code	Market Description	Dimensions mm			Anvil	
	IC	L mm	mm	RH		h min	X	Y	RH	Toolholder
External	3/8"	16	1.0	3FSER1.0ISO...	*16FSER1.0ISO...*	0.61	1.5	0.7	YE3	AL...-3
			1.25	3FSER1.25ISO...	*16FSER1.25ISO...*	0.77	1.4	0.8		
			1.5	3FSER1.5ISO...	*16FSER1.5ISO...*	0.92	1.3	0.9		
			1.75	3FSER1.75ISO...	*16FSER1.75ISO...*	1.07	1.0	1.1		
			2.0	3FSER2.0ISO...	*16FSER2.0ISO...*	1.23	1.4	1.3		
			2.5	3FSER2.5ISO...	*16FSER2.5ISO...*	1.53	1.6	1.5		
			3.0	3FSER3.0ISO...	*16FSER3.0ISO...*	1.84	1.6	1.6		
Internal	1/4"	11	1.0	2FSIR1.0ISO...	*11FSIR1.0ISO...*	0.58	1.0	0.6	-	NVR...-2
			1.5	2FSIR1.5ISO...	*11FSIR1.5ISO...*	0.87	0.9	0.8		
			2.0	2FSIR2.0ISO...	*11FSIR2.0ISO...*	1.15	0.9	1.0		
	3/8"	16	1.0	3FSIR1.0ISO...	*16FSIR1.0ISO...*	0.58	1.4	0.7	YI3	A/NVR...-3
			1.25	3FSIR1.25ISO	*16FSIR1.25ISO*	0.72	1.3	0.8		
			1.5	3FSIR1.5ISO...	*16FSIR1.5ISO...*	0.87	1.2	0.9		
			1.75	3FSIR1.75ISO...*	*16FSIR1.75ISO...*	1.01	1.0	1.1		
			2.0	3FSIR2.0ISO...	*16FSIR2.0ISO...*	1.15	1.3	1.3		
			2.5	3FSIR2.5ISO...	*16FSIR2.5ISO...*	1.44	1.3	1.4		
			3.0	3FSIR3.0ISO...	*16FSIR3.0ISO...*	1.73	1.2	1.5		

* Available Q1 2021

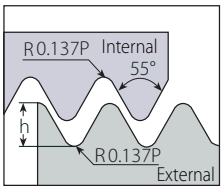


American UN | Defined by: ANSI B1.1:74 | Tolerance class: 2A/2B



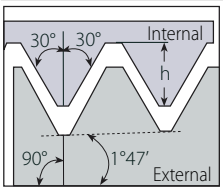
	Insert Size		Pitch	Ordering Code	Market Description	Dimensions mm			Anvil	
	IC	L mm	TPI	RH		h min	X	Y	RH	Toolholder
External	3/8"	16	24	3FSER24UN...*	*16FSER24UN...*	0.65	1.4	0.8	YE3	AL...-3
			20	3FSER20UN...	*16FSER20UN...*	0.78	1.4	0.8		
			18	3FSER18UN...	*16FSER18UN...*	0.87	1.2	0.9		
			16	3FSER16UN...	*16FSER16UN...*	0.97	1.2	1.1		
			14	3FSER14UN...	*16FSER14UN...*	1.11	0.9	1.2		
			12	3FSER12UN...	*16FSER12UN...*	1.30	1.3	1.4		
			8	3FSER8UN...*	*16FSER8UN...*	1.95	1.3	1.6		
Internal	3/8"	16	20	3FSIR20UN...	*16FSIR20UN...*	0.73	1.3	0.8	YI3	A/NVR...-3
			18	3FSIR18UN...*	*16FSIR18UN...*	0.81	1.2	0.9		
			16	3FSIR16UN...	*16FSIR16UN...*	0.92	1.1	0.9		
			14	3FSIR14UN...*	*16FSIR14UN...*	1.05	1.1	1.1		
			12	3FSIR12UN...	*16FSIR12UN...*	1.22	1.4	1.4		
			8	3FSIR8UN...*	*16FSIR8UN...*	1.83	1.2	2.5		

Whitworth for BSW, BSP | Defined by: B.S.84:1956, DIN 259, ISO228/1:1982 | Tolerance class: Medium class A



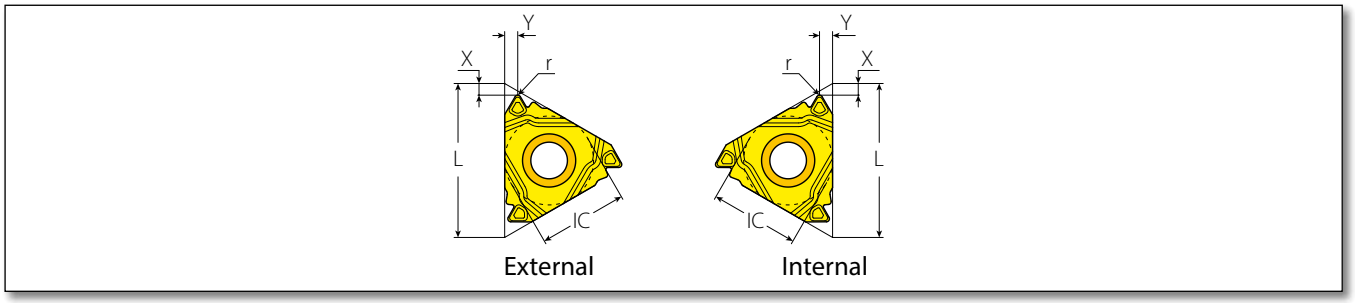
	Insert Size		Pitch	Ordering Code	Market Description	Dimensions mm			Anvil	
	IC	L mm	TPI	RH		h min	X	Y	RH	Toolholder
External	3/8"	16	19	3FSER19W...*	*16FSER19W...*	0.86	1.2	0.9	YE3	AL...-3
			14	3FSER14W...	*16FSER14W...*	1.16	1.0	1.2		
			11	3FSER11W...	*16FSER11W...*	1.48	1.4	1.5		
Internal	1/4"	11	19	2FSIR19W...*	*11FSER19W...*	0.86	1.2	1.9	-	NVR...-2
			14	2FSIR14W...*	*11FSER14W...*	1.16	1.0	1.0		
	3/8"	16	14	3FSIR14W...	*16FSIR14W...*	1.16	1.2	1.2	YI3	A/NVR...-3
			11	3FSIR11W...	*16FSIR11W...*	1.48	1.3	1.4		

NPT | Defined by: USAS B2.1:1968 | Tolerance class: Standard NPT

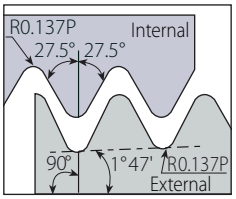


	Insert Size		Pitch	Ordering Code	Market Description	Dimensions mm			Anvil	
	IC	L mm	TPI	RH		h min	X	Y	RH	Toolholder
External	3/8"	16	18	3FSER18NPT...*	*16FSER18NPT...*	1.01	1.0	0.9	YE3	AL...-3
			14	3FSER14NPT...	*16FSER14NPT...*	1.33	0.9	1.2		
			11.5	3FSER11.5NPT...	*16FSER11.5NPT...*	1.64	1.1	1.5		
			8	3FSER8NPT...*	*16FSER8NPT...*	2.42	1.1	1.7		
Internal	3/8"	16	14	3FSIR14NPT...	*16FSIR14NPT...*	1.33	1.1	1.2	YI3	A/NVR...-3
			11.5	3FSIR11.5NPT...	*16FSIR11.5NPT...*	1.64	1.2	1.4		
			8	3FSIR8NPT...*	*16FSIR8NPT...*	2.42	1.2	1.8		

* Available Q1 2021



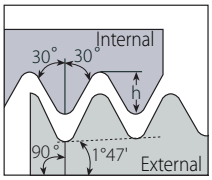
BSPT



	Insert Size			Ordering Code	Market Description	Dimensions mm			Anvil	
	IC	L mm	TPI	RH		h min	X	Y	RH	Toolholder
External	3/8"	16	14	3FSER14BSPT*	*16FSER14BSPT...*	1.16	0.9	1.0	YE3	AL…-3
			11	3FSER11BSPT*	*16FSER11BSPT...*	1.48	1.1	1.3		
Internal	3/8"	16	14	3FSIR14BSPT*	*16FSIR14BSPT...*	1.16	1.1	1.2	YI3	A/NVR..-3
			11	3FSIR11BSPT*	*16FSIR11BSPT...*	1.48	1.2	1.4		

Defined by: B.S. 21:1985
Tolerance class: Standard BSPT

API Round Casing & Tubing | Defined by: API STD. 5B:1979 | Tolerance class: Standard API RD



	Insert Size		Pitch	Ordering Code	Market Description	Dimensions mm			Anvil	
	IC	L mm	TPI	RH		h min	X	Y	RH	Toolholder
Internal	3/8"	16	10	3FSIR10APIRD...	*16FSIR10APIRD...*	1.41	1.2	1.5	YEI3-APIRD or YI3	AVRC… 3APIRD or AVRC…-3

* Available Q1 2021

PRECISION PRODUCTIVITY PROFITABILITY
HPC High Pressure Coolant for SWISS TYPE MACHINES

NEW

ALCS

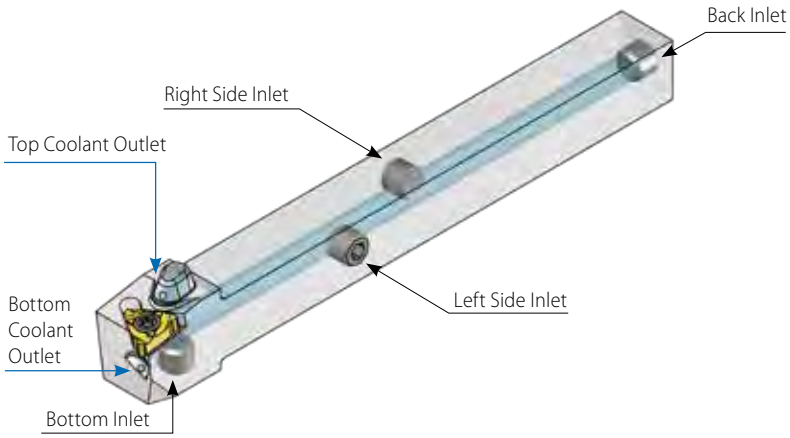
External Thread Turning Toolholders

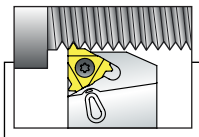
FOR SWISS TYPE MACHINES

WITH HIGH PRESSURE COOLANT (HPC)

Features and Benefits:

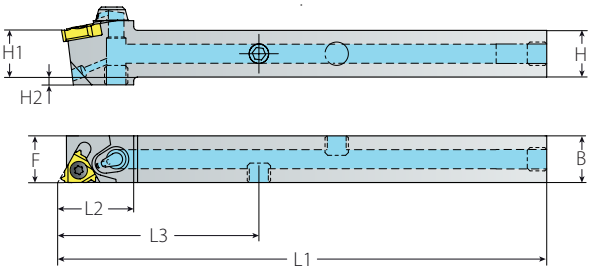
- Two dedicated inlets for Swiss type machines, accessible from both sides of the holder
- Back and bottom coolant inlets also available for conventional machines
- Two precise high pressure coolant outlets, designed to cool down the top and bottom of the insert for longer tool life and better chip evacuation
- High Pressure Coolant up to 70 bar
- Nickel coating for better wear resistance and anti-corrosion protection
- Available for standard insert sizes: IC1/4" (11), 3/8" (16)
- Shank sizes: 10mm and 12mm
- Left Hand holders are available as standard
- **New!** Now including innovative laser markings of spare parts and maximum torque details



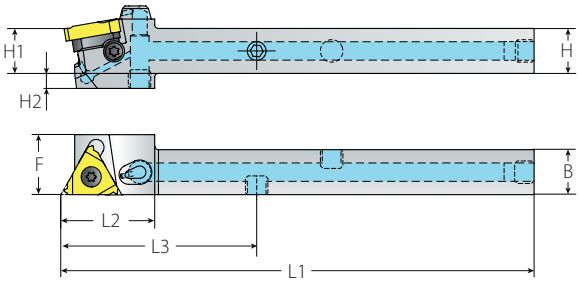


External Toolholders

NLCS Type
(without Anvil)

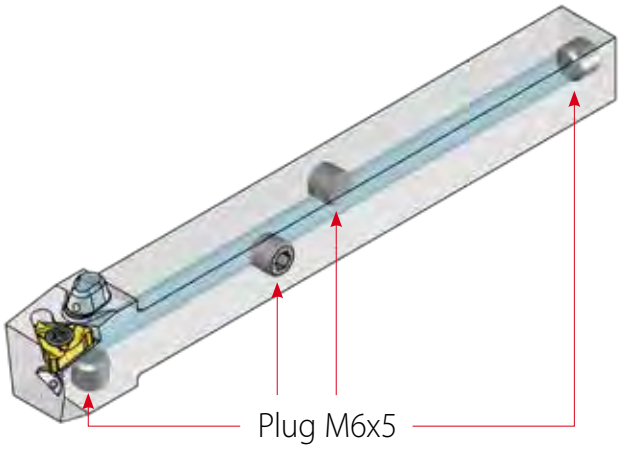


ALCS Type
(with Anvil)
& NLCS Type
(without Anvil)



Standard with Coolant

Insert Size	Ordering Code		Dimensions mm						Market Description		Spare Parts					
IC	RH	LH	H=H1=B	F	L1	L2	L3	H2	RH	LH	Insert Screw	Anvil Screw	Torx Key	Anvil RH	Anvil LH	Plug* x 4
1/4"	NLCS10-2	NLCS10-2LH	10	12	110.7	18.8	36.7	4	*NLCS10-11*	*NLCS10-11LH*	SN2T	-	K2T	-	-	Plug M6x5
	NLCS12-2	NLCS12-2LH	12	12	125.7	18.8	51.7	2	*NLCS12-11*	*NLCS12-11LH*						
3/8"	ALCS12-3	ALCS12-3LH	12	16	125.7	23.8	51.7	4	*ALCS12-16*	*ALCS12-16LH*	SA3T	SY3T	K3T	YE3	YI3	



* When reassembling the M6X5 plug, it is necessary to use LOCTITE 542.

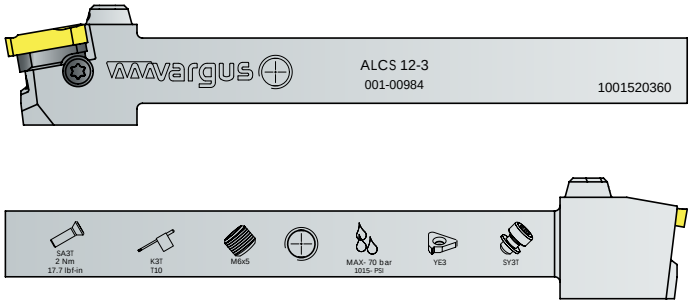
The NEW **External Toolholders with HPC** are included in the **VARGUS GENius™**, the most advanced Tool Selector and CNC Program Generator in the metal cutting tools industry.

VARGUS GENius™ Tool Selector and CNC Program Generator

ALCS

Laser markings include spare parts and maximum torque details

NEW

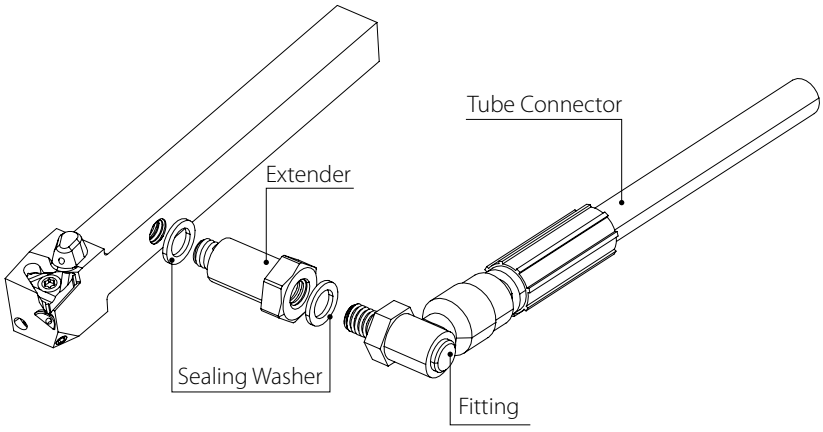


The following HPC accessories (not included) can be ordered separately:

Image	Ordering Code	Item Number	QTY
	Tube Connector 25-6	013-00941	1
	Angled Fitting M6x6	013-01011	1
	Straight Fitting M6x6	013-01012	1
	Extender M6x5*	013-01096	1
	Sealing Washer M6	013-01097	2

* When working with Shanks 10x10 & 12x12 the extender is necessary to connect the fitting.

How to Assemble the Accessories for All Coolant Inlets on Shanks 10x10 and 12x12

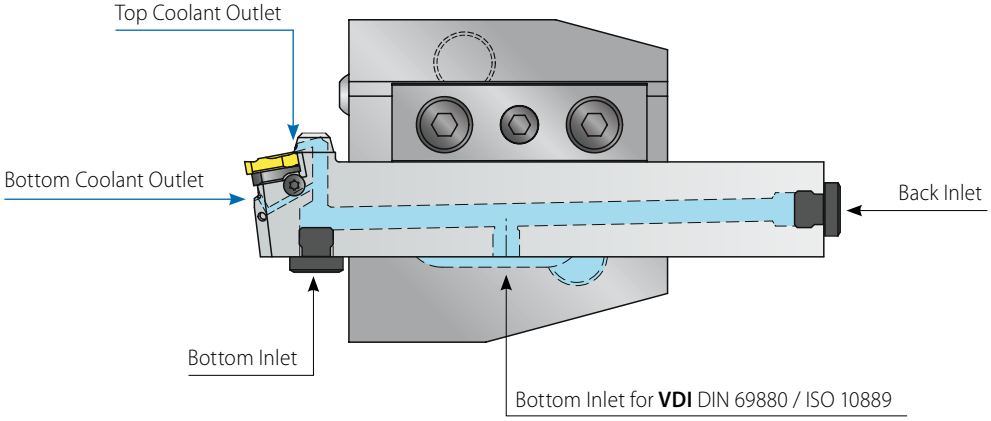


ALCN

External Thread Turning Toolholders WITH TWO HIGH PRESSURE COOLANT OUTLETS

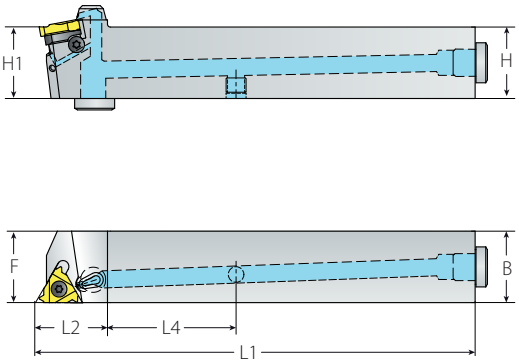
Features and Benefits:

- Two precise high pressure coolant outlets, designed to cool down the top and bottom of the insert for longer tool life and improved chip evacuation NEW
- Up to 70 bar
- Three different coolant inlets available:
  - Bottom inlet, specially designed for **VDI** DIN 69880 / ISO 10889 NEW
  - Back inlet
  - Bottom inlet
- Nickel coating for better wear resistance and anti-corrosion protection
- Greater range of holders for standard insert sizes: IC3/8" (16), 1/2" (22), & 5/8" (27) NEW
- Left Hand holders are available as standard



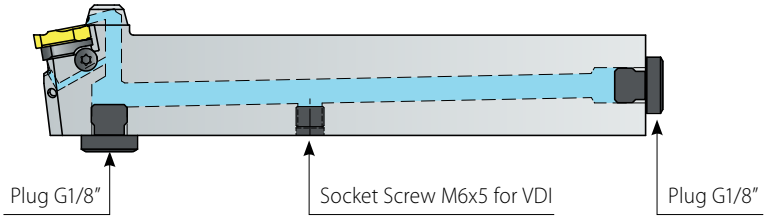
VARGUS GENius™ Tool Selector and CNC Program Generator

