



NOW INCLUDES  
**SUPPLEMENT**  
**2021**

**VARDEX**  
Advanced Threading Solutions

# MAIN CATALOG

Thread Turning

Thread Milling

METRIC



## Company Profile

**VARGUS is a world leading developer, manufacturer and supplier of high-quality, precision threading, grooving, turning and hand deburring tools.**

Established in 1960, VARGUS is the cutting tools division of the NEUMO Ehrenberg Group, a multinational organization headquartered in Germany.

With 13 international subsidiaries, and a network of distributors, warehouses and certified ISO 9001 manufacturing facilities, VARGUS Ltd. serves customers in more than 100 countries around the globe. A customer-focused organization, VARGUS Ltd. is committed to providing products and solutions of the highest quality and excellent value, and is renowned for its technical expertise and uncompromising service.

### COMPANY PRODUCTS:

#### **VARDEX**

Advanced Threading Solutions is the company's prominent product line for Thread Turning, Thread Milling, and Gear Milling Solutions.

**Thread Turning:** The VARDEX TT tools offer an extensive collection of pitches and standards in different grades, IC ranges and types of insert styles, as well as customized methods for the oil and gas industry.

**Thread Milling:** The VARDEX TM line provides a wide range of applications and solutions in multi-tooth, single-tooth for deep holes, and solid carbide tools.

**Gear Milling:** The VARDEX Gear Milling line is a revolutionary concept for gear, rack and spline applications, offered in indexable inserts and solid carbide tools.

**VARGUS GENius™:** VARGUS' industry-leading Thread Turning and Thread Milling solutions are seamlessly complimented by the VARGUS GENius™ software – The most powerful tool selector, cutting data and CNC program generating software.

#### **GROOVEX**

Innovative Grooving & Turning Solutions, the newest product line by VARGUS, provides innovative solutions for grooving, boring and turning, in a wide range of applications.

#### **SHAVIV**

Leading Deburring Solutions, manufactures world leading hand-deburring solutions for metals and plastics.





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This extended version of the MAIN VARDEX CATALOG includes the newest VARDEX products as they appear in the 2021 Catalog Supplement, followed by the VARDEX MAIN Catalog, Edition 02.



**VARDEX**  
Advanced Threading Solutions

MAIN CATALOG **SUPPLEMENT**  
2021

# MAIN CATALOG **SUPPLEMENT** 2021

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# Thread Turning

**FS LINE**



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: 3FSER3.0ISOFSK

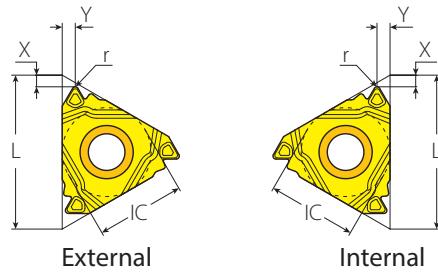
## Insert Marking:

- Insert designation on the bottom of the insert



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.





### Partial Profile 60°

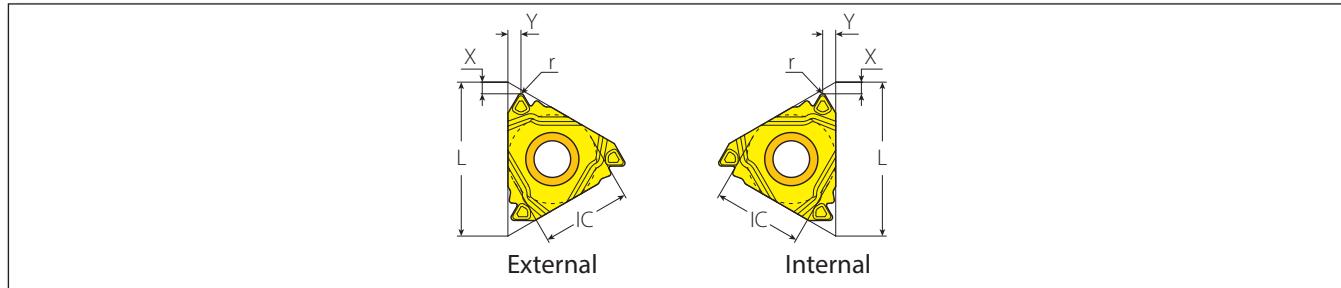
	Insert Size	Pitch			Ordering Code	Market Description	Dimensions mm			Anvil	
		IC	L mm	mm	TPI	RH	r	X	Y	RH	Toolholder
External	3/8"	16	0.5-1.5	48-16	3FSERA60...	16FSERA60...	0.06	0.8	0.9		
			1.75-3.0	14-8	3FSERG60...	16FSERG60...	0.27	1.3	1.7	YE3	AL...-3
		16	0.5-3.0	48-8	3FSERAG60...	16FSERAG60...	0.08	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	3/8"	16	0.5-1.5	48-16	2FSIRA60...	11FSIRA60...	0.05	0.8	0.9	-	NVR...-2
			1.75-3.0	14-8	3FSIRG60...	16FSIRG60...	0.16	1.1	1.5	YI3	A/NVR...-3
		16	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	Market Description	h min	X	Y	RH	Toolholder
External	3/8"	16	1.0	3FSER1.0ISO...	16FSER1.0ISO...	0.61	1.5	0.7			
			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	YE3	AL...-3	
			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			
			1.5	2FSIR1.5ISO...	11FSIR1.5ISO...	0.87	0.9	0.8	-	NVR...-2	
			2.0	2FSIR2.0ISO...	11FSIR2.0ISO...	1.15	0.9	1.0			
			1.0	3FSIR1.0ISO...	16FSIR1.0ISO...	0.58	1.4	0.7			
	3/8"	16	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	YI3	A/NVR...-3	
			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			


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

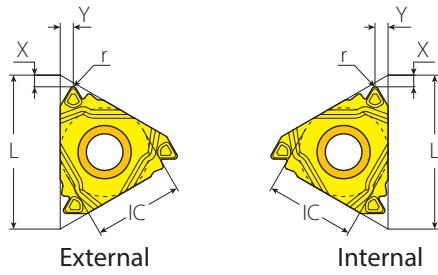
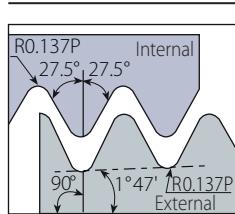
	Insert Size	Pitch	Ordering Code	Market Description			Dimensions mm		Anvil	
				IC	L mm	TPI	RH	h min	X	Y
External	3/8"	16	24	3FSER24UN...	16FSER24UN...	0.65	1.4	0.8	YE3	AL...-3
			20	3FSER20UN...	16FSER20UN...	0.78	1.4	0.8		
			18	3FSER18UN...	16FSER18UN...	0.87	1.2	0.9		
			16	3FSER16UN...	16FSER16UN...	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		
			20	3FSIR20UN...	16FSIR20UN...	0.73	1.3	0.8		
Internal	3/8"	16	18	3FSIR18UN...	16FSIR18UN...	0.81	1.2	0.9	YI3	A/NVR...-3
			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
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...	11FSIR19W...	0.86	1.2	1.9	-	NVR...-2
			14	2FSIR14W...	11FSIR14W...	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**

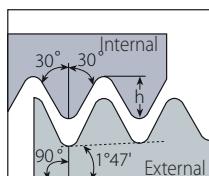
	Insert Size	Pitch	Ordering Code	Market Description			Dimensions mm		Anvil	
				IC	L mm	TPI	RH	h min	X	Y
External	3/8"	16	18	3FSER18NPT...	16FSER18NPT...	1.01	1.0	0.9	YE3	AL...-3
			14	3FSER14NPT...	16FSER14NPT...	1.33	0.9	1.2		
			11.5	3FSER11.5NPT...	16FSER11.5NPT...	1.64	1.1	1.5		
			8	3FSER8NPT...	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		

**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	

# Thread Turning



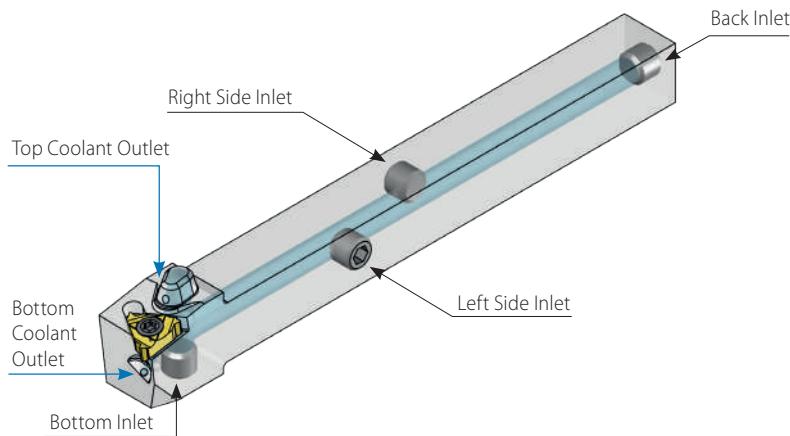
**ALCS**

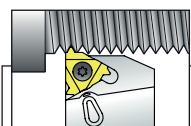
**NEW**

**External Thread Turning Toolholders  
FOR SWISS TYPE MACHINES  
WITH HIGH PRESSURE COOLANT (HPC)**

## Features and Benefits:

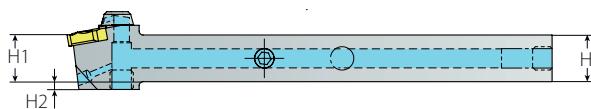
- Two dedicated inlets for Swiss type machines, accessible from both sides of the holder
- Back and bottom coolant inlets also available for conventional machines
- Two precise high pressure coolant outlets, designed to cool down the top and bottom of the insert for longer tool life and better chip evacuation
- 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



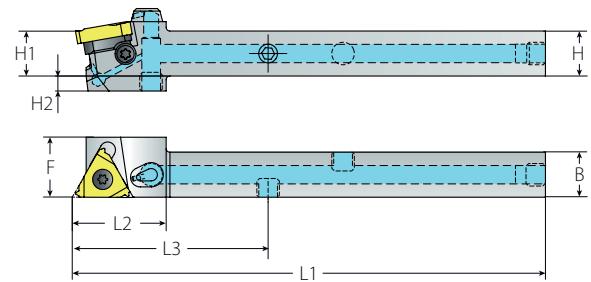
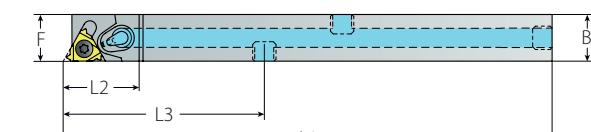


## External Toolholders

NLCS Type  
(without Anvil)

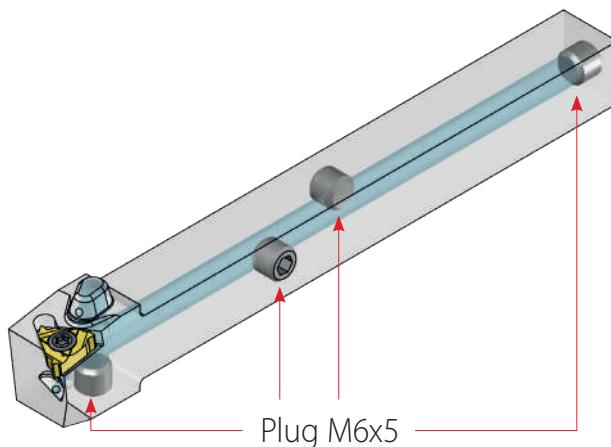


ALCS Type  
(with Anvil)  
& NLCS Type  
(without Anvil)



### 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	



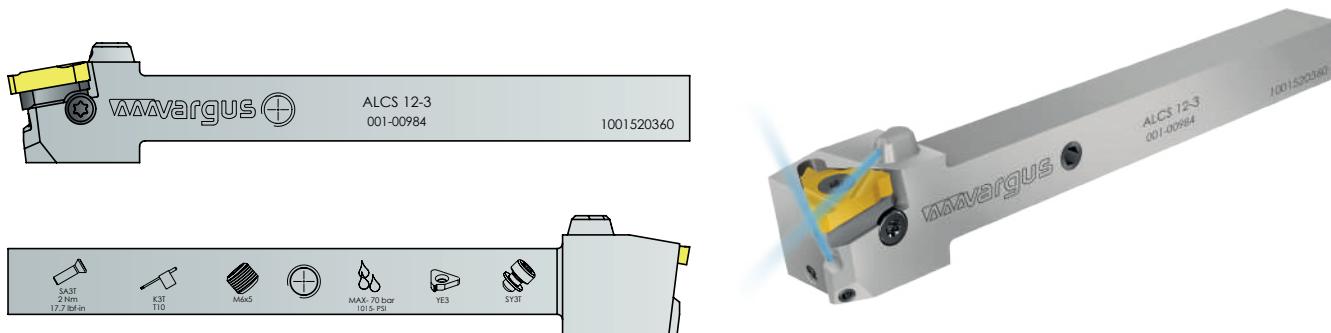
\* When reassembling the M6X5 plug,  
it is necessary to use LOCTITE 542.

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.



**Laser markings include spare parts  
and maximum torque details**

NEW

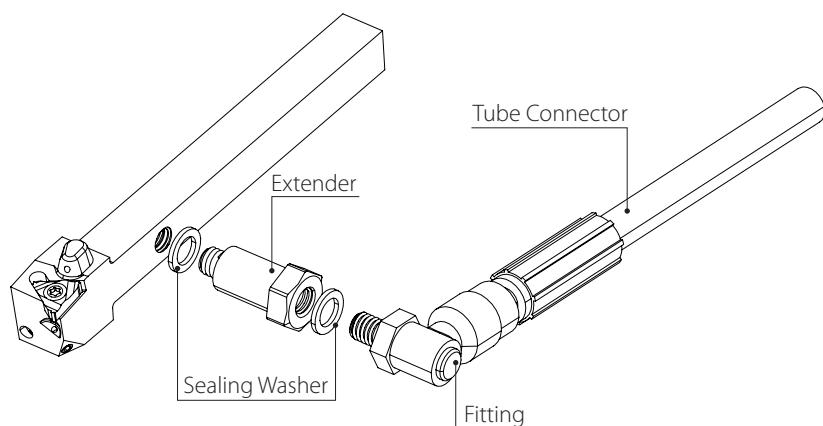


**The following HPC accessories (not included)  
can be ordered separately:**

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

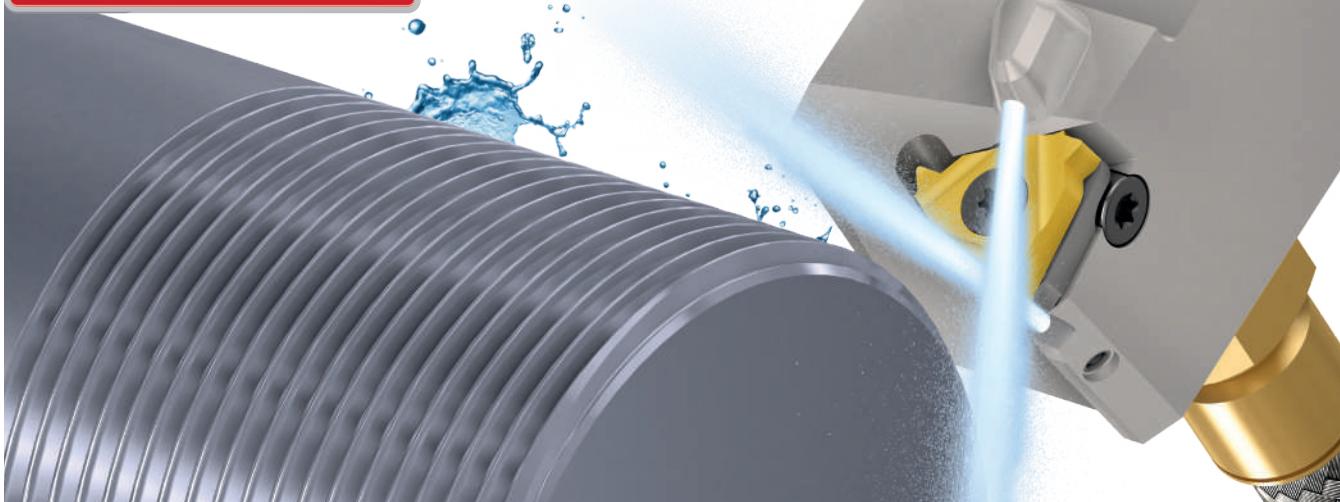


# Thread Turning

## ALCN External Thread Turning Toolholders WITH TWO HIGH PRESSURE COOLANT OUTLETS

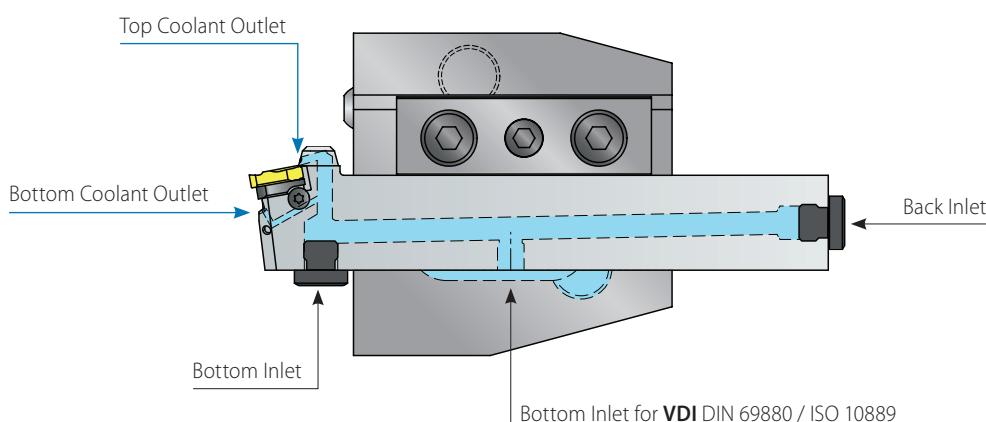


**NEW & EXPANDED**

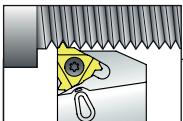


### Features and Benefits:

- 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: 1C3/8" (16), 1/2" (22), & 5/8" (27) **NEW**
- Left Hand holders are available as standard

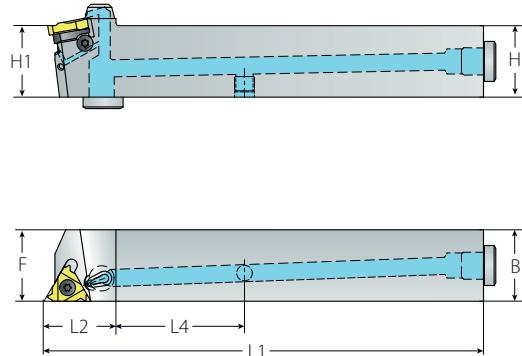


**VARGUS GENius™**  
Tool Selector and CNC Program Generator



## External Toolholders

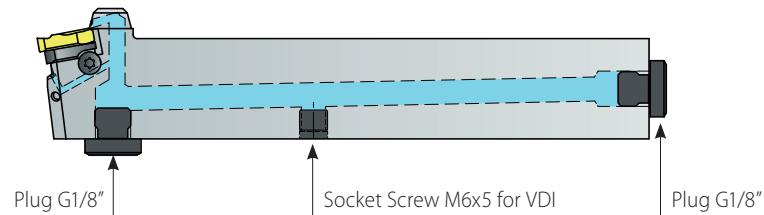
**ALCN**



### Standard with HPC

#### Spare Parts

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	SA3T (3.0 Nm)	SY3T	K3T	YE3	YI3	Plug G1/8"	Socket 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		35	SA4T (5.0 Nm)	SY4T	K4T	YE4	YI4	Plug G1/8"	Socket M6x5
	ALCN32-4	ALCN32-4LH		32	32	175.0		40							
5/8"	ALCN25-5	ALCN25-5LH		25	25	155.0		35	SA5T (10.0 Nm)	SY5T	K5T	YE5	YI5	Plug G1/8"	Socket M6x5
	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

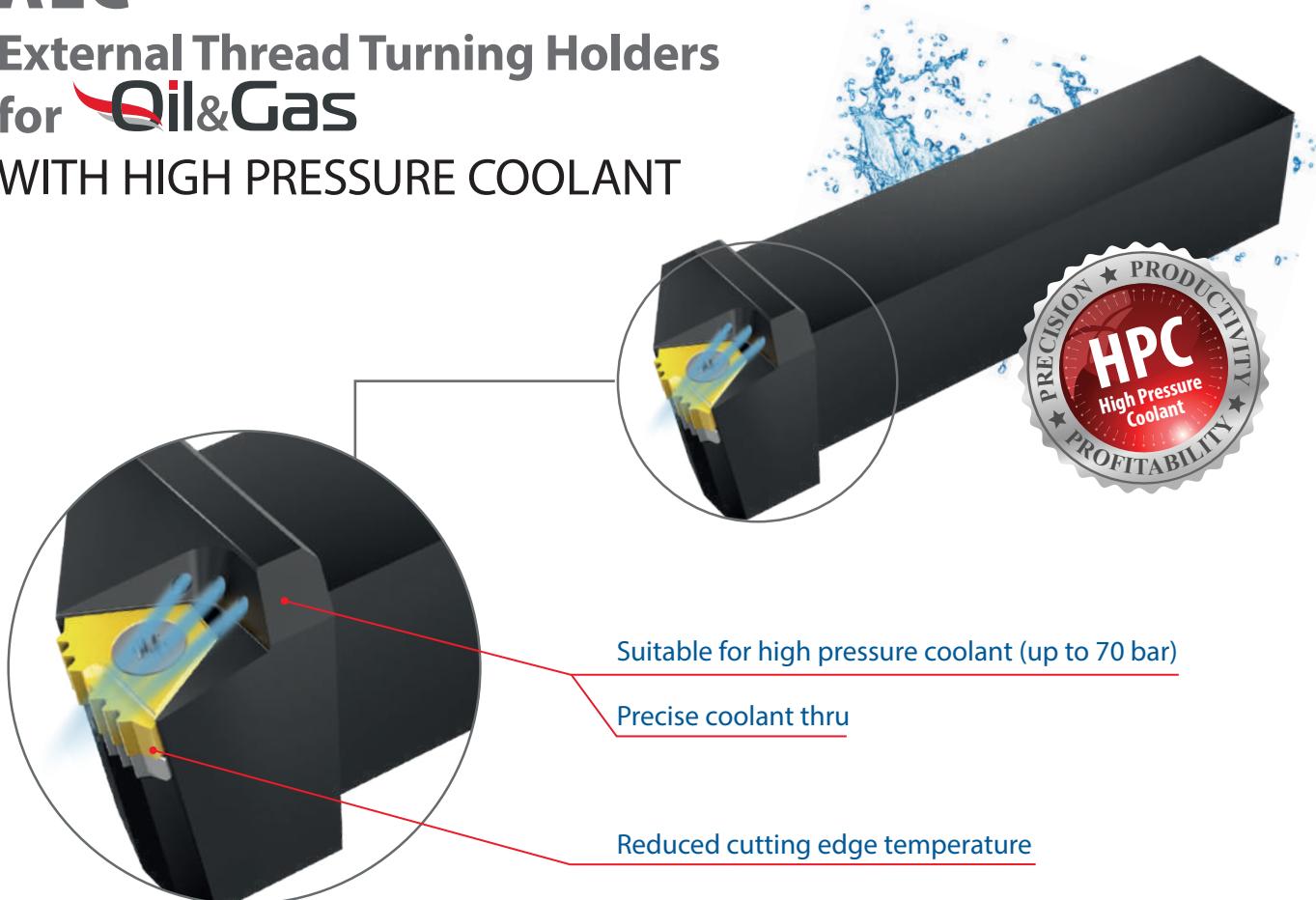


# Thread Turning

**ALC**

**External Thread Turning Holders  
for Oil&Gas**

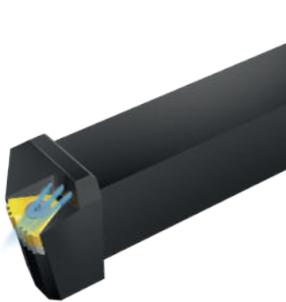
**WITH HIGH PRESSURE COOLANT**



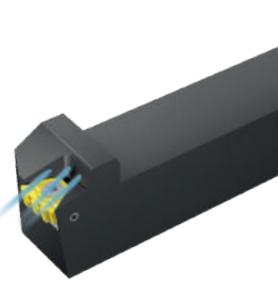
## Features and Benefits:

- 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



14D Standard with HPC



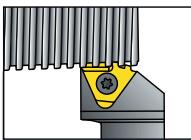
T+ Style with HPC



API with HPC

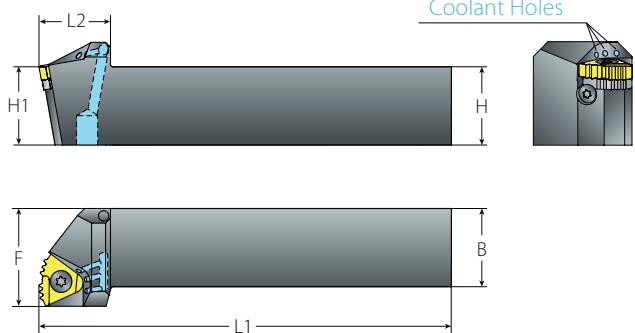
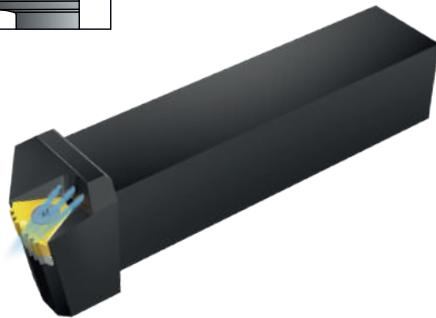


Z+ Style with HPC



## External Toolholders

Oil & Gas

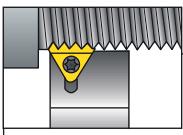


### 14D Standard with HPC

#### Spare Parts

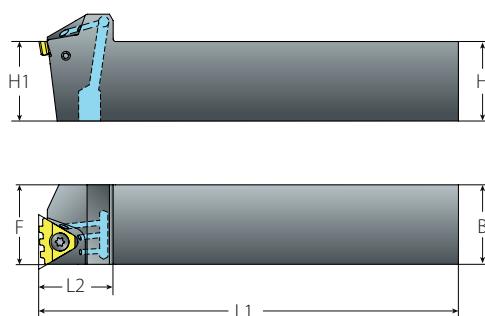
Insert Size	Ordering Code		Dimensions mm			Insert Screw (Max. Torque)	Anvil Screw	Torx Key	Anvil Key
IC	RH	H=H1=B	F	L1	L2	SA5T (10.0 Nm)	M4X6(14D)	K5T	KT15
14D	ALC32-14D	32	32	170	30				
	ALC40-14D	40	40	200	30				

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

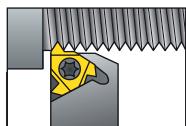


### T+ Style with HPC

#### Spare Parts

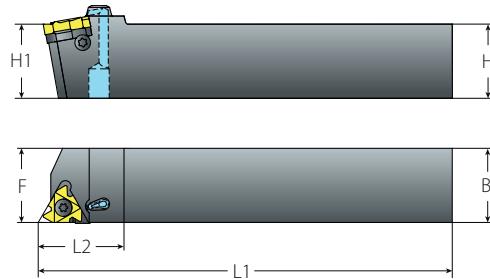
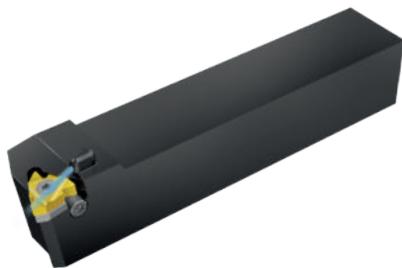
Insert Size	Ordering Code		Dimensions mm			Insert Screw (Max. Torque)	Anvil Screw	Torx Key	Anvil Key	Anvil RH
IC	RH	H=H1=B	F	L1	L2	SA4T (5.0 Nm)	SY4K2	K4T	K2	Y4T
1/2" T	ALC32-4T	32	32	170	30					
	ALC40-4T	40	40	200	30					

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



## External Toolholders

Oil&Gas

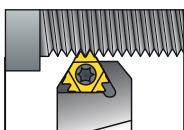


### API with HPC

#### Spare Parts

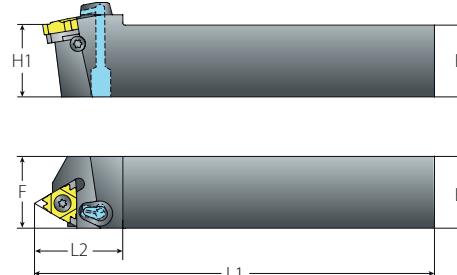
Insert Size	Ordering Code	Dimensions mm			Spare Parts				
IC	RH	H=H1=B	F	L1	L2	Insert Screw (Max. Torque)	Anvil Screw	Torx Key	Anvil RH
1/2"	ALC32-4-5BUT/API	32	32	177	37	SA4T (5.0 Nm)	SY4T	K4T	YEI4-API-1P; YEI4-5BUT
	ALC40-4-5BUT/API	40	40	205	37				

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



## External Toolholders

Oil&Gas



### Z+ Style with HPC

#### Spare Parts

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:

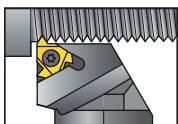
Internal and external V-CAP toolholders are available with IC1/2" (22) inserts in the following shank diameters:

- C4
- C5
- C6
- C8

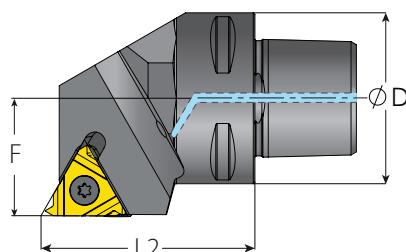
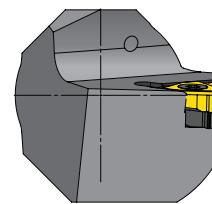
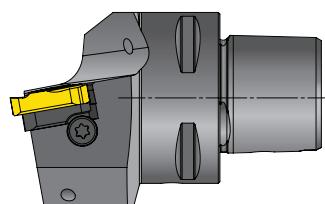
Special sizes are available upon request

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.





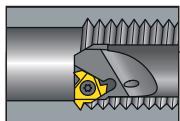
## V-CAP External Toolholders



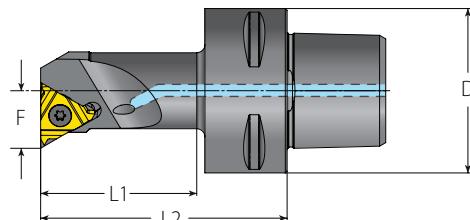
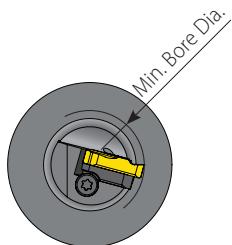
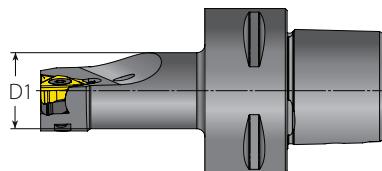
### V-CAP

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	40	27	50	VCAP40-SER27050-22	SA4T	SY4T	K4T	YE4
	VCAP50-SER35060-4	50	35	50	35	60	VCAP50-SER35060-22				
	VCAP63-SER45065-4	63	45	63	45	65	VCAP63-SER45065-22				
	VCAP80-SER55080-4	80	55	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-SEL55080-4).



## V-CAP Internal Toolholders



### V-CAP

#### Spare Parts

Insert Size	Ordering Code	Dimensions mm					Min. Bore Dia.	Market Description	Insert Screw	Anvil Screw	Torx Key	Anvil RH
IC	RH/LH	D1	D	F	L2	L1 (max)	mm	RH/LH				
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				
	VCAP40-SIR22090-4	32		22	90	69	40	VCAP40-SIR22090-22	SA4T	SY4T	K4T	YI4
	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				
	VCAP50-SIR22090-4	32		22	90	68	40	VCAP50-SIR22090-22				
	VCAP50-SIR27105-4	39.5		26	105	84	50	VCAP50-SIR27105-22	SA4T	SY4T	K4T	YI4
63	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-SEL55080-4).

# SMOOTH CUT SYSTEM

NEW

## Modular Toolholder Heads for Anti-Vibration Shanks

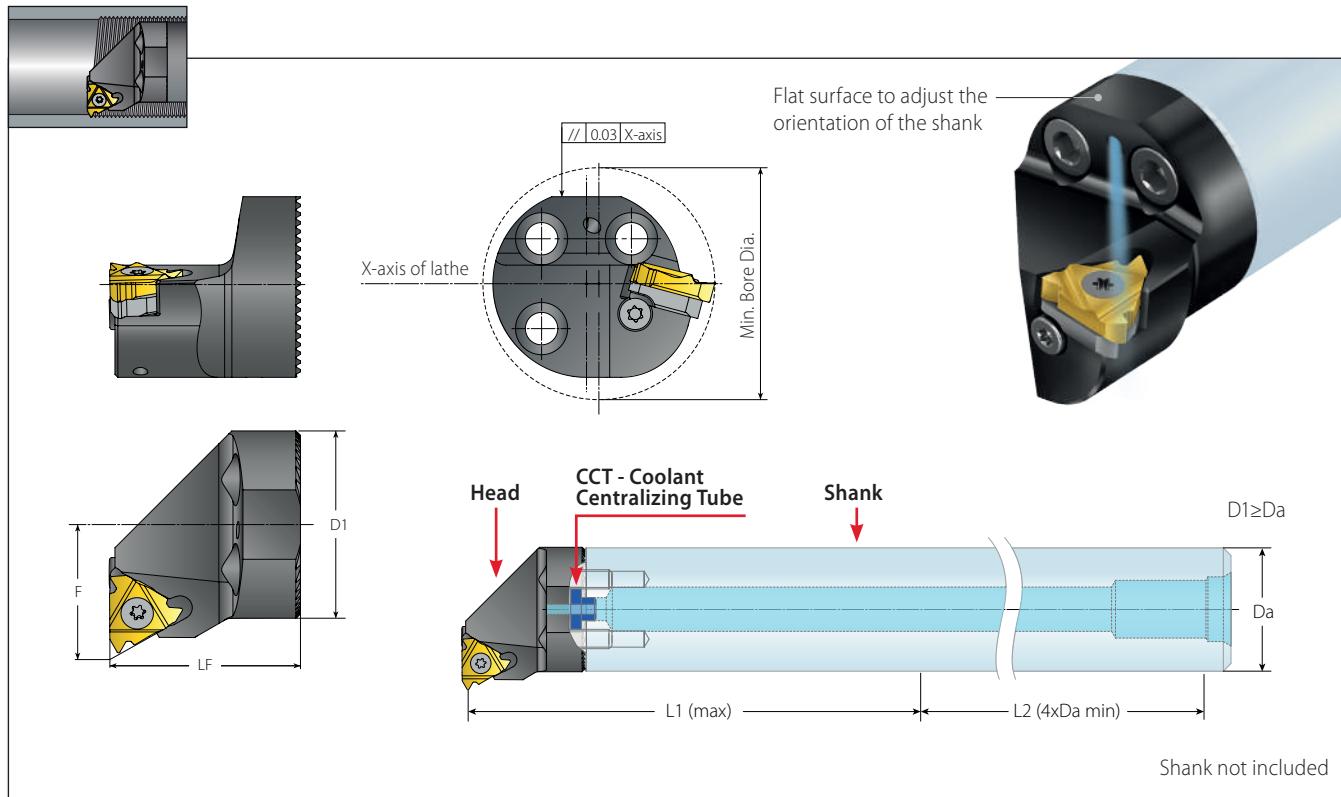


### Features and Benefits:

- 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.





### Smooth Cut Toolholder Heads

Insert Size	Ordering Code	Dimensions mm						Min. Bore dia.	Market Description	Spare Parts					
		IC	RH	D1	Da mm inch	F	L1 max	LF	mm	RH	Insert Screw	Anvil Screw	Torx Key	Anvil RH	CCT - Coolant Centralizing Tube
3/8"	VAS25-IR2517-3	25.3	25	1.00"	17.0	125.0	25.0	32		VAS25-IR2517-16					CCT6 -
	VAS32-IR3222-3	32.3	32	1.25"	22.0	160.0	32.0	40		VAS32-IR3222-16	SA3T	SY3T	K3T	YI3	
	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					- CCT12
	VAS40-IR3227-4	40.0	40	1.50"	27.0	200.0	32.0	50		VAS40-IR3227-22	SA4T	SY4T	K4T	YI4	
5/8"	VAS40-IR3627-5	40.0	40	1.50"	27.3	200.0	36.0	50		VAS40-IR3627-27	SA5T	SY5T	K5T	YI5	

# Thread Milling

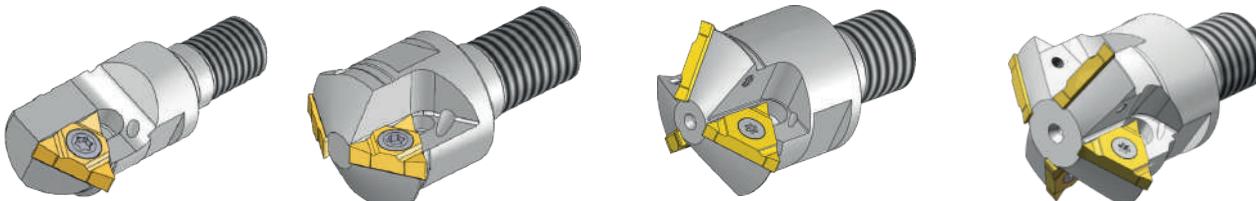
## TMSD Modular Toolholder Heads

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

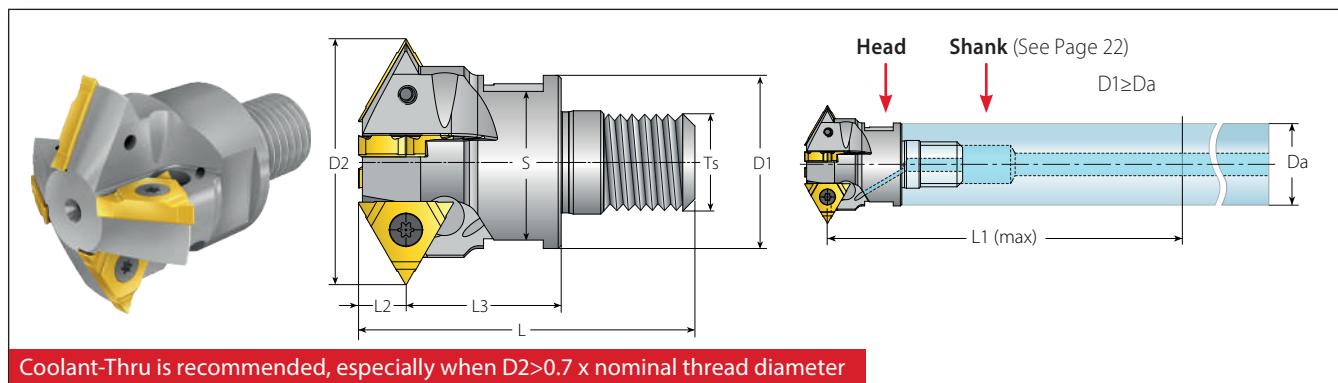


The NEW **TMSD Modular Toolholder Heads** are included in the **VARGUS GENius™**, the most advanced Tool Selector and CNC Program Generator in the metal cutting tools industry.



## TMSD Modular Toolholder Heads

**NEW**



Coolant-Thru is recommended, especially when  $D2 > 0.7 \times$  nominal thread diameter

### TMSD Modular Toolholder Heads for U Style Inserts

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		15.0	M06	9.0	1	5.4	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	3/4-10; 7/8-9; 1-8	5/8-32UN; 5/8-28UN; 5/8-27UNS; 11/16-24UN; 11/16-20UN; 11/16-16UN; 3/4-14UNS; 3/4-12UN	5/8-19; 1/2-14; 1-11	11/16-14; 3/4-12; 7/8-11; 3/4-10; 7/8-9; 1-8; 11/8-7	TR22x3; TR24x3
TM1SC-D17-M08-2U	16.75	M20x2.5	M18x0.5; M18x0.75; M18x1.0; M19x1.25; M19x1.5; M19x2.0	-	3/4-32UN; 3/4-28UN; 7/8-27UN; 3/4-24UN; 3/4-20UN; 3/4-16UN; 3/4-14UNS; 13/16-12UN; 7/8-10UN	1/2-14; 1-11	13/16-12; 7/8-11; 1-10; 7/8-9	-
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; 1 1/8-7; 1 1/8-6	7/8-32UN; 7/8-28UN; 7/8-27UNS; 7/8-24UNS; 7/8-20UNEF; 1-18UNS; 15/16-16UN; 1-14UNS; 1-12UNF; 1-10UNS; 1 1/8-8UN	3/4-14; 1-11	1-26; 1-20; 1-16; 1-12; 1-10; 1 1/8-9; 1-8; 1 1/8-7	(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	1 1/8-7	1-32UN; 1-28UN; 1-27UNS; 1-24UNS; 1-20UNEF; 1-18UNS; 1-16UN; 1-14UNS; 1-12UNF; 1 1/8-10UNS; 1 1/8-8UN	3/4-14; 1-11	1-26; 1-20; 1-16; 1 1/8-12; 1 1/8-9; 1 1/8-7	-
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	1 1/4-7; 1 3/8-6	1 1/8-28UN; 1 1/8-24UNS; 1 1/8-20UN; 1 1/8-18UNEF; 1 1/8-16UN; 1 1/8-14UNS; 1 1/8-12UN; 1 1/8-10UNS; 1 1/8-8UN	7/8-14; 1-11	1 1/8-26; 1 1/8-20; 1 3/8-16; 1 3/8-12; 1 3/8-8; 1 1/4-7	-
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	1 1/2-6	1 1/8-28UN; 1 3/8-24UNS; 1 1/8-20UN; 1 1/8-18UNEF; 1 1/8-16UN; 1 1/8-14UNS; 1 1/8-12UN; 1 1/8-10UNS; 1 1/8-8UN	1 1/8-11	1 1/8-26; 1 1/8-20; 1 3/8-16; 1 3/8-12; 1 3/8-8; 1 1/8-8	-
TM3SC-D36-M16-3U	36.5	M42x4.5; M48x5.0; M56x5.5	M39x1.5; M39x2.0; M40x2.5; M41x3.0; M42x3.5; M42x4.0	1 3/4-5; 2-4.5	1 1/8-16UN; 1 5/8-14UNS; 1 1/8-12UN; 1 5/8-10UNS; 1 5/8-8UN; 1 5/8-6UN	1 1/4-11	1 1/8-16; 1 5/8-12; 1 5/8-8; 1 5/8-6	-
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; 2 1/2-4	1 3/4-16UN; 1 3/4-14UNS; 1 13/16-12UN; 1 15/16-8UN; 1 15/16-6UN	1 1/2-11	1 1/8-16; 1 5/8-12; 1 5/8-8; 2 1/4-6; 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 cylindrical 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	-	-
	21.65	1.5	M24x1.5	-	-	-	-	-
TM2SC-D23-M10-2U	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)	-
	25.64	1.5	M28x1.5	-	-	-	-	-
	25.45	2.0	M30x2.0	-	-	-	-	-
TM3SC-D26-M12-2U	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)	-
	30.00	1.5	M33x1.5	-	-	-	-	-
	29.85	2.0	M34x2.0	-	-	-	-	-
	29.94	14		1 3/8-14UNS	-	-	-	-
TM4SC-D31-M12-2U	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

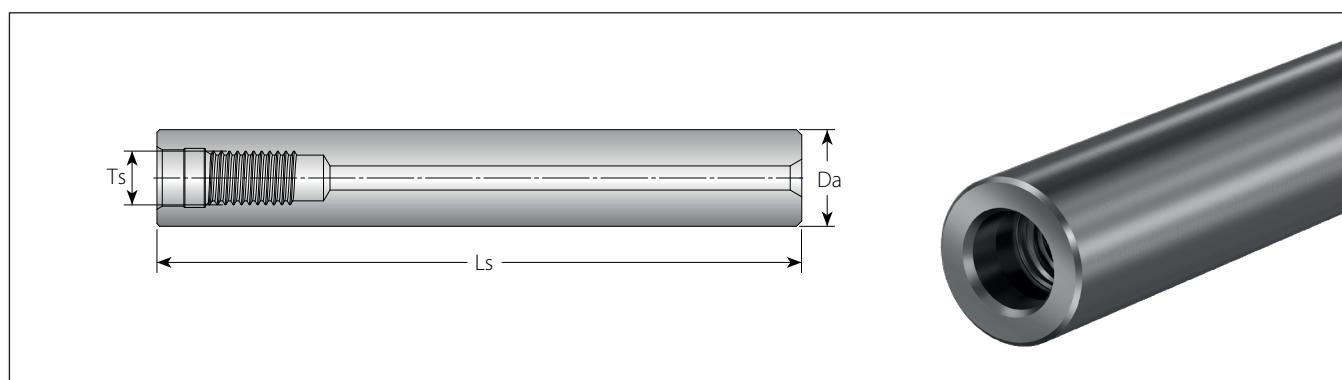
### Thread Application for Full Profile Inserts (ISO, UN, NPT & API Round) - con't

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 cylindrical 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)
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)

\* 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	
STMC-C13.0L085M08	13	85	M08	
STMC-C14.1L105M08	14.1	105	M08	
STMC-C18.0L120M10	18	120	M10	C
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.

# Thread Milling

## 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:

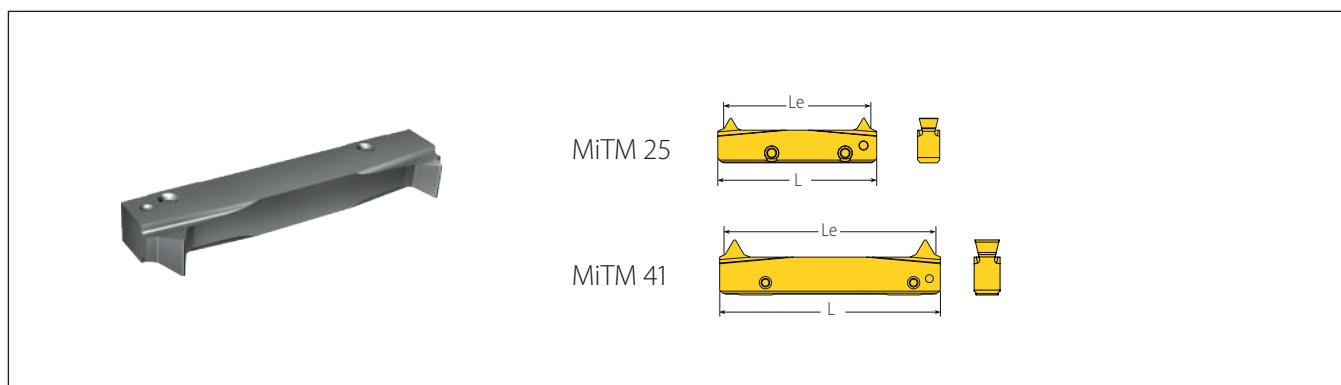
- For best results the MiTM Offset program requires working in conventional milling with multiple passes

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

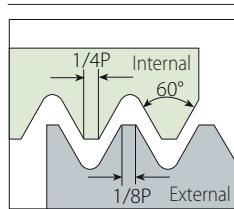


## MiTM Offset Inserts

**MiTM**



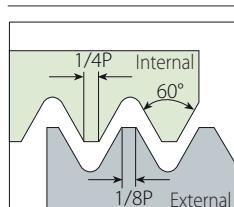
### ISO Metric



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

Insert Style	Pitch	Ordering Code	Cutting Edge	Teeth	Toolholder
L	mm	Internal	Le	Zt	
41	25	R25I3.00ISOTM-2...	2	24.0	2
	3.5	R41I3.50ISOTM-2...	2	38.5	2
	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

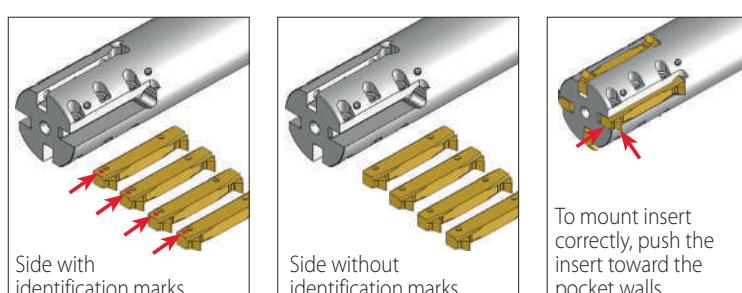


Defined by: ANSI B1.1:74  
Tolerance class: 2A/2B

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

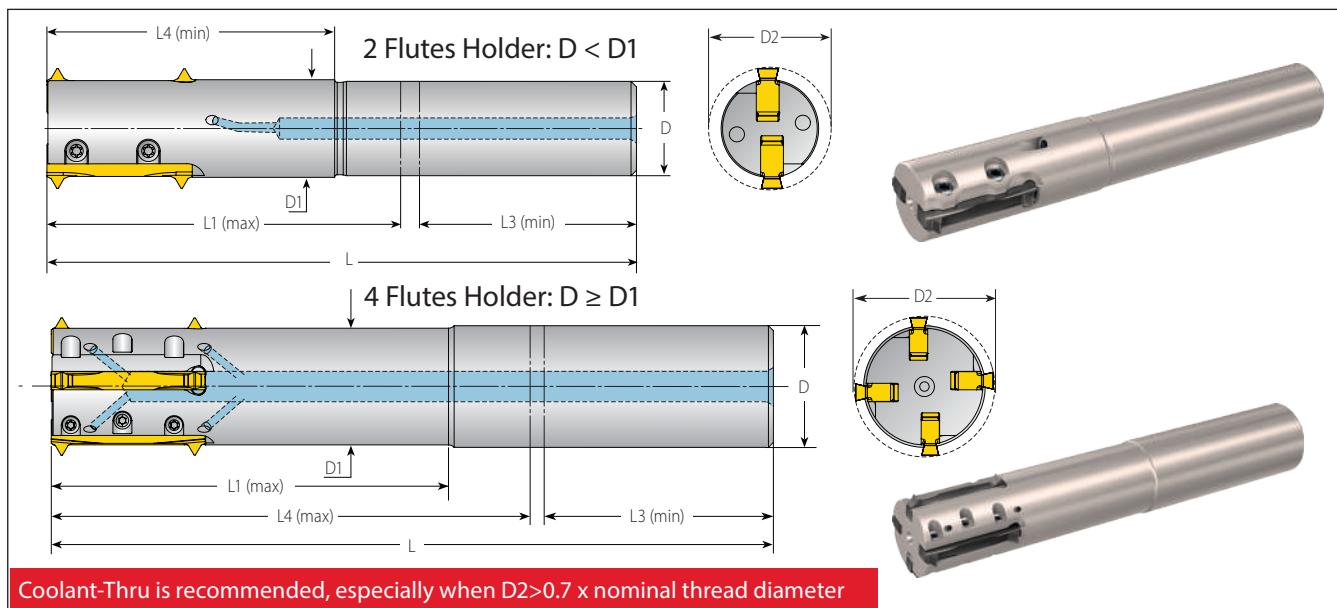
### Placing MiTM Offset Inserts Correctly

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



# Steel Cylindrical Shanks for MiTM Offset

MiTM



## MiTM Offset RTMOC

Insert Style	Ordering Code	Dimensions mm							No. of Flutes	Spare Parts				
		L	L1 (max)	L3 (min)	L4 (min)	L4 (max)	D	D1	D2	Z	Location Screw x2 (Max. Torque)	Clamping Screw (Max. Torque)	Torx+ Screwdriver	
25	RTMOC16C20-60S2	106	60	44	43	-	16	16.6	20.5	2	SLD4IP8 (M4x0.7) 2.0 Nm	-	KIP8	
41	RTMOC20C26-75B2	125	75	46	61	-	20	20.7	26.0	2	SLD4IP8A (M4x0.7) 2.0 Nm	SCD4IP8 2.0 Nm		
	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				

## Thread Application for MiTM Offset Inserts with RTMOC Toolholders

Insert Style	Toolholder	Min. Thread Dia.					
		MiTM Offset	D2 (mm)	ISO (coarse)	ISO (fine)	UNC	
25	RTMOC16C20-60S2	20.5	20.5	M24x3	M30x3	1-8UNC	1½-8UN
	RTMOC20C26-75B2	26.0	26.0	M30x3.5; M36x4	M42x4	1¼-7UNC; 1¾-6UNC	1½-6UN
	RTMOC25C30-90B4	30.5	30.5	M36x4	M36x3.5; M42x4	-	1½-7UN; 1¾-6UN
	RTMOC32C37-105B4	37.0	37.0	M42x4.5; M48x5	M42x3.5; M45x4	1¾-5UNC	1¹/₁₆-7UN; 1¹/₁₆-6UN
	RTMOC32C39-120B4	39.5	39.5	M48x5; M56x5.5	M48x4	2-4.5UNC	1½-7UN; 1¾-6UN

## Thread Application for MiTM Offset Inserts with Standard RTMC Toolholders

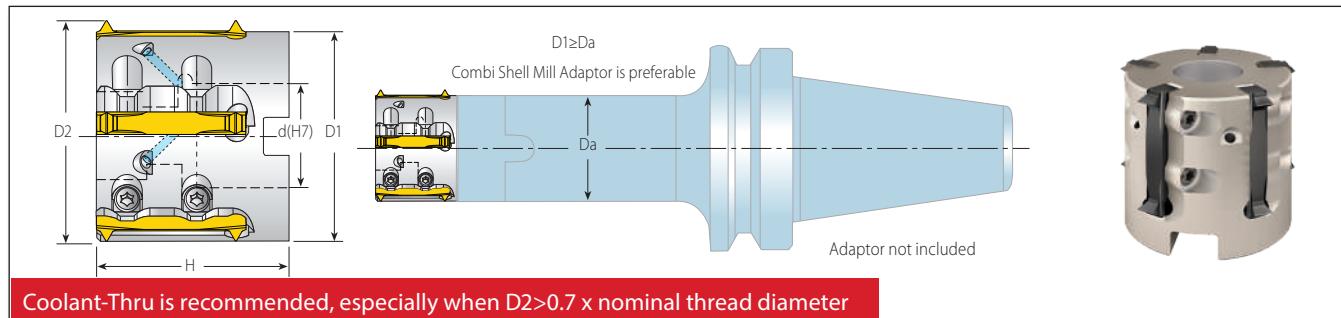
Insert Style	Toolholder	Min. Thread Dia.					
		MiTM Standard	D2 (mm)	ISO (coarse)	ISO (fine)	UNC	
25	RTMC2519-44S2	19.0	19.0	M24x3	M30x3	1-8UNC	1½-8UN
	RTMC2520-37S3	20.5	20.5	M24x3	M30x3	1-8UNC	1½-8UN
	RTMC2520-44S3						
	RTMC2522-43S3	22.0	22.0	M27x3	M30x3	-	1½-8UN
	RTMC2522-55S3						
	RTMC2530-55S5	30.0	30.0	-	M34x3	-	1¾-8UN
41	RTMC2530-80S4						
	RTMC3230-65B3	30.0	30.0	M36x4; M42x4.5	M36x3.5; M42x4	-	1½-7UN; 1¾-6UN
41	RTMC3236-65B4	35.9	35.9	M42x4.5; M48x5; M56x5.5; M64x6	M40x3.5; M42x4	1¾-5UNC; 2-4.5UNC	1¹/₁₆-7UN; 1½-6UN

## 2 Step Clamping System for MiTM 41 Cylindrical Shanks



## Shell Mill MiTM 25

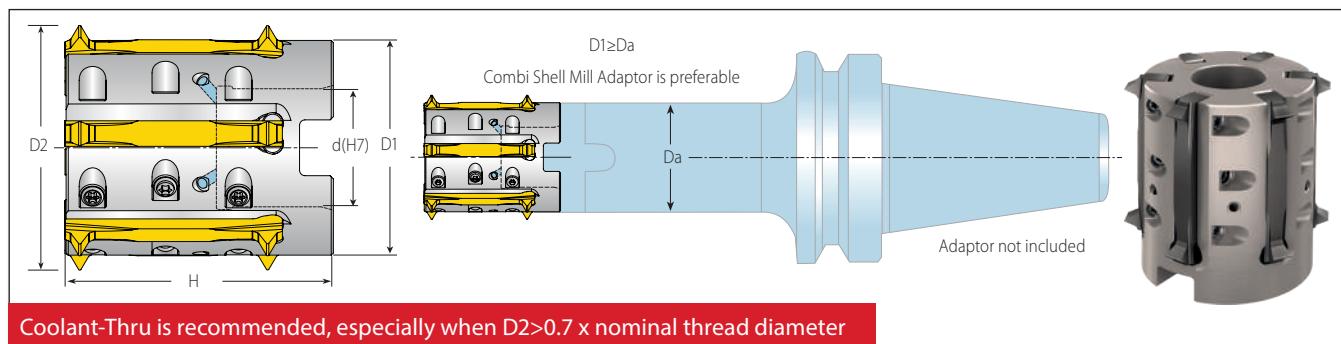
MiTM



### 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



### 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				M12x1.75x40
	RTMC-D58-27-41B6	50	57.9	27	50	6				

\* 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	-	1 5/16-8UN
	RTMC-D44-22-25S6	44		M48x3		1 5/16-8UN
	RTMC-D52-27-25S8	52		M56x3		2 1/4-8UN
41	RTMC-D48-22-41B5	48	M56x5.5; M64x6	M56x4; M70x6	2 1/4-4.5UNC	2 1/8-7UN; 2 1/8-6UN
	RTMC-D48-22-41B6			M64x4; M70x6		2 1/2-7UN; 2 1/2-6UN
	RTMC-D58-27-41B6	58	M68x6		-	

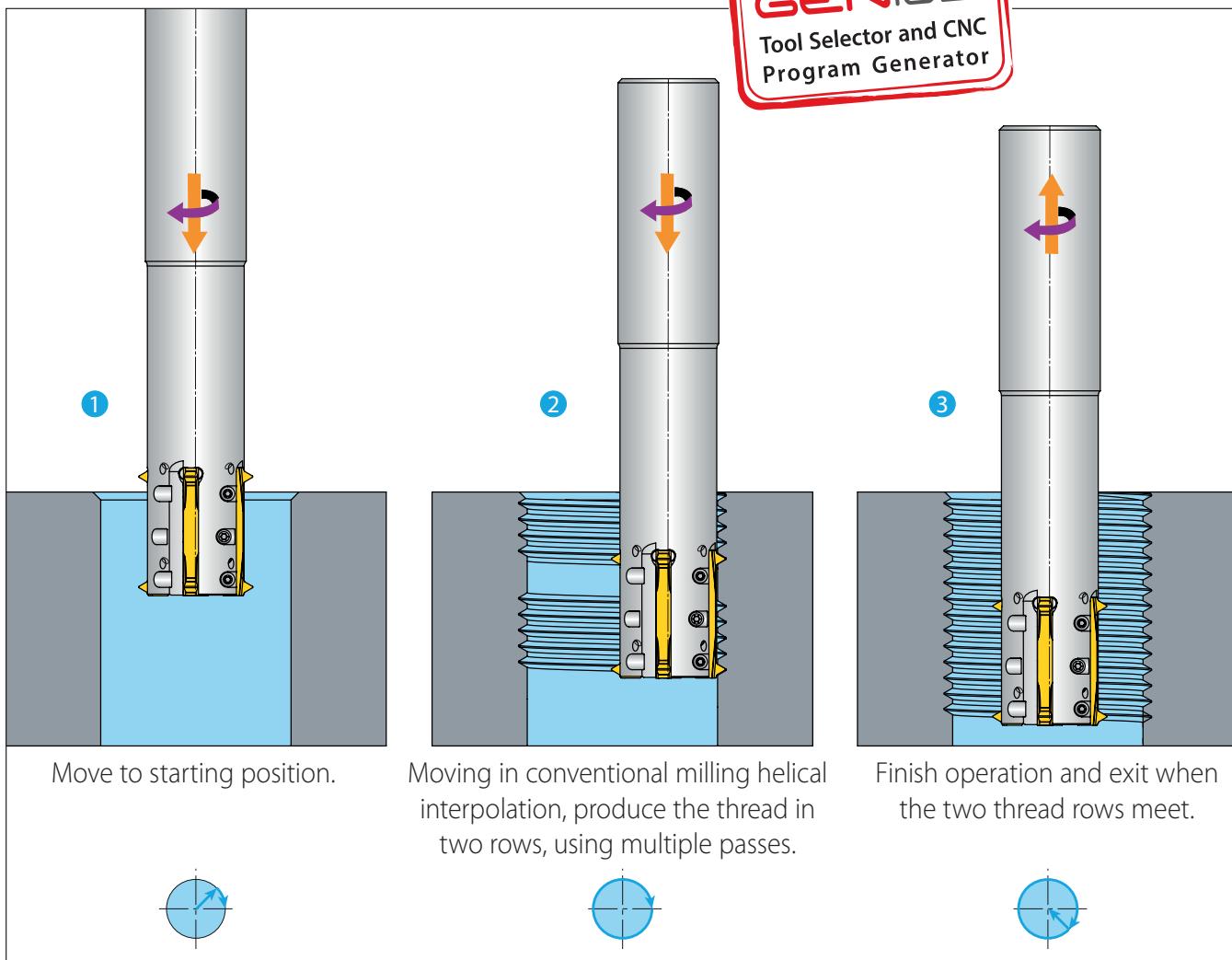
### 2 Step Clamping System for MiTM 41 Shell Mill Holders



## MiTM Offset - Operating Cycle

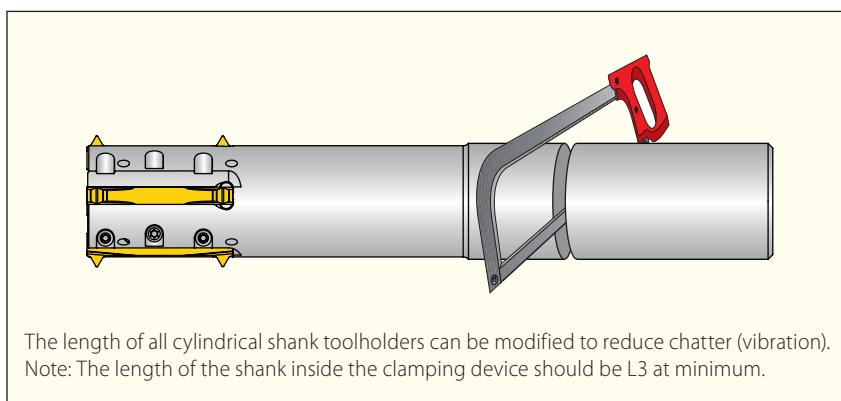


MiTM



### Grades

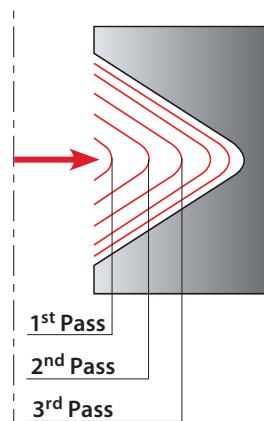
Grade	Application	Sample
<b>VBX</b>	TiCN coated carbide grade. Excellent grade for steels and general use.	
<b>VTX</b>	TiAlN coated carbide grade. Ideal for Stainless Steels.	



## 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

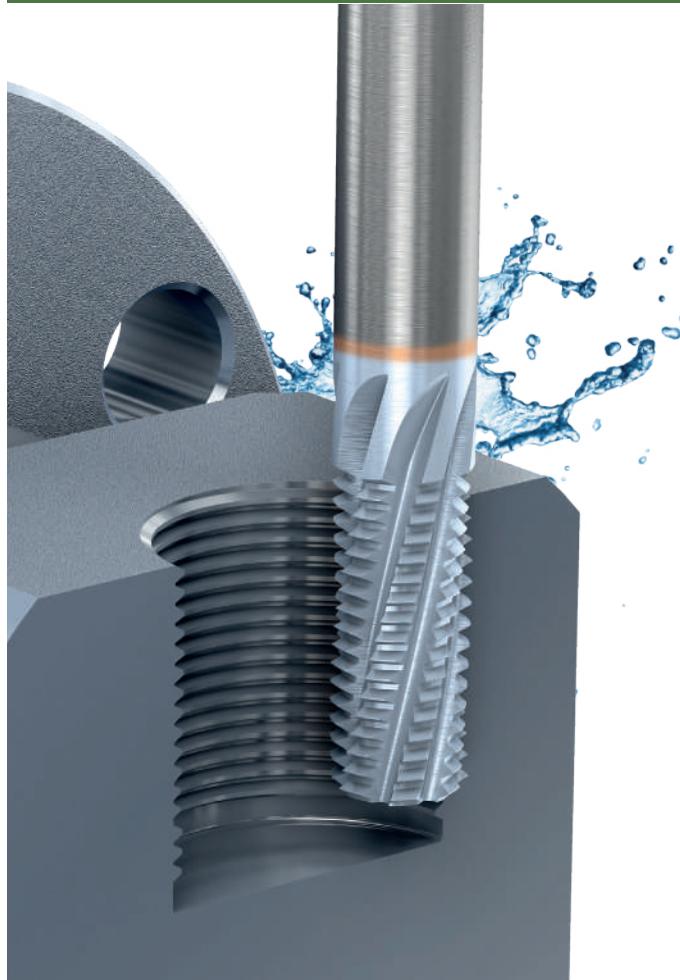
Conventional milling with multiple passes is required.  
For machining recommendations, use the Vargus GENius.



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

Material Group	Vargus No.	Material	Hardness Brinell HB	MiTM Offset Holders			MiTM Standard Holders				
				Vc [m/min]	Feed f [mm/tooth]	VBX	VTX	Vc [m/min]	Feed f [mm/tooth]	Standard	
<b>P</b> 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
<b>M</b> 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
<b>K</b> 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
<b>N</b> 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		Brass	90	100-180	100-200	0.30-0.65	120-210	100-200	0.60-1.00	0.60-1.50
	40	Copper and Copper Alloys	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
<b>S</b> 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		$\alpha+\beta$ Alloys	1050Rm	20-50	20-50	0.15-0.25	20-50	20-50	0.10-0.20	0.10-0.30
<b>H</b> 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

## Thread Milling



### TM Solid MultiFlute Helicool Tools

NEW

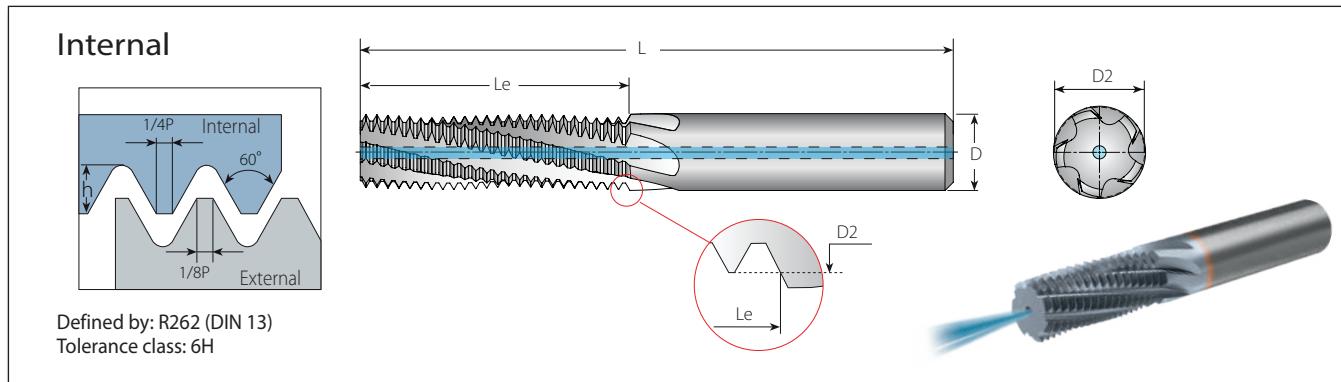
Increased Number  
of Flutes for Faster  
Machining

#### 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.



**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		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		6	5.00	57	12.4	6	16	5.3
M5x0.8		0.8	HC04039L10-I0.80ISOTM5...	4	3.90	45	10.8	6	13	4.2
	M6x1.0	1.0		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	1.5		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	2.0		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		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		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	1.0		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	1.5		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	2.0		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

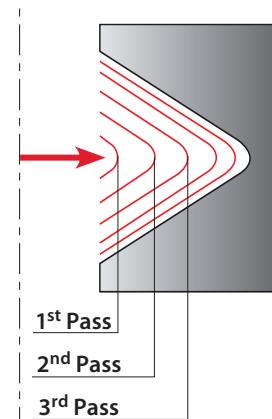
\* Bore diameter applies to smallest thread dia.

## 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.

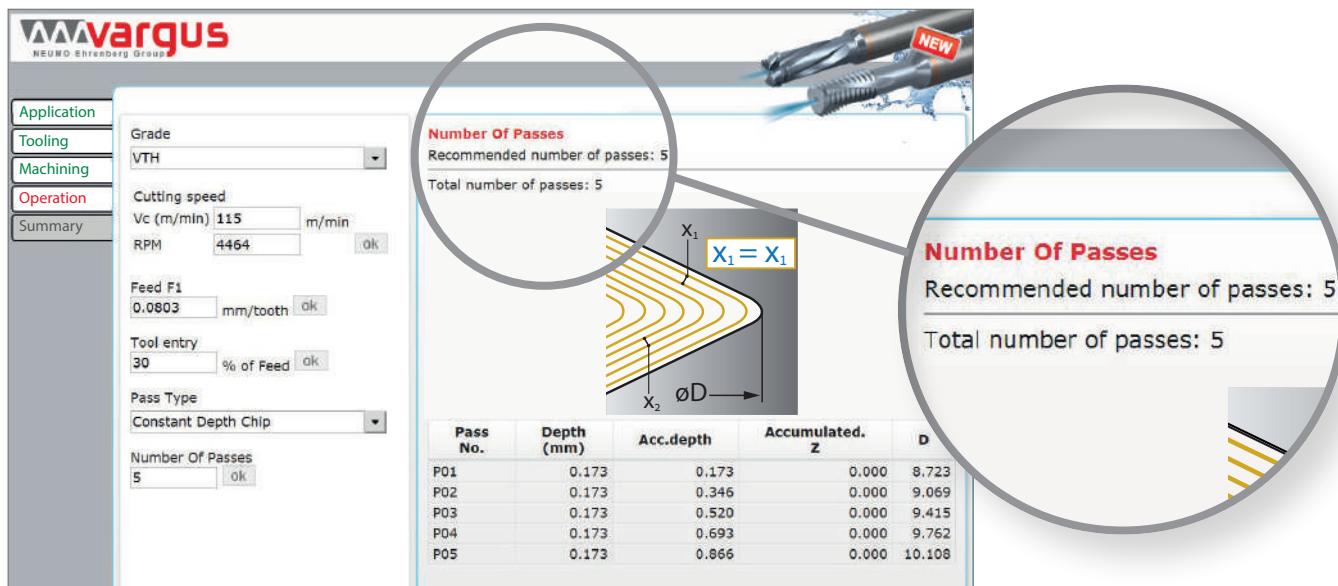
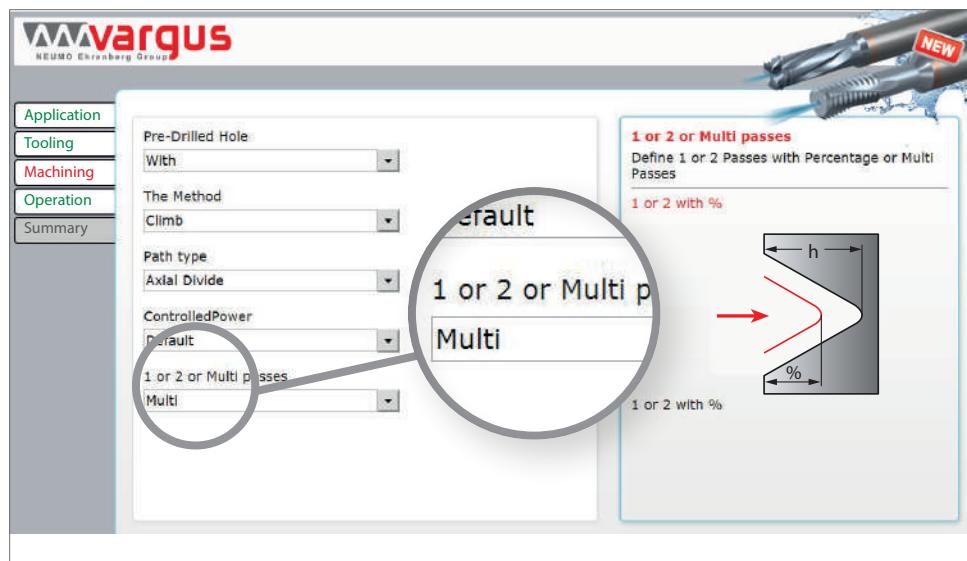
### Recommended Cutting Speeds Vc [m/min] and Feed f [mm/tooth]

Material Group	Vargus No.	Material	Hardness Brinell HB	2xDo Tools				3xDo Tools				
				Vc [m/min]	Feed f [mm/tooth] by Cutter Dia. = D2			Vc [m/min]	Feed f [mm/tooth] by Cutter Dia. = D2			
<b>P</b> 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
<b>M</b> 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
<b>K</b> 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
<b>N</b> 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

# 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 well as depth of the last pass
- Highly recommended for applications such as long threads, difficult to machine applications, and hard materials

# Thread Milling

## TM Solid TM DR

### Drilling, Thread Milling & Chamfering

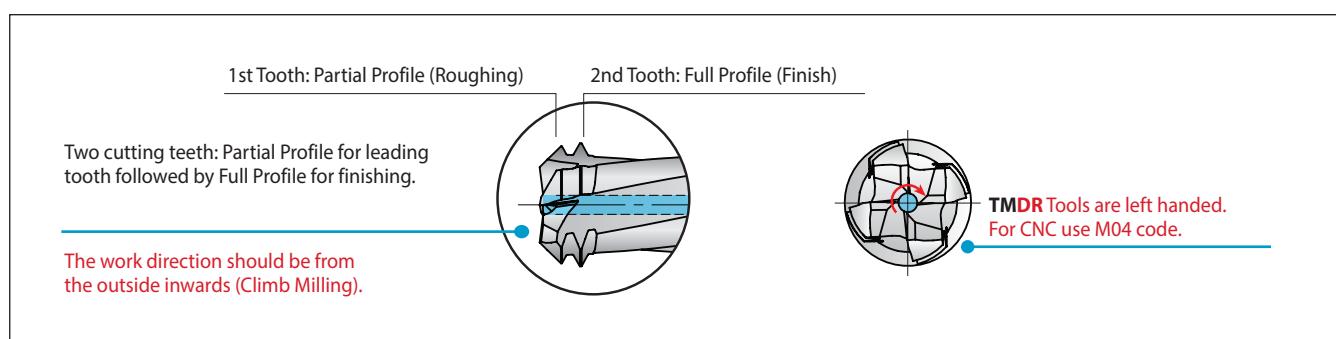
**EXPANDED LINE**

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



**Internal**

Defined by: R262 (DIN 13)  
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
<b>With Coolant</b>											
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
<b>With Coolant</b>										
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

## NPT

**TMDR**

**Internal**

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

**Left Hand Tool**

## 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
<b>With Coolant</b>										
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

**Left Hand Tool**

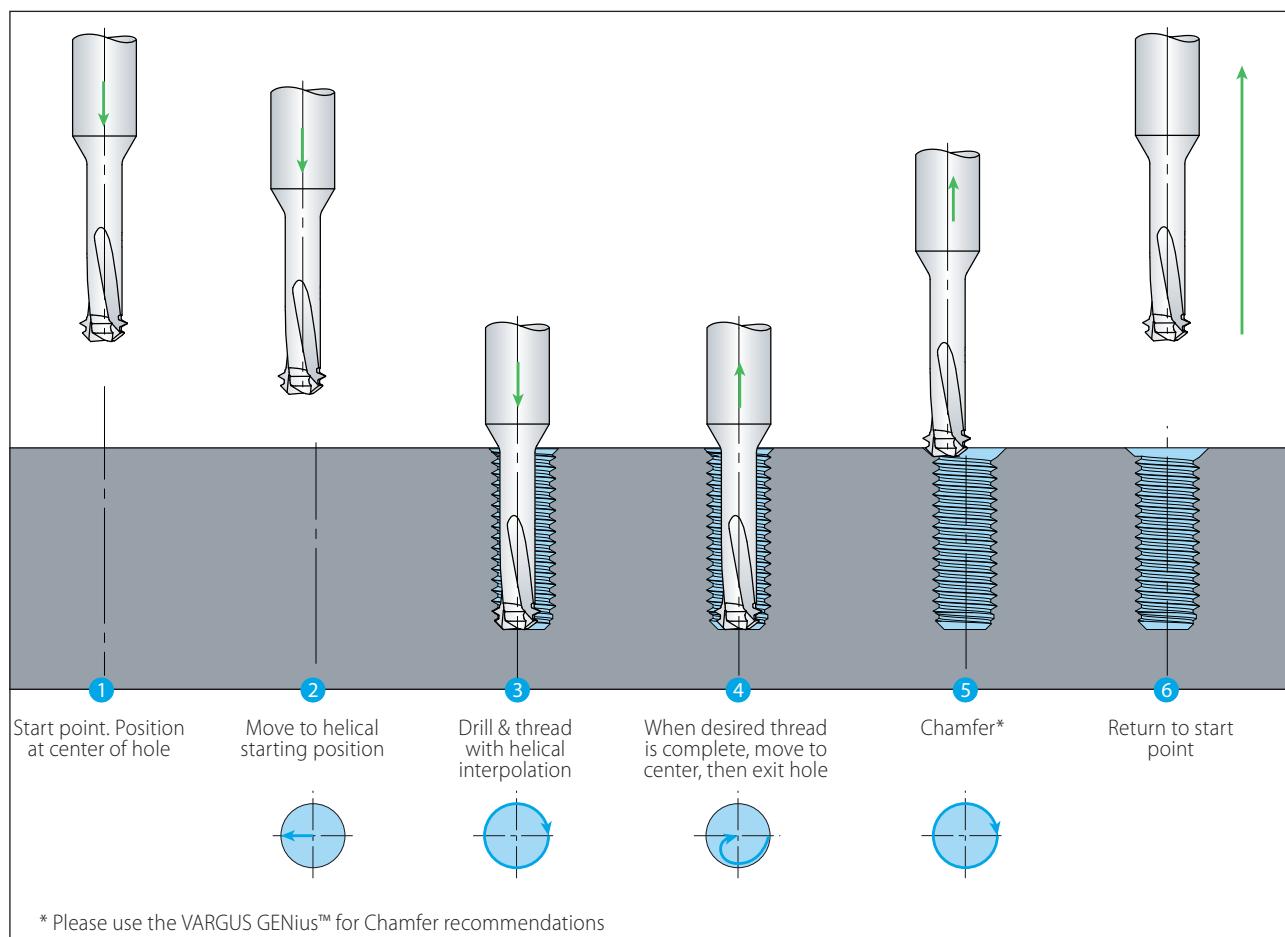
## TMDR - Drilling, Thread Milling & Chamfering

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth		
Standard	TPI	Internal	D	D2	L	L1	Z	Zt	L4*	D1
<b>With Coolant</b>										
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

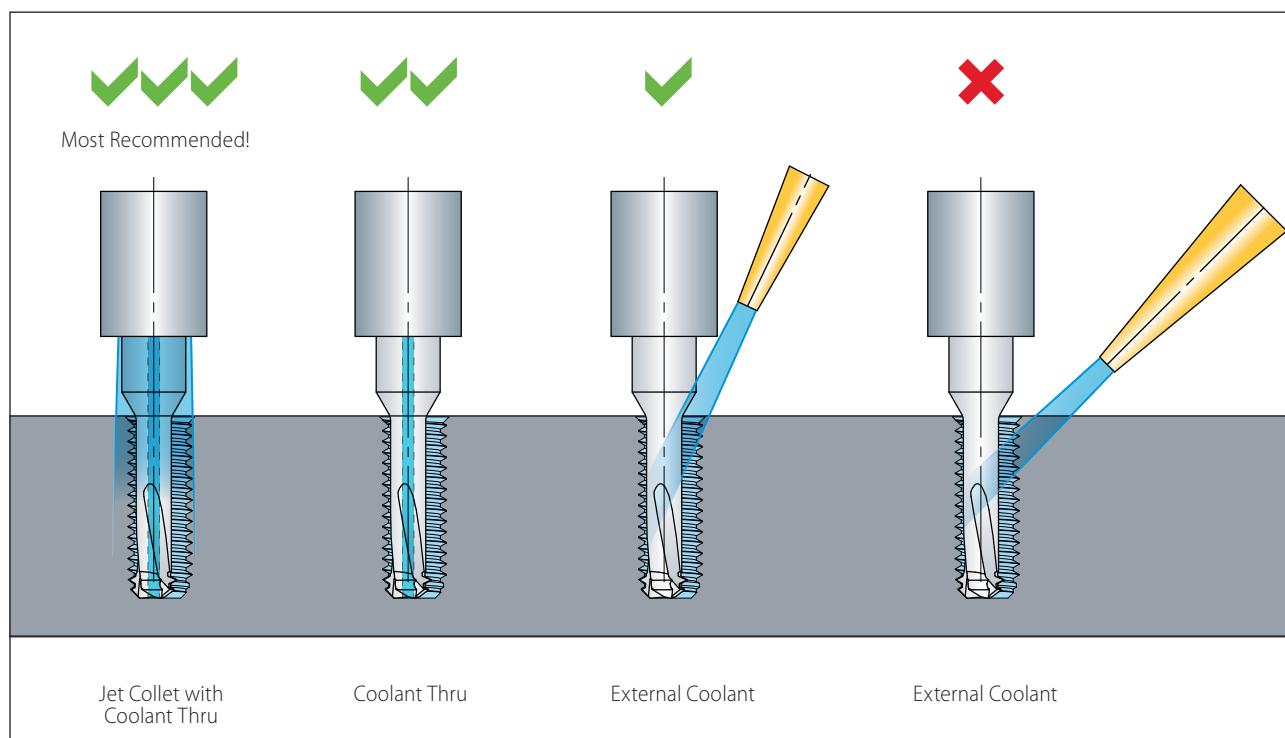
\* Please use the VARGUS GENius™ for Chamfer recommendations

## TMDR - Operating Cycle

TM**DR**



## 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]	Feed f [mm/tooth]	
				VTS		
<b>P</b> 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
<b>M</b> 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
<b>K</b> 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
<b>N</b> 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
<b>S</b> 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		$\alpha+\beta$ Alloys	1050Rm	25-35	0.02-0.05
<b>H</b> Hardened Material	25	Extra Hard Steel	Hardened & Tempered	45-50HRc	-	-
	26			51-55HRc	-	-

## Thread Milling

# TM Solid Helicool-R (HCR)

## Helical Thread Mill Flutes with Radial Coolant Thru

**EXPANDED LINE**

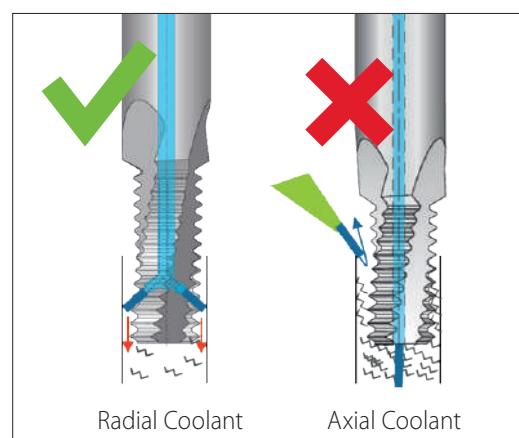
**Now Available  
in Additional  
Threading Standards:  
ISO, UN, BSP (G), NPT, BSPT & UNJ**



### 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

Chip Evacuation in Thru Holes using Axial & Radial Coolant



### Expansion Includes:

#### Metric Shanks:

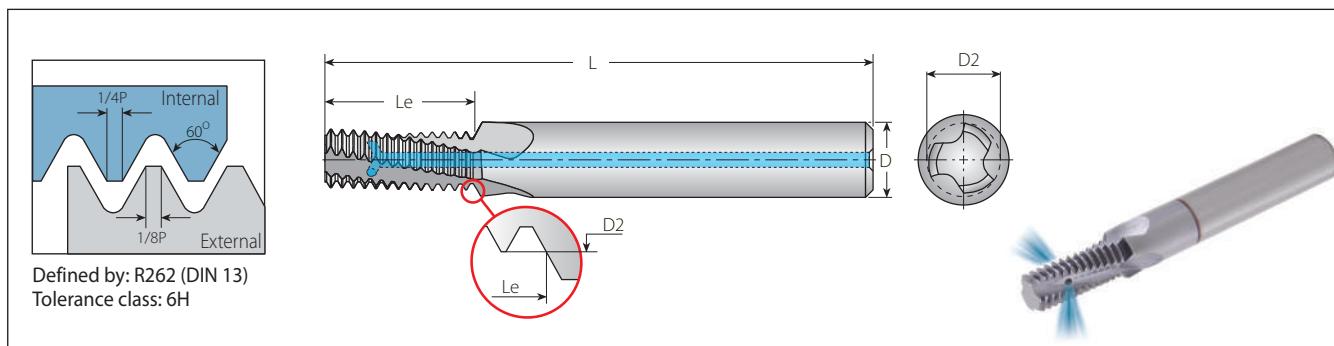
- ISO Metric
- American UN
- BSP (G)
- NPT
- BSPT
- UNJ

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



## ISO Metric

## Helicool-R (HCR)

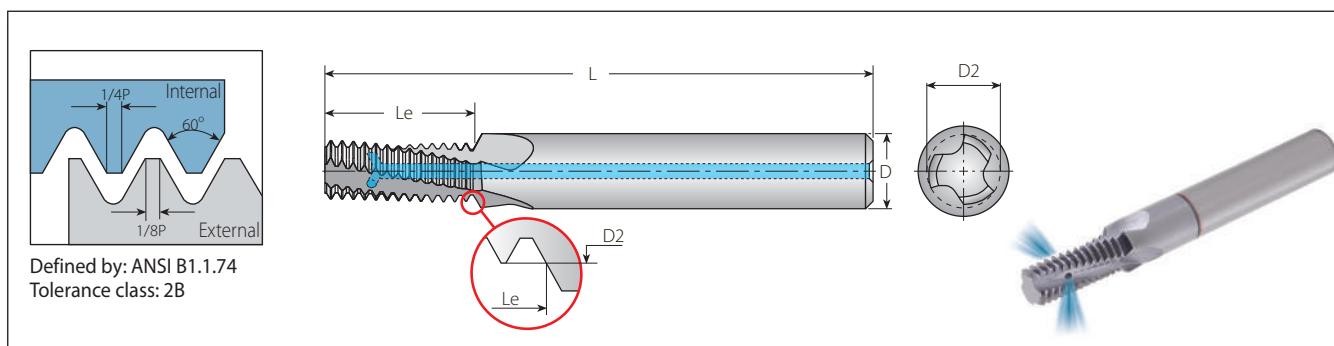


## Helicool-R (HCR)

2 x Do ( $Le \leq 2 \times$  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



## Helicool-R (HCR)

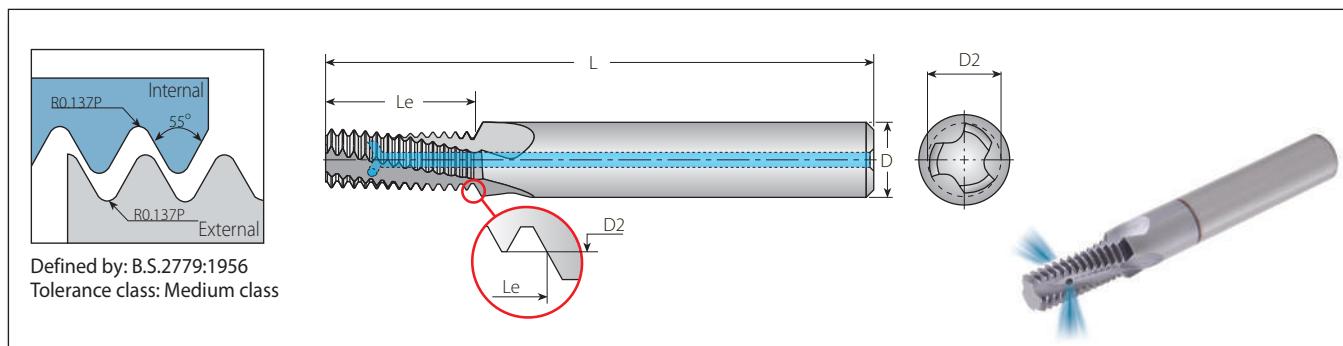
2 x Do ( $Le \leq 2 \times$  Thread Diameter)

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)

## Helicool-R (HCR)

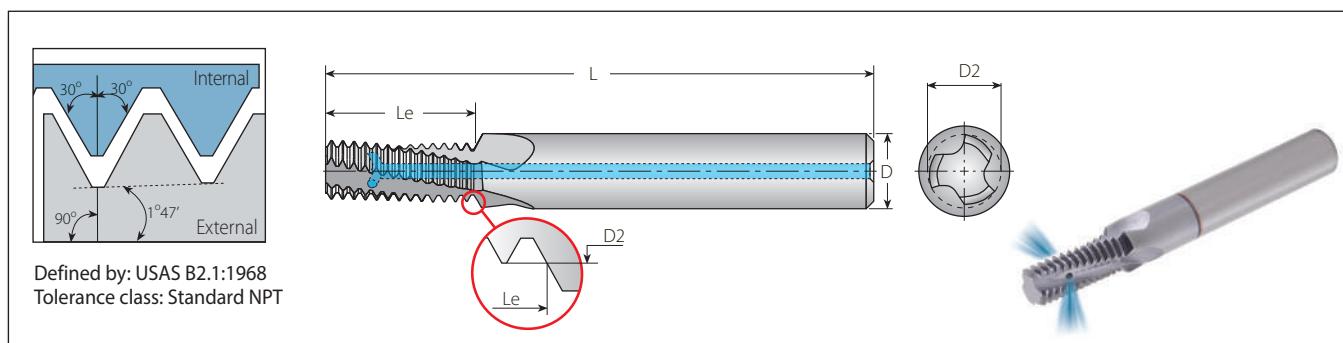


## Helicool-R (HCR)

2 x Do ( $Le \leq 2 \times$  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



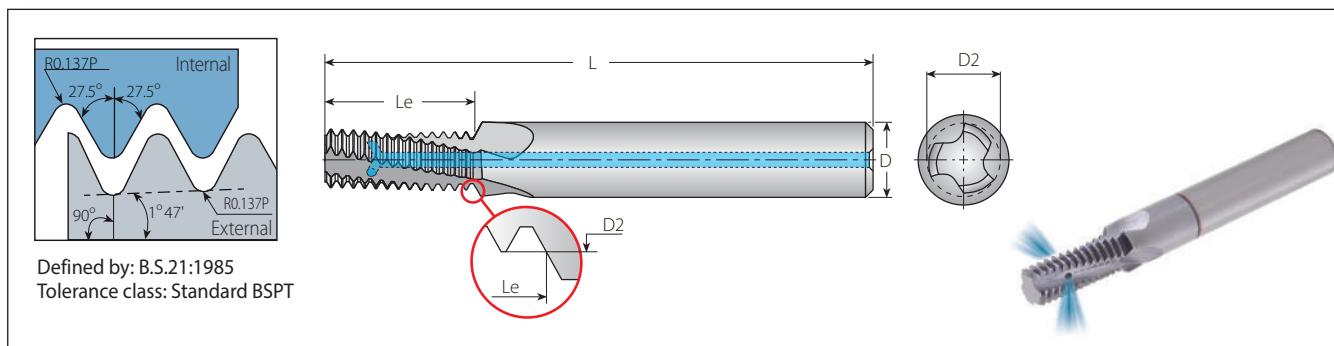
## Helicool-R (HCR)

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

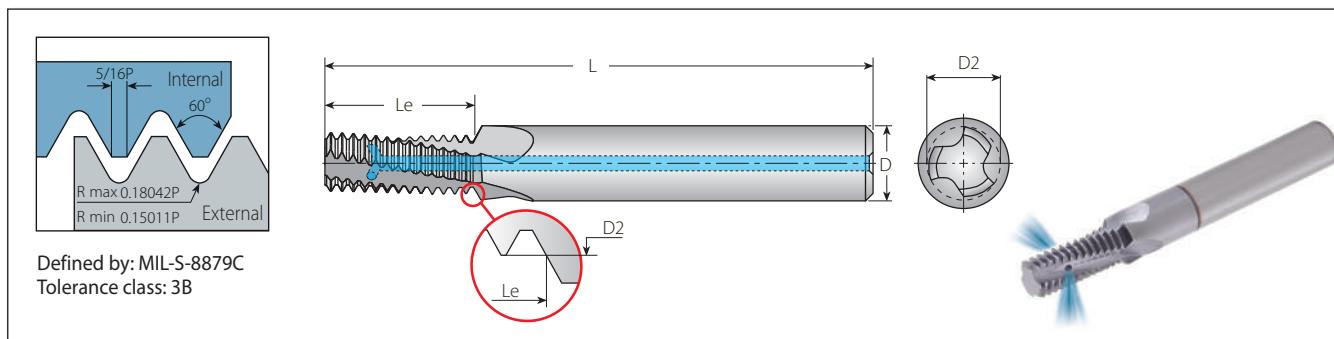
## Helicool-R (HCR)



## 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" x 28	28	HCR08076L10-EI28BSPT-TM...	8	7.65	61	10.2	3	11	8.7
1/4" x 19	19	HCR10099L15-EI19BSPT-TM...	10	9.90	73	15.4	3	11	11.8
3/8" x 19	19	HCR12111L15-EI19BSPT-TM...	12	11.15	73	15.4	4	11	15.2
1/2", 3/4" x 14	14	HCR16142L22-EI14BSPT-TM...	16	14.25	92	22.7	4	12	19.0

## UNJ



## 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]

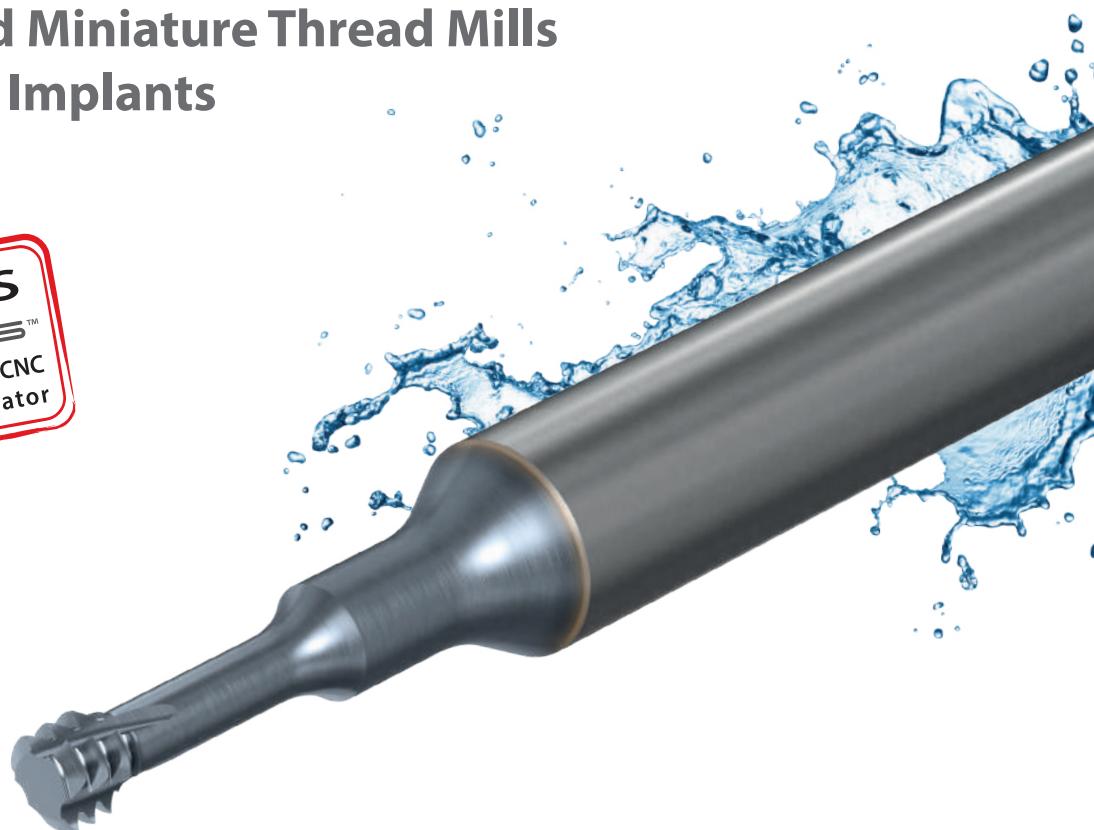
Material Group	Vargus No.	Material	Hardness Brinell HB	Vc [m/min]	Feed f [mm/tooth]	
				VTH		
<b>P</b> Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	80-250	0.03-0.08
	2		Medium Carbon (C=0.25-0.55%)	150	80-230	0.03-0.08
	3		High Carbon (C=0.55-0.85%)	170	80-200	0.03-0.08
	4	Low Alloy Steel (alloying 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
<b>M</b> 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
<b>K</b> 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
<b>N</b> 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
<b>S</b> 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		$\alpha+\beta$ Alloys	1050Rm	20-50	0.02-0.04
<b>H</b> 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

## Thread Milling

# TM Solid MilliPro Dental

NEW

## Reinforced Miniature Thread Mills for Dental Implants

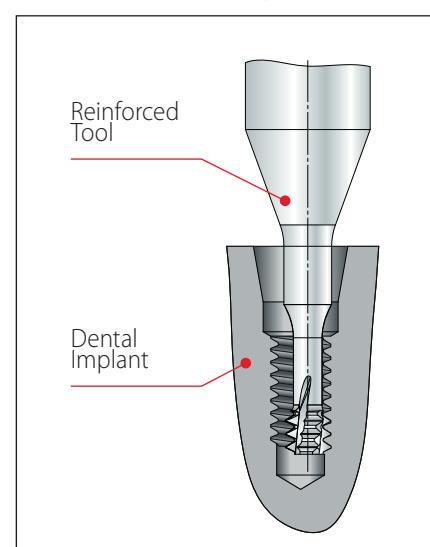


### Features and Benefits:

- 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

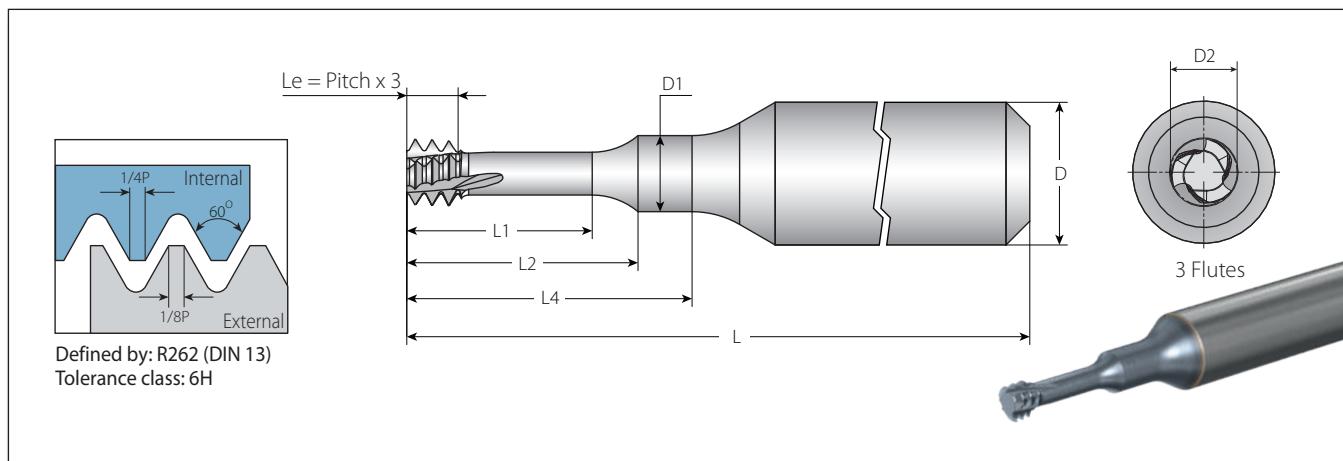
The new **MilliPro Dental** is fully supported by **VARGUS GENius™**, the most advanced Tool Selector and CNC Program Generator in the metal cutting tools industry

### Reinforced Overhang



## ISO Metric

## MilliPro Dental

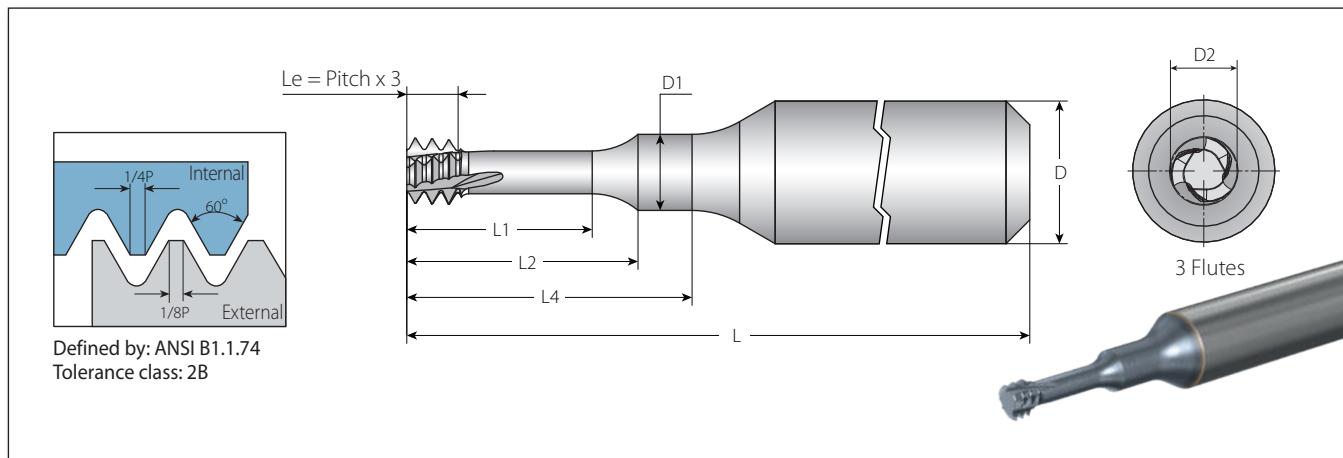


### Miniature Thread Mills for Dental Implants

3 x Do ( $L4 \geq 3 \times$  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		2.5	3.3	4.3	0.95			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	3	3	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



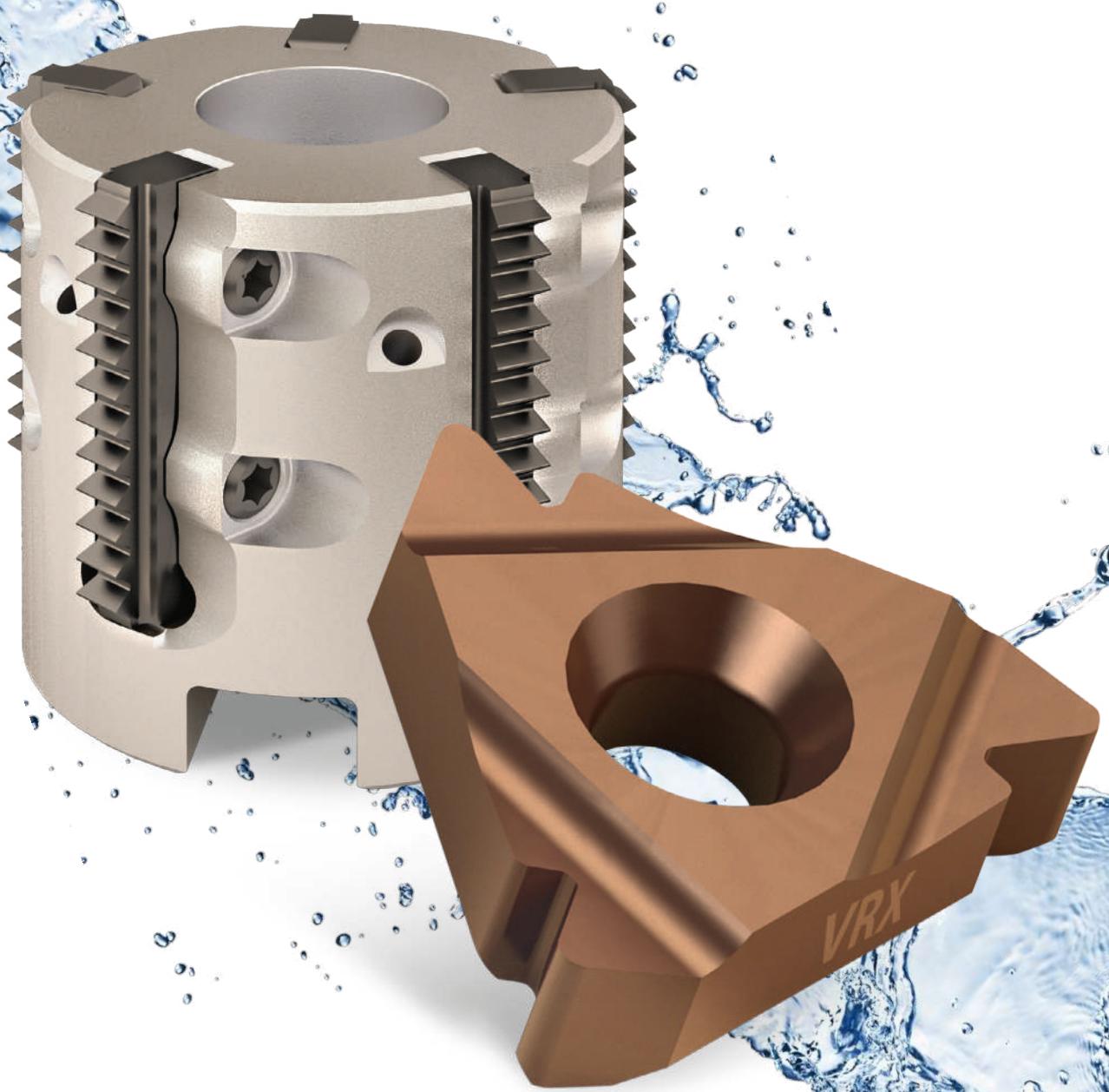
### Miniature Thread Mills for Dental Implants

3xDo ( $L4 \geq 3 \times$  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	Varigus No.	Material	Hardness Brinell HB	Vc [m/min]	Feed f [mm/tooth]	
				VTS		
<b>P</b> 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
<b>M</b> 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
	18		Hardened	330	50-80	0.02-0.03
<b>K</b> 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
<b>N</b> 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
<b>S</b> 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		$\alpha+\beta$ Alloys	1050Rm	25-35	0.02-0.07
<b>H</b> Hardened Material	25	Extra Hard Steel	Hardened & Tempered	45-50HRc	-	-
	26			51-55HRc	-	-



**VARDEX**  
Advanced Threading Solutions

# MAIN CATALOG

Thread Turning      Thread Milling

METRIC

### F-LINE

Fixed Clamping System



### VRX

Multipurpose Premium Grade



### MEGA LINE

For Extra Large Pitches



### V-CAP Toolholders

Polygon Shaped Shanks



### Oil&Gas

Professional Threading Solutions



### Mini-3 IC 5.0

Tools for Small Applications



### VG-Cut

Machining Between Shoulders



### Mini-V

Miniature Vertical Tools



### microScope

Toolholders: Shrink, Round Without Shoulder, Round Double Sided



### TMSD Vertical

Multi-Flute Vertical Tools



### TMDR, HCN

TMDR-Drilling,  
Thread Milling & Chamfering  
HCN-For Long Threads 3xD



### D-Line

Deep Rake Internal Inserts



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VARGUS GENius™ - The most powerful tool selector, cutting data and CNC program generating software for the metal cutting tools industry.

Thread Turning: The Vargus GENius™ guides the user to the right tool and the best cutting conditions for the application.

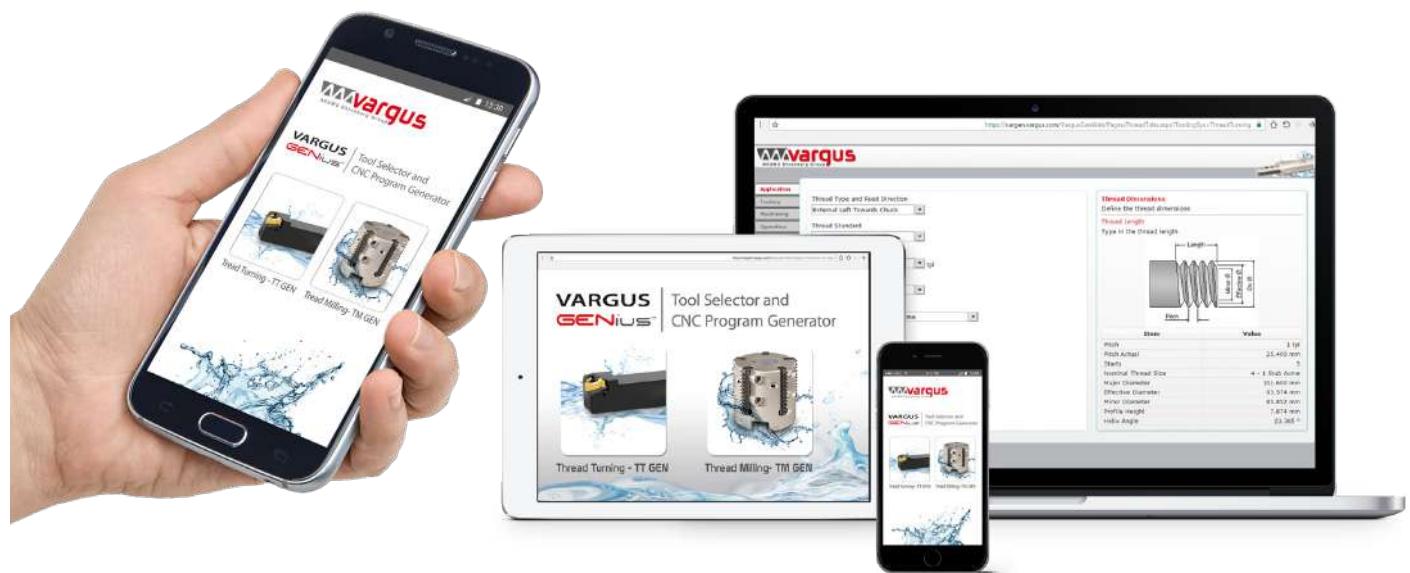
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- Always on, always updated!



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- Automatic updates



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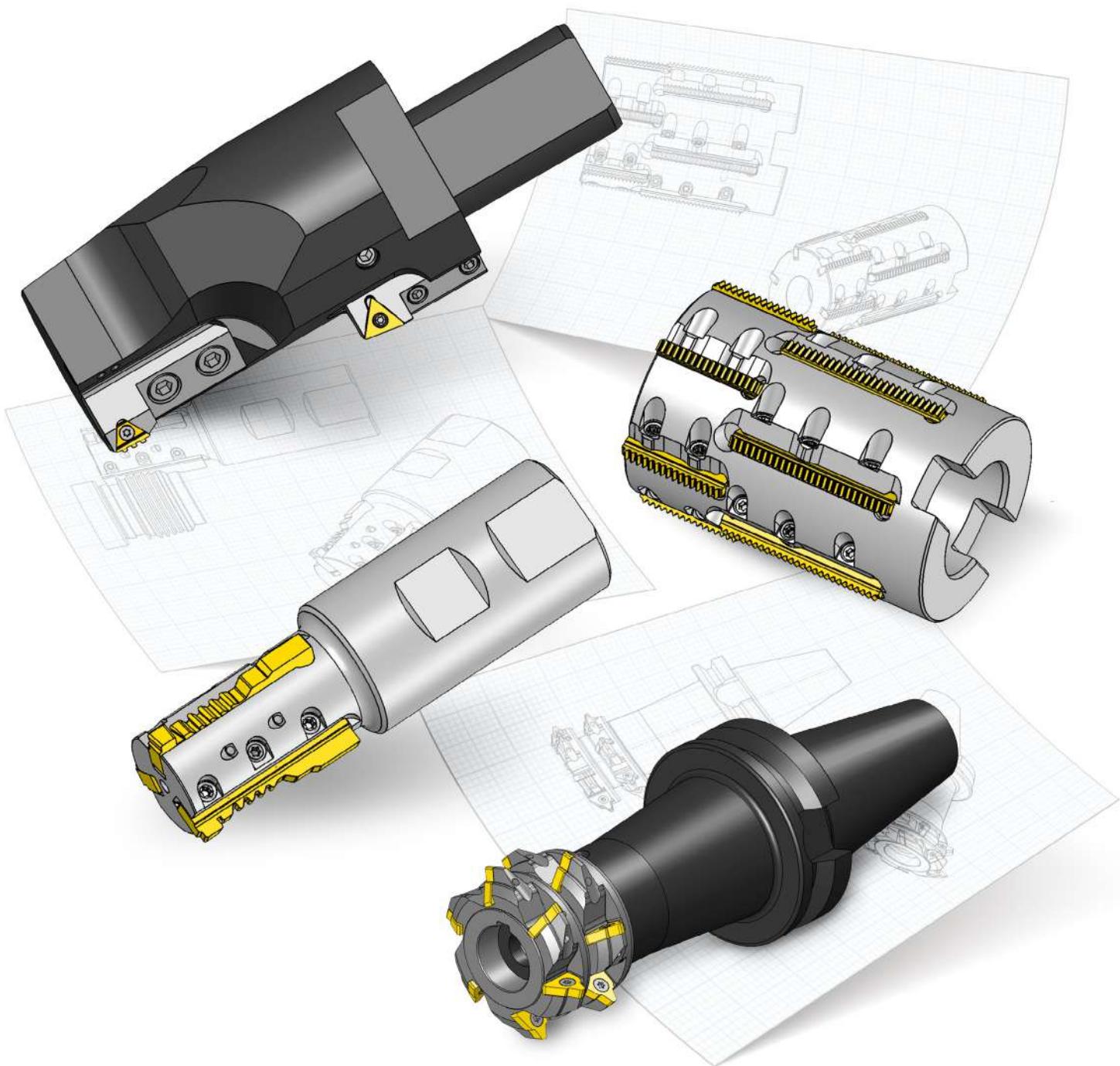
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## Gear Milling Tool Range



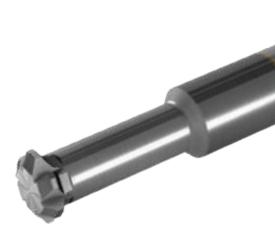
End Mill



Shell Mill

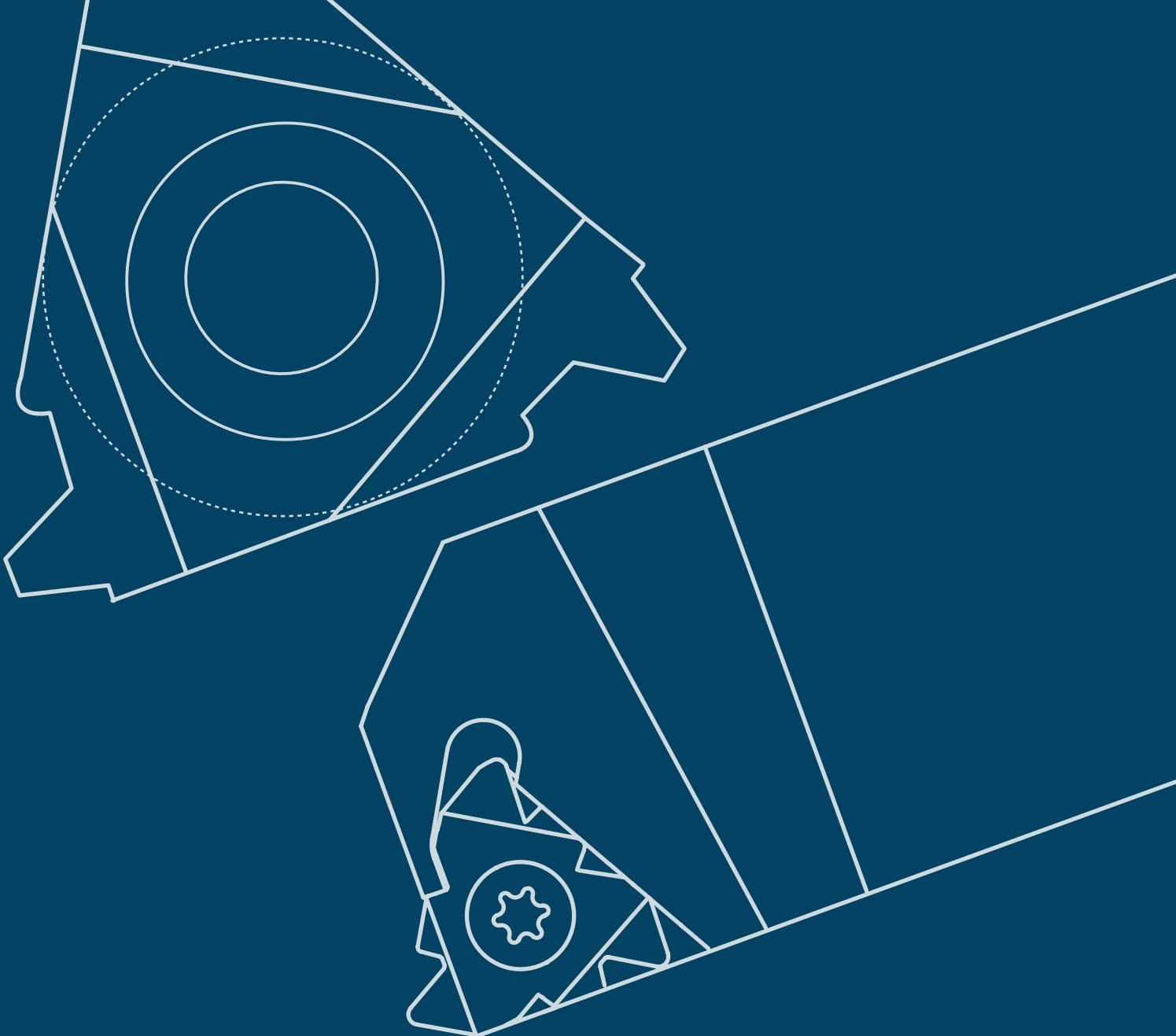


Disc Mill



Solid Carbide



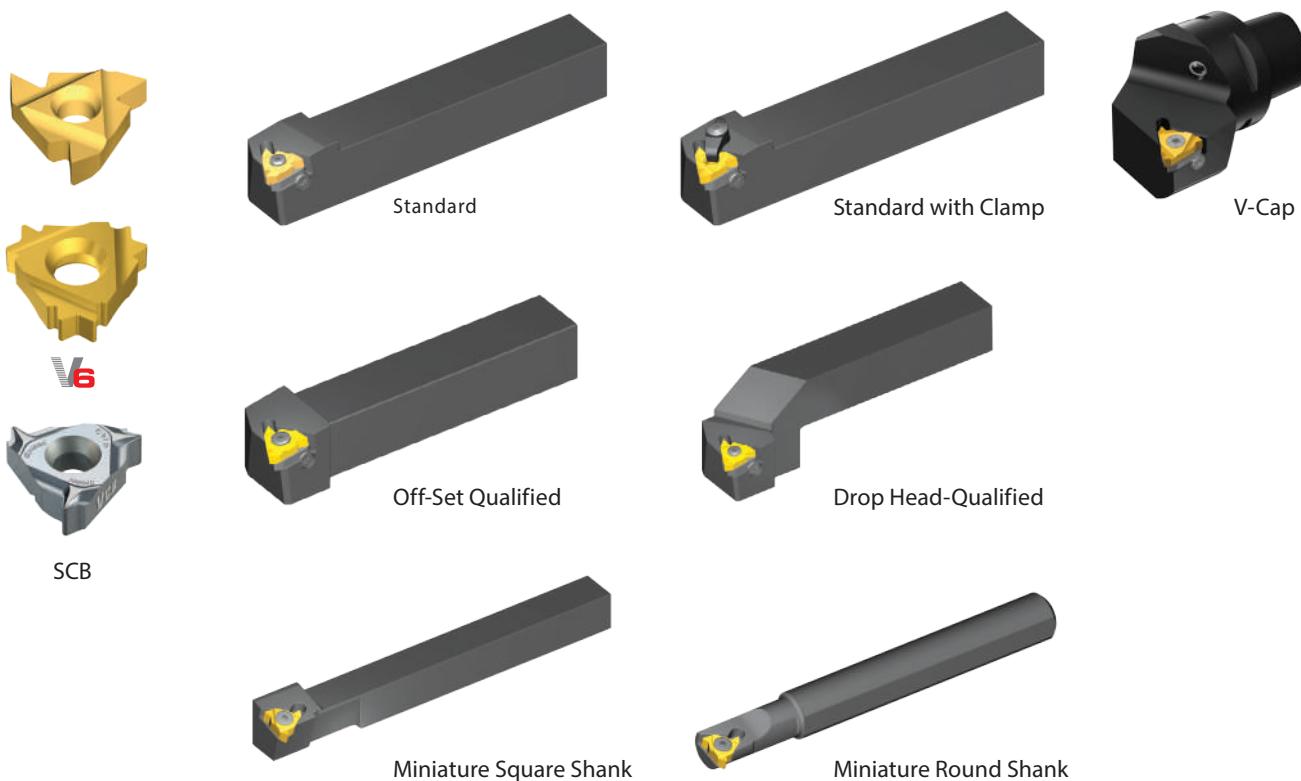


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## Thread Turning System - EXTERNAL

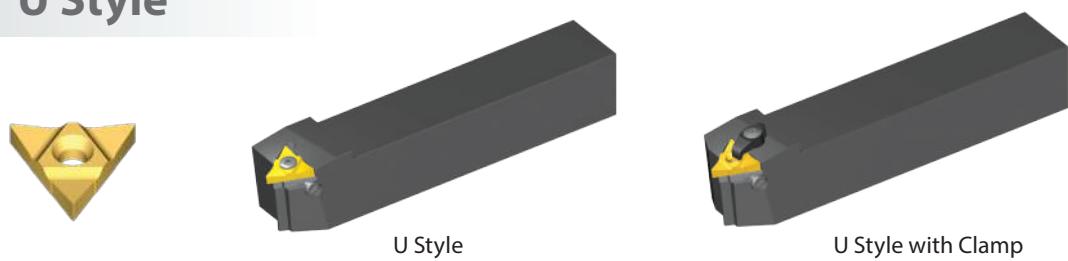
### Standard



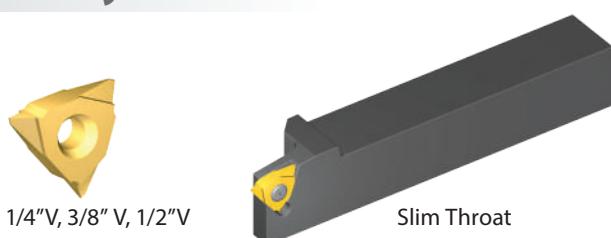
### F LINE



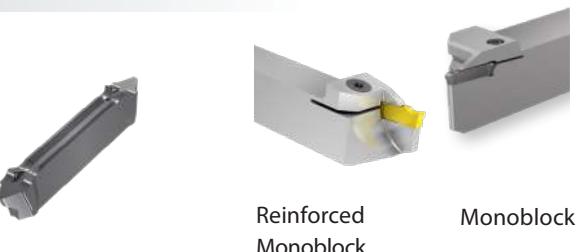
### U Style



### V Style

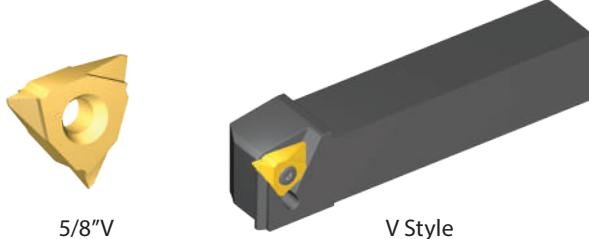


### VG-Cut



## Thread Turning System - EXTERNAL

### V Style



5/8"V

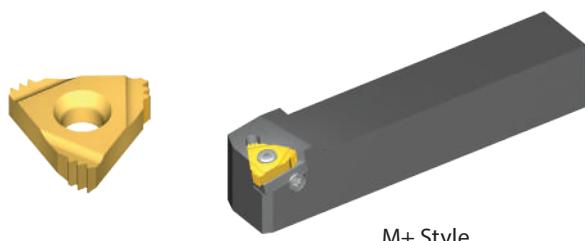
### MEGALINE



5/8"MG

MG Style

### Multi plus



M+ Style



### F LINE



MF+ Style



Z+ Style



T+ Style

### Oil&Gas



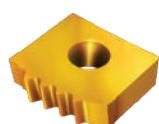
14D



14D Standard



CNGA



Chaser



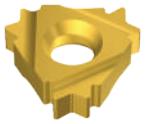
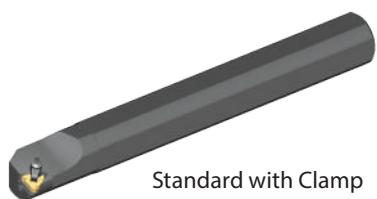
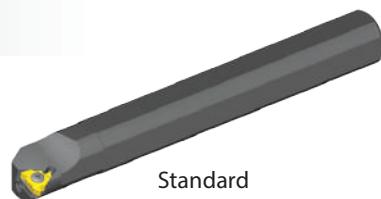
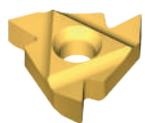
T+ Style



On Edge

## Thread Turning System - INTERNAL

### Standard



SCB

Oil & Gas

Carbide Shank

SCB

Miniature Square Shank

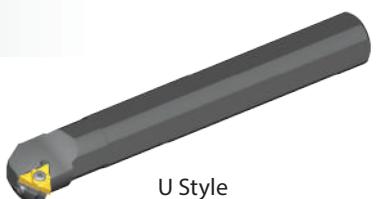
Miniature Round Shank

### F-LINE



F Style

### U Style

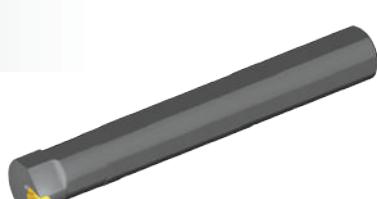


U Style



U Style with Clamp

### V Style



V Style

### MEGALINE



5/8"V



MG Style

### Multiplus



M+ Style



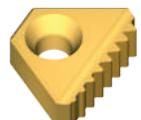
F-LINE



MF+ Style



Z+ Style



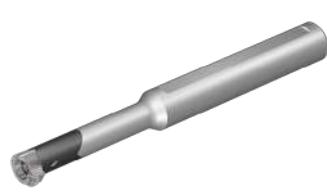
T+ Style

## Thread Turning System - INTERNAL

### Mini-V



Steel Shank

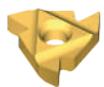


Carbide Shank



Sleeve Clamping Shank

### MINIPRO



Mini-3  
IC 4.0, IC 5.0, IC 6.0



Steel Shank /  
Carbide Implanted Shank



Mini-3 Adjustable



Carbide Shank



Mini-5L



Steel Shank /  
Carbide Implanted Shank



Mini-L Adjustable

### MINIPRO



Micro Double-Ended



Micro Sleeve

### microScope



Micro Single-  
Ended



Shrink  
Round Without  
Shoulder



Round  
Double Sided



2 Flats  
Round Shank



4 Flats  
Round  
Shank

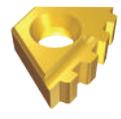


Square  
Shank



Drop Head

### Oil&Gas



14D



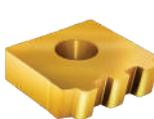
14D



14D with Clamping



CNGA



Chaser

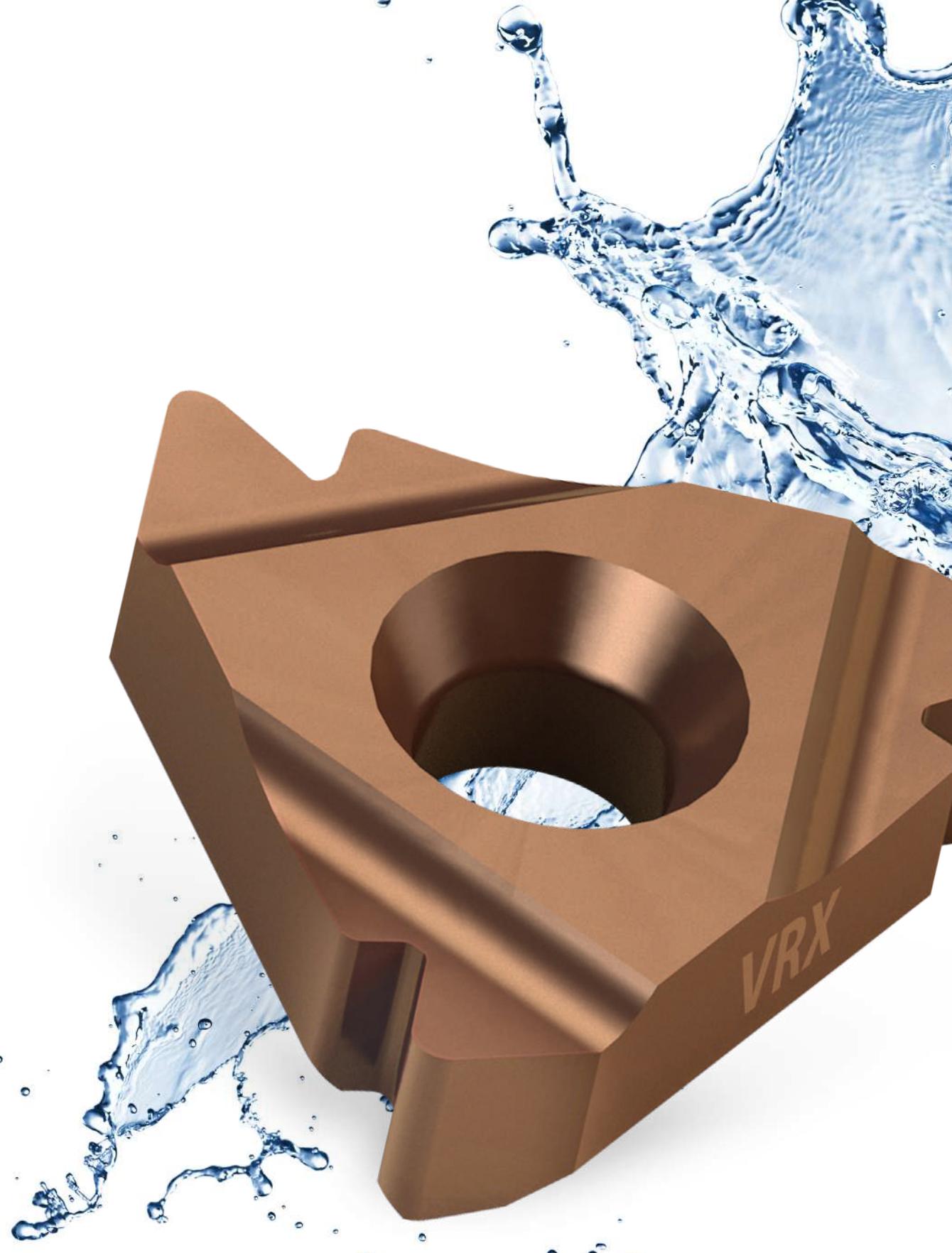


T+ Style



On Edge





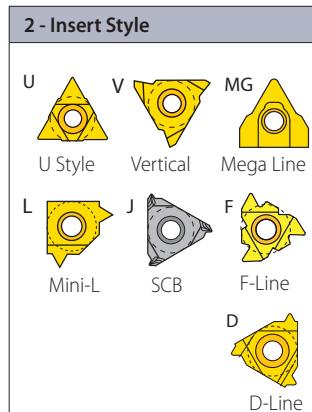
## Thread Turning Inserts

## Vardex Ordering Code System

### ■ Threading Inserts

3	1	E	R	1.5	ISO	7	8	9	10	VTX	12
1	2	3	4	5	6	7	8	9	10	11	12

1 - Insert Size
5LK - IC5.0L mm
4.0K - IC4.0 mm
5.0K - IC5.0 mm
6.0K - IC6.0 mm
2 - IC1/4"
3 - IC 3/8"
4 - IC 1/2"
5 - IC5/8"
14D - 14D
1616 - Chaser size 16x16



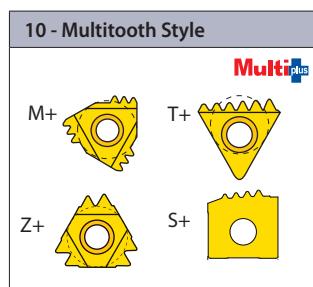
3 - Type of Insert
E - External
I - Internal
EI - External +Internal

4 - RH/LH Insert
R - Right Hand Insert
L - Left Hand Insert
None - Right + Left Insert

5 - Pitch	
Full Profile - Pitch Range	
mm	TPI
0.35-25.0	72-1
Partial Profile - Pitch Range	
mm	TPI
A	0.5 - 1.5
B	1.75 - 2.0
AG	0.5 - 3.0
G	1.75 - 3.0
N	3.5 - 5.0
U	5.5 - 8.0
Q	5.5 - 6.0
U	6.5 - 9.0
V	6.0 - 10.0
S	0.5 - 2.0
	48 - 13

6 - Standard
60 - Partial Profile 60°
55 - Partial Profile 55°
ISO - ISO Metric
UN - American UN
W - Whitworth for BSW, BSP
BSPT - British Standard Pipe Thread
NPT - NPT
ANPT - ANPT
NPTF - NPTF
NPS - NPS
RD - Round DIN 405
RD20400 - Round DIN 20400
TR - Trapez DIN 103
ACME - ACME
STACME - Stub ACME
UNJ - UNJ
MJ - ISO 5855
ABUT - American Buttress
BBUT - British Buttress
SAGE - Metric Buttress DIN 513
API - API
BUT - API Buttress Casing
APIRD - API Round Casing & Tubing
VAM - VAM
NVAM - New Vam
EL - Extreme Line Casing
H90 - H90
PG - Pg DIN 40430

7 - No. of Cutting Corners
6C - V6 Cutting Corners
8 - API Form
382
383
403
502
503
652
9 - No. of Teeth
(for Multitooth Style) 2, 3, 5, 6, 8



11 - Coarse Pitch Inserts
158/...

12 - Carbide Grade
VKX, VTX, VCB, VM7, VK2, VK2P, VBX, VRX, VTXP, VKXP, VRXP

## ■ Micro Threading Inserts - Double Ended

<b>3</b>	<b>S</b>	<b>I</b>	<b>R</b>	<b>0.5</b>	<b>ISO</b>	<b>VMX</b>
1	2	3	4	5	6	7
<b>1 - Insert Dia.</b>	<b>2 - Insert Style</b>	<b>3 - Type of Insert</b>	<b>4 - RH/LH Insert</b>	<b>5 - Pitch</b>		
3.0 - 3.0 mm	S - Micro Insert	I - Internal	R - Right Hand Insert	<b>Full Profile - Pitch Range</b>		
4.0 - 4.0 mm			L - Left Hand Insert	mm	TPI	
6.0 - 6.0 mm				0.30-1.5	40-16	
8.0 - 8.0 mm						
10.0 - 10.0 mm						
<b>6 - Standard</b>	<b>7 - Carbide Grades</b>	<b>Partial Profile - Pitch Range</b>				
60 - Partial Profile 60°	VMX	mm	TPI			
55 - Partial Profile 55°		A	0.5 - 1.5	A	48 - 16	
ISO - ISO Metric		F	0.5 - 3.0	F	48 - 24	
MJ - ISO 5855						
NPT - NPT						
NPTF - NPTF						
UN - American UN						
W - Whitworth for BSW, BSP						

## microScope

### ■ Micro Threading Inserts - Single Ended

<b>M</b>	<b>5</b>	<b>42</b>	<b>TH</b>	<b>0.5</b>	<b>ISO</b>	<b>L16</b>	<b>R</b>	<b>VBX</b>
1	2	3	4	5	6	7	8	9
<b>1 - Product Line</b>	<b>2 - Insert Size</b>	<b>3 - Min. Bore Dia.</b>						
M, MS - Microscope	4, 5, 6, 7	3.2, 4.2,...						
<b>4 - Type of Application</b>	<b>5 - Pitch (for Threading)</b>	<b>6 - Threading Standard</b>						
TH - Threading	<b>Full Profile - Pitch Range</b>	60 - Partial Profile 60°						
	mm	55 - Partial Profile 55°						
	0.5-1.5	ISO - ISO Metric						
		UN - American UN						
		W - Whitworth for BSW, BSP						
		NPT - NPT						
		TR - Trapez DIN 103						
<b>7 - Overhang</b>	<b>8 - LH or RH</b>	<b>9 - Carbide Grades</b>						
L16	R - RH Helix	VBX, VTX						
	L - LH Helix							



## CNGA and On Edge Inserts for Oil & Gas

C	N	G	A	6	4	I	R	5	BUT75	VKX
T	N	E	C	4	3	E	R	4	APIRD	VKX
1	2	3	4	5	6	7	8	9	10	11

1 - Insert Shape	2 - Clearance Angle on Major Cutting Edge	3 - Tolerances	4 - Clamp Type												
T  C	N	<table border="1"> <tr> <td>IC</td><td>S</td><td>m</td></tr> <tr> <td>Theoretical diameter of inscribed circle</td><td>Insert thickness</td><td></td></tr> <tr> <td>E</td><td><math>\pm 0.025</math></td><td><math>\pm 0.025</math></td></tr> <tr> <td>G</td><td><math>\pm 0.025</math></td><td><math>\pm 0.13</math></td></tr> </table>	IC	S	m	Theoretical diameter of inscribed circle	Insert thickness		E	$\pm 0.025$	$\pm 0.025$	G	$\pm 0.025$	$\pm 0.13$	C  A
IC	S	m													
Theoretical diameter of inscribed circle	Insert thickness														
E	$\pm 0.025$	$\pm 0.025$													
G	$\pm 0.025$	$\pm 0.13$													

5 - Theoretical diameter of inscribed circle	6 - Thickness	7 - Type of Insert	8 - RH/LH Insert	9 - Pitch
4 - 1/2" (12.7 mm) 5 - 5/8" (15.875 mm) 6 - 6/8" (19.05 mm)	3 - 3/16" (4.76 mm) 4 - 4/16" (6.35 mm) 5 - 5/16" (7.94 mm) 6 - 6/16" (9.525 mm)	E - External I - Internal EI - External + Internal	R - Right Hand Insert L - Left Hand Insert	10-5 TPI

10 - Standard	11 - No. of Teeth	12 - Carbide Grades
ACME - ACME STACME - Stub ACME API - API BUT - API Buttress Casing APIRD - API Round Casing & Tubing	VAM - VAM NVAM - New Vam EL - Extreme Line Casing H90 - H90	(For Multitooth Style) T3-T5

## VG-Cut Inserts

VG	D	3.0	ISO	1.50	RH	-	RS	VPG
1	2	3	4	5	6		7	8

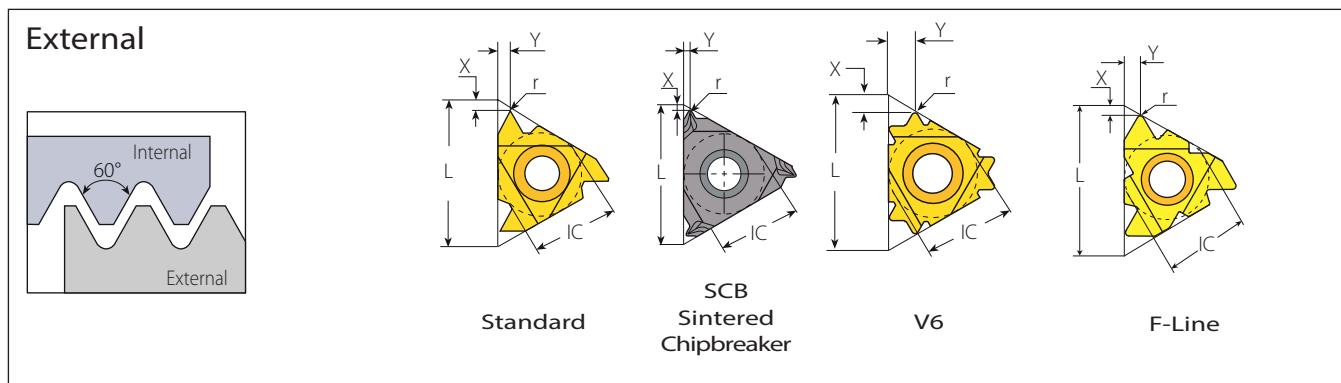
1 - Line Name	2 - Number of Cutting Corners	3 - Inserts Width	4 - Standard
VG - Deep Grooving, Threading & Parting Off	D - Double	3.0 mm	60 - Partial Profile 60° 55 - Partial Profile 55° ISO - ISO Metric UN - American UN W - Whitworth for BSW, BSP NPT - NPT
5 - Pitch	6 - RH/LH Inserts	7 - Top Rake Geometry	8 - Carbide Grade
Full Profile - Pitch Range	RH Helix LH Helix	RS - Close to right shoulder LS - Close to left shoulder	VPG
mm      TPI			
0.5-2.0	32-11.5		
Partial Profile - Pitch Range			
mm      TPI			
A    0.5 - 1.5	48 - 16		

## Mini-V Inserts

V	08	TH	1.5	ISO	R	VBX
1	2	3	4	5	6	7

1 - Product Line	2 - Insert Style	3 - Type of Application	4 - Pitch (for Threading)	5 - Threading Standard
V- Mini-V	08 , 11, 14, 16	TH - Threading	Full Profile - Pitch Range	60 - Partial Profile 60° 55 - Partial Profile 55° ISO - ISO Metric UN - American UN W - Whitworth for BSW, BSP BSPT - British Standard Pipe Thread NPT - NPT National Pipe Thread NPTF - NPTF National Seal Pipe Thread TR - Trapez Din 103
6 - RH	7 - Carbide Grade		mm      TPI	
R - RH Helix	VBX		0.5-2.0      32-12	
			Partial Profile - Pitch Range	
			mm      TPI	
			H    0.5-.75      48-32	
			I    1.0-1.25      24-20	
			J    1.5-1.75      16-14	
			A    0.5-1.5      48-16	
			G    1.75-3.0      14-8	
			AG    0.5-3.0      48-8	

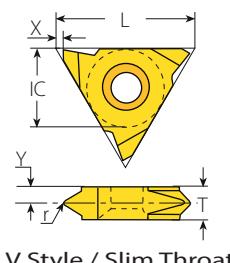
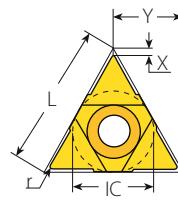
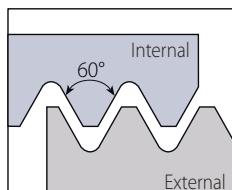
## Partial Profile 60°



### Standard



	Insert Size			Pitch		Ordering Code			Dimensions mm			Anvil		
	IC	L mm	mm	TPI	RH	LH	r	X	Y	RH	LH	Toolholder		
SCB	1/4"	11	0.5-1.5	48-16	2ERA60...	2ELA60...	0.05	0.8	0.9	-	-	NL..-2 (LH)		
	3/8"	16	0.5-1.5	48-16	3ERA60...	3ELA60...	0.05	0.8	0.9	YE3	YI3	AL..-3 (LH)		
			1.75-3.0	14-8	3ERG60...	3ELG60...	0.27	1.2	1.7					
V6	3/8"	16	0.5-3.0	48-8	3ERAG60...	3ELAG60...	0.08	1.2	1.7	YE3	-	AL..-3		
			0.5-1.5	48-16	3JERA60...		0.05	0.6	0.8					
			1.75-3.0	14-8	3JERG60...		0.27	1.1	1.5					
F-LINE	3/8" V6	16	0.5-3.0	48-8	3JERAG60...		0.08	0.9	1.5	YE3-6C	-	AL..-3		
			0.5-2.0	48-13	3ERS60-6C...		0.06	1.9	3.0					
			0.5-5.0	7-5	4ERN60...	4ELN60...	0.53	1.7	2.5	YE4	YI4	AL..-4 (LH)		
1/2"	22	3.5-5.0	7-5	4ERN60...	4ELN60...	0.53	1.7	2.5	YE4	YI4	AL..-4 (LH)			
	1/2" F	23	3.5-5.0	7-5	4FERN60...		0.53	1.7	2.5	YE4F	-	AL..-4F		
5/8"	27	5.5-6.0	4.5-4	5ERQ60...	5ELQ60...	0.64	2.1	3.1	YE5	YI5	AL..-5 (LH)			

**Partial Profile 60° (con't)****External****U Style****V Style / Slim Throat**

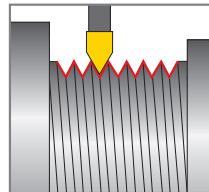
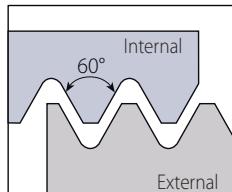
Insert Size			Pitch		Ordering Code		Dimensions mm			Anvil		
IC	L mm	mm	TPI	RH+LH		r	X	Y	RH	LH	Toolholder	
1/2"U	22	5.5-8.0	4.5-3.25	4UEIU60...		0.30	0.6	11.0	YE4U	YI4U	AL..-4U (LH)	
5/8"U	27	6.5-9.0	4-2.75	5UEIU60...		0.37	1.0	13.7	YE5U	YI5U	AL..-5U (LH)	

**Slim Throat**

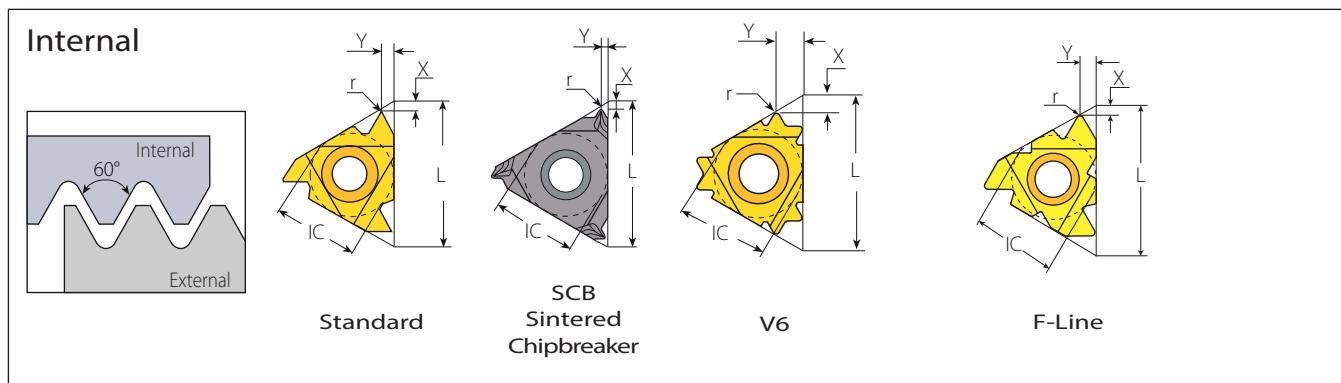
Insert Size			Pitch		Ordering Code		Dimensions mm				
IC	L mm	mm	TPI	RH	LH	r	X	Y	T	Toolholder	
1/4"V	11	0.5-1.5	48-16	2VERA60...	2VELA60...	0.05	0.69	2.3	3.2	NL..-2V (LH)	
		0.5-1.5	48-16	3VERA60...	3VELA60...	0.05	1.10	2.7	3.6		
3/8"V	16	1.75-3.0	14-8	3VERG60...	3VELG60...	0.27	1.10	1.9	3.6	NL..-3V (LH)	
		0.5-3.0	48-8	3VERAG60...	3VELAG60...	0.08	1.10	1.9	3.6		
1/2"V	22	3.5-5.0	7-5	4VERN60...	4VELN60...	0.53	1.10	2.3	4.8	NL..-4V (LH)	

**V Style**

Insert Size			Pitch		Ordering Code		Dimensions mm				
IC	L mm	mm	TPI	RH	LH	r	X	Y	T	Toolholder	
5/8"V	27	6.0-10.0	4-2.5	5VERV60...	5VELV60...	0.75	0.6	5.2	10	NL..-5V-10 (LH)	

**Partial Profile 60°****External****VG-Cut****VG-Cut**

Pocket Size	Ordering Code		Dimensions mm			No. of Passes	Helix	Min. Thread Diameter	Toolholder	
RH	W ref	Pitch mm	R	Y	L ref	Deg			Monoblock	
3	VGD3.0A60RH...	3.00	0.5-1.5	0.05	1.68	21.9	5 - 8	1.5°	Partial Profile A60	VGE...-3T...

**Partial Profile 60° (con't)****Standard**

Insert Size			Pitch		Ordering Code			Dimensions mm			Anvil		
IC	L mm	mm	TPI	RH	LH	r	X	Y	RH	LH	Toolholder		
1/4"	11	0.5-1.5	48-16	2IRRA60...	2ILA60...	0.05	0.8	0.9	-	-	NVR..-2 (LH)		
1/4" SCB	11	0.5-1.5	48-16	2JIRA60...		0.05	0.6	0.8	-	-	NVR..-2		
3/8"	16	0.5-1.5	48-16	3JIRA60...	3ILA60...	0.05	0.8	0.9	Y13	YE3	AVR..-3 (LH)		
		1.75-3.0	14-8	3IRG60...	3ILG60...	0.16	1.2	1.7					
		0.5-3.0	48-8	3IRAG60...	3ILAG60...	0.05	1.2	1.7					



SCB



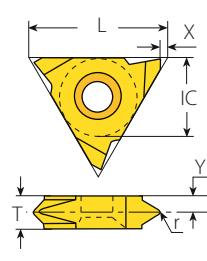
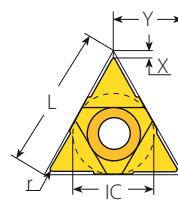
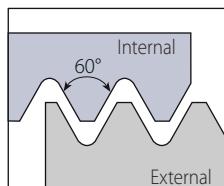
V6

3/8" SCB	16	0.5-1.5	48-16	3JIRA60...		0.05	0.6	0.8	Y13	-	AVR..-3
		1.75-3.0	14-8	3IRG60...		0.16	1.0	1.5			
		0.5-3.0	48-8	3IRAG60...		0.05	0.9	1.5			
3/8" V6	16	0.5-2.0	48-14	3IRS60-6C...		0.03	1.6	2.6	Y13-6C	-	AVR..-3 NVRC..-3 206/...



FLINE

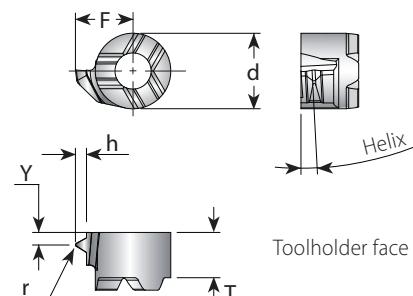
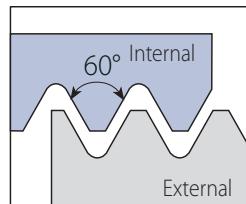
1/2"	22	3.5-5.0	7-5	4IRN60...	4ILN60...	0.30	1.7	2.5	Y14	YE4	AVR..-4 (LH)
1/2" F	23	3.5-5.0	7-5	4FIRN60...		0.3	1.7	2.5	Y14F	-	AVRC..-4F
5/8"	27	5.5-6.0	4.5-4	5IRQ60...	5ILQ60...	0.30	1.8	2.7	Y15	YE5	AVR..-5 (LH)

**Partial Profile 60° (con't)****Internal****U Style      V Style****U Style**

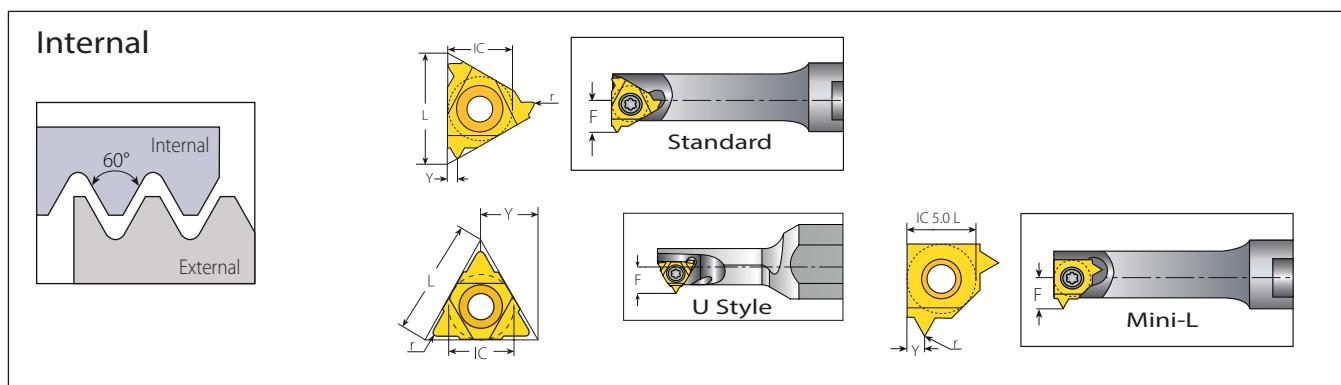
Insert Size			Pitch		Ordering Code		Dimensions mm			Anvil		
IC	L mm	mm	TPI	RH+LH	r	X	Y	RH	LH	Toolholder		
1/2"U	22	5.5-8.0	4.5-3.25	4UEIU60...	0.30	0.6	11.0	Y14U	YE4U	AVR..-4U (LH)		
5/8"U	27	6.5-9.0	4-2.75	5UEIU60...	0.37	1.0	13.7	Y15U	YE5U	AVR..-5U (LH)		

**V Style**

Insert Size			Pitch		Ordering Code		Dimensions mm			Toolholder	
IC	L mm	mm	TPI	RH	LH	r	X	Y	T	Toolholder	
5/8"V	27	6.0-10.0	4-2.5	5VIRV60...	5VILV60...	0.35	1.0	4.3	8	NVR..-5V (LH)	

**Partial Profile 60° (con't)****Mini-V****Internal****Mini-V**

Insert Style	Pitch			Ordering Code		Dimensions mm				Helix	Toolholder
	TPI	mm	RH	d	T	F	Y	r	Deg.		
V08	48-32	0.5-0.75	V08THH60R...	6	3.8	4.20	0.5	0.03	1.5		.V08...
	24-20	1.0-1.25	V08THI60R...			4.46	0.8	0.10	2.5		
	16-14	1.5-1.75	V08THJ60R...			4.76	0.9	0.14	3		
V11	48-32	0.5-0.75	V11THH60R...	8	4.2	5.80	0.5	0.30	1.5		.V11...
	24-20	1.0-1.25	V11THI60R...			6.06	0.8	0.10	1.5		
	16-14	1.5-1.75	V11THJ60R...			5.61	0.9	0.14	3		
V14	48-16	0.5-1.5	V14THA60R...	9	5.7	0.9	0.05				.V14...
	14-8	1.75-3.0	V14THG60R...			1.7	0.16	1.5			
	48-8	0.5-3.0	V14THAG60R...			1.7	0.05				
V16	48-16	0.5-1.5	V16THA60R...	11	5.7	0.9	0.05				.V16...
	14-8	1.75-3.0	V16THG60R...			1.7	0.16	1.5			
	48-8	0.5-3.0	V16THAG60R...			1.7	0.05				

**Partial Profile 60° (con't)****MINIPRO****Mini-3 Standard**

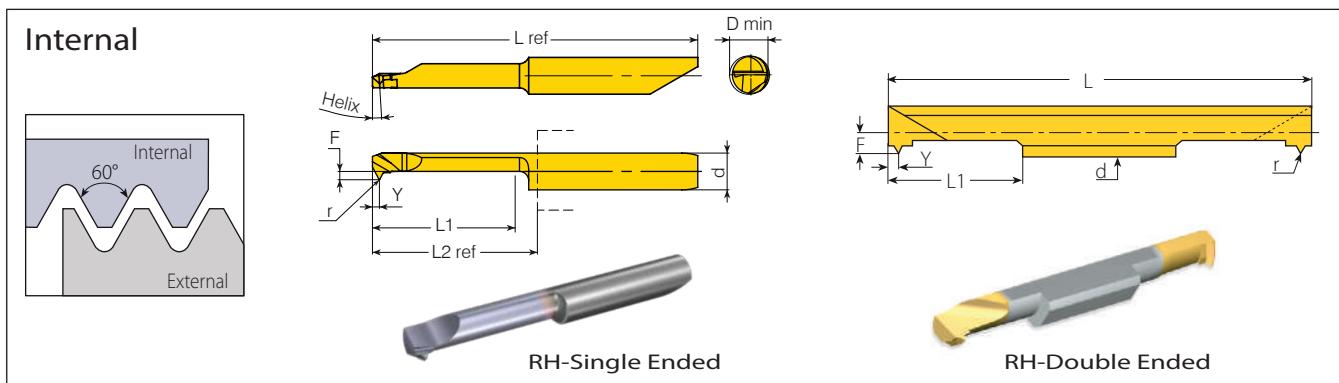
	Insert Size		Pitch		Ordering Code		Dimensions mm			Min. Bore Dia.	
	IC mm	L mm	mm	TPI	RH	LH	r	Y	F	mm	Toolholder
	4.0	6	0.5-1.25	48-20	4.0KIRA60...	4.0KILA60...	0.05	0.6	3.7	6.35	.NVR5-4.0K (LH)
	5.0	8	0.5-1.5	48-16	5.0KIRA60...	5.0KILA60...	0.05	0.7	4.7	7.80	.NVRC7-5.0K (LH)
	6.0	10	0.5-1.5	48-16	6.0KIRA60...	6.0KILA60...	0.05	0.9	5.3	10.00	.NVRC1..-6.0K (LH)

**Mini-3 U Style**

	Insert Size		Pitch		Ordering Code		Dimensions mm			Min. Bore Dia.	
	IC mm	L mm	mm	TPI	RH+LH		r	Y	F	mm	Toolholder
	5.0U	8	1.75-2.0	14-11	5.0KUIB60...		0.16	4.0	5.8	9.0	.NVRC8-5.0KU (LH)

**Mini-L**

	Insert Size		Pitch		Ordering Code		Dimensions mm			Min. Bore Dia.	
	IC mm	mm	TPI	RH	LH	r	Y	F	mm	Toolholder	
	5.0L	0.5-1.5	48-16	5LKIRA60...	5LKILA60...	0.05	0.9	4.65	8.0	.NVRC10-5LK (LH)	

**Partial Profile 60° (con't)****MINIPRO****Micro - Double Ended**

Insert Dia.	Pitch	Ordering Code	Dimensions mm					Min. Bore Dia.		
d mm	mm	TPI	RH	r	L1	L	F	Y	mm	Toolholder
3.0	0.5-1.0	48-24	3.0SIRF60...	0.05	16	50	1.46	0.9	3.3	SMC..-3.0
4.0	0.5-1.0	48-24	4.0SIRF60...	0.05	16	50	1.96	0.9	4.3	SMC..-4.0
6.0	0.5-1.5	48-16	6.0SIRA60...	0.05	16	50	2.50	0.9	6.0	SMC..-6.0

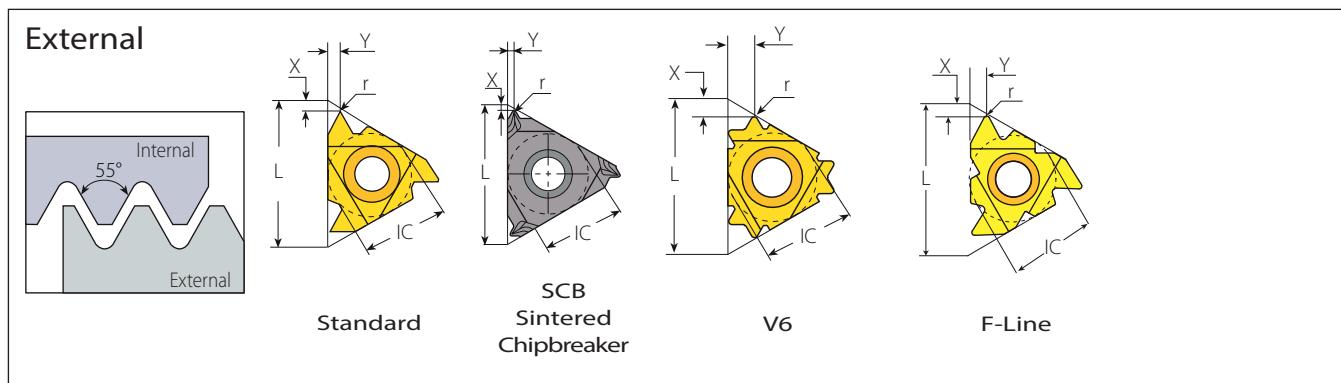
Left handed tool supplied by request (Example: 6.0SILA60...).

**Micro - Single Ended****micrOscope**

Insert Dla.	Pitch	Ordering Code	Dimensions mm					Min. Bore Dia.						
Thread	d mm	mm	TPI	RH/LH	Helix °	r	L1	F	Y	h min	L2 ref*	L ref	D mm	Toolholder
M1-M2x0.25		0.25		M407TH0.25P60L02R...	4.9	2.5		0.14	0.29				0.73	
M1.6-M3x0.35		0.35		M412TH0.35P60L04R...	3.8	4		0.18	0.29				1.22	
M2x0.4		0.4		M416TH0.40P60L05R...	4.2	5		0.20	0.41				1.57	MH...-4.0
M2.2-M2.5x0.45		0.45		M417TH0.45P60L06R...	4.0	6		0.22	0.46				1.71	
	4.0	0.5-1.0	48-24	MS429THF60L16R/L...		0.03	0.90				13.0	29.8		
		0.5-1.0	48-24	MS439THF60L16R/L...	3.5	0.03	16	1.90	0.90		18.4	35.4	3.2	MH...-4.0
	6.0	0.5-1.5	48-16	M659THA60L16R/L...		0.05	2.90						4.2	MH...-6.0
													6.2	

\* L2 Ref: Repeatability within +/-0.02.

## Partial Profile 55°



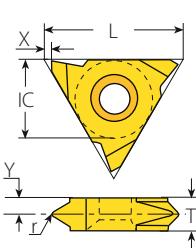
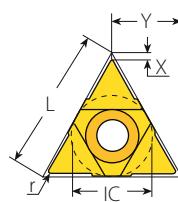
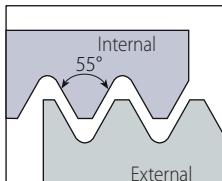
### Standard



Insert Size	Pitch				Ordering Code			Dimensions mm				Anvil				
	IC	L mm	mm	TPI	RH	LH	r	X	Y	RH	LH	Toolholder				
1/4"	11	0.5-1.5	48-16	2ERA55...	2ELA55...	0.05	0.8	0.9	-	-	NL..-2 (LH)	YE3	YI3	AL..-3 (LH)		
3/8"	16	1.75-3.0	14-8	3ERG55...	3ELG55...	0.21	1.2	1.7	YE3	YI3	AL..-3 (LH)	3ERAG55...	3ELAG55...	0.07	1.2	1.7

3/8" SCB	16	0.5-1.5	48-16	3JERA55...		0.05	0.6	0.8	YE3	-	AL..-3			
		1.75-3.0	14-8	3JERG55...		0.21	1.1	1.5						
		0.5-3.0	48-8	3JERAG55...		0.07	0.9	1.5						

3/8"V6	16	0.5-1.75	48-14	3ERS55-6C...		0.05	1.8	2.8	YE3-6C	-	AL..-3			
		1.75-2.0	14-12	3ERS55-6C...		0.05	1.8	2.8						
		0.5-3.0	48-8	3ERS55-6C...		0.07	0.9	1.5						

**Partial Profile 55° (con't)****External****U Style      V Style / Slim Throat****U Style**

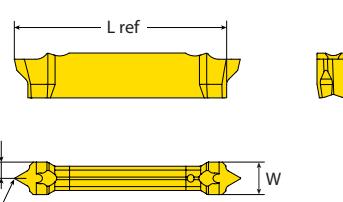
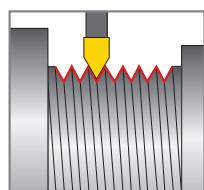
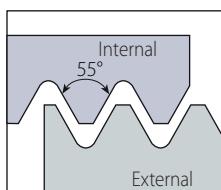
Insert Size			Pitch			Ordering Code			Dimensions mm			Anvil		
IC	L mm	mm	TPI	RH+LH		r	X	Y	RH	LH	Toolholder			
1/2"U	22	5.5-8.0	4.5-3.25		4UEIU55...	0.60	0.9	11.0	YE4U	YI4U	AL..-4U (LH)			
5/8"U	27	6.5-9.0	4-2.75		5UEIU55...	0.80	1.2	13.7	YE5U	YI5U	AL..-5U (LH)			

**Slim Throat**

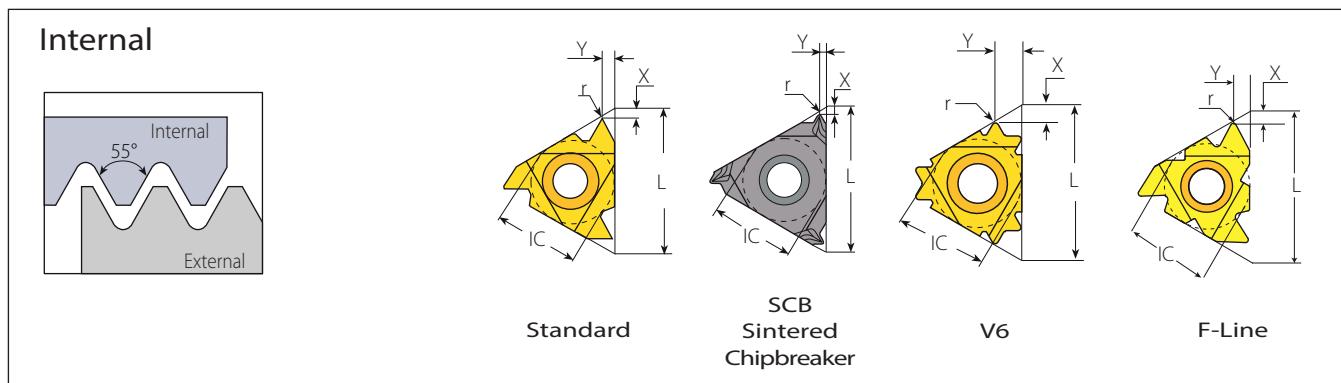
Insert Size			Pitch			Ordering Code			Dimensions mm				
IC	L mm	mm	TPI	RH	LH	r	X	Y	T	Toolholder			
1/4"V	11	0.5-1.5	48-16	2VERA55...	2VELA55...	0.05	0.8	2.7	3.2	NL..-2V (LH)			
		0.5-1.5	48-16	3VERA55...	3VELA55...	0.05	1.1	2.7	3.6				
3/8"V	16	1.75-3.0	14-8	3VERG55...	3VELG55...	0.21	1.1	1.9	3.6	NL..-3V (LH)			
		0.5-3.0	48-8	3VERAG55...	3VELAG55...	0.07	1.1	1.9	3.6				
1/2"V	22	3.5-5.0	7-5	4VERN55...	4VELN55...	0.43	1.1	2.3	4.8	NL..-4V (LH)			

**V Style**

Insert Size			Pitch			Ordering Code			Dimensions mm				
IC	L mm	mm	TPI	RH	LH	r	X	Y	T	Toolholder			
5/8"V	27	6.0-9.0	4-2.75	5VERV55...	5VELV55...	0.70	1.0	4.3	8	NL..-5V-8 (LH)			

**Partial Profile 55°****External****VG-Cut**

Pocket Size	Ordering Code	Dimensions mm			No. of Passes	Helix	Min. Thread Diameter	Toolholder
RH	W ref	Pitch TPI	R	Y	L ref	Deg		Monoblock
3	VGD3.0A55RH...	3.00	48-16	0.05	1.68	21.9	5 - 8	1.5° Partial Profile A55 VGE...-3T...

