

D

THREADING

Korloy threading tools are available for machining various shapes of thread at various pitches while ensuring high quality performances



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Technical information for Threading

- D03 Technical Information for Threading
- D09 Threading Insert with Chip Breaker

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- D12 ISO Metric
- D16 American UN
- D18 With Worth
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- D23 National Pipe Thread-Dry seal
- D23 Round DIN 405
- D24 Trapez DIN 103
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TAP

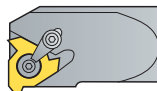
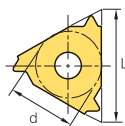
- D61 Technical Information for Tap
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D Threading Code System

Threading holder code system

1	2	3	4	5	6	7
E	R	H	10	(N)	- 11	(C)
Holder type	Hand of insert	Name	Height of shank	Shim	Insert size (mm)	Clamping system

1 Holder type E R H 10 (N) - 11 (C) E: For External I: For Internal	4 Height of shank E R H 10 (N) - 11 (C)  - External 8, 10, 12, 16, 20, 25, 32, 40, 50  - Internal 10, 12, 13, 16, 20, 25, 32, 49, 50, 60 *Refer to the specification for shank diameter information	6 Insert size (mm) E R H 10 (N) - 11 (C) 11: d = 6.35 16: d = 9.525 22: d = 12.7 27: d = 15.875 
2 Hand of insert E R H 10 (N) - 11 (C) R: Right handed L: Left handed	5 Shim E R H 10 (N) - 11 (C) No code: Shim required N: No shim required	7 Clamping system E R H 10 (N) - 11 (C) No code: Screw on system C: Clamp on system
3 Name E R H 10 (N) - 11 (C) H: Holder		

Threading insert code system

E	R	M	16	-	1.5	ISO
1	2	3	4	5	6	
Insert type	Hand of insert	Chip breaker	Insert size (mm)	Pitch	Type	

1

Insert type

E R M 16 - 1.5 ISO

E: External thread I: Internal thread

2

Hand of insert

E R M 16 - 1.5 ISO

R: Right handed L: Left handed

3

Chip breaker

E R M 16 - 1.5 ISO

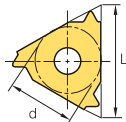
M: With chip breaker

4

Insert size (mm)

E R M 16 - 1.5 ISO

11: d = 6.35
16: d = 9.525
22: d = 12.7
27: d = 15.875



Insert shape

 < ER/IR >
 < ERM/IRM >

5

Pitch

E R M 16 - 1.5 ISO

Full profile		Partial profile	
mm	tpi	mm	tpi
0.35-6.0	72-3	A 0.5-1.5	48-16
		AG 0.5-3.0	48-8
		G 1.75-3.0	14-8
		N 3.5-5.0	7-5
		Q 5.5-6.0	4.5-4

6

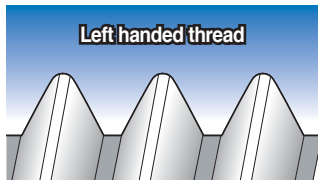
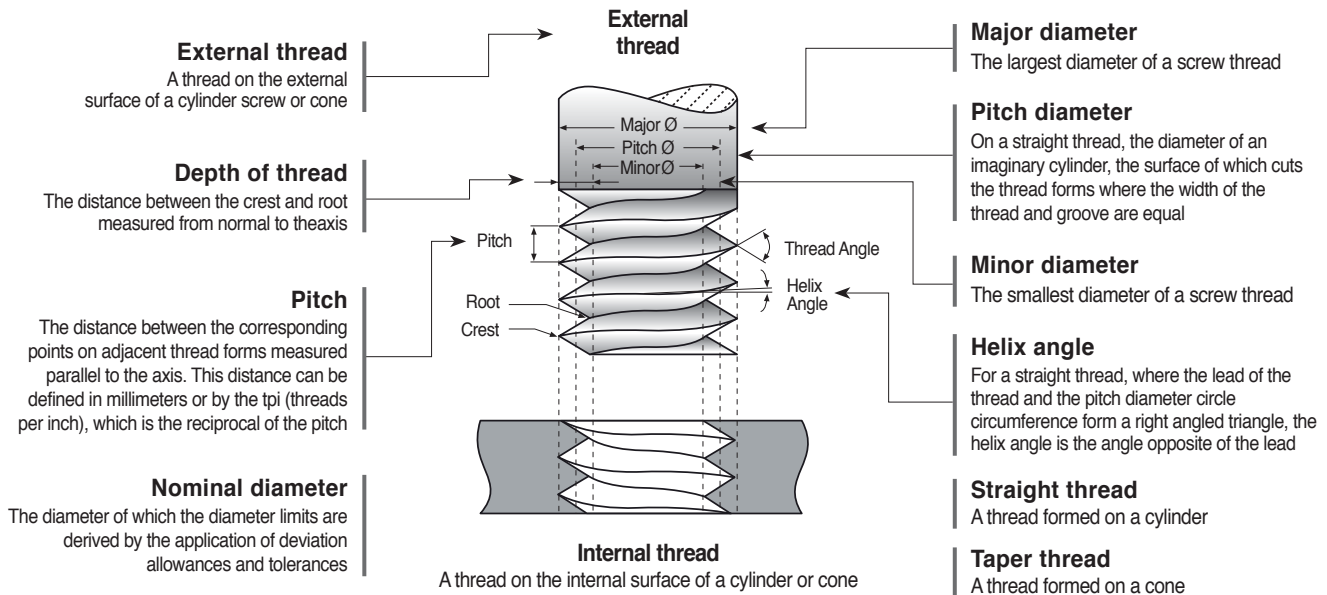
Type

E R M 16 - 1.5 ISO

Partial profile 60°
Partial Profile 55°
ISO Metric (Full Profile)
American UN (Full Profile) UN, UNC, UNF, UNEF
Whitworth (Full Profile) BSW, BSF, BSP
British Standard Pipe thread (Full Profile) BSPT
National Pipe Thread (Full Profile) NPT
National Pipe Threads-Dryseal (Full Profile) NPTF
Round DIN 405
Trapez DIN 103
American ACME
Stub ACME
UNJ
American Buttress
British Buttress
Metric Buttress-Sagengewinde
API
API Buttress Casing
API Round Casing & Tubing
EL-Extreme Line



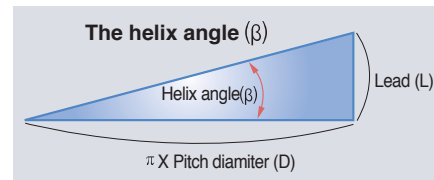
Special features



A thread which, when viewed axially, winds in a counter clockwise and receding direction. All left handed threads are designated LH



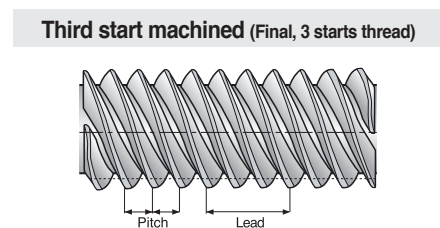
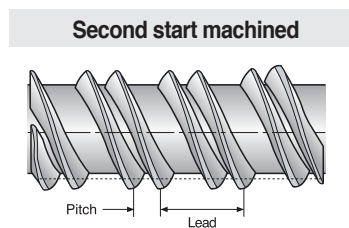
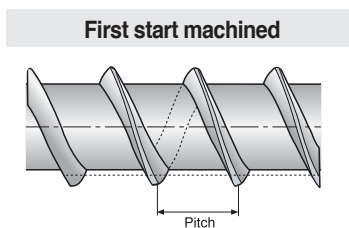
A thread which, when viewed axially, winds in a clockwise and receding direction. Threads are always right handed unless they are specified



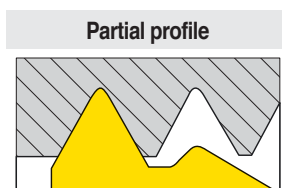
For a straight thread, where the lead of the thread and the pitch diameter circle circumference form a right angled triangle, the helix angle is the angle opposite of the lead

Machining a multi-start thread

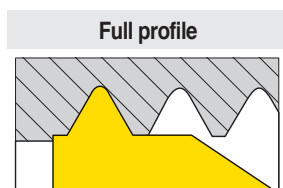
- A thread in which the lead is an integral multiple, greater than one, of the pitch. A multi-start thread permits a more rapid advance without a coarser (larger) thread form



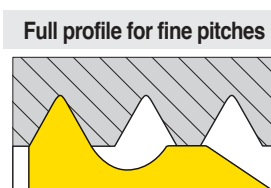
Insert profile style



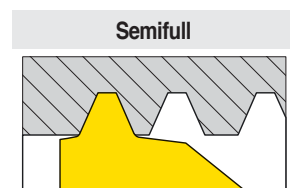
The V partial profile insert cuts without topping the outer diameter of the thread. The same insert can be used for a range of different thread pitches which have a common thread angle



The full profile insert will form a complete thread profile including the crest. For every thread pitch and standard, a separate insert is required



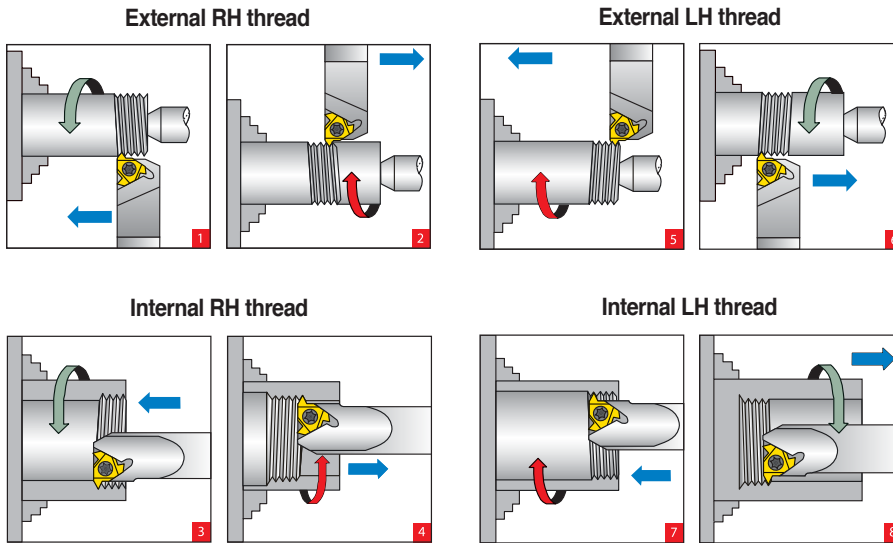
The full profile for Fine Pitches will form a complete thread. The topping of the outer diameter is generated by second tooth