External Toolholders



Standard with HPC

Insert Size	Ordering Code		Dimensions mm					Spare Parts						
IC	RH	LH	H=H1=B	F	L1	L2	L4	Insert Screw (Max. Torque)	Anvil Screw	Torx Key	Anvil RH	Anvil LH	Plug Screw x2	Socket Screw
3/8"	ALCN16-3	ALCN16-3LH	16	16	100.0	25.1	25	SA3T (3.0 Nm)	SY3T	K3T	YE3	YI3	Plug G1/8"	Socket Screw M6x5
	ALCN20-3	ALCN20-3LH	20	20	127.0		30							
	ALCN25-3	ALCN25-3LH	25	25	155.0		35							
	ALCN32-3	ALCN32-3LH	32	32	175.0		40							
1/2"	ALCN25-4	ALCN25-4LH	25	25	155.0	30.2	35	SA4T (5.0 Nm)	SY4T	K4T	YE4	YI4		
	ALCN32-4	ALCN32-4LH	32	32	175.0		40							
5/8"	ALCN25-5	ALCN25-5LH	25	25	155.0	35.1	35	SA5T (10.0 Nm)	SY5T	K5T	YE5	YI5		
	ALCN32-5	ALCN32-5LH	32	32	175.0		40							



The following HPC accessories (not included) can be ordered separately:

Image	Ordering Code	Item Number	QTY
	Tube Connector 25-6P	013-00941	1
	Angled Fitting G1_8x6P	013-00947	2
	Straight Fitting G1_8x6P	013-00942	

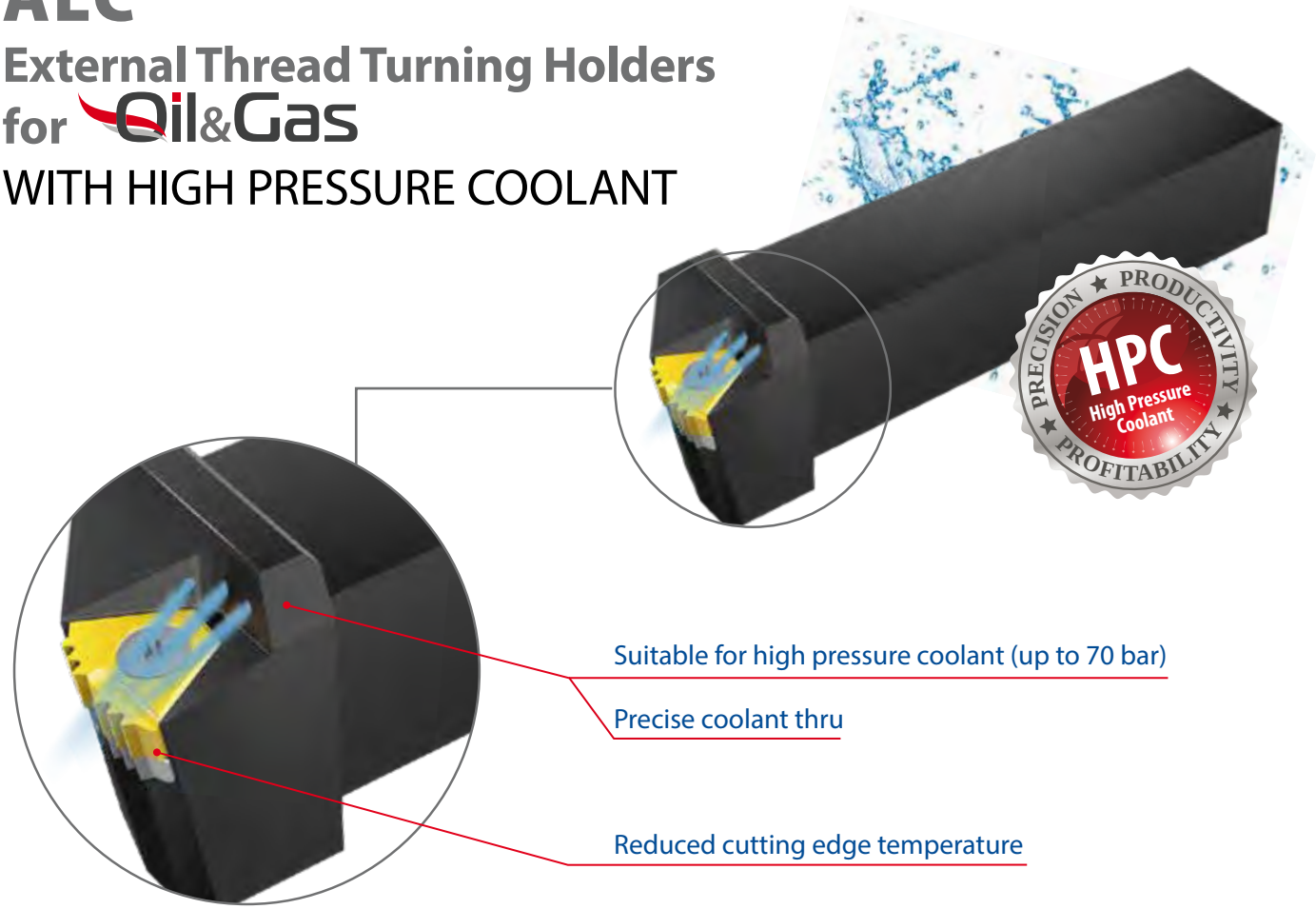
The NEW External Thread Turning Toolholders with HPC are fully supported by **VARGUS GENius™**, the most advanced Tool Selector and CNC Program Generator in the metal cutting industry

VARGUS GENius™ Tool Selector and CNC Program Generator

ALC

External Thread Turning Holders for Oil&Gas

WITH HIGH PRESSURE COOLANT

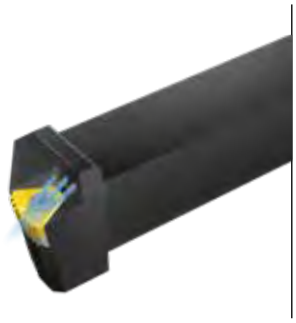


Features and Benefits:

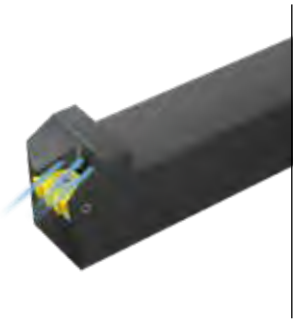
- Precise coolant thru, designed to efficiently cool down the cutting edge
- Suitable for high pressure coolant up to 70 bar
- Reduced cutting edge temperature for better tool life
- Better chip evacuation and improved chip control and flow

External holders with coolant are fully supported by **VARGUS GENius™**, the most advanced Tool Selector and CNC Program Generator in the metal cutting industry

VARGUS GENius™ Tool Selector and CNC Program Generator



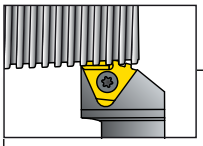
14D Standard with HPC



T+ Style with HPC

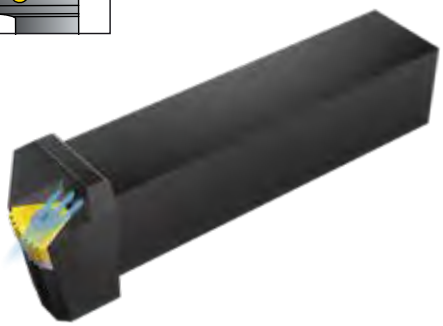
API with HPC

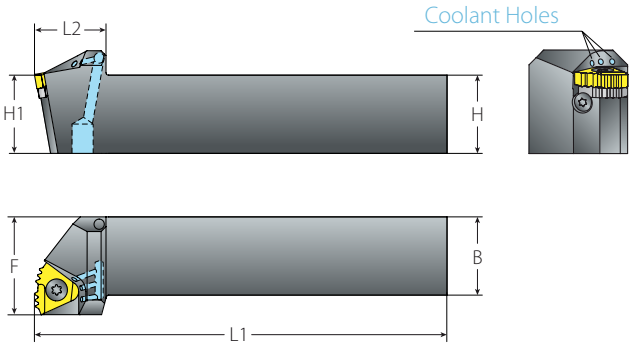
Z+ Style with HPC



External Toolholders

Oil&Gas

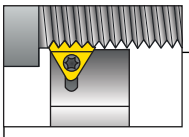




14D Standard with HPC

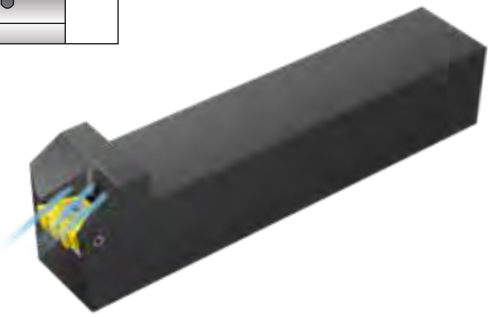
Insert Size	Ordering Code	Dimensions mm				Spare Parts			
IC	RH	H=H1=B	F	L1	L2	Insert Screw (Max. Torque)	Anvil Screw	Torx Key	Anvil Key
14D	ALC32-14D	32	32	170	30	SA5T (10.0 Nm)	M4X6(14D)	K5T	KT15
	ALC40-14D	40	40	200	30				

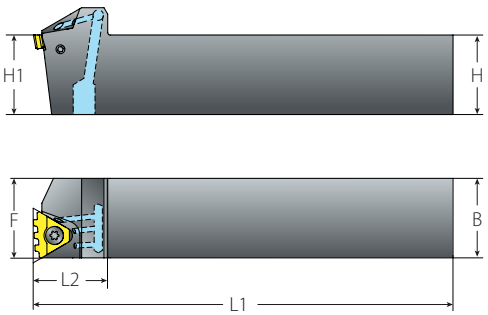
14D holders are supplied without anvils. For specific applications, refer to the Vardex Main Catalog.
Left Hand tools are available upon request.



External Toolholders

Oil&Gas

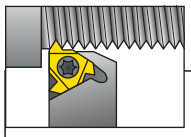




T+ Style with HPC

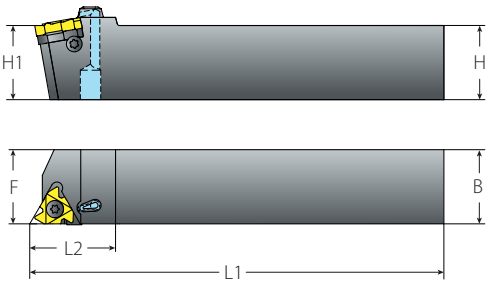
Insert Size	Ordering Code	Dimensions mm				Spare Parts				
IC	RH	H=H1=B	F	L1	L2	Insert Screw (Max. Torque)	Anvil Screw	Torx Key	Anvil Key	Anvil RH
1/2"T	ALC32-4T	32	32	170	30	SA4T (5.0 Nm)	SY4K2	K4T	K2	Y4T
	ALC40-4T	40	40	200	30					

All T Style toolholders have a 0° helix angle.
Left Hand tools are available upon request.



External Toolholders

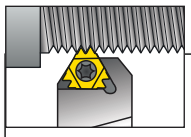
Oil&Gas



API with HPC

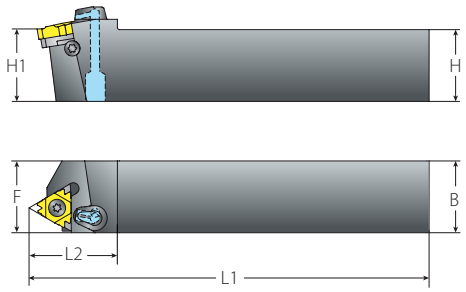
Insert Size	Ordering Code	Dimensions mm				Spare Parts			
IC	RH	H=H1=B	F	L1	L2	Insert Screw (Max. Torque)	Anvil Screw	Torx Key	Anvil RH
1/2"	ALC32-4-5BUT/API	32	32	177	37	SA4T (5.0 Nm)	SY4T	K4T	YEI4-API-1P; YEI4-5BUT
	ALC40-4-5BUT/API	40	40	205	37				

All API holders have a 0° helix angle.
Left Hand tools are available upon request



External Toolholders

Oil&Gas



Z+ Style with HPC

Insert Size	Ordering Code	Dimensions mm				Spare Parts			
IC	RH	H=H1=B	F	L1	L2	Insert Screw (Max. Torque)	Anvil Screw	Torx Key	Anvil RH
1/2"Z	ALC32-4Z	32	32	178	37	SA4T (5.0 Nm)	SY4T	K4T	YE4Z
	ALC40-4Z	40	40	208	37				

All Z Style toolholders have a 1.5° helix angle.
Left Hand tools are available upon request.

V-CAP
Internal & External Toolholders for IC1/2" (22)

Features and Benefits:

- Suitable for IC1/2" (22) insert size
- Polygon shaped shank, complies with standard ISO 26623
- Works with wide range of machine types
- For all industrial sectors
- High Pressure Coolant up to 70 bar for better chip evacuation and increased tool life

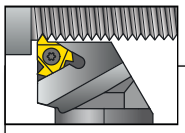
V-CAP Toolholder Range:

Internal and external V-CAP toolholders are available with IC1/2" (22) inserts in the following shank diameters:

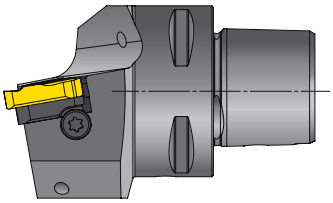
- C4
- C5
- C6
- C8

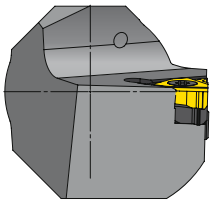
Special sizes are available upon request

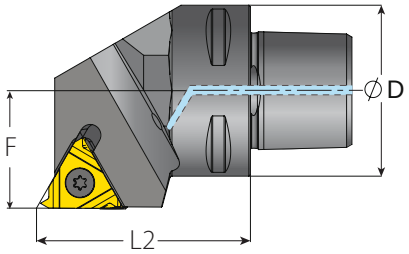
The NEW **V-CAP Toolholders** are included in the **VARGUS GENius™**, the most advanced Tool Selector and CNC Program Generator in the metal cutting tools industry.



V-CAP External Toolholders





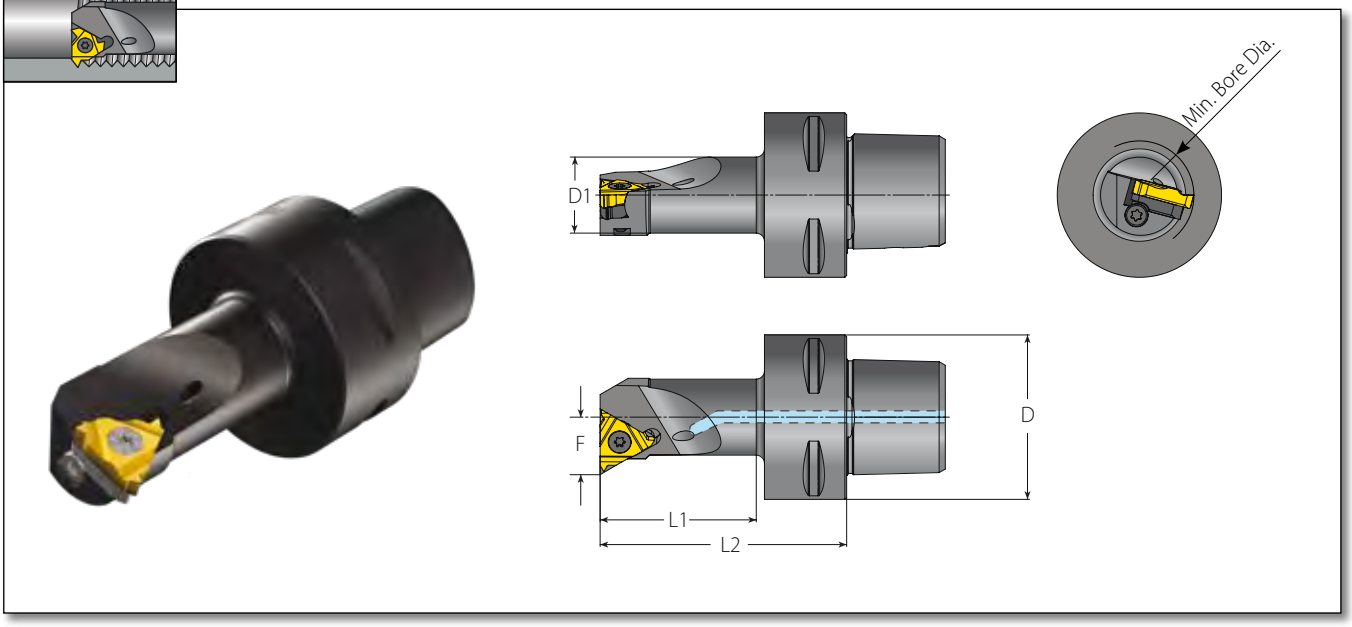


V-CAP

Insert Size	Ordering Code	Dimensions mm			Market Description	Spare Parts			
IC	RH/LH	D	F	L2	RH/LH	Insert Screw	Anvil Screw	Torx Key	Anvil RH
1/2"	VCAP40-SER27050-4	40	27	50	*VCAP40-SER27050-22*	SA4T	SY4T	K4T	YE4
	VCAP50-SER35060-4	50	35	60	*VCAP50-SER35060-22*				
	VCAP63-SER45065-4	63	45	65	*VCAP63-SER45065-22*				
	VCAP80-SER55080-4	80	55	81.7	*VCAP80-SER55080-22*				

The above toolholders are for RH inserts. For LH inserts, change R to L in the toolholder's ordering code (Example VCAP80-SE**L**55080-4).

V-CAP Internal Toolholders



V-CAP

Insert Size	Ordering Code	Dimensions mm					Min. Bore Dia.	Market Description	Spare Parts			
IC	RH/LH	D1	D	F	L2	L1 (max)	mm	RH/LH	Insert Screw	Anvil Screw	Torx Key	Anvil RH
1/2"	VCAP40-SIR15065-4	20	40	15.6	65	42	25	*VCAP40-SIR15065-22*	SN4T	-	K4T	-
	VCAP40-SIR19070-4	25		19	70	48	32	*VCAP40-SIR19070-22*	SA4T	SY4T	K4T	YI4
	VCAP40-SIR22090-4	32		22	90	69	40	*VCAP40-SIR22090-22*				
	VCAP40-SIR27080-4	39.5		26	80	60	50	*VCAP40-SIR27080-22*				
	VCAP50-SIR15065-4	20	50	15.6	65	42	25	*VCAP50-SIR15065-22*	SN4T	-	K4T	-
	VCAP50-SIR19070-4	25		19	70	47	32	*VCAP50-SIR19070-22*	SA4T	SY4T	K4T	YI4
	VCAP50-SIR22090-4	32		22	90	68	40	*VCAP50-SIR22090-22*				
	VCAP50-SIR27105-4	39.5		26	105	84	50	*VCAP50-SIR27105-22*				
	VCAP63-SIR19075-4	25	63	19	75	48	32	*VCAP63-SIR19075-22*				
	VCAP63-SIR22090-4	32		22	90	64	40	*VCAP63-SIR22090-22*				
	VCAP63-SIR27105-4	39.5		26	105	80	50	*VCAP63-SIR27105-22*				

The above toolholders are for RH inserts. For LH inserts, change R to L in the toolholder's ordering code (Example VCAP80-SE**L**55080-4).