**Partial Profile 55° (con't)****Standard**

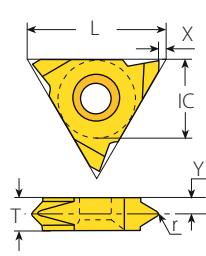
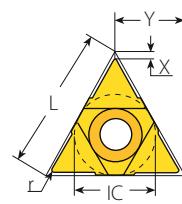
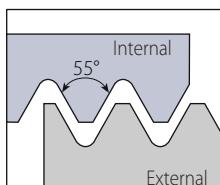
Insert Size			Pitch		Ordering Code			Dimensions mm			Anvil		
IC	L mm	mm	TPI	RH	LH	r	X	Y	RH	LH	Toolholder		
1/4"	11	0.5-1.5	48-16	2IRA55...	2ILA55...	0.05	0.8	0.9	-	-	NVR..-2 (LH)		
1/4" SCB	11	0.5-1.5	48-16	2JIRA55...		0.05	0.6	0.8	-	-	NVR..-2		



SCB	3/8"	16	0.5-1.5	48-16	3IRA55...	3ILA55...	0.05	0.8	0.9	YI3	YE3	AVR..-3 (LH)	
			1.75-3.0	14-8	3IRG55...	3ILG55...	0.21	1.2	1.7				
			0.5-3.0	48-8	3IRAG55...	3ILAG55...	0.07	1.2	1.7				
V6	3/8"	16	0.5-1.5	48-16	3JIRA55...		0.05	0.6	0.8	YI3	-	AVR..-3	
			1.75-3.0	14-8	3JIRG55...		0.21	1.1	1.5				
			0.5-3.0	48-8	3JIRAG55...		0.07	0.9	1.5				
3/8" V6			16	0.5-1.5	48-16	3IRS55-6C...		0.05	1.6	2.6	YI3-6C	-	AVR..-3 NVRC..-3 206/...



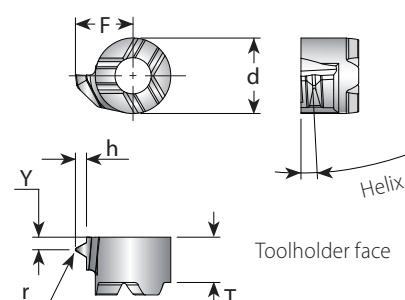
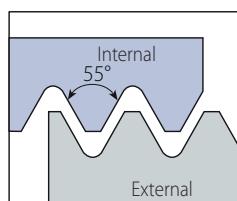
1/2"	22	3.5-5.0	7-5	4IRN55...	4ILN55...	0.43	1.7	2.5	YI4	YE4	AVR..-4 (LH)
1/2" F	23	3.5-5.0	7-5	4FIRN55...		0.43	1.7	2.5	YI4F	-	AVRC...-4F
5/8"	27	5.5-6.0	4.5-4	5IRQ55...	5ILQ55...	0.60	2.0	2.9	YI5	YE5	AVR..-5 (LH)

**Partial Profile 55° (con't)****Internal****U Style      V Style****U Style**

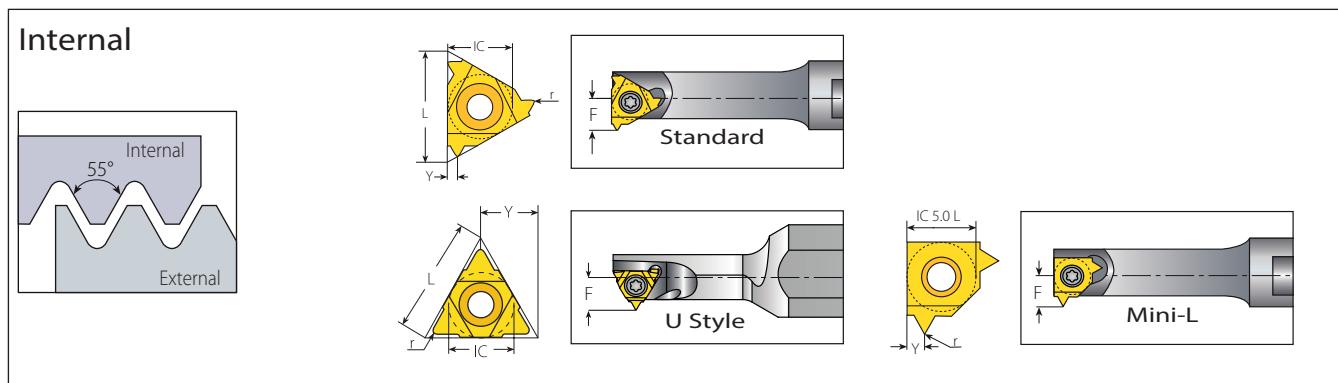
Insert Size				Pitch		Ordering Code			Dimensions mm				Anvil	
IC	L mm	mm	TPI	RH	LH	r	X	Y	RH	LH	Toolholder			
1/2"U	22	5.5-8.0	4.5-3.25		4UEIU55...	0.60	0.9	11.0	YI4U	YE4U	AVR..-4U (LH)			
5/8"U	27	6.5-9.0	4-2.75		5UEIU55...	0.80	1.2	13.7	YI5U	YE5U	AVR..-5U (LH)			

**V Style**

Insert Size				Pitch		Ordering Code			Dimensions mm				Toolholder	
IC	L mm	mm	TPI	RH	LH	r	X	Y	T	Toolholder				
5/8"V	27	6.0-9.0	4-2.75	5VIRV55...	5VILV55...	0.70	1.0	4.3	8	NVR..-5V (LH)				

**Partial Profile 55° (con't)****Mini-V****Internal****Mini-V**

Insert Style	Pitch			Ordering Code			Dimensions mm				Helix	Toolholder
	TPI	mm	RH	d	T	F	Y	r	Deg.			
V14	48-16	0.5-1.5	V14THA55R...	9	5.7	9	0.9	0.05		1.5	.V14-...	
	14-8	1.75-3.0	V14THG55R...				1.7	0.21				
	48-8	0.5-3.0	V14THAG55R...				1.7	0.07				
V16	48-16	0.5-1.5	V16THA55R...	11	5.7	10.2	0.9	0.07		1.5	.V16-...	
	14-8	1.75-3.0	V16THG55R...				1.7	0.25				
	48-8	0.5-3.0	V16THAG55R...				1.7	0.07				

**Partial Profile 55° (con't)****MINIPRO****Mini-3 Standard**

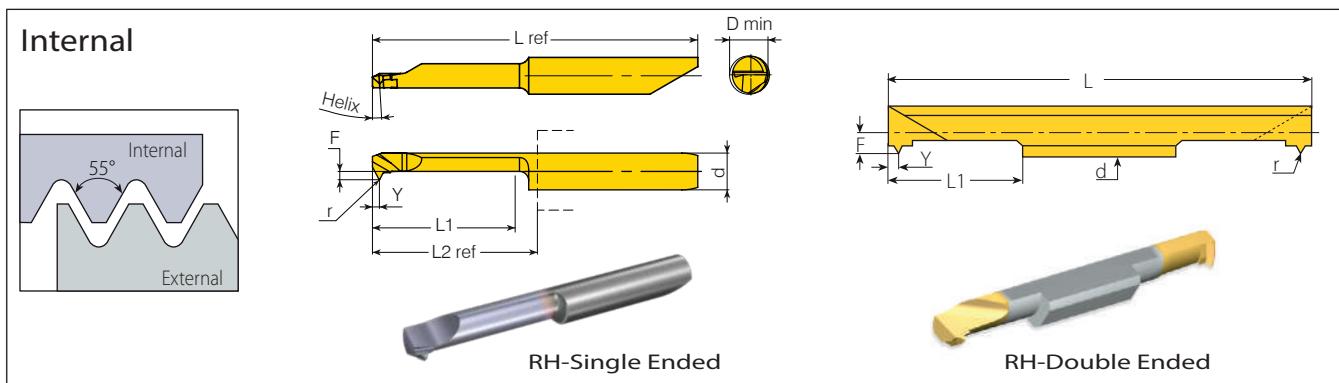
	Insert Size		Pitch		Ordering Code		Dimensions mm			Min. Bore Dia.	
	IC mm	L mm	mm	TPI	RH	LH	r	Y	F	mm	Toolholder
	4.0	6	0.5-1.25	48-20	4.0KILA55...	4.0KILA55...	0.05	0.6	3.8	6.45	.NVR5-4.0K (LH)
	5.0	8	0.5-1.5	48-16	5.0KILA55...	5.0KILA55...	0.05	0.7	4.7	7.80	.NVRC7-5.0K (LH)
	6.0	10	0.5-1.50	48-16	6.0KILA55...	6.0KILA55...	0.05	0.9	5.3	10.00	.NVRC1..-6.0K (LH)

**Mini-3 U Style**

	Insert Size		Pitch		Ordering Code		Dimensions mm			Min. Bore Dia.	
	IC mm	L mm	mm	TPI	RH+LH		r	Y	F	mm	Toolholder
	5.0U	8	1.75-2.0	14-11	5.0KUIB55...		0.21	4.0	5.7	9.0	.NVRC8-5.0KU (LH)

**Mini-L**

	Insert Size		Pitch		Ordering Code		Dimensions mm			Min. Bore Dia.	
	IC mm	mm	TPI	RH	LH	r	Y	F	mm	Toolholder	
	5.0L	0.5-1.5	48-16	5LKIRA55...	5LKILA55...	0.05	0.9	4.65	8.0	NVRC10-5LK (LH)	

**Partial Profile 55° (con't)****MINIPRO****Micro - Double Ended**

Insert Dia.	Pitch			Ordering Code		Dimensions mm					Min. Bore Dia.	
d mm	mm	TPI	RH	r	L1	L	F	Y	mm	Toolholder		
3.0	0.5-1.0	48-24	3.0SIRF55...	0.05	16	50	1.46	0.9	3.3	SMC..-3.0		
4.0	0.5-1.0	48-24	4.0SIRF55...	0.05	16	50	1.96	0.9	4.3	SMC..-4.0		
6.0	0.5-1.5	48-16	6.0SIRA55...	0.05	16	50	2.50	0.9	6.0	SMC..-6.0		

Left handed tool supplied by request (Example: 6.0SILA55...).

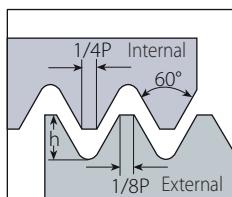
**Micro - Single Ended****micro**O**scope**

Insert Dia.	Pitch			Ordering Code		Dimensions mm					Min. Bore Dia.	
d mm	mm	TPI	RH/LH	Helix °	r	L1	F	Y	L2 ref*	L ref	D mm	Toolholder
4.0	0.5-1.0	48-24	MS429THF55L16R/L...	3.5	0.05	16	0.9	0.75	18.4	35.4	3.2	MH...-4.0
	0.5-1.0	48-24	MS439THF55L16R/L...		0.05		1.9				4.2	
6.0	0.5-1.5	48-16	M659THA55L16R/L...		0.06		2.9	0.9	18.5	42.2	6.2	MH...-6.0

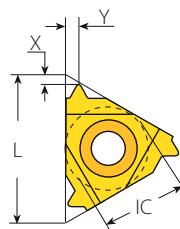
\* L2 Ref: Repeatability within +/-0.02.

## ISO Metric

### External



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

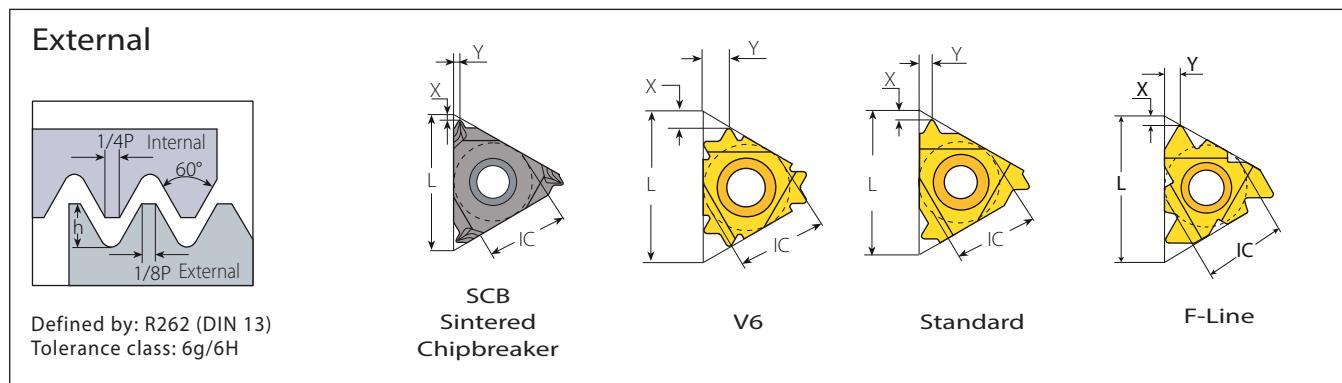


Standard

### Standard

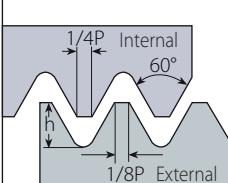


Insert Size	Pitch	Ordering Code			Dimensions mm			Anvil				
		IC	L mm	mm	RH	LH	h min	X	Y	RH	LH	Toolholder
1/4"	11		0.25	2ER0.25ISO...	2EL0.25ISO...	0.14	0.4	0.2				
			0.3	2ER0.3ISO...	2EL0.3ISO...	0.19	0.7	0.3				
			0.35	2ER0.35ISO...	2EL0.35ISO...	0.21	0.8	0.4				
			0.4	2ER0.4ISO...	2EL0.4ISO...	0.25	0.7	0.4				
			0.45	2ER0.45ISO...	2EL0.45ISO...	0.28	0.7	0.4				
			0.5	2ER0.5ISO...	2EL0.5ISO...	0.31	0.6	0.4				
			0.6	2ER0.6ISO...	2EL0.6ISO...	0.37	0.6	0.6				
			0.7	2ER0.7ISO...	2EL0.7ISO...	0.43	0.6	0.6				NL..-2 (LH)
			0.75	2ER0.75ISO...	2EL0.75ISO...	0.46	0.6	0.6				
			0.8	2ER0.8ISO...	2EL0.8ISO...	0.49	0.6	0.6				
			1.0	2ER1.0ISO...	2EL1.0ISO...	0.61	0.7	0.7				
			1.25	2ER1.25ISO...	2EL1.25ISO...	0.77	0.8	0.9				
			1.5	2ER1.5ISO...	2EL1.5ISO...	0.92	0.8	1.0				
			1.75	2ER1.75ISO...	2EL1.75ISO...	1.07	0.8	1.1				
3/8"	16		0.25	3ER0.25ISO...	3EL0.25ISO...	0.14	0.4	0.2				
			0.3	3ER0.3ISO...	3EL0.3ISO...	0.17	0.73	0.29				
			0.35	3ER0.35ISO...	3EL0.35ISO...	0.21	0.8	0.4				
			0.4	3ER0.4ISO...	3EL0.4ISO...	0.25	0.7	0.4				
			0.45	3ER0.45ISO...	3EL0.45ISO...	0.28	0.7	0.4				
			0.5	3ER0.5ISO...	3EL0.5ISO...	0.31	0.6	0.4				
			0.6	3ER0.6ISO...	3EL0.6ISO...	0.37	0.6	0.6				
			0.7	3ER0.7ISO...	3EL0.7ISO...	0.43	0.6	0.6				
			0.75	3ER0.75ISO...	3EL0.75ISO...	0.46	0.6	0.6	YE3	Y13	AL..-3 (LH)	
			0.8	3ER0.8ISO...	3EL0.8ISO...	0.49	0.6	0.6				
			1.0	3ER1.0ISO...	3EL1.0ISO...	0.61	0.7	0.7				
			1.25	3ER1.25ISO...	3EL1.25ISO...	0.77	0.8	0.9				
			1.5	3ER1.5ISO...	3EL1.5ISO...	0.92	0.8	1.0				
			1.75	3ER1.75ISO...	3EL1.75ISO...	1.07	0.9	1.2				
			2.0	3ER2.0ISO...	3EL2.0ISO...	1.23	1.0	1.3				
			2.5	3ER2.5ISO...	3EL2.5ISO...	1.53	1.1	1.5				
			3.0	3ER3.0ISO...	3EL3.0ISO...	1.84	1.2	1.6				
			3.5	3ER3.5ISO...	3EL3.5ISO...	2.15	1.6	1.9				

**ISO Metric (con't)****Standard**

Insert Size	Pitch	Ordering Code			Dimensions mm			Anvil					
		IC	L mm	mm	RH	LH	h min	X	Y	RH	LH	Toolholder	
 <b>V6</b>	16	3/8"	SCB	0.5	3JERO.5ISO...		0.31	1.2	0.5	YE3	-	AL..-3	
		0.75		3JERO.75ISO...			0.46	1.2	0.5				
		0.8		3JERO.8ISO...			0.49	1.2	0.5				
		1.0		3JER1.0ISO...			0.61	0.7	0.8				
		1.25		3JER1.25ISO...			0.77	0.7	0.8				
		1.5		3JER1.5ISO...			0.92	0.7	0.8				
		1.75		3JER1.75ISO...			1.07	1.2	1.5				
		2.0		3JER2.0ISO...			1.23	1.2	1.5				
		2.5		3JER2.5ISO...			1.53	1.2	1.5				
		3.0		3JER3.0ISO...			1.84	1.3	1.5				
 <b>F-LINE</b>	27	3/8"	V6	3.5	3JER3.5ISO...		2.15	1.2	1.5	YE3-6C	-	AL..-3	
		0.5		3ER0.5ISO-6C...			0.31	2.2	1.8				
		0.75		3ER0.75ISO-6C...			0.46	2.0	1.8				
		0.8		3ER0.8ISO-6C...			0.49	2.0	1.9				
		1.0		3ER1.0ISO-6C...			0.61	1.9	2.0				
		1.25		3ER1.25ISO-6C...			0.77	1.8	2.1				
		1.5		3ER1.5ISO-6C...			0.92	1.9	2.4				
		1.75		3ER1.75ISO-6C...			1.07	1.8	2.6				
 <b>1/2"</b>	22	3/8"	V6	2.0	3ER2.0ISO-6C...		1.23	1.9	2.8	YE4	YI4	AL..-4 (LH)	
		3.5		4ER3.5ISO...		4EL3.5ISO...	2.15	1.6	2.3				
		4.0		4ER4.0ISO...		4EL4.0ISO...	2.45	1.6	2.3				
		4.5		4ER4.5ISO...		4EL4.5ISO...	2.76	1.7	2.4				
		5.0		4ER5.0ISO...		4EL5.0ISO...	3.07	1.7	2.5				
		5.5		4ER5.5ISO...		4EL5.5ISO...	3.37	1.9	2.7				
 <b>1/2" F</b>	23	3/8"	V6	6.0	4ER6.0ISO...		4EL6.0ISO...	3.68	1.8	2.7	YE4F	-	AL..-4F
		3.5		4FER3.5ISO...			2.15	1.6	2.3				
		4.0		4FER4.0ISO...			2.45	1.6	2.3				
		4.5		4FER4.5ISO...			2.76	1.7	2.4				
		5.0		4FER5.0ISO...			3.07	1.7	2.5				
		5.5		4FER5.5ISO...			3.37	1.9	2.7				
 <b>F-LINE</b>	27	5/8"	V6	6.0	4FER6.0ISO...			3.68	1.8	2.7	YE5	YI5	AL..-5 (LH)
		5.5		5ER5.5ISO...		5EL5.5ISO...	3.37	1.9	2.7				
		6.0		5ER6.0ISO...		5EL6.0ISO...	3.68	2.0	2.9				

**ISO Metric (con't)**

External		U Style	V Style / Slim Throat
 <p>Defined by: R262 (DIN 13) Tolerance class: 6g/6H</p>			

**U Style**

	Insert Size		Pitch	Ordering Code		Dimensions mm			Anvil		Toolholder
	IC	L mm	mm	RH+LH	h min	X	Y	RH	LH		
 U	22	5.0	4UE5.0ISO...	3.07	2.2	11.0					AL..-4U (LH)
		5.5	4UE5.5ISO...	3.37	2.3	11.0	YE4U	YI4U			
		6.0	4UE6.0ISO...	3.68	2.6	11.0					
 U	27	8.0	5UE8.0ISO...	4.91	2.4	13.7	YE5U	YI5U			AL..-5U (LH)

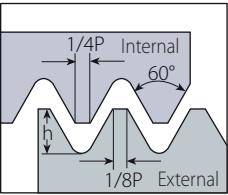
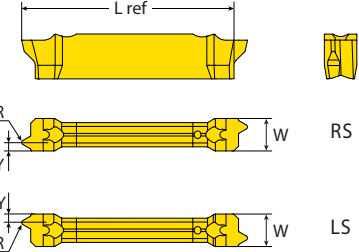
**Slim Throat**

	Insert Size		Pitch	Ordering Code		Dimensions mm					Toolholder
	IC	L mm	mm	RH	LH	h min	X	Y	T		
 V	11	0.75	2VER0.75ISO...	2VEL0.75ISO...	0.46	0.7	2.6	3.2			NL..-2V (LH)
		1.0	2VER1.0ISO...	2VEL1.0ISO...	0.61	0.7	2.5	3.2			
		1.5	2VER1.5ISO...	2VEL1.5ISO...	0.92	0.7	2.2.	3.2			
		1.75	2VER1.75ISO...	2VEL1.75ISO...	1.07	0.7	2.1	3.2			
		2.0	2VER2.0ISO...	2VEL2.0ISO...	1.23	0.7	1.9	3.2			
 V	16	0.35	3VER0.35ISO...	3VEL0.35ISO...	0.20	1.1	3.25	3.6			NL..-3V (LH)
		0.4	3VER0.4ISO...	3VEL0.4ISO...	0.25	1.1	3.20	3.6			
		0.5	3VER0.5ISO...	3VEL0.5ISO...	0.31	1.1	3.0	3.6			
		0.75	3VER0.75ISO...	3VEL0.75ISO...	0.46	1.1	3.0	3.6			
		0.8	3VER0.8ISO...	3VEL0.8ISO...	0.49	1.1	3.0	3.6			
		1.0	3VER1.0ISO...	3VEL1.0ISO...	0.61	1.1	2.9	3.6			
		1.25	3VER1.25ISO...	3VEL1.25ISO...	0.77	1.1	2.7	3.6			
		1.5	3VER1.5ISO...	3VEL1.5ISO...	0.92	1.1	2.6	3.6			
		1.75	3VER1.75ISO...	3VEL1.75ISO...	1.07	1.1	2.45	3.6			
		2.0	3VER2.0ISO...	3VEL2.0ISO...	1.23	1.1	2.3	3.6			
		2.5	3VER2.5ISO...	3VEL2.5ISO...	1.53	1.1	2.1	3.6			
		3.0	3VER3.0ISO...	3VEL3.0ISO...	1.84	1.1	2.0	3.6			

**V Style**

	Insert Size		Pitch	Ordering Code		Dimensions mm					Toolholder
	IC	L mm	mm	RH	LH	h min	X	Y	T		
 V	27	5.5	5VER5.5ISO...	5VEL5.5ISO...	3.37	1.0	3.3	6			NL..-5V-6 (LH)
		6.0	5VER6.0ISO...	5VEL6.0ISO...	3.68	1.0	3.3	6			
		8.0	5VER8.0ISO...	5VEL8.0ISO...	4.91	1.0	4.3	8			
		10.0	5VER10.0ISO...	5VEL10.0ISO...	6.13	1.0	5.2	10			

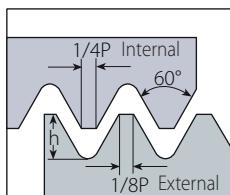
**ISO Metric (con't)**

External	RS/LS
 <p>Defined by: R262 (DIN 13) Tolerance class: 6g/6H</p>	<b>RS/LS</b> Varied range of threading standards for machining between shoulders and close to spindle. 

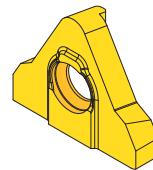
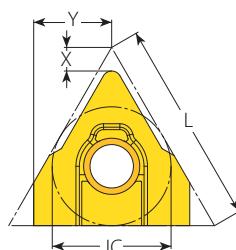
**VG-Cut**

Pocket Size	Ordering Code	Dimensions mm					No. of Passes	Helix	Min. Thread Diameter	Toolholder
		RH	W ref	Pitch mm	h min	Y				
3	VGD3.0ISO0.50RH-RS/LS...			0.50	0.31	0.53	5 - 7		M3x0.5	Monoblock
	VGD3.0ISO0.75RH-RS/LS...			0.75	0.46	0.64	5 - 8		M5x0.75	
	VGD3.0ISO1.00RH-RS/LS...			1.00	0.61	0.74	5 - 9		M6x1	
	VGD3.0ISO1.25RH-RS/LS...	3.00		1.25	0.77	0.85	6 - 10		M8x1.25	
	VGD3.0ISO1.50RH-RS/LS...			1.50	0.92	1.10	7 - 12	2.5°	M10x1.5 Coarse	
	VGD3.0ISO1.75RH-RS/LS...			1.75	1.07	1.20	8 - 14		M12x1.75 Coarse	
	VGD3.0ISO2.00RH-RS/LS...			2.00	1.23	1.30	9 - 14		M16x2.0 Coarse	
	VGD3.0ISO2.50RH-RS/LS			2.50	1.53	1.55	8 - 14		M18x2.5 Coarse	

LH Helix threads available upon request.

**ISO Metric (con't)****MEGA LINE****External**

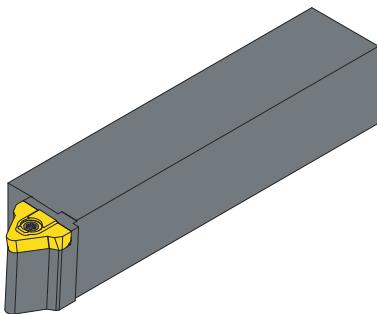
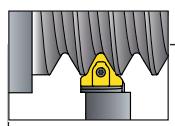
Defined by: R262 (DIN 13)  
Tolerance class: 6g/6H



Mega Line

**External**

	Insert Size		Pitch	Ordering Code		Dimensions mm			Number of Passes	
	IC	L mm	mm	RH	h min	X	Y	0.07mm-Min. Depth of Cut (On radius)	0.15mm-Max. Depth of Cut (On radius)	
5/8" MG	27	12.0	5MGER12.0ISO...		7.36	4.08		105	49	
			5MGER16.0ISO...		9.82	4.66		140	66	
			5MGER18.0ISO...		11.04	4.95		158	74	
			5MGER20.0ISO...		12.27	5.24		175	82	
			5MGER25.0ISO...		15.34	4.46		219	102	

**External Toolholders for ISO Metric****MEGA LINE****External****Spare Parts**

Insert	Ordering Code		Dimensions mm			Thread Diameter Range (Min.)	Insert Screw	Torx Key		
	RH	H=B=H1	F	L1	L2					
5MGER12.0ISO...	NL25-5MG12ISO	25	16.5	155		22 M43x12	S5MG	K6T		
	NL32-5MG12ISO	32	23.5	175						
	NL40-5MG12ISO	40	31.5	205						
5MGER16.0ISO...	NL25-5MG16ISO	25	16.5	155		22 M57x16				
	NL32-5MG16ISO	32	23.5	175						
	NL40-5MG16ISO	40	31.5	205						
5MGER18.0ISO...	NL25-5MG18ISO	25	16.5	155		22 M65x18				
	NL32-5MG18ISO	32	23.5	175						
	NL40-5MG18ISO	40	31.5	205						
5MGER20.0ISO...	NL25-5MG20ISO	25	16.5	155		22 M72x20				
	NL32-5MG20ISO	32	23.5	175						
	NL40-5MG20ISO	40	31.5	205						
5MGER25.0ISO...	NL25-5MG25ISO	25	16.5	155		22 M90x25				
	NL32-5MG25ISO	32	23.5	175						
	NL40-5MG25ISO	40	31.5	205						

Recommended thread infeed method for Mega Line: Flank or Modified Flank 1°.

**ISO Metric (con't)**

**External**

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

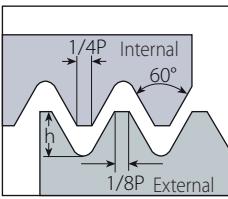
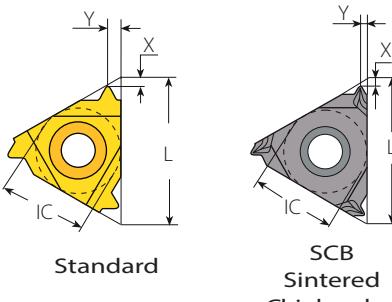
**M+ Style****Multiplus****F-LINE**

	Insert Size		Pitch	Teeth	Ordering Code		Dimensions mm			Anvil	Toolholder
	IC	L mm	mm	RH	h min	X	Y	RH			
	3/8"	16	1.0	3	3ER1.0ISO3M+...	0.61	1.8	2.6			
			1.5	2	3ER1.5ISO2M+...	0.92	1.6	2.4	YE3M		AL..-3
			2.0	2	3ER2.0ISO2M+...	1.23	2.1	3.1			
	1/2"	22	1.5	3	4ER1.5ISO3M+...	0.92	2.5	3.8			
			2.0	2	4ER2.0ISO2M+...	1.23	2.1	3.1	YE4M		AL..-4
			2.0	3	4ER2.0ISO3M+...	1.23	3.2	5.1			
	1/2" F	23	2.5	2	4ER2.5ISO2M+...	1.53	2.5	3.9			
			2.0	2	4FER2.0ISO2M+...	1.23	2.1	3.1	YE4M2F		AL..-4MF
	5/8"	27	2.0	3	4FER2.0ISO3M+...	1.23	3.2	5.1	YE4M3F		
			3.0	2	5ER3.0ISO2M+...	1.84	3.0	4.7	YE5M		AL..-5M

**T+ Style****Multiplus**

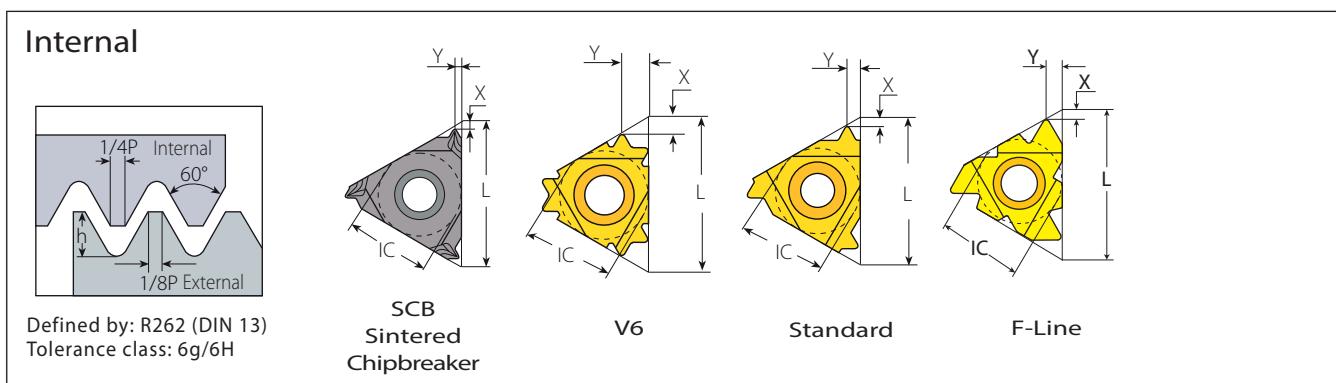
	Insert Size		Pitch	Teeth	Ordering Code		Dimensions mm			Anvil	Toolholder
	IC	L mm	mm	RH	h min	X	Y	RH			
	1/2" T	22	1.5	8	4ER1.5ISO8T+...	0.92	0.2	12.4			
			2.0	8	4ER2.0ISO8T+...	1.23	0.2	17.5	Y4T		AL..-4T

**ISO Metric (con't)**

Internal										
 <p>Defined by: R262 (DIN 13) Tolerance class: 6g/6H</p>										
 <p>Standard SCB Sintered Chipbreaker</p>										

**Standard**

Insert Size	Pitch			Ordering Code			Dimensions mm			Anvil		
	IC	L mm	mm	RH	LH	h min	X	Y	RH	LH	Toolholder	
  <b>1/4"</b>	11		0.35	2IR0.35ISO...	2IL0.35ISO...	0.20	0.8	0.3	-	-	NVR..-2 (LH)	
			0.4	2IR0.4ISO...	2IL0.4ISO...	0.23	0.8	0.4				
			0.45	2IR0.45ISO...	2IL0.45ISO...	0.26	0.8	0.4				
			0.5	2IR0.5ISO...	2IL0.5ISO...	0.29	0.6	0.4				
			0.6	2IR0.6ISO...	2IL0.6ISO...	0.35	0.6	0.6				
			0.7	2IR0.7ISO...	2IL0.7ISO...	0.40	0.6	0.6				
			0.75	2IR0.75ISO...	2IL0.75ISO...	0.43	0.6	0.6				
			0.8	2IR0.8ISO...	2IL0.8ISO...	0.46	0.6	0.6				
			1.0	2IR1.0ISO...	2IL1.0ISO...	0.58	0.6	0.7				
			1.25	2IR1.25ISO...	2IL1.25ISO...	0.72	0.8	0.9				
			1.5	2IR1.5ISO...	2IL1.5ISO...	0.87	0.8	1.0				
  <b>1/4" SCB</b>	11		0.5	2JIR0.5ISO...		0.29	1.2	0.5	-	-	NVR..-2	
			0.75	2JIR0.75ISO...		0.43	1.2	0.5				
			0.8	2JIR0.8ISO...		0.46	1.2	0.5				
			1.0	2JIR1.0ISO...		0.58	0.7	0.8				
			1.25	2JIR1.25ISO...		0.72	0.7	0.8				
			1.5	2JIR1.5ISO...		0.87	0.7	0.8				
  <b>3/8" SCB</b>	16		0.35	3IR0.35ISO...	3IL0.35ISO...	0.20	0.8	0.3	YI3	YE3	AVR..-3 (LH)	
			0.4	3IR0.4ISO...	3IL0.4ISO...	0.23	0.8	0.4				
			0.45	3IR0.45ISO...	3IL0.45ISO...	0.26	0.8	0.4				
			0.5	3IR0.5ISO...	3IL0.5ISO...	0.29	0.6	0.4				
			0.6	3IR0.6ISO...	3IL0.6ISO...	0.35	0.6	0.6				
			0.7	3IR0.7ISO...	3IL0.7ISO...	0.40	0.6	0.6				
			0.75	3IR0.75ISO...	3IL0.75ISO...	0.43	0.6	0.6				
			0.8	3IR0.8ISO...	3IL0.8ISO...	0.46	0.6	0.6				
			1.0	3IR1.0ISO...	3IL1.0ISO...	0.58	0.6	0.7				
			1.25	3IR1.25ISO...	3IL1.25ISO...	0.72	0.8	0.9				
			1.5	3IR1.5ISO...	3IL1.5ISO...	0.87	0.8	1.0				
			1.75	3IR1.75ISO...	3IL1.75ISO...	1.01	0.9	1.2				
			2.0	3IR2.0ISO...	3IL2.0ISO...	1.15	1.0	1.3				
			2.5	3IR2.5ISO...	3IL2.5ISO...	1.44	1.1	1.5				
			3.0	3IR3.0ISO...	3IL3.0ISO...	1.73	1.1	1.5				
			3.5	3IR3.5ISO...	3IL3.5ISO...	2.02	1.2	1.5				

**ISO Metric (con't)****Standard**

	Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
	IC	L mm	mm	RH	LH	h min	X	Y	RH	LH	Toolholder	
	3/8"	16	1.0	3JIR1.0ISO...		0.58	0.7	0.8	YI3	-	AVR..-3	
			1.25	3JIR1.25ISO...		0.72	0.7	0.8				
			1.5	3JIR1.5ISO...		0.87	0.7	0.8				
			1.75	3JIR1.75ISO...		1.01	1.1	1.5				
			2.0	3JIR2.0ISO...		1.15	1.1	1.5				
			2.5	3JIR2.5ISO...		1.44	1.1	1.5				
			3.0	3JIR3.0ISO...		1.73	1.1	1.5				
			3.5	3JIR3.5ISO...		2.02	1.2	1.5				
	3/8"	16	0.5	3IR0.5ISO-6C...		0.29	2.1	1.7	YI3-6C	-	AVR..-3 NVRC..-3 206/	
			0.75	3IR0.75ISO-6C...		0.43	2.0	1.8				
			0.8	3IR0.8ISO-6C...		0.46	1.9	1.8				
			1.0	3IR1.0ISO-6C...		0.58	2.0	2.0				
			1.25	3IR1.25ISO-6C...		0.72	1.8	2.2				
			1.5	3IR1.5ISO-6C...		0.87	1.6	2.3				
			1.75	3IR1.75ISO-6C...		1.01	1.6	2.4				
			2.0	3IR2.0ISO-6C...		1.15	1.7	2.6				
	1/2"	22	3.5	4IR3.5ISO...	4IL3.5ISO...	2.02	1.6	2.3	YI4	YE4	AVR..-4 (LH)	
			4.0	4IR4.0ISO...	4IL4.0ISO...	2.31	1.6	2.3				
			4.5	4IR4.5ISO...	4IL4.5ISO...	2.60	1.6	2.4				
			5.0	4IR5.0ISO...	4IL5.0ISO...	2.89	1.6	2.3				
			5.5	4IR5.5ISO...	4IL5.5ISO...	3.17	1.6	2.3				
			6.0	4IR6.0ISO...	4IL6.0ISO...	3.46	1.8	2.5				
	1/2"	23	3.5	4FIR3.5ISO...		2.02	1.6	2.3	YI4F	-	AVRC...-4F	
			4	4FIR4.0ISO...		2.31	1.6	2.3				
			4.5	4FIR4.5ISO...		2.60	1.6	2.4				
			5	4FIR5.0ISO...		2.89	1.6	2.3				
			5.5	4FIR5.5ISO...		3.18	1.6	2.3				
			6	4FIR6.0ISO...		3.46	1.8	2.5				
	5/8"	27	4.5	5IR4.5ISO...	5IL4.5ISO...	2.60	1.6	2.4	YI5	YE5	AVR..-5 (LH)	
			5.0	5IR5.0ISO...	5IL5.0ISO...	2.89	1.6	2.3				
			5.5	5IR5.5ISO...	5IL5.5ISO...	3.17	1.6	2.3				
			6.0	5IR6.0ISO...	5IL6.0ISO...	3.46	1.8	2.5				

**ISO Metric (con't)**

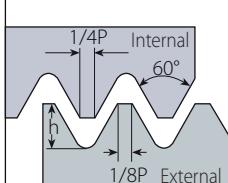
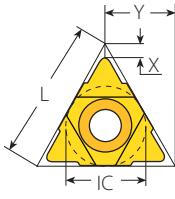
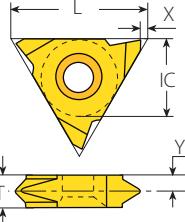
**Internal**

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

**D-Line Deep Rack****D-Line**

Insert Size	Pitch	Ordering Code		Dimensions mm			Anvil			
		IC	L mm	mm	RH	h min	X	Y	RH	Toolholder
1/4"	11		1.0		2DIR1.0ISO...	0.58	0.6	0.7	NVR..-2	
			1.25		2DIR1.25ISO...	0.72	0.8	0.9		
			1.5		2DIR1.5ISO...	0.87	0.9	1.0		
			2.0		2DIR2.0ISO...	1.15	1.1	0.9		
3/8"	16		1.0		3DIR1.0ISO...	0.58	0.6	0.7	YI3	AVR..-3
			1.5		3DIR1.5ISO...	0.87	0.8	1.0		
			1.75		3DIR1.75ISO...	1.01	0.9	1.2		
			2.0		3DIR2.0ISO...	1.15	1.0	1.3		
			2.5		3DIR2.5ISO...	1.44	1.1	1.5		
			3.0		3DIR3.0ISO...	1.73	1.1	1.5		
1/2"	22		3.5		4DIR3.5ISO...	2.02	1.6	2.3	YI4	AVR..-4
			4.0		4DIR4.0ISO...	2.31	1.6	2.3		

**ISO Metric (con't)**

Internal		U Style	V Style
	Defined by: R262 (DIN 13) Tolerance class: 6g/6H		

**U Style**

Insert Size		Pitch	Ordering Code		Dimensions mm			Anvil		
IC	L mm	mm	RH	LH	h min	X	Y	RH	LH	Toolholder
1/2"U	22	5.5	4UI5.5ISO...		3.17	2.4	11.0	YI4U	YE4U	AVR..-4U (LH)
		6.0	4UI6.0ISO...		3.46	2.1	11.0			
5/8"U	27	8.0	5UI8.0ISO...		4.62	2.4	13.7	YI5U	YE5U	AVR..-5U (LH)

**V Style**

Insert Size		Pitch	Ordering Code			Dimensions mm				
IC	L mm	mm	RH	LH	h min	X	Y	T	Toolholder	
5/8"V	27	6.0	5VIR6.0ISO...	5VIL6.0ISO...	3.46	1.0	3.3	6	NVR..-5V (LH)	
		8.0	5VIR8.0ISO...	5VIL8.0ISO...	4.62	1.0	4.3	8		
		10.0	5VIR10.0ISO...	5VIL10.0ISO...	5.77	1.0	5.2	10		

**ISO Metric (con't)**

**Internal**

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

M+ Style      F-Line M+      T+ Style

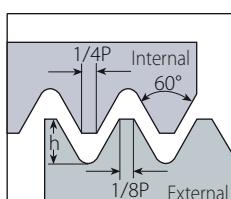
**M+ Style**

FLINE

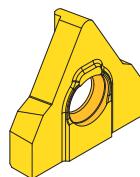
Insert Size	Pitch	Teeth	Ordering Code	Dimensions mm			Anvil				
				IC	L mm	mm	RH	h min	X	Y	RH
3/8"	16	1.0	3	3IR1.0ISO3M+...	0.58	1.7	2.6	YI3M	AVR..-3		
		1.5	2	3IR1.5ISO2M+...	0.87	1.6	2.4				
		2.0	2	3IR2.0ISO2M+...	1.15	2.0	3.1				
1/2"	22	1.5	3	4IR1.5ISO3M+...	0.87	2.5	3.8	YI4M	AVR..-4		
		2.0	2	4IR2.0ISO2M+...	1.15	2.0	3.1				
		2.0	3	4IR2.0ISO3M+...	1.15	3.2	5.1				
1/2" F	23	2.0	2	4FIR2.0ISO2M+...	1.15	2	3.1	YI4M2F	AVRC...-4MF		
5/8"	27	3.0	2	5IR3.0ISO2M+...	1.73	3.0	4.7	YI5M	AVR..-5M		

**T+ Style**

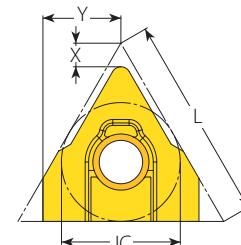
Insert Size	Pitch	Teeth	Ordering Code	Dimensions mm			Anvil				
				IC	L mm	mm	RH	h min	X	Y	RH
1/2"	22	1.5	8	4IR1.5ISO8T+...	0.87	0.2	12.4	Y4T	AVR..-4T		
		2.0	8	4IR2.0ISO8T+...	1.15	0.2	17.5				

**ISO Metric (con't)****MEGALINE****Internal**

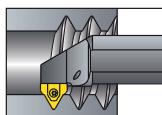
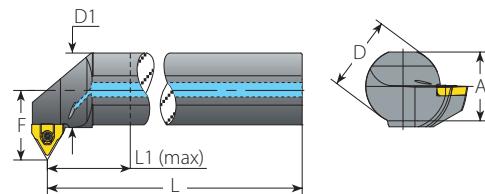
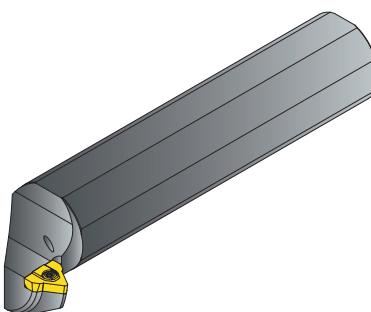
Defined by: R262 (DIN 13)  
Tolerance class: 6g/6H



Mega Line

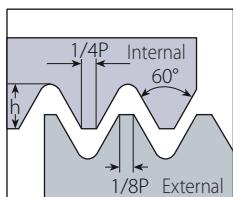
**Internal**

	Insert Size		Pitch	Ordering Code		Dimensions mm			Number of Passes	
	IC	L mm	mm	RH	h min	X	Y	0.07mm-Min. Depth of Cut (On radius)	0.15mm-Max. Depth of Cut (On radius)	
5/8" MG	27	12.0	5MGIR12.0ISO...		6.94	2.65		99	46	
			5MGIR16.0ISO...		9.32	3.01		132	62	
			5MGIR18.0ISO...		10.49	3.15	10.4	149	69	
			5MGIR20.0ISO...		11.63	3.29		165	77	
			5MGIR25.0ISO...		14.57	3.65		206	96	

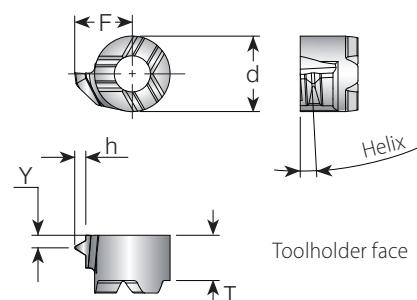
**Internal Toolholders for ISO Metric****MEGALINE****Internal****Spare Parts**

Insert	Ordering Code	Dimensions mm					Min. Bore Dia. mm	Thread Diameter Range (Min.-Max.)		Insert Screw	Torx Key	
		RH	A	L	L1 (max)	D	D1	F	mm	Short Chip Material	Long Chip Material	
5MGIR12.0ISO...	NVRC40-5MG12ISO	36	232.5	100	40	39.7	41.5	60.0	(M73-90)x12	(M85-90)x12	S5MG	K6T
	NVRC50-5MG12ISO	46	257.5	125	50	49.7	46.5	70.0	(M83-90)x12	(M83-90)x12		
5MGIR16.0ISO...	NVRC40-5MG16ISO	36	232.5	100	40	39.7	41.5	59.7	(M77-190)x16	(M89-190)x16	S5MG	K6T
	NVRC50-5MG16ISO	46	257.5	125	50	49.7	46.5	69.7	(M87-190)x16	(M101-190)x16		
5MGIR18.0ISO...	NVRC60-5MG16ISO	57	282.5	150	60	59.7	51.5	79.7	(M97-190)x16	(M113-190)x16	S5MG	K6T
	NVRC40-5MG18ISO	36	232.5	100	40	39.7	41.5	65.5	(M85-230)x18	(M91-230)x18		
5MGIR18.0ISO...	NVRC50-5MG18ISO	46	257.5	125	50	49.7	46.5	69.5	(M89-230)x18	(M103-230)x18		
	NVRC60-5MG18ISO	57	282.5	150	60	59.7	51.5	79.5	(M99-230)x18	(M115-230)x18		
5MGIR20.0ISO...	NVRC40-5MG20ISO	36	232.5	100	40	39.7	41.5	70.4	(M92-290)x20	(M93-290)x20	S5MG	K6T
	NVRC50-5MG20ISO	46	257.5	125	50	49.7	46.5	70.4	(M92-290)x20	(M105-290)x20		
5MGIR20.0ISO...	NVRC60-5MG20ISO	57	282.5	150	60	59.7	51.5	79.4	(M101-290)x20	(M117-290)x20		
	NVRC40-5MG25ISO	36	232.5	100	40	39.7	41.5	82.0	(M109-405)x25	(M109-405)x25		
5MGIR25.0ISO...	NVRC50-5MG25ISO	46	257.5	125	50	49.7	46.5	82.0	(M109-405)x25	(M110-405)x25		
	NVRC60-5MG25ISO	57	282.5	150	60	59.7	51.5	82.0	(M109-405)x25	(M122-405)x25		

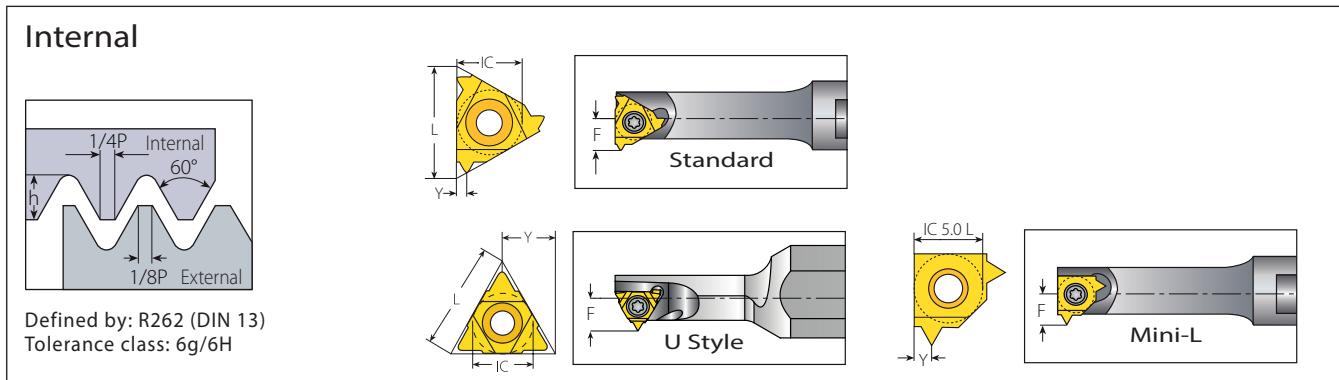
Recommended thread infeed method for Mega Line: Flank or Modified Flank 1°.

**ISO Metric (con't)****Mini-V****Internal**

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

**Mini-V**

Min. Thread	Insert Style	Pitch	Ordering Code	Dimensions mm					Helix	Toolholder	
				mm	RH	d	T	F	Y	h min	Deg.
M8x0.5	V08	0.5	V08TH0.50ISOR...	6	3.8	6	3.8	3.86	0.35	0.29	1
M8.5x0.75		0.75	V08TH0.75ISOR...					4.19	0.5	0.43	1.5
M9x1.0		1.0	V08TH1.0ISOR...					4.29	0.5	0.58	2
M10x1.25		1.25	V08TH1.25ISOR...					4.44	0.8	0.72	2.5
M10x1.5		1.5	V08TH1.5ISOR...					4.58	0.9	0.87	3
M12x1.75		1.75	V08TH1.75ISOR...					4.80	0.9	1.01	3
M14x2.0	V11	2.0	V11TH2.0ISOR...	8	4.2	8	4.2	6.47	1.1	1.15	2.5

**ISO Metric (con't)****MINIPRO****Mini-3 Standard**

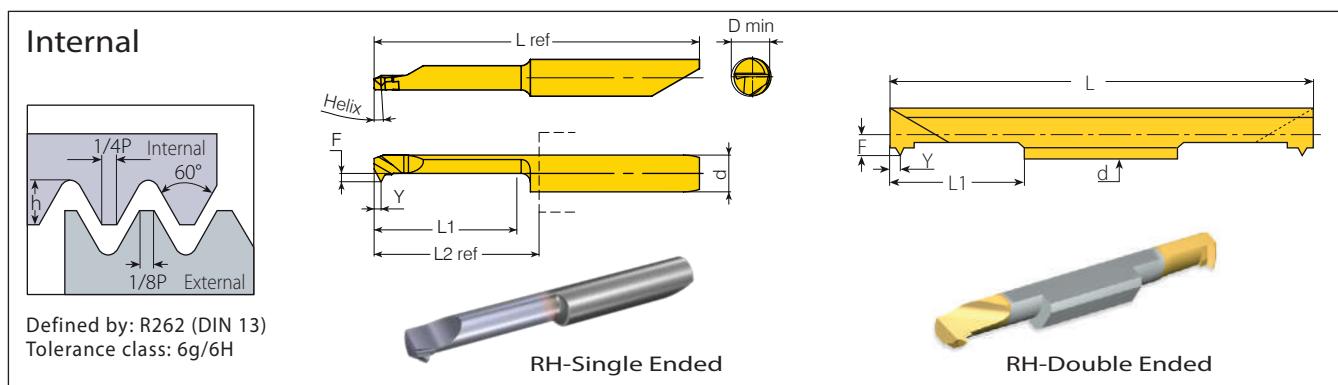
		Insert Size		Pitch		Ordering Code		Dimensions mm			Min. Bore Dia.	
		IC mm	L mm	mm	RH	LH	h min	Y	F	mm	Toolholder	
4.0	6	4.0	6	0.25	4.0KIR0.25ISO...	4.0KIL0.25ISO...	0.15	0.25	3.3	5.95		
				0.5	4.0KIR0.5ISO...	4.0KIL0.5ISO...	0.29	0.5	3.4	6.05		
				0.75	4.0KIR0.75ISO...	4.0KIL0.75ISO...	0.43	0.5	3.5	6.15	.NVR.5-4.0K (LH)	
				1.0	4.0KIR1.0ISO...	4.0KIL1.0ISO...	0.58	0.7	3.6	6.25		
				1.25	4.0KIR1.25ISO...	4.0KIL1.25ISO...	0.72	0.6	3.7	6.35		
5.0	8	5.0	8	0.5	5.0KIR0.5ISO...	5.0KIL0.5ISO...	0.29	0.5				
				0.75	5.0KIR0.75ISO...	5.0KIL0.75ISO...	0.43	0.5				
				1.0	5.0KIR1.0ISO...	5.0KIL1.0ISO...	0.58	0.6				
				1.25	5.0KIR1.25ISO...	5.0KIL1.25ISO...	0.72	0.7				
				1.5	5.0KIR1.5ISO...	5.0KIL1.5ISO...	0.87	0.7				
				1.75	5.0KIR1.75ISO...	5.0KIL1.75ISO...	1.01	0.8				
6.0	10	6.0	10	0.5	6.0KIR0.5ISO...	6.0KIL0.5ISO...	0.29	0.6	4.4	9.3		
				0.75	6.0KIR0.75ISO...	6.0KIL0.75ISO...	0.43	0.6	4.6	9.5		
				1.0	6.0KIR1.0ISO...	6.0KIL1.0ISO...	0.58	0.7	4.7	9.6		
				1.25	6.0KIR1.25ISO...	6.0KIL1.25ISO...	0.72	0.9	4.9	9.8	.NVRC1.-6.0K (LH)	
				1.5	6.0KIR1.5ISO...	6.0KIL1.5ISO...	0.87	1.0	5.0	9.9		
				1.75	6.0KIR1.75ISO...	6.0KIL1.75ISO...	1.01	1.05	5.2	10.0		
				2.0	6.0KIR2.0ISO...	6.0KIL2.0ISO...	1.15	1.05	5.3	10.0		

**Mini-3 U Style**

		Insert Size		Pitch		Ordering Code		Dimensions mm			Min. Bore Dia.	
		IC mm	L mm	mm	RH+LH		h min	Y	F	mm	Toolholder	
		5.0U	8	2	5.0KUI2.0ISO...		1.23	4.0	5.7	9.0	.NVRC8-5.0KU (LH)	

**Mini-L**

		Insert Size		Pitch		Ordering Code		Dimensions mm			Min. Bore Dia.	
		IC mm	L mm	mm	RH	LH	h min	Y	F	mm	Toolholder	
5.0L	5.0L	5.0	5.0	0.35	5LKIR0.35ISO...	5LKIL0.35ISO...	0.20	0.3	3.75	7.3		
				0.5	5LKIR0.5ISO...	5LKIL0.5ISO...	0.29	0.4	3.75	7.3		
				0.75	5LKIR0.75ISO...	5LKIL0.75ISO...	0.43	0.6	3.91	7.5		
				1.0	5LKIR1.0ISO...	5LKIL1.0ISO...	0.58	0.7	4.06	7.7		
				1.25	5LKIR1.25ISO...	5LKIL1.25ISO...	0.72	0.9	4.21	7.8	.NVRC10.-5LK (LH)	
				1.5	5LKIR1.5ISO...	5LKIL1.5ISO...	0.87	1.0	4.35	7.9		
				1.75	5LKIR1.75ISO...	5LKIL1.75ISO...	1.01	1.05	4.51	8.0		
				2.0	5LKIR2.0ISO...	5LKIL2.0ISO...	1.15	1.05	4.65	8.0		

**ISO Metric (con't)****MINIPRO****Micro - Double Ended**

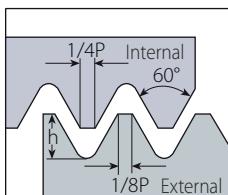
Thread	d mm	mm	Ordering Code		Dimensions mm					Min. Bore Dia.	
			RH	L1	L	F	Y	h min	mm	Toolholder	
M4x0.3		0.3	3.0SIR0.3ISO...	16	50	1.31	0.20	0.17	3.2		
M4x0.4		0.4	3.0SIR0.4ISO...	16	50	1.31	0.35	0.22	3.2		
M4x0.5		0.5	3.0SIR0.5ISO...	16	50	1.31	0.40	0.29	3.2		
M4x0.6	3.0	0.6	3.0SIR0.6ISO...	16	50	1.34	0.60	0.35	3.2		SMC..-3.0
M4.5x0.7		0.7	3.0SIR0.7ISO...	16	50	1.43	0.60	0.40	3.3		
M4.5x0.75		0.75	3.0SIR0.75ISO...	16	50	1.45	0.60	0.43	3.3		
M5x0.8		0.8	3.0SIR0.8ISO...	16	50	1.46	0.60	0.46	3.3		
M5x0.4		0.4	4.0SIR0.4ISO...	16	50	1.65	0.35	0.22	4.0		
M5x0.5		0.5	4.0SIR0.5ISO...	16	50	1.65	0.40	0.29	4.0		
M5x0.6		0.6	4.0SIR0.6ISO...	16	50	1.68	0.60	0.35	4.0		
M5x0.7	4.0	0.7	4.0SIR0.7ISO...	16	50	1.77	0.60	0.40	4.1		SMC..-4.0
M5.5x0.75		0.75	4.0SIR0.75ISO...	16	50	1.81	0.60	0.43	4.2		
M5.5x0.8		0.8	4.0SIR0.8ISO...	16	50	1.80	0.60	0.46	4.2		
M6x1		1.0	4.0SIR1.0ISO...	16	50	1.96	0.90	0.58	4.3		
M6x0.5		0.5	6.0SIR0.5ISO...	16	50	1.90	0.60	0.29	5.4		
M6.5x0.75		0.75	6.0SIR0.75ISO...	16	50	2.06	0.60	0.43	5.6		
M7x1	6.0	1.0	6.0SIR1.0ISO...	16	50	2.21	0.70	0.58	5.7		SMC..-6.0
M8x1.25		1.25	6.0SIR1.25ISO...	16	50	2.36	0.90	0.72	5.9		
M10.5x1.5		1.5	6.0SIR1.5ISO...	16	50	2.50	1.00	0.87	6.0		

Left handed tool supplied by request (Example: 3.0SIL0.3ISO...)

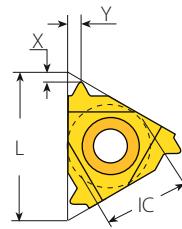
**Micro - Single Ended****microscope**

Thread	d mm	mm	Ordering Code		Dimensions mm					Min. Bore Dia.		
			RH/LH	Helix °	L1	F	Y	h min	L2 ref*	L ref	D mm	Toolholder
M3-M5x0.5		0.5	M425TH0.50ISOL08R...	3	7.6	1.95	0.4	0.58	13.0	29.8	2.46	
M4x0.7		0.7	M432TH0.70ISOL10R...	3.6	10.2	1.95	0.6	0.29			3.24	
M4x0.5		0.5	MS429TH0.50ISOL16R/L...			0.9	0.4	0.29			3.4	
M5x0.5		0.5	MS439TH0.50ISOL16R/L...			1.9	0.4	0.29			4.4	
M4x0.7	4.0	0.7	MS429TH0.70ISOL16R/L...			0.9	0.6	0.41	18.4	35.4	3.2	MH...-4.0
M4.5-M6x0.75		0.75	M429TH0.75ISOL16R...			1.9	0.6	0.44			3.1	
M5x0.8		0.8	MS429TH0.80ISOL16R/L...			0.9	0.6	0.46			4.0	
M6x1.0		1.0	MS439TH1.00ISOL16R/L...			1.9	0.7	0.58			4.8	
M5.5x0.5		0.5	M542TH0.50ISOL16R/L...	3.5		1.7	0.4	0.29			4.9	
M5.5x0.75	5.0	0.75	M542TH0.75ISOL16R/L...			1.7	0.6	0.43	18.35	41.2	4.6	MH...-5.0
M7x1.0		1.0	M549TH1.00ISOL16R/L...			2.4	0.7	0.58			5.8	
M6x0.5		0.5	M649TH0.50ISOL16R/L...			1.9	0.4	0.29			5.4	
M6.5x0.75		0.75	M649TH0.75ISOL16R/L...			1.9	0.6	0.43			5.6	
M7.5x1.0	6.0	1.0	M659TH1.00ISOL16R/L...			2.9	0.7	0.58	18.5	42.2	6.3	MH...-6.0
M8x1.25		1.25	M659TH1.25ISOL16R/L...			2.9	0.9	0.72			6.5	
M10x1.5		1.5	M659TH1.50ISOL16R/L...	3		2.9	1.0	0.87			8.3	

\* L2 Ref: Repeatability within +/-0.02.

**American UN - UNC, UNF, UNEF, UNS****External**

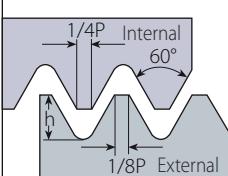
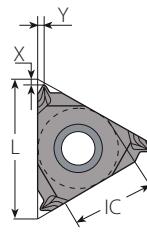
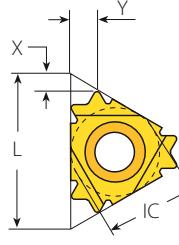
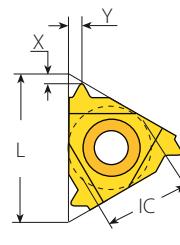
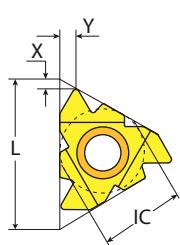
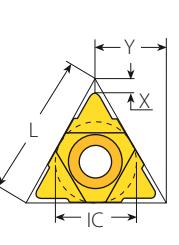
Defined by: ANSI B1.1:74  
Tolerance class: 2A/2B

**Standard****Standard**

Insert Size		Pitch	Ordering Code	Dimensions mm			Anvil			
IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder
1/4"	11	72	2ER72UN...	2EL72UN...	0.22	0.8	0.4	-	-	NL ..-2 (LH)
		64	2ER64UN...	2EL64UN...	0.24	0.8	0.4			
		56	2ER56UN...	2EL56UN...	0.28	0.7	0.4			
		48	2ER48UN...	2EL48UN...	0.32	0.6	0.6			
		44	2ER44UN...	2EL44UN...	0.35	0.6	0.6			
		40	2ER40UN...	2EL40UN...	0.39	0.6	0.6			
		36	2ER36UN...	2EL36UN...	0.43	0.6	0.6			
		32	2ER32UN...	2EL32UN...	0.49	0.6	0.6			
		28	2ER28UN...	2EL28UN...	0.56	0.6	0.7			
		27	2ER27UN...	2EL27UN...	0.58	0.7	0.8			
		24	2ER24UN...	2EL24UN...	0.65	0.7	0.8			
		20	2ER20UN...	2EL20UN...	0.78	0.8	0.9			
		18	2ER18UN...	2EL18UN...	0.87	0.8	1.0			
		16	2ER16UN...	2EL16UN...	0.97	0.9	1.1			
		14	2ER14UN...	2EL14UN...	1.11	0.9	1.1			
3/8"	16	80	3ER80UN...	3EL80UN...	0.18	0.8	0.3	YE3	YI3	AL..-3 (LH)
		72	3ER72UN...	3EL72UN...	0.22	0.8	0.4			
		64	3ER64UN...	3EL64UN...	0.24	0.8	0.4			
		56	3ER56UN...	3EL56UN...	0.28	0.7	0.4			
		48	3ER48UN...	3EL48UN...	0.32	0.6	0.6			
		44	3ER44UN...	3EL44UN...	0.35	0.6	0.6			
		40	3ER40UN...	3EL40UN...	0.39	0.6	0.6			
		36	3ER36UN...	3EL36UN...	0.43	0.6	0.6			
		32	3ER32UN...	3EL32UN...	0.49	0.6	0.6			
		28	3ER28UN...	3EL28UN...	0.56	0.6	0.7			
		27	3ER27UN...	3EL27UN...	0.58	0.7	0.8			
		26	3ER26UN...	3EL26UN...	0.59	0.7	0.8			
		24	3ER24UN...	3EL24UN...	0.65	0.7	0.8			
		20	3ER20UN...	3EL20UN...	0.78	0.8	0.9			
		18	3ER18UN...	3EL18UN...	0.87	0.8	1.0			
		16	3ER16UN...	3EL16UN...	0.97	0.9	1.1			
		14	3ER14UN...	3EL14UN...	1.11	1.0	1.2			
		13	3ER13UN...	3EL13UN...	1.20	1.0	1.3			
		12	3ER12UN...	3EL12UN...	1.30	1.1	1.4			
		11.5	3ER11.5UN...	3EL11.5UN...	1.35	1.1	1.5			
		11	3ER11UN...	3EL11UN...	1.42	1.1	1.5			
		10	3ER10UN...	3EL10UN...	1.56	1.1	1.5			
		9	3ER9UN...	3EL9UN...	1.73	1.2	1.7			
		8	3ER8UN...	3EL8UN...	1.95	1.2	1.6			



**American UN - UNC, UNF, UNEF, UNS (con't)**

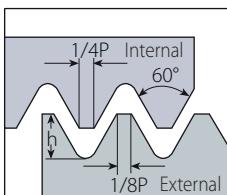
External											
 <p>Defined by: ANSI B1.1:74 Tolerance class: 2A/2B</p>											
 <p>SCB Sintered Chipbreaker</p>											
 <p>V6</p>											
 <p>Standard</p>											
 <p>F-Line</p>											
 <p>U Style</p>											

**Standard**

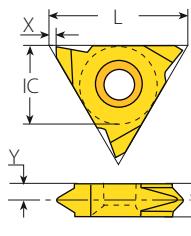
Insert Size	Pitch			Ordering Code		Dimensions mm			Anvil		
	IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder
 <p>SCB</p>	 <p>3/8" SCB</p>	 <p>16</p>	36	3JER36UN...		0.43	1.2	0.5			
			32	3JER32UN...		0.49	1.2	0.5			
			28	3JER28UN...		0.56	0.7	0.8			
			24	3JER24UN...		0.65	0.7	0.8			
			20	3JER20UN...		0.78	0.7	0.8			
			18	3JER18UN...		0.87	0.7	0.8			
			16	3JER16UN...		0.97	0.8	0.8	YE3	-	AL..-3
			14	3JER14UN...		1.11	1.2	1.5			
			13	3JER13UN...		1.20	1.2	1.5			
			12	3JER12UN...		1.30	1.3	1.5			
 <p>V6</p>	 <p>3/8" V6</p>	 <p>16</p>	32	3ER32UN-6C...		0.49	2.0	1.9			
			28	3ER28UN-6C...		0.56	2.0	2.0			
			24	3ER24UN-6C...		0.65	1.9	2.0			
			20	3ER20UN-6C...		0.78	1.8	2.1			
			18	3ER18UN-6C...		0.87	1.9	2.3	YE3-6C	-	AL..-3
			16	3ER16UN-6C...		0.97	1.8	2.4			
			14	3ER14UN-6C...		1.11	1.8	2.7			
			13	3ER13UN-6C...		1.20	1.9	2.9			
 <p>Standard</p>	 <p>1/2"</p>	 <p>22</p>	7	4ER7UN...	4EL7UN...	2.22	1.6	2.3			
			6	4ER6UN...	4EL6UN...	2.60	1.6	2.3	YE4	YI4	AL..-4 (LH)
			5	4ER5UN...	4EL5UN...	3.12	1.7	2.5			
			7	4FER7UN...		2.22	1.6	2.3			
 <p>F-Line</p>	 <p>1/2"F</p>	 <p>23</p>	6	4FER6UN...		2.60	1.6	2.3	YE4F		AL..-4F
			5	4FER5UN...		3.12	1.7	2.5			
			4.5	5ER4.5UN...	5EL4.5UN...	3.46	1.9	2.7	YE5	YI5	AL..-5 (LH)
			4	5ER4UN...	5EL4UN...	3.89	2.1	3.0			

**U Style**

Insert Size	Pitch			Ordering Code		Dimensions mm			Anvil		
	IC	L mm	TPI	RH+LH		h min	X	Y	RH	LH	Toolholder
 <p>U Style</p>	 <p>1/2"U</p>	 <p>22</p>	4.5	4UE4.5UN...		3.46	2.0	11.0			
			4	4UE4UN...		3.89	2.0	11.0	YE4U	YI4U	AL..-4U (LH)
5/8"U	27	3		5UE3UN...		5.19	2.5	13.7	YE5U	YI5U	AL..-5U (LH)

**American UN - UNC, UNF, UNEF, UNS (con't)****External**

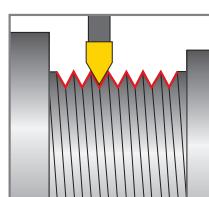
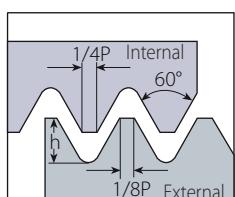
Defined by: ANSI B1.1:74  
Tolerance class: 2A/2B

**V Style / Slim Throat****Slim Throat**

Insert Size		Pitch		Ordering Code			Dimensions mm				Toolholder
IC	L mm	TPI	RH	LH	h min	X	Y	T			
1/4"V	11	20	2VER20UN...	2VEL20UN...	0.78	0.69	2.3	3.2		NL..-2V (LH)	
		18	2VER18UN...	2VEL18UN...	0.87	0.69	2.2	3.2			
		16	2VER16UN...	2VEL16UN...	0.97	0.69	2.2	3.2			
		14	2VER14UN...	2VEL14UN...	1.11	0.69	2.0	3.2			
		12	2VER12UN...	2VEL12UN...	1.30	0.69	1.8	3.2			
3/8"V	16	32	3VER32UN...	3VEL32UN...	0.48	1.1	3.0	3.6		NL..-3V (LH)	
		28	3VER28UN...	3VEL28UN...	0.56	1.1	3.0	3.6			
		24	3VER24UN...	3VEL24UN...	0.65	1.1	2.9	3.6			
		20	3VER20UN...	3VEL20UN...	0.78	1.1	2.7	3.6			
		18	3VER18UN...	3VEL18UN...	0.87	1.1	2.6	3.6			
		16	3VER16UN...	3VEL16UN...	0.97	1.1	2.55	3.6			
		14	3VER14UN...	3VEL14UN...	1.11	1.1	2.4	3.6			
		12	3VER12UN...	3VEL12UN...	1.30	1.1	2.2	3.6			
		10	3VER10UN...	3VEL10UN...	1.56	1.1	2.1	3.6			
		8	3VER8UN...	3VEL8UN...	1.95	1.1	2.0	3.6			
1/2"V	22	7	4VER7UN...	4VEL7UN...	2.22	1.1	2.5	4.8	NL..-4V (LH)		

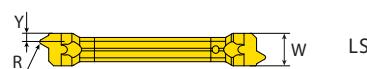
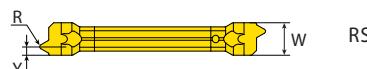
**V Style**

Insert Size		Pitch		Ordering Code			Dimensions mm				Toolholder
IC	L mm	TPI	RH	LH	h min	X	Y	T			
5/8"V	27	4	5VER4UN...	5VEL4UN...	3.89	1.0	3.3	6	NL..-5V-6 (LH)	NL..-5V-8 (LH)	
		3	5VER3UN...	5VEL3UN...	5.19	1.0	4.3	8	NL..-5V-8 (LH)		

**American UN - UNC, UNF, UNEF, UNS (con't)****External**

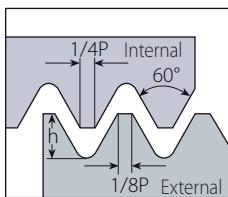
Defined by: ANSI B1.1:74  
Tolerance class: 2A/2B

**RS/LS** Varied range of threading standards for machining between shoulders and close to spindle.

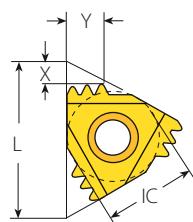
**VG-Cut**

Pocket Size	Ordering Code		Dimensions mm				No. of Passes	Helix	Min. Thread Diameter	Toolholder
	RH	W ref	Pitch TPI	h min	Y	L ref				
3	VGD3.0UN32RH-RS/LS...	3.00	32	0.49	0.66	21.9	5 - 8	2.5°	5/32"-32 UNC	VGE...-3T...
	VGD3.0UN28RH-RS/LS...		28	0.56	0.71		5 - 9		3/16"-28 UNC	
	VGD3.0UN24RH-RS/LS...		24	0.65	0.77		5 - 9		7/32"-24 UNC	
	VGD3.0UN20RH-RS/LS...		20	0.78	0.86		6 - 10		1/4"-20 UNC	
	VGD3.0UN18RH-RS/LS...		18	0.87	0.93		7 - 12		5/16"-18 UNC	
	VGD3.0UN16RH-RS/LS...		16	0.97	1.10		7 - 12		3/8"-16 UNC	
	VGD3.0UN14RH-RS/LS...		14	1.11	1.09		8 - 14		7/16"-14 UNC	
	VGD3.0UN12RH-RS/LS...		12	1.30	1.30		8 - 14		9/16"-14 UNC	

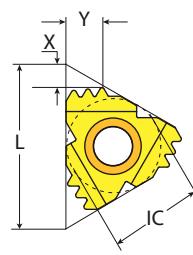
LH Helix threads available upon request.

**American UN - UNC, UNF, UNEF, UNS (con't)****External**

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



M+ Style



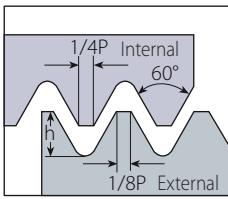
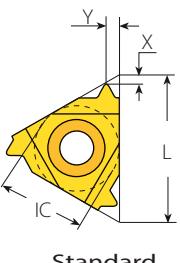
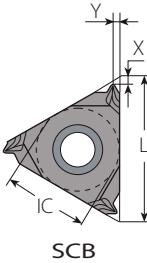
F-Line M+

**M+ Style****Multiplus**

Insert Size	Pitch	Teeth	Ordering Code	Dimensions mm			Anvil				
				IC	L mm	TPI	RH	h min	X	Y	RH
3/8"	16	20	3	3ER20UN3M+...	0.78	2.2	3.3				
		18	2	3ER18UN2M+...	0.87	1.5	2.2				
		18	3	3ER18UN3M+...	0.87	2.3	3.6				
		16	2	3ER16UN2M+...	0.97	1.7	2.5				YE3M
		14	2	3ER14UN2M+...	1.11	1.9	2.8				AL..-3
		12	2	3ER12UN2M+...	1.30	2.2	3.3				
1/2"	22	16	3	4ER16UN3M+...	0.97	2.6	4.1				
		14	2	4ER14UN2M+...	1.11	1.9	2.8				
		12	2	4ER12UN2M+...	1.30	2.2	3.3				YE4M
		12	3	4ER12UN3M+...	1.30	3.4	5.4				AL..-4
		11	2	4ER11UN2M+...	1.42	2.3	3.6				
		10	2	4ER10UN2M+...	1.56	2.5	3.9				
1/2" F	23	16	3	4FER16UN3M+...	0.97	2.6	4.1				YE4M3F
		12	3	4FER12UN3M+...	1.30	3.4	5.4				AL...-4MF
		12	2	4FER12UN2M+...	1.30	2.2	3.3				YE4M2F
		10	2	4FER10UN2M+...	1.56	2.5	3.9				
5/8"	27	8	2	5ER8UN2M+...	1.95	3.1	4.9	YE5M			AL..-5M

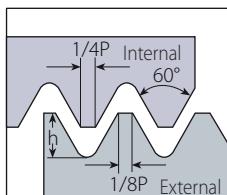
**F-LINE**

**American UN - UNC, UNF, UNEF, UNS (con't)**

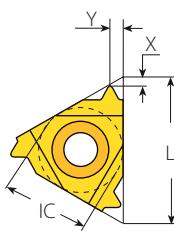
Internal									
		Defined by: ANSI B1.1:74		Tolerance class: 2A/2B					
						Standard			
						SCB Sintered Chipbreaker			

**Standard**

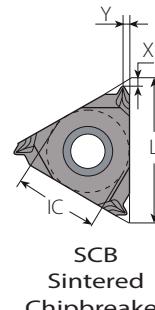
Insert Size	Pitch			Ordering Code			Dimensions mm			Anvil		
	IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder	
1/4"	11	28	72	2IR72UN...	2IL72UN...	0.20	0.8	0.3	-	-	NVR..-2 (LH)	
			64	2IR64UN...	2IL64UN...	0.23	0.8	0.4				
			56	2IR56UN...	2IL56UN...	0.26	0.7	0.4				
			48	2IR48UN...	2IL48UN...	0.31	0.6	0.6				
			44	2IR44UN...	2IL44UN...	0.33	0.6	0.6				
			40	2IR40UN...	2IL40UN...	0.37	0.6	0.6				
			36	2IR36UN...	2IL36UN...	0.41	0.6	0.6				
			32	2IR32UN...	2IL32UN...	0.46	0.6	0.6				
			28	2IR28UN...	2IL28UN...	0.52	0.6	0.7				
			27	2IR27UN...	2IL27UN...	0.54	0.7	0.8				
			24	2IR24UN...	2IL24UN...	0.61	0.7	0.8				
			20	2IR20UN...	2IL20UN...	0.73	0.8	0.9				
			18	2IR18UN...	2IL18UN...	0.81	0.8	1.0				
			16	2IR16UN...	2IL16UN...	0.92	0.9	1.1				
1/4" SCB	11	24	14	2IR14UN...	2IL14UN...	1.05	0.9	1.1	-	-	NVR..-2	
			12	2IR12UN...	2IL12UN...	1.22	0.8	1.1				
			11	2IR11UN...	2IL11UN...	1.33	0.8	1.1				
			36	2JIR36UN...		0.41	1.1	0.5				
			32	2JIR32UN...		0.46	1.2	0.5				
			28	2JIR28UN...		0.52	0.6	0.8				
			24	2JIR24UN...		0.61	0.7	0.8				
3/8"	16	24	20	2JIR20UN...		0.73	0.6	0.8	YI3	YE3	AVR..-3 (LH)	
			18	2JIR18UN...		0.81	0.6	0.8				
			16	2JIR16UN...		0.97	0.7	0.8				
			72	3IR72UN...	3IL72UN...	0.20	0.8	0.3				
			64	3IR64UN...	3IL64UN...	0.23	0.8	0.4				
			56	3IR56UN...	3IL56UN...	0.26	0.7	0.4				
			48	3IR48UN...	3IL48UN...	0.31	0.6	0.6				
			44	3IR44UN...	3IL44UN...	0.33	0.6	0.6				
			40	3IR40UN...	3IL40UN...	0.37	0.6	0.6				
			36	3IR36UN...	3IL36UN...	0.41	0.6	0.6				
			32	3IR32UN...	3IL32UN...	0.51	0.6	0.6				
			28	3IR28UN...	3IL28UN...	0.52	0.6	0.7				
			27	3IR27UN...	3IL27UN...	0.54	0.7	0.8				
			26	3IR26UN...	3IL26UN...	0.56	0.7	0.75				

**American UN - UNC, UNF, UNEF, UNS (con't)****Internal**

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



Standard

SCB  
Sintered  
Chipbreaker**Standard**

Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder	
	3/8"	16	24	3IR24UN...	3IL24UN...	0.61	0.7	0.8	YI3	YE3	AVR..-3 (LH)
			20	3IR20UN...	3IL20UN...	0.73	0.8	0.9			
			18	3IR18UN...	3IL18UN...	0.81	0.8	1.0			
			16	3IR16UN...	3IL16UN...	0.92	0.9	1.1			
			14	3IR14UN...	3IL14UN...	1.05	0.9	1.2			
			13	3IR13UN...	3IL13UN...	1.13	1.0	1.3			
			12	3IR12UN...	3IL12UN...	1.22	1.1	1.4			
			11.5	3IR11.5UN...	3IL11.5UN...	1.28	1.1	1.5			
			11	3IR11UN...	3IL11UN...	1.33	1.1	1.5			
			10	3IR10UN...	3IL10UN...	1.47	1.1	1.5			
	3/8" SCB	16	9	3IR9UN...	3IL9UN...	1.63	1.2	1.7	YI3	-	AVR..-3
			8	3IR8UN...	3IL8UN...	1.83	1.1	1.5			
			28	3JIR28UN...		0.52	0.6	0.8			
			24	3JIR24UN...		0.61	0.7	0.8			
			20	3JIR20UN...		0.73	0.6	0.8			
			18	3JIR18UN...		0.81	0.6	0.8			
			16	3JIR16UN...		0.92	0.7	0.8			
			14	3JIR14UN...		1.05	1.1	1.5			
			13	3JIR13UN...		1.13	1.1	1.5			
			12	3JIR12UN...		1.22	1.1	1.5			
			10	3JIR10UN...		1.47	1.1	1.5			
			9	3JIR9UN...		1.63	1.0	1.5			
			8	3JIR8UN...		1.83	1.1	1.5			



SCB

**American UN - UNC, UNF, UNEF, UNS (con't)**

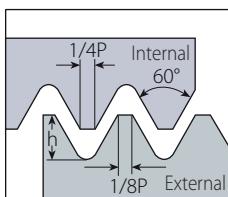
Internal		V6	Standard & D-Line	F-Line
Defined by: ANSI B1.1:74 Tolerance class: 2A/2B				

**Standard**

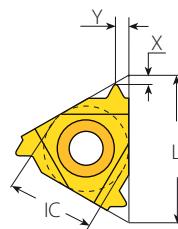
	Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
	IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder	
	3/8" V6	16	32	3IR32UN-6C...		0.51	2.0	1.8				
			28	3IR28UN-6C...		0.52	1.9	1.9				
			24	3IR24UN-6C...		0.61	1.9	1.9				
			20	3IR20UN-6C...		0.73	1.8	2.1				
			18	3IR18UN-6C...		0.81	1.7	2.1	YI3-6C	-	AVR..-3 NVRC..-3 206/...	
			16	3IR16UN-6C...		0.92	1.6	2.2				
			14	3IR14UN-6C...		1.05	1.7	2.5				
			13	3IR13UN-6C...		1.13	1.8	2.7				
	1/2"	22	12	3IR12UN-6C...		1.22	1.6	2.5				
			7	4IR7UN...	4IL7UN...	2.09	1.6	2.3	YI4	YE4	AVR..-4 (LH)	
			6	4IR6UN...	4IL6UN...	2.44	1.6	2.3				
			5	4IR5UN...	4IL5UN...	2.93	1.6	2.3				
	1/2" F	23	7	4FIR7UN...		2.09	1.6	2.3	YI4F		AVRC...-4F	
			6	4FIR6UN...		2.44	1.6	2.3				
			5	4FIR5UN...		2.93	1.6	2.3				
			4.5	5IR4.5UN...	5IL4.5UN...	3.26	1.7	2.4	YI5	YE5	AVR..-5 (LH)	
	5/8"	27	4	5IR4UN...	5IL4UN...	3.67	1.8	2.7				

**D-Line Deep Rake****D-Line**

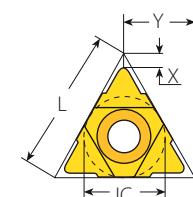
	Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
	IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder	
	1/4"	11	24	2DIR24UN...		0.61	0.7	0.8				
			20	2DIR20UN...		0.73	0.8	0.9	-		NVR..-2	
			18	2DIR18UN...		0.81	0.8	1.0				
			20	3DIR20UN...		0.73	0.8	0.9				
	3/8"	16	16	3DIR16UN...		0.92	0.9	1.1	YI3		AVR..-3	
			14	3DIR14UN...		1.05	0.9	1.2				
			12	3DIR12UN...		1.22	1.1	1.4				
			8	3DIR8UN...		1.83	1.1	1.5				

**American UNC (con't)****Internal**

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



Coarse Pitch



U Style Coarse Pitch

**Coarse Pitch RH**

Thread	Insert Size		Ordering Code		Dimensions mm			Min Bore Dia.	
	IC	L mm	RH	h min	X	Y	Toolholder RH	mm	
1/2"x13UN	6.0	10	6.0KIR13UN158/001...	1.13	0.8	0.9	BNVRC10S-6.0K	10.6	
9/16"x12UN	1/4"	11	2IR12UN158/002...	1.22	0.9	1.0	NVRC10-2-156/001	12.0	
5/8"x11UN	1/4"U		2UIR11UN158/003...	1.33	1.2	5.5	NVRC11-2U-156/002	13.4	
3/4"x10UN			3IR10UN...	1.47	1.1	1.5	NVRC13-3-156/016	16.3	
7/8"x9UN	3/8"	16	3IR9UN...	1.63	1.2	1.7	NVRC13-3-156/016	19.2	
1"x8UN			3IR8UN...	1.83	1.1	1.5	NVRC16-3	22.0	
1 1/8"x7UN			4IR7UN...	2.09	1.6	2.3	NVRC20-4	24.6	
1 1/4"x7UN	1/2"	22	4IR7UN...	2.09	1.6	2.3	NVRC20-4	27.8	
1 3/8"x6UN			4IR6UN...	2.44	1.6	2.3	NVRC20-4	30.3	

**Coarse Pitch LH**

Thread	Insert Size		Ordering Code		Dimensions mm			Min Bore Dia.	
	IC	L mm	LH	h min	X	Y	Toolholder LH	mm	
1/2"x13UN	6.0	10	6.0KIL13UN158/016...	1.13	0.8	0.9	BNVRC10S-6.0KLH	10.6	
9/16"x12UN	1/4"	11	2IL12UN158/017...	1.22	0.9	1.0	NVRC10-2LH-156/036	12.0	
5/8"x11UN	1/4"U		2UIR11UN158/003...	1.33	1.2	5.5	NVRC11-2ULH-156/035	13.4	
3/4"x10UN			3IL10UN...	1.47	1.1	1.5	NVRC13-3LH-156/026	16.3	
7/8"x9UN	3/8"	16	3IL9UN...	1.63	1.2	1.7	NVRC13-3LH-156/026	19.2	
1"x8UN			3IL8UN...	1.83	1.1	1.5	NVRC16-3LH	22.0	
1 1/8"x7UN			4IL7UN...	2.09	1.6	2.3	NVRC20-4LH	24.6	
1 1/4"x7UN	1/2"	22	4IL7UN...	2.09	1.6	2.3	NVRC20-4LH	27.8	
1 3/8"x6UN			4IL6UN...	2.44	1.6	2.3	NVRC20-4LH	30.3	



U Type RH inserts can be used for both LH and RH applications.

**American UN** - UNC, UNF, UNEF, UNS (con't)

Internal		U Style	V Style	M+ Style	F-Line M+

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

**U Style**

Insert Size			Pitch	Ordering Code		Dimensions mm			Anvil		
IC	L mm	TPI	RH+LH	h min	X	Y	RH	LH	Toolholder		
1/2"U	22	4.5	4UI4.5UN...	3.26	2.4	11.0	YI4U	YE4U	AVR..-4U (LH)		
		4	4UI4UN...	3.67	2.4	11.0					
5/8"U	27	3	5UI3UN...	4.89	2.7	13.7	YI5U	YE5U	AVR..-5U (LH)		

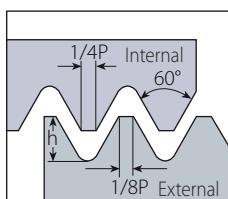
**V Style**

Insert Size			Pitch	Ordering Code		Dimensions mm				
IC	L mm	TPI	RH	LH	h min	X	Y	T	Toolholder	
5/8"V	27	4	5VIR4UN...	5VIL4UN...	3.67	1.0	3.3	6	NVR..-5V (LH)	
		3	5VIR3UN...	5VIL3UN...	4.89	1.0	4.3	8		

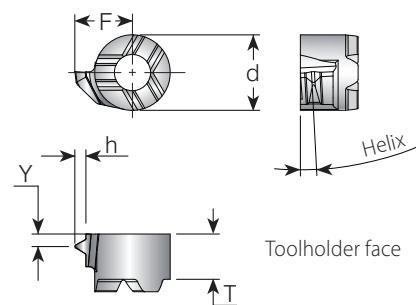
**M+ Style****Multiplus**

Insert Size			Pitch	Teeth	Ordering Code		Dimensions mm			Anvil	
IC	L mm	TPI	RH		h min	X	Y	RH	Toolholder		
3/8"	16	12	2	3	3IR12UN2M+...	1.22	2.2	3.3	YI3M	AVR..-3	
		14	2	3	3IR14UN2M+...	1.05	1.9	2.8			
		16	2	3	3IR16UN2M+...	0.92	1.7	2.5			
1/2"	22	16	3	3	4IR16UN3M+...	0.92	2.6	4.1	YI4M	AVR..-4	
		14	2	3	4IR14UN2M+...	1.05	1.9	2.8			
		12	2	3	4IR12UN2M+...	1.22	2.2	3.3			
		12	3	3	4IR12UN3M+...	1.22	3.4	5.4			
1/2"F	23	12	2	3	4FIR12UN2M+...	1.22	2.2	3.3	YI4M2F	AVRC...-4MF	
5/8"	27	8	2	3	5IR8UN2M+...	1.83	3.1	4.9	YI5M	AVR..-5M	

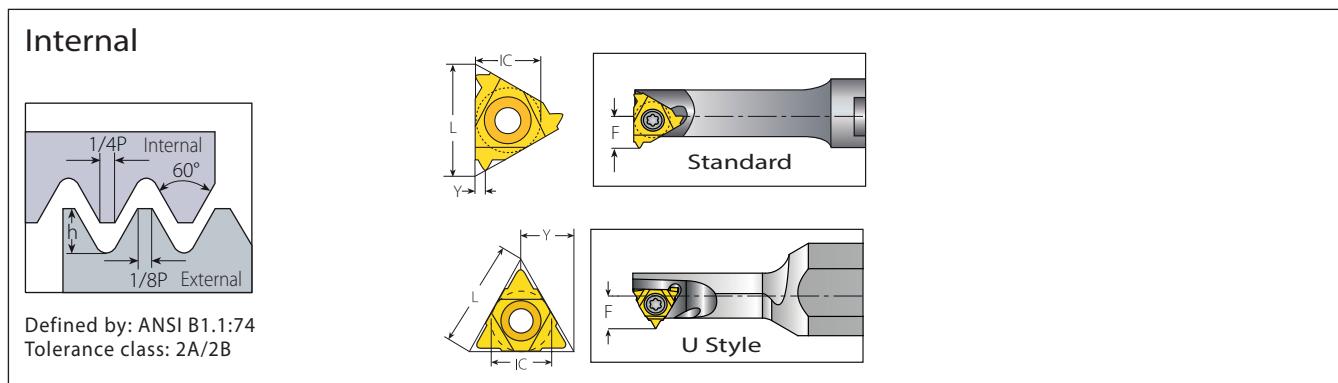
**FLINE**

**American UN** - UNC, UNF, UNEF, UNS (con't)**Mini-V****Internal**

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

**Mini-V**

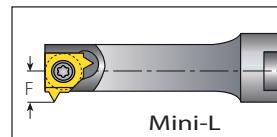
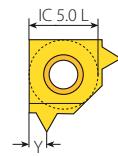
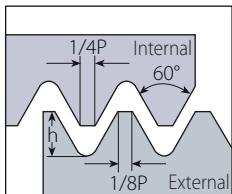
Min. Thread	Insert Style	Pitch	Ordering Code	Dimensions mm					Helix	Toolholder
				TPI	RH	d	T	F	Y	h min
3/8"-32UNEF	V08	32	V08TH32UNR...	6	3.8	4.21	0.5	0.46	1.5	.V08-...
3/8"-28UN		28	V08TH28UNR...				0.5	0.52	2	
3/8"-24UNF		24	V08TH24UNR...				0.65	0.61	2	
3/8"-20UNC		20	V08TH20UNR...				0.8	0.73	2.5	
3/8"-18UNS		18	V08TH18UNR...				0.85	0.81	2.5	
3/8"-16UNC		16	V08TH16UNR...				0.95	0.92	2.5	
7/16"-14UNC		14	V08TH14UNR...				1.1	1.05	3	
9/16"-12UNC	V11	12	V11TH12UNR...	8	4.2	6.44	1.24	1.22	2.5	.V11-...

**American UN** - UNC, UNF, UNEF, UNS (con't)**MINIPRO****Mini-3 Standard**

Insert Size		Pitch		Ordering Code		Dimensions mm			Min. Bore Dia.	
IC mm	L mm	TPI	RH	LH	h min	Y	F	mm	Toolholder	
4.0	6	32	4.0KIR32UN...	4.0KIL32UN...	0.46	0.5	3.50	6.15		
		28	4.0KIR28UN...	4.0KIL28UN...	0.52	0.6	3.50	6.15		
		24	4.0KIR24UN...	4.0KIL24UN...	0.61	0.6	3.60	6.25	.NVRC5-4.0K (LH)	
		20	4.0KIR20UN...	4.0KIL20UN...	0.73	0.6	3.70	6.35		
		18	4.0KIR18UN...	4.0KIL18UN...	0.81	0.7	3.70	6.35		
5.0	8	32	5.0KIR32UN...	5.0KIL32UN...	0.46	0.5				
		28	5.0KIR28UN...	5.0KIL28UN...	0.52	0.6				
		24	5.0KIR24UN...	5.0KIL24UN...	0.61	0.6				
		20	5.0KIR20UN...	5.0KIL20UN...	0.73	0.7	4.7	7.8	.NVRC7-5.0K (LH)	
		18	5.0KIR18UN...	5.0KIL18UN...	0.81	0.7				
		16	5.0KIR16UN...	5.0KIL16UN...	0.92	0.7				
		14	5.0KIR14UN...	5.0KIL14UN...	1.05	0.8				
6.0	10	40	6.0KIR40UN...	6.0KIL40UN...	0.37	0.6	4.50	9.5		
		32	6.0KIR32UN...	6.0KIL32UN...	0.46	0.6	4.60	9.5		
		28	6.0KIR28UN...	6.0KIL28UN...	0.52	0.65	4.70	9.6		
		24	6.0KIR24UN...	6.0KIL24UN...	0.61	0.75	4.80	9.7	.NVRC1..-6.0K (LH)	
		20	6.0KIR20UN...	6.0KIL20UN...	0.73	0.9	4.90	9.8		
		18	6.0KIR18UN...	6.0KIL18UN...	0.81	1.0	5.00	9.9		
		16	6.0KIR16UN...	6.0KIL16UN...	0.92	1.05	5.10	10.0		
		14	6.0KIR14UN...	6.0KIL14UN...	1.05	1.05	5.20	10.0		

**Mini-3 U Style**

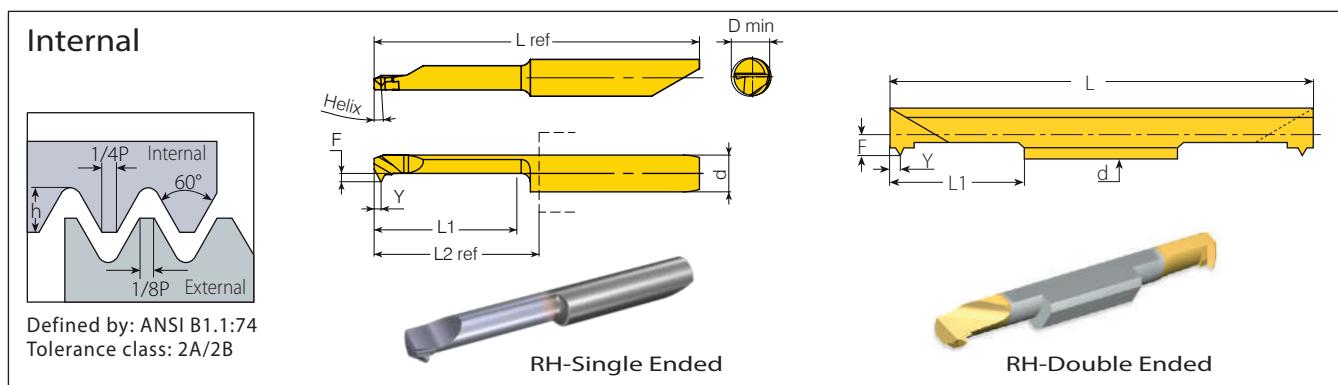
Insert Size		Pitch		Ordering Code		Dimensions mm			Min. Bore Dia.	
IC mm	L mm	TPI	RH+LH	h min	Y	F	mm	Toolholder		
5.0U	8	13	5.0KUI13UN...	1.20		5.6				
		12	5.0KUI12UN...	1.30	4.0	5.7	9.0	.NVRC8-5.0KU (LH)		
		11	5.0KUI11UN...	1.42		5.7				

**American UN** - UNC, UNF, UNEF, UNS (con't)**MINIPRO****Internal**

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

**Mini-L**

Insert Size IC mm	Pitch TPI	Ordering Code		Dimensions mm			Min. Bore Dia. mm	Toolholder .NVRC10.-5LK (LH)
		RH	LH	h min	Y	F		
5.0L	40	5LKIR40UN...	5LKIL40UN...	0.37	0.6	3.80	7.6	
	32	5LKIR32UN...	5LKIL32UN...	0.46	0.6	3.92	7.6	
	28	5LKIR28UN...	5LKIL28UN...	0.52	0.65	3.99	7.6	
	24	5LKIR24UN...	5LKIL24UN...	0.61	0.75	4.09	7.6	
	20	5LKIR20UN...	5LKIL20UN...	0.73	0.9	4.21	7.7	
	18	5LKIR18UN...	5LKIL18UN...	0.81	1.0	4.30	7.8	
	16	5LKIR16UN...	5LKIL16UN...	0.92	1.05	4.41	7.8	
	14	5LKIR14UN...	5LKIL14UN...	1.05	1.05	4.54	7.9	

**American UN** - UNC, UNF, UNEF, UNS (con't)**MINIPRO****Micro - Double Ended**

	Insert Dia.	Pitch	Ordering Code	Dimensions mm					Min. Bore Dia.	
Thread	d mm	mm	RH	L1	L	F	Y	h min	mm	Toolholder
10-40UNS		40	3.0SIR40UN...	16	50	1.35	0.60	0.37	3.2	
8-36UNF	3.0	36	3.0SIR36UN...	16	50	1.46	0.60	0.41	3.2	SMC..-3.0
8-32UNF		32	3.0SIR32UN...	16	50	1.40	0.60	0.46	3.3	
10-40UNS		40	4.0SIR40UN...	16	50	1.65	0.60	0.37	4.0	
10-36UNS		36	4.0SIR36UN...	16	50	1.70	0.60	0.41	4.1	
12-32UNEF		32	4.0SIR32UN...	16	50	1.76	0.60	0.46	4.1	
12-28UNF	4.0	28	4.0SIR28UN...	16	50	1.83	0.65	0.52	4.2	SMC..-4.0
1/4"-27UNS		27	4.0SIR27UN...	16	50	1.85	0.75	0.54	4.2	
12-24UNC		24	4.0SIR24UN...	16	50	1.93	0.75	0.61	4.3	
1/4"-20UNC		20	4.0SIR20UN...	16	50	2.03	0.76	0.73	4.3	
1/4"-32UNEF		32	6.0SIR32UN...	16	50	2.01	0.60	0.46	5.5	
5/16"-28UN		28	6.0SIR28UN...	16	50	2.08	0.65	0.52	5.6	
5/16"-27UNS		27	6.0SIR27UN...	16	50	2.10	0.75	0.54	5.6	
5/16"-24UNF	6.0	24	6.0SIR24UN...	16	50	2.18	0.75	0.61	5.7	SMC..-6.0
5/16"-20UN		20	6.0SIR20UN...	16	50	2.30	0.90	0.73	5.8	
5/16"-18UNC		18	6.0SIR18UN...	16	50	2.39	1.00	0.81	5.9	
3/8"-16UNC		16	6.0SIR16UN...	16	50	2.50	1.05	0.92	6.0	

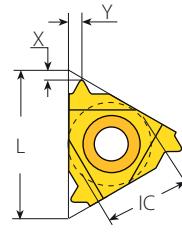
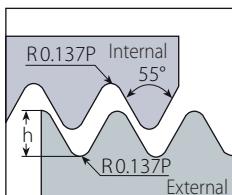
Left handed tool supplied by request (Example: 6.0SIL16UN...).

**Micro - Single Ended**

	Insert Dia.	Pitch	Ordering Code	Dimensions mm					Min. Bore Dia.			
Thread	d mm	TPI	RH/LH	Helix °	L1	F	Y	h min	L2 ref*	L ref	D mm	Toolholder
No.8-32UNC	4.0	32	MS429TH32UNL16R/L...			0.92	0.60	0.46	18.4	35.4	3.3	
No.10-28UNS		28	MS429TH28UNL16R/L...			0.92	0.65	0.52			3.6	MH...-4.0
1/4"-27UNS		27	M549TH27UNL16R/L...			2.4	0.75	0.54			5.3	
1/4"-24UNS	5.0	24	M542TH24UNL16R/L...	3.5	16	1.7	0.75	0.61	18.35	41.2	5.1	MH...-5.0
1/4"-20UNC		20	M542TH20UNL16R/L...			1.7	0.90	0.73			4.6	
5/16"-18UNC	6.0	18	M659TH18UNL16R/L...			2.9	1.05	0.81	18.5	42.2	6.3	
3/8"-16UNC		16	M659TH16UNL16R/L...			2.9	1.00	0.92			7.7	MH...-6.0

\* L2 Ref: Repeatability within +/-0.02.

**microscope**

**Whitworth** - BSW, BSP, BSF, BSB**External**

Defined by: B.S.84:1956, DIN 259, ISO228/1:1982  
Tolerance class: Medium class A

**Standard****Standard**

Insert Size		Pitch	Ordering Code		Dimensions mm			Anvil		
IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder
1/4"	11	72	2ER72W...	2EL72W...	0.23	0.7	0.4	-	-	NL ..-2 (LH)
		60	2ER60W...	2EL60W...	0.27	0.7	0.4			
		56	2ER56W...	2EL56W...	0.29	0.7	0.4			
		48	2ER48W...	2EL48W...	0.34	0.6	0.6			
		40	2ER40W...	2EL40W...	0.41	0.6	0.6			
		36	2ER36W...	2EL36W...	0.45	0.6	0.6			
		32	2ER32W...	2EL32W...	0.51	0.6	0.6			
		28	2ER28W...	2EL28W...	0.58	0.6	0.7			
		26	2ER26W...	2EL26W...	0.63	0.7	0.8			
		24	2ER24W...	2EL24W...	0.68	0.7	0.8			
		22	2ER22W...	2EL22W...	0.74	0.8	0.9			
		20	2ER20W...	2EL20W...	0.81	0.8	0.9			
		19	2ER19W...	2EL19W...	0.86	0.8	1.0			
		18	2ER18W...	2EL18W...	0.90	0.8	1.0			
		16	2ER16W...	2EL16W...	1.02	0.9	1.1			
		14	2ER14W...	2EL14W...	1.16	1.0	1.2			
3/8"	16	72	3ER72W...	3EL72W...	0.23	0.7	0.4	YE3	YI3	AL..-3 (LH)
		60	3ER60W...	3EL60W...	0.27	0.7	0.4			
		56	3ER56W...	3EL56W...	0.29	0.7	0.4			
		48	3ER48W...	3EL48W...	0.34	0.6	0.6			
		40	3ER40W...	3EL40W...	0.41	0.6	0.6			
		36	3ER36W...	3EL36W...	0.45	0.6	0.6			
		32	3ER32W...	3EL32W...	0.51	0.6	0.6			
		30	3ER30W...	3EL30W...	0.55	0.6	0.7			
		28	3ER28W...	3EL28W...	0.58	0.6	0.7			
		26	3ER26W...	3EL26W...	0.63	0.7	0.8			
		24	3ER24W...	3EL24W...	0.68	0.7	0.8			
		22	3ER22W...	3EL22W...	0.74	0.8	0.9			
		20	3ER20W...	3EL20W...	0.81	0.8	0.9			
		19	3ER19W...	3EL19W...	0.86	0.8	1.0			
		18	3ER18W...	3EL18W...	0.90	0.8	1.0			
		16	3ER16W...	3EL16W...	1.02	0.9	1.1			
		14	3ER14W...	3EL14W...	1.16	1.0	1.2			
		12	3ER12W...	3EL12W...	1.36	1.1	1.4			
		11	3ER11W...	3EL11W...	1.48	1.1	1.5			
		10	3ER10W...	3EL10W...	1.63	1.1	1.5			
		9	3ER9W...	3EL9W...	1.81	1.2	1.7			
		8	3ER8W...	3EL8W...	2.03	1.2	1.5			



**Whitworth** - BSW, BSP, BSF, BSB (con't)

External		SCB	V6	Standard	F-Line	U Style
Defined by: B.S.84:1956, DIN 259, ISO228/1:1982 Tolerance class: Medium class A						

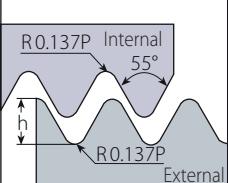
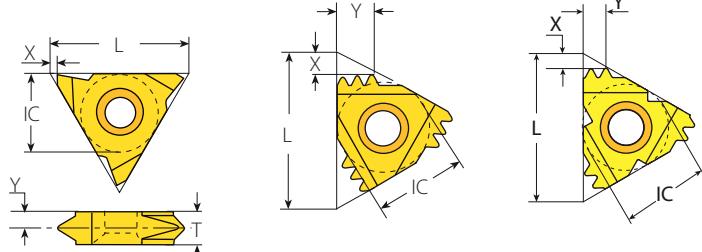
**Standard**

Insert Size	Pitch	Ordering Code			Dimensions mm			Anvil			
		IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH
SCB	3/8" 16		36	3JER36W...			0.45	1.2	0.5		
			32	3JER32W...			0.51	1.2	0.5		
			28	3JER28W...			0.58	0.7	0.8		
			24	3JER24W...			0.68	0.7	0.8		
			20	3JER20W...			0.81	0.7	0.8		
			19	3JER19W...			0.86	0.7	0.8		
			18	3JER18W...			0.90	0.8	0.8	YE3	-
			16	3JER16W...			1.02	0.8	0.8		
			14	3JER14W...			1.16	1.3	1.5		
			12	3JER12W...			1.36	1.3	1.5		
V6	3/8" 16		11	3JER11W...			1.48	1.3	1.5		
			10	3JER10W...			1.63	1.3	1.5		
			8	3JER8W...			2.03	1.3	1.5		
			19	3ER19W-6C...			0.86	1.8	2.2		
			16	3ER16W-6C...			1.02	1.6	2.4	YE3-6C	-
			14	3ER14W-6C...			1.16	1.8	2.7		
			12	3ER12W-6C...			1.36	1.9	3.0		
			7	4ER7W...	4EL7W...		2.41	1.6	2.3		
			6	4ER6W...	4EL6W...		2.71	1.6	2.3	YE4	YI4
			5	4ER5W...	4EL5W...		3.25	1.7	2.4		
F LINE	1/2" 22		7	4FER7W...			2.41	1.6	2.6		
			6	4FER6W...			2.71	1.6	2.3	YE4F	
			5	4FER5W...			3.25	1.7	2.4		
			4.5	5ER4.5W...	5EL4.5W...		3.61	1.8	2.6	YE5	YI5
			4	5ER4W...	5EL4W...		4.07	2.0	2.9		

**U Style**

Insert Size	Pitch	Ordering Code			Dimensions mm			Anvil			
		IC	L mm	TPI	RH+LH	h min	X	Y	RH	LH	
1/2"U	22		4.5		4UE14.5W...		3.61	2.3	11.0		
			4		4UE14W...		4.07	1.8	11.0	YE4U	YI4U
			3.5		4UE13.5W...		4.65	2.1	11.0		
			3.25		4UE13.25W...		5.00	2.0	11.0		
5/8"U	27		3.5		5UE13.5W...		4.65	2.1	13.7		
			3.25		5UE13.25W...		5.00	2.0	13.7	YE5U	YI5U
			3		5UE13W...		5.42	2.3	13.7		
			2.75		5UE12.75W...		5.91	2.4	13.7		

**Whitworth** - BSW, BSP, BSF, BSB (con't)

External	V Style / Slim Throat	M+ Style	F-Line M+
 <p>Defined by: B.S.84:1956, DIN 259, ISO228/1:1982 Tolerance class: Medium class A</p>			

**Slim Throat**

Insert Size	Pitch			Ordering Code			Dimensions mm				Toolholder
	IC	L mm	TPI	RH	LH	h min	X	Y	T		
1/4"V	11	19	2VER19W...	2VEL19W...	0.86	0.69	2.3	3.2			NL..-2V (LH)
		14	2VER14W...	2VEL14W...	1.16	0.69	2.0	3.2			
		11	2VER11W...	2VEL11W...	1.48	0.69	1.7	3.2			
	16	19	3VER19W...	3VEL19W...	0.86	1.1	2.7	3.6			NL..-3V (LH)
		18	3VER18W...	3VEL18W...	0.90	1.1	2.6	3.6			
		16	3VER16W...	3VEL16W...	1.02	1.1	2.6	3.6			
		14	3VER14W...	3VEL14W...	1.16	1.1	2.4	3.6			
		12	3VER12W...	3VEL12W...	1.36	1.1	2.2	3.6			
		11	3VER11W...	3VEL11W...	1.48	1.1	2.1	3.6			

**V Style**

Insert Size	Pitch			Ordering Code			Dimensions mm				Toolholder
	IC	L mm	TPI	RH	LH	h min	X	Y	T		
5/8"V	27	4	5VER4W...	5VEL4W...	4.07	1.0	3.3	6			NL..-5V-6 (LH)
		3	5VER3W...	5VEL3W...	5.42	1.0	4.3	8			NL..-5V-8 (LH)
		2.5	5VER2.5W...	5VEL2.5W...	6.51	1.0	5.2	10			NL..-5V-10 (LH)

**M+ Style**

FLINE



Insert Size	Pitch	Teeth	Ordering Code			Dimensions mm			Anvil		
			IC	L mm	TPI	RH	h min	X	Y	RH	Toolholder
3/8"	16	28	2	3ER28W2M+...	0.58	1.2	1.6			YE3M	AL..-3
		19	2	3ER19W2M+...	0.86	1.6	2.3				
		19	3	3ER19W3M+...	0.86	2.2	3.4				
		14	2	3ER14W2M+...	1.16	2.0	3.0				
1/2"	22	14	3	4ER14W3M+...	1.16	2.9	4.6			YE4M	AL..-4
		11	2	4ER11W2M+...	1.48	2.3	3.5				
1/2"F	23	11	2	4FER11W2M+...	1.48	2.3	3.5		YE4M2F	AL...-4MF	

## Whitworth - BSW, BSP, BSF, BSB (con't)

**External**

Defined by: B.S.84:1956, DIN 259, ISO228/1:1982  
Tolerance class: Medium class A

**RS/LS** Varied range of threading standards for machining between shoulders and close to spindle.

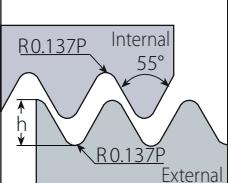
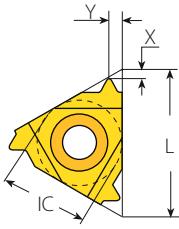
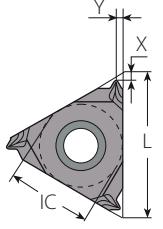
## VG-Cut



Pocket Size	Ordering Code		Dimensions mm					No. of Passes	Helix	Min. Thread Diameter	Toolholder
	RH	W ref	Pitch TPI	h min	Y	L ref	Deg				
3	VGD3.0W19RH-RS/LS...	3.00	19	0.86	0.95	21.9	7 - 12	8 - 14	2.5°	1/2"-19BSW	VGE...-3T...
	VGD3.0W14RH-RS/LS...		14	1.16	1.15		8 - 14			1/2"-14BSW	
	VGD3.0W11RH/LH...		11	1.48	1.68		8 - 14			5/8"-11BSW	

LH Helix threads available upon request.

**Whitworth** - BSW, BSP, BSF, BSB (con't)

Internal							
							
Defined by: B.S.84:1956, DIN 259, ISO228/1:1982		Tolerance class: Medium class A		Standard		SCB Sintered Chipbreaker	

**Standard**

		Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
		IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder	
			1/4"	11	72	2IR72W...	2IL72W...	0.23	0.7	0.4	-	-	NVR..-2 (LH)
					60	2IR60W...	2IL60W...	0.27	0.7	0.4			
					56	2IR56W...	2IL56W...	0.29	0.7	0.4			
					48	2IR48W...	2IL48W...	0.34	0.6	0.6			
					40	2IR40W...	2IL40W...	0.41	0.6	0.6			
					36	2IR36W...	2IL36W...	0.45	0.6	0.6			
					32	2IR32W...	2IL32W...	0.51	0.6	0.6			
					28	2IR28W...	2IL28W...	0.58	0.6	0.7			
					26	2IR26W...	2IL26W...	0.63	0.7	0.8			
					24	2IR24W...	2IL24W...	0.68	0.7	0.8			
					22	2IR22W...	2IL22W...	0.74	0.8	0.9			
					20	2IR20W...	2IL20W...	0.81	0.8	0.9			
					19	2IR19W...	2IL19W...	0.86	0.8	1.0			
					18	2IR18W...	2IL18W...	0.90	0.8	1.0			
					16	2IR16W...	2IL16W...	1.02	0.9	1.1			
					14	2IR14W...	2IL14W...	1.16	0.9	1.1			
					12	2IR12W...	2IL12W...	1.32	0.9	1.2			
			1/4"	11	36	2JIR36W...		0.45	1.2	0.5	-	-	NVR..-2
					32	2JIR32W...		0.51	1.2	0.5			
					28	2JIR28W...		0.58	0.7	0.8			
					24	2JIR24W...		0.68	0.7	0.8			
					20	2JIR20W...		0.81	0.7	0.8			
					19	2JIR19W...		0.86	0.6	0.8			
					18	2JIR18W...		0.90	0.8	0.8			
					16	2JIR16W...		1.02	0.8	0.8			
					14	2JIR14W...		1.16	0.7	0.9			
			16	3/8"	72	3IR72W...	3IL72W...	0.23	0.7	0.4	-	-	AVR..-3 (LH)
					60	3IR60W...	3IL60W...	0.27	0.7	0.4			
					56	3IR56W...	3IL56W...	0.29	0.7	0.4			
					48	3IR48W...	3IL48W...	0.34	0.6	0.6			
					40	3IR40W...	3IL40W...	0.41	0.6	0.6			
					36	3IR36W...	3IL36W...	0.45	0.6	0.6			
					32	3IR32W...	3IL32W...	0.51	0.6	0.6			
					30	3IR30W...	3IL30W...	0.55	0.6	0.7			

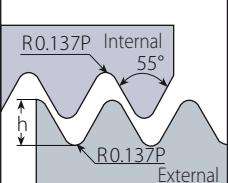
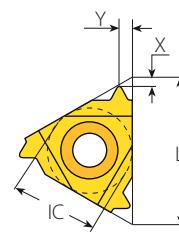
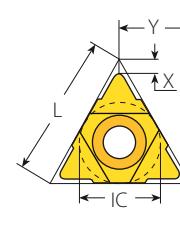
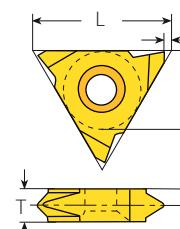
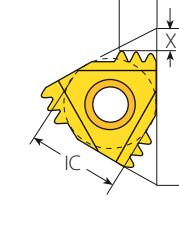
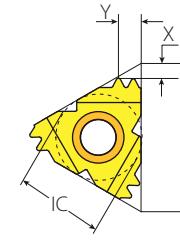
**Whitworth** - BSW, BSP, BSF, BSB (con't)

Internal		Standard				SCB Sintered Chipbreaker				V6				F-Line			
Defined by: B.S.84:1956, DIN 259, ISO228/1:1982 Tolerance class: Medium class A																	

**Standard**

IC	L mm	Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
		TPI	RH	LH	h min	X	Y	RH	LH	Toolholder			
	3/8"	16	28	3IR28W...	3IL28W...	0.58	0.6	0.7	YI3	YE3	AVR..-3 (LH)		
			26	3IR26W...	3IL26W...	0.63	0.7	0.8					
			24	3IR24W...	3IL24W...	0.68	0.7	0.8					
			22	3IR22W...	3IL22W...	0.74	0.8	0.9					
			20	3IR20W...	3IL20W...	0.81	0.8	0.9					
			19	3IR19W...	3IL19W...	0.86	0.8	1.0					
			18	3IR18W...	3IL18W...	0.90	0.8	1.0					
			16	3IR16W...	3IL16W...	1.02	0.9	1.1					
			14	3IR14W...	3IL14W...	1.16	1.0	1.2					
			12	3IR12W...	3IL12W...	1.36	1.1	1.4					
			11	3IR11W...	3IL11W...	1.48	1.1	1.5					
	3/8"	16	10	3IR10W...	3IL10W...	1.63	1.1	1.5	YI3	-	AVR...-3		
			9	3IR9W...	3IL9W...	1.81	1.2	1.7					
			8	3IR8W...	3IL8W...	2.03	1.2	1.5					
	3/8"	16	28	3JIR28W...		0.58	0.7	0.8	YI3-6C	-	AVR..-3 NVRC..-3 206/...		
			24	3JIR24W...		0.68	0.7	0.8					
			20	3JIR20W...		0.81	0.7	0.8					
			19	3JIR19W...		0.86	0.6	0.5					
			18	3JIR18W...		0.90	0.8	0.8					
			16	3JIR16W...		1.02	0.8	0.8					
			14	3JIR14W...		1.16	1.3	1.5					
			12	3JIR12W...		1.36	1.3	1.5					
			11	3JIR11W...		1.48	1.3	1.5					
			10	3JIR10W...		1.63	1.3	1.5					
			8	3JIR8W...		2.03	1.3	1.5					
	3/8"	16	19	3IR19W-6C...		0.86	1.7	2.2	YI3-6C	-	AVR..-3 NVRC..-3 206/...		
			16	3IR16W-6C...		1.02	1.6	2.6					
			14	3IR14W-6C...		1.16	1.8	2.7					
			12	3IR12W-6C...		1.36	1.7	2.6					
	1/2"	22	7	4IR7W...	4IL7W...	2.41	1.6	2.3	YI4	YE4	AVR..-4 (LH)		
			6	4IR6W...	4IL6W...	2.71	1.6	2.3					
			5	4IR5W...	4IL5W...	3.25	1.7	2.4					
			7	4FIR7W...		2.41	1.6	2.3					
	1/2"	23	6	4FIR6W...		2.71	1.6	2.3	YI4F	-	AVRC..-4F		
			5	4FIR5W...		3.25	1.7	2.4					
			4.5	5IR4.5W...	5IL4.5W...	3.61	1.8	2.6					
	5/8"	27	4	5IR4W...	5IL4W...	4.07	2.0	2.9	YI5	YE5	AVR..-5 (LH)		

**Whitworth** - BSW, BSP, BSF, BSB (con't)

Internal	D-Line	U Style	V Style	M+ Style	F-Line M+
 <p>Defined by: B.S.84:1956, DIN 259, ISO228/1:1982 Tolerance class: Medium class A</p>					

**D-Line Deep Rake****D-Line**

Insert Size	Pitch			Ordering Code		Dimensions mm			Anvil	
	IC	L mm	TPI	RH	h min	X	Y	RH	Toolholder	
1/4"	11	19		2DIR19W...	0.86	0.8	1.0	-	NVR..-2	
		19		3DIR19W...	0.86	0.8	1.0			
3/8"	16	14		3DIR14W...	1.16	1.0	1.2	YI3	AVR..-3	
		11		3DIR11W...	1.48	1.1	1.5			

**U Style**

Insert Size	Pitch			Ordering Code		Dimensions mm			Anvil	
	IC	L mm	TPI	RH+LH	h min	X	Y	RH	LH	Toolholder
1/2"U	22	4.5	4	4UEI4.5W...	3.61	2.3	11.0	YI4U	YE4U	AVR..-4U (LH)
			3.5	4UEI3.5W...	4.65	2.1	11.0			
			3.25	4UEI3.25W...	5.00	2.0	11.0			
			3.5	5UEI3.5W...	4.65	2.1	13.7			
5/8"U	27	3.25	3	5UEI3.25W...	5.00	2.0	13.7	YI5U	YE5U	AVR..-5U (LH)
			2.75	5UEI2.75W...	5.91	2.4	13.7			

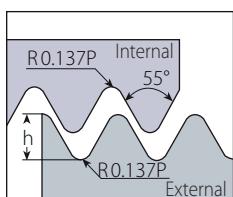
**V Style**

Insert Size	Pitch			Ordering Code		Dimensions mm				
	IC	L mm	TPI	RH	LH	h min	X	Y	T	Toolholder
5/8"V	27	4	4	5VIR4W...	5VIL4W...	4.07	1.0	3.3	6	NVR..-5V (LH)
			3	5VIR3W...	5VIL3W...	5.42	1.0	4.3	8	
			2.5	5VIR2.5W...	5VIL2.5W...	6.51	1.0	5.2	10	

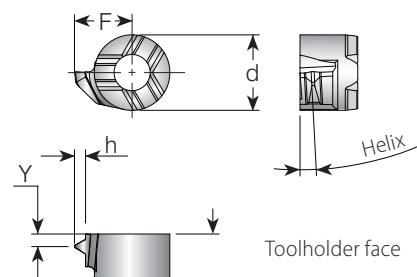
**M+ Style****Multi** plus

Insert Size	Pitch			Teeth	Ordering Code		Dimensions mm			Anvil	
	IC	L mm	TPI	RH	LH	h min	X	Y	T	RH	Toolholder
3/8"	16	14	2		3IR14W2M+...	1.16	2.0	3.0		YI3M	AVR..-3
1/2"	22	11	2		4IR11W2M+...	1.48	2.3	3.5		YI4M	AVR..-4
1/2" F	23	11	2		4FIR11W2M+...	1.48	2.3	3.5		YI4M2F	AVRC... -4MF

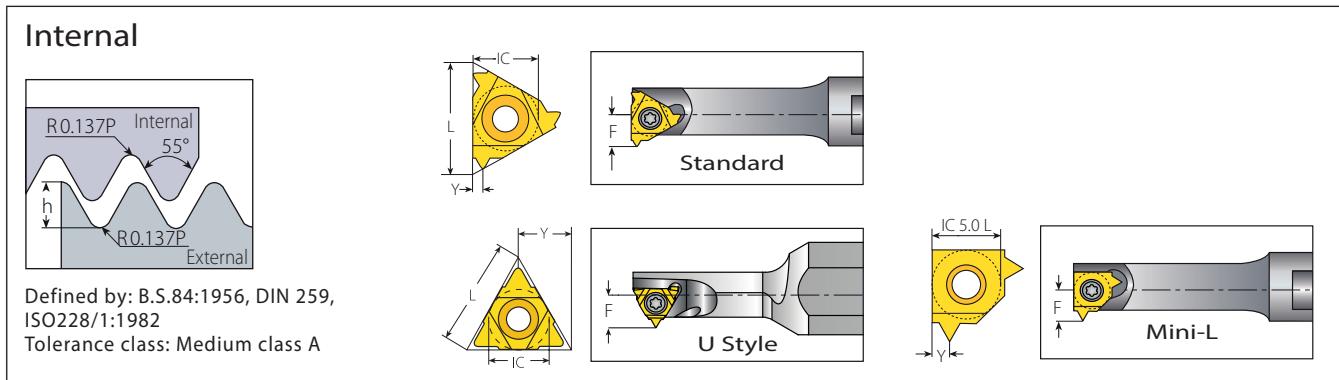
**FLINE**

**Whitworth** - BSW, BSP, BSF, BSB (con't)**Mini-V****Internal**

Defined by: B.S.84:1956, DIN 259, ISO228/1:1982  
Tolerance class: Medium Class A

**Mini-V**

Min. Thread	Insert Style	Pitch	Ordering Code	Dimensions mm					Helix	Toolholder	
				TPI	RH	d	T	F	Y	h min	Deg.
1/2"x19W	V11	19	V11TH19WR...			8	4.2	6.18	0.8	0.86	2 .V11...

**Whitworth** - BSW, BSP, BSF, BSB (con't)**MINIPRO****Mini-3 Standard**

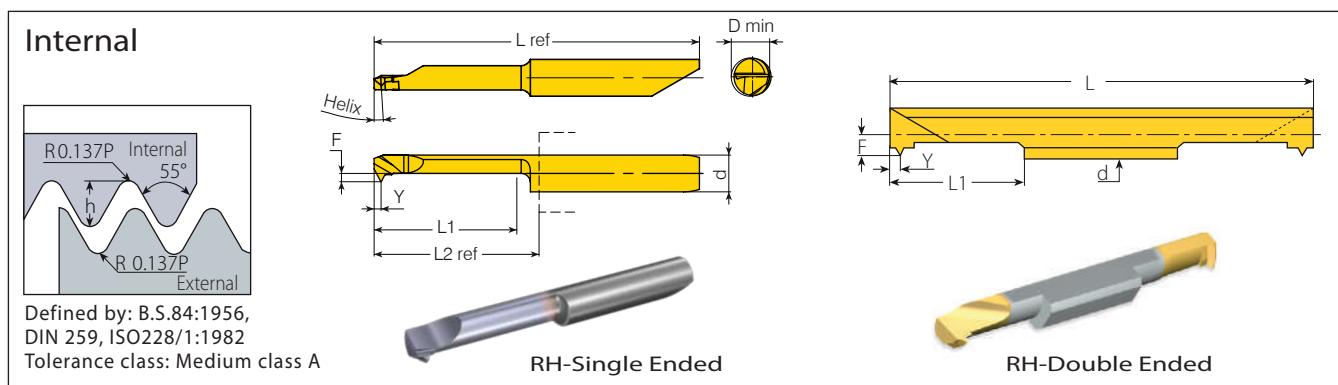
	Insert Size		Pitch		Ordering Code		Dimensions mm			Min. Bore Dia.	
	IC mm	L mm	TPI	RH	LH	h min	Y	F	mm	Toolholder	
	4.0	6	26	4.0KIR26W...	4.0KIL26W...	0.63	0.6	3.6	6.25		
			22	4.0KIR22W...	4.0KIL22W...	0.74	0.6	3.7	6.35		
			20	4.0KIR20W...	4.0KIL20W...	0.81	0.7	3.7	6.35	.NVR.5-4.0K (LH)	
			19	4.0KIR19W...	4.0KIL19W...	0.86	0.7	3.7	6.35		
			18	4.0KIR18W...	4.0KIL18W...	0.90	0.7	3.7	6.35		
	5.0	8	28	5.0KIR28W...	5.0KIL28W...	0.58	0.6				
			24	5.0KIR24W...	5.0KIL24W...	0.68	0.6				
			20	5.0KIR20W...	5.0KIL20W...	0.81	0.7				
			19	5.0KIR19W...	5.0KIL19W...	0.86	0.7				
			18	5.0KIR18W...	5.0KIL18W...	0.90	0.7				
			16	5.0KIR16W...	5.0KIL16W...	1.02	0.7				
	6.0	10	28	6.0KIR28W...	6.0KIL28W...	0.58	0.7	4.7	9.6		
			19	6.0KIR19W...	6.0KIL19W...	0.86	1.0	5.0	9.9	.NVRC1..-6.0K (LH)	
			14	6.0KIR14W...	6.0KIL14W...	1.16	1.1	5.3	10.0		

**Mini-3 U Style**

	Insert Size		Pitch		Ordering Code		Dimensions mm			Min. Bore Dia.	
	IC mm	L mm	TPI	RH+LH	h min	Y	F	mm	Toolholder		
	5.0U	8	14	5.0KUI14W...	1.16		5.6				
			12	5.0KUI12W...	1.36	4.0	5.7	9.0	.NVRC8-5.0KU (LH)		
			11	5.0KUI11W...	1.48		5.7				

**Mini-L**

	Insert Size		Pitch		Ordering Code		Dimensions mm			Min. Bore Dia.	
	IC mm	TPI	RH	LH	h min	Y	F	mm	Toolholder		
	5.0L		28	5LKIR28W...	5LKIL28W...	0.58	0.7	4.05	7.6		
			19	5LKIR19W...	5LKIL19W...	0.86	1.0	4.35	7.9	.NVRC10.-5LK (LH)	
			14	5LKIR14W...	5LKIL14W...	1.16	1.1	4.68	8.0		

**Whitworth** - BSW, BSP, BSF, BSB (con't)**MINIPRO****Micro - Double Ended**

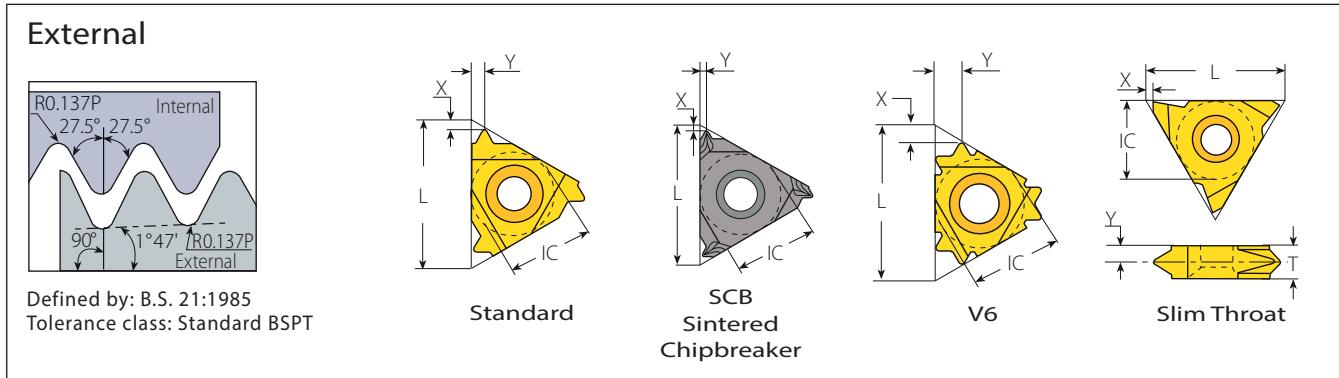
	Insert Dia.	Pitch	Ordering Code	Dimensions mm					Min. Bore Dia.	
Thread	d mm	TPI	RH	L1	L	F	Y	h min	mm	Toolholder
1/16"-28BSP		28	4.0SIR28W...	16	50	1.86	0.65	0.58	4.2	
1/4"-26BSF	4.0	26	4.0SIR26W...	16	50	1.93	0.75	0.63	4.2	SMC..-4.0
1/4"-24BSW		24	4.0SIR24W...	16	50	1.96	0.75	0.68	4.3	
1/16"-28BSP		28	6.0SIR28W...	16	50	2.50	0.65	0.58	6.0	
5/16"-28BSW		26	6.0SIR26W...	16	50	2.50	0.75	0.63	6.0	
5/16"-24BSW	6.0	24	6.0SIR24W...	16	50	2.50	0.75	0.68	6.0	SMC..-6.0
5/16"-22BSW		22	6.0SIR22W...	16	50	2.50	0.90	0.74	6.0	
3/8"-20BSF		20	6.0SIR20W...	16	50	2.50	0.90	0.81	6.0	
1/4"-19BSP		19	6.0SIR19W...	16	50	2.50	0.95	0.86	6.0	

Left handed tool supplied by request (Example: 6.0SIL19W...).

**Micro - Single Ended****microScope**

	Insert Dia.	Pitch	Ordering Code	Dimensions mm					Min. Bore Dia.			
Thread	d mm	TPI	RH/LH	Helix °	L1	F	Y	h min	L2 ref*	L ref	D mm	Toolholder
1/16"-28BSP	6.0	28	M659TH28WL16R/L...	3.5	16	2.9	0.65	0.58	18.5	42.2	6.5	MH...-6.0
1/4"-19BSP		19	M659TH19WL16R/L...				0.95	0.86			11.4	

\* L2 Ref: Repeatability within +/-0.02.

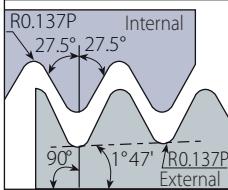
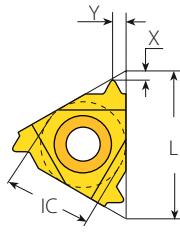
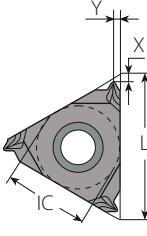
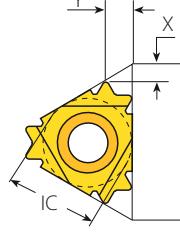
**BSPT****Standard**

	Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
	IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder	
SCB	1/4"	11	28	2ER28BSPT...	2EL28BSPT...	0.58	0.6	0.6	-	-	NL ..-2 (LH)	
			19	2ER19BSPT...	2EL19BSPT...	0.86	0.8	0.9				
			14	2ER14BSPT...	2EL14BSPT...	1.16	0.9	1.0				
	3/8"	16	28	3ER28BSPT...	3EL28BSPT...	0.58	0.6	0.6	YE3	YI3	AL..-3 (LH)	
			19	3ER19BSPT...	3EL19BSPT...	0.86	0.8	0.9				
			14	3ER14BSPT...	3EL14BSPT...	1.16	1.0	1.2				
V6	3/8" SCB	16	11	3ER11BSPT...	3EL11BSPT...	1.48	1.1	1.5	YE3	-	AL..-3	
			28	3JER28BSPT...		0.58	0.7	0.8				
			19	3JER19BSPT...		0.86	0.7	0.8				
			14	3JER14BSPT...		1.16	1.3	1.5				
3/8" V6	16	16	11	3JER11BSPT...		1.48	1.3	1.5	YE3-6C	-	AL..-3	
			19	3ER19BSPT-6C...		0.86	1.7	2.2				
			14	3ER14BSPT-6C...		1.16	1.9	2.8				

**Slim Throat**

	Insert Size		Pitch		Ordering Code		Dimensions mm					Toolholder
	IC	L mm	TPI	RH	LH	h min	X	Y	T	Toolholder		
3/8"V	16	16	28	3VER28BSPT...	3VEL28BSPT...	0.58	1.1	3.0	3.6	NL..-3V (LH)		
			19	3VER19BSPT...	3VEL19BSPT...	0.86	1.1	2.7	3.6			
			14	3VER14BSPT...	3VEL14BSPT...	1.16	1.1	2.4	3.6			
			11	3VER11BSPT...	3VEL11BSPT...	1.48	1.1	2.1	3.6			

**BSPT (con't)**

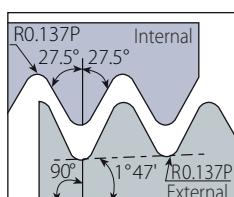
Internal									
									
									
Defined by: B.S. 21:1985 Tolerance class: Standard BSPT									

**Standard**

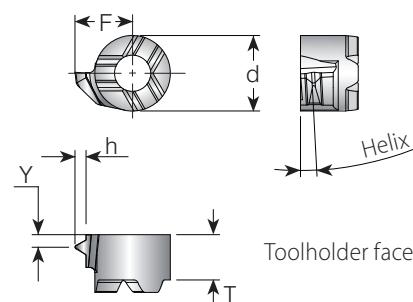
	Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
	IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder	
	1/4"	11	28	2IR28BSPT...	2IL28BSPT...	0.58	0.6	0.6	-	-	NVR..-2 (LH)	
			19	2IR19BSPT...	2IL19BSPT...	0.86	0.8	0.9	-	-	NVR..-2	
			14	2IR14BSPT...	2IL14BSPT...	1.16	0.9	1.0				
	1/4" SCB	11	28	2JIR28BSPT...		0.58	0.7	0.8	-	-	NVR..-2	
			19	2JIR19BSPT...		0.86	0.7	0.8				
	3/8"	16	28	3IR28BSPT...	3IL28BSPT...	0.58	0.6	0.6	YI3	YE3	AVR..-3 (LH)	
			19	3IR19BSPT...	3IL19BSPT...	0.86	0.8	0.9				
			14	3IR14BSPT...	3IL14BSPT...	1.16	1.0	1.2				
			11	3IR11BSPT...	3IL11BSPT...	1.48	1.1	1.5				
			28	3JIR28BSPT...		0.58	0.7	0.8	YI3	-	AVR..-3	
	3/8" SCB	16	19	3JIR19BSPT...		0.86	0.7	0.8				
			14	3JIR14BSPT...		1.16	1.3	1.5				
			11	3JIR11BSPT...		1.48	1.3	1.5				
	3/8" V6	16	28	3JIR28BSPT...		0.58	0.7	0.8	YI3-6C	-	AVR..-3	NVRC..-3 206/...
			19	3JIR19BSPT-6C...		0.86	1.8	2.3				
			14	3JIR14BSPT-6C...		1.16	1.9	2.7				

**D-Line Deep Rake****D-Line**

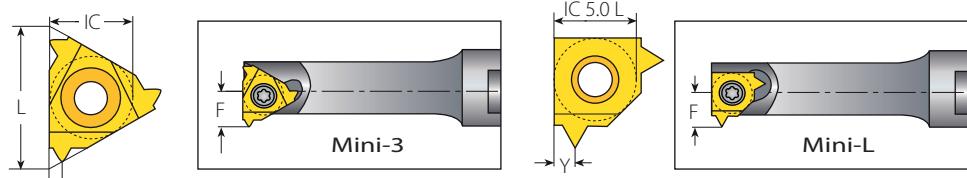
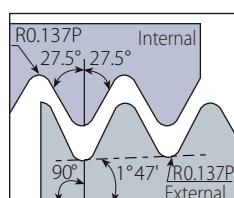
	Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
	IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder	
	1/4"	11	19	2DIR19BSPT...		0.86	0.8	0.9	-	-	NVR..-2	
			14	2DIR14BSPT...		1.16	0.9	1.0				
			19	3DIR19BSPT...		0.86	0.8	0.9				
	3/8"	16	14	3DIR14BSPT...		1.16	1.0	1.2	YI3	-	AVR..-3	
			11	3DIR11BSPT...		1.48	1.1	1.5				
			19	3IR19BSPT-6C...		0.86	1.8	2.3				

**BSPT (con't)****Mini-V****Internal**

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

**Mini-V**

Min. Thread	Insert Style	Pitch	Ordering Code	Dimensions mm					Helix	Toolholder	
				TPI	RH	d	T	F	Y	h min	Deg.
1/4"-19BSPT	V11	19	V11TH19BSPTR...			8	4.2	6.13	0.9	0.86	2.5

**BSPT****MINIPRO****Internal**

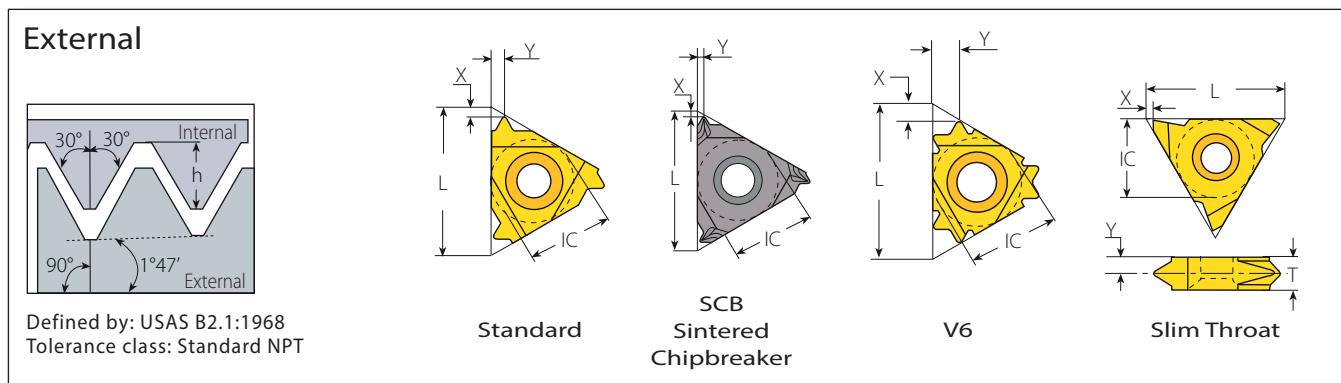
Defined by: B.S. 21:1985  
Tolerance class: Standard BSPT

**Mini-3 Standard**

	Insert Size		Pitch		Ordering Code		Dimensions mm			Min. Bore Dia.	
	IC mm	L mm	TPI	RH	LH	h min	Y	F	mm	Toolholder	
	4.0	6	28	4.0KIR28BSPT...	4.0KIL28BSPT...	0.58	0.6	3.6	6.25	.NVR.5-4.0K (LH)	
	5.0	8	28	5.0KIR28BSPT...	5.0KIL28BSPT...	0.58	0.6	4.7	7.8	.NVRC7-5.0K (LH)	
			19	5.0KIR19BSPT...	5.0KIL19BSPT...	0.86	0.7				
			28	6.0KIR28BSPT...	6.0KIL28BSPT...	0.58	0.6	4.7	9.6		
	6.0	10	19	6.0KIR19BSPT...	6.0KIL19BSPT...	0.86	0.9	5.0	9.9	.NVRC1..-6.0K (LH)	
			14	6.0KIR14BSPT...	6.0KIL14BSPT...	1.16	1.2	5.3	10.0		

**Mini-L**

	Insert Size		Pitch		Ordering Code		Dimensions mm			Min. Bore Dia.	
	IC mm	TPI	RH	LH	h min	Y	F	mm	Toolholder		
		28	5LKIR28BSPT...	5LKIL28BSPT...	0.58	0.6	4.05	7.6			
	5.0L	19	5LKIR19BSPT...	5LKIL19BSPT...	0.86	0.9	4.35	7.9	.NVRC10. -5LK (LH)		
		14	5LKIR14BSPT...	5LKIL14BSPT...	1.16	1.2	4.68	8.0			

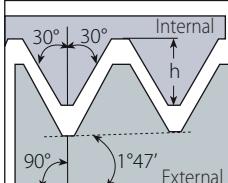
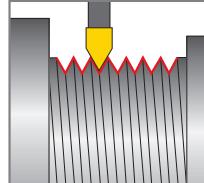
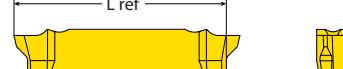
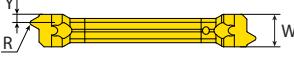
**NPT****Standard**

	Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
	IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder	
	1/4"	11	27	2ER27NPT...	2EL27NPT...	0.66	0.7	0.8	-	-	NL..-2 (LH)	
			18	2ER18NPT...	2EL18NPT...	1.01	0.8	1.0				
			14	2ER14NPT...	2EL14NPT...	1.33	0.8	1.0				
	3/8"	16	27	3ER27NPT...	3EL27NPT...	0.66	0.7	0.8	YE3	YI3	AL..-3 (LH)	
			18	3ER18NPT...	3EL18NPT...	1.01	0.8	1.0				
			14	3ER14NPT...	3EL14NPT...	1.33	0.9	1.2				
	3/8"	16	11.5	3ER11.5NPT...	3EL11.5NPT...	1.64	1.1	1.5	YE3	-	AL..-3	
			8	3ER8NPT...	3EL8NPT...	2.42	1.3	1.8				
			27	3JER27NPT...		0.66	0.6	0.8				
	SCB	16	18	3JER18NPT...		1.01	0.6	0.8	-	-	AL..-3	
			14	3JER14NPT...		1.33	1.1	1.5				
			11.5	3JER11.5NPT...		1.64	1.1	1.5				
	3/8" V6	16	8	3JER8NPT...		2.42	1.0	1.5	YE3-6C	-	AL..-3	
			14	3ER14NPT-6C...		1.33	1.9	3.0				

**Slim Throat**

	Insert Size		Pitch		Ordering Code		Dimensions mm					Toolholder
	IC	L mm	TPI	RH	LH	h min	X	Y	T			
	1/4"V	11	27	2VER27NPT...	2VEL27NPT...	0.66	0.7	2.0	3.2	-	NL..-2V (LH)	
			18	2VER18NPT...	2VEL18NPT...	1.01	0.7	1.8	3.2			
			14	2VER14NPT...	2VEL14NPT...	1.33	0.7	1.8	3.2			
	3/8"V	16	11.5	2VER11.5NPT...	2VEL11.5NPT...	1.64	0.7	2.1	3.2	-	NL..-3V (LH)	
			27	3VER27NPT...	3VEL27NPT...	0.66	1.1	2.9	3.6			
			18	3VER18NPT...	3VEL18NPT...	1.01	1.1	2.6	3.6			
			11.5	3VER11.5NPT...	3VEL11.5 NPT...	1.64	1.1	2.1	3.6			

**NPT (con't)**

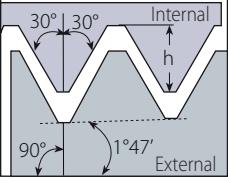
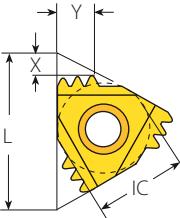
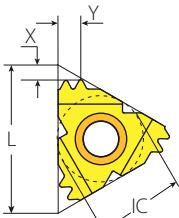
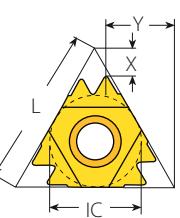
External	RS/LS
  <p>Defined by: USAS B2.1:1968 Tolerance class: Standard NPT</p>	<b>RS/LS</b> Varied range of threading standards for machining between shoulders and close to spindle.   

**VG-Cut**

Pocket Size	Ordering Code		Dimensions mm				No. of Passes	Helix	Min. Thread Diameter	Toolholder
	RH	W ref	Pitch TPI	h min	Y	L ref				
3	VGD3.0NPT18RH-RS/LS...		18	1.01	1.20		7 - 12		1/4"-18NPT	
3	VGD3.0NPT14RH-RS/LS...	3.00	14	1.33	1.40	21.9	8 - 14	1.5°	1/2"-14NPT	VGE...-3T...
3	VGD3.0NPT11.5RH-RS/LS...		11.5	1.64	1.60		9 - 15		1"-11.5NPT	

LH Helix threads available upon request.

**NPT (con't)**

External	M+ Style	F-Line M+	Z+ Style
			

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

**M+ Style**

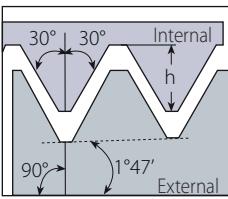
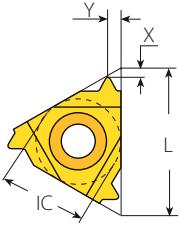
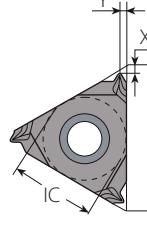
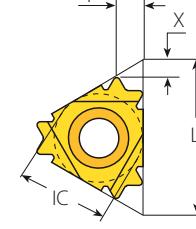
Insert Size	Pitch	Teeth	Ordering Code		Dimensions mm				Anvil		
			IC	L mm	TPI	RH	h min	X	Y	RH	Toolholder
3/8"	16	14	2			3ER14NPT2M+...	1.33	2.0	3.0	YE3M	AL..-3
1/2"	22	11.5	2			4ER11.5NPT2M+...	1.64	2.2	3.4	YE4M	AL..-4
1/2" F	23	11.5	2			4FER11.5NPT2M+...	1.64	2.2	3.4	YE4M2F	AL..-4MF
5/8"	27	11.5	3			5ER11.5NPT3M+...	1.64	3.5	5.6	YE5M	AL..-5M
			8	2		5ER8NPT2M+...	2.42	3.1	4.9		

**FLINE****Multi plus****Z+ Style**

Insert Size	Pitch	Teeth	Ordering Code		Dimensions mm				Anvil		
			IC	L mm	TPI	RH	h min	X	Y	RH	Toolholder
1/2"	22	11.5	2			4ER11.5NPT2Z+...	1.64	2.7	10.0	YE4Z	AL..-4Z
		8	2			4ER8NPT2Z+...	2.42	3.4	9.6		

**Multi plus**

**NPT (con't)**

Internal									
 <p>Defined by: USAS B2.1:1968 Tolerance class: Standard NPT</p>									
 <p>Standard &amp; D-Line</p>									
 <p>SCB Sintered Chipbreaker</p>									
 <p>V6</p>									

**Standard**

	Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil	
	IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder
	1/4"	11	27	2IR27NPT...	2IL27NPT...	0.66	0.7	0.8	-	-	NVR..-2 (LH)
			18	2IR18NPT...	2IL18NPT...	1.01	0.8	1.0	-	-	
			14	2IR14NPT...	2IL14NPT...	1.33	0.8	1.0	-	-	
	1/4" SCB	11	27	2JIR27NPT...		0.66	0.6	0.8	-	-	NVR..-2
			18	2JIR18NPT...		1.01	0.6	0.8	-	-	
	3/8"	16	27	3IR27NPT...	3IL27NPT...	0.66	0.7	0.8	YI3	YE3	AVR..-3 (LH)
			18	3IR18NPT...	3IL18NPT...	1.01	0.8	1.0			
			14	3IR14NPT...	3IL14NPT...	1.33	0.9	1.2			
			11.5	3IR11.5NPT...	3IL11.5NPT...	1.64	1.1	1.5			
			8	3IR8NPT...	3IL8NPT...	2.42	1.3	1.8			
	3/8" SCB	16	27	3JIR27NPT...		0.66	0.6	0.8	YI3	-	AVR..-3
			18	3JIR18NPT...		1.01	0.6	0.8			
			14	3JIR14NPT...		1.33	1.1	1.5			
			11.5	3JIR11.5NPT...		1.64	1.1	1.5			
			8	3JIR8NPT...		2.42	1.0	1.5			
	3/8" V6	16	14	3IR14NPT-6C...		1.33	1.9	2.8	YI3-6C	-	AVR..-3 NVRC..-3 206/...

**D-Line Deep Rake****D-Line**

	Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil	
	IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder
	1/4"	11	18	2DIR18NPT...		1.01	0.7	0.8	-	-	NVR..-2
			14	2DIR14NPT...		1.33	0.8	1.0			
	3/8"	16	18	3DIR18NPT...		1.01	0.8	1.0	YI3	-	AVR..-3
			14	3DIR14NPT...		1.33	0.9	1.2			
			11.5	3DIR11.5NPT...		1.64	1.1	1.5			

**NPT** (con't)

**Internal**

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

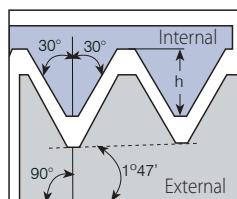
M+ Style      F-Line M+      Z+ Style

**M+ Style****Multi** plus**FLINE**

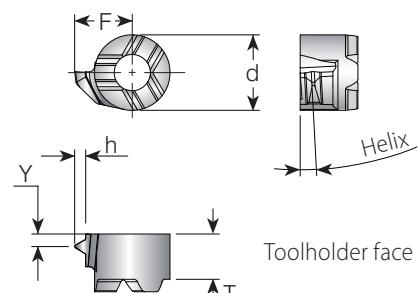
Insert Size			Pitch	Teeth	Ordering Code		Dimensions mm			Anvil	
IC	L mm	TPI		RH	h min	X	Y	RH	Toolholder		
3/8"	16	14	2	3IR14NPT2M+...	1.33	2.0	3.0	YI3M	AVR..-3		
1/2"	22	11.5	2	4IR11.5NPT2M+...	1.64	2.2	3.4	YI4M	AVR..-4		
1/2" F	23	11.5	2	4FIR11.5NPT2M+...	1.64	2.2	3.4	YI4M2F	AVRC...-4MF		
5/8"	27	11.5	3	5IR11.5NPT3M+...	1.64	3.5	5.6	YI5M	AVR..-5M		
		8	2	5IR8NPT2M+...	2.42	3.1	4.9				

**Z+ Style****Multi** plus

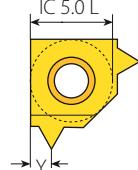
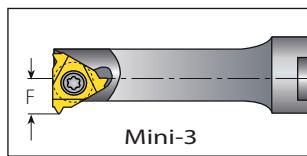
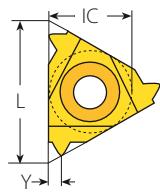
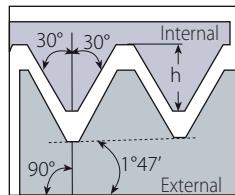
Insert Size			Pitch	Teeth	Ordering Code		Dimensions mm			Anvil	
IC	L mm	TPI		RH	h min	X	Y	RH	Toolholder		
1/2"	22	11.5	2	4IR11.5NPT2Z+...	1.64	2.7	10.0	YI4Z	AVR..-4Z		
		8	2	4IR8NPT2Z+...	2.42	3.4	9.6				

**NPT (con't)****Mini-V****Internal**

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

**Mini-V**

Min. Thread	Insert Style	Pitch	Ordering Code	Dimensions mm					Helix	Toolholder	
				TPI	RH	d	T	F	Y	h min	Deg.
1/8"-27NPT	V08	27	V08TH27NPTR...			6	3.8	4.35	0.6	0.64	2
1/4"-18NPT		18	V08TH18NPTR...					4.8	0.9	1.0	2

**NPT****MINIPRO****Internal**

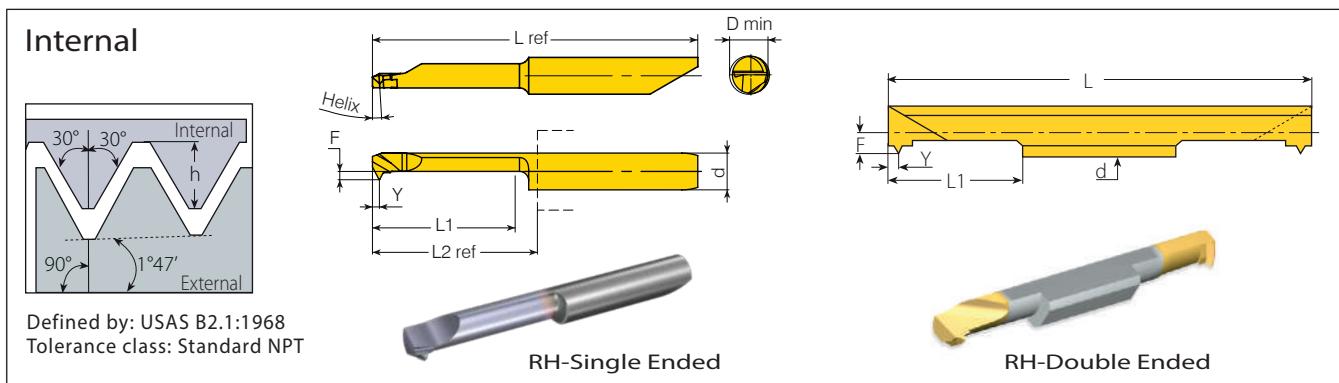
Defined by: USAS B2.1:1968  
Tolerance class: Standard NPT

**Mini-3 Standard**

	Insert Size		Pitch		Ordering Code		Dimensions mm			Min. Bore Dia.	Toolholder
	IC mm	L mm	TPI	RH	LH	h min	Y	F	mm		
	4.0	6.0	27	4.0KIR27NPT...	4.0KIL27NPT...	0.66	0.6	3.7	6.35	.NVR5-4.0K (LH)	
	5.0	8	27	5.0KIR27NPT...	5.0KIL27NPT...	0.66	0.6	4.7	7.8	.NVRC7-5.0K (LH)	
			18	5.0KIR18NPT...	5.0KIL18NPT...	1.01	0.8				
	6.0	10	27	6.0KIR27NPT...	6.0KIL27NPT...	0.66	0.8	5.3	10.0	.NVRC1..-6.0K (LH)	
			18	6.0KIR18NPT...	6.0KIL18NPT...	1.01	1.0	5.3			
			14	6.0KIR14NPT...	6.0KIL14NPT...	1.33	1.1	5.3			

**Mini-L**

	Insert Size		Pitch		Ordering Code		Dimensions mm			Min. Bore Dia.	Toolholder
	IC mm	TPI	RH	LH	h min	Y	F	mm			
		27	5LKIR27NPT...	5LKIL27NPT...	0.66	0.8	4.65				
	5.0L	18	5LKIR18NPT...	5LKIL18NPT...	1.01	1.0	4.65		8.0	.NVRC10..-5LK (LH)	
		14	5LKIR14NPT...	5LKIL14NPT...	1.33	1.1	4.65				

**NPT (con't)****MINIPRO****Micro - Double Ended**

Thread	d mm	Pitch	Ordering Code	Dimensions mm					Min. Bore Dia.		
				RH	L1	L	F	Y	h min	mm	Toolholder
1/16"-27NPT	6.0	27	6.0SIR27NPT...		16	50	2.50	1.00	0.66	5.9	
1/4"-18NPT		18	6.0SIR18NPT...		16	50	2.50	0.80	1.01	6.0	SMC..-6.0

Left handed tool supplied by request (Example: 6.0SIL18NPT...).

**microScope****Micro - Single Ended**

Thread	d mm	Pitch	Ordering Code	Dimensions mm					Min. Bore Dia.				
				RH/LH	Helix°	L1	F	Y	h min	L2 ref*	L ref	D mm	Toolholder
1/16"-27NPT		27	M659TH27NPTL16R/L...					0.75	0.66			6.1	
1/4"-18NPT	6.0	18	M659TH18NPTL16R/L...	3.5		16	2.9	1.0	1.01	18.5	42.2	10.7	MH...-6.0
1/2"-14NPT		14	M659TH14NPTL16R/L...					1.05	1.33			17.0	

\* L2 Ref: Repeatability within +/-0.02.

# ANPT

**External / Internal**

Defined by: MIL-P-7105B  
Tolerance class: Standard ANPT

**External Standard**

**Internal Standard**

## Standard - External



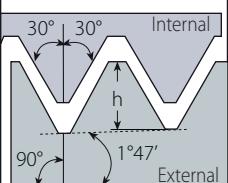
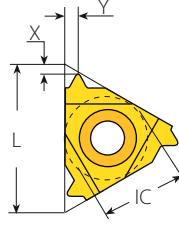
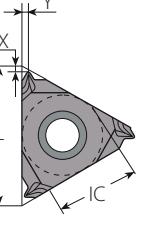
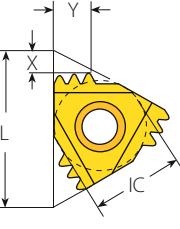
Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder	
3/8"	16	18	3ER18ANPT...	3EL18ANPT...	1.08	0.8	1.0	YE3	YI3	AL..-3 (LH)	
		14	3ER14ANPT...	3EL14ANPT...	1.39	0.8	1.0				

## Standard - Internal



Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder	
1/4"	11	18	2IR18ANPT...	2IL18ANPT...	1.08	0.80	1.0	-	-	NVR..-2 (LH)	
3/8"	16	14	3IR14ANPT...	3IL14ANPT...	1.39	0.80	1.0	YI3	YE3	AVR..-3 (LH)	

**NPTF**

External	Standard	SCB Sintered Chipbreaker	M+ Style
 <p>Defined by: ANSI B1.20.3-1976 Tolerance class: Standard NPTF</p>			

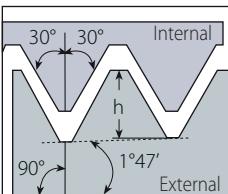
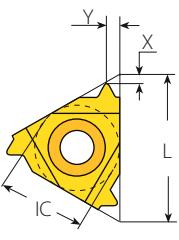
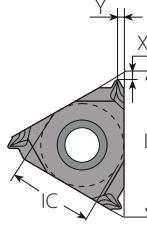
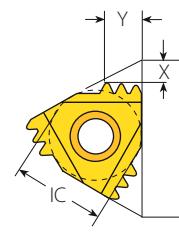
**Standard**

Insert Size	Pitch	Ordering Code			Dimensions mm			Anvil				
		IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder
1/4"	11			27	2ER27NPTF...	2EL27NPTF...	0.64	0.7	0.8	-	-	NL..-2 (LH)
				18	2ER18NPTF...	2EL18NPTF...	1.00	0.8	1.0			
				14	2ER14NPTF...	2EL14NPTF...	1.35	0.8	1.0			
	16			27	3ER27NPTF...	3EL27NPTF...	0.64	0.7	0.8			AL..-3 (LH)
				18	3ER18NPTF...	3EL18NPTF...	1.00	0.8	1.0	YE3	YI3	
				14	3ER14NPTF...	3EL14NPTF...	1.35	0.9	1.2			
				11.5	3ER11.5NPTF...	3EL11.5NPTF...	1.63	1.1	1.5			
3/8"	SCB	8	16	27	3JER27NPTF...		0.64	0.7	0.8			AL..-3
				18	3JER18NPTF...		1.00	0.6	0.8			
				14	3JER14NPTF...		1.35	1.1	1.5	YE3	-	
		11.5	16	3JER11.5NPTF...			1.63	1.1	1.5			
				8	3JER8NPTF...	3EL8NPTF...	2.38	1.3	1.8			
				27	3JER27NPTF...		0.64	0.7	0.8			

**M+ Style**
**Multi** plus

Insert Size	Pitch	Teeth	Ordering Code			Dimensions mm			Anvil		
			IC	L mm	TPI	RH	h min	X	Y	RH	Toolholder
3/8"	16	14	2			3ER14NPTF2M+...	1.35	2.0	3.0	YE3M	AL...-3

**NPTF (con't)**

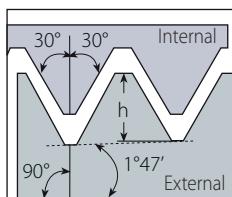
Internal		Standard						SCB Sintered Chipbreaker						M+ Style					
 <p>Defined by: ANSI B1.20.3-1976 Tolerance class: Standard NPTF</p>																			
<p><b>Standard</b></p>																			



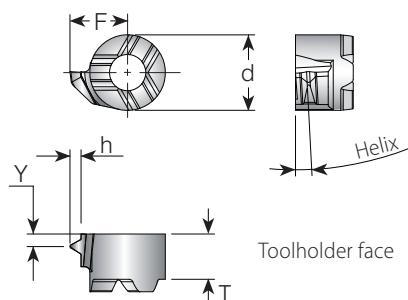
Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil			Toolholder	
IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder			
1/4"	11	27	2IR27NPTF...	2IL27NPTF...	0.64	0.7	0.8	-	-	NVR..-2 (LH)			
		18	2IR18NPTF...	2IL18NPTF...	1.00	0.8	1.0						
		14	2IR14NPTF...	2IL14NPTF...	1.35	0.8	1.0						
	11	27	2JIR27NPTF...		0.64	0.7	0.8	-	-	NVR..-2			
1/4" SCB	11	18	2JIR18NPTF...		1.00	0.6	0.8	YI3	YE3	AVR..-3 (LH)			
		27	3IR27NPTF...	3IL27NPTF...	0.64	0.7	0.8						
	16	18	3IR18NPTF...	3IL18NPTF...	1.00	0.8	1.0						
		27	3IR14NPTF...	3IL14NPTF...	1.35	0.9	1.2						
		14	3IR11.5NPTF...	3IL11.5NPTF...	1.63	1.1	1.5						
		11.5	3IR8NPTF...	3IL8NPTF...	2.38	1.3	1.8						
3/8" SCB	16	27	3JIR27NPTF...		0.64	0.7	0.8	YI3	-	AVR..-3			
		18	3JIR18NPTF...		1.00	0.6	0.8						
		14	3JIR14NPTF...		1.35	1.1	1.5						
		11.5	3JIR11.5NPTF...		1.63	1.1	1.5						
		8	3JIR8NPTF...		2.38	1.1	1.5						

**M+ Style**
**Multi** plus

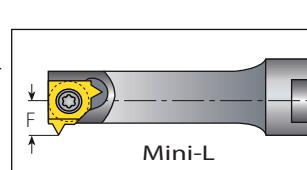
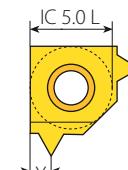
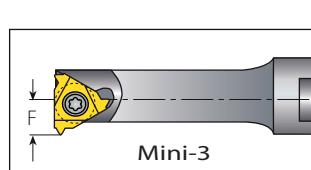
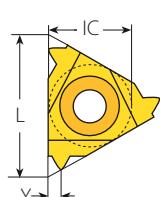
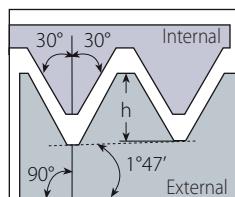

Insert Size		Pitch		Teeth		Ordering Code		Dimensions mm			Anvil		Toolholder	
IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder				
3/8"	16	14	2		3IR14NPTF2M+...	1.35	2.0	3.0	YI3M	AVR..-3				

**NPTF (con't)****Mini-V****Internal**

Defined by: ANSI B1.20.3-1976  
Tolerance class: Standard NPTF

**Mini-V**

Min. Thread	Insert Style	Pitch	Ordering Code	Dimensions mm					Helix	Toolholder	
				TPI	RH	d	T	F	Y	h min	Deg.
1/4"-18NPTF	V08	18	V08TH18NPTFR...			6	3.8	4.64	0.9	1.0	2.0

**NPTF (con't)****MINIPRO****Internal**

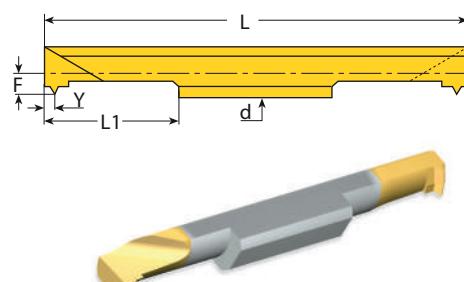
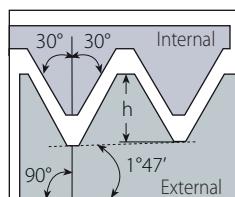
Defined by: ANSI B1.20.3-1976  
Tolerance class: Standard NPTF

**Mini-3 Standard**

Insert Size		Pitch		Ordering Code		Dimensions mm			Min. Bore Dia.	
IC mm	L mm	TPI	RH	LH	h min	Y	F	mm	Toolholder	
4.0	6	27	4.0KIR27NPTF...	4.0KIL27NPTF...	0.64	0.6	3.6	6.25	.NVR.5-4.0K (LH)	
		27	5.0KIR27NPTF...	5.0KIL27NPTF...	0.64	0.6	4.7	7.8	.NVRC7-5.0K (LH)	
		18	5.0KIR18NPTF...	5.0KIL18NPTF...	1.00	0.8				
5.0	8	27	6.0KIR27NPTF...	6.0KIL27NPTF...	0.64	0.8	5.3			
		18	6.0KIR18NPTF...	6.0KIL18NPTF...	1.00	1.0	5.3	10.0	.NVRC1..-6.0K (LH)	
		14	6.0KIR14NPTF...	6.0KIL14NPTF...	1.35	1.1	5.3			

**Mini-L**

Insert Size		Pitch		Ordering Code		Dimensions mm			Min. Bore Dia.	
IC mm	TPI	RH	LH	h min	Y	F	mm	Toolholder		
5.0L	27	5LKIR27NPTF...	5LKIL27NPTF...	0.64	0.8	4.65				
		18	5LKIR18NPTF...	5LKIL18NPTF...	1.00	1.0	4.65	8.0	.NVRC10..-5LK (LH)	
		14	5LKIR14NPTF...	5LKIL14NPTF...	1.35	1.1	4.65			

**NPTF****Internal**

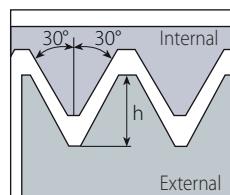
Defined by: ANSI B1.20.3-1976  
Tolerance class: Standard NPTF

RH-Double Ended

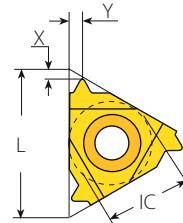
**Micro - Double Ended**

Insert Dia.		Pitch		Ordering Code		Dimensions mm			Min. Bore Dia.	
Thread	d mm	TPI	RH	L1	L	F	Y	h min	mm	Toolholder
1/16"-27NPTF	6.0	27	6.0SIR27NPTF...	16	50	2.50	0.80	0.64	6.0	SMC..-6.0
1/4"-18NPTF		18	6.0SIR18NPTF...	16	50	2.50	1.00	1.00		

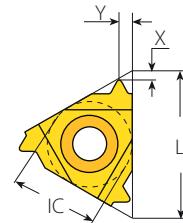
Left handed tool supplied by request (Example: 6.0SIL18NPTF...).