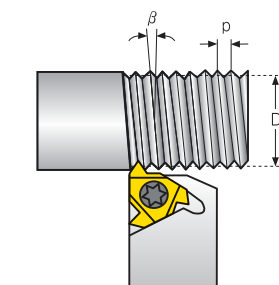
The Semi profile insert will form a complete thread including crest radius but without topping the outer diameter. Mainly used for trapezoidal profiles

Thread turning method

Thread	Inserts & Tool holder	Rotation	Feed direction	Helix method	Drawing no.
Right Hand Externa	EX RH	Counter clockwise	Towards chuck	Regular	1
	EX LH	Clockwise	From chuck	Reversed	2
Right Hand Internal	IN LH	Counter clockwise	Towards chuck	Regular	3
	IN LH	Clockwise	From chuck	Reversed	4
Left Hand External	EX LH	Clockwise	Towards chuck	Regular	5
	EX RH	Counter clockwise	From chuck	Reversed	6
Left Hand Internal	IN LH	Clockwise	Towards chuck	Regular	7
	IN RH	Counter clockwise	From chuck	Reversed	8



Calculating the helix angle (β)

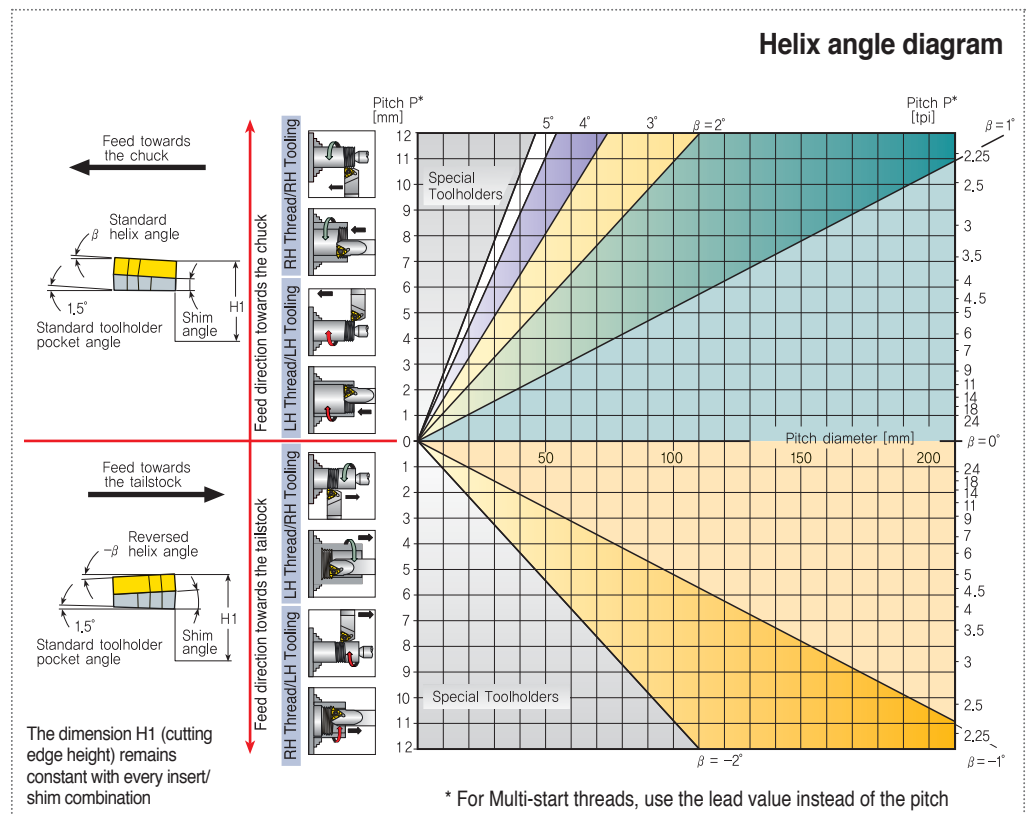


- The helix angle is calculated by the following formula:

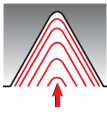
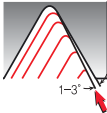
$$\beta = \tan^{-1} \frac{P \times N}{\pi \times D}$$

β : Helix angle ($^{\circ}$)
 P: Pitch (mm)
 N: No. of starts
 D: Pitch diameter (mm)
 Lead = $P \times N$

- The helix angle can also be found from the diagram below



Thread infeed method

Infeed	Application	
 Radial infeed	- When the pitch is smaller than 16 tpi - For material with short chips - For work with hardened material	 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.
 Flank infeed (modified)	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 results in three cutting edges, making chip flow very difficult.	 Flank infeed is recommended in the following cases.
 Alternate flank infeed	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.	 Use of the alternate flank method is recommended especially in large pitches and for materials with long chips.

Shim

Standard shim	ATE (External)	ATI (Through)	Helix angle 1.5°	Insert size	d	9.525		12.7		15.875	
					L	16		22		27	
				Holder		ER(L)H	IR(L)H	ER(L)H	IR(L)H	ER(L)H	IR(L)H
				Ordering code		ATE16	ATI16	ATE22	ATI22	ATE27	ATI27

※ Standard shim has lead angle 1.5°

Application grade

Grade	Features		Available insert type
PC5300	Universal grade	- For chip breaker type only - Stable machining on a wide application due to fine-grained carbide substrate with balanced heat resistance and toughness - Excellent wear resistance and oxidation resistance due to AlTiN coating film. Outstanding performance on high speed machining.	ERM/IRM (Insert with Chip breaker)
PC3030T	Specialized grade for threading inserts	- A tough sub-micron substrate with TiAlN coating provides good fracture toughness and excellent wear resistance. - Outstanding performance on STS and hard to cut materials.	ER/IR (Ground insert)
PC9070	Specialized grade for threading inserts	Strong wear resistance in stainless machining thanks to multilayer PVD coatings.	ER/IR (Ground insert)

Recommended cutting speed as per workpiece (vc)

Workpiece		  
P	Carbon steel, Alloy steel, Cast Steel	PC5300 PC3030T
M	Stainless steel, Heat resistant steel, Titanium alloy steel	PC5300 PC3030T PC9070
K	Carbon Iron, Aluminum, Cast Steel, Copper	PC5300 PC3030T

D Technical Information for Threading

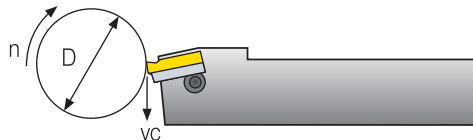
Recommended cutting speed as per workpiece (vc)

Workpiece			Hardness brinell (HB)	vc (m/min) PC3030T	PC9070	PC5300
P	Carbon steel	Low carbon (C=0.1-0.25 %)	125	115~190		110~190
		Medium carbon (C=0.25-0.55 %)	150	100~175		100~165
		High carbon (C=0.55-0.85 %)	170	90~155		90~155
	Low alloy steel (alloying elements ≤ 5%)	Non-hardened	180	100~180		100~180
		Hardened	275	75~140		75~140
		Hardened	350	70~135		70~135
	High alloy steel (alloying elements > 5%)	Annealed	200	80~120		80~120
		Hardened	325	50~100		50~100
	Cast steel	Low alloy (alloying elements <5%)	200	70~130		70~130
		High alloy (alloying elements >5%)	225	60~120		60~120
M	Stainless steel ferritic	Non-hardened	200	70~130	70~150	70~130
		Hardened	330	50~95	60~125	50~95
	Stainless steel austenitic	Austenitic	180	80~120	90~160	80~120
		Super austenitic	200	30~100	40~120	30~100
	Stainless steel cast ferritic	Non-hardened	200	90~120	90~150	90~120
		Hardened	330	65~110	65~120	65~110
	Stainless steel cast austenitic	Austenitic	200	85~110	85~120	85~110
		Hardened	330	60~100	60~110	60~100
	High temperature alloy	Annealed (Iron based)	200	45~60		45~60
		Aged (Iron based)	280	30~50		30~50
		Annealed (Nickel or Cobalt based)	250	20~30		20~30
		Aged (Nickel or Cobalt based)	350	15~25		15~25
	Titanium alloy	99.5% pure Titanium	400Rm	140~170		140~170
		Titanium alloy	1050Rm	50~70		50~70
K	Extra hard steel	Hardened & tempered	55HRC	45~60		45~60
	Malleable cast iron	Ferritic (short chips)	130	70~120		70~120
		Pearlitic (long chips)	230	70~120		70~120
	Gray cast iron	Low tensile strength	180	70~130		70~130
		High tensile strength	260	60~100		60~100
	Nodular SG iron	Ferritic	160	125~160		125~160
		Pearlitic	260	90~120		90~120
	Aluminum alloy wrought	Non-aging	60	100~250		100~250
		Aged	100	80~180		80~180
	Aluminum alloy	Cast	75	200~400		200~400
		Cast & aged	90	200~280		200~280
		Cast Si 13-22%	130	60~150		60~180
	Copper and copper alloy	Brass	90	80~120		80~210
		Bronze and non-leaded copper	100	80~120		80~210