SMOOTH CUT SYSTEM

NEW

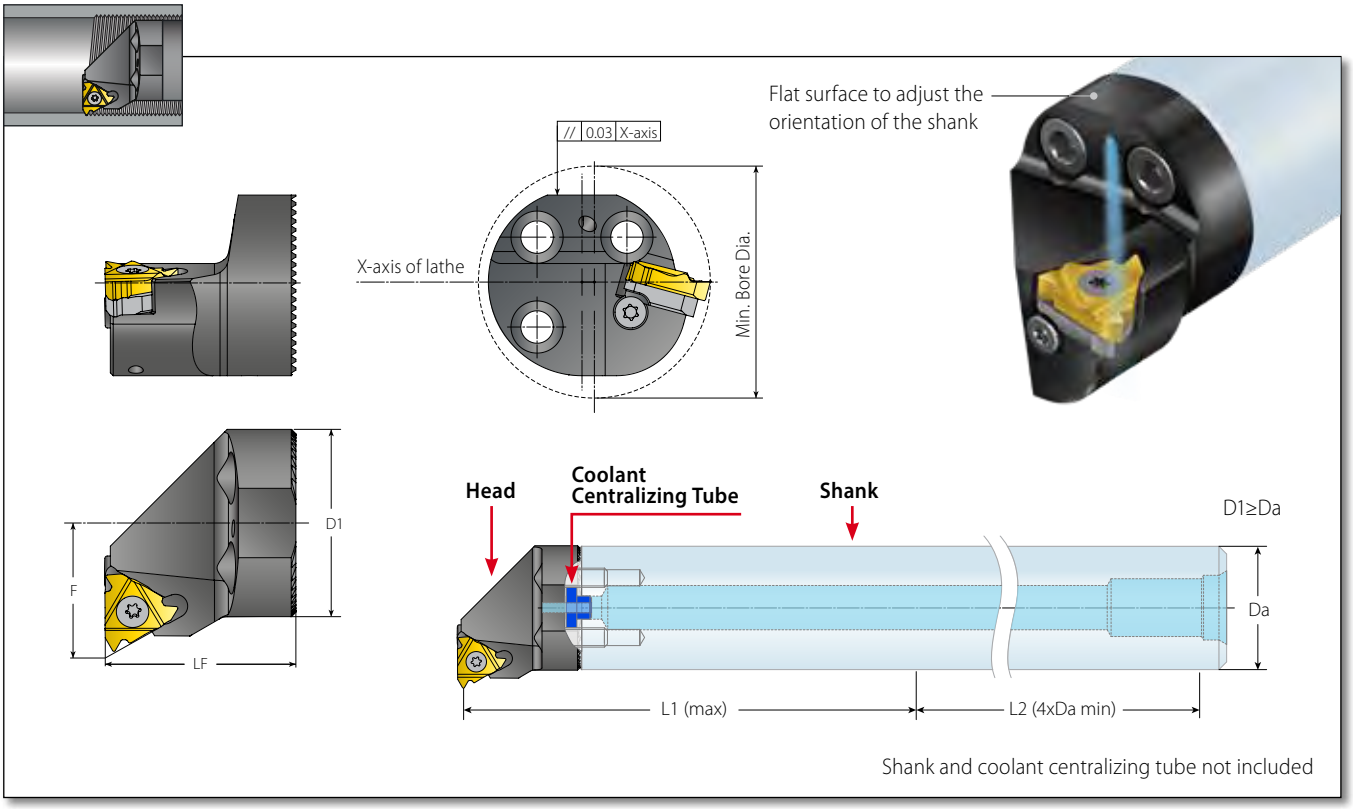
Modular Toolholder Heads for Anti-Vibration Shanks

Features and Benefits:

- Modular head for anti-vibration system
- Same head can be used with wide range of shanks of different lengths
- Maximum overhang 5xDa (Da - shank diameter)
- Compatible with the most common anti-vibration shanks in the market
- Available for standard insert sizes: IC3/8" (16), 1/2" (22), 5/8" (27)
- Toolholder includes High Pressure Coolant up to 70 bar for better chip evacuation and increased tool life

The NEW **Smooth Cut System Toolholder Heads** are included in the **VARGUS GENius™**, the most advanced Tool Selector and CNC Program Generator in the metal cutting tools industry.

VARGUS GENius™ Tool Selector and CNC Program Generator



Smooth Cut Toolholder Heads

Insert Size	Ordering Code	Dimensions mm						Min. Bore dia.	Market Description	Spare Parts			
IC	RH	D1	Da mm	Da inch	F	L1 max	LF	mm	RH	Insert Screw	Anvil Screw	Torx Key	Anvil RH
3/8"	VAS25-IR2517-3	25.3	25	1.00"	17.0	125.0	25.0	32	*VAS25-IR2517-16*	SA3T	SY3T	K3T	YI3
	VAS32-IR3222-3	32.3	32	1.25"	22.0	160.0	32.0	40	*VAS32-IR3222-16*				
	VAS40-IR3227-3	40.0	40	1.50"	27.0	200.0	32.0	50	*VAS40-IR3227-16*				
1/2"	VAS32-IR3222-4	32.3	32	1.25"	22.7	160.0	32.0	40	*VAS32-IR3222-22*	SA4T	SY4T	K4T	YI4
	VAS40-IR3227-4	40.0	40	1.50"	27.0	200.0	32.0	50	*VAS40-IR3227-22*				
5/8"	VAS40-IR3627-5	40.0	40	1.50"	27.3	200.0	36.0	50	*VAS40-IR3627-27*	SA5T	SY5T	K5T	YI5

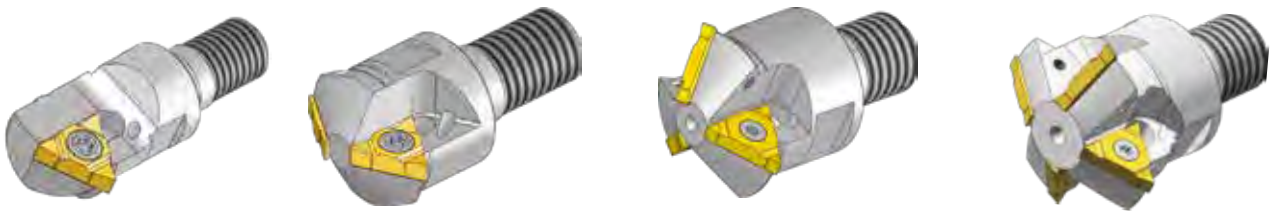
TMSD

Modular Toolholder Heads

NEW

Features and Benefits:

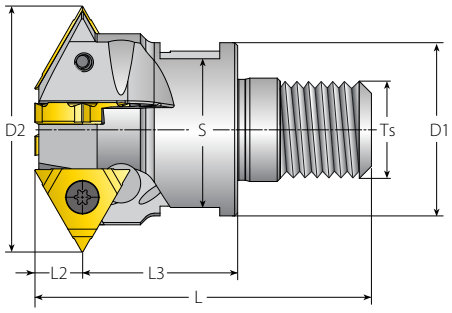
- One modular toolholder head fits an assortment of shank lengths
- Compatible with the most common steel and carbide shanks in the market
- Tools include high pressure coolant thru for extended tool life
- Multi-flute tools for fast machining
- Suitable for TMSD U Style inserts
- Specially suited for deep holes
- Reduced load on cutting edges due to single point insert design

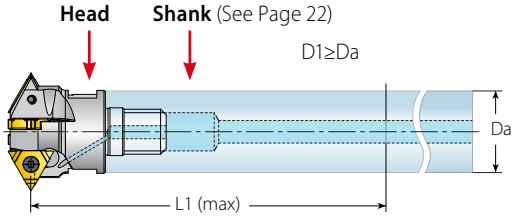


The NEW **TMSD Modular Toolholder Heads** are included in the **VARGUS GENius™**, the most advanced Tool Selector and CNC Program Generator in the metal cutting tools industry.

TMSD Modular Toolholder Heads

NEW





Coolant-Thru is recommended, especially when D2>0.7 x nominal thread diameter

TMSD Modular Toolholder Heads for U Style Inserts

Spare Parts

Insert Size	Ordering Code	Dimensions mm									No. of Flutes	Spare Parts	
IC		D1	D2	L	L1 (max) for Steel Shank)	L1 (max) for Carbide Shank)	L2	L3	Ts	S	Z	Insert Screw	Torx Key
1/4"U	TM1SC-D15-M06-2U	10.6	14.75	33	48	57.5	5.4	15.0	M06	9.0	1	SN2T	HK2T
	TM1SC-D17-M08-2U	13.0	16.75	37	60	72		17.0	M08	11.0	1		
	TM2SC-D21-M08-2U	14.1	20.65	34	72	86		14.0	M08	12.0	2		
	TM2SC-D23-M10-2U	18.0	22.65	38	86	103		14.0	M10	16.0	2		
	TM3SC-D26-M12-2U	21.0	26.60	48	105	125		20.0	M12	18.0	3		
	TM4SC-D31-M12-2U	25.0	31.0	51	115	138		23.0	M12	22.0	4		
3/8"U	TM3SC-D36-M16-3U	29.0	36.5	55	125	150	8.0	25.0	M16	25.0	3	SA3T	HK3T
	TM4SC-D42-M16-3U	29.0	42.0	55	144	172		26.0	M16	25.0	4		

TMSD Modular Head (U Style) Applications

Thread Applications for Partial Profile Inserts

Toolholder		Min. Thread Dia.						
	D2	ISO Coarse	ISO Fine	UNC	UN/UNF/UNEF/UNS	BSP (G)	Partial 55°	Trapez
TM1SC-D15-M06-2U	14.75	M18x2.5; M24x3.0	M16x0.5; M16x0.75; M16x1.0; M17x1.25; M17x1.5; M17x2.0	¾-10; ⅞-9; 1-8	⅝-32UN; ⅝-28UN; ⅝-27UNS; 11/16-24UN; 11/16-20UN; 11/16-16UN; ¾-14UNS; ¾-12UN	⅜-19; ½-14; 1-11	11/16-14; ¾-12; ⅞-11; ¾-10; ⅞-9; 1-8; 1⅛-7	TR22x3; TR24x3
TM1SC-D17-M08-2U	16.75	M20x2.5	M18x0.5; M18x0.75; M18x1.0; M19x1.25; M19x1.5; M19x2.0	-	¾-32UN; ¾-28UN; ⅞-27UN; ¾-24UN; ¾-20UN; ¾-16UNF; ¾-14UNS; 13/16-12UN; ⅞-10UN	½-14; 1-11	13/16-12; ⅞-11; 1-10; ⅞-9	-
TM2SC-D21-M08-2U	20.65	M24x3.0; M30x3.5; M36x4.0	M22x0.5; M22x0.75; M22x1.0; M23x1.25; M23x1.5; M23x2.0	1-8; 1⅛-7; 1⅜-6	⅞-32UN; ⅞-28UN; ⅞-27UNS; ⅞-24UNS; ⅞-20UNEF; 1-18UNS; 15/16-16UN; 1-14UNS; 15/16-12UN; 1-10UNS	¾-14; 1-11	1-26; 1-20; 1-16; 1-12; 1-10; 1⅛-9; 1-8; 1⅛-7	(TR26-TR60)x3; TR28x4; (TR60-TR110)x4; TR28x5
TM2SC-D23-M10-2U	22.65	M27x3.0; M30x3.5; M36x4.0	M24x0.5; M24x0.75; M25x1.0; M25x1.25; M26x1.5; M26x2.0; M27x2.5	1⅛-7	1-32UN; 1-28UN; 1-27UNS; 1-24UNS; 1-20UNEF; 1-18UNS; 1-16UN; 1-14UNS; 1-12UNF; 1⅛-10UNS; 1⅛-8UN	¾-14; 1-11	1-26; 1-20; 1-16; 11/16-12; 1⅛ -9; 1⅛-7	-
TM3SC-D26-M12-2U	26.60	M33x3.5; M36x4.0	M28x0.5; M28x0.75; M28x1.0; M28x1.25; M29x1.5; M29x2.0; M30x2.5; M33x3.0	1¼-7; 1⅜-6	1⅛-28UN; 1⅛-24UNS; 1⅛-20UN; 1⅛-18UNEF; 1⅛-16UN; 1¼-14UNS; 13/16-12UN; 1¼-10UNS; 13/16-8UN	⅞-14; 1-11	1⅛-26; 1⅛-20; 1⅜-16; 1⅜-12; 1⅜-8; 1¼-7	-
TM4SC-D31-M12-2U	31.0	M36X4.0	M32x0.5; M32x0.75; M33x1.0; M33x1.25; M33x1.5; M34x2.0; M34x2.5; M35x3.0; M36x3.5	1½-6	15/16-28UN; 1 3/8-24UNS; 15/16-20UN; 15/16-18UNEF; 15/16-16UN; 1⅜-14UNS; 1⅜-12UNF; 1⅜-10UNS; 1⅜-8UN	1⅛-11	1⅜-26; 1⅜8-20; 1⅜ -16; 1⅜ -12; 17/16-8	-
TM3SC-D36-M16-3U	36.5	M42x4.5; M48x5.0; M56x5.5	M39x1.5; M39x2.0; M40x2.5; M41x3.0; M42x3.5; M42x4.0	1¾-5; 2-4.5	19/16-16UN; 1⅝-14UNS; 19/16-12UN; 1⅝-10UNS; 1 5/8-8UN; 1⅝-6UN	1¼-11	1⅝-16; 1⅝-12; 1⅝-8; 1⅞-6	-
TM4SC-D42-M16-3U	42.0	M48x5.0; M56x5.5; M64x6.0	M45x1.5; M45x2.0; M46x2.5; M48x3.0; M48x3.5; M48x4.0	2-4.5; 2½-4	1¾-16UN; 1¾-14UNS; 113/16-12UN; 115/16-8UN; 115/16-6UN	1½-11	1⅞-16; 1⅞-12; 1⅞-8; 2¼-6; 2-4.5	-

For related inserts, see Vardex Main catalog.

TMSD Modular Head (U Style) Applications

Thread Application for Full Profile Inserts (ISO, UN, NPT & API Round)

Toolholder	Toolholder Cutting Diameter D2 (mm)	Pitch		Min. Thread Dia.		Cylindrical or Conical Pre-Drilled hole	Cylindrical Pre-Drilled hole	API Round, Cylindrical or Conical Pre-Drilled Hole (for cylidrical 2 radial passes 50%/50%; for conical one radial pass	API Round, Conical Pre-Drilled Hole only (one pass)
	* Adjusted D2	mm	TPI	ISO Coarse	UN/UNF/ UNEF/UNS	NPT Threading by 1 Radial Pass	** NPT Threading by 2 Radial Passes (50%/50%)	Thread Dia.	
TM1SC-D15-M06-2U	13.80	1.5		M16x1.5	-	-	-	-	-
	13.60	2.0		M16x2.0	-	-	-	-	-
	13.70	-	14	-	5/8-14UNS	-	-	-	-
	13.60	-	12	-	11/16-12UN	-	-	-	-
	14.59	-	14	-		1/2-14NPT; 3/4-14NPT	-	-	-
TM1SC-D17-M08-2U	15.79	1.5		M18x1.5	-	-	-	-	-
	15.60	2.0		M18x2.0	-	-	-	-	-
	15.69	-	14	-	3/4-14UNS	-	-	-	-
	15.60	-	12	-	3/4-12UN	-	-	-	-
	15.60	-	14	-	-	3/4-14NPT	-	-	-
TM2SC-D21-M08-2U	19.69	1.5		M22x1.5	-	-	-	-	-
	19.50	2.0		M22x2.0	-	-	-	-	-
	19.60	-	14	-	7/8-14UNF	-	-	-	-
	19.50	-	12	-	7/8-12UN	-	-	-	-
	20.50	-	14	-	-	3/4-14NPT	-	-	-
	20.28	-	11.5	-	-	1-11.5NPT; 1 1/4-11.5NPT; 1 1/2-11.5NPT; 2-11NPT	-	-	-
TM2SC-D23-M10-2U	21.65	1.5		M24x1.5		-	-	-	-
	21.50	2.0		M24x2.0		-	-	-	-
	21.49	-	14	-	1-14UNS	-	-	-	-
	21.50	-	12	-	1-12UNF	-			
	22.63	-	11.5	-		1-11.5NPT; 1 1/4-11.5NPT; 1 1/2-11.5NPT; 2-11NPT	-	-	-
	21.44	-	10	-	-	-	-	1.05x10APIRD (for UP TBG; UP TBG Long); 1.315...2.375x10APIRD (for TBG; UP TBG; UP TBG Long; Integral-Joint TBG)	-
TM3SC-D26-M12-2U	25.64	1.5		M28x1.5	-	-	-	-	-
	25.45	2.0		M30x2.0	-	-	-	-	-
	25.54		14		1 1/8-14UNS	-	-	-	-
	25.45		12		1 1/8-12UNF	-	-	-	-
	26.23	-	11.5	-	-	1-11.5NPT; 1 1/4-11.5NPT; 1 1/2-11.5NPT; 2-11NPT	-	-	-
	24.94	-	10	-	-	-	-	1.315...2.375x10APIRD (for TBG; UP TBG; UP TBG Long; Integral-Joint TBG)	-
TM4SC-D31-M12-2U	30.00	1.5		M33x1.5	-	-	-	-	-
	29.85	2.0		M34x2.0	-	-	-	-	-
	29.94		14		1 3/8-14UNS	-	-	-	-
	29.85		12		1 5/16-12UN	-	-	-	-
	30.63		11.5	-	-	1 1/4-11.5NPT; 1 1/2-11.5NPT; 2-11NPT	-	-	-
	29.44		10	-	-	-	-	1.66...3.5x10APIRD (for TBG; UP TBG; UP TBG Long; Integral-Joint TBG)	-

* Correct the toolholder cutting diameter D2 according to adjustment, as indicated in the above table.
** When the pre-drilled hole for 8NPT is conical, the thread can be machined in one pass.

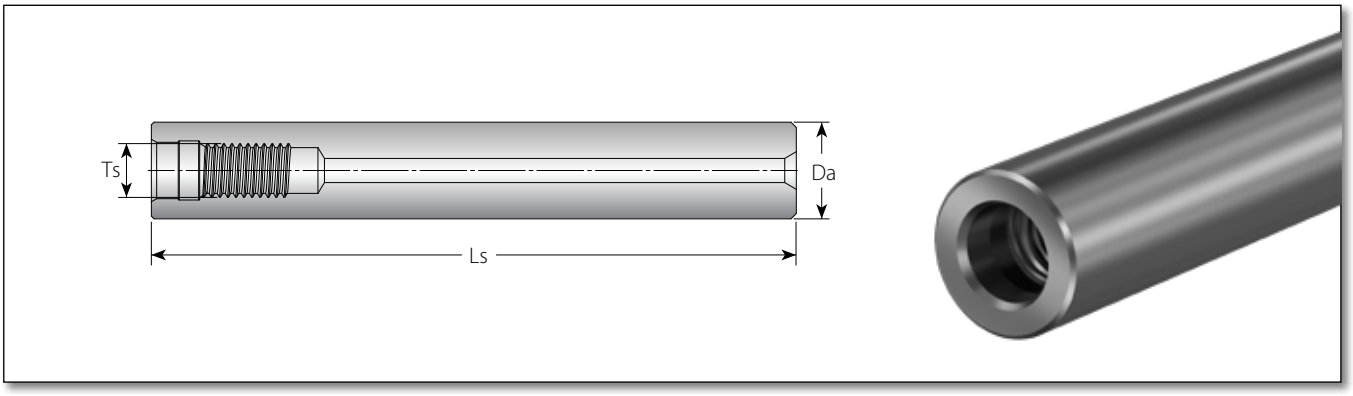
TMSD Modular Toolholder Heads

Thread Application for Full Profile Inserts (ISO, UN, NPT & API Round) - con't

Toolholder	Toolholder Cutting Diameter D2 (mm)	Pitch		Min. Thread Dia.		Cylindrical or Conical Pre-Drilled hole	Cylindrical Pre-Drilled hole	API Round, Cylindrical or Conical Pre-Drilled Hole (for cylidrical 2 radial passes 50%/50%; for conical one radial pass	API Round, Conical Pre-Drilled Hole only (one pass)
	* Adjusted D2	mm	TPI	ISO Coarse	UN/UNF/ UNEF/UNS	NPT Threading by 1 Radial Pass	** NPT Threading by 2 Radial Passes (50%/50%)	Thread Dia.	
TM3SC-D36-M16-3U	35.65	-	11.5	-	-	1 1/4-11.5NPT; 1 1/2-11.5NPT; 2-11.5NPT	-	-	-
	35.65	-	8	-	-	-	2 1/2..10-8NPT	-	-
	34.70	-	8	-	-	-	-	2.375...13.375x8APIRD (for CSG; TBG; UP TBG; UP TBG Long); 4.5...5.5x8APIRD (for LCSG)	8.625...20x8APIRD (for LCSG)
TM4SC-D42-M16-3U	41.15	-	11.5	-	-	1 1/2-11.5NPT; 2-11.5NPT	-	-	-
	41.15	-	8	-	-		2 1/2..10-8NPT	-	-
	40.20	-	8	-	-	-	-	2.875...20x8APIRD (for CSG; TGB; UP TBG; UP TBG Long); 4.5...7.625x8APIRD (for LCSG)	8.625x8APIRD (for LCSG)

* Correct the toolholder cutting diameter D2 according to adjustment, as indicated in the above table.
** When the pre-drilled hole for 8NPT is conical, the thread can be machined in one pass.