**NPS****External / Internal**

Defined by: USA NBS H28 (1957)  
Tolerance class: Standard NPS



External Standard



Internal Standard

**Standard - External**

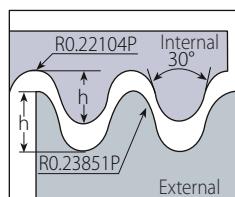
Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder	
3/8"	16	24	3ER24NPS...	3EL24NPS...	0.79	0.7	0.8	YE3	YI3	AL..-3 (LH)	
		16	3ER16NPS...	3EL16NPS...	1.21	0.8	1.1				
		14	3ER14NPS...	3EL14NPS...	1.33	0.9	1.2				
		12	3ER12NPS...	3EL12NPS...	1.63	1.1	1.4				
		11.5	3ER11.5NPS...	3EL11.5NPS...	1.71	1.1	1.5				
		9	3ER9NPS...	3EL9NPS...	2.20	1.2	1.6				
1/2"	22	8	4ER8NPS...	4EL8NPS...	2.46	1.3	1.9	YE4	YI4	AL..-4 (LH)	
		7	4ER7NPS...	4EL7NPS...	2.82	1.6	2.3				
		6	4ER6NPS...	4EL6NPS...	3.31	1.6	2.3				
5/8"	27	5	5ER5NPS...	5EL5NPS...	3.98	1.9	2.8	YE5	YI5	AL..-5 (LH)	

**Standard - Internal**

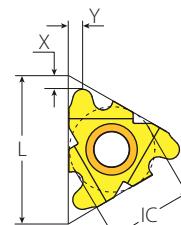
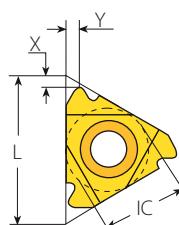
Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder	
3/8"	16	24	3IR24NPS...	3IL24NPS...	0.79	0.7	0.8	YI3	YE3	AVR..-3 (LH)	
		14	3IR14NPS...	3IL14NPS...	1.33	0.9	1.2				
		12	3IR12NPS...	3IL12NPS...	1.63	1.1	1.4				
		11.5	3IR11.5NPS...	3IL11.5NPS...	1.71	1.1	1.5				
		9	3IR9NPS...	3IL9NPS...	2.20	1.2	1.6				
		8	4IR8NPS...	4IL8NPS...	2.46	1.3	1.9				
1/2"	22	7	4IR7NPS...	4IL7NPS...	2.82	1.6	2.3	YE4	YI4	AVR..-4 (LH)	
		6	4IR6NPS...	4IL6NPS...	3.31	1.6	2.3				
		5	5IR5NPS...	5IL5NPS...	3.98	1.9	2.8	YE5	YI5	AVR..-5 (LH)	

## Round (DIN 405)

### External



Defined by: DIN 405  
Tolerance class: 7h/7H



Standard

F-Line

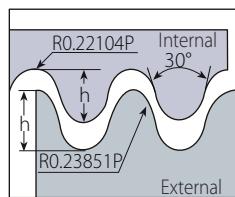
### Standard



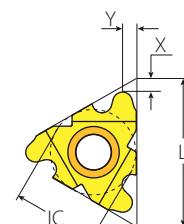
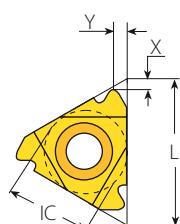
**F-LINE**

Insert Size	Pitch			Ordering Code		Dimensions mm			Anvil		
	IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder
3/8"	16	10	3ER10RD...	3EL10RD...	1.27	1.1	1.2				
			8	3ER8RD...	3EL8RD...	1.59	1.4	1.3	YE3	YI3	AL..-3 (LH)
			6	3ER6RD...	3EL6RD...	2.12	1.5	1.7			
1/2"	22	6	4ER6RD...	4EL6RD...	2.12	1.5	1.7		YE4	YI4	AL..-4 (LH)
			4	4ER4RD...	4EL4RD...	3.18	2.2	2.3			
1/2"F	23	6	4FER6RD...		2.12	1.5	1.7	YE4F			AL...-4F
			4	4FER4RD...		3.18	2.2	2.3			
5/8"	27	4	5ER4RD...	5EL4RD...	3.18	2.2	2.3	YE5	YI5	AL..-5 (LH)	

### Internal



Defined by: DIN 405  
Tolerance class: 7h/7H



Standard

F-Line

### Standard

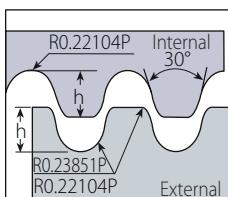


**F-LINE**

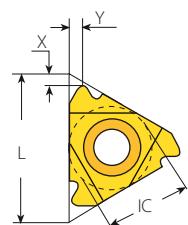
Insert Size	Pitch			Ordering Code		Dimensions mm			Anvil		
	IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder
3/8"	16	10	3IR10RD...	3IL10RD...	1.27	1.1	1.2				
			8	3IR8RD...	3IL8RD...	1.59	1.4	1.4	YI3	YE3	AVR..-3 (LH)
			6	3IR6RD...	3IL6RD...	2.12	1.4	1.5			
1/2"	22	6	4IR6RD...	4IL6RD...	2.12	1.5	1.7		YI4	YE4	AVR..-4 (LH)
			4	4IR4RD...	4IL4RD...	3.18	2.2	2.3			
1/2"F	23	6	4FIR6RD...		2.12	1.5	1.7	YI4F			AVRC...-4F
			4	4FIR4RD...		3.18	2.2	2.3			
5/8"	27	4	5IR4RD...	5IL4RD...	3.18	2.2	2.3	YI5	YE5	AVR..-5 (LH)	

## Round (DIN 20400)

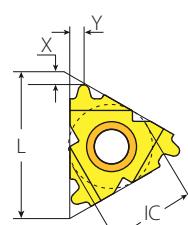
### External



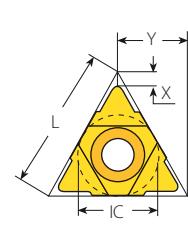
Defined by: DIN 20400  
Tolerance class: Standard



Standard



F-Line



U Style

### Standard



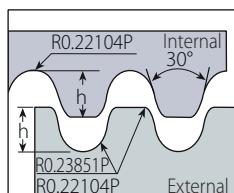
F-LINE

	Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
	IC	L mm	mm	RH	LH	h min	X	Y	RH	LH	Toolholder	
1/2"	22	22	3.0	4ER3.0RD20400...	4EL3.0RD20400...	1.65	1.3	1.7	YE4	YI4	AL..-4 (LH)	
			4.0	4ER4.0RD20400...	4EL4.0RD20400...	2.20	1.6	2.2				
			5.0	4ER5.0RD20400...	4EL5.0RD20400...	2.75	1.4	1.7				
			6.0	4ER6.0RD20400...	4EL6.0RD20400...	3.30	1.7	2.1				
1/2"F	23	23	3.0	4FER3.0RD20400...		1.65	1.3	1.7	YE4F		AL...-4F	
			4.0	4FER4.0RD20400...		2.2	1.6	2.2				
			5.0	4FER5.0RD20400...		2.75	1.4	1.7				
			6.0	4FER6.0RD20400...		3.3	1.7	2.1				

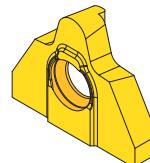
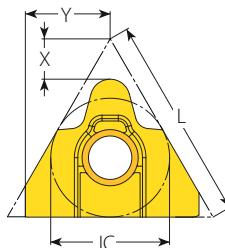
### U Style



	Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
	IC	L mm	mm	RH+LH	h min	X	Y	RH	LH	Toolholder		
	5/8"U	27	8.0	5UE18.0RD20400...	4.4	2.9	13.5	YE5U	YI5U	AL..-5U (LH)		

**Round (DIN 20400) (con't)****MEGALINE****External**

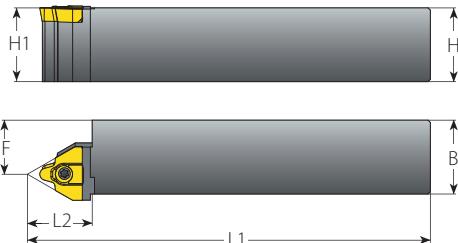
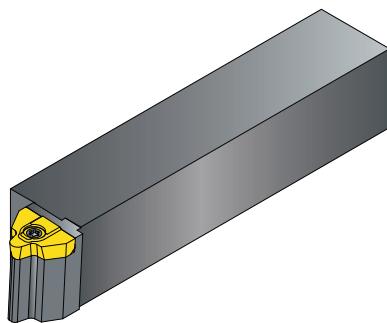
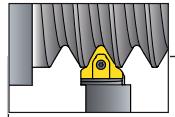
Defined by: DIN 20400  
Tolerance class: Standard



Mega Line

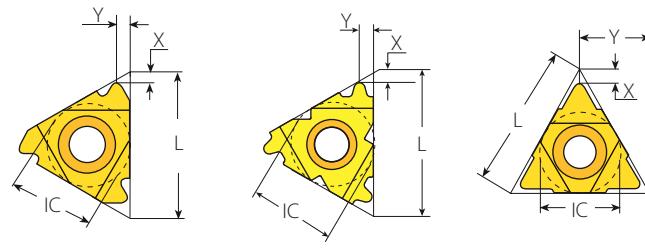
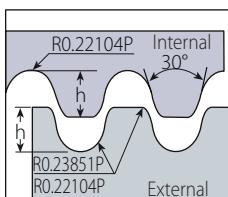
**External**

	Insert Size		Pitch	Ordering Code		Dimensions mm			Number of Passes	
	IC	L mm	mm	RH	h min	X	Y	0.07mm-Min. Depth of Cut (On radius)	0.15mm-Max. Depth of Cut (On radius)	
5/8" MG	27	10.0	5MGER10.0RD20400...		5.50	4.12		78	36	
		12.0	5MGER12.0RD20400...		6.60	5.39	11.3	93	43	
		16.0	5MGER16.0RD20400...		8.80	4.92		124	58	

**External Toolholders for Round (DIN 20400) MEGALINE****External****Spare Parts**

Insert	Ordering Code	Dimensions mm			Thread Diameter Range (Min.-Max.)	Insert Screw	Torx Key
		RH	H=B=H1	F			
5MGER10.0RD20400...	NL25-5MG10RD	25	16.5	155	22 (RD132-170)x10	S5MG	K6T
	NL32-5MG10RD	32	23.5	175			
	NL40-5MG10RD	40	31.5	205			
5MGER12.0RD20400...	NL25-5MG12RD	25	16.5	155	22 (RD180-224)x12	S5MG	K6T
	NL32-5MG12RD	32	23.5	175			
	NL40-5MG12RD	40	31.5	205			
5MGER16.0RD20400...	NL25-5MG16RD	25	16.5	155	22 (RD236-300)x16		
	NL32-5MG16RD	32	23.5	175			
	NL40-5MG16RD	40	31.5	205			

Recommended thread infeed method for Mega Line: Flank or Modified Flank 1°.

**Round (DIN 20400) (con't)****Internal**

Defined by: DIN 20400  
Tolerance class: Standard

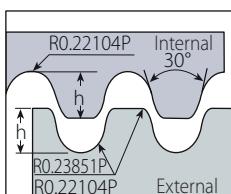
**Standard**

	Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
	IC	L mm	mm	RH	LH	h min	X	Y	RH	LH	Toolholder	
1/2"	22		3.0	4IR3.0RD20400...	4IL3.0RD20400...	1.65	1.3	1.7	YI4	YE4	AVR..-4 (LH)	
			4.0	4IR4.0RD20400...	4IL4.0RD20400...	2.20	1.6	2.2				
			5.0	4IR5.0RD20400...	4IL5.0RD20400...	2.75	1.4	1.7				
			6.0	4IR6.0RD20400...	4IL6.0RD20400...	3.30	1.7	2.1				
1/2"F	23		3.0	4FIR3.0RD20400...		1.65	1.3	1.7	YI4F		AVRC...-4F	
			4.0	4FIR4.0RD20400...		2.20	1.6	2.2				
			5.0	4FIR5.0RD20400...		2.75	1.4	1.7				
			6.0	4FIR6.0RD20400...		3.30	1.7	2.1				

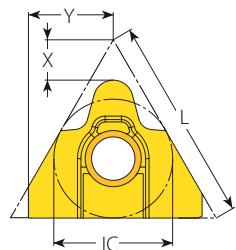
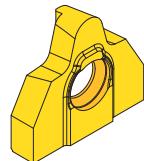
FLINE

**U Style**

	Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
	IC	L mm	mm	RH+LH	h min	X	Y	RH	LH	Toolholder		
	5/8"U	27	8.0	5UEI8.0RD20400...	4.40	2.9	13.5	YI5U	YE5U	AVR..-5U (LH)		

**Round (DIN 20400) (con't)****MEGA LINE****Internal**

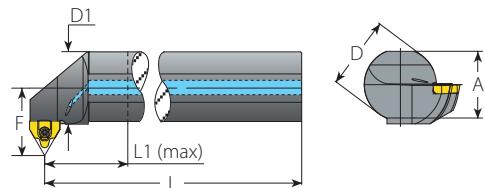
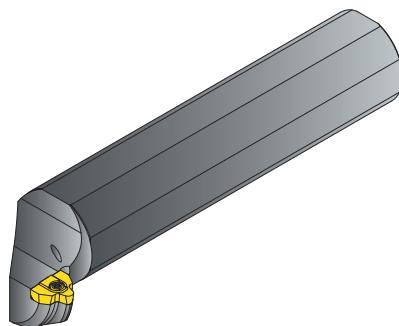
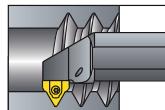
Defined by: DIN 20400  
Tolerance class: Standard



Mega Line

**Internal**

	Insert Size		Pitch	Ordering Code		Dimensions mm			Number of Passes	
	IC	L mm	mm	RH		h min	X	Y	0.07mm-Min. Depth of Cut (On radius)	0.15mm-Max. Depth of Cut (On radius)
5/8" MG	27	10.0	5MGIR10.0RD20400...			5.50	4.12		78	36
		12.0	5MGIR12.0RD20400...			6.60	5.39	10.4	93	43
		16.0	5MGIR16.0RD20400...			8.80	4.92		124	58

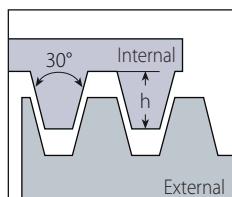
**Internal Toolholders for Round (DIN 20400) **MEGA LINE******Internal**

Insert	Ordering Code	Dimensions mm						Min. Bore Dia.	Thread Diameter Range (Min.-Max.)	Spare Parts			
		RH	A	L	L1 (max)	D	D1	F	mm	Short Chip Material	Long Chip Material	Insert Screw	Torx Key
5MGIR10.0RD20400...	NVRC40-5MG10RD	36	232.5	100	40	39.7	41.5	122	(RD132-170)x10 (RD132-170)x10				
	NVRC50-5MG10RD	46	257.5	125	50	49.7	46.5						
	NVRC60-5MG10RD	57	282.5	150	60	59.7	51.5						
5MGIR12.0RD20400...	NVRC40-5MG12RD	36	232.5	100	40	39.7	41.5	168	(RD180-224)x12 (RD180-224)x12				
	NVRC50-5MG12RD	46	257.5	125	50	49.7	46.5						
	NVRC60-5MG12RD	57	282.5	150	60	59.7	51.5						
5MGIR16.0RD20400...	NVRC40-5MG16RD	36	232.5	100	40	39.7	41.5	220	(RD236-300)x16 (RD236-300)x16				
	NVRC50-5MG16RD	46	257.5	125	50	49.7	46.5						
	NVRC60-5MG16RD	57	282.5	150	60	59.7	51.5						

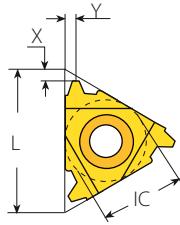
Recommended thread infeed method for Mega Line: Flank or Modified Flank 1°.

## Trapez

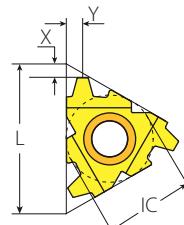
### External



Defined by: DIN 103  
Tolerance class: 7e/7H



Standard



F-Line

### Standard

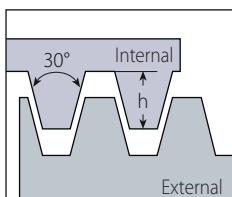
Insert Size		Pitch	Ordering Code		Dimensions mm			Anvil		
IC	L mm	mm	RH	LH	h min	X	Y	RH	LH	Toolholder
3/8"	16	1.5	2ER1.5TR...	2EL1.5TR...	0.90	0.8	0.9	-	-	NL..-2 (LH)
		1.5	3ER1.5TR...	3EL1.5TR...	0.90	1.0	1.1			
		2.0	3ER2.0TR...	3EL2.0TR...	1.25	1.1	1.3	YE3	YI3	AL..-3 (LH)
		2.5	3ER2.5TR...	3EL2.5TR...	1.55	1.2	1.4			
		3.0	3ER3.0TR...	3EL3.0TR...	1.75	1.3	1.5			
1/2"	22	4.0	4ER4.0TR...	4EL4.0TR...	2.25	1.7	1.9	YE4	YI4	AL..-4 (LH)
		5.0	4ER5.0TR...	4EL5.0TR...	2.75	2.1	2.5			
		6.0	4ER6.0TR...	4EL6.0TR...	3.50	2.3	2.7			
1/2" F	23	4.0	4FER4.0TR...		2.25	1.7	1.9	YE4F		AL..-4F
		5.0	4FER5.0TR...		2.75	2.1	2.5			
		6.0	4FER6.0TR...		3.50	2.3	2.7			
5/8"	27	6.0	5ER6.0TR...	5EL6.0TR...	3.50	2.3	2.7	YE5	YI5	AL..-5 (LH)



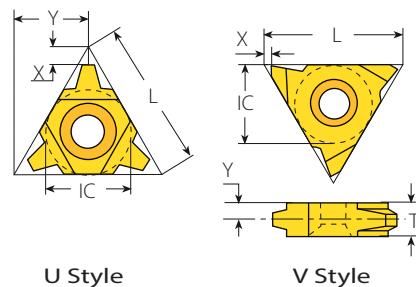
F-LINE

## Trapez

### External



Defined by: DIN 103  
Tolerance class: 7e/7H



U Style

V Style

### U Style

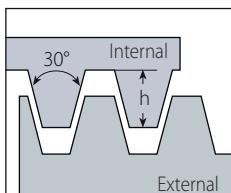


Insert Size	Pitch	Ordering Code		Dimensions mm			Anvil				
		IC	L mm	mm	RH+LH	h min	X	Y	RH	LH	Toolholder
1/2"U	22			6.0	4UE6.0TR...	3.50	2.0	11.0	YE4U	YI4U	AL..-4U (LH)
				7.0	4UE7.0TR...	4.00	2.3	11.0			
				8.0	4UE8.0TR...	4.50	2.6	11.0			
5/8"U	27			8.0	5UE8.0TR...	4.50	2.6	13.7	YE5U	YI5U	AL..-5U (LH)
				9.0	5UE9.0TR...	5.00	3.0	13.7			

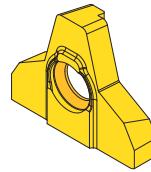
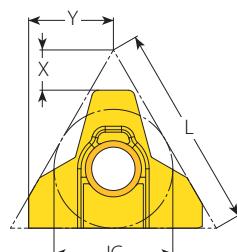
### V Style



Insert Size	Pitch	Ordering Code			Dimensions mm					Toolholder	
		IC	L mm	mm	RH	LH	h min	X	Y	T	
5/8"V	27			6.0	5VER6.0TR...	5VEL6.0TR...	3.50	1.0	3.3	6	NL..-5V-6 (LH)
				7.0	5VER7.0TR...	5VEL7.0TR...	4.00	1.0	3.3	6	
				8.0	5VER8.0TR...	5VEL8.0TR...	4.50	1.0	3.3	6	
				9.0	5VER9.0TR...	5VEL9.0TR...	5.00	1.0	4.3	8	NL..-5V-8 (LH)
				10.0	5VER10.0TR...	5VEL10.0TR...	5.50	1.0	4.3	8	
				12.0	5VER12.0TR...	5VEL12.0TR...	6.50	1.0	5.2	10	NL..-5V-10 (LH)

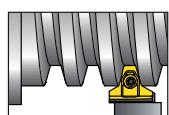
**Trapez** (con't)**MEGALINE****External**

Defined by: DIN 103  
Tolerance class: 7e/7H

**Mega Line****External**

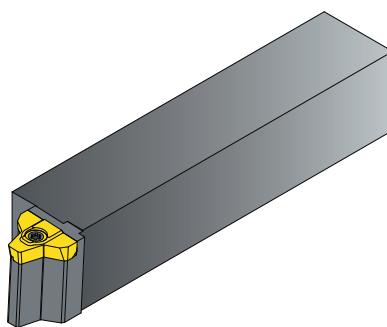
	Insert Size		Pitch	Ordering Code		Dimensions mm			Number of Passes	
	IC	L mm	mm	RH	h min	X	Y	0.07mm-Min. Depth of Cut (On radius)	0.15mm-Max. Depth of Cut (On radius)	
5/8" MG	27		12.0	5MGER12.0TR...	6.5	5.38	11.3	94	44	
			14.0	5MGER14.0TR...	8.0	4.38		115	54	
			16.0	5MGER16.0TR...	9.0	5.38		129	60	
			18.0	5MGER18.0TR...	10.0	5.38		143	67	
			20.0	5MGER20.0TR...	11.0	7.38		158	74	
			24.0	5MGER24.0TR...	13.0	7.38		186	87	

Recommended thread infeed method for Mega Line: Flank or Modified Flank 1°.



## External Toolholders for Trapez

**MEGA LINE**



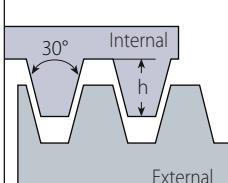
### External

Insert	Ordering Code	Dimensions mm			Thread Diameter Range (Min.-Max.)	Spare Parts	
		RH	H=B=H1	F		Insert Screw	Torx Key
5MGER12.0TR...	NL25-5MG12TR	25	16.5	155	22 (TR44-300)x12	S5MG	K6T
	NL32-5MG12TR	32	23.5	175			
	NL40-5MG12TR	40	31.5	205			
5MGER14.0TR...	NL25-5MG14TR	25	16.5	155	22 (TR55-145)x14	S5MG	K6T
	NL32-5MG14TR	32	23.5	175			
	NL40-5MG14TR	40	31.5	205			
5MGER16.0TR...	NL25-5MG16TR	25	16.5	155	22 (TR65-175)x16	S5MG	K6T
	NL32-5MG16TR	32	23.5	175			
	NL40-5MG16TR	40	31.5	205			
5MGER18.0TR...	NL25-5MG18TR	25	16.5	155	22 (TR85-200)x18	S5MG	K6T
	NL32-5MG18TR	32	23.5	175			
	NL40-5MG18TR	40	31.5	205			
5MGER20.0TR...	NL25-5MG20TR	25	16.5	155	22 (TR100-230)x20	S5MG	K6T
	NL32-5MG20TR	32	23.5	175			
	NL40-5MG20TR	40	31.5	205			
5MGER24.0TR...	NL25-5MG24TR	25	16.5	155	22 (TR135-300)x24	S5MG	K6T
	NL32-5MG24TR	32	23.5	175			
	NL40-5MG24TR	40	31.5	205			

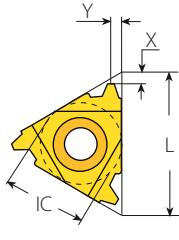
Recommended thread infeed method for Mega Line: Flank or Modified Flank 1°.

**Trapez** (con't)

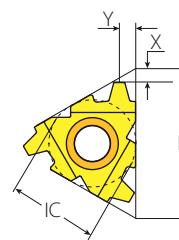
**Internal**



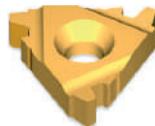
Defined by: DIN 103  
Tolerance class: 7e/7H



Standard



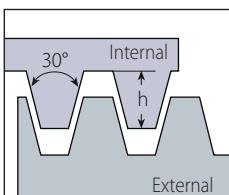
F-Line

**Standard****FLINE**

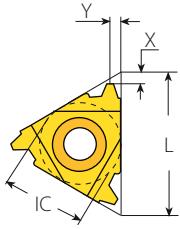
Insert Size	Pitch		Ordering Code		Dimensions mm			Anvil			Toolholder
	IC	L mm	mm	RH	LH	h min	X	Y	RH	LH	
3/8"	16	11	1.5	2IR1.5TR...	2IL1.5TR...	0.90	0.8	0.9	-	-	NVR..-2 (LH)
			1.5	3IR1.5TR...	3IL1.5TR...	0.90	1.0	1.1			
			2.0	3IR2.0TR...	3IL2.0TR...	1.25	1.1	1.3	YI3	YE3	AVR..-3 (LH)
			2.5	3IR2.5TR...	3IL2.5TR...	1.53	1.2	1.4			
			3.0	3IR3.0TR...	3IL3.0TR...	1.75	1.3	1.5			
1/2"	22		4.0	4IR4.0TR...	4IL4.0TR...	2.25	1.7	1.9	YI4	YE4	AVR..-4 (LH)
			5.0	4IR5.0TR...	4IL5.0TR...	2.75	2.1	2.5			
			6.0	4IR6.0TR...	4IL6.0TR...	3.50	2.3	2.7			
1/2" F	23		4.0	4FIR4.0TR...		2.25	1.7	1.9	YI4F		AVRC...-4F
			5.0	4FIR5.0TR...		2.75	2.1	2.5			
			6.0	4FIR6.0TR...		3.50	2.3	2.7			
5/8"	27	6.0	5IR6.0TR...	5IL6.0TR...	3.50	2.3	2.7	YI5	YE5	AVR..-5 (LH)	

**Trapez (con't)**

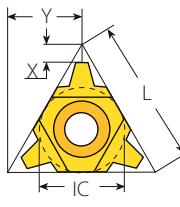
**Internal**



Defined by: DIN 103  
Tolerance class: 7e/7H



Coarse Pitch



U Style Coarse Pitch

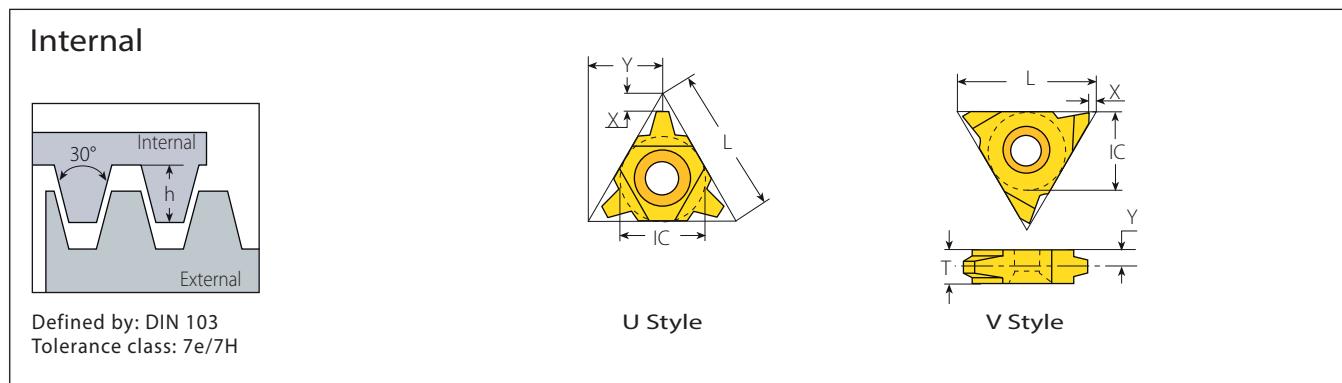
**Coarse Pitch RH**

Thread	Insert Size		Ordering Code	Dimensions mm			Min Bore Dia.		
	IC	L mm		RH	h min	X	Toolholder RH	mm	
TR18x4	3/8"U	16	3UIR4.0TR158/013...		2.25	2.10	8.0	NVRC11-3U-156/020	14.0
TR20x4	3/8"	16	3IR4.0TR158/012...		2.25	1.53	1.9	NVRC13-3-156/006	16.0
TR22x5			3UIR5.0TR158/011...		2.75	1.56	8.0	NVRC14-3U-156/018	17.0
TR24x5	3/8"U	16	3UIR5.0TR158/011...		2.75	1.56	8.0	NVRC15-3U-156/019	19.0
TR26x5			3UIR5.0TR158/011...		2.75	1.56	8.0	NVRC15-3U-156/019	21.0
TR28x5	1/2"	22	4IR5.0TR...		2.75	2.30	2.7	NVRC20-4-156/008	23.0
TR30x6	1/2"U	22	4UIR6.0TR158/007...		3.50	1.94	11.0	NVRC20-4U-156/011	24.0
TR36x6	5/8"	27	5IR6.0TR...		3.50	2.30	2.7	NVRC25-5-156/012	30.0
TR38x7			4UIR7.0TR158/008...		4.00	2.27	11.0	NVRC25-4U-156/013	31.0
TR40x7	1/2"U	22	4UIR7.0TR158/008...		4.00	2.27	11.0	NVRC25-4U-156/013	33.0
TR42x7			4UIR7.0TR158/008...		4.00	2.27	11.0	NVRC32-4U-156/014	35.0
TR44x7			4UIR7.0TR158/008...		4.00	2.27	11.0	NVRC32-4U-156/014	37.0
TR46x8			5UIR8.0TR158/010...		4.50	2.59	13.5	NVRC32-5U-156/015	38.0
TR48x8	5/8"U	27	5UIR8.0TR158/010...		4.50	2.59	13.5	NVRC32-5U-156/015	40.0
TR50x8			5UIR8.0TR158/010...		4.50	2.59	13.5	NVRC32-5U-156/015	42.0
TR52x8			5UIR8.0TR158/010...		4.50	2.59	13.5	NVRC32-5U-156/015	44.0

**Coarse Pitch LH**

Thread	Insert Size		Ordering Code	Dimensions mm			Min Bore Dia.		
	IC	L mm		LH	h min	X	Toolholder LH	mm	
TR18x4	3/8"U	16	3UIR4.0TR158/013...		2.25	2.10	8.0	NVRC11-3ULH-156/029	14.0
TR20x4	3/8"	16	3IL4.0TR158/015...		2.25	1.53	1.9	NVRC13-3LH-156/028	16.0
TR22x5			3UIR5.0TR158/011...		2.75	1.56	8.0	NVRC14-3ULH-156/030	17.0
TR24x5	3/8"U	16	3UIR5.0TR158/011...		2.75	1.56	8.0	NVRC15-3ULH-156/031	19.0
TR26x5			3UIR5.0TR158/011...		2.75	1.56	8.0	NVRC15-3ULH-156/031	21.0
TR28x5	1/2"	22	4IL5.0TR...		2.75	2.30	2.7	NVRC20-4LH-156/024	23.0
TR30x6	1/2"U	22	4UIR6.0TR158/007...		3.50	1.94	11.0	NVRC20-4ULH-156/021	24.0
TR36x6	5/8"	27	5IL6.0TR...		3.50	2.30	2.7	NVRC25-5LH-156/017	30.0
TR38x7			4UIR7.0TR158/008...		4.00	2.27	11.0	NVRC25-4ULH-156/032	31.0
TR40x7	1/2"U	22	4UIR7.0TR158/008...		4.00	2.27	11.0	NVRC25-4ULH-156/032	33.0
TR42x7			4UIR7.0TR158/008...		4.00	2.27	11.0	NVRC32-4ULH-156/022	35.0
TR44x7			4UIR7.0TR158/008...		4.00	2.27	11.0	NVRC32-4ULH-156/022	37.0
TR46x8			5UIR8.0TR158/010...		4.50	2.59	13.5	NVRC32-5ULH-156/027	38.0
TR48x8	5/8"U	27	5UIR8.0TR158/010...		4.50	2.59	13.5	NVRC32-5ULH-156/027	40.0
TR50x8			5UIR8.0TR158/010...		4.50	2.59	13.5	NVRC32-5ULH-156/027	42.0
TR52x8			5UIR8.0TR158/010...		4.50	2.59	13.5	NVRC32-5ULH-156/027	44.0

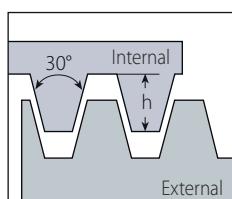
U Type RH inserts can be used for both LH and RH applications.

**Trapez (con't)****U Style**

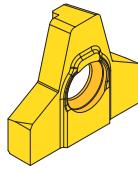
	Insert Size		Pitch	Ordering Code		Dimensions mm			Anvil	
	IC	L mm	mm	RH+LH	h min	X	Y	RH	LH	Toolholder
1/2"U	22	6.0		4UI6.0TR...	3.50	2.0	11.0			
		7.0		4UI7.0TR...	4.00	2.3	11.0	YI4U	YE4U	AVR..-4U (LH)
		8.0		4UI8.0TR...	4.50	2.6	11.0			
5/8"U	27	8.0		5UI8.0TR...	4.50	2.6	13.7	YI5U	YE5U	AVR..-5U (LH)
		9.0		5UI9.0TR...	5.00	3.0	13.7			

**V Style**

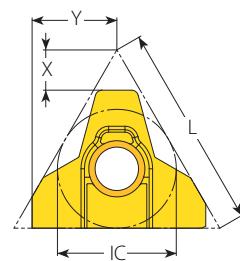
	Insert Size		Pitch	Ordering Code		Dimensions mm				
	IC	L mm	mm	RH	LH	h min	X	Y	T	Toolholder
5/8"V	27	6.0		5VIR6.0TR...	5VIL6.0TR...	3.50	1.0	3.3	6	
		7.0		5VIR7.0TR...	5VIL7.0TR...	4.00	1.0	3.3	6	
		8.0		5VIR8.0TR...	5VIL8.0TR...	4.50	1.0	3.3	6	NVR..-5V (LH)
		9.0		5VIR9.0TR...	5VIL9.0TR...	5.00	1.0	4.3	8	
		10.0		5VIR10.0TR...	5VIL10.0TR...	5.50	1.0	4.3	8	
		12.0		5VIR12.0TR...	5VIL12.0TR...	6.50	1.0	5.2	10	

**Trapez****MEGA/LINE****Internal**

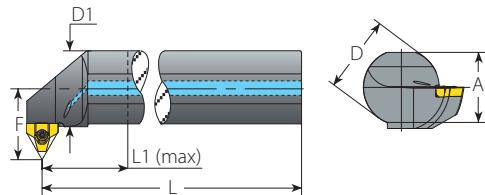
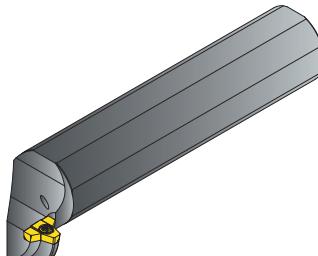
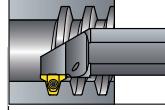
Defined by: DIN 103  
Tolerance class: 7e/7H



Mega Line

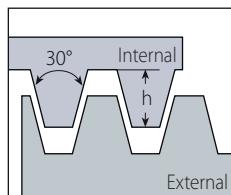
**Internal**

	Insert Size		Pitch	Ordering Code		Dimensions mm			Number of Passes	
	IC	L mm	mm	RH	h min	X	Y	0.07mm-Min. Depth of Cut (On radius)	0.15mm-Max. Depth of Cut (On radius)	
5/8" MG	27		12.0	5MGIR12.0TR...	6.5	5.38		96	45	
			14.0	5MGIR14.0TR...	8.0	4.38		118	55	
			16.0	5MGIR16.0TR...	9.0	5.38	10.4	131	61	
			18.0	5MGIR18.0TR...	10.0	5.38		145	68	
			20.0	5MGIR20.0TR...	11.0	7.38		160	75	
			24.0	5MGIR24.0TR...	13.0	7.38		188	88	

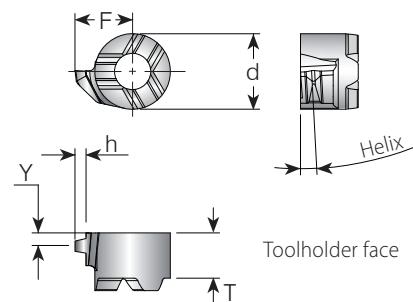
**Internal Toolholders for Trapez****MEGA/LINE****Internal**

Insert	Ordering Code	Dimensions mm						Min. Bore Dia.	Thread Diameter Range (Min.-Max.)	Spare Parts		
		RH	A	L	L1 (max)	D	D1	F	mm	Short Chip Material	Long Chip Material	Insert Screw
5MGIR12.0TR...	NVRC40-5MG12TR	36	232.5	100	40	39.7	41.5	73	(TR85-300)x12	(TR85-300)x12	S5MG	K6T
	NVRC50-5MG12TR	46	257.5	125	50	49.7	46.5	73	(TR85-300)x12	(TR95-300)x12		
	NVRC60-5MG12TR	57	282.5	150	60	59.7	51.5	83	(TR95-300)x12	(TR105-300)x12		
5MGIR14.0TR...	NVRC40-5MG14TR	36	232.5	100	40	39.7	41.5	101	(TR115-145)x14	(TR115-145)x14	S5MG	K6T
	NVRC50-5MG14TR	46	257.5	125	50	49.7	46.5	101	(TR115-145)x14	(TR115-145)x14		
	NVRC60-5MG14TR	57	282.5	150	60	59.7	51.5	101	(TR115-145)x14	(TR115-145)x14		
5MGIR16.0TR...	NVRC40-5MG16TR	36	232.5	100	40	39.7	41.5	64	(TR80-175)x16	(TR150-175)x16	S5MG	K6T
	NVRC50-5MG16TR	46	257.5	125	50	49.7	46.5	134	(TR150-175)x16	(TR150-175)x16		
	NVRC60-5MG16TR	57	282.5	150	60	59.7	51.5	134	(TR150-175)x16	(TR150-175)x16		
5MGIR18.0TR...	NVRC40-5MG18TR	36	232.5	100	40	39.7	41.5	72	(TR85-200)x18	(TR90-200)x18	S5MG	K6T
	NVRC50-5MG18TR	46	257.5	125	50	49.7	46.5	72	(TR90-200)x18	(TR180-200)x18		
	NVRC60-5MG18TR	57	282.5	150	60	59.7	51.5	162	(TR180-200)x18	(TR180-200)x18		
5MGIR20.0TR...	NVRC40-5MG20TR	36	232.5	100	40	39.7	41.5	80	(TR100-230)x20	(TR100-230)x20	S5MG	K6T
	NVRC50-5MG20TR	46	257.5	125	50	49.7	46.5	80	(TR100-230)x20	(TR100-230)x20		
	NVRC60-5MG20TR	57	282.5	150	60	59.7	51.5	85	(TR105-230)x20	(TR210-230)x20		
5MGIR24.0TR...	NVRC40-5MG24TR	36	232.5	100	40	39.7	41.5	111	(TR135-300)x24	(TR135-300)x24	S5MG	K6T
	NVRC50-5MG24TR	46	257.5	125	50	49.7	46.5	111	(TR135-300)x24	(TR135-300)x24		
	NVRC60-5MG24TR	57	282.5	150	60	59.7	51.5	111	(TR135-300)x24	(TR135-300)x24		

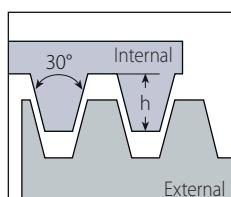
Recommended thread infeed method for Mega Line: Flank or Modified Flank 1°.

**Trapez (con't)****Mini-V****Internal**

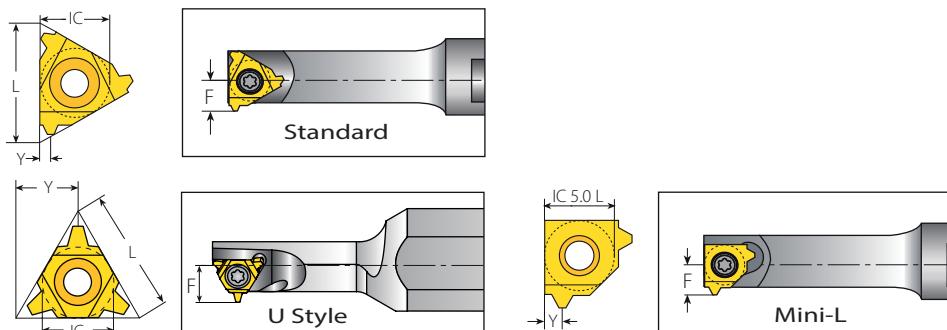
Defined by: DIN 103  
Tolerance class: 7e/7H

**Mini-V**

Min. Thread	Insert Style	Pitch	Ordering Code		Dimensions mm					Helix	Toolholder
			mm	RH	d	T	F	Y	h min		
TR10x2.0	V08	2.0	V08TH2.0TRR...		6	3.8	4.79	0.90	1.25	3.5	.V08...
TR11x3.0		3.0	V08TH3.0TRR...				4.95	1.18	1.75	5	
TR16x4.0	V11	4.0	V11TH4.0TRR...		8	4.2	6.53	1.55	2.25	4.5	.V11...

**Trapez****MINIPRO****Internal**

Defined by: DIN 103  
Tolerance class: 7e/7H

**Mini-3 Standard**

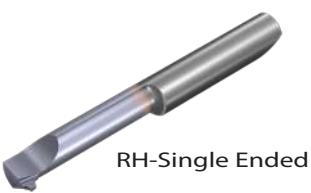
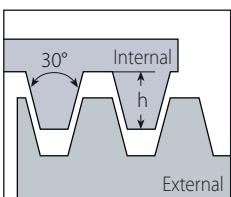
Insert Size	Pitch		Ordering Code		Dimensions mm					Min. Bore Dia.	Toolholder
	IC mm	L mm	mm	RH	LH	h min	Y	F	mm		
5.0	8	1.5	5.0KIR1.5TR...	5.0KIL1.5TR...	0.85	0.70	4.7	7.8	.NVRC7-5.0K (LH)		
6.0	10	1.5	6.0KIR1.5TR...	6.0KIL1.5TR...	0.85	0.85	5.3	10.0	.NVRC1..-6.0K (LH)		
		2.0	6.0KIR2.0TR...	6.0KIL2.0TR...	1.25	1.30	5.3	10.0			

**Mini-3 U Style**

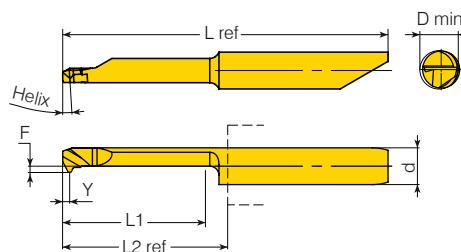
Insert Size	Pitch		Ordering Code		Dimensions mm					Min. Bore Dia.	Toolholder
	IC mm	L mm	mm	RH+LH	h min	Y	F	mm			
5.0U	8	2.0	5.0KUI2TR...	1.25	4.00	5.7	9.0	.NVRC8-5.0K (LH)			

**Mini-L**

Insert Size	Pitch		Ordering Code		Dimensions mm					Min. Bore Dia.	Toolholder
	IC mm	mm	RH	LH	h min	Y	F	mm			
5.0L		1.5	5LKIR1.5TR...	5LKIL1.5TR...	0.85	0.85	4.65	8.0			
		2.0	5LKIR2.0TR...	5LKIL2.0TR...	1.25	1.30	4.80	9.0	.NVRC10.-5LK (LH)		

**Trapez****MINIPRO****Internal**

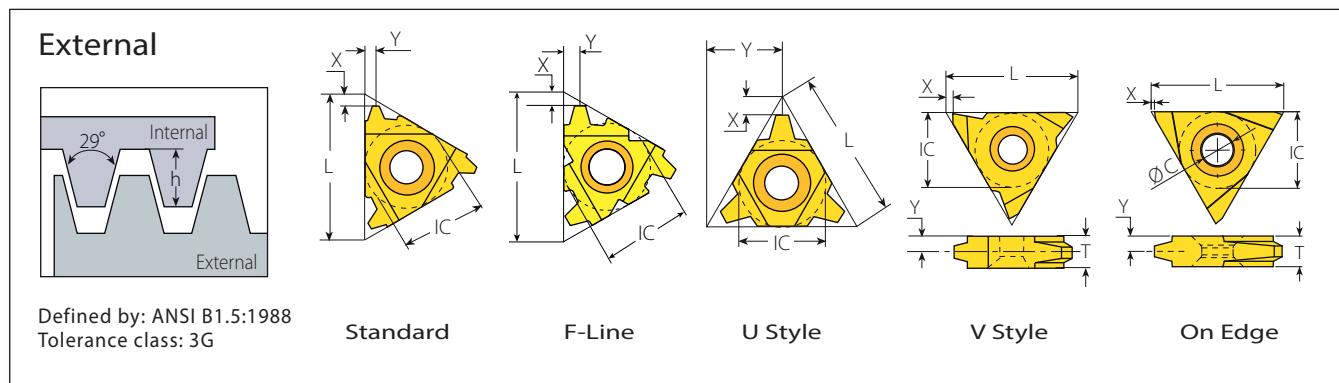
Defined by: DIN 103  
Tolerance class: 7e/7H

**Micro - Single Ended****microScope**

Thread	d mm	mm	Ordering Code		Helix °	L1	F	Y	h min	L2 ref*	L ref	Dimensions mm		Min. Bore Dia.	
			RH/LH									D mm		Toolholder	
TR8-TR10x1.5	6.0	1.5	M662TH1.5TRL20R...		3.3		2.95	1.1	0.9				6.2		MH...-4.0
TR9-TR12x2.0		2.0	M662TH2.0TRL20R...		4.0	20.3	2.95	1.3	1.25	23	46.7				
TR10-TR14x2.0	7.0	2.0	M772TH2.0TRL20R...		3.4		3.45						7.2		MH...-7.0
TR11-TR16x3.0		3.0	M772TH3.0TRL20R...		4.75		3.45	1.5	1.75						

\* L2 Ref: Repeatability within +/-0.02.

## American ACME



### Standard

	Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
	IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder	
	3/8"	16	11	16	2ER16ACME...	2EL16ACME...	0.92	1.0	1.1	-	-	NL..-2 (LH)
			16	16	3ER16ACME...	3EL16ACME...	0.92	1.0	1.1			
			14	3ER14ACME...	3EL14ACME...	1.03	1.0	1.2				
			12	3ER12ACME...	3EL12ACME...	1.19	1.1	1.2	YE3	YE3	AL..-3 (LH)	
			10	3ER10ACME...	3EL10ACME...	1.52	1.3	1.4				
			8	3ER8ACME...	3EL8ACME...	1.84	1.4	1.5				
			7	3ER7ACME...	3EL7ACME...	2.08	1.9	2.2				
	1/2"	22	7	4ER7ACME...	4EL7ACME...	2.08	1.9	2.2	YE4	YE4	AL..-4 (LH)	
			6	4ER6ACME...	4EL6ACME...	2.37	1.8	2.1				
			5	4ER5ACME...	4EL5ACME...	2.79	2.0	2.3				
			6	4FER6ACME...		2.37	1.8	2.1	YE4F	YE4F	AL...-4F	
			5	4FER5ACME...		2.79	2.0	2.3				
	5/8"	27	4	5ER4ACME...	5EL4ACME...	3.43	2.4	2.7	YE5	YE5	AL..-5 (LH)	
			27									

### U Style



	Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
	IC	L mm	TPI	RH+LH		h min	X	Y	RH	LH	Toolholder	
	1/2"U	22	4	4UE4ACME...		3.43	2.3	11.0	YE4U	YE4U	AL..-4U (LH)	
			3	4UE3ACME...		4.49	3.0	11.0				
			27	5UE3ACME...		4.49	3.0	13.7	YE5U	YE5U	AL..-5U (LH)	

### V Style



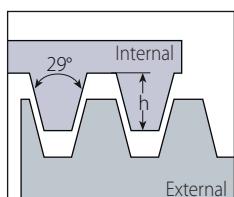
	Insert Size		Pitch		Ordering Code		Dimensions mm				
	IC	L mm	TPI	RH	LH	h min	X	Y	T	Toolholder	
	5/8"V	27	4	5VER4ACME...	5VEL4ACME...	3.43	1.0	3.3	6		
			3.5	5VER3.5ACME...	5VEL3.5ACME...	3.85	1.0	3.3	6		NL..-5V-6 (LH)
			3	5VER3ACME...	5VEL3ACME...	4.49	1.0	3.3	6		
			2	5VER2ACME...	5VEL2ACME...	6.60	1.0	5.2	10		NL..-5V-10 (LH)

### On Edge

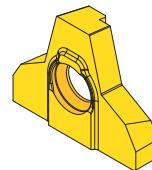
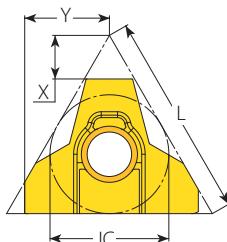


	Insert Size		Pitch		Ordering Code		Dimensions mm				
	IC	L mm	TPI	RH	LH	h min	T	Ø C	X	Y	
	1/2"	22	12	TNEC43EI12ACME...		1.19					
			10	TNEC43EI10ACME...		1.52					
			8	TNEC43EI8ACME...		1.83	4.76	5.2			2.4
			6	TNEC43EI6ACME...		2.36					0.5
	5/8"	27	4	TNEC43EI4ACME...		3.43					
			4	TNEC54EI4ACME...		3.43	6.35	6.5			3.2
			3	TNEC54EI3ACME...		4.50					
	3/4"	32	2	TNEC56EI2ACME...		6.60	9.53	8.0			4.8

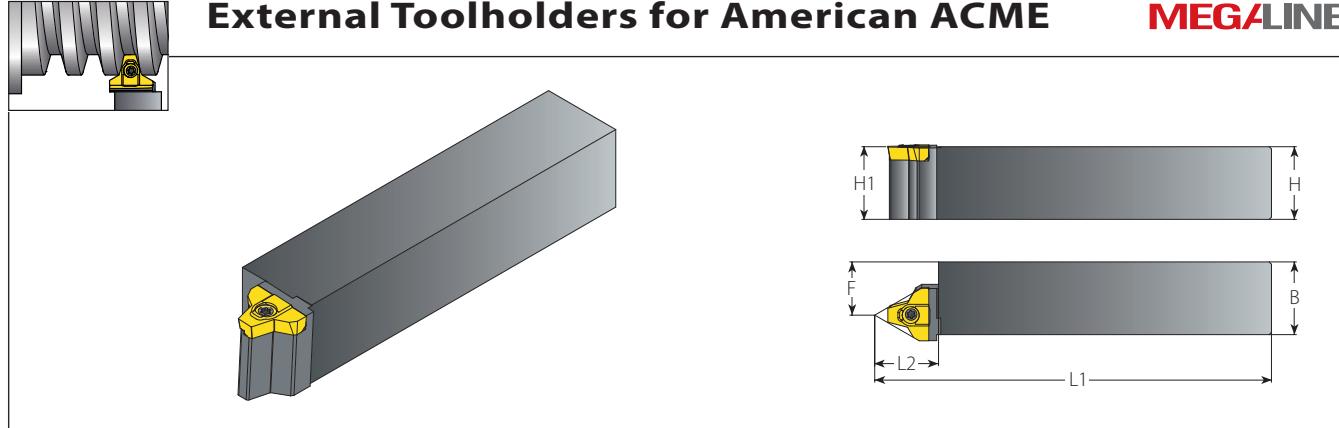
On Edge inserts are suited to existing toolholders on the market.

**American ACME (con't)****MEGALINE****External**

Defined by: ANSI B1.5:1988  
Tolerance class: 3G

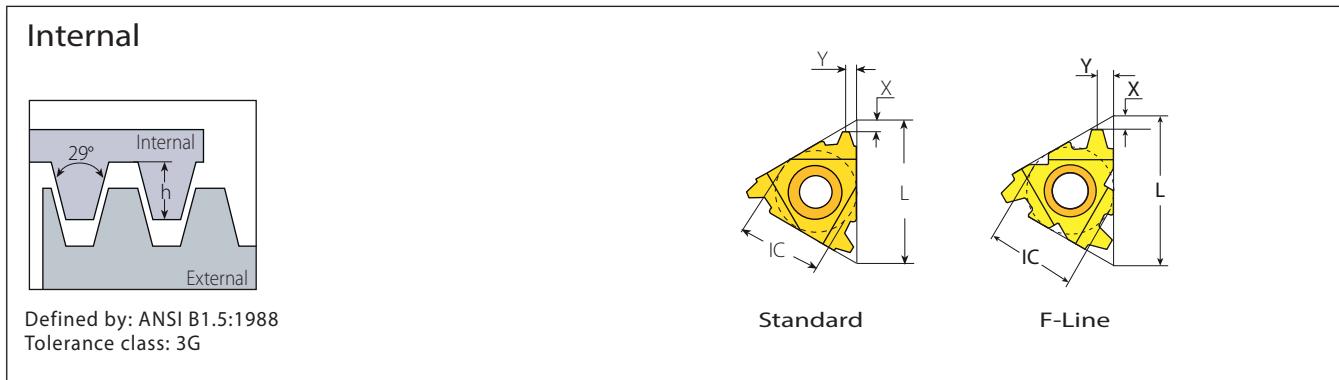
**Mega Line****External**

	Insert Size		Pitch	Ordering Code		Dimensions mm			Number of Passes	
	IC	L mm	TPI	RH	h min	X	Y	0.07mm-Min. Depth of Cut (On radius)	0.15mm-Max. Depth of Cut (On radius)	
5/8" MG	27	11.3	2	5MGER2ACME...	6.60	4.81		95	44	
			1 1/2	5MGER1-1/2ACME...	8.72	5.81		125	58	
			1 1/3	5MGER1-1/3ACME...	9.78	6.81		140	65	
			1	5MGER1ACME...	12.95	8.31		186	87	

**External Toolholders for American ACME****MEGALINE****External****Spare Parts**

Insert	Ordering Code	Dimensions			Thread Diameter Range (Min.-Max.)	Insert Screw	Torx Key
		RH	H=B=H1	F	L1	L2	
5MGER2ACME...	NL25-5MG2ACME	25	16.5	155	(3"-5")-2ACME	S5MG	K6T
	NL32-5MG2ACME	32	23.5	175			
	NL40-5MG2ACME	40	31.5	205			
5MGER1-1/2ACME...	NL25-5MG1-1/2ACME	25	16.5	155	(3"-5")-1 1/2ACME	S5MG	K6T
	NL32-5MG1-1/2ACME	32	23.5	175			
	NL40-5MG1-1/2ACME	40	31.5	205			
5MGER1-1/3ACME...	NL25-5MG1-1/3ACME	25	16.5	155	(3"-5")-1 1/3ACME	S5MG	K6T
	NL32-5MG1-1/3ACME	32	23.5	175			
	NL40-5MG1-1/3ACME	40	31.5	205			
5MGER1ACME...	NL25-5MG1ACME	25	16.5	155	(3.5"-5")-1ACME	S5MG	K6T
	NL32-5MG1ACME	32	23.5	175			
	NL40-5MG1ACME	40	31.5	205			

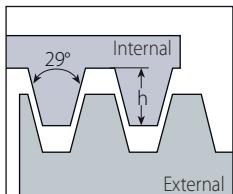
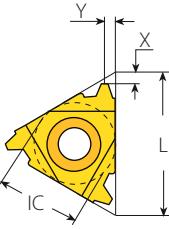
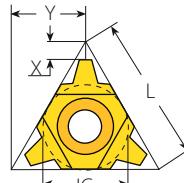
Recommended thread infeed method for Mega Line: Flank or Modified Flank 1°.

**American ACME (con't)****Standard**

	Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
	IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder	
	3/8"	16	11	16	2IR16ACME...	2IL16ACME...	0.92	0.9	0.9	-	-	NVR..-2 (LH)
				16	3IR16ACME...	3IL16ACME...	0.92	1.0	1.1			
				14	3IR14ACME...	3IL14ACME...	1.03	1.1	1.2			
				12	3IR12ACME...	3IL12ACME...	1.19	1.2	1.3	YI3	YE3	AVR..-3 (LH)
				10	3IR10ACME...	3IL10ACME...	1.52	1.2	1.3			
	1/2"	22	8	3IR8ACME...	3IL8ACME...	1.84	1.4	1.5				
				6	4IR6ACME...	4IL6ACME...	2.37	1.8	2.1	YI4	YE4	AVR..-4 (LH)
				5	4IR5ACME...	4IL5ACME...	2.79	2.0	2.3			
			23	6	4FIR6ACME...		2.37	1.8	2.1	YI4F		AVRC...-4F
				5	4FIR5ACME...		2.79	2.0	2.3			
	5/8"	27	4	5IR4ACME...	5IL4ACME...	3.43	2.3	2.6	YI5	YE5	AVR..-5 (LH)	

**FLINE**

**American ACME (con't)**

Internal									
 <p>Defined by: ANSI B1.5:1988 Tolerance class: 3G</p>								<b>Standard</b>	
								<b>U Style</b>	

**Coarse Pitch RH**

Thread	Insert Size			Ordering Code		Dimensions mm			Anvil		Min Bore Dia.	
	TPI	IC	L mm	RH	h min	X	Y	RH	Toolholder RH	mm		
1/2"x10	6.0U	10	6.0KUIR10ACME158/005...	1.52	1.0	5.2	-	NVRC8-6.0KU-156/003		10.16		
5/8"x8	1/4"U	11	2UIR8ACME158/006...	1.84	1.0	5.5	-	NVRC10-2U-156/004		12.70		
3/4"x6	3/8"	16	3IR6ACME...	2.37	1.7	1.8	-	NVRC11-3-156/005		14.82		
7/8"x6			3IR6ACME...	2.37	1.7	1.8	-	NVRC13-3-156/006		18.42		
1"x5	1/2"	22	4IR5ACME158/018...	2.79	2.0	2.3	-	NVRC17-4-156/039		20.32		
1 1/8"x5			4IR5ACME...	2.79	2.0	2.3	-	NVRC20-4-156/008		24.00		
1 1/4"x5	5/8"	27	4IR5ACME...	2.79	2.0	2.3	-	NVRC20-4-156/009		27.18		
1 1/2"x4			5IR4ACME...	3.43	2.3	2.6	-	NVRC28-5-156/010		32.38		
1 3/4"x4	5/8"	27	5IR4ACME...	3.43	2.3	2.6	YI5-1P	AVRC32-5		38.74		

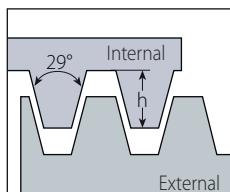
**Coarse Pitch LH**

Thread	Insert Size			Ordering Code		Dimensions mm			Anvil		Min Bore Dia.	
	TPI	IC	L mm	LH	h min	X	Y	LH	Toolholder LH	mm		
1/2"x10	6.0U	10	6.0KUIR10ACME158/005...	1.52	1.0	5.2	-	NVRC8-6.0KU-156/037		10.16		
5/8"x8	1/4"U	11	2UIR8ACME158/006...	1.84	1.0	5.5	-	NVRC10-2U-156/038		12.70		
3/4"x6	3/8"	16	3IL6ACME...	2.37	1.7	1.8	-	NVRC11-3LH-156/025		14.82		
7/8"x6			3IL6ACME...	2.37	1.7	1.8	-	NVRC13-3LH-156/028		18.42		
1"x5	1/2"	22	4IL5ACME158/019...	2.79	2.0	2.3	-	NVRC17-4LH-156/040		20.32		
1 1/8"x5			4IL5ACME...	2.79	2.0	2.3	-	NVRC20-4LH-156/024		24.00		
1 1/4"x5	5/8"	27	4IL5ACME...	2.79	2.0	2.3	-	NVRC20-4LH-156/033		27.18		
1 1/2"x4			5IL4ACME...	3.43	2.3	2.6	-	NVRC28-5LH-156/034		32.38		
1 3/4"x4	5/8"	27	5IL4ACME...	3.43	2.3	2.6	YE5-1P	AVRC32-5LH		38.74		

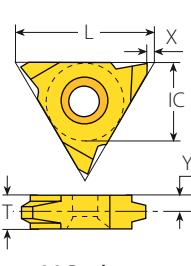
U Type RH Inserts Can Be Used for Both LH and RH Applications.

**U Style**

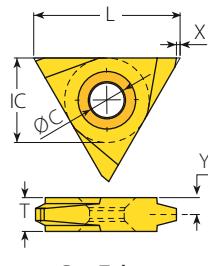
Insert Size			Pitch	Ordering Code		Dimensions mm			Anvil		
IC	L mm	TPI		RH+LH	h min	X	Y	RH	LH	Toolholder	
1/2"U	22	4		4UI4ACME...	3.43	2.3	11.0		YI4U	YE4U	AVR..-4U (LH)
		3		4UI3ACME...	4.49	2.9	11.0		YE4U		
5/8"U	27	3		5UI3ACME...	4.49	2.9	13.7	YI5U	YE5U		AVR..-5U(LH)

**American ACME (con't)****Internal**

Defined by: ANSI B1.5:1988  
Tolerance class: 3G



V Style



On Edge

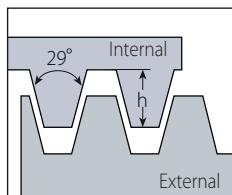
**V Style**

	Insert Size		Pitch		Ordering Code		Dimensions mm				Toolholder
	IC	L mm	TPI	RH	LH	h min	X	Y	T		
5/8"V	27	4	5VIR4ACME...	5VIL4ACME...	3.43	1.0	3.3	6			NVR..-5V (LH)
		3.5	5VIR3.5ACME...	5VIL3.5ACME...	3.85	1.0	3.3	6			
		3	5VIR3ACME...	5VIL3ACME...	4.49	1.0	3.3	6			
		2	5VIR2ACME...	5VIL2ACME...	6.60	1.0	5.2	10			

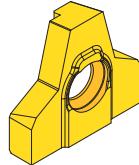
**On Edge**

	Insert Size		Pitch		Ordering Code		Dimensions mm				X	Y
	IC	L mm	TPI	RH	LH	h min	T	Ø C				
1/2"	22	12	12	TNEC43EI12ACME...	1.19						0.5	2.4
		10	10	TNEC43EI10ACME...	1.52							
		8	8	TNEC43EI8ACME...	1.83	4.76	5.2					
		6	6	TNEC43EI6ACME...	2.36							
		4	4	TNEC43EI4ACME...	3.43							
5/8"	27	4	4	TNEC54EI4ACME...	3.43	6.35	6.5					3.2
		3	3	TNEC54EI3ACME...	4.50							
3/4"	32	2	2	TNEC56EI2ACME...	6.60	9.53	8.0					4.8

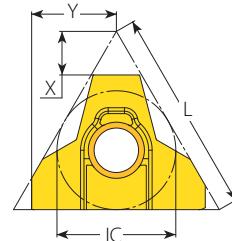
On Edge inserts are suited to existing toolholders on the market.

**American ACME (con't)****MEGALINE****Internal**

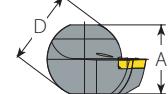
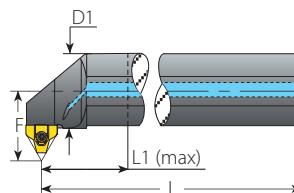
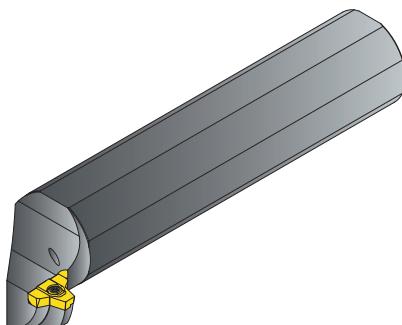
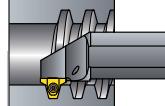
Defined by: ANSI B1.5:1988  
Tolerance class: 3G



Mega Line

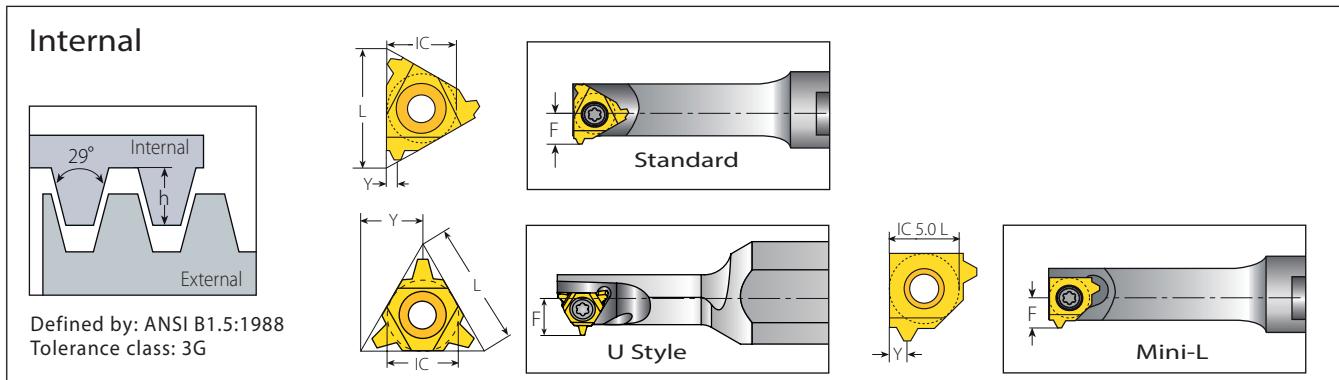
**Internal**

	Insert Size		Pitch		Ordering Code		Dimensions mm			Number of Passes	
	IC	L mm	TPI	RH	h min	X	Y	0.07mm-Min. Depth of Cut (On radius)	0.15mm-Max. Depth of Cut (On radius)		
	27	5/8" MG	2	5MGIR2ACME...	6.54	4.81		94	44		
			1 1/2	5MGIR1-1/2ACME...	8.55	5.81	10.4	124	58		
			1 1/3	5MGIR1-1/3ACME...	9.56	6.81		139	65		
			1	5MGIR1ACME...	12.57	8.31		184	86		

**Internal Toolholders for American ACME****MEGALINE****Internal**

Insert	Ordering Code	Dimensions mm						Min. Bore Dia.	Thread Diameter Range (Min.-Max.)	Spare Parts		
		RH	A	L	L1 (max)	D	D1	F	mm	Short Chip Material	Long Chip Material	
5MGIR2ACME...	NVRC40-5MG2ACME	36	232.5	100	40	39.7	41.5		63.5	(3"-5")-2ACME	(3.5"-5")-2ACME	S5MG
	NVRC50-5MG2ACME	46	257.5	125	50	49.7	46.5		76.2	(3.5"-5")-2ACME	(4"-5")-2ACME	
	NVRC60-5MG2ACME	57	282.5	150	60	59.7	51.5		88.9	(4"-5")-2ACME	(4.5"-5")-2ACME	
5MGIR1-1/2ACME...	NVRC40-5MG1-1/2ACME	36	232.5	100	40	39.7	41.5		59.3	(3"-5")-1 1/2ACME	(3.5"-5")-1 1/2ACME	K6T
	NVRC50-5MG1-1/2ACME	46	257.5	125	50	49.7	46.5		72.0	(3.5"-5")-1 1/2ACME	(4"-5")-1 1/2ACME	
	NVRC60-5MG1-1/2ACME	57	282.5	150	60	59.7	51.5		84.7	(4"-5")-1 1/2ACME	(4.5"-5")-1 1/2ACME	
5MGIR1-1/3ACME...	NVRC40-5MG1-1/3ACME	36	232.5	100	40	39.7	41.5		57.2	(3"-5")-1 1/3ACME	(3.5"-5")-1 1/3ACME	
	NVRC50-5MG1-1/3ACME	46	257.5	125	50	49.7	46.5		69.9	(3.5"-5")-1 1/3ACME	(4.0"-5")-1 1/3ACME	
	NVRC60-5MG1-1/3ACME	57	282.5	150	60	59.7	51.5		82.6	(4.0"-5")-1 1/3ACME	(4.5"-5")-1 1/3ACME	
5MGIR1ACME...	NVRC40-5MG1ACME	36	232.5	100	40	39.7	41.5		63.5	(3.5"-5")-1ACME	(4"-5")-1ACME	
	NVRC50-5MG1ACME	46	257.5	125	50	49.7	46.5		76.2	(4"-5")-1ACME	(4.5"-5")-1ACME	
	NVRC60-5MG1ACME	57	282.5	150	60	59.7	51.5		76.2	(4"-5")-1ACME	(4.5"-5")-1ACME	

Recommended thread infeed method for Megaline: Flank or Modified Flank 1°.

**American ACME (con't)****MINIPRO****Mini-3 Standard**

Insert Size			Pitch		Ordering Code			Dimensions mm			Min. Bore Dia.	
IC mm	L mm	TPI	RH	LH	h min	Y	F	mm	mm	Toolholder		
5.0	8	16	5.0KIR16ACME...	5.0KIL16ACME...	0.92	0.7	4.7	7.8	.NVRC7-5.0K (LH)			
6.0	10	12	6.0KIR12ACME...	6.0KIL12ACME...	1.19	1.1	5.1	10.0	.NVRC1.-6.0K (LH)			

**Mini-3 U Style**

Insert Size			Pitch		Ordering Code			Dimensions mm			Min. Bore Dia.	
IC mm	L mm	TPI	RH+LH	h min	Y	F	mm	mm	Toolholder			
5.0U	8	14	5.0KUI14ACME...	1.03								
		12	5.0KUI12ACME...	1.19	4.0	5.8	9.0					
		10	5.0KUI10ACME...	1.52								

**Mini-L**

Insert Size			Pitch		Ordering Code			Dimensions mm			Min. Bore Dia.	
IC mm	TPI	RH	LH	h min	Y	F	mm	mm	Toolholder			
5.0L	12	5LKIR12ACME...	5LKIL12ACME...	1.19	1.1	4.42	8.0		.NVRC10.-5LK (LH)			

## American ACME (2G)

External	Standard	F-Line	U Style	V Style
<p>Defined by: ANSI B1.5:1988 Tolerance class: 2G</p>				

### Standard


**FLINE**

Insert Size	Pitch		Ordering Code		Dimensions mm			Anvil		
	IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH
3/8"	16	10	3ER10ACME-2G...	3EL10ACME-2G...	1.52	1.3	1.4	YE3	YI3	AL..-3 (LH)
3/8"	16	8	3ER8ACME-2G...	3EL8ACME-2G...	1.84	1.4	1.5	YE3	YI3	AL..-3 (LH)
1/2"	22	5	4ER5ACME-2G...	4EL5ACME-2G...	2.79	2.0	2.3	YE4	YI4	AL..-4 (LH)
1/2"F	23	5	4FER5ACME-2G...		2.79	2.0	2.3	YE4F		AL..-4F

### U Style

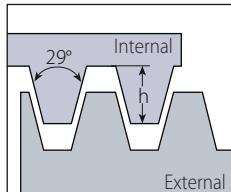


Insert Size	Pitch		Ordering Code		Dimensions mm			Anvil		
	IC	L mm	TPI	RH+LH	h min	X	Y	RH	LH	Toolholder
1/2"U	22	4	4UE4ACME-2G...		3.43	2.3	11.0			
1/2"U	22	3.5	4UE3.5ACME-2G...		3.85	2.6	11.0	YE4U	YI4U	AL..-4U (LH)
1/2"U	22	3	4UE3ACME-2G...		4.49	3.0	11.0			

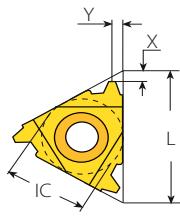
### V Style



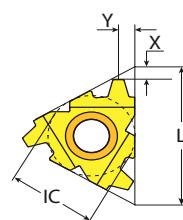
Insert Size	Pitch		Ordering Code		Dimensions mm				Toolholder	
	IC	L mm	TPI	RH	LH	h min	X	Y	T	Toolholder
5/8"V	27	4	5VER4ACME-2G...	5VEL4ACME-2G...	3.43	1.0	3.3	6		
5/8"V	27	3.5	5VER3.5ACME-2G...	5VEL3.5ACME-2G...	3.85	1.0	3.3	6		NL..-5V-6 (LH)
5/8"V	27	3	5VER3ACME-2G...	5VEL3ACME-2G...	4.49	1.0	3.3	6		

**American ACME (2G) (con't)****Internal**

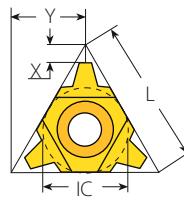
Defined by: ANSI B1.5:1988  
Tolerance class: 2G



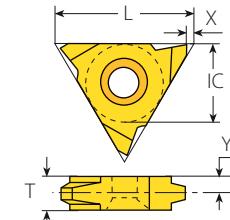
Standard



F-Line



U Style



V Style

**Standard**

Insert Size			Pitch		Ordering Code			Dimensions mm			Anvil		
IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder			
3/8"	16	10	3IR10ACME-2G...	3IL10ACME-2G...	1.52	1.2	1.3		YI3	YE3	AVR..-3 (LH)		
		8	3IR8ACME-2G...	3IL8ACME-2G...	1.84	1.4	1.5						
1/2"	22	5	4IR5ACME-2G...	4IL5ACME-2G...	2.79	2.0	2.3	YI4	YE4	AVR..-4 (LH)			
1/2" F	23	5	4FIR5ACME-2G...		2.79	2.0	2.3	YI4F			AVRC..-4F		

F LINE

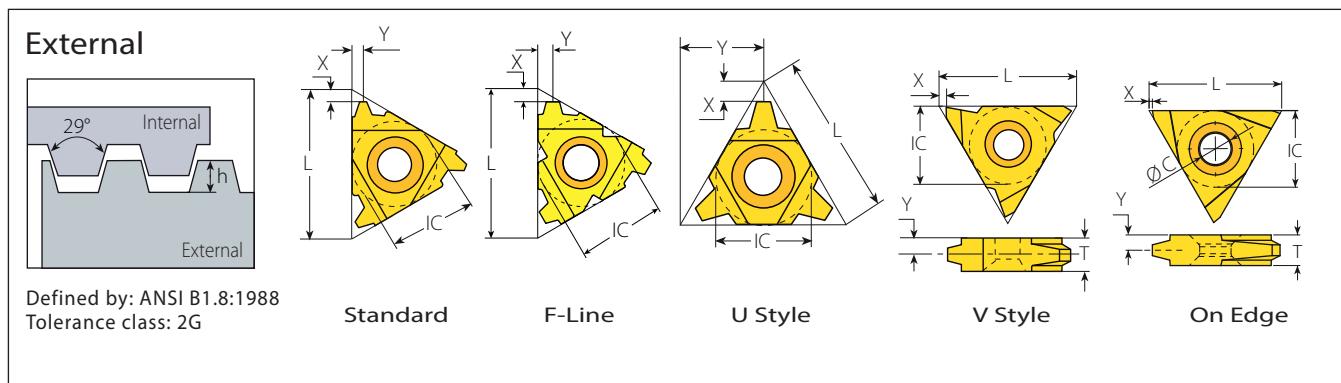
**U Style**

Insert Size			Pitch		Ordering Code			Dimensions mm			Anvil		
IC	L mm	TPI	RH+LH		h min	X	Y	RH	LH	Toolholder			
		4	4UI4ACME-2G...		3.43	2.3	11.0						
1/2" U	22	3.5	4UI3.5ACME-2G...		3.85	2.6	11.0	YI4U	YE4U	AVR..-4U (LH)			
		3	4UI3ACME-2G...		4.49	2.9	11.0						

**V Style**

Insert Size			Pitch		Ordering Code			Dimensions mm			Toolholder		
IC	L mm	TPI	RH	LH	h min	X	Y	T	Toolholder				
		4	5VIR4ACME-2G...	5VIL4ACME-2G...	3.43	1.0	3.3	6					
5/8" V	27	3.5	5VIR3.5ACME-2G...	5VIL3.5ACME-2G...	3.85	1.0	3.3	6	NVR..-5V (LH)				
		3	5VIR3ACME-2G...	5VIL3ACME-2G...	4.49	1.0	3.3	6					

## Stub ACME



### Standard

	Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
	IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder	
	1/4"	11	16	2ER16STACME...	2EL16STACME...	0.60	1.0	1.0	-	-	NL..-2 (LH)	
			16	3ER16STACME...	3EL16STACME...	0.60	1.0	1.0				
			14	3ER14STACME...	3EL14STACME...	0.67	1.1	1.1				
	3/8"	16	12	3ER12STACME...	3EL12STACME...	0.76	1.2	1.2		YE3	YI3	AL..-3 (LH)
			10	3ER10STACME...	3EL10STACME...	1.02	1.2	1.3				
			8	3ER8STACME...	3EL8STACME...	1.21	1.4	1.5				
			6	3ER6STACME...	3EL6STACME...	1.52	1.7	1.8				
 <b>F-LINE</b>	1/2"	22	6	4ER6STACME...	4EL6STACME...	1.52	1.7	1.8		YE4	YI4	AL..-4 (LH)
			5	4ER5STACME...	4EL5STACME...	1.78	2.1	2.3				
			4	4ER4STACME...	4EL4STACME...	2.16	2.3	2.3				
	1/2" F	23	6	4FER6STACME...		1.52	1.7	1.8		YE4F		AL...-4F
			5	4FER5STACME...		1.78	2.1	2.3				
			4	4FER4STACME...		2.16	2.3	2.3				
	5/8"	27	4	5ER4STACME...	5EL4STACME...	2.16	2.3	2.4		YE5	YI5	AL..-5 (LH)
			3	5ER3STACME...	5EL3STACME...	2.79	2.9	2.9				

### U Style

	Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
	IC	L mm	TPI	RH+LH	h min	X	Y	RH	LH	Toolholder		
	1/2"U	22	4	4UE4STACME...		2.16	2.6	11.0		YE4U	YI4U	AL..-4U (LH)
			3	4UE3STACME...		2.79	3.4	11.0				

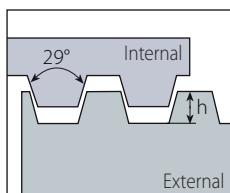
### V Style

	Insert Size		Pitch		Ordering Code		Dimensions mm				
	IC	L mm	TPI	RH	LH	h min	X	Y	T	Toolholder	
	5/8"V	27	4	5VER4STACME...	5VEL4STACME...	2.16	1.0	3.3	6		NL..-5V-6 (LH)
			3	5VER3STACME...	5VEL3STACME...	2.79	1.0	3.3	6		
			2	5VER2STACME...	5VEL2STACME...	4.06	1.0	4.3	8		NL..-5V-8 (LH)

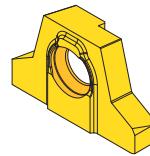
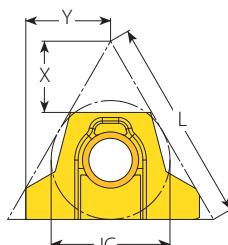
### On Edge

	Insert Size		Pitch		Ordering Code		Dimensions mm				
	IC	L mm	TPI	RH	LH	h min	T	Ø C	X	Y	
	3/8"	16	12		TNEC32EI12STACME...	0.76					
			10		TNEC32EI10STACME...	1.02	3.18	3.8	1.0	1.6	
			8		TNEC32EI8STACME...	1.22					
	1/2"	22	12		TNEC43EI12STACME...	0.76					
			10		TNEC43EI10STACME...	1.02					
			8		TNEC43EI8STACME...	1.22	4.76	5.2			
			6		TNEC43EI6STACME...	1.52					
	5/8"	27	4		TNEC43EI4STACME...	2.16					
			4		TNEC54EI4STACME...	2.16	6.35	6.5			

On Edge inserts are suited to existing toolholders on the market.

**Stub ACME (con't)****MEGALINE****External**

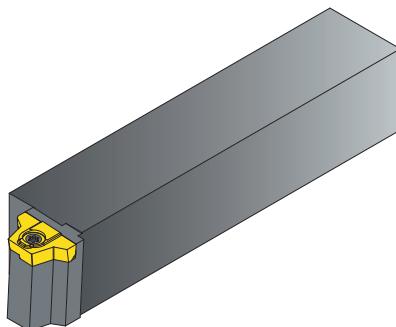
Defined by: ANSI B1.8:1988  
Tolerance class: 2G



Mega Line

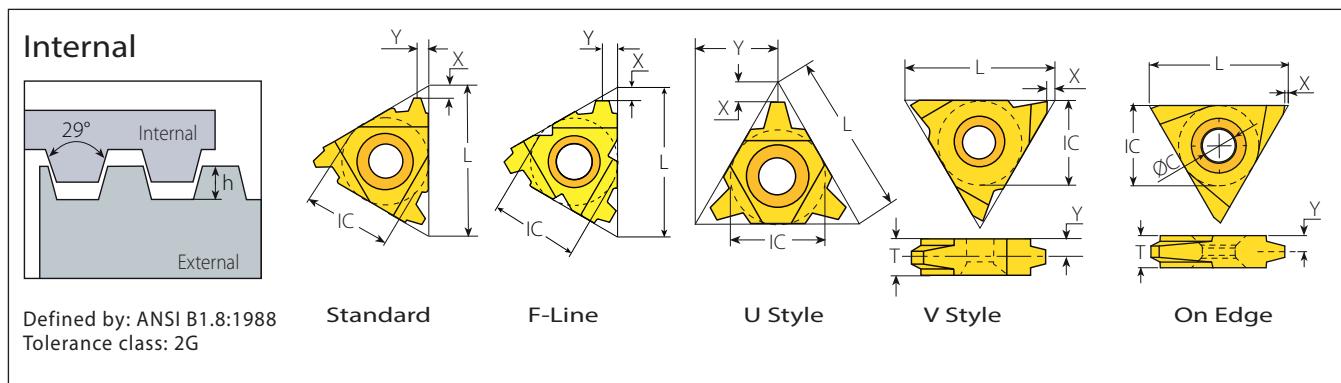
**External**

	Insert Size		Pitch		Ordering Code		Dimensions mm			Number of Passes	
	IC	L mm	TPI	RH	h min	X	Y	0.07mm-Min. Depth of Cut (On radius)	0.15mm-Max. Depth of Cut (On radius)		
	5/8" MG	27	1	5MGER1STACME...	7.87	9.51	11.3	113	53		

**External Toolholders for Stub ACME****MEGALINE****External**

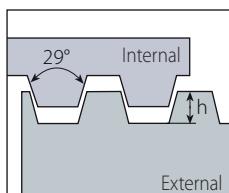
Insert	Ordering Code	Dimensions mm			Thread Diameter Range (Min.-Max.)	Spare Parts	
		RH	H=B=H1	F	L1	L2	Insert Screw
5MGER1STACME...	NL25-5MG1STACME	25	16.5	155	(3.5"-5")-1STACME	S5MG	K6T
	NL32-5MG1STACME	32	23.5	175			
	NL40-5MG1STACME	40	31.5	205			

Recommended thread infeed method for Mega Line: Flank or Modified Flank 1°.

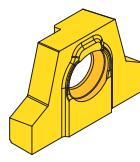
**Stub ACME (con't)****Standard**

	Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil			
	IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder		
	1/4"	11	16	2IR16STACME...	2IL16STACME...	0.60	1.0	1.0	-	-	NVR..-2 (LH)		
				3IR16STACME...	3IL16STACME...	0.60	1.0	1.0					
				3IR14STACME...	3IL14STACME...	0.67	1.1	1.1					
				3IR12STACME...	3IL12STACME...	0.76	1.1	1.2					
				3IR10STACME...	3IL10STACME...	1.02	1.2	1.3	YI3	YE3	AVR..-3 (LH)		
				3IR8STACME...	3IL8STACME...	1.21	1.4	1.5					
				3IR6STACME...	3IL6STACME...	1.52	1.7	1.8					
 <b>F-LINE</b>	3/8"	16	6	4IR6STACME...	4IL6STACME...	1.52	1.7	1.8					
				4IR12STACME...	4IL12STACME...	0.67	1.1	1.1					
				4IR10STACME...	4IL10STACME...	1.02	1.2	1.3					
				4IR8STACME...	4IL8STACME...	1.21	1.4	1.5					
				4IR6STACME...	4IL6STACME...	1.52	1.7	1.8	YI4	YE4	AVR..-4 (LH)		
				4IR5STACME...	4IL5STACME...	1.78	2.1	2.3					
				4IR4STACME...	4IL4STACME...	2.16	2.3	2.3					
	1/2"	22	6	4FIR6STACME...	4FIL6STACME...	1.52	1.7	1.8					
				4FIR12STACME...	4FIL12STACME...	0.67	1.1	1.1					
				4FIR10STACME...	4FIL10STACME...	1.02	1.2	1.3					
				4FIR8STACME...	4FIL8STACME...	1.21	1.4	1.5					
				4FIR6STACME...	4FIL6STACME...	1.52	1.7	1.8	YI4F	YE4F	AVRC..-4F		
				4FIR5STACME...	4FIL5STACME...	1.78	2.1	2.3					
				4FIR4STACME...	4FIL4STACME...	2.16	2.3	2.3					
	5/8"	27	4	5IR4STACME...	5IL4STACME...	2.16	2.3	2.4					
				5IR3STACME...	5IL3STACME...	2.79	2.9	2.9	YI5	YE5	AVR..-5 (LH)		
				5IR2STACME...	5IL2STACME...	4.06	1.0	4.3					
				5IR1STACME...	5IL1STACME...	6.35	1.0	6.5					
				5IR0STACME...	5IL0STACME...	8.5	1.0	8.5					
				5IR-1STACME...	5IL-1STACME...	10.7	1.0	10.7					
				5IR-2STACME...	5IL-2STACME...	12.9	1.0	12.9					
	3/8"	16	12	Insert Size		Pitch		Ordering Code		Dimensions mm			
				IC	L mm	TPI	RH	LH	h min	X	Y	T	Toolholder
				3/8"	16	12	TNEC32EI12STACME...		0.76				
					10	10	TNEC32EI10STACME...		1.02	3.175	3.8	1	1.6
					8	8	TNEC32EI8STACME...		1.22				
					12	12	TNEC43EI12STACME...		0.76				
					10	10	TNEC43EI10STACME...		1.02				
	1/2"	22	8	1/2"	22	8	TNEC43EI8STACME...		1.22	4.76	5.2	0.5	2.4
					6	6	TNEC43EI6STACME...		1.52				
					4	4	TNEC43EI4STACME...		2.16				
					12	12	TNEC43EI12STACME...		0.76				
					10	10	TNEC43EI10STACME...		1.02				
					8	8	TNEC43EI8STACME...		1.22				
					6	6	TNEC43EI6STACME...		1.52				
	5/8"	27	4	5/8"	27	4	TNEC54EI4STACME...		2.16	6.35	6.5		3.2
					12	12	TNEC54EI12STACME...		0.76				
					10	10	TNEC54EI10STACME...		1.02				
					8	8	TNEC54EI8STACME...		1.22				
					6	6	TNEC54EI6STACME...		1.52				
					4	4	TNEC54EI4STACME...		2.16				
					12	12	TNEC54EI12STACME...		0.76				

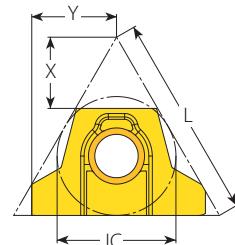
On Edge inserts are suited to existing toolholders on the market.

**Stub ACME (con't)****MEGALINE****Internal**

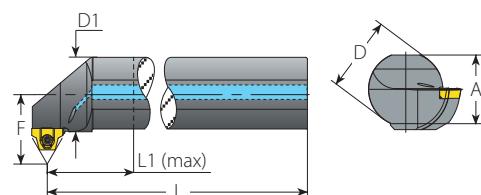
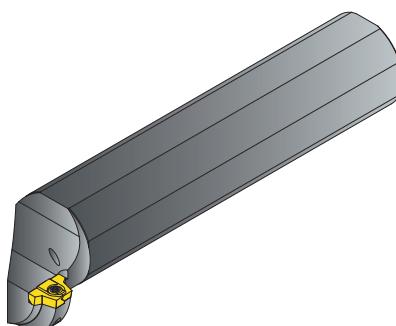
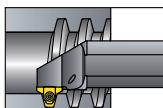
Defined by: ANSI B1.8:1988  
Tolerance class: 2G



Mega Line

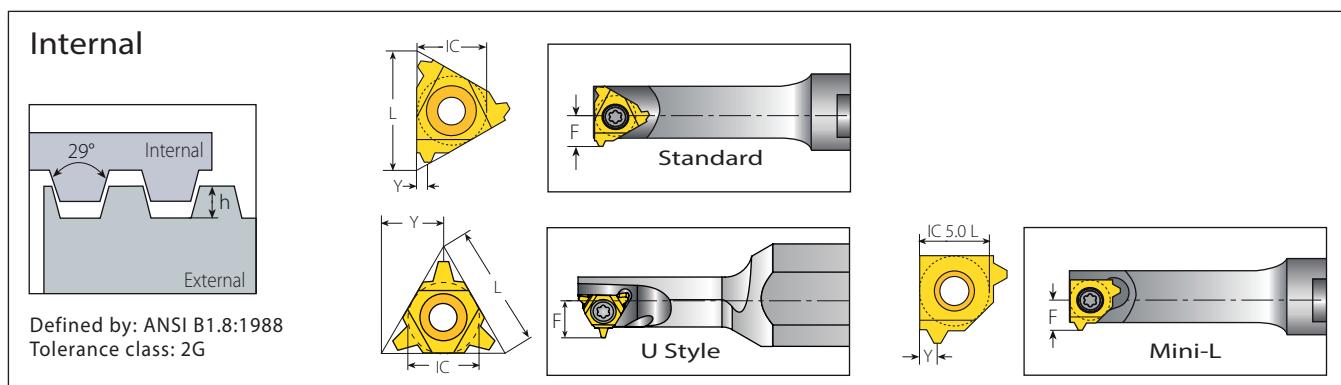
**Internal**

	Insert Size		Pitch		Ordering Code		Dimensions mm			Number of Passes	
	IC	L mm	TPI	RH	h min	X	Y	0.07mm-Min. Depth of Cut (On radius)	0.15mm-Max. Depth of Cut (On radius)		
	5/8" MG	27	1	5MGIR1STACME...	7.82	9.51	10.4	113	53		

**Internal Toolholders for Stub ACME****MEGALINE****Internal****Spare Parts**

Insert	Ordering Code	Dimensions						Min. Bore Dia.	Thread Diameter Range (Min.-Max.)			
		RH	A	L	L1 (max)	D	D1	F	mm	Short Chip Material	Long Chip Material	Insert Screw
5MGIR 1STACME...	NVRC40-5MG1STACME	36	232.5	100	40	39.7	41.5	73.7	(3.5"-5")-1STACME	(3.5"-5")-1STACME	S5MG	K6T
	NVRC50-5MG1STACME	46	257.5	125	50	49.7	46.5	73.7	(3.5"-5")-1STACME	(4.0"-5")-1STACME		
	NVRC60-5MG1STACME	57	282.5	150	60	59.7	51.5	86.4	(4.0"-5")-1STACME	(4.5"-5")-1STACME		

Recommended thread infeed method for Mega Line: Flank or Modified Flank 1°.

**Stub ACME (con't)****MINIPRO****Mini-3 Standard**

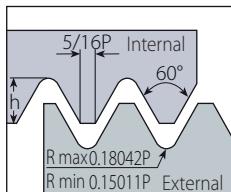
Insert Size			Pitch		Ordering Code			Dimensions mm			Min. Bore Dia.	
IC mm	L mm	TPI	RH	LH	h min	Y	F	mm	mm	Toolholder		
5.0	8	16	5.0KIR16STACME...	5.0KIL16STACME...	0.60	0.7	4.7	7.8	.NVRC7-5.0K (LH)			
6.0	10	12	6.0KIR12STACME...	6.0KIL12STACME...	0.76	1.2	5.1	10.0	.NVRC1..-6.0K (LH)			

**Mini-3 U Style**

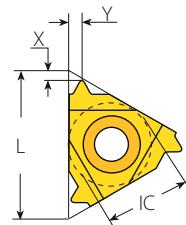
Insert Size			Pitch		Ordering Code			Dimensions mm			Min. Bore Dia.	
IC mm	L mm	TPI	RH+LH		h min	Y	F	mm	mm	Toolholder		
5.0U	8	14	5.0KUI14STACME...		0.67		5.8					
		12	5.0KUI12STACME...		0.76	4.0	5.7		9.0	.NVRC8-5.0KU (LH)		
		10	5.0KUI10STACME...		1.02		5.6					

**Mini-L**

Insert Size			Pitch		Ordering Code			Dimensions mm			Min. Bore Dia.	
IC mm	TPI	RH	LH	h min	Y	F	mm	mm	Toolholder			
5.0L	12	5LKIR12STACME...	5LKIL12STACME...	0.76	1.2	4.42	8.0	.NVRC10.-5LK (LH)				

**UNJ - UNJC, UNJF, UNJEF, UNJS****External**

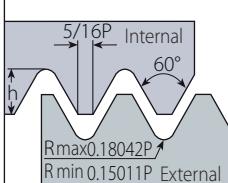
Defined by: MIL-S-8879C  
Tolerance class: 3A/3B

**Standard****Standard**

Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder	
1/4"	11	48	2ER48UNJ...	2EL48UNJ...	0.31	0.6	0.5	-	-	NL..-2 (LH)	
		44	2ER44UNJ...	2EL44UNJ...	0.33	0.6	0.6				
		40	2ER40UNJ...	2EL40UNJ...	0.37	0.6	0.6				
		36	2ER36UNJ...	2EL36UNJ...	0.41	0.6	0.6				
		32	2ER32UNJ...	2EL32UNJ...	0.46	0.6	0.7				
		28	2ER28UNJ...	2EL28UNJ...	0.52	0.7	0.7				
		24	2ER24UNJ...	2EL24UNJ...	0.61	0.7	0.8				
		20	2ER20UNJ...	2EL20UNJ...	0.73	0.8	0.9				
		18	2ER18UNJ...	2EL18UNJ...	0.81	0.8	1.0				
		16	2ER16UNJ...	2EL16UNJ...	0.92	0.9	1.1				
		14	2ER14UNJ...	2EL14UNJ...	1.05	1.0	1.2				
		48	3ER48UNJ...	3EL48UNJ...	0.31	0.6	0.5				
		44	3ER44UNJ...	3EL44UNJ...	0.33	0.6	0.6				
		40	3ER40UNJ...	3EL40UNJ...	0.37	0.6	0.6				
3/8"	16	36	3ER36UNJ...	3EL36UNJ...	0.41	0.6	0.6	YE3	YL3	AL..-3 (LH)	
		32	3ER32UNJ...	3EL32UNJ...	0.46	0.6	0.7				
		28	3ER28UNJ...	3EL28UNJ...	0.52	0.7	0.7				
		24	3ER24UNJ...	3EL24UNJ...	0.61	0.7	0.8				
		20	3ER20UNJ...	3EL20UNJ...	0.73	0.8	0.9				
		18	3ER18UNJ...	3EL18UNJ...	0.81	0.8	1.0				
		16	3ER16UNJ...	3EL16UNJ...	0.92	0.9	1.1				
		14	3ER14UNJ...	3EL14UNJ...	1.05	1.0	1.2				
		13	3ER13UNJ...	3EL13UNJ...	1.13	1.0	1.3				
		12	3ER12UNJ...	3EL12UNJ...	1.22	1.1	1.3				
		11	3ER11UNJ...	3EL11UNJ...	1.33	1.2	1.5				
		10	3ER10UNJ...	3EL10UNJ...	1.47	1.2	1.5				
		9	3ER9UNJ...	3EL9UNJ...	1.63	1.3	1.7				
		8	3ER8UNJ...	3EL8UNJ...	1.83	1.2	1.6				



**UNJ - UNJC, UNJF, UNJEF, UNJS (con't)**

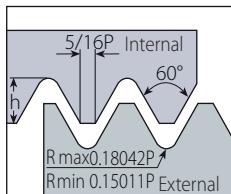
External		SCB Sintered Chipbreaker	Standard	U Style
 <p>Defined by: MIL-S-8879C Tolerance class: 3A/3B</p>				

**Standard**

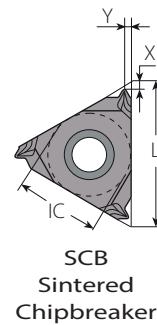
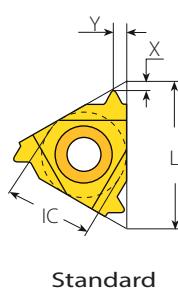
	Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil			
	IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder		
 SCB	 3/8"	 SCB	 16	36	3JER36UNJ...	0.41	1.3	0.5					
				32	3JER32UNJ...	0.46	1.2	0.5					
				28	3JER28UNJ...	0.52	0.7	0.8					
				24	3JER24UNJ...	0.61	0.7	0.8					
				20	3JER20UNJ...	0.73	0.7	0.8					
				18	3JER18UNJ...	0.81	0.7	0.8					
				16	3JER16UNJ...	0.92	0.8	0.8					
				14	3JER14UNJ...	1.05	1.3	1.5					
				12	3JER12UNJ...	1.22	1.3	1.5					
				10	3JER10UNJ...	1.47	1.3	1.5					
				8	3JER8UNJ...	1.83	1.4	1.5					
	 1/2"	 22	 22	7	4ER7UNJ...	4EL7UNJ...	2.09	1.7	2.3				
				6	4ER6UNJ...	4EL6UNJ...	2.44	1.7	2.3				
				5	4ER5UNJ...	4EL5UNJ...	2.93	1.8	2.5				
				4.5	5ER4.5UNJ...	5EL4.5UNJ...	3.26	2.0	2.7				
	 5/8"	 27	 27	4	5ER4UNJ...	5EL4UNJ...	3.67	2.2	3.1				

**U Style**

	Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
	IC	L mm	TPI	RH+LH	h min	X	Y	RH	LH	Toolholder		
	1/2"U	22	4.5	4UE4.5UNJ...	3.26	2.1	11.0					
			4	4UE4UNJ...	3.67	2.2	11.0					

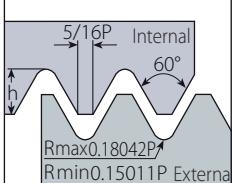
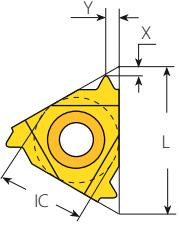
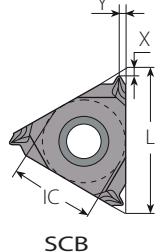
**UNJ - UNJC, UNJF, UNJEF, UNJS (con't)****Internal**

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

**Standard**

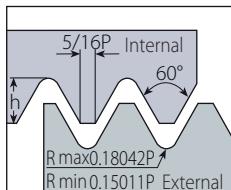
	Insert Size		Pitch	Ordering Code		Dimensions mm			Anvil		
	IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder
    SCB	1/4"	11	48	2IR48UNJ...	2IL48UNJ...	0.28	0.6	0.5	NVR..-2 (LH)	NVR..-2	
			44	2IR44UNJ...	2IL44UNJ...	0.30	0.6	0.6			
			40	2IR40UNJ...	2IL40UNJ...	0.33	0.6	0.6			
			36	2IR36UNJ...	2IL36UNJ...	0.37	0.6	0.6			
			32	2IR32UNJ...	2IL32UNJ...	0.42	0.6	0.7			
			28	2IR28UNJ...	2IL28UNJ...	0.47	0.7	0.7			
			24	2IR24UNJ...	2IL24UNJ...	0.55	0.7	0.8			
			20	2IR20UNJ...	2IL20UNJ...	0.66	0.8	0.9			
			18	2IR18UNJ...	2IL18UNJ...	0.74	0.8	1.0			
			16	2IR16UNJ...	2IL16UNJ...	0.83	0.9	1.1			
			14	2IR14UNJ...	2IL14UNJ...	0.95	1.0	1.2			
  SCB	1/4"	11	36	2JIR36UNJ...		0.37	1.1	0.5	NVR..-2 (LH)	NVR..-2	
			32	2JIR32UNJ...		0.42	1.2	0.5			
			28	2JIR28UNJ...		0.47	0.6	0.8			
			24	2JIR24UNJ...		0.55	0.6	0.8			
			20	2JIR20UNJ...		0.66	0.6	0.8			
			18	2JIR18UNJ...		0.74	0.6	0.8			
			16	2JIR16UNJ...		0.83	0.6	0.8			
			14	2JIR14UNJ...		0.95	0.6	0.8			

**UNJ - UNJC, UNJF, UNJEF, UNJS (con't)**

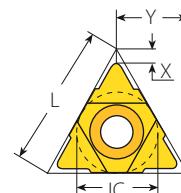
Internal									
 <p>Defined by: MIL-S-8879C Tolerance class: 3A/3B</p>									
				Standard		SCB Sintered Chipbreaker			

**Standard**

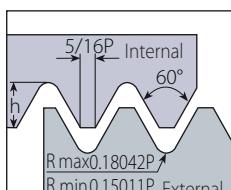
Insert Size	Pitch		Ordering Code		Dimensions mm			Anvil		
	IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH
 <b>3/8"</b>	 <b>16</b>	48	3IR48UNJ...	3IL48UNJ...	0.28	0.6	0.5			
		44	3IR44UNJ...	3IL44UNJ...	0.30	0.6	0.6			
		40	3IR40UNJ...	3IL40UNJ...	0.33	0.6	0.6			
		36	3IR36UNJ...	3IL36UNJ...	0.37	0.6	0.6			
		32	3IR32UNJ...	3IL32UNJ...	0.42	0.6	0.7			
		28	3IR28UNJ...	3IL28UNJ...	0.47	0.7	0.7			
		24	3IR24UNJ...	3IL24UNJ...	0.55	0.7	0.8			
		20	3IR20UNJ...	3IL20UNJ...	0.66	0.8	0.9			
		18	3IR18UNJ...	3IL18UNJ...	0.74	0.8	1.0	YI3	YE3	AVR..-3 (LH)
		16	3IR16UNJ...	3IL16UNJ...	0.83	0.9	1.1			
		14	3IR14UNJ...	3IL14UNJ...	0.95	1.0	1.2			
		13	3IR13UNJ...	3IL13UNJ...	1.02	1.0	1.3			
		12	3IR12UNJ...	3IL12UNJ...	1.11	1.1	1.3			
		11	3IR11UNJ...	3IL11UNJ...	1.21	1.2	1.5			
		10	3IR10UNJ...	3IL10UNJ...	1.33	1.2	1.5			
		9	3IR9UNJ...	3IL9UNJ...	1.48	1.3	1.7			
		8	3IR8UNJ...	3IL8UNJ...	1.66	1.2	1.6			
 <b>3/8"</b> <b>SCB</b>	 <b>16</b>	28	3JIR28UNJ...		0.47	0.6	0.8			
		24	3JIR24UNJ...		0.55	0.6	0.8			
		20	3JIR20UNJ...		0.66	0.6	0.8			
		18	3JIR18UNJ...		0.74	0.6	0.8			
		16	3JIR16UNJ...		0.83	0.6	0.8	YI3	-	AVR..-3
		14	3JIR14UNJ...		0.95	1.1	1.5			
		12	3JIR12UNJ...		1.11	1.1	1.5			
		10	3JIR10UNJ...		1.33	1.1	1.5			
 <b>1/2"</b>	 <b>22</b>	7	4IR7UNJ...	4IL7UNJ...	1.90	1.7	2.3			
		6	4IR6UNJ...	4IL6UNJ...	2.21	1.7	2.3	YI4	YE4	AVR..-4 (LH)
		5	4IR5UNJ...	4IL5UNJ...	2.66	1.8	2.5			
		4.5	5IR4.5UNJ...	5IL4.5UNJ...	2.95	2.0	2.7	YI5	YE5	AVR..-5 (LH)
 <b>5/8"</b>	 <b>27</b>	4	5IR4UNJ...	5IL4UNJ...	3.32	2.2	2.4			

**UNJ - UNJC, UNJF, UNJEF, UNJS (con't)****Internal**

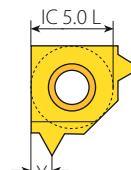
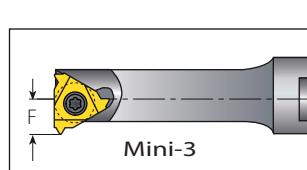
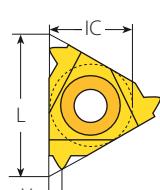
Defined by: MIL-S-8879C  
Tolerance class: 3A/3B

**U Style**

Insert Size			Pitch	Ordering Code		Dimensions mm			Anvil		
IC	L mm	TPI	RH+LH	h min	X	Y	RH	LH	Toolholder		
1/2"U	22	4.5	4UI4.5UNJ...	2.95	2.1	11.0	YI4U	YE4U	AVR..-4U (LH)		
		4	4UI4UNJ...	3.32	2.2	11.0					

**MINIPRO****Internal**

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

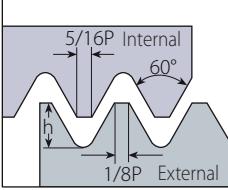
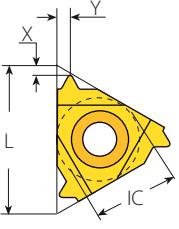
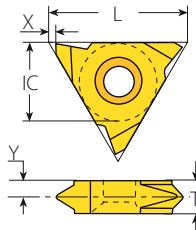
**MINIPRO****Mini-3 Standard**

Insert Size			Pitch	Ordering Code		Dimensions mm			Min. Bore Dia.		
IC mm	L mm	TPI	RH	LH	h min	Y	F	mm	Toolholder		
6.0	10	20	6.0KIR20UNJ...	6.0KIL20UNJ...	0.66	0.9	4.90	9.8	.NVRC1..-6.0K (LH)		

**Mini-L**

Insert Size			Pitch	Ordering Code		Dimensions mm			Min. Bore Dia.		
IC mm	TPI	RH	LH	h min	Y	F	mm	Toolholder			
5.0L	32	5LKIR32UNJ...	5LKIL32UNJ...	0.42	0.6	3.92	7.6				
	28	5LKIR28UNJ...	5LKIL28UNJ...	0.47	0.6	3.99	7.6				
	24	5LKIR24UNJ...	5LKIL24UNJ...	0.55	0.8	4.20	7.6				
	20	5LKIR20UNJ...	5LKIL20UNJ...	0.66	0.9	4.21	7.7				.NVRC10..-5LK (LH)
	18	5LKIR18UNJ...	5LKIL18UNJ...	0.74	1.0	4.30	7.8				
	16	5LKIR16UNJ...	5LKIL16UNJ...	0.83	1.0	4.41	7.8				
	14	5LKIR14UNJ...	5LKIL14UNJ...	0.95	1.0	4.54	7.9				

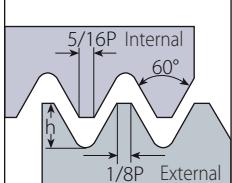
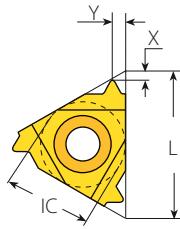
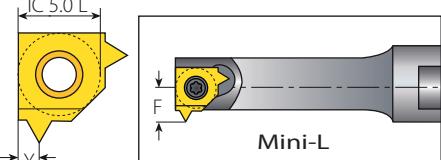
**MJ**

External					
 <p>Defined by: ISO 5855 Tolerance class: 4h/6h-4H/5H</p>				 <p>Standard</p>	
		 <p>Slim Throat</p>			

**Standard****Slim Throat**

Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
IC	L mm	mm	RH	LH	h min	X	Y	RH	LH	Toolholder	
1/4"	11	1.0	2ER1.0MJ...	2EL1.0MJ...	0.58	0.7	0.7	YF3	YI3	NL..-2 (LH)	
		1.25	2ER1.25MJ...	2EL1.25MJ...	0.72	0.8	0.9				
		1.5	2ER1.5MJ...	2EL1.5MJ...	0.87	0.8	1.0				
	16	0.7	3ER0.7MJ...	3EL0.7MJ...	0.40	0.6	0.6				
		0.8	3ER0.8MJ...	3EL0.8MJ...	0.45	0.7	0.7				
		1.0	3ER1.0MJ...	3EL1.0MJ...	0.58	0.7	0.7				
		1.25	3ER1.25MJ...	3EL1.25MJ...	0.72	0.8	0.9				
		1.5	3ER1.5MJ...	3EL1.5MJ...	0.87	0.8	1.0				
		2.0	3ER2.0MJ...	3EL2.0MJ...	1.15	1.0	1.3				
		2.5	3ER2.5MJ...	3EL2.5MJ...	1.49	1.1	1.5				
		3.0	3ER3.0MJ...	3EL3.0MJ...	1.73	1.2	1.6				

**MJ** (con't)

Internal											
		 									
Defined by: ISO 5855											
Tolerance class: 4h/6h-4H/5H		Standard									

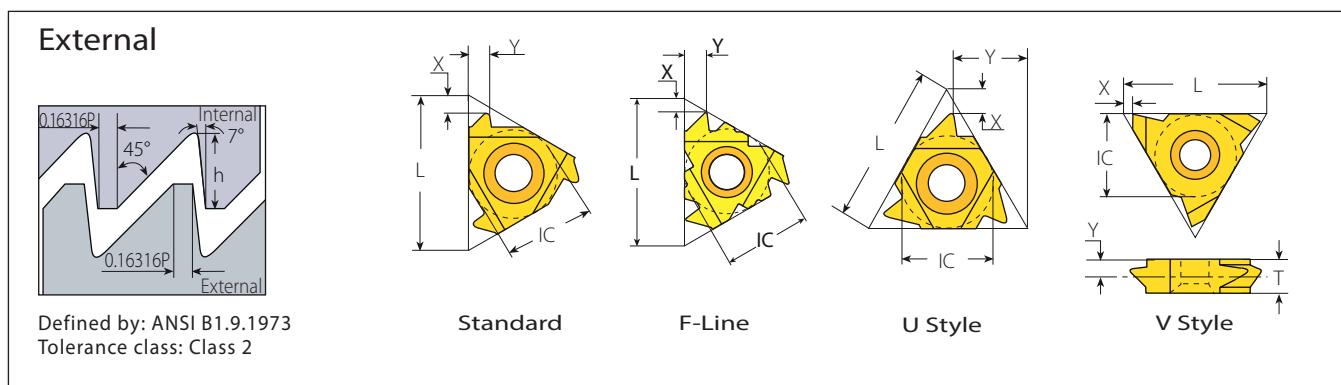
**Standard**

	Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
	IC mm	L mm	mm	RH	LH	h min	X	Y	RH	LH	Toolholder	
	1/4"	11	1.0	2IR1.0MJ...	2IL1.0MJ...	0.49	0.6	0.7	-	-	NVR..-2 (LH)	
			1.25	2IR1.25MJ...	2IL1.25MJ...	0.61	0.8	0.9				
			1.5	2IR1.5MJ...	2IL1.5MJ...	0.73	0.8	1.0				
			2.0	2IR2.0MJ...	2IL2.0MJ...	0.97	0.8	1.0				
	3/8"	16	0.75	3IR0.75MJ...	3IL0.75MJ...	0.37	0.6	0.6	YI3	YE3	AVR..-3 (LH)	
			0.8	3IR0.8MJ...	3IL0.8MJ...	0.44	0.7	0.7				
			1.0	3IR1.0MJ...	3IL1.0MJ...	0.49	0.6	0.7				
			1.25	3IR1.25MJ...	3IL1.25MJ...	0.61	0.8	0.9				
			1.5	3IR1.5MJ...	3IL1.5MJ...	0.73	0.8	1.0				
			2.0	3IR2.0MJ...	3IL2.0MJ...	0.97	0.8	1.3				
			2.5	3IR2.5MJ...	3IL2.5MJ...	1.23	1.1	1.5				
			3.0	3IR3.0MJ...	3IL3.0MJ...	1.46	1.2	1.6				

**MINIPRO****Mini - L**

	Insert Size		Pitch		Ordering Code		Dimensions mm			Min. Bore Dia.	
	IC mm	mm	RH	LH	h min	Y	F	mm	Toolholder		
	5.0L	1.0	5LKIR1.0MJ...	5LKIL1.0MJ...	0.49	0.7	4.06	7.6	.NVRC10.-5LK (LH)		
		1.25	5LKIR1.25MJ...	5LKIL1.25MJ...	0.61	0.9	4.21	7.6			
		1.5	5LKIR1.50MJ...	5LKIL1.50MJ...	0.73	1.0	4.35	7.7			

## American Buttress



### Standard



	Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
	IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder	
	1/4"	11	20	2ER20ABUT...	2EL20ABUT...	0.84	1.0	1.4	-	-	NL..-2 (LH)	
			16	2ER16ABUT...	2EL16ABUT...	1.05	1.3	1.9				
	3/8"	16	20	3ER20ABUT...	3EL20ABUT...	0.84	1.0	1.4			YE3	
			16	3ER16ABUT...	3EL16ABUT...	1.05	1.3	1.9				YI3
			12	3ER12ABUT...	3EL12ABUT...	1.40	1.4	2.0				
	1/2"	10	3ER10ABUT...	3EL10ABUT...	1.68	1.5	2.3				AL..-3 (LH)	
			8	4ER8ABUT...	4EL8ABUT...	2.10	2.0	3.2				AL..-4 (LH)
	1/2" F	22	6	4ER6ABUT...	4EL6ABUT...	2.80	2.2	3.5	YE4	YI4	YE4F	AL...-4F
			8	4FER8ABUT...		2.10	2.0	3.2				
			6	4FER6ABUT...		2.80	2.2	3.5				

### U Style

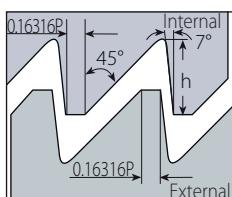


	Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
	IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder	
	1/2"U	22	4	4UER4ABUT...	4UEL4ABUT...	4.21	2.4	9.8	YE4U-BUT4	YI4U-BUT4	AL..-4U (LH)	
	5/8"U	27	3	5UER3ABUT...	5UEL3ABUT...	5.61	3.1	12.1	YE5U-BUT3	YI5U-BUT3	AL..-5U (LH)	

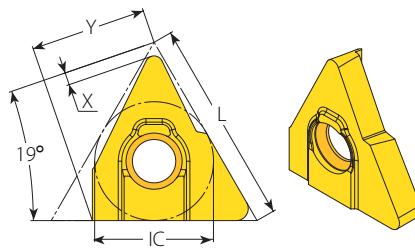
### V Style



	Insert Size		Pitch		Ordering Code		Dimensions mm				
	IC	L mm	TPI	RH	LH	h min	X	Y	T	Toolholder	
	5/8"V	27	4	5VER4ABUT...	5VEL4ABUT...	4.21	0.6	1.8	6	NL..-5V-6 (LH)	
			3	5VER3ABUT...	5VEL3ABUT...	5.61	0.6	2.2	8	NL..-5V-8 (LH)	
			2.5	5VER2.5ABUT...	5VEL2.5ABUT...	6.73	0.6	2.7	10	NL..-5V-10ABUT (LH)	

**American Buttress (con't)****MEGALINE****External**

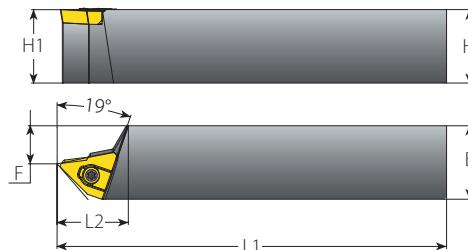
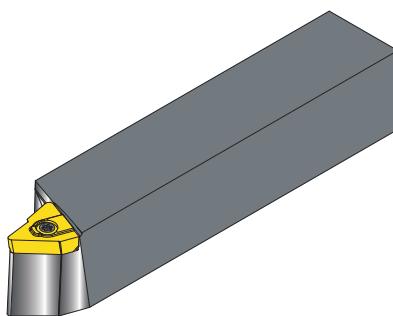
Defined by: ANSI B1.9.1973  
Tolerance class: Class 2



Mega Line

**External**

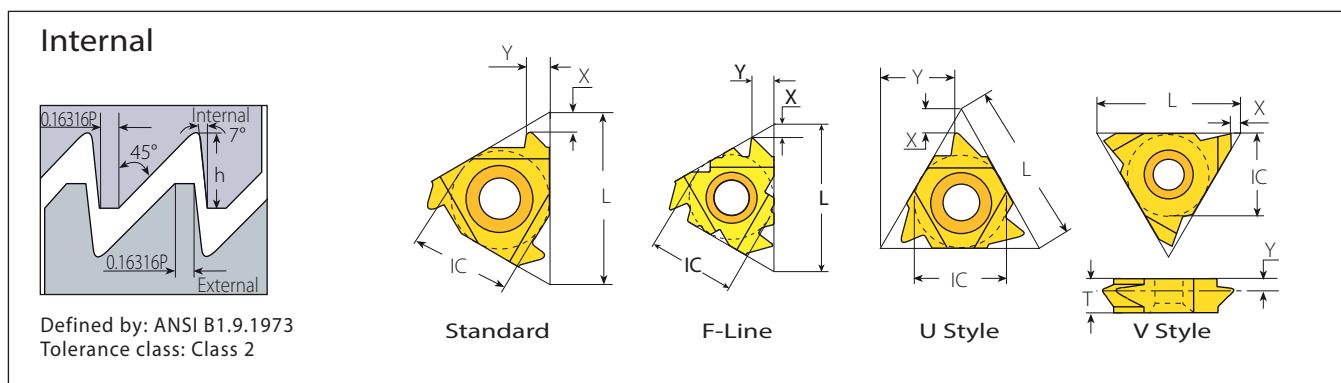
	Insert Size		Pitch	Ordering Code		Dimensions mm			Number of Passes	
	IC	L mm	TPI	RH	h min	X	Y	0.07mm-Min. Depth of Cut (On radius)	0.15mm-Max. Depth of Cut (On radius)	
	5/8" MG	27	2	5MGER2ABUT...	8.42	1.58	15.55	120	56	
			1.5	5MGER1.5ABUT...	11.22	1.64		160	75	

**External Toolholders for American Buttress****MEGALINE****External****Spare Parts**

Insert	Ordering Code		Dimensions mm			Thread Diameter Range (Min.-Max.)	Insert Screw	Torx Key		
	RH	H=B=H1	F	L1	L2					
5MGER2ABUT...	NL25-5MG2ABUT	25	9.5	150	31	(7"-24")-2ABUT	S5MG	K6T		
	NL32-5MG2ABUT	32	16.5	170						
	NL40-5MG2ABUT	40	24.5	200						
5MGER1.5ABUT...	NL25-5MG1.5ABUT	25	9.5	150	31	(11"-24")-1.5ABUT				
	NL32-5MG1.5ABUT	32	16.5	170						
	NL40-5MG1.5ABUT	40	24.5	200						

Recommended thread infeed method for Mega Line: Flank or Modified Flank 1°.

## American Buttress (con't)



### Standard



	Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil			
	IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder		
	1/4"	11	20	2IR20ABUT...	2IL20ABUT...	0.84	1.0	1.4	-	-	NVR..-2 (LH)		
			16	2IR16ABUT...	2IL16ABUT...	1.05	1.3	1.9					
	3/8"	16	20	3IR20ABUT...	3IL20ABUT...	0.84	1.0	1.4	YI3	YE3	AVR..-3 (LH)		
			16	3IR16ABUT...	3IL16ABUT...	1.05	1.3	1.9					
	1/2"	12	3IR12ABUT...	3IL12ABUT...	1.40	1.4	2.0	YI4	YE4	AVR..-4 (LH)			
			10	3IR10ABUT...	3IL10ABUT...	1.68	1.5	2.3					
	1/2"	22	4IR8ABUT...	4IL8ABUT...	2.10	2.0	3.2	YI4F		AVRC...-4F			
			6	4IR6ABUT...	4IL6ABUT...	2.80	2.2	3.5					
	1/2"V	23	4FIR8ABUT...			2.10	2.0	3.2	YI4F		AVRC...-4F		
			6	4FIR6ABUT...		2.80	2.2	3.5					

### U Style

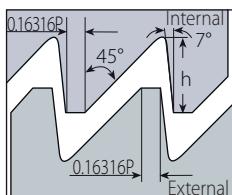


	Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
	IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder	
	1/2"U	22	4	4UIR4ABUT...	4UIL4ABUT...	4.21	2.4	9.8	YI4U-4B	YE4U-4B	AVR..-4U (LH)	
	5/8"U	27	3	5UIR3ABUT...	5UIL3ABUT...	5.61	3.1	12.1	YI5U-3B	YE5U-3B	AVR..-5U (LH)	

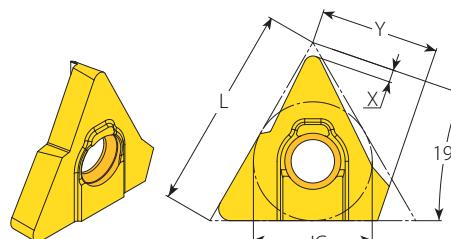
### V Style



	Insert Size		Pitch		Ordering Code		Dimensions mm				Toolholder	
	IC	L mm	TPI	RH	LH	h min	X	Y	T	Toolholder		
	5/8"V	27	4	5VIR4ABUT...	5VIL4ABUT...	4.21	0.6	1.8	6	NVR..-5V (LH)		
			3	5VIR3ABUT...	5VIL3ABUT...	5.61	0.6	2.2	8			
			2.5	5VIR2.5ABUT...	5VIL2.5ABUT...	6.73	0.6	2.7	10			

**American Buttress (con't)****MEGALINE****Internal**

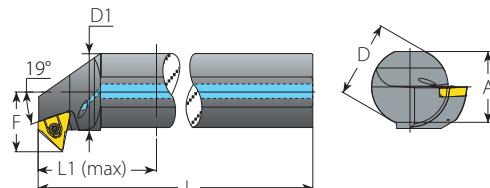
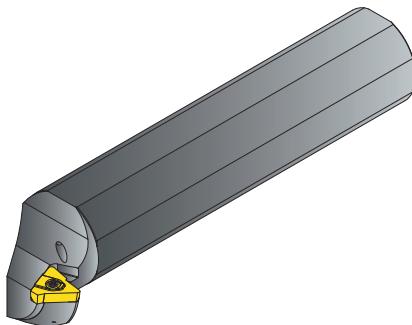
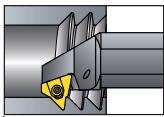
Defined by: ANSI B1.9.1973  
Tolerance class: Class 2



Mega Line

**Internal**

	Insert Size		Pitch		Ordering Code		Dimensions mm			Number of Passes	
	IC	L mm	TPI	RH	h min	X	Y	0.07mm-Min. Depth of Cut (On radius)	0.15mm-Max. Depth of Cut (On radius)		
	5/8" MG	27	2	5MGIR2ABUT...	8.94	1.58	15.9	128	60		
			1.5	5MGIR1.5ABUT...	11.92	1.64		170	79		

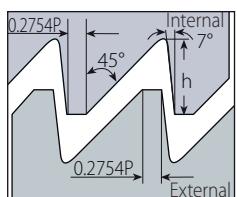
**Internal Toolholders for American Buttress****MEGALINE****Internal****Spare Parts**

Insert	Ordering Code	Dimensions mm						Min. Bore Dia.	Thread Diameter Range (Min.-Max.)	Insert Screw	Torx Key	
		RH	A	L	L1 (max)	D	D1	F				
5MGIR2ABUT...	NVRC40-5MG2ABUT	36	230.5	100	40	39.7	35.0		(7"-16")-2ABUT	(7"-16")-2ABUT	S5MG	K6T
	NVRC50-5MG2ABUT	46	255.5	125	50	49.7	39.5					
	NVRC60-5MG2ABUT	57	280.5	150	60	59.7	44.0					
5MGIR1.5ABUT...	NVRC40-5MG1.5ABUT	36	230.5	100	40	39.7	35.0		(11"-22")-1.5ABUT	(11"-22")-1.5ABUT		
	NVRC50-5MG1.5ABUT	46	255.5	125	50	49.7	39.5					
	NVRC60-5MG1.5ABUT	57	280.5	150	60	59.7	44.0					

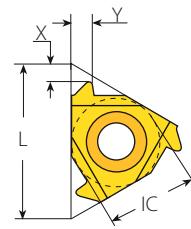
Recommended thread infeed method for Mega Line: Flank or Modified Flank 1°.

## British Buttress

### External



Defined by: B.S. 1657: 1950  
Tolerance class: Medium Class



Standard

### Standard

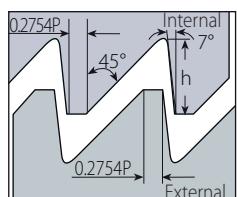


	Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
	IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder	
	3/8"	16	16	3ER16BBUT...	3EL16BBUT...	0.80	1.1	1.6	YE3	YI3	AL..-3 (LH)	
			12	3ER12BBUT...	3EL12BBUT...	1.07	1.4	2.1				
			10	3ER10BBUT...	3EL10BBUT...	1.28	1.4	2.2				
			8	3ER8BBUT...	3EL8BBUT...	1.61	1.6	2.5				
	1/2"	22	8	4ER8BBUT...	4EL8BBUT...	1.61	1.6	2.5	YE4	YI4	AL..-4 (LH)	

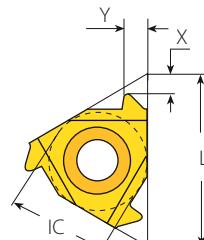


## British Buttress

### Internal



Defined by: B.S. 1657: 1950  
Tolerance class: Medium Class



Standard

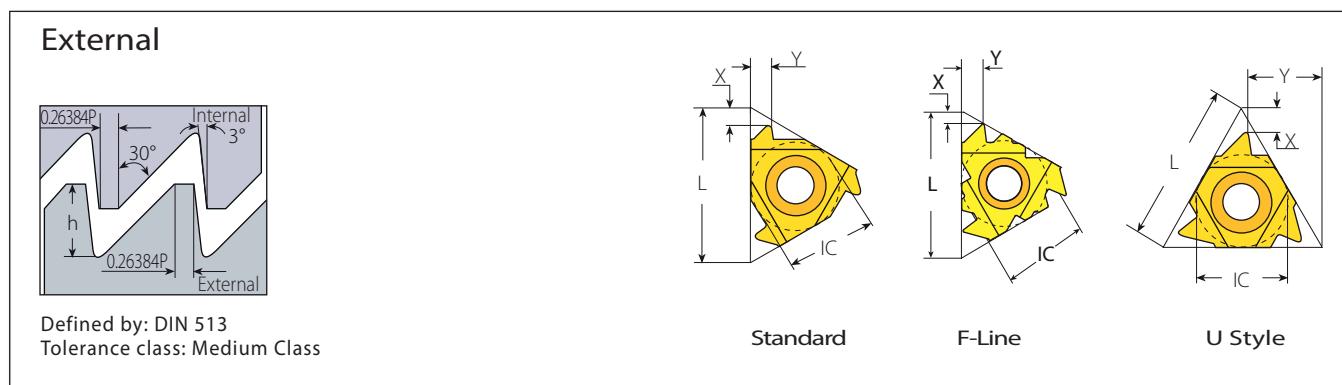
### Standard



	Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
	IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder	
	3/8"	16	16	3IR16BBUT...	3IL16BBUT...	0.80	1.1	1.6	YI3	YE3	AVR..-3 (LH)	
			12	3IR12BBUT...	3IL12BBUT...	1.07	1.4	2.1				
			10	3IR10BBUT...	3IL10BBUT...	1.28	1.4	2.2				
			8	3IR8BBUT...	3IL8BBUT...	1.61	1.6	2.5				
	1/2"	22	8	4IR8BBUT...	4IL8BBUT...	1.61	1.6	2.5	YI4	YE4	AVR..-4 (LH)	



## Metric Buttress (Sägengewinde)

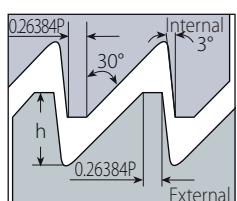


### Standard - External

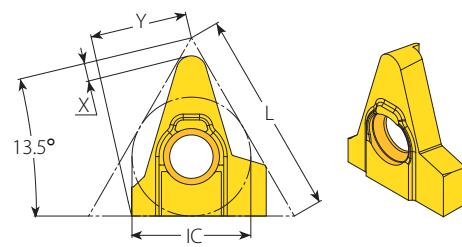
	Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
	IC	L mm	mm	RH	LH	h min	X	Y	RH	LH	Toolholder	
	3/8"	16	2.0	3ER2.0SAGE...	3EL2.0SAGE...	1.74	1.5	2.1	YE3	YI3	AL..-3 (LH)	
			2.0	4ER2.0SAGE...	4EL2.0SAGE...	1.74	1.5	2.1				
	1/2"	22	3.0	4ER3.0SAGE...	4EL3.0SAGE...	2.60	1.8	2.6	YE4	YI4	AL..-4 (LH)	
	1/2" F	23	4.0	4ER4.0SAGE...	4EL4.0SAGE...	3.55	1.75	3.1				
			3.0	4FER3.0SAGE...		2.60	1.8	2.6	YE4F		AL..-4F	
	5/8"	27	4.0	5ER4.0SAGE...	5EL4.0SAGE...	3.55	1.9	3.2	YE5 082/038	YI5 082/039	AL..-5 (LH)	

### U Style - External

	Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
	IC	L mm	mm	RH	LH	h min	X	Y	RH	LH	Toolholder	
	1/2" U	22	5.0	4UER5.0SAGE...	4UEL5.0SAGE...	4.41	1.27	10.35	YE4U-SAGE5	YI4U-SAGE5	AL..-4U (LH)	
			6.0	4UER6.0SAGE...	4UEL6.0SAGE...	5.29	1.25	10.28	YE4U-SAGE6	YI4U-SAGE6		

**Metric Buttress (Sägengewinde) (con't)****MEGALINE****External**

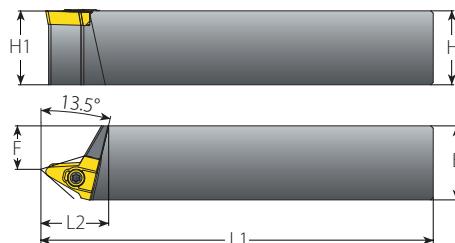
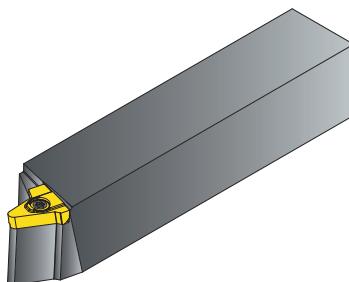
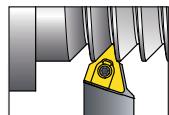
Defined by: DIN 513  
Tolerance class: Medium Class



Mega Line

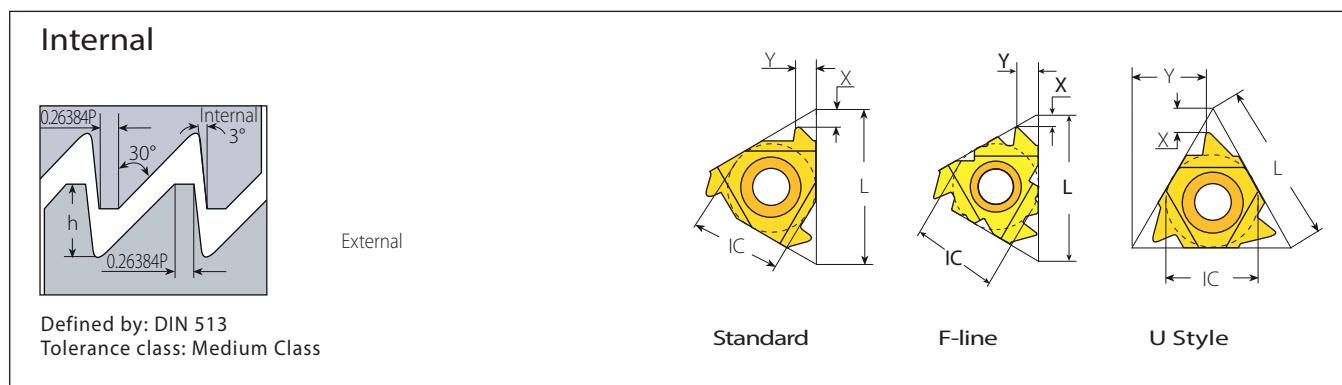
**External**

	Insert Size		Pitch	Ordering Code		Dimensions mm			Number of Passes	
	IC	L mm	mm	RH	h min	X	Y	0.07mm-Min. Depth of Cut (On radius)	0.15mm-Max. Depth of Cut (On radius)	
5/8" MG	27		10.0	5MGER10.0SAGE...	8.68	1.57			124	58
			12.0	5MGER12.0SAGE...	10.41	1.81			149	69
			14.0	5MGER14.0SAGE...	12.15	2.05	13.3		174	81
			16.0	5MGER16.0SAGE...	13.88	3.27			198	93
			20.0	5MGER20.0SAGE...	17.36	2.56			248	116

**External Toolholders for Metric Buttress (Sägengewinde)****MEGALINE****External****Spare Parts**

Insert	Ordering Code		Dimensions mm			Thread Diameter Range (Min.-Max.)	Insert Screw	Torx Key		
	RH	H=B=H1	F	L1	L2					
5MGER10.0SAGE...	NL25-5MG10SAGE	25	11.8	150	30	(S65-80)x10	S5MG	K6T		
	NL32-5MG10SAGE	32	18.8	170						
	NL40-5MG10SAGE	40	26.8	200						
5MGER12.0SAGE...	NL25-5MG12SAGE	25	11.8	150	30	(S85-146)x12				
	NL32-5MG12SAGE	32	18.8	170						
	NL40-5MG12SAGE	40	26.8	200						
5MGER14.0SAGE...	NL25-5MG14SAGE	25	11.8	150	30	(S115-145)x14				
	NL32-5MG14SAGE	32	18.8	170						
	NL40-5MG14SAGE	40	26.8	200						
5MGER16.0SAGE...	NL25-5MG16SAGE	25	11.8	150	30	(S150-175)x16				
	NL32-5MG16SAGE	32	18.8	170						
	NL40-5MG16SAGE	40	26.8	200						
5MGER20.0SAGE...	NL25-5MG20SAGE	25	11.8	150	30	(S210-230)x20				
	NL32-5MG20SAGE	32	18.8	170						
	NL40-5MG20SAGE	40	26.8	200						

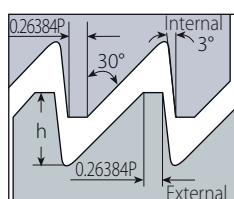
Recommended thread infeed method for Mega Line: Flank or Modified Flank 1°.

**Metric Buttress (Sägengewinde) (con't)****Standard - Internal****F-LINE**

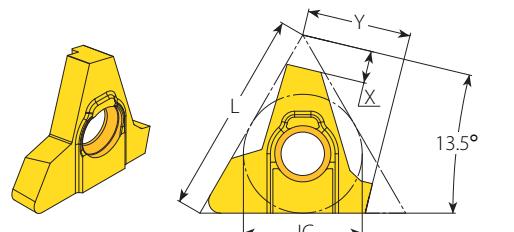
Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
IC	L mm	mm	RH	LH	h min	X	Y	RH	LH	Toolholder	
3/8"	16	2.0	3IR2.0SAGE...	3IL2.0SAGE...	1.50	1.5	2.2	YI3	YE3	AVR..-3 (LH)	
		3.0	4IR3.0SAGE...	4IL3.0SAGE...	2.25	1.7	2.9	YI4	YE4	AVR..-4 (LH)	
	22	4.0	4IR4.0SAGE...	4IL4.0SAGE...	3.09	2.03	3.25				
1/2" F	23	3.0	4FIR3.0SAGE...		2.25	1.7	2.9	YI4F		AVRC...-4F	
		4.0	4FIR4.0SAGE...		3.09	2.03	3.25				
5/8"	27	4.0	5IR4.0SAGE...	5IL4.0SAGE...	3.09	2.1	3.2	YI5 082/039	YE5 082/038	AVR..-5 (LH)	

**U Style - Internal**

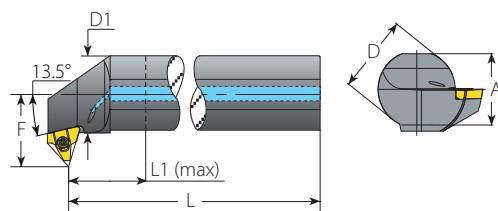
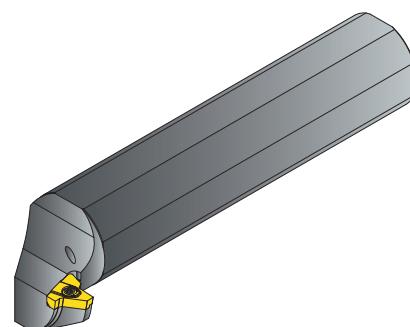
Insert Size		Pitch		Ordering Code		Dimensions mm			Anvil		
IC	L mm	mm	RH	LH	h min	X	Y	RH	LH	Toolholder	
1/2"U	22	5.0	4UIR5.0SAGE...	4UIL5.0SAGE...	3.76	1.8	10.3	YI4U-5S	YE4U-5S	AVR..-4U (LH)	
		6.0	4UIR6.0SAGE...	4UIL6.0SAGE...	4.54	1.9	10.15	YI4U-6S	YE4U-6S		

**Metric Buttress (Sägengewinde) (con't)****MEGALINE****Internal**

Defined by: DIN 513  
Tolerance class: Medium Class



Mega Line

**Internal****Internal Toolholders for Metric Buttress (Sägengewinde)****MEGALINE****Internal****Spare Parts**

Insert	Ordering Code	Dimensions mm						Min. Bore Dia.	Thread Diameter Range (Min.-Max.)			
		RH	A	L	L1 (max)	D	D1	F	mm	Short Chip Material	Long Chip Material	
5MGIR10.0SAGE...	NVRC40-5MG10SAGE	36	230.5	100	40	39.7	29.0	50	(S65-80)x10	(S75-80)x10		
	NVRC40-5MG12SAGE	36	230.5	100	40	39.7	41.5	67	(S85-400)x12	(S90-400)x12		
5MGIR12.0SAGE...	NVRC50-5MG12SAGE	46	255.5	125	50	49.7	46.5	72	(S90-400)x12	(S105-400)x12		
	NVRC60-5MG12SAGE	57	280.5	150	60	59.7	51.5	82	(S100-400)x12	(S250-400)x12		
5MGIR14.0SAGE...	NVRC40-5MG14SAGE	36	230.5	100	40	39.7	41.5	94	(S115-145)x14	(S115-145)x14		
	NVRC50-5MG14SAGE	46	255.5	125	50	49.7	46.5	94	(S115-145)x14	(S115-145)x14		
5MGIR16.0SAGE...	NVRC60-5MG14SAGE	57	280.5	150	60	59.7	51.5	94	(S115-145)x14	(S120-145)x14		
	NVRC40-5MG16SAGE	36	230.5	100	40	39.7	41.5	126	(S150-175)x16	(S150-175)x16		
5MGIR18.0SAGE...	NVRC50-5MG16SAGE	46	255.5	125	50	49.7	46.5	126	(S150-175)x16	(S150-175)x16		
	NVRC60-5MG16SAGE	57	280.5	150	60	59.7	51.5	126	(S150-175)x16	(S150-175)x16		
5MGIR20.0SAGE...	NVRC40-5MG20SAGE	36	230.5	100	40	39.7	41.5	75	(S105-230)x20	(S105-230)x20		
	NVRC50-5MG20SAGE	46	255.5	125	50	49.7	46.5	75	(S105-230)x20	(S210-230)x20		
	NVRC60-5MG20SAGE	57	280.5	150	60	59.7	51.5	80	(S110-230)x20	(S210-230)x20		

Recommended thread infeed method for Megaline: Flank or Modified Flank 1°.

**API**

External		Standard	F-Line	On Edge
	$\alpha = \text{arctg} (IPF/24)$			
Defined by: API SPEC. 7:1990 Tolerance class: Standard API				

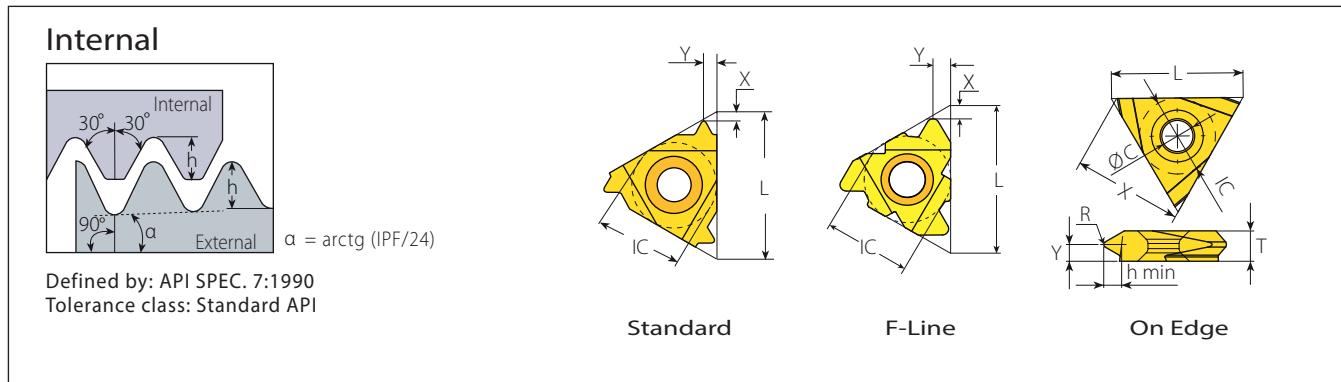
**Standard**

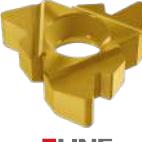
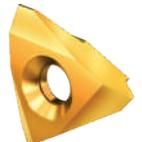
	Insert Size	Pitch	Thread	Taper	Ordering Code	Size	Dimensions mm			Anvil						
							IC	L mm	TPI	IPF	RH	h min	X	Y	RH	Toolholder
	1/2"	22	4	V-0.038R	2	4ER4API382...	NC23-NC50	3.09	2.1	2.8						
			4	V-0.038R	3	4ER4API383...	NC56-NC77	3.08	2.1	2.8						
			4	V-0.050	2	4ER4API502...	6 5/8" REG, 5 1/2" FH, 6 5/8" FH	3.75	2.0	2.9	YEI	4-API-1P	AL...-4	5BUT/API	or	
			4	V-0.050	3	4ER4API503...	5 1/2", 7 5/8", 8 5/8" REG	3.74	2.0	2.9	YE4				or	
			5	V-0.040	3	4ER5API403...	2 3/8"-4 1/2" REG	2.99	1.8	2.6						
			6	V-0.055	1.5	4ER6API551...	NC10-NC16	1.41	2.6	2.0						
	1/2" F	23	4	V-0.038R	2	4FER4API382...	NC23-NC50	3.09	2.1	2.8						
			4	V-0.038R	3	4FER4API383...	NC56-NC77	3.08	2.1	2.8						
			4	V-0.050	2	4FER4API502...	6 5/8" REG, 5 1/2" FH, 6 5/8" FH	3.75	2.0	2.9	YE4F					
			4	V-0.050	3	4FER4API503...	5 1/2", 7 5/8", 8 5/8" REG	3.74	2.0	2.9					AL...-4F	
			5	V-0.040	3	4FER5API403...	2 3/8"-4 1/2" REG	2.99	1.8	2.6						
			6	V-0.055	1.5	4FER6API551...	NC10-NC16	1.41	2.6	2.0						
	5/8"	27	4	V-0.038R	2	5ER4API382...	NC23-NC50	3.09	2.1	2.8						
			4	V-0.038R	3	5ER4API383...	NC56-NC77	3.08	2.1	2.8						
			4	V-0.050	2	5ER4API502...	6 5/8" REG, 5 1/2" FH, 6 5/8" FH	3.75	2.1	3.1	YE5OIL					
			4	V-0.050	3	5ER4API503...	5 1/2", 7 5/8", 8 5/8" REG	3.74	2.1	3.1					AL..-5 OIL	
			5	V-0.040	3	5ER5API403...	2 3/8"-4 1/2" REG	2.99	1.9	2.7						
			4	V-0.065	2	5ER4API652...	2 3/8"IF- 5 1/2IF	2.81	2.3	2.8						

**On Edge**

	Insert Size	Pitch	Thread	Taper	Ordering Code	Size	Dimensions mm			Position							
							IC	L mm	TPI	IPF	RH	R	h min	T	ØC	X	Y
	5/8"	27	5	V-0.040	3	TNEC54ER5API403...	2 3/8"-4 1/2" REG	0.51	3.00	6.35						3.9	
			4	V-0.050	2	TNEC55ER4API502...	6 5/8" REG, 5 1/2 FH, 6 5/8 FH	0.64	3.76	7.94						5.0	
			4	V-0.050	3	TNEC55ER4API503...	5 1/2", 7 5/8", 8 5/8" REG	0.64	3.76	7.94	6.50	23.4				5.0	
			4	V-0.038	2	TNEC55ER4API382...	NC23-NC50, 2 3/8 - 6 5/8 IF	0.97	3.10	7.94						5.0	
			4	V-0.038	3	TNEC55ER4API383...	NC56-NC77	0.97	3.10	7.94						5.0	

On Edge inserts are compatible with most commonly used toolholders in the market.

**API (con't)****Standard**

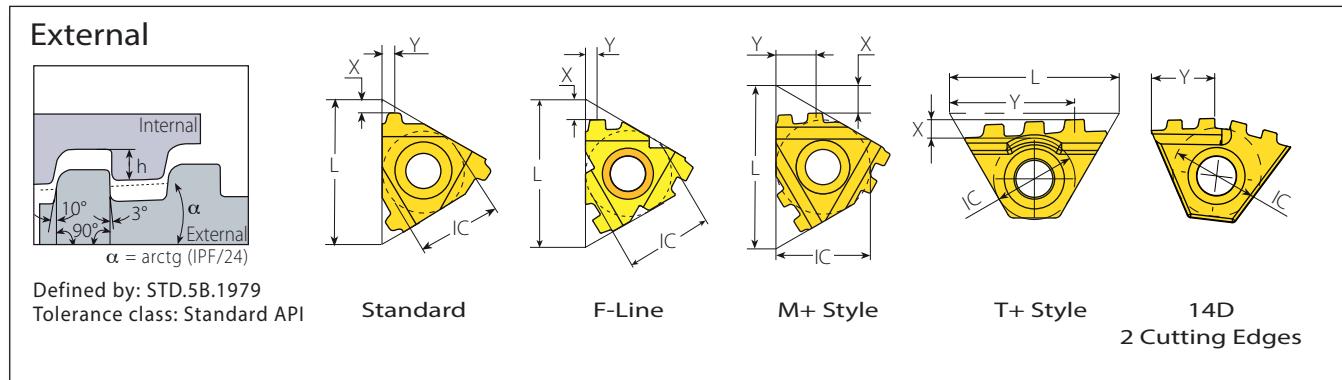
	Insert Size	Pitch	Thread	Taper	Ordering Code	Size	Dimensions mm			Anvil	Toolholder				
							IC	L mm	TPI	IPF	RH	h min	X	Y	RH
	1/2"	22	4	V-0.038R	2	4IR4API382...	NC23-NC50	3.09	2.1	2.8					
			4	V-0.038R	3	4IR4API383...	NC56-NC77	3.08	2.1	2.8					
			4	V-0.050	2	4IR4API502...	6 5/8" REG, 5 1/2"FH, 6 5/8" FH	3.75	2.1	3.1	YEI 4-API-1P AVRC..-4 5BUT/API or YI4				
			4	V-0.050	3	4IR4API503...	5 1/2", 7 5/8", 8 5/8" REG	3.74	2.0	2.9					AVR...-4
			5	V-0.040	3	4IR5API403...	2 3/8"-4 1/2" REG	2.99	1.8	2.6					
			6	V-0.055	1.5	4IR6API551...	NC10-NC16	1.41	2.6	2.0					
 <b>F-LINE</b>	1/2" F	23	4	V-0.038R	2	4FIR4API382...	NC23-NC50	3.09	2.1	2.8					
			4	V-0.038R	3	4FIR4API383...	NC56-NC77	3.08	2.1	2.8					
			4	V-0.050	2	4FIR4API502...	6 5/8" REG, 5 1/2"FH, 6 5/8" FH	3.75	2.1	3.1					YI4F
			4	V-0.050	3	4FIR4API503...	5 1/2", 7 5/8", 8 5/8" REG	3.74	2.0	2.9					AVR...-4F
			5	V-0.040	3	4FIR5API403...	2 3/8"-4 1/2" REG	2.99	1.8	2.6					
			6	V-0.055	1.5	4FIR6API551...	NC10-NC16	1.41	2.6	2.0					
	5/8"	27	4	V-0.038R	2	5IR4API382...	NC23-NC50	3.09	2.1	2.8					
			4	V-0.038R	3	5IR4API383...	NC56-NC77	3.08	2.1	2.8					
			4	V-0.050	2	5IR4API502...	6 5/8" REG, 5 1/2"FH, 6 5/8" FH	3.75	2.1	3.1					YI5OIL
			4	V-0.050	3	5IR4API503...	5 1/2", 7 5/8", 8 5/8" REG	3.74	2.1	3.1					AVR..-5 OIL
			5	V-0.040	3	5IR5API403...	2 3/8"-4 1/2" REG	2.99	1.9	2.7					
			4	V-0.065	2	5IR4API652...	2 3/8"IF- 5 1/2"IF	2.81	2.3	2.8					

**On Edge**

	Insert Size	Pitch	Thread	Taper	Ordering Code	Size	Dimensions mm			Position						
							IC	L mm	TPI	IPF	RH	R	h min	T	Ø C	X
	5/8"	27	5	V-0.040	3	TNEC54IR5API403...	2 3/8"-4 1/2" REG	0.51	3.00	6.35						3.9
			4	V-0.050	2	TNEC55IR4API502...	6 5/8" REG, 5 1/2"FH, 6 5/8" FH	0.64	3.76	7.94						5.0
			4	V-0.050	3	TNEC55IR4API503...	5 1/2", 7 5/8", 8 5/8" REG	0.64	3.76	7.94	6.50	23.4				5.0
			4	V-0.038	2	TNEC55IR4API382...	NC23-NC50, 2 3/8"-6 5/8" IF	0.97	3.10	7.94						5.0
			4	V-0.038	3	TNEC55IR4API383...	NC56-NC77	0.97	3.10	7.94						5.0

On Edge inserts are compatible with most commonly used toolholders in the market.

## API Buttress Casing



### Standard



F-LINE

Insert Size	Pitch	Taper	Ordering Code	Size	Dimensions mm			Anvil	Toolholder		
					IC	L mm	TPI	IPF	RH	h min	X
1/2"	22		5	0.75	4ER5BUT75...	4 1/2"-13 3/8"	1.55	3.1	1.9	YE14-BUT or YE4	AL..-4 5BUT/API or AL...-4
			5	1	4ER5BUT1...	16"-20"	1.55	3.1	1.9		
1/2"F	23		5	0.75	4FER5BUT75...	4 1/2"-13 3/8"	1.55	3.1	1.9	YE4F	AL...-4F
			5	1	4FER5BUT1...	16"-20"	1.55	3.1	1.9		



### M+ Style



Multi plus

Insert Size	Pitch	Taper	Teeth	Ordering Code	Size	Dimensions mm			Anvil	Toolholder	
						IC	L mm	TPI	IPF	RH	h min
5/8"	27	5	0.75	2	5ER5BUT752M+...	4 1/2"-13 3/8"	1.55	4.8	6.8	YE5M	AL..-5M

Multi plus

### T+ Style



Insert Size	Pitch	Taper	Teeth	Ordering Code	Size	Dimensions mm			Anvil	Toolholder	
						IC	L mm	TPI	IPF	RH	h min
1/2" T	22	5	0.75	3	4ER5BUT753T+...	4 1/2"-13 3/8"	1.55	2.5	16.1	Y4T	AL..-4T
					4ER5BUT13T+...	16"-20"					

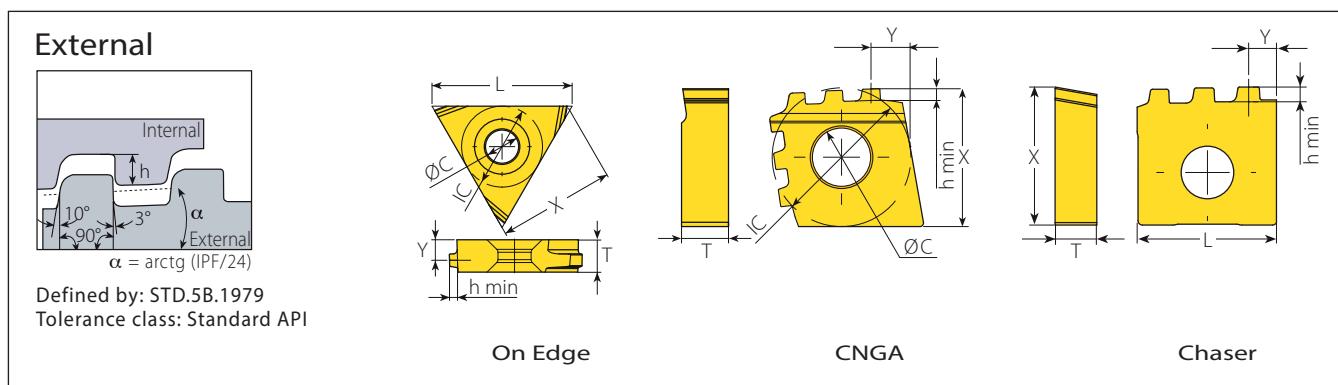
Multi plus

### 14D



Insert Size	Pitch	Taper	Teeth	Ordering Code	Size	Dimensions mm			Anvil	Toolholder	
						IC	TPI	IPF	RH		
14D	5	0.75	2	14DER5BUT752T+...	4 1/2"-9 5/8"	1.55	10.0	Y14DER-5 BUT Y14DER-5BUT-0.4N	AL...-14D	Y14DER-5BUT-0.4N	AL...-14D
					10 3/4"-13 3/8"						
					16"-20"						

## API Buttress Casing (con't)



### On Edge



Insert Size				Pitch	Taper	Ordering Code		Size	Dimensions mm				Position	
IC	L mm	TPI	IPF	RH				h min	T	Ø C	X	Y		
5/8"	27	5	0.75	TNEC54ER5BUT75...		4 1/2"-13 3/8"		1.55	6.35	6.5	23.4	4.0		
		5	1	TNEC54ER5BUT1...		16"-20"								

On Edge inserts are compatible with most commonly used toolholders in the market.

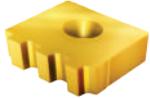
### CNGA



Insert Size				Pitch	Taper	Teeth	Ordering Code		Size	Dimensions mm				Position	
IC	TPI	IPF	RH						h min	T	Ø C	X	Y		
3/4"	5	0.75	3	CNGA64ER5BUT75T3...		4 1/2"-13 3/8"		1.55	6.35	8.0	18.9	5.6			
	5	1	3	CNGA64ER5BUT1T3...		16"-20"								5.5	

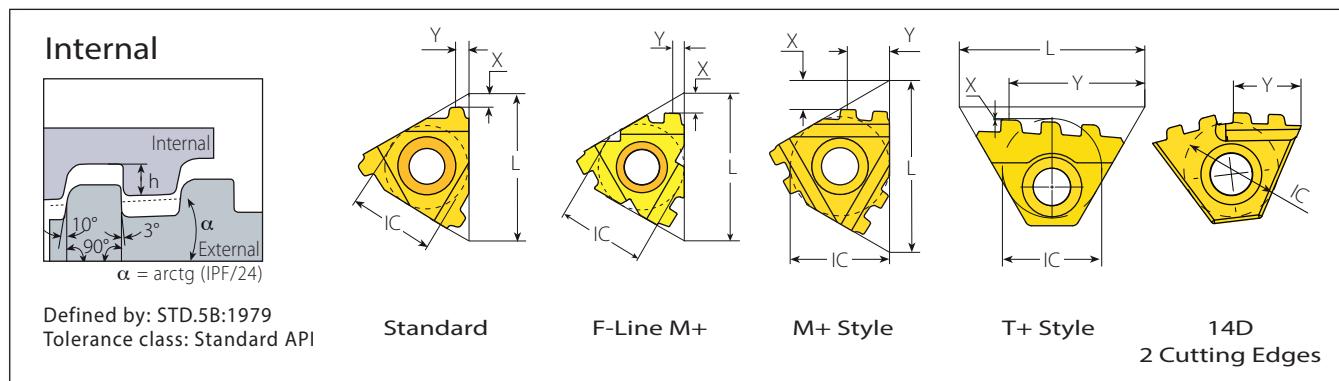
CNGA inserts are compatible with most commonly used toolholders in the market.

### Chaser



Insert Size				Pitch	Taper	Teeth	Ordering Code		Size	Dimensions mm				Position	
L	TPI	IPF	RH						h min	T	X	Y			
16	5	0.75	3	1616ER5BUT75S+...		4 1/2"-13 3/8"		1.55	4.76	15.7	3.2				
	5	1	3	1616ER5BUT1S+...		16"-20"									

Chaser inserts are compatible with most commonly used toolholders in the market.

**API Buttress Casing (con't)****Standard****F-LINE**

Insert Size	Pitch	Taper	Ordering Code	Size	Dimensions mm			Anvil	RH	Toolholder		
					IC	L mm	TPI	IPF	RH	h min	X	Y
1/2"	22		5	0.75	4IR5BUT75...	4 1/2"-13 3/8"	1.55	2.8	1.9	YEI 4-BUT or YI4	AVRC..-4 5BUT/API or AVR...-4	
			5	1	4IR5BUT1...	16"-20"	1.55	2.8	1.9			
1/2"F	23		5	0.75	4FIR5BUT75...	4 1/2"-13 3/8"	1.55	2.8	1.9	YI4F	AVRC...-4F	
			5	1	4FIR5BUT1...	16"-20"	1.55	2.8	1.9			

**M+ Style**

Insert Size	Pitch	Taper	Teeth	Ordering Code	Size	Dimensions mm			Anvil	RH	Toolholder			
						IC	L mm	TPI	IPF	RH	h min	X	Y	
5/8"	27	5	0.75	2	5IR5BUT752M+...	4 1/2"-13 3/8"	1.55	4.8	6.7	YI5M	AVR..-5M			

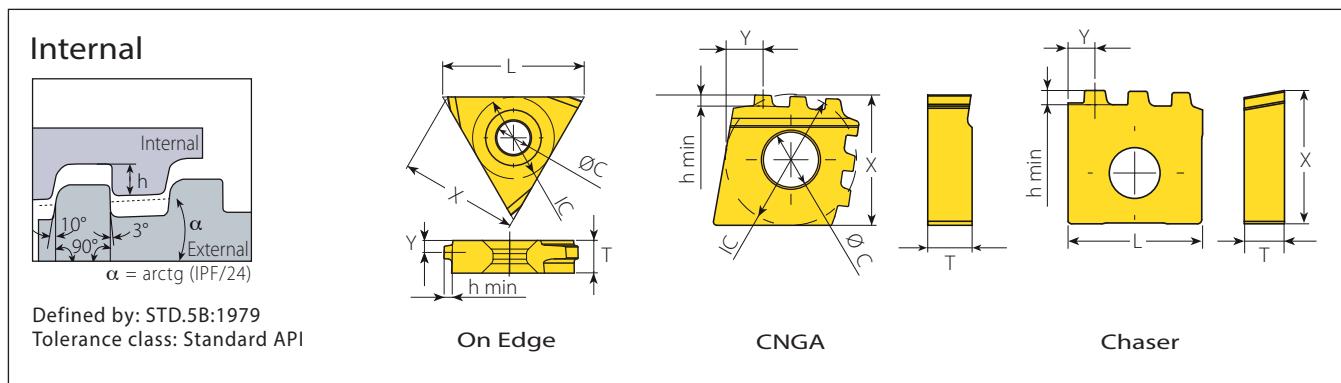
**T+ Style**

Insert Size	Pitch	Taper	Teeth	Ordering Code	Size	Dimensions mm			Anvil	RH	Toolholder				
						IC	L mm	TPI	IPF	RH	h min	X	Y		
1/2"T	22	5	0.75	3	4IR5BUT753T+...	4 1/2"-13 3/8"	1.55	2.5	16.1	Y4T	AVR..-4T				
					4IR5BUT13T+...	16"-20"									

**14D**

Insert Size	Pitch	Taper	Teeth	Ordering Code	Size	Dimensions mm			Anvil	RH	Toolholder
						IC	TPI	IPF	RH	h min	Y
14D	5	0.75	2	14DIR5BUT752T+...	4 1/2"-9 5/8"	1.55	10.0	Y14DIR-5 BUT Y14DIR-5BUT-0.4N	AVRC...-14D		
				14DIR5BUT12T+...	16"-20"	1.55					

## API Buttress Casing (con't)



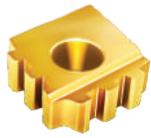
### On Edge



Insert Size			Pitch	Taper	Ordering Code		Size	Dimensions mm				Position	
IC	L mm	TPI	IPF	RH				h min	T	Ø C	X	Y	
5/8"	22	5	0.75	TNEC54IR5BUT75...			4 1/2"-13 3/8"						
		5	1	TNEC54IR5BUT1...			16"-20"	1.55	6.35	6.5	23.4	4.3	

On Edge inserts are compatible with most commonly used toolholders in the market.

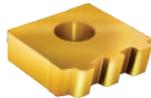
### CNGA



Insert Size			Pitch	Taper	Teeth	Ordering Code		Size	Dimensions mm				Position	
IC	TPI	IPF			RH				h min	T	Ø C	X	Y	
	5	0.75	3		CNGA64IR5BUT75T3...			4 1/2"-13 3/8"						5.6
3/4"	5	0.75	2		CNGA64IR5BUT75T2...			4 1/2"-13 3/8"	1.55	6.35	8.0	18.9		10.4
	5	1	3		CNGA64IR5BUT1T3...			16"-20"						5.5

CNGA inserts are compatible with most commonly used toolholders in the market.

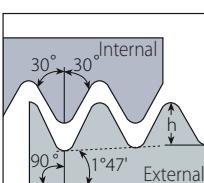
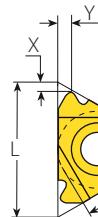
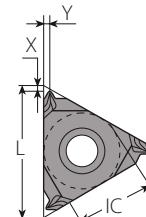
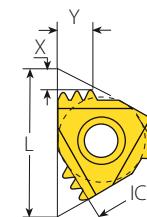
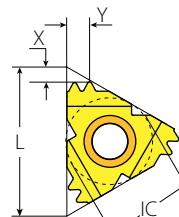
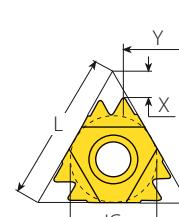
### Chaser



Insert Size			Pitch	Taper	Teeth	Ordering Code		Size	Dimensions mm				Position	
L	TPI	IPF			RH				h min	T	X	Y		
16	5	0.75	3		1616IR5BUT75S...			4 1/2"-13 3/8"	1.55					
	5	1	3		1616IR5BUT13S...			16"-20"		4.76	15.7	3.2		

Chaser inserts are compatible with most commonly used toolholders in the market.

## API Round Casing & Tubing

External	Standard	SCB Sintered Chipbreaker	M+ Style	F-Line M+	Z+ Style
 <p>Defined by: API STD. 5B:1979 Tolerance class: Standard API RD</p>					

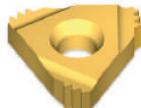
### Standard



SCB

Insert Size	Pitch			Ordering Code		Dimensions mm			Anvil	
	IC	L mm	TPI	RH	h min	X	Y	RH	Toolholder	
3/8"	16	10		3ER10APIRD...	1.41	1.2	1.4	YE13-APIRD or YE3	AL...-3 APIRD or AL..-3	
		8		3ER8APIRD...	1.81	1.3	1.5			
3/8" SCB	16	10		3JER10APIRD...	1.41	1.2	1.5	YE5M	AL..-5M	
		8		3JER8APIRD...	1.81	1.3	1.5			

### M+ Style



F-LINE

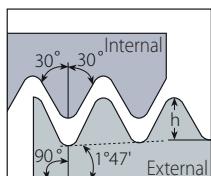


Insert Size	Pitch	Teeth	Ordering Code		Dimensions mm			Anvil	
			IC	L mm	TPI	RH	h min	X	Y
1/2"	22	10	2			4ER10APIRD2M+...	1.41	2.3	3.8
1/2" F	23	10	2			4FER10APIRD2M+...	1.41	2.3	3.8
5/8"	27	10	3			5ER10APIRD3M+...	1.41	3.9	6.3
		8	2			5ER8APIRD2M+...	1.81	2.9	4.5

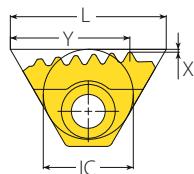
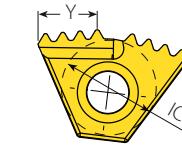
### Z+ Style



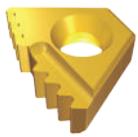
Insert Size	Pitch	Teeth	Ordering Code		Dimensions mm			Anvil	
			IC	L mm	TPI	RH	h min	X	Y
1/2"	22	10	2			4ER10APIRD2Z+...	1.41	3.0	9.9
		8	2			4ER8APIRD2Z+...	1.81	3.7	9.6

**API Round Casing & Tubing (con't)****External**

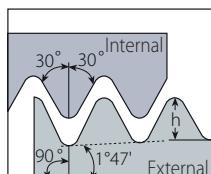
Defined by: API STD. 5B:1979  
Tolerance class: Standard API RD

**T+ Style****14D -  
2 Cutting Edges****T+ Style****Multiplus**

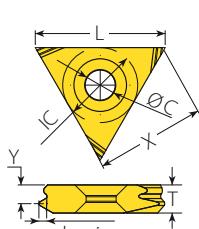
	Insert Size		Pitch	Teeth	Ordering Code		Dimensions mm			Anvil	
	IC	L mm	TPI	RH	h min	X	Y	RH	Toolholder		
1/2" T	22	10	6	4ER10APIRD6T+...	1.41	0.2	16.2				
		8	3	4ER8APIRD3T+...	1.81	0.2	14.2	Y4T	AL..-4T		
		8	5	4ER8APIRD5T+...	1.81	0.2	16.7				

**14D****Multiplus**

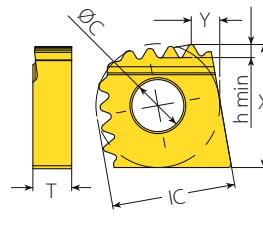
	Insert Size		Pitch	Teeth	Ordering Code		Size	Dimensions mm			Anvil	
	IC	TPI	RH		h min	Y	RH	Toolholder				
14D	14D	10	4	14DER10APIRD4T+...	2 3/8" and up	1.41	8.7	Y14DER-10 APIRD				
		10	3	14DER10APIRD3T+...	2 3/8" and up		8.8	Y14DER-10 APIRD-3+	AL...-14D			
		8	3	14DER8APIRD3T+...	2 3/8" and up	1.81	8.1	Y14DER-8 APIRD				

**API Round Casing & Tubing (con't)****External**

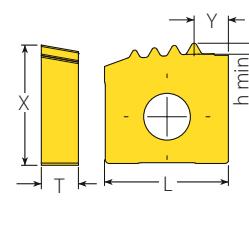
Defined by: API STD. 5B:1979  
Tolerance class: Standard API RD



On Edge



CNGA



Chaser

**On Edge**

Insert Size		Pitch		Ordering Code		Dimensions mm			Position	
IC	L mm	TPI		RH		h min	T	Ø C	X	Y
1/2"	22		10		TNEC43ER10APIRD...	1.41		4.76	5.2	18.6
			8		TNEC43ER8APIRD...	1.81				3.2

On Edge inserts are compatible with most commonly used toolholders in the market.