Calculation of n [RPM]

$$n = \frac{vc \times 1000}{\pi \times D}$$

$$vc = \frac{\pi \times D \times n}{1000}$$



n: Revolution Per Minute [min⁻¹]
vc: Cutting Speed [m/min]
D: Workpiece Diameter [mm]

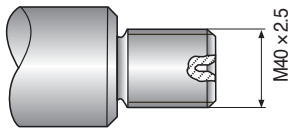
Number of passes

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

※ One cutting depth is calculated by total cutting depth divided into machining times
ex) ER16-1.5ISO, hmin 0.92: If 10 times machining, one cutting depth is 0.092 (0.92/10)



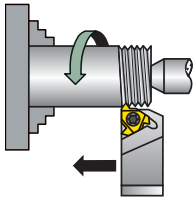
Step by step thread turning



Application

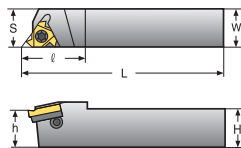
- Thread: External right hand ISO metric M40x2.5
- Material: 4140 (25 HRC)

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

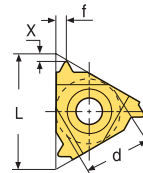
3 Choose the tool holder



Chosen tool holder: ERH 25-16

Insert size	Ordering code	Dimensions (mm)				
d	RH (Right Hand)	H=h	W	S	L	ℓ
9.525	ERH25-16	25	25	25	153.6	30

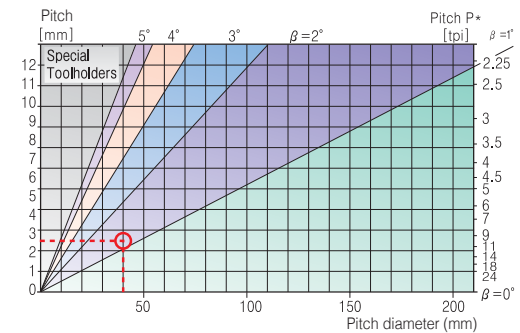
2 Choose the insert size



Chosen insert: ER16-2.5 ISO

Insert size	Pitch	Ordering code	Shim	Tool holder
d	mm	RH (Right Hand)	RH (Right Hand)	
9.525	2.5	ER16-2.5ISO	ATE16	ERH□□-16

4 Determine the helix angle



From the table, using a pitch of 2.5 mm (10 tpi) and a workpiece diameter of 40mm (1.57"), we find the helix angle to be 1.5°

5 Choose the correct shim

Resultant Helix angle		1.5°
Insert size	d	9.525
	L	16
Ordering code		ATE16

6 Choose the carbide grade and cutting speed

Workpiece			HB	vc (m/min)
				PC3030T
P	Low alloy steel (alloying elements ≤ 5%)	Non-hardened	180	85~145
		Hardened	275	75~140
		Hardened	350	70~135

- Carbide grade chosen: PC3030T
- Cutting speed: 140m/min

7 Determine the number of passes

Pitch	mm	1.50	1.75	2.00	2.50	3.00	3.50	4.00
	tpi	16	14	12	10	8	7	6
No. of passes		6~10	7~12	7~12	8~14	9~16	10~18	11~18

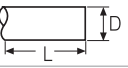
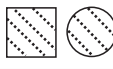
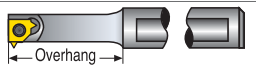
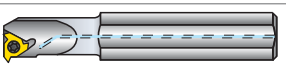
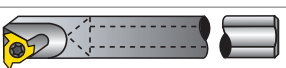
- Carbide grade chosen: PC3030T
- Cutting speed: 140m/min

8 Summary

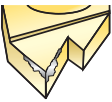
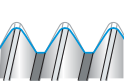
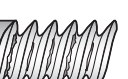
Thread type	ISO M40 x 2.5 External right hand
1. Feed direction	Towards the chuck
2. Insert and grade	ER16-2.5ISO, PC3030T
3. Tool holder	ERH25-16
4. Helix angle	1.5°
5. Shim	ATE16
6. Cutting speed	140m/min
7. Number of passes	10

D Technical Information for Threading

➤ Cutting condition depending on

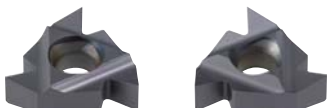
Workpiece	Material type		Coolant	Coolant type	
	Material dimension			Holder cross section area	
	Diameter and length chipflow character			Holder overhang	
	Material hardness		Holders	Through coolant option	
Thread application	External or internal			Shank type: Carbide, alloy,	
	Profile shape			Carbide implant grade	
	Surface finish			Profile shape: Pitch and depth	
	Machine stability		Insert	Nose radius	
Machine	Max. RPM			Chip breaker style	
	Clamping system stability				

➤ Trouble shooting

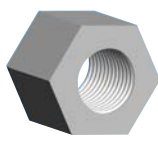
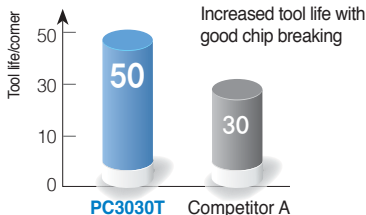
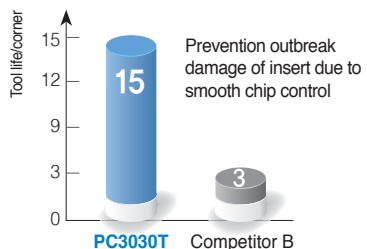
Problem	Possible cause	Solution
 Increased flank wear	Cutting speed too high Depth of cut too low/too many passes Unsuitable carbide grade Insufficient cooling	➤ Reduce cutting speed/use coated insert ➤ Increase the depth of cut per pass ➤ Use a coated carbide grade ➤ Increase coolant flow rate
 Uneven cutting edge wear	Incorrect helix angle Wrong infeed method	➤ Choose the correct shim ➤ Use the Alternating Flank Infeed method
 Extreme plastic deformation	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
 Cutting edge breakage	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
 Built-up edge	Incorrect cutting speed Unsuitable carbide grade	➤ Change the cutting speed ➤ Use a coated carbide
 Thread profile is too shallow	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
 Poor surface quality	Too low cutting speed Wrong shim Flank infeed method is not appropriate	➤ Increase cutting speed ➤ Choose correct shim ➤ Use the alternate flank or radial infeed method

Threading insert with chip breaker

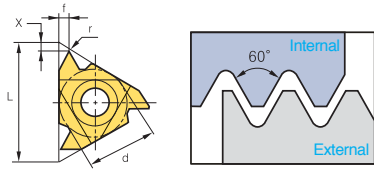
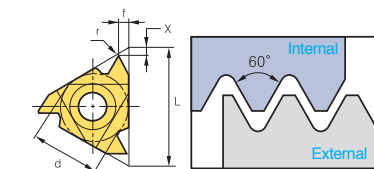
- Features**
- Economical insert
 - Good toughness and high accuracy as ground type inserts
 - Exclusive insert design improves chip control
 - New grade for general application of various kinds of workpieces

Type	Ground insert		Insert with a chip breaker			
C/B Code	None		None		U	
Designation	ER16-1.5ISO		ERM16-1.5ISO		ERM16-1.5ISO-U	
Machining	External	Internal	External	Internal	External	Internal
Insert Shape						
Chip Shape						
Class	P, M, K, N, S		P, M, K		P, M, K	
Application	G-Class		M-Class		M-Class	
Features	• Groove-shaped chip breaker with superior chip evacuation lowers cutting load • Enables high precision machining • Applicable for machining of various shapes of threads • Applicable for machining of various workpieces		• Unique 3 dimensional chip breaker improves machinability with good chip control • Excellent cutting edge treatment technology ensures high precision sharp cutting edge		• Groove-shaped chip breaker with superior chip evacuation lowers cutting load • Reduces machining pass by 10~30% • Excellent cutting edge treatment achieves high precision sharp cutting edge	

Application examples

KORLOY		ERM16-1.5ISO [PC3030T]	IRM16-2.0ISO [PC3030T]
Competitor tools		ER16-1.5ISO [A-Maker]	IR16-2.0ISO [B-Maker]
Workpiece	Material	SCM440	STS304
	Figure		
Cutting condition	Cutting speed (m/min)	63	120
	Pass	8	9
	Machining	Radial infeed	Radial infeed
	Pitch	1.5	2.0
Coolant		Wet	Wet
Result		 Increased tool life with good chip breaking	 Prevention outbreak damage of insert due to smooth chip control

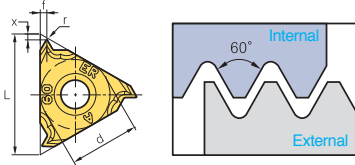
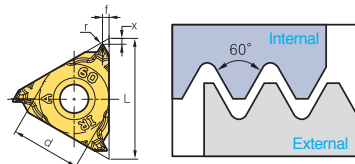
Partial profile 60°

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch		Dimensions (mm)					Picture
							(mm)	(tpi)	d	L	r	x	f	
External	ER 11-A60	●	●	EL 11-A60			0.5~1.5	48~16	6.35	11	0.05	0.8	0.9	
	16-A60	●	●	16-A60	●		0.5~1.5	48~16	9.525	16	0.05	0.8	0.9	
	16-G60	●		16-G60	●		1.75~3.0	14~8	9.525	16	0.27	1.2	1.7	
	16-AG60	●	●	16-AG60	●		0.5~3.0	48~8	9.525	16	0.08	1.2	1.7	
	22-N60	●	●	22-N60	●		3.5~5.0	7~5	12.7	22	0.53	1.7	2.5	
	27-Q60	●		27-Q60			5.5~6.0	4.5~4	15.875	27	0.64	2.1	3.1	
Internal	IR 11-A60	●	●	IL 11-A60	●	●	0.5~1.5	48~16	6.35	11	0.05	0.8	0.9	
	16-A60	●	●	16-A60	●		0.5~1.5	48~16	9.525	16	0.05	0.8	0.9	
	16-G60	●		16-G60	●		1.75~3.0	14~8	9.525	16	0.16	1.2	1.7	
	16-AG60	●	●	16-AG60	●		0.5~3.0	48~8	9.525	16	0.05	1.2	1.7	
	22-N60	●	●	22-N60	●		3.5~5.0	7~5	12.7	22	0.30	1.7	2.5	
	27-Q60	●	●	27-Q60			5.5~6.0	4.5~4	15.875	27	0.30	1.8	2.7	