Steel Shank for TMSD Modular Toolholder Heads



Ordering Code	Da	Ls	Ts	Shank
STMC-C10.6L075M06	10.6	75	M06	C
STMC-C13.0L085M08	13	85	M08	
STMC-C14.1L105M08	14.1	105	M08	
STMC-C18.0L120M10	18	120	M10	
STMC-C21.0L135M12	21	135	M12	
STMC-C25.0L140M12	25	140	M12	
STMC-C29.0L180M16	29	180	M16	

TMSD Modular Toolholder Heads can be used with most common steel and carbide shanks available in the market.

MiTM Offset

NEW

Fast Machining for Large Pitches in Deep Holes

PATENT PENDING

Features and Benefits:

- Reduced machining times: Two cutting rows, with each row machining half the thread simultaneously

Inserts:

- Two sizes: MiTM 25 and MiTM 41
- Double-toothed inserts
- Two cutting edges per insert
- MiTM Offset inserts can also be used with standard MiTM holders in order to reduce cutting forces
- Thread standards: ISO Metric and American UN
- Grades:
  - **VTX:** TiAlN coated carbide grade. Ideal for stainless steel
  - **VBX:** TiCN coated carbide grade. Excellent grade for steel and general use

Holders:

- Cylindrical steel holders and shell mills are available
- Up to 2.5xDo (thread diameter)
- Up to 8 flutes for faster machining
- All holders are available with coolant thru for increased tool life and better chip evacuation

Recommended Machining Method:

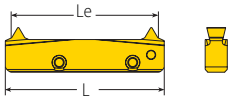
- For best results the MiTM Offset program requires working in conventional milling with multiple passes

MiTM Offset tools are fully supported by **VARGUS GENius™**, the most advanced Tool Selector and CNC Program Generator in the metal cutting industry

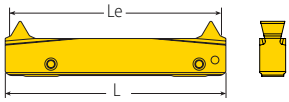
VARGUS GENius™ Tool Selector and CNC Program Generator

MiTM Offset Inserts

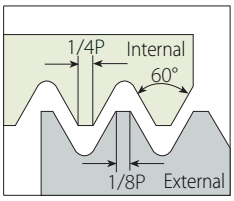
MiTM 25



MiTM 41



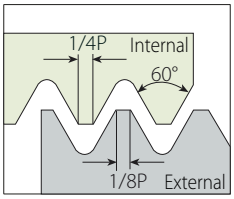
ISO Metric



Defined by: R262 (DIN 13)
Tolerance class: 6g/6H

Insert Style	Pitch	Ordering Code	Cutting Edge		Teeth	Toolholder
L	mm	Internal		Le	Zt	
25	3	R25I3.00ISOTM-2...	2	24.0	2	RTMOC....S
41	3.5	R41I3.50ISOTM-2...	2	38.5	2	RTMOC....B; RTMC-D...B
	4	R41I4.00ISOTM-2...	2	40.0	2	
	4.5	R41I4.50ISOTM-2...	2	40.5	2	
	5	R41I5.00ISOTM-2...	2	40.0	2	
	5.5	R41I5.50ISOTM-2...	2	38.5	2	
	6	R41I6.00ISOTM-2...	2	36.0	2	

American UN



Defined by: ANSI B1.1:74
Tolerance class: 2A/2B

Insert Style	Pitch	Ordering Code	Cutting Edge		Teeth	Toolholder
L	TPI	Internal		Le	Zt	
25	8	R25I8UNTM-2…	2	22.23	2	RTMOC....S
41	7	R41I7UNTM-2…	2	39.92	2	RTMOC....B; RTMC-D...B
	6	R41I6UNTM-2…	2	38.10	2	
	5	R41I5UNTM-2…	2	35.56	2	
	4.5	R41I4.5UNTM-2…	2	39.51	2	

Placing MiTM Offset Inserts Correctly

Always mount all inserts with the identification mark on the same side.
Process is applicable for steel cylindrical shanks and shell mill holders.

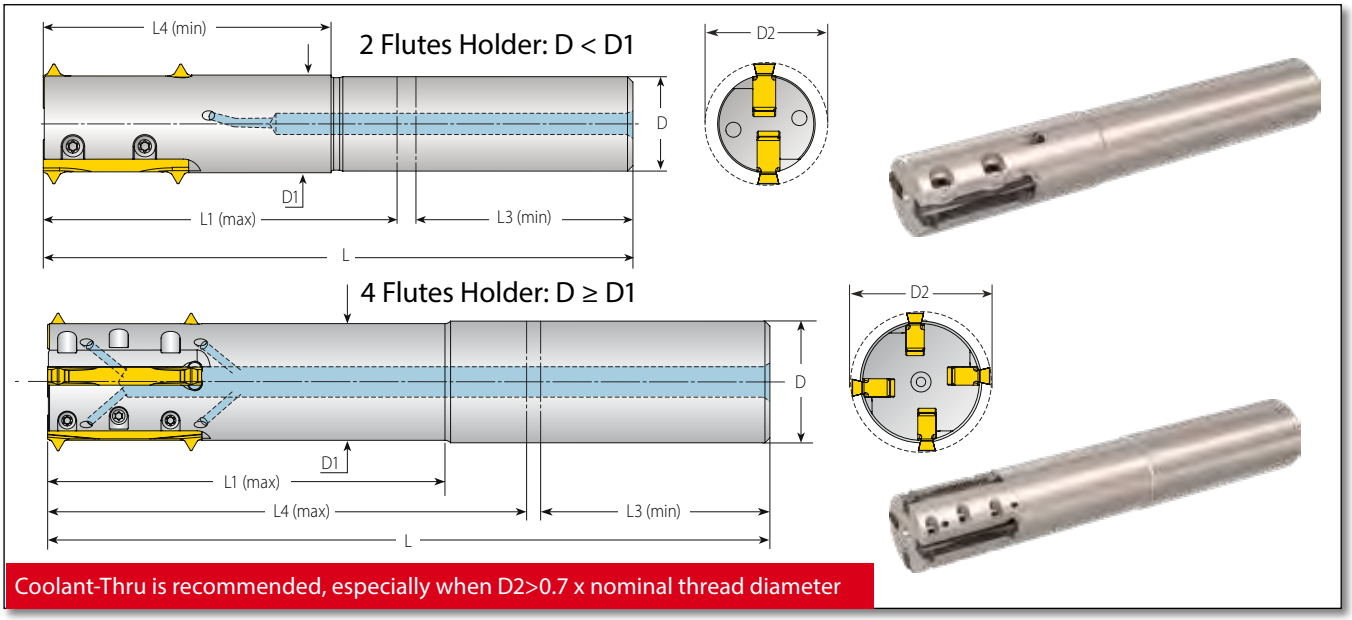
Side with identification marks

Side without identification marks

To mount insert correctly, push the insert toward the pocket walls.

Steel Cylindrical Shanks for MiTM Offset

MiTM



Coolant-Thru is recommended, especially when D2>0.7 x nominal thread diameter

MiTM Offset RTMOC

Insert Style	Ordering Code	Dimensions mm								No. of Flutes
		L	L1 (max)	L3 (min)	L4 (min)	L4 (max)	D	D1	D2	Z
25	RTMOC16C20-60S2	106	60	44	43	-	16	16.6	20.5	2
41	RTMOC20C26-75B2	125	75	46	61	-	20	20.7	26.0	2
	RTMOC25C30-90B4	145	90	51	-	-	25	25.0	30.5	4
	RTMOC32C37-105B4	177	105	69	-	105	32	30.3	37.0	4
	RTMOC32C39-120B4	194	120	69	-	-	32	32.0	39.5	4

Spare Parts

		
Location Screw x2 (Max. Torque)	Clamping Screw (Max. Torque)	Torx+ Screwdriver
SLD4IP8 (M4x0.7) 2.0 Nm	-	KIP8
SLD4IP8A (M4x0.7) 2.0 Nm	SCD4IP8 2.0 Nm	

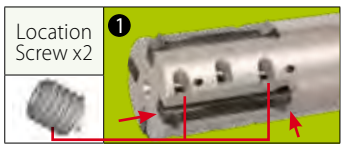
Thread Application for MiTM Offset Inserts with RTMOC Toolholders

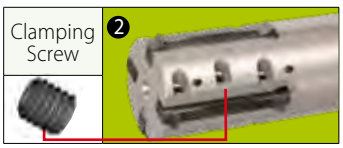
Insert Style	Toolholder		Min. Thread Dia.			
	MiTM Offset	D2 (mm)	ISO (coarse)	ISO (fine)	UNC	UN/UNF/UNEF/UNS
25	RTMOC16C20-60S2	20.5	M24x3	M30x3	1-8UNC	1 1/16-8UN
41	RTMOC20C26-75B2	26.0	M30x3.5; M36x4	M42x4	1 1/4-7UNC; 1 3/8-6UNC	1 7/16-6UN
	RTMOC25C30-90B4	30.5	M36x4	M36x3.5; M42x4	-	1 7/16-7UN; 1 7/16-6UN
	RTMOC32C37-105B4	37.0	M42x4.5; M48x5	M42x3.5; M45x4	1 3/4-5UNC	1 11/16-7UN; 1 11/16-6UN
	RTMOC32C39-120B4	39.5	M48x5; M56x5.5	M48x4	2-4.5UNC	1 7/8-7UN; 1 7/8-6UN

Thread Application for MiTM Offset Inserts with Standard RTMC Toolholders

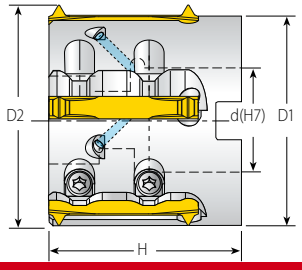
Insert Style	Toolholder		Min. Thread Dia.			
	MiTM Standard	D2 (mm)	ISO (coarse)	ISO (fine)	UNC	UN/UNF/UNEF/UNS
25	RTMC2519-44S2	19.0	M24x3	M30x3	1-8UNC	1 1/16-8UN
	RTMC2520-37S3	20.5	M24x3	M30x3	1-8UNC	1 1/16-8UN
	RTMC2520-44S3					
	RTMC2522-43S3	22.0	M27x3	M30x3	-	1 1/16-8UN
	RTMC2522-55S3					
	RTMC2530-55S5	30.0	-	M34x3	-	1 3/8-8UN
	RTMC2530-80S4					
41	RTMC3230-65B3	30.0	M36x4; M42x4.5	M36x3.5; M42x4	-	1 7/16-7UN; 1 7/16-6UN
	RTMC3236-65B4	35.9	M42x4.5; M48x5; M56x5.5; M64x6	M40x3.5; M42x4	1 3/4-5UNC; 2-4.5UNC	1 11/16-7UN; 1 5/8-6UN

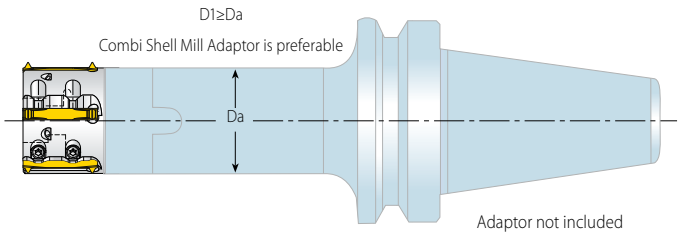
2 Step Clamping System for MiTM 41 Cylindrical Shanks





Shell Mill MiTM 25



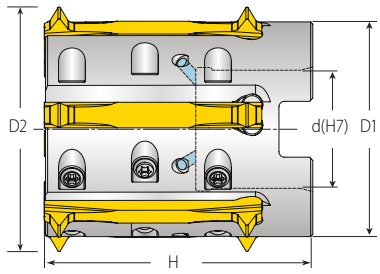


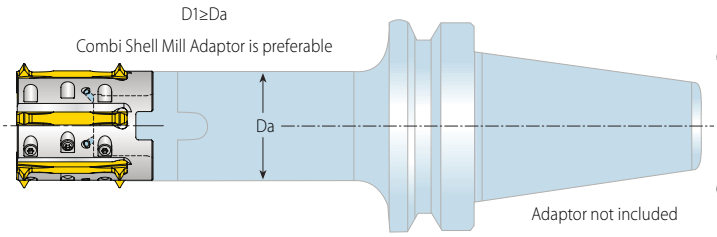
Coolant-Thru is recommended, especially when D2>0.7 x nominal thread diameter

Standard Shell Mill

Insert Style	Ordering Code	Dimensions mm				No. of Flutes	Spare Parts		
		D1	D2	d(H7)	H	Z	Location Screw x2 (Max. Torque)	Torx+ Screwdriver	Holder Screw
25	RTMC-D36-16-25S5	32	36	16	33.5	5	SLD4IP8 (M4x0.7) 2.0 Nm	KIP8	M8x1.25x35
	RTMC-D44-22-25S6	40	44	22	38.0	6			M10x1.50x35
	RTMC-D52-27-25S8	48	52	27	40.0	8			M12x1.75x30

Shell Mill MiTM 41





Coolant-Thru is recommended, especially when D2>0.7 x nominal thread diameter

Standard Shell Mill

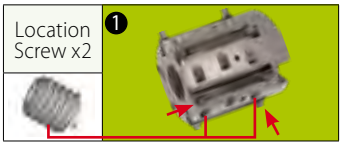
Insert Style	Ordering Code	Dimensions mm				No. of Flutes	Spare Parts			
		D1	D2	d(H7)	H	Z	Location Screw x2 (Max. Torque)	Clamping Screw (Max. Torque)	Torx+ Screwdriver	Holder Screw
41	RTMC-D48-22-41B5	40	48.0	22	50	5	SLD4IP8A (M4x0.7) 2.0 Nm	SCD4IP8 (M4x0.7) 2.0 Nm	KIP8	M10x1.50x40
	RTMC-D48-22-41B6*	40	48.0	22	50	6				
	RTMC-D58-27-41B6	50	57.9	27	50	6				M12x1.75x40

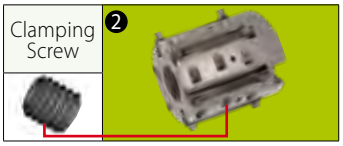
* New Shell Mill holder, also suitable with standard MiTM 41 inserts

Thread Application for MiTM Offset Inserts with Shell Mill

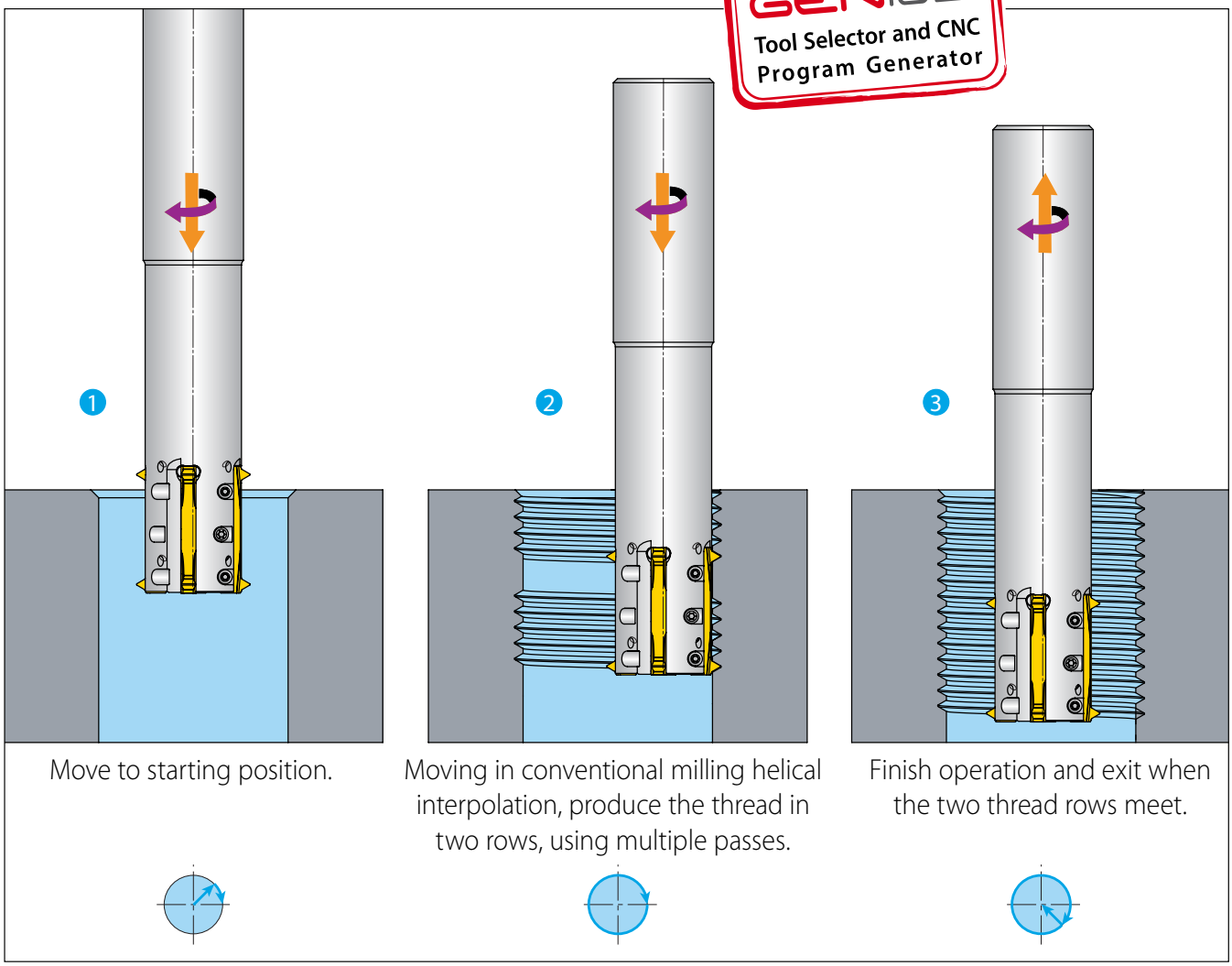
Insert Style	Toolholder		Min. Thread Dia.			
		D2 (mm)	ISO (coarse)	ISO (fine)	UNC	UN/UNF/UNEF/UNS
25	RTMC-D36-16-25S5	36	-	M40x3	-	1⅝-8UN
	RTMC-D44-22-25S6	44		M48x3		1⅝-8UN
	RTMC-D52-27-25S8	52		M56x3		2¼-8UN
41	RTMC-D48-22-41B5	48	M56x5.5; M64x6	M56x4; M70x6	2¼-4.5UNC	2⅛-7UN; 2⅛-6UN
	RTMC-D48-22-41B6					
	RTMC-D58-27-41B6	58	M68x6	M64x4; M70x6	-	2½-7UN; 2½-6UN

2 Step Clamping System for MiTM 41 Shell Mill Holders





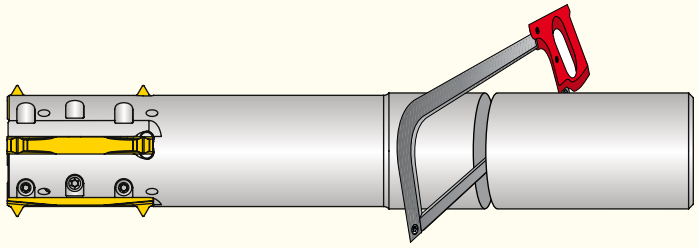
MiTM Offset - Operating Cycle



1. Move to starting position.
2. Moving in conventional milling helical interpolation, produce the thread in two rows, using multiple passes.
3. Finish operation and exit when the two thread rows meet.