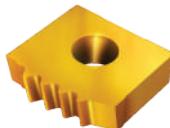
**Multi** plus

**CNGA**

Insert Size		Pitch	Teeth	Ordering Code		Dimensions mm			Position	
IC	TPI			RH		h min	T	Ø C	X	Y
3/4"		10	5		CNGA64ER10APIRDT5...	1.41		6.35	8.0	18.9
		8	4		CNGA64ER8APIRDT4...	1.81				4.5

CNGA inserts are compatible with most commonly used toolholders in the market.

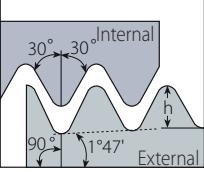
**Multi** plus

**Chaser**

Insert Size		Pitch	Teeth	Ordering Code		Dimensions mm			Position	
L	TPI			RH		h min	T	X	Y	
16		10	4		1616ER10APIRD4S...	1.41		4.76	15.4	4.4
		8	3		1616ER8APIRD3S...	1.81			15.9	

Chaser inserts are compatible with most commonly used toolholders in the market.

## API Round Casing & Tubing (con't)

Internal		Standard	SCB Sintered Chipbreaker	M+ Style	F-Line M+	Z+ Style
 <p>Defined by: API STD. 5B:1979 Tolerance class: Standard API RD</p>						

### Standard



SCB

Insert Size	Pitch			Ordering Code		Dimensions mm			Anvil		
	IC	L mm	TPI	RH	h min	X	Y	RH	Toolholder		
3/8"	16	10		3IR10APIRD...	1.41	1.2	1.4	YEI3-APIRD or YI3	AVRC... 3APIRD or AVRC..-3		
		8		3IR8APIRD...	1.81	1.3	1.5				
3/8" SCB	16	10		3JIR10APIRD...	1.41	1.2	1.5	AVRC... 3APIRD or AVRC..-3			
		8		3JIR8APIRD...	1.81	1.3	1.5				

### M+ Style



F-LINE

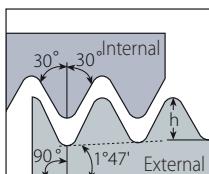


Insert Size	Pitch			Teeth		Ordering Code		Dimensions mm			Anvil	
	IC	L mm	TPI	RH	h min	X	Y	RH	Toolholder			
1/2"	22	10	2		4IR10APIRD2M+...	1.41	2.4	3.7	YI4M	AVR..-4		
		8	2		4IR8APIRD2M+...	1.81	2.9	4.5				
1/2" F	23	10	2		4FIR10APIRD2M+...	1.41	2.4	3.7	YI4M2F	AVRC..-4MF		
		5/8"	27	10	3	5IR10APIRD3M+...	1.41	3.9	6.3		YI5M	AVR..-5M
		8	2		5IR8APIRD2M+...	1.81	2.9	4.5				

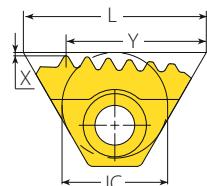
### Z+ Style



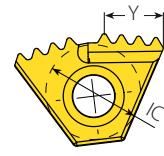
Insert Size	Pitch			Teeth		Ordering Code		Dimensions mm			Anvil	
	IC	L mm	TPI	RH	h min	X	Y	RH	Toolholder			
1/2"	22	10	2		4IR10APIRD2Z+...	1.41	3.0	9.9	YI4Z	AVR..-4Z		
		8	2		4IR8APIRD2Z+...	1.81	3.7	9.6				

**API Round Casing & Tubing (con't)****Internal**

Defined by: STD. 5B:1979  
Tolerance class: Standard API RD



Z+ Style

14D -  
2 Cutting Edges**Multi**  
plus**T+ Style**

	Insert Size		Pitch	Teeth	Ordering Code		Dimensions mm			Anvil	
	IC	L mm	TPI		RH		h min	X	Y	RH	Toolholder
1/2" T	22	10	6		4IR10APIRD6T+...		1.41	0.2	16.8	Y4T	AVR..-4T
		8	3		4IR8APIRD3T+...		1.81	0.2	14.2		
		8	5		4IR8APIRD5T+...		1.81	0.2	16.7		

**14D**

	Insert Size		Pitch	Teeth	Ordering Code	Size	Dimensions mm		Anvil		
	IC	TPI					h min	Y	Toolholder		
14D	14D	10	4		14DIR10APIRD4T+...	2 3/8" and up	1.41	8.71	Y14DIR-10 APIRD	AVRC...-14D	
		10	3		14DIR10APIRD3T+...	2 3/8" and up		8.79	Y14DIR-10 APIRD-3+		
		8	3		14DIR8APIRD3T+...	2 3/8" and up		8.10	Y14DIR-8 APIRD		

## API Round Casing & Tubing (con't)

**Internal**

Defined by: STD. 5B:1979  
Tolerance class: Standard API RD

**On Edge**

**CNGA**

**Chaser**

### On Edge



Insert Size		Pitch		Ordering Code		Dimensions mm				Position	
IC	L mm	TPI		RH		h min	T	Ø C	X	Y	
1/2"	22	10		TNEC43IR10APIRD...		1.41	4.76	5.2	18.6	3.2	
		8		TNEC43IR8APIRD...		1.81					

On Edge inserts are compatible with most commonly used toolholders in the market.

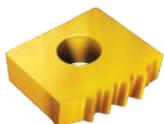
### CNGA



Insert Size		Pitch	Teeth	Ordering Code		Dimensions mm				Position	
IC	TPI			RH		h min	T	Ø C	X	Y	
3/4"	10	5		CNGA64IR10APIRDT5...		1.41	6.35	8.0	18.9	4.5	
	8	4		CNGA64IR8APIRDT4...		1.81					

CNGA inserts are compatible with most commonly used toolholders in the market.

### Chaser



Insert Size		Pitch	Teeth	Ordering Code		Dimensions mm				Position	
L	TPI			RH		h min	T	Ø C	X	Y	
16	10	4		1616IR10APIRD4S...		1.41	4.76	15.4	5.7		
	8	3		1616IR8APIRD3S...		1.81		15.9	4.4		

Chaser inserts are compatible with most commonly used toolholders in the market.

**VAM**

**External**

Defined by: VAM  
Tolerance class: Standard VAM

**Standard**

**F-Line**

**On Edge**

**Standard****F-LINE**

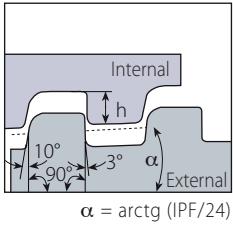
Insert Size	Pitch	Taper	Ordering Code	Size	Dimensions mm			Anvil		
					IC	L mm	TPI	IPF	RH	Toolholder
3/8"	16	8	3ER8VAM...	2 3/8", 2 7/8"	0.97	1.7			YE3	AL..-3
			4ER6VAM...	3 1/2"	0.97	2.4			YE4	AL..-4
			4ER5VAM...	5"-9 5/8"	1.55	2.4				
1/2"	22	6	4FER6VAM...	3 1/2"	0.97	2.4			YE4F	AL..-4F
			4FER5VAM...	5"-9 5/8"	1.55	2.4				
1/2"F	23	6								

**On Edge**

Insert Size	Pitch	Taper	Ordering Code	Size	Dimensions mm			Position		
					IC	L mm	TPI	IPF	RH	Y
1/2"	22	8	TNEC43ER8VAM...	2 3/8", 2 7/8"	0.97				4.76	5.2
			TNEC43ER6VAM...	3 1/2"	0.97				4.76	18.6
			TNEC54ER5VAM...	5"-9 5/8"	1.55				6.35	2.90
5/8"	27	5								23.4
										4.00

On Edge inserts are compatible with most commonly used toolholders in the market.

**VAM** (con't)

Internal		Standard	F-Line	On Edge	CNGA
 <p><math>\alpha = \text{arctg} (\text{IPF}/24)</math></p> <p>Defined by: VAM Tolerance class: Standard VAM</p>					

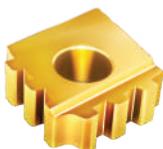
**Standard****F-LINE**

	Insert Size			Pitch		Taper	Ordering Code		Size	Dimensions mm			Anvil	
	IC	L mm	TPI	IPF	RH		h min	X	Y	RH	Toolholder			
	3/8"	16	8	0.75	3IR8VAM...	2 3/8", 2 7/8"	1.02	1.7	1.8	YI3	AVR..-3			
	1/2"	22	6		4IR6VAM...	3 1/2"	1.02	2.5	2.5	YI4	AVR..-4			
	1/2" F	23	6		4IR5VAM...	5"-9 5/8"	1.55	2.4	2.5	4FIR6VAM...	3 1/2"	1.02	2.5	2.5
					4FIR5VAM...	5"-9 5/8"	1.55	2.4	2.5	YI4F	AVRC..-4F			

**On Edge**

	Insert Size			Pitch		Taper	Ordering Code		Size	Dimensions mm			Position	
	IC	L mm	TPI	IPF	RH		h min	T	Ø C	X	Y			
	1/2"	22	8	0.75	TNEC43IR8VAM...	2 3/8", 2 7/8"	1.02	4.78	5.2	18.6	3.2			
			6		TNEC43IR6VAM...	3 1/2"	1.02	4.78			3.1			
	5/8 "	27	5		TNEC54IR5VAM...	5"- 9 5/8"	1.55	6.35	6.5	23.4	4.2			

On Edge inserts are compatible with most commonly used toolholders in the market.

**CNGA**

	Insert Size	Pitch	Taper	Teeth	Ordering Code		Size	Dimensions mm			Position	
	IC	TPI	IPF	RH			h min	T	Ø C	X	Y	
	3/4"	5	3/4	2	CNGA64IR5VAM75T2...		5"- 9 5/8"	1.55	6.35	8.0	18.9	9.3

CNGA inserts are compatible with most commonly used toolholders in the market.

**New VAM**

**External**

$\alpha = \text{arctg} (\text{IPF}/24)$

Defined by: VAM  
Tolerance class: Standard VAM

**Standard**

**F-Line**

**Standard****FLINE**

Insert Size		Pitch	Taper	Ordering Code	Size	Dimensions mm			Anvil	
IC	L mm	TPI	IPF	RH		h min	X	Y	RH	Toolholder
3/8"	16	8	0.75	3ER8NVAM...	2 3/8", 2 7/8"	0.97	1.8	1.8	YE3	AL...-3
1/2"	22	6		4ER6NVAM...	3 1/2"	0.97	2.3	2.3	YE4	AL...-4
1/2" F	23	6		4ER5NVAM...	5"-9 5/8"	1.55	2.3	2.3	YE4F	AL...-4F
		5		4FER6NVAM...	3 1/2"	0.97	2.2	2.1		
				4FER5NVAM...	5"-9 5/8"	1.55	2.5	2.3		

## New VAM (con't)

Internal	Standard	F-Line	On Edge	CNGA
<p>Defined by: VAM Tolerance class: Standard VAM</p>				

## Standard



F-LINE

Insert Size	Pitch	Taper	Ordering Code	Size	Dimensions mm			Anvil		
					IC	L mm	TPI	IPF	RH	Toolholder
3/8"	16	8	3IR8NVAM...	2 3/8", 2 7/8"	1.23	1.8	1.8		Y13	AVR...-3
			4IR6NVAM...	3 1/2"	1.23	2.5	2.5		Y14	AVR...-4
			4IR5NVAM...	5"-9 5/8"	1.77	2.3	2.5	0.75		
1/2"	22	6	4FIR6NVAM...	3 1/2"	1.23	2.0	1.8		Y14F	AVRC...-4F
			4FIR5NVAM...	5"-9 5/8"	1.77	2.1	2.1			
1/2"	23	6								
1/2"	23	5								

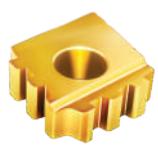
## On Edge



Insert Size	Pitch	Taper	Ordering Code	Size	Dimensions mm									
					IC	L mm	TPI	IPF	RH	h min	T	Ø C	X	Y
1/2"	22	8	TNEC43IR8NVAM...	2 3/8"-2 7/8"	1.23	4.76	5.2		18.6	3.2				
			TNEC43IR6NVAM...	3 1/2"-4 1/2"	1.23	4.76	5.2	0.75	23.4	3.1				
			TNEC54IR5NVAM...	5"-16"	1.77	6.35	6.5			4.2				

On Edge inserts are compatible with most commonly used toolholders in the market.

## CNGA



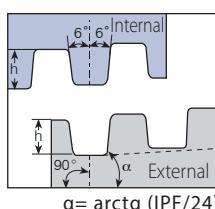
Multiplus

Insert Size	Pitch	Taper	Teeth	Ordering Code	Size	Dimensions mm					Position			
						IC	TPI	IPF	RH	h min	T	Ø C	X	Y
3/4"	6	0.75	2	CNGA64IR6NVAM75T2...	3 1/2"-4 1/2"	1.23	6.35							
	5			CNGA64IR5NVAM75T2...	5"-16"	1.77	6.35		8	18.9	9.3			

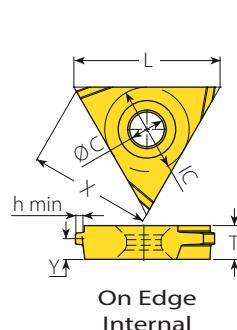
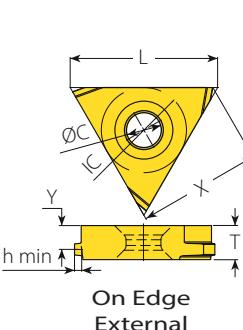
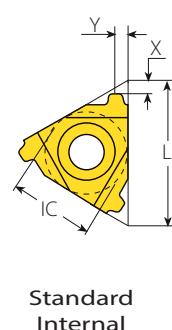
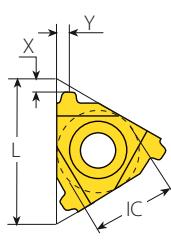
CNGA inserts are compatible with most commonly used toolholders in the market.

## EL-Extreme Line

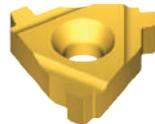
### External / Internal



Defined by: API STD,5B:1979  
Tolerance class: Standard



### Standard - External



Insert Size				Pitch	Taper	Ordering Code	Size	Dimensions mm			Anvil	
IC	L mm	TPI	IPF	RH			h min	X	Y	RH	Toolholder	
1/2"	22	6	1.5	4ER6EL15...			5"-7 5/8"	1.21	1.9	1.9	YE4	
		5	1.25	4ER5EL125...			8 5/8"-10 3/4"	1.71	2.3	2.4		

### On Edge - External



Insert Size				Pitch	Taper	Ordering Code	Size	Dimensions mm			Position
IC	L mm	TPI	IPF	RH			h min	T	Ø C	X	Y
5/8"	27	6	1.5	TNEC54ER6EL15...			5"-7 5/8"	1.21	6.35	6.5	23.4
		5	1.25	TNEC54ER5EL125...			8 5/8"-10 3/4"	1.71	6.35		4.3

On Edge inserts are compatible with most commonly used toolholders in the market.

### Standard - Internal



Insert Size				Pitch	Taper	Ordering Code	Size	Dimensions mm			Anvil	
IC	L mm	TPI	IPF	RH			h min	X	Y	RH	Toolholder	
1/2"	22	6	1.5	4IR6EL15...			5"-7 5/8"	1.39	1.8	1.9	Y14	AVR..-4
		5	1.25	4IR5EL125...			8 5/8"-10 3/4"	1.91	2.2	2.4		

### On Edge - Internal



Insert Size				Pitch	Taper	Ordering Code	Size	Dimensions mm			Position
IC	L mm	TPI	IPF	RH			h min	T	Ø C	X	Y
5/8"	27	6	1.5	TNEC54IR6EL15...			5"-7 5/8"	1.39	6.35	6.5	23.4
		5	1.25	TNEC54IR5EL125...			8 5/8"-10 3/4"	1.91	6.35		4.3

On Edge inserts are compatible with most commonly used toolholders in the market.

## Hughes H-90

**External / Internal**

Defined by: API specification 7-2/ISO 10242-2

**U Style**

**On Edge External**

**On Edge Internal**

### U Style - External



Insert Size				Pitch	Taper	Ordering Code		Size			Dimensions mm			Anvil	
IC	L mm	TPI	IPF	RH				h min			X	Y	RH	Toolholder	
1/2" U	22	3.5	2	4UER3.5H902...	3 1/2"-6 5/8"	2.50	4.2	11	YE4U-H90	AL..-4U					
5/8" U	27	3.5	3	4UER3.5H903...	7"-8 5/8"	2.50	4.2	11	YE5U-H90	AL..-5UH90					

### On Edge - External



Insert Size				Pitch	Taper	Ordering Code		Size			Dimensions mm			Position	
IC	L mm	TPI	IPF	RH				h min			T	Ø C	X	Y	
				3.5	2	TNEC55ER3.5H902...	3 1/2"-6 5/8"	2.50	7.93					4.3	
5/8"	27	3.5	3	TNEC55ER3.5H903...	7"-8 5/8"	2.50	7.93	6.5	23.4					4.3	
				3	1.25*	TNEC56ER3H90SL...	2 3/8"-3 1/2"	2.24	9.53					5.7	

On Edge inserts are compatible with most commonly used toolholders in the market.

### U Style - Internal



Insert Size				Pitch	Taper	Ordering Code		Size			Dimensions mm			Anvil	
IC	L mm	TPI	IPF	RH				h min			X	Y	RH	Toolholder	
1/2" U	22	3.5	2	4UIR3.5H902...	3 1/2"-6 5/8"	2.50	4.2	11	YI4U-H90	AVR..-4U					
5/8" U	27	3.5	3	4UIR3.5H903...	7"-8 5/8"	2.50	4.2	11	YI5U-H90	AVR..-5UH90					

### On Edge - Internal

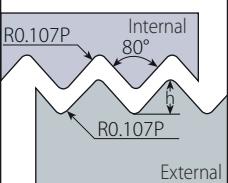
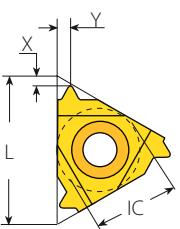
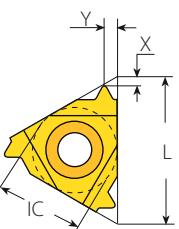


Insert Size				Pitch	Taper	Ordering Code		Size			Dimensions mm			Position	
IC	L mm	TPI	IPF	RH				h min			T	Ø C	X	Y	
				3.5	2	TNEC55IR3.5H902...	3 1/2"-6 5/8"	2.49	7.93					4.3	
5/8"	27	3.5	3	TNEC55IR3.5H903...	7"-8 5/8"	2.49	7.93	6.5	23.4					4.3	
				3	1.25*	TNEC56IR3H90SL...	2 3/8"-3 1/2"	2.24	9.53					5.7	

On Edge inserts are compatible with most commonly used toolholders in the market.

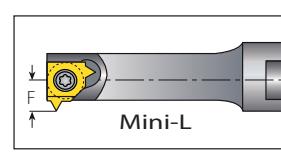
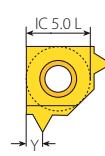
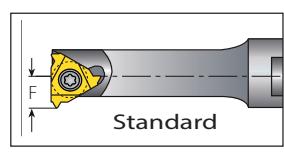
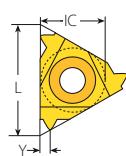
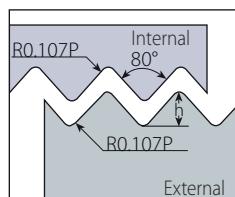
\* H-90 Slimline.

**Pg**

External / Internal									
 <p>Defined by: DIN 40430 Tolerance class: Standard</p>									
 <p>Standard External</p>									
 <p>Standard Internal</p>									

**Standard - External****Standard - Internal**

	Insert Size		Pitch		Thread		Ordering Code			Dimensions mm			Anvil		
	IC	L mm	TPI	RH	LH	h min	X	Y	RH	LH	Toolholder				
	1/4"	11	20 Pg7	2ER20PG...	2EL20PG...	0.61	0.8	0.9	-	-	NL..-2 (LH)				
			18 Pg9/11/13.5/16	2ER18PG...	2EL18PG...	0.67	0.8	1.0							
			16 Pg21/29/36/42/48	2ER16PG...	2EL16PG...	0.76	0.9	1.1							
	3/8"	16	20 Pg7	3ER20PG...	3EL20PG...	0.61	0.8	0.9	YE3	YI3	AL..-3 (LH)				
			18 Pg9/11/13.5/16	3ER18PG...	3EL18PG...	0.67	0.8	1.0							
			16 Pg21/29/36/42/48	3ER16PG...	3EL16PG...	0.76	0.9	1.1							

**Pg** (con't)**MINIPRO****Internal**

Defined by: DIN 40430  
Tolerance class: Standard

**Mini-3 Standard**

Insert Size IC mm	Pitch L mm	Thread TPI	Ordering Code			Dimensions mm			Min. Bore Dia.	
			RH	LH	h min	Y	F	mm	Toolholder	
5.0	8	20 Pg7	5.0KIR20PG...	5.0KIL20PG...	0.61	0.7	4.7	7.8	(C)NVRC7-5.0K (LH)	
6.0	10	20 Pg7	6.0KIR20PG...	6.0KIL20PG...	0.61	0.8	5.3	10.0	.NVRC1..-6.0K (LH)	
		18 Pg9/11/13.5/16	6.0KIR18PG...	6.0KIL18PG...	0.67	0.9	5.3			

**Mini-L**

Insert Size IC mm	Pitch TPI	Thread	Ordering Code			Dimensions mm			Min. Bore Dia.	
			RH	L H	h min	Y	F	mm	Toolholder	
5.0L	20	Pg7	5LKIR20PG...	5LKIL20PG...	0.61	0.8	4.65	8.0	.NVRC10..-5LK (LH)	
	18	Pg9/11/13.5/16	5LKIR18PG...	5LKIL18PG...	0.67	0.9	4.65			





## Thread Turning Toolholders

## Vardex Ordering Code System

### External Toolholders

A	L	32	-	4	U	C			
1	2	3		4	5	6	7	8	9
<b>1 - Anvil</b>									
A - Anvil Required N - No Anvil Required O - Miniature Holder					<b>2 - Holder Style</b> L - External V - Miniature Square Shank VR - Miniature Round Shank				
					<b>3 - Shank Square [mm]</b> 8, 10, 12, 16, 20, 25, 32, 40, 50, 60				
<b>4 - Insert Size</b> 2 - IC1/4" 3 - IC3/8" 4 - IC1/2" 5 - IC5/8"									
<b>5 - Insert Style</b> U - U style V - Vertical F - F Line M - Multi+ M MF - Multi+ F Line Z - Multi+ Z T - Multi+ T 14D - Multi+ 14D MG - Mega Line					<b>6 - Clamping</b> C - With Clamping				
					<b>7 - Insert Width</b> (for IC5/8"V) 6, 8, 10				
<b>8 - Tool Type</b> CQ - Drop Head FQ - Off-Set OIL - For API Inserts					<b>9 - RH/LH Holder</b> None - Right Hand LH - Left Hand				

### Internal Toolholders

C	A	VR	C	20	6	-	3	8	9	10	11	12
1	2	3	4	5	6		7	8	9	10	11	12
<b>1 - Shank Type</b> B - Anti Vibration System C - Carbide Shank S - Mini Holders	<b>2 - Anvil</b> A - Anvil Required N - No Anvil Required O - Miniature Holder	<b>3 - Tool Type</b> VR - Internal Round Shank	<b>4 - Cooling</b> C - With Coolant Channel	<b>5 - Shank Front Dia.</b> 10, 10D, 12, 13, 16 16D, 20, 25, 25D, 32, 40, 50 6.2 (Mini Adjust) 8.0 (Mini Adjust)	<b>6 - Holder Length</b> (Mini Holders) U - Ultra Short S - Short M - Medium L - Long T - Adjustable							
<b>7 - Insert Size</b> 5LK - IC5.0L mm 4.0K - IC4.0 mm 5.0K - IC5.0 mm 6.0K - IC6.0 mm 2 - IC1/4" 3 - IC3/8" 4 - IC1/2" 5 - IC5/8"	<b>8 - Insert Style</b> U - U style V - Vertical F - F Line M - Multi+ M MF - Multi+ F Line Z - Multi+ Z T - Multi+ T 14D - Multi+ 14D MG - Mega Line	<b>9 - Clamping</b> C - Wth Clamp	<b>10 - Oil Field</b> OIL - For API Inserts	<b>11 - RH/LH Holder</b> None - Right Hand LH - Left Hand	<b>12 - Serial No.</b> 156/... (Coarse Pitch Holder) 206/... (V6 Holder)							

### Micro, Microscope & Adjustable Toolholders (Sleeves)

M	H	C	R	22	-	4	-	5	-	4F	
1	2	3	4	5		6		7		8	
<b>1 - Holder Shape</b> S - Sleeve (Double Ended) M - Microscope (Single Ended)	<b>2 - Holder Type</b> V - Adjustable Holders for Mini M - Micro (Double Ended) H - Microscope Round Holder HS - Microscope with Square Shank HD - Microscope with Drop Head	<b>3 - Coolant</b> C or D - Coolant Thru	<b>4 - Round Tools</b> R - Microscope Round Bore S - Microscope Shrink by Screw								
<b>5 - Shank Size [mm]</b> 10-28	<b>6 - Holder Bore Size</b> Micro Size 3, 4, 5, 6, 7, 8, 10 Adjustable Holders (for Mini) 6.2, 8	<b>7 - Holder Bore Size for Double Sided</b> Microscope Size 4, 5, 6,	<b>8 - No. of Flats</b> 4F - 4 Flats None - 2 Flats								

## ■ V-CAP Toolholders

VCAP	40	-	S	E	R	27	050	-	3		
1	2		3	4	5	6	7		8		
1 - Holder Style		2 - D (Polygon Size)		3 - Insert Style		4 - External / Internal		5 - RH / LH			
VCAP - Vargus Polygon Shank		32, 40, 50, 63		S - Threading		E - External I - Internal		R - Right Hand L - Left Hand			
6 - Cutting Radius		7 - Tool Overhang		8 - Insert Size							
12-45		40-105		3 - IC3/8"							

## ■ VG-Cut Toolholders for Threading

VG	E	R	2525	-	3	T12	PH
1	2	3	4		5	6	7
1 - Line Name		2 - Application Approach		3 - RH / LH		4 - Shank Size	
VG - Deep Grooving & Parting Off		E - External		R - Right Hand L - Left Hand		Width-Height	
5 - Pocket Size		6 - Depth of Cut		7 - PH		PH - Reinforced blade structure	
3		T8, T12 - Limit Depth of Cut 8, 12 mm					

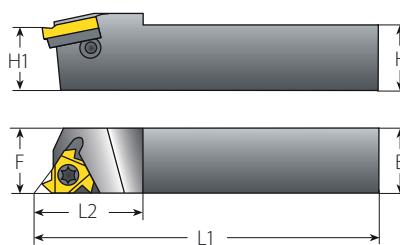
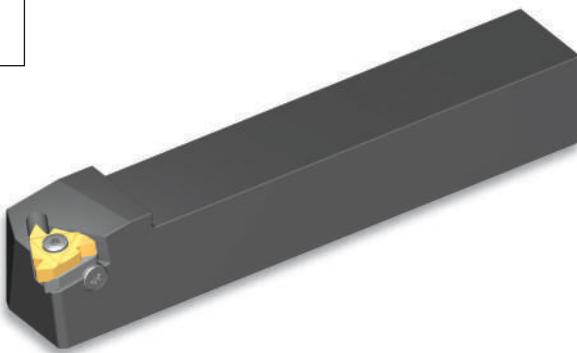
## ■ Mini-V Holders

C	V	08	-	12	21	-
1	2	3		4	5	6
1 - Holder Type	2 - Product Line	3 - Insert Size	4 - Shank Diameter	5 - Tool Overhang	6 - RH or LH	
C - Carbide Shank None - Steel Shank	V - Mini-V	08, 11, 14, 16	6, 8, 12, 16	12, 21, 29, 30, 42, 50, 56, 64, 80	None - RH L - LH	

## ■ Mini-V Sleeves

MH	C	16	-	6
1	2	3		4
1 - Holder Type	2 - Coolant	3 - Shank Dia.	4 - Sleeve Bore Dia.	
MH - Microscope Holder	C - Coolant Channels	12, 16, 20	6, 8	

## External Toolholders



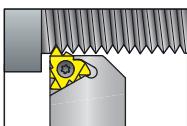
### Standard

### Spare Parts

Insert Size	Ordering Code	Dimensions mm			Insert Screw	Anvil Screw	Torx Key	Anvil RH	Anvil LH	
IC	RH/LH	H=H1=B	F	L1	L2					
1/4"	NL8-2	8	11	136.4	17.5	SN2T	K2T	-	-	
	NL10-2	10	11	125.0	17.5					
	NL12-2	12	12	125.0	17.5					
3/8"	NL12-3	12	16	83.2	22	SA3T	-	K3T	-	-
	AL3/8-3	9.52	16	63.6	20.5	SA3T	SY3T	K3T	YE3	YI3
	AL12-3	12	16	83.2	22					
	AL16-3	16	16	100.0	20.5					
	AL20-3	20	20	128.6	30					
	AL25-3	25	25	153.6	30					
	AL32-3	32	32	173.6	30					
1/2"	AL25-4	25	25	155.7	36	SA4T	SY4T	K4T	YE4	YI4
	AL32-4	32	32	175.7	36					
	AL40-4	40	40	205.7	36					
5/8"	AL25-5	25	32	151.6	35	SA5T	SY5T	K5T	YE5	YI5
	AL32-5	32	32	176.6	40					
	AL40-5	40	40	206.6	40					
	AL50-5	50	50	256.6	40					

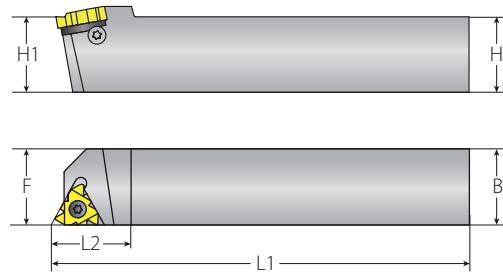
The above toolholders have a 1.5° helix angle. For other helix angles, see page 203.

The above toolholders are for RH inserts. For LH inserts, add LH to the toolholder's ordering code (Example AL20-3LH).



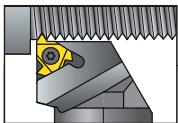
## External Toolholders

**F-LINE**

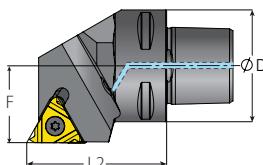
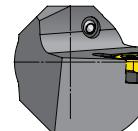
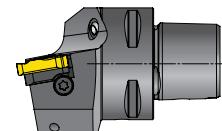


### Standard F-Line

Insert Size	Ordering Code	Dimensions mm				Spare Parts			
IC	RH	H=H1=B	F	L1	L2	Insert Screw	Anvil Screw	Torx Key	Anvil RH
1/2" F	AL25-4F	25	25	155	33	SA4T	SY4T	K6T	YE4F
	AL32-4F	32	32	175	33				
	AL40-4F	40	40	205	33				



## External Toolholders



Max. coolant pressure 10bar

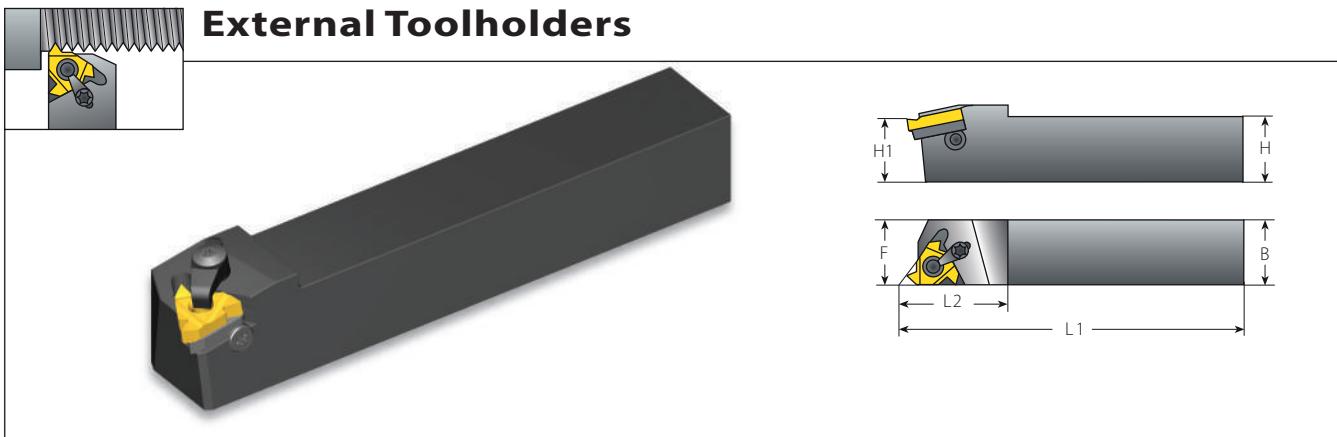
### V-CAP

Insert Size	Ordering Code	Dimensions mm			Spare Parts					
IC	RH/LH	D	F	L2	Insert Screw	Anvil Screw	Torx Key	Coolant Jet	Anvil RH	Anvil LH
3/8"	VCAP32-SER22040-3	32	22	40	SA3T	SY3T	K3T	OD6	YE3	YI3
	VCAP40-SER27050-3	40	27	50						
	VCAP50-SER35060-3	50	35	60						
	VCAP63-SER45065-3	63	45	65				OD8		

The above toolholders are for RH inserts. For LH inserts, add LH to the toolholder's ordering code (Example VCAP32-SER22040-3).

The above toolholders have a 1.5° helix angle. For other helix angles, see page 203.

## External Toolholders



### Standard with Clamp

(Dual System, Screw or Clamp)

#### Spare Parts

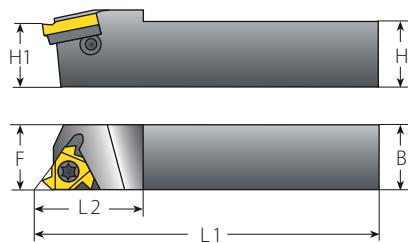
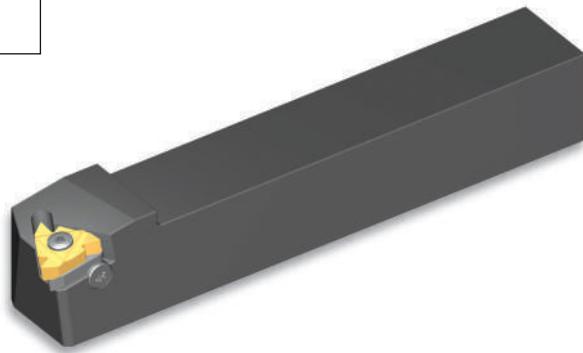
Insert Size	Ordering Code	Dimensions mm				Insert Screw	Anvil Screw	Clamp	Torx Key	Anvil RH	Anvil LH
IC	RH/LH	H=H1=B	F	L1	L2						
3/8"	AL16-3C	16	16	100.0	20.5	SA3T	SY3T	C3	K3CT	YE3	YI3
	AL20-3C	20	20	128.6	30						
	AL25-3C	25	25	153.6	30						
	AL32-3C	32	32	173.6	30						
1/2"	AL25-4C	25	25	155.7	36	SA4T	SY4T	C4	K4T	YE4	YI4
	AL32-4C	32	32	175.7	36						
	AL40-4C	40	40	205.7	36						
5/8"	AL25-5C	25	32	151.6	35	SA5T	SY5T	C5	K5T	YE5	YI5
	AL32-5C	32	32	176.6	40						
	AL40-5C	40	40	206.6	40						
	AL50-5C	50	50	256.6	40						

The above toolholders have a 1.5° helix angle. For other helix angles, see page 203.  
The above toolholders are for RH inserts. For LH inserts, add LH to the toolholder's ordering code (Example AL16-3CLH).



## External Toolholders

Oil & Gas

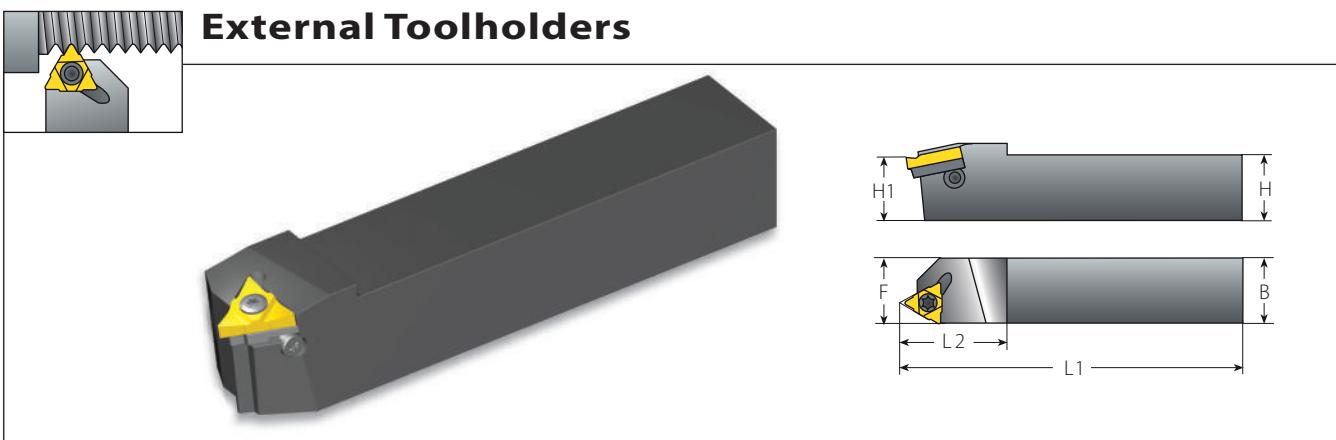


### Oil & Gas

### Spare Parts

Insert Size	Ordering Code	Thread Form	Connection No. or Size	Dimensions mm			Helix Angle	Spare Parts			
IC	RH			H=H1=B=F	L1	L2		Insert Screw	Anvil Screw	Torx Key	Anvil RH
3/8"	AL32-3-APIRD	APIRD 8	2.375"-20"	32	173.0	28.8	1	SA3T	SY3T	K3T	YE13 APIRD
	AL40-3-APIRD	APIRD 10	1.05"-3.5"	40	205.0	37.4	1				
1/2"	AL32-4-5BUT/API	5BUT, V0.038R, V0.050, V0.040, V0.055	4 1/2"-20"	32	177.0	36.6	0	SA4T	SY4T	K4T	YE14-API-1P YE14-5BUT
	AL40-4-5BUT/API	NC10-NC77 all sizes	NC23-NC77 all sizes	40	204.0	34.5	0				
5/8"	AL32-5OIL	V0.038R, V0.050	NC23-NC77 all sizes	32	175.9	40.0	1.5	SA5T	SY5T	K5T	YE5OIL
	AL40-5OIL	V0.038R, V0.050	NC23-NC77 all sizes	40	205.9	40.0	1.5				

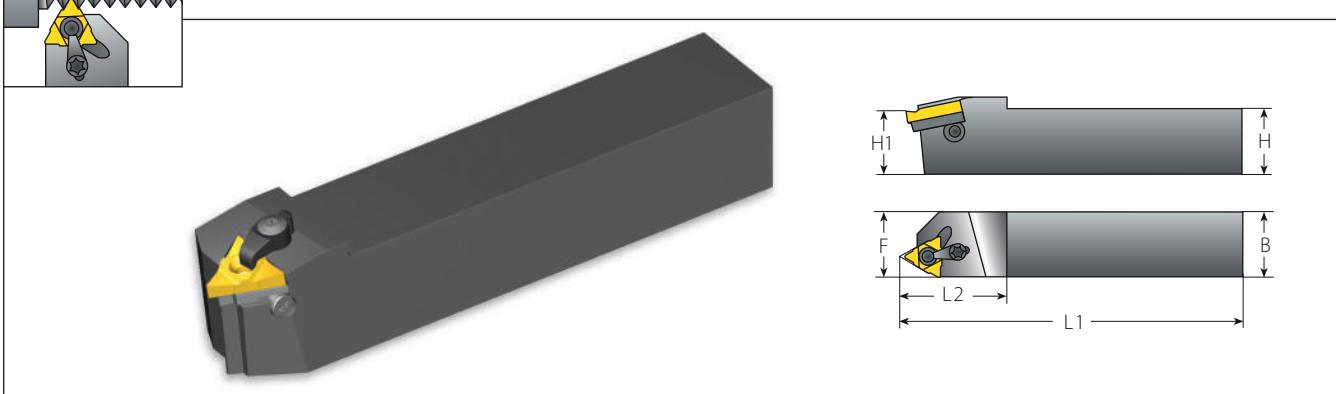
## External Toolholders



### U Style

Insert Size	Ordering Code		Dimensions mm			Spare Parts				
IC	RH/LH	$H=H_1=B$	F	L1	L2	Insert Screw	Anvil Screw	Torx Key	Anvil RH	Anvil LH
1/2"U	AL25-4U	25	25	178.4	38	SA4T	SY4T	K4T	YE4U	YI4U
	AL32-4U	32	32	178.4	38					
	AL40-4U	40	40	208.4	38					
5/8"U	AL25-5U	25	25	179.1	40	SA5T	SY5T	K5T	YE5U	YI5U
	AL32-5U	32	32	179.1	40					
	AL40-5U	40	40	209.1	40					
	AL50-5U	50	50	259.1	40					

## External Toolholders



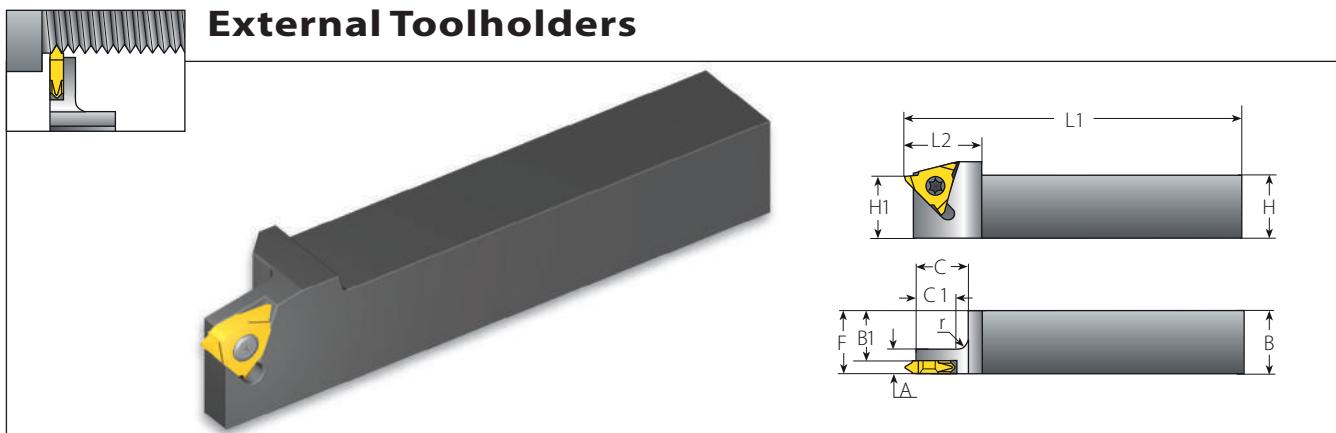
### U Style with Clamp

(Dual System, Screw or Clamp)

Insert Size	Ordering Code		Dimensions mm			Spare Parts					
IC	RH/LH	$H=H_1=B$	F	L1	L2	Insert Screw	Anvil Screw	Clamp	Torx Key	Anvil RH	Anvil LH
1/2"U	AL32-4UC	32	32	178.4	38	SA4T	SY4T	C4	K4T	YE4U	YI4U
	AL40-4UC	40	40	208.4	38						
5/8"U	AL32-5UC	32	32	179.1	40	SA5T	SY5T	C5	K5T	YE5U	YI5U
	AL40-5UC	40	40	209.1	40						
	AL50-5UC	50	50	259.1	40						

All U Style Toolholders have a 1.5° helix angle. For other helix angles see page 203.  
The above toolholders are for RH inserts. For LH inserts, add LH to the toolholder's ordering code (Example AL25-4ULH).

## External Toolholders

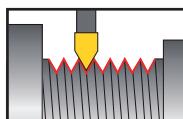


### Slim Throat

Insert Size	Ordering Code	Dimensions mm									Spare Parts	
IC	RH/LH	H=B=F	H1	A	B1	C	C1	L1	L2	r	Insert Screw	Torx Key
1/4"V	NL8-2V	8	10	7	4.8	12.5	11.5	60	14.0	1	SN2T	K2T
	NL10-2V	10	10	7	6.8	12.5	11.5	70	14.0	1		
	NL12-2V	12	12	7	8.8	14.5	11.5	80	14.0	3		
	NL16-2V	16	16	7	12.8	14.5	11.5	100	14.0	3		
3/8"V	NL10-3V	10	14	7	6.4	14.5	11.5	70	18.5	3	SN3TV	K3T
	NL12-3V	12	14	7	8.4	14.5	11.5	80	18.5	3		
	NL16-3V	16	16	7	12.4	14.5	11.5	100	25.0	3		
	NL20-3V	20	20	7	16.4	16.5	11.5	125	30.0	3		
	NL25-3V	25	25	7	21.4	16.5	11.5	150	30.0	5		
	NL32-3V	32	32	7	28.4	16.5	11.5	170	30.0	5		
	NL40-3V	40	40	7	36.4	16.5	11.5	200	30.0	5		
1/2"V	NL25-4V	25	25	12	20.2	16.5	11.5	150	30.0	5	SN4T	K4T
	NL32-4V	32	32	12	27.2	16.5	11.5	170	30.0	5		
	NL40-4V	40	40	12	35.2	16.5	11.5	200	30.0	5		

All Slim Throat toolholders have a 1.5° helix angle see page 203.

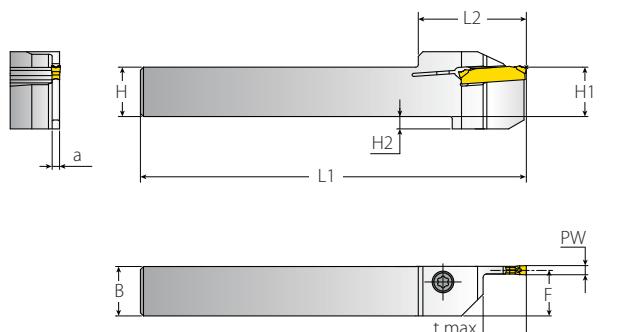
The above toolholders are for RH inserts. For LH inserts, add LH to the toolholder's ordering code (Example NL8-2V**LH**).



## External Toolholders

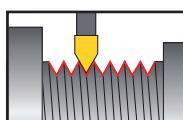


Right hand shown

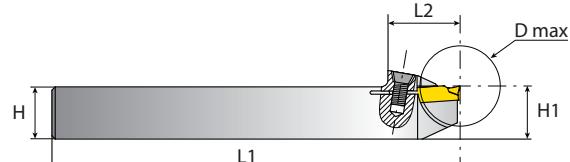
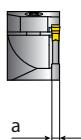
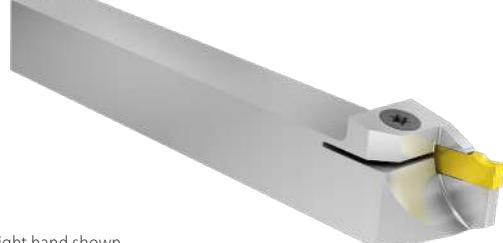


## Monoblock

Ordering Code		Dimensions mm								Spare Parts	VG-Cut
PW	RH/LH	t max	HxB	H1	F	L1	L2	a	H2	Cylindrical Holder Screw	Torx Key
3	VGER/L1212-3T12	12	12x12	12	10.8	125	35	2.4	4.0	SM3.5x14-T15	KT-15
	VGER/L1616-3T12	12	16x16	16	14.8				4.0		
	VGER/L2020-3T08	8	20x20	20	18.8				-		
	VGER/L2020-3T12	12	20x20	20	18.8				-		
	VGER/L2525-3T08	8	25x25	25	23.8				-		
	VGER/L2525-3T12	12	25x25	25	23.8				-		



## External Toolholders

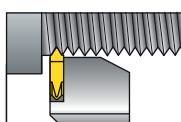


Right hand shown

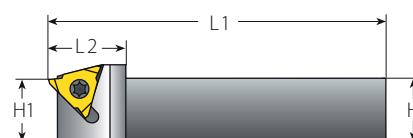
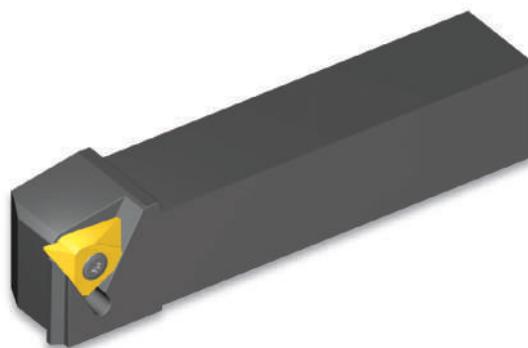
## Reinforced Monoblock

Ordering Code		Dimensions mm								Spare Parts	VG-Cut
PW	RH/LH	D max	HxB	H1	F	L1	L2	a	Cylindrical Holder Screw	Torx Key	
3	VGER/L1616-3T12PH	26	16x16	16	14.8	125	30	2.4	22	SCM4x14	KT-15
	VGER/L2020-3T12PH	26	20x20	20	18.8				22		
	VGER/L2020-3T21PH	42	20x20	20	18.8				30		
	VGER/L2525-3T12PH	26	25x25	25	18.8				22		
	VGER/L2525-3T21PH	42	25x25	25	23.8				30		

All VG-Cut tooling have 1.5° helix angle.



## External Toolholders



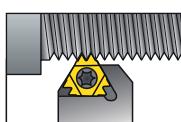
### V Style

Insert Size	Ordering Code	Dimensions mm					Spare Parts			
		IC	RH/LH	H=H1=B	B1	F	L1	L2	Insert Screw	Torx Key
5/8"V	NL32-5V-6	32	25.5	32.0	170	40			SN6T	K6T
	NL32-5V-8	32	25.5	34.1	170	40				
	NL32-5V-10	32	25.5	35.8	170	40				
	NL32-5V-10ABUT*	32	25.5	35.8	170	40				
	NL40-5V-6	40	33.5	40.0	200	40				
	NL40-5V-8	40	33.5	42.1	200	40				
	NL40-5V-10	40	33.5	43.8	200	40				
	NL40-5V-10ABUT*	40	33.5	43.8	200	40				

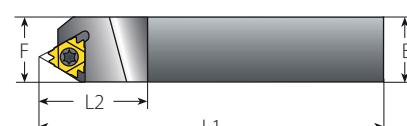
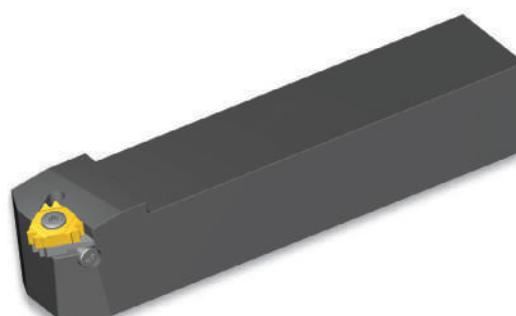
All V Style toolholders have a 1° helix angle.

The above toolholders are for RH inserts. For LH inserts, add LH to the toolholder's ordering code (Example NL32-5V-6 LH).

\* To be used only with inserts 5VER2.5ABUT...



## External Toolholders



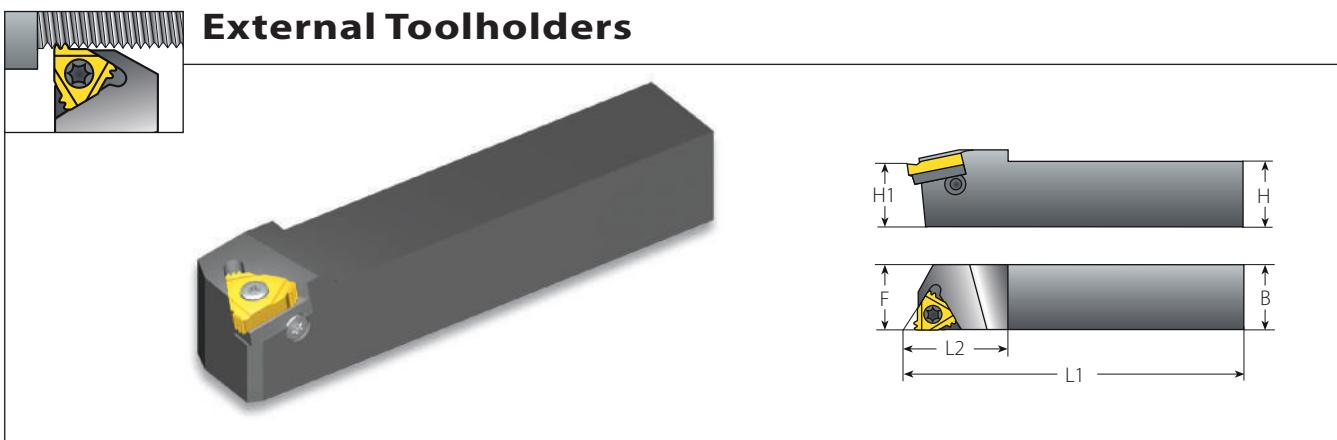
### Z+ Style

Insert Size	Ordering Code	Dimensions mm					Spare Parts					
		IC	RH	H=H1=B	F	L1	L2	Insert Screw	Anvil Screw	Torx Key	Anvil RH	Anvil LH
1/2"Z	AL32-4Z	32	32	178.4	38			SA4T	SY4T	K4T	YE4Z	YI4Z
	AL40-4Z	40	40	208.4	38							

All Z Style toolholders have a 1.5° helix angle.

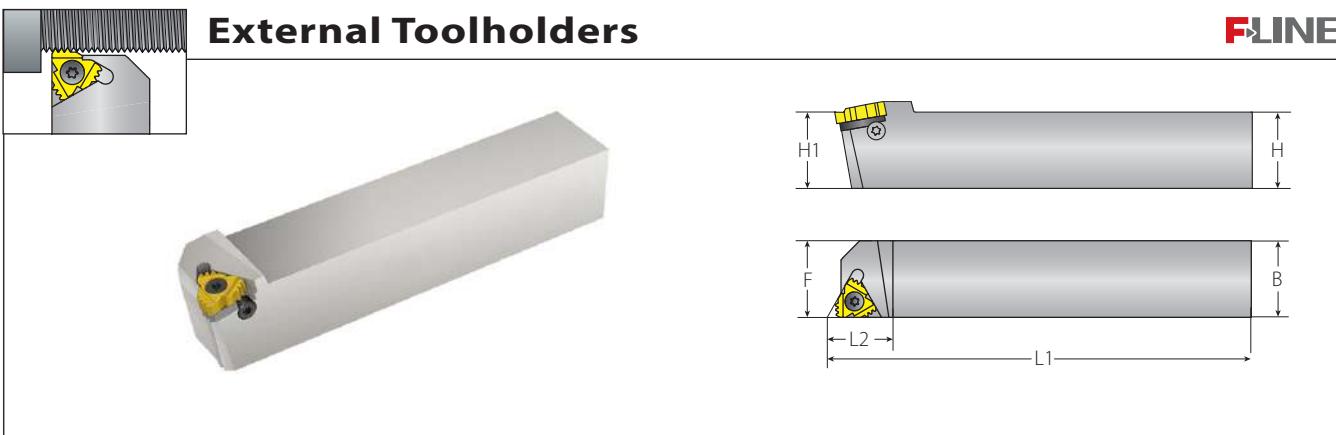
**Multi** plus

## External Toolholders



### M+ Style

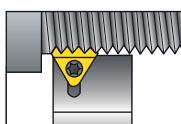
Insert Size Ordering Code Dimensions mm						Spare Parts					<b>Multiplus</b>
IC	RH	H=H1=B	F	L1	L2	Insert Screw	Anvil Screw	Torx Key	Anvil RH	Anvil LH	
5/8" M	AL32-5M	32	32	176.6	40	SA5T	SY5T	K5T	YE5M	Y15M	
	AL40-5M	40	40	206.6	40						
	AL50-5M	50	50	256.6	40						



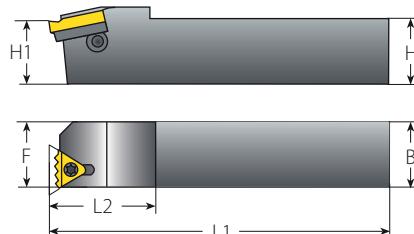
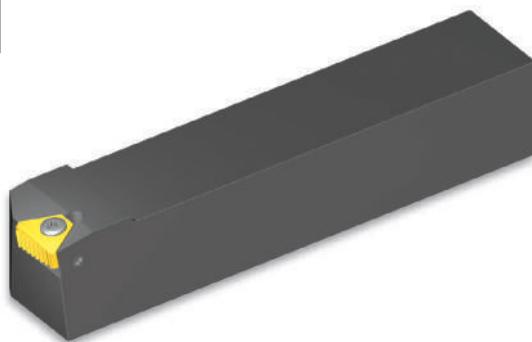
### F-Line M+ Style

Insert Size Ordering Code Dimensions mm						Spare Parts					<b>Multiplus</b>
IC	RH	H=H1=B	F	L1	L2	Insert Screw	Anvil Screw	Torx Key	Anvil RH		
1/2" F	AL25-4MF	25	25	155	33	SA4T	SY4T	K6T	YE4M2F		
	AL32-4MF	32	32	175	33						
	AL40-4MF	40	40	205	33						

The above toolholders have a 1.5° helix angle. For other helix angles, see page 203.



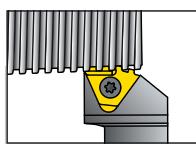
## External Toolholders



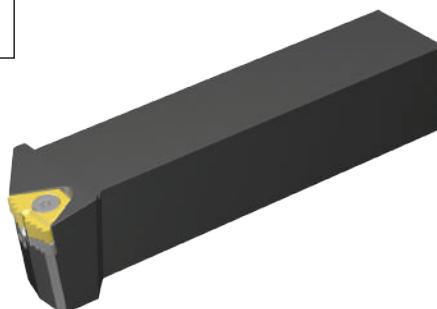
### T+ Style

Insert Size	Ordering Code	Dimensions mm				Spare Parts					Mult <sup>i</sup> plus
IC	RH	H=H1=B	F	L1	L2	Insert Screw	Anvil Screw	Insert Torx Key	Anvil Torx Key	Anvil RH/LH	
1/2" T	AL25-4T	25	27	150	30	SA4T	SY4K2	K4T	K2	Y4T	
	AL32-4T	32	34	170	30						
	AL40-4T	40	42	200	30						

All T Style toolholders have a 0° helix angle.



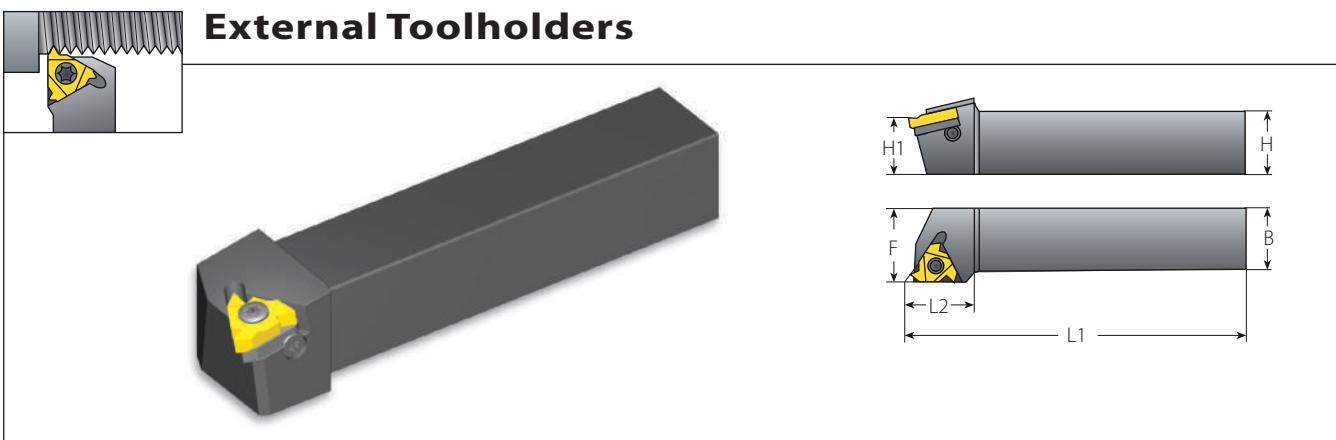
## External Toolholders



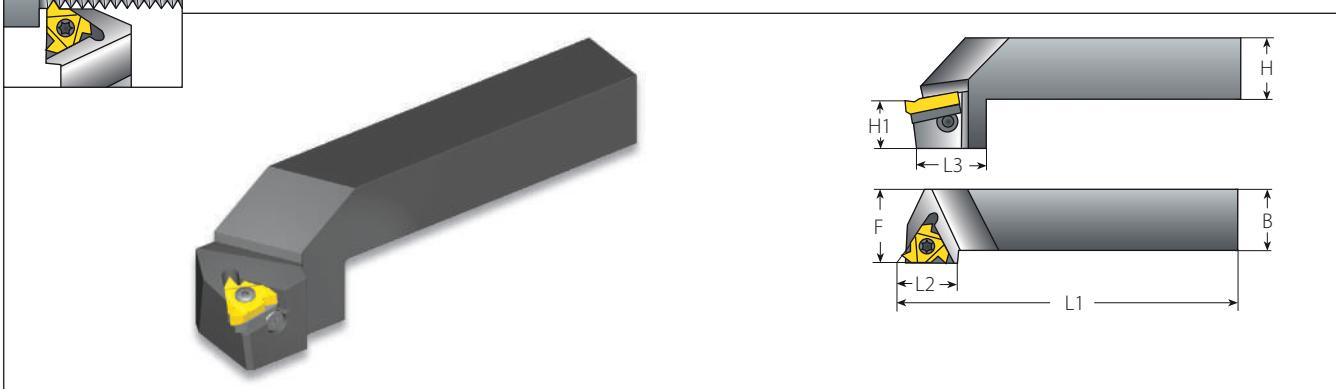
### 14D Standard

Insert Size	Ordering Code	Dimensions mm				Spare Parts				Mult <sup>i</sup> plus
IC	RH	H=H1=B	F	L1	L2	Insert Screw	Anvil Screw & Washer	Torx Key	Anvil Key	
14D	AL25-14D	25	32	150	25	SA5T	M4x6(14D)	KT15	K5T	
	AL32-14D	32	40	170	25					
	AL40-14D	40	40	200	30					

14D holders are supplied without anvils. For specific applications, please use the anvils indicated in the table on page 204.

**External Toolholders****Off-Set Qualified (FQ)**

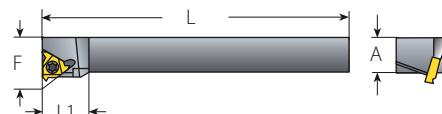
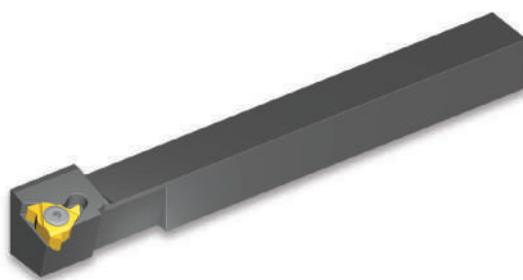
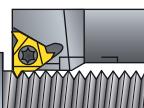
Insert Size	Ordering Code	Dimensions mm				Spare Parts				
IC	RH/LH	H=H1=B	F	L1	L2	Insert Screw	Anvil Screw	Torx Key	Anvil RH	Anvil LH
3/8"	AL20-3FQ	20	25	125	25	SA3T	SY3T	K3T	YE3	YI3
	AL25-3FQ	25	32	150	25					
	AL32-3FQ	32	40	170	32					
1/2"	AL25-4FQ	25	32	150	30	SA4T	SY4T	K4T	YE4	YI4
	AL32-4FQ	32	40	170	30					
5/8"	AL32-5FQ	32	40	170	35	SA5T	SY5T	K5T	YE5	YI5

**External Toolholders****Drop Head-Qualified (CQ)**

Insert Size	Ordering Code	Dimensions mm						Spare Parts				
IC	RH/LH	H=B	F	L1	L2	L3	H1	Insert Screw	Anvil Screw	Torx Key	Anvil RH	Anvil LH
3/8"	AL20-3CQ	20	25	125	24	38	17.5	SA3T	SY3T	K3T	YE3	YI3
	AL25-3CQ	25	32	150	24	38	22.2					
	AL32-3CQ	32	40	170	24	38	22.2					
1/2"	AL25-4CQ	25	32	150	30	38	22.2	SA4T	SY4T	K4T	YE4	YI4
	AL32-4CQ	32	40	170	30	38	22.2					
5/8"	AL32-5CQ	32	40	170	33	43	25.4	SA5T	SY5T	K5T	YE5	YI5

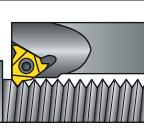
The above toolholders have a 1.5° helix angle. For other helix angles see page 203.  
The above toolholders are for RH inserts. For LH inserts, add LH to the toolholder's ordering code (Example AL20-3FQLH).

## External + Internal Toolholders



### Miniature Square Shank\*

Insert Size	Ordering Code	Dimensions mm				Min. Bore Dia.	Spare Parts	
IC	RH/LH	A	L	L1 (max)	F	mm	Insert Screw	Torx Key
1/4"	OV8-2	8	100	25	12	29.2	SN2T	K2T
	OV10-2	10	100	25	14	36.1		



## External + Internal Toolholders



### Miniature Round Shank\*

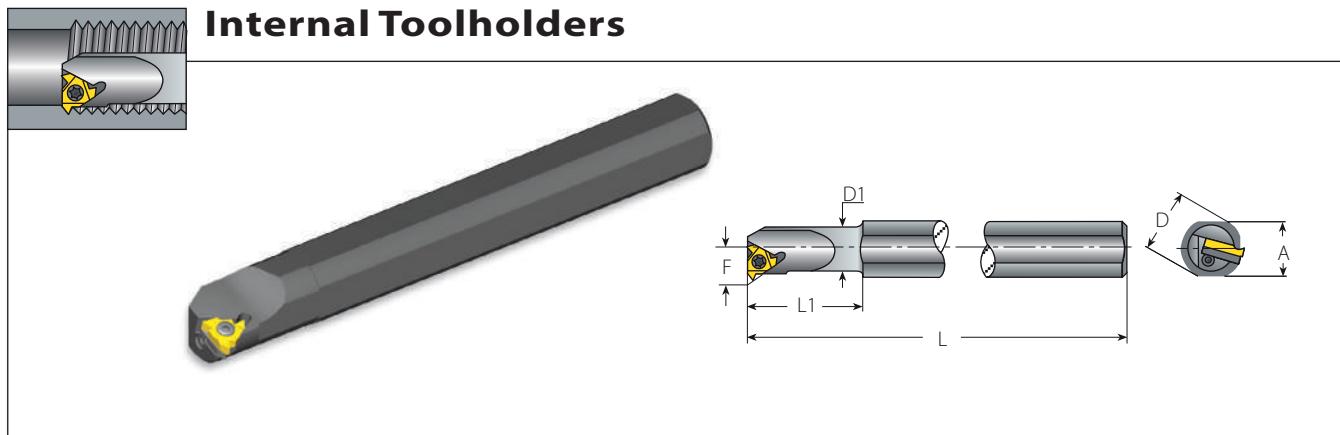
Insert Size	Ordering Code	Dimensions mm				Min. Bore Dia.	Spare Parts			
IC	RH/LH	A	L	L1 (max)	D	D1	F	mm	Insert Screw	Torx Key
1/4"	OVR12-2	11.4	100	25	12	10	7.4	13	SN2T	K2T
	OVR15-2	14.3	100	32	15	13	8.9	16		
	OVR16D-2	15.3	100	32	16	13	8.9	16		

\* Miniature square and round toolholders are designed for use on automatic lathes for the optical and other precision industries. They can be used for both external and internal threading, as follows:

Thread	ER	EL	IR	IL
Insert	ER	EL	IR	IL
Holder	LH	RH	RH	LH

Miniature toolholders have a 0.5° helix angle.  
The above toolholders are for RH inserts. For LH inserts, add LH to the toolholder's ordering code (Example OV8-2LH).

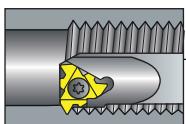
## Internal Toolholders



### Standard

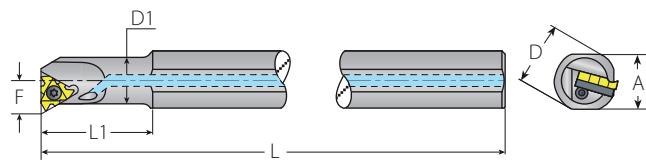
Insert Size	Ordering Code		Dimensions mm				Min. Bore Dia.	Spare Parts					
IC	RH/LH	A	L	L1 (max)	D	D1	F	mm	Insert Screw	Anvil Screw	Torx Key	Anvil RH	Anvil LH
1/4"	NVR10D-2	9.5	100	40	10	10.0	7.3	13	SN2T	-	K2T	-	-
	NVR10-2	18.0	180	25	20	10.0	7.3	13					
	NVR13-2	18.0	180	32	20	13.0	8.9	16					
3/8"	NVR13-3	18.0	180	32	20	12.7	10.3	17	SN3T	-	K3T	-	-
	NVR16-3	18.0	180	40	20	16.0	11.5	20					
	NVR16D-3	15.2	150	64	16	16.0	11.3	20					
	AVR20-3	18.0	180	80	20	20.0	13.4	24					
	AVR25-3	29.0	250	60	32	25.0	16.3	29					
	AVR25D-3	22.6	200	100	25	24.6	16.1	29					
	AVR32-3	29.0	250	128	32	32.0	19.6	36					
	AVR40-3	36.0	300	160	40	40.0	23.8	44					
1/2"	NVR20-4	18.0	180	80	20	20.0	15.6	27	SA4T	-	K4T	-	-
	AVR25-4	29.0	250	60	32	25.0	17.4	32					
	AVR25D-4	22.6	200	100	25	24.6	17.2	32					
	AVR32-4	29.0	250	128	32	32.0	21.5	39					
	AVR40-4	36.0	300	160	40	40.0	25.8	47					
	AVR50-4	45.0	350	200	50	50.0	30.8	57					
5/8"	AVR32-5	29.0	250	128	32	32.0	22.4	40	SA5T	SY5T	K5T	YI5	YE5
	AVR40-5	36.0	300	160	40	40.0	26.4	48					
	AVR50-5	45.0	350	200	50	50.0	31.4	58					
	AVR60-5	54.0	400	240	60	60.0	36.4	69					

- The above toolholders have a 1.5° helix angle. For other helix angles, see page 203.
- Toolholders with prefix "N" cannot be used with an anvil.
- Holders with coolant channel are available as standard (Example NVR**C**10D-2).
- The above toolholders are for RH inserts. For LH inserts, add LH to the toolholder's ordering code (Example NVR10D-2**LH**).



## Internal Toolholders

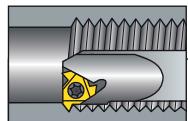
**F-LINE**



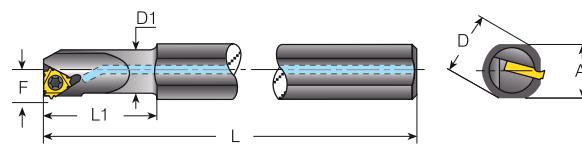
### Standard F-Line

Insert Size	Ordering Code	Dimensions mm					Min. Bore Dia.	Spare Parts				
IC	RH	A	L	L1 (max)	D	D1	F	mm	Insert Screw	Anvil Screw	Torx Key	Anvil RH
1/2"	AVRC25-4F	29.0	250	60	32	25.0	17.9	32	SA4T	SY4T	K6T	Y14F
	AVRC25D-4F	22.6	200	100	25	24.6	17.9	32				
	AVRC32-4F	29.0	250	128	32	32.0	21.6	39				
	AVRC40-4F	36.0	300	160	40	40.0	25.4	47				
	AVRC50-4F	45.0	350	200	50	50.0	30.6	57				

The above toolholders have a 1.5° helix angle. For other helix angles, see page 203.



## Internal Toolholders for V6 (without anvil)\*

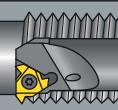


Specially designed for V6 inserts

### V6 Style

Insert Size	Ordering Code	Dimensions mm					Min. Bore Dia.	Spare Parts		
IC	RH	A	L	L1 (max)	D	D1	F	mm	Insert Screw	Torx Key
3/8" V6	NVRC13-3-206/001	18	180	32	20	12.7	10.3	17	SN3TM	K3T
	NVRC16-3-206/002	18	180	40	20	16	11.5	20		
	NVRC16D-3-206/003	15.2	150	64	16	16	11.3	20	SN3T	

\* V6 inserts cannot be used on standard internal toolholders without anvil. For this purpose you must use one of these special V6 toolholders.  
The above toolholders have a 1.5° helix angle.



## Internal Toolholders



D1

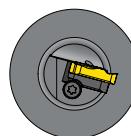
F

T

L1

D

L2



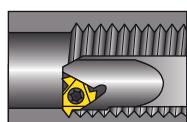
### V-CAP

#### Spare Parts

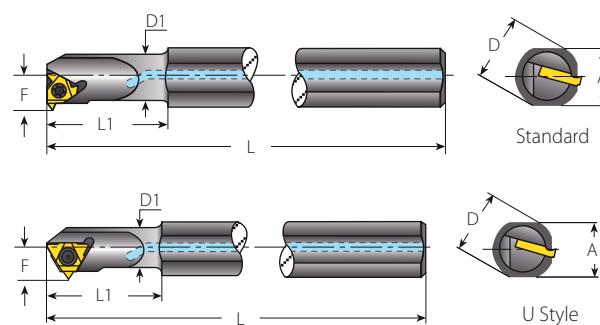
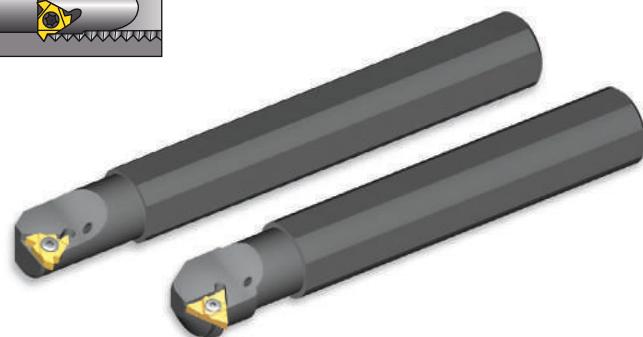
Insert Size	Ordering Code	Dimensions mm				Min. Bore Dia.	Insert Screw	Anvil Screw	Torx Key	Anvil RH	Anvil LH
IC	RH/LH	D1	D	F	L2	L1 (max)	mm				
3/8"	VCAP40-SIR12060-3	15.5		12	60	37	20	SN3T	-	K3T	-
	VCAP40-SIR14060-3	18.5		14	60	38	25				
	VCAP40-SIR17070-3	24.5	40	17	70	48	32	SA3T	SY3T	K3T	YI3
	VCAP40-SIR22090-3	32.0		22	90	69	40				YE3
	VCAP40-SIR27080-3	39.5		27	80	60	50				
	VCAP50-SIR12060-3	15.5		12	60	35	20	SN3T	-	K3T	-
	VCAP50-SIR14060-3	18.5		14	60	36	25				
	VCAP50-SIR17070-3	24.5	50	17	70	47	32	SA3T	SY3T	K3T	YI3
	VCAP50-SIR22090-3	32.0		22	90	68	40				YE3
	VCAP50-SIR27105-3	40.0		27	105	84	50				
63	VCAP63-SIR14070-3	18.5		14	70	42	25				
	VCAP63-SIR17075-3	24.5		17	75	48	32	SA3T	SY3T	K3T	YI3
	VCAP63-SIR22090-3	32.0		22	90	64	40				YE3
	VCAP63-SIR27105-3	40.0		27	105	80	50				

The above toolholders have a 1.5° helix angle. For other helix angles, see page 203.

The above toolholders are for RH inserts. For LH inserts, add LH to the toolholder's ordering code (Example VCAP40-SIL12060-3).



## Internal Toolholders



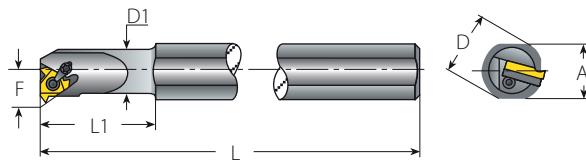
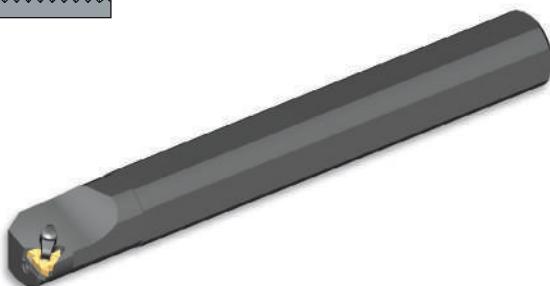
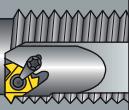
### Standard for Coarse Pitch

Insert Size		Ordering Code		Dimensions mm				F to Insert	Holder Helix	Spare Parts		
IC	RH	LH		A	L	L1 (max)	D	D1	mm	Deg.	Insert Screw	Torx Key
1/4"	NVRC10-2-156/001	NVRC10-2LH-156/036		18.0	180	25.0	20	10.1	6.53	3.0	SN2T	K2T
3/8"	NVRC11-3-156/005	NVRC11-3LH-156/025		18.0	180	25.4	20	11.2	8.30	4.5	SN3TM	K3T
	NVRC13-3-156/006	NVRC13-3LH-156/028		18.0	180	32.0	20	13.0	9.05	4.0	SN3T	K3T
1/2"	NVRC13-3-156/016	NVRC13-3LH-156/026		18.0	180	34.0	20	13.8	8.90	2.5		
	NVRC17-4-156/007	NVRC17-4LH-156/023		18.0	180	40.0	20	16.7	11.45	4.0	SN4TM	K4T
	NVRC17-4-156/039	NVRC17-4LH-156/040		18.0	180	40.0	20	16.5	13.40	4.0		
	NVRC20-4-156/008	NVRC20-4LH-156/024		18.0	180	50.0	20	19.6	12.55	3.5	SN4T	K4T
5/8"	NVRC20-4-156/009	NVRC20-4LH-156/033		18.0	180	50.0	20	19.6	12.55	3.0		
	NVRC25-5-156/012	NVRC25-5LH-156/017		29.0	250	60.0	32	25.0	16.78	3.3	SN5TM	K5T
NVRC28-5-156/010	NVRC28-5LH-156/034			29.0	250	50.0	32	28.0	17.80	3.5		

### U Style for Coarse Pitch

Insert Size		Ordering Code		Dimensions mm				F to Insert	Holder Helix	Spare Parts		
IC	RH	LH		A	L	L1 (max)	D	D1	mm	Deg.	Insert Screw	Torx Key
6.0U	NVRC8-6.0KU-156/003	NVRC8-6.0KULH-156/037		18.0	180	24.0	20	8.0	5.86	4.0	SN6MTN	KIP6
1/4"U	NVRC10-2U-156/004	NVRC10-2ULH-156/038		18.0	180	32.0	20	10.0	7.40	4.0		
	NVRC11-2U-156/002	NVRC11-2ULH-156/035		18.0	180	32.0	20	11.2	7.30	3.0	SM2T8	K2T
3/8"U	NVRC11-3U-156/020	NVRC11-3ULH-156/029		18.0	180	32.0	20	11.0	8.23	4.5		
	NVRC14-3U-156/018	NVRC14-3ULH-156/030		18.0	180	38.0	20	13.4	9.99	4.5	SN3TM	K3T
	NVRC15-3U-156/019	NVRC15-3ULH-156/031		18.0	180	38.0	20	15.4	10.99	4.0		
1/2"U	NVRC20-4U-156/011	NVRC20-4ULH-156/021		18.0	180	40.0	20	19.2	13.68	4.0		
	NVRC25-4U-156/013	NVRC25-4ULH-156/032		29.0	250	60.0	32	25.0	17.63	3.5	SN4T	K4T
5/8"U	NVRC32-4U-156/014	NVRC32-4ULH-156/022		29.0	250	60.0	32	28.0	18.76	3.3	SA4T	K4T
	NVRC32-5U-156/015	NVRC32-5ULH-156/027		29.0	250	60.0	32	31.6	20.96	3.2	SN5T	K5T

## Internal Toolholders



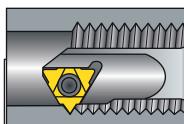
### Standard with Clamp

(Dual System, Screw or Clamp)

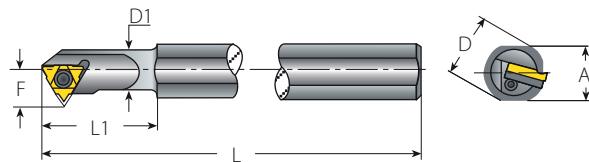
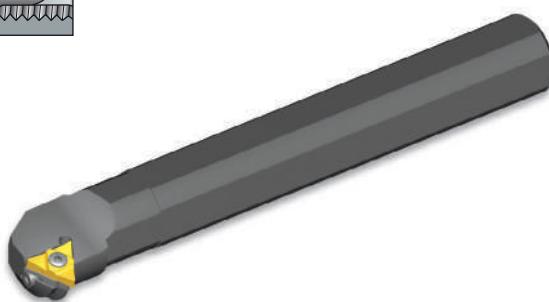
#### Spare Parts

Insert Size Ordering Code		Dimensions mm					Min. Bore Dia.	Spare Parts						
IC	RH/LH	A	L	L1 (max)	D	D1	F	mm	Insert Screw	Anvil Screw	Clamp	Torx Key	Anvil RH	Anvil LH
3/8"	AVR20-3C	18.0	180	80	20	20.0	13.4	24	SA3T	SY3T	C3	K3CT	YI3	YE3
	AVR25-3C	28.0	250	60	32	25.0	16.3	29						
	AVR25D-3C	22.6	200	100	25	24.6	16.1	29						
	AVR32-3C	29.0	250	128	32	32.0	19.6	36						
	AVR40-3C	36.0	300	160	40	40.0	23.8	44						
1/2"	AVR25-4C	29.0	250	60	32	25.0	17.4	32	SA4T	SY4T	C4	K4T	YI4	YE4
	AVR25D-4C	22.6	200	100	25	24.6	17.2	32						
	AVR32-4C	29.0	250	128	32	32.0	21.5	39						
	AVR40-4C	36.0	300	160	40	40.0	25.8	47						
5/8"	AVR32-5C	29.0	250	128	32	32.0	22.4	40	SN5T	SY5T	C5	K5T	YI5	YE5
	AVR40-5C	36.0	300	160	40	40.0	26.4	48						
	AVR50-5C	45.0	350	200	50	50.0	31.4	58						
	AVR60-5C	54.0	400	240	60	60.0	36.4	69						

- The above toolholders have a 1.5° helix angle. For other helix angles, see page 203.
- Holders with coolant channel available as standard (Example AVR**C**20-3C).
- The above toolholders are for RH inserts. For LH inserts, add LH to the toolholder's ordering code (Example AVR20-3CLH).



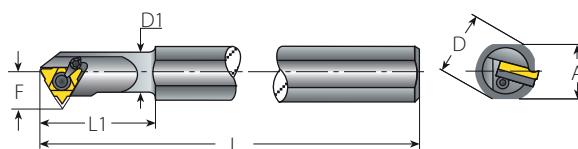
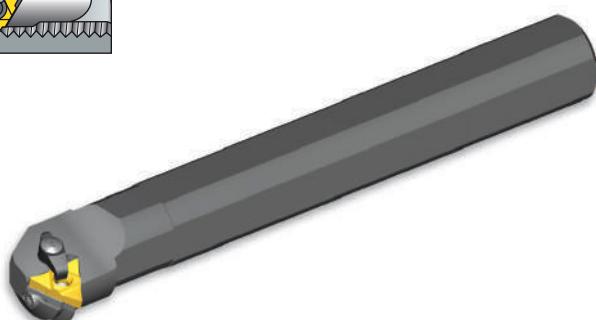
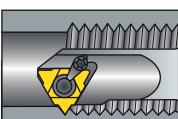
## Internal Toolholders



### U Style

Insert Size Ordering Code								Dimensions mm					Min. Bore Dia.	Spare Parts				
IC	RH/LH	A	L	L <sub>1</sub> (max)	D	D1	F	mm	Insert Screw	Anvil Screw	Torx Key	Anvil RH	Anvil LH					
1/2"U	AVR32-4U	29	250	128	32	32	25.5	42	SA4T	SY4T	K4T	YI4U	YE4U					
	AVR40-4U	36	300	160	40	40	29.5	51										
5/8"U	NVR32-5U	29	250	128	32	32	24.7	42	SN5T	-	K5T	-	-					
	AVR40-5U	36	300	160	40	40	29.4	51										
	AVR50-5U	45	350	200	50	50	34.3	63	SA5T	SY5T	K5T	YI5U	YE5U					
	AVR60-5U	54	400	240	60	60	39.3	74										

- The above toolholders have a 1.5° helix angle. For other helix angles, see page 203.
- Holders with coolant channel available as standard (Example AVR32-4U).
- The above toolholders are for RH inserts. For LH inserts, add LH to the toolholder's ordering code (Example AVR32-4ULH).

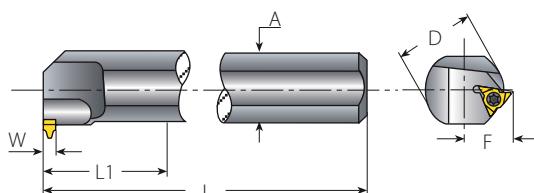
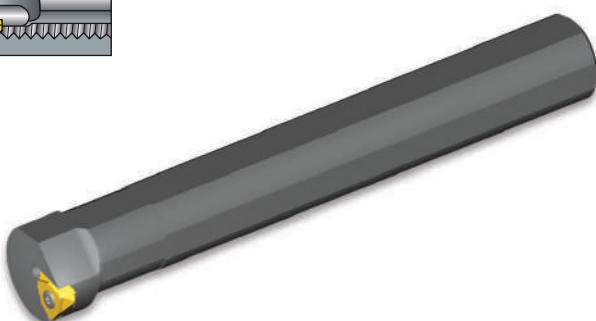
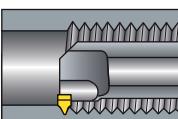
**Internal Toolholders****U style with Clamp**

(Dual System, Screw or Clamp)

## Spare Parts

Insert Size Ordering Code		Dimensions mm					Min. Bore Dia.	Spare Parts						
IC	RH/LH	A	L	L1 (max)	D	D1	F	mm	Insert Screw	Anvil Screw	Clamp	Torx Key	Anvil RH	Anvil LH
1/2"U	AVR32-4UC	29.0	250	128	32	32.0	25.5	42	SA4T	SY4T	C4	K4T	YI4U	YE4U
	AVR40-4UC	36.0	300	160	40	40.0	29.5	51						
5/8"U	AVR40-5UC	36.0	300	160	40	40.0	29.4	53	SA5T	SY5T	C5	K5T	YI5U	YE5U
	AVR50-5UC	45.0	350	200	50	50.0	34.4	63						
	AVR60-5UC	54.0	400	240	60	60.0	39.3	74						

The above toolholders have a 1.5° helix angle. For other helix angles, see page 203.

**Internal Toolholders****V Style**

## Spare Parts

Insert Size Ordering Code		Dimensions mm							Insert Screw	Torx Key
IC	RH/LH	A	L	L1 (max)	D	F	W			
5/8"V	NVR40-5V	36	300	160	40	28.4	6.5	SN6T	K6T	
	NVR50-5V	45	350	200	50	33.4	6.5			
	NVR60-5V	54	400	240	60	38.0	6.5			

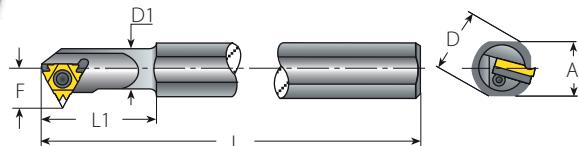
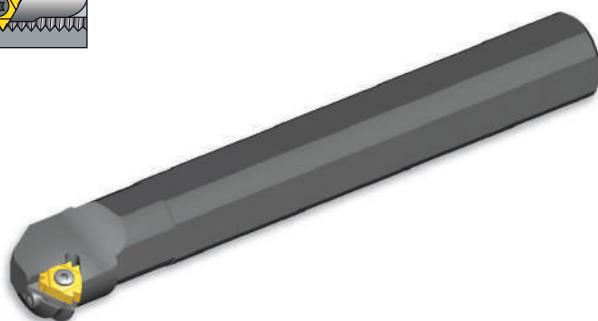
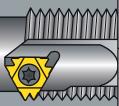
The above toolholders have a 1.0° helix angle.

**Minimum Bore Diameter**

Holder	Pitch mm	6.0 ISO	8.0 ISO	10.0 ISO
	Pitch TPI	4 UN	3 UN	2.5 W
NVR40-5V		48	54	62
NVR50-5V		58	58	62
NVR60-5V		68	68	68

The above toolholders are for RH inserts. For LH inserts, add LH to the toolholder's ordering code (Example AVR32-4UCLH). Holders with coolant channel available as standard (Example AVRC32-4UC).

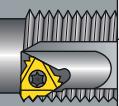
## Internal Toolholders



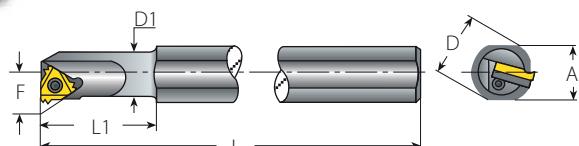
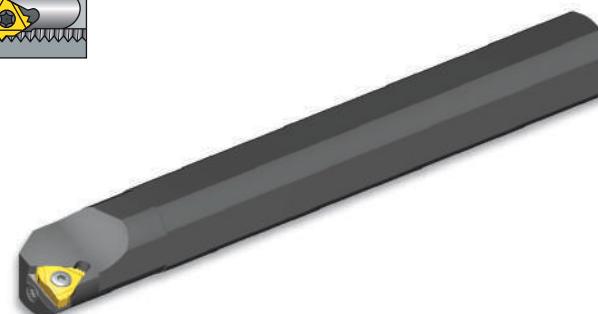
### Z+ Style

**Multiplus**

Insert Size	Ordering Code	Dimensions mm						Min. Bore Dia.	Spare Parts				
IC	RH	A	L	L1 (max)	D	D1	F	mm	Insert Screw	Anvil Screw	Torx Key	Anvil RH	Anvil LH
1/2"Z	AVR32-4Z	29	250	128	32	32	25.5	42	SA4T	SY4T	K4T	YI4Z	YE4Z
	AVR40-4Z	36	300	160	40	40	29.5	51					



## Internal Toolholders

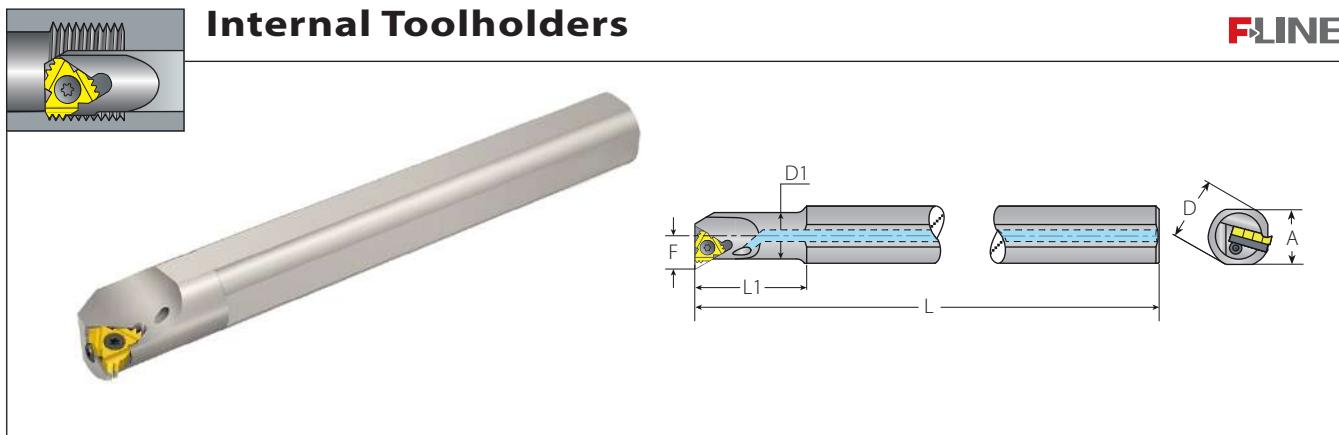


### M+ Style

**Multiplus**

Insert Size	Ordering Code	Dimensions mm						Min. Bore Dia.	Spare Parts				
IC	RH	A	L	L1 (max)	D	D1	F	mm	Insert Screw	Anvil Screw	Torx Key	Anvil RH	Anvil LH
5/8" M	AVR32-5M	29	250	128	32	32	22.4	40	SN5T	SY5T	K5T	YI5M	YE5M
	AVR40-5M	36	300	160	40	40	26.4	48					
	AVR50-5M	45	350	200	50	50	31.4	58	SA5T	SY5T	K5T	YI5M	YE5M
	AVR60-5M	54	400	240	60	60	36.4	69					

The above toolholders have a 1.5° helix angle. For other helix angles, see page 203.  
Holders with coolant channel available as standard (Example AVR<sup>C</sup>32-4Z).

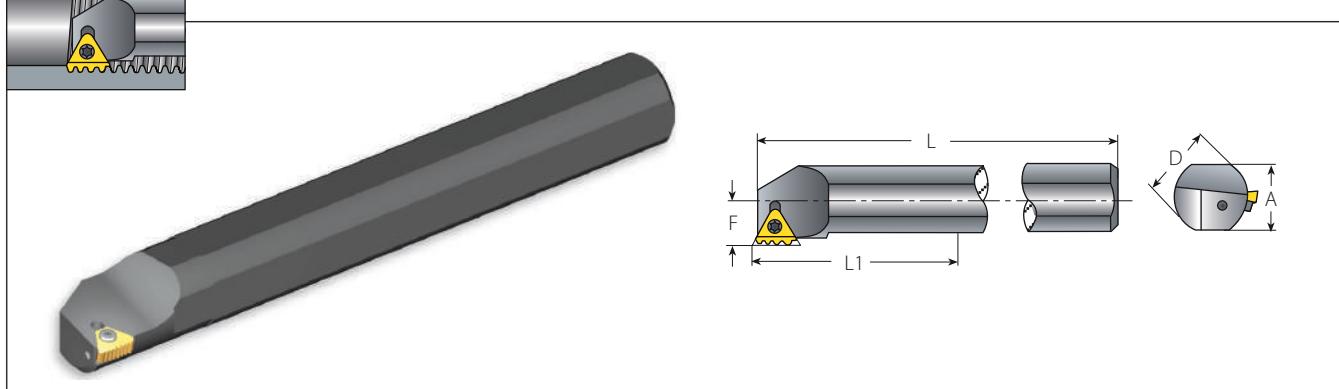
**Internal Toolholders****F-LINE****F-Line M+ Style**

## Spare Parts

**Multi plus**

Insert Size	Ordering Code		Dimensions mm				Min. Bore Dia.	Spare Parts				
IC	RH	A	L	L <sup>1</sup> (max)	D	D1	F	mm	Insert Screw	Anvil Screw	Torx Key	Anvil RH
1/2" F	AVRC25-4MF	29	250	60	32	25.0	17.9	32	SA4T	SY4T	K6T	YI4M2F
	AVRC25D-4MF	22.6	200	100	25	24.6	17.9	32				
	AVRC32-4MF	29	250	128	32	32.0	21.4	39				
	AVRC40-4MF	36	300	160	40	40.0	25.6	47				
	AVRC50-4MF	45	350	200	50	50.0	30.6	57				

The above toolholders have a 1.5° helix angle. For other helix angles, see page 203.

**Internal Toolholders****T+ Style**

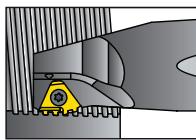
## Spare Parts

**Multi plus**

Insert Size	Ordering Code		Dimensions mm				Min. Bore Dia.	Spare Parts				
IC	RH	A	L	L <sup>1</sup> (max)	D	F	mm	Insert Screw	Anvil Screw	Torx Key	Anvil Torx Key	Anvil RH/LH
1/2" T	AVR40-4T	36	300	160	40	23.3	60	SA4T	SY4K2	K4T	K2	Y4T
	AVR50-4T	45	350	200	50	28.3	70					
	AVR60-4T	54	400	240	60	33.3	80					

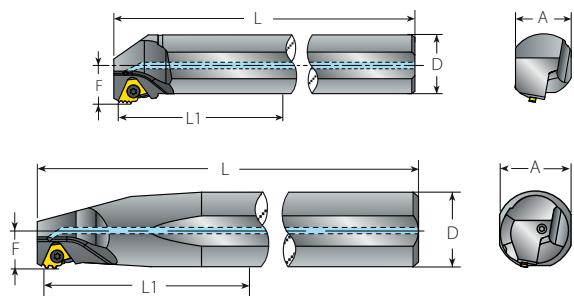
All toolholders have a 0° helix angle.

Holders with coolant channel available as standard (Example: AVRC40-4T).



## Internal Toolholders

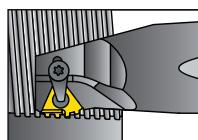
Oil & Gas



### 14D Standard

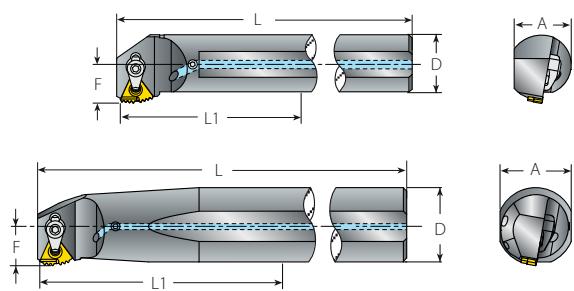
Multiplus

Insert Size		Ordering Code		Dimensions mm			Min. Bore Dia.	Spare Parts			
IC	RH	A	L	L1 (max)	D	F	mm	Insert Screw	Anvil Screw & Washer	Torx Key	Anvil Key
14D	AVRC40-14D	37	300	160	40	26	54.5	SA5T		K5T	
	AVRC50-14D	46	300	160	50	25	54.5				



## Internal Toolholders

Oil & Gas

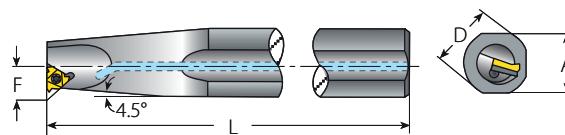
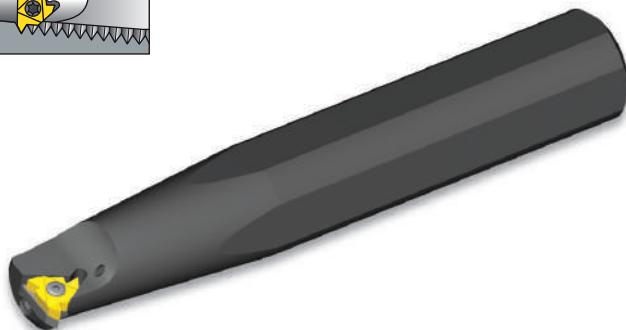
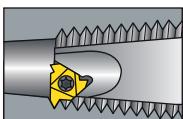


### 14D Standard with Clamp

Multiplus

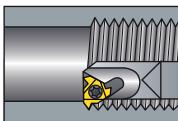
Insert Size		Ordering Code		Dimensions mm			Min. Bore Dia.	Spare Parts				
IC	RH	A	L	L1 (max)	D	F	mm	Insert Screw	Anvil Screw & Washer	Clamp	Torx Key	Anvil Key
14D	AVRC40-14DC	37	300	160	40	26	54.5	SA5T	M4x6(14D)	C5	K5T	KT15
	AVRC50-14DC	46	300	160	50	25	54.5					

14D holders are supplied without anvils. For specific applications, please use the anvils indicated in the table on page 204.

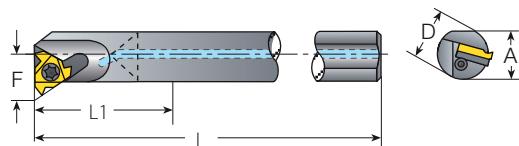
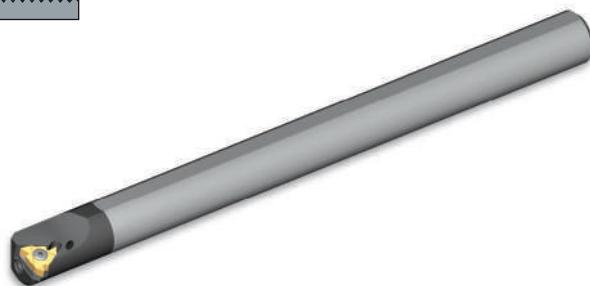
**Internal Toolholders****Oil & Gas****Spare Parts**

Insert Size	Ordering Code	Thread Form	Connection No. or Size	Dimensions mm				Helix Angle Deg.	Spare Parts			
IC	RH			A	L	D	F		Insert Screw	Anvil Screw	Torx Key	Anvil RH
3/8"	AVRC25-3-APIRD	APIRD 8 APIRD 10	2.375"-20" 1.315"-3.5"	29	250	25	14.5	1	SA3T SY3T K3T YEI3-APIRD			
	AVRC32-3-APIRD	APIRD 8 APIRD 10	2.375"-20" 1.66"-3.5"	29	250	32	19.6	1				
	AVRC40-3-APIRD	APIRD 8 APIRD 10	2.375"-20" 1.9"-3.5"	36	300	40	22.0	1				
1/2"	AVRC40-4-BUT/API	5BUT, V.038R, V.050, V.040, V.055	4 1/2"-20" NC10-NC77 all sizes	36	300	40	24.2	0	SA4T	SY4T	K4T	YEI4-API-1P YEI4-5BUT
5/8"	AVR50-5OIL	V0.038R	NC23-NC38	45	300	50	22.6	1.5	SA5T SY5T K5T YI5OIL			
	AVRC50-5OIL	V0.038R	NC23-NC38									
	AVR80-5OIL	V0.050R	NC40-NC77		72	400	80	39.7				
	AVRC80-5OIL	V0.050R	NC40-NC77									

Toolholders ordered with an internal coolant channel have an internal BSP 1/2" thread for connection to the flexible coolant pipe.



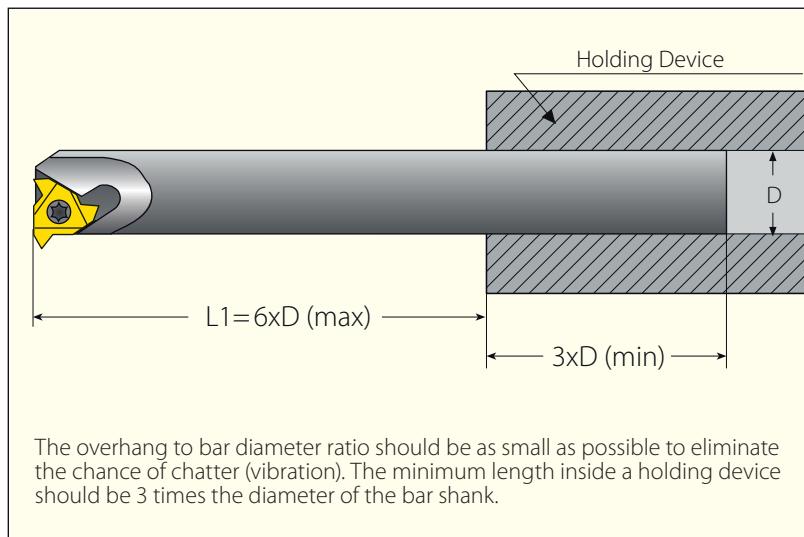
## Internal Toolholders



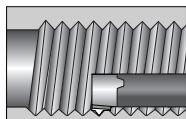
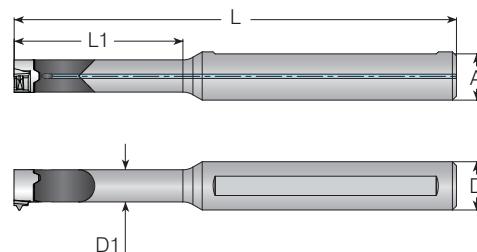
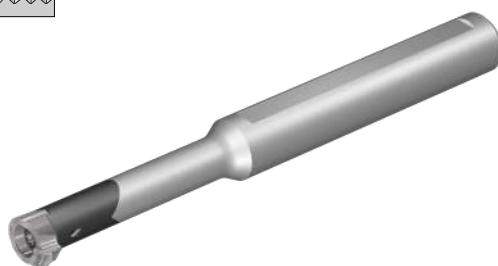
### Standard with Carbide Shank

Insert Size	Ordering Code	Dimensions mm					Min. Bore Dia.	Spare Parts				
IC	RH/LH	D	A	F	L	L <sub>1</sub> (max)	mm	Insert Screw	Anvil Screw	Torx Key	Anvil RH	Anvil LH
1/4"	CNVRC10-2	10	9.5	7.3	150	60	13	SN2T		K2T	-	-
	CNVRC12-2	12	11.7	8.3	180	72	15	-	-	-	-	-
3/8"	CNVRC16-3	16	15.6	11.5	200	96	20	SN3T	-	K3T	-	-
	CAVRC20-3	20	19.5	13.4	250	120	24	SA3T	SY3T	K3T	YI3	YE3
1/2"	CNVRC20-4	20	19.5	15.5	250	120	25	SN4T	-	K4T	-	-

Toolholders with prefix "CN" cannot be used with an anvil. The above toolholders have coolant channel as standard.

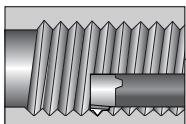


The above toolholders have 1.5° helix angle. For other helix angles see page 203.  
The above toolholders are for RH inserts. For LH inserts, add LH to the toolholder's ordering code (Example CNVRC10-2LH).

**Internal Toolholders****Mini-V****Carbide Shank with Alloy Steel Head****Spare Parts**

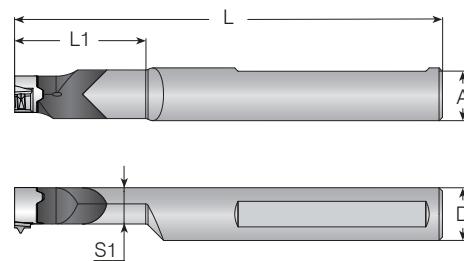
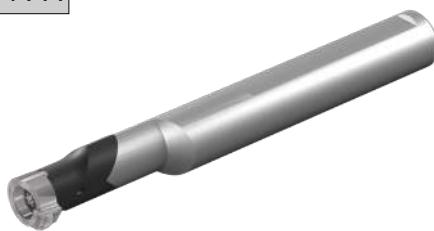
Insert Style	Ordering Code	Dimensions mm					Screw	Size	Torx Key
	RH	A	L	L1	D	D1			
V08	CV08-1221	11.5	80.5	21	12	6	SNV08	M2.6x0.45x8	K2T
	CV08-1230		90.5	30					
V11	CV11-1229	11.5	95.0	29	12	8	SNV11	M3.5x0.6x10	K3T
	CV11-1242		110.0	42					
V16	CV16-1240	11.0	130.0	40	12	11	SNV16	M5x0.8x12	K4T
	CV16-1256		130.0	56					
	CV16-1280		150.0	80					





## Internal Toolholders

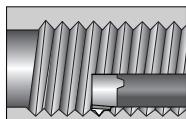
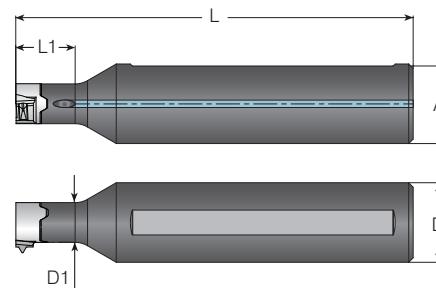
**Mini-V**



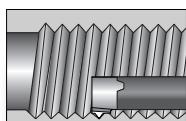
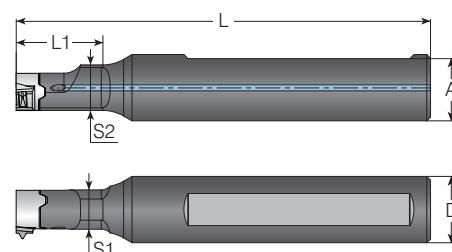
### Reinforced Carbide Shank

#### Spare Parts

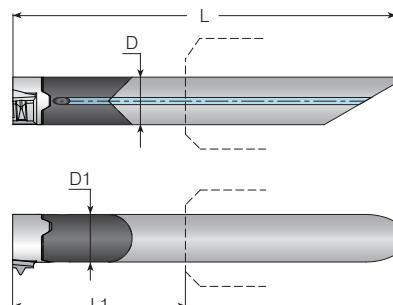
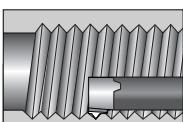
Insert Style	Ordering Code	Dimensions mm						Screw	Size	Key
V14	RH	A	L	L1	D	S1	S2	SNV14	M4x0.7x12	KT15
	CV14-1234	11	100.0	34.0	12	9.3	11.9			
V16	CV14-1634	15	100.0	34.0	16	9.3	12.45	SNV16	M5x0.8x12	K4T
	CV16-1640	15	129.7	39.7	16	11	14.75			

**Internal Toolholders****Mini-V****Alloy Steel Shank****Spare Parts**

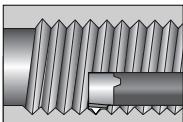
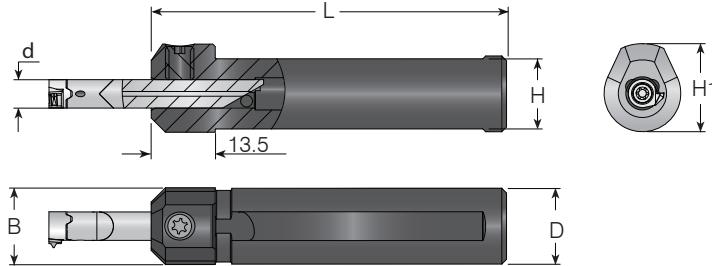
Insert Style	Ordering Code	Dimensions mm					Screw	Size	Torx Key
RH	A	L	L1	D	D1				
V08	V08-1612	15.6	80	12	16	6	SNV08	M2.6x0.45x8	K2T
V11	V11-1612	15.6	80	12	16	8	SNV11	M3.5x0.6x10	K3T
V16	V16-1622	15.0	100	22	16	11	SNV16	M5.0x0.8x12	K4T

**Internal Toolholders****Mini-V****Alloy Steel Shank****Spare Parts**

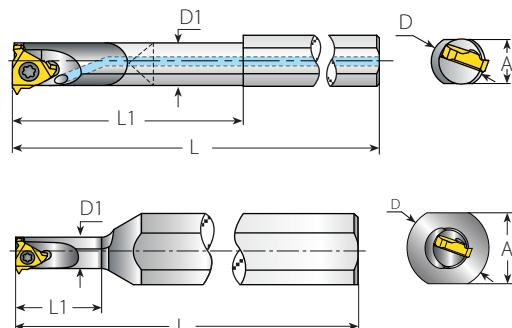
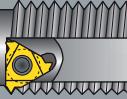
Insert Style	Ordering Code	Dimensions mm							Screw	Size	Torx Key
RH	A	L	L1	D	S1	S2					
V14	V14-1620	15.0	100	20	16	9.5	11	SNV14	M4x0.7x12	KT15	

**Internal Toolholders****Mini-V****Holder for Sleeve Clamping****Spare Parts**

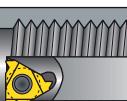
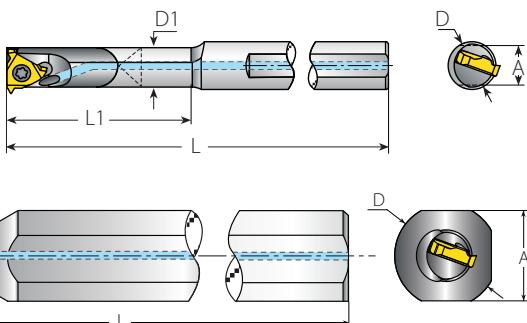
Insert Style	Ordering Code	Dimensions mm					Ordering Code	Spare Part	Spare Part
RH	A	L	L1 (max)	D	D1	Sleeve	Screw	Size	Torx Key
V08	CV08-0621	-	45	21	6	MHC...-6	SNV08	M2.6x0.45x8	K2T
V11	CV11-0829	-	64.5	29	8	MHC...-8	SNV11	M3.5x0.6x10	K3T

**Internal Toolholders****Mini-V****Sleeves****Spare Parts**

Ordering Code			Dimensions mm			Spare Part	Spare Part
d	Sleeve	D=B	H1	H	L	Screw	Torx Key
6	MHC12-6	12	16.0	10.8	70.0	SL7DT15	KT15
	MHC16-6	16	18.6	14.8	75.0		
	MHC20-6	20	22.0	18.8	84.0		
8	MHC16-8	16	18.6	14.8	100.0		
	MHC20-8	20	22.0	18.8	103.5		

**Internal Toolholders Standard****MINIPRO****Mini-3 Standard****Spare Parts**

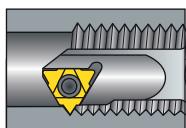
Insert Size	Ordering Code	Dimensions mm					Anti-Vibration System	Spare Parts	
IC	RH/LH	A	L	L1	D	D1		Insert Screw	Torx Key
4.0	SNVR5-4.0K	11.0	100	12	12	5.1	No	SN4MT	K6MT
	CNVRC5-4.0K	5.2	100	26	6	5.1	Carbide Shank		

**Internal Toolholders Standard****Mini-3 Standard****Spare Parts**

Insert Size	Ordering Code	Dimensions mm					Anti-Vibration System	Spare Parts	
IC	RH/LH	A	L	L1	D	D1		Insert Screw	Torx Key
5.0	NVRC7-5.0K	15	125	18	16	6.6	No	SN5MT	K6MT
	CNVRC7-5.0K	7	125	31	8	6.6	Carbide Shank		

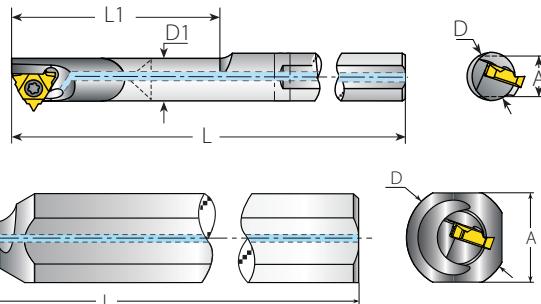
The above toolholders have 2.5° helix angle.

The above toolholders are for RH inserts. For LH inserts, add LH to the toolholder's ordering code (Example: CNVRC5-4.0KLH).



## Internal Toolholders U Style

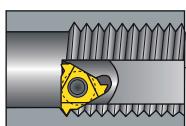
**MINIPRO**



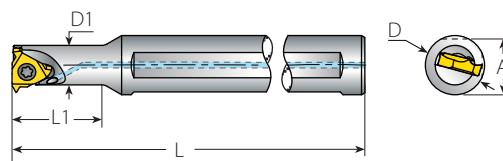
### Mini-3 U Style

#### Spare Parts

Insert Size	Ordering Code	Dimensions mm				Anti-Vibration System	Spare Parts
IC mm	RH/LH	A	L	L1	D	D1	Insert Screw Torx Key
5.0U	NVRC8-5.0KU	15	125	21	16	7.3	No
	CNVRC8-5.0KU	7	125	35	8	7.3	Carbide Shank



## Internal Toolholders



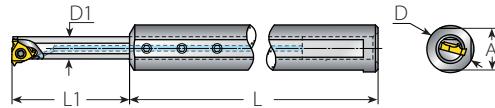
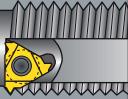
### Mini-3 Standard

#### Spare Parts

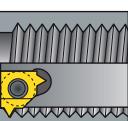
Insert Size	Ordering Code	Dimensions mm				Anti-Vibration System	Spare Parts
IC	RH/LH	A	L	L1	D	D1	Insert Screw Torx Key
6.0	SNVRC12U-6.0K	11.4	82	16	12	8	No
	BNVRC10S-6.0K	9.4	89	22	10	8	Carbide Implanted
	BNVRC10M-6.0K	9.4	98	31	10	8	Carbide Implanted
	BNVRC10L-6.0K	9.4	110	43	10	8	Carbide Implanted

The above toolholders have 2.5° helix angle.

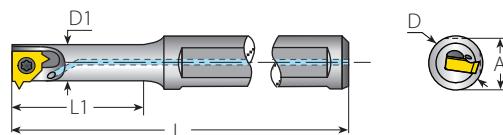
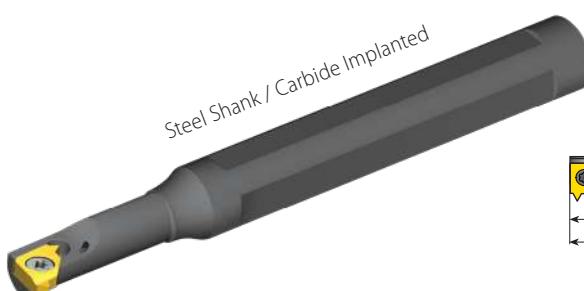
The above toolholders are for RH inserts. For LH inserts, add LH to the toolholder's ordering code (Example: NVRC8-5.0KULH).

**Internal Toolholders****MINIPRO****Mini-3 Adjustable****Spare Parts**

Insert Size		Ordering Code		Dimensions mm					Spare Parts			
IC	Sleeve	Holder RH/LH	A	L	L1	D	D1	Insert Screw	Torx Key for Insert Screw	Holder Screw x3	Key for Holder Screw	
6.0	SVC16-8.0	BNVRC8.0T-6.0K	15.6	100	8-56	16	8	SN6MTN	KIP6	S4.0	K2.0	

**Internal Toolholders**

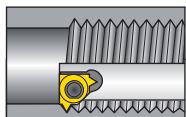
Steel Shank / Carbide Implanted

**Mini-L****Spare Parts**

Insert Size	Ordering Code	Dimensions mm					Anti-Vibration System	Insert Screw	Torx Key
IC	RH/LH	A	L	L1	D	D1			
5.0L	SNVRC10U-5LK	9.4	81	16	10	6.2	No	SN5LSTR	K7MT
	BNVRC10S-5LK	9.4	87	22	10	6.2	Carbide Implanted		
	BNVRC10M-5LK	9.4	97	31	10	6.2	Carbide Implanted		
	BNVRC10L-5LK	9.4	109	43	10	6.2	Carbide Implanted		

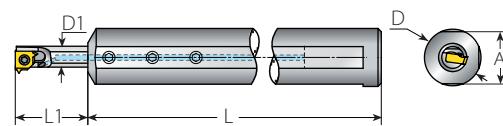
The above toolholders have 2.5° helix angle.

The above toolholders are for RH inserts. For LH inserts, add LH to the toolholder's ordering code (Example: SNVRC10U-5LK**LH**).



## Internal Toolholders

**MINIPRO**

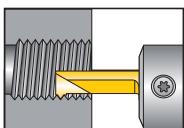


### Mini-L Adjustable

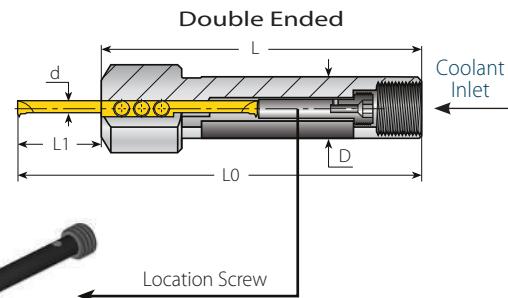
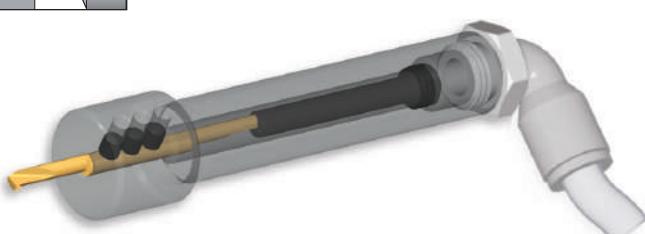
#### Spare Parts

Insert Size		Ordering Code		Dimensions mm					Insert Screw	Torx Key for Insert Screw	Holder Screw x 3	Key for Holder Screw
IC	Sleeve	Holder RH/LH	A	L	L1	D	D1					
5.0L	SVC16-6.2	BNVRC6.2T-5LK	15.6	100	8-44	16	6.2		SN5LSTR	K7MT	S4.0	K2.0

The above toolholders are for RH inserts. For LH inserts, add LH to the toolholder's ordering code (Example: BNVRC6.2T-5LK**LH**).



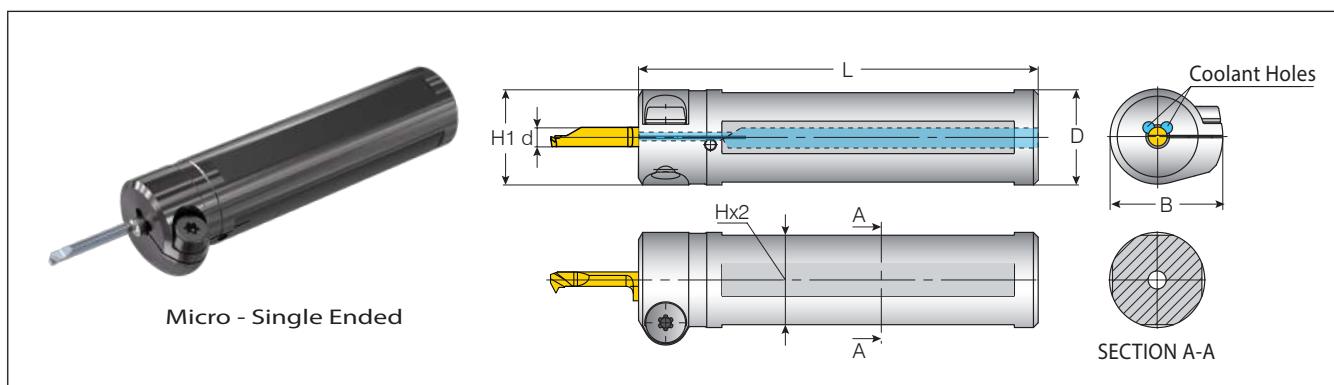
## Internal Toolholders



### Micro - Double Ended

#### Spare Parts

Micro Insert Dia.	Shank Dia.	Ordering Code	Dimensions mm			Location Screw (Every toolholder package contains the full range of location screws needed)			Clamping Screw x 3	
d mm	D		L	L1	L0	Screw	M	Key	Screw	Key
3	10	SMC10-3.0	80	9 - Short	89	AGISM8X28	28	K4.0	M4X0.7X4.0	K2.0
	12	SMC12-3.0		16 - Medium	96	AGISM8X21	21			
	16	SMC16-3.0	95	9 - Short	104	AGISM8X49	49			
	20	SMC20-3.0		16 - Medium	111	AGISM8X42	42			
4	10	SMC10-4.0	80	9 - Short	89	AGISM8X28	28			
	12	SMC12-4.0		16 - Medium	96	AGISM8X21	21			
	16	SMC16-4.0	95	21 - Long	101	AGISM8X16	16			
	20	SMC20-4.0		9 - Short	104	AGISM8X49	49			
6	12	SMC12-6.0	80	16 - Medium	111	AGISM8X42	42			
	16	SMC16-6.0		21 - Long	116	AGISM8X37	37			
	12	SMC12-6.0	95	9 - Short	89	AGISM8X28	28			
	16	SMC16-6.0		16 - Medium	96	AGISM8X21	21			
	20	SMC20-6.0		21 - Long	101	AGISM8X16	16			
	16	SMC16-6.0	95	9 - Short	104	AGISM8X49	49			
	20	SMC20-6.0		16 - Medium	111	AGISM8X42	42			
	16	SMC16-6.0		21 - Long	116	AGISM8X37	37			

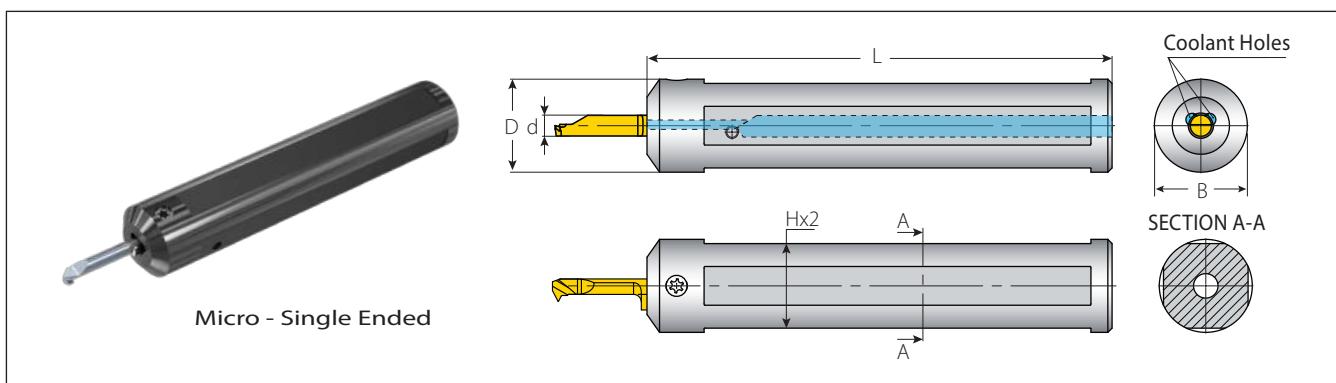
**Internal Toolholders****micro**scope**Shrink**

Micro Insert Dia.	Ordering Code	Dimensions mm					Spare Parts	
		D	B	H1	H	L	Shrink Screw	Key
4.0	MHCS10-4-4F	10.0	19.7	13.3	8.8	65.0	SM5x10-15IPx2*	F15IP*
	MHCS12-4-4F	12.0	19.7	13.8	10.8	70.0		
	MHCS16-4-4F	16.0	21.7	16.0	14.8	75.0		
	MHCS20-4-4F	20.0	23.7	20.0	18.8	84.0		
	MHCS22-4-4F	22.0	24.7	22.0	20.0	110.0		
5.0	MHCS16-5-4F	16.0	21.7	16.0	14.8	75.0		
	MHCS20-5-4F	20.0	23.7	20.0	18.8	84.0		
6.0	MHCS12-6-4F	12.0	19.7	13.8	10.8	70.0		
	MHCS16-6-4F	16.0	21.7	16.0	14.8	75.0		
	MHCS20-6-4F	20.0	23.7	20.0	18.8	84.0		
	MHCS22-6-4F	22.0	24.7	22.0	20.0	110.0		
7.0	MHCS16-7-4F	16.0	21.7	16.0	14.8	75.0		
	MHCS20-7-4F	20.0	23.7	20.0	18.8	84.0		

SM5x10-15IPx2 is a special screw which can be used from both its sides.  
For an alternative screw, please use MS5x10 (key: S4).

## Internal Toolholder

**micro**scope

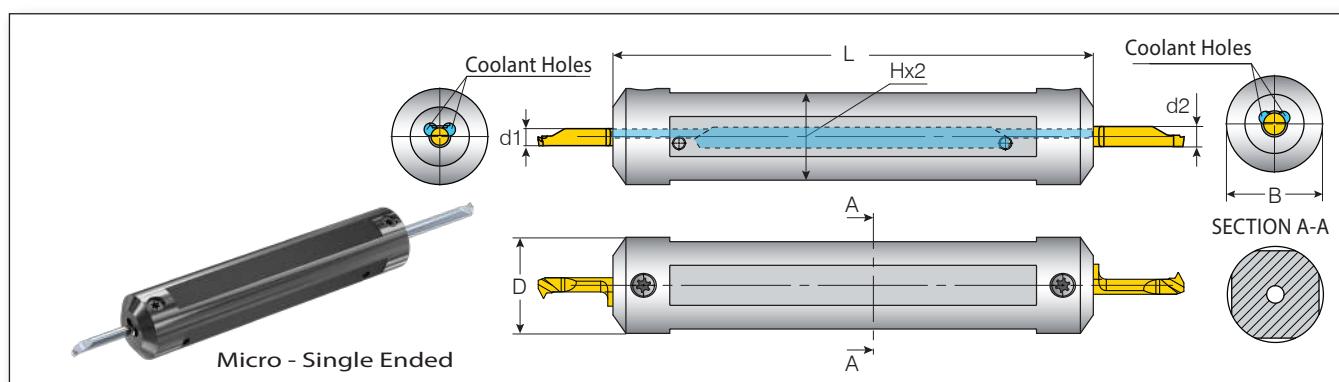


### Round without Shoulder

Micro Insert Dia.	Ordering Code	Dimensions mm			Spare Parts	
d (mm)		B=D	H	L	Clamping Screw Key	
4.0	MHCR20-4-4F	20	18.8	83.5	SLDBT15IP	F15IP
	MHCR22-4-4F	22	20.0	110.0		
5.0	MHCR20-5-4F	20	18.8	83.5		
	MHCR22-5-4F	22	20.0	110.0		
6.0	MHCR20-6-4F	20	18.8	83.5		
	MHCR22-6-4F	22	20.0	110.0		
7.0	MHCR25-7-4F	25	20.0	110.0		

## Internal Toolholder

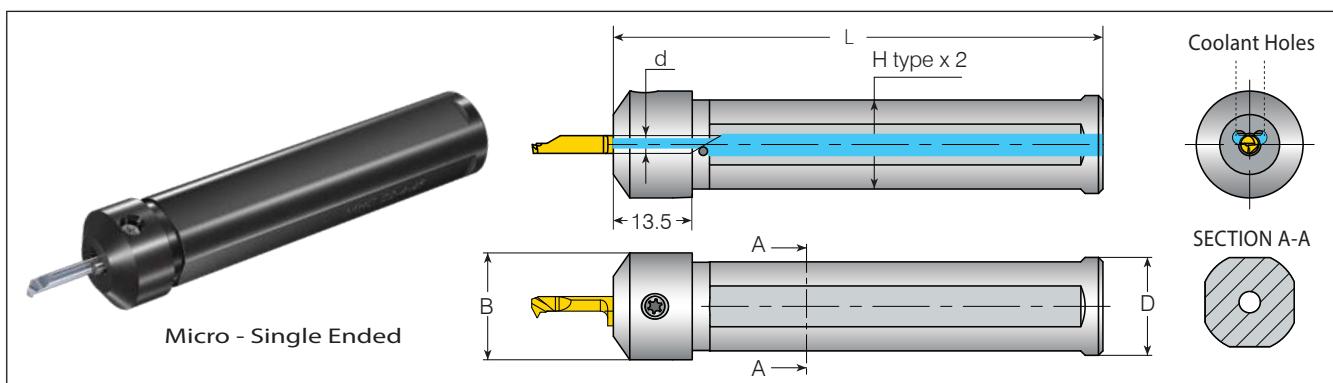
**micro**scope



### Round Double Sided

Micro Insert Dia.	Ordering Code	Dimensions mm			Spare Parts	
d1 - d2 (mm)		B=D	H	L	Clamping Screw Key	
4.0 - 5.0	MHCR075-4-5-4F*	19.05	17.8	83.5	SLDBT15IP	F15IP
	MHCR20-4-5-4F*	20	18.8	83.5		
	MHCR22-4-5-4F	22	20.0	110.0		
	MHCR25-4-5-4F	25	23.0	110.0		
6.0 - 7.0	MHCR20-6-7-4F*	20	18.8	83.5		
	MHCR25-6-7-4F	25	23.0	110.0		

\* Front screw must be removed in order to mount the toolholder on the machine. Once mounted, set the screw back in place and secure the insert.

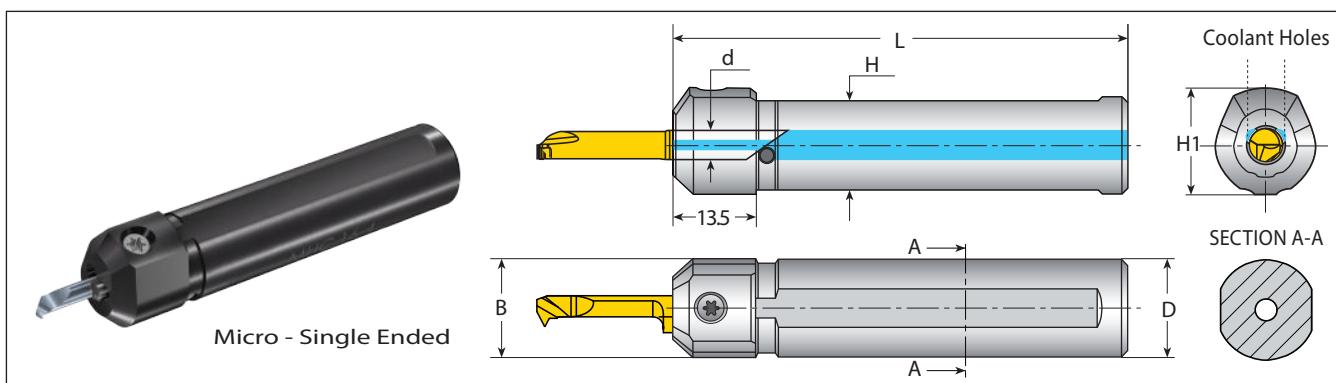
**Internal Toolholders****micro***O*scope**Round Shank - 4 Flats**

Micro Insert Dia.	Ordering Code	Dimensions mm				Spare Parts			
		D	B	H	L	Clamping Screw	Torx Key		
4.0	MHC20-4-4F	20.0	22.0	18.8	83.5	SL7DT15 or SL7DBT15IP*	KT15 or F15IP*		
	MHC22-4-4F	22.0	24.0	20.0	110				
	MHC23-4-4F	23.0	25.0	21.0					
	MHC25-4-4F	25.0	27.0	23.0					
	MHC28-4-4F	28.0	30.0	26.0					
5.0	MHC20-5-4F	20.0	22.0	18.8	83.5	SL7DT15 or SL7DBT15IP*	KT15 or F15IP*		
	MHC22-5-4F	22.0	24.0	20.0	110				
	MHC23-5-4F	23.0	25.0	21.0					
	MHC25-5-4F	25.0	27.0	23.0					
	MHC28-5-4F	28.0	30.0	26.0					
6.0	MHC20-6-4F	20.0	22.0	18.8	83.5	SL7DT15 or SL7DBT15IP*	KT15 or F15IP*		
	MHC22-6-4F	22.0	24.0	20.0	110				
	MHC23-6-4F	23.0	25.0	21.0					
	MHC25-6-4F	25.0	27.0	23.0					
	MHC28-6-4F	28.0	30.0	26.0					
7.0	MHC22-7-4F	22.0	24.0	20.0	110	SL7DT15 or SL7DBT15IP*	KT15 or F15IP*		
	MHC23-7-4F	23.0	25.0	21.0					
	MHC25-7-4F	25.0	27.0	23.0					
	MHC28-7-4F	28.0	30.0	26.0					

\* Torx+ screw and key are now available for improved clamping.

## Internal Toolholders

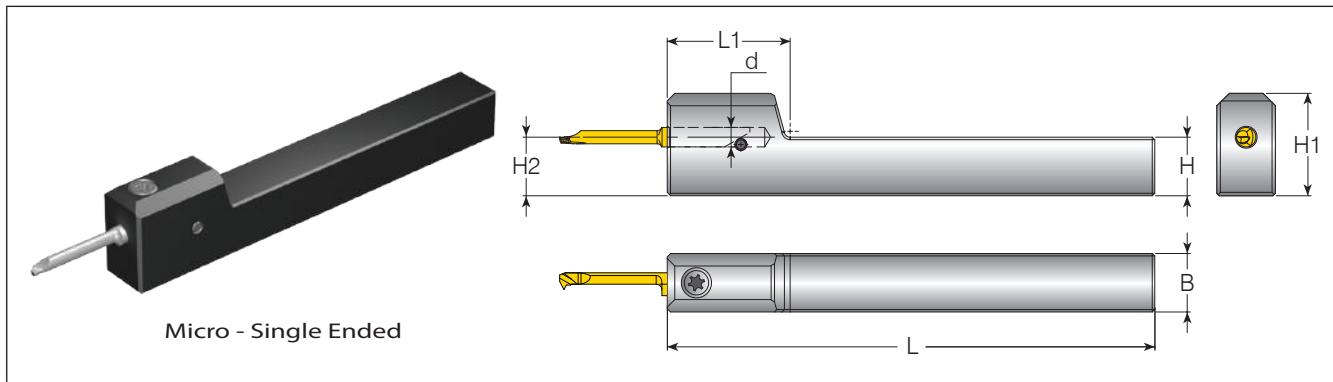
**micro**scope



### Round Shank - 2 Flats

Micro Insert Dia.	Ordering Code	Dimensions mm				Spare Parts	
		D=B	H1	H	L	Clamping Screw	Torx Key
4.0	MHC10-4	10	14	8.8	65	SL7DT15 or SL7DBT15IP*	KT15 or F15IP*
	MHC12-4	12	16	10.8	70		
	MHC16-4	16	17.6	14.8	75		
	MHC20-4	20	22	18.8	84		
5.0	MHC10-5	10	14	8.8	65	SL7DT15 or SL7DBT15IP*	KT15 or F15IP*
	MHC12-5	12	16	10.8	70		
	MHC16-5	16	18.6	14.8	75		
	MHC20-5	20	22	18.8	84		
6.0	MHC12-6	12	16	10.8	70	SL7DT15 or SL7DBT15IP*	KT15 or F15IP*
	MHC16-6	16	18.6	14.8	75		
	MHC20-6	20	22	18.8	84		
7.0	MHC16-7	16	18.6	14.8	75	SL7DT15 or SL7DBT15IP*	KT15 or F15IP*
	MHC20-7	20	22	18.8	84		

\* Torx+ screw and key are now available for improved clamping.

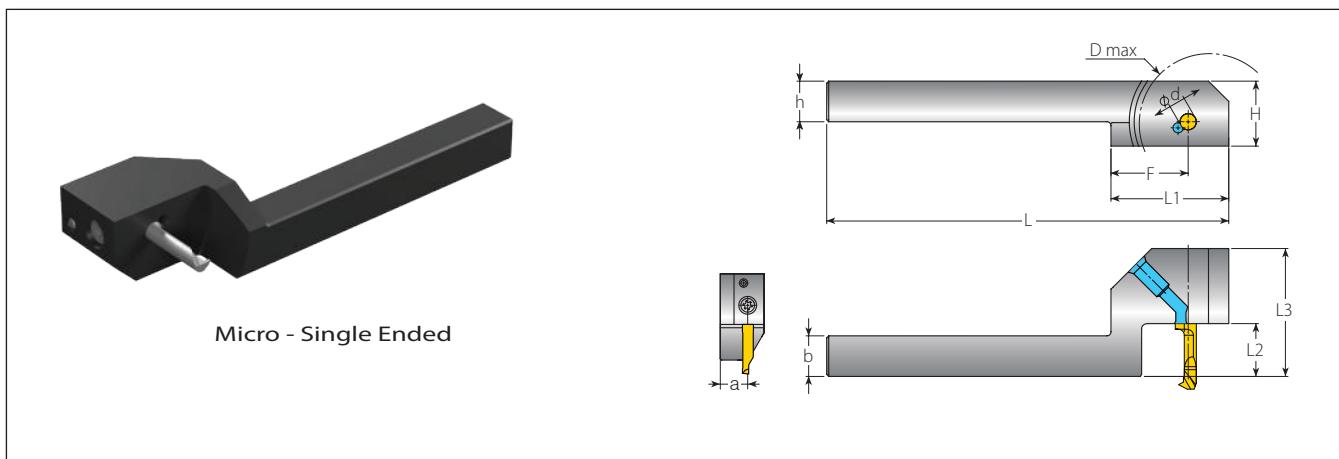
**Internal Toolholders****micro**scope**Microscope Holder with Square Shank****Spare Parts**

Micro Insert Dia.	Ordering Code	Dimensions mm				Clamping Screw	Torx Key
d mm		H=H2=B	H1	L	L1	SL7DT15 or SL7DBT15IP*	KT15 or F15IP*
4.0	MHS1010-4	10.0	19.0	100.0	25.0		
5.0	MHS1010-5	10.0	19.5	100.0	25.0		
4.0	MHS1212-4	12.0	21.0	100.0	25.0		
5.0	MHS1212-5	12.0	21.5	100.0	27.0		
6.0	MHS1212-6	12.0	22.0	100.0	27.0		

\* Torx+ screw and key are now available for improved clamping.

## Internal Toolholders

**micro**scope



### Microscope Holder with Drop Head

Micro Insert Dia.	Ordering Code	Dimensions mm								Spare Parts		
		d mm	a=b=h	L3	H	L	L1	F	D max	L2	Clamping Screw	Torx Key
4.0	MHD1010-4L0500	10.0		31.5	16.0	99.0	29.0	19.0	26.0	13.0	SL7DT15 or SL7DBT15IP*	KT15 or F15IP*
5.0	MHD1010-5L0800			48.0						23.0		
6.0	MHD1010-6L1000			53.0						28.0		
4.0	MHD1212-4L0700			36.5						18.0		
5.0	MHD1212-5L0800			48.0						23.0		
6.0	MHD1212-6L1000			53.0						28.0		

\* Torx+ screw and key are now available for improved clamping.

## Thread Turning Kits



TT External + Internal Kit

TT External Kit

TT Internal Kit

### TT External + Internal Kit

Ordering Code	Contents			
	Holder External + Internal	10 x External Inserts	10 x Internal Inserts	Torx Key
KHTT3EI-...	AL20-3 AVRC20-3	3ERA60...	3IRA60...	K3T
		3ERG60...	3IRG60...	
		3ER11W...	3IR11W...	
		3ER14W...	3IR14W...	
		3ER1.0ISO...	3IR1.0ISO...	
		3ER1.25ISO...	3IR1.25ISO...	
		3ER1.5ISO...	3IR1.5ISO...	
		3ER2.0ISO...	3IR2.0ISO...	
		3ER2.5ISO...	3IR2.5ISO...	
		3ER3.0ISO...	3IR3.0ISO...	

### TT External Kit

Ordering Code	Contents			
	Holder External	10 x External Inserts	Torx Key	
KHTT3E-...	AL20-3	3ERA60...	K3T	
		3ERG60...		
		3ER11W...		
		3ER14W...		
		3ER1.0ISO...		
		3ER1.25ISO...		
		3ER1.5ISO...		
		3ER2.0ISO...		
		3ER2.5ISO...		
		3ER3.0ISO...		

### TT Internal Kit

Ordering Code	Contents			
	Holder Internal	10 x Internal Inserts	Torx Key	
KHTT3I-...	AVRC 20-3	3IRA60...	K3T	
		3IRG60...		
		3IR11W...		
		3IR14W...		
		3IR1.0ISO...		
		3IR1.25ISO...		
		3IR1.5ISO...		
		3IR2.0ISO...		
		3IR2.5ISO...		
		3IR3.0ISO...		

Ordering Code Example: KHTT3I-VKX.  
Additional kits are available by request.

## Thread Turning Inserts Kits



TT Inserts Kit

### TT External Insert Kit

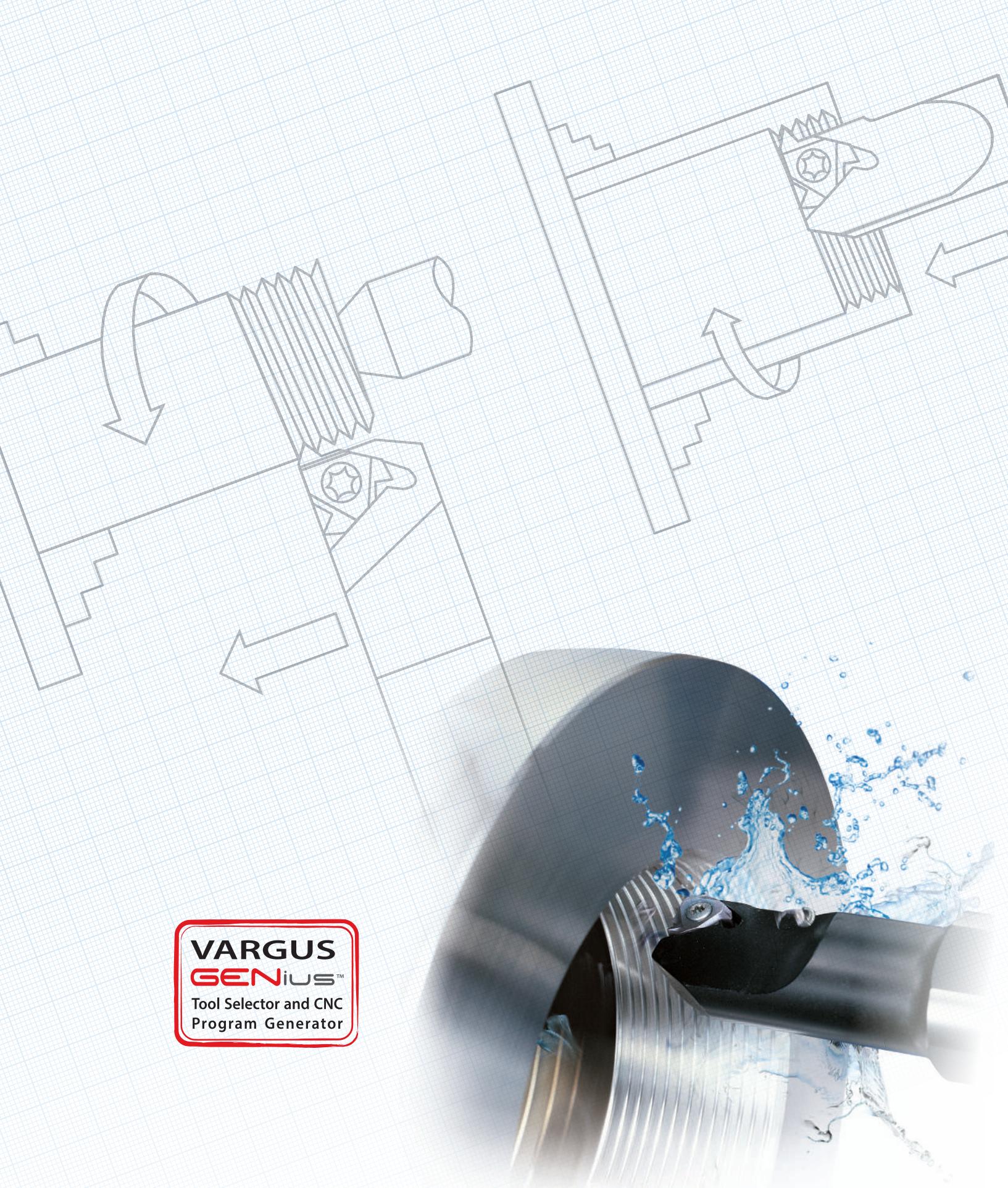
Ordering Code	Contents	Torx Key	Insert Screw
KITT3E-...	10 x External Inserts	K3T	SA3T
	3ERA60...		
	3ERG60...		
	3ER11W...		
	3ER14W...		
	3ER1.0ISO...		
	3ER1.25ISO...		
	3ER1.5ISO...		
	3ER2.0ISO...		
	3ER2.5ISO...		
	3ER3.0ISO...		

### TT Internal Insert Kit

Ordering Code	Contents	Torx Key	Insert Screw
KITT3I-...	10 x Internal Inserts	K3T	SA3T
	3IRA60...		
	3IRG60...		
	3IR11W...		
	3IR14W...		
	3IR1.0ISO...		
	3IR1.25ISO...		
	3IR1.5ISO...		
	3IR2.0ISO...		
	3IR2.5ISO...		
	3IR3.0ISO...		

Ordering Code Example: KITT3E-VKX.  
Additional kits are available by request.





**VARGUS**  
**GENius™**  
Tool Selector and CNC  
Program Generator

## Thread Turning Technical Data

# Thread Terminology

## External Thread

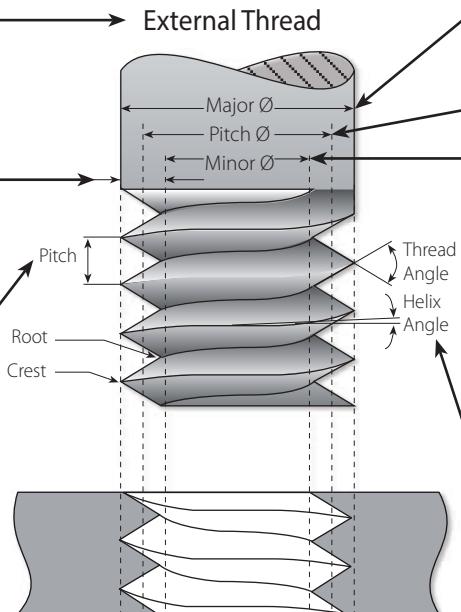
A thread on the external surface of a cylinder screw or cone.

## Depth of Thread

The distance between crest and root measured normal to the axis.

## Pitch

The distance between two corresponding points on adjacent thread forms is measured parallel to the axis. This distance can be defined in either millimeters or by TPI (threads per inch).



## Major Diameter

The largest diameter of a screw thread.

## Pitch Diameter

On a straight thread, the diameter of an imaginary cylinder, the surface of which cuts the thread forms where the width of the thread and groove are equal.

## Minor Diameter

The smallest diameter of a screw thread.

## Helix Angle

For a straight thread, where the lead of the thread and the pitch diameter circle circumference form a right angled triangle, the helix angle is the angle opposite the lead.

## Straight Thread

A thread formed on a cylinder.

## Taper Thread

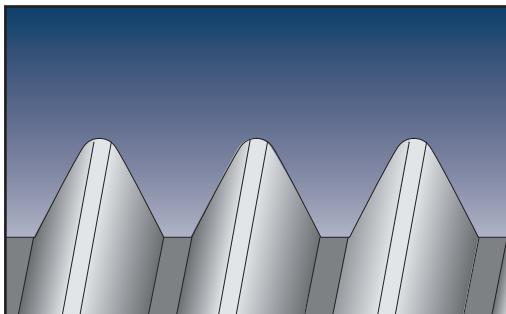
A thread formed on a cone.

## Nominal Diameter

The diameter from which the diameter limits are derived by the application of deviation allowances and tolerances.

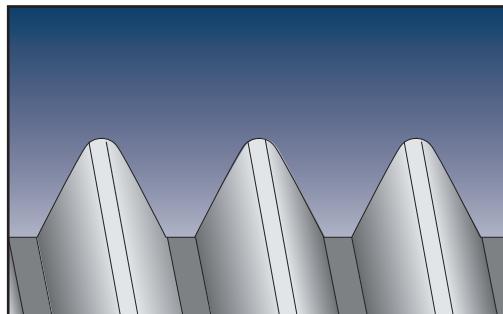
**Internal Thread**  
A thread on the internal surface of a cylinder or cone.

## Left-hand thread



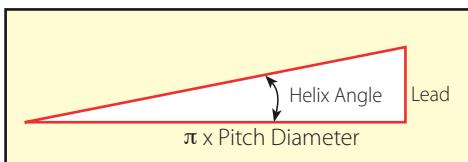
A thread which, when viewed axially, winds in a counterclockwise and receding direction. All left-hand threads are designated LH.

## Right-hand thread



A thread which, when viewed axially, winds in a clockwise and receding direction. Threads are always right-hand unless otherwise specified.

## The Helix Angle $\beta$



## Lead

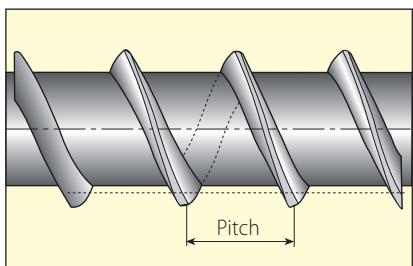
The distance a threaded part moves axially, with respect to a fixed mating part, in one complete revolution.

The lead is equal to the pitch multiplied by the number of thread starts.

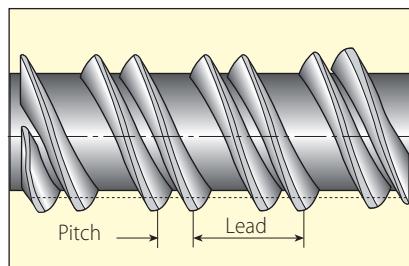
# Machining a Multi-Start Thread

A thread in which the lead is an integral multiple, greater than one, of the pitch.  
A multi-start thread permits a more rapid advance without a coarser (larger) thread form.

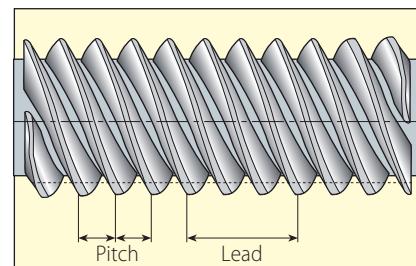
First Start Machined



Second Start Machined



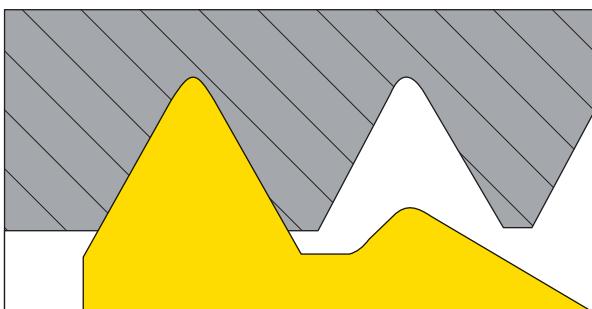
Third Start Machined  
(Final, 3 Starts Thread)



$$\text{Lead} = 3 \times \text{Pitch}$$

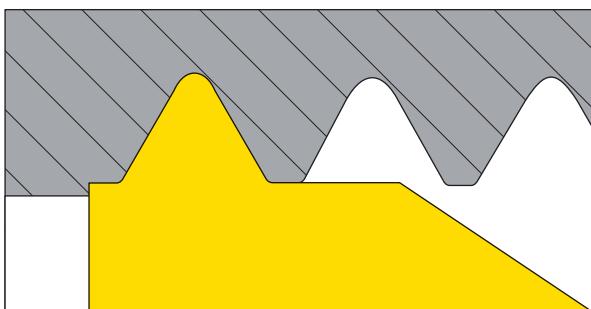
## Insert Profile Styles

Partial Profile



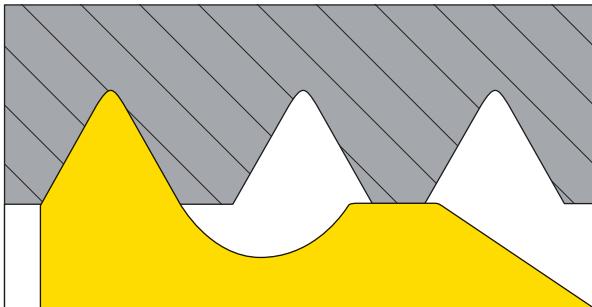
The V partial profile insert cuts without topping the outer diameter of the thread. The same insert can be used for a range of different thread pitches which have a common thread angle.

Full Profile



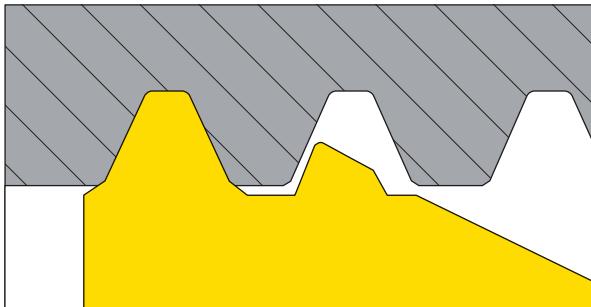
The full profile insert will form a complete thread profile including the crest. For every thread pitch and standard, a separate insert is required.

Full Profile for Fine Pitches



The full profile for Fine Pitches will form a complete thread. The toppling of the outer diameter is generated by the second tooth.

Semi Full

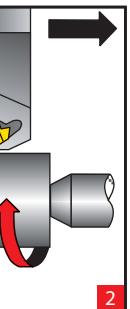
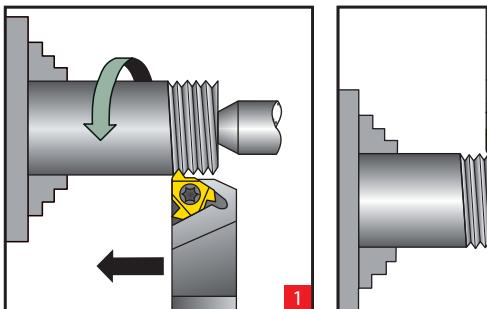


The Semi full profile insert will form a complete thread including crest radius but without toppling the outer diameter. Mainly used for trapezoidal profiles.

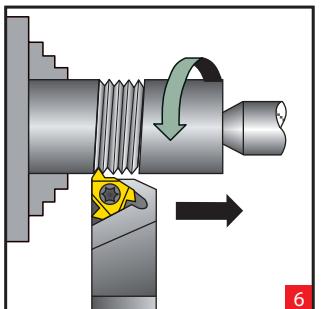
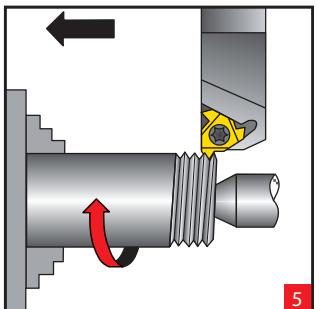
## Thread Turning Methods for Symmetrical Inserts

Thread	Inserts & Toolholder	Rotation	Feed Direction	Helix Method	Drawing No.
Right Hand External	EX RH	Counterclockwise	Towards chuck	Regular	1
	EX LH	Clockwise	From chuck	Reversed	2
Right Hand Internal	IN RH	Counterclockwise	Towards chuck	Regular	3
	IN LH	Clockwise	From chuck	Reversed	4
Left Hand External	EX LH	Clockwise	Towards chuck	Regular	5
	EX RH	Counterclockwise	From chuck	Reversed	6
Left Hand Internal	IN LH	Clockwise	Towards chuck	Regular	7
	IN RH	Counterclockwise	From chuck	Reversed	8

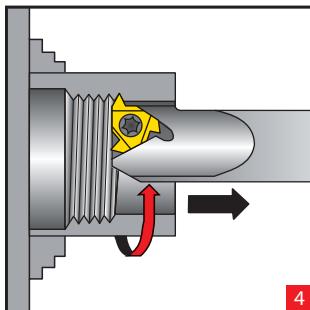
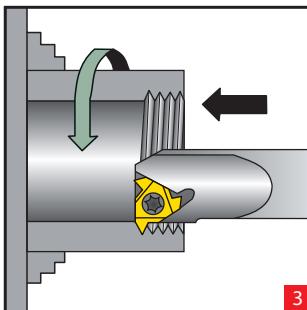
External RH Thread



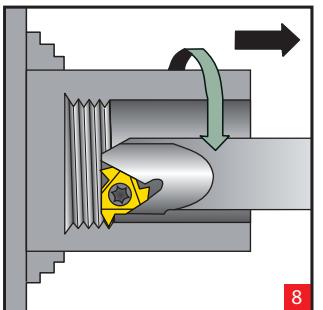
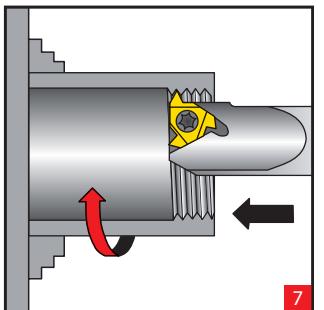
External LH Thread



Internal RH Thread

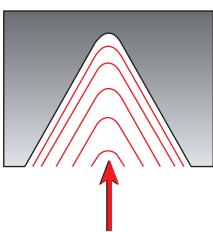


Internal LH Thread



## Thread Infeed Methods

Radial Infeed



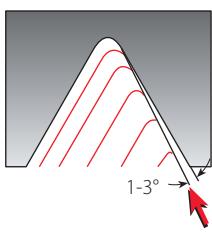
Radial infeed is the simplest and quickest method.

The feed is perpendicular to the turning axis, and both flanks of the insert perform the cutting operation.

Radial infeed is recommended in 3 cases:

- When the pitch is smaller than 16 TPI
- For material with short chips
- For work with hardened material

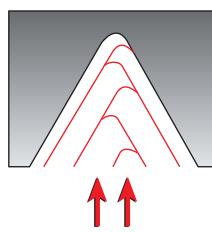
Flank Infeed (modified)



Flank infeed is recommended in the following cases:

- When the thread pitch is greater than 16 TPI, using the radial method, the effective cutting edge length is too large, resulting in chatter.
- For TRAPEZ and ACME. The radial method result in three cutting edges, making chip flow very difficult.

Alternate Flank Infeed



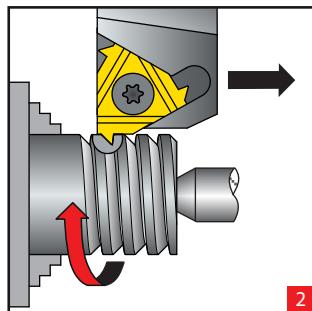
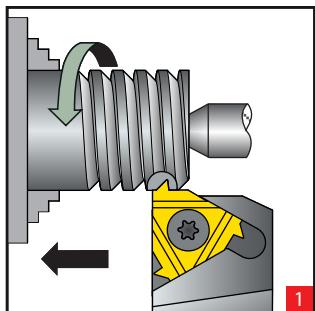
Use of the alternate flank method is recommended especially in large pitches and for materials with long chips.

This method divides the load equally on both flanks, resulting in equal wear along the cutting edges. Alternate flank infeed requires more complicated programming, and is not available on all lathes.

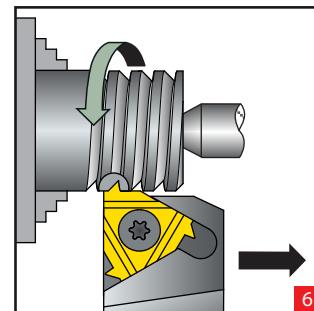
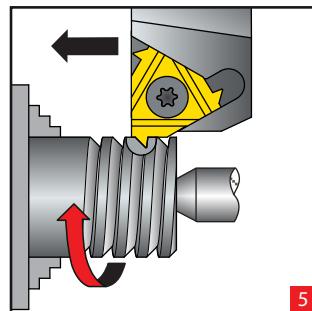
## Thread Turning Methods for Asymmetrical Inserts (ABUT, BBUT, SAGE)

Thread	Inserts & Toolholder	Rotation	Feed Direction	Helix Method	Drawing No.
Right Hand External	EX RH	Counterclockwise	Towards chuck	Regular	1
	EX LH	Clockwise	From chuck	Reversed	2
Right Hand Internal	IN RH	Counterclockwise	Towards chuck	Regular	3
	IN LH	Clockwise	From chuck	Reversed	4
Left Hand External	EX LH	Clockwise	Towards chuck	Regular	5
	EX RH	Counterclockwise	From chuck	Reversed	6
Left Hand Internal	IN LH	Clockwise	Towards chuck	Regular	7
	IN RH	Counterclockwise	From chuck	Reversed	8

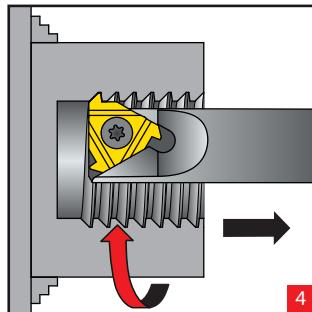
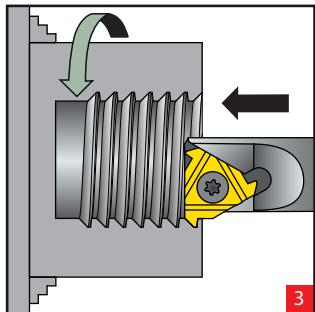
External RH Thread



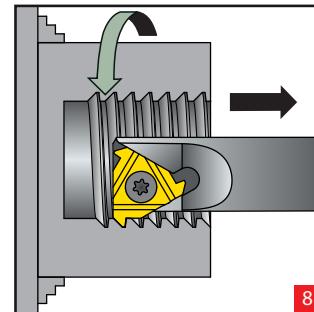
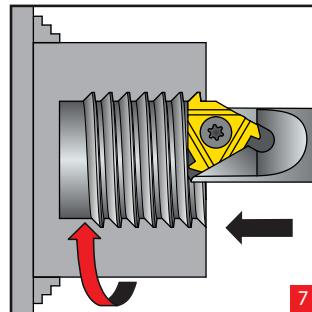
External LH Thread



Internal RH Thread

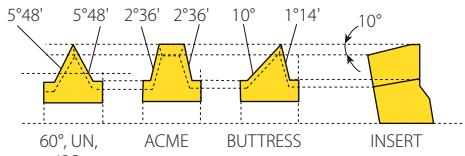


Internal LH Thread

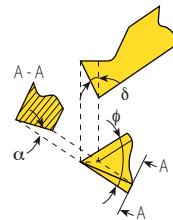


# Calculating the Helix Angle and Choosing The Right Anvil

## Flank Clearance Angle $\alpha$ (For External Inserts)



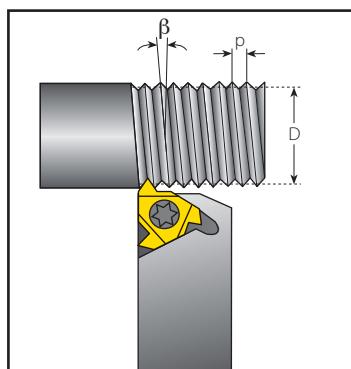
Vardex toolholders are designed to tilt the insert when seated in the toolholder (10° for external, 15° for internal tooling). This results in the differing flank clearance angles, based on the geometry of the insert. To ensure that the side of the insert cutting edge will not rub on the workpiece, it is most important that the insert helix angle be correct - especially in profiles with small enclosed flank angles. This correction is provided by Vardex anvils.



$$\alpha = \arctan(\tan \theta / 2 \times \tan \delta)$$

Where:  
 $\alpha$  - Flank clearance angle  
 $\delta$  - Tilt angle  
 $\theta$  - Enclosed flank angle

## Calculating the Helix Angle $\beta$



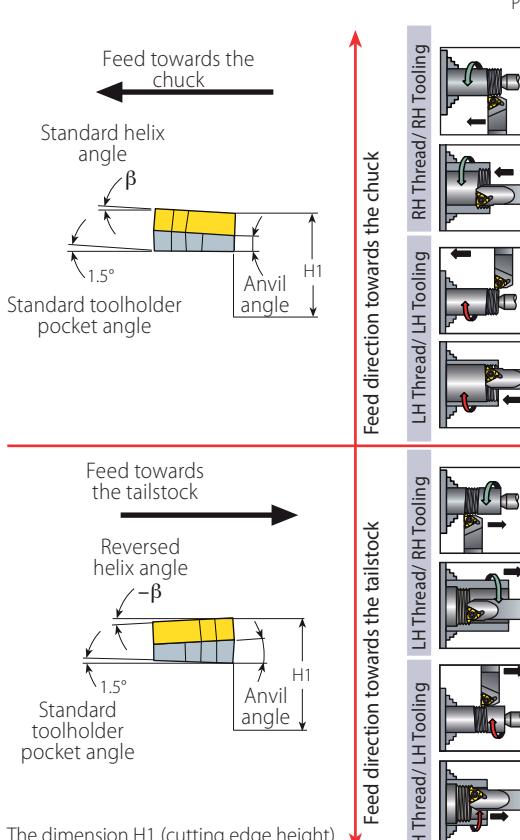
The helix angle is calculated by the following formula:

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

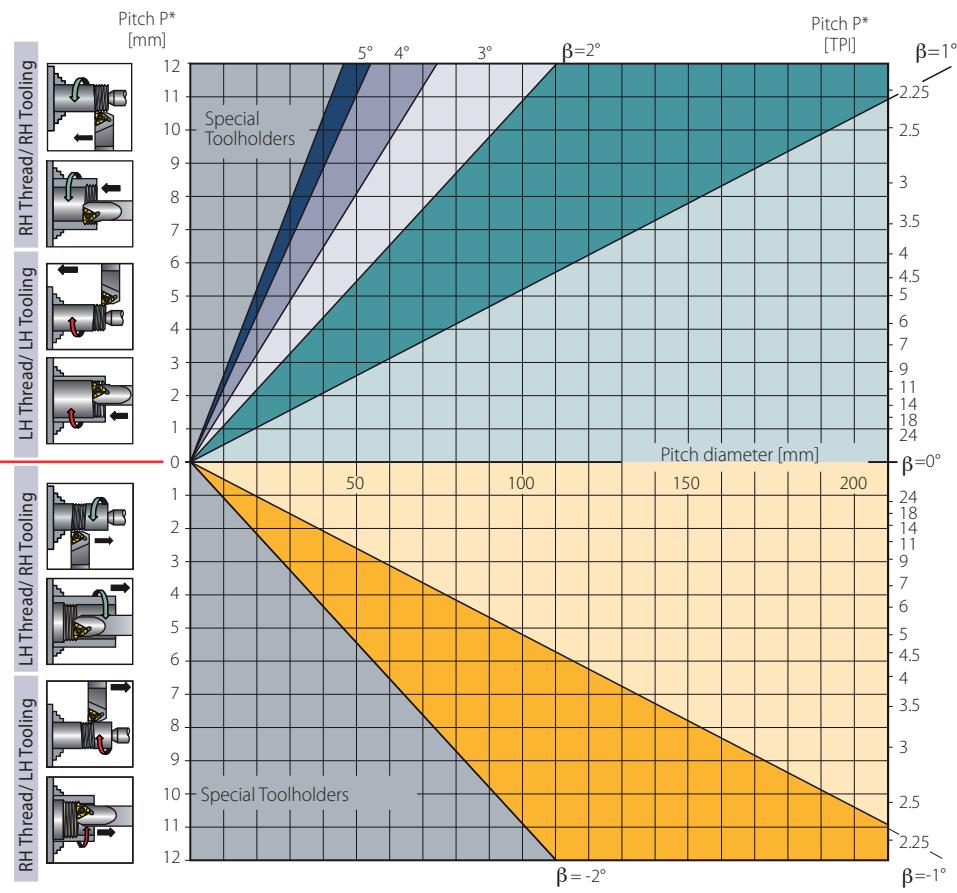
$\beta$  - Helix angle [°]  
 $P$  - Pitch [mm]  
 $N$  - No. of starts  
 $D$  - Pitch diameter [mm]  
 $\text{Lead} = P \times N$

The helix angle can also be found from the diagram below.