➔ Applicable holders D31, D32

●: Stock item

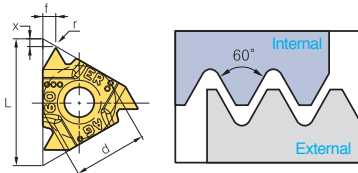
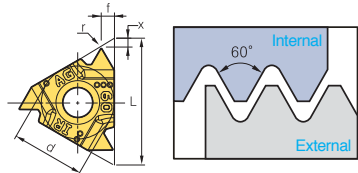
Partial profile 60° (M chip breaker)

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch		Dimensions (mm)					Picture
						(mm)	(tpi)	d	L	r	x	f	
External	ERM 16-A60	●				0.5~1.5	48~16	9.525	16	0.05	0.8	0.9	
	16-G60	●				1.75~3.0	14~8	9.525	16	0.27	1.2	1.7	
	16-AG60	●				0.5~3.0	48~8	9.525	16	0.08	1.2	1.7	
	22-N60	●				3.5~5.0	7~5	12.7	22	0.53	1.7	2.5	
Internal	IRM 11-A60	●				0.5~1.5	48~16	6.35	11	0.08	0.8	0.9	
	16-A60	●				0.5~1.5	48~16	9.525	16	0.08	0.8	0.9	
	16-G60	●				1.75~3.0	14~8	9.525	16	0.12	1.2	1.7	
	16-AG60	●				0.5~3.0	48~8	9.525	16	0.08	1.2	1.7	
	22-N60	●				3.5~5.0	7~5	12.7	22	0.30	1.7	2.5	

➔ Applicable holders D31, D32

●: Stock item

Partial profile 60° (U chip breaker) new

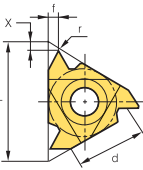
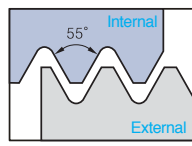
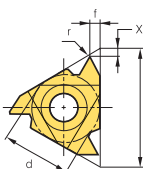
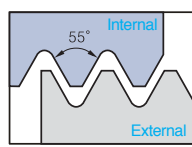
Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch		Dimensions (mm)					Picture
						(mm)	(tpi)	d	L	r	x	f	
External	ERM 16-AG60-U					0.5~3.0	48~8	9.525	16	0.08	1.2	1.7	
Internal	IRM 16-AG60-U					0.5~3.0	48~8	9.525	16	0.08	1.2	1.7	

➔ Applicable holders D31, D32

●: Stock item



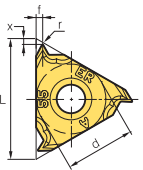
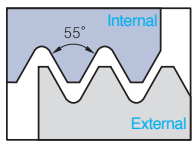
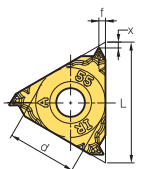
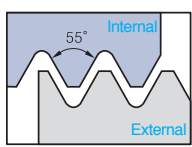
Partial profile 55°

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch		Dimensions (mm)					Picture
							(mm)	(tpi)	d	L	r	x	f	
External	ER 11-A55			EL 11-A55			0.5~1.5	48~16	6.35	11	0.05	0.8	0.9	 
	16-A55	●		16-A55			0.5~1.5	48~16	9.525	16	0.05	0.8	0.9	
	16-G55	●		16-G55			1.75~3.0	14~8	9.525	16	0.21	1.2	1.7	
	16-AG55	●		16-AG55	●		0.5~3.0	48~8	9.525	16	0.07	1.2	1.7	
	22-N55	●		22-N55			3.5~5.0	7~5	12.7	22	0.43	1.7	2.5	
	27-Q55			27-Q55			5.5~6.0	4.5~4	15.875	27	0.60	2.0	2.9	
Internal	IR 11-A55	●		IL 11-A55	●		0.5~1.5	48~16	6.35	11	0.05	0.8	0.9	 
	16-A55	●		16-A55			0.5~1.5	48~16	9.525	16	0.05	0.8	0.9	
	16-G55	●		16-G55			1.75~3.0	14~8	9.525	16	0.21	1.2	1.7	
	16-AG55	●		16-AG55	●		0.5~3.0	48~8	9.525	16	0.07	1.2	1.7	
	22-N55	●		22-N55			3.5~5.0	7~5	12.7	22	0.43	1.7	2.5	
	27-Q55			27-Q55			5.5~6.0	4.5~4	15.875	27	0.60	2.0	2.9	

Applicable holders D31, D32

● Stock item

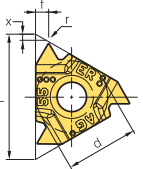
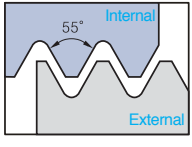
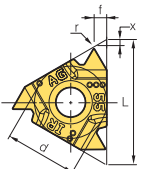
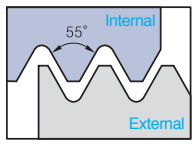
Partial profile 55° (M chip breaker)

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch		Dimensions (mm)					Picture
						(mm)	(tpi)	d	L	r	x	f	
External	ERM 16-A55	●				0.5~1.5	48~16	9.525	16	0.08	0.8	0.9	 
	16-G55	●				1.75~3.0	14~8	9.525	16	0.21	1.2	1.7	
	16-AG55	●				0.5~3.0	48~8	9.525	16	0.07	1.2	1.7	
	22-N55	●				3.5~5.0	7~5	12.7	22	0.43	1.7	2.5	
Internal	IRM 11-A55	●				0.5~1.5	48~16	6.35	11	0.08	0.8	0.9	 
	16-A55	●				0.5~1.5	48~16	9.525	16	0.05	0.8	0.9	
	16-G55					1.75~3.0	14~8	9.525	16	0.08	1.2	1.7	
	16-AG55	●				0.5~3.0	48~8	9.525	16	0.08	1.2	1.7	
	22-N55	●				3.5~5.0	7~5	12.7	22	0.43	1.7	2.5	

Applicable holders D31, D32

● Stock item

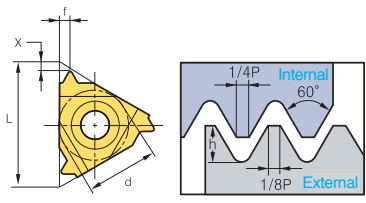
Partial profile 55° (U chip breaker) **new**

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch		Dimensions (mm)					Picture
						(mm)	(tpi)	d	L	r	x	f	
External	ERM 16-AG55-U					0.5~3.0	48~8	9.525	16	0.07	1.2	1.7	 
Internal	IRM 16-AG55-U					0.5~3.0	48~8	9.525	16	0.08	1.2	1.7	 

Applicable holders D31, D32

● Stock item

ISO Metric

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (mm)	Dimensions (mm)					Picture
								d	L	hmin	X	f	
External	ER 11-0.35ISO			EL 11-0.35ISO			0.35	6.35	11	0.21	0.8	0.4	
	11-0.4ISO			11-0.4ISO			0.4	6.35	11	0.25	0.7	0.4	
	11-0.45ISO			11-0.45ISO			0.45	6.35	11	0.28	0.7	0.4	
	11-0.5ISO			11-0.5ISO			0.5	6.35	11	0.31	0.6	0.4	
	11-0.6ISO			11-0.6ISO			0.6	6.35	11	0.37	0.6	0.6	
	11-0.7ISO			11-0.7ISO			0.7	6.35	11	0.43	0.6	0.6	
	11-0.75ISO			11-0.75ISO			0.75	6.35	11	0.46	0.6	0.6	
	11-0.8ISO			11-0.8ISO			0.8	6.35	11	0.49	0.6	0.6	
	11-1.0ISO			11-1.0ISO			1.0	6.35	11	0.61	0.7	0.7	
	11-1.25ISO		●	11-1.25ISO			1.25	6.35	11	0.77	0.8	0.9	
	11-1.5ISO	●		11-1.5ISO			1.5	6.35	11	0.92	0.8	1.0	
	11-1.75ISO			11-1.75ISO			1.75	6.35	11	1.07	0.8	1.1	
	16-0.35ISO			16-0.35ISO			0.35	9.525	16	0.21	0.8	0.4	
	16-0.4ISO			16-0.4ISO			0.4	9.525	16	0.25	0.7	0.4	
	16-0.45ISO	●		16-0.45ISO			0.45	9.525	16	0.28	0.7	0.4	
	16-0.5ISO	●		16-0.5ISO	●		0.5	9.525	16	0.31	0.6	0.4	
	16-0.6ISO	●		16-0.6ISO			0.6	9.525	16	0.37	0.6	0.6	
	16-0.7ISO	●		16-0.7ISO			0.7	9.525	16	0.43	0.6	0.6	
	16-0.75ISO	●		16-0.75ISO			0.75	9.525	16	0.46	0.6	0.6	
	16-0.8ISO	●	●	16-0.8ISO			0.8	9.525	16	0.49	0.6	0.6	
	16-1.0ISO	●	●	16-1.0ISO	●		1.0	9.525	16	0.61	0.7	0.7	
	16-1.25ISO	●	●	16-1.25ISO			1.25	9.525	16	0.77	0.8	0.9	
	16-1.5ISO	●	●	16-1.5ISO	●		1.5	9.525	16	0.92	0.8	1.0	
	16-1.75ISO	●	●	16-1.75ISO			1.75	9.525	16	1.07	0.9	1.2	
	16-2.0ISO	●	●	16-2.0ISO	●		2.0	9.525	16	1.23	1.0	1.3	
	16-2.5ISO	●	●	16-2.5ISO			2.5	9.525	16	1.53	1.1	1.5	
	16-3.0ISO	●	●	16-3.0ISO			3.0	9.525	16	1.84	1.2	1.6	
	22-3.5ISO	●	●	22-3.5ISO			3.5	12.7	22	2.15	1.6	2.3	
	22-4.0ISO	●	●	22-4.0ISO	●		4.0	12.7	22	2.45	1.6	2.3	
	22-4.5ISO	●	●	22-4.5ISO			4.5	12.7	22	2.78	1.7	2.4	
	22-5.0ISO	●	●	22-5.0ISO			5.0	12.7	22	3.07	1.7	2.5	
	27-5.5ISO			27-5.5ISO			5.5	15.875	27	3.37	1.9	2.7	
	27-6.0ISO		●	27-6.0ISO			6.0	15.875	27	3.68	2.0	2.9	