Grades

Grade	Application	Sample
VBX	TiCN coated carbide grade. Excellent grade for **steels and general use**.	
VTX	TiAlN coated carbide grade. Ideal for **Stainless Steels.**	

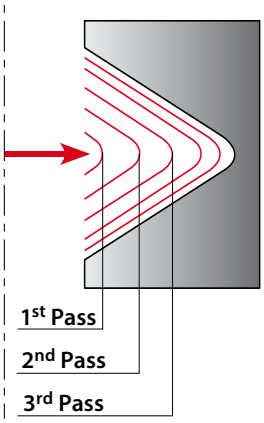


The length of all cylindrical shank toolholders can be modified to reduce chatter (vibration).
Note: The length of the shank inside the clamping device should be L3 at minimum.

MiTM Offset - Recommended No. of Passes According to Pitch

Pitch TPI	8	7	6	5	4.5
Pitch mm	3	3.5	4.0-4.5	5.0	5.5-6.0
No. of Passes	5-8	5-8	6-10	8-11	9-12

Conventional milling with multiple passes is required.
For machining recommendations, use the Vargus GENius.



Recommended Cutting Speeds Vc [m/min] and Feed f [mm/tooth]

Material Group	Vargus No.	Material		Hardness Brinell HB	MiTM Offset Holders Vc [m/min] VBX	MiTM Offset Holders Vc [m/min] VTX	MiTM Offset Holders Feed f [mm/tooth]	MiTM Standard Holders Vc [m/min] VBX	MiTM Standard Holders Vc [m/min] VTX	MiTM Standard Holders Feed f [mm/tooth] Standard	MiTM Standard Holders Feed f [mm/tooth] Shell Mill
P Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	100-210	90-180	0.25-0.50	100-210	90-180	0.30-0.50	0.30-0.75
	2		Medium Carbon (C=0.25-0.55%)	150	100-180	90-170	0.25-0.55	100-180	90-170	0.30-0.50	0.30-0.75
	3		High Carbon (C=0.55-0.85%)	170	90-150	90-160	0.25-0.50	100-170	90-160	0.25-0.35	0.25-0.52
	4	Low Alloy Steel (alloying elements≤5%)	Non Hardened	180	80-130	80-130	0.25-0.55	60-90	90-155	0.28-0.45	0.28-0.67
	5		Hardened	275	80-130	80-130	0.25-0.50	80-150	80-160	0.25-0.45	0.25-0.67
	6		Hardened	350	70-120	70-130	0.25-0.45	70-140	70-150	0.25-0.40	0.25-0.60
	7	High Alloy Steel (alloying elements>5%)	Annealed	200	60-110	65-115	0.25-0.50	60-130	70-115	0.20-0.30	0.20-0.45
	8		Hardened	325	70-115	70-115	0.25-0.35	70-110	60-100	0.18-0.30	0.18-0.45
	9	Cast Steel	Low Alloy (alloying elements <5%)	200	90-150	90-160	0.25-0.45	100-170	100-170	0.20-0.30	0.20-0.45
	10		High Alloy (alloying elements >5%)	225	65-115	70-120	0.25-0.35	70-120	70-130	0.17-0.30	0.17-0.45
M Stainless Steel	11	Stainless Steel Ferritic	Non Hardened	200	90-150	90-160	0.25-0.45	100-170	120-180	0.22-0.34	0.22-0.50
	12		Hardened	330	90-150	90-160	0.25-0.35	100-170	120-180	0.21-0.32	0.21-0.48
	13	Stainless Steel Austenitic	Austenitic	180	70-120	70-130	0.25-0.45	70-140	100-140	0.25-0.40	0.25-0.60
	14		Super Austenitic	200	70-120	70-130	0.25-0.35	70-140	100-140	0.17-0.26	0.17-0.39
	15	Stainless Steel Cast Ferritic	Non Hardened	200	70-120	70-130	0.25-0.45	70-140	100-140	0.25-0.37	0.25-0.55
	16		Hardened	330	70-120	70-130	0.25-0.35	70-140	100-140	0.17-0.26	0.17-0.39
	17	Stainless Steel Cast Austenitic	Austenitic	200	65-115	70-120	0.25-0.45	70-120	100-120	0.20-0.30	0.20-0.45
	18		Hardened	330	65-115	70-120	0.25-0.35	70-120	100-120	0.17-0.26	0.17-0.39
K Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	60-110	65-115	0.16-0.30	60-130	100-120	0.25-0.37	0.25-0.55
	29		Pearlitic (long chips)	230	60-110	65-115	0.15-0.25	60-120	80-100	0.20-0.30	0.20-0.45
	30	Grey Cast Iron	Low Tensile Strength	180	60-110	65-115	0.25-0.45	60-130	80-100	0.22-0.34	0.22-0.50
	31		High Tensile Strength	260	60-100	70-100	0.25-0.35	60-100	80-100	0.20-0.30	0.20-0.45
	32	Nodular Sg Iron	Ferritic	160	60-110	65-115	0.25-0.45	60-125	80-100	0.15-0.25	0.15-0.37
	33		Pearlitic	260	50-90	60-90	0.25-0.35	50-90	60-90	0.20-0.30	0.20-0.45
N Non-Ferrous Metals	34	Aluminum Alloys Wrought	Non Aging	60	100-200	-	0.30-0.70	100-250	-	0.60-1.00	0.60-1.50
	35		Aged	100	100-180	-	0.30-0.65	100-180	-	0.50-0.90	0.50-1.20
	36	Aluminum Alloys	Cast	75	100-200	-	0.30-0.65	150-400	-	0.50-0.90	0.50-1.20
	37		Cast & Aged	90	100-200	-	0.25-0.55	150-280	-	0.40-0.60	0.40-0.90
	38	Aluminum Alloys	Cast Si 13-22%	130	80-130	80-130	0.30-0.65	80-150	-	0.50-0.90	0.50-1.20
	39	Copper and Copper Alloys	Brass	90	100-180	100-200	0.30-0.65	120-210	100-200	0.60-1.00	0.60-1.50
	40		Bronze And Non Leaded Copper	100	100-200	100-200	0.25-0.55	120-210	100-200	0.50-0.90	0.50-1.20
S Heat Resistant Material	19	High Temperature Alloys	Annealed (iron based)	200	20-45	20-40	0.25-0.35	20-45	20-40	0.12-0.22	0.12-0.33
	20		Aged (iron based)	280	20-30	20-30	0.15-0.25	20-30	20-30	0.10-0.20	0.10-0.30
	21		Annealed (nickel or cobalt based)	250	15-20	15-20	0.15-0.25	15-20	15-20	0.08-0.20	0.08-0.30
	22		Aged (nickel or cobalt based)	350	10-15	10-15	0.15-0.25	10-15	10-15	0.08-0.20	0.08-0.30
	23	Titanium Alloys	Pure 99.5 Ti	400Rm	70-120	70-130	0.15-0.25	70-140	70-120	0.10-0.20	0.10-0.30
	24		α+β Alloys	1050Rm	20-50	20-50	0.15-0.25	20-50	20-50	0.10-0.20	0.10-0.30
H Hardened Material	25	Extra Hard Steel	Hardened & Tempered	45-50 HRC	15-45	15-45	0.17-0.27	15-45	15-45	0.05-0.18	0.05-0.27
	26			51-55 HRC	15-40	15-40	0.15-0.20	15-40	15-40	0.05-0.18	0.05-0.27

TM Solid MultiFlute

NEW

Helicool Tools

Increased Number of Flutes for Faster Machining

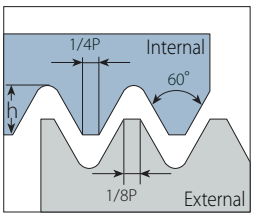
Features and Benefits:

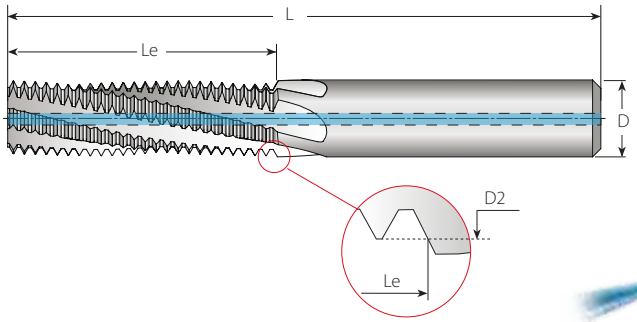
- Reduced machining times: Up to 40%!
- Large number of flutes (max 7)
- Available in 2xDo and 3xDo (thread diameter)
- Thread Standards:
  ISO Metric (mm shank): M3x0.5 to M16x2.0
- VTH Grade:
  General-purpose, heavy duty thread milling grade, TiCN coated for high resistance to wear
- For better chip evacuation in high feeds, radial multi-pass machining is required

Helicool MultiFlute Tools are fully supported by **VARGUS GENius™**, the most advanced Tool Selector and CNC Program Generator in the metal cutting tools industry.

VARGUS GENius™ Tool Selector and CNC Program Generator

Internal





Defined by: R262 (DIN 13)
Tolerance class: 6H

Helical Flutes with Coolant Thru

2 x Do (Le ≤ 2 x Thread Diameter)

Thread		Pitch	Ordering Code		Dimensions mm			No. of Flutes	Teeth	Bore Dia.*
M Coarse	M Fine	mm	Internal	D	D2	L	Le	Z	Zt	mm
M3x0.5	M3.5-M16x0.5	0.5	HC04024L06-I0.50ISOTM5…	4	2.40	45	6.2	5	12	2.5
	M4x0.5	0.5	HC04032L08-I0.50ISOTM6…	4	3.20	45	8.2	6	16	3.5
M4x0.7		0.7	HC04031L08-I0.70ISOTM5…	4	3.15	45	8.7	5	12	3.3
	M6x0.75	0.75	HC06050L12-I0.75ISOTM6…	6	5.00	57	12.4	6	16	5.3
M5x0.8		0.8	HC04039L10-I0.80ISOTM6…	4	3.90	45	10.8	6	13	4.2
M6x1.0	M8-M40x1.0	1.0	HC06048L12-I1.00ISOTM6…	6	4.80	57	12.5	6	12	5.0
M8x1.25		1.25	HC08065L16-I1.25ISOTM6…	8	6.50	61	16.9	6	13	6.8
M10x1.5	M12-M48x1.5	1.5	HC10082L20-I1.50ISOTM7…	10	8.20	73	20.2	7	13	8.5
M12x1.75		1.75	HC10099L25-I1.75ISOTM7…	10	9.90	73	25.4	7	14	10.2
M14x2.0	M17-M80x2.0	2.0	HC12116L29-I2.00ISOTM6…	12	11.60	80	29.0	6	14	12.0
M16x2.0	M17-M80x2.0	2.0	HC14136L33-I2.00ISOTM7…	14	13.60	92	33.0	7	16	14.0

Helical Flutes with Coolant Thru

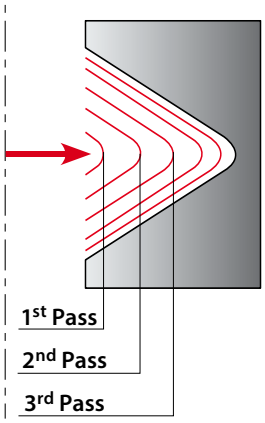
3x Do (Le ≤ 3 x Thread Diameter)

Thread		Pitch	Ordering Code		Dimensions mm			No. of Flutes	Teeth	Bore Dia.*
M Coarse	M Fine	mm	Internal	D	D2	L	Le	Z	Zt	mm
M3x0.5	M3.5-M16x0.5	0.5	HC04024L09-I0.50ISOTM4…	4	2.40	45	9.3	4	18	2.5
	M4x0.5	0.5	HC04032L12-I0.50ISOTM5…	4	3.20	45	12.2	5	24	3.5
M4x0.7		0.7	HC04031L12-I0.70ISOTM4…	4	3.15	47	13.0	4	18	3.3
	M6x0.75	0.75	HC06050L18-I0.75ISOTM5…	6	5.00	60	18.4	5	24	5.3
M5x0.8		0.8	HC04039L15-I0.80ISOTM5…	4	3.90	50	15.6	5	19	4.2
M6x1.0	M8-M40x1.0	1.0	HC06048L18-I1.00ISOTM5…	6	4.80	60	18.5	5	18	5.0
M8x1.25		1.25	HC08065L25-I1.25ISOTM5…	8	6.50	66	25.7	5	20	6.8
M10x1.5	M12-M48x1.5	1.5	HC10082L30-I1.50ISOTM5…	10	8.20	75	30.8	5	20	8.5
M12x1.75		1.75	HC10099L36-I1.75ISOTM5…	10	9.90	86	37.7	5	21	10.2
M14x2.0	M17-M80x2.0	2.0	HC12116L42-I2.00ISOTM5…	12	11.60	102	43.0	5	21	12.0
M16x2.0	M17-M80x2.0	2.0	HC14136L48-I2.00ISOTM5…	14	13.60	108	49.0	5	24	14.0

* Bore diameter applies to smallest thread dia.

Efficient Multi-passes Machining Method

Due to the high volume of chips, thinner chips are required. This is achieved by radial multi-pass machining, which reduces the accumulation of chips, and thereby enables higher speeds and feed rates.



Recommended No. of Passes According to Pitch

Pitch TPI	48	32	24	20	16	14	12	10	8
Pitch mm	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.50	3.00
No. of Passes	2-3	2-3	3-4	4-5	5-6	5-6	6-7	7-8	7-9

Climb milling with multiple passes is required.
For machining recommendations, use the Vargus GENius.

Recommended Cutting Speeds Vc [m/min] and Feed f [mm/tooth]

					2xDo Tools				3xDo Tools			
Material Group	Vargus No.	Material		Hardness Brinell HB	Vc [m/min]	Feed f [mm/tooth] by Cutter Dia. = D2			Vc [m/min]	Feed f [mm/tooth] by Cutter Dia. = D2		
					VTH	2.4-4.0	4.0-9.0	>9.0	VTH	2.4-4.0	4.0-9.0	>9.0
P Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	145-185	0.05-0.08	0.09-0.14	0.11-0.17	70-110	0.03-0.05	0.07-0.10	0.08-0.13
	2		Medium Carbon (C=0.25-0.55%)	150	135-175	0.05-0.08	0.09-0.14	0.11-0.17	70-110	0.03-0.05	0.07-0.10	0.08-0.13
	3		High Carbon (C=0.55-0.85%)	170	120-160	0.05-0.08	0.09-0.14	0.11-0.17	65-105	0.03-0.05	0.07-0.10	0.08-0.13
	4	Low Alloy Steel (alloying elements≤5%)	Non Hardened	180	100-140	0.05-0.08	0.09-0.14	0.11-0.17	65-105	0.03-0.05	0.07-0.10	0.08-0.13
	5		Hardened	275	95-135	0.05-0.08	0.09-0.14	0.11-0.17	65-105	0.03-0.05	0.07-0.10	0.08-0.13
	6		Hardened	350	90-130	0.04-0.06	0.06-0.10	0.08-0.11	60-100	0.03-0.05	0.05-0.08	0.07-0.10
	7	High Alloy Steel (alloying elements>5%)	Annealed	200	50-90	0.05-0.08	0.09-0.14	0.11-0.17	50-90	0.03-0.05	0.07-0.10	0.08-0.13
	8		Hardened	325	40-80	0.04-0.06	0.06-0.10	0.08-0.11	40-80	0.03-0.05	0.05-0.08	0.07-0.10
	9	Cast Steel	Low Alloy (alloying elements <5%)	200	145-185	0.05-0.08	0.09-0.14	0.11-0.17	70-110	0.03-0.05	0.07-0.10	0.08-0.13
	10		High Alloy (alloying elements >5%)	225	95-135	0.04-0.06	0.06-0.10	0.08-0.11	65-105	0.03-0.05	0.05-0.08	0.07-0.10
M Stainless Steel	11	Stainless Steel Ferritic	Non Hardened	200	85-125	0.04-0.06	0.06-0.10	0.08-0.11	60-100	0.03-0.05	0.05-0.08	0.07-0.10
	12		Hardened	330	70-110	0.04-0.06	0.06-0.10	0.08-0.11	60-100	0.03-0.05	0.05-0.08	0.07-0.10
	13	Stainless Steel Austenitic	Austenitic	180	80-120	0.05-0.08	0.09-0.14	0.11-0.17	60-100	0.03-0.05	0.07-0.10	0.08-0.13
	14		Super Austenitic	200	75-115	0.05-0.08	0.09-0.14	0.11-0.17	60-100	0.03-0.05	0.07-0.10	0.08-0.13
	15	Stainless Steel Cast Ferritic	Non Hardened	200	90-130	0.05-0.08	0.09-0.14	0.11-0.17	60-100	0.03-0.05	0.07-0.10	0.08-0.13
	16		Hardened	330	65-105	0.04-0.06	0.06-0.10	0.08-0.11	60-100	0.03-0.05	0.05-0.08	0.07-0.10
	17	Stainless Steel Cast Austenitic	Austenitic	200	85-125	0.05-0.08	0.09-0.14	0.11-0.17	60-100	0.03-0.05	0.07-0.10	0.08-0.13
	18		Hardened	330	60-100	0.04-0.06	0.06-0.10	0.08-0.11	60-100	0.03-0.05	0.05-0.08	0.07-0.10
K Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	60-70	0.05-0.08	0.09-0.14	0.11-0.17	60-100	0.03-0.05	0.07-0.10	0.08-0.13
	29		Pearlitic (long chips)	230	85-125	0.05-0.08	0.09-0.14	0.11-0.17	60-100	0.03-0.05	0.07-0.10	0.08-0.13
	30	Grey Cast Iron	Low Tensile Strength	180	95-135	0.05-0.08	0.09-0.14	0.11-0.17	65-105	0.03-0.05	0.07-0.10	0.08-0.13
	31		High Tensile Strength	260	60-100	0.04-0.06	0.06-0.10	0.08-0.11	70-110	0.03-0.05	0.05-0.08	0.07-0.10
	32	Nodular Sg Iron	Ferritic	160	55-95	0.05-0.08	0.09-0.14	0.11-0.17	40-80	0.03-0.05	0.07-0.10	0.08-0.13
	33		Pearlitic	260	50-90	0.04-0.06	0.06-0.10	0.08-0.11	40-80	0.03-0.05	0.05-0.08	0.07-0.10
N Non-Ferrous Metals	34	Aluminum Alloys Wrought	Non Aging	60	200-300	0.06-0.10	0.11-0.17	0.16-0.19	70-110	0.06-0.09	0.11-0.16	0.13-0.20
	35		Aged	100	150-250	0.06-0.10	0.11-0.17	0.16-0.19	70-110	0.06-0.09	0.11-0.16	0.13-0.20
	36	Aluminum Alloys	Cast	75	100-200	0.06-0.10	0.11-0.17	0.16-0.19	70-110	0.06-0.09	0.11-0.16	0.13-0.20
	37		Cast & Aged	90	120-220	0.06-0.10	0.11-0.17	0.16-0.19	70-110	0.06-0.09	0.11-0.16	0.13-0.20
	38	Aluminum Alloys	Cast Si 13-22%	130	200-300	0.06-0.10	0.11-0.17	0.16-0.19	70-110	0.06-0.09	0.11-0.16	0.13-0.20
	39	Copper and Copper Alloys	Brass	90	200-300	0.06-0.10	0.11-0.17	0.16-0.19	70-110	0.06-0.09	0.11-0.16	0.13-0.20
	40		Bronze And Non Leaded Copper	100	150-250	0.06-0.10	0.11-0.17	0.16-0.19	70-110	0.06-0.09	0.11-0.16	0.13-0.20