## Helix Angle Diagram



The dimension H1 (cutting edge height) remains constant with every insert / anvil combination.



\* For Multi-start threads, use the lead value instead of the pitch

# Anvils

Resultant Helix Angle		4.5°	3.5°	2.5°	1.5°	0.5°	0°	-0.5°	-1.5°	
Insert Size	Holder	Ordering Code								
IC	L mm									
3/8"	16	ER / IL	YE3-3P	YE3-2P	YE3-1P	YE3	YE3-1N	YE3-1.5N	YE3-2N	YE3-3N
		EL / IR	YI3-3P	YI3-2P	YI3-1P	YI3	YI3-1N	YI3-1.5N	YI3-2N	YI3-3N
3/8" V6	16	ER	YE3-6C-3P	YE3-6C-2P	YE3-6C-1P	YE3-6C	YE3-6C-1N	YE3-6C-1.5N	YE3-6C-2N	YE3-6C-3N
		IR	YI3-6C-3P	YI3-6C-2P	YI3-6C-1P	YI3-6C	YI3-6C-1N	YI3-6C-1.5N	YI3-6C-2N	YI3-6C-3N
1/2"	22	ER / IL	YE4-3P	YE4-2P	YE4-1P	YE4	YE4-1N	YE4-1.5N	YE4-2N	YE4-3N
		EL / IR	YI4-3P	YI4-2P	YI4-1P	YI4	YI4-1N	YI4-1.5N	YI4-2N	YI4-3N
1/2" F	23	ER	YE4F-3P	YE4F-2P	YE4F-1P	YE4F	YE4F-1N	YE4F-1.5N		
		IR	YI4F-3P	YI4F-2P	YI4F-1P	YI4F	YI4F-1N	YI4F-1.5N		
1/2" U	22	ER / IL	YE4U-3P	YE4U-2P	YE4U-1P	YE4U	YE4U-1N	YE4U-1.5N	YE4U-2N	YE4U-3N
		EL / IR	YI4U-3P	YI4U-2P	YI4U-1P	YI4U	YI4U-1N	YI4U-1.5N	YI4U-2N	YI4U-3N
5/8"	27	ER / IL	YE5-3P	YE5-2P	YE5-1P	YE5	YE5-1N	YE5-1.5N	YE5-2N	YE5-3N
		EL / IR	YI5-3P	YI5-2P	YI5-1P	YI5	YI5-1N	YI5-1.5N	YI5-2N	YI5-3N
5/8" U	27	ER / IL	YE5U-3P	YE5U-2P	YE5U-1P	YE5U	YE5U-1N	YE5U-1.5N	YE5U-2N	YE5U-3N
		EL / IR	YI5U-3P	YI5U-2P	YI5U-1P	YI5U	YI5U-1N	YI5U-1.5N	YI5U-2N	YI5U-3N
3/8" M+	16	ER / IL			YE3M-1P	YE3M	YE3M-1N	YE3M-1.5N	YE3M-2N	
		EL / IR			YI3M-1P	YI3M	YI3M-1N	YI3M-1.5N		
1/2" M+	22	ER / IL			YE4M-1P	YE4M	YE4M-1N	YE4M-1.5N	YE4M-2N	
		EL / IR			YI4M-1P	YI4M	YI4M-1N	YI4M-1.5N		
1/2" F 2M+	23	ER			YE4M2F-1P	YE4M2F	YE4M2F-1N	YE4M2F-1.5N		
1/2" F 3M+					YE4M3F-1P	YE4M3F	YE4M3F-1N	YE4M3F-1.5N		
1/2" F 2M+		IR			YI4M2F-1P	YI4M2F	YI4M2F-1N	YI4M2F-1.5N		
5/8" M+	27	ER / IL				YE5M	YE5M-1N	YE5M-1.5N		
		EL / IR				YI5M	YI5M-1N	YI5M-1.5N		
1/2" Z+	22	ER / IL			YE4Z-1P	YE4Z	YE4Z-1N			
		EL / IR			YI4Z-1P	YI4Z	YI4Z-1N			
1/2" T+	22	ER / IL EL / IR						Y4T		

Standard Anvil	V6 Anvil	U Style Anvil	M+ Style Anvil	Z+ Style Anvil	T+ Style Anvil
ER/IL	EL/IR	ER	IR	ER/IL	EL/IR

V6 is indicated on the backside

Same anvil turned over

FLINE Anvil	M+ Style Anvil
ER	IR

ER      IR      ER      IR

## Oil & Gas - Anvils

Resultant Helix Angle	3°	2°	1°	0°	0.5°
Insert Size					
3/8" APIRD			YEI3-APIRD		
1/2" API	YEI4-API-3P	YEI4-API-2P	YEI4-API-1P		
1/2" BUT					YEI4-BUT-0.5N

## Oil & Gas - 14D Anvils

Standard	Application	Anvils with Protected Second Cutting Edge	
		Ordering Code External Application	Ordering Code Internal Application
API Round Casing & Tubing	10 TPI from Ø 2 3/8" and up	Y14DER-10APIRD (4 teeth)	Y14DIR-10APIRD (4 teeth)
	10 TPI from Ø 2 3/8" and up	Y14DER10APIRD-3+ (3 teeth)	Y14DIR10APIRD-3+ (3 teeth)
	8 TPI from Ø 2 3/8" and up	Y14DER-8APIRD	Y14DIR-8APIRD
API Buttress Casing	5 TPI for Ø 4 1/2" - Ø 9 5/8"	Y14DER-5 BUT	Y14DIR-5 BUT
	5 TPI for Ø 10 3/4" and up	Y14DER-5BUT-0.4N	Y14DIR-5BUT-0.4N

## Anvil Kits

Anvil Size		Ordering Code	Included Anvils:
IC	L mm		
3/8"	16	ABY3	YE3-2P, 1P, 1N, 2N, 3N
			YI3-2P, 1P, 1N, 2N, 3N
3/8" V6	16	ABY3-6C	YE3-6C-2P, 1P, 1N, 2N, 3N
			YI3-6C-2P, 1P, 1N, 2N, 3N
1/2"	22	ABY4	YE4-2P, 1P, 1N, 2N, 3N
			YI4-2P, 1P, 1N, 2N, 3N
1/2"U	22	ABY4U	YE4U-2P, 1P, 1N, 2N, 3N
			YI4U-2P, 1P, 1N, 2N, 3N
5/8"	27	ABYE5	YE5-2P, 1P, 1N, 2N, 3N
			YI5-2P, 1P, 1N, 2N, 3N
5/8"U	27	ABYI5	YE5U-2P, 1P, 1N, 2N, 3N
			YI5U-2P, 1P, 1N, 2N, 3N

To ensure that you always have on hand an assortment of anvils for any job, we recommend that anvil kits be readily available.

### Important!

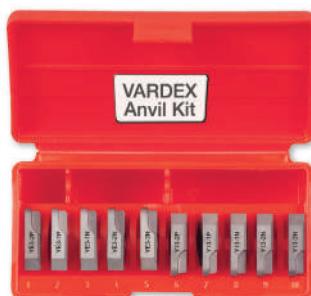
Use a V6 anvil when using a V6 insert.



For External RH  
use YE3-6C anvil.



For Internal RH  
use YI3-6C anvil.



## Spare Parts

### External and Internal Toolholders (not including Micro and Microscope)

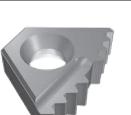


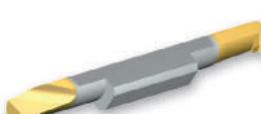
Toolholder	IC	Designation	Thread	Designation	Thread	Key	Torx size	EX RH/IN LH	IN RH/EX LH
Standard & D-Line	1/4"	SN2T	M2.6x0.45x6.5	-	-	K2T	T8	-	-
	3/8", 3/8"V6	SA3T	5-40UNCx11.3	SY3T	UNC5x7.3	K3T	T10	YE3/YE3-6C	YI3/YI3-6C
	3/8"	SN3T	5-40UNCx8.8	-	-	K3T	T10	-	-
	1/2"	SA4T	8-32UNCx14.0	SY4T	UNC8x9.3	K4T	T20	YE4	YI4
	1/2"	SN4T	8-32UNCx11.0	-	-	K4T	T20	-	-
	1/2F"	SA4T	8-32UNCx14.0	SY4T	UNC8x9.3	K6T	T20	YE4F	YI4F
	5/8"	SA5T	M5x0.8x22.0	SY5T	M5x0.8x9.5	K5T	T25	YE5	YI5
Standard Coarse	5/8"	SN5T	M5x0.8x13.9	-	-	K5T	T25	-	-
	3/8"	SN3TM	5-40UNCx7.3	-	-	K3T	T10	-	-
	1/2"	SN4TM	8-32UNCx9.8	-	-	K4T	T20	-	-
Standard with Clamp	5/8"	SN5TM	M5x0.8x13.9	-	-	K5T	T25	-	-
	3/8"	SA3T/C3	UNC5x12.0/M5x0.8x22.0	SY3T	UNC5x7.3	K3CT	T15/T10	YE3	YI3
	1/2"	SA4T/C4	UNC8x15.2/M6x1.0x29.5	SY4T	UNC8x9.3	K4T	T20	YE4	YI4
U Style	5/8"	SA5T/C5	M5x0.8x22.0/M8x1.25x28.0	SY5T	M5x0.8x9.5	K5T	T25	YE5	YI5
	1/2"U	SA4T	UNC8x15.2	SY4T	UNC8x9.3	K4T	T20	YE4U	YI4U
U Style with Clamp	5/8"U	SA5T	M5x0.8x22.0	SY5T	M5x0.8x9.5	K5T	T25	YE5U	YI5U
	1/2"U	SA4T/C4	UNC8x15.2/M6x1.0x29.5	SY4T	UNC8x9.3	K4T	T20	YE4U	YI4U
V Style	5/8"U	SA5T/C5	M5x0.8x22.0/M8x1.25x28.0	SY5T	M5x0.8x9.5	K5T	T25	YE5U	YI5U
	1/4"V	SN2T	M2.6x0.45x6.5	-	-	K2T	T8	-	-
Mega Line	3/8"V	SN3TV	5-40UNCx6.7	-	-	K3T	T10	-	-
	1/2"V	SN4T	8-32UNCx11.0	-	-	K4T	T20	-	-
Z+ Style	5/8"V	SN6T	M6x1.0x29.0	-	-	K6T	T20	-	-
	5/8"MG	S5MG	M5x0.8x16.0	-	-	K6T	T20	-	-
M+ Style	1/2"Z	SA4T	UNC8x15.2	SY4T	UNC8x9.3	K4T	T20	YE4Z	YI4Z
	3/8"M	SA3T	UNC5x12.0	SY3T	UNC5x7.3	K3T	T10	YE3M	YI3M
T+ Style	1/2"Z	SA4T	UNC8x15.2	SY4T	UNC8x9.3	K4T	T20	YE4M	YI4M
	5/8"M	SA5T	M5x0.8x22.0	SY5T	M5x0.8x9.5	K5T	T25	YE5M	YI5M
API	1/2"Z	SA4T	UNC8x15.2	SY4K2	UNC8x7.3	K4T/K2	T20/T8	Y4T	Y4T
	5/8"	SA5T/C5	M5x0.8x22.0/M8x1.25x28.0	SY5T	M5x0.8x9.5	K5T	T25	YE5OIL	YI5OIL
API 14D	14D	SA5T	M5x0.8x22.0	M4x0.7x6.0 (14D)		K5T/KT15	T25/T15	Y14DER-...	Y14DIR-...
	V08	SNV08	M2.6x0.45x8	-	-	K2T	T8	-	-
Mini-V	V11	SNV11	M3.5x0.6x10	-	-	K3T	T10	-	-
	V14	SNV14	M4x0.7x12	-	-	KT15	T15	-	-
Mini-L	V16	SNV16	M5x0.8x12	-	-	K4T	T20	-	-
	5.0L	SN5LSTR	M2.2x0.45x4.5	-	-	K7MT	T7	-	-
Mini-3	4.0mm	SN4MT	M2x0.4x4.0	-	-	K6MT	T6	-	-
	5.0mm	SN5MT	M2x0.4x5.3	-	-	K6MT	T6	-	-
	6.0mm	SN6MTN	M2.0x0.4x4.7	-	-	KIP6	T+6	-	-
Mini Adjustable Holder	-	S4.0	M4x0.7x4.0	-	-	K2.0	-	-	-

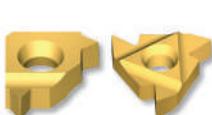
For Micro and Microscope Toolholders see pages 188-193

## Grades and Their Applications

General Use			
VRX	VTX	VKX	
			
Premium multipurpose submicron grade for stronger wear resistance and improved productivity. AlTiN alloyed PVD coated.	General purpose grade with tough submicron substrate. Provides good fracture toughness in non-rigid cutting conditions. TiAlN coated.	General purpose grade, excellent in steel and stainless steel, recommended for rigid cutting conditions. Ground or sintered chipbreaker styles. TiN coated.	
General Use	Stainless Steel	Non Ferrous, High Temperature Alloys and Titanium	
VCB	VM7	VK2	VK2P
			
Sintered chipbreaker with ground profile for machining materials with long chips. TiAlN coated.	Specialty grade for threading stainless steel. Multi-layer PVD coated.	Uncoated grade for non-ferrous, aluminum, high temperature and titanium alloys.	Highly-polished version of the VK2 uncoated grade for high quality surface finish in aluminum.

VG-Cut	Oil&Gas	General Use for Oil & Gas Materials	
VPG	VRXP	VTXP	VKXP
			
Sub-micron substrate for a wide range of applications. Excellent anti-fracture resistance. Highly recommended for medium to high cutting speeds. TiAlN coated.	Premium submicron grade with reinforced cutting edge for the oil & gas industry. Ideal for steel and stainless steel in unstable cutting conditions. AlTiN alloyed PVD coated.	Excellent all-purpose grade, tailor-made to the oil & gas industry with reinforced cutting edge. Recommended for non-rigid cutting conditions. TiAlN coated.	General purpose grade, excellent in steel and stainless steel, and highly recommended for rigid cutting conditions. Special design with reinforced cutting edge for the oil & gas industry. TiN coated.

Micro Line	MINIPRO	For all Mini Inserts
VMX		VTX
		 
General purpose carbide grade for Micro double-ended inserts. TiN coated.		Sub-micron grade for general machining in low and medium cutting speeds. Highly recommended for stainless steel. TiAlN coated

micrOscope	Mini 5L & Mini IC 6.0	Mini IC4.0, IC5.0 & Mini-V
VBX, VTX	VKX	VBX
		 
General purpose carbide grade for micrOscope threading inserts. TiCN coated.	General purpose carbide grade for the Mini 5L and Mini 6.0 inserts. TiN coated.	Sub-micron grade for general machining in low and medium cutting speeds for Mini 4.0K, 5.0K and Mini-V lines. Highly recommended for steel. TiCN coated

## Thread Turning Grades According to Product Lines

### General

Insert Style	VRX	VTX	VKX	VCB	VM7	VK2	VK2P	VPG
TT inserts general	✓	✓	✓		✓	✓	✓	
SCB (Sintered Chipbreaker)			✓	✓				
V6			✓					
Mega Line			✓					
F line	✓	✓						
D-Line			✓					
VG Cut								✓

### Oil & Gas



Insert Style	VRX	VTX	VKX	VRXP	VTXP	VKXP
T+		✓	✓		✓	✓
14D	✓	✓	✓	✓	✓	✓
CNGA		✓			✓	
On Edge		✓			✓	
Chaser		✓			✓	✓

### MiniPro



Insert Style	VKX	VTX	VBX	VMX
Mini 4.0K, 5.0K		✓	✓	
Mini 5LK, 6.0K RH	✓	✓		
Mini 5LK, 6.0K LH	✓			
Mini-V		✓	✓	
Micro (Double Ended)				✓
Microscope (Single Ended)		✓	✓	

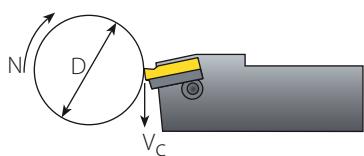
## Recommended Grades and Cutting Speeds Vc [m/min] Not Including MiniPro Line

Material Group	Vargus No.	Material	Hardness Brinell HB	Vc [m/min]				
				Coated				Uncoated
				VKX(P)	VCB	VM7	VTX(P), VRX(P)	VK2(P)
<b>P</b> Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	115-190	115-190		115-190
	2		Medium Carbon (C=0.25-0.55%)	150	100-175	100-165		100-175
	3		High Carbon (C=0.55-0.85%)	170	90-165	90-155		90-165
	4	Low Alloy Steel (alloying elements≤5%)	Non Hardened	180	100-180	100-180		100-180
	5		Hardened	275	75-140	75-140		75-140
	6		Hardened	350	70-135	70-135		70-135
	7	High Alloy Steel (alloying elements>5%)	Annealed	200	80-120	80-120		80-120
	8		Hardened	325	50-100	50-100		50-100
	9	Cast Steel	Low Alloy (alloying elements <5%)	200	70-130	70-130		70-130
	10		High Alloy (alloying elements >5%)	225	60-120	60-120		60-120
<b>M</b> Stainless Steel	11	Stainless Steel Ferritic	Non Hardened	200	70-130	70-130	70-150	70-130
	12		Hardened	330	60-115	50-95	60-125	60-115
	13	Stainless Steel Austenitic	Austenitic	180	90-140	80-120	90-160	90-140
	14		Super Austenitic	200	40-110	30-100	40-120	40-110
	15	Stainless Steel Cast Ferritic	Non Hardened	200	90-120	90-120	90-150	90-120
	16		Hardened	330	65-110	65-110	65-120	65-110
	17	Stainless Steel Cast Austenitic	Austenitic	200	85-110	85-110	85-120	85-110
	18		Hardened	330	60-100	60-100	60-110	60-100
<b>K</b> Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	60-70	70-120		60-70
	29		Pearlitic (long chips)	230	60-145	70-120		60-145
	30	Grey Cast Iron	Low Tensile Strength	180	70-130	70-130		70-130
	31		High Tensile Strength	260	60-115	60-100		60-115
	32	Nodular Sg Iron	Ferritic	160	125-160	125-160		125-160
	33		Pearlitic	260	90-120	90-120		90-120
<b>N</b> Non-Ferrous Metals	34	Aluminium Alloys Wrought	Non Aging	60	100-365	100-250		100-365
	35		Aged	100	80-220	80-180		80-220
	36	Aluminium Alloys	Cast	75	200-400	200-400		200-400
	37		Cast & Aged	90	200-280	200-280		200-280
	38	Aluminium Alloys	Cast Si 13-22%	130	60-180	60-150		60-180
	39	Copper and Copper Alloys	Brass	90	80-225	80-210		80-225
	40		Bronze And Non Leaded Copper	100	80-255	80-210		80-255
<b>S</b> Heat Resistant Material	19	High Temperature Alloys	Annealed (iron based)	200	45-60	45-60		45-60
	20		Aged (iron based)	280	30-50	30-50		30-50
	21		Annealed (nickel or cobalt based)	250	20-30	20-30		20-30
	22		Aged (nickel or cobalt based)	350	15-25	15-25		15-25
	23	Titanium Alloys	Pure 99.5 Ti	400Rm	140-170	140-170		140-170
	24		$\alpha+\beta$ Alloys	1050Rm	50-70	50-70		50-70
<b>H</b> Hardened Material	25	Extra Hard Steel	Hardened & Tempered	45-50HRC	45-60	45-60		45-60
	26			51-55HRC	40-50	40-50		40-50

### Calculation of N [RPM]

$$N = \frac{1000 \times V_c}{\pi \times D}$$

$$V_c = \frac{N \times \pi \times D}{1000}$$



N - Revolution Per Minute [RPM]

Vc - Cutting Speed [m/min]

D - Workpiece Diameter [mm]

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

### Mini, Micro and Microscope

Material Group	Vargus No.	Material	Hardness Brinell HB	Vc [m/min]			
				Coated			
				VMX (Micro)	VBX/VTX (Microscope)	VKX/VBX VTX (Mini)	
<b>P</b> Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	50-120	140-200	40-80
	2		Medium Carbon (C=0.25-0.55%)	150	40-100	120-180	40-80
	3		High Carbon (C=0.55-0.85%)	170	30-80	110-180	40-80
	4	Low Alloy Steel (alloying elements≤5%)	Non Hardened	180	50-70	100-155	40-80
	5		Hardened	275	40-60	90-145	40-80
	6		Hardened	350	30-50	80-135	40-80
	7	High Alloy Steel (alloying elements>5%)	Annealed	200	30-50	65-115	40-60
	8		Hardened	325	25-40	50-100	40-60
	9	Cast Steel	Low Alloy (alloying elements <5%)	200	30-50	30-50	40-60
	10		High Alloy (alloying elements >5%)	225	25-40	25-40	40-60
<b>M</b> Stainless Steel	11	Stainless Steel Ferritic	Non Hardened	200	60-100	80-120	40-60
	12		Hardened	330	40-60	55-95	40-60
	13	Stainless Steel Austenitic	Austenitic	180	50-90	60-100	40-60
	14		Super Austenitic	200	40-60	50-90	40-60
	15	Stainless Steel Cast Ferritic	Non Hardened	200	40-60	60-80	40-60
	16		Hardened	330	30-50	45-65	40-60
	17	Stainless Steel Cast Austenitic	Austenitic	200	40-60	50-70	40-60
	18		Hardened	330	30-50	40-60	40-60
<b>K</b> Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	50-70	60-80	40-80
	29		Pearlitic (long chips)	230	50-70	60-80	40-80
	30	Grey Cast Iron	Low Tensile Strength	180	50-70	60-80	40-80
	31		High Tensile Strength	260	40-60	40-70	40-80
	32	Nodular Sg Iron	Ferritic	160	50-70	60-80	40-80
	33		Pearlitic	260	60-80	70-90	40-80
<b>N</b> Non-Ferrous Metals	34	Aluminium Alloys Wrought	Non Aging	60	100-300	80-240	40-120
	35		Aged	100	100-150	100-170	40-120
	36	Aluminium Alloys	Cast	75	100-150	100-150	40-120
	37		Cast & Aged	90	60-100	60-100	40-120
	38	Aluminium Alloys	Cast Si 13-22%	130	100-150	100-150	40-120
	39	Copper and Copper Alloys	Brass	90	60-100	80-200	40-120
	40		Bronze And Non Leaded Copper	100	60-100	80-200	40-120
<b>S</b> Heat Resistant Material	19	High Temperature Alloys	Annealed (iron based)	200	25-45	25-45	30-45
	20		Aged (iron based)	280	20-30	20-30	20-30
	21		Annealed (nickel or cobalt based)	250	15-20	15-20	15-20
	22		Aged (nickel or cobalt based)	350	10-15	10-15	15-20
	23	Titanium Alloys	Pure 99.5 Ti	400Rm	60-100	60-100	70-100
	24		$\alpha+\beta$ Alloys	1050Rm	40-50	40-50	40-50
<b>H</b> Hardened Material	25	Extra Hard Steel	Hardened & Tempered	45-50HRc	20-40	20-40	20-40
	26			51-55HRc	20-40	20-40	20-40

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

### VG-Cut

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

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

### Mini-V

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

\* Available for sizes V08 and V11. Sizes V14 and V16 are available upon request.

## Cutting Conditions Parameters

Workpiece	Material Type	
	Material Dimension: Diameter and Length	
	Chipflow Character	
	Material Hardness	
Thread Application	External or Internal	
	Profile Shape	
	Surface Finish	
Machine	Machine Stability	
	Max. RPM	
	Clamping System Stability	
Coolant	Coolant Type	
Holders	Holder Cross Section Area	
	Holder Overhang	
	Through Coolant Option	
	Shank Type: Carbide, Alloy, Carbide Implant	
Insert	Grade	
	Profile Shape: Pitch and Depth	
	Nose Radius	
	Chipbreaker Style	

## Number of Passes

Pitch	mm	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00	8.00
	TPI	48	32	24	20	16	14	12	10	8	7	6	5.5	5	4.5	4	3
No. of passes		4-6	4-7	4-8	5-9	6-10	7-12	7-12	8-14	9-16	10-18	11-18	11-19	12-20	12-20	12-20	15-24
No. of passes (SCB)		3-4	3-4	3-5	4-6	5-6	6-8	6-8	8-10	9-12	10-14						
No. of passes (Micro / Microscope & Mini)		6-9	6-11	6-12	8-14	9-15	11-18	11-18									

## Depths of Cut and Number of Passes for Mini-V

1. High pressure coolant is recommended
2. Infeed method - modified flank infeed 1°

### Option of modified volume chip

		Mini-V														
		Pitch mm	0.5	0.75	1	1.25		1.5	1.75	2	2.5	3	3.5	4		
Insert Style		Pitch TPI	48	32	27	24	20	19	18	16	14	12	10	8	7	6
V08		Standard	Passes (modified volume)													
		ISO														
		UN	13	19		25	16			19	22					
		W														
		NPT			28				43							
V11		ISO														
		UN	13	19		25	16			19	22	24				
		W														
		BSPT						19								
V14		ISO														
		UN	7	10		13	16			19	22	24	32	38		
		W														
V16		ISO														
		UN	7	10		13	16			19	22	24	32	38		
		W														

### Option of constant depth chip

		Mini-V														
		Pitch mm	0.5	0.75	1	1.25		1.5	1.75	2	2.5	3	3.5	4		
Insert Style		Pitch TPI	48	32	27	24	20	19	18	16	14	12	10	8	7	6
V08		Standard	Passes (same)													
		ISO														
		UN	11-24	17-35		23-48	18-28			21-34	25-40					
		W				25-53			40-83							
		NPT														
V11		NPTF														
		TR									50-104	70-145				
		ISO														
		UN	11-24	17-35		23-48	14-28			17-34	20-40	23-46				
		W						21-34								
V14		BSPT														90-187
		TR														
		ISO														
		UN	11-24	17-35		23-48	14-28			9-15	11-18	11-18	12-21	18-24		
V16		W														
		ISO														
		UN	11-24	17-35		23-48	14-28			9-15	11-18	11-18	12-21	18-24		
		W														

## Number of Passes and Depth of Cut per Pass for Multi+ Inserts



Standard	Insert Type	Insert Size	Pitch	Teeth	Ordering Code	Passes	Depth of cut per pass						
							IC	L mm	RH		1	2	3
ISO External	M+	3/8"	16	1.0	mm	3	3ER1.0ISO3M+...	2	0.32	0.30			
				1.5	mm	2	3ER1.5ISO2M+...	3	0.34	0.30	0.29		
				2.0	mm	2	3ER2.0ISO2M+...	3	0.45	0.40	0.38		
		1/2"	22	1.5	mm	3	4ER1.5ISO3M+...	2	0.48	0.45			
				2.0	mm	2	4ER2.0ISO2M+...	3	0.45	0.40	0.38		
	T+	5/8"	27	2.0	mm	3	4ER2.0ISO3M+...	2	0.64	0.59			
				2.5	mm	2	4ER2.5ISO2M+...	4	0.46	0.42	0.38	0.36	
				3.0	mm	2	5ER3.0ISO2M+...	4	0.53	0.47	0.45	0.39	
		1/2" T	22	1.5	mm	8	4ER1.5ISO8T+...	1	0.93				
				2.0	mm	8	4ER2.0ISO8T+...	1	1.23				
ISO Internal	M+	3/8"	16	1.0	mm	3	3IR1.0ISO3M+...	2	0.30	0.28			
				1.5	mm	2	3IR1.5ISO2M+...	3	0.31	0.28	0.27		
				2.0	mm	2	3IR2.0ISO2M+...	3	0.42	0.37	0.36		
		1/2"	22	1.5	mm	3	4IR1.5ISO3M+...	2	0.45	0.41			
				2.0	mm	2	4IR2.0ISO2M+...	3	0.42	0.37	0.36		
	T+	5/8"	27	2.0	mm	3	4IR2.0ISO3M+...	2	0.59	0.56			
				3.0	mm	2	5IR3.0ISO2M+...	4	0.49	0.45	0.42	0.37	
				1.5	mm	8	4IR1.5ISO8T+...	1	0.86				
		1/2"	22	2.0	mm	8	4IR2.0ISO8T+...	1	1.15				
UN External	M+	3/8"	16	20	TPI	3	3ER20UN3M+...	2	0.41	0.38			
				18	TPI	2	3ER18UN2M+...	3	0.32	0.28	0.27		
				18	TPI	3	3ER18UN3M+...	2	0.45	0.42			
				16	TPI	2	3ER16UN2M+...	3	0.36	0.32	0.30		
				14	TPI	2	3ER14UN2M+...	3	0.43	0.38	0.37		
				12	TPI	2	3ER12UN2M+...	3	0.47	0.43	0.40		
		1/2"	22	16	TPI	3	4ER16UN3M+...	2	0.51	0.47			
				14	TPI	2	4ER14UN2M+...	3	0.43	0.38	0.37		
	T+	5/8"	27	12	TPI	2	4ER12UN2M+...	3	0.47	0.43	0.40		
				12	TPI	3	4ER12UN3M+...	2	0.67	0.63			
				11	TPI	2	4ER11UN2M+...	4	0.43	0.38	0.36	0.32	
				10	TPI	2	4ER10UN2M+...	4	0.46	0.42	0.40	0.36	
				8	TPI	2	5ER8UN2M+...	4	0.56	0.50	0.48	0.41	
		3/8"	16	12	TPI	2	3IR12UN2M+...	3	0.45	0.39	0.38		
				14	TPI	2	3IR14UN2M+...	3	0.41	0.36	0.34		
				16	TPI	2	3IR16UN2M+...	3	0.33	0.30	0.28		
UN Internal	M+	1/2"	22	16	TPI	3	4IR16UN3M+...	2	0.47	0.44			
				14	TPI	2	4IR14UN2M+...	3	0.41	0.36	0.34		
				12	TPI	2	4IR12UN2M+...	3	0.45	0.39	0.38		
		5/8"	27	12	TPI	3	4IR12UN3M+...	2	0.63	0.59			
				8	TPI	2	5IR8UN2M+...	4	0.52	0.47	0.44	0.38	
	T+	3/8"	16	28	TPI	2	3ER28W2M+...	3	0.23	0.20	0.20		
				19	TPI	2	3ER19W2M+...	3	0.33	0.28	0.27		
				19	TPI	3	3ER19W3M+...	2	0.45	0.41			
BSW External	M+	1/2"	22	14	TPI	2	3ER14W2M+...	3	0.43	0.38	0.35		
				14	TPI	3	4ER14W3M+...	2	0.60	0.56			
		3/8"	16	11	TPI	2	4ER11W2M+...	4	0.44	0.38	0.36	0.30	
				11	TPI	3	5ER8W3M+...	4	0.56	0.50	0.48	0.41	

## Number of Passes and Depth of Cut per Pass for Multi+ Inserts

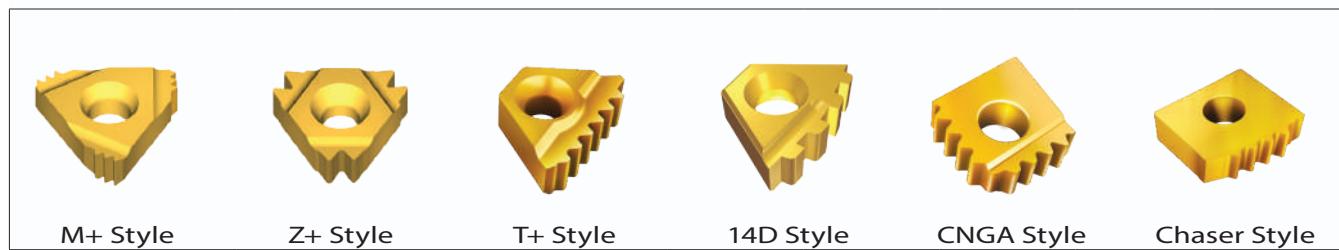


Standard	Insert Type	Insert Size		Pitch	Teeth	Ordering Code	Passes	Depth of cut per pass			
		IC	L mm					RH			
BSW Internal	M+	3/8"	16	14	TPI	2	3IR14W2M+...	3	0.43	0.38	0.35
		1/2"	22	11	TPI	2	4IR11W2M+...	4	0.44	0.38	0.36
NPT External	M+	3/8"	16	14	TPI	2	3ER14NPT2M+...	3	0.52	0.45	0.43
		1/2"	22	11.5	TPI	2	4ER11.5NPT2M+...	4	0.46	0.43	0.42
	Z+	5/8"	27	11.5	TPI	3	5ER11.5NPT3M+...	4	0.48	0.43	0.42
				8	TPI	2	5ER8NPT2M+...	4	0.72	0.64	0.60
NPT Internal	M+	3/8"	16	14	TPI	2	3IR14NPT2M+...	3	0.52	0.45	0.43
		1/2"	22	11.5	TPI	2	4IR11.5NPT2M+...	4	0.46	0.43	0.42
	Z+	5/8"	27	11.5	TPI	2	5IR11.5NPT3M+...	4	0.48	0.43	0.42
				8	TPI	2	5IR8NPT2M+...	4	0.72	0.64	0.60
NPTF External	M+	3/8"	16	14	TPI	2	3ER14NPTF2M+...	3	0.51	0.44	0.42
NPTF Internal	M+	3/8"	16	14	TPI	2	3IR14NPTF2M+...	3	0.51	0.44	0.42

## API RD, API BUT, OTTM, OTTG

The following table provides the optimal cutting pass division options, depending on the material, machine stability and clamping conditions:

Application	No. of Passes / Pass No.	1	2	3	4	5	6
APIRD 8 Ex, In	3 passes	0.89	0.81	0.11			
	4 passes	0.6	0.58	0.52	0.11		
	5 passes	0.47	0.47	0.43	0.33	0.11	
	6 passes	0.39	0.41	0.37	0.29	0.24	0.11
APIRD 10 Ex, In	3 passes	0.67	0.63	0.11			
	4 passes	0.44	0.45	0.41	0.11		
	5 passes	0.34	0.37	0.33	0.26	0.11	
	6 passes	0.28	0.32	0.29	0.22	0.19	0.11
BUT 5 Ex, In	3 passes	0.760	0.705	0.110			
	4 passes	0.506	0.501	0.458	0.110		
	5 passes	0.395	0.409	0.374	0.287	0.110	
	6 passes	0.329	0.353	0.324	0.249	0.210	0.110
OTTM 5 Ex , In OTTG 5 Ex , In	3 passes	0.760	0.730	0.110			
	4 passes	0.506	0.501	0.483	0.110		
	5 passes	0.395	0.409	0.374	0.312	0.110	
	6 passes	0.329	0.353	0.324	0.249	0.235	0.110

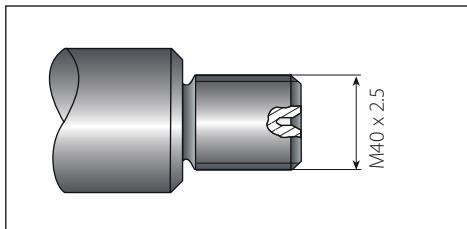


## Cutting Speed Recommendations for Materials Specified by API STB 5



Material	J55-K55	N80-L80-C95-TN70	TN95-P110-TN110
Cutting Speed (m/min)	170-200	150-180	130-160

# Step by Step Thread Turning - Example 1



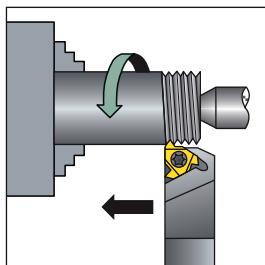
## Application:

Thread: External Right Hand

ISO Metric M40x2.5

Material: 4140 (25 HRC)

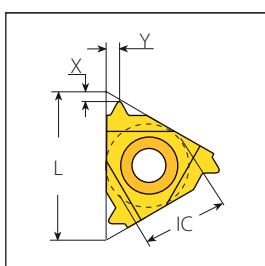
## 1 Choose the Thread Turning Method



Feed direction towards the chuck was chosen.

Therefore, an external right hand insert and an external right hand holder will be used.

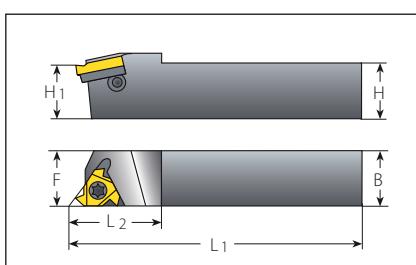
## 2 Choose the Insert Size



Chosen insert: 3ER2.5ISO

Insert Size	Pitch	Ordering Code	Anvil	Toolholder
IC	L mm	mm	RH	RH
3/8"	16	2.5	3ER2.5ISO...	YE3 AL.-3(LH)

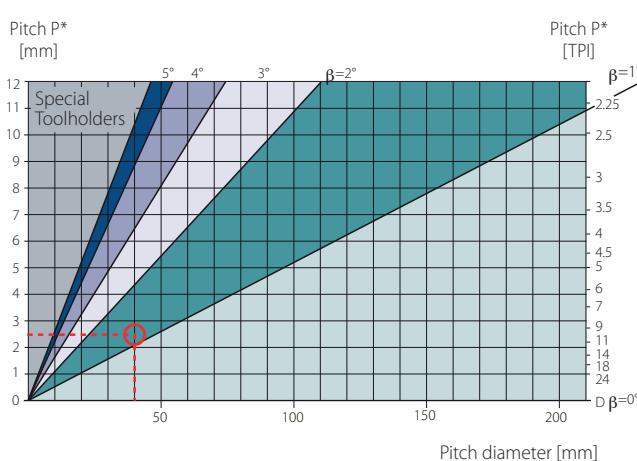
## 3 Choose the Toolholder



Chosen toolholder: AL 25-3

Insert Size	Ordering Code	Dimensions mm			
IC	RH	H=H1=B	F	L1	L2
3/8"	AL25-3	25	25	153.6	30

## 4



From the table, using a pitch of 2.5 mm (10 TPI) and a workpiece diameter of 40 mm (1.57"), we find the helix angle to be  $1.5^\circ$ .

## 5 Choose the Correct Anvil

Anvil chosen: YE3

Resultant Helix Angle		3.5	2.5	<b>1.5</b>	0.5
Insert Size	Ordering Code	Holder	Ordering Code		
IC	L mm				
3/8"	16	ER/IL	YE3-2P	YE3-1P	<b>YE3</b>

## 6 Choose the Carbide Grade and Cutting Speed

Carbide Grade chosen: VTX  
Cutting Speed: 140 m/min

Material:			Hardness Brinell HB	<b>VTX</b>	VCB
P	Low alloy steel (alloying elements≤5%)	Non hardened	180	<b>85-145</b>	100-180
		Hardened	275	75-140	75-140
		Hardened	350	70-135	70-135

## 7 Determine the Number of Passes

Number of passes: 14

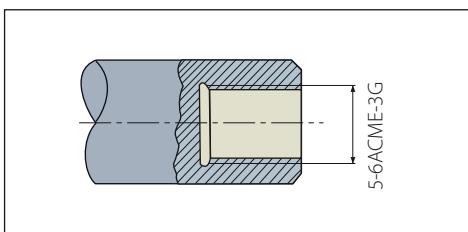
### ISO External

Pitch	mm	1.50	1.75	2.00	<b>2.50</b>	3.00	3.50	4.00
TPI		16	14	12	10	8	7	6
No. of Passes		6-10	7-12	7-12	<b>8-14</b>	9-16	10-18	11-18

## Summary

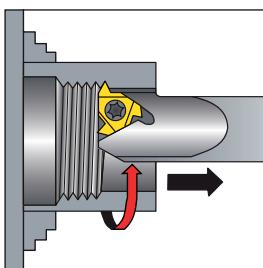
Thread Type		ISO M40x2.5 External Right Hand
<b>1</b>	<b>Feed Direction:</b>	Towards the chuck
<b>2</b>	<b>Insert and Grade:</b>	3ER2.5ISOVTX
<b>3</b>	<b>Toolholder:</b>	AL25-3
<b>4</b>	<b>Helix Angle:</b>	1.5°
<b>5</b>	<b>Anvil:</b>	YE3
<b>6</b>	<b>Cutting Speed:</b>	140 m/min
<b>7</b>	<b>Number of Passes:</b>	14

## Step by Step Thread Turning - Example 2



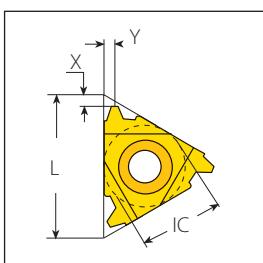
**Application:**  
**Thread:** Internal Right Hand  
**ACME**  
**Pitch:** 6 TPI  
**Bore dia:** 5"  
**Material:** Stainless Steel Austemetic

### 1 Choose the Thread Turning Method



To facilitate the removal of chips from the machined area, we chose a feed direction away from the chuck. Therefore, an internal left hand insert and an internal left hand toolholder are to be used.

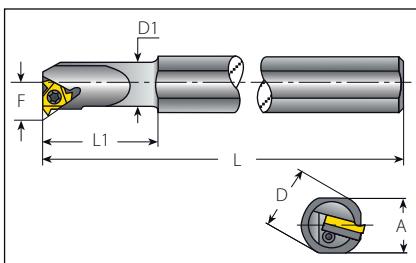
### 2 Choose the Insert Size



Chosen insert: 4IL6ACME

Insert Size	Pitch	Ordering Code	Anvil	Toolholder
IC	L mm	TPI	RH	LH
1/2"	22	6	4IL6ACME...	YE4

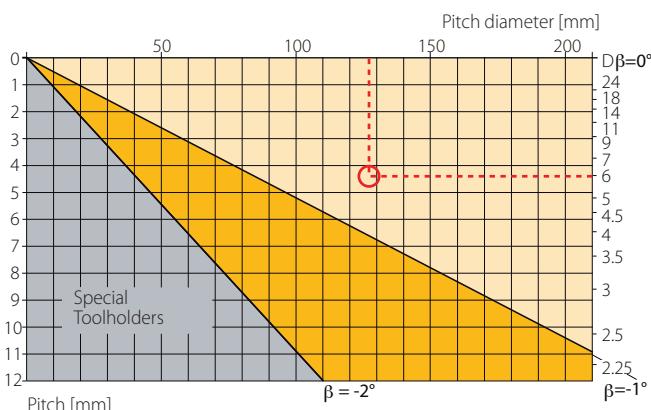
### 3 Choose the Toolholder



Chosen toolholder: AVR 40-4LH

Insert Size	Ordering Code	Dimensions mm						Min Bore
IC	RH	A	L	L1	D	D1	F	mm
1/2"	AVR 40-4	36.0	300	160	40	40.0	25.8	47

### 4 Determine the Helix Angle



In this case, a right hand thread is being turned with a left hand toolholder. The reverse helix method is used. From the lower part of the table, using a pitch of 6 TPI and a bore diameter of 127mm, we obtain a helix angle of **-0.65°**.

## 5 Choose the Correct Anvil

Anvil chosen: YE4-2N

Resultant Helix Angle		1.5	0.5	0	-0.5	-1.5
Insert Size	Ordering Code					
IC	L mm					
1/2"	22	ER/IL	YE4	YE4-1N	YE4-1.5N	YE4-2N

## 6 Choose the Carbide Grade and Cutting Speed

Carbide grade chosen: VTX  
Cutting speed: 140 m/min

	Material:	Hardness Brinell HB	VTX	VCB
<b>M</b>	Stainless Steel Austenitic	180	90-140	80-120
	Super Austenitic	200	40-110	30-100

## 7 Determine the Number of Passes

Number of passes: 18

### ACME External & Internal

Pitch	mm	3.00	3.50	4.00	4.50	5.00	5.50	6.00
TPI		8	7	<b>6</b>	5.5	5	4.5	4
No. of Passes		9-16	10-18	<b>11-18</b>	11-19	12-20	12-20	12-20

## Summary

Thread Type		5"x6 ACME Internal Right Hand
<b>1</b>	<b>Feed Direction:</b>	Away from the chuck
<b>2</b>	<b>Insert and Grade:</b>	4IL6ACMEVTX
<b>3</b>	<b>Toolholder:</b>	AVR40-4LH
<b>4</b>	<b>Helix Angle:</b>	-0.65°
<b>5</b>	<b>Anvil:</b>	YE4-2N
<b>6</b>	<b>Cutting Speed:</b>	140 m/min
<b>7</b>	<b>Number of Passes:</b>	18

## Material Comparison Table

Material Group	Vargus No.	USA AISI/SAE	Germany W.-Nr.	Germany DIN	Great Britain BS	France AFNOR	Italy UNI
	1	1015	1.0037	St37-2	Fe360B	E24-2	Fe360 B FU
	1	1020	1.0044	St44-2	Fe430B FN	E28-2	Fe430B FN
	2	ASTM A570Gr.50	1.0050	St50-2	Fe490-2 FN	A50-2	Fe490
	2	-	1.0070	St70-2	Fe690-2 FN	A70-2	Fe690
	1	1015	1.0401	C15	080M15	CC12	C15C16
	1	1020	1.0402	C22	050A20	CC20	C20C21
	2	1035	1.0501	C35	060A35	CC35	C35
	2	1045	1.0503	C45	080M46	CC45	C45
	2	1055	1.0535	C55	070M55	-	C55
	2	1060	1.0601	C60	080A62	CC55	C60
	1	1213	1.0715	95Mn28	230M07	S250	CF95Mn28
	1	12L13	1.0718	95MnPb28	-	S250Pb	CF95MnPb28
	1	-	1.0722	10SPb20	-	10PbF2	CF10SPb20
	2	1140	1.0726	35S20	212M36	35MF4	-
	2	1215	1.0736	95Mn36	240M07	S300	CF95Mn36
	2	12L14	1.0737	95MnPb36	-	S300Pb	CF95MnPb36
	2	9255	1.0904	55Si7	250A53	55S7	55Si8
	2	9262	1.0961	60SiCr7	-	60SC7	60SiCr8
	1	1015	1.1141	Ck15	080M15	XC1 2	C16
	2	1039	1.1157	40Mn4	150M36	35M5	-
	2	1025	1.1158	Ck25	-	-	-
	2	1335	1.1167	36Mn5	-	40M5	-
	2	1330	1.1170	28Mn6	150M28	20M5	C28Mn
	2	1035	1.1183	Cf35	060A35	XC38TS	C36
	2	1045	1.1191	Ck45	080M46	XC42	C45
	2	1055	1.1203	Ck55	070M55	XC55	C50
	3	1050	1.1213	Cf53	060A52	XC48TS	C53
	3	1060	1.1221	Ck60	080A62	XC60	C60
	8	1095	1.1274	Ck101	060A96	-	-
	9	-	1.3401	X120Mn12	Z120M12	Z120M12	XG120Mn12
	8	52100	1.3505	100Cr6	534A99	100C6	100Cr6
	8	ASTM A20Gr.A	1.5415	15Mo3	1501-240	15D3	16Mo3KW
	8	4520	1.5423	16Mo5	1503-245-420	-	16Mo5
	4	ASTMA350LF5	1.5622	14Ni6	-	16N6	14Ni6
	8	ASTM A353	1.5662	X8Ni9	1501-509; 510	-	X10Ni9
	8	2515	1.5680	12Ni19	-	Z18N5	-
	5	3135	1.5710	36NiCr6	640A35	35NC6	-
	5	3415	1.5732	14NiCr10	-	14NC11	16NiCr11
	5	3415; 3310	1.5752	14NiCr14	655M13; 655M12	12NC15	-
	5	9840	1.6511	36CrNiMo4	816M40	40NCD3	38NiCrMo4(KB)
	5	8620	1.6523	21NiCrMo2	805M20	20NCD2	20NiCrMo2
	5	8740	1.6546	40NiCrMo22	311-Type7	-	40NiCrMo2(KB)
	5	4340	1.6582	34CrNiMo6	817M40	35NCD6	35NiCrMo6(KB)
	5	-	1.6587	17CrNiMo6	820A16	18NCD6	-
	5	-	1.6657	14NiCrMo134	832M13	-	15NiCrMo13
	2	5015	1.7015	15Cr3	523M15	12C3	-
	5	5132	1.7033	34Cr4	530A32	32C4	34Cr4(KB)
	5	5140	1.7035	41Cr4	530M40	42C4	41Cr4
	5	5140	1.7045	42Cr4	-	-	-
	5	5115	1.7131	16MnCr5	(527M20)	16MC5	16MnCr5
	5	5155	1.7176	55Cr3	527A60	55C3	-
	5	4130	1.7218	25CrMo4	1717CD5110	25CD4	25CrMo4(KB)
	5	4137; 4135	1.7220	34CrMo4	708A37	35CD4	35CrMo4
	5	4140; 4142	1.7223	41CrMo4	708M40	42CD4TS	41CrMo4
	5	4140	1.7225	42CrMo4	708M40	42CD4	42CrMo4
	5	-	1.7262	15CrMo5	-	12CD4	-
	5	ASTM A182; F11; F12	1.7335	13CrMo4 4	1501-620Gr.27	15CD3.5; 15CD4.5	14CrMo4 5
	5	-	1.7361	32CrMo12	722M24	30CD12	32CrMo12
	5	ASTM A182; F22	1.7380	10CrMo9 10	1501-622; Gr.31; 45	12CD9; 10	12CrMo9, 10
	5	-	1.7715	14MoV6 3	1503-660-440	-	-
	5	6150	1.8159	50CrV4	735A50	50CV4	50CrV4
	8	-	1.8509	41CrAlMo7	905M39	40CAD6, 12	41CrAlMo7
	8	-	1.8523	39CrMoV13 9	897M39	-	36CrMoV12
	5	W.110	1.1545	C105W1	-	Y1105	C98KU; C100KU
	5	W.112	1.1663	C125W	-	Y2120	C120KU
	8	L3	1.2067	100Cr6	BL3	Y100C6	-
	10	D3	1.2080	X210Cr12	BD3	Z200Cr12	X210Cr13KU
	10	-	-	-	-	-	X250Cr12KU
	10	-	1.2311	40CrMnMo7	-	-	35CrMo8KU
	10	-	1.2312	40CrMnMoS8-6	-	-	-
	10	H11	1.2343	X38CrMoV5-1	BH11	Z38CDV5	X37CrMoV51 1KU
	10	H13	1.2344	X40CrMoV5-1	BH13	Z40CDV5	X35CrMoV05KU
	10	-	-	-	-	-	X40CrMoV511KU
	10	A2	1.2363	X100CrMoV5-1	BA2	Z1 00CDV5	X100CrMoV51KU
	10	-	1.2367	X38CrMoV5-3	-	Z38CDV5-3	-
	10	D2	1.2379	X155CrVMo 12-1	BD2	Z160CDV12	X155CrVMo12 1 KU
	10	-	1.2419	105WCr6	-	105WC13	10WCr6; 107WCr5KU
	10	-	1.2436	X210CrW12	-	-	X215CrW121KU
	10	S1	1.2542	45WCrV17	BS1	-	45WCrV8KU
	10	H21	1.2581	X30WCrV9 3	BH21	Z30WCV9	X30WCrV9 3KU
	10	-	1.2601	X165CrMoV12	-	-	X165CrMoW12KU
	10	L6	1.2713	55NiCrMo6	-	55NCDV7	-
	10	-	1.2738	40CrMnNiMo8-6-4	-	-	-
	10	W210	1.2833	100V1	BW2	Y1105V; 100V2	-
	10	-	1.3243	S 6-5-2-5	-	Z85WDKCV-06-05-04-02	HS 6-5-2-5
	10	T4	1.3255	S 18-1-2-5	BT4	Z80WKCV-18-05-04-01	X78WC01805KU
	10	M2	1.3343	S 6-5-2	BM2	Z85WDCV-06-05-04-02	X82WMo0605KU
	10	M7	1.3348	S 2-9-2	-	Z100WCWV-09-04-02-02	HS 2-9-2
	10	T1	1.3355	S 18-0-1	BT1	Z80WCV-18-04-01	X75W18KU

**P**

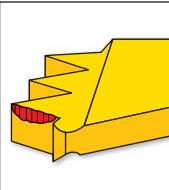
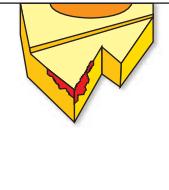
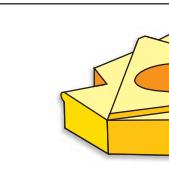
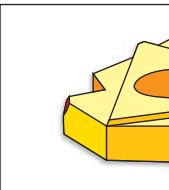
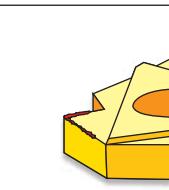
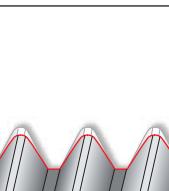
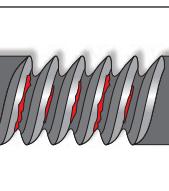
Sweden SS	Japan JIS	Russia GOST	Spain UNE	Vardex No.	
1311	STKM 12A;C	-	Fe360B	1	
1412	SM400A;B;C	St4ps;sp	Fe430B FN	1	
1550	SS490	St5ps;sp	A490-2	2	
-	-	-	A690-2	2	
1350	-	-	F.111	1	
1450	-	20	1 C 22 ; F.112	1	
1550	-	30	F.113	2	
1650	-	45	F.114	2	
1655	-	55	F.115	2	
-	-	60(G)	-	2	
1912	SUM22	-	F.2111-11SMn28	1	
1914	SUM22L	-	F.2112-11SMnPb28	1	
-	-	-	F.2122-10SPb20	1	
1957	-	-	F.210.G	2	
-	-	-	F.2113-12SMn35	2	
1926	-	-	F.2114-12SMnPb35	2	
2085	-	55S2	F.1440-56Si7	2	
-	-	-	F.1442-60SiCr8	2	
1370	S15C	15	F.1110-C15k ; F.1111-C16k	1	
-	-	40G	-	2	
-	S25C	25	F.1120-C25k	2	
2120	SMn438(H)	35G2 ; 35GL	F.1203-36Mn6 ; F.8212-36Mn5	2	
-	SCM1	30G	28Mn6	2	
1572	S35C	35	-	2	
1672	S45C	45	F.1140-C45k ; F.1142-C48k	2	
-	S55C	55	F.1150-C55k	2	
1674	S50C	50	-	3	
1678	S58C	60;60G ;60GA	-	3	
1870	SUP4	-	-	8	
-	SCMnH/1	110G13L	F.8251-AM-X120Mn12	9	
2258	SUJ2	SchCh15	F.1310-100Cr6	8	
2912	-	-	F.2601-16Mo3	8	
-	-	-	F.2602-16Mo5	8	
-	-	-	F.2641-15Ni6	4	
-	-	-	F.2645-X8Ni09	8	
-	-	-	-	8	
-	SNC236	-	-	5	
-	SNC415(H)	-	F.1540-15NiCr11	5	
-	SNC81 5(H)	-	-	5	
-	-	40ChN2MA ; 40ChGNM	F.1280-35NiCrMo4	5	
2506	SNCM220(H)	20ChGNM	F.1552-20NiCrMo2 ; F.1534-20NiMo31	5	
-	SNCM240	38ChGNM	F.1204-40NiCrMo2 ; F.1205-40NiCrMo2DF	5	
2541	-	38Ch2N2MA	F.1272-40NiCrMo7 ; 34CrNiMo6	5	
-	-	-	F.1560-14NiCrMo13	5	
-	SCr415(H)	15Ch	-	2	
-	SCr430(H)	35Ch	F.8221-35Cr4	5	
-	SCr440(H)	40Ch	F.1211-41Cr4DF ; F.1202-42Cr4	5	
2245	SCR440	40Ch	F.1202-42Cr4	5	
2511	-	18ChG	F.1516-16MnCr5 ; F.1517-16MnCr5	5	
-	SUP9(A)	50ChGA	F.1431-55Cr3	5	
2225	SCM420	20ChM ; 30ChM	F.8372-AM26CrMo4 ; F.8330-AM25CrMo4 ; F.1256-30CrMo4-1	5	
2234	SCM432; SCCR M3	A358ChGM;35ChM;35ChML	F.8331-AM34CrMo4 ; F.823134CrMo4 ; F.1250-35CrMo4 ; F.1254-35CrMo4DF	5	
2244	SCM440	40ChFA	F.8332-AM42CrMo4 ; F.8232-42CrMo4 ; F.1252-40CrMo4	5	
2244	SCM440(H)	-	F.8332-AM42CrMo4 ; F.8232-42CrMo4 ; F.1252-40CrMo4	5	
2216	SCM415(H)	-	F.1551-12CrMo4	5	
-	-	12ChM ; 15ChM	F.2631-14CrMo45	5	
2240	-	-	F.124.A	5	
2218	-	12Ch8	TU.H	5	
-	-	-	F.2621-13MoCrV6	5	
2230	SUP10	50ChGFA ; 50CHFA	F.1430-51CrV4	5	
2940	-	38ChMJuA	F.1740-41CrAlMo7	8	
-	-	-	-	8	
1880	-	U10A-1;2	F.516	5	
-	SK2	U13	F.5123 ; C120	5	
-	-	Ch	F.5230 ; 100Cr6	8	
-	SKD1	Ch12	F.5212 ; X210 Cr12	10	
-	-	-	-	10	
-	-	-	-	10	
-	SKD6	4ChMFS	F.5317 ; X37 CrMoV5	10	
2242	SKD61	4ChMF1S	F.5318 ; X40CrMoC5	10	
-	-	-	-	10	
2260	SKD12	-	F.5227 ; X100CrMoV5	10	
-	-	-	-	10	
2310	SKD11	-	F.520A	10	
2140	SKS31;SKS2,SKS3	ChWG	F.5233 ; 105WCr5	10	
2312	SKD2	-	F.5213 ; X210CrW12	10	
2710	-	5ChW2SF	F.5241 ; 45WCrSi8	10	
-	SKD5	3Ch2W8F	F.5323 ; X30WCrV9	10	
2310	-	-	F.5211 ; X160CrMoV12	10	
-	SKT4	5ChNM	F.520S	10	
-	-	-	-	10	
-	SKS43	-	-	10	
2723	SKH55	2723	R6M5K5	10	
-	SKH3	-	F.5530 ; 18-1-1-5	10	
2722	SKH9	(R6AMS); R6M5	F.5603 ; 6-5-2	10	
2782	-	-	F.5607 ; 18-0-1	10	
-	SKH2	R18	F.5520 ; 18-0-1	10	

**Material Comparison Table (con't)**

Material Group	Vargus No.	USA AISI/SAE	Germany W.-Nr.	Germany DIN	Great Britain BS	France AFNOR	Italy UNI
<b>M</b> <b>Stainless Steel</b>	12	403	1.4000	X6Cr13	403S17	Z6C13	X6Cr13
	12	-	1.4001	X7Cr14	-	-	-
	12	410	1.4006	X10Cr13	410S21	Z10C14	X12Cr13
	12	430	1.4016	X6Cr17	430S15	Z8C17	X8Cr17
	12	-	1.4027	G-X20Cr14	420C29	Z20C13M	-
	12	-	1.4034	X46Cr13	420S45	Z40CM;Z38C13M	X40Cr14
	12	431	1.4057	X20CrNi172	431S29	Z15CrNi6.02	X16CrNi16
	12	430	1.4104	X12CrMoSi17	-	Z10CF17	X10CrS17
	12	434	1.4113	X6CrMo171	434S17	Z8CD17.01	X8CrMo17
	12	-	1.4313	X5CrNi134	425C11	Z4CND13.4M	-
	12	-	1.4408	G-X6CrNiMo18 10	316C16	-	-
	12	HW3	1.4718	X45CrSi93	401S45	Z45CS 9	X45CrSi8
	12	405	1.4724	X10CrAl13	403S17	Z10C13	X10CrAl12
	11	-	1.4742	X10CrAl18	430S15	Z12CAS18	X8Cr17
	12	HNV6	1.4747	X80CrNiS120	443S65	Z80CSN20.02	X80CrNi20
	11	446	1.4762	X10CrAl24	-	Z10CAS24	X16Cr26
	13	304	1.4301	X5CrNi18 10	304S15	Z6CN18.09	X5CrNi1810
	13	303	1.4305	X10CrNiS18 9	303S21	Z10CNF 18.09	X10CrNiS 18.09
	13	304L	1.4306	X2CrNi19 11	304S12;304C12	Z2CrNi18.10;Z3CN 19.10	X2CrNi18.11
	13	CF8	1.4308	G-X6CrNi18 9	304C15	Z6CN18.10M	-
	13	301	1.4310	X12CrNi177	301S21	Z12CN 17.07	X1 2CrNi1 707
	13	304LN	1.4311	X2CrNiN18 10	304S62	Z2CN18.10	-
	13	316	1.4401	X5CrNiMo1722	316S16	Z6CND17.11	X5CrNiMo17 12
	13	316LN	1.4429	X2CrNiMoN17133	-	Z2CND17.13	-
	13	316L	1.4435	X2CrNiMo18143	316S12	Z2CND17.13	X2CrNiMo17 13
	13	317L	1.4438	X2CrNiMo17133	317S12	Z2CND19.15	X2CrNiMo18 16
	13	329	1.4460	X8CrNiMo275	-	-	-
	12	321	1.4541	X6CrNiTi18 10	2337	Z6CNT18.10	X6CrNiTi18 11
	12	347	1.4550	X6CrNiNb18 10	347S17	Z6CNNb18.10	X6CrNiNb18 11
	12	316Ti	1.4571	X6CrNiMoTi17122	320S17	Z6NDT1 7.12	X6CrNiMoTi17 12
	12	-	1.4581	G-X5CrNiMoNb18 10	318C17	Z4CNDNb18 12M	XG8CrNiMo18 11
	12	318	1.4583	X10CrNiMoNb18 12	-	Z6CNDNb17 13B	X6CrNiMoNb17 13
	13	309	1.4828	X15CrNiSi20 12	309S24	Z15CNS20.12	-
	13	310S	1.4845	X12CrNi25 21	310S24	Z12CN25 20	X6CrNi25 20
	13	330	1.4864	X12NiCr36 16	-	Z12NCS35.16	-
	13	-	1.4865	G-X40NiCrSi38 18	330C11	-	XG50NiCr39 19
	13	EV8	1.4871	X53CrMnNiN2 19	349S54;321S12	Z52CMN21.09	X53CrMnNiN219
	13	321	1.4878	X12CrNiTi18 9	321S320	Z6CNT18.12B	X6CrNiTi1811
	30	No 20 B	0.6010	GG10	-	Ft 10 D	-
	30	No 25 B	0.6015	GG15	Grade 150	Ft 15 D	-
	30	No 30 B	0.6020	GG20	Grade 220	Ft 20 D	-
	29	No 35 B; No 40 B	0.6025	GG25	Grade 260	Ft 25 D	-
	29	No 45 B	0.6030	GG30	Grade 300	R 30 D	-
	29	No 50 B	0.6035	GG35	Grade 350	Ft 35 D	-
	29	No 55 B	0.6040	GG40	Grade 400	Ft 40 D	-
	29	ASTM	-	DIN4694	3468: 1974	-	-
	29	A436-72	-	GGL-		A32-301	
	29	Type 2	-	NiCr20 2	L-NiCr 20 2	L-NC 20 2	-
	30	60-40-18	0.7040	GGG 40	SNG 420/12	FCS 400-12	GS 370-17
	30	-	0.7043	GGG 40.3	SNG 370/17	FGS 370-17	-
	30	-	0.7033	GGG 35.3	-	-	-
	31	80-55-06	0.7050	GGG 50	SNG 500/7	FGS 500-7	GS 500
	31	-	0.7060	GGG 60	SNG 600/3	FGS 600-3	-
	31	100-70-03	0.7070	GGG70	SNG 700/2	FGS 700-2	GS 700-2
	31	-	-	DIN 1694	-	L-NM 13 7	-
	31	Type 2	-	GGG NiMn 13 7	L-NiMn 13 7	L-NC 20 2	-
	31	-	-	GGG NiCr 20 2	L-NC 20 2	-	-
	28	32510	0.8135	GTS-35	B 340/12	MN 35-10	-
	29	40010	0.8145	GTS-45	P 440/7	-	-
	29	50005	0.8155	GTS-55	P 510/4	MP 50-5	-
	29	70003	0.8165	GTS-65	P 570/3	MP 60-3	-
	29	80002	0.8170	GTS-70	P690/2	MP 70-2	-
<b>N</b> <b>Non-Ferrous Metals</b>	36	-	-	G-AlSi12	LM20	-	-
	36	-	-	GD-AlSi12	-	-	-
	36	-	-	GD-AlSi8Cu3	LM24	-	-
	36	-	-	G-AlSi10Mg	LM9	-	-
	36	-	-	G-AlSi12	LM6	-	-
	19	330	1.4864	X12NiCrSi	-	Z12NCS35.16	-
<b>S</b> <b>Heat Resistant Material</b>	19	-	1.4865	G-X40NiCrSi	330C11	-	XG50NiCr
	19	5390 A	2.4603	-	-	NC22FeD	-
	19	-	2.4630	NiCr20Ti	HR5, 203-4	NC20T	-
	19	5666	2.4856	NiCr22Mo9N	-	NC22FeDNB	-
	19	5537 C	LW2.496	CoCr20W15	-	KC20WN	-
	19	4676	2.4375	NiCu30Al	3072-76	-	-
	19	-	2.4631	NiCr20TiAk	Hr40, 601	NC20TA	-
	19	AMS 5399	2.4973	NiCr19Co11	-	NC19KDT	-
	21	5391	LW2.467	S-NiCr13A16	3146-3	NC12AD	-
	21	5660	LW2.466	NiCr19Fe19	HR8	NC19FeNb	-
	21	5383	LW2.466	NiCr19Fe19	-	NC20K14	-
	21	-	-	CoCr22W14	-	KC22WN	-
	21	-	LW2.467	NiCo15Cr10	-	-	-
	23	-	-	TiAl14Mo4Sn4Si0.5	-	-	-
	23	-	-	TiAl5Sn2.5	TA14/17	T-A5E	-
	23	-	-	TiAl6V4	TA10-13/TA2	T-A6V	-
	23	-	-	TiAl6V4EL1	TA11	-	-

Sweden SS	Japan JIS	Russia GOST	Spain UNE	Vardex No.	
2301	SUS403	08Ch13	F.3110-X6Cr13 ; F.8401-AM-X12Cr13	12	
-	-	08Ch13	F.3110-X6Cr13 ; F.8401-AM-X12Cr13	12	
2302	SUS410	12Ch13 ; 15Ch13L	F.3401-X10Cr13	12	
2320	SUS430	12Ch17	F.3113-X6Cr17	12	
-	SCS2	20Ch13L	-	12	
2304	SUS420J2	40Ch13	F.3405-X4Cr13	12	
2321	SUS431	20Ch17N2	F.3427-X19CrNi172	12	
2383	SUS430F	-	F.3117-X10CrS17 ; F.3413-X14CrMoS17	12	
2325	SUS434	-	F.3116-X6CrMo171	12	
-	SCS5	-	-	12	
-	SCS14	07Ch18N10G2S2M2L	F.8414-AM-X7CrNiMo2010	12	
-	SUH1	40Ch9S2	F.3220-X4CrSi109-03	12	
-	SUS405	10Ch13SJU	F.3152-X10CrAl13	12	
-	SUH21	15Ch18SJU	F.3153-X10CrAl18	11	
-	SUH4	-	F.3222-X80CrSiNi20-02	12	
2322	SUH446	-	F.3154-X10CrAl24	11	
2332	SUS304	08Ch18N10	F.3551-X5CrNi1811; F.3541-X5CrNi1810 ; F.3504-X6CrNi1910	13	
2346	SUS303	-	F.3508-X10CrNiS18-09	13	
2352	SCS19; SUS304L	03Ch18N11	F.3503-X2CrNi1810	13	
2333	SCS13	07Ch18N9L	-	13	
2331	SUS301	-	F.3517-X12CrNi177	13	
2371	SUS304LN	-	F.3541-X2CrNiN1810	13	
2347	SUS316	-	F.3534-X5CrNiMo17122	13	
2375	SUS316LN	-	F.3543-X2CrNiMoN17133	13	
2353	SCS16	03Ch17N14M3	F.3533-X2CrNiMo17132	13	
2367	SUS317L	-	F.3539-X2CrNiMo18164	13	
2324	SUS329L;	-	F.3309-X8CrNiMo27-05; F.3552-X8CrNiMo266	13	
58B	SUS321	06Ch18N10T; 08Ch18N10T; 09Ch18N10T; 12Ch18N10T	F.3523-X6CrNiTi1810	12	
2338	SUS347	08Ch18N12B	F.3524-X6CrNiNb1810	12	
2350	-	10Ch17N13M2T	F.3535-X6CrNiMoTi17122	12	
-	SCS22	-	-	12	
-	-	-	-	12	
-	SUH309	20Ch20N14S2	F.3312-X15CrNiSi20-12	13	
2361	SUH310	20Ch23N18	-	13	
-	SUH330	-	F.3313-X12CrNiSi36-16	13	
-	SCH15	-	-	13	
-	SUH35,SUH36;SU321	55Ch20G9AN4	F.3217-X53CrMnNiN21-09	13	
-	-	-	-	13	
01 10	-	C410	FG10	30	
01 15	-	C415	FG15	30	
01 20	-	C420	FG20	30	
01 25	-	C425	FG25	29	
01 30	-	C430	FG30	29	
01 35	-	C435	FG35	29	
01 40	-	C440	-	29	
MB	-	-	-	29	
ISO-215	-	-	-	29	
523	-	-	-	29	
07 17-02	-	VC42-12	-	30	
07 17-12	-	VC42-12	-	30	
07 17-15	-	-	-	30	
07 27-02	-	VC50-2	-	31	
07 32-03	-	VC60-2	-	31	
07 37-01	-	VC70-2	-	31	
07 72	-	-	-	31	
07 76	-	-	-	31	
-	-	-	-	31	
08 15	-	-	-	28	
08 52	-	-	-	29	
08 54	-	-	-	29	
08 58	-	-	-	29	
08 62	-	-	-	29	
4260	-	-	-	36	
4247	-	-	-	36	
4250	-	-	-	36	
4253	-	-	-	36	
4261	-	-	-	36	
-	SUH 330	-	F.3313-X12CrNiSi36-16	19	
-	SCH 15	-	-	19	
-	-	-	-	19	
-	-	-	-	19	
-	-	-	-	19	
-	-	-	-	19	
-	-	-	-	19	
-	-	-	-	21	
-	-	-	-	21	
-	-	-	-	21	
-	-	-	-	21	
-	-	-	-	23	
-	-	-	-	23	
-	-	-	-	23	
-	-	-	-	23	

## Troubleshooting

Problem	Possible Cause	Solution
	<b>Increased flank wear</b> Cutting speed too high -----> Depth of cut too low/ too many passes -----> Unsuitable carbide grade -----> Insufficient cooling ----->	Reduce cutting speed / use coated insert Increase the depth of cut per pass Use a coated carbide grade Increase coolant flow rate
	<b>Uneven cutting edge wear</b> $\backslash\{2063\}$ helix angle -----> Wrong infeed method ----->	Choose the correct anvil Use the alternating flank infeed method
	<b>Extreme plastic deformation</b> Depth of cut too large -----> Insufficient cooling -----> Cutting speed too high -----> Unsuitable carbide grade -----> Nose radius too small ----->	Decrease depth of cut/ increase number of passes Increase coolant flow rate Reduce cutting speed Use a tougher carbide Use an insert with a larger radius, if possible
	<b>Cutting edge breakage</b> Depth of cut too large -----> Extreme plastic deformation -----> Insufficient cooling -----> Unsuitable carbide grade -----> Instability ----->	Decrease depth of cut/ increase number of passes Use a tougher carbide Increase flow rate and/ or correct flow direction Use a tougher carbide Check stability of the system
	<b>Built-up edge</b> Incorrect cutting speed -----> Unsuitable carbide grade ----->	Change the cutting speed Use a coated carbide
	<b>Thread profile is too shallow</b> The tool is not at the workpiece axis height -----> Insert is not machining the thread crest -----> Worn insert ----->	Change tool height Measure the workpiece diameter Change the cutting edge sooner
	<b>Poor surface quality</b> Cutting speed too low -----> Wrong anvil -----> Flank infeed method is not appropriate ----->	Increase cutting speed Choose correct anvil Use the alternate flank or radial infeed method

# VRX

Multipurpose Premium Grade

Multipurpose Thread Turning Grade for Stronger  
Wear Resistance and Improved Productivity

## Redefining the Threading Benchmark

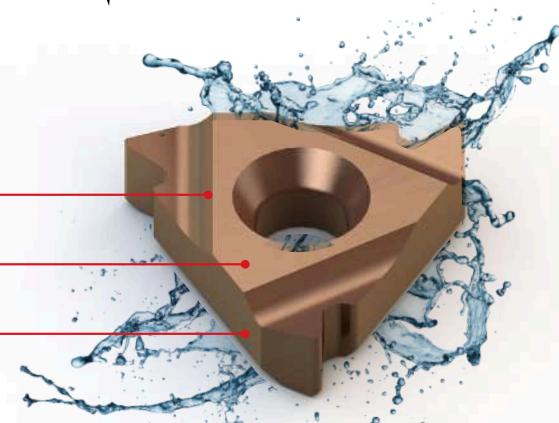
Thread Turning  
Technical Data



AlTiN Alloyed PVD Coating

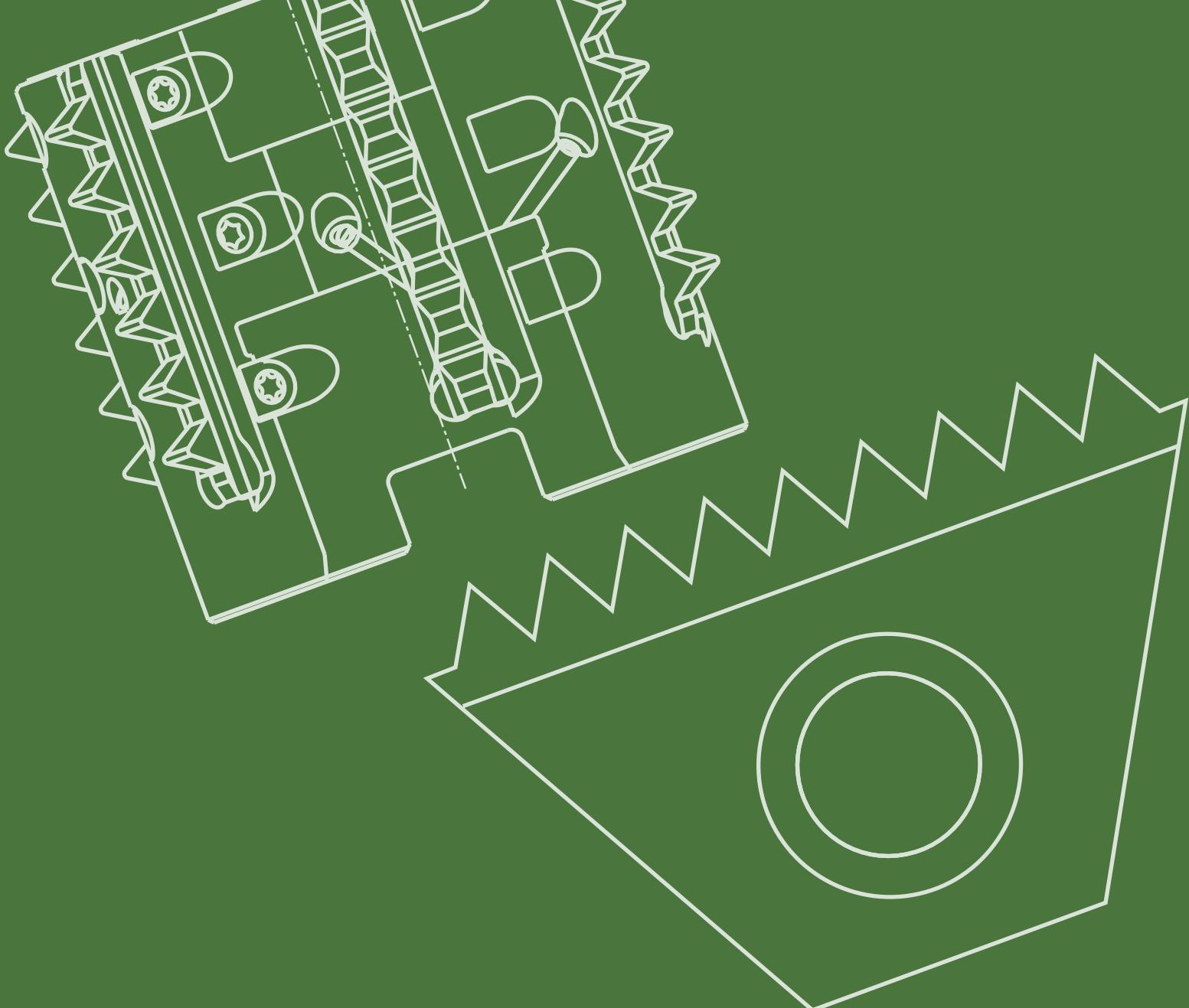
High Oxidation Temperature

Submicron Substrate



See page 206 for more information.





# THREAD MILLING

■ MiTM .....	233
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■ TMSD .....	297
■ TM Solid .....	333
■ Technical Data .....	377

## Thread Milling Systems

### MiTM Multi-Flute Indexable Thread Mill Inserts

#### MiTM19 (A) For Small Bores



Standard



Conical

#### MiTM24 (M) For Medium Bores



Standard



Conical

#### MiTM25 (S) For Standard Applications



Standard



Conical



Shell Mill



Shell Mill Conical

#### MiTM40 (L) For Long Threads



Standard



Shell Mill



Shell Mill Conical

#### MiTM41 (B) For Large Pitches



Standard



Shell Mill

## Standard

### Standard / TMF



Mini TMMC



Standard TMC



Coarse 124/...



TMLC



TM2C



TMOC



TM Shell Mill

### Coarse Pitch



Coarse 124/...  
(Standard TMC Style)



Coarse 124/...  
(Mini TMMC Style)

### Conical



TMNC

### TMSC - Single Point



TMSC

### TMVC - Single Point Vertical



TMVC

## Thread Milling Systems

### TMSD Thread Milling for Deep Holes

#### U Style For Large Pitches



#### L Style (Mini L) For Small Bores and Short L2



#### Vertical Style (7V, 9V, 11V)



#### L Style (3/8" L) For Large Trapezoid Profiles and ABUT



#### A Style For Shorter L2



## TM Solid Solid Carbide Thread Milling Tools

#### Helical Flutes with Coolant



#### Helical Flutes



#### Miniature Tools



#### Straight Flutes



#### Long Tools

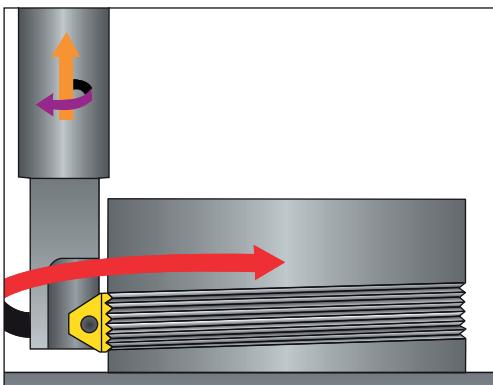


## Thread Milling Methods

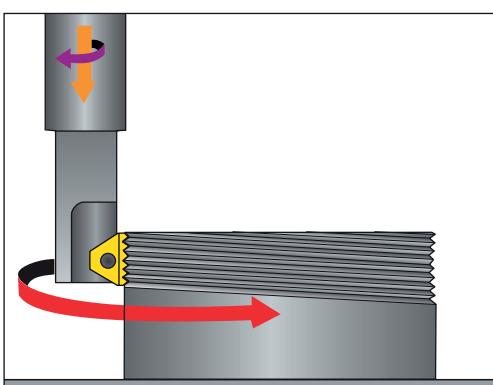
(for RH Tools only)

### External

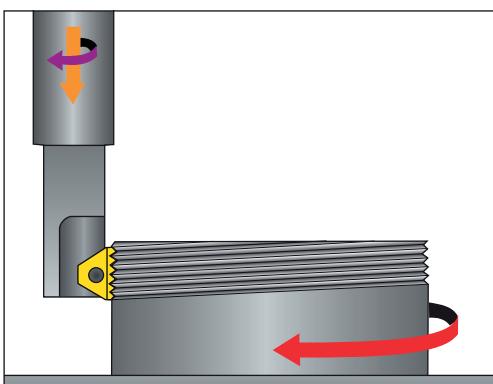
Right Hand Thread - Conventional Milling



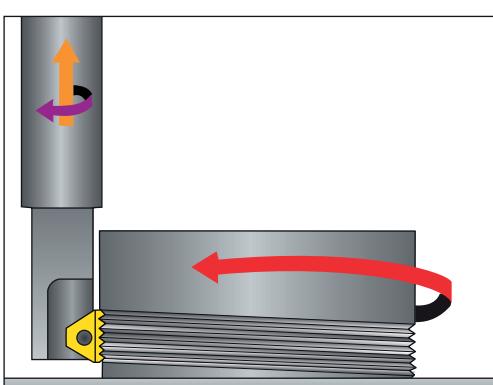
Left Hand Thread - Conventional Milling



Right Hand Thread - Climb Milling

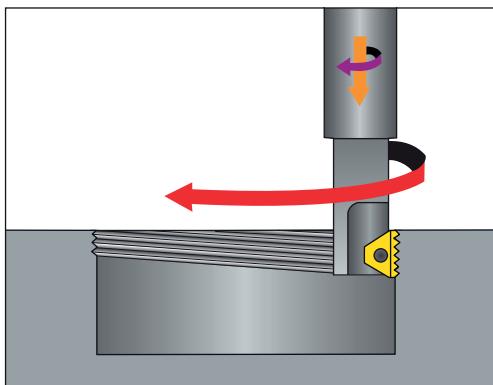


Left Hand Thread - Climb Milling

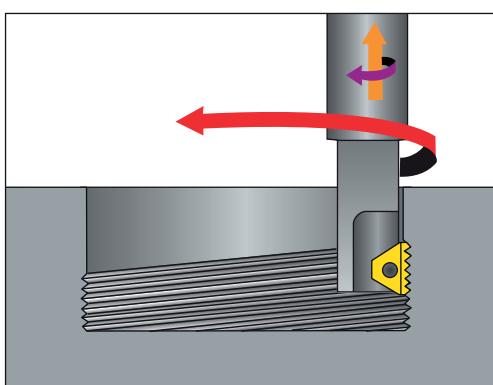


### Internal

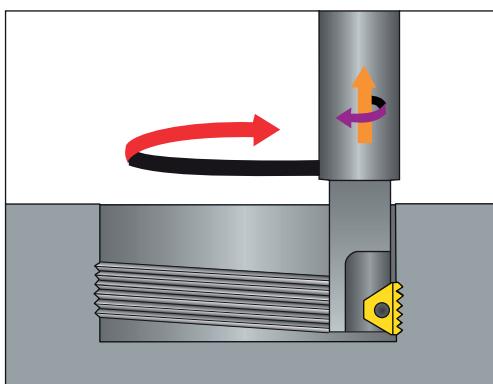
Right Hand Thread - Conventional Milling



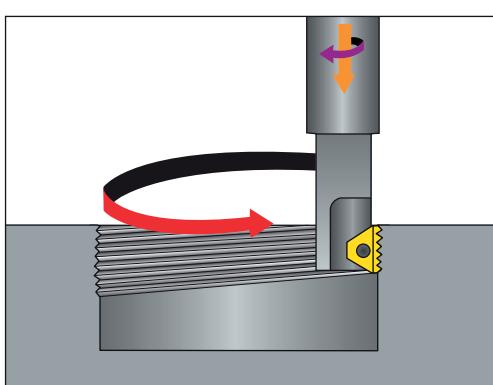
Left Hand Thread - Conventional Milling



Right Hand Thread - Climb Milling



Left Hand Thread - Climb Milling



## The Thread Milling Advantages

- Enables machining of large work pieces which cannot be easily mounted on a lathe
- Easily machine non-rotatable and asymmetrical parts
- Complete operation in one clamping
- Threading of large diameters requires less power than threading using taps
- No upper limits to bore diameter
- Chips are short
- Blind holes without a thread relief groove can be machined
- Thread relief grooves are unnecessary
- One holder can be used for both internal and external threads
- One tool can be used for both right hand and left hand thread
- Inventory can be reduced to a minimum as small range of tooling covers a wide range of thread diameters
- Interchangeable inserts
- Suitable for machining of hard materials
- Threads have a high surface finish
- Allows for correction of tool diameter and length
- Interrupted cuts are easily machined
- One tool for a wide range of materials
- A better thread quality in soft materials where taps normally tear the material
- Short machining time due to high cutting speed and rapid feed rates
- Small cutting forces allow machining of parts with thin walls







**MiTM**

**Super Fast Thread Milling System**

**Inserts | Toolholders**

# Vardex Ordering Code System

## MiTM Inserts

R	25	I	1.00	ISO	TM	VBX						
1	2	3	4	5	6	7						
1 - Product Line	2 - Insert Style	3 - Type of Insert	4 - Pitch	5 - Standard	6 - System	7 - Carbide Grade						
R - MiTM line	19, 24, 25, 40, 41	I - Internal E - External EI - External+Internal NC - Plug	0.5-6.0 mm 32-4 TPI	ISO - ISO Metric UN - American UN W - BSW, BSP NPT - NPT NPTF - NPTF BSPT - BSPT	TM	VBX VTX						

MiTM

## MiTM Holders

R	TM	C	25	17	-	26	S	2				
1	2	3	4	5		6	7	8				
1 - Product Line	2 - Holder Type	3 - Cooling	4 - Shank Dia. [mm]	5 - Cutting Dia. [mm]								
R - MiTM line BR - MiTM with Anti-vibration System	TM - Standard Holder TMN - Conical Holder	C - Coolant Channel	12, 20, 25, 32	10 - 36								
6 - Tool Overhang [mm]	7 - Insert Style	8 - No. of Flutes										
19 - 80	A - 19 M - 24 S - 25 L - 40 B - 41	1 - 5										

## MiTM Shell Mill

R	TM	C	-	D36	-	16	-	25S	5			
1	2	3		4		5		6	7			
1 - Product Line	2 - Holder Type	3 - Cooling	4 - Cutting Dia. [mm]	5 - Drive Hole Dia. [mm]								
R - MiTM line	TM - Standard Holder TMN - Conical Holder	C - Coolant Channel	36 - 58	16, 22, 27								
6 - Insert Style	7 - No. of Flutes											
25S 40L 41B	5 - 8											

# MiTM

The VARDEX Multi-flute Indexable Thread Milling (MiTM) system for fast machining, reduces cycle times when machining threads with long inserts. Nickel coating for all MiTM toolholders provides better anti-rust protection.

## MiTM 19 (A)

For Small Bores



No. of Flutes (Z) 1  
Cutting Dia. (D2) 10.0-11.75  
Tool Overhang (L1) 20.0-25.2

No. of Flutes (Z) 1  
Cutting Dia. (D2) 10.2  
Tool Overhang (L1) 19.0

## MiTM 24 (M)

For Medium Bores



No. of Flutes (Z) 1-2  
Cutting Dia. (D2) 13.6-16  
Tool Overhang (L1) 26-36

No. of Flutes (Z) 1  
Cutting Dia. (D2) 13.9  
Tool Overhang (L1) 26

## MiTM 25 (S)

For Standard Applications



No. of Flutes (Z) 2-5  
Cutting Dia. (D2) 17-30  
Tool Overhang (L1) 26-80

No. of Flutes (Z) 2-4  
Cutting Dia. (D2) 17-28  
Tool Overhang (L1) 26-43



No. of Flutes (Z) 5-8  
Cutting Dia. (D2) 36-52  
Tool Overhang (L1) max.200

No. of Flutes (Z) 5  
Cutting Dia. (D2) 36  
Tool Overhang (L1) max.200

## MiTM 40 (L)

For Long Threads



No. of Flutes (Z) 3-4  
Cutting Dia. (D2) 22-30  
Tool Overhang (L1) 43-80



No. of Flutes (Z) 6-8  
Cutting Dia. (D2) 44-52  
Tool Overhang (L1) max.200



No. of Flutes (Z) 6  
Cutting Dia. (D2) 45  
Tool Overhang (L1) max.200

## MiTM 41 (B)

For Large Pitches

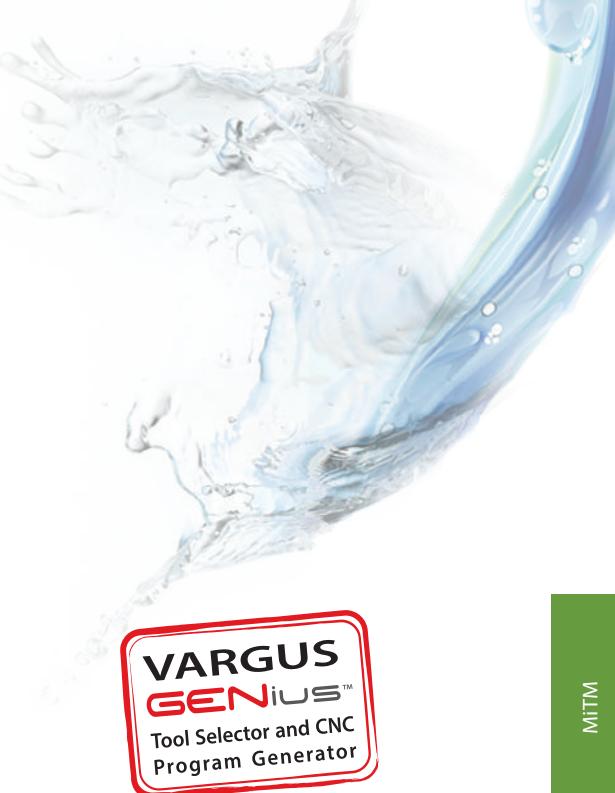


No. of Flutes (Z) 1-5  
Cutting Dia. (D2) 24.5-36  
Tool Overhang (L1) 43-65



No. of Flutes (Z) 5-6  
Cutting Dia. (D2) 48-58  
Tool Overhang (L1) max.200

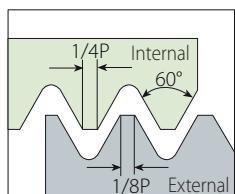
MiTM



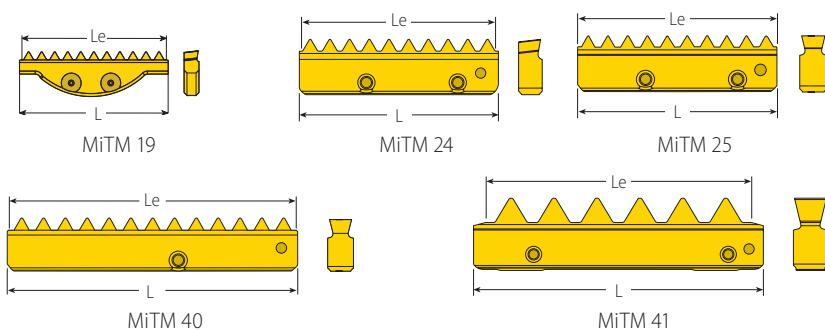
**VARGUS**  
**GENius™**  
Tool Selector and CNC  
Program Generator

# ISO Metric

## External / Internal



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



## Standard MiTM

Insert Style	Pitch	Ordering Code		Cutting Edge		Teeth	Toolholder
		L	mm	External	Internal	Le	Zt
19	0.5		R19I0.50ISOTM...		1	20.0	40
	0.75		R19I0.75ISOTM...		1	20.0	27
	1.0		R19I1.00ISOTM...		1	20.0	20
	1.25		R19I1.25ISOTM...		1	20.0	16
	1.5		R19I1.50ISOTM...		1	19.5	13
	1.75		R19I1.75ISOTM...		1	19.25	11
	2.0		R19I2.00ISOTM...		1	20.0	10
24	0.5		R24I0.50ISOTM...		1	24.5	49
	0.75		R24I0.75ISOTM...		1	24.75	33
	1.0		R24I1.00ISOTM...		1	24.0	24
	1.25		R24I1.25ISOTM...		1	25.0	20
	1.5		R24I1.50ISOTM...		1	24.0	16
	1.75		R24I1.75ISOTM...		1	24.5	14
	2.0		R24I2.00ISOTM...		1	24.0	12
25	2.5		R24I2.50ISOTM...		1	25.0	10
	1.0	R25E1.00ISOTM...	R25I1.00ISOTM...	2	24.0	24	
	1.25	R25E1.25ISOTM...	R25I1.25ISOTM...	2	23.75	19	
	1.5	R25E1.50ISOTM...	R25I1.50ISOTM...	2	24.0	16	(B)RTMC....S
	2.0	R25E2.00ISOTM...	R25I2.00ISOTM...	2	24.0	12	
	2.5	R25E2.50ISOTM...	R25I2.50ISOTM...	2	25.0	10	
	3.0	*R25E3.00ISOTM...	*R25I3.00ISOTM...	2	24.0	8	
40	1.0		R40I1.00ISOTM...		2	39.0	39
	1.5		R40I1.50ISOTM...		2	39.0	26
	2.0		R40I2.00ISOTM...		2	38.0	19
	2.5		R40I2.50ISOTM...		2	37.5	15
	3.0		R40I3.00ISOTM...		2	39.0	13
	3.0	R41E3.00ISOTM...	R41I3.00ISOTM...	2	39.0	13	
	3.5	R41E3.50ISOTM...	R41I3.50ISOTM...	2	38.5	11	
41	4.0	R41E4.00ISOTM...	R41I4.00ISOTM...	2	40.0	10	
	4.5	R41E4.50ISOTM...	R41I4.50ISOTM...	2	40.5	9	RTMC....B
	5.0	R41E5.00ISOTM...	R41I5.00ISOTM...	2	40.0	8	
	5.5	R41E5.50ISOTM...	R41I5.50ISOTM...	2	38.5	7	
	6.0	R41E6.00ISOTM...	R41I6.00ISOTM...	2	36.0	6	

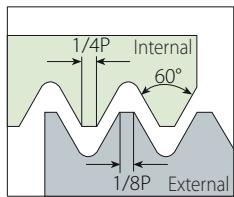
\* 3.0 ISO inserts do not fit into toolholder RTMC2517...  
For external insert 3.0 ISO use for CNC program (D2 + 0.5mm).

MiTM inserts 25, 40 and 41 are offered with 2 cutting edges. In case of chip flow difficulty, inserts with a single cutting edge can be ordered by request. Example: R25I2.00ISOTM(S)...

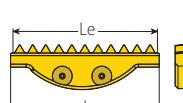


## American UN - UNC, UNF, UNEF, UNS

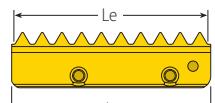
### External / Internal



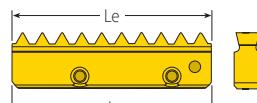
Defined by: ANSI B1.1:74  
Tolerance class: 2A/2B



MiTM 19



MiTM 24



MiTM 25

### Standard MiTM



Insert Style	Pitch	Ordering Code		Cutting Edge		Teeth	Toolholder		
		L	TPI	External	Internal	Le	Zt		
19	32			R19I32UNTM...		1	19.84	25	RTMC....A
	28			R19I28UNTM...		1	19.96	22	
	27			R19I27UNTM...		1	19.76	21	
	24			R19I24UNTM...		1	20.11	19	
	20			R19I20UNTM...		1	19.05	15	
	18			R19I18UNTM...		1	19.76	14	
	16			R19I16UNTM...		1	19.05	12	
	14			R19I14UNTM...		1	19.96	11	
	13			R19I13UNTM...		1	19.54	10	
	12			R19I12UNTM...		1	19.05	9	
24	32			R24I32UNTM...		1	24.61	31	RTMC....M
	28			R24I28UNTM...		1	24.49	27	
	24			R24I24UNTM...		1	24.34	23	
	20			R24I20UNTM...		1	24.13	19	
	18			R24I18UNTM...		1	23.99	17	
	16			R24I16UNTM...		1	23.81	15	
	14			R24I14UNTM...		1	23.59	13	
	12			R24I12UNTM...		1	23.28	11	
	10			R24I10UNTM...		1	22.86	9	
	20	R25E20UNTM...		R25I20UNTM...		2	24.13	19	
25	18	R25E18UNTM...		R25I18UNTM...		2	23.99	17	(B)RTMC....S
	16	R25E16UNTM...		R25I16UNTM...		2	23.81	15	
	14	R25E14UNTM...		R25I14UNTM...		2	23.58	13	
	12	R25E12UNTM...		R25I12UNTM...		2	23.28	11	
	10	R25E10UNTM...		R25I10UNTM...		2	22.86	9	
	9	*R25E9UNTM...		*R25I9UNTM...		2	22.58	8	
	8	*R25E8UNTM...		*R25I8UNTM...		2	22.22	7	

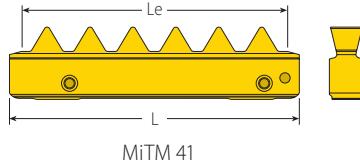
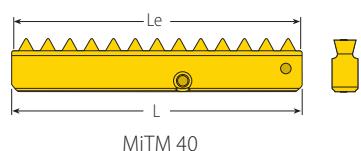
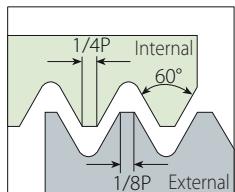
\* 8 UN & 9 UN inserts do not fit into toolholder RTMC2517....  
For external insert 8 UN use for CNC program (D2 + 0.5mm).

MiTM inserts 25, 40 and 41 are offered with 2 cutting edges. In case of chip flow difficulty, inserts with a single cutting edge can be ordered by request. Example: R25I20UNTM(S)...



## American UN - UNC, UNF, UNEF, UNS (con't)

### External / Internal



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

MiTM

### Standard MiTM

Insert Style	Pitch	Ordering Code		Cutting Edge		Teeth	Toolholder		
		L	TPI	External	Internal	Le	Zt		
40	20			R40I20UNTM...		2	39.37	31	(B)RTMC....L
	18			R40I18UNTM...		2	39.51	28	
	16			R40I16UNTM...		2	39.69	25	
	14			R40I14UNTM...		2	39.91	22	
	12			R40I12UNTM...		2	38.10	18	
	10			R40I10UNTM...		2	38.10	15	
	9			R40I9UNTM...		2	39.51	14	
41	8			R40I8UNTM...		2	38.10	12	RTMC....B
	8	R41E8UNTM...	R41I8UNTM...			2	38.10	12	
	7	R41E7UNTM...	R41I7UNTM...			2	39.91	11	
	6	R41E6UNTM...	R41I6UNTM...			2	38.10	9	
	5	R41E5UNTM...	R41I5UNTM...			2	35.56	7	
	4.5	R41E4.5UNTM...	R41I4.5UNTM...			2	39.51	7	
	4	R41E4UNTM...	R41I4UNTM...			2	38.10	6	



MiTM inserts 25, 40 and 41 are offered with 2 cutting edges. In case of chip flow difficulty, inserts with a single cutting edge can be ordered by request. Example: R25I20UNTM(S)...



## Whitworth for BSF, BSP (G)

**External / Internal**

Defined by: B.S.84:1956, DIN 259,  
DIN ISO228/1:1982  
Tolerance class: Medium Class A

MiTM 19      MiTM 24      MiTM 25

MiTM 40      MiTM 41

### Standard MiTM

	Insert Style	Pitch	Ordering Code		Cutting Edge		Teeth	Toolholder
			L	TPI	External+ Internal	Internal		
	19	19	R19EI19WTM...			1	20.05	15
		16	R19EI16WTM...			1	19.05	12
		14	R19EI14WTM...			1	19.96	11
	24	19	R24EI19WTM...			1	24.06	18
		14	R24EI14WTM...			1	23.59	13
		12	R24EI12WTM...			1	23.28	11
	25	16	R25EI16WTM...			2	23.81	15
		14	R25EI14WTM...			2	23.58	13
		12	R25EI12WTM...			2	23.28	11
	40	11	R25EI11WTM...			2	23.09	10
		16	R40EI16WTM...			2	39.69	25
		14	R40EI14WTM...			2	39.91	22
	41	12	R40EI12WTM...			2	38.10	18
		11	R40EI11WTM...			2	39.25	17
		8			R41I8WTM...	2	38.10	12
	41	7			R41I7WTM...	2	39.91	11
		6			R41I6WTM...	2	38.10	9

MiTM inserts 25, 40 and 41 are offered with 2 cutting edges. In case of chip flow difficulty, inserts with a single cutting edge can be ordered by request. Example: R25EI16WTM(S)...



## NPT

**External / Internal**

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

MiTM 19      MiTM 24      MiTM 25

MiTM 40      MiTM 41

MiTM

### Standard MiTM

Insert Style	Pitch	Ordering Code	Cutting Edge		Teeth	Toolholder
			L	TPI	Le	Zt
19	18	R19EI18NPT-TM...	1	19.76	14	RTMNC....A
24	18	R24EI18NPT-TM...	1	23.99	17	RTMNC....M
	14	R25EI14NPT-TM...	1	23.58	13	RTMNC....S
25	11.5	R25EI11.5NPT-TM...	1	24.30	11	
	8	R25EI8NPT-TM...	1	22.22	7	RTMNC-D36-16-25S
40	11.5	R40EI11.5NPT-TM...	1	37.55	17	RTMNC-D45-22-40L6
	8	R40EI8NPT-TM...	1	38.10	12	
41	8	R41EI8NPT-TM...	1	38.10	12	RTMC....B

## NPTF

**External / Internal**

Defined by: ANSI B1.20.3-1976  
Tolerance class: Standard NPTF

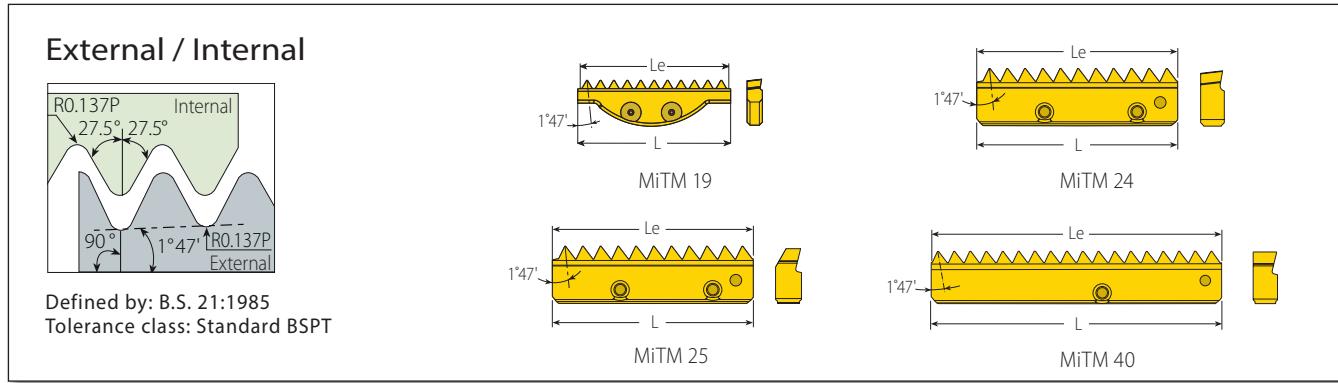
MiTM 19      MiTM 24      MiTM 25

MiTM 40      MiTM 41

### Standard MiTM

Insert Style	Pitch	Ordering Code	Cutting Edge		Teeth	Toolholder
			L	TPI	Le	Zt
19	18	R19EI18NPTFTM...	1	19.76	14	RTMNC....A
24	18	R24EI18NPTFTM...	1	23.99	17	RTMNC....M
	14	R25EI14NPTFTM...	1	23.58	13	RTMNC....S
25	11.5	R25EI11.5NPTFTM...	1	24.30	11	
	8	R25EI8NPTFTM...	1	22.22	7	RTMNC-D36-16-25S
40	11.5	R40EI11.5NPTFTM...	1	37.55	17	RTMNC-D45-22-40L6
	8	R40EI8NPTFTM...	1	38.10	12	
41	8	R41EI8NPTFTM...	1	38.10	12	RTMC....B

## BSPT



## Standard MiTM



Insert Style	Pitch	Ordering Code	Cutting Edge	Teeth	Toolholder
L	TPI	External+ Internal	Le	Zt	
19	19	R19EI19BSPT-TM...	1	20.05	15 RTMNC...A
24	19	R24EI19BSPT-TM...	1	24.06	18 RTMNC 2014-26M1
25	14	R25EI14BSPT-TM...	1	23.58	13 RTMNC...S
25	11	R25EI11BSPT-TM...	1	23.09	10 RTMNC...S
40	11	R40EI11BSPT-TM...	1	39.25	17 RTMNC-D45-22-40L6

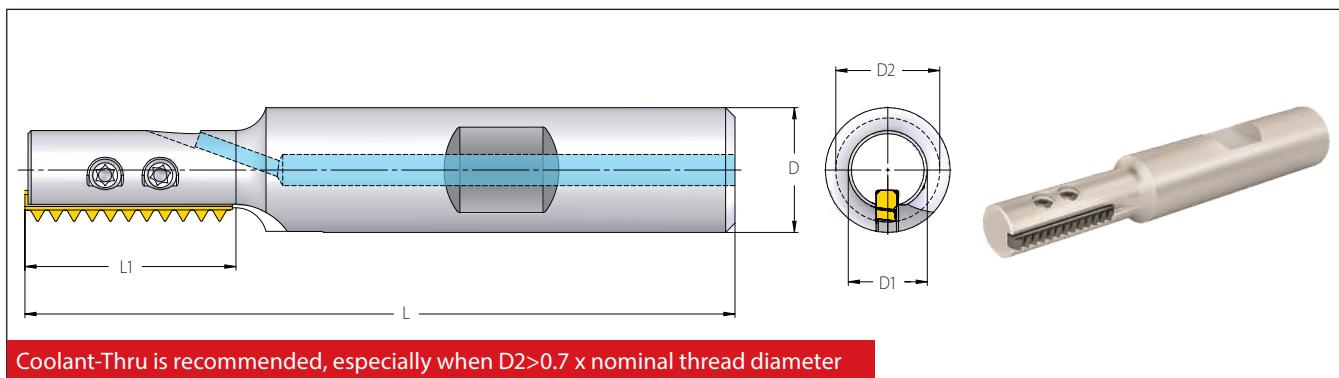
## Plug Insert



Insert Style	Ordering Code	Teeth	Toolholder
L	External+ Internal	Zt	
24	R24NC		RTMC....M
25	R25NC		(B)RTMC....S RTMNC....S
40	R40NC	No Teeth	(B)RTMC....L RTMNC....L
41	R41NC		RTMC....B

Fill unused toolholder pockets with plug inserts (R.NC).  
This assures balance and prevents instability and chips from packing into empty pockets.

## Standard Toolholders (MiTM 19)



MiTM

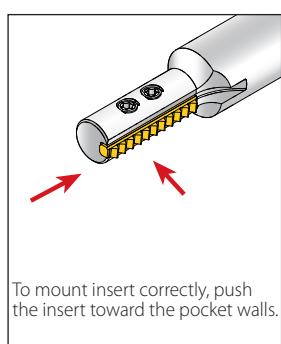
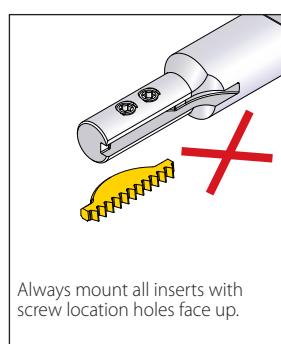
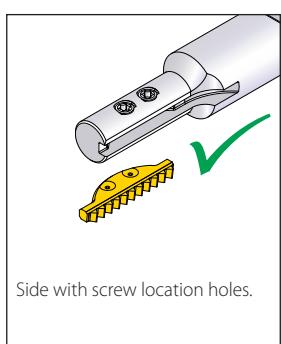
### RTMC - for Standard Threads

#### Spare Parts

Insert Style	Ordering Code	Dimensions mm				No. of Flutes		
		L	L1	D	D1			
19	RTMC1210-20A1	68	20	12	7.5	10	1	
	RTMC1212-25A1	73.5	25.2	12	8.7	11.75	1	

### Standard Thread Application by Toolholder

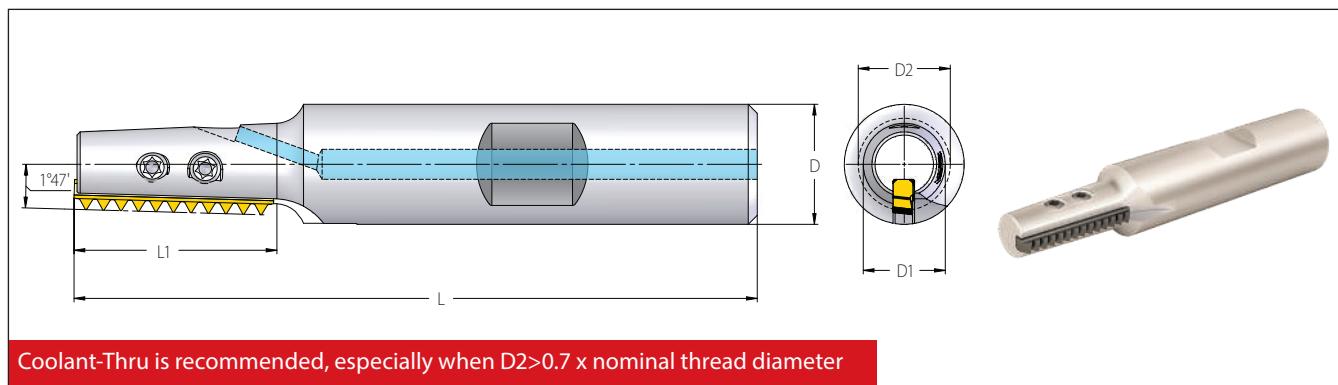
Toolholder	Min. Thread Dia.							
	D2 (mm)	ISO (coarse)	ISO (fine)	UNC	UN/UNF/UNEF/UNS	BSF	BSP(G)	
RTMC1210-20A1	10	M12x1.75	M11x0.5; M11x0.75; M11.5x1; M12x1.25; M12x1.5	1/2-13	7/16-32UN; 7/16-28UNEF; 7/16-27UNS; 1/2-24UNS; 1/2-20UNF; 1/2-18UNS; 1/2-16UN; 1/2-14UNS	1/2-16	1/4-19	
RTMC1212-25A1	11.75	M14x2.0; M16x2.0	M12.5x0.5; M13x0.75; M13x1; M13.5x1.25; M14x1.5; M14x1.75	9/16-12	1/2-32UN; 9/16-28UNS; 9/16-27UNS; 9/16-24UNEF; 9/16-20UN; 9/16-18UNF; 9/16-16UN; 9/16-14UNS;	5/8-14	1/4-14	



#### 2 Step Clamping System



## Conical Toolholders (MiTM 19)



### RTMNC - for Conical Threads

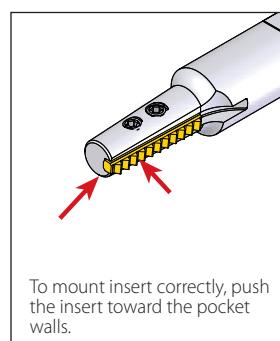
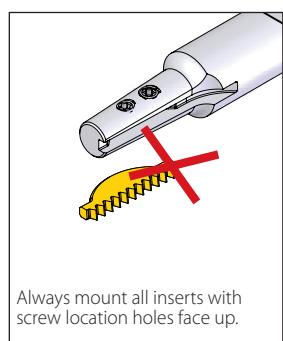
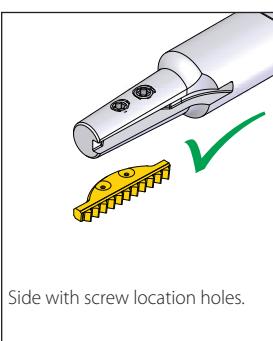
Insert Style	Ordering Code	Dimensions mm					No. of Flutes	Spare Parts	
		L	L1	D	D1	D2		Location Screw x2	Torx+ Screwdriver
19	RTMNC1210-19A1	66.5	19	12	8	10.6	1	SLD3IP6 (M3x0.5)	KIP6 Use the included Vardex Torx+ screwdriver only. Recommended max. torque 1.2 Nxm

MiTm

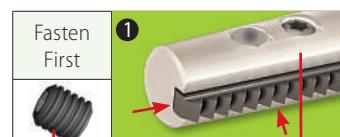
### Conical Thread Application by Toolholder

Toolholder				
D2 (mm)	NPT	NPTF	BSPT	
RTMNC1210-19A1	10.6	1/4-18* 3/8-18	1/4-18* 3/8-18	1/4-19* 3/8-19

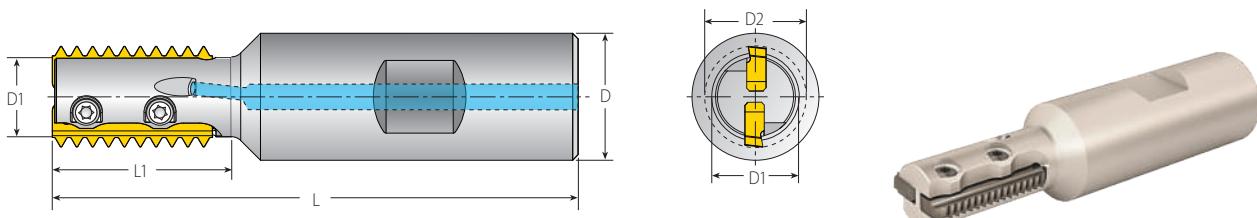
\* Using MiTM 19 tools the maximum thread length is 10.5mm.



### 2 Step Clamping System



## Standard Toolholders (MiTM 24)



Coolant-Thru is recommended, especially when  $D2 > 0.7 \times$  nominal thread diameter

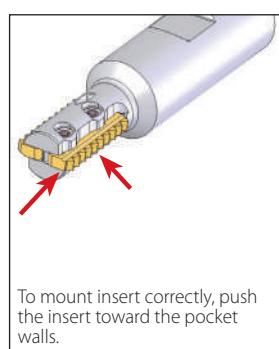
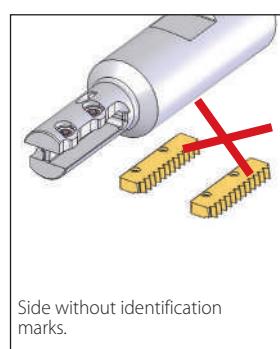
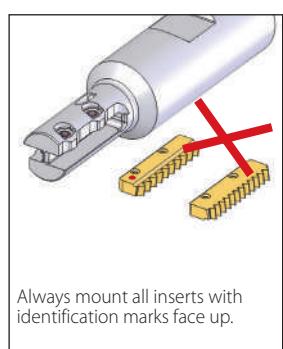
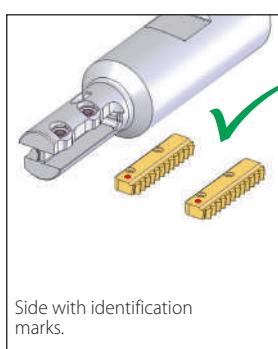
MiTM

### RTMC - for Standard Threads

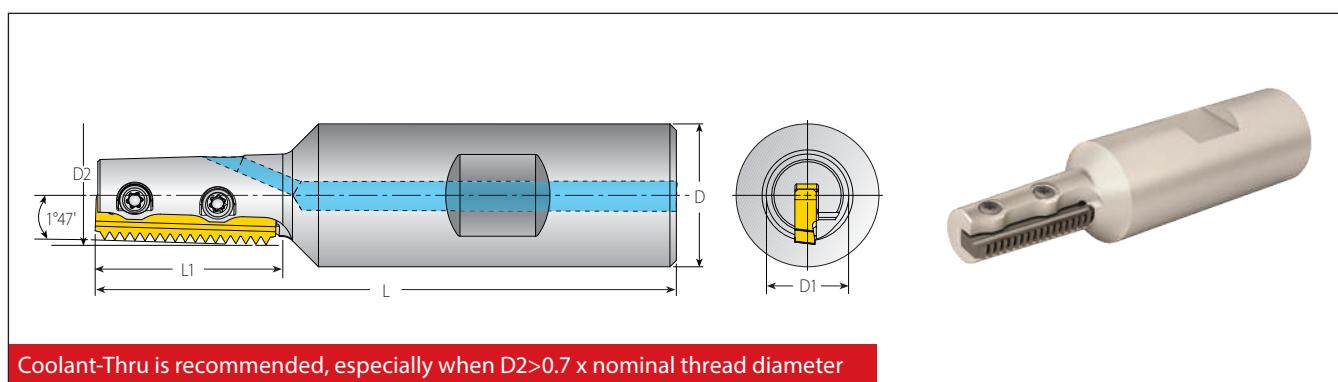
Insert Style	Ordering Code	Dimensions mm				No. of Flutes	Spare Parts		
		L	L1	D	D1	D2	Z	Location Screw x2	Torx+ Screwdriver
24	RTMC2013-26M1	82	26	20	10.7	13.6	1	SLD4IP8 (M4x0.7)	KIP8 Use the included Vardex Torx+ screwdriver only. Recommended max. torque 1.2 NxM
	RTMC2015-30M1	85	30	20	11.9	15.1	1		
	RTMC2016-28M2	83	28	20	12.6	16	2		
	RTMC2016-36M1	91	36	20	12.6	16	1		

### Standard Thread Application by Toolholder

Toolholder	Min. Thread Dia.						
	D2 (mm)	ISO (coarse)	ISO (fine)	UNC	UN/UNF/UNEF/UNS	BSF	BSP(G)
RTMC2013-26M1	13.6	M16x2	M14.5x0.5; M15x0.75; M15x1; M15x1.25; M16x1.5; M16x1.75	-	11/16-12UN; 5/8-14UNS; 7/8-16UN; 5/8-18UNF; 5/8-20UN; 5/8-24UNEF; 5/8-28UN; 5/8-32UN	11/16-14; 3/4-12	5/8-19; 1/2-14
RTMC2015-30M1	15.1	M18x2.5	M16x0.5; M17x0.75; M17x1; M17x1.25; M17x1.5; M18x1.75; M18x2	3/4-10	3/4-12UN; 3/4-14UNS; 11/16-16UN; 11/16-20UN; 11/16-24UNEF; 11/16-28UN; 11/16-32UN	3/4-12	1/2-14
RTMC2016-28M2	16	M20x2.5	M17x0.5; M17x0.75; M18x1; M18x1.25; M18x1.5; M18x1.75; M19x2	3/4-10	3/4-12UN; 3/4-14UNS; 3/4-16UN; 3/4-18UNS; 3/4-20UNEF; 11/16-24UNEF; 11/16-28UN; 11/16-32UN	3/4-12	1/2-14
RTMC2016-36M1	16	M20x2.5	M17x0.5; M17x0.75; M18x1; M18x1.25; M18x1.5; M18x1.75; M19x2	3/4-10	3/4-12UN; 3/4-14UNS; 3/4-16UN; 3/4-18UNS; 3/4-20UNEF; 11/16-24UNEF; 11/16-28UN; 11/16-32UN	3/4-12	1/2-14



## Conical Toolholders (MiTM 24)



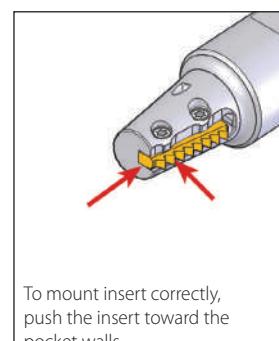
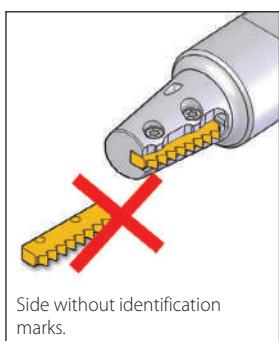
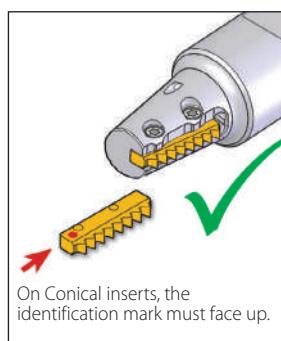
### RTMC - for Conical Threads

Insert Style	Ordering Code	Dimensions mm					No. of Flutes	Spare Parts	
		L	L1	D	D1	D2		Location Screw x2	Torx+ Screwdriver
24	RTMNC2014-26M1	81	26	20	11.5	13.9	1	SLD4IP8 (M4x0.7)	KIP8 Use the included Vardex Torx+ screwdriver only. Recommended max. torque 1.2 Nxm

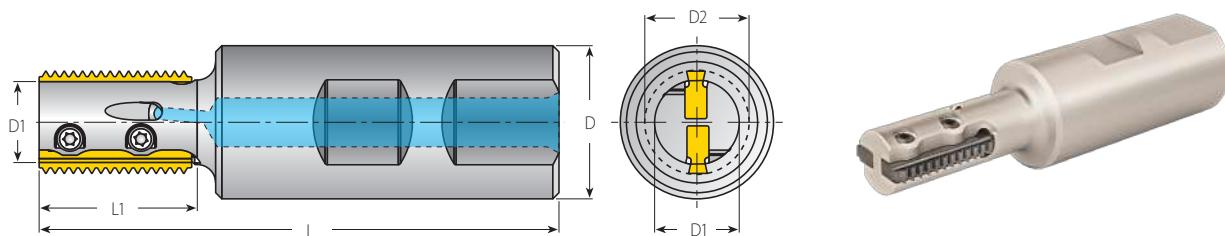
MiTM

### Conical Thread Application by Toolholder

Toolholder	Thread Dia.			
	D2 (mm)	NPT	NPTF	BSPT
RTMNC2014-26M1	13.9	3/8-18	3/8-18	3/8-19



## Standard Toolholders (MiTM 25)



Coolant-Thru is recommended, especially when  $D2 > 0.7 \times$  nominal thread diameter

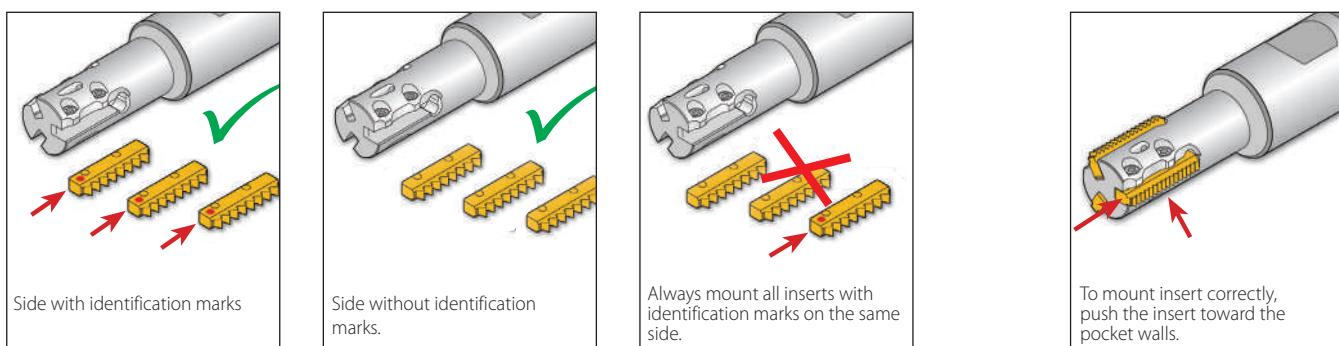
MiTM

### RTMC - for Standard Threads

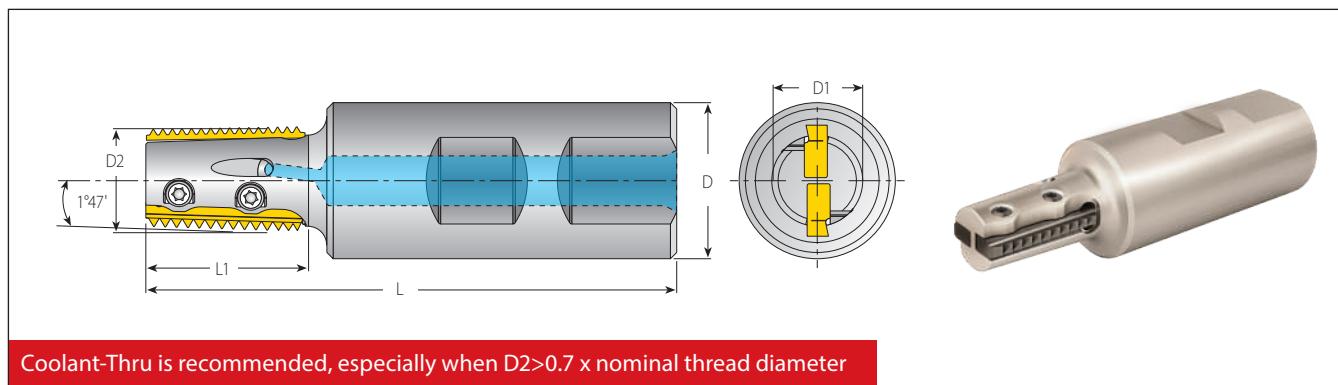
Insert Style	Ordering Code	Dimensions mm			No. of Flutes	Spare Parts			
		L	L1	D	D1	D2	Z	Location Screw x2	Torx+ Screwdriver
25	RTMC2517-26S2	85	26	25	14	17	2	SLD4IP8 (M4x0.7)	KIP8 Use the included Vardex Torx+ screwdriver only. Recommended max. torque 1.2 Nxm
	RTMC2517-36S2	95	36		14	17	2		
	RTMC2519-32S2	92	32		15	19	2		
	RTMC2519-44S2	104	44		15	19	2		
	RTMC2520-37S3	96	37		16.5	20.5	3		
	RTMC2520-44S3	103	44		16.5	20.5	3		
	RTMC2522-43S3	102	43		18	22	3		
	RTMC2522-55S3	114	55		18	22	3		
	RTMC2530-55S5	115	55		26	30	5		
	BRTMC2530-80S4	140	80		26	30	4		

### Standard Thread Application by Toolholder

Toolholder	Min.Thread Dia.						
	D2 (mm)	ISO (coarse)	ISO (fine)	UNC	UN/UNF/UNEF/UNS	BSF	BSP(G)
RTMC2517-26S2	17	M20x2.5	M19x1; M19x1.5; M20x2	-	7/16-10UNS; 13/16-12UN; 7/16-14UNF; 3/4-16UNF; 3/4-18UNS; 3/4-20UNEF	7/8-11; 7/8-12; 7/8-14; 7/8-16	1/2-14
RTMC2517-36S2	19	M22x2.5 M24x3	M21x1; M21x1.5; M22x2	7/8-9; 1-8	7/8-20UNEF; 7/8-18UNS; 7/8-16UN; 7/8-14UNF; 7/8-12UN; 7/8-10UNS	7/8-16; 7/8-14; 15/16-12; 15/16-11	5/8-14
RTMC2519-32S2	20.5	M24x3	M22x1; M23x1.5; M23x2; M23.5x2.5	1-8	15/16-9UN; 1-10UNS; 15/16-12UN; 1-14UNS; 15/16-16UN; 7/8-18UNS; 7/8-20UNEF	1-11; 1-12; 1-14; 1-16	1-14
RTMC2519-44S2	22	M27x3	M24x1; M24x1.5; M25x2; M25x2.5	-	1 1/16-8UN; 1-9UN; 1-10UNS; 1-12UNF; 1-14UNS; 1-16UN; 1-18UN; 15/16-20UNEF	1-11; 1-12; 1-14; 1-16	3/4-14
RTMC2522-43S3	26	-	M32x1; M32x1.5; M33x2; M33x2.5; M34x3	-	1 1/8-8UN; 1 1/8-9UN; 1 1/8-10UN; 1 1/8-12UN; 1 1/8-14UNS; 1 1/8-16UN; 1 1/8-18UNEF; 1 1/8-20UN	1 1/8-11; 1 1/8-12; 1 1/8-14; 1 1/8-16	1-11
RTMC2522-55S3	30	-		-			
BRTMC2530-80S4							



## Conical Toolholders (MiTM 25)

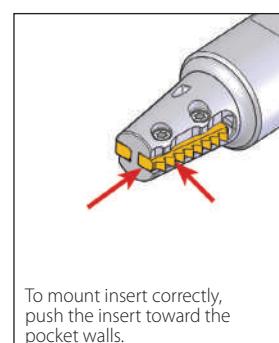
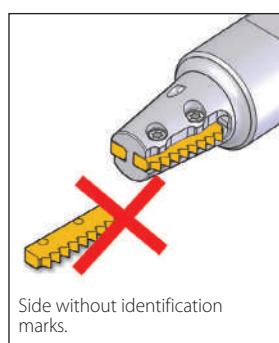
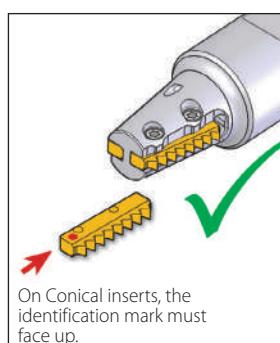


### RTMNC - for Conical Threads

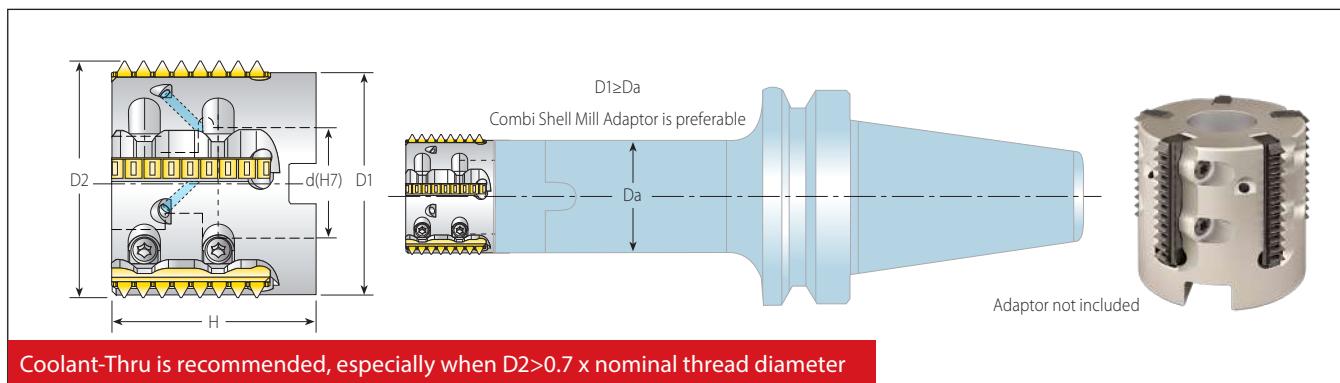
Insert Style	Ordering Code	Dimensions mm				No. of Flutes	Spare Parts	
		L	L1	D	D1		Location Screw x2	Torx+ Screwdriver
25	RTMNC2517-26S2	85	26	25	14	17.2	2	KIP8 Use the included Vardex Torx+ screwdriver only. Recommended max. torque 1.2 Nxm
	RTMNC2522-43S3	102	43	25	18	22.2	3	
	RTMNC2528-43S4	103	43	25	25	28.4	4	

### Conical Thread Application by Toolholder

Toolholder	D2(mm)	Thread Dia.		
		NPT	NPTF	BSPT
RTMNC2517-26S2	17.2	½-14; ¾-14; 1-11.5; 1¼-11.5; 1½-11.5; 2-11.5	½-14; ¾-14; 1-11.5; 1¼-11.5; 1½-11.5; 2-11.5	½-14; ¾-14
RTMNC2522-43S3	22.2	¾-14; 1-11.5; 1¼-11.5; 1½-11.5; 2-11.5	¾-14; 1-11.5; 1¼-11.5; 1½-11.5; 2-11.5	¾-14; 1-11; 1¼-11; 1½-11; 2-11; 2½-11; 3-11; 4-11; 5-11; 6-11
RTMNC2528-43S4	28.4	1-11.5; 1¼-11.5; 1½-11.5; 2-11.5	1-11.5; 1¼-11.5; 1½-11.5; 2-11.5	1-11; 1¼-11; 1½-11; 2-11; 2½-11; 3-11; 4-11; 5-11; 6-11



## Shell Mill (MiTM 25)



MiTM

### Conical and Standard Shell Mills

						No. of Flutes	Spare Parts		
		D1	D2	d(H7)	H	Z	Location Screw x2	Torx+ Screwdriver	Holder Screw
Standard	25	RTMC-D36-16-25S5	32	36	16	33.5	KIP8 (M4x0.7)	M8x1.25x35 M10x1.50x35 M12x1.75x30	
		RTMC-D44-22-25S6	40	44	22	38.0			
		RTMC-D52-27-25S8	48	52	27	40.0			
Conical		RTMNC-D36-16-25S5	32	35.9*	16	33.5		M8x1.25x35	

\* For inserts 8NPT and 8NPTF use for CNC program 36.4mm.

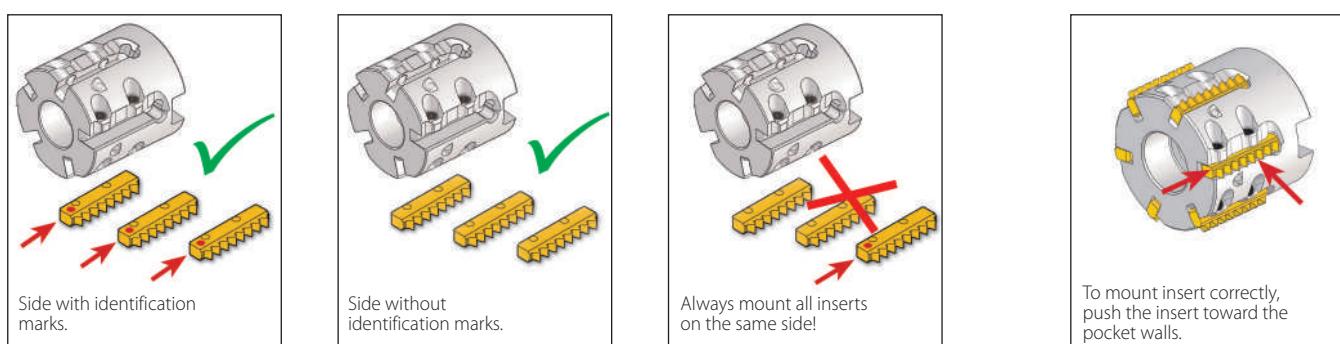
### Standard Thread Applications by Toolholder

Toolholder			Min. Thread Dia.			
	D2(mm)	ISO (fine)	UN/UNF/UNEF/UNS		BSW	BSP(G)
Standard	RTMC-D36-16-25S5	36	M38x1; M39x1.5; M39x2; M40x3	1 $\frac{1}{16}$ -12UN; 1 $\frac{5}{16}$ -14UNS; 1 $\frac{1}{16}$ -16UN; 1 $\frac{1}{2}$ -18UNEF; 1 $\frac{1}{2}$ -20UN	1 $\frac{3}{4}$ -16 1 $\frac{1}{4}$ -12	1 $\frac{1}{4}$ -11
	RTMC-D44-22-25S6	44	M48x1; M48x1.5; M48x2; M48x3	1 $\frac{7}{8}$ -12UN; 1 $\frac{13}{16}$ -16UN; 1 $\frac{3}{16}$ -20UN; 1 $\frac{1}{16}$ -8UN; 1 $\frac{1}{8}$ -10UNS; 1 $\frac{1}{8}$ -14UNS	2-16 2-12	1 $\frac{1}{2}$ -11
	RTMC-D52-27-25S8	52	M55x1; M55x1.5; M55x2; M56x3	2 $\frac{1}{4}$ -8UN; 2 $\frac{1}{4}$ -10UN; 2 $\frac{1}{4}$ -12UN; 2 $\frac{1}{4}$ -14UN; 2 $\frac{1}{4}$ -16UN; 2 $\frac{1}{4}$ -18UN; 2 $\frac{1}{4}$ -20UN	2 $\frac{1}{4}$ -16 2 $\frac{1}{4}$ -12	2-11

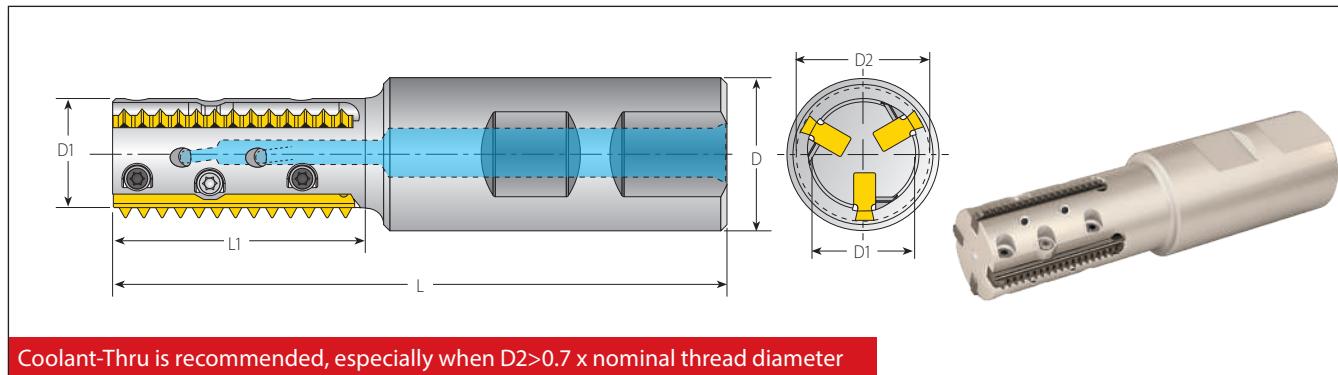
### Conical Thread Applications by Toolholder

Toolholder			Thread Dia.		
	D2 (mm)	NPT	NPTF	BSPT	
Conical	RTMNC-D36-16-25S5	35.9*	1 $\frac{1}{4}$ -11.5; 1 $\frac{1}{2}$ -11.5; 2-11.5 2 $\frac{1}{2}$ -8 (and up)	1 $\frac{1}{4}$ -11.5; 1 $\frac{1}{2}$ -11.5; 2-11.5 2 $\frac{1}{2}$ -8; 3-8	1 $\frac{1}{2}$ -6x11

\* For inserts 8NPT and 8NPTF use for CNC program 36.4mm.



## Standard Toolholders (MiTM 40)

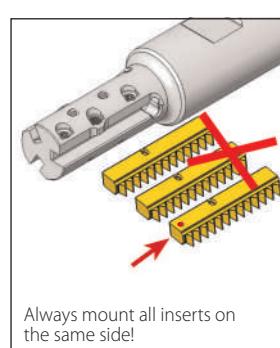
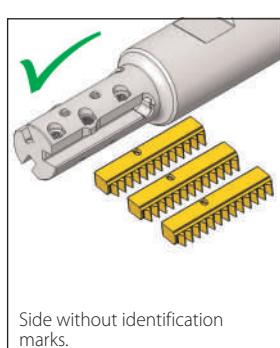
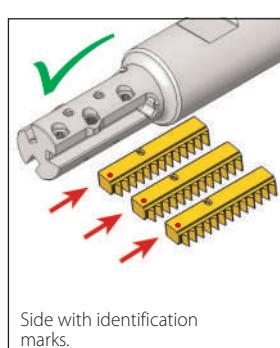


### RTMC - for Standard Threads

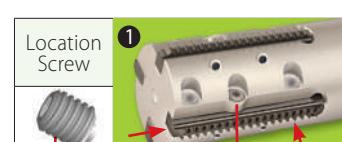
Insert Style	Ordering Code	Dimensions mm					No. of Flutes	Spare Parts		
		L	L1	D	D1	D2		Location Screw	Clamping Screw x2	Torx+ Screwdriver
40	RTMC2522-43L3	102	43	25	18	22	3	SLD4IP8A (M4x0.7)	SCD4IP8 (M4x0.7)	KIP8 Use the included Varlox Torx+ screwdriver only. Recommended max. torque 1.2 Nxm
	RTMC2522-65L3	124	65	25	18	22	3			
	RTMC3230-55L4	117	55	32	26	30	4			
	BRTMC3230-80L3	142	80	32	26	30	3			

### Standard Thread Application by Toolholder

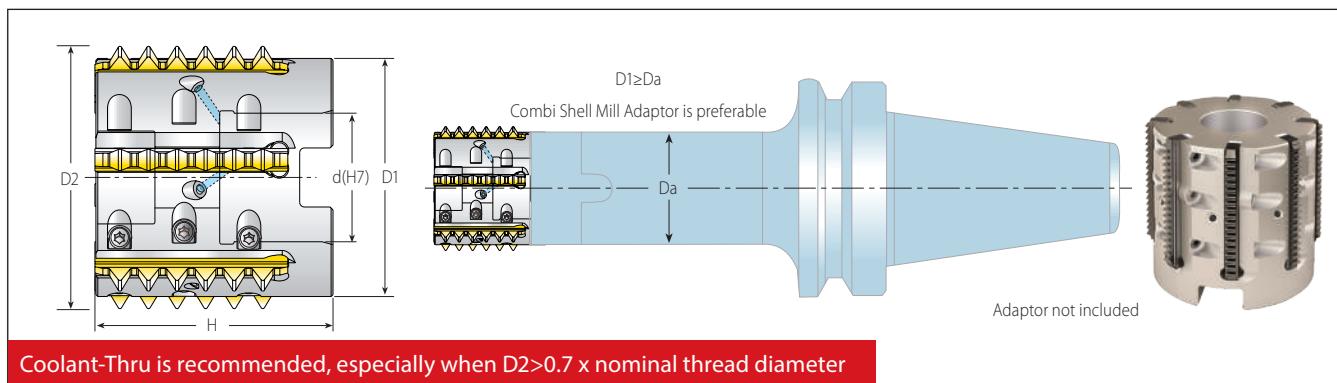
Toolholder				Min. Thread Dia.					
	D2 (mm)	ISO (coarse)	ISO (fine)	UNC	UN/UNF/UNEF/UNS			BSF	BSP(G)
RTMC2522-43L3	22	M27x3	M24x1; M24x1.5 M25x2; M25x2.5	-	1 1/16-8UN; 1-9UN; 1-10UNS; 1-12UNF; 1-14UNS; 1-16UN; 1-18UN; 1 5/16-20UNEF	1-11; 1-12; 1-14; 1-16;	3/4-14		
RTMC2522-65L3	22	M27x3	M24x1; M24x1.5 M25x2; M25x2.5	-	1 1/16-8UN; 1-9UN; 1-10UNS; 1-12UNF 1-14UNS; 1-16UN; 1-18UN; 1 5/16-20UNEF	1-11; 1-12; 1-14; 1-16;	3/4-14		
RTMC3230-55L4	30	-	M32x1; M32x1.5 M33x2; M33x2.5; M34x3	-	1 3/8-8UN; 1 3/8-9UN; 1 3/8-10UN; 1 3/8-12UN; 1 3/8-14UNS; 1 3/8-16UN; 1 3/8-18UNEF; 1 3/8-20UN	1 3/8-11; 1 3/8-12; 1 3/8-14; 1 3/8-16	1-11		
BRTMC3230-80L3	30	-	M32x1; M32x1.5 M33x2; M33x2.5; M34x3	-	1 3/8-8UN; 1 3/8-9UN; 1 3/8-10UN; 1 3/8-12UN; 1 3/8-14UNS; 1 3/8-16UN; 1 3/8-18UNEF; 1 3/8-20UN	1 3/8-11; 1 3/8-12; 1 3/8-14; 1 3/8-16	1-11		



2 Step Clamping System



## Shell Mill (MiTM 40)



MiTM

### Conical and Standard Shell Mills

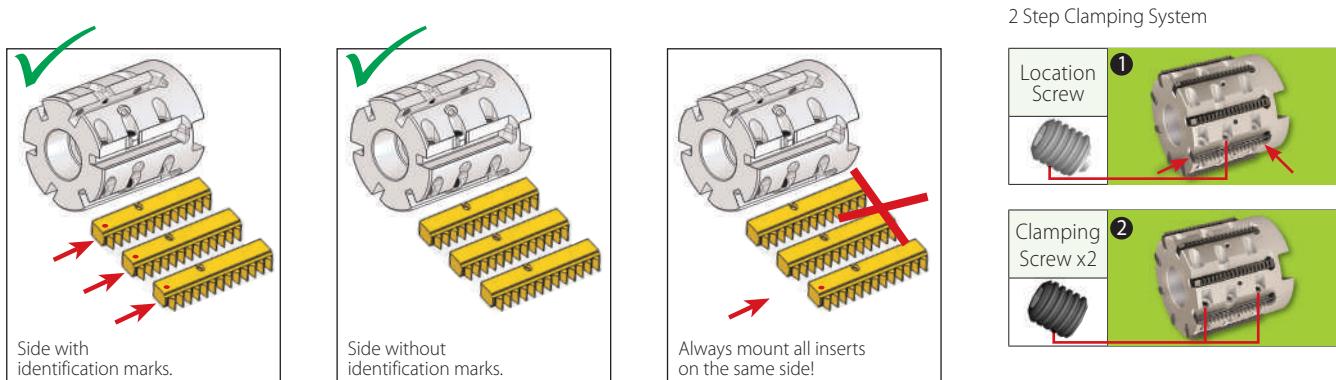
Conical and Standard Shell Mills							Spare Parts			
Insert Style	Ordering Code	Dimensions mm			No. of Flutes	Location Screw	Clamping Screw x2	Torx+ Screwdriver	Holder Screw	
		D1	D2	d(H7)	H	Z				
Standard	40	RTMC-D44-22-40L6	40	44	22	48	6	<b>KIP8</b> Use the included Vardex Torx+ screwdriver only. Recommended max. torque 1.2 Nxm	M10x1.5x40	
		RTMC-D52-27-40L8	48	52	27	50	8		M12x1.75x40	
Conical	RTMNC-D45-22-40L6	40	45	22	48	6	<b>KIP8</b> Use the included Vardex Torx+ screwdriver only. Recommended max. torque 1.2 Nxm	M10x1.5x40		

### Standard Thread Application by Toolholder

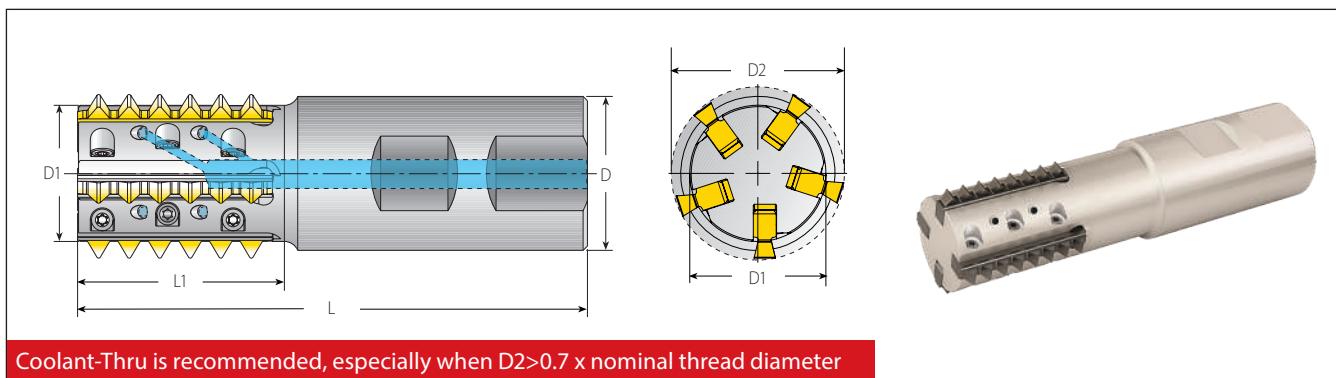
Toolholder			Min. Thread Dia.			
	D2 (mm)	ISO (fine)	UN/UNF/UNEF/UNS		BSW	BSP(G)
Standard	RTMC-D44-22-40L6	44	M48x1; M48x1.5; M48x2; M48x3	1 1/8-12UN; 1 13/16-16UN; 1 13/16-20UN; 1 13/16-8UN; 1 1/8-10UNS; 1 1/8-14UNS	2-16 2-12	1 1/2-11
	RTMC-D52-27-40L8	52	M55x1; M55x1.5; M55x2; M56x3	2 1/4-8UN; 2 1/4-10UN; 2 1/4-12UN; 2 1/4-14UN; 2 1/4-16UN; 2 1/4-18UN; 2 1/4-20UN	2 1/4-16 2 1/4-12	2-11

### Conical Thread Application by Toolholder

Toolholder			Min. Thread Dia.		
	D2 (mm)	NPT	NPTF	BSPT	
Conical	RTMNC-D45-22-40L6	45	2-11.5; 2 1/2-8 (and up)	2-11.5; 2 1/2-8; 3-8	2-6x11



## Standard Toolholders (MiTM 41)



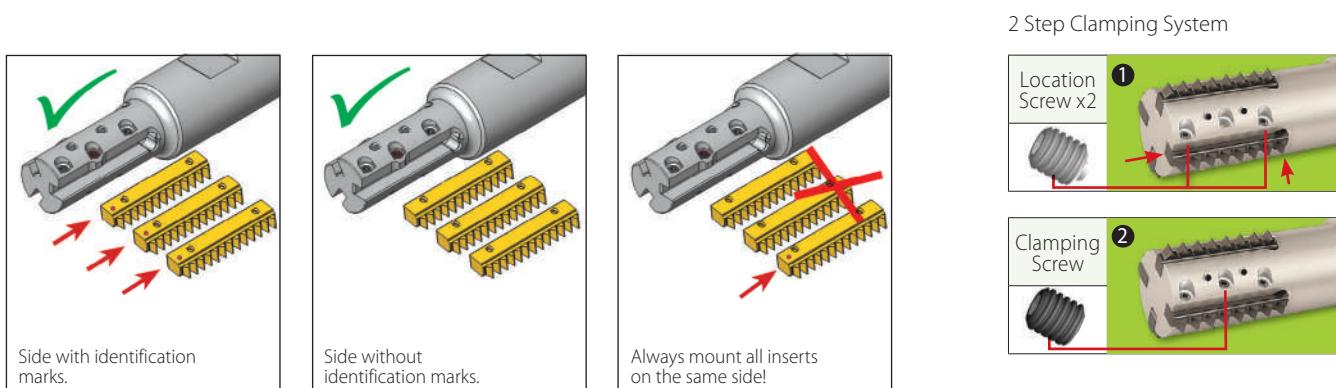
### RTMC - for Standard Threads

Insert Style	Ordering Code	Dimensions mm					No. of Flutes	Spare Parts			
		L	L1	D	D1	D2*		Location Screw x2	Clamping Screw	Torx+ Screwdriver	
41	RTMC2521-45B1	105	45	25	16.0	21.2	1	SLD4IP8A (M4x0.7)	SCD4IP8 (M4x0.7)	KIP8 Use the included Vardex Torx+ screwdriver only. Recommended max. torque 1.2 NxM	
	RTMC2524-43B2	104	43	25	19.2	24.5	2				
	RTMC3230-43B3	106.5	43	32	24.2	30.0	3				
	RTMC3230-65B3	128.5	65	32	24.2	30.0	3				
	RTMC3236-43B5	106	43	32	28.3	35.9	5				
	RTMC3236-65B4	128	65	32	28.3	35.9	4				

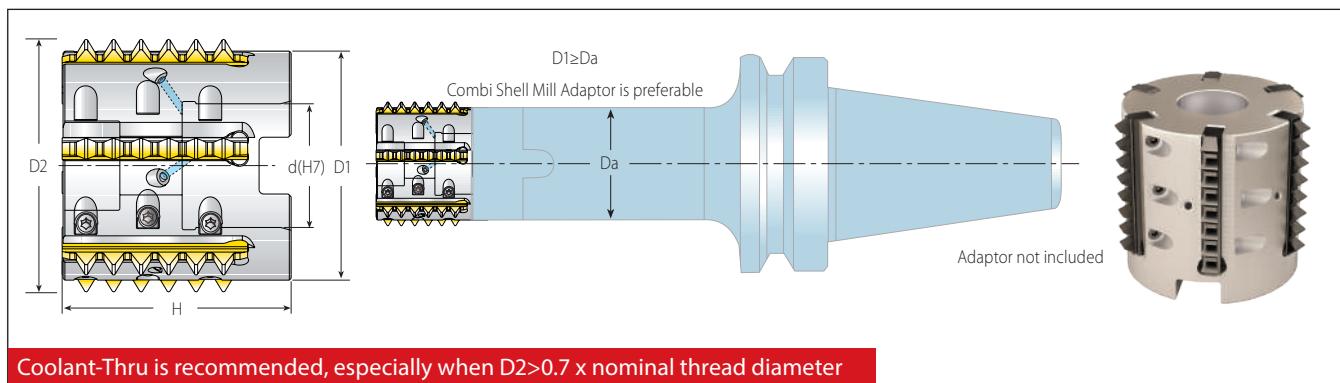
### Standard Thread Application by Toolholder

Toolholder	D2* (mm)	Min. Thread Dia.							
		ISO (coarse)	ISO (fine)	UNC	UN/UNF/UNEF/UNS	BSW/BSF	NPT	NPTF	
RTMC2521-45B1	21.2	M27x3; M30x3.5; M33x3.5; M36x4; M39x4	M30x3; M42x4	1-8, 1 1/8-7; 1 1/4-7; 1 1/8-6; 1 1/2-6	1 1/16-8UN; 1 7/16-6UN	1-8BSW; 1 1/8-7BSW	-	-	
RTMC2524-43B2	24.5	M30x3.5; M36x4	M28x3; M45x4	1 1/8-7; 1 1/8-6	1 1/8-8UN; 1 7/16-6UN	1 1/8-8BSF; 1 1/4-7BSW	-	-	
RTMC3230-43B3	30.0	M36x4; M42x4.5	M34x3; M34x3.5; M45x4	1 1/8-6	1 3/8-8UN; 1 7/16-6UN	1 1/8-8BSF; 1 1/4-7BSF; 1 1/2-6BSW	-	-	
RTMC3230-65B3	30.0	M36x4; M42x4.5	M34x3; M34x3.5; M45x4	1 1/8-6	1 3/8-8UN; 1 7/16-6UN	1 1/8-8BSF; 1 1/4-7BSF; 1 1/2-6BSW	-	-	
RTMC3236-43B5	35.9	M42x4.5; M48x5; M56x5.5; M64x6	M40x3; M40x3.5; M42x4; M70x6	1 3/4-5; 2-4.5; 2 1/2-4	1 1/8-8UN; 1 7/16-6UN	1 1/8-8BSF; 1 1/4-7BSF; 1 1/8-6BSF	2 1/2-8	2 1/2-8	
RTMC3236-65B4	35.9	M42x4.5; M48x5; M56x5.5; M64x6	M40x3; M40x3.5; M42x4; M70x6	1 3/4-5; 2-4.5; 2 1/2-4	1 1/8-8UN; 1 7/16-6UN	1 1/8-8BSF; 1 1/4-7BSF; 1 1/8-6BSF	2 1/2-8	2 1/2-8	

\* For external applications, inserts R41E... use for CNC program (D2+0.6mm).



## Shell Mill (MiTM 41)



MiTM

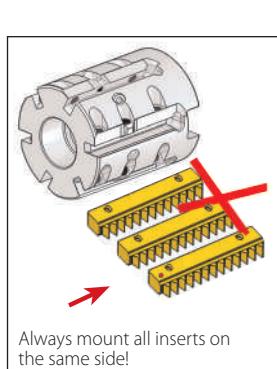
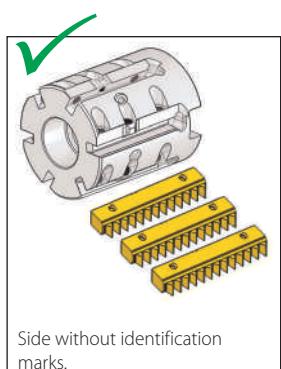
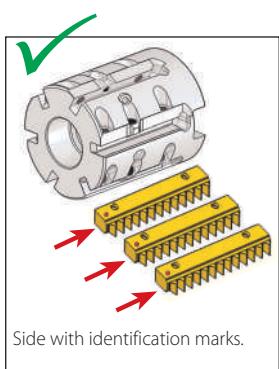
### Standard Shell Mill

Insert Style	Ordering Code	Dimensions mm					No. of Flutes	Spare Parts		
		D1	D2*	d(H7)	H	Z		Location Screw x2	Clamping Screw	Torx+ Screwdriver
41	RTMC-D48-22-41B5	40	47.9	22	50	5	SLD4IP8A (M4x0.7)	SCD4IP8 (M4x0.7)	KIP8 Use the included Vardex Torx+ screwdriver only. Recommended max. torque 1.2 Nxm	M10x1.5x40
	RTMC-D58-27-41B6	50	57.9	27	50	6				

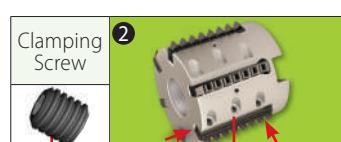
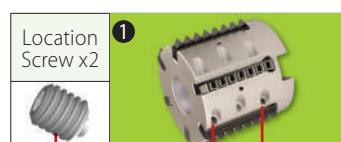
### Standard Thread Application by Toolholder

Toolholder		Min. Thread Dia.						
	D2* (mm)	ISO (coarse)	ISO (fine)	UNC	UN/UNF/UNEF/UNS	BSF	NPT	NPTF
RTMC-D48-22-41B5	47.9	M56x5.5; M64x6	M55x4; M70x6;	2½-4.5; 2½-4	2½-8UN; 2½-6UN	2½-8; 2½-6	2½-8	2½-8
RTMC-D58-27-41B6	57.9	M68x6	M64x4; M70x6	2¾-4	2½-8UN; 2½-6UN	2½-8; 2½-6	2½-8	2½-8

\* For external applications, inserts R41E... use for CNC program (D2+0.6mm).



2 Step Clamping System



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

Material Group	Vargus No.	Material	Hardness Brinell HB	Vc [m/min]		Feed f [mm/tooth]		
				V BX	V TX	(Excluding MiTM 19)	(for MiTM 19)	
<b>P</b> Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	100-210	90-180	0.1-0.35	0.06-0.2
	2		Medium Carbon (C=0.25-0.55%)	150	100-180	90-170	0.1-0.4	0.06-0.25
	3		High Carbon (C=0.55-0.85%)	170	100-170	90-160	0.1-0.35	0.06-0.2
	4	Low Alloy Steel (alloying elements≤5%)	Non Hardened	180	80-140	90-155	0.1-0.4	0.06-0.25
	5		Hardened	275	80-150	80-160	0.1-0.35	0.06-0.2
	6		Hardened	350	70-140	70-150	0.1-0.3	0.06-0.2
	7	High Alloy Steel (alloying elements>5%)	Annealed	200	60-130	70-115	0.1-0.35	0.06-0.2
	8		Hardened	325	70-110	60-100	0.1-0.2	0.06-0.1
	9	Cast Steel	Low Alloy (alloying elements <5%)	200	100-170	100-170	0.1-0.3	0.06-0.2
	10		High Alloy (alloying elements >5%)	225	70-120	70-130	0.1-0.2	0.06-0.1
<b>M</b> Stainless Steel	11	Stainless Steel Ferritic	Non Hardened	200	100-170	120-180	0.1-0.3	0.06-0.2
	12		Hardened	330	100-170	120-180	0.1-0.2	0.06-0.1
	13	Stainless Steel Austenitic	Austenitic	180	70-140	100-140	0.1-0.3	0.06-0.2
	14		Super Austenitic	200	70-140	100-140	0.1-0.2	0.06-0.1
	15	Stainless Steel Cast Ferritic	Non Hardened	200	70-140	100-140	0.1-0.3	0.06-0.2
	16		Hardened	330	70-140	100-140	0.1-0.2	0.06-0.1
	17	Stainless Steel Cast Austenitic	Austenitic	200	70-120	100-120	0.1-0.3	0.06-0.2
	18		Hardened	330	70-120	100-120	0.1-0.2	0.06-0.1
<b>K</b> Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	60-130	100-120	0.05-0.16	0.03-0.1
	29		Pearlitic (long chips)	230	60-120	80-100	0.04-0.1	0.02-0.06
	30	Grey Cast Iron	Low Tensile Strength	180	60-130	80-100	0.1-0.3	0.06-0.2
	31		High Tensile Strength	260	60-100	80-100	0.1-0.2	0.06-0.1
	32	Nodular Sg Iron	Ferritic	160	60-125	80-100	0.1-0.3	0.06-0.2
	33		Pearlitic	260	50-90	60-90	0.1-0.2	0.06-0.1
<b>N</b> Non-Ferrous Metals	34	Aluminium Alloys Wrought	Non Aging	60	100-250	-	0.15-0.55	0.09-0.3
	35		Aged	100	100-180	-	0.15-0.5	0.09-0.3
	36	Aluminium Alloys	Cast	75	150-400	-	0.15-0.5	0.09-0.3
	37		Cast & Aged	90	150-280	-	0.1-0.4	0.06-0.25
	38	Aluminium Alloys	Cast Si 13-22%	130	80-150	-	0.15-0.5	0.09-0.3
	39	Copper and Copper Alloys	Brass	90	120-210	100-200	0.15-0.5	0.09-0.3
	40		Bronze And Non Leaded Copper	100	120-210	100-200	0.1-0.4	0.06-0.25
<b>S</b> Heat Resistant Material	19	High Temperature Alloys	Annealed (iron based)	200	20-45	20-40	0.1-0.2	0.06-0.1
	20		Aged (iron based)	280	20-30	20-30	0.04-0.1	0.02-0.06
	21		Annealed (nickel or cobalt based)	250	15-20	15-20	0.04-0.1	0.02-0.06
	22		Aged (nickel or cobalt based)	350	10-15	10-15	0.04-0.1	0.02-0.06
	23	Titanium Alloys	Pure 99.5 Ti	400Rm	70-140	70-120	0.04-0.1	0.02-0.06
	24		$\alpha+\beta$ Alloys	1050Rm	20-50	20-50	0.04-0.1	0.02-0.06
<b>H</b> Hardened Material	25	Extra Hard Steel	Hardened & Tempered	45-50HRc	15-45	15-45	0.06-0.12	0.04-0.07
	26			51-55HRc	15-40	15-40	0.04-0.08	0.02-0.05

MiTM

## Grades

Grade	Application	Sample
<b>VBX</b>	TiCN coated carbide grade. Excellent grade for steels and general use.	
<b>VTX</b>	TiAIN coated carbide grade. Ideal for Stainless Steels.	





# STANDARD

Thread Milling

Inserts | Toolholders

## Vardex Ordering Code System

### Thread Milling Inserts

3	B	I	1.5	ISO	TM2	F	028/...	VBX
1	2	3	4	5	6	7	8	9
<b>1 - Insert Size</b>	<b>2 - Cutting Edge Length</b>	<b>3 - Type of Insert</b>	<b>4 - Pitch</b>					
6.0 - 6.0 mm 2 - $\frac{1}{4}$ " 3 - $\frac{3}{8}$ " 3B - $\frac{3}{8}$ "B 4 - $\frac{1}{2}$ " 5 - $\frac{5}{8}$ " 6B - $\frac{3}{4}$ "B	B - TMB	E - External I - Internal EI - External + Internal	0.35 - 6.0mm, 80-4 TPI					
<b>5 - Standard</b>	<b>6 - System</b>	<b>8 - Coarse Pitch Inserts</b>						
ISO - ISO Metric UN - American UN UNJ - UNJ W - Whitworth for BSW, BSP NPT - NPT NPTF - NPTF NPS - NPS	BSPT - British Standard Pipe Thread PG - Pg DIN 40430 ACME - ACME TR - Trapez DIN 103	TM2 TM	028/...					
	<b>7 - Pitch Type</b>	<b>9 - Carbide Grade</b>						
	VBX VTX VK2							
	F - Fine Pitch							

TM Standard

### Thread Milling Toolholders

B	TM	N	C	20	-	3	B	LH	-	10
1	2	3	4	5		6	7	8	9	
<b>1 - Shank Type</b>	<b>2 - System</b>	<b>3 - Holder Type</b>	<b>4 - Cooling</b>							
B - Anti Vibration System	TM - Thread Milling	2 - Twin Flute M - Mini L - Long Tool N - Tapered Holder	V - Vertical Holder S - Single Point O - Offset W - Wide Cut. Dia.							
<b>5 - Shank Dia.</b>	<b>6 - Insert Size</b>	<b>7 - Cut. Edge Length</b>	<b>9 - RH / LH Holder</b>							
10, 12, 16, 20, 25, 32, 40	6.0 - 6.0mm 2 - $\frac{1}{4}$ " 3 - $\frac{3}{8}$ " 3B - $\frac{3}{8}$ "B 4 - $\frac{1}{2}$ " 5 - $\frac{5}{8}$ " 6B - $\frac{3}{4}$ "B	B - TMB	None - Right Hand LH - Left Hand							
		<b>8 - Serial No.</b>	<b>10 - Serial No.</b>							
		(for TMO Holders) 1 - 16	(for Coarse Pitch Holders) 124/...							

### Thread Milling Shell Mill

TMSH	-	D63	-	22	-	3	B
1		2		3		4	5
<b>1 - System</b>	<b>2 - Cutting Dia.</b>	<b>3 - Drive Hole Dia.</b>	<b>4 - Insert Size</b>				
Thread Mill Shell Mill	38, 50, 63, 80, 100, 125	16, 22, 27, 32, 40	2 - $\frac{1}{4}$ " 3 - $\frac{3}{8}$ " 3B - $\frac{3}{8}$ "B 5 - $\frac{5}{8}$ " 6B - $\frac{3}{4}$ "B				
<b>5 - Cut. Edge Length</b>							
B - TMB							

# Thread Milling Standard System



TMMC

Miniature Applications



No. of Flutes (Z) 1  
Cutting Dia. (D2) 9.0  
Tool Overhang (L1) 12.0-17.0

TMC

Standard Applications



No. of Flutes (Z) 1  
Cutting Dia. (D2) 9.0-46.0  
Tool Overhang (L1) 12.0-63.0

TMC 124/...