Applicable holders D31

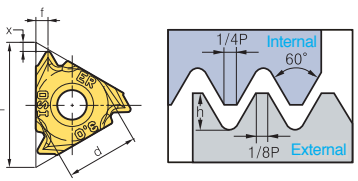
●: Stock item



D

Threading

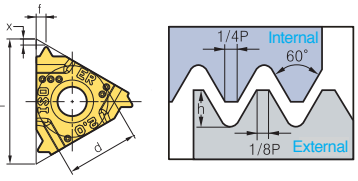
ISO Metric (M chip breaker)

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch	Dimensions (mm)					Picture
						(mm)	d	L	hmin	X	f	
External	ERM 16-1.0ISO	●				1.0	9.525	16	0.61	0.7	0.7	
	16-1.25ISO					1.25	9.525	16	0.77	0.8	0.9	
	16-1.5ISO	●				1.5	9.525	16	0.93	0.8	1.0	
	16-1.75ISO	●				1.75	9.525	16	1.09	0.9	1.2	
	16-2.0ISO	●				2.0	9.525	16	1.25	1.0	1.3	
	16-2.5ISO	●				2.5	9.525	16	1.55	1.1	1.5	
	16-3.0ISO	●				3.0	9.525	16	1.87	1.2	1.6	

➔ Applicable holders D31

● Stock item

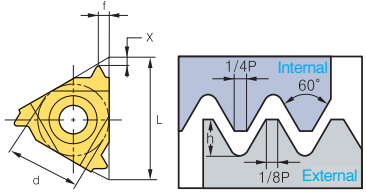
ISO Metric (U chip breaker) **new**

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch	Dimensions (mm)					Picture
						(mm)	d	L	hmin	X	f	
External	ERM 16-1.5ISO-U					1.5	9.525	16	0.93	0.8	1.0	
	16-2.0ISO-U					2.0	9.525	16	1.25	1.0	1.3	

➔ Applicable holders D31

● Stock item

ISO Metric

Type	Designation (Right)		PC3030T	PC9070T	Designation (Left)		Pitch (mm)	Dimensions (mm)					Picture
								d	L	hmin	X	f	
Internal	IR	11-0.35ISO			IL	11-0.35ISO	0.35	6.35	11	0.20	0.8	0.3	
		11-0.4ISO				11-0.4ISO	0.4	6.35	11	0.23	0.8	0.4	
		11-0.45ISO				11-0.45ISO	0.45	6.35	11	0.26	0.8	0.4	
		11-0.5ISO	●			11-0.5ISO	0.5	6.35	11	0.29	0.6	0.4	
		11-0.6ISO				11-0.6ISO	0.6	6.35	11	0.35	0.6	0.6	
		11-0.7ISO				11-0.7ISO	0.7	6.35	11	0.40	0.6	0.6	
		11-0.75ISO	●			11-0.75ISO	0.75	6.35	11	0.43	0.6	0.6	
		11-0.8ISO				11-0.8ISO	0.8	6.35	11	0.46	0.6	0.6	
		11-1.0ISO	●	●		11-1.0ISO	1.0	6.35	11	0.58	0.6	0.7	
		11-1.25ISO	●	●		11-1.25ISO	1.25	6.35	11	0.72	0.8	0.9	
		11-1.5ISO	●	●		11-1.5ISO	1.5	6.35	11	0.87	0.8	1.0	
		11-1.75ISO		●		11-1.75ISO	1.75	6.35	11	1.01	0.9	1.1	
		11-2.0ISO	●	●		11-2.0ISO	2.0	6.35	11	1.15	0.9	1.1	
		11-2.5ISO	●			11-2.5ISO	2.5	6.35	11	1.44	0.8	1.1	
		16-0.35ISO				16-0.35ISO	0.35	9.525	16	0.20	0.8	0.3	
		16-0.4ISO				16-0.4ISO	0.4	9.525	16	0.23	0.8	0.4	
		16-0.45ISO				16-0.45ISO	0.45	9.525	16	0.26	0.8	0.4	
		16-0.5ISO	●			16-0.5ISO	0.5	9.525	16	0.29	0.6	0.4	
		16-0.6ISO				16-0.6ISO	0.6	9.525	16	0.35	0.6	0.6	
		16-0.7ISO				16-0.7ISO	0.7	9.525	16	0.40	0.6	0.6	
		16-0.75ISO	●			16-0.75ISO	0.75	9.525	16	0.43	0.6	0.6	
		16-0.8ISO				16-0.8ISO	0.8	9.525	16	0.46	0.6	0.6	
		16-1.0ISO	●	●		16-1.0ISO	1.0	9.525	16	0.58	0.6	0.7	
		16-1.25ISO	●	●		16-1.25ISO	1.25	9.525	16	0.72	0.8	0.9	
		16-1.5ISO	●	●		16-1.5ISO	1.5	9.525	16	0.87	0.8	1.0	
		16-1.75ISO	●	●		16-1.75ISO	1.75	9.525	16	1.01	0.9	1.2	
		16-2.0ISO	●	●		16-2.0ISO	2.0	9.525	16	1.15	1.0	1.3	
		16-2.5ISO	●	●		16-2.5ISO	2.5	9.525	16	1.44	1.1	1.5	
		16-3.0ISO	●	●		16-3.0ISO	3.0	9.525	16	1.73	1.1	1.5	
		22-3.5ISO	●	●		22-3.5ISO	3.5	12.7	22	2.02	1.6	2.3	
		22-4.0ISO	●	●		22-4.0ISO	4.0	12.7	22	2.31	1.6	2.3	
		22-4.5ISO	●	●		22-4.5ISO	4.5	12.7	22	2.60	1.6	2.4	
		22-5.0ISO	●	●		22-5.0ISO	5.0	12.7	22	2.89	1.6	2.3	
		27-5.5ISO				27-5.5ISO	5.5	15.875	27	3.17	1.6	2.3	
		27-6.0ISO	●			27-6.0ISO	6.0	15.875	27	3.46	1.8	2.5	

➔ Applicable holders D32

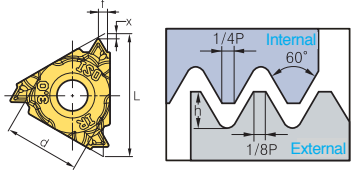
●: Stock item



D

Threading

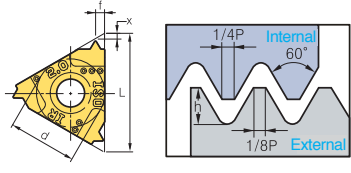
ISO Metric (M chip breaker)

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch	Dimensions (mm)					Picture
						(mm)	d	L	hmin	X	f	
Internal	IRM 11-1.5ISO	●				1.5	6.35	11	0.85	0.8	1.0	
	16-1.0ISO	●				1.0	9.525	16	0.58	0.6	0.7	
	16-1.25ISO					1.25	9.525	16	0.72	0.8	0.9	
	16-1.5ISO	●				1.5	9.525	16	0.85	0.8	1.0	
	16-1.75ISO					1.75	9.525	16	1.01	0.9	1.2	
	16-2.0ISO	●				2.0	9.525	16	1.12	1.0	1.3	
	16-2.5ISO	●				2.5	9.525	16	1.44	1.1	1.5	
	16-3.0ISO	●				3.0	9.525	16	1.69	1.1	1.5	

➔ Applicable holders D32

●: Stock item

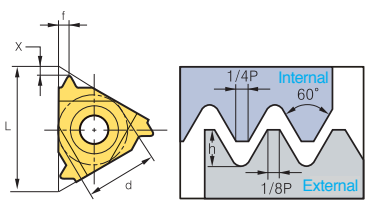
ISO Metric (U chip breaker) **new**

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch	Dimensions (mm)					Picture
						(mm)	d	L	hmin	X	f	
Internal	IRM 16-1.5ISO-U					1.5	9.525	16	0.85	0.8	1.0	
	16-2.0ISO-U					2.0	9.525	16	1.12	1.0	1.3	

➔ Applicable holders D32

●: Stock item

American UN (UN, UNC, UNF, UNEF, UNS)