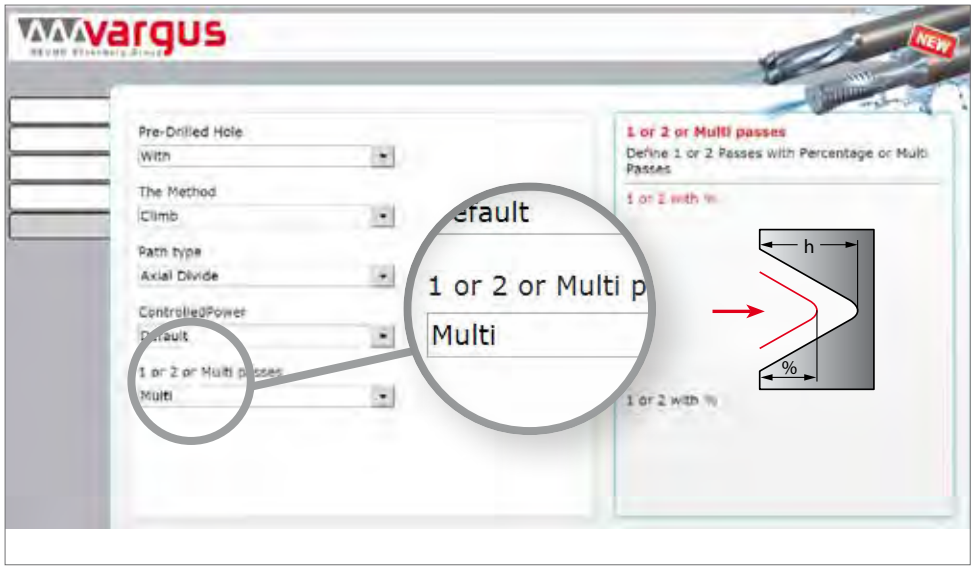
VARGUS GENius™

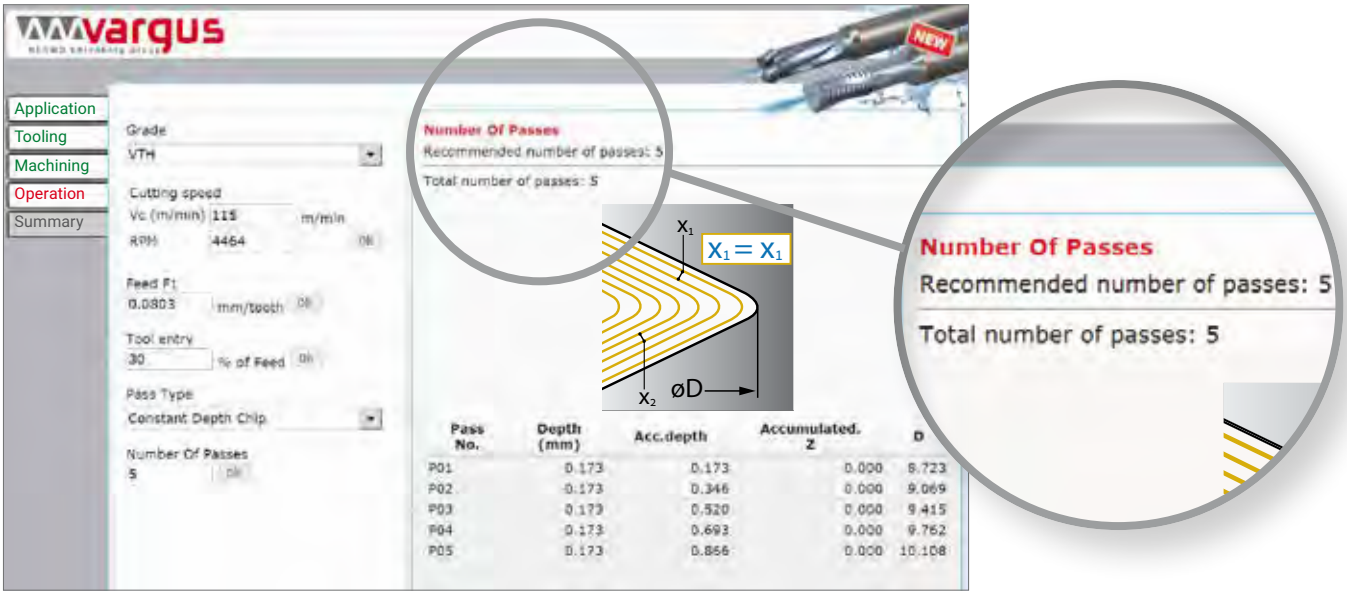
Tool Selector and CNC Program Generator

Thread Milling CNC Program Generator with Multiple Passes

PATENT PENDING

The VARGUS GENius™ automatically generates the recommended number of passes for the application!





Features and Benefits:

- The VARGUS GENius™ now offers unlimited multiple radial passes for thread milling applications
- The software automatically generates the recommended number of passes required based on the machining data that is entered
- The new update allows for complete control of the number of passes, as the well as depth of the last pass
- Highly recommended for applications such as long threads, difficult to machine applications, and hard materials

TM Solid TMDR

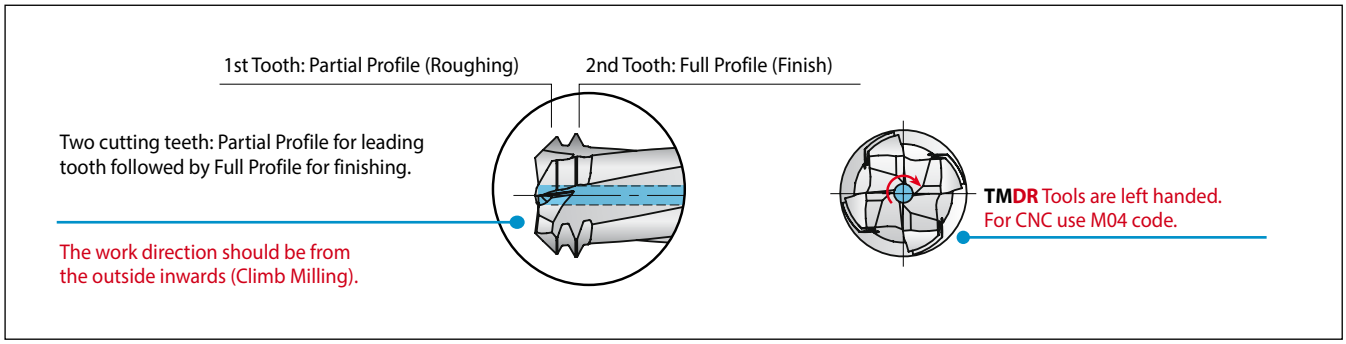
Drilling, Thread Milling & Chamfering

EXPANDED LINE

Now Available in Full Profiles ISO, BSP, NPT & BSPT

Features and Benefits:

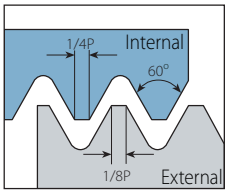
- TMDR tools drill, thread and chamfer all in one tooling operation
- Pre-drilled holes are no longer required!
- Drilling and thread milling is done simultaneously, while chamfering is produced at the end of the operation
- All tools are left handed, and are suitable for right and left hand threads
- All expansion tools are available with coolant thru
- Expansion Includes:
  - ISO Metric: M10, M12, M16 & M24 tools for 2.5xDo
  - BSP: 28, 19 & 14 TPI
  - NPT: 27, 18 & 14 TPI
  - BSPT: 28, 19, & 14 TPI
- VTS Grade:
  A general-purpose, heavy duty thread milling grade. TiAlN coated for high resistance to wear



The **TMDR** is fully supported by **VARGUS GENius™**, the most advanced Tool Selector and CNC Program Generator in the metal cutting tools industry.

VARGUS GENius™ Tool Selector and CNC Program Generator

Internal



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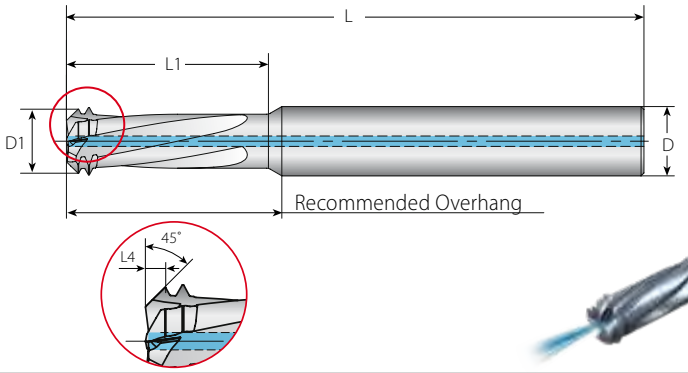
Tolerance class: 6H



Left Hand Tool

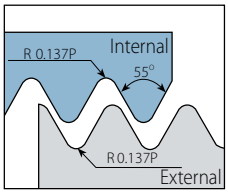
TMDR - Drilling, Thread Milling & Chamfering

2.5 x Do (L1 ≤ 2.5 x Thread Diameter)

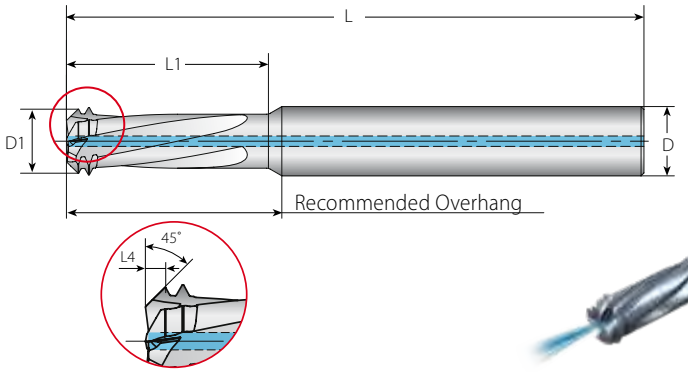
Thread		Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth		
M Coarse	M Fine	mm	Internal	D	D2	L	L1	Z	Zt	L4*	D1
With Coolant											
M10x1.5	M11-M14x1.5	1.50	TDC2L08078L280-I1.50ISO...	8	7.8	64	28.0	4	2	1.12	7.24
M12x1.75		1.75	TDC2L10090L320-I1.75ISO...	10	9.0	80	32.0	4	2	1.20	8.35
M16x2.0	M17-M23x2.0	2.00	TDC2L12118L430-I2.00ISO...	12	11.8	100	43.0	4	2	2.00	11.13
M24x3.0		3.00	TDC2L18178L650-I3.0ISO...	18	17.8	135	65.0	4	2	2.50	16.90

BSP (G)

Internal



Defined by: B.S.2779:1956
Tolerance class: Medium class



Left Hand Tool

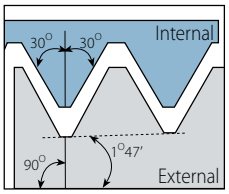
TMDR - Drilling, Thread Milling & Chamfering

2 x Do (L1 ≤ 2 x Thread Diameter)

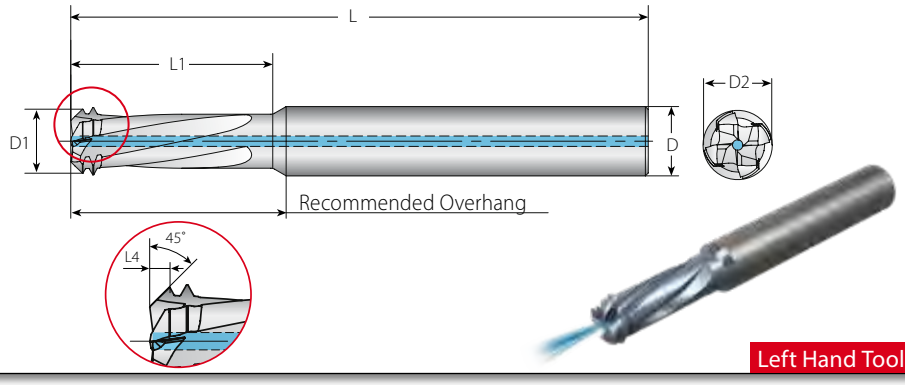
Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth		
Standard	TPI	Internal	D	D2	L	L1	Z	Zt	L4*	D1
With Coolant										
1/16"x28	28	TDC2L08059L175-I28BSP...	8	5.9	64	17.5	4	2	0.60	5.50
1/8"x28	28	TDC2L08078L230-I28BSP...	8	7.8	64	23.0	4	2	0.60	7.28
1/4"x19	19	TDC2L12105L320-I19BSP...	12	10.5	80	32.0	4	2	0.80	10.00
3/8"x19	19	TDC2L14126L380-I19BSP...	14	12.6	100	38.0	4	2	0.80	12.04
1/2"x14	14	TDC2L16158L456-I14BSP...	16	15.8	135	45.6	4	2	1.27	15.16

* Please use the VARGUS GENius™ for Chamfer recommendations

Internal



Defined by: USAS B2.1:1968
Tolerance class: Standard NPT

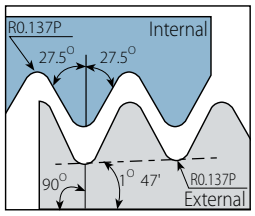


TMDR - Drilling, Thread Milling & Chamfering

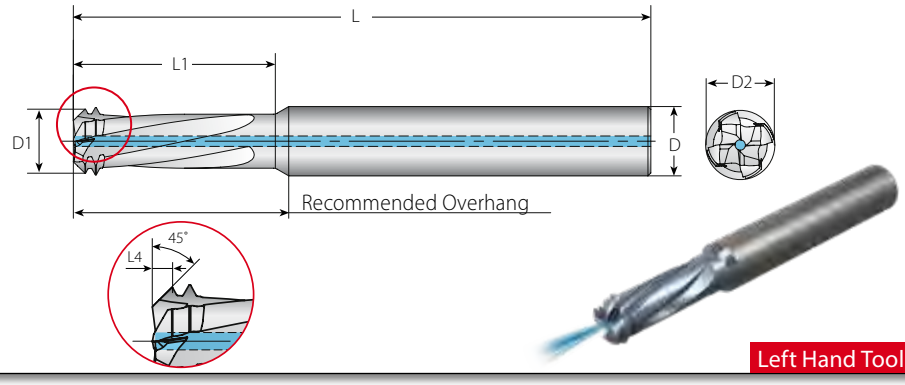
Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth		
Standard	TPI	Internal	D	D2	L	L1	Z	Zt	L4*	D1
With Coolant										
1/16"x27	27	TDC2L08056L112-I27NPT...	8	5.6	64	11.2	4	2	0.60	5.07
1/8"x27	27	TDC2L08075L112-I27NPT...	8	7.5	64	11.2	4	2	0.60	6.97
1/4"x18	18	TDC2L10094L164-I18NPT...	10	9.4	80	16.4	4	2	1.00	8.67
3/8"x18	18	TDC2L12119L164-I18NPT...	12	11.9	100	16.4	4	2	1.00	11.19
1/2"x14	14	TDC2L16153L286-I14NPT...	16	15.3	100	28.6	6	2	1.50	14.41

BSPT

External / Internal



Defined by: B.S.21:1985
Tolerance class: Standard BSPT

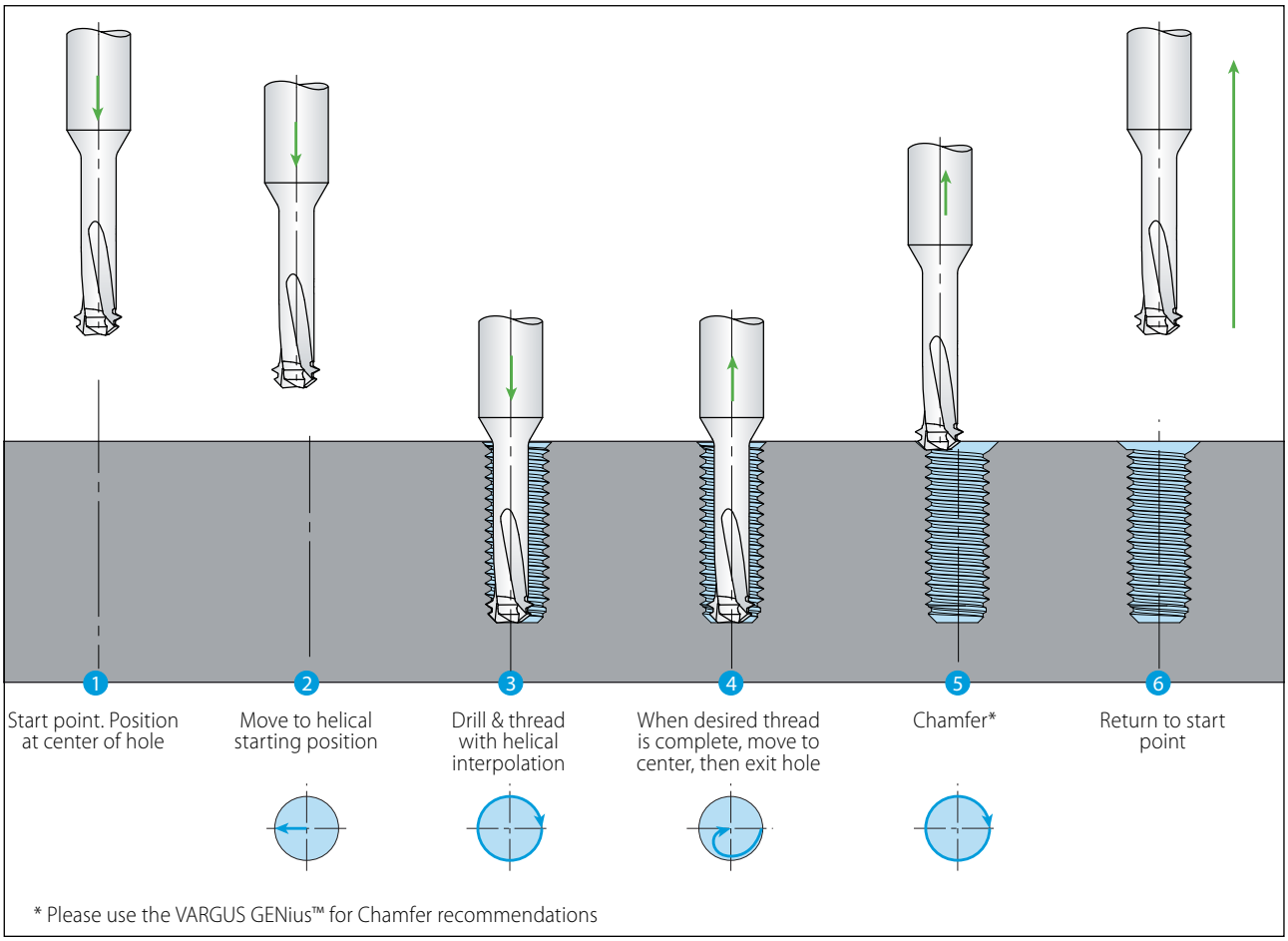


TMDR - Drilling, Thread Milling & Chamfering

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth		
Standard	TPI	Internal	D	D2	L	L1	Z	Zt	L4*	D1
With Coolant										
1/16"x28 BSPT	28	TDC2L06054L170-I28BSPT...	6	5.36	58	17.0	3	2	0.70	3.99
1/8"x28 BSPT	28	TDC2L08068L210-I28BSPT...	8	6.76	64	21.0	4	2	0.70	5.39
1/4"x19 BSPT	19	TDC2L10091L285-I19BSPT...	10	9.14	100	28.5	4	2	1.00	7.23
3/8"x19 BSPT	19	TDC2L12116L355-I19BSPT...	12	11.59	100	35.5	4	2	1.00	9.68
1/2"x14 BSPT	14	TDC2L16146L450-I14BSPT...	16	14.57	135	45.0	6	2	1.35	12.05