Coarse Pitch Thread



No. of Flutes (Z) 1  
Cutting Dia. (D2) 9.0-22.0  
Tool Overhang (L1) 15.0-40.0

TMLC

For Long Threads



No. of Flutes (Z) 1  
Cutting Dia. (D2) 11.5-46.0  
Tool Overhang (L1) 17.0-93.0

TMNC

For Conical Applications



No. of Flutes (Z) 1  
Cutting Dia. (D2) 15.5-37.0  
Tool Overhang (L1) 22.0-58.0

TM2C

Fast Infeed



No. of Flutes (Z) 2  
Cutting Dia. (D2) 17.0-52.0  
Tool Overhang (L1) 20.0-65.0

TMOC

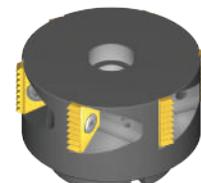
For Fewer Cycles



No. of Flutes (Z) 1  
Cutting Dia. (D2) 14.5-30.0  
Tool Overhang (L1) 25.0-52.0

TMSH

Fast Machining in Large Diameters and Deep Holes



No. of Flutes (Z) 6-9  
Cutting Dia. (D2) 38.0-125.0  
Tool Overhang (L1) Max. 200

TMSC

For Short Threads  
Economical Solutions



No. of Flutes (Z) 1  
Cutting Dia. (D2) 12.5  
Tool Overhang (L1) 25.0

TMVC

For Large Pitches

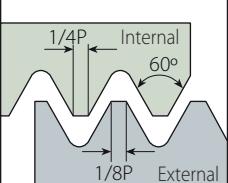


No. of Flutes (Z) 1  
Cutting Dia. (D2) 46.0  
Tool Overhang (L1) 60.0

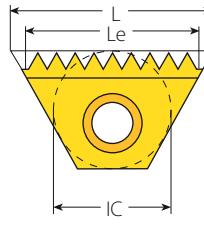
TM Standard

## ISO Metric

**External / Internal**



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

**Standard TM**

TM Standard

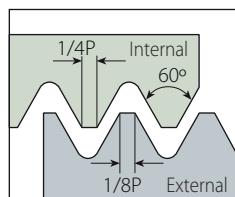
### Standard TM

Insert Size		Pitch	Ordering Code		Le	Teeth	
IC	L mm	mm	External	Internal	mm	Toolholder	
6.0mm	10.4	0.5		6.0I0.5ISOTM...	10.0	20	
		0.75		6.0I0.75ISOTM...	9.75	13	
		1.0		6.0I1.0ISOTM...	9.0	9	TMMC..-6.0
		1.25		6.0I1.25ISOTM...	8.75	7	
		1.5		6.0I1.5ISOTM...	9.0	6	
1/4"	11	0.5		2I0.5ISOTM2...	10.0	20	
		0.75	2E0.75ISOTM2...	2I0.75ISOTM2...	10.5	14	
		1.0	2E1.0ISOTM2...	2I1.0ISOTM2...	10.0	10	
		1.25	2E1.25ISOTM2...		10.0	8	TMC..-2 TMSH..-2
		1.25		2I1.25ISOTM2...	8.75	7	
		1.5	2E1.5ISOTM2...		9.0	6	
		1.5		2I1.5ISOTM2...	10.5	7	
3/8"	16	0.5		3I0.5ISOTM2...	15.0	30	
		0.75	3E0.75ISOTM2...	3I0.75ISOTM2...	15.0	20	
		0.8		3I0.8ISOTM2...	14.4	18	
		1.0	3E1.0ISOTM2...		14.0	14	
		1.0		3I1.0ISOTM2...	15.0	15	TMC..-3 TMSH..-3
		1.25	3E1.25ISOTM2...	3I1.25ISOTM2...	15.0	12	
		1.5	3E1.5ISOTM2...	3I1.5ISOTM2...	15.0	10	
		1.75	3E1.75ISOTM2...	3I1.75ISOTM2...	14.0	8	
		2.0	3E2.0ISOTM2...	3I2.0ISOTM2...	14.0	7	
		1.0	3BE1.0ISOTM2...	3BI1.0ISOTM2...	22.0	22	
3/8"B	22	1.25	3BE1.25ISOTM2...	3BI1.25ISOTM2...	21.25	17	
		1.5	3BE1.5ISOTM2...	3BI1.5ISOTM2...	21.0	14	
		1.75	3BE1.75ISOTM2...	3BI1.75ISOTM2...	21.0	12	
		2.0	3BE2.0ISOTM2...	3BI2.0ISOTM2...	22.0	11	
		1.0	5E1.0ISOTM2...	5I1.0ISOTM2...	26.0	26	
5/8"	27	1.25	5E1.25ISOTM2...	5I1.25ISOTM2...	25.0	20	
		1.5	5E1.5ISOTM2...	5I1.5ISOTM2...	25.5	17	
		1.75	5E1.75ISOTM2...	5I1.75ISOTM2...	24.5	14	
		2.0	5E2.0ISOTM2...	5I2.0ISOTM2...	24.0	12	
		2.5	5E2.5ISOTM2...	5I2.5ISOTM2...	25.0	10	
		3.0	5E3.0ISOTM2...	5I3.0ISOTM2...	24.0	8	
		3.5	5E3.5ISOTM2...	5I3.5ISOTM2...	24.5	7	
		4.0	5E4.0ISOTM2...	5I4.0ISOTM2...	24.0	6	
		4.5	5E4.5ISOTM2...	5I4.5ISOTM2...	22.5	5	

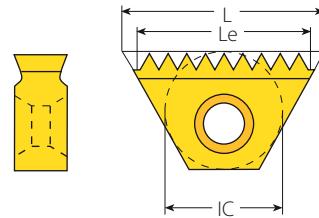
All inserts have 2 cutting edges, except MiniTM (IC 6.0 mm) which has one cutting edge.

## ISO Metric (con't)

### External / Internal



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

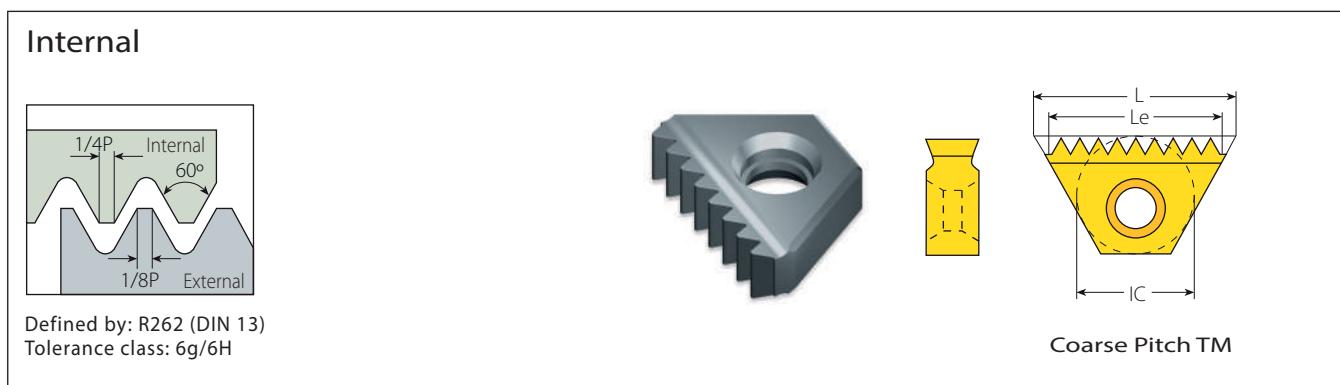


Standard TM

### Standard TM

Insert Size		Pitch	Ordering Code		Le	Teeth	Toolholder
IC	L mm	mm	External	Internal	mm		
3/4"B	38.5	1.5	6BE1.5ISOTM2...	6BI1.5ISOTM2...	36.0	24	
		2.0	6BE2.0ISOTM2...	6BI2.0ISOTM2...	36.0	18	
		2.5	6BE2.5ISOTM2...	6BI2.5ISOTM2...	35.0	14	
		3.0	6BE3.0ISOTM2...	6BI3.0ISOTM2...	36.0	12	
		4.0	6BE4.0ISOTM2...	6BI4.0ISOTM2...	32.0	8	TMC..-6B TMSH..-6B
		4.5	6BE4.5ISOTM2...	6BI4.5ISOTM2...	31.5	7	
		5.0	6BE5.0ISOTM2...	6BI5.0ISOTM2...	30.0	6	
		5.5	6BE5.5ISOTM2...	6BI5.5ISOTM2...	33.0	6	
		6.0	6BE6.0ISOTM2...	6BI6.0ISOTM2...	30.0	5	

## ISO Metric (con't)



### Coarse Pitch TM

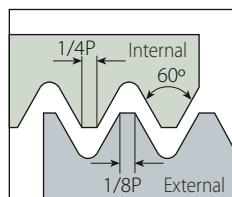
Thread	Insert Size		Ordering Code	Cutting Edge	Le	Teeth	Bore Dia. Range
	IC	L mm	Internal		mm	Toolholder	mm
M10x0.75	6.0 mm	10.4	6.0I0.75ISOTM028/001...	1	9.75	13	TMMC12-6.0 9.1-10
M10x0.75			6.0I0.75ISOTM028/001...	1	9.75	13	TMMC20-6.0 9.1-10
M12x1.25			6.0I1.25ISOTM028/002...	1	8.75	7	TMMC12-6.0 10.6-11.4
M12x1.25			6.0I1.25ISOTM028/002...	1	8.75	7	TMMC20-6.0 10.6-11.4
M12x1.75			6.0I1.75ISOTM028/003...	1	8.75	5	TMMC20-6.0-124/003 10.1-19
M14x2.0	1/4"	11	2I2.0ISOTM028/004...	2	10.0	5	TMC12-2 11.8-19.5
M14x2.0			2I2.0ISOTM028/004...	2	10.0	5	TMC20-2 11.8-19.5
M16x2.0			2I2.0ISOTM028/004...	2	10.0	5	TMC12-2 11.8-19.5
M16x2.0			2I2.0ISOTM028/004...	2	10.0	5	TMC20-2 11.8-19.5
M20x2.5	3/8"	16	3I2.5ISOTM028/005...	1	12.5	5	TMC16-3-124/001 17.2-19.2
M22x2.5	1/2"	22	4I2.5ISOTM028/006...	1	17.5	7	TMC25-4-124/002 19.2-31.6
M24x3.0			4I3.0ISOTM028/007...	1	18.0	6	TMC25-4-124/002 20.7-32.7
M27x3.0			4I3.0ISOTM028/007...	1	18.0	6	TMC25-4-124/002 20.7-32.7
M30x3.5	5/8"	27	5I3.5ISOTM028/008...	2	24.5	7	TMC25-5-124/004 26.2-35.9
M33x3.5			5I3.5ISOTM028/008...	2	24.5	7	TMC25-5-124/004 26.2-35.9
M36x3.0			5I3.0ISOTM028/009...	2	24.0	8	TMC25-5 32.7-39
M36x4.0			5I4.0ISOTM028/010...	2	24.0	6	TMC25-5 31.6-38.5
M39x3.0			5I3.0ISOTM028/009...	2	24.0	8	TMC25-5 32.7-39
M39x4.0			5I4.0ISOTM028/010...	2	24.0	6	TMC25-5 31.6-38.5
M42x4.5			5I4.5ISOTM028/011...	2	22.5	5	TMC25-5 37.1-48
M45x4.5			5I4.5ISOTM028/011...	2	22.5	5	TMC25-5 37.1-48
M48x5.0			5I5.0ISOTM028/075...	2	20.0	4	TMC25-5 38.9-∞
M52x5.0			5I5.0ISOTM028/075...	2	20.0	4	TMC25-5 38.9-∞

TM Standard

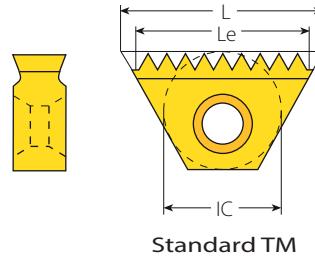
For Toolholder information, see page 286.

## ISO Metric (con't)

### External / Internal



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

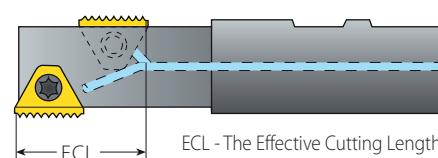


Standard TM

### Standard TM Inserts for TMO Toolholders

Insert Size		Pitch	Ordering Code			ECL
IC	L mm	mm	External	Internal	Toolholder	mm
1/4"	11	0.5		2I0.5ISOTM2...	TMOC20-2-8	19.0
		0.75	2E0.75ISOTM2...	2I0.75ISOTM2...	TMOC20-2-9	19.5
		1.0	2E1.0ISOTM2...	2I1.0ISOTM2...	TMOC20-2-8	19.0
		1.25	2E1.25ISOTM2...		TMOC20-2-10	18.7
		1.25		2I1.25ISOTM2...	TMOC20-2-10	16.2
		1.5	2E1.5ISOTM2...		TMOC20-2-8	18.0
		1.5		2I1.5ISOTM2...	TMOC20-2-8	19.5
3/8"	16	0.5		3I0.5ISOTM2...	TMOC20-3-1	28.5
		0.5		3I0.5ISOTM2...	TMOC20-3-10	29.0
		0.75	3E0.75ISOTM2...	3I0.75ISOTM2...	TMOC20-3-11	28.5
		1.0	3E1.0ISOTM2...		TMOC20-3-10	28.0
		1.0		3I1.0ISOTM2...	TMOC20-3-10	29.0
		1.25	3E1.25ISOTM2...	3I1.25ISOTM2...	TMOC20-3-7	28.7
		1.5	3E1.5ISOTM2...	3I1.5ISOTM2...	TMOC20-3-1	28.5
		1.75	3E1.75ISOTM2...	3I1.75ISOTM2...	TMOC20-3-12	26.2
		2.0	3E2.0ISOTM2...	3I2.0ISOTM2...	TMOC20-3-10	28.0
		1.0	5E1.0ISOTM2...	5I1.0ISOTM2...	TMOC25-5-12	46.0
5/8"	27	1.0	5E1.0ISOTM2...	5I1.0ISOTM2...	TMOC25-5-16	47.0
		1.25	5E1.25ISOTM2...	5I1.25ISOTM2...	TMOC25-5-13	48.7
		1.5	5E1.5ISOTM2...	5I1.5ISOTM2...	TMOC25-5-14	48.0
		1.5	5E1.5ISOTM2...	5I1.5ISOTM2...	TMOC25-5-16	46.5
		1.75	5E1.75ISOTM2...	5I1.75ISOTM2...	TMOC25-5-15	47.2
		2.0	5E2.0ISOTM2...	5I2.0ISOTM2...	TMOC25-5-12	44.0
		2.5	5E2.5ISOTM2...	5I2.5ISOTM2...	TMOC25-5-12	45.0
		2.5	5E2.5ISOTM2...	5I2.5ISOTM2...	TMOC25-5-14	47.5
		3.0	5E3.0ISOTM2...	5I3.0ISOTM2...	TMOC25-5-16	45.0
		3.5	5E3.5ISOTM2...	5I3.5ISOTM2...	TMOC25-5-16	45.5
		4.0	5E4.0ISOTM2...	5I4.0ISOTM2...	TMOC25-5-12	44.0
		4.5	5E4.5ISOTM2...	5I4.5ISOTM2...	TMOC25-5-14	45.0
		5.0		5I5.0ISOTM...028/075	TMOC25-5-12	40.0

TM Standard

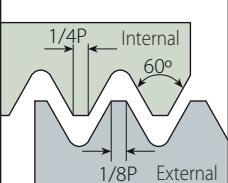


ECL - The Effective Cutting Length

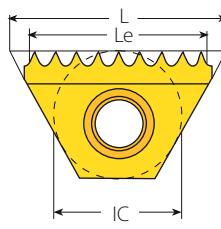
For Le and number of teeth of the above inserts, see the table for standard inserts on pages 258-259.  
For Toolholder information, see page 291.

## ISO Metric (con't)

**External / Internal**



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

**Fine Pitch TM**

TM Standard

### Fine Pitch TM

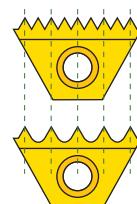
Insert Size		Pitch	Ordering Code		Le	Teeth	
IC	L mm	mm	External	Internal	mm		Toolholder
6.0mm	10.4	0.35	6.0E0.35ISOTMF...	6.0I0.35ISOTMF...	9.45	14	
		0.4	6.0E0.4ISOTMF...	6.0I0.4ISOTMF...	9.2	12	
		0.45	6.0E0.45ISOTMF...	6.0I0.45ISOTMF...	9.45	11	
		0.5	6.0E0.5ISOTMF...		9.5	10	
		0.6	6.0E0.6ISOTMF...		9.0	8	TMMC..-6.0
		0.7	6.0E0.7ISOTMF...		9.1	7	
		0.75	6.0E0.75ISOTMF...		8.25	6	
		0.8	6.0E0.8ISOTMF...		8.8	6	
		0.9	6.0E0.9ISOTMF...		8.1	5	
1/4"	11	0.35	2E0.35ISOTM2F...	2I0.35ISOTM2F...	10.15	15	
		0.4	2E0.4ISOTM2F...	2I0.4ISOTM2F...	10.0	13	
		0.45	2E0.45ISOTM2F...	2I0.45ISOTM2F...	9.45	11	
		0.5	2E0.5ISOTM2F...		9.5	10	
		0.6	2E0.6ISOTM2F...		10.2	9	TMC..-2 TMSH..-2
		0.7	2E0.7ISOTM2F...		9.1	7	
		0.8	2E0.8ISOTM2F...		8.8	6	
		0.9	2E0.9ISOTM2F...		9.9	6	
3/8"	16	0.35	3E0.35ISOTM2F...	3I0.35ISOTM2F...	14.35	21	
		0.4	3E0.4ISOTM2F...	3I0.4ISOTM2F...	14.8	19	
		0.45	3E0.45ISOTM2F...	3I0.45ISOTM2F...	14.85	17	
		0.5	3E0.5ISOTM2F...		13.5	14	
		0.6	3E0.6ISOTM2F...		13.8	12	
		0.7	3E0.7ISOTM2F...		14.7	11	
		0.8	3E0.8ISOTM2F...		13.6	9	
		0.9	3E0.9ISOTM2F...		13.5	8	

NOTE: Two orbits are required to complete the thread. Fine Pitch TM Inserts produce partial profile thread.

Sample order: **6.0E0.35ISOTMF VBX**

All inserts have 2 cutting edges, except MiniTM (IC 6.0 mm), which has one cutting edge.

For toolholder information, see page 282.



### Fine Pitch Threads

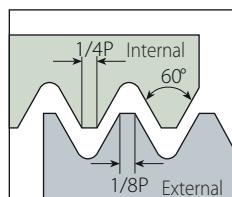
Fine pitch threads are threads with small pitches. It is difficult to produce multitooth inserts for small pitches because of the small radius between the teeth. Vargus developed inserts where every second tooth was dropped to enlarge the radius between the teeth.

#### Important!

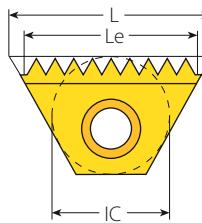
- All the fine pitch inserts are partial profile type (as a result of the enlarged radius).

## American UN

### External / Internal



Defined by: ANSI B1.1.74  
Tolerance class: Class 2A/2B



Standard TM

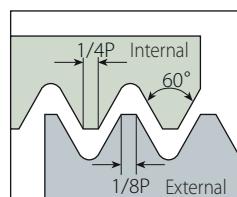
### Standard TM

Insert Size		Pitch	Ordering Code		Le	Teeth	
IC	L mm	TPI	External	Internal	mm	Toolholder	
6.0mm	10.4	32		6.0I32UNTM...	9.53	12	
		28		6.0I28UNTM...	9.07	10	
		24		6.0I24UNTM...	9.53	9	
		20		6.0I20UNTM...	8.89	7	TMMC..-6.0
		18		6.0I18UNTM...	8.47	6	
		16		6.0I16UNTM...	7.94	5	
1/4"	11	48		2I48UNTM2...	10.05	19	
		40		2I40UNTM2...	10.16	16	
		32		2I32UNTM2...	10.32	13	
		28	2E28UNTM2...	2I28UNTM2...	9.98	11	
		27	2E27UNTM2...	2I27UNTM2...	10.35	11	TMC..-2 TMSH..-2
		24	2E24UNTM2...	2I24UNTM2...	9.53	9	
		20	2E20UNTM2...	2I20UNTM2...	10.16	8	
		18	2E18UNTM2...	2I18UNTM2...	9.88	7	
		16	2E16UNTM2...	2I16UNTM2...	9.53	6	
		14	2E14UNTM2...	2I14UNTM2...	9.07	5	
3/8"	16	40		3I40UNTM2...	14.61	23	
		32		3I32UNTM2...	15.08	19	
		28	3E28UNTM2...	3I28UNTM2...	14.51	16	
		27	3E27UNTM2...	3I27UNTM2...	14.11	15	
		26	3E26UNTM2...	3I26UNTM2...	14.65	15	
		24	3E24UNTM2...	3I24UNTM2...	14.82	14	
		20	3E20UNTM2...	3I20UNTM2...	13.97	11	TMC..-3 TMSH..-3
		18	3E18UNTM2...	3I18UNTM2...	14.11	10	
		16	3E16UNTM2...	3I16UNTM2...	14.29	9	
		14	3E14UNTM2...	3I14UNTM2...	14.51	8	
		13	3E13UNTM2...	3I13UNTM2...	13.68	6	
		12	3E12UNTM2...	3I12UNTM2...	14.82	7	
3/8"B	22	11.5	3E11.5UNTM2...	3I11.5UNTM2...	13.25	6	
		24	3BE24UNTM2...	3BI24UNTM2...	21.16	20	
		20	3BE20UNTM2...	3BI20UNTM2...	21.59	17	
		18	3BE18UNTM2...	3BI18UNTM2...	21.17	15	
		16	3BE16UNTM2...	3BI16UNTM2...	20.64	13	BTMC..-3B TMSH..-3B
		14	3BE14UNTM2...	3BI14UNTM2...	21.77	12	
		13	3BE13UNTM2...	3BI13UNTM2...	21.49	11	
		12	3BE12UNTM2...	3BI12UNTM2...	21.17	10	

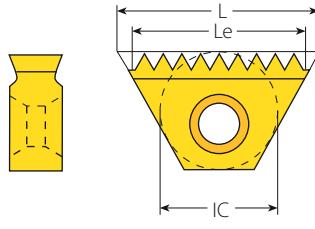
All inserts have 2 cutting edges, except Mini TM (IC 6.0 mm), which has one cutting edge.  
For toolholder information, see page 282.

## American UN (con't)

### External / Internal



Defined by: ANSI B1.1.74  
Tolerance class: Class 2A/2B



Standard TM

### Standard TM

Insert Size		Pitch		Ordering Code		Le	Teeth	
IC	L mm	TPI	External	Internal	mm		Toolholder	
5/8"	27	24	5E24UNTM2...	5I24UNTM2...	25.40	24		
		20	5E20UNTM2...	5I20UNTM2...	25.40	20		
		18	5E18UNTM2...	5I18UNTM2...	25.40	18		
		16	5E16UNTM2...	5I16UNTM2...	25.40	16		
		14	5E14UNTM2...	5I14UNTM2...	25.40	14		
		13	5E13UNTM2...	5I13UNTM2...	25.40	13		
		12	5E12UNTM2...	5I12UNTM2...	25.40	12		
		11.5	5E11.5UNTM2...	5I11.5UNTM2...	24.30	11		
		11	5E11UNTM2...	5I11UNTM2...	25.40	11		
		10	5E10UNTM2...		22.86	9		
		10		5I10UNTM2...	25.40	10		
		9	5E9UNTM2...	5I9UNTM2...	22.58	8		
		8	5E8UNTM2...	5I8UNTM2...	22.23	7		
		7	5E7UNTM2...		21.77	6		
		7		5I7UNTM2...	25.40	7		
3/4"B	38.5	6	5E6UNTM2...		21.17	5		
		6		5I6UNTM2...	25.40	6		
		6	6BE6UNTM2...	6BI6UNTM2...	33.87	8		
		5	6BE5UNTM2...	6BI5UNTM2...	30.48	6		
		4.5	6BE4.5UNTM2...	6BI4.5UNTM2...	33.87	6		
		4	6BE4UNTM2...	6BI4UNTM2...	31.75	5		

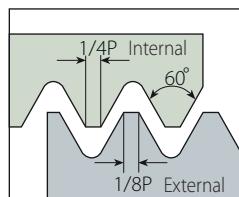
TMC..-5  
TMSH..-5

TMC..-6B  
TMSH..-6B

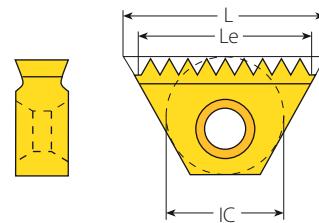
All inserts have 2 cutting edges, except MiniTM (IC 6.0 mm), which has one cutting edge.  
For toolholder information, see page 282.

## American UN (con't)

### Internal



Defined by: ANSI B1.1.74  
Tolerance class: Class 2A/2B



Coarse Pitch TM

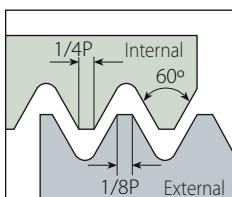
### Coarse Pitch TM

Thread	Insert Size		Ordering Code	Cutting Edge	Le	Teeth	Bore Dia. Range	
	IC	L mm					mm	Toolholder
7/16"-20UNF	6.0mm	10.4	6.0I20UNTM028/012...	1	8.89	7	TMMC12-6.0	9.7-11.4
7/16"-20UNF			6.0I20UNTM028/012...	1	8.89	7	TMMC20-6.0	9.7-11.4
7/16"-16UN			6.0I16UNTM028/014...	1	7.94	5	TMMC12-6.0	9.3-14.1
7/16"-16UN			6.0I16UNTM028/014...	1	7.94	5	TMMC20-6.0	9.3-14.1
7/16"-14UNC			6.0I14UNTM028/013...	1	9.07	5	TMMC20-6.0-124/003	9.1-9.9
1/2"-13UNC	1/4"	11	2I13UNTM028/015...	1	9.77	5	TMC20-2-124/005	10.5-19.5
1/2"-16UN	6.0mm	10.4	6.0I16UNTM028/014...	1	7.94	5	TMMC12-6.0	9.3-14.1
1/2"-16UN			6.0I16UNTM028/014...	1	7.94	5	TMMC20-6.0	9.3-14.1
9/16"-12UNC	1/4"	11	2I12UNTM028/016...	1	8.47	4	TMC20-2-124/005	11.9-15.6
9/16"-18UNF			2I18UNTM028/017...	2	9.88	7	TMC12-2	12.7-14.5
9/16"-18UNF			2I18UNTM028/017...	2	9.88	7	TMC20-2	12.7-14.5
9/16"-16UN	6.0mm	10.4	6.0I16UNTM028/014...	1	7.94	5	TMMC12-6.0	9.3-14.1
9/16"-16UN			6.0I16UNTM028/014...	1	7.94	5	TMMC20-6.0	9.3-14.1
5/8"-11UNC	1/4"	11	2I11UNTM028/018...	1	9.24	4	TMC20-2-124/006	13.3-18.5
5/8"-12UN			2I12UNTM028/016...	1	8.47	4	TMC20-2-124/005	11.9-15.6
5/8"-16UN	6.0mm	10.4	6.0I16UNTM028/014...	1	7.94	5	TMMC12-6.0	9.3-14.1
5/8"-16UN			6.0I16UNTM028/014...	1	7.94	5	TMMC20-6.0	9.3-14.1
11/16"-12UN	1/4"	11	2I12UNTM028/016...	1	8.47	4	TMC20-2-124/005	11.9-15.6
3/4"-10UNC	3/8"	16	3I10UNTM028/019...	1	12.70	5	TMC16-3-124/001	16.3-31.6
3/4"-12UN			3I12UNTM028/020...	2	14.82	7	TMNC16-3	16.7-18.3
13/16"-12UN			3I12UNTM028/020...	2	14.82	7	TMC16-3	18.3-19.5
7/8"-9UNC	1/2"	22	4I9UNTM028/021...	1	16.93	6	TMC25-4-124/002	19.1-32.5

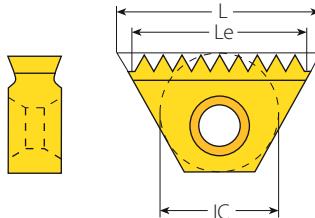
For toolholder information, see page 282.

## American UN (con't)

### Internal



Defined by: ANSI B1.1.74  
Tolerance class: Class 2A/2B



Coarse Pitch TM

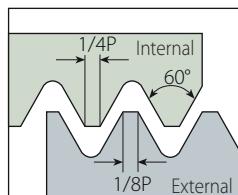
### Coarse Pitch TM

Thread	Insert Size		Ordering Code	Cutting Edge	Le	Teeth	Bore Dia. Range
	IC	L mm	Internal		mm	Toolholder	mm
1"-8UNC	1/2"	22	4I8UNTM028/022...	1	19.05	6	TMC25-4-124/007 21.9-28.3
1 1/16"-8UN			4I8UNTM028/022...	1	19.05	6	TMC25-4-124/007 21.9-28.3
1 1/8"-7UNC			4I7UNTM028/023...	1	18.14	5	TMC25-4-124/002 24.6-35.9
1 1/8"-8UN			4I8UNTM028/022...	1	19.05	6	TMC25-4-124/007 21.9-28.3
1 3/16"-8UN			4I8UNTM028/022...	1	19.05	6	TMC25-4-124/007 21.9-28.3
1 1/4"-7UNC			4I7UNTM028/023...	1	18.14	5	TMC25-4-124/002 24.6-35.9
1 1/4"-8UN	5/8"	27	5I8UNTM028/024...	2	22.23	7	TMC25-5-124/004 28.3-33.0
1 5/16"-8UN			5I8UNTM028/024...	2	22.23	7	TMC25-5-124/004 28.3-33.0
1 3/8"-6UNC			5I6UNTM028/025...	2	25.40	6	TMC25-5-124/004 30.3-36.7
1 3/8"-8UN			5I8UNTM028/024...	2	22.23	7	TMC25-5-124/004 28.3-33.0
1 7/16"-6UN			5I6UNTM028/025...	2	25.40	6	TMC25-5-124/004 30.3-36.7
1 7/16"-8UN			5I8UNTM028/024...	2	22.23	7	TMC25-5 33.0-39.0
1 1/2"-6UNC			5I6UNTM028/025...	2	25.40	6	TMC25-5-124/004 30.3-36.7
1 1/2"-8UN			5I8UNTM028/024...	2	22.23	7	TMC25-5 33.0-39.0
1 9/16"-6UN			5I6UNTM028/025...	2	25.40	6	TMC25-5-124/004 30.3-36.7
1 9/16"-8UN			5I8UNTM028/024...	2	22.23	7	TMC25-5 33.0-39.0
1 5/8"-6UN			5I6UNTM028/025...	2	25.40	6	TMC25-5 36.7-45.0
1 5/8"-8UN			5I8UNTM028/024...	2	22.23	7	TMC25-5 33.0-39.0
1 11/16"-6UN			5I6UNTM028/025...	2	25.40	6	TMC25-5 36.7-45.0
1 3/4"-5UNC			5I5UNTM028/077...	2	20.32	4	TMC25-5 38.9-∞
1 3/4"-6UN			5I6UNTM028/025...	2	25.40	6	TMC25-5 36.7-45.0
1 13/16"-6UN			5I6UNTM028/025...	2	25.40	6	TMC25-5 36.7-45.0
1 7/8"-6UN			5I6UNTM028/025...	2	25.40	6	TMC25-5 36.7-45.0
1 15/16"-6UN			5I6UNTM028/025...	2	25.40	6	TMC25-5 36.7-45.0

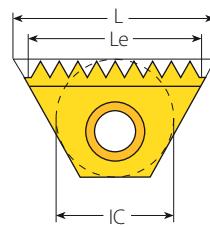
For toolholder information, see page 282.

## American UN (con't)

### External / Internal



Defined by: ANSI B1.1.74  
Tolerance class: Class 2A/2B

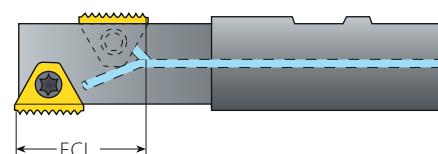


Standard TM

### Standard TM Inserts for TMO Toolholders

Insert Size	Pitch	Ordering Code			ECL	
IC	L mm	TPI	External	Internal	Toolholder	mm
1/4"	11	48		2I48UNTM2...	TMOC20-2-1	19.58
		48		2I48UNTM2...	TMOC20-2-2	18.52
		48		2I48UNTM2...	TMOC20-2-9	19.05
		32		2I32UNTM2...	TMOC20-2-1	19.85
		28	2E28UNTM2...	2I28UNTM2...	TMOC20-2-3	17.24
		24	2E24UNTM2...	2I24UNTM2...	TMOC20-2-2	17.99
		20	2E20UNTM2...	2I20UNTM2...	TMOC20-2-4	19.05
		18	2E18UNTM2...	2I18UNTM2...	TMOC20-2-2	18.34
		16	2E16UNTM2...	2I16UNTM2...	TMOC20-2-1	19.05
		14	2E14UNTM2...	2I14UNTM2...	TMOC20-2-3	16.33
3/8"	16	32		3I32UNTM2...	TMOC20-3-3	27.78
		32		3I32UNTM2...	TMOC20-3-11	28.58
		28	3E28UNTM2...	3I28UNTM2...	TMOC20-3-3	27.21
		27	3E27UNTM2...	3I27UNTM2...	TMOC20-3-4	27.28
		24	3E24UNTM2...	3I24UNTM2...	TMOC20-3-6	27.52
		20	3E20UNTM2...	3I20UNTM2...	TMOC20-3-6	26.67
		18	3E18UNTM2...	3I18UNTM2...	TMOC20-3-6	26.82
		16	3E16UNTM2...	3I16UNTM2...	TMOC20-3-6	26.99
		14	3E14UNTM2...	3I14UNTM2...	TMOC20-3-6	27.21
		13	3E13UNTM2...	3I13UNTM2...	TMOC20-3-2	25.4
		12	3E12UNTM2...	3I12UNTM2...	TMOC20-3-6	27.52
		11.5	3E11.5UNTM2...	3I11.5UNTM2...	TMOC20-3-5	24.3

TM Standard

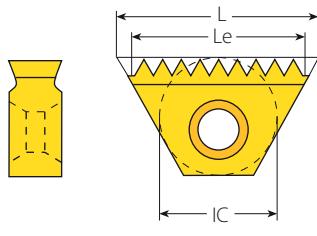
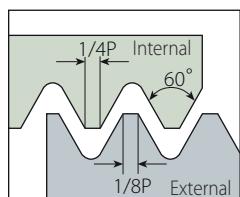


ECL - The Effective Cutting Length

For Le and number of teeth of the above inserts, see the table for standard inserts on pages 263-264.  
For toolholder information, see page 291.

## American UN (con't)

### External / Internal

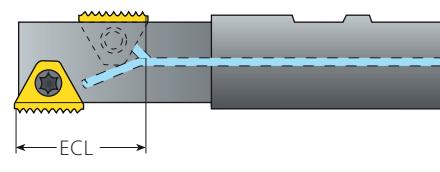


Defined by: ANSI B1.1.74  
Tolerance class: Class 2A/2B

Standard TM

### Standard TM Inserts for TMO Toolholders

Insert Size		Pitch	Ordering Code			ECL
IC	L mm	TPI	External	Internal	Toolholder	mm
5/8"	27	24	5E24UNTM2..	5I24UNTM2..	TMOC25-5-1	50.80
		24	5E24UNTM2...	5I24UNTM2...	TMOC25-5-2	46.57
		20	5E20UNTM2...	5I20UNTM2...	TMOC25-5-1	50.80
		18	5E18UNTM2...	5I18UNTM2...	TMOC25-5-1	50.80
		18	5E18UNTM2...	5I18UNTM2...	TMOC25-5-2	46.57
		16	5E16UNTM2...	5I16UNTM2...	TMOC25-5-3	47.63
		14	5E14UNTM2...	5I14UNTM2...	TMOC25-5-1	50.80
		14	5E14UNTM2...	5I14UNTM2...	TMOC25-5-4	47.17
		13	5E13UNTM2...	5I13UNTM2...	TMOC25-5-1	50.80
		12	5E12UNTM2...	5I12UNTM2...	TMOC25-5-2	46.57
		12	5E12UNTM2...		TMOC25-5-1	50.80
		11.5	5E11.5UNTM2...	5I11.5UNTM2...	TMOC25-5-5	46.38
		11	5E11UNTM2...	5I11UNTM2...	TMOC25-5-6	48.49
		11		5I11UNTM2...	TMOC25-5-1	46.18
		10	5E10UNTM2...		TMOC25-5-7	43.18
		10		5I10UNTM2...	TMOC25-5-7	45.72
		9	5E9UNTM2...	5I9UNTM2...	TMOC25-5-8	45.16
		8	5E8UNTM2...	5I8UNTM2...	TMOC25-5-9	44.45
		7	5E7UNTM2...		TMOC25-5-10	43.54
		7		5I7UNTM2...	TMOC25-5-10	47.17
		6	5E6UNTM2...		TMOC25-5-2	42.33
		6		5I6UNTM2...	TMOC25-5-2	46.57
		5		5I5UNTM...028/077	TMOC25-5-7	40.64

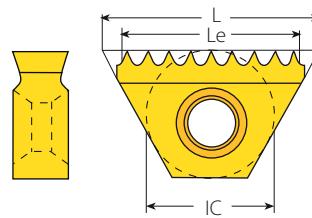
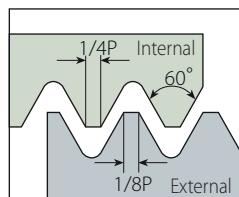


ECL - The Effective Cutting Length

For Le and number of teeth of the above inserts, see the table for standard inserts on pages 263-264.  
For toolholder information, see page 291.

## American UN (con't)

### External / Internal



Defined by: ANSI B1.1.74  
Tolerance class: Class 2A/2B

Fine Pitch TM

### Fine Pitch TM

Insert Size		Pitch	Ordering Code		Le	Teeth	
IC	L mm	TPI	External	Internal	mm	Toolholder	
6.0mm	10.4	80	6.0E80UNTMF...	6.0I80UNTMF...	9.84	16	
		72	6.0E72UNTMF...	6.0I72UNTMF...	9.53	14	
		64	6.0E64UNTMF...	6.0I64UNTMF...	9.13	12	
		56	6.0E56UNTMF...	6.0I56UNTMF...	9.53	11	
		48	6.0E48UNTMF...		9.00	9	TMMC..-6.0
		44	6.0E44UNTMF...		8.66	8	
		40	6.0E40UNTMF...		8.26	7	
		36	6.0E36UNTMF...		9.17	7	
		32	6.0E32UNTMF...		8.73	6	
		80	2E80UNTM2F...	2I80UNTM2F...	9.84	16	
1/4"	11	72	2E72UNTM2F...	2I72UNTM2F...	10.23	15	TMC..-2 TMSH..-2
		64	2E64UNTM2F...	2I64UNTM2F...	9.92	13	
		56	2E56UNTM2F...	2I56UNTM2F...	9.53	11	
		48	2E48UNTM2F...		10.05	10	
		44	2E44UNTM2F...		9.81	9	
		40	2E40UNTM2F...		9.53	8	
		36	2E36UNTM2F...		9.17	7	
		32	2E32UNTM2F...		8.73	6	
		80	3E80UNTM2F...	3I80UNTM2F...	14.29	23	
		72	3E72UNTM2F...	3I72UNTM2F...	14.46	21	
3/8"	16	64	3E64UNTM2F...	3I64UNTM2F...	14.68	19	TMC..-3 TMSH..-3
		56	3E56UNTM2F...	3I56UNTM2F...	14.06	16	
		48	3E48UNTM2F...		14.29	14	
		44	3E44UNTM2F...		14.43	13	
		40	3E40UNTM2F...		14.61	12	
		36	3E36UNTM2F...		14.82	11	
		32	3E32UNTM2F...		13.49	9	

NOTE: Two orbits are required to complete the thread. Fine Pitch TM Inserts produce partial profile thread.

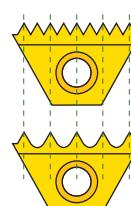
Sample order: 6.0E80UNTMF VBX

All inserts have 2 cutting edges, except MiniTM (IC 6.0 mm), which has one cutting edge.

For toolholder information, see page 282.

### Fine Pitch Threads

Fine pitch threads are threads with small pitches. It is difficult to produce multitooth inserts for small pitches because of the small radius between the teeth. Vargus developed inserts where every second tooth was dropped to enlarge the radius between the teeth.

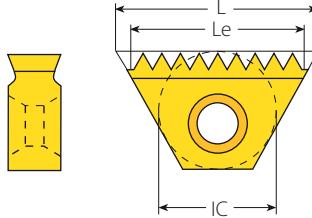
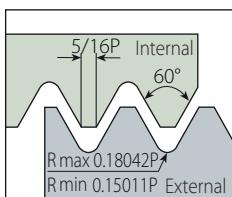


#### Important!

- All the fine pitch inserts are partial profile type (as a result of the enlarged radius).

# UNJ

## External / Internal



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

Standard TM

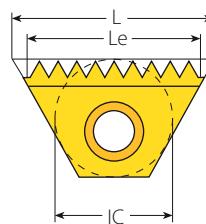
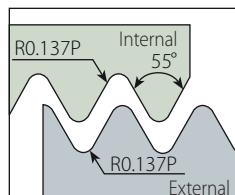
## Standard TM

Insert Size		Pitch		Ordering Code		Le	Teeth	
IC	L mm	TPI	External	Internal	mm		Toolholder	
6.0mm	10.4	24		6.0I24UNJTM...	9.53	9		
		20		6.0I20UNJTM...	8.89	7		
		18		6.0I18UNJTM...	8.47	6		
		16		6.0I16UNJTM...	9.53	6		
1/4"	11	24	2E24UNJTM2...	2I24UNJTM2...	9.53	9		
		20	2E20UNJTM2...	2I20UNJTM2...	10.16	8		
		18		2I18UNJTM2...	9.88	7		
		16	2E16UNJTM2...	2I16UNJTM2...	9.53	6		
		14	2E14UNJTM2...	2I14UNJTM2...	9.07	5		
3/8"	16	24	3E24UNJTM2...	3I24UNJTM2...	14.82	14		
		20	3E20UNJTM2...	3I20UNJTM2...	13.97	11		
		18	3E18UNJTM2...	3I18UNJTM2...	14.11	10		
		16	3E16UNJTM2...	3I16UNJTM2...	14.29	9		
		14	3E14UNJTM2...	3I14UNJTM2...	14.51	8		
		13	3E13UNJTM2...		13.68	7		
		12	3E12UNJTM2...	3I12UNJTM2...	14.82	7		
5/8"	27	16	5E16UNJTM2...	5I16UNJTM2...	25.40	16		
		12	5E12UNJTM2...	5I12UNJTM2...	25.40	12		
		11	5E11UNJTM2...	5I11UNJTM2...	25.40	11		

All inserts have 2 cutting edges, except MiniTM (IC 6.0 mm), which has one cutting edge.  
For toolholder information, see page 282.

## Whitworth for BSW, BSP

### External / Internal



BSW Defined by: B.S.84:1956, DIN 259, ISO228/1:1982

BSP Defined by: B.S.2779:1956

Tolerance class: BSW-Medium class A, BSP-Medium class

Standard TM

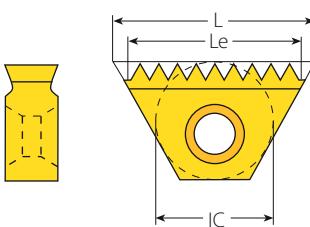
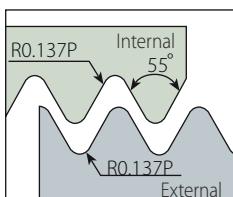
### Standard TM

Insert Size		Pitch	Ordering Code	Le	Teeth	
IC	L mm	TPI	External + Internal	mm	Toolholder	
6.0mm	10.4	28	6.0EI28WTM...	9.07	10	
		26	6.0EI26WTM...	8.79	9	
		24	6.0EI24WTM...	9.53	9	
		20	6.0EI20WTM...	8.89	7	
		19	6.0EI19WTM...	9.36	7	
1/4"	11	28	2EI28WTM2...	9.98	11	
		26	2EI26WTM2...	9.77	10	
		24	2EI24WTM2...	9.53	9	
		20	2EI20WTM2...	10.16	8	
		19	2EI19WTM2...	9.36	7	
		14	2EI14WTM2...	9.07	5	
3/8"	16	26	3EI26WTM2...	14.65	15	
		24	3EI24WTM2...	14.82	14	
		20	3EI20WTM2...	13.97	11	
		19	3EI19WTM2...	14.71	11	
		18	3EI18WTM2...	14.11	10	
		16	3EI16WTM2...	14.29	9	
		14	3EI14WTM2...	14.51	8	
		12	3EI12WTM2...	14.82	7	
		11	3EI11WTM2...	13.85	6	
		24	3BEI24WTM2...	21.17	20	
3/8"B	22	20	3BEI20WTM2...	21.59	17	
		19	3BEI19WTM2...	21.39	16	
		18	3BEI18WTM2...	21.17	15	
		16	3BEI16WTM2...	20.64	13	
		14	3BEI14WTM2...	21.77	12	
		12	3BEI12WTM2...	21.17	10	
		11	3BEI11WTM2...	20.78	9	
		16	5EI16WTM2...	25.40	16	
5/8"	27	14	5EI14WTM2...	25.40	14	
		12	5EI12WTM2...	23.28	11	
		11	5EI11WTM2...	23.09	10	
		10	5EI10WTM2...	25.40	10	
		9	5EI9WTM2...	22.58	8	
		8	5EI8WTM2...	22.23	7	
		7	5EI7WTM2...	21.77	6	
		6	5EI6WTM2...	21.17	5	
		11	6BEI11WTM2...	34.64	15	
		6	6BEI6WTM2...	33.87	8	
3/4"B	38.5	5	6BEI5WTM2...	30.48	6	
		4.5	6BEI4.5WTM2...	33.87	6	

All inserts have 2 cutting edges, except MiniTM (IC 6.0 mm) which has one cutting edge.  
For toolholder information, see page 282.

## Whitworth for BSW only (con't)

### Internal



Defined by: B.S.84:1956, DIN259, ISO228/1:1982  
Tolerance class: Medium class A

Coarse Pitch TM

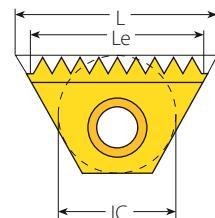
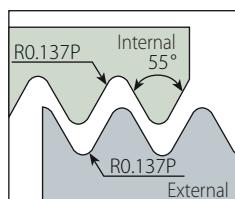
### Coarse Pitch TM

Thread	Insert Size		Ordering Code	Cutting Edge	Le	Teeth	Bore Dia. Range	
Inch	IC	L mm	Internal		mm	Toolholder	mm	
7/16"-18	6.0mm	10.4	6.0I18WTM028/035...	1	8.47	6	TMMC12-6.0	9.3-14.2
7/16"-18			6.0I18WTM028/035...	1	8.47	6	TMMC20-6.0	9.3-14.2
7/16"-26			6.0I26WTM028/036...	1	8.79	9	TMMC12-6.0	9.8-10.5
7/16"-26			6.0I26WTM028/036...	1	8.79	9	TMMC20-6.0	9.8-10.5
1/2"-16	1/4"	11	2I16WTM028/051...	1	9.53	6	TMC20-2-124/005	10.6-12.2
1/2"-20	6.0mm	10.4	6.0I20WTM028/037...	1	8.89	7	TMMC12-6.0	11.0-11.4
1/2"-20			6.0I20WTM028/037...	1	8.89	7	TMMC20-6.0	11.0-11.4
9/16"-16	1/4"	11	2I16WTM028/038...	2	9.53	6	TMC12-2	12.2-18.5
9/16"-16			2I16WTM028/038...	2	9.53	6	TMC20-2	12.2-18.5
5/8"-14			2I14WTM028/039...	1	9.07	5	TMC20-2-124/006	13.5-19.0
11/16"-14			2I14WTM028/039...	1	9.07	5	TMC20-2-124/006	13.5-19.0
11/16"-16			2I16WTM028/038...	2	9.53	6	TMC12-2	12.2-18.5
11/16"-16			2I16WTM028/038...	2	9.53	6	TMC20-2	12.2-18.5
3/4"-12	3/8"	16	3I12WTM028/040...	1	14.82	7	TMC16-3-124/001	16.3-17.9
3/4"-16	1/4"	11	2I16WTM028/038...	2	9.53	6	TMC12-2	12.2-18.5
3/4"-16			2I16WTM028/038...	2	9.53	6	TMC20-2	12.2-18.5
13/16"-12	3/8"	16	3I12WTM028/041...	2	14.82	7	TMC16-3	17.9-21.0
7/8"-9	1/2"	22	4I9WTM028/042...	1	16.93	6	TMC25-4-124/002	18.6-32.5
7/8"-11			4I11WTM028/043...	1	18.47	8	TMC25-4-124/002	19.2-22.0
15/16"-12	3/8"	16	3I12WTM028/041...	2	14.82	7	TMC20-3	21.0-30.6
1"-8	1/2"	22	4I8WTM028/044...	1	15.88	5	TMC25-4-124/002	21.3-26.0
1"-10			4I10WTM028/045...	1	17.78	7	TMC25-4-124/002	22.1-31.6
1"-12	3/8"	16	3I12WTM028/041...	2	14.82	7	TMC20-3	21.0-30.6
1 1/16"-12			3I12WTM028/041...	2	14.82	7	TMC20-3	21.0-30.6
1 1/8"-7	5/8"	27	5I7WTM028/046...	1	21.77	6	TMC25-5-124/008	23.9-27.1
1 1/8"-9	1/2"	22	4I9WTM028/042...	1	16.93	6	TMC25-4-124/002	18.6-32.5
1 1/8"-12	3/8"	16	3I12WTM028/041...	2	14.82	7	TMC20-3	21.0-30.6
1 3/16"-8	5/8"	27	5I8WTM028/047...	2	22.23	7	TMC25-5-124/004	26.0-32.4
1 3/16"-12	3/8"	16	3I12WTM028/041...	2	14.82	7	TMC20-3	21.0-30.6
1 1/4"-7	5/8"	27	5I7WTM028/048...	2	21.77	6	TMC25-5-124/004	21.7-35.9
1 1/4"-9	1/2"	22	4I9WTM028/042...	1	16.93	6	TMC25-4-124/002	18.6-32.5
1 1/4"-12	3/8"	16	3I12WTM028/041...	2	14.82	7	TMC20-3	21.0-30.6
1 5/16"-6	5/8"	27	5I6WTM028/049...	2	21.17	5	TMC25-5-124/004	27.9-32.6
1 5/16"-8			5I8WTM028/047...	2	22.23	7	TMC25-5-124/004	26.0-32.4

For toolholder information, see page 282.

## Whitworth for BSW only (con't)

### Internal



Defined by: B.S.84:1956, DIN259, ISO228/1:1982  
Tolerance class: Medium class A

Coarse Pitch TM Inserts

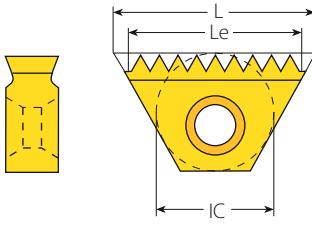
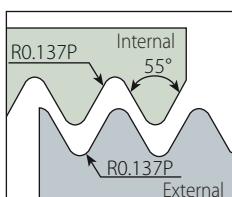
### Coarse Pitch TM

Thread	Insert Size		Ordering Code	Cutting Edge	Le	Teeth	Bore Dia. Range	
	IC	L mm					mm	Toolholder
1 5/16"-12	3/8"	16	3I12WTM028/041...	2	14.82	7	TMC20-3	21.0-30.6
1 3/8"-8			5I8WTM028/047...		22.23	7	TMC25-5-124/004	26.0-32.4
1 3/8"-6			5I6WTM028/049...		21.17	5	TMC25-5-124/004	27.9-32.6
1 3/8"-12			5I12WTM028/050...		23.28	11	TMC25-5	32.2-34.6
1.4-6			5I6WTM028/049...		21.17	5	TMC25-5-124/004	27.9-32.6
1.4-8			5I8WTM028/047...		22.23	7	TMC25-5-124/004	26.0-32.4
1.4-12			5I12WTM028/050...		23.28	11	TMC25-5	32.2-34.6
1 7/16"-6			5I6WTM028/049...		21.17	5	TMC25-5-124/004	27.9-32.6
1 7/16"-8			5I8WTM028/047...		22.23	7	TMC25-5	32.4-39.0
1 7/16"-12		27	5I12WTM028/050...		23.28	11	TMC25-5	32.2-34.6
1 1/2"-6			5I6WTM028/049...		21.17	5	TMC25-5-124/004	27.9-32.7
1 1/2"-8			5I8WTM028/047...		22.23	7	TMC25-5	32.4-39.0
1.6-6			5I6WTM028/049...		21.17	5	TMC25-5	32.6-38.5
1.6-8			5I8WTM028/047...		22.23	7	TMC25-5	32.4-39.0
1 5/8"-8			5I8WTM028/047...		22.23	7	TMC25-5	32.4-39.0
1 5/8"-6			5I6WTM028/049...		21.17	5	TMC25-5	32.6-38.5
1 3/4"-7			5I7WTM028/048...		21.77	6	TMC25-5	39.8-42.0
1 7/8"-6			5I6WTM028/049...		21.17	5	TMC32-5	42.2-45.0
1.9-6			5I6WTM028/049...		21.17	5	TMC32-5	42.2-45.0

For toolholder information, see page 282.

## Whitworth for BSW only (con't)

### External / Internal

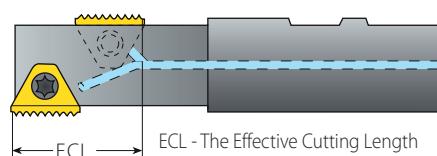


Defined by: B.S.84:1956, DIN259, ISO228/1:1982  
Tolerance class: Medium class A

Standard TM

### Standard TM Inserts for TMO Toolholders

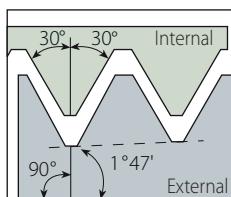
Insert Size		Pitch	Ordering Code	ECL
IC	L mm	TPI	External + Internal	Toolholder mm
1/4"	11	28	2EI28WTM2...	TMOC20-2-3 17.24
		26	2EI26WTM2...	TMOC20-2-5 18.56
		24	2EI24WTM2...	TMOC20-2-2 17.99
		20	2EI20WTM2...	TMOC20-2-6 19.05
		19	2EI19WTM2...	TMOC20-2-7 17.38
		14	2EI14WTM2...	TMOC20-2-3 16.33
3/8"	16	26	3EI26WTM2...	TMOC20-3-2 27.35
		26	3EI26WTM2...	TMOC20-3-6 26.38
		24	3EI24WTM2...	TMOC20-3-7 28.57
		20	3EI20WTM2...	TMOC20-3-6 26.67
		19	3EI19WTM2...	TMOC20-3-8 28.07
		18	3EI18WTM2...	TMOC20-3-6 26.81
		16	3EI16WTM2...	TMOC20-3-6 26.99
		14	3EI14WTM2...	TMOC20-3-6 27.21
		12	3EI12WTM2...	TMOC20-3-6 27.52
		11	3EI11WTM2...	TMOC20-3-9 27.71
5/8"	27	16	5EI16WTM2...	TMOC25-5-3 47.63
		14	5EI14WTM2...	TMOC25-5-1 50.80
		14	5EI14WTM2...	TMOC25-5-4 47.17
		12	5EI12WTM2...	TMOC25-5-2 44.45
		11	5EI11WTM2...	TMOC25-5-6 46.18
		10	5EI10WTM2...	TMOC25-5-7 45.72
		9	5EI9WTM2...	TMOC25-5-8 45.16
		8	5EI8WTM2...	TMOC25-5-9 44.45
		7	5EI7WTM2...	TMOC25-5-4 43.54
		6	5EI6WTM2...	TMOC25-5-11 42.33



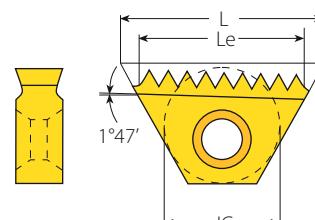
For Le and number of teeth of the above inserts, see the table for standard inserts on page 271.  
For toolholder information see page 291.

## NPT

### External / Internal



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



Standard TM

### Standard TM

Insert Size		Pitch	Ordering Code	Le	Teeth	Toolholder	
IC	L mm	TPI	External + Internal	mm		RH	LH
3/8"	16	18	3E18NPT-TM2...*	14.11	10		
		14	3E14NPT-TM2...	14.51	8	TMNC..-3	TMNC..-3LH
		11.5	3EI11.5NPT-TM2...	13.25	6		
3/8"B	22	14	3BEI14NPT-TM2...	21.77	12	BTMNC..-3B	BTMNC..-3BLH
		11.5	3BEI11.5NPT-TM2...**	19.88	9		
5/8"	27	11.5	5EI11.5NPT-TM2...	24.30	11	TM.C..-5	TM.C..-5LH
		8	5EI8NPT-TM2...	22.23	7	TMNC..-5	TMNC..-5LH
3/4"B	38.5	11.5	6BEI11.5NPT-TM2...	35.34	16	TMC..-6B	TMC..-6BLH
		8	6BEI8NPT-TM2...	31.75	10		

\* For external thread only.

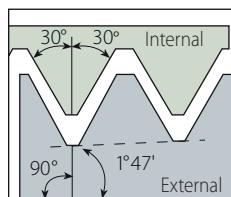
To thread with insert cutting edge marked "L", use LH toolholders.

For toolholder information, see page 286.

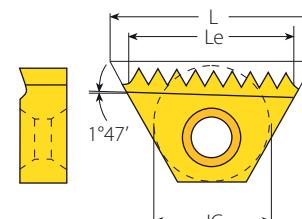
\*\* Single sided insert - RH only.

## NPT

### Internal



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



Coarse Pitch TM

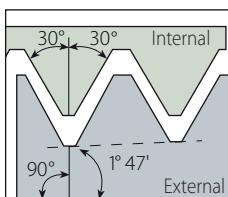
### Coarse Pitch TM

Thread	Insert Size		Ordering Code	Cutting Edge	Le	Teeth	Toolholder
Inch	IC	L mm	Internal		mm		
1/4"-18	1/4"	11	2I18NPT-TM028/074...	1	9.88	7	TMC20-2-124/009
3/8"-18			2I18NPT-TM028/074...	1	9.88	7	TMC20-2-124/009

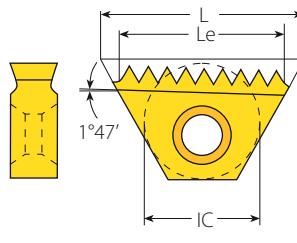
For toolholder information, see page 286.

## NPTF (Dry Seal)

### External / Internal



Defined by: ANSI 1.20.3-1976  
Tolerance class: Standard NPTF



Standard TM

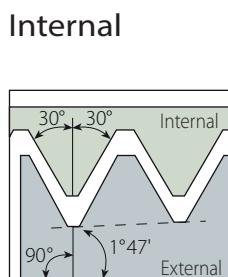
### Standard TM

Insert Size		Pitch	Ordering Code	Le	Teeth	Toolholder	
IC	L mm	TPI	External + Internal	mm		RH	LH
3/8"	16	14	3EI14NPTFTM2...	14.51	8	TMNC..-3	TMNC..-3LH
		11.5	3EI11.5NPTFTM2...	13.25	6		
3/8"B	22	14	3BEI14NPTFTM2...	21.77	12	BTMNC..-3B	BTMNC..-3BLH
		11.5	3BEI11.5NPTFTM2...	19.88	9		
5/8"	27	11.5	5EI11.5NPTFTM2...	24.30	11	TMC..-5	TMC..-5LH
		8	5EI8NPTFTM2...	22.23	7		
3/4"B	38.5	11.5	6BEI11.5NPTFTM2...	35.34	16	TMC..-6B	TMC..-6BLH
		8	6BEI8NPTFTM2...	31.75	10		

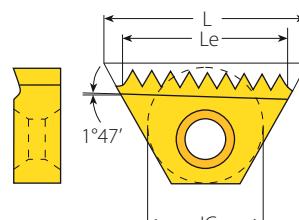
To thread with insert cutting edge marked "L", use LH toolholders.

For toolholder information, see page 286.

## NPTF (Dry Seal)



Defined by: ANSI 1.20.3-1976  
Tolerance class: Standard NPTF



Coarse Pitch TM

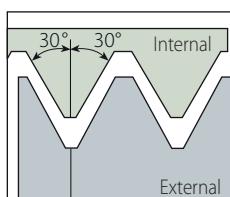
### Coarse Pitch TM

Thread	Insert Size		Ordering Code	Cutting Edge	Le	Teeth	Toolholder
Inch	IC	L mm	Internal		mm		
1/4"-18	1/4"	11	2I18NPTFTM028/078...	1	9.88	7	TMC20-2-124/009
3/8"-18			2I18NPTFTM028/078...	1	9.88	7	TMC20-2-124/009

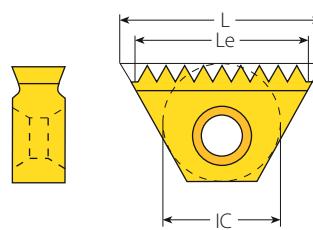
For toolholder information, see page 286.

## NPS

### External / Internal



Defined by: USA NBS H28 (1957)  
Tolerance class: Standard NPS



Standard TM

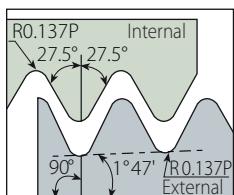
### Standard TM

Insert Size		Pitch	Ordering Code	Le	Teeth	Nominal Thread Size	Toolholder
IC	L mm	TPI	External + Internal	mm			
3/8"	16	14	3EI14NPSTM2...	14.51	8	1/2"	TMNC16-3
		14	3EI14NPSTM2...	14.51	8	3/4"	TMNC20-3
	22	11.5	3BEI11.5NPSTM2...*	13.25	6	1", 1 1/4"	TMNC20-3
5/8"B	27	11.5	3BEI11.5NPSTM2...*	19.88	9	1", 1 1/4"	BTMNC20-3B
		8	5EI11.5NPSTM2...	24.30	11	1 1/2", 2"	TMC25-5
			5EI8NPSTM2...	22.23	7	2 1/2" & larger	TMC32-5

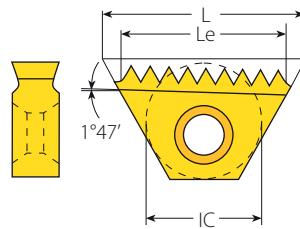
\* One cutting edge.  
All inserts have 2 cutting edges.  
For toolholder information, see page 282.

## BSPT

### External / Internal



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



Standard TM

### Standard TM

Insert Size		Pitch	Ordering Code	Le	Teeth	Toolholder	
IC	L mm	TPI	External + Internal	mm		RH	LH
1/4"	11	19	2EI19BSPT-TM2...	9.36	7	TMC..-2	TMC..-2LH
3/8"	16	14	3EI14BSPT-TM2...	14.51	8	TMNC..-3	TMNC..-3LH
5/8"	27	11	5EI11BSPT-TM2...	23.09	10	TMC..-5	TMC..-5LH

To thread with insert cutting edge marked "L", use a LH toolholder.  
For toolholder information, see page 282.

## Pg

**External / Internal**

Defined by: DIN 40430  
Tolerance class: Standard

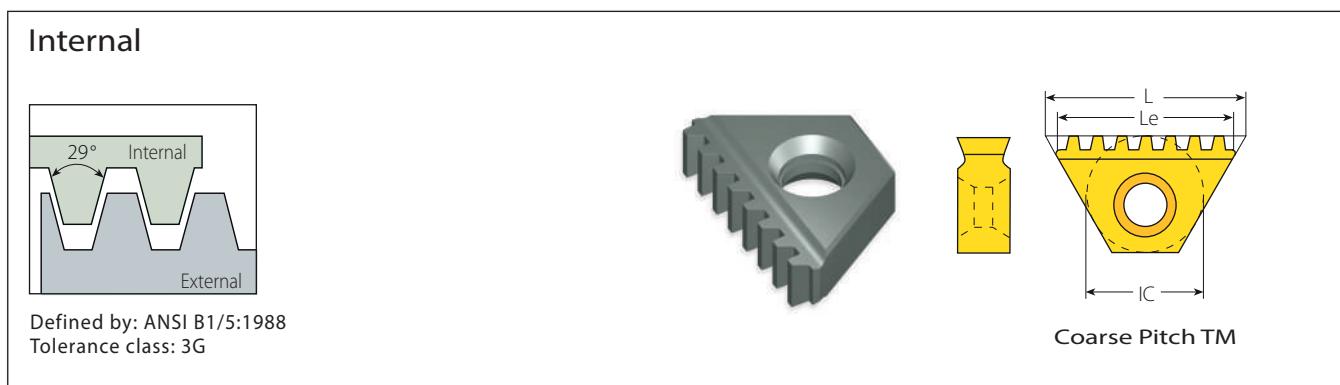
Standard TM

### Standard TM

Insert Size		Pitch	Ordering Code	Le	Teeth	Nominal Thread Size	
IC	L mm	TPI	External + Internal	mm			Toolholder
6.0mm	10.4	20	6EI20PGTM...	8.99	7	Pg7	TMMC..-6.0
		20	2EI20PGTM2...	10.16	8	Pg7	
	11	18	2EI18PGTM2...	9.88	7	Pg9, Pg11, Pg13.5, Pg16	TMC..-2
		16	2EI16PGTM2...	9.53	6	Pg21, Pg29, Pg36, Pg42, Pg48	TMSH..-2
1/4"	16	20	3EI20PGTM2...	13.97	11	Pg7	
		18	3EI18PGTM2...	14.11	10	Pg9, Pg11, Pg13.5, Pg16	TMC..-3
	16	16	3EI16PGTM2...	14.29	9	Pg21, Pg29, Pg36, Pg42, Pg48	TMSH..-3
		16	5EI16PGTM2...	25.40	16	Pg21, Pg29, Pg36, Pg42, Pg48	TMC..-5, TMSH..-5
5/8"	27	16					

All inserts have 2 cutting edges, except MiniTM (IC 6.0 mm) which has one edge.  
For toolholder information, see page 282.

# ACME



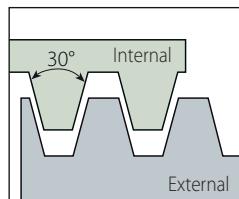
## Coarse Pitch TM

Thread	Insert Size		Ordering Code	Cutting Edge	Le	Teeth	Bore Dia. Range
Inch	IC	L mm	Internal	mm	Toolholder	mm	
1/2"-16	6.0mm	10.4	6.0I16ACMETM028/052...	1	7.94	5	TMMC12-6.0 11.1
1/2"-16			6.0I16ACMETM028/052...	1	7.94	5	TMMC20-6.0 11.1
5/8"-16			2I16ACMETM028/053...	2	9.53	6	TMC12-2 14.2
5/8"-16			2I16ACMETM028/053...	2	9.53	6	TMC20-2 14.2
5/8"-14			2I14ACMETM028/054...	1	9.07	5	TMC20-2-124/005 14.0
3/4"-16			2I16ACMETM028/055...	2	9.53	6	TMC12-2 17.4
3/4"-16			2I16ACMETM028/055...	2	9.53	6	TMC20-2 17.4
3/4"-14			2I14ACMETM028/083...	1	9.07	5	TMC20-2-124/006 17.2
3/4"-12			2I12ACMETM028/056...	1	8.47	4	TMC20-2-124/006 16.9
7/8"-14			3I14ACMETM028/057...	2	14.51	8	TMNC16-3 20.4
7/8"-12	1/4"	11	2I12ACMETM028/058...	1	8.47	4	TMC20-2-124/006 20.1
1"-14		3/8"	3I14ACMETM028/059...	2	14.51	8	TMC16-3 23.5
1"-12			3I12ACMETM028/060...	2	14.82	7	TMNC16-3 23.2
1"-10	1/2"	22	4I10ACMETM028/061...	1	17.78	7	TMC25-4-124/002 22.8
1"-8			4I8ACMETM028/062...	1	19.05	6	TMC25-4-124/002 22.2
1 1/8"-12			3I12ACMETM028/060...	2	14.82	7	TMC16-3 26.4
1 1/8"-10		1/2"	4I10ACMETM028/084...	1	17.78	7	TMC25-4-124/007 26.0
1 1/8"-8			4I8ACMETM028/063...	1	19.05	6	TMC25-4-124/002 25.4-28.5
1 1/4"-12	3/8"	16	3I12ACMETM028/060...	2	14.82	7	TMC20-3 29.6
1 1/4"-10	5/8"	27	5I10ACMETM028/064...	2	22.86	9	TMC25-5-124/004 29.2
1 1/4"-8	1/2"	22	4I8ACMETM028/063...	1	19.05	6	TMC25-4-124/002 25.4-28.5
1 3/8"-10		5/8"	5I10ACMETM028/065...	2	22.86	9	TMC25-5-124/004 32.3
1 3/8"-8			5I8ACMETM028/066...	2	22.23	7	TMC25-5-124/004 31.7
1 3/8"-6			5I6ACMETM028/067...	1	21.17	5	TMC25-5-124/008 30.6
1 1/2"-10			5I10ACMETM028/068...	2	22.86	9	TMC25-5 35.5
1 1/2"-8			5I8ACMETM028/069...	2	22.23	7	TMC25-5-124/004 34.9
1 1/2"-6			5I6ACMETM028/070...	2	21.17	5	TMC25-5-124/004 33.8
1 3/4"-10			5I10ACMETM028/064...	2	22.86	9	TMC32-5 41.9
1 3/4"-8			5I8ACMETM028/069...	2	22.23	7	TMC25-5 41.2
1 3/4"-6			5I6ACMETM028/070...	2	21.17	5	TMC25-5 40.2
1 3/4"-5			5I5ACMETM028/071...	2	20.32	4	TMC25-5-124/004 39.3
2"-8			5I8ACMETM028/069...	2	22.23	7	TMC32-5 47.6
2"-6			5I6ACMETM028/072...	2	21.17	5	TMC25-5 46.5
2"-5			5I5ACMETM028/071...	2	20.32	4	TMC25-5 45.7
2 1/4"-6			5I6ACMETM028/072...	2	21.17	5	TMC32-5 52.9
2 1/4"-5			5I5ACMETM028/073...	2	20.32	4	TMC25-5 52.0
2 1/2"-5			5I5ACMETM028/073...	2	20.32	4	TMC32-5 58.4

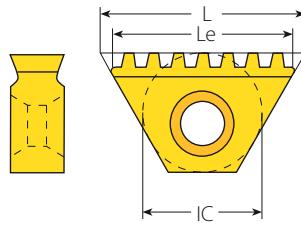
For toolholder information, see page 282.

# Trapez

## Internal



Defined by: Trapez DIN 103  
Tolerance class: 7e/7H

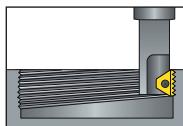


Coarse Pitch TM

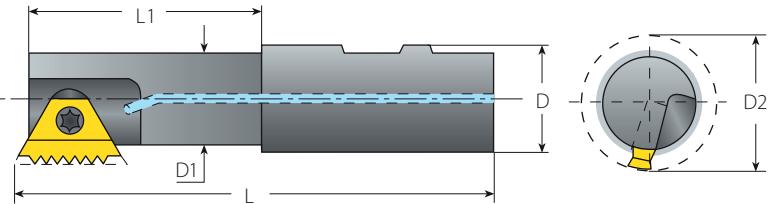
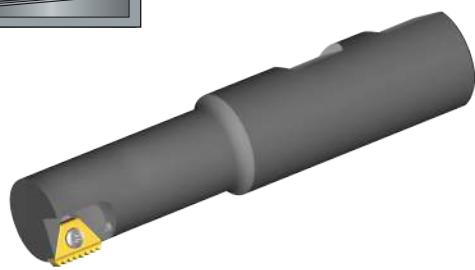
## Coarse Pitch TM

Thread	Insert Size			Ordering Code	Cutting Edge	Le	Teeth	Bore Dia. Range
mm	mm	IC	L mm	Internal		mm	Toolholder	mm
TR16x2.0	1/4"	11	2I2.0TRTM028/028...	1	10	5	TMC20-2-124/006	14.0
TR18x2.0			2I2.0TRTM028/029...	1	10	5	TMC20-2-124/006	16.0-18.0
TR20x2.0			2I2.0TRTM028/029...	1	10	5	TMC20-2-124/006	16.0-18.0
TR24x3.0	1/2"	22	4I3.0TRTM028/030...	1	18	6	TMC25-4-124/002	21.0
TR26x3.0			4I3.0TRTM028/031...	1	18	6	TMC25-4-124/002	23.0-27.0
TR28x3.0			4I3.0TRTM028/031...	1	18	6	TMC25-4-124/002	23.0-27.0
TR30x3.0			4I3.0TRTM028/031...	1	18	6	TMC25-4-124/002	23.0-27.0
TR32x3.0			4I3.0TRTM028/032...	1	18	6	TMC25-4-124/007	29.0-33.0
TR34x3.0			4I3.0TRTM028/032...	1	18	6	TMC25-4-124/007	29.0-33.0
TR36x3.0			4I3.0TRTM028/032...	1	18	6	TMC25-4-124/007	29.0-33.0
TR38x3.0			5I3.0TRTM028/033...	2	24	8	TMC25-5-124/004	35.0-39.0
TR40x3.0	5/8"	27	5I3.0TRTM028/033...	2	24	8	TMC25-5-124/004	35.0-39.0
TR42x3.0			5I3.0TRTM028/033...	2	24	8	TMC25-5-124/004	35.0-39.0
TR44x3.0			5I3.0TRTM028/033...	2	24	8	TMC25-5	41.0-45.0
TR46x3.0			5I3.0TRTM028/033...	2	24	8	TMC25-5	41.0-45.0
TR48x3.0			5I3.0TRTM028/033...	2	24	8	TMC25-5	41.0-45.0
TR50x3.0			5I3.0TRTM028/033...	2	24	8	TMC32-5	47.0-57.0
TR52x3.0			5I3.0TRTM028/033...	2	24	8	TMC32-5	47.0-57.0
TR55x3.0			5I3.0TRTM028/033...	2	24	8	TMC32-5	47.0-57.0
TR60x3.0			5I3.0TRTM028/033...	2	24	8	TMC32-5	47.0-57.0
TR65x4.0			5I4.0TRTM028/034...	2	24	6	TMC32-5	61.0-106.0
TR70x4.0			5I4.0TRTM028/034...	2	24	6	TMC32-5	61.0-106.0
TR75x4.0			5I4.0TRTM028/034...	2	24	6	TMC32-5	61.0-106.0
TR80x4.0			5I4.0TRTM028/034...	2	24	6	TMC32-5	61.0-106.0
TR85x4.0			5I4.0TRTM028/034...	2	24	6	TMC32-5	61.0-106.0
TR90x4.0			5I4.0TRTM028/034...	2	24	6	TMC32-5	61.0-106.0
TR95x4.0			5I4.0TRTM028/034...	2	24	6	TMC32-5	61.0-106.0
TR100x4.0			5I4.0TRTM028/034...	2	24	6	TMC32-5	61.0-106.0
TR105x4.0			5I4.0TRTM028/034...	2	24	6	TMC32-5	61.0-106.0
TR110x4.0			5I4.0TRTM028/034...	2	24	6	TMC32-5	61.0-106.0

For toolholder information, see page 282.



## External and Internal Toolholders



TM Standard

### TM Standard

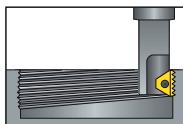
Insert Size	Ordering Code	Dimensions mm					Spare Parts	
		L	L1	D	D1	D2	Insert Screw	Torx Key
6.0mm	TMMC12-6.0	69.0	12.0	12	6.8	9.0	SN7T	K7T
	TMMC20-6.0	84.0	17.0	20	6.8	9.0		
1/4"	TMC12-2	70.0	12.0	12	8.9	11.5	SN2TM	K2T
	TMC20-2	85.0	20.0	20	8.9	11.5		
3/8"	TMC20-2LH	85.0	20.0	20	8.9	11.5	SN3TM	K3T
	TMC16-3	90.0	22.0	16	13.6	17.0		
3/8"B	TMC20-3	95.0	43.0	20	16.6	20.0	SN3TM	K3T
	BTMC16-3B	79.5	29.0	16	13.5	17.0		
5/8"	BTMC20-3B	81.5	29.0	20	15.5	19.0	SN3T	K3T
	BTMC25-3B	92.3	30.0	25	15.5	19.0		
3/4"B	BTMWC25-3B	90.8	30.0	25	18.5	22.0	SN5TM	K5T
	TMC25-5	110.0	52.0	25	24.0	30.0		
	TMC25-5LH	110.0	52.0	25	24.0	30.0	SM7T	K30T
	TMC32-5	120.0	58.0	32	31.0	37.0		
	TMC32-6B	115.0	53.0	32	27.0	35.0		
	TMC40-6B	135.0	63.0	40	38.0	46.0		

## Internal Thread Application for Standard Toolholder

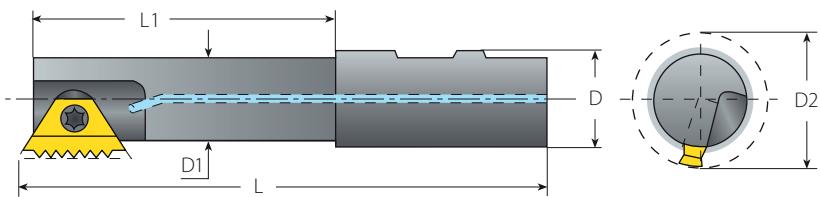
Toolholder		Min. Thread Dia.								
D2	ISO Coarse	ISO Fine		UNC	UN/UNF/UNEF/UNS		UNJ			
TMMC12-6.0 TMMC20-6.0	9.0	M10x0.75; M12x1.0; M14x1.25; M14x1.5		$\frac{7}{16}$ -32UN; $\frac{7}{16}$ -28UNEF; $\frac{1}{2}$ -24UNS; $\frac{7}{16}$ -20UNF; $\frac{7}{16}$ -18UNF; $\frac{7}{16}$ -16UNF		$\frac{9}{16}$ -24UNJEF; $\frac{1}{2}$ -20UNJF; $\frac{9}{16}$ -18UNJF; $\frac{9}{16}$ -16UNJF				
TMC12-2 TMC20-2 TMC20-2LH	11.5	M15x1.0; M16x1.5		$\frac{9}{16}$ -32UN; $\frac{9}{16}$ -28UN; $\frac{9}{16}$ -24UNEF; $\frac{5}{8}$ -20UN; $\frac{9}{16}$ -18UNF; $\frac{9}{16}$ -16UNF; $\frac{7}{8}$ -14UNF		$\frac{9}{16}$ -24UNJEF; $\frac{3}{4}$ -20UNJEF; $\frac{5}{8}$ -18UNJF; $\frac{5}{8}$ -16UNJF; $\frac{7}{8}$ -14UNJF				
TMC16-3	17.0	M20x1.0; M22x1.5; M24x2.0		$\frac{3}{4}$ -32UN; $\frac{13}{16}$ -28UN; $\frac{7}{8}$ -24UNS; $\frac{7}{8}$ -20UNEF; $\frac{7}{8}$ -18UNS $\frac{7}{8}$ -16UNS; 1-14UNS; $\frac{13}{16}$ -12UN		$\frac{15}{8}$ -24UNJ; $\frac{7}{8}$ -20UNJEF; $1\frac{1}{16}$ -18UNJEF; $\frac{7}{8}$ -16UNJ; $1\frac{5}{8}$ -14UNJ; $1\frac{1}{16}$ -12UNJ				
TMC20-3	20.0	M24x1.0; M25x1.5; M27x2.0		$\frac{7}{8}$ -32UN; $\frac{15}{16}$ -28UN; 1-24UNS; $\frac{15}{16}$ -20UNEF; 1-18UNS; 1-16 UNS; 1-14UNS; $1\frac{1}{16}$ -12UN		$1\frac{5}{8}$ -24 UNJ; $1\frac{1}{16}$ -20UNJEF; $1\frac{1}{16}$ -18UNJEF; 1-16UNJ; $1\frac{5}{8}$ -14UNJ; $1\frac{1}{16}$ -12UNJ				
BTMC16-3B	17.0	M20x1.0; M22x1.5; M24x2.0		$\frac{7}{8}$ -24UNS; $\frac{7}{8}$ -20UNEF; $\frac{7}{8}$ -18UNS; $\frac{7}{8}$ -16UNS; 1-14UNS; $\frac{13}{16}$ -12UN						
BTMC20-3B BTMC25-3B	19.0	M22x1.0; M24x1.5; M25x2.0		$\frac{7}{8}$ -24UNS; $\frac{15}{16}$ -20UNEF; 1-18UNS; 1-16UNS; 1-14UNS; 1-12UNF						
BTMWC25-3B	22.0	M27x1.5	M25x1.0; M30x2		1-24UNS; $1\frac{1}{16}$ -20UN; $1\frac{1}{16}$ -18UNEF; $1\frac{1}{16}$ -16UNEF; $1\frac{1}{8}$ -14UNS; $1\frac{1}{8}$ -12UNF					
TMC25-5	30.0	M35x1.5; M39x2.0; M36x3.0; M36x4.0; M42x4.5; M48x5.0		$1\frac{3}{4}$ -5	$1\frac{3}{8}$ -24UNS; $1\frac{3}{8}$ -20UN; $1\frac{1}{16}$ -18UNEF; $1\frac{7}{16}$ -16UNEF; $1\frac{1}{2}$ -14UNS; $1\frac{1}{2}$ -12UNF; $1\frac{5}{8}$ -10UNS; $1\frac{7}{16}$ -8UN; $1\frac{5}{8}$ -6UN		$1\frac{7}{16}$ -16UNJ; $1\frac{1}{2}$ -12UNJF			
TMC25-5LH										
TMC32-5	37.0	M45x1.5; M45x2.0; M50x3.0; M56x4.0		$1\frac{5}{8}$ -24UNS; $1\frac{11}{16}$ -20UN; $1\frac{11}{16}$ -18UNEF; $1\frac{11}{16}$ -16UNEF; $1\frac{3}{4}$ -14UNS; $1\frac{3}{4}$ -12 UN; $1\frac{7}{16}$ -10UNS; 2-8 UN; $2\frac{1}{4}$ -6UN		$1\frac{11}{16}$ -16UNJ; $1\frac{3}{4}$ -12UNJ				
TMC32-6B	35.0	M64x6.0	M42x1.5; M42x2.0; M48x3.0; M55x4.0; M48x5.0; M56x5.5	2-4.5; $2\frac{1}{2}$ -4	$2\frac{1}{4}$ -6UN					
TMC40-6B	46.0	M64x6.0	M52x1.5; M55x2.0; M60x3.0; M60x4.0; M60x5.5	$2\frac{1}{2}$ -4	$2\frac{3}{8}$ -6UN					

TM Standard

D2	BSW/BSF	BSP	BSPT	NPT	NPTF	PG	NPS	Trapez	ACME
TMMC12-6.0 TMMC20-6.0	9.0	$\frac{7}{16}$ -26BSF; $\frac{1}{2}$ -20BSW; $\frac{7}{16}$ -18BSF;	$\frac{1}{4}$ -19			PG7			$\frac{1}{2}$ -16
TMC12-2 TMC20-2 TMC20-2LH	11.5	$\frac{5}{8}$ -26BSF; $\frac{5}{8}$ -20BSW; $\frac{9}{16}$ -16BSF; $1\frac{1}{16}$ -14BSF	$\frac{3}{8}$ -19; $\frac{1}{2}$ -14	$\frac{3}{8}$ -19		PG9; PG21			$\frac{5}{8}$ -16;
TMC16-3	17.0	$\frac{13}{16}$ -26BSF; $\frac{7}{8}$ -20BSW; $\frac{7}{8}$ -16BSW; $\frac{13}{16}$ -12BSW	$\frac{5}{8}$ -14; $1\frac{1}{4}$ -11			PG13.5; PG21	$\frac{1}{2}$ -14; 1-11.5		1-14; $1\frac{1}{8}$ -12
TMC20-3	20.0	$\frac{15}{16}$ -26BSF; 1-20BSW; $1\frac{11}{16}$ -16BSW; $1\frac{15}{16}$ -12BSW;	$\frac{3}{4}$ -14; 1-11			PG16; PG21	$\frac{3}{4}$ -14; 1-11.5		1 $\frac{1}{4}$ -12
BTMC16-3B	17.0	$\frac{7}{8}$ -20BSW; $\frac{7}{8}$ -16BSW; $\frac{13}{16}$ -12BSW	$\frac{5}{8}$ -14; 1-11				1-11.5		
BTMC20-3B BTMC25-3B	19.0	$\frac{15}{16}$ -20BSW; 1-16BSW; $1\frac{1}{16}$ -12BSW	$\frac{3}{4}$ -14; 1-11				1-11.5		
BTMWC25-3B	22.0	$1\frac{1}{16}$ -20BSW; $1\frac{1}{8}$ -16BSW	$\frac{7}{8}$ -14; 1-11				1-11.5		
TMC25-5	30.0	$1\frac{1}{4}$ -16BSW; $1\frac{3}{8}$ -12BSW; $1\frac{7}{16}$ -8BSW; $1\frac{3}{4}$ -7BSF; 1-6BSW		$1\frac{1}{8}$ -11	$1\frac{1}{4}$ -11	$1\frac{1}{4}$ -11.5	$1\frac{1}{4}$ -11.5	PG29	$1\frac{1}{4}$ -11.5; $2\frac{1}{2}$ -8
TMC25-5LH								TR44-3.0	$1\frac{1}{2}$ -10; $1\frac{1}{4}$ -8; $1\frac{3}{4}$ -6; 2-5
TMC32-5	37.0	$1\frac{3}{4}$ -16BSW; $1\frac{7}{8}$ -12BSW; 2.1-8BSW; $1\frac{7}{8}$ -6BSW;	$1\frac{1}{2}$ -11	$1\frac{1}{2}$ -11	$1\frac{1}{2}$ -11.5	$1\frac{1}{2}$ -11.5	PG36	$1\frac{1}{2}$ -11.5; $2\frac{1}{2}$ -8	TR50-3.0; TR65-4.0
TMC32-6B	35.0	$2\frac{1}{4}$ -6 BSF; 3-5BSF; $3\frac{1}{2}$ -4.5BSF;	$1\frac{1}{2}$ -11		$2\frac{1}{2}$ -8	$2\frac{1}{2}$ -8			$1\frac{3}{4}$ -10; 2-8; $2\frac{1}{4}$ -6; $2\frac{1}{2}$ -5
TMC40-6B	46.0	$2\frac{5}{8}$ -6BSW; 3-5BSF; $3\frac{1}{2}$ -4.5BSF	2-11		3-8	3-8			



## External and Internal Toolholders



### TML Long Tools

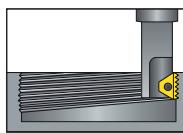
#### Spare Parts

Insert Size	Ordering Code	Dimensions mm					Spare Parts
IC		L	L1	D	D1	D2	Insert Screw Torx Key
1/4"	TMLC25-2	125.0	17.0	25	8.9	11.5	SN2TM K2T
3/8"	TMLC25-3	125.0	25.0	25	18.6	22.0	SN3T K3T
	BTMLC25-3	125.0	63.5	25	18.6	22.0	
3/8"B	BTMLC20-3B	96.5	44.0	20	15.5	19.0	SN3T K3T
	BTMLC25-3B	125.0	63.5	25	18.6	22.0	
5/8"	TMLC25-5	150.0	92.0	25	24.0	30.0	SN5TM K5T
	TMLC32-5	160.0	98.0	32	31.0	37.0	
3/4"B	TMLC40-6B	165.0	93.0	40	38.0	46.0	SM7T K30T

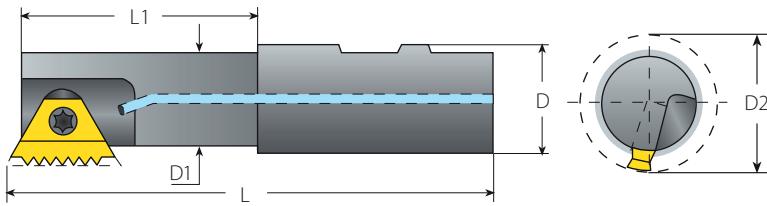
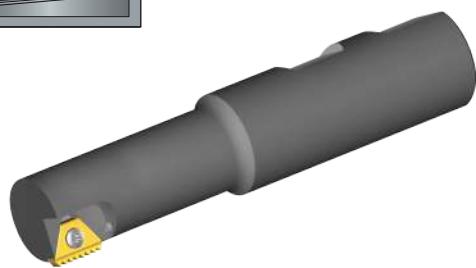
## Internal Thread Application for TML Toolholder

Toolholder		Min. Thread Dia.				
D2	ISO Coarse	ISO Fine	UNC	UN/UNF/UNEF/UNS	UNJ	
TMLC25-2	11.5	M15x1.0; M16x1.5		% <sub>16</sub> -32UNS; % <sub>16</sub> -28UNS; % <sub>16</sub> -24UNEF; % <sub>8</sub> -20UN; % <sub>16</sub> -18UNF; % <sub>16</sub> -16UNF; % <sub>8</sub> -14UNF	% <sub>16</sub> -24UNJEF; 3/4-20UNJEF; 5/8-18UNJF; 5/8-16UNJF; 7/8-14UNJF	
TMLC25-3 BTMLC25-3	22.0	M27x1.5	M25x1.0; M30x2.0		1-32UN; 1-28UN; 1-24UNS; 1 <sub>1</sub> / <sub>16</sub> -20UN; 1 <sub>1</sub> / <sub>16</sub> -18UNEF; 1 <sub>1</sub> / <sub>16</sub> -16UNEF; 1 <sub>8</sub> -14UNS; 1 <sub>8</sub> -12	
BTMLC20-3B	19.0		M22x1.0; M24x1.5; M25x2.0		7/8-24UNS; 15/16-20UNEF; 1-18UNS; 1-16UNS; 1-14UNS; 1-12UNF	
BTMLC25-3B	22.0	M27x1.5	M25x1.0; M30x2.0		1-24UNS; 1 <sub>1</sub> / <sub>16</sub> -20UN; 1 <sub>1</sub> / <sub>16</sub> -18UNEF; 1 <sub>1</sub> / <sub>16</sub> -16UNEF; 1 <sub>8</sub> -14UNS; 1 <sub>8</sub> -12UNF	
TMLC25-5	30.0		M35x1.5; M39x2.0; M36x3.0; M36x4.0; M42x4.5; M48x5.0	1 <sub>3</sub> / <sub>4</sub> -5	13/8-24UNS; 13/8-20UN; 17/16-18UNEF; 17/16-16UNEF; 1 <sub>1</sub> / <sub>2</sub> -14UNS; 1 <sub>1</sub> / <sub>2</sub> -12UNF; 15/8-10UNS; 17/16-8UN; 15/8-6UN	
TMLC32-5	37.0		M45x1.5; M45x2.0; M50x3.0; M56x4.0		15/8-24UNS; 11 <sub>1</sub> / <sub>16</sub> -20UN; 11 <sub>1</sub> / <sub>16</sub> -18UNEF; 11 <sub>1</sub> / <sub>16</sub> -16UNEF; 13/4-14UNS; 13/4-12UN; 17/8-10UNS; 2-8 UN; 21/4-6UN	
TMLC40-6B	46.0	M64x6.0	M52x1.5; M55x2.0; M60x3.0; M60x4.0; M60x5.5	2 <sub>1</sub> / <sub>2</sub> -4	2 <sub>3</sub> / <sub>8</sub> -6UN	

D2	BSW/BSF	BSP	BSPT	NPT	NPTF	PG	NPS	Trapez	ACME
TMLC25-2	5/8-26BSF; 5/8-20BSW; 1 <sub>1</sub> / <sub>16</sub> -14BSF	3/8-19; 1 <sub>2</sub> -14	3/8-19			PG9; PG21			
TMLC25-3 BTMLC25-3	1 <sub>1</sub> / <sub>16</sub> -26BSF; 1 <sub>1</sub> / <sub>16</sub> -20BSW; 1 <sub>1</sub> / <sub>8</sub> -16BSW	7/8-14; 1-11				PG21	1-11.5		
BTMLC20-3B	15/16-20BSW; 1-16BSW; 1 <sub>1</sub> / <sub>16</sub> -12BSW	3/4-14; 1-11					1-11.5		
BTMLC25-3B	1 <sub>1</sub> / <sub>16</sub> -20BSW; 1 <sub>1</sub> / <sub>8</sub> -16BSW	7/8-14; 1-11				PG21	1-11.5		
TMLC25-5	13/4-7BSF; 17/8-6BSW	1 <sub>1</sub> / <sub>4</sub> -11	1 <sub>1</sub> / <sub>4</sub> -11	1 <sub>1</sub> / <sub>4</sub> -11.5	1 <sub>1</sub> / <sub>4</sub> -11.5	PG29	1 <sub>1</sub> / <sub>4</sub> -11.5; 2 <sub>1</sub> / <sub>2</sub> -8	TR44-3.0	1 <sub>1</sub> / <sub>2</sub> -10; 1 <sub>3</sub> / <sub>4</sub> -8; 1 <sub>3</sub> / <sub>4</sub> -6; 2-5
TMLC32-5	17/8-6BSW	1 <sub>1</sub> / <sub>2</sub> -11	1 <sub>1</sub> / <sub>2</sub> -11	1 <sub>1</sub> / <sub>2</sub> -11.5	1 <sub>1</sub> / <sub>2</sub> -11.5	PG36	1 <sub>1</sub> / <sub>2</sub> -11.5; 2 <sub>1</sub> / <sub>2</sub> -8	TR50-3.0; TR65-4.0	1 <sub>3</sub> / <sub>4</sub> -10; 2-8; 2 <sub>1</sub> / <sub>4</sub> -6; 2 <sub>1</sub> / <sub>2</sub> -5
TMLC40-6B	3-5BSF; 3 <sub>1</sub> / <sub>2</sub> -4.5BSF	2-11		2 <sub>1</sub> / <sub>2</sub> -8	2 <sub>1</sub> / <sub>2</sub> -8				



## External and Internal Toolholders



### 124/... - For Coarse Pitch Threads

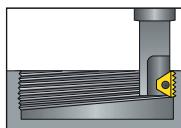
#### Spare Parts

Insert Size	Ordering Code	Dimensions mm					Spare Parts	
IC		L	L1	D	D1	D2	Insert Screw	Torx Key
6.0mm	TMMC20-6.0-124/003	85	15.0	20	6.7	9.0	SN7T	K7T
1/4"	TMC20-2-124/005	77	15.5	20	7.4	10.0	SN2TM	K2T
	TMC20-2-124/006	77	15.5	20	9.0	12.0		
	TMC20-2-124/009	77	15.5	20	7.4	10.0		
3/8"	TMC16-3-124/001	91	20.5	16	12.2	15.5	SN3TM	K3T
1/2"	TMC25-4-124/002	88	30.0	25	13.4	18.0	SN4TM	K4T
	TMC25-4-124/007	98	40.0	25	16.0	20.0	SA4TM	
5/8"	TMC25-5-124/004	98	40.0	25	19.0	25.0	SA5TM	K5T
	TMC25-5-124/008	98	40.0	25	16.4	22.0	SN5TM	

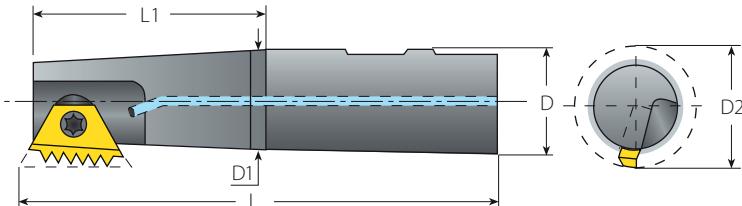
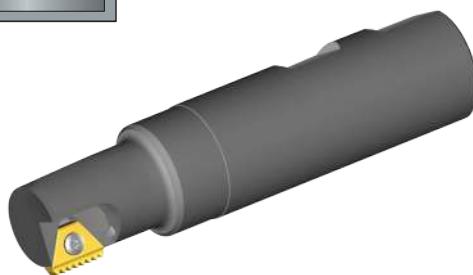
## Internal Thread Application for 124/... Coarse Pitch Toolholder

Toolholder		Min. Thread Dia.						
	D2	ISO Coarse	ISO Fine	UNC	UN/UNF/UNEF/UNS			UNJ
TMMC20-6.0-124/003	9.0	M12x1.75	M12x1.0; M22x1.5; M12x1.75	7/16-14	1 1/16-32UN; 1/2-24UNS; 9/16-18UNF; 9/16-16UNF			9/16-24UNJEF; 1/2-20UNJF; 9/16-18UNJF; 9/16-16UNJF
TMC20-2-124/005	10.0			1/2-13	5/8-12UN			
TMC20-2-124/006	12.0			5/8-11				
TMC20-2-124/009	10.0							
TMC16-3-124/001	15.5	M20x2.5	M20x1.0; M22x1.5; M22x2.0	3/4-10	1 1/16-32UN; 3/4-28UN; 3/4-24UNS; 13/16-20UNEF; 7/8-18UNS; 7/8-16UNS; 7/8-14UNF; 7/8-12UN			1 5/8-24UNJ; 13/16-20UNJEF; 1/16-18UNJEF; 13/16-16UNJ; 7/8-14UNJF; 7/8-12UNJ
TMC25-4-124/002	18.0	M22x2.5; M24x3.0		7/8-9; 1 1/8-7				
TMC25-4-124/007	20.0			1-8				
TMC25-5-124/004	25.0	M30x3.5	M30x1.5; M33x2.0; M39x3.0; M56x4.0	13/8-6	1 1/8-24UNS; 1 3/16-20UN; 1 3/16-18UNEF; 1 3/16-16UNEF; 1 1/4-14UNS; 1 1/4-12UNF; 1 1/2-10UNS; 1 1/4-8UN			1 3/16-16UNJ; 1 1/4-12UNJF
TMC25-5-124/008	22.0							

	D2	BSW/BSF	BSP	BSPT	NPT	NPTF	PG	NPS	Trapez	ACME
TMMC20-6.0-124/003	9.0	7/16-26BSF; 7/16-18BSF;	1/4-19				PG7	1/2-14; 1-11.5		
TMC20-2-124/005	10.0	1/2-16BSF								5/8-14
TMC20-2-124/006	12.0	5/8-14BSF							TR16-2	3/4-14; 3/4-12
TMC20-2-124/009	10.0				1/4-18	1/4-18				
TMC16-3-124/001	15.5	3/4-12BSF	1/2-14	3/4-14; 1-11	3/4-14; 1-11.5	3/4-14; 1-11.5	PG13.5; PG21	1-11.5		
TMC25-4-124/002	18.0	7/8-11BSF; 1-10BSF; 7/8-9BSW; 1-8BSW							TR24-3.0	1-10; 1-8
TMC25-4-124/007	20.0								TR32-3.0	1 1/8-10
TMC25-5-124/004	25.0	1 3/16-8BSW; 1 1/4-7BSW; 1 5/16-6BSW	1-11	1-11	1 1/4-11.5; 2 1/2-8	1 1/4-11.5; 2 1/2-8	PG21	1 1/4-11.5; 2 1/2-8	TR38-3.0	1 1/4-10; 1 3/8-8; 1 1/2-6; 1 3/4-5
TMC25-5-124/008	22.0	1 1/8-7BSW								1 3/8-6



## External and Internal Toolholders

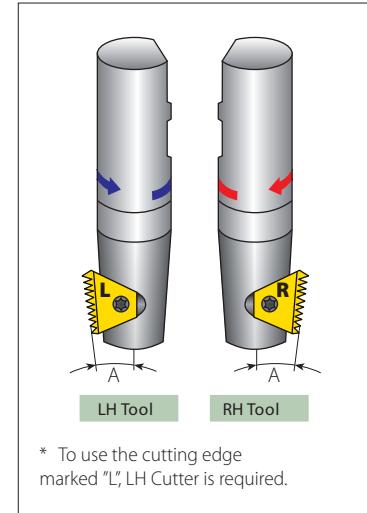


### TMN - For Conical Threads (NPT, NPTF, BSPT)

Spare Parts



Insert Size		Ordering Code		Dimensions mm					Spare Parts	
IC	RH	*LH	L	L1	D	D1	D2	Insert Screw	Torx Key	
3/8"	TMNC16-3	TMNC16-3LH	90.0	22.0	16	12.5	15.5	SN3TM	K3T	
	TMNC20-3	TMNC20-3LH	85.0	23.0	20	15.0	19.0			
3/8"B	BTMNC16-3B	BTMNC16-3BLH	79.5	29.0	16	13.5	17.0	SN3TM	K3T	
	BTMNC20-3B	BTMNC20-3BLH	81.5	29.0	20	15.5	19.0			
5/8"	TMNC32-5	TMNC32-5LH	120.0	58.0	32	31.0	37.0	SN5TM	K5T	

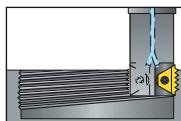


\* To use the cutting edge marked "L", LH Cutter is required.

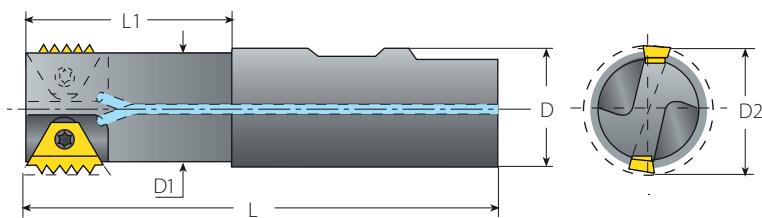
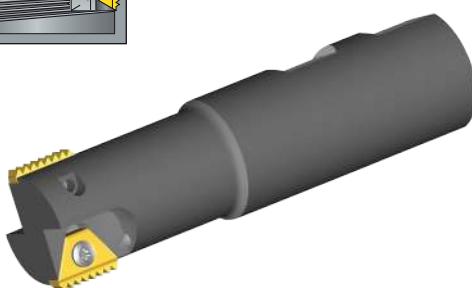
## Internal Thread Application for TMN Toolholder

Toolholder		Min. Thread Dia.						
	D2	ISO Fine		UNC	UN/UNF/UNEF/UNS		UNJ	
TMNC16-3 TMNC16-3LH	15.5	M20x1.0; M22x1.5; M22x2.0		$\frac{11}{16}$ -32UN; $\frac{3}{4}$ -28UN; $\frac{3}{4}$ -24UNS; $\frac{13}{16}$ -20UNEF; $\frac{7}{8}$ -18UNS; $\frac{7}{8}$ -16UNS; $\frac{7}{8}$ -14UNF; $\frac{3}{4}$ -12UN		$\frac{15}{8}$ -24UNJ; $\frac{13}{16}$ -20UNJEF; $1\frac{1}{16}$ -18UNJEF; $\frac{13}{16}$ -16UNJ; $\frac{7}{8}$ -14UNJF; $\frac{7}{8}$ -12UNJ		
TMNC20-3 TMNC20-3LH	19.0	M22x1.0; M24x1.5; M25x2.0		$\frac{7}{8}$ -32UN; $\frac{7}{8}$ -28UN; $\frac{7}{8}$ -24UNS; $\frac{15}{16}$ -20UNEF; 1-18UNS; 1-16UNS; 1-14UNS; 1-12UNF		$\frac{15}{8}$ -24UNJ; $\frac{15}{16}$ -20UNJEF; $1\frac{1}{16}$ -18UNJEF; $\frac{15}{16}$ -16UNJ; $1\frac{5}{8}$ -14UNJ; 1-12UNJF		
BTMNC16-3B BTMNC16-3BLH	17.0	M20x1.0; M22x1.5; M24x2.0		$\frac{7}{8}$ -24UNS; $\frac{7}{8}$ -20UNEF; $\frac{7}{8}$ -18UNS; $\frac{7}{8}$ -16UNS; 1-14UNS; $\frac{13}{16}$ -12UN				
BTMNC20-3B BTMNC20-3BLH	19.0	M22x1.0; M24x1.5; M25x2.0		$\frac{7}{8}$ -24UNS; $\frac{15}{16}$ -20UNEF; 1-18UNS; 1-16UNS; 1-14UNS; 1-12UNF				
TMNC32-5 TMNC32-5LH	37.0	M45x1.5; M45x2.0; M50x3.0; M56x4.0		$\frac{15}{8}$ -24UNS; $1\frac{11}{16}$ -20UN; $1\frac{11}{16}$ -18UNEF; $1\frac{11}{16}$ -16UNEF; $\frac{13}{4}$ -14UNS; $\frac{13}{4}$ -12UN; $\frac{17}{8}$ -10UNS; 2-8UN; $2\frac{1}{4}$ -6UN				

	D2	BSW/BSF	BSP	BSPT	NPT	NPTF	PG	NPS	Trapez	ACME
TMNC16-3 TMNC16-3LH	15.5	$\frac{13}{16}$ -16BSW	$\frac{1}{2}$ -14	$\frac{1}{2}$ -14; 1-11	$\frac{1}{2}$ -14; 1-11.5	$\frac{1}{2}$ -14; 1-11.5	PG11; PG21	$\frac{1}{2}$ -14; 1-11.5		$\frac{7}{8}$ -14; 1-12
TMNC20-3 TMNC20-3LH	19.0	$\frac{15}{16}$ -26BSW; $\frac{15}{16}$ -20BSW; 1-16BSW; $1\frac{1}{16}$ -12BSW	$\frac{3}{4}$ -14; 1-11	$\frac{3}{4}$ -14; 1-11.5	$\frac{3}{4}$ -14; 1-11.5	$\frac{3}{4}$ -14; 1-11.5	PG21	$\frac{3}{4}$ -14; 1-11.5		
BTMNC16-3B BTMNC16-3BLH	17.0	$\frac{7}{8}$ -20BSW; $\frac{7}{8}$ -16BSW; $\frac{13}{16}$ -12BSW	$\frac{5}{8}$ -14; 1-11		$\frac{3}{4}$ -14; 1-11.5	$\frac{3}{4}$ -14; 1-11.5		1-11.5		
BTMNC20-3B BTMNC20-3BLH	19.0	$\frac{15}{16}$ -20BSW; 1-16BSW; $1\frac{1}{16}$ -12BSW	$\frac{3}{4}$ -14; 1-11		$\frac{3}{4}$ -14; 1-11.5	$\frac{3}{4}$ -14; 1-11.5		1-11.5		
TMNC32-5 TMNC32-5LH	37.0	$\frac{17}{8}$ -6BSW	$1\frac{1}{2}$ -11	$1\frac{1}{2}$ -11	$1\frac{1}{2}$ -11.5; $2\frac{1}{2}$ -8	$1\frac{1}{2}$ -11.5; $2\frac{1}{2}$ -8	PG36	$1\frac{1}{2}$ -11.5; $2\frac{1}{2}$ -8		



## External and Internal Toolholders



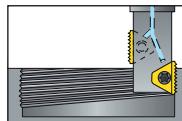
### TM2 - Twin Flutes

Insert Size	Ordering Code	Dimensions mm					Spare Parts		
		IC	L	L1	D	D1	D2	Insert Screw	Torx Key
1/4"	TM2C20-2		85	20.0	20	14.4	17.0	SN2TM	K2T
3/8"	TM2C25-3		100	43.0	25	22.5	26.0	SN3T	K3T
3/8"B	BTM2C25-3B		104.2	46.0	25	22.5	26.0		
5/8"	TM2C32-5		120	45.0	32	36.0	42.0	SN5TM	K5T
3/4"B	TM2C40-6B		137.2	65.0	40	44.0	52.0	SM7T	K30T

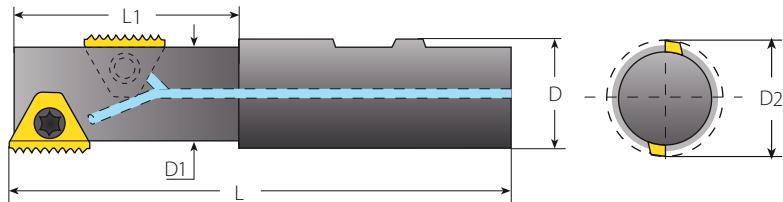
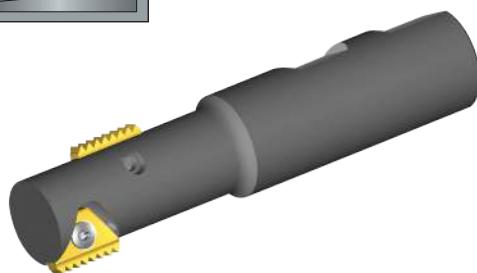
TM Standard

### Internal Thread Application for TM2 Toolholder

Toolholder	Min. Thread Dia.											
	D2 (mm)	ISO Fine	UNC	UN/UNF/UNEF/UNS	UNJ	BSW/BSF	BSP	BSPT	NPT	NPTF	PG	NPS
TM2C20-2	17.0	M22x1.5		3/4-32UN; 13/16-28UN; 7/8-24UNs; 7/8-20UNEF; 7/8-18UNS; 7/8-16UNS; 1-14UNS	15/8-24UNJ; 7/8-20UNJEF; 11/16-18UNJEF; 7/8-16UNJ; 15/8-14UNJ		5/8-14				PG16; PG21	
TM2C25-3 BTM2C25-3B	26.0	M32x1.5; M33x2.0		1 1/4-24UNS; 1 3/16-20UN; 1 1/4-18UNEF; 1 1/4-16UNEF; 1 3/8-14UNS; 1 5/16-12UN	15/8-24UNJ; 1 3/16-20UNJ; 1 1/4-18UNJEF; 1 1/4-16UNJ; 1 5/16-12UNJ	1 3/16-26BSF; 1 1/4-20BSW; 1 5/16-16BSW	1 1/8-11				PG36	1 1/4-11.5
TM2C32-5	42.0	M48x1.5; M50x2.0; M55x3.0; M64x4.0		1 7/8-20UN; 2-18UNS; 2-16UNS; 2-14UNS; 2-12UN; 2 1/4-10UNS; 2 1/4-8UN; 2 1/2-6UN	1 15/16-16UNJ; 2-12UNJ	2-16BSW; 2-12BSW; 2 1/4-8BSW	2-11	2-11	2-11.5	2-11.5	PG36	2-11.5; 2 1/2-8
TM2C40-6B	52.0	M58x1.5; M68x4.0; M70x6.0	2 3/4-4	2 5/8-6UN		2 7/8-6BSW; 2 7/8-5BSW; 3 3/4-4.5BSF	2 1/4-11		2 1/2-8	2 1/2-8		



## External and Internal Toolholders

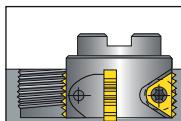


### TMO - Twin Flute Offset

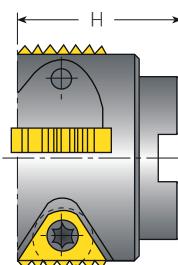
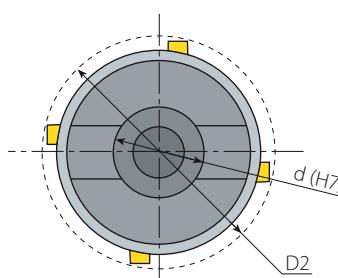
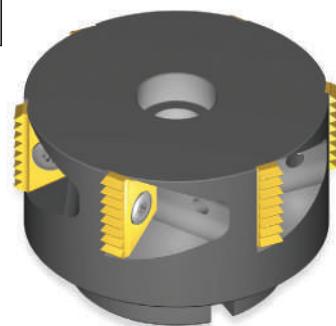
Spare Parts

Insert Size	Ordering Code	Applicable Threads			Dimensions mm				Insert Screw	Torx Key
IC		External	Internal	External & Internal	L	L1	D	D1	D2	
1/4"	TMOC20-2-1	16UN	48/32/16UN							
	TMOC20-2-2	24/18UN	48/24/18UN	24W						
	TMOC20-2-3	28/14UN	28/14UN	28/14W						
	TMOC20-2-4	20UN	20UN							
	TMOC20-2-5			26W		90	25	20	11.9	14.5
	TMOC20-2-6			20W						
	TMOC20-2-7			19W						
	TMOC20-2-8	1.0/1.5ISO	0.5/1.0/1.5ISO							
	TMOC20-2-9	0.75ISO	48UN, 0.75ISO							
	TMOC20-2-10	1.25ISO	1.25ISO							
3/8"	TMOC20-3-1	1.5ISO	0.5/1.5ISO							
	TMOC20-3-2	13UN	13UN	26W						
	TMOC20-3-3	28UN	32/28UN							
	TMOC20-3-4	27UN	27UN							
	TMOC20-3-5		11.5UN	11.5NPS						
	TMOC20-3-6	24/20/18/16/14/12UN	24/20/18/16/14/12UN	26/20/18/16/14/12W, 14NPS		95	43	20	16.6	20.0
	TMOC20-3-7	1.25ISO	1.25ISO	24W						
	TMOC20-3-8			19W						
	TMOC20-3-9			11W						
	TMOC20-3-10	1.0/2.0ISO	0.5/1.0/2.0ISO							
	TMOC20-3-11	0.75ISO	32UN, 0.75ISO							
	TMOC20-3-12	1.75ISO	1.75ISO							
5/8"	TMOC25-5-1	24/20/18/14/13/12UN	24/20/18/14/13/11UN	14W						
	TMOC25-5-2	24/18/12UN	24/18/12/6UN	12W						
	TMOC25-5-3	16UN	16UN	16W, 8NPS						
	TMOC25-5-4	14/7UN	14UN	14/7W						
	TMOC25-5-5		11.5UN	11.5NPS						
	TMOC25-5-6	11UN	11UN	11W						
	TMOC25-5-7	10UN	10/5UN	10W						
	TMOC25-5-8	9UN	9UN	9W		110	52	25	24	30.0
	TMOC25-5-9	8UN	8UN	8W						
	TMOC25-5-10		7UN							
	TMOC25-5-11	6UN		6W						
	TMOC25-5-12	1.0/2.0/2.5/4.0ISO	1.0/2.0/2.5/4.0ISO							
	TMOC25-5-13	1.25ISO	1.25ISO							
	TMOC25-5-14	1.5/2.5/4.5ISO	1.5/2.5/4.5ISO							
	TMOC25-5-15	1.75ISO	1.75ISO							
	TMOC25-5-16	1.0/1.5/3.0/3.5ISO	1.0/1.5/3.0/3.5ISO							

TM Standard



## External and Internal Toolholders



Cutter Drive  
ISO 240-1975 (mm)

### TM Shell Mill

#### Spare Parts

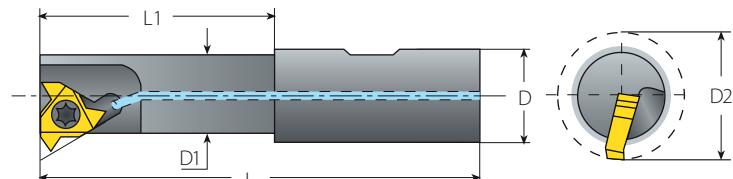
Insert Size	Ordering Code	No. of inserts	Dimensions mm			Insert Screw	Torx Key	Holder Screw
IC			D2	d(H7)	H			
1/4"	TMSH-D38-16-2	6	38.0	16.0	40.0	SN2T	HK2T	M8x1.25x35
1/4"	TMSH-D50-22-2	8	50.0	22.0	40.0			M10x1.50x35
3/8"	TMSH-D50-22-3	6	50.0	22.0	40.0	SN3TM	HK3T	M10x1.50x35
3/8B"	TMSH-D63-22-3B	6	63.0	22.0	40.0			
5/8"	TMSH-D63-22-5	4	63.0	22.0	45.0	SN5TM	HK5T	M10x1.50x35
3/4B"	TMSH-D63-22-6B	4	63.0	22.0	50.0	SM7T	HK7T	M10x1.50x35
5/8"	TMSH-D80-27-5	6	80.0	27.0	50.0	SN5TM	HK5T	M12x1.75x40
3/4B"	TMSH-D80-27-6B	5	80.0	27.0	50.0	SM7T	HK7T	M12x1.75x40
5/8"	TMSH-D100-32-5	7	100.0	32.0	55.0	SN5TM	HK5T	M16x2.00x40
3/4B"	TMSH-D100-32-6B	6	100.0	32.0	55.0	SM7T	HK7T	M16x2.00x40
5/8"	TMSH-D125-40-5	9	125.0	40.0	63.0	SN5TM	HK5T	M20x2.50x50
3/4B"	TMSH-D125-40-6B	8	125.0	40.0	63.0	SM7T	HK7T	M20x2.50x50

## Internal Thread Application for Shell Mill Toolholder

Toolholder		Min. Thread Dia.										
	D2 (mm)	ISO Fine	UNC	UN/UNF/UNEF/UNS	UNJ	BSW/BSF	BSP	BSPT	NPT	NPTF	PG	NPS
TMSH-D38-16-2	38.0	M45x1.5		1 <sup>11</sup> / <sub>16</sub> -20UN; 1 <sup>3</sup> / <sub>4</sub> -18UNS; 1 <sup>3</sup> / <sub>4</sub> -16UNS; 1 <sup>7</sup> / <sub>8</sub> -14UNS	1 <sup>5</sup> / <sub>8</sub> -24UNJ; 1 <sup>11</sup> / <sub>16</sub> -20UNJ; 1 <sup>3</sup> / <sub>4</sub> -16UNJ	1 <sup>3</sup> / <sub>4</sub> -26BSF; 1 <sup>3</sup> / <sub>4</sub> -20BSW					PG36	
TMSH-D50-22-2	50.0	M56x1.5		2 <sup>1</sup> / <sub>4</sub> -20UN; 2 <sup>1</sup> / <sub>4</sub> -18UNS; 2 <sup>1</sup> / <sub>4</sub> -16UNS; 2 <sup>1</sup> / <sub>4</sub> -14UNS	2 <sup>1</sup> / <sub>4</sub> -20UNJ; 2 <sup>1</sup> / <sub>4</sub> -16UNJ							
TMSH-D50-22-3	50.0	M56x1.5; M58x2.0		2 <sup>1</sup> / <sub>4</sub> -20UN; 3 <sup>1</sup> / <sub>4</sub> -18UNS; 2 <sup>1</sup> / <sub>4</sub> -20UNJ; 3 <sup>1</sup> / <sub>4</sub> -16UNS; 3 <sup>1</sup> / <sub>4</sub> -14UNS; 2 <sup>1</sup> / <sub>4</sub> -16UNJ; 2 <sup>3</sup> / <sub>8</sub> -12UN	2 <sup>1</sup> / <sub>4</sub> -20BSW; 2 <sup>3</sup> / <sub>8</sub> -16BSW; 2 <sup>3</sup> / <sub>8</sub> -12BSW	2 <sup>1</sup> / <sub>4</sub> -11					PG42	2-11.5
TMSH-D63-22-3B	63.0	M70x1.5; M70x2.0		2 <sup>3</sup> / <sub>4</sub> -20UN; 2 <sup>3</sup> / <sub>4</sub> -18UNS; 2 <sup>3</sup> / <sub>4</sub> -16UNS; 2 <sup>3</sup> / <sub>4</sub> -14UNS; 2 <sup>7</sup> / <sub>8</sub> -12UN			2 <sup>1</sup> / <sub>2</sub> -11					
TMSH-D63-22-5	63.0	M70x1.5; M70x2.0; M75x3.0; M80x4.0		2 <sup>3</sup> / <sub>4</sub> -20UN; 3 <sup>3</sup> / <sub>4</sub> -18UNS; 3 <sup>3</sup> / <sub>4</sub> -16UNS; 3 <sup>3</sup> / <sub>4</sub> -14UNS; 2 <sup>7</sup> / <sub>8</sub> -12UN; 3-10UNS; 3-8UN	2 <sup>3</sup> / <sub>4</sub> -16UNJ; 2 <sup>7</sup> / <sub>8</sub> -12UNJ	2 <sup>7</sup> / <sub>8</sub> -16BSW; 2 <sup>7</sup> / <sub>8</sub> -12BSW; 3 <sup>1</sup> / <sub>8</sub> -8BSW	2 <sup>1</sup> / <sub>2</sub> -11	3-11				3-8
TMSH-D63-22-6B	63.0	M70x2.0; M80x4.0; M85x6.0	3 <sup>1</sup> / <sub>4</sub> -4	3 <sup>1</sup> / <sub>4</sub> -6UN		3 <sup>3</sup> / <sub>8</sub> -6BSW; 3 <sup>1</sup> / <sub>2</sub> -4.5BSF	2 <sup>1</sup> / <sub>2</sub> -11		3-8	3-8		
TMSH-D80-27-5	80.0	M90x2.0; M95x3.0; M95x4.0		3 <sup>1</sup> / <sub>2</sub> -18UNS; 3 <sup>1</sup> / <sub>2</sub> -16UNS; 3 <sup>1</sup> / <sub>2</sub> -14UNS; 3 <sup>1</sup> / <sub>2</sub> -12UN; 3 <sup>3</sup> / <sub>4</sub> -10UNS; 3 <sup>3</sup> / <sub>4</sub> -8UN	3 <sup>3</sup> / <sub>8</sub> -16UNJ; 3 <sup>1</sup> / <sub>2</sub> -12UNJ	3 <sup>1</sup> / <sub>2</sub> -16BSW; 3 <sup>1</sup> / <sub>2</sub> -12BSW; 3 <sup>3</sup> / <sub>4</sub> -8BSW	3 <sup>1</sup> / <sub>4</sub> -11	4-11				3 <sup>1</sup> / <sub>2</sub> -8
TMSH-D80-27-6B	80.0	M90x2.0; M95x4.0; M105x6.0		3 <sup>7</sup> / <sub>8</sub> -6UN		4-6BSW	3 <sup>1</sup> / <sub>4</sub> -11		3 <sup>1</sup> / <sub>2</sub> -8	3 <sup>1</sup> / <sub>2</sub> -8		
TMSH-D100-32-5	100.0	M110x2.0; M115x3.0; M115x4.0			4 <sup>1</sup> / <sub>4</sub> -16UNJ; 4 <sup>3</sup> / <sub>8</sub> -12UNJ	4 <sup>1</sup> / <sub>4</sub> -16BSW; 4 <sup>1</sup> / <sub>4</sub> -12BSW; 4 <sup>5</sup> / <sub>8</sub> -8BSW	4-11	4-11				
TMSH-D100-32-6B	100.0	M110x2.0; M115x4.0; M125x6.0				4 <sup>7</sup> / <sub>8</sub> -6BSW	4-11		5-8	5-8		
TMSH-D125-40-5	125.0	M135x2.0; M140x3.0; M140x4.0			5 <sup>1</sup> / <sub>4</sub> -16UNJ; 5 <sup>3</sup> / <sub>8</sub> -12UNJ	5 <sup>1</sup> / <sub>4</sub> -16BSW; 5 <sup>1</sup> / <sub>4</sub> -12BSW; 5 <sup>5</sup> / <sub>8</sub> -8BSW	5-11	5-11				
TMSH-D125-40-6B	125.0	M135x2.0; M140x4.0; M150x6.0				5 <sup>7</sup> / <sub>8</sub> -6BSW	5-11		5-8	5-8		



## External and Internal Toolholders

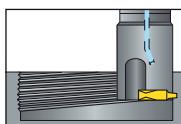


### TMS - Single Point (Standard Inserts)

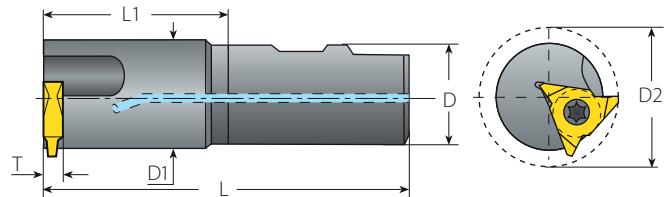
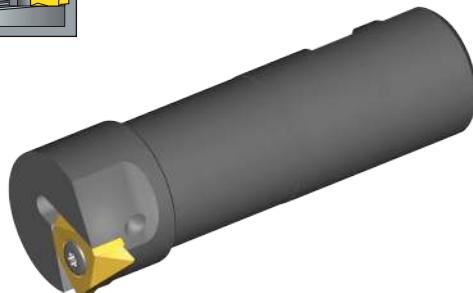
Insert Size	Ordering Code	Dimensions mm					Spare Parts	
IC		L	L1	D	D1	D2	Insert Screw SN2TK	Torx Key K2T
1/4"	TMSC10-2	65	25	10	9.3	12.5		

Use Standard laydown thread turning inserts. See Thread Turning Inserts section - Page 17.

Use external LH inserts for external thread and internal RH inserts for internal thread.



## External and Internal Toolholders



### TMV - Single Point (Vertical Insert)

Insert Size	Ordering Code	Dimensions mm					Spare Parts	
IC		L	L1	D	D1	D2	Insert Screw SN6T	Torx Key K6T
5/8"V	TMVC32-5	120	60	32	35.6	46		

Requires IC 5/8" Vertical thread turning inserts (width T=6). Use external LH inserts for external threads and internal RH inserts for internal threads.

See Thread Turning Inserts section - Page 17.

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

Material Group	Vargus No.	Material	Hardness Brinell HB	Vc [m/min]			Feed f[mm/tooth]	
				Coated		Uncoated		
				VBX	VTX	VK2		
<b>P</b> Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	100-210	90-180		0.05-0.3
	2		Medium Carbon (C=0.25-0.55%)	150	100-180	90-170		0.05-0.25
	3		High Carbon (C=0.55-0.85%)	170	100-170	90-160		0.05-0.2
	4	Low Alloy Steel (alloying elements≤5%)	Non Hardened	180	90-160	90-155		0.05-0.25
	5		Hardened	275	80-180	80-160		0.05-0.2
	6		Hardened	350	70-140	70-150		0.05-0.15
	7	High Alloy Steel (alloying elements>5%)	Annealed	200	60-130	70-115		0.05-0.2
	8		Hardened	325	70-110	60-100		0.05-0.1
	9	Cast Steel	Low Alloy (alloying elements <5%)	200	100-170	100-170	100-150	0.05-0.15
	10		High Alloy (alloying elements >5%)	225	70-120	70-130	60-130	0.05-0.1
<b>M</b> Stainless Steel	11	Stainless Steel Ferritic	Non Hardened	200	100-170	120-180		0.05-0.15
	12		Hardened	330	100-170	120-180		0.05-0.1
	13	Stainless Steel Austenitic	Austenitic	180	70-140	100-140		0.05-0.15
	14		Super Austenitic	200	70-140	100-140		0.05-0.1
	15	Stainless Steel Cast Ferritic	Non Hardened	200	70-140	100-140		0.05-0.15
	16		Hardened	330	70-140	100-140		0.05-0.1
	17	Stainless Steel Cast Austenitic	Austenitic	200	70-120	100-120		0.05-0.15
	18		Hardened	330	70-120	100-120		0.05-0.1
<b>K</b> Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	60-130	100-120		0.02-0.8
	29		Pearlitic (long chips)	230	60-120	80-100		0.02-0.05
	30	Grey Cast Iron	Low Tensile Strength	180	60-130	80-100		0.05-0.15
	31		High Tensile Strength	260	60-100	80-100		0.05-0.1
	32	Nodular Sg Iron	Ferritic	160	60-125	80-100		0.05-0.15
	33		Pearlitic	260	50-90	60-90		0.05-0.1
<b>N</b> Non-Ferrous Metals	34	Aluminium Alloys Wrought	Non Aging	60	100-250		200-300	0.1-0.4
	35		Aged	100	100-180		60-110	0.1-0.3
	36	Aluminium Alloys	Cast	75	150-400		60-120	0.1-0.3
	37		Cast & Aged	90	150-280		60-100	0.05-0.25
	38	Aluminium Alloys	Cast Si 13-22%	130	80-150		20-50	0.1-0.3
	39	Copper and Copper Alloys	Brass	90	120-210	100-200	50-70	0.1-0.3
	40		Bronze And Non Leaded Copper	100	120-210	100-200	50-70	0.05-0.25
<b>S</b> Heat Resistant Material	19	High Temperature Alloys	Annealed (iron based)	200	20-45	20-40	20-30	0.05-0.1
	20		Aged (iron based)	280	20-30	20-30	15-25	0.02-0.05
	21		Annealed (nickel or cobalt based)	250	20-50	15-20	15-20	0.02-0.05
	22	Titanium Alloys	Aged (nickel or cobalt based)	350	10-15	10-15	10-15	0.02-0.05
	23		Pure 99.5 Ti	400Rm	70-140	70-120	40-60	0.02-0.05
	24		$\alpha+\beta$ Alloys	1050Rm	20-50	20-50	20-40	0.02-0.05
<b>H</b> Hardened Material	25	Extra Hard Steel	Hardened & Tempered	45-50Hrc	20-45	20-45		0.01-0.03
	26			51-55Hrc	20-45	20-45		0.01-0.02

**Grades**

Grade	Application	Sample
<b>VBX</b>	First choice for steel and cast iron A tough sub-micron substrate with TiCN coating	
<b>VTX</b>	First choice for stainless steel A tough sub-micron substrate with TiAlN coating	
<b>VK2</b>	Uncoated grade for machining cast iron & nonferrous metals	





# TMSD



## Thread Milling for Deep Holes

Inserts | Toolholders

## Vardex Ordering Code System

### TMSD Inserts

2	U	I	DB	60	TM	VBX
1	2	3	4	5	6	7

1 - Insert Size	2 - Insert Style	3 - Type of Insert
5 - IC5.0 mm	U -	I - Internal
2 - IC1/4"	A -	EI - External + Internal
3 - IC3/8"	L -	
4 - IC1/2"	V - Vertical Style 7, 9, 11	
5 - IC5/8"	V - V Style 5/8"	
7 - IC6.8 mm		
9 - IC8.5 mm		
11 - IC10.7 mm		

4 - Pitch				
Full Profile - Pitch Range				
mm		TPI		
1.0-8.0			18-2.5	
Partial Profile - U, A, L Styles			Partial Profile - Vertical Style	
	mm	TPI	mm	TPI
DA	0.5-1.5	48-16	VA	0.5-1.0
DB	1.5-2.0	16-12	VB	-
DC	2.5-4.0	10-6	VC	-
DD	2.0-2.5	9-12	VD	1.0-2.0
DE	2.5-3.5	10-7	VE	2.0-3.0
DH	4.0-6.0	6-4	VF	1.0-1.5
DK	6.0-8.0	4-3	VG	1.5-2.0
DL	-	11-7	VH	-
DM	2.5	10	VK	2.0-2.5
DN	1.0-2.0	24-11	VJ	-
DP	1.5-3.0	16-8	VM	-
DR	-	26-14	VN	1.5-2.5
DT	2.0-4.0	12-6		

5 - Standard
60 - Partial Profile 60°
55 - Partial Profile 55°
ISO - ISO Metric
UN - American UN
NPT - NPT
TR - Trapez DIN 103
ACME - ACME
STACME - Stub ACME
ABUT - American Buttress
APIRD - API Round Casing & Tubing

6 - System
TM - TMSD (U, A, L Styles)
TM3 - TMSD Vertical

7 - Carbide Grade
VBX, VTX

### TMSD Toolholders (U, A, L Styles)

C	TM	2	S	C	14	C	17	-	65	-	2	U
1	2	3	4	5	6	7	8		9		10	11
1 - Shank Style	2 - System	3 - No. of Flutes	4 - Insert Type	5 - Cooling	6 - Shank Dia.	7 - Shank Type	8 - Cutting Dia.					
None - Steel Shank C - Carbide Shank	TM	1 - 4	S - Single Point	C - Coolant	8 - 40	Weldon C - Cylindrical	13 - 42					
9 - Max. Tool Overhang	10 - Insert Size	11 - Insert Style	12 - Tool Application									
144	5 - IC5.0 mm 2 - IC1/4" 3 - IC3/8" 4 - IC1/2"	U A L	ABUT - For American Buttress									

### TMSD Toolholders (Vertical Style)

C	GM	C	9	C	13	-	45	-	7	-	3
1	2	3	4	5	6		7		8		9
1 - Holder Type	2 - System	3 - Cooling	4 - Shank Dia.	5 - Shank Style	6 - Cutting Dia.	7 - Tool Overhang	8 - Insert Size				
None - Steel Shank C - Carbide Shank	GM - Groove Milling and Thread Milling	C - Coolant	8, 9, 11.5, 12, 14, 15, 20, 25	C - Cylindrical W - Weldon	10.5-22.0	25-65	7 - IC6.8 mm 9 - IC8.5 mm 11 - IC10.7 mm				
9 - Number of Flutes											
3											

### TMSD Shell Mill (U, L, V Styles)

TM	4	S	C		D42	-	16	-	3	U	9
1	2	3	4		5		6		7	8	
1 - System	2 - No. of Flutes	3 - Insert Type	4 - Cooling	5 - Cutting Dia.	6 - Drive Hole Dia.	7 - Insert Size	8 - Insert Style				
TM	4-7	S - Single Point	C - Coolant	42 - 98	16, 22, 27, 32	3 - IC3/8" 4 - IC1/2" 5 - IC5/8"	U, L, V				
9 - Tool Application											
ABUT - American Buttress											

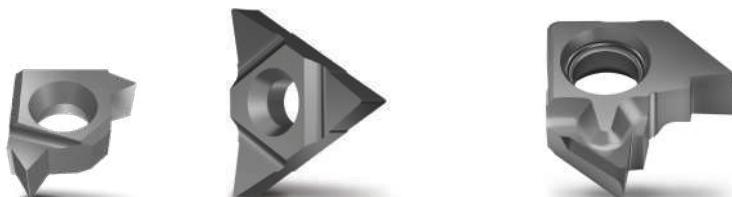
# TMSD

## Thread Milling for Deep Holes

A multi-flute, highly productive and economical solution for milling threads in deep holes



### Full Profile Inserts



ISO, American UN, NPT, API RD

American Buttress

### U Style For Large Pitches

**Weldon Shank**



Tool Overhang (L1) 40-145  
Cutting Dia. (D2) 14.75-42  
No. of Flutes (Z) 1-4

**Carbide Cylindrical Shank**



Tool Overhang (L1) max 135  
Cutting Dia. (D2) 14.75-31.0  
No. of Flutes (Z) 1-4

**Steel Cylindrical Shank**



Tool Overhang (L1) max 144  
Cutting Dia. (D2) 23.3-36.5  
No. of Flutes (Z) 2-4

**Shell Mill**



Tool Overhang (L1) max 200  
Cutting Dia. (D2) 42-98  
No. of Flutes (Z) 4-7

### L Style (Mini L) For Small Bores

**Weldon Shank**



Tool Overhang (L1) 29-42  
Cutting Dia. (D2) 13-17.7  
No. of Flutes (Z) 1-3

**Carbide Cylindrical Shank**



Tool Overhang (L1) max 65  
Cutting Dia. (D2) 13-17.7  
No. of Flutes (Z) 1-3

### Vertical Style (7V, 9V, 11V)

**Weldon Shank**



Tool Overhang (L1) 25-45  
Cutting Dia. (D2) 10.5-20.8  
No. of Flutes (Z) 3

**Carbide Cylindrical Shank**



Tool Overhang (L1) max 65  
Cutting Dia. (D2) 10.5-20.8  
No. of Flutes (Z) 3

### L Style (3/8" L) For Large Trapezoid Profiles and ABUT

**Weldon Shank**



Tool Overhang (L1) 50-105  
Cutting Dia. (D2) 21.6-35.5  
No. of Flutes (Z) 1-3

**Carbide Cylindrical Shank**



Tool Overhang (L1) max 120  
Cutting Dia. (D2) 21.6-33.5  
No. of Flutes (Z) 1-3

**Shell Mill**



Tool Overhang (L1) max 200  
Cutting Dia. (D2) 48-80  
No. of Flutes (Z) 5-7

### A Style For Shorter L2

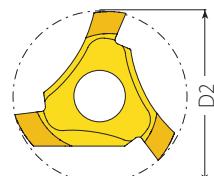
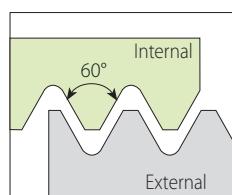
**Steel Cylindrical Shank**



Tool Overhang (L1) max 144  
Cutting Dia. (D2) 26-35.3  
No. of Flutes (Z) 3

## Partial Profile 60°

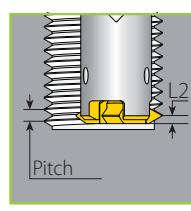
### Internal



Vertical Style

### Vertical Style

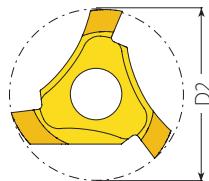
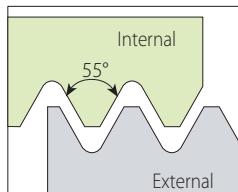
Insert Style	Pitch	Ordering Code	Dimensions mm							Application (Min. Thread Size)		
			Internal	D2	T	L2	ISO Coarse	ISO Fine	UNC	UN/UNF/UNEF/UNS	Toolholder	
7V	0.5-1.0 28-27	7VIVA60TM3...	10.5			0.6	-	M11.5x0.5; M11.5x0.75; M12x1.0	-	1/2-28UNEF; 1/2-27UNS		
	1.0-1.5 24-16	7VIVF60TM3...	11.1			0.8	-	M12.5x1; M13x1.5	-	1/2-24UNS; 1/2-20UNF; 5/16-18UNF; 5/16-16UN	CGMC8C13-40-7-3 CGMC9C13-45-7-3 GMC20W13-25-7-3	
	1.5-2.0 16-12	7VIVG60TM3...	11.8			1.0	M14x2.0	M14x1.5	-	5/16-16UN; 5/16-14UNS; 5/8-12UN		
	1.5-2.5 16-11	7VIVN60TM3...	12.4			1.1	-	M15x1.5 M16x2 M18x2.5	5/16-11; 5/16-12	5/16-14UNS; 5/16-16UN		
9V	0.5-1.0 28-27	9VIVA60TM3...	13.1			0.6	-	M14x0.5; M14x0.75; M15x1	-	5/16-28UN; 5/16-27UNS		
	1.0-1.5 24-16	9VIVF60TM3...	13.7			0.8	-	M15x1; M15.5x1.5	-	5/16-24UNEF; 5/16-20UN; 5/16-18UNF; 5/16-16UN	CGMC11.5C17-50-9-3 CGMC12C17-50-9-3 GMC20W17-30-9-3	
	1.5-2.0 16-12	9VIVG60TM3...	14.4			1.0	-	M16.5x1.5; M17x2	-	1 1/16-16UN; 3/4-14UNS; 1 1/16-12UN		
	2.0-2.5 12-10	9VIVK60TM3...	15.1			1.4	-	M17.5x2; M18x2.5	5/4-10	1 1/16-12UN;		
11V	1.0-2.0 24-12	11VIVD60TM3...	17.9			1.0	-	M19x1, M19.5x1.25; M19.5x1.5; M20x1.75, M20x2	-	5/4-24UNS; 5/16-20UNEF; 5/16-18UNS; 13/16-16UN; 5/8-14UNF; 13/16-12UN	CGMC14C22-60-11-3 CGMC15C22-65-11-3 GMC25W22-45-11-3	
	2.0-3.0 12-8	11VIVE60TM3...	19.5			1.5	M22x2.5 M24x3	M23x2	1-8	5/16-10UNS; 5/16-12UN		



Vertical Style

## Partial Profile 55°

### Internal



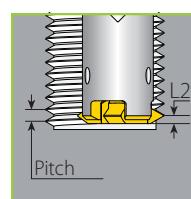
Vertical Style

### Vertical Style

Insert Style	Pitch	Ordering Code	Dimensions mm					Application (Min. Thread Size)			
			TPI	Internal	D2	T	L2	r	BSP (G)	Partial 55°	Toolholder
7V	26-19	7VIVJ55TM3...	11.35		2.9	0.8	0.07	1/4-19 ; 3/8-19		-	CGMC8C13-40-7-3 CCGMC9C13-45-7-3
	16-14	7VIVH55TM3...	12.0			1.0	0.13	1/2-14 ; 5/8-14; 3/4-14; 7/8-14;	%16-16; 5/8-14		GMC20W13-25-7-3
9V	26-19	9VIVJ55TM3...	13.35		4.2	0.8	0.09	3/8-19	5/8-26 ; 3/8-16		CGMC11.5C17-50-9-3 CGMC12C17-50-9-3
	16-10	9VIVC55TM3...	15.4			1.2	0.15	1/2-14	3/4-16 ; 11/16-14; 3/4-12; 7/8-11; 3/4-10		GMC20W17-30-9-3
11V	16-12	11VIVG55TM3...	17.8			0.9	0.16	1/2-14	13/16-16 ; 15/16-12		CGMC14C22-60-11-3
	11-9	11VIVB55TM3...	19.1		5.5	1.3	0.21	1-11	7/8-11; 1-10; 1 1/8-9		CGMC15C22-65-11-3
	8-7	11VIVM55TM3...	19.6			1.5	0.36	-	1-8; 1 1/8-7;		GMC25W22-45-11-3



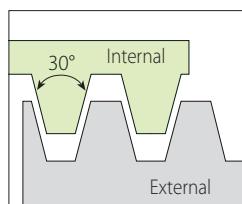
TMSD



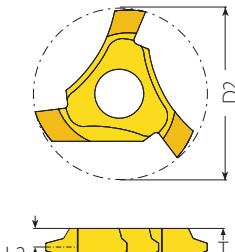
Vertical Style

## Trapez

### Internal



Defined by: DIN 103  
Tolerance class: 7e/7H



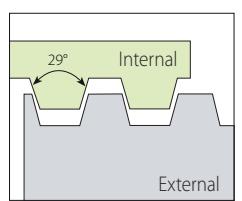
Vertical Style

### Vertical Style

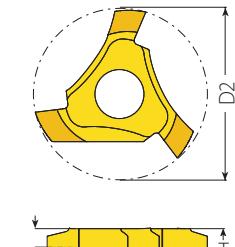
Insert Style	Pitch	Ordering Code	Dimensions mm			Application			
			mm	Internal	D2	T	L2	Trapez	Toolholder
	7V	7VI2.0TR-1TM3...						TR16x2	
		7VI2.0TR-2TM3...			12.3	2.9	1.3	TR18x2	CGMC8C13-40-7-3 CGMC9C13-45-7-3 GMC20W13-25-7-3
		7VI2.0TR-3TM3...						TR20x2	
	9V	9VI3.0TR-1TM3...			15.4	4.2	1.95	TR22x3	CGMC11.5C17-50-9-3 CGMC12C17-50-9-3 GMC20W17-30-9-3
		9VI3.0TR-2TM3...						TR24x3	

## Stub ACME

### Internal



Defined by: ANSI B1.8: 1988  
Tolerance class: 2G

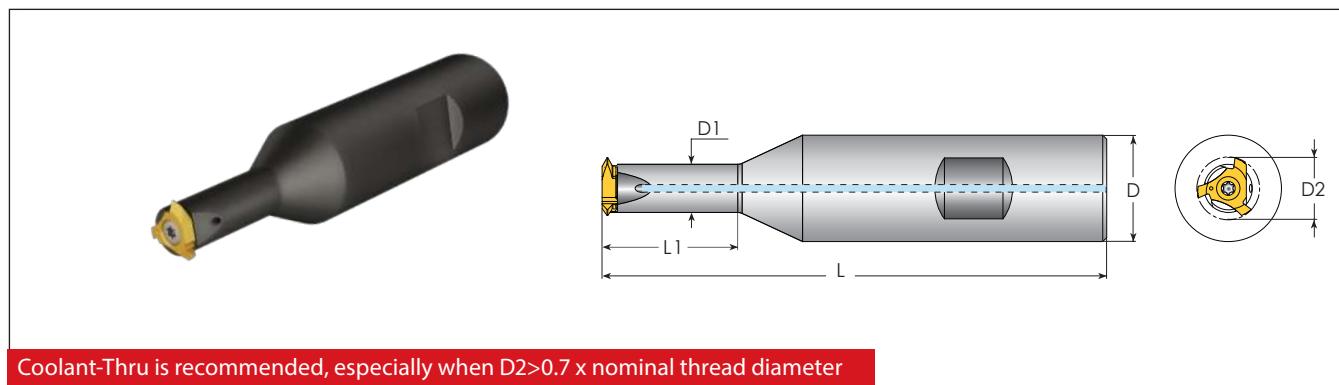


Vertical Style

### Vertical Style

Insert Style	Pitch	Ordering Code	Dimensions mm			Application			
			TPI	Internal	D2	T	L2	Stub ACME	Toolholder
	7V	7VI8STACMETM3...			12.3	2.9	1.3	5/8-8	
		7VI6STACME-1TM3...			12.7	2.9	1.3	3/4-6	CGMC8C13-40-7-3 CGMC9C13-45-7-3 GMC20W13-25-7-3
		7VI6STACME-2TM3...						7/8-6	
	9V	9VI5STACME-1TM3...						1-5	
		9VI5STACME-2TM3...			16.7	4.2	1.95	1 1/8-5	CGMC11.5C17-50-9-3 CGMC12C17-50-9-3
		9VI5STACME-3TM3...						1 1/4-5	GMC20W17-30-9-3
	11V	11VI4STACME-1TM3...						1 1/8-4	
		11VI4STACME-2TM3...			20.8	5.5	2.6	1 1/2-4	CGMC14C22-60-11-3 CGMC15C22-65-11-3
		11VI4STACME-3TM3...						1 3/4-4	GMC25W22-45-11-3
		11VI4STACME-4TM3...						2-4	

## Vertical Toolholders - Weldon Shank

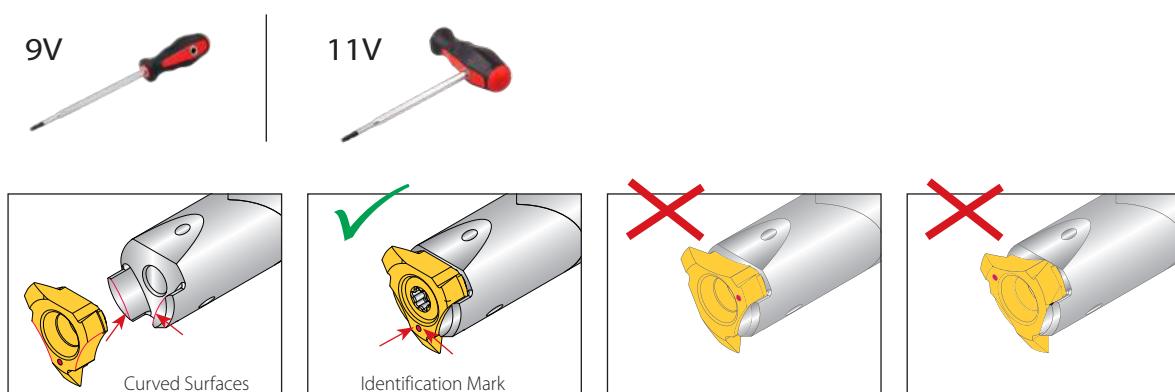


Spare Parts										
Insert Style	Ordering Code	Dimensions mm					Insert Screw	Torx Key	Blade	Handle
	Toolholder	L	L1	D	D1	D2*				
7V	GMC20W13-25-7-3	95	25	20	9	10.5-12.7	SN2T8-M1 (M3.0x0.5x9)	K2T	-	-
9V	GMC20W17-30-9-3	105	30	20	11.5	13.1-16.7	SN3T15-M2 (M4x0.7x13.5)	-	Blade T15-1/4	Smart Handle 1/4x2
11V	GMC25W22-45-11-3	115	45	25	15	17.8-20.8	SN4T20-M3 (M5x0.8x15.5)	-	Blade T20-1/4	Smart Handle 1/4X2

\* The tool cutting diameter (D2) is defined by the insert (See pages 300-302).

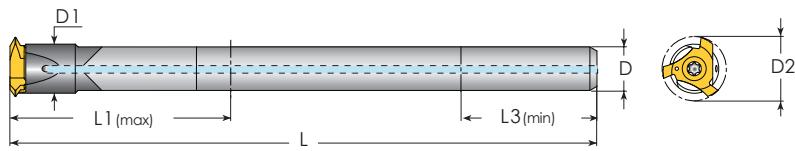
TMSD

### For Correct Clamping:

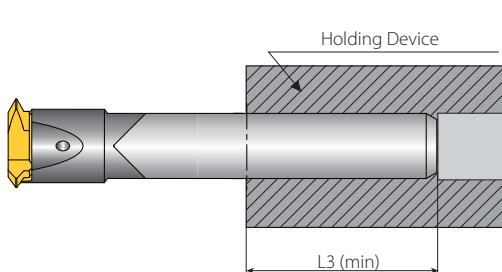


Always mount insert with the identification mark between the two curved surfaces on the toolholder.

## Vertical Toolholders - Carbide Cylindrical Shank



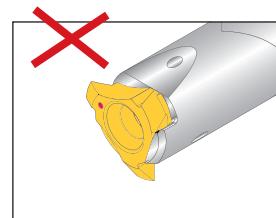
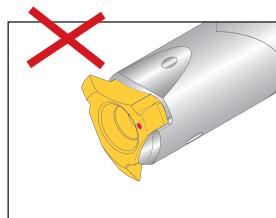
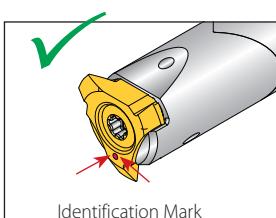
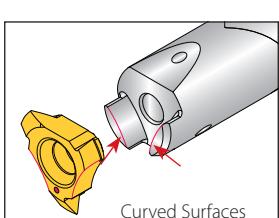
Coolant-Thru is recommended, especially when  $D2 > 0.7 \times$  nominal thread diameter



Dimensions mm							Spare Parts					
Insert Style	Ordering Code	Toolholder	L	L1	L3 (min)	D	D1	D2*	Insert Screw	Torx Key	Blade	Handle
7V	CGMC8C13-40-7-3		115	40	18	8	9	10.5-12.7	SN2T8-M1 (M3.0x0.5x9)	K2T	-	-
	CGMC9C13-45-7-3			45	20	9						
9V	CGMC11.5C17-50-9-3		125	50	25	11.5	11.5	13.1-16.7	SN3T15-M2 (M4x0.7x13.5)	-	Blade T15-1/4	Smart Handle 1/4x2
	CGMC12C17-50-9-3			50	26	12						
11V	CGMC14C22-60-11-3		135	60	30	14	15	17.8-20.8	SN4T20-M3 (M5x0.8x15.5)	-	Blade T20-1/4	Smart Handle 1/4x2
	CGMC15C22-65-11-3			65	32	15						

\* The tool cutting diameter (D2) is defined by the insert (See pages 300-302).

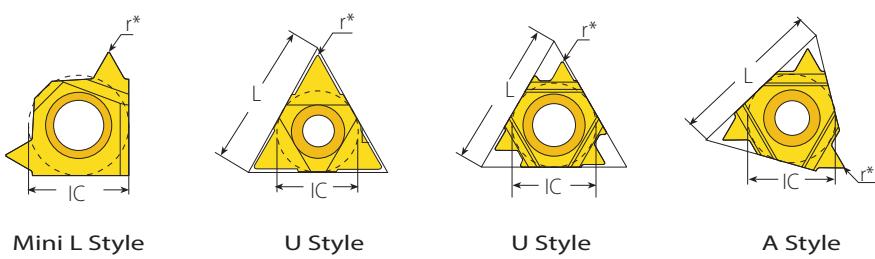
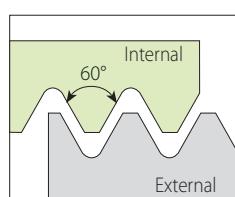
### For Correct Clamping:



Always mount insert with the identification mark between the two curved surfaces on the toolholder.

## Partial Profile 60°

### Internal



2UIDM60 TM...  
2UIDD60 TM...

### L Style



Insert Size	Pitch			Ordering Code	Dimensions mm		
	IC	L mm	mm		Internal	r*	Toolholder
5.0L (Mini L)	-		0.5-1.5	48-16	5LIDA60TM...	0.04	TM.SC...5L
			1.0-2.0	24-11	5LIDN60TM...	0.06	CTM. SC..5L

### U Style



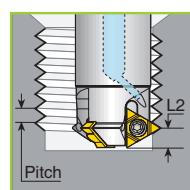
2UIDM60 TM...  
2UIDD60 TM...

Insert Size	Pitch			Ordering Code	Dimensions mm		TM.SD
	IC	L mm	mm		Internal	r*	
1/4"U	11	11	0.5-1.5	48-16	2UIDA60TM...	0.05	TM.SC...2U
			1.5-2.0	16-12	2UIDB60TM...	0.06	CTM. SC...2U
			2.0-2.5	9-12	2UIDD60TM...	0.11	CTM2SC 14C17-65-2U
			2.5	10	2UIDM60TM...	0.11	
			2.5-4.0	10-6	2UIDC60TM...	0.14	TM.SC...2U CTM. SC...2U
3/8"U	16	16	1.5-2.0	16-12	3UIDB60TM...	0.06	
			2.5-3.5	10-7	3UIDE60TM...	0.14	TM.SC...3U
			4.0-6.0	6-4	3UIDH60TM...	0.25	
1/2"U	22	22	6.0-8.0	4-3	4UIDK60TM...	0.30	TM.SC D...4U

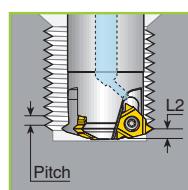
### A Style



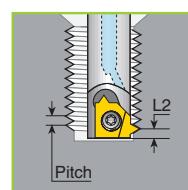
Insert Size	Pitch			Ordering Code	Dimensions mm		TM.SD
	IC	L mm	mm		Internal	r*	
1/4"A	11		1.5-3.0	16-8	2AIDP60TM...	0.06	TM.SC...2A
3/8"A	16		2.0-4.0	12-6	3AIDT60TM...	0.08	TM.SC...3A



U Style  
For Large Pitches



A Style  
For Shorter L2

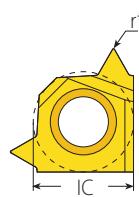
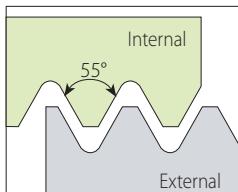


Mini-L Style  
For Small Bores and Short L2

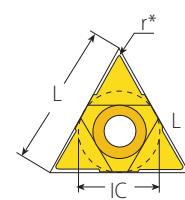
\* The indicated radius (r) refers to the insert nose radius only.

## Partial Profile 55°

### Internal



Mini L Style



U Style

### L Style

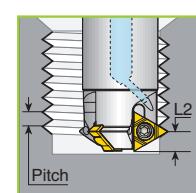


Insert Size	Pitch		Ordering Code	Dimensions mm	
	IC	TPI		Internal	*r
5.0L (Mini L)		26-14	5LIDR55TM...		0.10 TM.SC...5L CTM. SC..5L

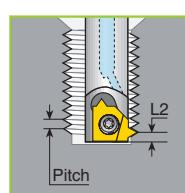
### U Style



Insert Size	Pitch		Ordering Code	Dimensions mm		
	IC	L mm		Internal	*r	Toolholder
1/4"U	11	48-16	2UIDA55TM...	0.11		
		16-12	2UIDB55TM...	0.08		TM.SC...2U CTM. SC..2U
		11-7	2UIDL55TM...	0.24		
3/8"U	16	16-12	3UIDB55TM...	0.08		
		11-7	3UIDL55TM...	0.24		TM.SC...3U
		6-4	3UIDH55TM...	0.27		
1/2"U	22	4-3	4UIDK55TM...	0.50		TM.SC D...4U



U Style  
For Large Pitches

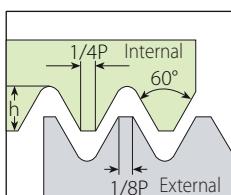


Mini-L Style  
For Small Bores and Short L2

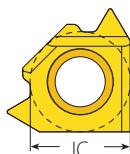
\* The indicated radius (r) refers to the insert nose radius only.

## ISO Metric

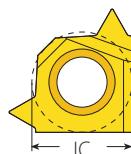
### Internal



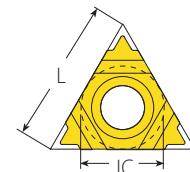
Defined by: R262 (DIN 13)  
Tolerance class: 6g/6H



Mini L Style  
5LI2.0ISOTM...



Mini L Style



U Style

### L Style



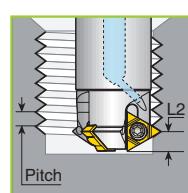
Insert Size	Pitch	Ordering Code		Toolholder Cutting Diameter D2 (mm)
		IC	Internal	
5.0L (Mini L)	1.0		5LI1.0ISOTM...	TM.SC...5L CTM.SC...5L
	1.5		5LI1.5ISOTM...	
	2.0		5LI2.0ISOTM...	

### U Style

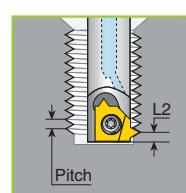


Insert Size	Pitch	Ordering Code		Toolholder Cutting Diameter D2 (mm)		
		IC	L mm	Internal	Toolholder	* Adjusted D2
1/4"U	11		1.5	2UI1.5ISOTM...	TM2SC25W23-70-2U; TM3SC25W26-80-2U; TM4SC32W31-95-2U; TM2SC18C23-86-2U; TM3SC20C26-105-2U; TM4SC25C31-115-2U; CTM3SC20C26-110-2U; CTM4SC25C31-135-2U	For 1.5ISO change D2 to D2-1.0
			2.0	2UI2.0ISOTM...	CTM4SC25C31-135-2U	For 2.0ISO change D2 to D2-1.15

\* Correct the toolholder cutting diameter D2 according to adjustment, as indicated in the above table.



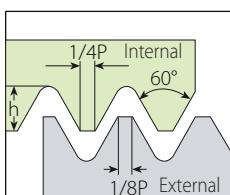
U Style  
For Large Pitches



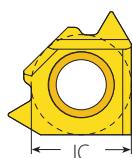
Mini-L Style  
For Small Bores and Short L2

## American UN - UNC; UNF; UNEF; UNS

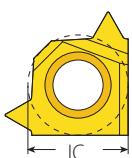
### Internal



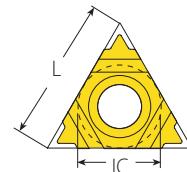
Defined by: ANSI B1.1:74  
Tolerance class: 2A/2B



Mini L Style  
5LI14UNTM...  
5LI12UNTM...



Mini L Style



U Style

### L Style



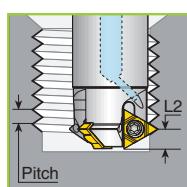
Insert Size	Pitch	Ordering Code			Toolholder Cutting Diameter D2 (mm)
		IC	TPI	Internal	
5.0L (Mini L)	18			5LI18UNTM...	-
	16			5LI16UNTM...	
	14			5LI14UNTM...	
	12			5LI12UNTM...	

### U Style

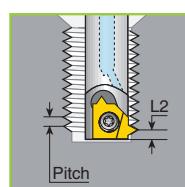


Insert Size	Pitch	Ordering Code			Toolholder Cutting Diameter D2 (mm)		
		IC	L mm	TPI	Internal	Toolholder	* Adjusted D2
1/4"U	11		14		2UI14UNTM...	TM2SC25W23-70-2U; TM3SC25W26-80-2U; TM4SC32W31-95-2U; TM2SC18C23-86-2U; TM3SC20C26-105-2U; TM4SC25C31-115-2U; CTM3SC20C26-110-2U; CTM4SC25C31-135-2U	For 14UN change D2 to D2-1.06

\* Correct the toolholder cutting diameter D2 according to adjustment, as indicated in the above table.



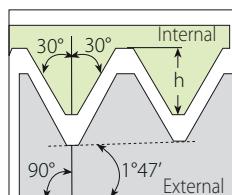
U Style  
For Large Pitches



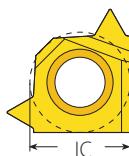
Mini-L Style  
For Small Bores and Short L2

## NPT

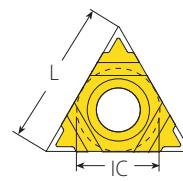
### External / Internal



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



Mini L Style



U Style

### L Style



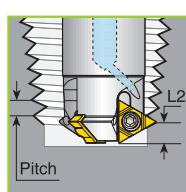
Insert Size	Pitch	Ordering Code		Toolholder Cutting Diameter D2 (mm)		
		IC	TPI	External/Internal	Toolholder	Adjusted D2
5.0L (Mini L)	18			5LEI18NPT-TM...	TM.SC...5L CTM.SC...5L	-

### U Style

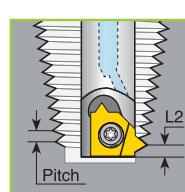


Insert Size	Pitch	Ordering Code		Toolholder Cutting Diameter D2 (mm)			
		IC	L mm	TPI	Internal/External	Toolholder	* Adjusted D2
1/4"U	14	14		2UEI14NPT-TM...	TM1SC16W15-40-2U; CTM1SC08C15-40-2U; CTM1SC11C15-60-2U		14.59
					TM2SC25W21-60-2U; CTM2SC14C21-65-2U; CTM2SC16C21-80-2U		20.49
		11		2UEI11.5NPT-TM...	TM2SC25W23-70-2U; TM2SC18C23-86-2U		22.63
					TM3SC25W26-80-2U; TM3SC20C26-105-2U; CTM3SC20C26-110-2U		25.63
					TM4SC32W31-95-2U; TM4SC25C31-115-2U; CTM4SC25C31-135-2U		30.63
	11.5	11.5		3UEI11.5NPT-TM...	TM3SC32W36-95-3U; TM3SC32W36-145-3U; TM3SC25C36-125-3U; TM3SC28C36-144-3U		35.65
					TM4SC40W42-120-3U; TM4SCD42-16-3U		41.15
					TM5SCD48-22-3U		47.15
					TM3SC32W36-95-3U; TM3SC32W36-145-3U; TM3SC25C36-125-3U; TM3SC28C36-144-3U		35.65
					TM4SC40W42-120-3U; TM4SCD42-16-3U		41.15
3/8"U	16	8		3UEI8NPT-TM...	TM5SC-D48-22-3U		47.15
					TM6SC-D56-22-3U		55.15
					TM6SC-D88-27-4U		88.06
					TM7SC-D98-32-4U		98.06

\* Correct the toolholder cutting diameter D2 according to adjustment, as indicated in the above table.