Type	Designation (Right)		PC3030T	PC9070T	Designation (Left)		PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm)					Picture
										d	L	hmin	X	f	
External	ER	11-72UN			EL	11-72UN			72	6.35	11	0.22	0.8	0.4	
		11-64UN				11-64UN			64	6.35	11	0.24	0.8	0.4	
		11-56UN				11-56UN			56	6.35	11	0.28	0.7	0.4	
		11-48UN				11-48UN			48	6.35	11	0.32	0.6	0.6	
		11-44UN				11-44UN			44	6.35	11	0.35	0.6	0.6	
		11-40UN				11-40UN			40z	6.35	11	0.39	0.6	0.6	
		11-36UN				11-36UN			36	6.35	11	0.43	0.6	0.6	
		11-32UN				11-32UN			32	6.35	11	0.49	0.6	0.6	
		11-28UN				11-28UN			28	6.35	11	0.56	0.6	0.7	
		11-27UN				11-27UN			27	6.35	11	0.58	0.7	0.8	
		11-24UN				11-24UN			24	6.35	11	0.65	0.7	0.8	
		11-20UN				11-20UN			20	6.35	11	0.78	0.8	0.9	
		11-18UN				11-18UN			18	6.35	11	0.87	0.8	1.0	
		11-16UN				11-16UN			16	6.35	11	0.97	0.9	1.1	
		11-14UN				11-14UN			14	6.35	11	1.11	0.9	1.1	
		16-72UN				16-72UN			72	9.525	16	0.22	0.8	0.4	
		16-64UN				16-64UN			64	9.525	16	0.24	0.8	0.4	
		16-56UN				16-56UN			56	9.525	16	0.28	0.7	0.4	
		16-48UN				16-48UN			48	9.525	16	0.32	0.6	0.6	
		16-44UN				16-44UN			44	9.525	16	0.35	0.6	0.6	
		16-40UN				16-40UN			40	9.525	16	0.39	0.6	0.6	
		16-36UN				16-36UN			36	9.525	16	0.43	0.6	0.6	
		16-32UN	●			16-32UN			32	9.525	16	0.49	0.6	0.6	
		16-28UN				16-28UN			28	9.525	16	0.56	0.6	0.7	
		16-27UN				16-27UN			27	9.525	16	0.58	0.7	0.8	
		16-24UN	●	●		16-24UN			24	9.525	16	0.65	0.7	0.8	
		16-20UN	●	●		16-20UN			20	9.525	16	0.78	0.8	0.9	
		16-18UN	●	●		16-18UN			18	9.525	16	0.87	0.8	1.0	
		16-16UN	●	●		16-16UN			16	9.525	16	0.97	0.9	1.1	
		16-14UN	●	●		16-14UN			14	9.525	16	1.11	1.0	1.2	
		16-13UN				16-13UN			13	9.525	16	1.20	1.0	1.3	
		16-12UN	●	●		16-12UN			12	9.525	16	1.30	1.1	1.4	
		16-11.5UN				16-11.5UN			11.5	9.525	16	1.35	1.1	1.5	
		16-11UN	●	●		16-11UN			11	9.525	16	1.42	1.1	1.5	
		16-10UN	●	●		16-10UN			10	9.525	16	1.56	1.1	1.5	
		16-9UN	●			16-9UN			9	9.525	16	1.73	1.2	1.7	
		16-8UN	●			16-8UN			8	9.525	16	1.95	1.2	1.6	
		22-7UN				22-7UN			7	12.7	22	2.22	1.6	2.3	
		22-6UN				22-6UN			6	12.7	22	2.60	1.6	2.3	
		22-5UN				22-5UN			5	12.7	22	3.12	1.7	2.5	
		27-4.5UN				27-4.5UN			4.5	15.875	27	3.46	1.9	2.7	
		27-4UN				27-4UN			4	15.875	27	3.89	2.1	3.0	

Applicable holders D31

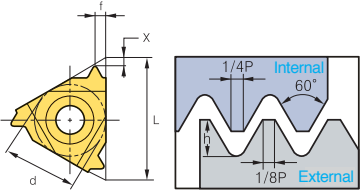
●: Stock item



D

Threading

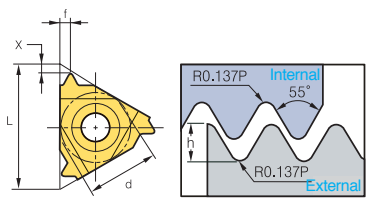
American UN (UN, UNC, UNF, UNEF, UNS)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm)					Picture
								d	L	hmin	X	f	
Internal	IR 11-72UN			IL 11-72UN			72	6.35	11	0.20	0.8	0.3	
	11-64UN			11-64UN			64	6.35	11	0.23	0.8	0.4	
	11-56UN			11-56UN			56	6.35	11	0.26	0.7	0.4	
	11-48UN			11-48UN			48	6.35	11	0.31	0.6	0.6	
	11-44UN			11-44UN			44	6.35	11	0.33	0.6	0.6	
	11-40UN			11-40UN			40	6.35	11	0.37	0.6	0.6	
	11-36UN			11-36UN			36	6.35	11	0.41	0.6	0.6	
	11-32UN			11-32UN			32	6.35	11	0.46	0.6	0.6	
	11-28UN			11-28UN			28	6.35	11	0.52	0.6	0.7	
	11-27UN			11-27UN			27	6.35	11	0.54	0.7	0.8	
	11-24UN			11-24UN			24	6.35	11	0.61	0.7	0.8	
	11-20UN		●	11-20UN			20	6.35	11	0.73	0.8	0.9	
	11-18UN	●		11-18UN			18	6.35	11	0.81	0.8	1.0	
	11-16UN		●	11-16UN			16	6.35	11	0.92	0.9	1.1	
	11-14UN			11-14UN			14	6.35	11	1.05	0.9	1.1	
	11-12UN		●	11-12UN			12	6.35	11	1.22	0.8	1.1	
	11-11UN	●		11-11UN			11	6.35	11	1.33	0.8	1.1	
	16-72UN			16-72UN			72	9.525	16	0.20	0.8	0.3	
	16-64UN			16-64UN			64	9.525	16	0.23	0.8	0.4	
	16-56UN			16-56UN			56	9.525	16	0.26	0.7	0.4	
	16-48UN			16-48UN			48	9.525	16	0.31	0.6	0.6	
	16-44UN			16-44UN			44	9.525	16	0.33	0.6	0.6	
	16-40UN			16-40UN			40	9.525	16	0.37	0.6	0.6	
	16-36UN			16-36UN			36	9.525	16	0.41	0.6	0.6	
	16-32UN			16-32UN			32	9.525	16	0.51	0.6	0.6	
	16-28UN			16-28UN			28	9.525	16	0.52	0.6	0.7	
	16-27UN			16-27UN			27	9.525	16	0.54	0.7	0.8	
	16-24UN			16-24UN			24	9.525	16	0.61	0.7	0.8	
	16-20UN	●		16-20UN			20	9.525	16	0.73	0.8	0.9	
	16-18UN		●	16-18UN			18	9.525	16	0.81	0.8	1.0	
	16-16UN	●	●	16-16UN			16	9.525	16	0.92	0.9	1.1	
	16-14UN	●		16-14UN			14	9.525	16	1.05	0.9	1.2	
	16-13UN			16-13UN			13	9.525	16	1.13	1.0	1.3	
	16-12UN	●	●	16-12UN			12	9.525	16	1.22	1.1	1.4	
	16-11.5UN			16-11.5UN			11.5	9.525	16	1.28	1.1	1.5	
	16-11UN	●	●	16-11UN			11	9.525	16	1.33	1.1	1.5	
	16-10UN	●		16-10UN	●		10	9.525	16	1.47	1.1	1.5	
	16-9UN		●	16-9UN			9	9.525	16	1.63	1.2	1.7	
	16-8UN	●	●	16-8UN	●		8	9.525	16	1.83	1.2	1.5	
	22-7UN			22-7UN			7	12.7	22	2.09	1.6	2.3	
	22-6UN			22-6UN			6	12.7	22	2.44	1.6	2.3	
	22-5UN			22-5UN			5	12.7	22	2.93	1.7	2.3	
	27-4.5UN			27-4.5UN			4.5	15.875	27	3.26	1.9	2.4	
	27-4UN			27-4UN			4	15.875	27	3.67	2.1	2.7	

➔ Applicable holders D32

●: Stock item

Whitworth (BSW, BSF, BSP, BSB)

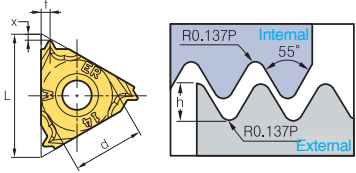
Type	Designation (Right)		PC3030T	PC9070T	Designation (Left)		Pitch (tpi)	Dimensions (mm)					Picture
								d	L	hmin	X	f	
External	ER	11-72W			EL	11-72W	72	6.35	11	0.23	0.7	0.4	
		11-60W				11-60W	60	6.35	11	0.27	0.7	0.4	
		11-56W				11-56W	56	6.35	11	0.29	0.7	0.4	
		11-48W				11-48W	48	6.35	11	0.34	0.6	0.6	
		11-40W				11-40W	40	6.35	11	0.41	0.6	0.6	
		11-36W				11-36W	36	6.35	11	0.45	0.6	0.6	
		11-32W				11-32W	32	6.35	11	0.51	0.6	0.6	
		11-28W				11-28W	28	6.35	11	0.58	0.6	0.7	
		11-26W				11-26W	26	6.35	11	0.63	0.7	0.8	
		11-24W				11-24W	24	6.35	11	0.68	0.7	0.8	
		11-22W				11-22W	22	6.35	11	0.74	0.8	0.9	
		11-20W				11-20W	20	6.35	11	0.81	0.8	0.9	
		11-19W				11-19W	19	6.35	11	0.86	0.8	1.0	
		11-18W				11-18W	18	6.35	11	0.90	0.8	1.0	
		11-16W				11-16W	16	6.35	11	1.02	0.9	1.1	
		11-14W				11-14W	14	6.35	11	1.16	1.0	1.2	
		16-72W				16-72W	72	9.525	16	0.23	0.7	0.4	
		16-60W				16-60W	60	9.525	16	0.27	0.7	0.4	
		16-56W				16-56W	56	9.525	16	0.29	0.7	0.4	
		16-48W				16-48W	48	9.525	16	0.34	0.6	0.6	
		16-40W				16-40W	40	9.525	16	0.41	0.6	0.6	
		16-36W				16-36W	36	9.525	16	0.45	0.6	0.6	
		16-32W				16-32W	32	9.525	16	0.51	0.6	0.6	
		16-30W				16-30W	30	9.525	16	0.55	0.6	0.7	
		16-28W	●	●		16-28W	28	9.525	16	0.58	0.6	0.7	
		16-26W				16-26W	26	9.525	16	0.63	0.7	0.8	
		16-24W				16-24W	24	9.525	16	0.68	0.7	0.8	
		16-22W				16-22W	22	9.525	16	0.74	0.8	0.9	
		16-20W				16-20W	20	9.525	16	0.81	0.8	0.9	
		16-19W	●	●		16-19W	19	9.525	16	0.86	0.8	1.0	
		16-18W	●			16-18W	18	9.525	16	0.90	0.8	1.0	
		16-16W	●			16-16W	16	9.525	16	1.02	0.9	1.1	
		16-14W	●	●		16-14W	14	9.525	16	1.16	1.0	1.2	
		16-12W	●			16-12W	12	9.525	16	1.36	1.1	1.4	
		16-11W	●	●		16-11W	11	9.525	16	1.48	1.1	1.5	
		16-10W	●			16-10W	10	9.525	16	1.63	1.1	1.5	
		16-9W				16-9W	9	9.525	16	1.81	1.2	1.7	
		16-8W	●			16-8W	8	9.525	16	2.03	1.2	1.5	
		22-7W				22-7W	7	12.7	22	3.32	1.6	2.3	
		22-6W				22-6W	6	12.7	22	2.71	1.6	2.3	
		22-5W				22-5W	5	12.7	22	3.25	1.7	2.4	
		27-4.5W				27-4.5W	4.5	15.875	27	3.61	1.8	2.6	
		27-4W				27-4W	4	15.875	27	4.07	2.0	2.9	