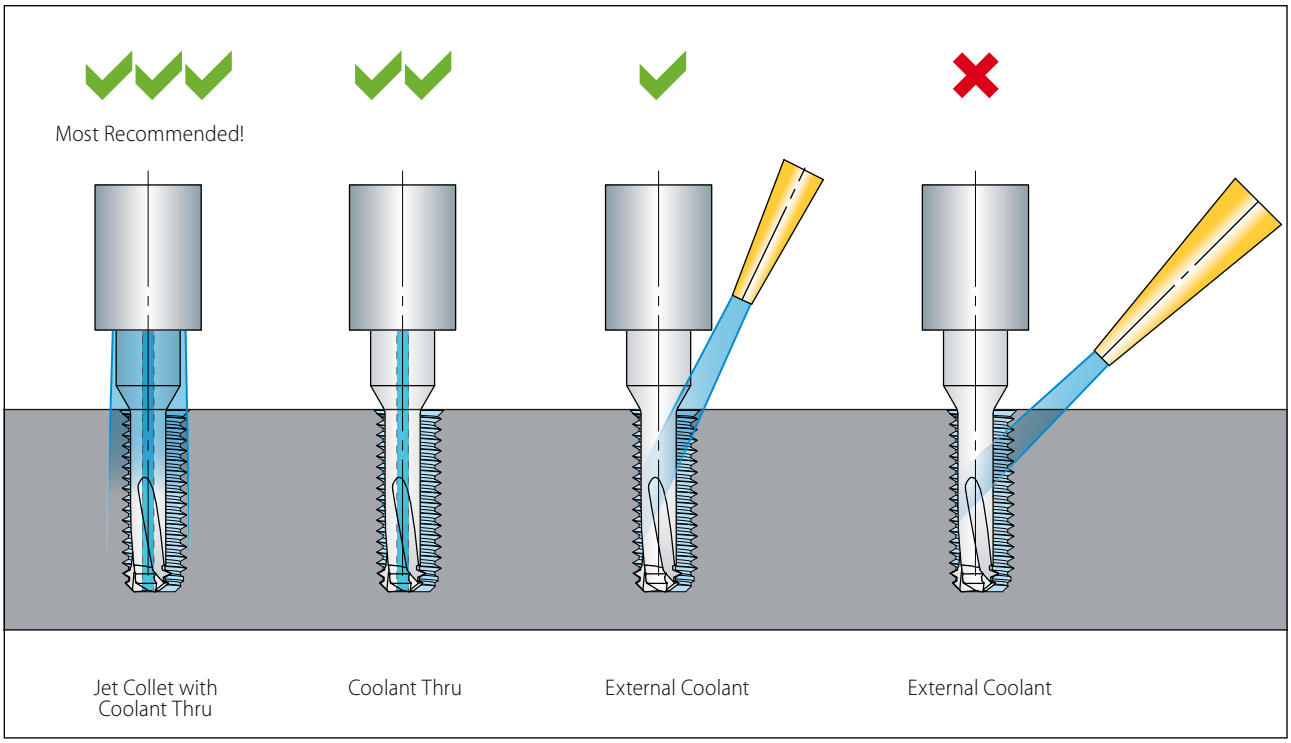
* Please use the VARGUS GENius™ for Chamfer recommendations

TMDR - Operating Cycle



* Please use the VARGUS GENius™ for Chamfer recommendations

TMDR - Coolant Use for Best Chip Evacuation



Recommended Cutting Speeds Vc [m/min] and Feed f [mm/tooth]

Material Group	Vargus No.	Material		Hardness Brinell HB	Vc [m/min] VTS	Feed f [mm/tooth]
P Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	60-120	0.02-0.12
	2		Medium Carbon (C=0.25-0.55%)	150	60-120	0.02-0.12
	3		High Carbon (C=0.55-0.85%)	170	60-90	0.02-0.12
	4	Low Alloy Steel (alloying elements≤5%)	Non Hardened	180	60-90	0.02-0.12
	5		Hardened	275	50-80	0.02-0.05
	6		Hardened	350	50-80	0.02-0.03
	7	High Alloy Steel (alloying elements>5%)	Annealed	200	50-80	0.02-0.07
	8		Hardened	325	50-80	0.02-0.03
	9	Cast Steel	Low Alloy (alloying elements <5%)	200	70-90	0.02-0.12
	10		High Alloy (alloying elements >5%)	225	60-80	0.02-0.03
M Stainless Steel	11	Stainless Steel Ferritic	Non Hardened	200	60-90	0.02-0.12
	12		Hardened	330	50-80	0.02-0.03
	13	Stainless Steel Austenitic	Austenitic	180	60-90	0.02-0.12
	14		Super Austenitic	200	50-80	0.02-0.12
	15	Stainless Steel Cast Ferritic	Non Hardened	200	60-90	0.02-0.12
	16		Hardened	330	50-80	0.02-0.03
	17	Stainless Steel Cast Austenitic	Austenitic	200	60-90	0.02-0.12
	18		Hardened	330	50-80	0.02-0.03
K Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	50-80	0.02-0.03
	29		Pearlitic (long chips)	230	60-90	0.02-0.09
	30	Grey Cast Iron	Low Tensile Strength	180	70-100	0.02-0.12
	31		High Tensile Strength	260	60-90	0.02-0.09
	32	Nodular Sg Iron	Ferritic	160	70-100	0.02-0.12
	33		Pearlitic	260	60-90	0.02-0.09
N Non-Ferrous Metals	34	Aluminum Alloys Wrought	Non Aging	60	60-250	0.03-0.11
	35		Aged	100	60-150	0.03-0.12
	36	Aluminum Alloys	Cast	75	60-250	0.03-0.12
	37		Cast & Aged	90	60-150	0.02-0.12
	38	Aluminum Alloys	Cast Si 13-22%	130	250	0.03-0.11
	39	Copper and Copper Alloys	Brass	90	60-250	0.03-0.12
	40		Bronze And Non Leaded Copper	100	60-150	0.03-0.11
S Heat Resistant Material	19	High Temperature Alloys	Annealed (iron based)	200	60	0.02-0.12
	20		Aged (iron based)	280	50	0.02-0.03
	21		Annealed (nickel or cobalt based)	250	35	0.02-0.03
	22		Aged (nickel or cobalt based)	350	30	0.02-0.03
	23	Titanium Alloys	Pure 99.5 Ti	400Rm	30-50	0.02-0.05
	24		α+β Alloys	1050Rm	25-35	0.02-0.05
H Hardened Material	25	Extra Hard Steel	Hardened & Tempered	45-50HRc	-	-
	26			51-55HRc	-	-

TM Solid Helicool-R (HCR)

Helical Thread Mill Flutes with Radial Coolant Thru

EXPANDED LINE

Now Available in Additional Threading Standards: ISO, UN, BSP (G), NPT, BSPT & UNJ

Features and Benefits:

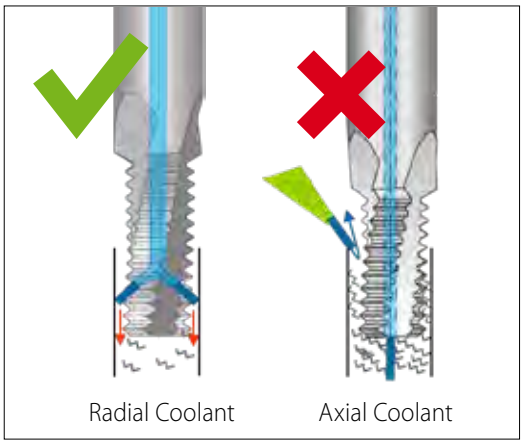
- Effective coolant in thru holes
- Delivering coolant directly to the cutting area
- Good solution when external cooling is not available or ineffective

Expansion Includes:

Metric Shanks:

- ISO Metric
- American UN
- BSP (G)
- NPT
- BSPT
- UNJ

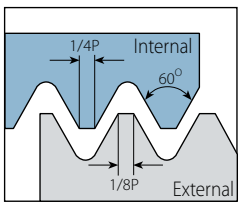
Chip Evacuation in Thru Holes using Axial & Radial Coolant



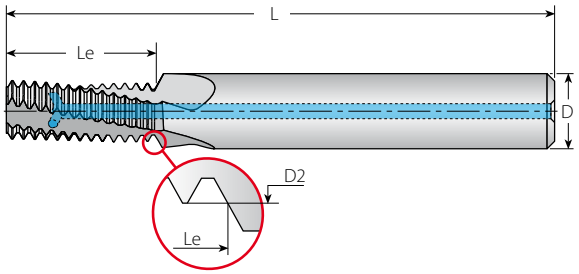
The new **HCR tools** are fully supported by **VARGUS GENius™**, the most advanced Tool Selector and CNC Program Generator in the metal cutting tools industry

VARGUS GENius™ Tool Selector and CNC Program Generator

ISO Metric



Defined by: R262 (DIN 13)
Tolerance class: 6H

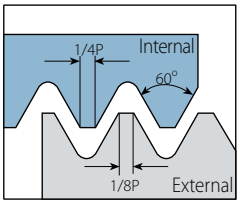


Helicool-R (HCR)

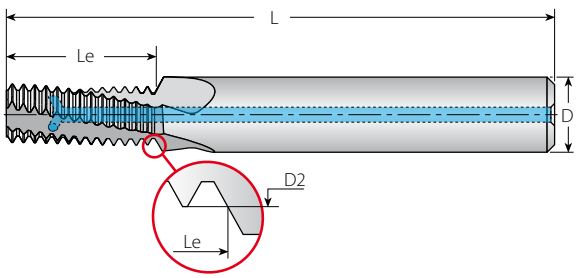
2 x Do (Le≤ 2 x Thread Diameter)

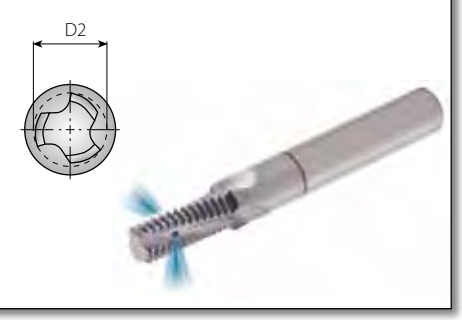
Thread		Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
M Coarse	M Fine	mm	Internal	D	D2	L	Le	Z	Zt	mm
M14x2.0	M17-M80x2.0	2.0	HCR12116L29-I2.00ISOTM…	12	11.6	80	29.0	4	14	12.0
M16x2.0	M17-M80x2.0	2.0	HCR14136L33-I2.00ISOTM...	14	13.6	92	33.0	4	16	14.0
M20x2.5		2.5	HCR18171L41-I2.50ISOTM...	18	17.1	102	41.2	4	16	17.5

American UN



Defined by: ANSI B1.1.74
Tolerance class: 2B





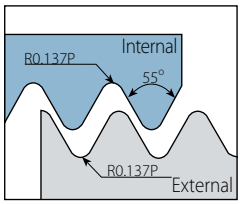
Helicool-R (HCR)

2 x Do (Le≤ 2 x Thread Diameter)

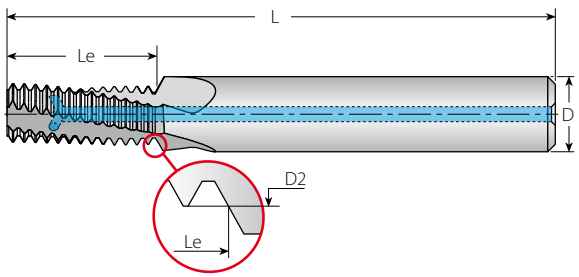
Thread			Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
UNC	UNF	UNEF	TPI	Internal	D	D2	L	Le	Z	Zt	mm
	1/4"x28	7/16", 1/2"x28	28	HCR06052L13-I28UNFTM...	6	5.15	57	13.1	3	14	5.5
	5/16", 3/8"x24	9/16"-11/16"x24	24	HCR08066L16-I24UNFTM...	8	6.68	61	16.4	3	15	6.8
	3/8"x24	9/16"-11/16"x24	24	HCR10082L19-I24UNFTM...	10	8.20	73	19.6	3	18	8.5
1/4"x20	7/16", 1/2"x20	3/4"-1"x20	20	HCR06048L13-I20UNCTM...	6	4.88	57	13.3	3	10	5.2
	7/16", 1/2"x20	3/4"-1"x20	20	HCR10096L22-I20UNFTM...	10	9.60	73	22.2	3	17	9.8
5/16"x18	9/16", 5/8"x18	11/16"-1 11/16"x18	18	HCR08061L16-I18UNCTM...	8	6.15	61	16.2	3	11	6.5
3/8"x16	3/4"x16		16	HCR08076L19-I16UNCTM...	8	7.65	61	19.8	3	12	8.0
7/16"x14	7/8"x14		14	HCR10090L22-I14UNCTM...	10	9.00	73	22.7	3	12	9.3
1/2"x13			13	HCR12104L26-I13UNCTM...	12	10.35	80	26.4	4	13	10.8
9/16"x12	1"-1 1/2"x12		12	HCR12118L28-I12UNCTM...	12	11.80	80	28.6	4	13	12.3
5/8"x11			11	HCR14131L33-I11UNCTM...	14	13.10	92	33.5	4	14	13.5
3/4"x10			10	HCR16159L39-I10UNCTM...	16	15.90	92	39.4	4	15	16.5
1"x8			8	HCR20199L52-I8UNCTM...	20	19.90	102	52.4	4	16	22.0

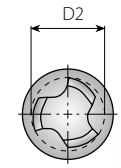
* Bore diameter applies to smallest thread dia.

BSP (G)



Defined by: B.S.2779:1956
Tolerance class: Medium class



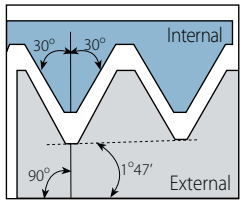


Helicool-R (HCR)

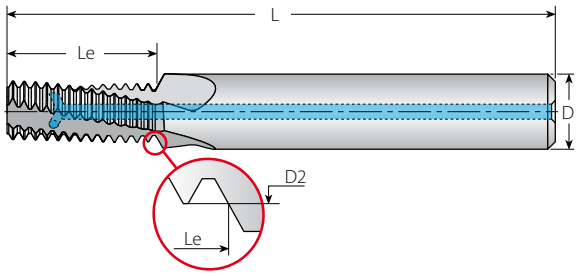
2 x Do (Le≤ 2 x Thread Diameter)

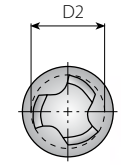
Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
Standard	TPI	Internal	D	D2	L	Le	Z	Zt	mm
1/8"x28	28	HCR10082L19-EI28BSPTM...	10	8.20	73	19.5	3	21	8.7
1/4", 3/8"x19	19	HCR12110L27-EI19BSPTM...	12	11.00	80	27.4	4	20	11.8
1/2"-7/8"x14	14	HCR18179L42-EI14BSPTM...	18	17.90	102	42.6	4	23	19.0

NPT



Defined by: USAS B2.1:1968
Tolerance class: Standard NPT



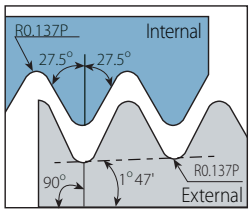


Helicool-R (HCR)

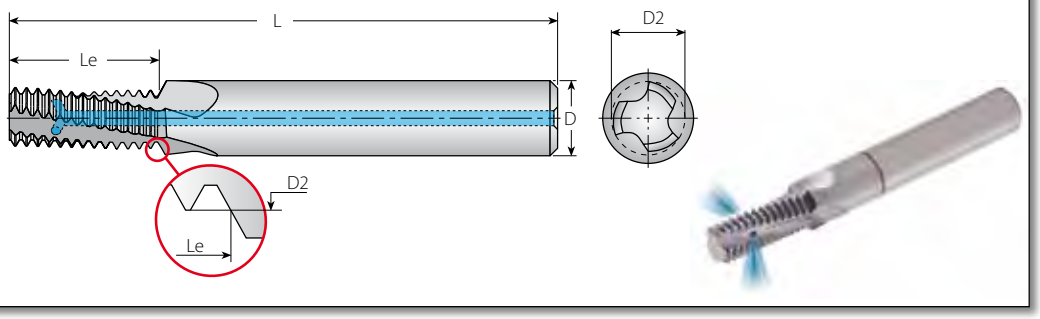
Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
Standard	TPI	Internal	D	D2	L	Le	Z	Zt	mm
1/16"x27	27	HCR06059L09-EI27NPT-TM...	6	5.90	57	9.9	3	10	6.3
1/8"x27	27	HCR08076L09-EI27NPT-TM...	8	7.65	61	9.9	3	10	8.5
1/4"x18	18	HCR10099L14-EI18NPT-TM...	10	9.90	73	14.8	3	10	11.1
3/8"x18	18	HCR12111L14-EI18NPT-TM...	12	11.15	73	14.8	4	10	14.5
1/2", 3/4"x14	14	HCR16142L19-EI14NPT-TM...	16	14.25	92	19.0	4	10	17.7, 23.0
1", 1 1/4", 1 1/2", 2"x11.5	11.5	HCR20196L23-EI11.5NPT-TM...	20	19.60	102	23.2	4	10	29.0, 37.7, 44.0, 56.0

* Bore diameter applies to smallest thread dia.

BSPT



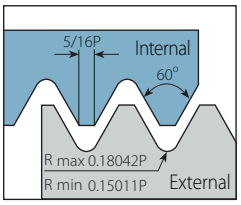
Defined by: B.S.21:1985
Tolerance class: Standard BSPT



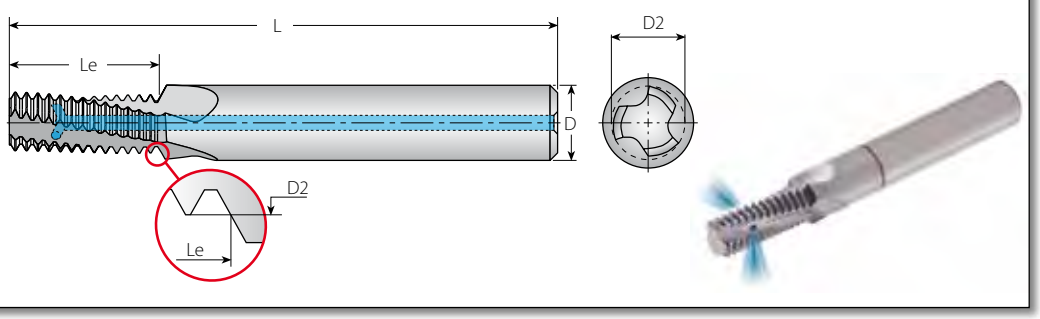
Helicool-R (HCR)

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
Standard	TPI	Internal	D	D2	L	Le	Z	Zt	mm
1/8"x28	28	HCR08076L10-EI28BSPT-TM...	8	7.65	61	10.2	3	11	8.7
1/4"x19	19	HCR10099L15-EI19BSPT-TM...	10	9.90	73	15.4	3	11	11.8
3/8"x19	19	HCR12111L15-EI19BSPT-TM...	12	11.15	73	15.4	4	11	15.2
1/2", 3/4"x14	14	HCR16142L22-EI14BSPT-TM...	16	14.25	92	22.7	4	12	19.0

UNJ



Defined by: MIL-S-8879C
Tolerance class: 3B



Helicool-R (HCR)

2 x Do (Le≤ 2 x Thread Diameter)

Thread				Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
UNJC	UNJF	UNJEF	UNJ	TPI	Internal	D	D2	L	Le	Z	Zt	mm
-	0.250"(1/4")	0.4375"(7/16")	0.5625"(9/16")	28	HCR06054L13-I28UNJTM...	6	5.40	57	13.1	3	14	5.6
-	0.3125"(5/16")	0.5625"(9/16")	-	24	HCR08067L15-I24UNJTM...	8	6.70	61	16.4	3	15	7.0
-	0.4375"(7/16")	0.750"(3/4")	0.5625"(9/16")	20	HCR10096L21-I20UNJTM...	10	9.60	73	22.2	4	17	10.0
0.3125"(5/16")	0.5625"(9/16")	1.0625"(1 1/16")	-	18	HCR08064L15-I18UNJTM...	8	6.40	61	16.2	3	11	6.75
0.375"(3/8")	0.750"(3/4")	-	0.4375"(7/16")	16	HCR08077L19-I16UNJTM...	8	7.70	61	19.8	3	12	8.1

* Bore diameter applies to smallest thread dia.