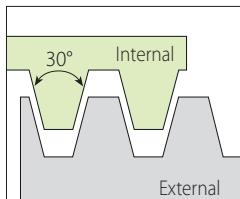
U Style  
For Large Pitches



Mini-L Style  
For Small Bores and Short L2

## Trapez

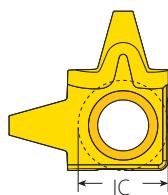
### Internal



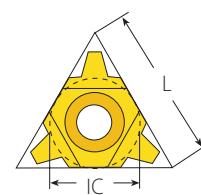
Defined by: DIN 103  
Tolerance class: 7e/7H



Mini L Style



3/8" L



U Style

### L Style

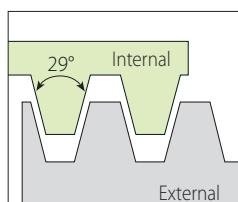
	Insert Size		Pitch	Ordering Code		Application	
	IC	mm		Internal		Internal	Toolholder
	5.0L (Mini L)	2.0		5LI2.0TR-1TM...		TR16x2, TR20x2	TM,SC...5L CTM, SC...5L
		2.0		5LI2.0TR-2TM...		TR18x2	
	3/8" L	6.0		3LI6.0TR-1TM...		(TR30-36)x6	TM1SC25W21-50-3L; CTM1SC½"C21-75-3L
		6.0		3LI6.0TR-2TM...		(TR115-130)x6	TM7SCD80-32-3L
		7.0		3LI7.0TRTM...		(TR38-44)x7	TM2SC25W28-70-3L; CTM2SC18C28-100-3L
		8.0		3LI8.0TR-1TM...		(TR46-52)x8	TM3SC32W33-90-3L; CTM3SC20C33-120-3L
		8.0		3LI8.0TR-2TM...		(TR175-240)x8	TM7SCD80-32-3L

### U Style

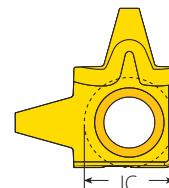
	Insert Size		Pitch	Ordering Code		Application	
	IC	L mm	mm	Internal		Internal	Toolholder
	1/4" U	11	3.0	2UI3.0TR-1TM...		(TR22-TR30)x3	See pages 314-321
				2UI3.0TR-2TM...		(TR32-TR60)x3	
			4.0	2UI4.0TR-1TM...		(TR20-TR28)x4	
				2UI4.0TR-2TM...		(TR65-TR110)x4	
			5.0	2UI5.0TR-1TM...		TR22x5; TR28x5	
				2UI5.0TR-2TM...		TR24x5; TR26x5	

## American ACME

### Internal



Defined by: ANSI B1.5: 1988  
Tolerance class: 3G



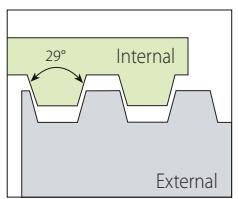
3/8" L

### L Style

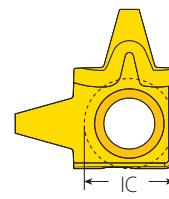
Insert Size	Pitch	Ordering Code		Application	Toolholder
		IC	TPI	Internal	Internal
 3/8" L	5	3LI5ACMETM...		1 1/4-5ACME	
		3LI4ACME-1TM...		1 3/8-4ACME	TM1SC25W21-50-3L; CTM1SC 1/2" C21-75-3L
		3LI4ACME-2TM...		1 1/2-4ACME	
	4	3LI4ACME-3TM...		1 3/4-4ACME	TM2SC25W28-70-3L; CTM2SC18C28-100-3L
		3LI4ACME-4TM...		2-4ACME	
		3LI3ACME-1TM...		2 1/4-3ACME	TM3SC32W33-90-3L; CTM3SC20C33-120-3L
	3	3LI3ACME-2TM...		2 1/2-3ACME	
		3LI3ACME-3TM...		2 3/4-3ACME	

### Stub ACME

### Internal



Defined by: ANSI B1.8: 1988  
Tolerance class: 2G



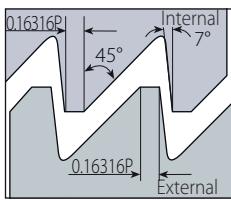
3/8" L

### L Style

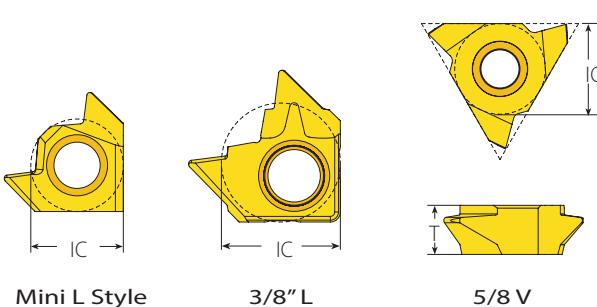
Insert Size	Pitch	Ordering Code		Application	Toolholder
		IC	TPI	Internal	Internal
 3/8" L	5	3LI5STACMETM...		1 1/4-5TACME	
		3LI4STACME-1TM...		1 3/8-4TACME	TM1SC25W21-50-3L; CTM1SC 1/2" C21-75-3L
		3LI4STACME-2TM...		1 1/2-4TACME	
	4	3LI4STACME-3TM...		2-4TACME	
		3LI3STACME-1TM...		2 1/4-3TACME	TM3SC32W33-90-3L; CTM3SC20C33-120-3L
		3LI3STACME-2TM...		2 1/2-3TACME	
	3	3LI3STACME-3TM...		2 3/4-3TACME	

## American Buttress

### Internal



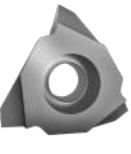
Defined by: ANSI B1.9.1973  
Tolerance class: Class 2



### L Style

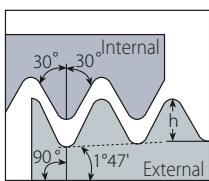
Insert Size	Pitch	Ordering Code		Application	
		IC	TPI	Internal	Internal
	5.0L (Mini L)	16	5LI16ABUT-TM...	0.875"-4.0" ABUT	TM2SC16W14-35-5L-ABUT CTM2SC10C14-50-5L-ABUT
				1.25"-4.0" ABUT	TM3SC20W18-45-5L-ABUT CTM3SC14C18-65-5L-ABUT
	12	5LI12ABUT-TM...	0.875"-6.0" ABUT	TM2SC16W14-35-5L-ABUT CTM2SC10C14-50-5L-ABUT	
			1.25"-6.0" ABUT	TM3SC20W18-45-5L-ABUT CTM3SC14C18-65-5L-ABUT	
	3/8'' L	10	5LI10ABUT-TM...	0.875"-16.0" ABUT	TM2SC16W14-35-5L-ABUT CTM2SC10C14-50-5L-ABUT
				1.25"-16.0" ABUT	TM3SC20W18-45-5L-ABUT CTM3SC14C18-65-5L-ABUT
		16	3LI16ABUT-TM...	1.75"-4.0" ABUT	TM2SC25W26-80-3L-ABUT CTM2SC20C26-105-3L-ABUT
				2.5"-4.0" ABUT	TM3SC32W35-105-3L-ABUT
		12	3LI12ABUT-TM...	1.75"-6.0" ABUT	TM2SC25W26-80-3L-ABUT CTM2SC20C26-105-3L-ABUT
				2.5"-6.0" ABUT	TM3SC32W35-105-3L-ABUT
				3.0"-6.0" ABUT	TM5SCD48-22-3L-ABUT
				4.0"-6.0" ABUT	TM6SCD58-27-3L-ABUT
	10	3LI10ABUT-TM...	1.75"-6.0" ABUT	TM2SC25W26-80-3L-ABUT CTM2SC20C26-105-3L-ABUT	
			2.5"-6.0" ABUT	TM3SC32W35-105-3L-ABUT	
			3.0"-6.0" ABUT	TM5SCD48-22-3L-ABUT	
			4.0"-6.0" ABUT	TM6SCD58-27-3L-ABUT	
	8	3LI8ABUT-TM...	1.75"-6.0" ABUT	TM2SC25W26-80-3L-ABUT CTM2SC20C26-105-3L-ABUT	
			2.5"-6.0" ABUT	TM3SC32W35-105-3L-ABUT	
			3.0"-6.0" ABUT	TM5SCD48-22-3L-ABUT	
			4.0"-6.0" ABUT	TM6SCD58-27-3L-ABUT	
	6	3LI6ABUT-TM...	1.75"-6.0" ABUT	TM2SC25W26-80-3L-ABUT CTM2SC20C26-105-3L-ABUT	
			2.5"-6.0" ABUT	TM3SC32W35-105-3L-ABUT	
			3.0"-6.0" ABUT	TM5SCD48-22-3L-ABUT	
			4.0"-6.0" ABUT	TM6SCD58-27-3L-ABUT	

### V Style

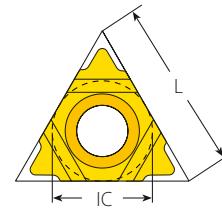
Insert Size	Pitch	Ordering Code		Application		
		IC	TPI	Internal	Internal	
	5/8'' V	4	5VI4ABUT-TM...	6	5.5"-24.0" ABUT	TM6SCD88-32-5V6-ABUT
		3	5VI3ABUT-TM...	8	6.0"-24.0" ABUT	TM6SCD88-32-5V8-ABUT
		2.5	5VI2.5ABUT-TM...	10	7.0"-24.0" ABUT	

## API Round Casing & Tubing

### Internal



Defined by: API STD. 5B:1979  
Tolerance class: Standard API RD



### U Style

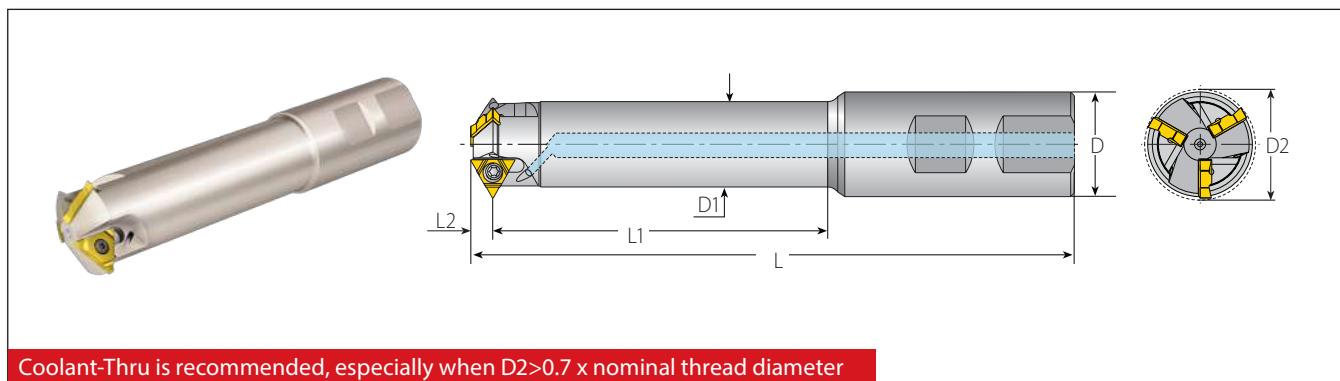


Insert Size	Pitch	Ordering Code	Toolholder Cutting Diameter D2 (mm)					
			IC	L mm	TPI	Internal	Toolholder	* Adjusted D2
1/4"U	11	10	2UI10APIRDTM...				TM2SC25W23-70-2U	21.44
							TM2SC18C23-86-2U	21.74
							TM3SC25W26-80-2U	24.44
3/8"U	16	8	3UI8APIRDTM...				TM3SC20C26-105-2U	
							TM4SC32W31-95-2U	29.44
							TM4SC25C31-115-2U	
							TM3SC32W36-95-3U	34.7
							TM3SC32W36-145-3U	
							TM3SC25C36-125-3U	
							TM3SC25C36-125-3U	
							TM4SC40W42-120-3U	40.2
							TM4SCD42-16-3U	
							TM5SCD48-22-3U	46.2
							TM6SCD56-22-3U	54.2

TMSD

\* Correct the toolholder cutting diameter D2 according to adjustment, as indicated in the above table.

## Standard Toolholders - Weldon Shank (U Style)



Coolant-Thru is recommended, especially when  $D2 > 0.7 \times$  nominal thread diameter

### Weldon Shank for U Style Inserts

Insert Size	Ordering Code	Dimensions mm						No. of Flutes	Spare Parts	
		L	L1	L2	D	D1	D2	Z	Insert Screw	Torx Key
1/4"U	TM1SC16W15-40-2U	95	40	5.4	16	11.0	14.75*	1	SN2T	HK2T
	TM2SC25W21-60-2U	123	60		25	16.0	20.65*	2		
	TM2SC25W23-70-2U	135	70		25	17.7	23.0	2		
	TM3SC25W26-80-2U	147	80		25	20.4	26.0	3		
	TM4SC32W31-95-2U	164	95		32	25.7	31.0	4		
3/8"U	TM3SC32W36-95-3U	166	95	8.0	32	29.0	36.5	3	SA3T	HK3T
	TM3SC32W36-145-3U	225	145		32	28.0	36.5	3		
	TM4SC40W42-120-3U	201	120		40	34.2	42.0	4		

TMSD

### Weldon Shank (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
TM1SC16W15-40-2U	14.75*	M18x2.5; M24x3.0	M16x0.5; M16x0.75; M16x1.0; M17x1.25; M17x1.5; M17x2.0	3/4-10	%-32UN; %-28UN; %-27UNS; 11/16-24UN; 11/16-20UN; 11/16-16UN; 3/4-14UNS; 3/4-12UN	3/8-19; 1/2-14; 1-11	11/16-14; 3/4-12; 5/8-11; 3/4-10; 5/8-9; 1-8; 11/8-7	TR22x3; TR24x3		
TM2SC25W21-60-2U	20.65*	M24x3.0; M30x3.5	M22x0.5; M22x0.75; M22x1.0; M23x1.25; M23x1.5; M23x2.0	1-8; 11/8-7; 13/8-6	%-32UN; 7/8-28UN; 7/8-27UNS; 7/8-24UNS; 7/8-20UNEF; 1-18UNS; 15/16-16UN; 1-14UNS; 11/16-12UN; 1-10UNS	3/4-14; 1-11	1-26; 1-20; 1-16; 1-12; 1-10; 1 1/8-9; 1-8; 1 1/8-7	(TR26- TR60)x3		
TM2SC25W23-70-2U	23.0	M27x3.0; M30x3.5; M36x4.0	M24x0.5; M24x0.75; M25x1.0; M25x1.25; M26x1.5; M26x2.0; M27x2.5	11/8-7	1-32UN; 1-28UN; 1-27UNS; 1-24UNS; 1-20UNEF; 1-18UNS; 1-16UN; 1-14UNS; 1-12UNF; 1 1/8-10UNS; 1 1/8-8UN	3/4-14; 1-11	1-26; 1-20; 1-16; 1 1/8-12; 1 1/8-9; 1 1/8-7	-		
TM3SC25W26-80-2U	26.0	M30x3.5; M36x4.0	M27x0.5; M27x0.75; M28x1.0; M28x1.25; M28x1.5; M29x2.0; M30x2.5; M30x3.0	1 1/4-7; 1 3/8-6	1 1/8-28UN; 1 1/8-24UNS; 1 1/8-20UN; 1 1/8-18UNEF; 1 1/8-16UN; 1 1/8-14UNS; 1 1/8-12UNF; 1 1/8-10UNS; 1 1/8-8UN	3/8-14; 1-11	1 1/8-26; 1 1/8-20; 1 1/8-16; 1 1/8-12; 1 1/8-8; 1 1/4-7	-		
TM4SC32W31-95-2U	31.0	M36X4.0	M32x0.5; M32x0.75; M33x1.0; M33x1.25; M33x1.5; M34x2.0; M34x2.5; M35x3.0; M36x3.5	1 1/2-6	1 1/8-28UN; 1 1/8-24UNS; 1 1/8-20UN; 1 1/8-18UNEF; 1 1/8-16UN; 1 1/8-14UNS; 1 1/8-12UNF; 1 1/8-10UNS; 1 1/8-8UN	1 1/8-11	1 1/8-26; 1 1/8-20; 1 1/8-16; 1 1/8-12; 1 1/8-8	-		
TM3SC32W36-95-3U TM3SC32W36-145-3U	36.5	M42x4.5; M48x5.0; M56x5.5; M64x6.0	M39x1.5; M39x2.0; M40x2.5; M41x3.0; M42x3.5; M42x4.0	1 3/4-5; 2-4.5; 2 1/2-4	1 1/8-16UN; 1 1/8-14UNS; 1 1/8-12UN; 1 1/8-10UNS; 1 1/8-8UN; 1 1/8-6UN	1 1/4-11	1 5/8-16; 1 5/8-12; 1 5/8-8; 1 1/8-6; 1 1/4-5	-		
TM4SC40W42-120-3U	42.0	M48x5.0; M56x5.5; M64x6.0	M45x1.5; M45x2.0; M46x2.5; M48x3.0; M48x3.5; M48x4.0	2-4.5; 2 1/2-4	1 3/4-16UN; 1 3/4-14UNS; 1 13/16-12UN; 1 13/16-8UN; 1 15/16-6UN	1 1/2-11	1 1/8-16; 1 1/8-12; 1 1/8-8; 2 1/4-6; 2-4.5	-		

\* For TR inserts use the CNC program (D2+0.25mm).

## Weldon Shank (U Style) Applications (con't)

### Thread Applications for Full Profile Inserts (ISO & UN)

Toolholder	Toolholder Cutting Diameter D2 (mm)	Pitch			Min. Thread Dia.
		* Adjusted D2	mm	TPI	
TM2SC25W23-70-2U	22.0	1.5	-	M26x1.5	-
	21.85	2.0	-	M26x2.0	-
	21.94	-	14	-	1-14UNS
	21.85	-	12	-	1-12UNF
TM3SC25W26-80-2U	25.0	1.5	-	M28x1.5	-
	24.85	2.0	-	M29x2.0	-
	24.94	-	14	-	1 1/8-14UNF
	24.85	-	12	-	1 1/8-12UNF
TM4SC32W31-95-2U	30.0	1.5	-	M33x1.5	-
	29.85	2.0	-	M34x2.0	-
	29.94	-	14	-	1 3/8-14UNS
	29.85	-	12	-	1 3/8-12UNF

### Thread Applications for Full Profile Inserts (NPT)

Toolholder	Toolholder Cutting Diameter D2 (mm)	Pitch	Cylindrical or Conical Pre-Drilled Hole	Cylindrical Pre-Drilled Hole		
			* Adjusted D2	TPI	NPT Threading by 1 Radial Pass	**NPT Threading by 2 Radial Passes (50% / 50%)
TM1SC16W15-40-2U	14.59	14	14.59	14	1/2-14NPT; 3/4-14NPT	-
TM2SC25W21-60-2U	20.49	14	20.49	14	3/4-14NPT	-
TM2SC25W23-70-2U	22.63	11.5	22.63	11.5	1-11.5NPT; 1 1/4-11.5NPT; 1 1/2-11.5NPT; 2-11.5NPT	-
TM3SC25W26-80-2U	25.63	11.5	25.63	11.5	1-11.5NPT; 1 1/4-11.5NPT; 1 1/2-11.5NPT; 2-11.5NPT	-
TM4SC32W31-95-2U	30.63	11.5	30.63	11.5	1 1/4-11.5NPT; 1 1/2-11.5NPT; 2-11.5NPT	-
TM3SC32W36-95-3U	35.65	11.5	35.65	11.5	1 1/4-11.5NPT; 1 1/2-11.5NPT; 2-11.5NPT	-
TM3SC32W36-145-3U	35.65	8	35.65	8	-	2 1/2...10-8NPT
TM3SC32W36-95-3U	35.65	8	35.65	8	-	2 1/2...10-8NPT
TM4SC40W42-120-3U	41.15	11.5	41.15	11.5	1 1/2-11.5NPT; 2-11.5NPT	-
TM4SC40W42-120-3U	41.15	8	41.15	8	-	2 1/2...10-8NPT

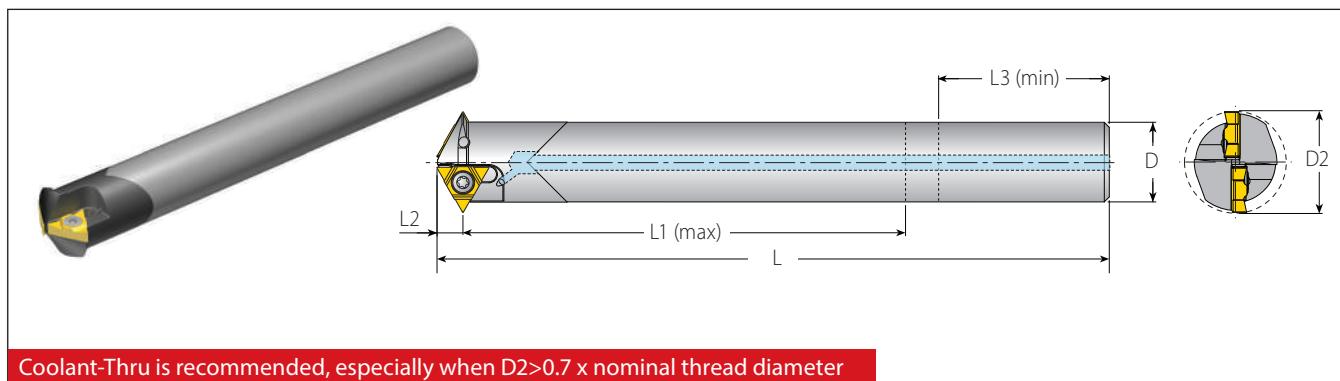
\*\* When the pre-drilled hole for 8NPT is conical, the thread can be machined in one pass.

### Thread Applications for Full Profile Inserts (API Round)

Toolholder	Toolholder Cutting Diameter D2 (mm)	Pitch	Cylindrical or Conical Pre-Drilled Hole (for cylindrical 2 radial passes 50%/50%; for conical one radial pass)	Conical Pre-Drilled Hole only (one pass)
			* Adjusted D2	TPI
TM2SC 25W23-70-2U	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 25W26-80-2U	24.44		1.66...2.875x10APIRD (for TBG; UP TBG; UP TBG Long; Integral-Joint TBG)	
TM4SC 32W31-95-2U	29.44	8	1.66...3.5x10APIRD (for TBG; UP TBG; UP TBG Long; Integral-Joint TBG)	-
TM3SC 32W36-95-3U	34.7		2.375...13.375x8APIRD (for CSG; TBG; UP TBG; UP TBG Long); 4.5...5.5x8APIRD (for LCGS)	
TM3SC 32W36-145-3U	34.7	8	2.375...20x8APIRD (for CSG; TBG; UP TBG; UP TBG Long); 4.5...7.625x8APIRD (for LCGS)	8.625...20x8APIRD (for LCGS)
TM4SC 40W42-120-3U	40.2		2.875...20x8APIRD (for CSG; TBG; UP TBG; UP TBG Long); 4.5...7.625x8APIRD (for LCGS)	8.625x8APIRD (for LCGS)

\* Correct the toolholder cutting diameter D2 according to adjustment, as indicated in the above table.

## Standard Toolholders - Carbide Cylindrical Shank (U Style)



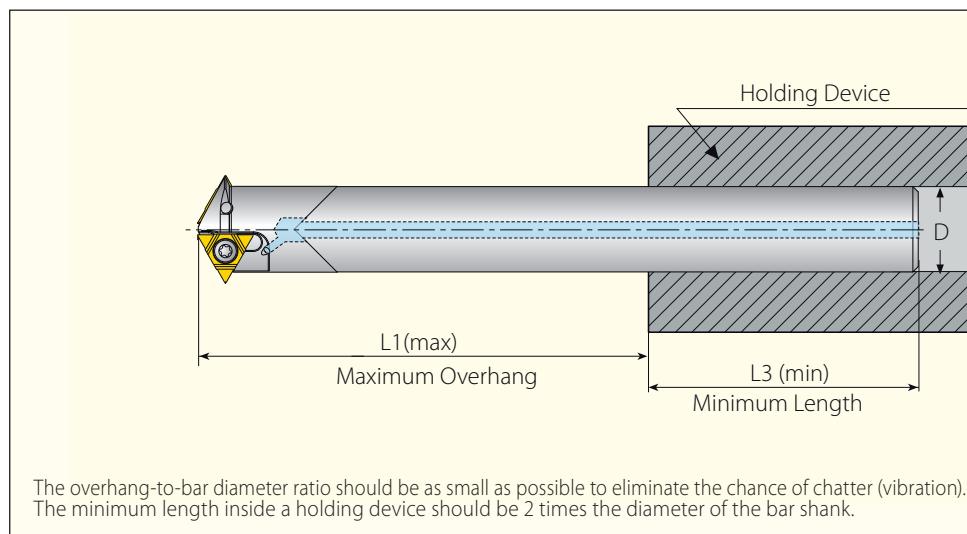
### Carbide Cylindrical Shank for U Style Inserts

Insert Size	Ordering Code	Dimensions mm					No. of Flutes	Spare Parts		
		L	L1 (max)	L2	L3 (min)	D	D2	Z	Insert Screw	Torx Key
1/4"U	CTM1SC08C15-40-2U	109	40	5.4	18	8	14.75*	1	SN2T	HK2T
	CTM1SC11C15-60-2U	120	60		25	10.7	14.75*	1		
	CTM2SC14C17-65-2U**	132	65		30	14	17.9**	2		
	CTM2SC14C21-65-2U	136	65		30	14	20.65*	2		
	CTM2SC16C21-80-2U	135	80		34	16	20.65*	2		
	CTM3SC20C26-110-2U	165	110		40	20	26.0*	3		
	CTM4SC25C31-135-2U	186	135		46	25	31.0*	4		

\* For TR inserts use the CNC program ( $D2+0.25\text{mm}$ ).

\*\* To be used only with inserts 2UIDD60TM... or 2UIDM60TM...

For insert 2UIDD60 TM... use the CNC program ( $D2+0.7\text{mm}$ ).



## Carbide Cylindrical Shank (U Style) Applications

### Thread Applications for Partial Profile Inserts

Toolholder	D2	Min. Thread Dia.						
		ISO Coarse	ISO Fine	UNC	UN/UNF/UNEF/UNS	BSP (G)	Partial 55°	Trapez
CTM1SC08C15-40-2U	14.75*	M18x2.5; M24x3.0; M30x3.5; M36x4.0	M16x0.5; M16x0.75; M16x1.0; M17x1.25; M17x1.5; M17x2.0	¾-10; ⅝-9; 1-8; ⅛-7; ⅜-6	⅝-32UN; ⅝-28UN; ⅝-27UNS; ⅛-24UNEF; ⅛-20UN; ⅛-16UN; ¾-14UNS; ⅛-12UN	½-14; 1-11	⅛-26; ⅛-20; ⅛-16; ⅛-14; ¾-12; ⅝-11; ¾-10; ⅝-9; 1-8; ⅛-7	TR22x3; TR24x3; TR20x4; TR22x5; TR24x5; TR26x5; TR28x5
CTM1SC11C15-60-2U	14.75*	M18x2.5; M24x3.0	M16x0.5; M16x0.75; M16x1.0; M17x1.25; M17x1.5; M17x2.0	¾-10; ⅝-9; 1-8	⅝-32UN; ⅝-28UN; ⅝-27UNS; ⅛-24UNEF; ⅛-20UN; ⅛-16UN; ¾-14UNS; ⅛-12UN	½-14; 1-11	⅛-26; ⅛-20; ⅛-16; ⅛-14; ¾-12; ⅝-11; ¾-10; ⅝-9	TR22x3; TR24x3
CTM2SC14C17-65-2U	17.2**	M20x2.5; M22x2.5	M21x2.0	⅝-9	⅝-10UNS; ⅛-12UN	-	-	-
CTM2SC14C21-65-2U	20.65*	M24x3.0; M30x3.5; M36x4.0	M22x0.5; M22x0.75; M22x1.0; M23x1.25; M23x1.5; M23x2.0	1-8; ⅝-7; ⅛-6	⅝-32UN; ⅝-28UN; ⅝-27UNS; ⅝-24UNS; ⅛-20UNEF; 1-18UNS; ⅛-16UN; 1-14UNS; ⅛-12UN; 1-10UNS	¾-14; 1-11	1-26; 1-20; 1-16; 1-12; 1-10; ⅝-9; 1-8; ⅛-7	(TR26-TR60)x3; TR28x4; (TR65-TR110)x4; TR28x5
CTM2SC16C21-80-2U	20.65*	M24x3.0; M30x3.5	M22x0.5; M22x0.75; M22x1.0; M23x1.25; M23x1.5; M23x2.0	1-8; ⅝-7; ⅛-6	⅝-32UN; ⅝-28UN; ⅝-27UNS; ⅝-24UNS; ⅛-20UNEF; 1-18UNS; ⅛-16UN; 1-14UNS; ⅛-12UN; 1-10UNS	¾-14; 1-11	1-26; 1-20; 1-16; 1-12; 1-10; ⅝-9; 1-8; ⅛-7	(TR26-TR60)x3
CTM3SC20C26-110-2U	26	M30x3.5; M36x4.0	M27x0.5; M27x0.75; M28x1.0; M28x1.25; M28x1.5; M29x2.0; M30x2.5; M30x3.0	⅛-7; ⅛-6	⅛-28UN; ⅛-24UNS; 1⅛-20UN; ⅛-18UNEF; 1⅛-16UN; 1⅛-14UNS; ⅛-12UNF; 1⅛-10UNS; ⅛-8UN	⅝-14; 1-11	⅛-26; ⅛-20; ⅛-16; ⅛-12; ⅛-8; 1⅛-7	(TR40-TR60)x3 (TR65-TR110)x4
CTM4SC25C31-135-2U	31	M36x4.0	M32x0.5; M32x0.75; M33x1.0; M33x1.25; M33x1.5; M34x2.0; M34x2.5; M35x3.0; M36x3.5	⅛-6	⅛-28UN; 1⅛-24UNS; 1⅛-20UN; 1⅛-18UNEF; 1⅛-16UN; 1⅛-14UNS; 1⅛-12UNF; 1⅛-10UNS; 1⅛-8UN	1⅛-11	⅛-26; 1⅛-20; ⅛-16; 1⅛-12; 1⅛-8	(TR50-TR60)x3 (TR65-TR110)x4

\* For TR inserts use the CNC program (D2+0.25mm).

\*\* To be used only with inserts 2UIDD60TM... or 2UIDM60TM...

For insert 2UIDD60TM... use the CNC program (D2+0.7mm).

### Thread Applications for Full Profile Inserts (ISO & UN)

Toolholder	Toolholder Cutting Diameter D2 (mm)	Pitch			Min. Thread Dia.	
		* Adjusted D2	mm	TPI	ISO Fine	UN/UNF/UNEF/UNS
CTM3SC20C26-110-2U	25.0	1.5	-	-	M28x1.5	-
	24.85	2.0	-	-	M29x2.0	-
	24.94	-	14	-	-	1 1/8-14UNS
	24.85	-	12	-	-	1 1/8-12UNF
CTM4SC25C31-135-2U	30.0	1.5	-	-	M33x1.5	-
	29.85	2.0	-	-	M34x2.0	-
	29.94	-	14	-	-	1 3/8-14UNS
	29.85	-	12	-	-	1 3/8-12UNF

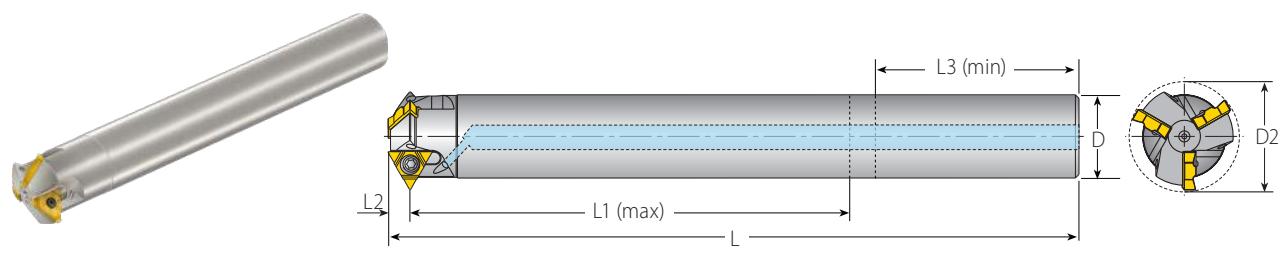
\* Correct the toolholder cutting diameter D2 according to adjustment, as indicated in the above table.

### Thread Applications for Full Profile Inserts (NPT)

Toolholder	Toolholder Cutting Diameter D2 (mm)	Pitch	Cylindrical or Conical Pre-Drilled Hole		Cylindrical Pre-Drilled Hole	
			* Adjusted D2	TPI	NPT Threading by 1 Radial Pass	NPT Threading by 2 Radial Passes (50% / 50%)
CTM1SC08C15-40-2U	14.59	14	1/2-14NPT; 3/4-14NPT	-	-	-
CTM1SC11C15-60-2U	-	-	-	-	-	-
CTM2SC14C21-65-2U	20.49	14	3/4-14NPT	-	-	-
CTM2SC16C21-80-2U	-	-	-	-	-	-
CTM3SC20C26-110-2U	25.63	11.5	1-11.5NPT; 1 1/4-11.5NPT; 1 1/2-11.5NPT; 2-11.5NPT	-	-	-
CTM4SC25C31-135-2U	30.63	11.5	1 1/4-11.5NPT; 1 1/2-11.5NPT; 2-11.5NPT	-	-	-

\* Correct the toolholder cutting diameter D2 according to adjustment, as indicated in the above table.

## Standard Toolholders - Steel Cylindrical Shank (U Style)



Coolant-Thru is recommended, especially when  $D2 > 0.7 \times$  nominal thread diameter

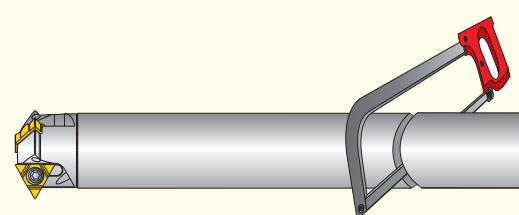
### Steel Cylindrical Shank for U Style Inserts

Insert Size	Ordering Code	Dimensions mm				No. of Flutes	Spare Parts			
		L	L1 (max)	L2	L3 (min)	D	D2	Z	Insert Screw	Torx Key
1/4"U	TM2SC18C23-86-2U	166	86		40	18	23.3	2	SN2T	HK2T
	TM3SC20C26-105-2U	186	105	5.4	40	20	26	3		
	TM4SC25C31-115-2U	196	115		46	25	31	4		
3/8"U	TM3SC25C36-125-3U	193	125	8.0	46	25	36.5	3	SA3T	HK3T
	TM3SC28C36-144-3U	222	144		60	28	36.5	3		

## Steel Cylindrical Shank (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°	
TM2SC18C23-86-2U	23.3	M27x3.0; M30x3.5; M36x4.0	M24x0.5; M25x0.75; M25x1.0; M25x1.25; M26x1.5; M26x2.0; M27x2.5	1½-7	1-32UN; 1-28UN; 1-27UN; 1-24UNS; 1-20UNEF; 1-18UNS; 1-16UN; 1-14UNS; 1½-12UN; 1½-10UNS; 1½-8UN	¾-14; 1-11	1-26; 1-20; 1½-16; 1½-12; 1½-9; 1½-7	
TM3SC20C26-105-2U	26	M30x3.5; M36x4.0	M27x0.5; M27x0.75; M28x1.0; M28x1.25; M28x1.5; M29x2.0; M30x2.5; M30x3.0	1¾-7; 1¾-6	1½-28UN; 1½-24UNS; 1½-20UN; 1½-18UNEF; 1½-16UN; 1½-14UNS; 1½-12UNF; 1½-10UNS; 1½-8UN	¾-14; 1-11	1½-26; 1½-20; 1¾-16; 1¾-12; 1¾-8; 1¼-7	
TM4SC25C31-115-2U	31	M36x4.0	M32x0.5; M32x0.75; M33x1.0; M33x1.25; M33x1.5; M34x2.0; M34x2.5; M35x3.0; M36x3.5	1½-6	1½-28UN; 1½-24UNS; 1½-20UN; 1½-18UNEF; 1½-16UN; 1½-14UNS; 1¾-12UNF; 1½-10UNS; 1½-8UN	1½-11	1¾-26; 1¾-20; 1¾-16; 1¾-12; 1¾-8	
TM3SC25C36-125-3U TM3SC28C36-144-3U	36.5	M42.5x4.5; M48x5.0; M56x5.5; M64x6.0	M39x1.5; M40x2.5; M41x3.0; M42x3.5; M42x4.0	1¾-5; 2-4.5; 2½-4	1½-16UN; 1½-14UNS; 1½-12UN; 1½-10UNS; 1½-8UN; 1½-6UN	1¼-11	1½-16; 1½-12; 1½-8; 1½-6; 1¾-5	



The length of 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.

## Steel Cylindrical Shank (U Style) Applications (con't)

### Thread Applications for Full Profile Inserts (ISO & UN)

Toolholder	Toolholder Cutting Diameter D2 (mm)	Pitch			Min. Thread Dia.
		* Adjusted D2	mm	TPI	ISO Fine
TM2SC18C23-86-2U	22.00	1.5	-	M26x1.5	-
	21.85	2.0	-	M26x2.0	-
	21.94	-	14	-	1-14UNS
	21.85	-	12	-	1-12UNF
TM3SC20C26-105-2U	25.00	1.5	-	M28x1.5	-
	24.85	2.0	-	M29x2.0	-
	24.94	-	14	-	1 1/8-14UNS
	24.85	-	12	-	1 1/8-12UNF
TM4SC25C31-115-2U	30.00	1.5	-	M33x1.5	-
	29.85	2.0	-	M34x2.0	-
	29.94	-	14	-	1 3/8-14UNS
	29.85	-	12	-	1 3/8-12UNF

### Thread Applications for Full Profile Inserts (NPT)

Toolholder	Toolholder Cutting Diameter D2 (mm)	Pitch	Cylindrical or Conical Pre-Drilled Hole	Cylindrical Pre-Drilled Hole		
			* Adjusted D2	TPI	NPT Threading by 1 Radial Pass	**NPT Threading by 2 Radial Passes (50% / 50%)
TM2SC18C23-86-2U	22.63	11.5	1-11.5NPT; 1 1/4-11.5NPT; 1 1/2-11.5NPT; 2-11.5NPT	-	-	-
TM3SC20C26-105-2U	25.63	11.5	1-11.5NPT; 1 1/4-11.5NPT; 1 1/2-11.5NPT; 2-11.5NPT	-	-	-
TM4SC25C31-115-2U	30.63	11.5	1 1/4-11.5NPT; 1 1/2-11.5NPT; 2-11.5NPT	-	-	-
TM3SC25C36-125-3U	35.65	11.5	1 1/4-11.5NPT; 1 1/2-11.5NPT; 2-11.5NPT	-	-	-
TM3SC28C36-144-3U						
TM3SC25C36-125-3U	35.65	8	-		2 1/2...10-8NPT	
TM3SC28C36-144-3U						

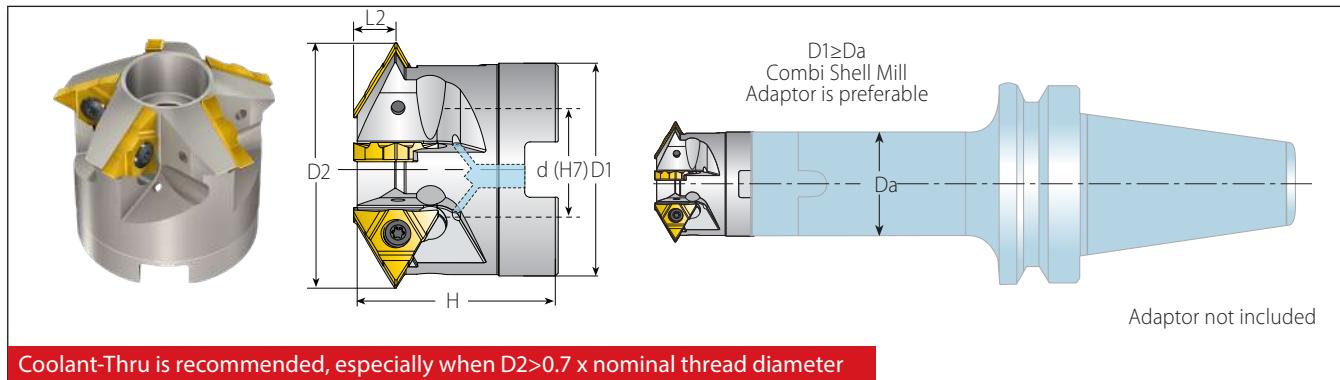
\*\* When the pre-drilled hole for 8NPT is conical, the thread can be machined in one pass.

### Thread Applications for Full Profile Inserts (API Round)

Toolholder	Toolholder Cutting Diameter D2 (mm)	Pitch	Cylindrical or Conical Pre-Drilled Hole (for cylindrical 2 radial passes 50%/50%; for conical one radial pass)	Conical Pre-Drilled Hole only (one pass)	
			* Adjusted D2	TPI	Thread Dia.
TM2SC 18C23-86-2U	21.74	10	1.05x10APIRD (for UP TBG; UP TBG Long); 1.315...2.375x10APIRD (for TBG; UP TBG; UP TBG Long; Integral-Joint TBG)	-	-
TM3SC 20C26-105-2U	24.44		1.66...2.875x10APIRD (for TBG; UP TBG; UP TBG Long; Integral-Joint TBG)	-	-
TM4SC 25C31-115-2U	29.44	8	1.66...3.5x10APIRD (for TBG; UP TBG; UP TBG Long; Integral-Joint TBG)	-	-
TM3SC 25C36-125-3U	34.7		2.375...20x8APIRD (for CSG; TBG; UP TBG; UP TBG Long); 4.5...7.625x8APIRD (for LCSG)	8.625...9.625x8APIRD (for LCSG)	8.625...20x8APIRD (for LCSG)
TM3SC 28C36-144-3U					

\* Correct the toolholder cutting diameter D2 according to adjustment, as indicated in the above table.

## Shell Mill (U Style)



### Shell Mill for U Style Inserts

Insert Size	Ordering Code	Dimensions mm				No. of Flutes	Spare Parts			
		D1	D2	d(H7)	H		Insert Screw	Torx Key	Holder Screw	Holder Screwdriver
3/8"U	TM4SC-D42-16-3U	34	42	16	40	8.0	4	SN3T	HK3T	SA5T-C5 (M8x1.25x28)
	TM5SC-D48-22-3U	40	48	22	40	8.0	5			M10x1.50x35
	TM6SC-D56-22-3U	48	56	22	40	8.0	6			
1/2"U	TM6SC-D88-27-4U	76	88	27	50	10.8	6	SA4T	HK4T	M12x1.75x40
	TM7SC-D98-32-4U	85	98	32	55	10.8	7			M16x2.0x40

## Shell Mill (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°	
TM4SC-D42-16-3U	42	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; 1¹³/₁₆-8UN; 1⁵/₁₆-6UN	1½ - 11	1¾-16; 1¾-12; 1¾-8; 1¾-6; 2-4.5	
TM5SC-D48-22-3U	48	M56x5.5; M64x6.0	M52x1.5; M52x2.0; M52x2.5; M52x3.0; M55x4.0	2¼ - 4.5; 2½ - 4	2-16UN; 2-14UN; 2-12UN; 2¼-10UNS; 2⅓-8UN; 2⅓-6UN	1¾ - 11	2-16; 2¼-12; 2¼-8; 2¼-6; 3-5; 3½-4.5; 2¼-4	
TM6SC-D56-22-3U	56	M64x6.0	M60x1.5; M60x2.0; M60x2.5; M60x3.0; M64x4.0	2½ - 4	2¾-16UN; 2¾-14UN; 2¾-12UN; 2½-10UNS; 2¾-8UN; 2½-6UN	2 - 11	2½-16; 2½-12; 2½-8; 2¾-6; 3-5; 3½-4.5; 4¼-4	
TM6SC-D88-27-4U	88	-	M95x6.0; M125x8	4- 4	4¼-4UN	-	4-3; 4¼-4	
TM7SC-D98-32-4U	98	-	M105x6.0; M125x8	-	4¼-4UN	-	4¼-4	

## Shell Mill (U Style) Applications (con't)

### Thread Applications for Full Profile Inserts (NPT)

Toolholder	Toolholder Cutting Diameter D2 (mm)	Pitch	Cylindrical or Conical Pre-Drilled Hole	Cylindrical Pre-Drilled Hole
* Adjusted D2		TPI	NPT Threading by 1 Radial Pass	**NPT Threading by 2 Radial Passes (50% / 50%)
TM4SC-D42-16-3U	41.15	11.5	1 1/2-11.5NPT; 2-11.5NPT	-
TM4SC-D42-16-3U	41.15	8	-	2 1/2...10-8NPT
TM5SC-D48-22-3U	47.15	11.5	2-11.5NPT	-
TM5SC-D48-22-3U	47.15	8	-	2 1/2...10-8NPT
TM6SC-D56-22-3U	55.15	8	-	2 1/2...10-8NPT
TM6SC-D88-27-4U	88.06	8	3 1/2"...160D-8NPT	160D...240D-8NPT
TM7SC-D98-32-4U	98.06	8	4"...160D-8NPT	160D...240D-8NPT

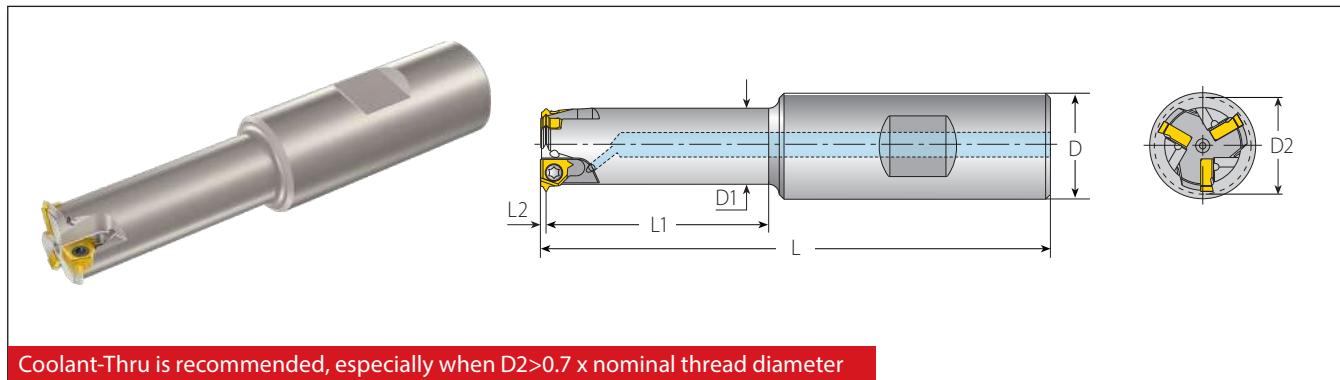
\*\* When the pre-drilled hole for 8NPT is conical, the thread can be machined in one pass.

### Thread Applications for Full Profile Inserts (API Round)

Toolholder	Toolholder Cutting Diameter D2 (mm)	Pitch	Cylindrical or Conical Pre-Drilled Hole (for cylindrical 2 radial passes 50%/50%; for conical one radial pass)	Conical Pre-Drilled Hole only (one pass)
* Adjusted D2		TPI	Thread Dia.	
TM4SC-D42-16-3U	40.2		2.875...20x8APIRD (for CSG; TBG; UP TBG; UP TBG Long); 4.5...7.625x8APIRD (for LCSG)	
TM5SC-D48-22-3U	46.2	8	3.5...20x8APIRD (for CSG; TBG; UP TBG; UP TBG Long); 4.5...7.625x8APIRD (for LCSG)	8.625...20x8APIRD (for LCSG)
TM6SC-D56-22-3U	54.2		4...20x8APIRD (for CSG; TBG; UP TBG; UP TBG Long); 4.5...7.625x8APIRD (for LCSG)	

\* Correct the toolholder cutting diameter D2 according to adjustment, as indicated in the above table.

## Standard Toolholders - Weldon Shank (L Style - Mini L)



**Weldon Shank for Mini-L Style Inserts**

Insert Size	Ordering Code	Dimensions mm					No. of Flutes	Spare Parts		
		L	L1	L2	D	D1	D2	Z	Insert Screw	Torx Key
5.0L (Mini L)	TM1SC16W13-29-5L	81	29	1.1	16	9.8	13.0	1	SN5LTR	K7T
	TM2SC16W14-33-5L	85	33		16	10.3	13.5	2		
	TM3SC20W18-42-5L	96	42	1.87	20	14.3	17.7	3		
	TM2SC16W14-35-5L-ABUT	88	35		16	10.3	14.0	2		
	TM3SC20W18-45-5L-ABUT	100	45		20	14.3	18.2	3		

## **Weldon Shank (L Style - Mini L) 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
TM1SC16W13-29-5L	13	M16x2	M14x0.5; M14x0.75; M14.5x1.0; M15x1.5; M17x2.0	5/8-11	5/16-32UN; 5/8-28UN; 5/16-27UNS; 5/8-24UNEF; 5/8-20UN; 5/8-18UNF; 5/8-16UN; 5/8-14UNS; 5/8-12UN	3/8-19	5/8-14	TR16X2; TR18X2
TM2SC16W14-33-5L	13.5	M16x2	M15x0.5; M15x0.75; M15x1.0; M16x1.5; M17x2.0	-	5/8-32UN; 5/8-28UN; 5/8-27UNS; 5/8-24UNEF; 5/8-20UN; 5/8-18UNF; 5/8-16UN; 5/8-14UNS; 1 1/16-12UN	3/8-19	1 1/16-14	TR16X2; TR18X2
TM3SC20W18-42-5L	17.7	-	M19x0.5; M19x0.75; M19x1.0; M20x1.5; M20x2.0	-	3/4-32UN; 3/4-28UN; 5/8-27UNS; 3/4-24UNS; 1 3/16-20UNEF; 7/8-18UNS; 1 3/16-16UN; 5/8-14UNF; 1 3/16-12UN	1/2-14	-	TR20X2

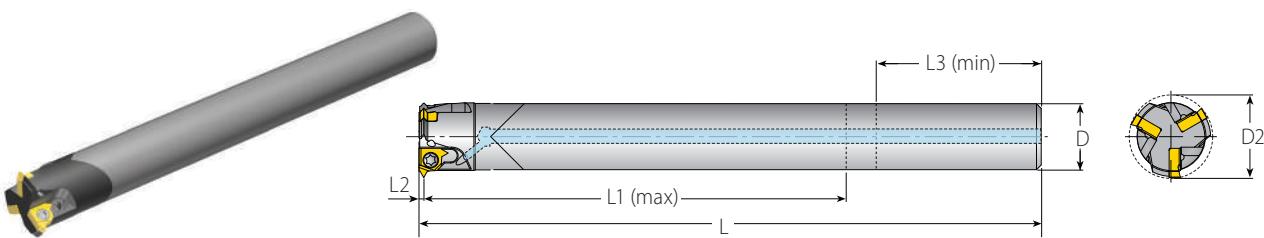
### **Thread Applications for Full Profile Inserts (ISO, UN, NPT)**

Toolholder			Min. Thread Dia.		
	D2	ISO Fine	UN/UNF/UNEF/UNS	NPT	
TM1SC16W13-29-5L	13	M14.5x1.0; M15x1.5; M17x2.0	5/8-18UNF; 5/8-16UN; 5/8-14UNS; 5/8-12UN	3/8-18NPT	
TM2SC16W14-33-5L	13.5	M15x1.0; M16x1.5; M17x2.0	5/8-18UNF; 5/8-16UN; 5/8-14UNS; 1 1/16-12UN	3/8-18NPT	
TM3SC20W18-42-5L	17.7	M19x1.0; M20x1.5; M20x2.0	5/8-18UNS; 1 3/16-16UN; 5/8-14UNF; 1 3/16-12UN	-	

### **Thread Applications for Full Profile American Buttress Inserts**

Toolholder		Thread Dia.
	D2	American Buttress
TM2SC16W14-35-5L-ABUT	14.0	(0.875"-4")-16; (0.875"-6")-12; (0.875"-16")-10
TM3SC20W18-45-5L-ABUT	18.2	(1.25"-4")-16; (1.25"-6")-12; (1.25"-16")-10

## Standard Toolholders - Carbide Cylindrical Shank (L Style - Mini L)

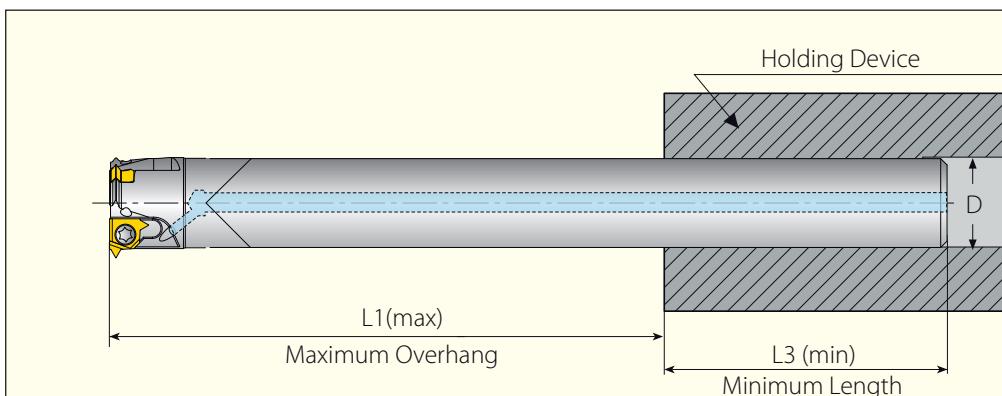


Coolant-Thru is recommended, especially when  $D2 > 0.7 \times$  nominal thread diameter

### Carbide Cylindrical Shank for Mini-L Style Inserts

Insert Size	Ordering Code	Dimensions mm					No. of Flutes	Spare Parts	
		L	L1 (max)	L2	L3 (min)	D		Insert Screw	Torx Key
5.0L (Mini L)	CTM1SC09C13-43-5L	109	43		20	9.5	13.0	1	SN5LTR
	CTM2SC10C14-50-5L	116	50	1.1	22	10	13.5	2	
	CTM3SC14C18-65-5L	132	65		30	14	17.7	3	
	CTM2SC10C14-50-5L-ABUT	116	50	1.87	22	10	14.0	2	
	CTM3SC14C18-65-5L-ABUT	132	65		30	14	18.2	3	

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The overhang-to-bar diameter ratio should be as small as possible to eliminate the chance of chatter (vibration). The minimum length inside a holding device should be 2 times the diameter of the bar shank.

## Carbide Cylindrical Shank (L Style - Mini L) 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
CTM1SC09C13-43-5L	13	M16x2	M14x0.5; M14x0.75; M14.5x1.0; M15x1.5; M17x2.0	5/8-11	1/16-32UN; 5/16-28UN; 1/8-27UNS; 5/16-24UNEF; 5/16-20UN; 5/8-18UNF; 5/16-16UN; 5/8-14UNS; 1/16-12UN	3/8-19	5/8-14	TR16X2; TR18X2
CTM2SC10C14-50-5L	13.5	M16x2	M15x0.5; M15x0.75; M15x1.0; M16x1.5; M17x2.0	-	5/16-32UN; 5/8-28UN; 5/8-27UNS; 5/16-24UNEF; 5/16-20UN; 5/8-18UNF; 5/16-16UN; 5/8-14UNS; 11/16-12UN	3/8-19	11/16-14	TR16X2; TR18X2
CTM3SC14C18-65-5L	17.7	-	M19x0.5; M19x0.75; M19x1.0; M20x1.5; M20x2.0	-	3/4-32UN; 3/4-28UN; 7/8-27UNS; 3/4-24UNS; 13/16-20UNEF; 7/8-18UNS; 13/16-16UN; 7/8-14UNF; 13/16-12UN	1/2-14	-	TR20X2

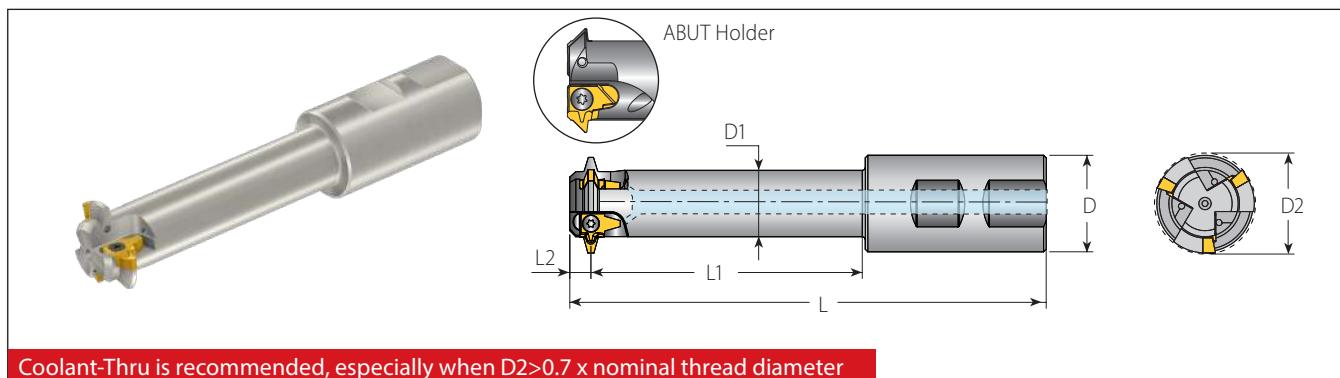
### Thread Applications for Full Profile Inserts (ISO, UN, NPT)

Toolholder			Min. Thread Dia.		
	D2	ISO Fine	UN/UNF/UNEF/UNS	NPT	
CTM1SC09C13-43-5L	13	M14.5x1.0; M15x1.5; M17x2.0	5/8-18UNF; 5/8-16UN; 5/8-14UNS; 1/16-12UN	3/8-18NPT	
CTM2SC10C14-50-5L	13.5	M15x1.0; M16x1.5; M17x2.0	5/8-18UNF; 5/8-16UN; 5/8-14UNS; 11/16-12UN	3/8-18NPT	
CTM3SC14C18-65-5L	17.7	M19x1.0; M20x1.5; M20x2.0	5/8-18UNS; 13/16-16UN; 7/8-14UNF; 13/16-12UN	-	

### Thread Applications for Full Profile American Buttress Inserts

Toolholder		Thread Dia.
	D2	American Buttress
CTM2SC10C14-50-5L-ABUT	14.0	(0.875"-4")-16; (0.875"-6")-12; (0.875"-16")-10
CTM3SC14C18-65-5L-ABUT	18.2	(1.25"-4")-16; (1.25"-6")-12; (1.25"-16")-10

## Standard Toolholders - Weldon Shank (L Style - 3/8" L)



### Weldon Shank for 3/8" L Style Inserts

Insert Size	Ordering Code	Dimensions mm					No. of Flutes	Spare Parts			
IC	Toolholder	L	L1	L2	D	D1	D2	Z	Insert Screw	Torx Key	
3/8" L	TM1SC25W21-50-3L	115	50		25	12.7	21.6	1	SN3T	HK3T	
	TM2SC25W28-70-3L	135	70	7.0	25	18.1	28.5	2	SA3T		
	TM3SC32W33-90-3L	158	90		32	22.0	33.5	3	SN3T		
	TM2SC25W26-80-3L-ABUT	143	80	4.7	25	20.1	26.4	2	SA3T		
	TM3SC32W35-105-3L-ABUT	172	105		32	28.0	35.5	3			

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## Weldon Shank (L Style - 3/8" L) Applications

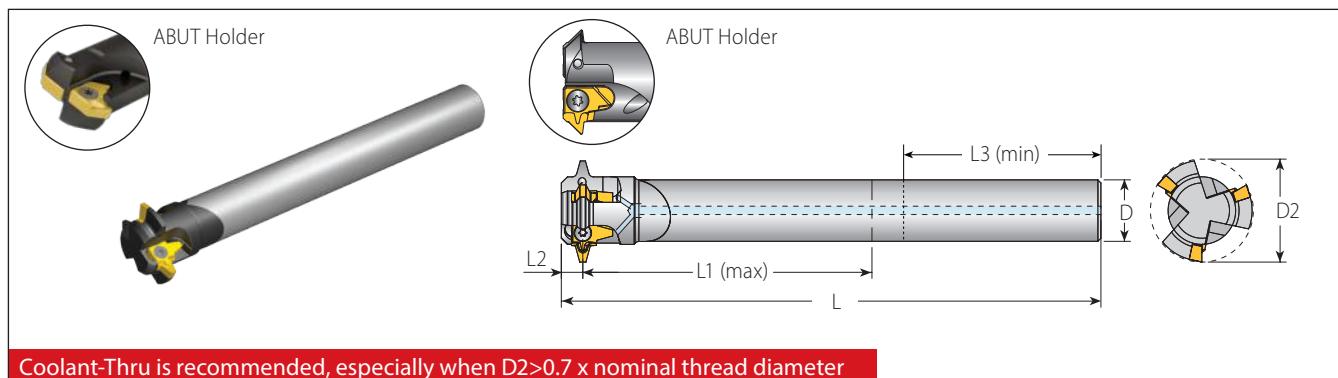
### Thread Applications for Partial Profile Inserts

Toolholder	Min. Thread Dia.			
	D2	Trapez	American ACME	Stub ACME
TM1SC25W21-50-3L	21.6	(TR30-36)x6	1 1/4-5; 1 3/8-4; 1 1/2-4	1 1/4-5; 1 3/8-4; 1 1/2-4
TM2SC25W28-70-3L	28.5	(TR38-44)x7	1 3/4-4	-
TM3SC32W33-90-3L	33.5	(TR46-52)x8	2-4; 2 1/4-3; 2 1/2-3; 2 3/4-3	2-4; 2 1/4-3; 2 1/2-3; 2 3/4-3

### Thread Applications for Full Profile American Buttress Inserts

Toolholder	Thread Dia.	
	D2	American Buttress
TM2SC25W26-80-3L-ABUT	26.4	(1.75"-4")-16; (1.75"-6")-12; (1.75"-6")-10; (1.75"-6")-8; (1.75"-6")-6
TM3SC32W35-105-3L-ABUT	35.5	(2.5"-4")-16; (2.5"-6")-12; (2.5"-6")-10; (2.5"-6")-8; (2.5"-6")-6

## Standard Toolholders - Carbide Cylindrical Shank (L Style - 3/8" L)



### Carbide Cylindrical Shank for 3/8" L Style Inserts

Insert Size	Ordering Code	Dimensions mm					No. of Flutes	Spare Parts				
		IC	Toolholder	L	L1(max)	L2	L3(min)	D	D2	Z	Insert Screw	Torx Key
3/8"	CTM1SC1/2"C21-75-3L			115	75		40	12.7	21.6	1	SN3T	HK3T
	CTM2SC18C28-100-3L			155	100	7.0	46	18	28.5	2	SA3T	
	CTM3SC20C33-120-3L			176	120		46	20	33.5	3	SN3T	
	CTM2SC20C26-105-3L-ABUT			172.5	105	4.7	40	20	26.4	2	SA3T	

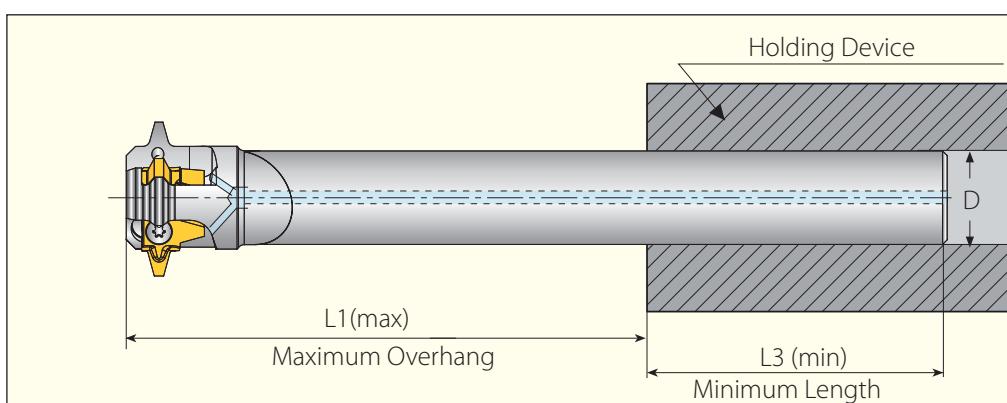
## Carbide Cylindrical Shank (L Style - 3/8" L) Applications

### Thread Applications for Partial Profile Inserts

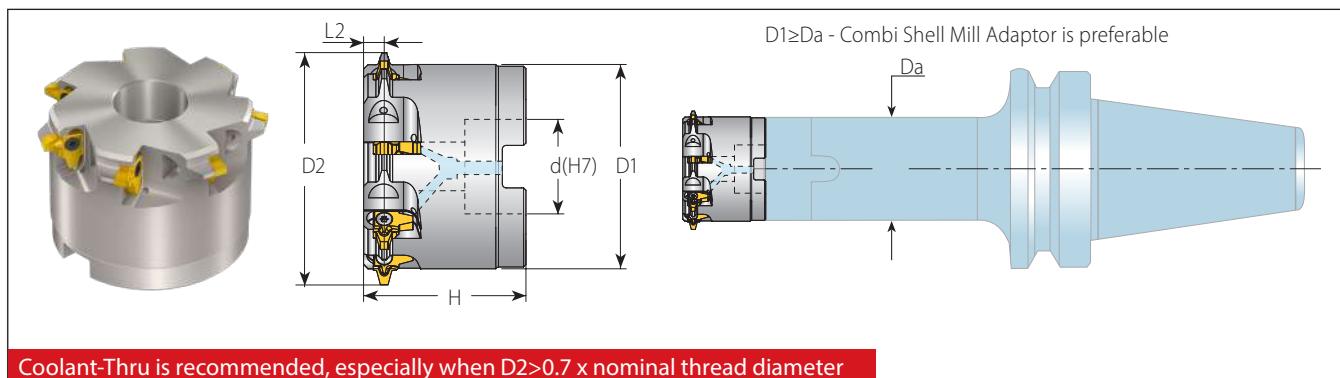
Toolholder	Min. Thread Dia.		
D2	Trapez	American ACME	Stub ACME
CTM1SC1/2"C21-75-3L	21.6	(TR30-36)x6	1 1/4-5; 1 3/8-4; 1 1/2-4
CTM2SC18C28-100-3L	28.5	(TR38-44)x7	1 3/4-4
CTM3SC20C33-120-3L	33.5	(TR46-52)x8	2-4; 2 1/4-3; 2 1/2-3; 2 3/4-3
			2-4; 2 1/4-3; 2 1/2-3; 2 3/4-3

### Thread Applications for Full Profile American Buttress Inserts

Toolholder	Thread Dia.	
D2	American Buttress	
CTM2SC20C26-105-3L-ABUT	26.4	(1.75"-4")-16; (1.75"-6")-12; (1.75"-6")-10; (1.75"-6")-8; (1.75"-6")-6



## Shell Mill (L Style - 3/8" L)



### Shell Mill for 3/8" L Style Inserts

Insert Size	Ordering Code	Dimensions mm					No. of Flutes	Spare Parts				
		IC	Toolholder	D1	D2	d(H7)	H	L2	Z	Insert Screw	Torx Key	Holder Screw
3/8" L	TM7SC-D80-32-3L			69.2	80	32	55	7.0	7	SA3T	HK3T	M16x2.0x40
	TM5SC-D48-22-3L-ABUT			41.0	48	22		40	4.7			M10x1.50x35
	TM6SC-D58-27-3L-ABUT			51.0	58	27			6			M12x1.75x40

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## Shell Mill (L Style - 3/8" L) Applications

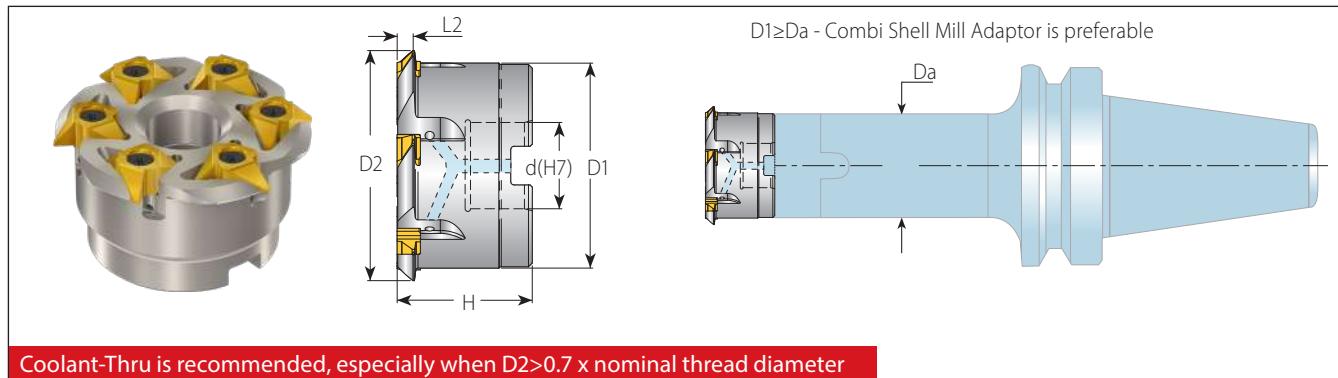
### Thread Applications for Partial Profile Inserts

Toolholder	Min. Thread Dia.		
D2	Trapez	American ACME	Stub ACME
TM7SC-D80-32-3L	80	(TR115-130)x6; (TR175-240)x8	-

### Thread Applications for Full Profile American Buttress Inserts

Toolholder	Thread Dia.	
D2	American Buttress	
TM5SC-D48-22-3L-ABUT	48	(3.0"-6")-12; (3.0"-6")-10; (3.0"-6")-8; (3.0"-6")-6
TM6SC-D58-27-3L-ABUT	58	(4.0"-6")-12; (4.0"-6")-10; (4.0"-6")-8; (4.0"-6")-6

## Shell Mill (5/8" V Style)



### Shell Mill for 5/8"V Style Inserts

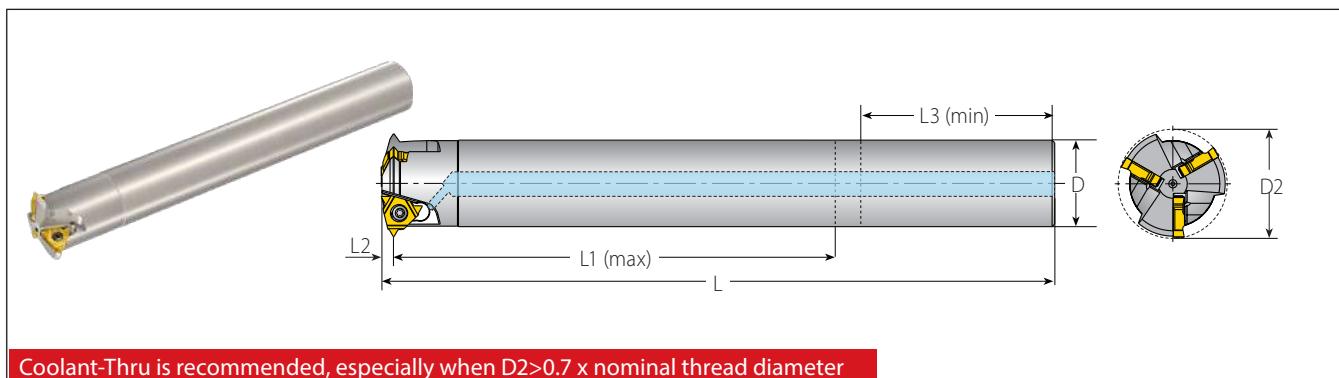
Insert Size	Ordering Code	Dimensions mm						No. of Flutes	Spare Parts				
		IC	Toolholder	D1	D2	d(H7)	H	L2	Z	Insert	Insert Screw	Torx Key	Holder Screw
5/8"V	TM6SC-D88-32-5V6-ABUT			72.5	88	32	47.9	5.35	6	5VI4ABUT-TM...	SA5T	HK5T	M16x2.0x40
	TM6SC-D88-32-5V8-ABUT			72.5	88	32	51.7	8.50		5VI2.5ABUT-TM...			
							50.0	7.10	6	5VI3ABUT-TM...			

## Shell Mill (5/8" V Style) Applications

### Thread Applications for Full Profile American Buttress Inserts

Toolholder	D2	Thread Dia.
TM6SC-D88-32-5V6-ABUT	88	American Buttress
TM6SC-D88-32-5V8-ABUT	88	(5.0"-24")-4
		(6.0"-24")-3; (7.0"-24")-2.5

## Standard Toolholders - Steel Cylindrical Shank (A Style)



### Steel Cylindrical Shank for A-Style Inserts

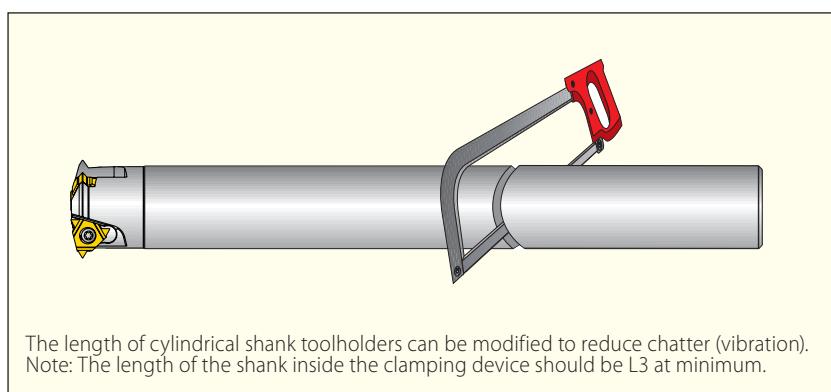
Insert Size	Ordering Code	Dimensions mm						No. of Flutes	Spare Parts	
		L	L1 (max)	L2	L3 (min)	D	D2	Z	Insert Screw	Torx Key
1/4"A	TM3SC20C26-105-2A	184	105	3.0	40	20	26.0	3	SN2T	HK2T
3/8"A	TM3SC28C35-144-3A	218	144	4.0	46	28	35.3	3	SA3T	HK3T

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### Steel Cylindrical Shank (A Style) Applications

#### Thread Applications for Partial Profile Inserts

Toolholder	Min. Thread Dia.					
	D2	ISO Coarse	ISO Fine	UNC	UN/UNF/UNEF/UNS	BSP (G)
TM3SC20C26-105-2A	26	-	M28x1.5; M29x2.0; M30x2.5; M30x3.0	-	1 1/16-16UN; 1 1/8-14UNS; 1 5/16-12UN; 1 1/4-10UNS; 1 3/16-8UN	-
TM3SC28C35-144-3A	35.3	-	M38x2.0; M39x2.5; M39x3.0; M40x4.0	-	1 1/16-12UN; 1 1/8-10UNS; 1 1/8-8UN; 1 1/8-6UN	-



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

Material Group	Vardex No.	Material	Hardness Brinell HB	Vc [m/min]		Feed* f [mm/tooth] by Cutting Dia. (D2)			
				VBX	VTX	13-23	24-42	Shell Mill	
<b>P</b> Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	100-210	90-180	0.20-0.32	0.30-0.50	0.30-0.75
	2		Medium Carbon (C=0.25-0.55%)	150	100-180	90-170	0.20-0.32	0.30-0.50	0.30-0.75
	3		High Carbon (C=0.55-0.85%)	170	100-170	90-160	0.15-0.23	0.25-0.35	0.25-0.52
	4	Low Alloy Steel (alloying elements≤5%)	Non Hardened	180	60-90	90-155	0.17-0.28	0.28-0.45	0.28-0.67
	5		Hardened	275	80-150	80-160	0.15-0.28	0.25-0.45	0.25-0.67
	6		Hardened	350	70-140	70-150	0.15-0.25	0.25-0.40	0.25-0.60
	7	High Alloy Steel (alloying elements>5%)	Annealed	200	60-130	70-115	0.15-0.22	0.20-0.30	0.20-0.45
	8		Hardened	325	70-110	60-100	0.13-0.21	0.18-0.30	0.18-0.45
	9	Cast Steel	Low Alloy (alloying elements <5%)	200	100-170	100-170	0.15-0.22	0.20-0.30	0.20-0.45
	10		High Alloy (alloying elements >5%)	225	70-120	70-130	0.12-0.22	0.17-0.30	0.17-0.45
<b>M</b> Stainless Steel	11	Stainless Steel Ferritic	Non Hardened	200	100-170	120-180	0.15-0.22	0.22-0.34	0.22-0.50
	12		Hardened	330	100-170	120-180	0.16-0.23	0.21-0.32	0.21-0.48
	13	Stainless Steel Austenitic	Austenitic	180	70-140	100-140	0.15-0.25	0.25-0.40	0.25-0.60
	14		Super Austenitic	200	70-140	100-140	0.12-0.20	0.17-0.26	0.17-0.39
	15	Stainless Steel Cast Ferritic	Non Hardened	200	70-140	100-140	0.16-0.24	0.25-0.37	0.25-0.55
	16		Hardened	330	70-140	100-140	0.12-0.20	0.17-0.26	0.17-0.39
	17	Stainless Steel Cast Austenitic	Austenitic	200	70-120	100-120	0.15-0.22	0.20-0.30	0.20-0.45
	18		Hardened	330	70-120	100-120	0.12-0.20	0.17-0.26	0.17-0.39
<b>K</b> Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	60-130	100-120	0.16-0.24	0.25-0.37	0.25-0.55
	29		Pearlitic (long chips)	230	60-120	80-100	0.15-0.22	0.20-0.30	0.20-0.45
	30	Grey Cast Iron	Low Tensile Strength	180	60-130	80-100	0.15-0.22	0.22-0.34	0.22-0.50
	31		High Tensile Strength	260	60-100	80-100	0.15-0.22	0.20-0.30	0.20-0.45
	32	Nodular Sg Iron	Ferritic	160	60-125	80-100	0.10-0.20	0.15-0.25	0.15-0.37
	33		Pearlitic	260	50-90	60-90	0.15-0.22	0.20-0.30	0.20-0.45
<b>N</b> Non-Ferrous Metals	34	Aluminium Alloys Wrought	Non Aging	60	100-250		0.30-0.50	0.60-1.00	0.60-1.50
	35		Aged	100	100-180		0.28-0.50	0.50-0.90	0.50-1.20
	36	Aluminium Alloys	Cast	75	150-400		0.28-0.50	0.50-0.90	0.50-1.20
	37		Cast & Aged	90	150-280		0.25-0.40	0.40-0.60	0.40-0.90
	38	Aluminium Alloys	Cast Si 13-22%	130	80-150		0.28-0.50	0.50-0.90	0.50-1.20
	39	Copper and Copper Alloys	Brass	90	120-210	100-200	0.30-0.50	0.60-1.00	0.60-1.50
	40		Bronze and Non Leaded Copper	100	120-210	100-200	0.28-0.50	0.50-0.90	0.50-1.20
<b>S</b> Heat Resistant Material	19	High Temperature Alloys	Annealed (iron based)	200	20-45	20-40	0.09-0.15	0.12-0.22	0.12-0.33
	20		Aged (iron based)	280	20-30	20-30	0.07-0.13	0.10-0.20	0.10-0.30
	21		Annealed (nickel or cobalt based)	250	15-20	15-20	0.08-0.15	0.08-0.20	0.08-0.30
	22	Titanium Alloys	Aged (nickel or cobalt based)	350	10-15	10-15	0.08-0.15	0.08-0.20	0.08-0.30
	23		Pure 99.5 Ti	400Rm	70-140	70-120	0.07-0.13	0.10-0.20	0.10-0.30
	24	a+β alloys		1050Rm	20-50	20-50	0.07-0.13	0.10-0.20	0.10-0.30
<b>H</b> Hardened Material	25	Extra Hard Steel	Hardened & Tempered	45-50HRC	15-45	15-45	0.05-0.12	0.05-0.18	0.05-0.27
	26			51-55HRC	15-40	15-40	0.05-0.12	0.05-0.18	0.05-0.27

\* When using a Shell Mill toolholder, the feed can be increased by 50%.

\* For 3/8" L it is recommended to machine in two passes and decrease the feed by 40%.

## Grades

Grade	Application
<b>VBX</b>	TiCN coated carbide grade. Excellent grade for Steels and General Use.
<b>VTX</b>	TiAlN coated carbide grade. Ideal for Stainless Steels.







# TM Solid

Solid Carbide Thread Milling Tools

## Vardex Ordering Code System

### ■ TM Solid Carbide

<b>HC</b>		<b>10</b>	<b>082</b>	<b>L15</b>	-	<b>I</b>	<b>1.50</b>	<b>ISO</b>	<b>TM</b>		<b>VTH</b>		
1		2	3	4		6	7	8	9	10	11		
<b>1 - Line</b>		<b>2 - No. of Teeth</b>		<b>3 - Shank Dia.</b>		<b>4 - Cutting Dia.</b>		<b>5 - Tool Cutting Length</b>		<b>6 - Type of Tool</b>			
HC - Helicool HCN - Helicool with relief neck HCR - Helicool R HCC - Helicool C H - Helical S - Straight Flutes D - Deep Threading or MilliPro TDC - TMDR with coolant TD - TMDR without coolant		1T - 1 Tooth 3T - 3 Teeth (MilliPro) 2L - 2 Teeth LH (MilliPro HD)		03 - 3.0 mm 04 - 4.0 06 - 6.0 08 - 8.0 <b>10</b> - 10.0 12 - 12.0 14 - 14.0 16 - 16.0 18 - 18.0 20 - 20.0		0.7 - 19.9 mm Up to 3Do		E - External I - Internal EI - External + Internal					
<b>7 - Pitch</b>			<b>8 - Standard</b>			<b>9 - System</b>		<b>10 - No. of Flutes</b>		<b>11 - Carbide Grade</b>			
Full Profile - Pitch Range			60 - Partial Profile 60° ISO - ISO Metric UN - American UN UNC - UN Coarse UNF - UN Fine UNEF - UN Extra Fine UNJ - UNJ MJ - MJ BSW - Whitworth Coarse BSP - BSP BSF - Whitworth Fine BSPT - BSPT NPT - NPT ANPT - ANPT NPTF - NPTF NPS - NPS PG - PG TP60 - Taper 60° TP55 - Taper 55°			TM TML - Extra Long		3 - 3 Flutes 5 - 5 Flutes * For straight flutes only.		VTS VTH			
Partial Profile - Pitch Range													
	mm	TPI											
	0.25-6.0	80 - 4.5											
TA	0.5-0.8	32-56											
TB	0.5-1.0	24-56											
TC	1.0-1.50	16-24											
TD	1.0-1.75	14-24											
TF	0.5-1.25	20-48											

TM Solid

### ■ HTC Thriller

<b>HTC</b>	<b>M6</b>	<b>1.0</b>	<b>2D</b>	<b>VTN</b>
1	2	3	4	5
<b>1 - Line</b>	<b>2 - Thread Diameter</b>	<b>3 - Pitch</b>	<b>4 - Thread Length</b>	<b>5 - Carbide Grade</b>
HTC - Thriller	M6 - M12	1 - 1.75mm	2D 2.5D	VTN VTS

# TM Solid Carbide Program



## Miniature Threads MilliPro

MilliPro &  
MilliPro EL  
From M1.6x0.35 (1-72UNF)

MilliPro HD  
Up to 62 HRc

MilliPro Dental  
From M1.0x0.25 (0-80UNF)

TMDR  
From M3x0.5 (4-40UNC)

## Normal Use Straight Flutes

Taper  
For Bone Plate Applications  
From Pitch 0.3-0.6mm



From M4.5x0.75 (No.8-36UNF)

## Radial Coolant Helicool-R (HCR)



From M6x1.0

## Economical Tool Helical

Taper  
For Bone Plate Applications  
From Pitch 0.3-0.6mm



From M3x0.5 (No.8-36UNF)

## Long Thread Deep Threading

Full Profile



Up to 3XDo

## Heavy Duty Helicool



From M3x0.5 (No.10-32UNF)

## Helicool and Chamfer Helicool-C (HCC)

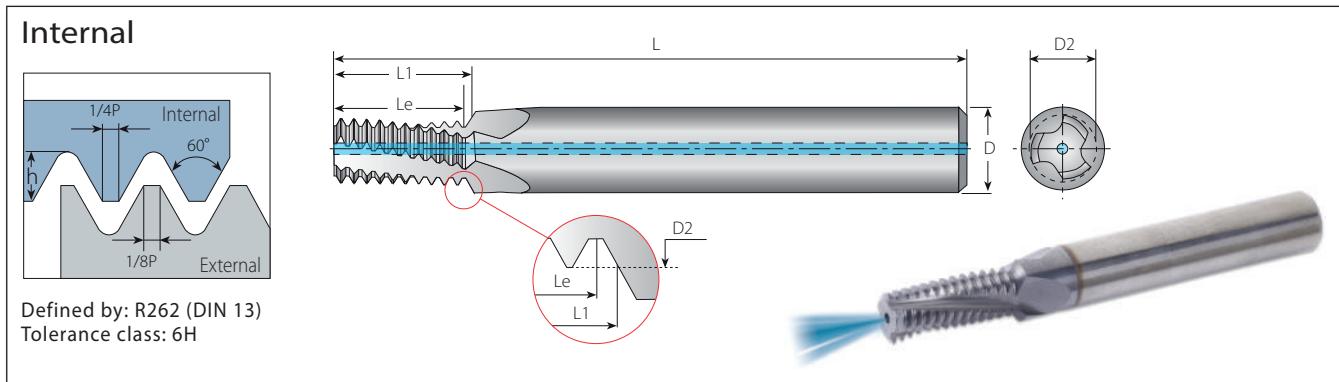


From M6x1.0

## Drill, Thread and Chamfer HTC



From M6x1.0

**Helical Flutes with Thru-Hole Coolant****1.5 x Do (Le ≤ 1.5 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	HC04024L04-I0.50ISOTM...	4	2.40	45	4.7	3	9	2.5
M4x0.7		0.7	HC04031L06-I0.70ISOTM...	4	3.15	45	6.6	3	9	3.3
M5x0.8		0.8	HC04039L07-I0.80ISOTM...	4	3.90	45	7.6	3	9	4.2
M6x1.0	M8-M40x1.0	1.0	HC06048L09-I1.00ISOTM...	6	4.80	57	9.5	3	9	5.0
M8x1.25		1.25	HC08065L13-I1.25ISOTM...	8	6.50	61	13.1	3	10	6.8
M10x1.5	M12-M48x1.5	1.5	HC10082L15-I1.50ISOTM...	10	8.20	73	15.7	3	10	8.5
M12x1.75		1.75	HC10099L18-I1.75ISOTM...	10	9.90	73	18.4	4	10	10.2
M14x2.0	M17-M80x2.0	2.0	HC12116L21-I2.00ISOTM...	12	11.60	73	21.0	4	10	12.0
M16x2.0	M17-M80x2.0	2.0	HC14136L25-I2.00ISOTM...	14	13.60	92	25.0	4	12	14.0

**Helical Flutes with Thru-Hole Coolant****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-I0.50ISOTM...	4	2.40	45	6.2	3	12	2.5
M4x0.5		0.5	HC04032L08-I0.50ISOTM...	4	3.20	45	8.2	3	16	3.5
M5x0.5		0.5	HC06042L10-I0.50ISOTM...	6	4.20	57	10.2	3	20	4.5
M4x0.7		0.7	HC04031L08-I0.70ISOTM...	4	3.15	45	8.7	3	12	3.3
M6x0.75		0.75	HC06050L12-I0.75ISOTM...	6	5.00	57	12.4	3	16	5.3
M5x0.8		0.8	HC04039L10-I0.80ISOTM...	4	3.90	45	10.8	3	13	4.2
M6x1.0	M8-M40x1.0	1.0	HC06048L12-I1.00ISOTM...	6	4.80	57	12.5	3	12	5.0
M8x1.0		1.0	HC08067L16-I1.00ISOTM...	8	6.70	61	16.5	3	16	7.0
M10x1.0		1.0	HC10087L20-I1.00ISOTM...	10	8.70	73	20.5	3	20	9.0
M12x1.0		1.0	HC12107L24-I1.00ISOTM...	12	10.70	73	24.5	4	24	11.0
M8x1.25		1.25	HC08065L16-I1.25ISOTM...	8	6.50	61	16.9	3	13	6.8
M10x1.25		1.25	HC10085L20-I1.25ISOTM...	10	8.50	73	20.6	3	16	8.8
M10x1.5	M12-M48x1.5	1.5	HC10082L20-I1.50ISOTM...	10	8.20	73	20.2	3	13	8.5
M12x1.5		1.5	HC10099L24-I1.50ISOTM...	10	9.90	73	24.7	4	16	10.5
M14x1.5		1.5	HC12119L29-I1.50ISOTM...	12	11.90	80	29.2	4	19	12.5
M16x1.5		1.5	HC14139L32-I1.50ISOTM...	14	13.90	92	32.2	4	21	14.5
M12x1.75		1.75	HC10099L25-I1.75ISOTM...	10	9.90	73	25.4	4	14	10.2
M14x2.0	M17-M80x2.0	2.0	HC12116L29-I2.00ISOTM...	12	11.60	80	29.0	4	14	12.0
M16x2.0	M17-M80x2.0	2.0	HC14136L33-I2.00ISOTM...	14	13.60	92	33.0	4	16	14.0
M18x2.5		2.5	HC16148L36-I2.50ISOTM...	16	14.80	92	36.2	4	14	15.5
M20x2.5		2.5	HC18171L41-I2.50ISOTM...	18	17.10	102	41.2	4	16	17.5
M24x3.0		3.0	HC20199L49-I3.00ISOTM...	20	19.90	102	49.5	4	16	21.0

\* Bore diameter applies to smallest thread dia.

## ISO Metric (con't)

**Helicool**

**Internal**

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

### Helical Flutes with Thru-Hole Coolant

3 x Do ( $Le \leq 3.0 \times$  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-I0.50ISOTM...	4	2.40	45	9.25	3	18	2.5
M4x0.7		0.7	HC04031L12-I0.70ISOTM...	4	3.15	47	12.95	3	18	3.3
M5x0.8		0.8	HC04039L15-I0.80ISOTM...	4	3.90	50	15.60	3	19	4.2
M6x1.0	M8-M40x1.0	1.0	HC06048L18-I1.00ISOTM...	6	4.80	60	18.50	3	18	5.0
M8x1.25		1.25	HC08065L25-I1.25ISOTM...	8	6.50	66	25.63	3	20	6.8
M10x1.5	M12-M48x1.5	1.5	HC10082L30-I1.50ISOTM...	10	8.20	75	30.75	3	20	8.5
M12x1.75		1.75	HC10099L36-I1.75ISOTM...	10	9.90	86	37.63	4	21	10.2
M16x2.0	M17-M80x2.0	2.0	HC14136L48-I2.00ISOTM...	14	13.60	108	49.00	4	24	14.0

\*\* Above solid carbide tools ( $Le=3xD$ ) are suitable for light machining only. Reduce feed by 30%.

## ISO Metric

**HCN**

**Internal**

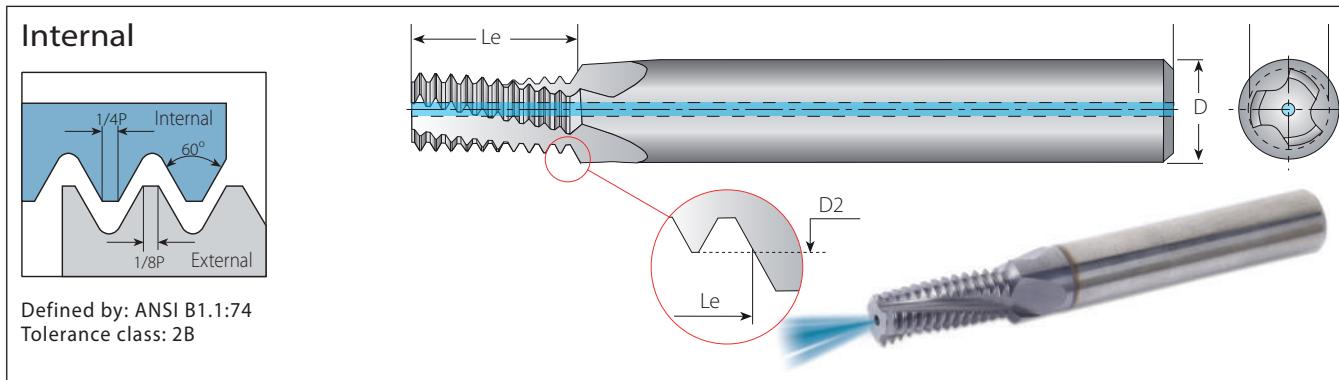
Defined by: R262 (DIN 13)  
Tolerance class: 6H

### Helical Flutes with Relief Neck

3 x Do ( $L1 \leq 3.0 \times$  Thread Diameter)

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*		
Coarse	Fine	mm	Internal	D	D2	L	Le	L1	Z	Zt	mm
M3x0.5	M3.5-M16x0.5	0.5	HCN04024L09-I0.50ISOTM...	4	2.40	45	5.0	9	3	10	2.5
M4x0.7		0.7	HCN04031L12-I0.70ISOTM...	4	3.15	47	7.0	12	3	10	3.3
M5x0.8		0.8	HCN04039L15-I0.80ISOTM...	4	3.90	50	8.8	15	3	11	4.2
M6x1.0	M8-M40x1.0	1.0	HCN06048L18-I1.00ISOTM...	6	4.80	60	10.0	18	3	10	5.0
M8x1.25	M8-M40x1.0	1.0	HCN08067L24-I1.00ISOTM...	8	6.70	66	13.0	24	4	13	7.0
M10x1.5	M12-M48x1.5	1.5	HCN10082L30-I1.50ISOTM...	10	8.70	75	17.0	30	4	17	9.0
M12x1.75		1.75	HCN08065L24-I1.25ISOTM...	8	6.50	66	13.75	24	3	11	6.8
M14x1.5	M14-M48x1.5	1.5	HCN10099L36-I1.50ISOTM...	10	9.90	86	19.5	36	4	13	10.5
M16x1.5	M16-M48x1.5	1.5	HCN12119L42-I1.50ISOTM...	12	11.90	92	22.5	42	4	15	12.5
M18x1.75		1.75	HCN14139L48-I1.50ISOTM...	14	13.90	102	25.5	48	5	17	14.5
M20x2.0	M17-M80x2.0	2.0	HCN12116L42-I2.00ISOTM...	12	11.60	92	24.0	42	4	12	12.0
M22x2.0	M17-M80x2.0	2.0	HCN14136L48-I2.00ISOTM...	14	13.60	102	26.0	48	4	13	14.0

\* Bore diameter applies to smallest thread dia.

**Helical Flutes with Thru-Hole Coolant****1.5 x Do (Le ≤ 1.5 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	
No.10-24	5/16", 3/8"x24	9/16"-11/16"x24	24	HC04035L07-I24UNCTM...	4	3.58	45	7.9	3	7	3.8	
No.12-24	5/16", 3/8"x24	9/16"-11/16"x24	24	HC06041L08-I24UNCTM...	6	4.15	57	9.0	3	8	4.5	
1/4"x20	7/16", 1/2"x20	3/4"-1"x20	20	HC06048L09-I20UNCTM...	6	4.88	57	9.5	3	7	5.2	
5/16"x18	9/16", 5/8"x18	11/16"-1 11/16"x18	18	HC08061L11-I18UNCTM...	8	6.15	61	12.0	3	8	6.5	
3/8"x16	3/4"x16		16	HC08076L15-I16UNCTM...	8	7.65	61	15.1	3	9	8.0	
7/16"x14	7/8"x14		14	HC10090L17-I14UNCTM...	10	9.00	73	17.2	3	9	9.3	
1/2"x13			13	HC12104L20-I13UNCTM...	12	10.35	73	20.5	4	10	10.8	
9/16"x12	1"-1 1/2"x12		12	HC12118L22-I12UNCTM...	12	11.80	73	22.2	4	10	12.3	

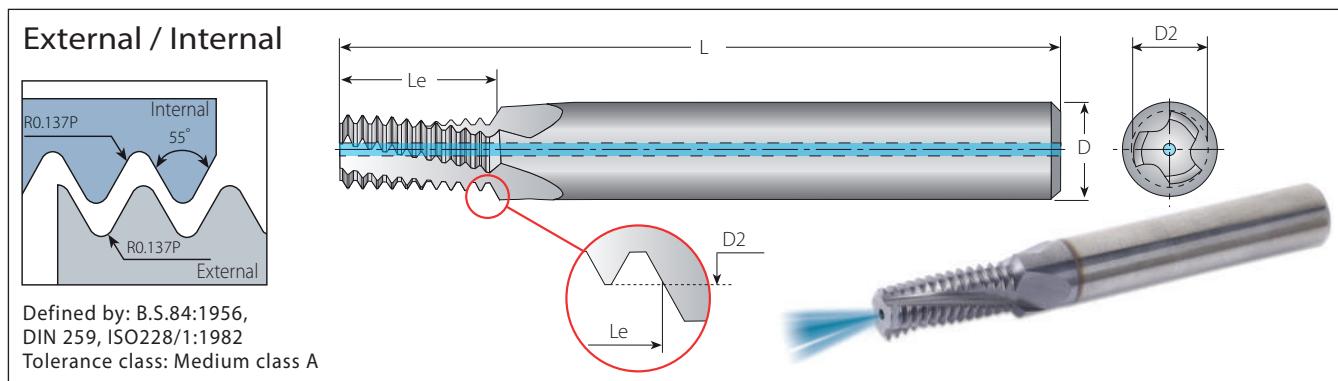
**Helical Flutes with Thru-Hole Coolant****2 x Do (Le ≤ 2 x Thread Diameter)**

Thread				Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
UNC	UNF	UNEF	TPI	Internal	D	D2	L	Le	Z	Zt	mm	
No.10-32	No.12-3/8"x32		32	HC04038L09-I32UNFTM...	4	3.80	45	9.9	3	12	4.0	
	No.12-3/8"x32		32	HC06044L11-I32UNEFTM...	6	4.40	57	11.5	3	14	4.7	
No.12, 1/4"x28	7/16", 1/2"x28		28	HC06043L11-I28UNFTM...	6	4.30	57	11.3	3	12	4.6	
1/4"x28	7/16", 1/2"x28		28	HC06052L13-I28UNEFTM...	6	5.15	57	13.1	3	14	5.5	
	7/16", 1/2"x28		28	HC10099L22-I28UNEFTM...	10	9.90	73	22.2	3	24	10.2	
No.10-24	5/16", 3/8"x24	9/16"-11/16"x24	24	HC04035L10-I24UNCTM...	4	3.58	45	10.0	3	9	3.8	
No.12-24	5/16", 3/8"x24	9/16"-11/16"x24	24	HC06041L11-I24UNCTM...	6	4.15	57	11.1	3	10	4.5	
	5/16", 3/8"x24	9/16"-11/16"x24	24	HC08066L16-I24UNFTM...	8	6.68	61	16.4	3	15	6.8	
3/8"x24	9/16"-11/16"x24		24	HC10082L19-I24UNEFTM...	10	8.20	73	19.6	3	18	8.5	
	9/16"-11/16"x24		24	HC14129L29-I24UNEFTM...	14	12.90	92	29.1	4	27	13.2	
1/4"x20	7/16", 1/2"x20	3/4"-1"x20	20	HC06048L13-I20UNCTM...	6	4.88	57	13.3	3	10	5.2	
	7/16", 1/2"x20	3/4"-1"x20	20	HC10096L22-I20UNFTM...	10	9.60	73	22.2	3	17	9.8	
1/2"x20	3/4"-1"x20		20	HC12111L26-I20UNEFTM...	12	11.10	80	26.0	4	20	11.5	
	3/4"-1"x20		20	HC18174L38-I20UNEFTM...	18	17.40	102	38.7	4	30	17.8	
5/16"x18	9/16", 5/8"x18	11/16"-1 11/16"x18	18	HC08061L16-I18UNCTM...	8	6.15	61	16.2	3	11	6.5	
	9/16", 5/8"x18	11/16"-1 11/16"x18	18	HC14125L28-I18UNFTM...	14	12.50	92	28.9	4	20	12.8	
5/8"x18	11/16"-1 11/16"x18		18	HC16141L31-I18UNEFTM...	16	14.10	92	31.7	4	22	14.5	
3/8"x16	3/4"x16		16	HC08076L19-I16UNCTM...	8	7.65	61	19.8	3	12	8.0	
	3/4"x16		16	HC18170L38-I16UNEFTM...	18	17.00	102	38.8	4	24	17.5	
7/16"x14	7/8"x14		14	HC10090L22-I14UNCTM...	10	9.00	73	22.7	3	12	9.3	
	7/8"x14		14	HC20199L44-I14UNFTM...	20	19.90	102	44.4	4	24	20.5	
1/2"x13			13	HC12104L26-I13UNCTM...	12	10.35	80	26.4	4	13	10.8	
9/16"x12	1"-1 1/2"x12		12	HC12118L28-I12UNCTM...	12	11.80	80	28.6	4	13	12.3	
	1"-1 1/2"x12		12	HC20199L51-I12UNFTM...	20	19.90	102	51.9	4	24	23.5	
5/8"x11			11	HC14131L33-I11UNCTM...	14	13.10	92	33.5	4	14	13.5	
3/4"x10			10	HC16159L39-I10UNCTM...	16	15.90	92	39.4	4	15	16.5	
7/8"x9			9	HC20190L46-I9UNCTM...	20	19.00	102	46.6	4	16	19.5	
1"x8			8	HC20199L52-I8UNCTM...	20	19.90	102	52.4	4	16	22.0	

\* Bore diameter applies to smallest thread dia.

## Whitworth

## Helicool

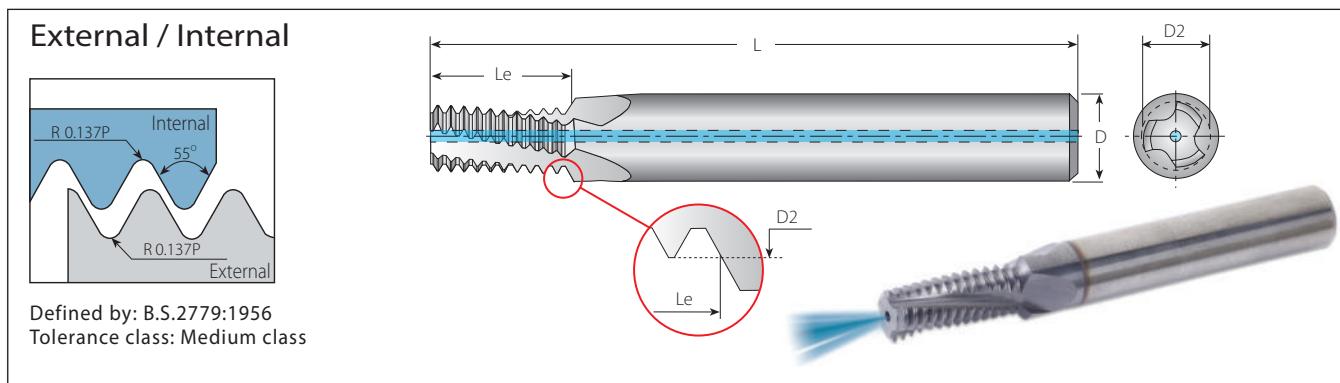


### Helical Flutes with Thru-Hole Coolant

2 x Do ( $Le \leq 2 \times$  Thread Diameter)

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*	
BSW	BSF	TPI	External / Internal	D	D2	L	Le	Z	Zt	mm
1/4"x26	26	HC06050L13-EI26BSFTM...	6	5.00	57	13.2	3	13	5.3	
5/16"x22	22	HC08063L16-EI22BSFTM...	8	6.35	61	16.7	3	14	6.7	
1/4"x20	3/8"x20	HC06044L13-EI20BSWTM...	6	4.45	57	13.3	3	10	5.0	
3/8"x20	20	HC08076L19-EI20BSFTM...	8	7.65	61	19.7	3	15	8.2	
5/16"x18	7/16"x18	18	HC06058L16-EI18BSWTM...	6	5.85	57	16.2	3	11	6.5
7/16"x18	18	HC10092L23-EI18BSFTM...	10	9.20	73	23.3	3	16	9.7	
3/8"x16	1/2", 9/16"x16	16	HC08072L19-EI16BSWTM...	8	7.20	61	19.8	3	12	7.9
1/2", 9/16"x16	16	HC12105L26-EI16BSFTM...	12	10.50	80	26.2	4	16	11.1	
9/16"x16	16	HC14122L29-EI16BSFTM...	14	12.15	92	29.4	4	18	12.6	
7/16"x14	5/8", 11/16"x14	14	HC10085L22-EI14BSWTM...	10	8.50	73	22.7	3	12	9.2
5/8", 11/16"x14	14	HC14134L31-EI14BSFTM...	14	13.40	92	31.7	4	17	14.0	
11/16"x14	14	HC16150L35-EI14BSFTM...	16	15.00	92	35.4	4	19	15.6	
1/2"x12	3/4"x12	12	HC10096L26-EI12BSWTM...	10	9.65	73	26.5	3	12	10.5
9/16"x12	3/4"x12	12	HC12113L28-EI12BSWTM...	12	11.25	80	28.6	4	13	12.1
3/4"x12	12	HC18162L39-EI12BSFTM...	18	16.20	102	39.2	4	18	16.8	
5/8"x11	7/8"x11	11	HC14126L33-EI11BSWTM...	14	12.60	92	33.5	4	14	13.4
11/16"x11	11	HC16142L35-EI11BSWTM...	16	14.20	92	35.8	4	15	15.0	

\* Bore diameter applies to smallest thread dia.

**Helical Flutes with Thru-Hole Coolant**1.5 x Do ( $Le \leq 1.5 \times$  Thread Diameter)

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
Standard	TPI	External / Internal	D	D2	L	Le	Z	Zt	mm
1/16", 1/8"x28	28	HC08064L12-EI28BSPTM...	8	6.40	61	12.2	3	13	6.7
1/8"x28	28	HC10082L15-EI28BSPTM...	10	8.20	73	15.0	3	16	8.7
1/4", 3/8"x19	19	HC12110L20-EI19BSPTM...	12	11.00	80	20.7	4	15	11.8
3/8"x19	19	HC16145L26-EI19BSPTM...	16	14.50	92	26.1	4	19	15.2
1"-4"x11	11	HC20199L42-EI11BSPTM...	20	19.90	102	42.7	4	18	30.7

**Helical Flutes with Thru-Hole Coolant**2 x Do ( $Le \leq 2 \times$  Thread Diameter)

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
Standard	TPI	External / Internal	D	D2	L	Le	Z	Zt	mm
1/16", 1/8"x28	28	HC08064L15-EI28BSPTM...	8	6.40	61	15.9	3	17	6.7
1/8"x28	28	HC10082L19-EI28BSPTM...	10	8.20	73	19.5	3	21	8.7
1/4", 3/8"x19	19	HC12110L27-EI19BSPTM...	12	11.00	80	27.4	4	20	11.8
3/8"x19	19	HC16145L34-EI19BSPTM...	16	14.50	92	34.1	4	25	15.2
1/2"-7/8"x14	14	HC18179L42-EI14BSPTM...	18	17.90	102	42.6	4	23	19.0

\* Bore diameter applies to smallest thread dia.

## NPT

**Helicool**

**External / Internal**

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

### Helical Flutes with Thru-Hole Coolant

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
Standard	TPI	External / Internal	D	D2	L	Le	Z	Zt	mm
1/16"x27	27	HC06059L09-EI27NPT-TM...	6	5.90	57	9.9	3	10	6.3
1/8"x27	27	HC08076L09-EI27NPT-TM...	8	7.65	61	9.9	3	10	8.5
1/4"x18	18	HC10099L14-EI18NPT-TM...	10	9.90	73	14.8	3	10	11.1
3/8"x18	18	HC12111L14-EI18NPT-TM...	12	11.15	73	14.8	4	10	14.5
1/2", 3/4"x14	14	HC16142L19-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	HC20196L23-EI11.5NPT-TM...	20	19.60	102	23.2	4	10	29.0, 37.7, 44.0, 56.0
2 1/2", 3"x8	8	HC20196L33-EI8NPT-TM...	20	19.60	102	33.3	4	10	66.5, 82.1

## ANPT

**Helicool**

**External / Internal**

Defined by: MIL-P-7105B  
Tolerance class: Standard ANPT

### Helical Flutes with Thru-Hole Coolant

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
Standard	TPI	External / Internal	D	D2	L	Le	Z	Zt	mm
1/4", 3/8"x18	18	HC10099L14-EI18ANPT-TM...	10	9.90	73	14.8	3	10	11.1 / 14.5
1/2", 3/4"x14	14	HC14139L18-EI14ANPT-TM...	14	13.90	92	19.0	4	10	17.7 / 23.0

\* Bore diameter applies to smallest thread dia.

## NPTF

**Helicool**

**External / Internal**

Defined by: ANSI 1.20.3-1976  
Tolerance class: Standard NPTF

## Helical Flutes with Thru-Hole Coolant

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
Standard	TPI	External / Internal	D	D2	L	Le	Z	Zt	mm
1/16"x27	27	HC06059L09-EI27NPTFTM...	6	5.90	57	9.9	3	10	6.3
1/8"x27	27	HC08076L09-EI27NPTFTM...	8	7.65	61	9.9	3	10	8.4
1/4"x18	18	HC10099L14-EI18NPTFTM...	10	9.90	73	14.8	3	10	11.1
3/8"x18	18	HC12111L14-EI18NPTFTM...	12	11.15	73	14.8	4	10	14.7
1/2", 3/4"x14	14	HC16142L19-EI14NPTFTM...	16	14.25	92	19.0	4	10	17.9, 23.4
1", 1 1/4", 1 1/2", 2"x11.5	11.5	HC20196L23-EI11.5NPTFTM...	20	19.60	102	23.2	4	10	29.0, 37.7, 43.7, 55.6
2 1/2", 3"x8	8	HC20196L33-EI8NPTFTM...	20	19.60	102	33.3	4	10	66.3, 82.1

## BSPT

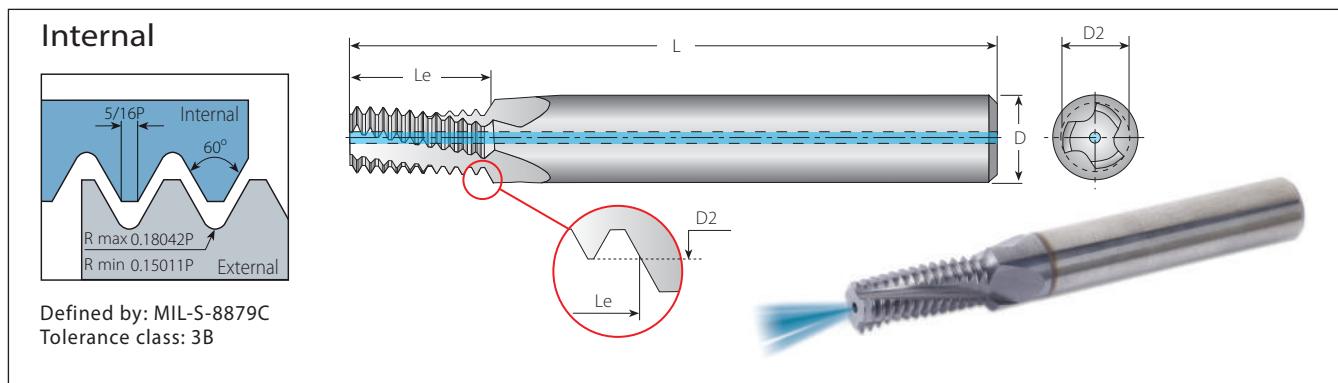
**Helicool**

**External / Internal**

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

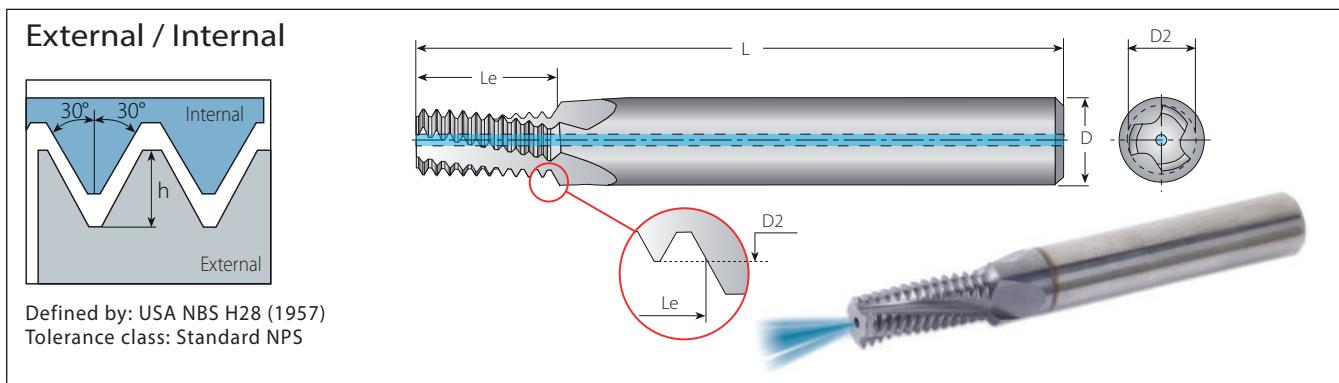
## Helical Flutes with Thru-Hole Coolant

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
Standard	TPI	External / Internal	D	D2	L	Le	Z	Zt	mm
1/16"x28	28	HC06059L10-EI28BSPT-TM...	6	5.90	57	10.2	3	11	6.7
1/8"x28	28	HC08076L10-EI28BSPT-TM...	8	7.65	61	10.2	3	11	8.7
1/4"x19	19	HC10099L15-EI19BSPT-TM...	10	9.90	73	15.4	3	11	11.8
3/8"x19	19	HC12111L15-EI19BSPT-TM...	12	11.15	73	15.4	4	11	15.2
1/2", 3/4"x14	14	HC16142L22-EI14BSPT-TM...	16	14.25	92	22.7	4	12	19.0
1", 1 1/2", 2", 2 1/2"x11	11	HC20196L28-EI11BSPT-TM...	20	19.60	102	28.9	4	12	30.7

**Helical Flutes with Thru-Hole Coolant****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	
0.138"(#6)	0.190"(#10)	0.216"(#12)	0.4375(7/16")	32	HC04027L07-I32UNJTM...	4	2.70	45	7.5	3	9	2.8	
-	0.250"(1/4")	0.4375"(7/16")	0.5625"(9/16")	28	HC06054L13-I28UNJTM...	6	5.40	57	13.1	3	14	5.6	
0.190"(#10)	0.3125"(5/16")	0.5625"(9/16")	-	24	HC04037L09-I24UNJTM...	4	3.70	45	10.0	3	9	4.0	
-	0.3125"(5/16")	0.5625"(9/16")	-	24	HC08067L15-I24UNJTM...	8	6.70	61	16.4	3	15	7.0	
0.250"(1/4")	0.4375"(7/16")	0.750"(3/4")	0.3125"(5/16")	20	HC06050L12-I20UNJTM...	6	5.00	57	13.3	3	10	5.3	
-	0.4375"(7/16")	0.750"(3/4")	0.5625"(9/16")	20	HC10096L21-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	HC08064L15-I18UNJTM...	8	6.40	61	16.2	3	11	6.75	
0.375"(3/8")	0.750"(3/4")	-	0.4375"(7/16")	16	HC08077L19-I16UNJTM...	8	7.70	61	19.8	3	12	8.1	
0.4375"(7/16")	0.875"(7/8")	-	-	14	HC10092L21-I14UNJTM...	10	9.20	73	22.7	4	12	9.5	
0.500"(1/2")	-	-	-	13	HC10099L25-I13UNJTM...	10	9.90	73	26.4	4	13	11.0	

\* Bore diameter applies to smallest thread dia.

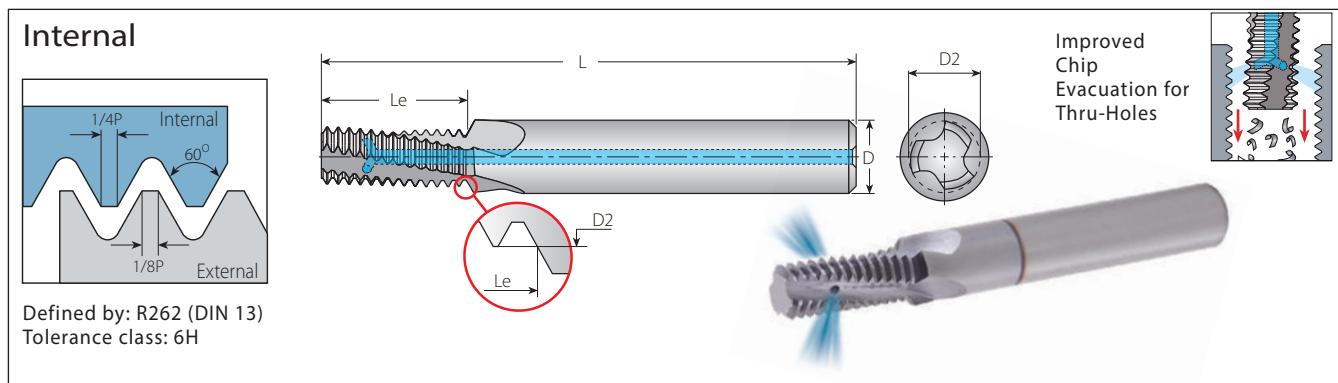


### Helical Flutes with Thru-Hole Coolant

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
Standard	TPI	External / Internal	D	D2	L	Le	Z	Zt	mm
1/8"	27	HC08076L09-EI27NPSTM...	8	7.65	61	9.9	3	10	8.5
1/4"	18	HC10099L14-EI18NPSTM...	10	9.90	73	14.8	3	10	11.1
3/8"	18	HC12111L14-EI18NPSTM...	12	11.15	73	14.8	4	10	14.5
1/2", 3/4"	14	HC16142L18-EI14NPSTM...	16	14.25	92	19.0	4	10	17.7; 23.0
1", 2"	11.5	HC20196L22-EI11.5NPSTM...	20	19.60	102	23.2	4	10	29.0; 56.0

\* Bore diameter applies to smallest thread dia.

## ISO Metric



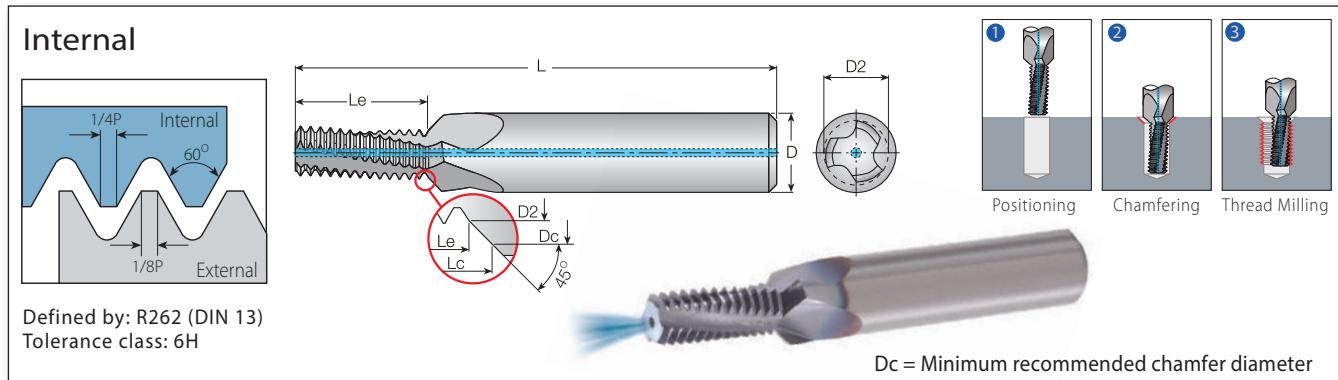
## Helicool-R (HCR)

### Helical Flutes with Radial Cooling

2 x Do (Le ≤ 2 x Thread Diameter)

Thread	Pitch	Ordering Code	D	D2	L	Le	Flutes	Teeth	Bore Dia.*	
M Coarse	M Fine	mm	Internal					Z	Zt	mm
M6x1.0	M8-M40x1.0	1.0	HCR06048L12-I1.00ISOTM...	6	4.8	57	12.5	3	12	5.0
	M10x1.0	1.0	HCR10087L20-I1.00ISOTM...	10	8.7	73	20.5	3	20	9.0
	M12x1.0	1.0	HCR12107L24-I1.00ISOTM...	12	10.7	73	24.5	4	24	11.0
M8x1.25		1.25	HCR08065L16-I1.25ISOTM...	8	6.5	64	16.9	3	13	6.8
M10x1.5	M12-M48x1.5	1.5	HCR10082L20-I1.50ISOTM...	10	8.2	73	20.3	3	13	8.5
	M12x1.5	1.5	HCR10099L24-I1.50ISOTM...	10	9.9	73	24.8	4	16	10.5
	M14x1.5	1.5	HCR12119L29-I1.50ISOTM...	12	11.9	84	29.3	4	19	12.5
M12x1.75		1.75	HCR14139L32-I1.50ISOTM...	14	13.9	84	32.3	4	21	14.5
			M16x1.5				25.4	4	14	10.2

## ISO Metric



## Helicool-C (HCC)

### Helical Flutes with Axial Coolant - Thru & Chamfer

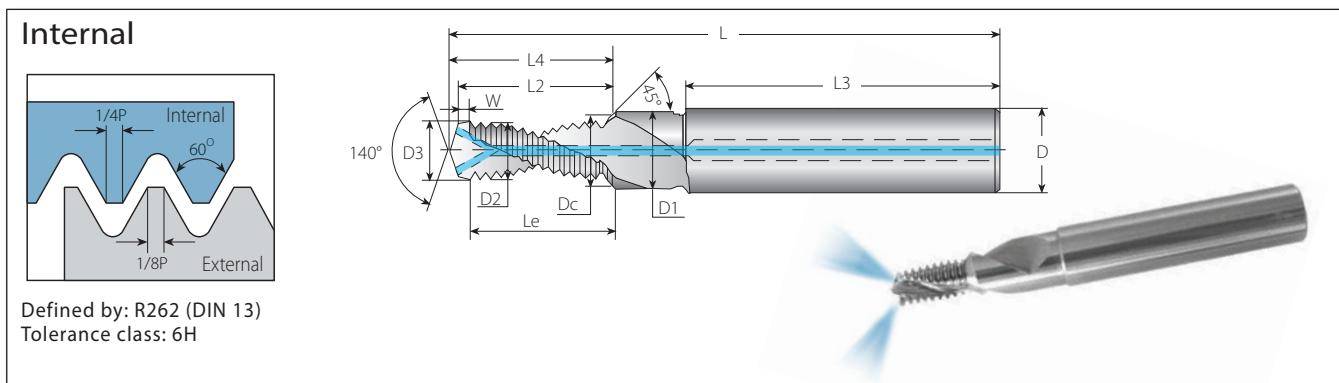
2 x Do (Le ≤ 2 x Thread Diameter)

Thread	Pitch	Ordering Code	D	D2	Dc	L	Le	Lc	No. of Flutes	Teeth	Bore Dia.*	
M Coarse	M Fine	mm	Internal					Z	Zt	mm		
M6x1.0	M8-M40x1.0	1.0	HCC08048L12-I1.00ISOTM...	8	4.8	6.3	61	12.5	13.3	3	12	5.0
	M10x1.0	1.0	HCC12087L20-I1.00ISOTM...	12	8.7	10.3	73	20.5	21.3	3	20	9.0
	M12x1.0	1.0	HCC14107L24-I1.00ISOTM...	14	10.7	12.3	80	24.5	25.3	4	24	11.0
M8x1.25		1.25	HCC10065L16-I1.25ISOTM...	10	6.5	8.3	73	16.9	17.8	3	13	6.8
M10x1.5	M12-M48x1.5	1.5	HCC12082L20-I1.50ISOTM...	12	8.2	10.3	80	20.3	21.3	3	13	8.5
	M12x1.5	1.5	HCC14099L24-I1.50ISOTM...	14	9.9	12.3	80	24.8	26.0	4	16	10.5
	M14x1.5	1.5	HCC16119L29-I1.50ISOTM...	16	11.9	14.3	92	29.3	30.5	4	19	12.5
M12x1.75		1.75	HCC18139L32-I1.50ISOTM...	18	13.9	16.3	92	32.3	33.5	4	21	14.5
			M16x1.5				25.4	26.6	4	14	10.2	

\* Bore diameter applies to smallest thread dia.

## ISO Metric

## HTC (Thriller)

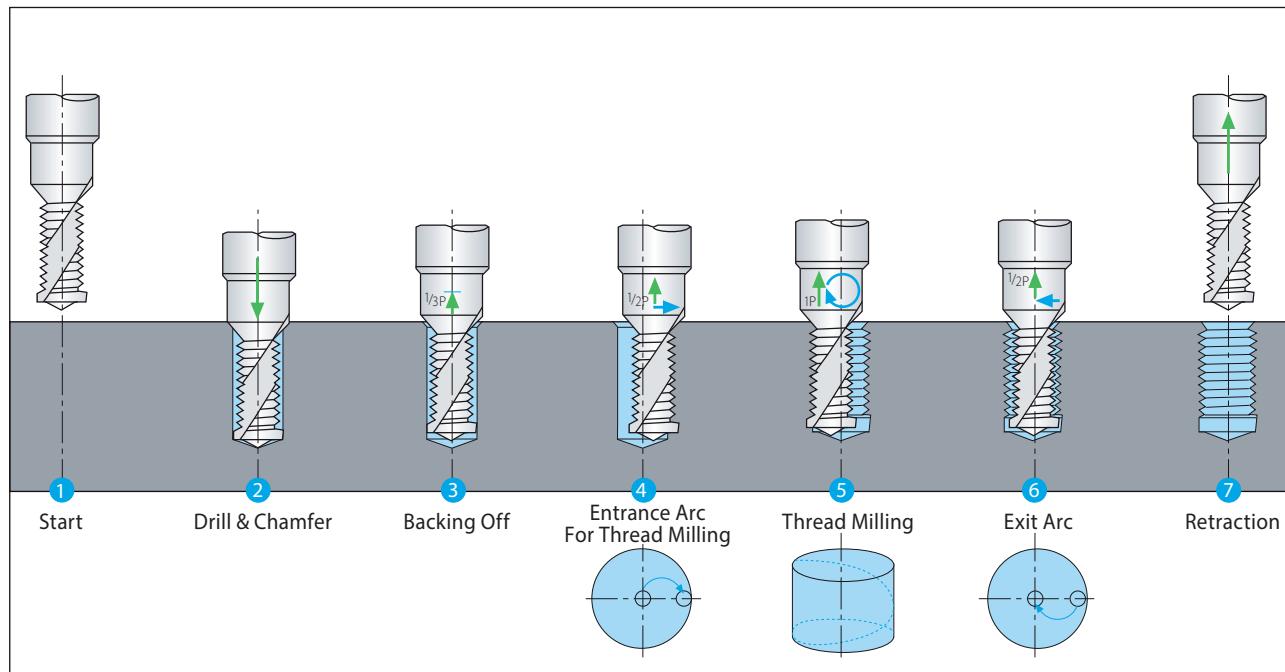


### HTC (Thriller) Drill, Chamfer & Thread with Coolant-Thru

Thread	Ordering Code	Pitch	Dimensions mm										No. of Flutes	Teeth	
		mm	L	L4	L2	L3	W	Le	D3	D	D1	Dc	D2	Z	Zt
ISO 2xDx Coarse	Internal														
M6x1.0	HTCM6x1.0x2D...	1.00	62.0	14.5	13.7	36	1.0	12.7	5.0	8	6.6	6.3	4.85	2	11
M8x1.25	HTCM8x1.25x2D...	1.25	74.0	18.2	17.1	40	1.3	15.8	6.8	10	9.0	8.3	6.45	2	11
M10x1.5	HTCM10x1.5x2D...	1.50	79.0	23.4	22.1	45	1.5	20.6	8.5	12	11.0	10.3	8.08	2	12
M12x1.75	HTCM12x1.75x2D...	1.75	89.0	27.1	25.5	45	1.5	24.0	10.3	14	13.5	12.3	9.74	2	12
ISO 2.5xDx Coarse															
M6x1.0	HTCM6x1.0x2.5D...	1.00	62.0	16.5	15.7	36	1.0	14.7	5.0	8	6.6	6.3	4.85	2	13
M8x1.25	HTCM8x1.25x2.5D...	1.25	74.0	23.2	22.1	40	1.3	20.8	6.8	10	9.0	8.3	6.45	2	15
M10x1.5	HTCM10x1.5x2.5D...	1.50	79.0	27.9	26.6	45	1.5	25.1	8.5	12	11.0	10.3	8.08	2	15

TM Solid

### HTC - Thriller Operating Cycle

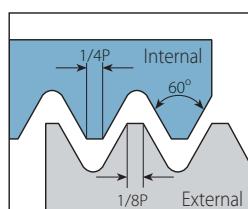


HTC line is suitable for Aluminium and Cast Iron machining only.

# ISO Metric

# Helical

## External / Internal



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

## Helical Flutes - External

**2 x Do (Le ≤ 2 x Thread Diameter)**

Thread	Pitch	Ordering Code	Dimensions mm			No. of Flutes	Teeth	
M Coarse	mm	External	D	D2	L	Le	Z	Zt
M3x0.5	0.5	H04039L06-E0.5ISOTM...	4	3.9	45	6.0	3	12
M4x0.75	0.75	H04039L09-E0.75ISOTM...	4	3.9	45	9.0	3	12
M6x1.0	1.0	H04039L12-E1.0ISOTM...	4	3.9	45	12.0	3	12
M8x1.25	1.25	H06059L16-E1.25ISOTM...	6	5.9	57	16.25	3	13
M10x1.5	1.5	H08079L21-E1.5ISOTM...	8	7.9	63	21.0	3	14
M14x2.0	2.0	H10099L28-E2.0ISOTM...	10	9.9	73	28.0	4	14

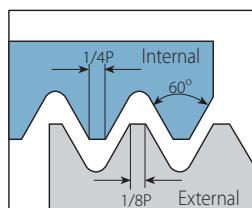
## Helical Flutes - Internal

**2 x Do (Le ≤ 2 x Thread Diameter)**

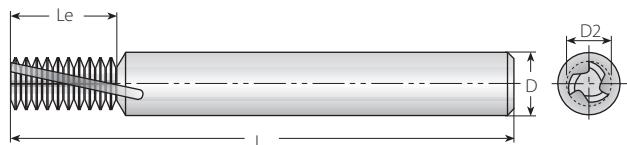
Thread	Pitch	Ordering Code	Dimensions mm			No. of Flutes	Teeth	Bore Dia.*		
M Coarse	M Fine	mm	Internal	D	D2	L	Le	Z	Zt	mm
M3x0.5	M3.5-M16x0.5	0.5	H04022L06-I0.5ISOTM...	4	2.2	45	6.0	3	12	2.5
	M4x0.5	0.5	H04030L08-I0.5ISOTM...	4	3.0	45	8.0	3	16	3.5
	M5x0.5	0.5	H04039L10-I0.5ISOTM...	4	3.9	45	10.0	3	20	4.5
	M4x0.7	0.7	H04028L08-I0.7ISOTM...	4	2.8	45	8.4	3	12	3.3
	M6x0.75	0.75	H04039L12-I0.75ISOTM...	4	3.9	45	12.0	3	16	5.3
	M5x0.8	0.8	H04035L10-I0.8ISOTM...	4	3.5	45	10.4	3	13	4.2
	M6x1.0	M8-M40x1.0	1.0	H04039L12-I1.0ISOTM...	4	3.9	45	12.0	3	12
	M8x1.0	1.0	H06059L16-I1.0ISOTM...	6	5.9	57	16.0	3	16	7.0
	M10x1.0	1.0	H08079L20-I1.0ISOTM...	8	7.9	63	20.0	3	20	9.0
	M12x1.0	1.0	H10099L24-I1.0ISOTM...	10	9.9	73	24.0	4	24	11.0
	M8x1.25	1.25	H06058L16-I1.25ISOTM...	6	5.8	57	16.25	3	13	6.8
	M10x1.25	1.25	H08077L20-I1.25ISOTM...	8	7.7	63	20.0	3	16	8.8
	M10x1.5	M12-M48x1.5	1.5	H08077L21-I1.5ISOTM...	8	7.7	63	21.0	3	14
	M12x1.5	1.5	H10094L24-I1.5ISOTM...	10	9.4	73	24.0	4	16	10.5
	M14x1.5	1.5	H12112L28-I1.5ISOTM...	12	11.2	83	28.5	4	19	12.5
	M16x1.5	1.5	H12119L33-I1.5ISOTM...	12	11.9	83	33.0	4	22	14.5
	M12x1.75	1.75	H10087L24-I1.75ISOTM...	10	8.7	73	24.5	4	14	10.2
	M14x2.0	M17-M80x2.0	2.0	H10099L28-I2.0ISOTM...	10	9.9	73	28.0	4	14
	M16x2.0	M17-M80x2.0	2.0	H12119L32-I2.0ISOTM...	12	11.9	83	32.0	4	16
	M18-M22x2.5	2.5	H16139L40-I2.5ISOTM...	16	13.9	92	40.0	5	16	15.5
	M24x3.0	3.0	H16159L42-I3.0ISOTM...	16	15.9	92	42.0	4	14	21.0

\* Bore diameter applies to smallest thread dia.

## External / Internal



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



## Helical Flutes - External

2 x Do (Le ≤ 2 x Thread Diameter)

Thread		Pitch	Ordering Code		Dimensions mm			No. of Flutes	Teeth
UNC	UNF	TPI	External		D	D2	L	Z	Zt
No.8-32		32	H04039L09-E32UNCTM...		4	3.9	45	8.7	3
	No.12-28	28	H04039L12-E28UNFTM...		4	3.9	45	11.8	3
No.12-24		24	H04039L12-E24UNCTM...		4	3.9	45	11.6	3
1/4"x20		20	H04039L13-E20UNCTM...		4	3.9	45	12.7	3
5/16"x18		18	H06059L17-E18UNCTM...		6	5.9	57	16.9	3
3/8"x16		16	H08079L19-E16UNCTM...		8	7.9	63	19.1	3
9/16"x12		12	H12119L30-E12UNCTM...		12	11.9	83	29.6	4
									14

## Helical Flutes - Internal

2 x Do (Le ≤ 2 x Thread Diameter)

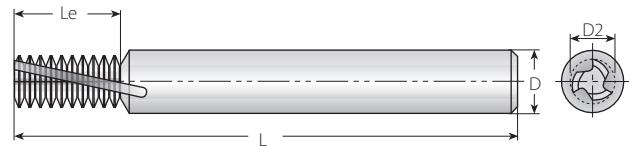
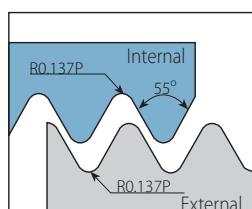
Thread		Pitch	Ordering Code		Dimensions mm			No. of Flutes	Teeth	Bore Dia.*
UNC	UNF	UNEF	TPI	Internal	D	D2	L	Z	Zt	mm
No.8-36			36	H04030L09-I36UNFTM...	4	3.0	45	8.5	3	12
No.10-32	No.12-3/8"x32		32	H04033L11-I32UNFTM...	4	3.3	45	11.1	3	14
No.12-28, 1/4"x28	7/16", 1/2"x28		28	H04038L12-I28UNFTM...	4	3.8	45	11.8	3	13
1/4"x28	7/16", 1/2"x28		28	H06046L13-I28UNFTM...	6	4.6	57	12.7	3	14
	7/16", 1/2"x28		28	H10092L23-I28UNEFTM...	10	9.2	73	22.7	4	25
No.10-24	5/16", 3/8"x24	9/16"-11/16"x24	24	H04029L11-I24UNCTM...	4	2.9	45	10.6	3	10
No.12-24	5/16", 3/8"x24	9/16"-11/16"x24	24	H04035L12-I24UNCTM...	4	3.5	45	11.6	3	11
	5/16", 3/8"x24	9/16"-11/16"x24	24	H06057L16-I24UNFTM...	6	5.7	57	15.9	3	15
3/8"x24	9/16"-11/16"x24	24	H08074L19-I24UNFTM...	8	7.4	63	19.1	3	18	8.5
	9/16"-11/16"x24	24	H12119L29-I24UNEFTM...	12	11.9	83	28.6	4	27	13.2
1/4"x20	7/16", 1/2"x20	3/4"-1"x20	20	H04039L13-I20UNCTM...	4	3.9	45	12.7	3	10
	7/16", 1/2"x20	3/4"-1"x20	20	H10085L23-I20UNFTM...	10	8.5	73	22.9	4	18
1/2"x20	3/4"-1"x20	20	H10099L26-I20UNFTM...	10	9.9	73	25.4	4	20	11.5
	3/4"-1"x20	20	H16159L38-I20UNEFTM...	16	15.9	92	38.1	5	30	17.8
5/16"x18	9/16", 5/8"x18	11/16"-1 11/16"x18	18	H06052L17-I18UNCTM...	6	5.2	57	16.9	3	12
	9/16", 5/8"x18	11/16"-1 11/16"x18	18	H12113L30-I18UNFTM...	12	11.3	83	29.6	4	21
5/8"x18	11/16"-1 11/16"x18	18	H12119L33-I18UNFTM...	12	11.9	83	32.5	4	23	14.5
3/8"x16	3/4"-1"x16	16	H08067L19-I16UNCTM...	8	6.7	63	19.1	3	12	8.0
	3/4"-1"x16	16	H16159L38-I16UNFTM...	16	15.9	92	38.1	4	24	17.5
7/16"x14	7/8"x14	14	H08076L24-I14UNCTM...	8	7.6	63	23.6	4	13	9.3
	7/8"x14	14	H20187L44-I14UNFTM...	20	18.7	104	44.4	4	24	20.5
1/2"x13		13	H10089L26-I13UNCTM...	10	8.9	73	25.4	4	13	10.8
9/16"x12	1"-1 1/2"x12	12	H12103L30-I12UNCTM...	12	10.3	83	29.6	4	14	12.3
1"-1 1/2"x12		12	H20199L51-I12UNFTM...	20	19.9	104	50.8	5	24	23.5
5/8"x11		11	H12110L32-I11UNCTM...	12	11.0	83	32.3	4	14	13.5
3/4"x10		10	H16135L38-I10UNCTM...	16	13.5	92	38.1	5	15	16.5
7/8"x9		9	H16152L45-I9UNCTM...	16	15.2	92	45.2	4	16	19.5
1"x8		8	H20170L51-I8UNCTM...	20	17.0	104	50.8	4	16	22.0

\* Bore diameter applies to smallest thread dia.

## BSP (G)

Helical

### External / Internal



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

### Helical Flutes

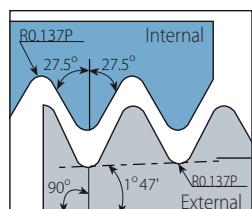
2 x Do ( $Le \leq 2 \times$  Thread Diameter)

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
Standard	TPI	External / Internal	D	D2	L	Le	Z	Zt	mm
1/16" x 28, 1/8" x 28	28	H06058L16-EI28BSPTM...	6	5.8	57	16.3	3	18	6.7
1/8" x 28	28	H08077L20-EI28BSPTM...	8	7.7	63	20.0	3	22	8.7
1/4" x 19, 3/8" x 19	19	H10099L27-EI19BSPTM...	10	9.9	73	26.7	4	20	11.8
3/8" x 19	19	H16134L33-EI19BSPTM...	16	13.4	92	33.4	4	25	15.2
1/2", 3/4" x 14	14	H16157L44-EI14BSPTM...	16	15.7	92	43.5	5	24	19.0
1", 1 1/2", 2", 2 1/2" x 11	11	H20199L42-EI11BSPTM...	20	19.9	104	41.6	5	18	30.7

## BSPT

Helical

### External / Internal



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

### Helical Flutes

TM Solid

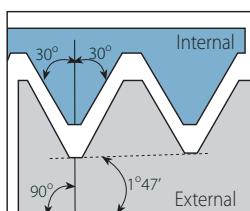
Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
Standard	TPI	External / Internal	D	D2	L	Le	Z	Zt	mm
1/16" x 28	28	H06058L16-EI28BSPT-TM...	6	5.8	57	16.3	3	18	6.7
1/8" x 28	28	H08077L20-EI28BSPT-TM...	8	7.7	63	20.0	3	22	8.7
1/4" x 19	19	H10099L27-EI19BSPT-TM...	10	9.9	73	26.7	4	20	11.8
3/8" x 19	19	H16134L33-EI19BSPT-TM...	16	13.4	92	33.4	4	25	15.2
1/2", 3/4" x 14	14	H16157L44-EI14BSPT-TM...	16	15.7	92	43.5	5	24	19.0
1", 1 1/2", 2", 2 1/2" x 11	11	H20199L42-EI11BSPT-TM...	20	19.9	104	41.6	5	18	30.7

\* Bore diameter applies to smallest thread dia.

## NPT

**Helical**

### External / Internal



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

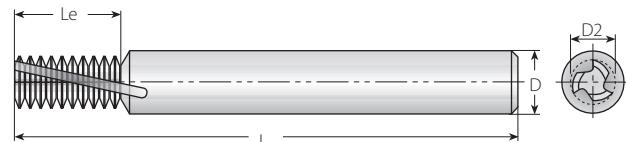
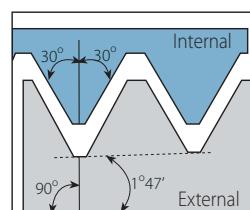
### Helical Flutes

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
Standard	TPI	External / Internal	D	D2	L	Le	Z	Zt	mm
1/16"x27	27	H06053L09-EI27NPT-TM...	6	5.3	57	9.4	3	10	6.3
1/8"x27	27	H08075L09-EI27NPT-TM...	8	7.5	63	9.4	4	10	8.5
1/4"x18	18	H10094L14-EI18NPT-TM...	10	9.4	73	14.1	4	10	11.1
3/8"x18	18	H12119L14-EI18NPT-TM...	12	11.9	83	14.1	4	10	14.5
1/2", 3/4"x14	14	H16155L25-EI14NPT-TM...	16	15.5	92	25.4	5	14	17.7, 23.0
1"-2"x11.5	11.5	H20199L33-EI11.5NPT-TM...	20	19.9	104	33.1	5	15	29.0-56.0
2 1/2", 3"x8	8	H20199L38-EI8NPT-TM...	20	19.9	104	38.1	4	12	66.5

## NPTF

**Helical**

### External / Internal



Defined by: ANSI 1.20.3-1976  
Tolerance class: Standard NPTF

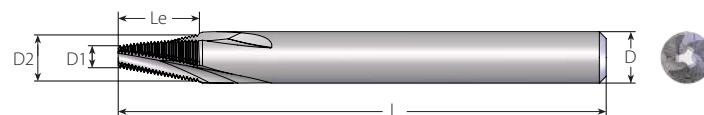
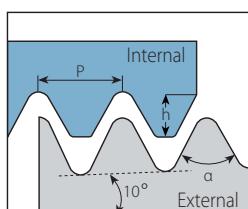
### Helical Flutes

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
Standard	TPI	External / Internal	D	D2	L	Le	Z	Zt	mm
1/16"x27	27	H06053L09-EI27NPTFTM...	6	5.3	57	9.4	3	10	6.3
1/8"x27	27	H08075L09-EI27NPTFTM...	8	7.5	63	9.4	4	10	8.4
1/4"x18	18	H10094L14-EI18NPTFTM...	10	9.4	73	14.1	4	10	11.1
3/8"x18	18	H12119L14-EI18NPTFTM...	12	11.9	83	14.1	4	10	14.7
1/2", 3/4"x14	14	H16155L25-EI14NPTFTM...	16	15.5	92	25.4	5	14	17.9, 23.4
1"-2"x11.5	11.5	H20199L33-EI11.5NPTFTM...	20	19.9	104	33.1	5	15	29.4-56.2
2 1/2", 3"x8	8	H20199L38-EI8NPTFTM...	20	19.9	104	38.1	4	12	67.0

## Tap 60°, Tap 55°

**Helical**

### Internal



### Helical Flutes - Taper 60°

#### TM Solid Helical Flutes for Bone Plate Applications

Pitch	Ordering Code	Taper	Thread Angle	Profile Height	Dimensions mm					No. of Flutes	Teeth
mm	Internal		α	h	D	D2	D1	L	Le	Z	Zt
0.4	H06059L080-I0.4TAP60TM...	20°	60°	0.20	6	5.9	3.2	57	8.0	3	20
0.5	H06059L090-I0.5TAP60TM...	20°	60°	0.25	6	5.9	2.9	57	9.0	3	18

### Helical Flutes - Taper 55°

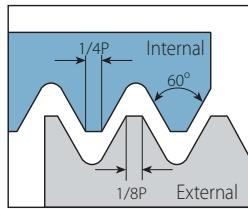
#### TM Solid Helical Flutes for Bone Plate Applications

Pitch	Ordering Code	Taper	Thread Angle	Profile Height	Dimensions mm					No. of Flutes	Teeth
mm	Internal		α	h	D	D2	D1	L	Le	Z	Zt
0.3	H03028L039-I0.3TAP55TM...	20°	55°	0.18	3	2.8	1.5	38	3.9	3	13
0.35	H04039L063-I0.35TAP55TM...	20°	55°	0.20	4	3.9	1.8	45	6.3	3	18
0.4	H06059L100-I0.4TAP55TM...	20°	55°	0.29	6	5.9	2.5	57	10.0	3	25
0.5	H06059L090-I0.5TAP55TM...	20°	55°	0.33	6	5.9	2.9	57	9.0	3	18
0.6	H06059L066-I0.6TAP55TM...	20°	55°	0.47	6	5.9	3.8	57	6.6	3	11

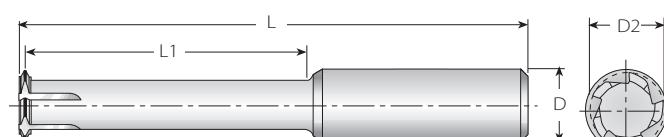
## ISO Metric

## Deep Threading

### Internal



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



TM Solid

### Deep Threading - Long Tools for Deep Holes

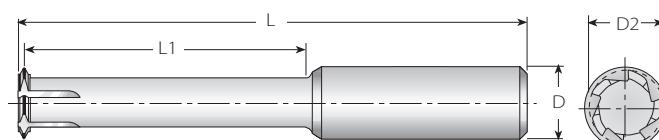
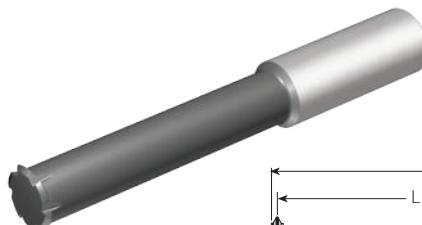
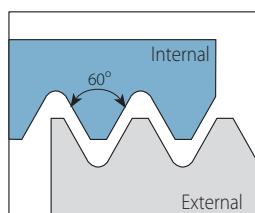
3 x Do (L1 ≤ 3 x Thread Diameter)

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.
M Coarse	mm	Internal	D	D2	L	L1	Z	Zt	mm
M6x1	1.0	D1T08041-I1.0ISOTM...	8	4.1	63	19	3	1	5.0
M8x1.25	1.25	D1T10058-I1.25ISOTM...	10	5.8	73	26	3	1	6.8
M10x1.5	1.50	D1T10077-I1.50ISOTM...	10	7.7	73	32	3	1	8.5
M12x1.5	1.50	D1T12094-I1.50ISOTM...	12	9.4	83	38	4	1	10.5
M12x1.75	1.75	D1T12087-I1.75ISOTM...	12	8.7	83	38	4	1	10.2
M14x2	2.0	D1T16102-I2.0ISOTM...	16	10.2	92	44	4	1	12.0
M16x2	2.0	D1T16122-I2.0ISOTM...	16	12.2	100	50	4	1	14.0
M18x2.5	2.50	D1T16129-I2.5ISOTM...	16	12.9	108	57	5	1	15.5
M20x2.5	2.50	D1T16148-I2.5ISOTM...	16	14.8	114	63	5	1	17.5

## Partial Profile 60°

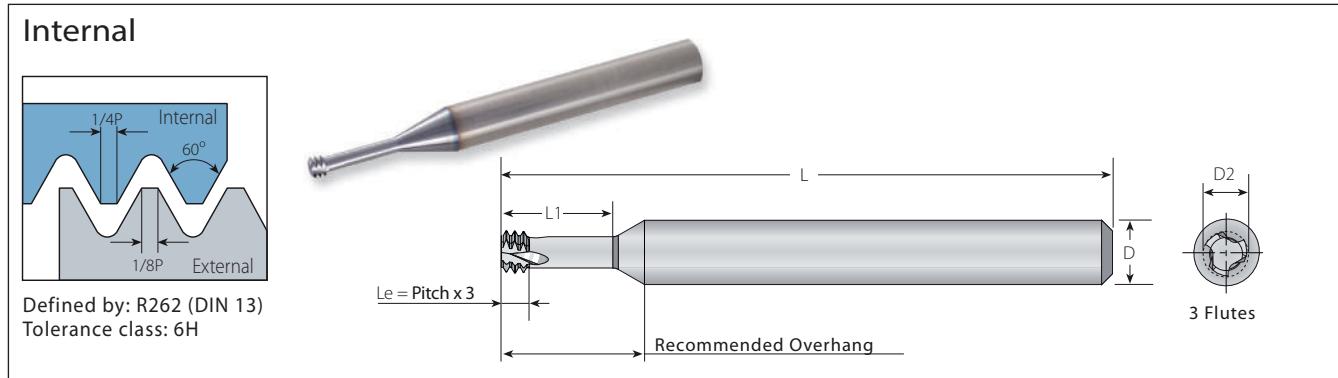
## Deep Threading

### Internal



### Deep Threading - Long Tools for Deep Holes

M Coarse	M Fine	UN, UNS, UNF, UNEF	Min. Thread		Pitch		Ordering Code		Dimensions mm				
			mm	TPI	Internal	D	D2	L	L1	Z	Zt		
M5x0.8	M5x0.5, M5X0.75	No.10-56UNS, No.10-48UNS, No.10-40UNS, No.10-36UNS, No.10-32UNF	0.5-0.8	32-56	D1T04390L160-ITA60TM...	4	3.90	45	16	4	1		
M6x1.0	M6x0.5, M6X0.75	No.12-56UNS, No.12-48UNS, $\frac{1}{4}$ -40UNS, $\frac{1}{4}$ -36UNS, $\frac{1}{4}$ -32UNEF, $\frac{1}{4}$ -28UNF, $\frac{1}{4}$ -27UNS, $\frac{1}{4}$ -24UNS	0.5-1.0	24-56	D1T06485L200-ITB60TM...	6	4.85	51	20	5	1		
M8x1.25	M7x0.5, M7x0.75, M7.5x1.0	$\frac{5}{16}$ -48UNS, $\frac{5}{16}$ -40UNS, $\frac{5}{16}$ -36UNS, $\frac{5}{16}$ -32UNEF, $\frac{5}{16}$ -28UN, $\frac{5}{16}$ -27UNS, $\frac{5}{16}$ -24UNS, $\frac{5}{16}$ -20UN	0.5-1.25	20-48	D1T06590L250-ITF60TM...	6	5.90	64	25	5	1		
-	M10.5x0.5, M11x0.75, M11x1.0	$\frac{7}{16}$ -32UN, $\frac{7}{16}$ -28UNEF, $\frac{7}{16}$ -27UNS, $\frac{7}{16}$ -24UNS	0.5-1.0	24-56	D1T10990L350-ITB60TM...	10	9.90	73	35	6	1		
M10x1.5	M10x1.0, M10X1.25	$\frac{3}{8}$ -24UNF, $\frac{3}{8}$ -20UN, $\frac{7}{16}$ -18UNS, $\frac{7}{16}$ -16UN	1.0-1.50	16-24	D1T08790L320-ITC60TM...	8	7.90	63	32	6	1		
M12x1.75	M12x1.0, M12X1.25, M12x1.5	$\frac{1}{2}$ -24UNS, $\frac{1}{2}$ -20UNS, $\frac{1}{2}$ -18UNS, $\frac{1}{2}$ -16UNS, $\frac{1}{2}$ -14UNS	1.0-1.75	14-24	D1T10990L380-ITD60TM...	10	9.90	73	38	6	1		
-	M13.5x1.0, M14x1.25, M14x1.5	$\frac{9}{16}$ -24UNEF	1.0-1.75	14-24	D1T12119L450-ITD60TM...	12	11.90	83	45	6	1		



## MilliPro Miniature Thread Mills

**2 x Do (L1 ≤ 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	L1	Z	Zt	mm
M1.6x0.35		0.35	D3T03012L034-I0.35ISOTM...	3	1.20	30	3.4	3	3	1.25
M2x0.4		0.4	D3T06015L042-I0.4ISOTM...	6	1.55	57	4.2	3	3	1.6
M2.2x0.45		0.45	D3T06016L046-I0.45ISOTM...	6	1.65	57	4.6	3	3	1.75
M2.5x0.45		0.45	D3T06019L052-I0.45ISOTM...	6	1.95	57	5.2	3	3	2.05
M3x0.5	M3.5-M16x0.5	0.5	D3T06024L062-I0.5ISOTM...	6	2.40	57	6.2	3	3	2.5
M3.5x0.6		0.6	D3T06027L073-I0.6ISOTM...	6	2.75	57	7.3	3	3	2.9
M4x0.7		0.7	D3T06031L083-I0.7ISOTM...	6	3.15	57	8.3	3	3	3.3
M5x0.8		0.8	D3T06040L104-I0.8ISOTM...	6	4.05	57	10.4	3	3	4.2
M6x1.0	M8-M40x1.0	1.0	D3T06048L125-I1.0ISOTM...	6	4.80	57	12.5	3	3	5.0
M8x1.25		1.25	D3T08065L166-I1.25ISOTM...	8	6.50	63	16.6	3	3	6.8
M10x1.5	M12-M48x1.50	1.50	D3T10082L208-I1.50ISOTM...	10	8.20	73	20.8	3	3	8.5
M12x1.75		1.75	D3T10099L250-I1.75ISOTM...	10	9.90	73	25.0	3	3	10.3
M16x2.0		2.0	D3T12119L330-I2.0ISOTM...	12	11.90	83	33.0	3	3	14.0
M20x2.5		2.50	D3T16159L413-I2.5ISOTM...	16	15.90	92	41.3	3	3	17.5

## MilliPro Miniature Thread Mills

**3 x Do (L1 ≤ 3 x Thread Diameter)**

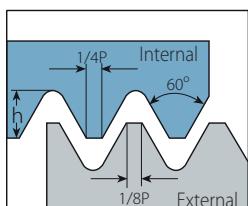
Thread	Pitch	Ordering Code	Dimensions mm			No. of Flutes	Teeth	Bore Dia.*		
M Coarse	M Fine	mm	Internal	D	D2	L	L1	Z	Zt	mm
M1.6X0.35		0.35	D3T03012L050-I0.35ISOTM...	3	1.20	30	5.0	3	3	1.25
M2x0.4		0.4	D3T03015L062-I0.4ISOTM...	3	1.55	30	6.2	3	3	1.6
M2X0.4		0.4	D3T06015L062-I0.4ISOTM...	6	1.55	57	6.2	3	3	1.6
M2.5x0.45		0.45	D3T03019L077-I0.45ISOTM...	3	1.95	30	7.7	3	3	2.05
M2.5x0.45		0.45	D3T06019L077-I0.45ISOTM...	6	1.95	57	7.7	3	3	2.05
M3X0.5	M3.5-M16x0.5	0.5	D3T03024L092-I0.5ISOTM...	3	2.40	30	9.2	3	3	2.5
M3x0.5	M3.5-M16x0.5	0.5	D3T06024L092-I0.5ISOTM...	6	2.40	57	9.2	3	3	2.5
M4x0.7		0.7	D3T06031L123-I0.7ISOTM...	6	3.15	57	12.3	3	3	3.3
M5x0.8		0.8	D3T06040L154-I0.8ISOTM...	6	4.05	57	15.4	3	3	4.2
M6x1.0	M8-M40x1.0	1.00	D3T06048L185-I1.0ISOTM...	6	4.80	57	18.5	3	3	5.0
M8x1.25		1.25	D3T08065L246-I1.25ISOTM...	8	6.50	63	24.6	3	3	6.8

\* Bore diameter applies to smallest thread dia.

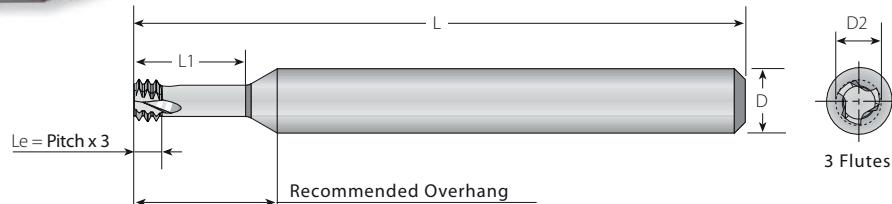
## American UN

## MilliPro

### Internal



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



### MilliPro Miniature Thread Mills

2 x Do ( $L1 \leq 2 \times$  Thread Diameter)

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*	
UNC	UNF	TPI	Internal	D	D2	L	L1	Z	Zt	mm
No.1-72	72	D3T06014L039-I72UNTM...	6	1.45	57	3.9	3	3	3	1.6
No.1-64	No.2-64	64	D3T06014L042-I64UNTM...	6	1.40	57	4.2	3	3	1.5
No.2-56	No.3-56	56	D3T06016L050-I56UNTM...	6	1.65	57	5.0	3	3	1.8
No.3-48	No.4-48	48	D3T06019L060-I48UNTM...	6	1.90	57	6.0	3	3	2.1
No.4, No.5-40	No.6-40	40	D3T06021L060-I40UNTM...	6	2.10	57	6.0	3	3	2.3
No.5-40	No.6-40	40	D3T06024L072-I40UNTM...	6	2.45	57	7.2	3	3	2.6
	No.8-36	36	D3T06033L087-I36UNTM...	6	3.30	57	8.7	3	3	3.5
No.6, No.8-32	No.10-32	32	D3T06025L074-I32UNTM...	6	2.55	57	7.4	3	3	2.8
No.8-32	No.10-32	32	D3T06032L100-I32UNTM...	6	3.20	57	10.0	3	3	3.5
	No.10-32	32	D3T06038L103-I32UNTM...	6	3.80	57	10.3	3	3	4.0
	1/4"x28	28	D3T06052L132-I28UNTM...	6	5.25	57	13.2	3	3	5.5
No.10-24	5/16"x24	24	D3T06035L102-I24UNTM...	6	3.58	57	10.2	3	3	3.9
	5/16"x24	24	D3T08066L165-I24UNTM...	8	6.68	63	16.5	3	3	6.9
1/4"x20	7/16"x20	20	D3T06048L134-I20UNTM...	6	4.88	57	13.4	3	3	5.2
	7/16"x20	20	D3T10095L230-I20UNTM...	10	9.55	73	23.0	3	3	9.9
5/16"x18		18	D3T08061L169-I18UNTM...	8	6.15	63	16.9	3	3	6.6
3/8"x16		16	D3T08067L191-I16UNTM...	8	6.70	63	19.1	3	3	8.0
7/16"x14		14	D3T10090L233-I14UNTM...	10	9.00	73	23.3	3	3	9.4

### MilliPro Miniature Thread Mills

3 x Do ( $L1 \leq 3 \times$  Thread Diameter)

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*	
UNC	UNF	TPI	Internal	D	D2	L	L1	Z	Zt	mm
No.1-72	72	D3T03014L057-I72UNTM...	3	1.45	30	5.75	3	3	3	1.6
No.1-72	72	D3T06014L057-I72UNTM...	6	1.45	57	5.75	3	3	3	1.6
No.2-56	No.3-56	56	D3T03016L070-I56UNTM...	3	1.65	30	7.0	3	3	1.8
No.4, No.5-40	No.6-40	40	D3T03021L090-I40UNTM...	3	2.10	30	9.0	3	3	2.3
No.4, No.5-40	No.6-40	40	D3T06021L090-I40UNTM...	6	2.10	57	9.0	3	3	2.3
No.5-40	No.6-40	40	D3T06024L100-I40UNTM...	6	2.45	57	10.0	3	3	2.6
No.6, No.8-32	No.10-32	32	D3T03025L110-I32UNTM...	3	2.55	30	11.0	3	3	2.8
No.6, No.8-32	No.10-32	32	D3T06025L110-I32UNTM...	6	2.55	57	11.0	3	3	2.8
No.8-32	No.10-32	32	D3T06032L130-I32UNTM...	6	3.20	57	13.0	3	3	3.4
	No.10-32	32	D3T06038L150-I32UNTM...	6	3.80	57	15.1	3	3	4.0
No.12-28	1/4"x28	28	D3T06044L170-I28UNTM...	6	4.40	57	17.0	3	3	4.7
	1/4"x28	28	D3T06052L196-I28UNTM...	6	5.25	57	19.6	3	3	5.5
	5/16"x24	24	D3T08066L245-I24UNTM...	8	6.68	63	24.5	3	3	6.9
1/4"x20	7/16"x20	20	D3T06048L198-I20UNTM...	6	4.88	57	19.8	3	3	5.1
5/16"x18		18	D3T08061L239-I18UNTM...	8	6.15	63	24.0	3	3	6.6

\* Bore diameter applies to smallest thread dia.

## UNJ

## MilliPro

**Internal**

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

### MilliPro - Miniature Thread Mills

3 x Do (L1 ≤ 3 x Thread Diameter)

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*	
UNJC	UNJF	TPI	Internal	D	D2	L	L1	Z	Zt	mm
0.138"(#6)	0.190"(#10)	32	D3T06027L110-I32UNJTM...	6	2.70	57	11.0	3	3	2.8
	0.250"(1/4")	28	D3T06054L195-I28UNJTM...	6	5.40	57	19.5	3	3	5.6
0.190"(#10)		24	D3T06037L149-I24UNJTM...	6	3.70	57	14.9	3	3	4.0
	0.3125"(5/16")	24	D3T08067L241-I24UNJTM...	8	6.70	63	24.1	3	3	7.0
0.250"(1/4")		20	D3T06050L195-I20UNJTM...	6	5.00	57	19.5	3	3	5.3
	0.4375"(7/16")	20	D3T10096L335-I20UNJTM...	10	9.60	73	33.5	3	3	10.0
0.3125"(5/16")	0.5625"(9/16")	18	D3T08064L241-I18UNJTM...	8	6.40	63	24.1	3	3	6.75
0.375"(3/8")	0.750"(3/4")	16	D3T08077L290-I16UNJTM...	8	7.70	63	29.0	3	3	8.1
0.4375"(7/16")	0.875"(7/8")	14	D3T10092L335-I14UNJTM...	10	9.20	73	33.5	3	3	9.5
0.500"(1/2")		13	D3T10099L385-I13UNJTM...	10	9.90	73	38.5	3	3	11.0

## MJ

## MilliPro

**Internal**

Defined by: ISO 5855  
Tolerance class: 4h/6h-4H/5H

### MilliPro - Miniature Thread Mills

3 x Do (L1 ≤ 3 x Thread Diameter)

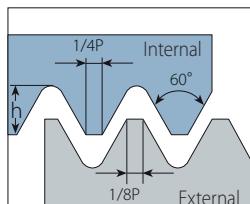
Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.
Standard	mm	Internal	D	D2	L	L1	Z	Zt	mm
MJ3x0.5	0.5	D3T06024L092-I0.5MJTM...	6	2.40	57	9.2	3	3	2.6
MJ3.5x0.6	0.6	D3T06028L110-I0.6MJTM...	6	2.85	57	11.0	3	3	3.0
MJ4x0.7	0.7	D3T06031L123-I0.7MJTM...	6	3.15	57	12.3	3	3	3.4
MJ5x0.8	0.8	D3T06040L154-I0.8MJTM...	6	4.05	57	15.4	3	3	4.3
MJ6x1.0	1.0	D3T06048L185-I1.0MJTM...	6	4.80	57	18.5	3	3	5.1
MJ8x1.25	1.25	D3T08065L246-I1.25MJTM...	8	6.50	63	24.6	3	3	6.9
MJ10x1.5	1.50	D3T10082L308-I1.50MJTM...	10	8.20	73	30.8	3	3	8.7
MJ12x1.75	1.75	D3T10099L370-I1.75MJTM...	10	9.90	73	37.0	3	3	10.4
MJ14x2	2.0	D3T12119L425-I2.0MJTM...	12	11.90	83	42.5	3	3	12.25

\* Bore diameter applies to smallest thread dia.

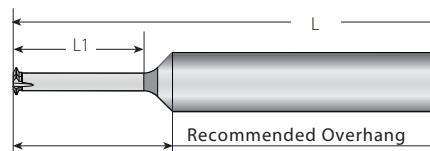
## ISO Metric

## MilliPro Dental

### Internal



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



### MilliPro Dental

#### Miniature Thread Mills for Dental Implants

3xD<sub>O</sub> (L<sub>1</sub>≤3 x Thread Diameter)

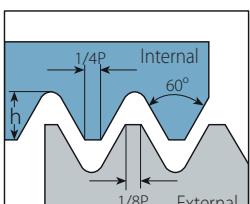
Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.	
M Coarse	M Fine	mm	Internal	D	D <sub>2</sub>	L	L <sub>1</sub>	Z	Z <sub>t</sub>	mm
M1.0x0.25	M1.4x0.25	0.25	D1T03007L031-I0.25ISOTM...	3	0.70	31	3.1	3	1	0.75
M1.2x0.25	M1.4x0.25	0.25	D1T03009L038-I0.25ISOTM...	3	0.90	31	3.8	3	1	0.95
M1.4x0.3	-	0.30	D1T03011L044-I0.30ISOTM...	3	1.05	31	4.4	3	1	1.15
M1.6x0.35	-	0.35	D1T03012L050-I0.35ISOTM...	3	1.20	31	5.0	3	1	1.30
M1.8x0.35	M2.0x0.35	0.35	D1T03014L056-I0.35ISOTM...	3	1.40	31	5.6	3	1	1.50
M2.0x0.4	-	0.40	D1T03015L062-I0.40ISOTM...	3	1.50	31	6.2	3	1	1.65
M2.5x0.45	-	0.45	D1T03019L077-I0.45ISOTM...	3	1.95	31	7.7	3	1	2.10

TM Solid

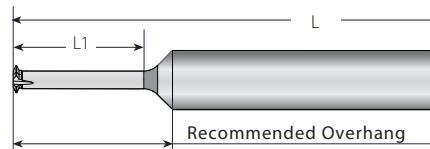
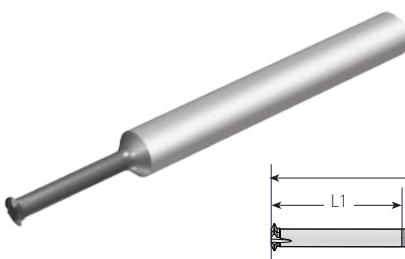
## American UN

## MilliPro Dental

### Internal



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



### MilliPro Dental

#### Miniature Thread Mills for Dental Implants

3xD<sub>O</sub> (L<sub>1</sub>≤3 x Thread Diameter)

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.
UNF	TPI	Internal	D	D <sub>2</sub>	L	L <sub>1</sub>	Z	Z <sub>t</sub>	mm
0-80	80	D1T03011L046-I80UNTM...	3	1.15	31	4.6	3	1	1.30
1-72	72	D1T03014L065-I72UNTM...	3	1.45	31	6.5	3	1	1.60

The MilliPro Dental line was specially designed for machining Titanium and Stainless Steel in high RPM.  
MilliPro Dental D1T tools are also suitable for general use applications.

## ISO Metric

## MilliPro EL

**Internal**

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

### MilliPro EL

#### Miniature Thread Mills, Extra Long Tools

2 x Do (L1 ≤ 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	L1	Z	Zt	mm
M2x0.4		0.4	D3T06015L042-I0.4ISOTML...	6	1.55	100	4.2	3	3	1.6
M2.5x0.45		0.45	D3T06019L052-I0.45ISOTML...	6	1.95	100	5.2	3	3	2.05
M3x0.5	M3.5-M16x0.5	0.5	D3T06024L062-I0.5ISOTML...	6	2.40	100	6.2	3	3	2.5

## American UN

## MilliPro EL

**Internal**

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

### MilliPro EL

#### Miniature Thread Mills, Extra Long Tools

2 x Do (L1 ≤ 2 x Thread Diameter)

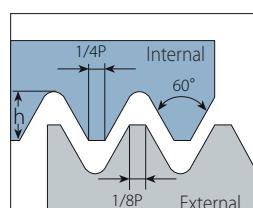
Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*	
UNC	UNF	TPI	Internal	D	D2	L	L1	Z	Zt	mm
No.2-56	No.3-56	56	D3T06016L050-I56UNTM...	6	1.65	100	5.0	3	3	1.8
No.4, No.5-40	No.6-40	40	D3T06021L060-I40UNTM...	6	2.10	100	6.0	3	3	2.3
No.6, No.8-32	No.10-32	32	D3T06025L074-I32UNTM...	6	2.55	100	7.4	3	3	2.8
No.8-32	No.10-32	32	D3T06032L100-I32UNTM...	6	3.20	100	10.0	3	3	3.4

\* Bore diameter applies to smallest thread dia.

## ISO Metric

## MilliPro HD

### Internal



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

Left Hand Tool

### MilliPro HD

#### Miniature Thread Mills for Hard Materials Up to 62HRc

2 x Do ( $L1 \leq 2 \times$  Thread Diameter)

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*	
M Coarse	M Fine	mm	Internal	D	D2	L	L1	Z	Zt	mm
M2x0.4		0.4	S2L06015L042-I0.4ISOTM...	6	1.55	76	4.60	4	2	1.6
M2.2x0.45		0.45	S2L06016L046-I0.45ISOTM...	6	1.65	76	5.05	4	2	1.8
M2.5x0.45		0.45	S2L06019L052-I0.45ISOTM...	6	1.95	76	5.65	4	2	2.05
M3x0.5	M3.5-M16x0.5	0.5	S2L06024L062-I0.5ISOTM...	6	2.40	76	6.75	4	2	2.55
M3.5x0.6		0.6	S2L06027L073-I0.6ISOTM...	6	2.75	76	7.90	4	2	2.95
M4x0.7		0.7	S2L06031L083-I0.7ISOTM...	6	3.15	76	9.05	4	2	3.35
M5x0.8		0.8	S2L06040L104-I0.8ISOTM...	6	4.05	76	11.20	4	2	4.3
M6x1.0	M8-M40x1.0	1.0	S2L06048L125-I1.0ISOTM...	6	4.80	76	13.50	5	2	5.1
M8x1.25		1.25	S2L08065L166-I1.25ISOTM...	8	6.50	80	17.85	5	2	6.8
M10x1.5	M12-M48x1.50	1.50	S2L08079L208-I1.50ISOTM...	8	7.90	80	22.30	6	2	8.6
M12x1.75		1.75	S2L10099L250-I1.75ISOTM...	10	9.90	101	26.75	6	2	10.4

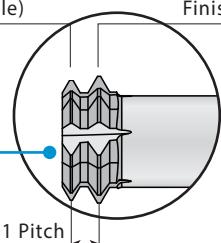
### MilliPro HD

#### Miniature Thread Mills for Hard Materials Up to 62HRc

3 x Do ( $L1 \leq 3 \times$  Thread Diameter)

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*	
M Coarse	M Fine	mm	Internal	D	D2	L	L1	Z	Zt	mm
M2x0.4		0.4	S2L06015L062-I0.4ISOTM...	6	1.55	76	6.60	4	2	1.6
M2.5x0.45		0.45	S2L06019L077-I0.45ISOTM...	6	1.95	76	8.15	4	2	2.05
M3x0.5	M3.5-M16x0.5	0.5	S2L06024L092-I0.5ISOTM...	6	2.40	76	9.75	4	2	2.55
M4x0.7		0.7	S2L06031L123-I0.7ISOTM...	6	3.15	76	13.05	4	2	3.35
M5x0.8		0.8	S2L06040L154-I0.8ISOTM...	6	4.05	76	16.20	4	2	4.3
M6x1.0	M8-M40x1.0	1.0	S2L06048L185-I1.0ISOTM...	6	4.80	76	19.50	5	2	5.1
M8x1.25		1.25	S2L08065L246-I1.25ISOTM...	8	6.50	80	25.85	5	2	6.8

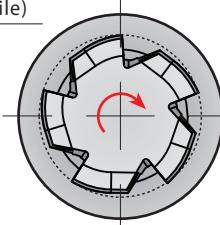
#### Roughing (Partial Profile)



Two cutting teeth: Partial Profile for leading tooth followed by Full Profile for finishing.

The work direction should be from the top to the bottom (Climb Milling).

#### Finish (Full Profile)



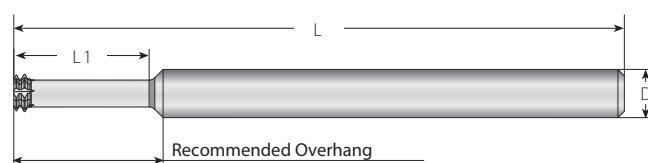
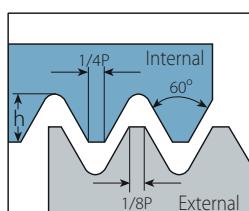
MilliPro HD Tools are left handed. For CNC use M04 code.

\* Bore diameter applies to smallest thread dia.