Applicable holders D31

●: Stock item



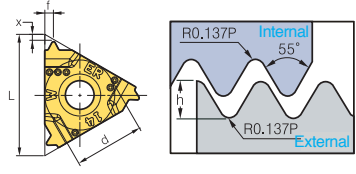
Whitworth (M chip breaker) **new**

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch	Dimensions (mm)					Picture
						(tpi)	d	L	hmin	X	f	
External	ERM 16-11W	●				14	9.525	16	1.16	1.0	1.2	
	16-14W	●				11	9.525	16	1.48	1.1	1.5	
	16-19W	●				19	9.525	16	0.86	0.8	1.0	

➔ Applicable holders D31

●: Stock item

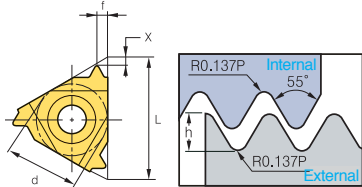
Whitworth (U chip breaker) **new**

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch	Dimensions (mm)					Picture
						(tpi)	d	L	hmin	X	f	
External	ERM 16-14W-U					14	9.525	16	1.16	1.0	1.2	
	16-11W-U					11	9.525	16	1.48	1.1	1.5	

➔ Applicable holders D31

●: Stock item

Whitworth (BSW, BSF, BSP, BSB)

Type	Designation (Right)		PC3030T	PC9070T	Designation (Left)		Pitch (tpi)	Dimensions (mm)					Picture
								d	L	hmin	X	f	
Internal	IR	11-72W			IL	11-72W	72	6.35	11	0.23	0.7	0.4	
		11-60W				11-60W	60	6.35	11	0.27	0.7	0.4	
		11-56W				11-56W	56	6.35	11	0.29	0.7	0.4	
		11-48W				11-48W	48	6.35	11	0.34	0.6	0.6	
		11-40W				11-40W	40	6.35	11	0.41	0.6	0.6	
		11-36W				11-36W	36	6.35	11	0.45	0.6	0.6	
		11-32W				11-32W	32	6.35	11	0.51	0.6	0.6	
		11-28W				11-28W	28	6.35	11	0.58	0.6	0.7	
		11-26W				11-26W	26	6.35	11	0.63	0.7	0.8	
		11-24W				11-24W	24	6.35	11	0.68	0.7	0.8	
		11-22W				11-22W	22	6.35	11	0.74	0.8	0.9	
		11-20W				11-20W	20	6.35	11	0.81	0.8	0.9	
		11-19W	●	●		11-19W	19	6.35	11	0.86	0.8	1.0	
		11-18W				11-18W	18	6.35	11	0.90	0.8	1.0	
		11-16W				11-16W	16	6.35	11	1.02	0.9	1.1	
		11-14W	●			11-14W	14	6.35	11	1.16	0.9	1.1	
		11-12W				11-12W	12	6.35	11	1.32	0.9	1.2	
		16-72W				16-72W	72	9.525	16	0.23	0.7	0.4	
		16-60W				16-60W	60	9.525	16	0.27	0.7	0.4	
		16-56W				16-56W	56	9.525	16	0.29	0.7	0.4	
		16-48W				16-48W	48	9.525	16	0.34	0.6	0.6	
		16-40W				16-40W	40	9.525	16	0.41	0.6	0.6	
		16-36W				16-36W	36	9.525	16	0.45	0.6	0.6	
		16-32W				16-32W	32	9.525	16	0.51	0.6	0.6	
		16-30W				16-30W	30	9.525	16	0.55	0.6	0.7	
		16-28W				16-28W	28	9.525	16	0.58	0.6	0.7	
		16-26W				16-26W	26	9.525	16	0.63	0.7	0.8	
		16-24W				16-24W	24	9.525	16	0.68	0.7	0.8	
		16-22W				16-22W	22	9.525	16	0.74	0.8	0.9	
		16-20W				16-20W	20	9.525	16	0.81	0.8	0.9	
		16-19W				16-19W	19	9.525	16	0.86	0.8	1.0	
		16-18W				16-18W	18	9.525	16	0.90	0.8	1.0	
		16-16W				16-16W	16	9.525	16	1.02	0.9	1.1	
		16-14W	●			16-14W	14	9.525	16	1.16	1.0	1.2	
		16-12W	●			16-12W	12	9.525	16	1.36	1.1	1.4	
		16-11W	●	●		16-11W	11	9.525	16	1.48	1.1	1.5	
		16-10W	●			16-10W	10	9.525	16	1.63	1.1	1.5	
		16-9W	●			16-9W	9	9.525	16	1.81	1.2	1.7	
		16-8W	●			16-8W	8	9.525	16	2.03	1.2	1.5	
		22-7W				22-7W	7	12.7	22	3.32	1.6	2.3	
		22-6W				22-6W	6	12.7	22	2.71	1.6	2.3	
		22-5W				22-5W	5	12.7	22	3.25	1.7	2.4	
		27-4.5W				27-4.5W	4.5	15.875	27	3.61	1.8	2.6	
		27-4W				27-4W	4	15.875	27	4.07	2.0	2.9	

Applicable holders D32

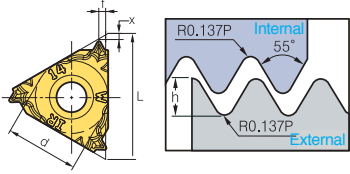
●: Stock item



D

Threading

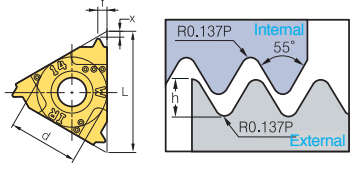
Whitworth (M chip breaker) **new**

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch	Dimensions (mm)					Picture
						(Left)	d	L	hmin	X	f	
Internal	IRM 16-14W					14	9.525	16	1.16	1.0	1.2	
	16-11W	●				11	9.525	16	1.48	1.1	1.5	

➔ Applicable holders D32

●: Stock item

Whitworth (U chip breaker) **new**

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch	Dimensions (mm)					Picture
						(tpi)	d	L	hmin	X	f	
Internal	IRM 16-14W-U					14	9.525	16	1.16	1.0	1.2	
	16-11W-U					11	9.525	16	1.48	1.1	1.5	

➔ Applicable holders D32

●: Stock item

British Standard Pipe Thread (BSPT)

Type	Designation (Right)		Pitch	Dimensions (mm)					Picture
				d	L	hmin	X	f	
External	ER	11-28BSPT							
		11-19BSPT							
		11-14BSPT							
		16-28BSPT							
		16-19BSPT							
		16-14BSPT							
		16-11BSPT							
Internal	IR	11-28BSPT							
		11-19BSPT							
		11-14BSPT							
		16-28BSPT							
		16-19BSPT							
		16-14BSPT							
		16-11BSPT							

Applicable holders D31, D32

●: Stock item

National Pipe Thread (NPT)

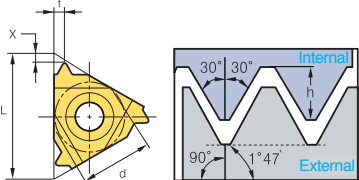
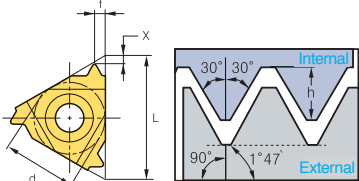
Type	Designation (Right)		Pitch	Dimensions (mm)					Picture
				d	L	hmin	X	f	
External	ER	11-27NPT							
		11-18NPT							
		11-14NPT							
		16-27NPT							
		16-18NPT							
		16-14NPT							
		16-11.5NPT							
		16-8NPT							
Internal	IR	11-27NPT							
		11-18NPT							
		11-14NPT							
		16-27NPT							
		16-18NPT							
		16-14NPT							
		16-11.5NPT							
		16-8NPT							