Recommended Cutting Speeds Vc [m/min] and Feed f [mm/tooth]

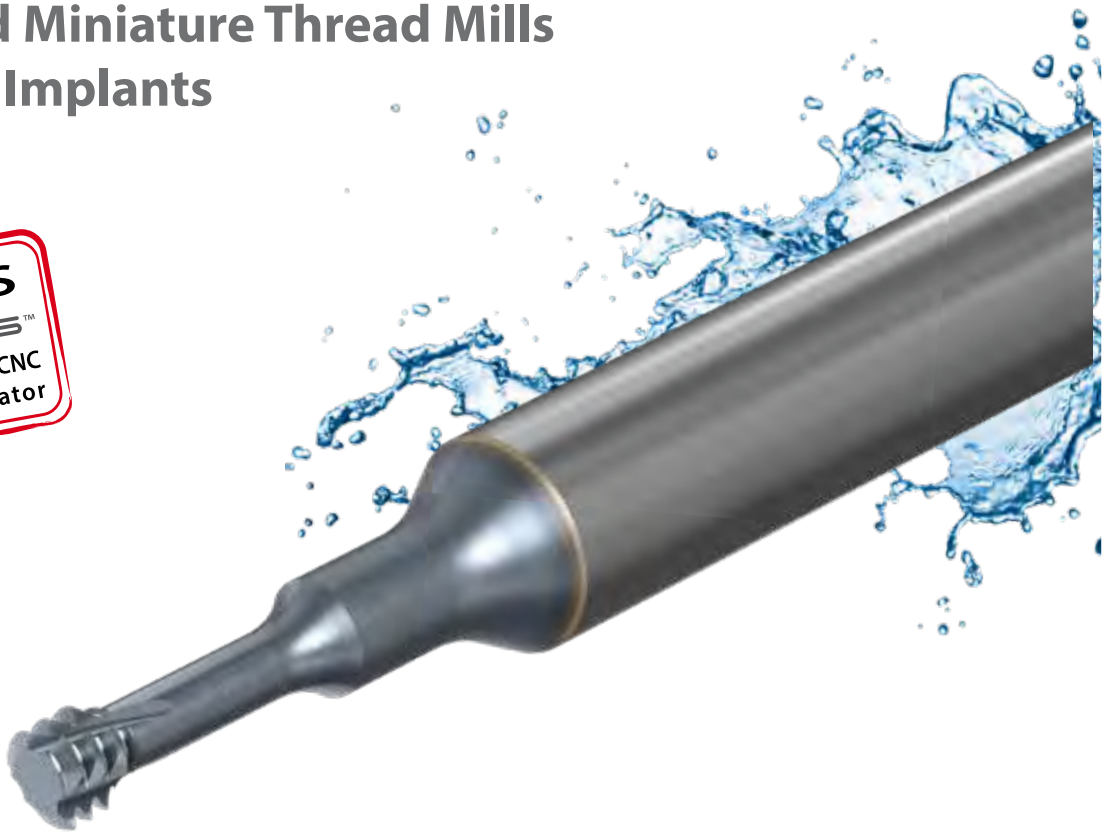
Material Group	Vargus No.	Material		Hardness Brinell HB	Vc [m/min] VTH	Feed f [mm/tooth]
P Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	80-250	0.03-0.08
	2		Medium Carbon (C=0.25-0.55%)	150	80-230	0.03-0.08
	3		High Carbon (C=0.55-0.85%)	170	80-200	0.03-0.08
	4	Low Alloy Steel (alloying elements≤5%)	Non Hardened	180	60-180	0.03-0.08
	5		Hardened	275	60-170	0.03-0.07
	6		Hardened	350	60-160	0.02-0.06
	7	High Alloy Steel (alloying elements>5%)	Annealed	200	40-100	0.03-0.07
	8		Hardened	325	30-80	0.03-0.06
	9	Cast Steel	Low Alloy (alloying elements <5%)	200	80-250	0.03-0.07
	10		High Alloy (alloying elements >5%)	225	60-170	0.03-0.07
M Stainless Steel	11	Stainless Steel Ferritic	Non Hardened	200	60-150	0.03-0.08
	12		Hardened	330	60-120	0.03-0.06
	13	Stainless Steel Austenitic	Austenitic	180	60-140	0.03-0.08
	14		Super Austenitic	200	60-130	0.03-0.06
	15	Stainless Steel Cast Ferritic	Non Hardened	200	60-160	0.03-0.06
	16		Hardened	330	60-110	0.02--0.05
	17	Stainless Steel Cast Austenitic	Austenitic	200	60-150	0.02-0.05
	18		Hardened	330	60-100	0.02-0.04
K Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	60-70	0.03-0.08
	29		Pearlitic (long chips)	230	60-150	0.03-0.07
	30	Grey Cast Iron	Low Tensile Strength	180	70-160	0.03-0.07
	31		High Tensile Strength	260	40-120	0.03-0.07
	32	Nodular Sg Iron	Ferritic	160	40-110	0.03-0.08
	33		Pearlitic	260	40-100	0.03-0.07
N Non-Ferrous Metals	34	Aluminum Alloys Wrought	Non Aging	60	200-300	0.04-0.1
	35		Aged	100	150-250	0.03-0.1
	36	Aluminum Alloys	Cast	75	100-200	0.03-0.1
	37		Cast & Aged	90	120-220	0.06-0.12
	38	Aluminum Alloys	Cast Si 13-22%	130	200-300	0.05-0.12
	39	Copper and Copper Alloys	Brass	90	200-300	0.05-0.12
	40		Bronze And Non Leaded Copper	100	150-250	0.05-0.12
S Heat Resistant Material	19	High Temperature Alloys	Annealed (iron based)	200	30-60	0.03-0.7
	20		Aged (iron based)	280	20-50	0.03-0.06
	21		Annealed (nickel or cobalt based)	250	15-35	0.03-0.06
	22		Aged (nickel or cobalt based)	350	15-30	0.02-0.05
	23	Titanium Alloys	Pure 99.5 Ti	400Rm	40-80	0.02-0.05
	24		α+β Alloys	1050Rm	20-50	0.02-0.04
H Hardened Material	25	Extra Hard Steel	Hardened & Tempered	45-50HRc	15-45	0.02-0.03
	26			51-55HRc	15-40	0.02-0.03

TM Solid MilliPro Dental

NEW

Reinforced Miniature Thread Mills for Dental Implants

VARGUS GENius™ Tool Selector and CNC Program Generator

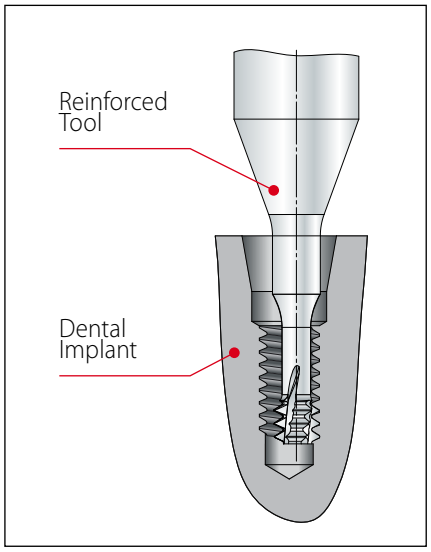


Features and Benefits:

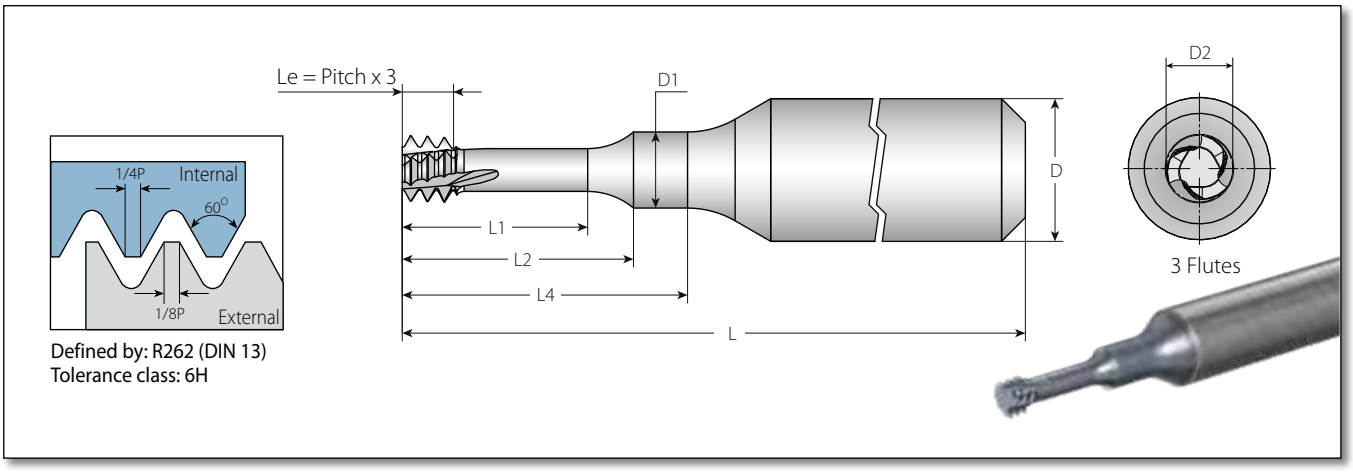
- Reinforced overhang for better stability
- Specifically designed for the dental implant industry
- Increased tool life
- Now with 3 flutes and 3 teeth
- Available in ISO Metric and American UN
- VTH Grade

The new **MilliPro Dental** is fully supported by **VARGUS GENius™**, the most advanced Tool Selector and CNC Program Generator in the metal cutting tools industry

Reinforced Overhang



ISO Metric



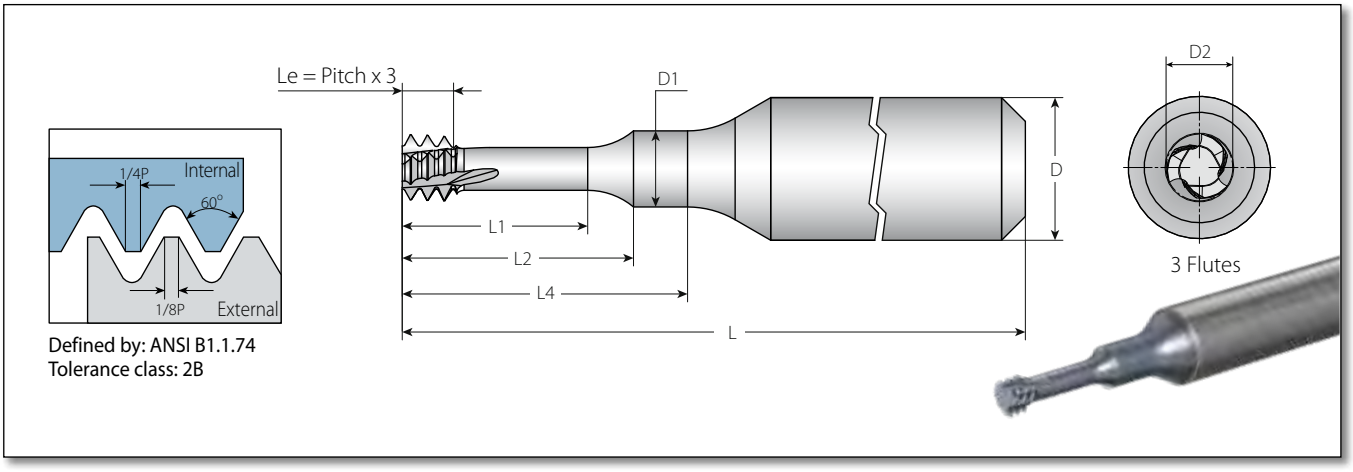
Defined by: R262 (DIN 13)
Tolerance class: 6H

Miniature Thread Mills for Dental Implants

3 x Do (L4≥3 x Thread Diameter)

Thread		Pitch	Ordering Code	Dimensions mm							No. of Flutes	Teeth	Bore Dia.
M Coarse	M Fine	mm	Internal	D	D2	L	L1	L2	L4	D1	Z	Zt	mm
M1.2x0.25	M1.4x0.25	0.25	DD3T03009L043-I0.25ISOTM...	3	0.90	39	2.5	3.3	4.3	0.95	3	3	0.97
M1.4x0.30		0.3	DD3T03011L050-I0.30ISOTM...		1.05		2.8	3.5	5.0	1.05			1.12
M1.6x0.35	M1.8x0.35	0.35	DD3T03012L058-I0.35ISOTM...		1.20		3.3	4.2	5.9	1.25			1.27
M1.8x0.35	M2.0x0.35	0.35	DD3T03014L065-I0.35ISOTM...		1.40		3.8	4.7	6.6	1.45			1.47
M2.0x0.4		0.4	DD3T03015L067-I0.40ISOTM...		1.54		3.9	4.9	6.7	1.70			1.63
M2.5x0.45		0.45	DD3T03019L082-I0.45ISOTM...		1.96		4.8	5.8	8.2	2.00			2.08

American UN



Defined by: ANSI B1.1.74
Tolerance class: 2B

Miniature Thread Mills for Dental Implants

3xDo (L4≥3 x Thread Diameter)

Thread	Pitch	Ordering Code	Dimensions mm							No. of Flutes	Teeth	Bore Dia.
UNF	TPI	Internal	D	D2	L	L1	L2	L4	D1	Z	Zt	mm
0-80UN	80	DD3T03011L052-I80UNTM...	3	1.16	39	2.8	3.6	5.0	1.15	3	3	1.27
1-72UN	72	DD3T03014L065-I72UNTM...		1.44		3.9	4.9	6.5	1.60			1.56

Recommended Cutting Speeds Vc [m/min] and Feed f [mm/tooth]

Material Group	Vargus No.	Material		Hardness Brinell HB	Vc [m/min] VTS	Feed f [mm/tooth]
P Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	60-120	0.02-0.16
	2		Medium Carbon (C=0.25-0.55%)	150	60-120	0.02-0.16
	3		High Carbon (C=0.55-0.85%)	170	60-90	0.02-0.16
	4	Low Alloy Steel (alloying elements≤5%)	Non Hardened	180	60-90	0.02-0.16
	5		Hardened	275	50-80	0.02-0.07
	6		Hardened	350	50-80	0.02-0.03
	7	High Alloy Steel (alloying elements>5%)	Annealed	200	50-80	0.02-0.09
	8		Hardened	325	50-80	0.02-0.03
	9	Cast Steel	Low Alloy (alloying elements <5%)	200	70-90	0.02-0.16
	10		High Alloy (alloying elements >5%)	225	60-80	0.02-0.03
M Stainless Steel	11	Stainless Steel Ferritic	Non Hardened	200	60-90	0.02-0.16
	12		Hardened	330	50-80	0.02-0.03
	13	Stainless Steel Austenitic	Austenitic	180	60-90	0.02-0.16
	14		Super Austenitic	200	50-80	0.02-0.16
	15	Stainless Steel Cast Ferritic	Non Hardened	200	60-90	0.02-0.16
	16		Hardened	330	50-80	0.02-0.03
	17	Stainless Steel Cast Austenitic	Austenitic	200	60-90	0.02-0.16
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K Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	50-80	0.02-0.03
	29		Pearlitic (long chips)	230	60-90	0.02-0.12
	30	Grey Cast Iron	Low Tensile Strength	180	70-100	0.02-0.16
	31		High Tensile Strength	260	60-90	0.02-0.12
	32	Nodular Sg Iron	Ferritic	160	70-100	0.02-0.16
	33		Pearlitic	260	60-90	0.02-0.12
N Non-Ferrous Metals	34	Aluminum Alloys Wrought	Non Aging	60	60-250	0.03-0.15
	35		Aged	100	60-150	0.03-0.16
	36	Aluminum Alloys	Cast	75	60-250	0.03-0.16
	37		Cast & Aged	90	60-150	0.02-0.16
	38	Aluminum Alloys	Cast Si 13-22%	130	250	0.03-0.15
	39	Copper and Copper Alloys	Brass	90	60-250	0.03-0.16
	40		Bronze And Non Leaded Copper	100	60-150	0.03-0.15
S Heat Resistant Material	19	High Temperature Alloys	Annealed (iron based)	200	60	0.02-0.16
	20		Aged (iron based)	280	50	0.02-0.03
	21		Annealed (nickel or cobalt based)	250	35	0.02-0.03
	22		Aged (nickel or cobalt based)	350	30	0.02-0.03
	23	Titanium Alloys	Pure 99.5 Ti	400Rm	30-50	0.02-0.07
	24		α+β Alloys	1050Rm	25-35	0.02-0.07
H Hardened Material	25	Extra Hard Steel	Hardened & Tempered	45-50HRc	-	-
	26			51-55HRc	-	-

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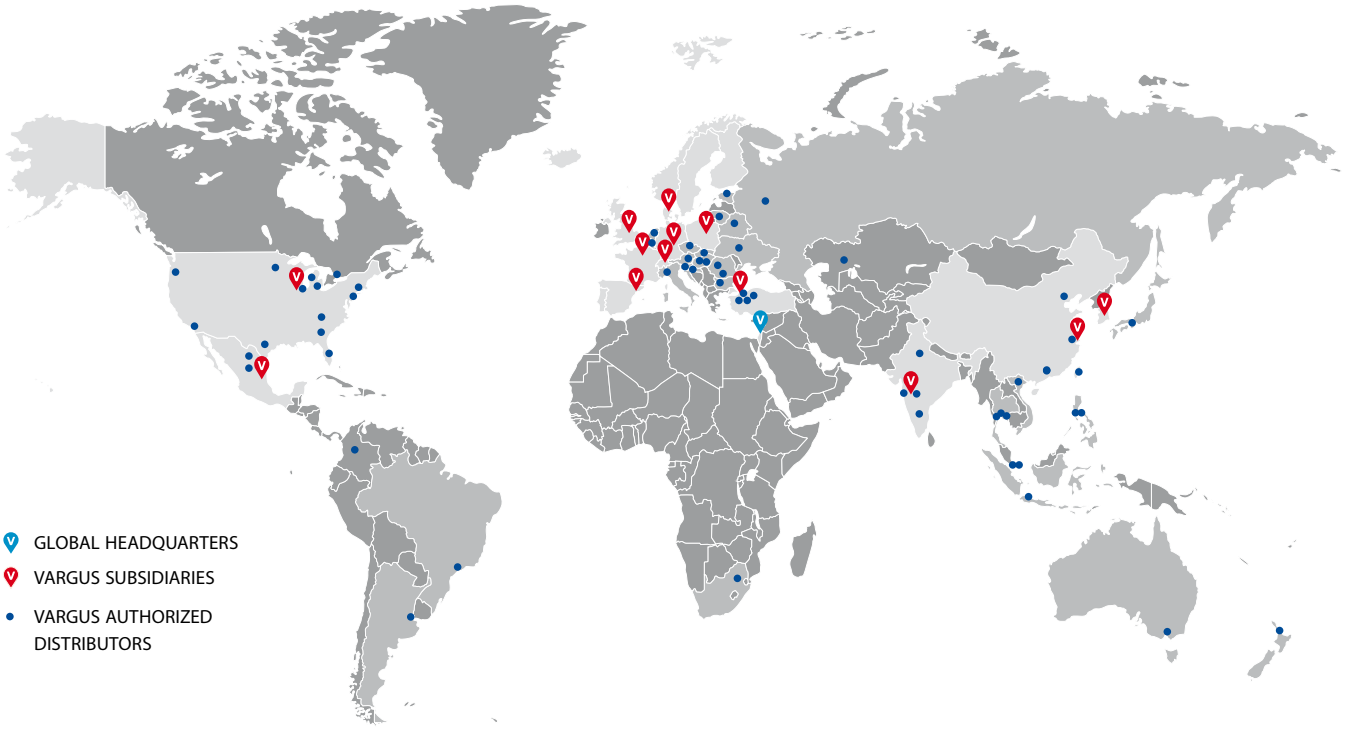

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