# American UN

# MilliPro HD

## Internal



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

Left Hand Tool

## MilliPro HD

### Miniature Thread Mills for Hard Materials Up to 62HRc

2 x Do ( $L_1 \leq 2 \times$  Thread Diameter)

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*	
UNC	UNF	TPI	Internal	D	D2	L	$L_1$	Z	Zt	mm
No.2-56	No.3-56	56	S2L06016L050-I56UNTM...	6	1.65	76	5.45	4	2	1.80
No.3-48	No.4-48	48	S2L06019L060-I48UNTM...	6	1.90	76	6.53	4	2	2.10
No.4-40, No.5-40	No.6-40	40	S2L06021L060-I40UNTM...	6	2.10	76	6.64	4	2	2.35
No.5-40	No.6-40	40	S2L06024L072-I40UNTM...	6	2.45	76	7.84	4	2	2.65
	No.8-36	36	S2L06033L087-I36UNTM...	6	3.30	76	9.41	4	2	3.55
No.6-32, No.8-32	No.10-32	32	S2L06025L074-I32UNTM...	6	2.55	76	8.20	4	2	2.85
No.8-32	No.10-32	32	S2L06032L100-I32UNTM...	6	3.20	76	10.79	4	2	3.50
	No.10-32	32	S2L06037L100-I32UNTM...	6	3.70	76	10.80	4	2	4.17
	1/4"x28	28	S2L06052L132-I28UNTM...	6	5.25	76	14.11	5	2	5.55
No.10-24	5/16"x24	24	S2L06035L102-I24UNTM...	6	3.58	76	11.26	4	2	3.90
	5/16"x24	24	S2L08066L165-I24UNTM...	8	6.68	80	17.56	5	2	7.00
1/4"x20	7/16"x20	20	S2L06048L134-I20UNTM...	6	4.88	76	14.67	5	2	5.20
	7/16"x20	20	S2L10095L230-I20UNTM...	10	9.55	101	24.27	6	2	9.90
5/16"x18	18		S2L08061L160-I18UNTM...	8	6.15	80	18.17	4	2	6.50
3/8"x16	16		S2L08076L197-I16UNTM...	8	7.65	80	21.29	5	2	8.00
7/16"x14	14		S2L10090L233-I14UNTM...	10	9.00	101	25.11	6	2	9.50
1/2"x13	13		S2L10099L256-I13UNTM...	10	9.90	101	27.55	6	2	10.90

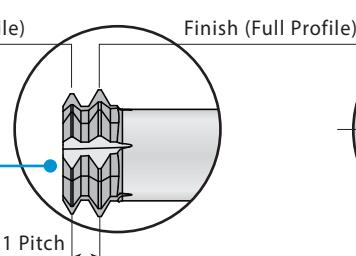
## MilliPro HD

### Miniature Thread Mills for Hard Materials Up to 62HRc

3 x Do ( $L_1 \leq 3 \times$  Thread Diameter)

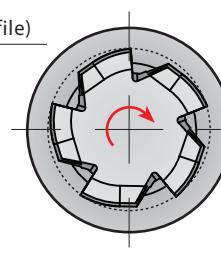
Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*	
UNC	UNF	TPI	Internal	D	D2	L	$L_1$	Z	Zt	mm
No.4-40, No.5-40	No.6-40	40	S2L06021L090-I40UNTM...	6	2.10	76	9.64	4	2	2.35
No.5-40	No.6-40	40	S2L06024L100-I40UNTM...	6	2.45	76	10.64	4	2	2.65
No.6-32, No.8-32	No.10-32	32	S2L06025L110-I32UNTM...	6	2.55	76	11.79	4	2	2.85
No.8-32	No.10-32	32	S2L06032L130-I32UNTM...	6	3.20	76	13.79	4	2	3.50
	1/4"x28	28	S2L06052L196-I28UNTM...	6	5.25	76	20.51	5	2	5.55
	5/16"x24	24	S2L08066L245-I24UNTM...	8	6.68	80	25.56	5	2	7.00
1/4"x20	7/16"x20	20	S2L06048L198-I20UNTM...	6	4.88	76	21.07	5	2	5.20
5/16"x18	18		S2L08061L240-I18UNTM...	8	6.15	80	26.17	4	2	6.50
7/16"x14	14		S2L10090L335-I14UNTM...	10	9.00	101	35.31	6	2	9.50

#### Roughing (Partial Profile)



Two cutting teeth: Partial Profile for leading tooth followed by Full Profile for finishing.

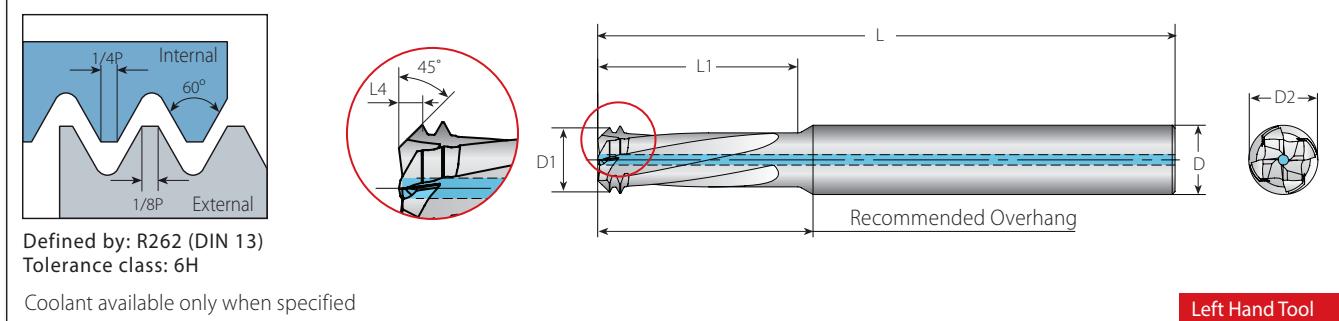
The work direction should be from the top to the bottom (Climb Milling).



MilliPro HD Tools are left handed. For CNC use M04 code.

\* Bore diameter applies to smallest thread dia.

## Internal



## TMDR - Drilling, Thread Milling &amp; Chamfering

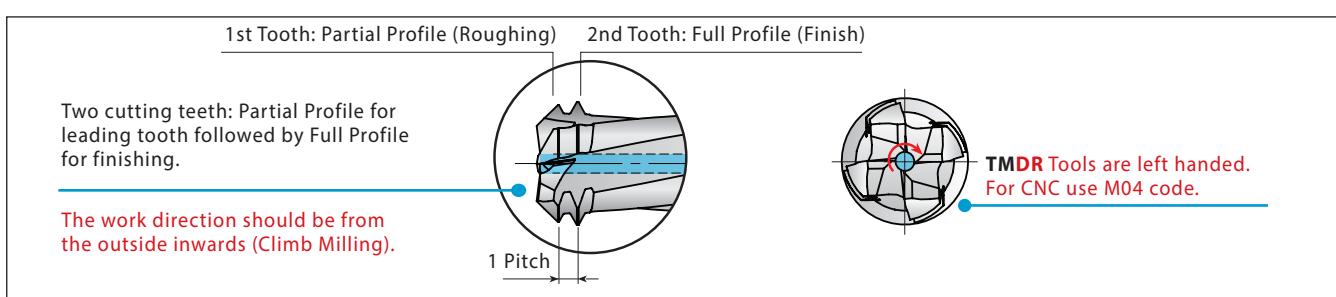
2 x Do ( $L1 \leq 2 \times$  Thread Diameter)

Thread		Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth		
M Coarse	M Fine	mm	Internal	D	D2	L	L1	Z	Zt	L4*	D1
<b>Without coolant</b>											
M3x0.5	M4x0.5	0.50	TD-2L06024L070-I0.50ISO...	6	2.40	58	7.0	3	2	0.40	2.08
M4x0.7		0.70	TD-2L06032L092-I0.70ISO...	6	3.20	58	9.2	3	2	0.57	2.88
M5x0.8		0.80	TD-2L06039L115-I0.80ISO...	6	3.90	58	11.5	3	2	0.70	3.51
M6-M7x1.0	M8-M9x1.0	1.00	TD-2L06047L140-I1.00ISO...	6	4.70	58	14.0	3	2	0.79	4.16
<b>With coolant</b>											
M6-M7x1.0	M8-M9x1.0	1.00	TDC2L08047L140-I1.00ISO...	8	4.70	64	14.0	3	2	0.79	4.16
M8x1.25	M9-M12x1.25	1.25	TDC2L08061L180-I1.25ISO...	8	6.10	64	18.0	4	2	0.90	5.57
M10x1.5	M11-M15x1.5	1.50	TDC2L08078L230-I1.50ISO...	8	7.80	64	23.0	4	2	1.12	7.24
M12x1.75		1.75	TDC2L10090L260-I1.75ISO...	10	9.00	80	26.0	4	2	1.20	8.35
M16x2.0	M17-M23x2.0	2.00	TDC2L12118L350-I2.00ISO...	12	11.80	100	35.0	4	2	2.00	11.13
M18-M22x2.50		2.50	TDC2L16150L446-I2.5ISO...	16	15.00	135	44.6	4	2	2.25	14.08

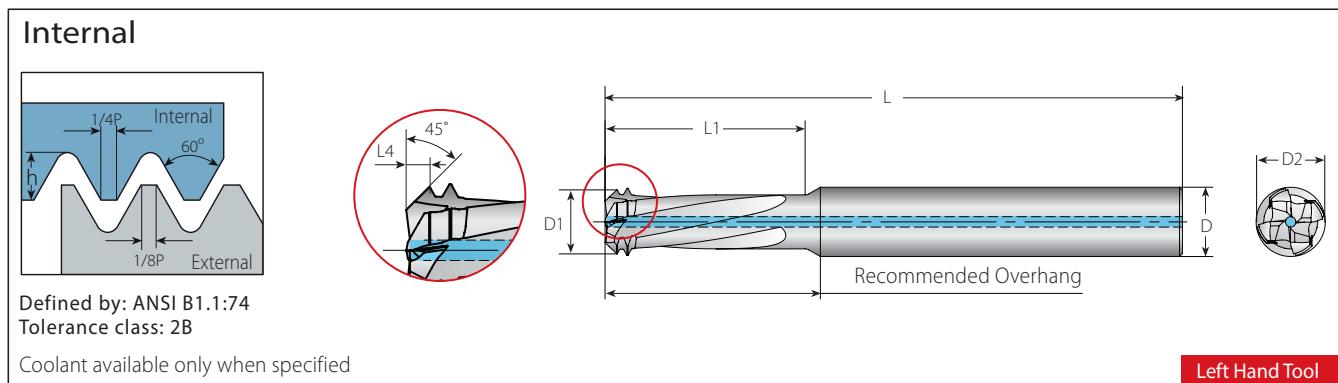
## TMDR - Drilling, Thread Milling &amp; Chamfering

2.5 x Do ( $L1 \leq 2.5 \times$  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
<b>Without coolant</b>											
M3x0.5	M4x0.5	0.50	TD-2L06024L085-I0.50ISO...	6	2.40	58	8.5	3	2	0.40	2.08
M4x0.7		0.70	TD-2L06032L112-I0.70ISO...	6	3.20	58	11.2	3	2	0.57	2.88
M5x0.8		0.80	TD-2L06039L144-I0.80ISO...	6	3.90	58	14.4	3	2	0.70	3.51
M6-M7x1.0	M8-M9x1.0	1.00	TD-2L06047L170-I1.00ISO...	6	4.70	58	17.0	3	2	0.79	4.16
<b>With coolant</b>											
M6-M7x1.0	M8-M9x1.0	1.00	TDC2L08047L170-I1.00ISO...	8	4.70	64	17.0	3	2	0.79	4.16
M8x1.25	M9-M12x1.25	1.25	TDC2L08061L220-I1.25ISO...	8	6.10	64	22.0	4	2	0.90	5.57
M18-M22x2.50		2.50	TDC2L16150L546-I2.5ISO...	16	15.00	135	54.6	4	2	2.25	14.08



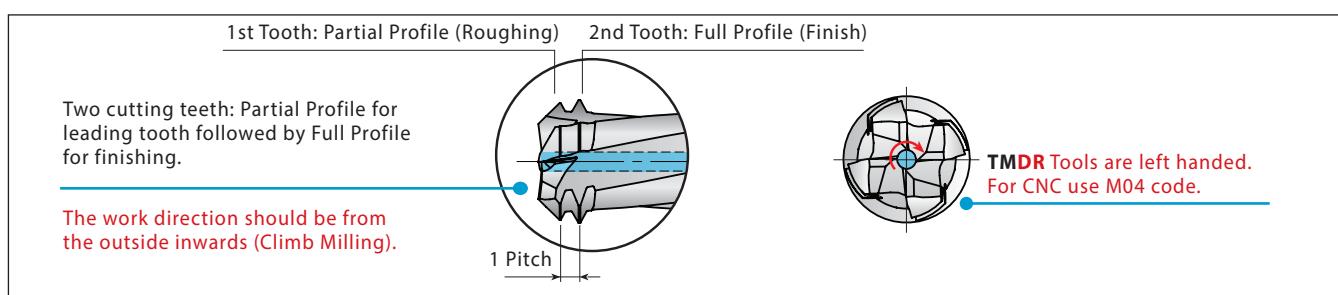
\* Please use the VARGUS GENius™ for Chamfer recommendations

**TMDR - Drilling, Thread Milling & Chamfering****2 x Do (L1 ≤ 2 x Thread Diameter)**

Thread				Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	
UNC	UNF	UN	TPI	Internal	D	D2	L	L1	Z	Zt	L4*	D1
<b>Without coolant</b>												
No.4-40, No.5-40	No.6-40		40	TD-2L06021L072-I40UNC...	6	2.10	58	7.2	3	2	0.38	1.76
No.6-32, No.8-32			32	TD-2L06026L086-I32UNC...	6	2.60	58	8.6	3	2	0.45	2.21
No.8-32	No.10-32		32	TD-2L06030L100-I32UNC...	6	3.00	58	10.0	3	2	0.60	2.62
1/4"x28	5/16"x28	28		TD-2L06050L144-I28UNF...	6	5.00	58	14.4	3	2	0.69	4.58
No.10-24, No.12-24			24	TD-2L06035L114-I24UNC...	6	3.50	58	11.4	3	2	0.80	3.18
1/4"x20	5/16"x20	20		TD-2L06048L145-I20UNC...	6	4.80	58	14.5	3	2	0.80	4.29
<b>With coolant</b>												
1/4"x28	5/16"x28	28		TDC2L08050L144-I28UNF...	8	5.00	64	14.4	3	2	0.69	4.58
5/16"x24, 3/8"x24			24	TDC2L08065L176-I24UNF...	8	6.50	64	17.6	3	2	0.85	6.02
1/4"x20	5/16"x20	20		TDC2L08048L145-I20UNC...	8	4.80	64	14.5	3	2	0.80	4.29

**TMDR - Drilling, Thread Milling & Chamfering****2.5 x Do (L1 ≤ 2.5 x Thread Diameter)**

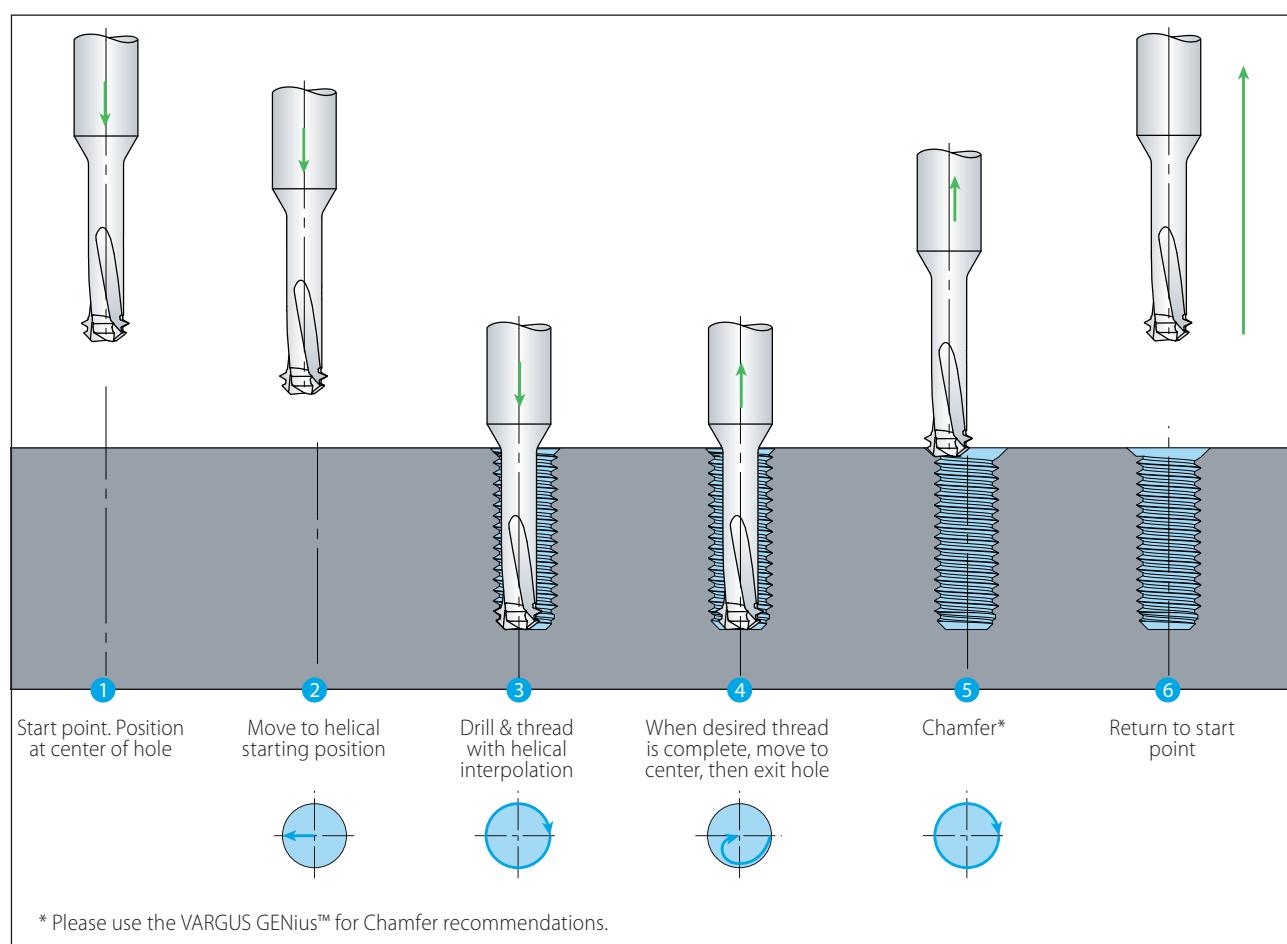
Thread				Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	
UNC	UNF	UN	TPI	Internal	D	D2	L	L1	Z	Zt	L4*	D1
<b>Without coolant</b>												
No.4-40, No.5-40	No.6-40		40	TD-2L06021L088-I40UNC...	6	2.10	58	8.8	3	2	0.38	1.76
No.6-32, No.8-32			32	TD-2L06026L105-I32UNC...	6	2.60	58	10.5	3	2	0.45	2.21
No.8-32	No.10-32		32	TD-2L06030L122-I32UNC...	6	3.00	58	12.2	3	2	0.60	2.62
1/4"x28	5/16"x28	28		TD-2L06050L178-I28UNF...	6	5.00	58	17.8	3	2	0.69	4.58
1/4"x20	5/16"x20	20		TD-2L06048L180-I20UNC...	6	4.80	58	18.0	3	2	0.80	4.29
<b>With coolant</b>												
1/4"x28	5/16"x28	28		TDC2L08050L178-I28UNF...	8	5.00	64	17.8	3	2	0.69	4.58
5/16"x24, 3/8"x24			24	TDC2L08065L218-I24UNF...	8	6.50	64	21.8	3	2	0.85	6.02
1/4"x20	5/16"x20	20		TDC2L08048L180-I20UNC...	8	4.80	64	18.0	3	2	0.80	4.29
3/8"x16	7/16"x16	16		TDC2L08067L260-I16UNC...	8	6.70	64	26.0	4	2	1.10	6.18



\* Please use the VARGUS GENius™ for Chamfer recommendations

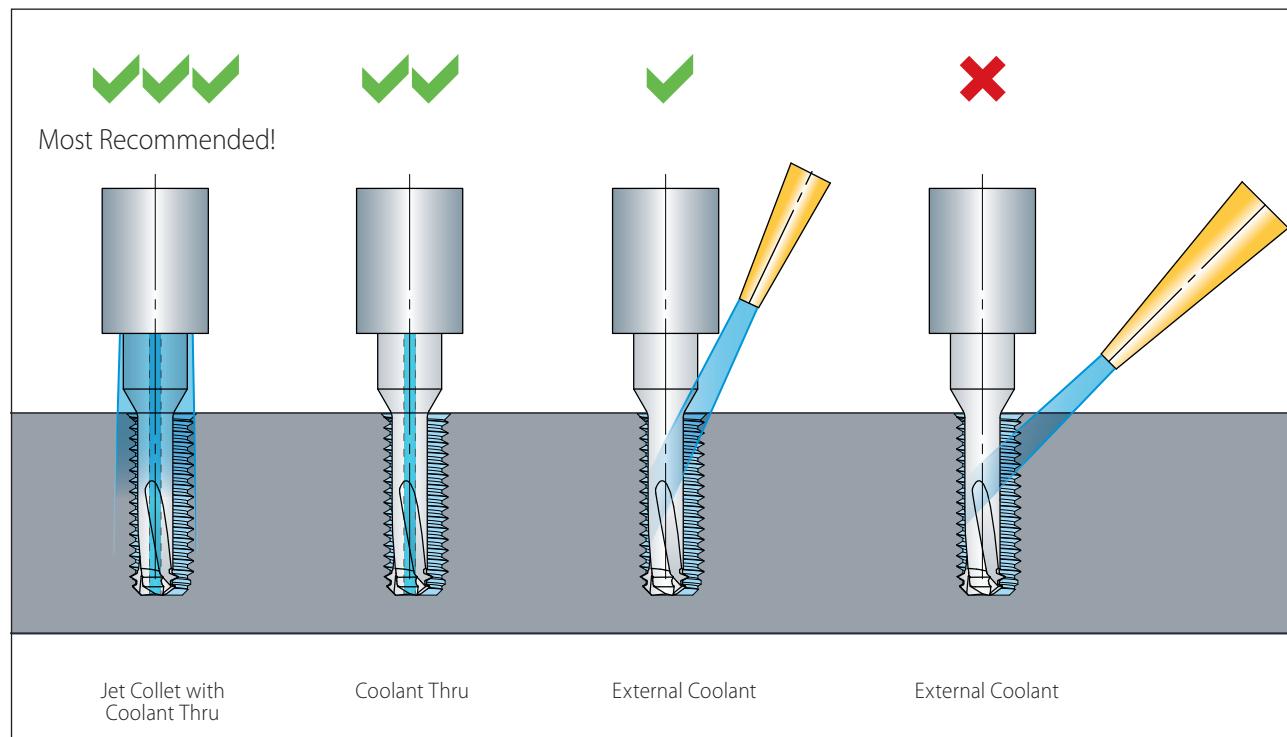
## TMDR - Operating Cycle

**TMDR**



## TMDR - Coolant Use for Best Chip Evacuation

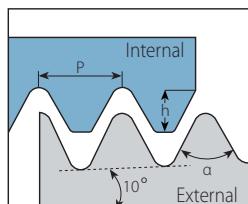
TM Solid



## Tap 60°, Tap 55°

## Straight

### Internal



### Straight Flutes - Taper 60°

#### TM Solid Straight Flutes for Bone Plate Applications

Pitch	Ordering Code	Taper	Thread Angle	Profile Height	Dimensions mm					No. of Flutes	Teeth
mm		Internal	α	h	D	D2	D1	L	Le	Z	Zt
0.4	S06059L080-I0.4TAP60TM...	20°	60°	0.20	6	5.9	3.2	57	8.0	3	20
0.5	S06059L090-I0.5TAP60TM...	20°	60°	0.25	6	5.9	2.9	57	9.0	3	18

### Straight Flutes - Taper 55°

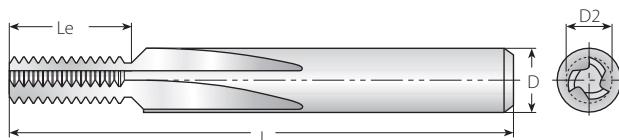
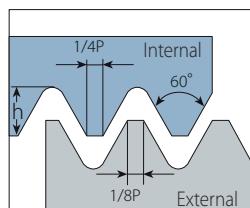
#### TM Solid Straight Flutes for Bone Plate Applications

Pitch	Ordering Code	Taper	Thread Angle	Profile Height	Dimensions mm					No. of Flutes	Teeth
mm		Internal	α	h	D	D2	D1	L	Le	Z	Zt
0.3	S03028L039-I0.3TAP55TM...	20°	55°	0.18	3	2.8	1.5	38	3.9	3	13
0.35	S04039L063-I0.35TAP55TM...	20°	55°	0.20	4	3.9	1.8	45	6.3	3	18
0.4	S06059L100-I0.4TAP55TM...	20°	55°	0.29	6	5.9	2.5	57	10.0	3	25
0.5	S06059L090-I0.5TAP55TM...	20°	55°	0.33	6	5.9	2.9	57	9.0	3	18
0.6	S06059L066-I0.6TAP55TM...	20°	55°	0.47	6	5.9	3.8	57	6.6	3	11

# ISO Metric

# Straight

## External / Internal



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

## Straight Flutes - External

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	
Min. Dia.	mm	External	D	D2	L	Le	Z	Zt	h mm
M3	0.50	S06059-E0.5ISOTM...	6	5.90	57	15.0	3	30	0.31
M4.5	0.75	S08079-E0.75ISOTM...	8	7.90	63	19.5	3,5*	26	0.46
M6	1.00	S10099-E1.0ISOTM...	10	9.90	72	24.0	5	24	0.61
M10	1.50	S12119-E1.5ISOTM...	12	11.90	83	30.0	5	20	0.92
M14	2.00	S12119-E2.0ISOTM...	12	11.90	83	30.0	5	15	1.23
M24	3.00	S16159-E3.0ISOTM...	16	15.90	92	36.0	5	12	1.84
M36	4.00	S16159-E4.0ISOTM...	16	15.90	92	40.0	5	10	2.45
M64	6.00	S20199-E6.0ISOTM...	20	19.90	104	36.0	5	6	3.68

## Straight Flutes - Internal

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	
Min. Dia.	mm	Internal	D	D2	L	Le	Z	Zt	h mm
M4.5	0.75	S04030-I0.75ISOTM...	4	3.00	42	6.7	3	9	0.43
M8	0.75	S06059-I0.75ISOTM...	6	5.90	57	15.0	3	20	0.43
M5	0.80	S04036-I0.8ISOTM...	4	3.60	42	8.0	3	10	0.46
M6	1.00	S06040-I1.0ISOTM...	6	4.00	57	9.0	3	9	0.58
M12	1.00	S08079-I1.0ISOTM...	8	7.90	63	20.0	3,5*	20	0.58
M8	1.25	S06050-I1.25ISOTM...	6	5.00	57	12.5	3	10	0.72
M10	1.50	S06059-I1.5ISOTM...	6	5.90	57	15.0	3	10	0.87
M14	1.50	S10099-I1.5ISOTM...	10	9.90	72	24.0	5	16	0.87
M18	1.50	S12119-I1.5ISOTM...	12	11.90	83	30.0	5	20	0.87
M12	1.75	S08079-I1.75ISOTM...	8	7.90	63	19.2	3,5*	11	1.01
M16	2.00	S10099-I2.0ISOTM...	10	9.90	72	24.0	5	12	1.15
M18	2.00	S12119-I2.0ISOTM...	12	11.90	83	30.0	5	15	1.15
M20	2.50	S12119-I2.5ISOTM...	12	11.90	83	30.0	5	12	1.44
M24	3.00	S16159-I3.0ISOTM...	16	15.90	92	36.0	5	12	1.73
M30	3.50	S16159-I3.5ISOTM...	16	15.90	92	38.5	5	11	2.02
M36	4.00	S16159-I4.0ISOTM...	16	15.90	92	40.0	5	10	2.31
M48	5.00	S20199-I5.0ISOTM...	20	19.90	104	40.0	5	8	2.89
M64	6.00	S20199-I6.0ISOTM...	20	19.90	104	36.0	5	6	3.46

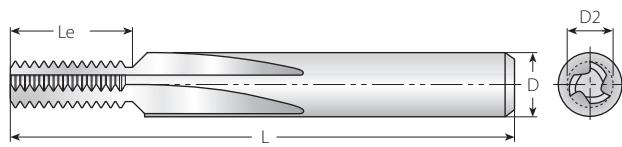
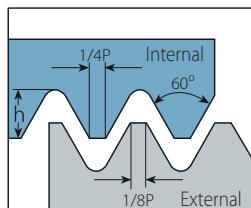
TM Solid

\* Available in 3 and 5 flutes. Add 3 or 5 to the ordering code (TM3.../TM5...).

## American UN

## Straight

### External / Internal



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

### Straight Flutes - External

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	
Min. Dia.	TPI	External	D	D2	L	Le	Z	Zt	h mm
No.6	32	S06059-E32UNTM...	6	5.90	57	14.3	3	18	0.49
No.12	28	S08079-E28UNTM...	8	7.90	63	19.9	3, 5*	22	0.56
1/4"	20	S10099-E20UNTM...	10	9.90	72	22.9	5	18	0.78
5/16"	18	S10099-E18UNTM...	10	9.90	72	24.0	5	17	0.87
3/8"	16	S12119-E16UNTM...	12	11.90	83	28.6	5	18	0.97
9/16"	12	S12119-E12UNTM...	12	11.90	83	29.6	5	14	1.30
1"	8	S16159-E8UNTM...	16	15.90	92	38.1	5	12	1.95
1 3/8"	6	S20199-E6UNTM...	20	19.90	104	38.1	5	9	2.60

### Straight Flutes - Internal

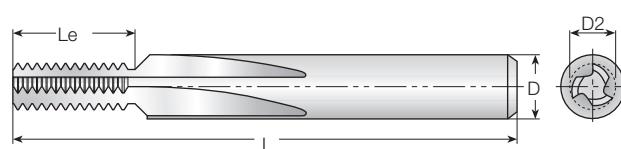
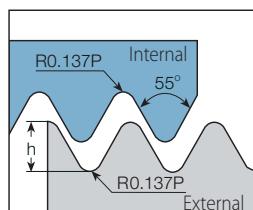
Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	
Min. Dia.	TPI	Internal	D	D2	L	Le	Z	Zt	h mm
No.8	36	S04030-I36UNTM...	4	3.00	42	6.3	3	9	0.41
No.8	32	S04030-I32UNTM...	4	3.00	42	6.3	3	8	0.46
5/16"	32	S06059-I32UNTM...	6	5.90	57	14.3	3	18	0.46
No.12	28	S04036-I28UNTM...	4	3.60	42	8.2	3	9	0.52
7/16"	28	S08079-I28UNTM...	8	7.90	63	19.9	3, 5*	22	0.52
No.12	24	S06040-I24UNTM...	6	4.00	57	8.5	3	8	0.61
1/4"	20	S06040-I20UNTM...	6	4.00	57	10.2	3	8	0.73
9/16"	20	S10099-I20UNTM...	10	9.90	72	22.9	5	18	0.73
5/16"	18	S06050-I18UNTM...	6	5.00	57	12.7	3	9	0.81
9/16"	18	S10099-I18UNTM...	10	9.90	72	24.0	5	17	0.81
3/8"	16	S06059-I16UNTM...	6	5.90	57	14.3	3	9	0.92
3/4"	16	S12119-I16UNTM...	12	11.90	83	28.6	5	18	0.92
7/16"	14	S08079-I14UNTM...	8	7.90	63	18.1	3, 5*	10	1.05
1/2"	13	S08079-I13UNTM...	8	7.90	63	19.5	3, 5*	10	1.13
9/16"	12	S10099-I12UNTM...	10	9.90	72	23.3	5	11	1.22
1"	12	S12119-I12UNTM...	12	11.90	83	29.6	5	14	1.22
5/8"	11	S10099-I11UNTM...	10	9.90	72	23.1	5	10	1.33
3/4"	10	S12119-I10UNTM...	12	11.90	83	27.9	5	11	1.47
7/8"	9	S16159-I9UNTM...	16	15.90	92	33.3	5	12	1.63
1"	8	S16159-I8UNTM...	16	15.90	92	38.1	5	12	1.83
1 1/8"	7	S16159-I7UNTM...	16	15.90	92	36.3	5	10	2.09
1 3/8"	6	S20199-I6UNTM...	20	19.90	104	38.1	5	9	2.44
1 3/4"	5	S20199-I5UNTM...	20	19.90	104	40.6	5	8	2.93
2"	4.5	S20199-I4.5UNTM...	20	19.90	104	39.5	5	7	3.26

\* Available in 3 and 5 flutes. Add 3 or 5 to the ordering code (TM3.../TM5...).

## BSW

## Straight

### External / Internal



Defined by: B.S.84:1956, DIN 259, ISO228/1:1982  
Tolerance class: Medium class A

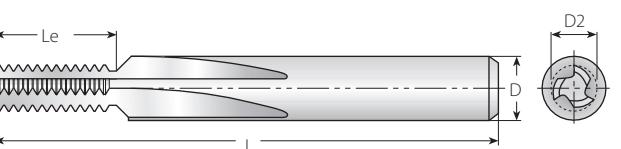
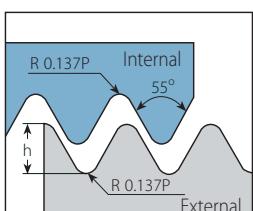
### Straight Flutes

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	
Min. Dia.	TPI	External / Internal	D	D2	L	Le	Z	Zt	h mm
1/4"	20	S06040-EI20BSWTM...	6	4.00	57	10.16	3	8	0.81
5/16"	18	S06050-EI18BSWTM...	6	5.00	57	11.29	3	8	0.90
3/8"	16	S06059-EI16BSWTM...	6	5.90	57	14.29	3	9	1.02
7/16"	14	S08079-EI14BSWTM...	8	7.90	63	18.14	3, 5*	10	1.16
1/2"	12	S08079-EI12BSWTM...	8	7.90	63	19.05	3, 5*	9	1.36
5/8"	11	S10099-EI11BSWTM...	10	9.90	72	23.09	5	10	1.48
3/4"	10	S12119-EI10BSWTM...	12	11.90	83	27.94	5	11	1.63
7/8"	9	S12119-EI9BSWTM...	12	11.90	83	28.22	5	10	1.81
1"	8	S16159-EI8BSWTM...	16	15.90	92	38.10	5	12	2.03
1 1/8"	7	S16159-EI7BSWTM...	16	15.90	92	36.29	5	10	2.32
1 3/8"	6	S16159-EI6BSWTM...	16	15.90	92	38.10	5	9	2.71
1 5/8"	5	S20199-EI5BSWTM...	20	19.90	104	40.64	5	8	3.25
1 7/8"	4.5	S20199-EI4.5BSWTM...	20	19.90	104	39.51	5	7	3.61

## BSP

## Straight

### External / Internal



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

### Straight Flutes

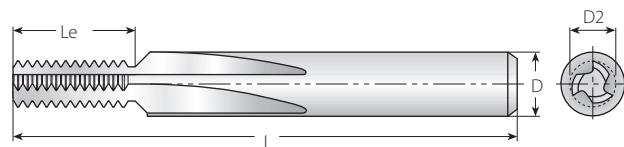
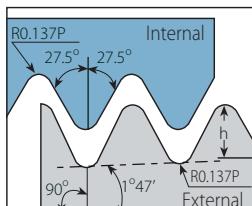
Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	
Min. Dia.	TPI	External / Internal	D	D2	L	Le	Z	Zt	h mm
1/16"	28	S06059-EI28BSPTM...	6	5.90	57	14.51	3	16	0.58
1/4"	19	S08079-EI19BSPTM...	8	7.90	63	18.72	3, 5*	14	0.86
1/2"	14	S12119-EI14BSPTM...	12	11.90	83	29.03	5	16	1.16
1"	11	S16159-EI11BSPTM...	16	15.90	92	34.64	5	15	1.48

\* Available in 3 and 5 flutes. Add 3 or 5 to the ordering code (TM3.../TM5...).

## BSPT

## Straight

### External / Internal



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

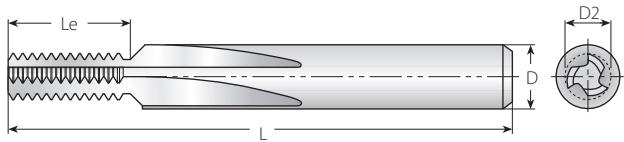
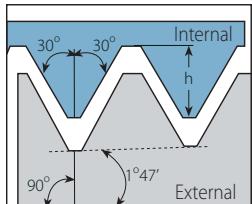
### Straight Flutes

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	
Min. Dia.	TPI	External / Internal	D	D2	L	Le	Z	Zt	h mm
1/16"	28	S06059-EI28BSPT-TM...	6	5.90	57	9.98	3	11	0.58
1/4"	19	S08079-EI19BSPT-TM...	8	7.90	63	14.71	3, 5*	11	0.86
1/2"	14	S12119-EI14BSPT-TM...	12	11.90	83	19.96	5	11	1.16
1"	11	S16159-EI11BSPT-TM...	16	15.90	92	39.25	5	17	1.48

## NPT

## Straight

### External / Internal



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

### Straight Flutes

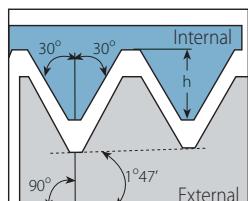
Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	
Min. Dia.	TPI	External / Internal	D	D2	L	Le	Z	Zt	h mm
1/16"	27	S06059-EI27NPT-TM...	6	5.90	57	9.41	3	10	0.66
1/4"	18	S08079-EI18NPT-TM...	8	7.90	63	14.11	3, 5*	10	1.01
1/2"	14	S12119-EI14NPT-TM...	12	11.90	83	19.96	5	11	1.33
1"	11.5	S16159-EI11.5NPT-TM...	16	15.90	92	26.51	5	12	1.64
2 1/2"	8	S16159-EI8NPT-TM...	16	15.90	92	38.10	5	12	2.42

\* Available in 3 and 5 flutes. Add 3 or 5 to the ordering code (TM3.../TM5...).

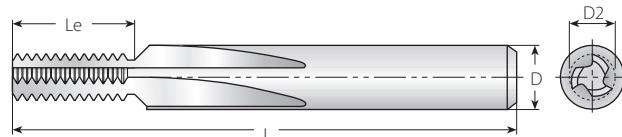
## ANPT

## Straight

### External / Internal



Defined by: MIL-P-7105B  
Tolerance class: Standard ANPT



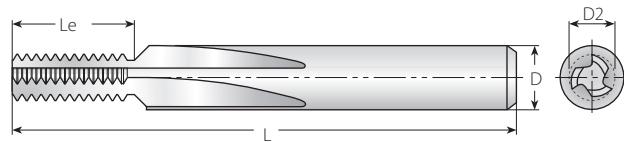
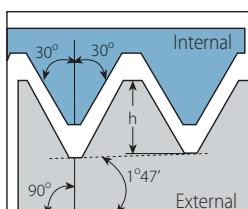
### Straight Flutes

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	
Min. Dia.	TPI	External / Internal	D	D2	L	Le	Z	Zt	h mm
1/4"	18	S08079-EI18ANPT-TM...	8	7.90	63	14.11	5	10	1.10
1/2"	14	S12119-EI14ANPT-TM...	12	11.90	83	19.96	5	11	1.42

## NPTF

## Straight

### External / Internal



Defined by: ANSI 1.20.3-1976  
Tolerance class: Standard NPTF

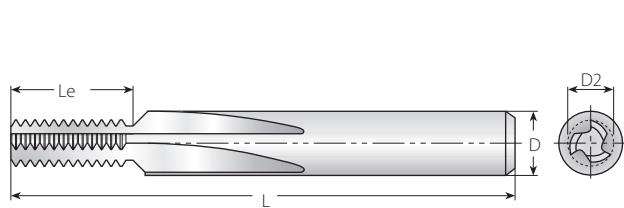
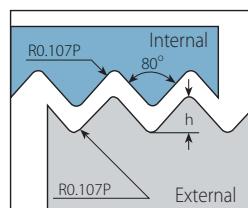
### Straight Flutes

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	
Min. Dia.	TPI	External / Internal	D	D2	L	Le	Z	Zt	h mm
1/16"	27	S06059-EI27NPTFTM...	6	5.90	57	9.41	3	10	0.64
1/4"	18	S08079-EI18NPTFTM...	8	7.90	63	14.11	3, 5*	10	1.0
1/2"	14	S12119-EI14NPTFTM...	12	11.90	83	19.96	5	11	1.35
1"	11.5	S16159-EI11.5NPTFTM...	16	15.90	92	26.51	5	12	1.63
2 1/2"	8	S16159-EI8NPTFTM...	16	15.90	92	38.10	5	12	2.38

## Pg

## Straight

### External / Internal



Defined by: DIN 40430  
Tolerance class: Standard

TM Solid

### Straight Flutes

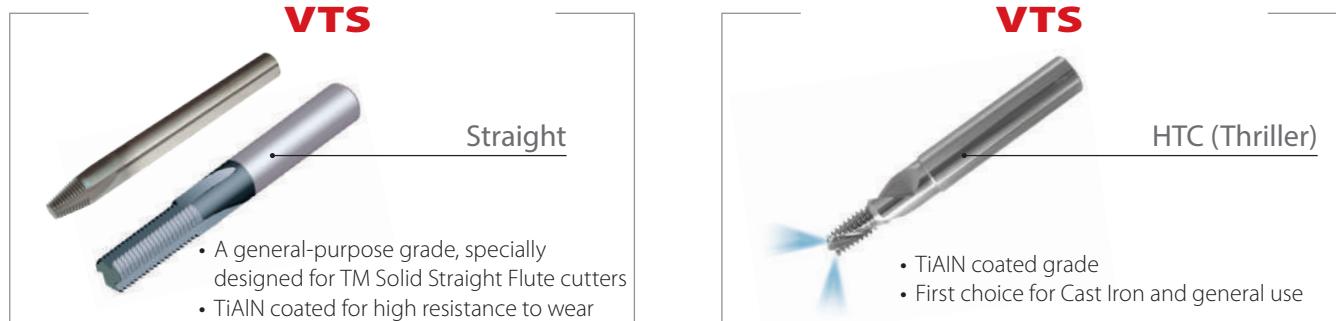
Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	
TPI	External / Internal	D	D2	L	Le	Z	Zt	h mm	
Pg7	20	S08079-EI20PGTM...	8	7.90	63	19.05	3, 5*	15	0.61
Pg9, 11, 13.5, 16	18	S10099-EI18PGTM...	10	9.90	72	23.99	5	17	0.67
Pg21, 29, 36, 42, 48	16	S12119-EI16PGTM...	12	11.90	83	28.58	5	18	0.76

\* Available in 3 and 5 flutes. Add 3 or 5 to the ordering code (TM3.../TM5...).

## Grades and Their Applications



TM Solid



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

Material Group	Vargus No.	Material	Hardness Brinell HB	Vc [m/min]			Feed [mm/tooth]					
				Helicool, HCR, HCC, Helical, Straight, Deep Threading		MilliPro	Helical	Straight	Deep Threading	Helicool HCC HCR		MilliPro
				VTH	VTS					VTH		
<b>P</b> Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	80-250	50-180	60-120	0.03-0.08	0.03-0.08	0.10-0.35	0.03-0.08	0.02-0.16
	2		Medium Carbon (C=0.25-0.55%)	150	80-230	50-140	60-120	0.03-0.08	0.03-0.08	0.08-0.30	0.03-0.08	0.02-0.16
	3		High Carbon (C=0.55-0.85%)	170	80-200	50-120	60-90	0.03-0.08	0.03-0.06	0.08-0.30	0.03-0.08	0.02-0.16
	4	Low Alloy Steel (alloying elements≤5%)	Non Hardened	180	60-180	60-170	60-90	0.03-0.08	0.03-0.07	0.08-0.30	0.03-0.08	0.02-0.16
	5		Hardened	275	60-170	60-160	50-80	0.03-0.07	0.03-0.07	0.08-0.30	0.03-0.07	0.02-0.07
	6		Hardened	350	60-160	60-150	50-80	0.02-0.05	0.02-0.04	0.05-0.15	0.02-0.06	0.02-0.03
	7	High Alloy Steel (alloying elements>5%)	Annealed	200	40-100	40-90	50-80	0.03-0.07	0.03-0.07	0.10-0.24	0.03-0.07	0.02-0.09
	8		Hardened	325	30-80	30-70	50-80	0.02-0.04	0.02-0.05	0.05-0.15	0.03-0.06	0.02-0.03
	9	Cast Steel	Low Alloy (alloying elements <5%)	200	80-250	70-200	70-90	0.03-0.08	0.03-0.06	0.08-0.30	0.03-0.07	0.02-0.16
	10		High Alloy (alloying elements >5%)	225	60-170	60-150	60-80	0.03-0.05	0.03-0.06	0.05-0.15	0.03-0.07	0.02-0.03
<b>M</b> Stainless Steel	11	Stainless Steel Ferritic	Non Hardened	200	60-150	50-140	60-90	0.04-0.07	0.02-0.05	0.11-0.35	0.03-0.08	0.02-0.16
	12		Hardened	330	60-120	50-110	50-80	0.02-0.06	0.01-0.03	0.05-0.24	0.03-0.06	0.02-0.03
	13	Stainless Steel Austenitic	Austenitic	180	60-140	60-130	60-90	0.03-0.08	0.02-0.05	0.11-0.35	0.03-0.08	0.02-0.16
	14		Super Austenitic	200	60-130	50-120	50-80	0.03-0.08	0.02-0.05	0.11-0.35	0.03-0.06	0.02-0.16
	15	Stainless Steel Cast Ferritic	Non Hardened	200	60-160	50-150	60-90	0.03-0.08	0.02-0.05	0.11-0.35	0.03-0.06	0.02-0.16
	16		Hardened	330	60-110	50-100	50-80	0.02-0.05	0.02-0.03	0.10-0.24	0.02-0.05	0.02-0.03
	17	Stainless Steel Cast Austenitic	Austenitic	200	60-150	50-140	60-90	0.03-0.08	0.02-0.06	0.11-0.35	0.02-0.05	0.02-0.16
	18		Hardened	330	60-100	50-90	50-80	0.02-0.05	0.01-0.03	0.10-0.24	0.02-0.04	0.02-0.03
<b>K</b> Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	60-70	60-150	50-80	0.03-0.08	0.03-0.08	0.05-0.15	0.03-0.08	0.02-0.03
	29		Pearlitic (long chips)	230	60-150	80-100	60-90	0.03-0.08	0.03-0.06	0.10-0.24	0.03-0.07	0.02-0.12
	30	Grey Cast Iron	Low Tensile Strength	180	70-160	50-140	70-100	0.03-0.08	0.03-0.06	0.09-0.25	0.03-0.07	0.02-0.16
	31		High Tensile Strength	260	40-120	40-110	60-90	0.02-0.06	0.02-0.05	0.10-0.24	0.03-0.07	0.02-0.12
	32	Nodular Sg Iron	Ferritic	160	40-110	40-100	70-100	0.03-0.08	0.03-0.07	0.09-0.25	0.03-0.08	0.02-0.16
	33		Pearlitic	260	40-100	40-90	60-90	0.02-0.06	0.02-0.05	0.10-0.24	0.03-0.07	0.02-0.12
<b>N</b> Non-Ferrous Metals	34	Aluminium Alloys Wrought	Non Aging	60	200-300	150-250	60-250	0.05-0.12	0.05-0.15	0.12-0.40	0.04-0.1	0.03-0.15
	35		Aged	100	150-250	100-220	60-150	0.05-0.12	0.03-0.1	0.10-0.32	0.03-0.1	0.03-0.16
	36	Aluminium Alloys	Cast	75	100-200	80-150	60-250	0.05-0.12	0.05-0.15	0.10-0.32	0.03-0.1	0.03-0.16
	37		Cast & Aged	90	120-220	90-160	60-150	0.05-0.12	0.03-0.1	0.10-0.30	0.06-0.12	0.02-0.16
	38	Aluminium Alloys	Cast Si 13-22%	130	200-300	150-250	250	0.05-0.12	0.05-0.15	0.10-0.32	0.05-0.12	0.03-0.15
	39	Copper and Copper Alloys	Brass	90	200-300	150-250	60-250	0.06-0.13	0.05-0.15	0.12-0.40	0.05-0.12	0.03-0.16
	40		Bronze And Non Leaded Copper	100	150-250	100-220	60-150	0.05-0.12	0.03-0.1	0.10-0.32	0.05-0.12	0.03-0.15
<b>S</b> Heat Resistant Material	19	High Temperature Alloys	Annealed (iron based)	200	30-60	30-50	60	0.03-0.07	0.02-0.04	0.11-0.35	0.03-0.7	0.02-0.16
	20		Aged (iron based)	280	20-50	20-40	50	0.02-0.04	0.01-0.03	0.05-0.15	0.03-0.06	0.02-0.03
	21		Annealed (nickel or cobalt based)	250	15-35	15-30	35	0.02-0.04	0.01-0.03	0.05-0.15	0.03-0.06	0.02-0.03
	22		Aged (nickel or cobalt based)	350	15-30	15-25	30	0.02-0.04	0.01-0.03	0.05-0.15	0.02-0.05	0.02-0.03
	23	Titanium Alloys	Pure 99.5 Ti	400Rm	40-80	30-70	30-50	0.02-0.04	0.01-0.03	0.10-0.24	0.02-0.05	0.02-0.07
	24		$\alpha+\beta$ Alloys	1050Rm	20-50	20-45	25-35	0.02-0.04	0.01-0.02	0.10-0.24	0.02-0.04	0.02-0.07
<b>H</b> Hardened Material	25	Extra Hard Steel	Hardened & Tempered	45-50HRc	15-45	15-35	45	0.02-0.03	0.02	0.03-0.06	0.02-0.03	-
	26			51-55HRc	15-40	15-30	30	0.02-0.03	0.01	0.03-0.06	0.02-0.03	-

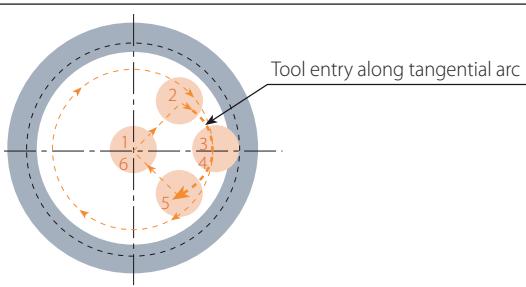
**Recommendation:**

At tool entry, set the Feed f [mm/tooth] to 70% lower than the threading Feed.

**Example:**

Threading Feed: 0.3 [mm/tooth]

Tool entry Feed: 0.09 [mm/tooth]



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

**TMDR**

Material Group	Vargus No.	Material	Hardness Brinell HB	Vc(m/min)	Feed [mm/tooth]	
				TMDR		
				VTS		
<b>P</b> 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
<b>M</b> 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
<b>K</b> 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
<b>N</b> 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
<b>S</b> 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		$\alpha+\beta$ Alloys	1050Rm	25-35	0.02-0.05
<b>H</b> Hardened Material	25	Extra Hard Steel	Hardened & Tempered	45-50HRc	-	-
	26			51-55HRc	-	-

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

**HCN**

Material Group	Vargus Nr.	Material	Hardness Brinell HB	Vc(m/min)	Feed [mm/tooth]	
				HCN		
				VTH		
<b>P</b> Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	50-180	0.03-0.08
	2		Medium Carbon (C=0.25-0.55%)	150	50-140	0.03-0.08
	3		High Carbon (C=0.55-0.85%)	170	50-120	0.03-0.06
	4	Low Alloy Steel (alloying elements≤5%)	Non Hardened	180	60-170	0.03-0.07
	5		Hardened	275	60-160	0.03-0.07
	6		Hardened	350	60-150	0.02-0.04
	7	High Alloy Steel (alloying elements>5%)	Annealed	200	40-90	0.03-0.07
	8		Hardened	325	30-70	0.02-0.05
	9	Cast Steel	Low Alloy (alloying elements <5%)	200	70-200	0.03-0.06
	10		High Alloy (alloying elements >5%)	225	60-150	0.03-0.06
<b>M</b> Stainless Steel	11	Stainless Steel Ferritic	Non Hardened	200	50-140	0.02-0.05
	12		Hardened	330	50-110	0.01-0.03
	13	Stainless Steel Austenitic	Austenitic	180	60-130	0.02-0.05
	14		Super Austenitic	200	50-120	0.02-0.05
	15	Stainless Steel Cast Ferritic	Non Hardened	200	50-150	0.02-0.05
	16		Hardened	330	50-100	0.02-0.03
	17	Stainless Steel Cast Austenitic	Austenitic	200	50-140	0.02-0.06
	18		Hardened	330	50-90	0.01-0.03
<b>K</b> Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	60-150	0.03-0.08
	29		Pearlitic (long chips)	230	80-100	0.03-0.06
	30	Grey Cast Iron	Low Tensile Strength	180	50-140	0.03-0.06
	31		High Tensile Strength	260	40-110	0.02-0.05
	32	Nodular Sg Iron	Ferritic	160	40-100	0.03-0.07
	33		Pearlitic	260	40-90	0.02-0.05
<b>N</b> Non-Ferrous Metals	34	Aluminum Alloys Wrought	Non Aging	60	150-250	0.05-0.15
	35		Aged	100	100-220	0.03-0.1
	36	Aluminum Alloys	Cast	75	80-150	0.05-0.15
	37		Cast & Aged	90	90-160	0.03-0.1
	38	Aluminum Alloys	Cast Si 13-22%	130	150-250	0.05-0.15
	39	Copper and Copper Alloys	Brass	90	150-250	0.05-0.15
	40		Bronze And Non Leaded Copper	100	100-220	0.03-0.1
<b>S</b> Heat Resistant Material	19	High Temperature Alloys	Annealed (iron based)	200	30-50	0.02-0.04
	20		Aged (iron based)	280	20-40	0.01-0.03
	21		Annealed (nickel or cobalt based)	250	15-30	0.01-0.03
	22		Aged (nickel or cobalt based)	350	15-25	0.01-0.03
	23	Titanium Alloys	Pure 99.5 Ti	400Rm	30-70	0.01-0.03
	24		$\alpha+\beta$ Alloys	1050Rm	20-45	0.01-0.02
<b>H</b> Hardened Material	25	Extra Hard Steel	Hardened & Tempered	45-50HRc	-	-
	26			51-55HRc	-	-

## MilliPro HD Cutting Speeds Vc [m/min] and Feed f [mm/tooth]

Material Group	Vargus No.	Material	Hardness Brinell HB	Vc [m/min]	Feed f [mm/tooth] by Cutting Dia.=D2				
				VTH	1.5-2.5	2.5-5	5-7	7-9	9-11
<b>P</b> Steel	6	Low Alloy Steel (alloying elements≤5%)	Hardened	350	25-160	0.04	0.05	0.06	0.07
	8	High Alloy Steel (alloying elements>5%)	Hardened	325	25-180				
<b>M</b> Stainless Steel	12	Stainless Steel Ferritic	Hardened	330	25-120	0.04	0.05	0.06	0.07
	16	Stainless Steel Cast Ferritic	Hardened	330	25-110				
	18	Stainless Steel Cast Austenitic	Hardened	330	25-100				
<b>K</b> Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	25-160	0.05	0.06	0.07	0.08
	29		Pearlitic (long chips)	230	25-150	0.04	0.05	0.06	0.07
	30	Grey Cast Iron	Low Tensile Strength	180	25-130	0.05	0.06	0.07	0.08
	31		High Tensile Strength	260	25-100	0.04	0.05	0.06	0.07
	32	Nodular Sg Iron	Ferritic	160	25-125	0.04	0.05	0.06	0.07
	33		Pearlitic	260	25-90	0.03	0.04	0.05	0.06
<b>S</b> Heat Resistant Material	21	High Temperature Alloys	Annealed (nickel or cobalt based)	250	15-35	0.03	0.04	0.05	0.06
	22		Aged (nickel or cobalt based)	350	15-30				
	23	Titanium Alloys	Pure 99.5 Ti	400Rm	25-70				
	24		$\alpha+\beta$ alloys	1050Rm	25-50				
<b>H</b> Hardened Material	25	Extra Hard Steel	Hardened & Tempered	45-50HRc	25-70	0.04	0.05	0.06	0.07
	26			51-55HRc	25-60	0.03	0.04	0.05	0.06
	27			56-62HRc	25-50	0.02	0.03	0.04	0.05

## HTC Recommended Grades, Cutting Speed and Feed

Material Group	Material	Hardness Brinell HB	Strength (N-mm <sup>2</sup> )	Vc [m/min]		fb[mm/rev]		fz[mm/tooth]	
				VTN	VTS	≤6mm	≤12mm	≤6mm	≤12mm
<b>K</b> Cast Iron	Cast Iron	Grey Cast Iron	≤150	≤500	50-80	80-120	0.10-0.15	0.15-0.22	0.02-0.05
		Grey Cast Iron, Heat Treated	150-300	500-1000	50-80	80-120	0.10-0.15	0.15-0.22	0.02-0.05
		Spher. Graph. Cast Iron	≤200	≤700	50-80	80-120	0.10-0.15	0.15-0.22	0.02-0.05
<b>N</b> Non-Ferrous Metals	Aluminium/Magnesium	Short Chips, Brass, Bronze, Red Brass	≤200	≤700	100-300	—	0.06-0.10	0.10-0.30	0.03-0.06
		Aluminium, Magnesium Non-Alloy	≤100	≤350	100-400	100-400	0.10-0.25	0.25-0.30	0.03-0.06
		Aluminium, Wrought Alloy, Breaking Strain (A5) < 14%	≤180	≤600	100-400	100-400	0.10-0.25	0.25-0.30	0.03-0.06
		Aluminium, Wrought Alloy, Breaking Strain (A5) ≥ 14%	≤180	≤600	100-400	100-400	0.03-0.06	0.06-0.12	0.03-0.06
		Aluminium, Cast Alloy, Si<10%	≤180	≤600	100-300	100-400	0.10-0.25	0.25-0.30	0.03-0.06
	Fibre Reinforced Plastic	Aluminium, Cast Alloy, Si≥10%	≤180	≤600	—	100-300	0.10-0.25	0.25-0.30	0.03-0.06
<b>K</b> Plastic	Thermo Plastics	—	—	60-120	60-120	0.10-0.25	0.25-0.30	0.03-0.06	0.06-0.10
	Thermosetting Plastic	—	—	60-100	60-100	0.10-0.25	0.25-0.30	0.03-0.06	0.06-0.10
	Fibre Reinforced Plastic	—	—	40-60	60-80	0.10-0.15	0.15-0.22	0.02-0.05	0.05-0.10

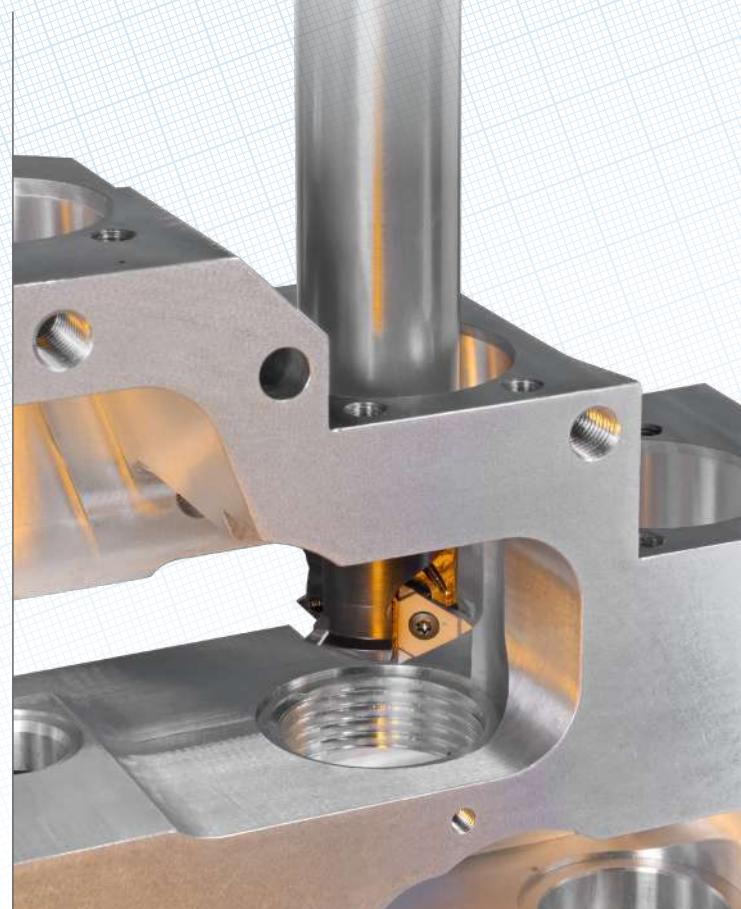
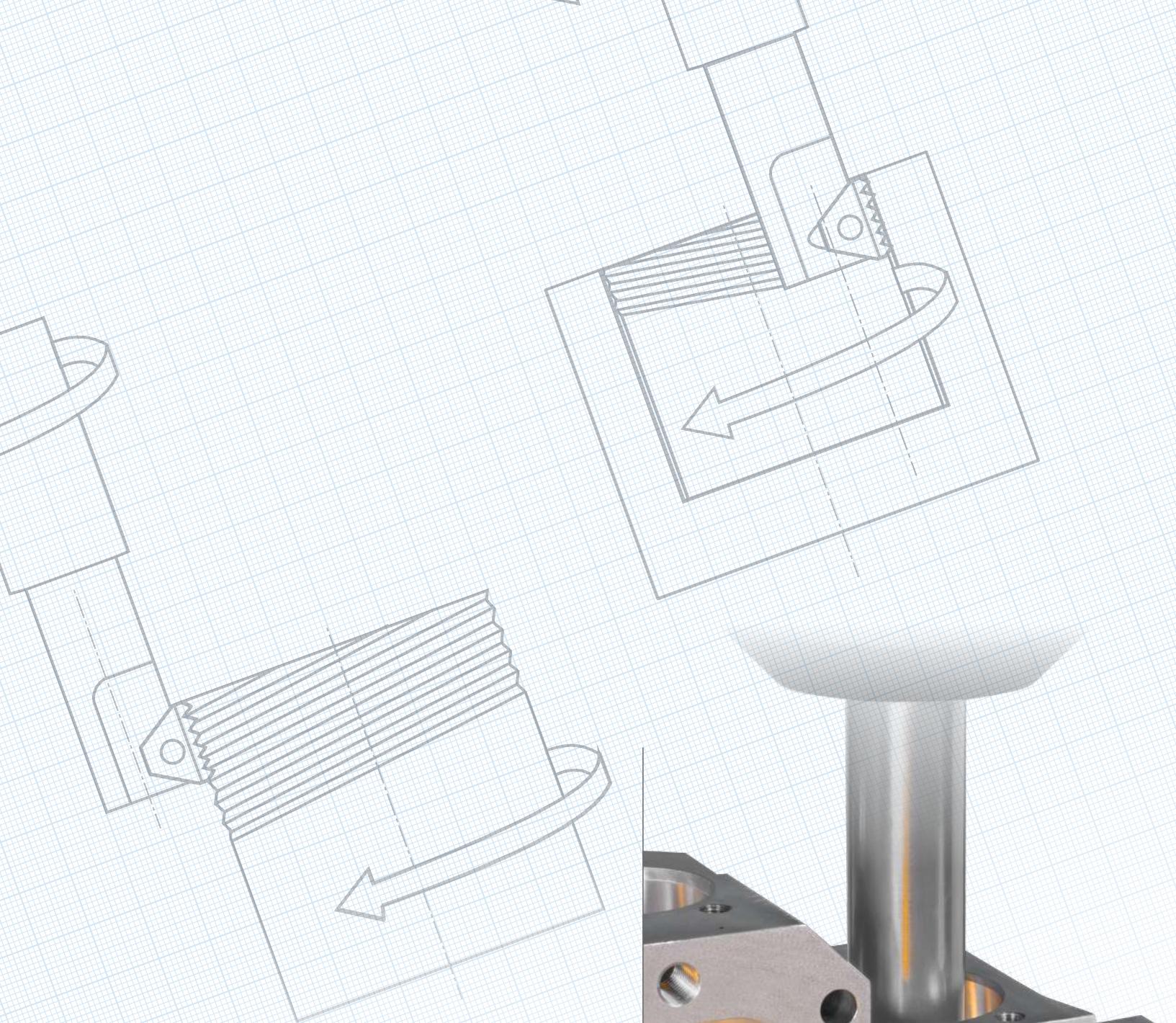
Vc - Cutting Speed [m/min]

fb (Drilling) - Feed per Revolution [mm/rev]

fz (Threading) - Feed per Tooth [mm/tooth]







## Thread Milling Technical Data

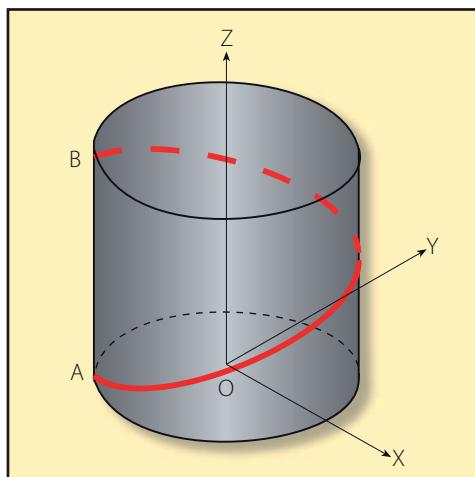
## About Thread Milling

To perform a thread milling operation, a milling machine with three-axis control capable of helical interpolation is required. Helical interpolation is a CNC function producing tool movement along a helical path. This helical motion combines circular movement in one plane with a simultaneous linear motion in a plane perpendicular to the first. For example, the path from point A to point B (Fig. A) on the envelope of the cylinder combines a circular movement in the xy plane with a linear displacement in the z direction.

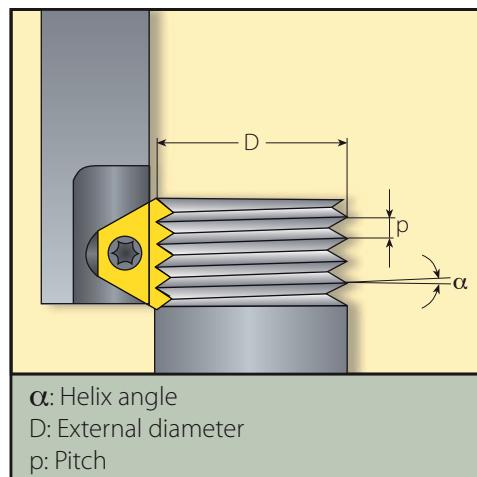
On most CNC systems this function can be executed in two different ways:

GO2: Helical interpolation in a clockwise direction

GO3: Helical interpolation in a counter-clockwise direction



**Fig. A**



**Fig. B**

The thread milling operation (Fig. B) consists of circular rotation of the tool around its own axis together with an orbiting motion along the bore or workpiece circumference.

During one such orbit, the tool will shift vertically one pitch length. These movements combined with the insert geometry create the required thread form.

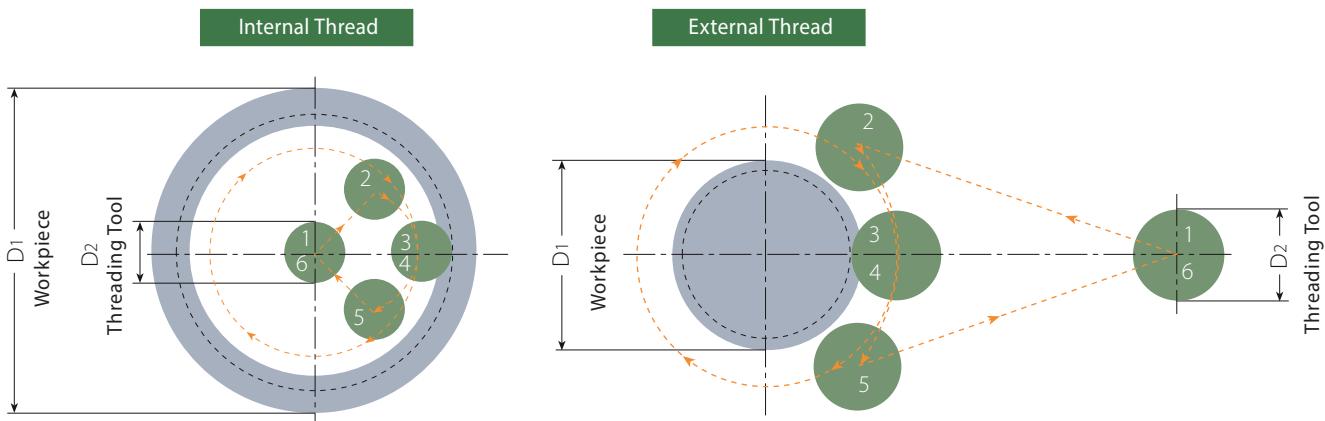
There are three acceptable ways of approaching the workpiece with the tool to initiate production of the thread:

- 1 Tangential Arc Approach**
- 2 Radial Approach**
- 3 Tangential Line Approach**

## 1 Tangential Arc Approach

With this method, the tool enters and exits the workpiece smoothly. No marks are left on the workpiece and there is no vibration, even with harder materials.

Although it requires slightly more complex programming than the radial approach (see below), this is the method recommended for machining the highest quality threads.



1-2: Rapid approach

2-3: Tool entry along tangential arc, with simultaneous feed along z-axis

3-4: Helical movement during one full orbit ( $360^\circ$ )

4-5: Tool exit along tangential arc, with continuing feed along z-axis

5-6: Rapid return

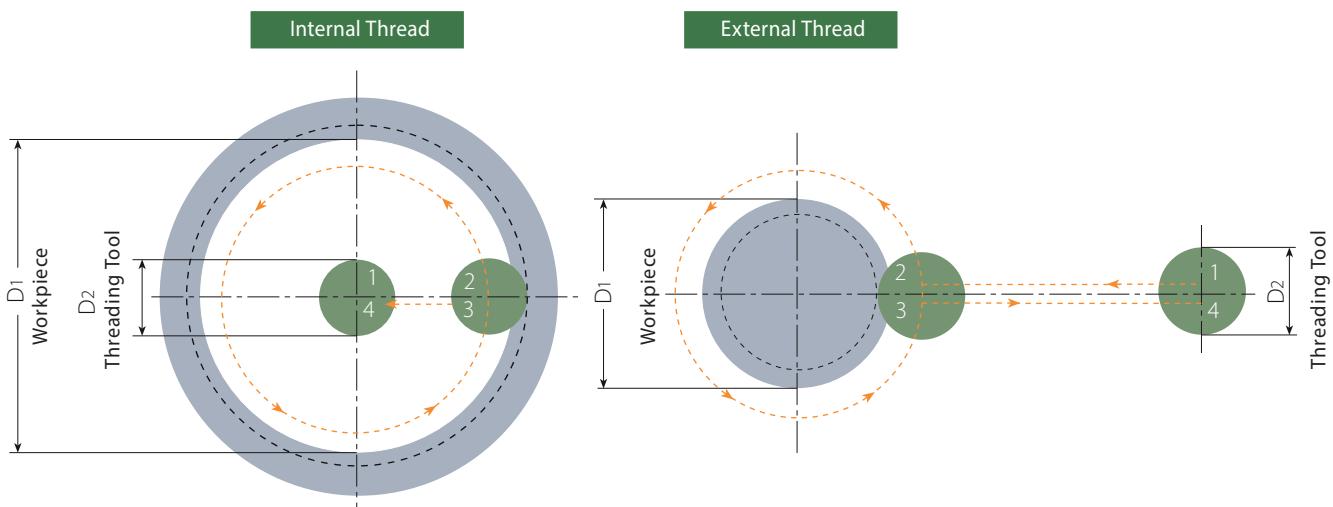
## 2 Radial Approach

This is the simplest method. There are two characteristics worth noting about the radial approach:

1. A small vertical mark may be left at the entry (and exit) point. This is of no significance to the thread itself.

2. When using this method with very hard materials, there may be a tendency of the tool to vibrate as it approaches the full cutting depth.

**Note:** Radial feed during entry to the full profile depth should only be 1/3 of the subsequent circular feed.



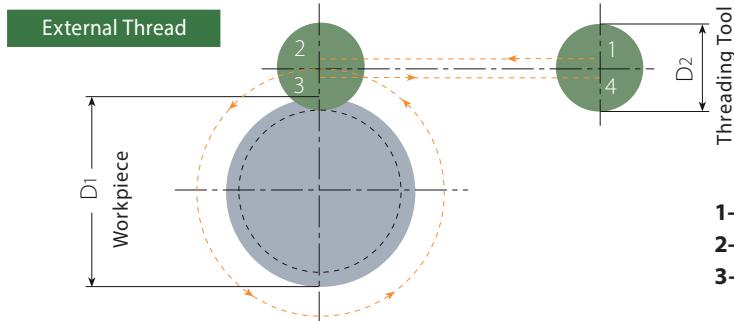
1-2: Radial entry

2-3: Helical movement during one full orbit ( $360^\circ$ )

3-4: Radial exit

### 3 Tangential Line Approach

This method is very simple, and has all of the advantages of the tangential arc method. However, it is applicable only with external threads.



- 1-2: Radial entry with simultaneous feed along z axis
- 2-3: Helical movement during one full orbit (360°)
- 3-4: Radial exit

## Preparing for the Thread Milling Operation

### 1 Calculation of Rotational Velocity and Feed at the Cutting Edge

$$N = \frac{1000 \times V}{\pi \times D_2}$$

$$V = \frac{N \times \pi \times D_2}{1000}$$

$$F_1 = N \times z \times f$$

N - Rotational Velocity [R.P.M.]

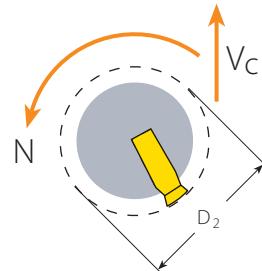
V - Cutting Speed [m/min]

D<sub>2</sub> - Toolholder Cutting Dia. [mm]

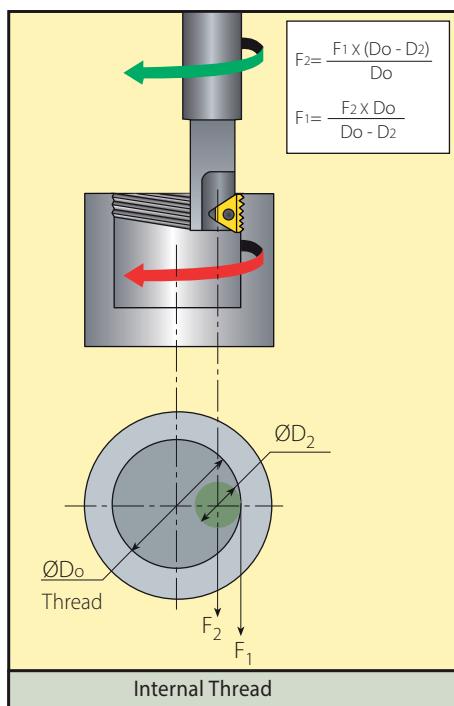
F<sub>1</sub> - Tool Feed Rate at the Cutting Edge [mm/min]

z - No. of Cutting Edges

f - Feed per Tooth per Rotation [mm/tooth]

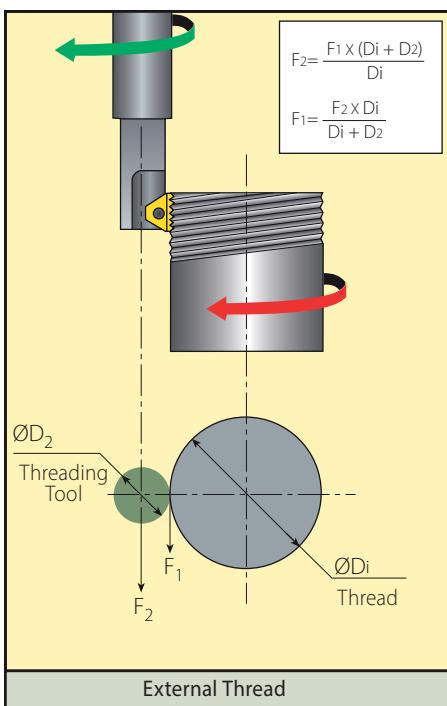


### 2 Calculation of Feed Rates at the Tool Center Line



$$F_2 = \frac{F_1 \times (D_o - D_2)}{D_o}$$

$$F_1 = \frac{F_2 \times D_o}{D_o - D_2}$$



$$F_2 = \frac{F_1 \times (D_i + D_2)}{D_i}$$

$$F_1 = \frac{F_2 \times D_i}{D_i + D_2}$$

The equations define the relationship between feed rates at the cutting edge and at the tool center line.

On most CNC machines the feed rate required for programming is that of the center-line of the tool. When dealing with linear tool movement the feed rate at the cutting edge and the center line are identical. This is not the case with circular tool movement.

## List of "G" Codes (ISO) for CNC Program

Code	Description	Code	Description
%	Recognition code (ISO or EIA) + End of tape	H	Tool length compensation number
G00	Fast feed linear positioning	D	Tool radius compensation number
G01	Linear interpolation	X	X coordinate
G02	Circular/Helical interpolation CW	Y	Y coordinate
G03	Circular/Helical interpolation CCW	Z	Z coordinate
G40	Cutter radius compensation cancel	R	Radius of travel
G41	Cutter radius compensation left	I	X coordinate to center of starting arc travel
G42	Cutter radius compensation right	J	Y coordinate to center of starting arc travel
G43	Tool length compensation +	M3	Spindle forward rotation
G49	Tool length compensation cancel	M5	Spindle stop
G57	Work coordinate system selection	M30	Program end & rewind
G90	Absolute command relative to work coordinate origin	O	Program number
G91	Incremental command relative to tool position	N	Block number (can be avoided)
F	Feed mm/min	(	Start of comment
S	Spindle speed RPM	)	End of comment

## CNC Program Sample (Thread: M60 x 1.5 x 20)

```

%00001 (TMINRH CLIMB CYCLES = 1)..... Program no.
(Fanuc 11M Controller.) ..... Remark
G90 G00 G57 X0 Y0..... Home (origin) set
G43 H10 Z0 M3 S946 ..... Tool length compensation-on and RPM set
G91 G00 X0 Y0 Z-20.272 ..... Go down in Z-axis
G41 D60 X9.459 Y-20.595 Z0 ..... Tool diameter compensation-on
G91 G03 X20.595 Y20.595 Z0.272 R20.595 F36 ..... Entrance by tangential arc
G91 G03 X0 Y0 Z1.500 I-30.054 J0 ..... Thread machining-HELICAL interpolation movement
G91 G03 X-20.595 Y20.595 Z0.272 R20.595 ..... Exit by tangential arc
G00 G40 X-9.459 Y-20.595 Z0 ..... Tool diameter compensation-off
G90 G49 G57 G00 Z200.000 M5 ..... Tool length compensation-off and RPM close
M30 ..... End of program
%

```

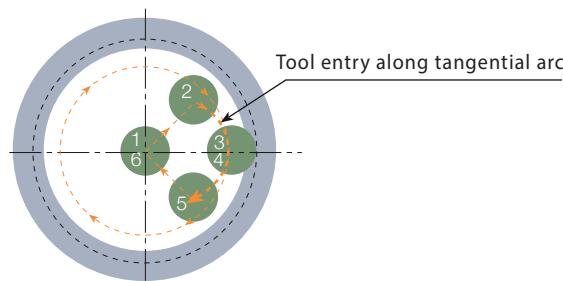
### Recommendation:

At tool entry, set the Feed f [mm/tooth] to 70% lower than the threading Feed.

### Example:

Threading Feed: 0.3[mm/tooth]

Tool entry Feed: 0.09[mm/tooth]



## Minimum Bore Diameters for TM Standard line

Pitch mm		0.5	0.6	0.7	0.75 0.80	0.9	1.0	1.25	1.5	1.75	2.0		2.5	3.0	3.5	4.0	4.5	5.0	5.5		6.0						
Pitch TPI		48	44	36	32	28	26 24	20 19	18 16	14	13 12	11.5 11	10	9 8	7	6		5		4.5		4					
Toolholder Ordering Code	D2									Minimum Bore Diameter D <sub>i</sub> mm																	
TMMC12-6.0		9.0	9.5	9.7	9.9	10.0	10.4	10.7	11.4	12.0																	
TMMC20-6.0		9.0	9.5	9.7	9.9	10.0	10.4	10.7	11.4	12.0																	
TMMC20-6.0-124/003		9.0	9.5	9.7	9.9	10.0	10.4	10.7	11.4	12.0																	
TMC12-2		11.5	12.0	12.2	12.4	12.5	12.9	13.2	13.9	14.5	15.1																
TMC20-2		11.5	12.0	12.2	12.4	12.5	12.9	13.2	13.9	14.5	15.1																
TMLC25-2		11.5	12.0	12.2	12.4	12.5	12.9	13.2	13.9	14.5	15.1																
TMSC10-2		12.5	13.0	12.6	13.6	13.5	13.9	14.2	14.9	15.5	16.1																
TMOC20-2		14.5	15.1	15.2	15.3	15.4	16.0	16.4	17.0	17.8	18.6																
TMNC16-3		15.5	16.0	16.2	16.4	16.5	16.9	17.2	17.9	18.5	19.0	19.5	20.0														
TMC16-3-124/001		15.5	16.0	16.2	16.4	16.5	16.9	17.2	17.9	18.5	19.0	19.5	20.0														
TMC16-3		17.0	17.6	17.8	18.0	18.2	18.7	19.0	19.6	20.0	20.5	21.0	21.5														
BTMC16-3B		17.0	17.6	17.8	18.0	18.2	18.7	19.0	19.6	20.0	20.5	21.0	21.5														
TM2C20-2		17.0	17.6	17.8	18.0	18.2	18.7	19.0	19.6	20.0	20.5																
BTMC20-3B		19.0	19.7	20.0	20.2	20.4	20.8	21.0	21.6	22.0	22.5	23.0	23.5														
TMNC20-3		19.0	19.7	20.0	20.2	20.4	20.8	21.0	21.6	22.0	22.5	23.0	23.5														
TMC20-3		20.0	20.7	21.0	21.2	21.4	21.8	22.0	22.6	23.0	23.5	24.0	24.5														
TMOC20-3		20.0	20.7	21.0	21.2	21.4	21.8	22.0	22.6	23.0	23.5	24.0	24.5														
BTMWC25-3B		22.0	22.7	23.0	23.2	23.4	23.8	24.0	24.6	25.0	25.5	26.0	26.5														
BTMLC25-3B		22.0	22.7	23.0	23.2	23.4	23.8	24.0	24.6	25.0	25.5	26.0	26.5														
TMLC25-3		22.0	22.7	23.0	23.2	23.4	23.8	24.0	24.6	25.0	25.5	26.0	26.5														
TMC25-5-124/004		25.0	25.7	26.0	26.2	26.4	26.8	27.0	27.7	28.2	28.7	29.2	29.7	31.3	33.7	36.7	39.7	42.7									
TM2C25-3		26.0	26.7	27.0	27.2	27.4	27.8	28.0	28.7	29.3	29.8	30.3	30.8														
BTM2C25-3B		26.0	26.7	27.0	27.2	27.4	27.8	28.0	28.7	29.3	29.8	30.3	30.8														
TMC25-5		30.0	30.7	31.0	31.2	31.4	31.8	32.0	32.8	33.5	34.1	34.6	35.6	36.6	39.0	42.0	45.0	48.0									
TMLC25-5		30.0	30.7	31.0	31.2	31.4	31.8	32.0	32.8	33.5	34.1	34.6	35.6	36.6	39.0	42.0	45.0	48.0									
TMOC25-5		30.0	30.7	31.0	31.2	31.4	31.8	32.0	32.8	33.5	34.1	34.6	35.6	36.6	39.0	42.0	45.0	48.0									
TMC32-6B		35.0								38.5	39.1	39.6	40.6	42.0	44.0	47.0	50.0	53.4	42.5	50.0	44.6	57.5	56.6				
TMC32-5		37.0	38.0	38.2	38.4	38.6	39.1	39.5	40.4	41.0	41.5	42.0	43.0	44.0	46.5	49.0	52.0	55.5									
TMLC32-5		37.0	38.0	38.2	38.4	38.6	39.1	39.5	40.4	41.0	41.5	42.0	43.0	44.0	46.5	49.0	52.0	55.5									
TMNC32-5		37.0	38.0	38.2	38.4	38.6	39.1	39.5	40.4	41.0	41.5	42.0	43.0	44.0	46.5	49.0	52.0	55.5									
TMSH-D38-16-2		38.0	38.5	38.7	38.9	39.0	39.6	40.0	41.0	42.0	43.0																
TM2C32-5		42.0	43.2	43.4	43.6	43.8	44.5	45.0	46.0	46.5	47.0	47.4	48.2	49.0	52.0	54.5	57.5	61.0									
TMVC32-5		46.0																			62.5						
TMC40-6B		46.0								49.5	50.1	50.6	51.6	53.0	55.0	55.2	55.6	55.0	52.5	54.0	54.5	57.5	56.6				
TMLC40-6B		46.0								49.5	50.1	50.6	51.6	53.0	55.0	55.2	55.6	55.0	52.5	54.0	54.5	57.5	56.6				
TMSH-D50-22-2		50.0	50.5	50.7	50.9	51.0	51.6	52.0	53.0	54.0	54.5	54.5															
TMSH-D50-22-3		50.0	50.5	50.7	50.9	51.0	51.6	52.0	53.0	54.0	54.5	55.0	55.5														

## Minimum Bore Diameters for TM Standard line (con't)

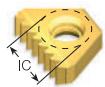
Pitch mm		0.5	0.6	0.7	0.75 0.80	0.9	1.0	1.25	1.5	1.75	2.0		2.5	3.0	3.5	4.0	4.5	5.0	5.5		6.0		
Pitch TPI		48	44	36	32	28	26 24	20 19	18 16	14	13 12	11.5 11	10	9 8	7	6		5		4.5		4	
Toolholder Ordering Code	D2																						
TM2C40-6B		52.0								56.0	56.2	56.5	57.0	59.0	61.5		63.0	64.0	66.0	67.0	67.6	69.0	70.0
TMSH-D63-22-3B		63.0	63.5	63.7	63.9	64.0	64.6	65.0	66.0	67.0	67.5	68.0	69.0										
TMSH-D63-22-5		63.0	63.5	63.7	63.9	64.0	64.6	65.0	66.0	67.0	67.5	68.0	69.0	70.0	72.0	73.0	74.0	75.0					
TMSH-D63-22-6B		63.0								67.0	67.5	68.0	69.0	70.0	72.0	73.0	74.0	75.0	77.0	78.0	78.6	80.0	81.0
TMSH-D80-27-5		80.0	80.5	80.7	80.9	81.0	81.6	82.0	83.0	84.0	84.5	85.0	86.0	87.0	89.0	90.0	91.0	92.0					
TMSH-D80-27-6B		80.0								84.0	84.5	85.0	86.0	87.0	89.0	90.0	91.0	92.0	94.0	95.0	95.6	97.0	98.0
TMSH-D100-32-5		100.0	100.5	100.7	100.9	101.0	101.6	102.0	103.0	104.0	104.5	105.0	106.0	107.0	109.0	110.0	111.0	112.0					
TMSH-D100-32-6B		100.0								104.0	104.5	105.0	106.0	107.0	109.0	110.0	111.0	112.0	114.0	115.0	115.6	117.0	118.0
TMSH-D125-40-5		125.0	125.5	125.7	125.9	126.0	126.6	127.0	128.0	129.0	129.5	130.0	131.0	132.0	134.0	135.0	136.0	137.0					
TMSH-D125-40-6B		125.0								129.0	129.5	130.0	131.0	132.0	134.0	135.0	136.0	137.0	139.0	140.0	140.6	142.0	143.0

### Coarse Pitch Tooling:

This table is not applicable to the Coarse Pitch system, which can thread mill bores smaller than those listed above.

See the Coarse Pitch section of the various thread standards.

## Spare Parts for TM Standard Line



IC	Holder	Holder Screw	Designation	Thread	Torx Key	Torx Size
6.0mm	TMMC..-6.0		SN7T	M2.2x0.45x5.0	K7T	T7
1/4"	TM.C..-2		SN2TM	M2.6x0.45x5.9	K2T	T8
3/8"	TM.C..-3, TMC..-3-124/...		SN3T, SN3TM	5-40UNCx8.8, 7.3	K3T	T10
3/8"B	BTM.C..-3B		SN3T	5-40UNCx8.8	K3T	T10
1/2"	TMC..-4-124/...		SN4TM, SA4TM	8-32UNCx9.8, 10.7	K4T	T20
5/8"	TM.C..-5, TMC..-5-124/...		SN5TM, SA5TM	M5x0.8x15.0, 12.8	K5T	T25
3/4"B	TM.C..-6B		SM7T	M7x1.0x15.0	K30T	T30
1/4"	TMSH-D38-16-2	M8X1.25X35	SN2T	M2.6x0.45x6.5	HK2T	T8
1/4"	TMSH-D50-22-2	M10X1.50X35	SN2T	M2.6x0.45x6.5	HK2T	T8
3/8"	TMSH-D50-22-3	M10X1.50X35	SN3TM	5-40UNCx7.3	HK3T	T10
3/8"B	TMSH-D63-22-3B	M10X1.50X35	SN3TM	5-40UNCx7.3	HK3T	T10
5/8"	TMSH-D63-22-5	M10X1.50X35	SN5TM	M5x0.8x15.0	HK5T	T25
3/4"B	TMSH-D63-22-6B	M10X1.50X35	SM7T	M7x1.0x15.0	HK7T	T30
5/8"	TMSH-D80-27-5	M12X1.75X40	SN5TM	M5x0.8x15.0	HK5T	T25
3/4"B	TMSH-D80-27-6B	M12X1.75X40	SM7T	M7x1.0x15.0	HK7T	T30
5/8"	TMSH-D100-32-5	M16X2.00X40	SN5TM	M5x0.8x15.0	HK5T	T25
3/4"B	TMSH-D100-32-6B	M16X2.00X40	SM7T	M7x1.0x15.0	HK7T	T30
5/8"	TMSH-D125-40-5	M20X2.50X50	SN5TM	M5x0.8x15.0	HK5T	T25
3/4"B	TMSH-D125-40-6B	M20X2.50X50	SM7T	M7x1.0x15.0	HK7T	T30
1/4"	TMSC10-2		SN2TK	M2.6x0.45x5.9	K2T	T8
5/8"V	TMVC32-5		SN6T	M6x1.0x29.0	K6T	T20

## Spare Parts for MiTM Line



Insert Size	Holder	Holder Screw	Designation	Thread	Torx Key	Torx Size
19	RTMC...A		SLD3IP6	M3x0.5	KIP6	Torx+6
24	RTMC...M		SLD4IP8	M4x0.7	KIP8	Torx+8
25	RTMC...S RTMC-D...S		SLD4IP8	M4x0.7	KIP8	Torx+8
40	RTMC...L RTMC-D...L		SLD4IP8A SCD4IP8	M4x0.7	KIP8	Torx+8
41	RTMC...B RTMC-D...B		SLD4IP8A SCD4IP8	M4x0.7	KIP8	Torx+8
25	RTMC-D36-16-25S5	M8x1.25x35	SLD4IP8	M4x0.7	KIP8	Torx+8
	RTMC-D44-22-25S6	M10x1.50x35				
	RTMC-D52-22-25S8	M12x1.75x30				
40	RTMNC-D36-16-25S5	M8x1.25x35	SLD4IP8A SCD4IP8	M4x0.7	KIP8	Torx+8
	RTMC-D44-22-40L6	M10x1.5x40				
	RTMC-D52-27-40L8	M12x1.75x40				
41	RTMNC-D45-22-40L6	M10x1.5x40	SLD4IP8A SCD4IP8	M4x0.7	KIP8	Torx+8
	RTMC-D48-22-41B5	M10x1.5x40				
	RTMC-D58-27-41B6	M12x1.75x40				

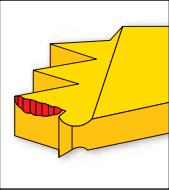
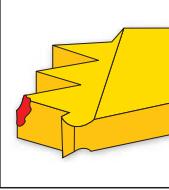
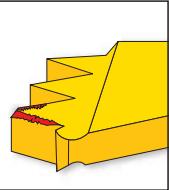
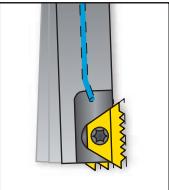
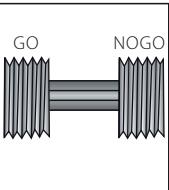
## Spare Parts for TMSD Line



Insert Screw

IC	Holder	Holder Screw	Designation	Thread	Torx Key	Blade	Handle	Torx Size
7V	GMC...-7-3 CGMC...-7-3		SN2T8-M1	M3.0x0.5x9	K2T			T8
9V	GMC...-9-3 CGMC...-9-3		SN2T15-M2	M4x0.7x13.5	-	Blade T15-1/4	Smart Handle 1/4x2	T15
11V	GMC...-11-3 CGMC...-11-3		SN4T20-M3	M55x0.8x15.5	-	Blade T20-1/4	Smart Handle 1/4x2	T20
1/4"U, 1/4"A	TM.C...-2U CTMC...-2U or 2A		SN2T	M2.6x0.45x6.5	HK2T			T8
3/8"U, 3/8"A	TM.C....-3U TM.C-D...-3U or 3A		SN3T	5-40UNCx8.8	HK3T			T10
1/2"U	TM.C....-4U TM.C-D...-4U		SA4T	8-32UNCX14.0	HK4T			T20
5.0L	TM.C....-5L CTMC...-5L		SN5LTR	M2.2X0.45X5.0	K7T			T7
3/8"L	TM.C....-3 CTMC...-3L		SN3T SA3T	5-40UNCx8.8 5-40UNCx11.3	HK3T			T10
5/8"V	TM.SC-D...-5V..		SA5T	M5x0.8x22.0	HK5T			T25
3/8"U	TM4SC-D42-16-3U	SA5T-C5 (M8x1.25x28) Holder Screwdriver TK5T						
	TM5SC-D48-22-3U	M10x1.50x35	SN3T	5-40UNCx8.8	HK3T			T10
	TM6SC-D56-22-3U	M10x1.50x35						
1/2"U	TM6SC-D88-27-4U	M12x1.75x40						
	TM7SC-D98-32-4U	M16x2.0x40	SA4T	8-32UNCX14.0	HK4T			T20
3/8"U	TM7SC-D80-32-3L	M16x2.0x40						
	TM5SC-D48-22-3L-ABUT	M10x1.50x35	SA3T	5-40UNCx11.3	HK3T			T10
	TM6SC-D58-27-3L-ABUT	M12x1.75x40						
5/8"V	TM6SC-D88-32-5V6-ABUT	M16x2.0x40	SA5T	M5x0.8x22.0	HK5T			T25
	TM6SC-D88-32-5V8-ABUT	M16x2.0x40						

## Troubleshooting

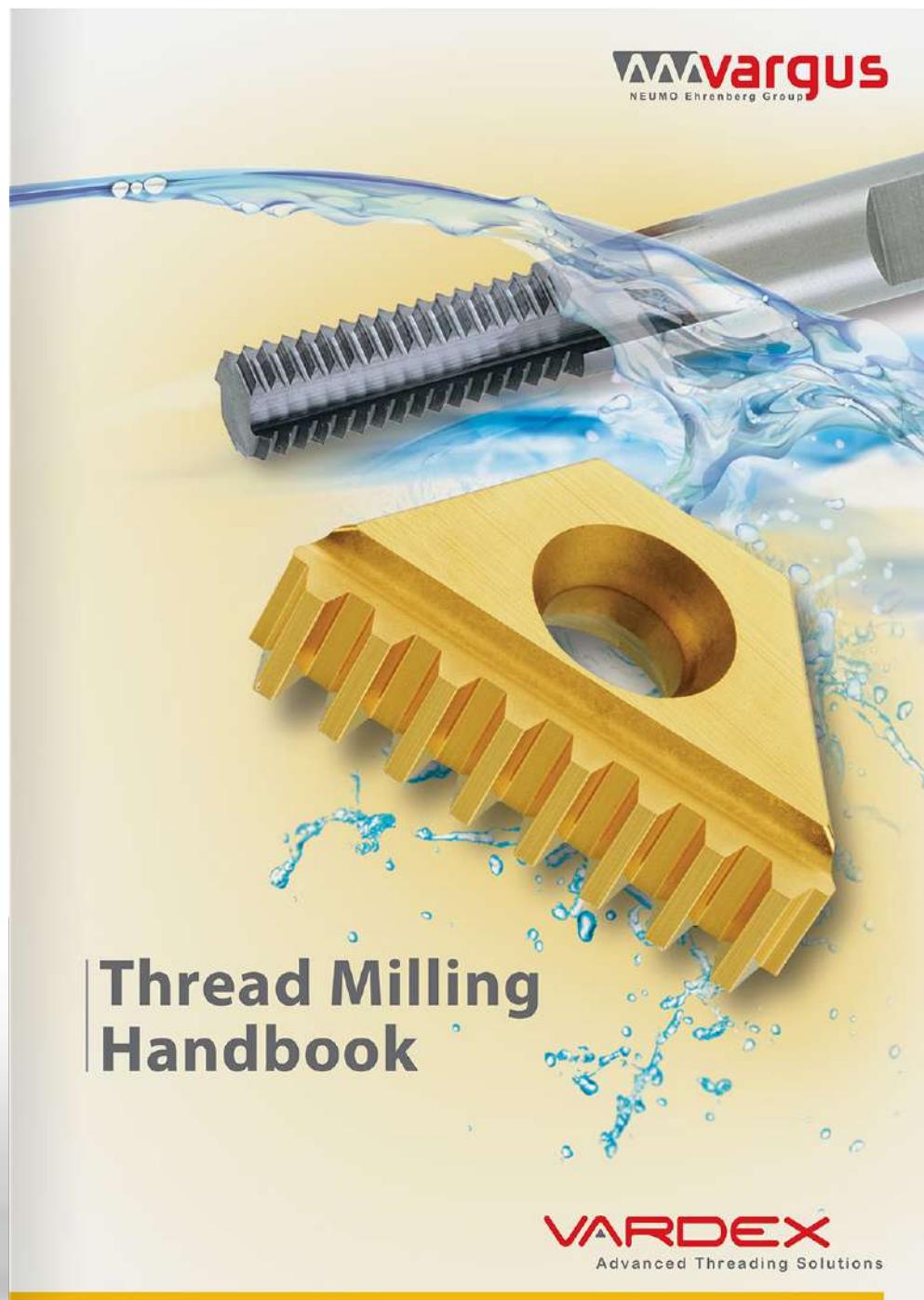
Problem	Possible Cause	Solution
	Increased insert flank wear Cutting speed too high Chip is too thin Insufficient coolant	Reduce cutting speed/use coated insert Increase feed rate Increase coolant flow rate
	Chipping of cutting edge Chip is too thick Vibration	Reduce feed rate Use the tangential arc method Increase RPM Check stability
	Material build up on the cutting edge Incorrect cutting speed Unsuitable carbide grade	Change cutting speed Use a coated carbide grade
	Chatter / Vibration Feed rate is too high Profile is too deep Thread length is too long	Reduce the feed Execute two passes, each with increased cutting depth Execute two passes, each cutting only half the thread length Execute two passes, each cutting only half the thread length
	Insufficient thread accuracy Tool deflection	Reduce feed rate Execute a "zero" cut

## The Thread Milling Handbook

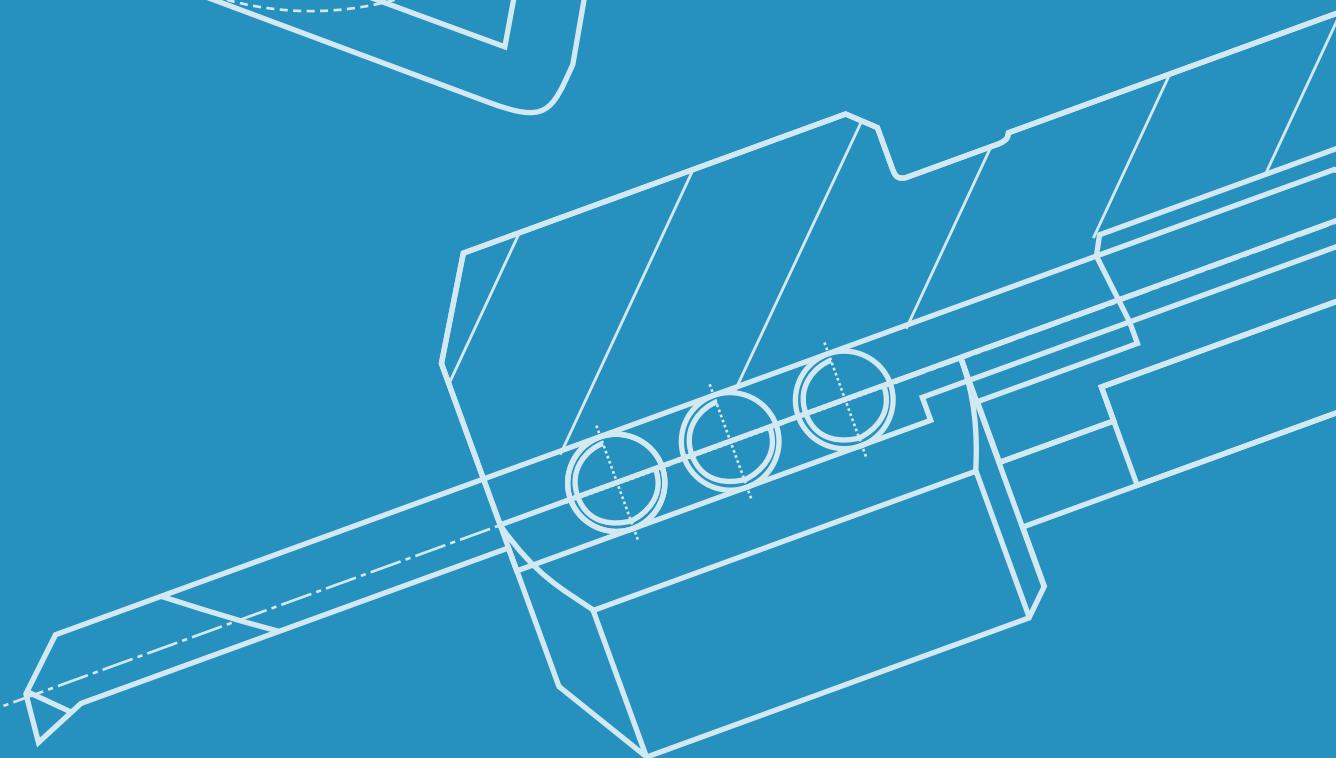
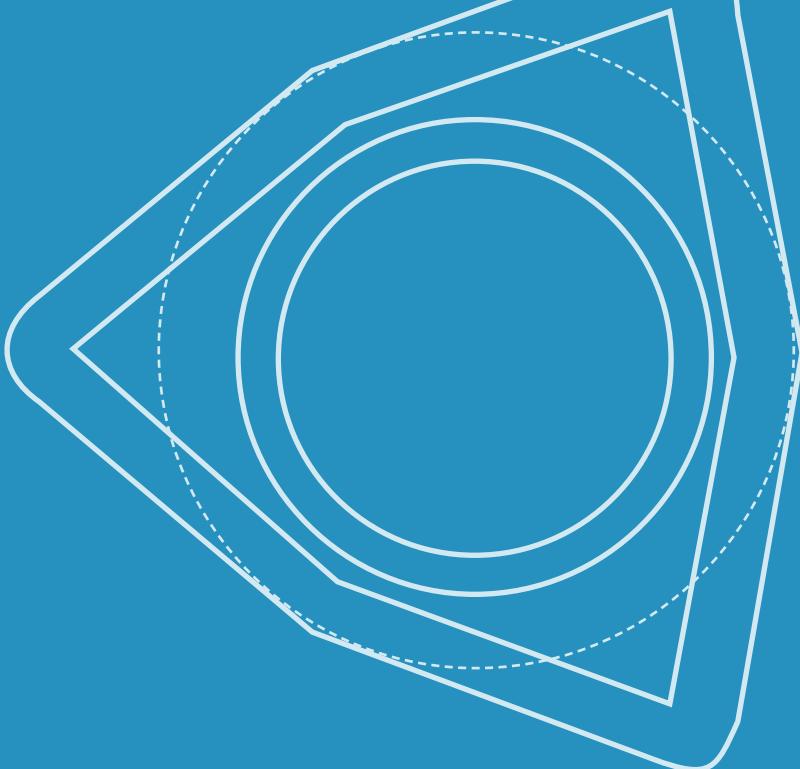
### The Thread Milling Handbook:

Your everyday guide to the theory and implementation of the thread milling system.

Download it for free at [www.vargus.com](http://www.vargus.com)







# MINIPRO

- PowerBore Inserts ..... 391
- Micro (Boring & Grooving) Inserts ..... 393
- Toolholders (PowerBore & Micro) ..... 403
- Technical Data ..... 411

## Vardex Ordering Code System

### ■ PowerBore Inserts

T 1	D 2	O 3	W 4	41 5	14 6	VTX 7
<b>1 - Insert Shape</b> C - Diamond 80 deg. T - Triangle W - Trigon 80 deg.	<b>2 - Clearance Angle</b> C - 7 deg. D - 15 deg.	<b>3 - Tolerance Class</b> 0 - Special Tolerance Class	<b>4 - Insert Type</b> W - Hole + Countersink			
<b>5 - Insert Dimension</b> 40 - IC 0.156" - Thickness-1.02mm 41 - IC 0.160" - Thickness-1.19mm 42 - IC 0.156" - Thickness-1.57mm 50 - IC 0.187" - Thickness-2.44mm	<b>6 - Corner Radius</b> 11 - R 0.05 12 - R 0.18 13 - R 0.20 14 - R 0.38	<b>7 - Carbide Grade</b> VTX				

### ■ Micro Boring Inserts - Double Ended

6.0 1	S 2	I 3	R 4	0.2 5	M 6	-	Bore 7	-	1 8	VMX 9
<b>1 - Insert Dia.</b> 3.0 - 3.0mm 4.0 - 4.0mm 6.0 - 6.0mm 8.0 - 8.0mm 10.0 - 10.0mm	<b>2 - Insert Style</b> S - Micro Insert	<b>3 - Type of Insert</b> I - Internal	<b>4 - RH or LH</b> R - Right Hand Insert L - Left Hand Insert	<b>5 - Corner Radius</b> 0.2						
<b>6 - Tool Length</b> U - Ultra Short S - Short M - Medium L - Long	<b>7 - Tool Application</b> Bore - Boring Copy - Boring Copy Chamfer - Boring Chamfer Back - Back Edge 3527, 3537, 3547 - Long Nose BD - Bore Drill	<b>8 - Front Relief</b> 1 - With Relief 0 - Without Relief	<b>9 - Carbide Grade</b> VMX							

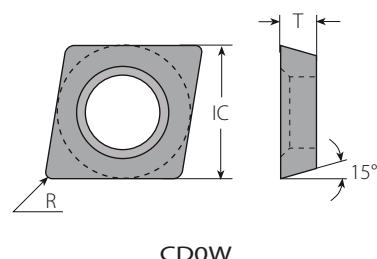
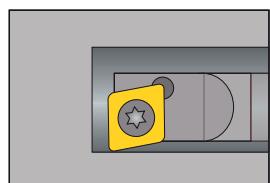
### ■ Micro Grooving Inserts - Double Ended

4.0 1	S 2	I 3	R 4	0.7 5	A 6	-	D471/D472 7	-	1.4 8	VMX 9
<b>1 - Insert Dia.</b> 3.0 - 3.0 mm 4.0 - 4.0 mm 6.0 - 6.0 mm 8.0 - 8.0 mm 10.0 - 10.0 mm	<b>2 - Insert Style</b> S - Micro Insert	<b>3 - Type of Insert</b> I - Internal	<b>4 - RH / LH Insert</b> R - Right Hand Insert L - Left Hand Insert	<b>5 - Groove Std. Width</b> 0.9 - 2.15 (mm)						
<b>6 - Insert Length</b> A - Axially S - Short M - Medium L - Long	<b>7 - Groove Standard</b> DIN 471 DIN 472 DIN 7993 DIN 76SH, DIN 76ST DIN 3770S, DIN 3770D DIN 471/472 - Face Grooving	<b>8 - Groove Depth</b> 0.5 - 1.5 (mm)	<b>9 - Carbide Grade</b> VMX							

## Boring

**POWERBORE**

### Internal



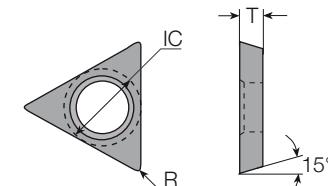
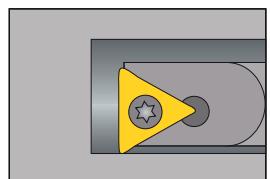
CD0W

### CD0W Inserts



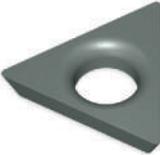
Insert Size	Ordering Code	Dimensions mm		Spare Parts
		R	T	
.156"	CD0W4011...	0.05	1.02	VS01
	CD0W4012...	0.18	1.02	
	CD0W4014...	0.38	1.02	

### Internal



TD0W

### TD0W Inserts

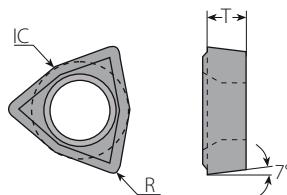
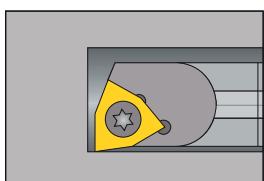


Insert Size	Ordering Code	Dimensions mm		Spare Parts
		R	T	
.160"	TD0W4111...	0.05	1.19	VS01, VS40
	TD0W4112...	0.18	1.19	
	TD0W4114...	0.38	1.19	

## Boring

**POWERBORE**

### Internal



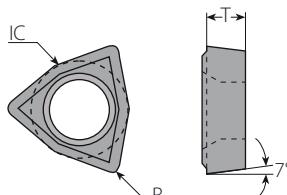
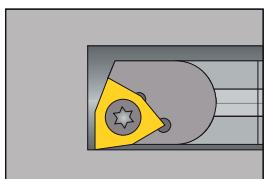
WCOW 4213, 4214

### WCOW Inserts



Insert Size	Ordering Code	Dimensions mm		Spare Parts
IC		R	T	Insert Screw
.156"	WCOW4213...	0.20	1.57	VS40
	WCOW4214...	0.38	1.57	

### Internal



WCOW 5013, 5014

### WCOW Inserts

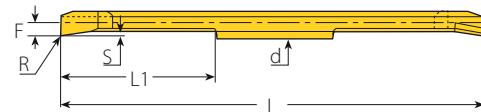
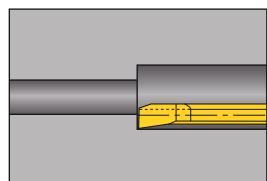


Insert Size	Ordering Code	Dimensions mm		Spare Parts
IC		R	T	Insert Screw
.187"	WCOW5013...	0.20	2.44	VS41
	WCOW5014...	0.38	2.44	

## Micro Boring - Boring

**MINIPRO**

### Internal



RH-Double Ended

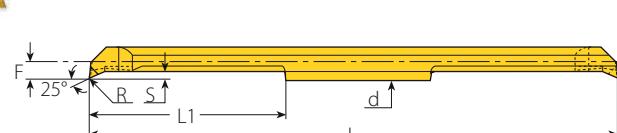
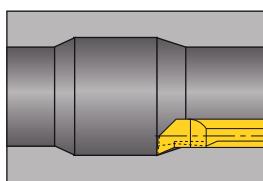
### Micro - Double Ended

Insert Dia.	Ordering Code	Dimensions mm					Min. Bore Dia.	Toolholder
d mm	RH	R	L1	L	S	F	mm	
3.0	3.0SIRO.1U-Bore-1...	0.1	6	36	0.56	1.36	3.2	SMC..-3.0
	3.0SIRO.1S-Bore-1...	0.1	9	36	0.56	1.36		
	3.0SIRO.2S-Bore-1...	0.2	9	36	0.66	1.42		
	3.0SIRO.2M-Bore-1...	0.2	16	50	0.66	1.42		
4.0	4.0SIRO.2S-Bore-1...	0.2	9	36	0.66	1.92	4.2	SMC..-4.0
	4.0SIRO.2M-Bore-1...	0.2	16	50	0.66	1.92		
	4.0SIRO.2L-Bore-1...	0.2	21	60	0.66	1.92		
6.0	6.0SIRO.2S-Bore-1...	0.2	9	36	0.77	2.92	6.2	SMC..-6.0
	6.0SIRO.2M-Bore-1...	0.2	16	50	0.77	2.92		
	6.0SIRO.2L-Bore-1...	0.2	21	60	0.77	2.92		
8.0	8.0SIRO.2S-Bore-1...	0.2	12	54	0.82	3.92	8.2	SMC..-8.0
	8.0SIRO.2M-Bore-1...	0.2	20	70	0.82	3.92		
	8.0SIRO.2L-Bore-1...	0.2	28	86	0.82	3.92		
10.0	10.0SIRO.2S-Bore-1...	0.2	15	60	1.00	4.92	10.2	SMC..-10.0
	10.0SIRO.2M-Bore-1...	0.2	25	80	1.00	4.92		
	10.0SIRO.2L-Bore-1...	0.2	35	100	1.00	4.92		

## Micro Boring - Copy

**MINIPRO**

### Internal



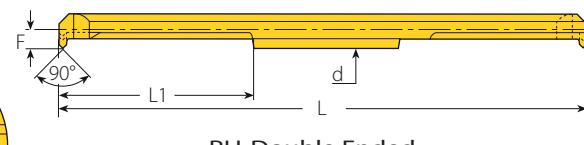
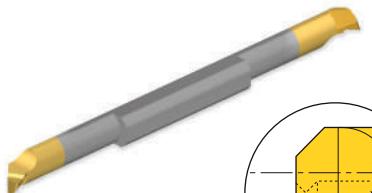
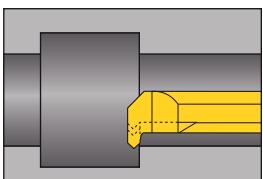
RH-Double Ended

### Micro - Double Ended

Insert Dia.	Ordering Code	Dimensions mm					Min. Bore Dia.	Toolholder
d mm	RH	R	L1	L	S	F	mm	
4.0	4.0SIR0.2S-Copy-1...	0.2	9	36	1.0	1.92	4.2	SMC..-4.0
	4.0SIR0.2M-Copy-1...	0.2	16	50	1.0	1.92		
	4.0SIR0.2L-Copy-1...	0.2	21	60	1.0	1.92		
6.0	6.0SIR0.2S-Copy-1...	0.2	9	36	1.3	2.92	7.0	SMC..-6.0
	6.0SIR0.2M-Copy-1...	0.2	16	50	1.3	2.92		
	6.0SIR0.2L-Copy-1...	0.2	21	60	1.3	2.92		

## Micro Boring - Chamfer

### Internal



RH-Double Ended

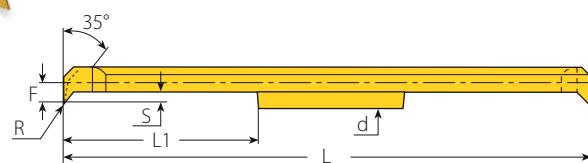
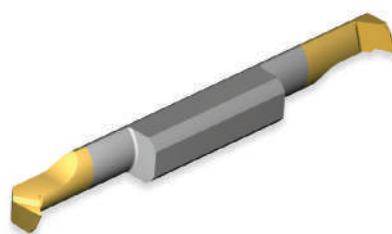
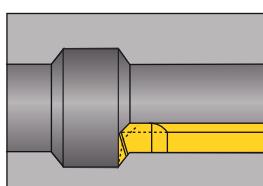
### Micro - Double Ended

Insert Dia.	Ordering Code	Dimensions mm					Min. Bore Dia.	Toolholder	
d mm	RH	R	L1	L	F	S1	S	mm	
4.0	4.0SIR0.2S-Chamfer-0...	0.2	9	36	1.92	1.0	0.40	4.2	SMC...-4.0
	4.0SIR0.2M-Chamfer-0...	0.2	16	50	1.92	1.0	0.40		
	4.0SIR0.2L-Chamfer-0...	0.2	21	60	1.92	1.0	0.40		
6.0	6.0SIR0.2S-Chamfer-0...	0.2	9	36	2.92	1.2	0.70	6.2	SMC...-6.0
	6.0SIR0.2M-Chamfer-0...	0.2	16	50	2.92	1.2	0.70		
	6.0SIR0.2L-Chamfer-0...	0.2	21	60	2.92	1.2	0.70		

## Micro Boring - Long Nose

**MINIPRO**

Internal



RH-Double Ended

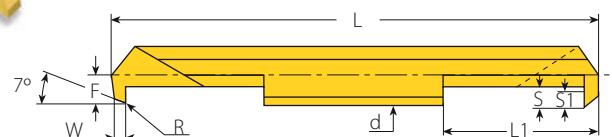
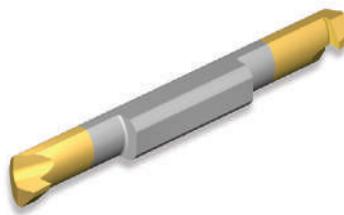
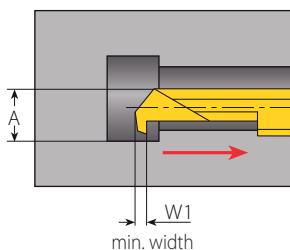
### Micro - Double Ended

Insert Dia. d mm	Ordering Code RH	Dimensions mm					Min. Bore Dia. mm	Toolholder
		R	L1	L	S	F		
6.0	6.0SIRO.2S-3527-1...	0.2	9	36	2.7	2.92	6.9	SMC...-6.0
	6.0SIRO.2M-3527-1...	0.2	16	50	2.7	2.92		
	6.0SIRO.2L-3527-1...	0.2	21	60	2.7	2.92		
8.0	8.0SIRO.2S-3537-1...	0.2	12	54	3.7	3.92	8.9	SMC...-8.0
	8.0SIRO.2M-3537-1...	0.2	20	70	3.7	3.92		
	8.0SIRO.2L-3537-1...	0.2	28	86	3.7	3.92		
10.0	10.0SIRO.2S-3547-1...	0.2	15	60	4.7	4.92	10.8	SMC...-10.0
	10.0SIRO.2M-3547-1...	0.2	25	80	4.7	4.92		
	10.0SIRO.2L-3547-1...	0.2	35	100	4.7	4.92		

## Micro Boring - Back Boring

**MINIPRO**

### Internal



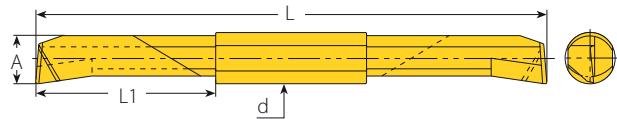
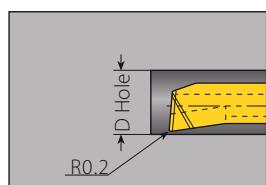
RH-Double Ended

### Micro - Double Ended

Insert Dia. d mm	Ordering Code RH	Dimensions mm										Min. Bore Dia. mm	Toolholder
		R	L1	L	A	W	W1	S	S1	F			
3.0	3.0SIR0.2S-Back-1...	0.05	9	36	3.42	1.5	1.81	0.8	0.6	1.42	3.2	SMC...-3.0	
	3.0SIR0.2M-Back-1...	0.05	16	50									
4.0	4.0SIR0.2S-Back-1...	0.05	9	36	4.44	2.0	2.34	1.3	1.0	1.92	4.2	SMC...-4.0	
	4.0SIR0.2M-Back-1...	0.05	16	50									
	4.0SIR0.2L-Back-1...	0.05	21	60									
6.0	6.0SIR0.2S-Back-1...	0.05	9	36	6.44	2.0	2.46	1.9	1.6	2.92	6.2	SMC...-6.0	
	6.0SIR0.2M-Back-1...	0.05	16	50									
	6.0SIR0.2L-Back-1...	0.05	21	60									

## Micro Boring - Boredrill

### Internal



RH-Double Ended

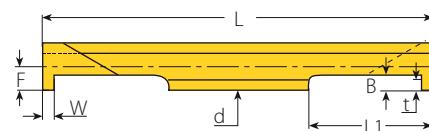
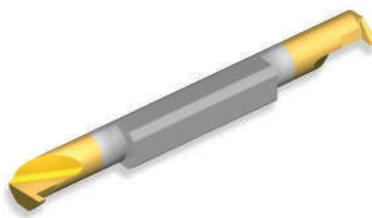
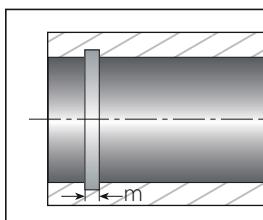
### Micro - Double Ended

Insert Dia. d mm	Ordering Code RH	Dimensions mm				Min. Bore Dia. mm	Toolholder
		L1	L	A	mm		
4.0	4.0SIR0.2M-BD-1...	16	50	3.53	3.74	5.20	SMC...-4.0
	6.0SIR0.2M-BD-1...	16	50				
6.0	6.0SIR0.2L-BD-1...	21	60	5.20	5.80	7.80	SMC...-6.0
	8.0SIR0.2S-BD-1...	12	54				
8.0	8.0SIR0.2M-BD-1...	20	70	6.90	7.80	8.6	SMC...-8.0
	8.0SIR0.2L-BD-1...	28	86				

# DIN 472 Retaining Ring Grooves for Bores

**MINIPRO**

## Internal



RH-Double Ended

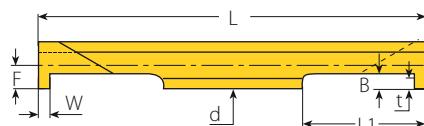
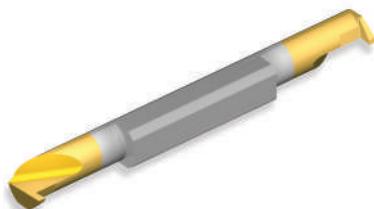
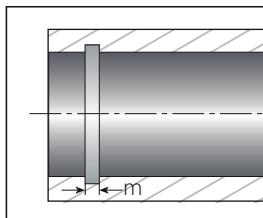
## Micro - Double Ended

Insert Dia. d mm	Ordering Code	Groove Std.		Dimensions mm					Min. Bore Dia. mm	Toolholder	
		RH	m (H13)	W	L1	L	B	t			
3.0	3.0SIR0.90S-D472-0.5...	0.90	0.99	9.0	36.0				0.8	3.2	SMC..-3.0
	3.0SIR0.90M-D472-0.5...	0.90	0.99	16.0	50.0						
	3.0SIR1.10S-D472-0.5...	1.10	1.19	9.0	36.0						
	3.0SIR1.10M-D472-0.5...	1.10	1.19	16.0	50.0						
4.0	4.0SIR0.90S-D472-1.1...	0.90	0.99	9.0	36.0				1.4	4.1	SMC..-4.0
	4.0SIR0.90M-D472-1.1...	0.90	0.99	16.0	50.0						
	4.0SIR0.90L-D472-1.1...	0.90	0.99	21.0	60.0						
	4.0SIR1.10S-D472-1.1...	1.10	1.19	9.0	36.0						
	4.0SIR1.10M-D472-1.1...	1.10	1.19	16.0	50.0						
	4.0SIR1.10L-D472-1.1...	1.10	1.19	21.0	60.0						
	4.0SIR1.30S-D472-1.1...	1.30	1.39	9.0	36.0						
	4.0SIR1.30M-D472-1.1...	1.30	1.39	16.0	50.0						
	4.0SIR1.30L-D472-1.1...	1.30	1.39	21.0	60.0						
	4.0SIR1.60S-D472-1.1...	1.60	1.69	9.0	36.0						
	4.0SIR1.60M-D472-1.1...	1.60	1.69	16.0	50.0						
	4.0SIR1.60L-D472-1.1...	1.60	1.69	21.0	60.0						
6.0	6.0SIR0.90S-D472-1.5...	0.90	0.99	9.0	36.0				1.8	6.1	SMC..-6.0
	6.0SIR0.90M-D472-1.5...	0.90	0.99	16.0	50.0						
	6.0SIR0.90L-D472-1.5...	0.90	0.99	21.0	60.0						
	6.0SIR1.10S-D472-1.5...	1.10	1.19	9.0	36.0						
	6.0SIR1.10M-D472-1.5...	1.10	1.19	16.0	50.0						
	6.0SIR1.10L-D472-1.5...	1.10	1.19	21.0	60.0						
	6.0SIR1.30S-D472-1.5...	1.30	1.39	9.0	36.0						
	6.0SIR1.30M-D472-1.5...	1.30	1.39	16.0	50.0						
	6.0SIR1.30L-D472-1.5...	1.30	1.39	21.0	60.0						
	6.0SIR1.60S-D472-1.5...	1.60	1.69	9.0	36.0						
	6.0SIR1.60M-D472-1.5...	1.60	1.69	16.0	50.0						
	6.0SIR1.60L-D472-1.5...	1.60	1.69	21.0	60.0						
	6.0SIR1.85S-D472-1.5...	1.85	1.94	9.0	36.0						
	6.0SIR1.85M-D472-1.5...	1.85	1.94	16.0	50.0						
	6.0SIR1.85L-D472-1.5...	1.85	1.94	21.0	60.0						
	6.0SIR2.15S-D472-1.5...	2.15	2.24	9.0	36.0						
	6.0SIR2.15M-D472-1.5...	2.15	2.24	16.0	50.0						
	6.0SIR2.15L-D472-1.5...	2.15	2.24	21.0	60.0						

# DIN 472 Retaining Ring Grooves for Bores (con't)

**MINIPRO**

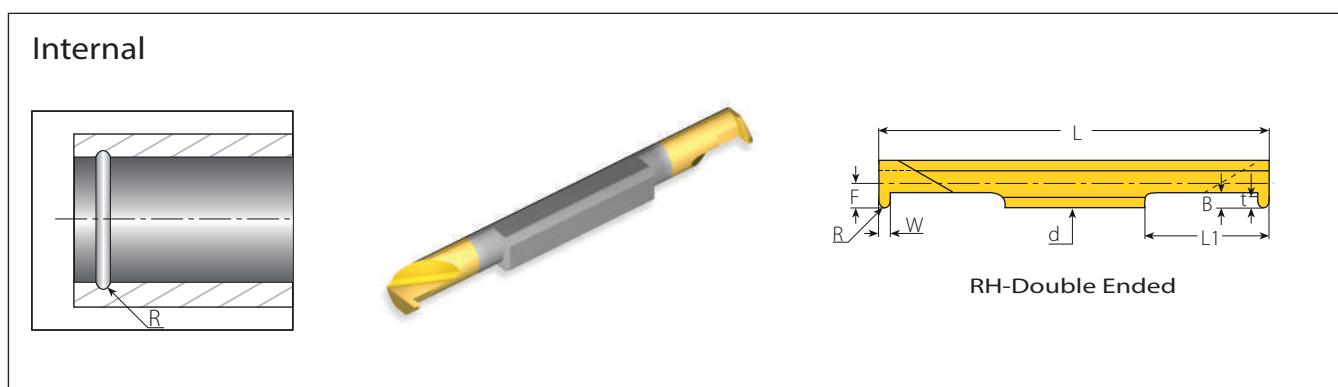
## Internal



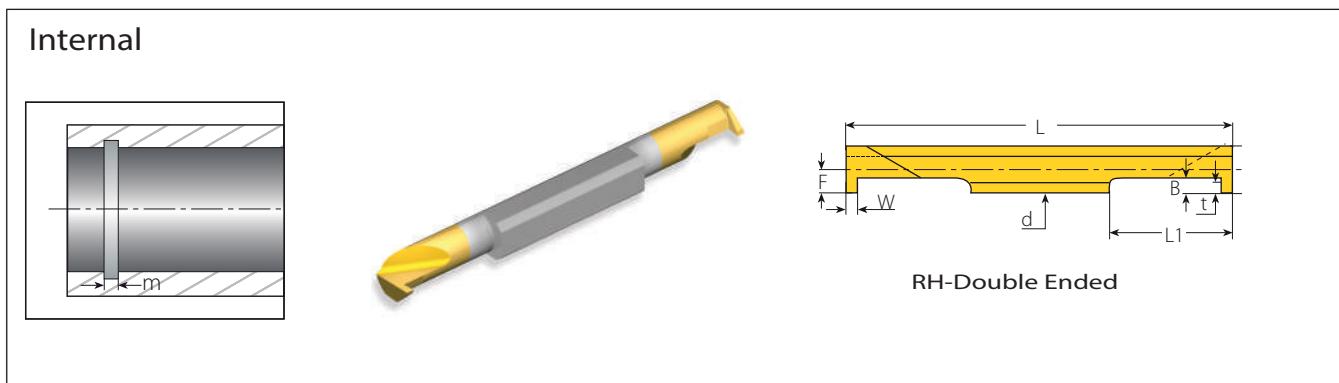
RH-Double Ended

## Micro - Double Ended

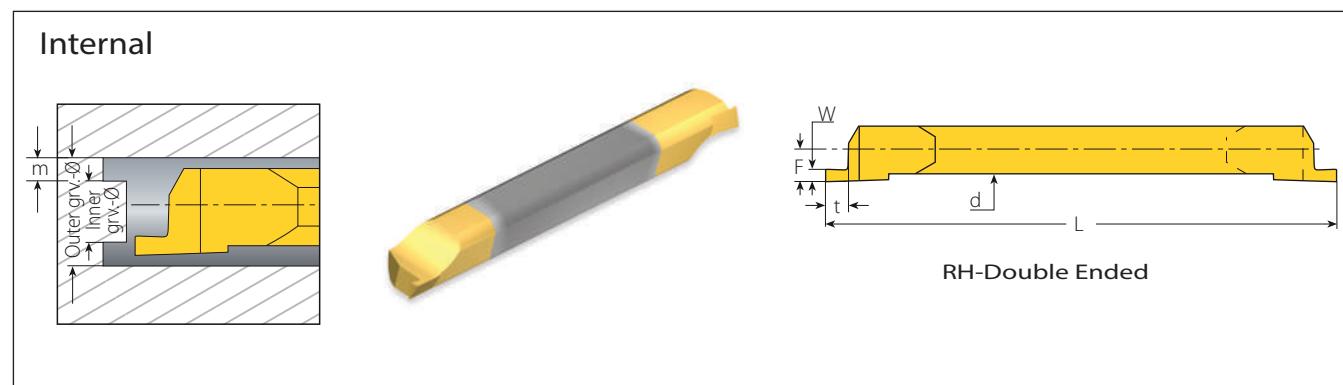
Insert Dia. d mm	Ordering Code RH	Groove Std.		Dimensions mm					Min. Bore Dia. mm	Toolholder		
		m (H13)	W	L1	L	B	t	F				
8.0	8.0SIR1.10M-D472-2.0...	1.10	1.19	20	70	2.5	2.0		3.9	8.4	SMC..-8.0	
	8.0SIR1.30M-D472-2.0...	1.30	1.39	20	70	2.5	2.0					
	8.0SIR1.60M-D472-2.5...	1.60	1.69	20	70	3.0	2.5					
	8.0SIR1.85M-D472-2.5...	1.85	1.94	20	70	3.0	2.5					
	8.0SIR2.15M-D472-3.0...	2.15	2.24	20	70	3.5	3.0					
	8.0SIR2.65M-D472-3.5...	2.65	2.74	20	70	4.0	3.5					
	8.0SIR3.15M-D472-3.5...	3.15	3.28	20	70	4.0	3.5					
10.0	10.0SIR1.30M-D472-3.5...	1.30	1.39	25	80				4.0	4.9	10.4	SMC..-10.0
	10.0SIR1.60M-D472-3.5...	1.60	1.69	25	80							
	10.0SIR1.85M-D472-3.5...	1.85	1.94	25	80							
	10.0SIR2.15M-D472-3.5...	2.15	2.24	25	80							
	10.0SIR2.65M-D472-3.5...	2.65	2.74	25	80							
	10.0SIR3.15M-D472-3.5...	3.15	3.28	25	80							
	10.0SIR4.15M-D472-3.5...	4.15	4.28	25	80							
	10.0SIR5.15M-D472-3.5...	5.15	5.28	25	80							

**Micro (Partial Profile) - Double Ended**

Insert Dia.	Ordering Code	Groove Std.			Dimensions mm				Min. Bore Dia.	Toolholder	
d mm	RH	R	W	L1	L	B	t	F	mm		
3.0	3.0SIR0.4S-D7993-0.6...	0.40	0.80	9.0	36.0	0.8	0.6	1.40	3.2	SMC..-3.0	
	3.0SIR0.4M-D7993-0.6...	0.40	0.80	16.0	50.0						
	4.0SIR0.4S-D7993-0.6...	0.40	0.80	9.0	36.0	0.9	0.6	1.90	4.1		
	4.0SIR0.4M-D7993-0.6...	0.40	0.80	16.0	50.0						
	4.0SIR0.4L-D7993-0.6...	0.40	0.80	21.0	60.0	1.1	0.8	1.90	4.1		
	4.0SIR0.6S-D7993-0.8...	0.60	1.20	9.0	36.0						
	4.0SIR0.6M-D7993-0.8...	0.60	1.20	16.0	50.0	1.4	1.1	2.90	6.1		
	4.0SIR0.6L-D7993-0.8...	0.60	1.20	21.0	60.0						
	4.0SIR0.9S-D7993-1.1...	0.90	1.80	9.0	36.0	1.4	1.1	3.90	8.4		
	4.0SIR0.9M-D7993-1.1...	0.90	1.80	16.0	50.0						
4.0	4.0SIR0.9L-D7993-1.1...	0.90	1.80	21.0	60.0	1.6	1.3	4.90	10.4	SMC..-4.0	
	4.0SIR1.0S-D7993-1.2...	1.00	2.00	9.0	36.0						
	4.0SIR1.0M-D7993-1.2...	1.00	2.00	16.0	50.0	1.5	1.2	2.90	6.1		
	4.0SIR1.0L-D7993-1.2...	1.00	2.00	21.0	60.0						
	4.0SIR1.1S-D7993-1.3...	1.10	2.20	9.0	36.0	1.6	1.3	3.90	8.4		
	4.0SIR1.1M-D7993-1.3...	1.10	2.20	16.0	50.0						
	4.0SIR1.1L-D7993-1.3...	1.10	2.20	21.0	60.0	2.5	2.0	4.90	10.4		
	4.0SIR0.9M-D7993-2.0...	0.90	1.80	20.0	70.0						
8.0	8.0SIR1.1M-D7993-2.0...	1.10	2.20	20.0	70.0						
	8.0SIR1.4M-D7993-2.0...	1.40	2.80	20.0	70.0	3.4	2.9	4.90	10.4		
	10.0SIR1.4M-D7993-2.9...	1.40	2.80	25.0	80.0						
10.0	10.0SIR1.8M-D7993-2.9...	1.80	3.60	25.0	80.0	3.4	2.9	4.90	10.4	SMC..-10.0	

**Micro - Double Ended**

Insert Dia. d mm	Ordering Code RH	Groove Std. m (H13)	Dimensions mm						Min. Bore Dia. mm	Toolholder
			W	L1	L	B	t	F		
6.0	6.0SIR1.6S-D3770S-1.5...	1.6	1.98	9.0	36.0				6.1	SMC..-6.0
	6.0SIR1.6M-D3770S-1.5...	1.6	1.98	16.0	50.0	1.8	1.5	2.9		
	6.0SIR1.6L-D3770S-1.5...	1.6	1.98	21.0	60.0					
	6.0SIR2.0S-D3770D-1.8...	2.0	2.38	9.0	36.0					
	6.0SIR2.0M-D3770D-1.8...	2.0	2.38	16.0	50.0	2.0	1.8	2.9		
	6.0SIR2.0L-D3770D-1.8...	2.0	2.38	21.0	60.0					

**Micro (Partial Profile) - Double Ended**

Insert Dia. d mm	Ordering Code RH	Groove Std.		Dimensions mm					Inner Groove Ø	Outer Groove Ø
		m (H13)	W	t	L	F	Sleeve			
4.0	4.0SIR0.7A-D471/472-1.4...	0.70	0.77	1.4	50	1.40	SMC..-4.0	3.50	5.00	
	4.0SIR0.8A-D471/472-1.5...	0.80	0.87	1.5				3.40	5.20	
	4.0SIR0.9A-D471/472-1.6...	0.90	0.97	1.6				3.30	5.30	
	4.0SIR1.1A-D471/472-1.8...	1.10	1.19	1.8				3.10	5.50	
	4.0SIR1.3A-D471/472-2.0...	1.30	1.39	2.0				2.90	5.70	
	4.0SIR1.6A-D471/472-2.3...	1.60	1.69	2.3				2.60	6.00	
6.0	6.0SIR0.7A-D471/472-1.4...	0.70	0.77	1.4	50	1.90	SMC..-6.0	5.50	7.00	
	6.0SIR0.8A-D471/472-1.5...	0.80	0.87	1.5				5.40	7.20	
	6.0SIR0.9A-D471/472-1.6...	0.90	0.97	1.6				5.30	7.30	
	6.0SIR1.1A-D471/472-1.8...	1.10	1.19	1.8				5.10	7.50	
	6.0SIR1.3A-D471/472-2.0...	1.30	1.39	2.0				4.90	7.70	
	6.0SIR1.6A-D471/472-2.3...	1.60	1.69	2.3				4.60	8.00	
	6.0SIR1.85A-D471/472-2.5...	1.85	1.94	2.5				4.40	8.20	
	6.0SIR2.15A-D471/472-2.8...	2.15	2.24	2.8				4.10	8.50	
8.0	8.0SIR1.1A-D471/472-1.8...	1.10	1.19	1.8	70	3.95	SMC..-8.0	8.06	10.44	
	8.0SIR1.3A-D471/472-2.0...	1.30	1.39	2.0				7.66	10.44	
	8.0SIR1.6A-D471/472-2.3...	1.60	1.69	2.3				7.06	10.44	
	8.0SIR1.85A-D471/472-2.5...	1.85	1.94	2.5				6.56	10.44	
	8.0SIR2.15A-D471/472-2.8...	2.15	2.24	2.8				5.96	10.44	
	8.0SIR2.65A-D471/472-3.3...	2.65	2.74	3.3				4.96	10.44	
10.0	10.0SIR1.3A-D471/472-2.0...	1.30	1.39	2.0	80	4.95	SMC..-10.0	9.66	12.44	
	10.0SIR1.6A-D471/472-2.3...	1.60	1.69	2.3				9.06	12.44	
	10.0SIR1.85A-D471/472-2.5...	1.85	1.94	2.5				8.56	12.44	
	10.0SIR2.15A-D471/472-2.8...	2.15	2.24	2.8				7.96	12.44	
	10.0SIR2.65A-D471/472-3.3...	2.65	2.74	3.3				6.96	12.44	
	10.0SIR3.15A-D471/472-3.8...	3.15	3.24	3.8				5.96	12.44	
	10.0SIR4.15A-D471/472-4.8...	4.15	4.24	4.8				3.96	12.44	





**MINIPRO**

## MiniPro Toolholders

PowerBore Toolholders | Micro Toolholders

## Vardex Ordering Code System

### ■ PowerBore Toolholders

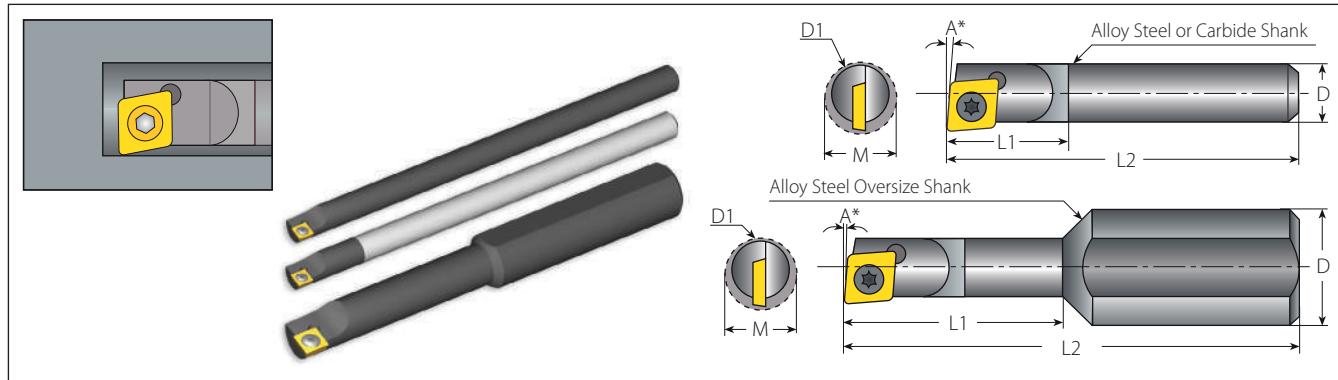
C 1	05 2	-	D 3	T 4	J 5	-	-	5 6
<b>1 - Shank Style</b> C - Carbide S - Steel	<b>2 - Shank Dia.</b> 04 - 4.0 mm 05 - 5.0 mm 06 - 6.0 mm 08 - 8.0 mm 10 - 10.0 mm 12 - 12.0 mm	<b>3 - Bar Dia. [D<sub>1</sub>]</b> A - 4.2 B - 4.6 C - 4.8 D - 5.0 E - 5.2 F - 6.0 G - 6.4 H - 7.9 J - 8.0	<b>4 - Insert Shape</b> C - Diamond 80 Deg.  T - Triangle  W - Trigon 80 Deg. 	<b>5 - Holder Length [L<sub>2</sub>]</b> A - 57 C - 64 D - 70 E - 76 G - 89 J - 102 P - 152	<b>6 - Front Relief Angle</b> 0, 5, 7			

### ■ Micro Toolholders (Sleeves)

S 1	M 2	C 3	16 4	-	3 5
<b>1 - Holder Shape</b> S - Sleeve (Double Ended)	<b>2 - Holder Type</b> M - Micro (Double Ended)	<b>3 - Cooling</b> C - Coolant Channel	<b>4 - Holder Dia.</b> 10, 12, 16, 20	<b>5 - Bore Size</b> Micro Size 3, 4, 6, 8, 10	

## PowerBore Boring Bars for CD0W Inserts

**POWERBORE**



### Alloy Steel Shanks - Standard Size

Shank	Ordering Code	Dimensions mm						Spare Parts		
		A	D	D1	M	L2	L1	Insert Type	Screw	Torx Key
5.0	S05-ACC-7	7°	5.0	4.2	4.6	64	12	CD0W	VS01	VT51
	S05-BCC-5	5°	5.0	4.6	5.3	64				
	S05-DCC-5	5°	5.0	5.0	6.1	64				
	S05-DCC-0	0°	5.0	5.0	6.4	64				
6.0	S06-FCE-5	5°	6.0	6.0	7.0	76	D1=D			
	S06-FCE-0	0°	6.0	6.0	7.3	76				

### Solid Carbide Shank - Standard Size

Shank	Ordering Code	Dimensions mm						Spare Parts		
		A	D	D1	M	L2	L1	Insert Type	Screw	Torx Key
4.0	C04-ACP-7	7°	4.0	4.2	4.6	152	12	CD0W	VS01	VT51
	C05-CCJ-5	5°	5.0	4.8	5.5	102				
	C05-DCJ-5	5°	5.0	5.0	6.1	102				
	C05-DCJ-0	0°	5.0	5.0	6.5	102				
6.0	C06-FCJ-5	5°	6.0	6.0	7.0	102	D1=D			
	C06-FCJ-0	0°	6.0	6.0	7.3	102				

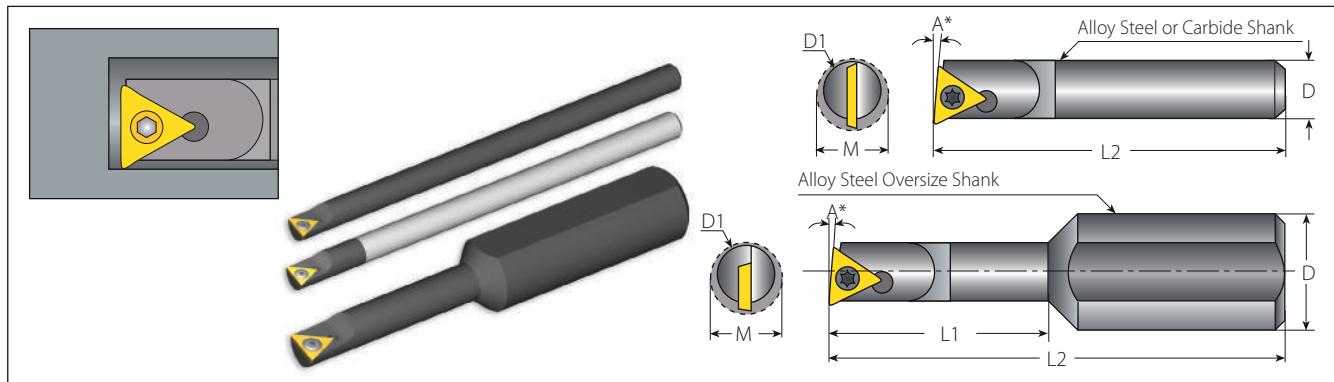
### Alloy Steel Shanks - Oversize

Shank	Ordering Code	Dimensions mm						Spare Parts		
		A	D	D1	M	L2	L1	Insert Type	Screw	Torx Key
8.0	S08-BCA-5	5°	8.0	4.6	5.5	57	25	CD0W	VS01	VT51
	S08-ECA-5	5°	8.0	5.2	5.8	57				
	S08-ECA-0	0°	8.0	5.2	6.2	57				
	S08-GCC-5	5°	8.0	6.4	7.4	64				
	S08-GCC-0	0°	8.0	6.4	7.6	64				

- \* 5° angle for facing and thru-hole boring.
- \* 0° angle for thru-hole boring and boring to a shoulder.

## PowerBore Boring Bars for TD0W Inserts

**POWERBORE**



### Alloy Steel Shanks - Standard Size

Shank	Ordering Code	Dimensions mm				Insert Type	Spare Parts	
		A	D=D1	M	L2			
5.0	S05-DTG--5	5°	5.0	7.1	89	TD0W	VS01	VT51
	S05-DTG--0	0°	5.0	7.1	89			
6.0	S06-FTJ--5	5°	6.0	7.3	102	TD0W	VS40	VT51
	S06-FTJ--0	0°	6.0	7.3	102			
8.0	S08-JTJ--5	5°	8.0	9.2	102	TD0W	VS40	VT51
	S08-JTJ--0	0°	8.0	9.2	102			

### Solid Carbide Shank - Standard Size

Shank	Ordering Code	Dimensions mm				Insert Type	Spare Parts	
		A	D=D1	M	L2			
5.0	C05-DTJ--5	5°	5.0	7.1	102	TD0W	VS01	VT51
	C05-DTJ--0	0°	5.0	7.1	102			
6.0	C06-FTJ--5	5°	6.0	7.3	102	TD0W	VS40	VT51
	C06-FTJ--0	0°	6.0	7.3	102			
8.0	C08-JTJ--5	5°	8.0	9.2	102	TD0W	VS40	VT51
	C08-JTJ--0	0°	8.0	9.2	102			

### Alloy Steel Shanks - Oversize

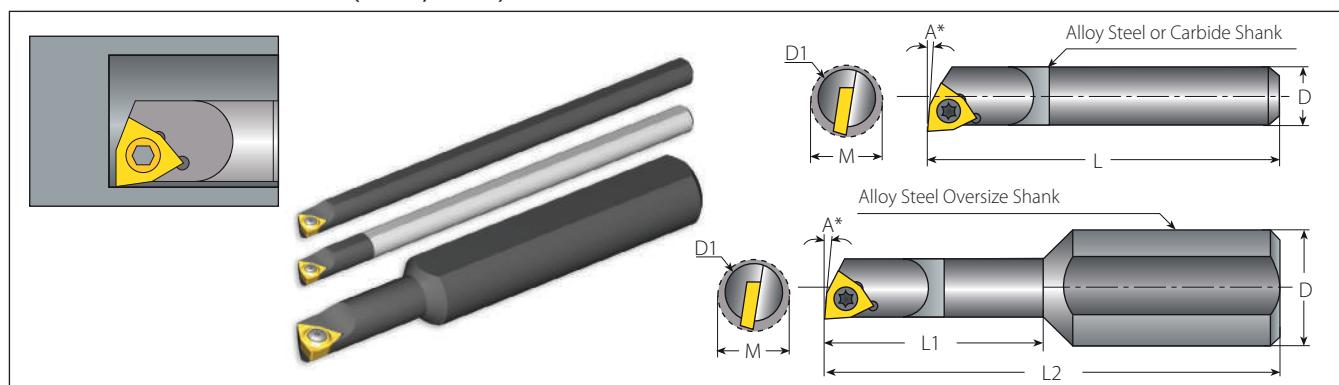
Shank	Ordering Code	Dimensions mm						Insert Type	Spare Parts		
		A	D	D1	M	L2	L1				
12.0	S12-ETC-5	5°	12.0	5.2	6.9	64	25	TD0W	VS01	VT51	
	S12-ETC-0	0°	12.0	5.2	6.9	64	25				
	S12-GTD--5	5°	12.0	6.4	7.6	70	32		VS40		
	S12-GTD--0	0°	12.0	6.4	7.6	70	32				
	S12-HTE--5	5°	12.0	7.9	9.1	76	38		VS40		
	S12-HTE--0	0°	12.0	7.9	9.1	76	38				

\* 5° angle for facing and thru-hole boring.

\* 0° angle for thru-hole boring and boring to a shoulder.

## PowerBore Boring Bars for WC0W Inserts (4213, 4214)

**POWERBORE**



### Alloy Steel Shanks - Standard Size

Shank	Ordering Code	Dimensions mm				Spare Parts					
		A	D=D1	M	L	Insert Type	Screw	Torx Key			
5.0	S05-DWC-5	5°	5.0	6.1	64	WC0W4213 WC0W4214	VS40	VT51			
	S05-DWC-0	0°	5.0	6.4							
6.0	S06-FWJ--5	5°	6.0	7.0	102						
	S06-FWJ--0	0°	6.0	7.3							

### Solid Carbide Shank - Standard Size

Shank	Ordering Code	Dimensions mm				Spare Parts		
		A	D=D1	M	L	Insert Type	Screw	Torx Key
5.0	C05-DWJ--5	5°	5.0	6.1	102	WC0W4213 WC0W4214	VS40	VT51
	C05-DWJ--0	0°	5.0	6.4				
6.0	C06-FWJ--5	5°	6.0	7.0				
	C06-FWJ--0	0°	6.0	7.3				

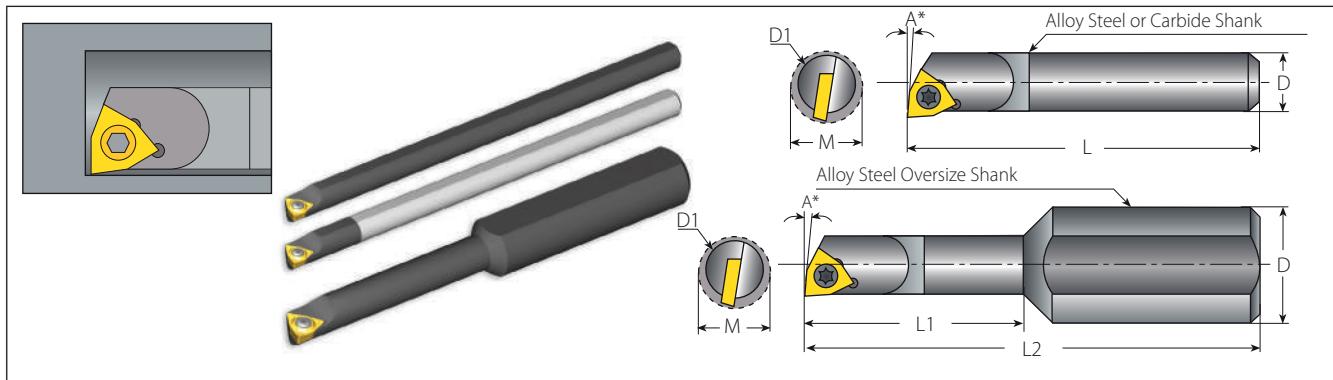
### Alloy Steel Shanks - Oversize

Shank	Ordering Code	Dimensions mm						Spare Parts		
		A	D	D1	M	L2	L1	Insert Type	Screw	Torx Key
10.0	S10-EWA--5	5°	10.0	5.2	5.8	57	13	WC0W4213 WC0W4214	VS40	VT51
	S10-EWA--0	0°	10.0	5.2	6.2	57				
	S10-GWC--5	5°	10.0	6.4	7.4	64				
	S10-GWC--0	0°	10.0	6.4	7.6	64				

\* 5° angle for facing and thru-hole boring.  
\* 0° angle for thru-hole boring and boring to a shoulder.

## PowerBore Boring Bars for WC0W Inserts (5013, 5014)

**POWERBORE**



### Alloy Steel Shanks - Standard Size

Shank	Ordering Code	Dimensions mm				Spare Parts		
		A	D=D1	M	L	Insert Type	Screw	Torx Key
8.0	S08-JWJ--5	5°	8.0	9.2	102	WC0W5013 WC0W5014	VS41	VT51
	S08-JWJ--0	0°	8.0	9.2				

### Solid Carbide Shank - Standard Size

Shank	Ordering Code	Dimensions mm				Spare Parts		
		A	D=D1	M	L	Insert Type	Screw	Torx Key
8.0	C08-JWJ--5	5°	8.0	9.2	102	WC0W5013 WC0W5014	VS41	VT51
	C08-JWJ--0	0°	8.0	9.2				

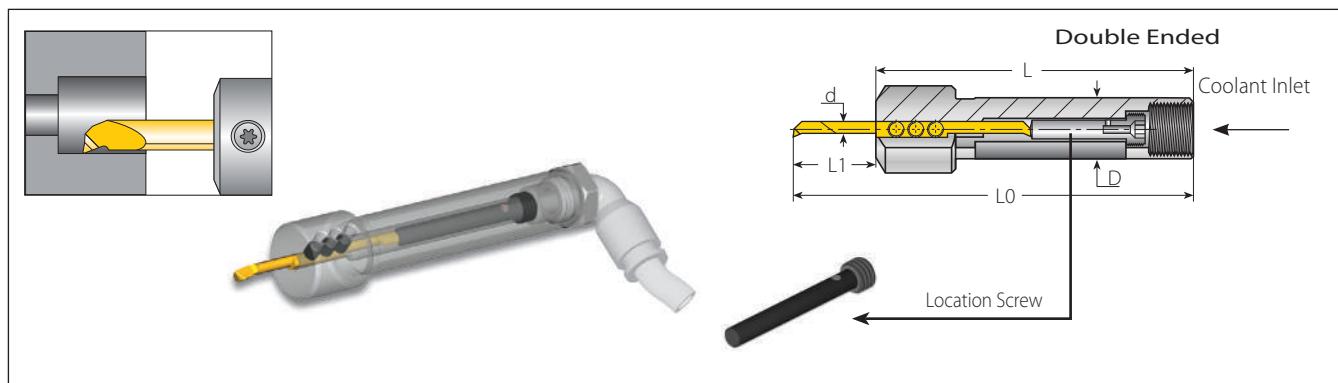
### Alloy Steel Shanks - Oversize

Shank	Ordering Code	Dimensions mm						Spare Parts		
		A	D	D1	M	L2	L1	Insert Type	Screw	Torx Key
10.0	S10-HWE--5	5°	10.0	7.9	9.2	76	38	WC0W5013 WC0W5014	VS41	VT51
	S10-HWE--0	0°	10.0	7.9	9.2	76				

\* 5° angle for facing and thru-hole boring.  
\* 0° angle for thru-hole boring and boring to a shoulder.

## Internal Toolholders

**MINIPRO**



### Micro - Double Ended

Micro Insert Dia.	Shank Dia.	Ordering Code	Dimensions mm			Location Screw*			Clamping Screw x 3	
			d mm	D	L	L1	L0	Screw	M	Key
3	10	SMC10-3.0	80	9 - Short 16 - Medium	89 96	AGISM8X28 AGISM8X21 AGISM8X49 AGISM8X42	28	M4X0.7X4.0	K2.0	
	12	SMC12-3.0					21			
	16	SMC16-3.0	95	9 - Short 16 - Medium	104 111		49			
	20	SMC20-3.0					42			
4	10	SMC10-4.0	80	9 - Short 16 - Medium 21 - Long	89 96 101	AGISM8X28 AGISM8X21 AGISM8X16 AGISM8X49 AGISM8X42 AGISM8X37	28	M4X0.7X4.0	K2.0	
	12	SMC12-4.0					21			
	16	SMC16-4.0	95	9 - Short 16 - Medium 21 - Long	104 111 116		16			
	20	SMC20-4.0					37			
6	12	SMC12-6.0	80	9 - Short 16 - Medium 21 - Long	89 96 101	AGISM8X28 AGISM8X21 AGISM8X16 AGISM8X49 AGISM8X42 AGISM8X37	28	K4.0	K3.0	
	16	SMC16-6.0					21			
	20	SMC20-6.0	95	9 - Short 16 - Medium 21 - Long	104 111 116		16			
	16	SMC16-8.0	95	12 - Short 20 - Medium 28 - Long	107 115 123		49			
8	20	SMC20-8.0					42			
	16	SMC16-10.0	95	15 - Short 25 - Medium 35 - Long	110 120 130		17			
10	20	SMC20-10.0					30	M6X1.0X5.0	K3.0	
	16	SMC16-10.0					20			
							10			

\* Every toolholder package contains the full range of location screws needed.





# MINIPRO

## MiniPro Technical Data

**Recommended Grades, Cutting Speeds Vc [m/min],  
Feed f [mm/rev] and Max Depth [mm]**

**MINIPRO**

Material Group	Vargus No.	Material	Hardness Brinell HB	Vc [m/min]		Feed [mm/rev]			Max Depth [mm]			
				Coated		Power Bore	Micro Boring	Micro Grooving	TD0W CD0W	WD0W	Micro Boring	
				VTX (PowerBore)	VMX Micro							
<b>P</b> Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	115-190	50-120	0.25	0.05	0.03	0.45	0.6	0.4
	2		Medium Carbon (C=0.25-0.55%)	150	100-175	40-100	0.2	0.04	0.02	0.45	0.6	0.4
	3		High Carbon (C=0.55-0.85%)	170	90-165	30-80	0.15	0.03	0.01	0.45	0.6	0.4
	4	Low Alloy Steel (alloying elements≤5%)	Non Hardened	180	85-145	50-70	0.2	0.04	0.02	0.35	0.5	0.3
	5		Hardened	275	75-140	40-60	0.15	0.04	0.01	0.35	0.5	0.3
	6		Hardened	350	70-135	30-50	0.1	0.03	0.01	0.35	0.5	0.3
	7	High Alloy Steel (alloying elements>5%)	Annealed	200	70-110	30-50	0.1	0.04	0.02	0.18	0.4	0.15
	8		Hardened	325	50-100	25-40	0.05	0.03	0.01	0.18	0.4	0.15
	9	Cast Steel	Low Alloy (alloying elements<5%)	200	75-140	30-50	0.25	0.04	0.02	0.18	0.4	0.15
	10		High Alloy (alloying elements>5%)	225	60-120	25-40	0.1	0.04	0.02	0.18	0.4	0.15
<b>M</b> Stainless Steel	11	Stainless Steel Ferritic	Non Hardened	200	70-130	60-100	0.2	0.04	0.01	0.22	0.5	0.2
	12		Hardened	330	60-115	40-60	0.08	0.03	0.01	0.18	0.4	0.15
	13	Stainless Steel Austenitic	Austenitic	180	90-140	50-90	0.2	0.04	0.01	0.22	0.5	0.2
	14		Super Austenitic	200	40-110	40-60	0.08	0.04	0.01	0.18	0.4	0.15
	15	Stainless Steel Cast Ferritic	Non Hardened	200	90-120	40-60	0.2	0.04	0.02	0.22	0.5	0.2
	16		Hardened	330	65-110	30-50	0.08	0.03	0.01	0.18	0.4	0.15
	17	Stainless Steel Cast Austenitic	Austenitic	200	85-110	40-60	0.2	0.04	0.02	0.22	0.5	0.2
	18		Hardened	330	60-100	30-50	0.08	0.03	0.01	0.18	0.4	0.15
<b>K</b> Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	70-160	50-70	0.15	0.02	0.02	0.3	0.4	0.25
	29		Pearlitic (long chips)	230	60-145	50-70	0.10	0.01	0.01	0.3	0.4	0.25
	30	Grey Cast Iron	Low Tensile Strength	180	70-130	50-70	0.15	0.02	0.02	0.45	0.6	0.4
	31		High Tensile Strength	260	60-115	40-60	0.1	0.01	0.02	0.45	0.6	0.4
	32	Nodular Sg Iron	Ferritic	160	125-160	50-70	0.15	0.02	0.02	0.45	0.6	0.4
	33		Pearlitic	260	90-120	60-80	0.1	0.01	0.01	0.45	0.6	0.4
<b>N</b> Non-Ferrous Metals	34	Aluminium Alloys Wrought	Non Aging	60	100-365	100-300	0.3	0.03	0.03	0.63	1.0	0.5
	35		Aged	100	80-220	100-150	0.2	0.03	0.03	0.63	1.0	0.5
	36	Aluminium Alloys	Cast	75	200-400	100-150	0.3	0.03	0.03	0.63	1.0	0.5
	37		Cast & Aged	90	200-280	60-100	0.2	0.03	0.03	0.63	1.0	0.5
	38	Aluminium Alloys	Cast Si 13-22%	130	60-180	100-150	0.3	0.02	0.02	0.63	1.0	0.5
	39	Copper and Copper Alloys	Brass	90	80-225	60-100	0.3	0.03	0.03	0.63	1.0	0.5
	40		Bronze And Non Leaded Copper	100	80-255	60-100	0.2	0.03	0.03	0.63	1.0	0.5
<b>S</b> Heat Resistant Material	19	High Temperature Alloys	Annealed (iron based)	200	45-60	25-45	0.2	0.04	0.01	0.22	0.5	0.2
	20		Aged (iron based)	280	30-50	20-30	0.08	0.03	0.01	0.18	0.4	0.15
	21		Annealed (nickel or cobalt based)	250	20-30	15-20	0.08	0.01	0.01	0.18	0.4	0.15
	22		Aged (nickel or cobalt based)	350	15-25	10-15	0.05	0.01	0.01	0.18	0.4	0.15
	23	Titanium Alloys	Pure 99.5 Ti	400Rm	140-170	60-100	0.05	0.02	0.02	0.18	0.4	0.15
	24		α+β Alloys	1050Rm	50-70	40-50	0.05	0.02	0.02	0.18	0.4	0.15
<b>H</b> Hardened Material	25	Extra Hard Steel	Hardened & Tempered	45-50HRc	45-65	20-45	0.02	0.01	0.01	0.05	0.2	0.05
	26			51-55HRc	45-60	20-40	0.01	0.01	0.01	0.05	0.1	0.05

**Grades**

**VTX**



General use carbide grade.  
TiAlN coated.

**VMX**



General use carbide grade  
for Micro inserts. TiN coated.

Spare Parts for PowerBore line						
Insert	Boring Bar	Insert	Torx Screw	Screw Description	Torx Key	Torx Size
	A	CD0W	VS01	1-72 Oval X 2.77LG.		T6
	B	TD0W Min. Bore 7.1 > Bore 7.1	VS01 VS40	1-72 Oval X 2.77LG. M2 X 0.4 X 3.86LG.		
	E	WC0W4213, WC0W4214	VS40	M2 X 0.4 X 3.86LG.		
	F	WC0W5013, WC0W5014	VS41	M2 X 0.4 X 4.90LG.		

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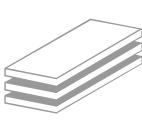
Metal



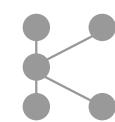
Aluminum



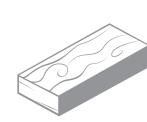
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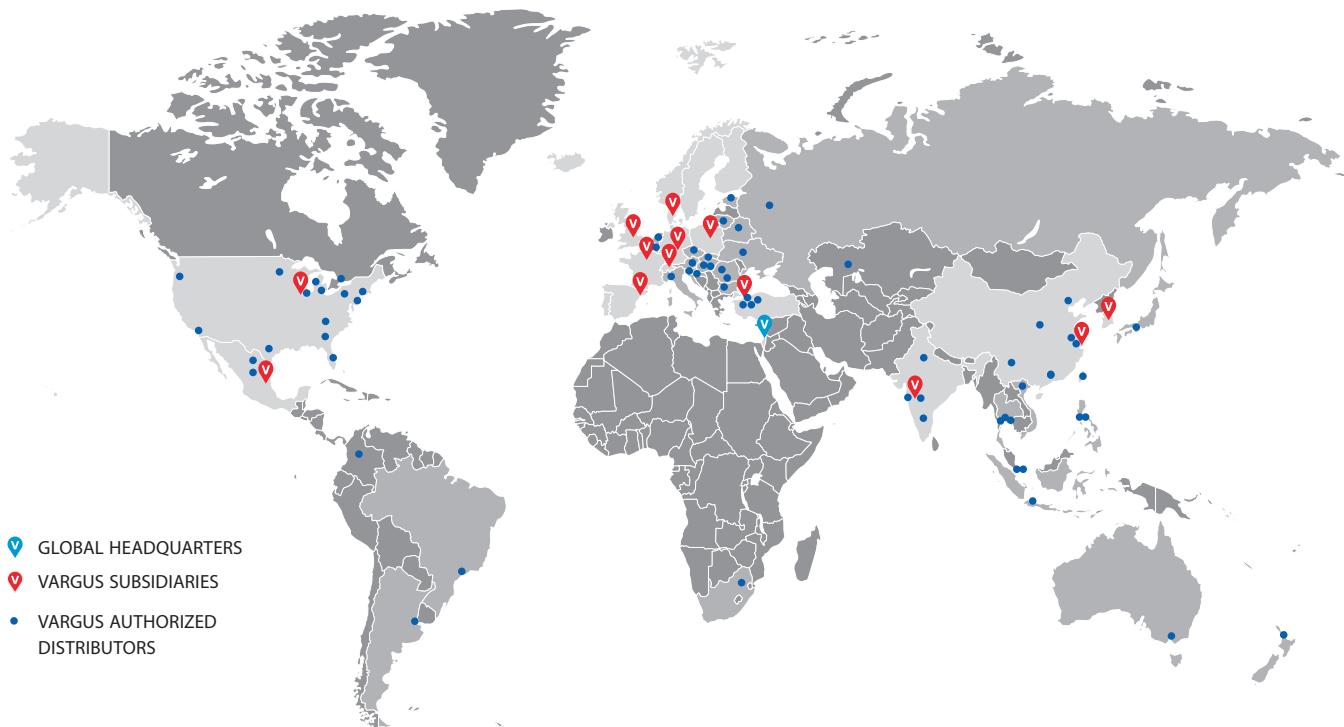
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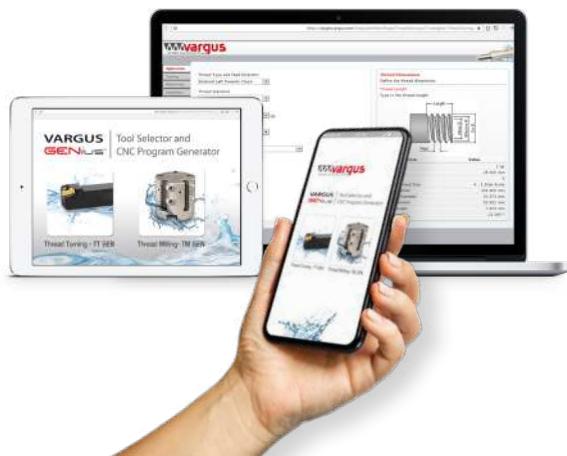
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