Applicable holders D31, D32

●: Stock item



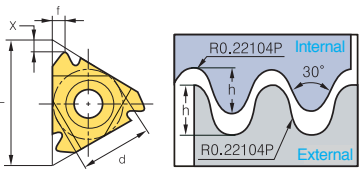
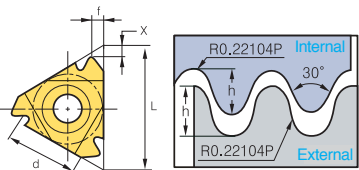
National Pipe Threads-Dryseal (NPTF)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm)					Picture
								d	L	hmin	X	f	
External	ER 11-27NPTF			EL 11-27NPTF			27	6.35	11	0.64	0.7	0.8	
	11-18NPTF			11-18NPTF			18	6.35	11	1.00	0.8	1.0	
	11-14NPTF			11-14NPTF			14	6.35	11	1.35	0.8	1.0	
	16-27NPTF			16-27NPTF			27	9.525	16	0.64	0.7	0.8	
	16-18NPTF	●		16-18NPTF			18	9.525	16	1.00	0.8	1.0	
	16-14NPTF			16-14NPTF			14	9.525	16	1.35	0.9	1.2	
	16-11.5NPTF			16-11.5NPTF			11.5	9.525	16	1.63	1.1	1.5	
	16-8NPTF			16-8NPTF			8	9.525	16	2.38	1.3	1.8	
Internal	IR 11-27NPTF			IL 11-27NPTF			27	6.35	11	0.64	0.7	0.8	
	11-18NPTF			11-18NPTF			18	6.35	11	1.00	0.8	1.0	
	11-14NPTF			11-14NPTF			14	6.35	11	1.35	0.8	1.0	
	16-27NPTF			16-27NPTF			27	9.525	16	0.64	0.7	0.8	
	16-18NPTF			16-18NPTF			18	9.525	16	1.00	0.8	1.0	
	16-14NPTF			16-14NPTF			14	9.525	16	1.35	0.9	1.2	
	16-11.5NPTF			16-11.5NPTF			11.5	9.525	16	1.63	1.1	1.5	
	16-8NPTF			16-8NPTF			8	9.525	16	2.38	1.3	1.8	

Applicable holders D31, D32

● Stock item

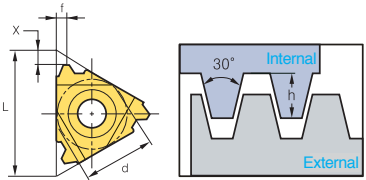
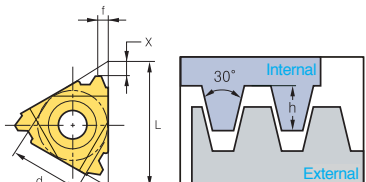
Round DIN 405

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm)					Picture
								d	L	hmin	X	f	
External	ER 16-10RD			EL 16-10RD			10	9.525	16	1.27	1.1	1.2	
	16-8RD			16-8RD			8	9.525	16	1.59	1.4	1.3	
	16-6RD			16-6RD			6	9.525	16	2.12	1.5	1.7	
	22-6RD			22-6RD			6	12.7	22	2.12	1.5	1.7	
	22-4RD			22-4RD			4	12.7	22	3.18	2.2	2.3	
	27-4RD			27-4RD			4	15.875	27	3.18	2.2	2.3	
Internal	IR 16-10RD			IL 16-10RD			10	9.525	16	1.27	1.1	1.2	
	16-8RD			16-8RD			8	9.525	16	1.59	1.4	1.4	
	16-6RD			16-6RD			6	9.525	16	2.12	1.4	1.5	
	22-6RD			22-6RD			6	12.7	22	2.12	1.5	1.7	
	22-4RD			22-4RD			4	12.7	22	3.18	2.2	2.3	
	27-4RD			27-4RD			4	15.875	27	3.18	2.2	2.3	

Applicable holders D31, D32

● Stock item

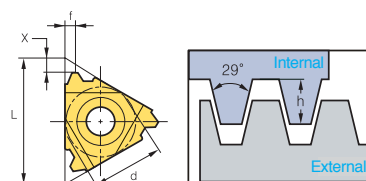
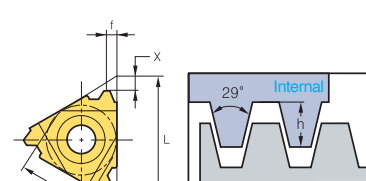
Trapez DIN 103 (TR)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (mm)	Dimensions (mm)					Picture
								d	L	hmin	X	f	
External	ER 11-1.5TR			EL 11-1.5TR			1.5	6.35	11	0.90	0.8	0.9	
	16-1.5TR			16-1.5TR			1.5	9.525	16	0.90	1.0	1.1	
	16-2.0TR	●		16-2.0TR	●		2.0	9.525	16	1.25	1.1	1.3	
	16-3.0TR	●	●	16-3.0TR			3.0	9.525	16	1.75	1.3	1.5	
	22-4.0TR	●	●	22-4.0TR	●		4.0	12.7	22	2.25	1.7	1.9	
	22-5.0TR	●	●	22-5.0TR	●		5.0	12.7	22	2.75	2.1	2.5	
	27-6.0TR	●	●	27-6.0TR			6.0	15.875	27	3.50	2.3	2.7	
Internal	IR 11-1.5TR			IL 11-1.5TR	●		1.5	6.35	11	0.90	0.8	0.9	
	16-1.5TR			16-1.5TR	●		1.5	9.525	16	0.90	1.0	1.1	
	16-2.0TR			16-2.0TR	●		2.0	9.525	16	1.25	1.1	1.3	
	16-2.5TR			16-2.5TR			2.5	9.525	16	1.53	1.2	1.4	
	16-3.0TR	●		16-3.0TR	●		3.0	9.525	16	1.75	1.3	1.5	
	22-4.0TR	●	●	22-4.0TR	●		4.0	12.7	22	2.25	1.7	1.9	
	22-5.0TR	●	●	22-5.0TR			5.0	12.7	22	2.75	2.1	2.5	
	27-6.0TR	●	●	27-6.0TR	●		6.0	15.875	27	3.50	2.3	2.7	

Applicable holders D31, D32

●: Stock item

American ACME (ACME)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm)					Picture
								d	L	hmin	X	f	
External	ER 11-16ACME			EL 11-16ACME			16	6.35	11	0.92	1.0	1.1	
	16-16ACME			16-16ACME			16	9.525	16	0.92	1.0	1.1	
	16-14ACME			16-14ACME			14	9.525	16	1.03	1.0	1.2	
	16-12ACME			16-12ACME			12	9.525	16	1.19	1.1	1.2	
	16-10ACME			16-10ACME			10	9.525	16	1.52	1.3	1.4	
	16-8ACME			16-8ACME			8	9.525	16	1.84	1.4	1.5	
	16-6ACME			16-6ACME			6	9.525	16	2.37	1.7	1.9	
	22-6ACME	●		22-6ACME			6	12.7	22	2.37	1.8	2.1	
	22-5ACME			22-5ACME			5	12.7	22	2.79	2.0	2.3	
	27-4ACME			27-4ACME			4	15.875	27	3.43	2.4	2.7	
Internal	IR 11-16ACME			IL 11-16ACME			16	6.35	11	0.92	0.9	0.9	
	16-16ACME			16-16ACME			16	9.525	16	0.92	1.0	1.1	
	16-14ACME			16-14ACME			14	9.525	16	1.03	1.1	1.2	
	16-12ACME			16-12ACME			12	9.525	16	1.19	1.2	1.3	
	16-10ACME			16-10ACME			10	9.525	16	1.52	1.2	1.3	
	16-8ACME			16-8ACME			8	9.525	16	1.84	1.4	1.5	
	16-6ACME			16-6ACME			6	9.525	16	2.37	1.7	1.9	
	22-6ACME			22-6ACME			6	12.7	22	2.37	1.8	2.1	
	22-5ACME			22-5ACME			5	12.7	22	2.79	2.0	2.3	
	27-4ACME	●		27-4ACME			4	15.875	27	3.43	2.3	2.6	

Applicable holders D31, D32

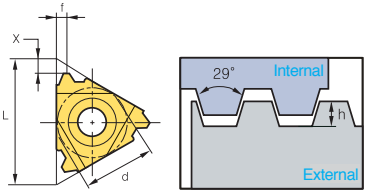
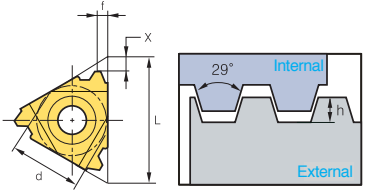
●: Stock item



D

Threading

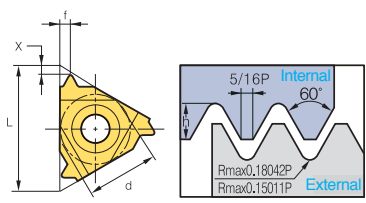
Stub ACME (STACME)

Type	Designation (Right)		PC3030T	PC9070T	Designation (Left)		Pitch (tpi)	Dimensions (mm)					Picture
								d	L	hmin	X	f	
External	ER	11-16STACME			EL	11-16STACME	16	6.35	11	0.60	1.0	1.0	
		16-16STACME				16-16STACME	16	9.525	16	0.60	1.0	1.0	
		16-14STACME				16-14STACME	14	9.525	16	0.67	1.1	1.1	
		16-12STACME				16-12STACME	12	9.525	16	0.76	1.2	1.2	
		16-10STACME				16-10STACME	10	9.525	16	1.02	1.2	1.3	
		16-8STACME				16-8STACME	8	9.525	16	1.21	1.4	1.5	
		16-6STACME				16-6STACME	6	9.525	16	1.52	1.7	1.8	
		22-6STACME				22-6STACME	6	12.7	22	1.52	1.7	1.8	
		22-5STACME				22-5STACME	5	12.7	22	1.78	2.1	2.3	
		27-4STACME				27-4STACME	4	15.875	27	2.16	2.3	2.4	
		27-3STACME				27-3STACME	3	15.875	27	2.79	2.9	2.9	
Internal	IR	11-16STACME			IL	11-16STACME	16	6.35	11	0.60	1.0	1.0	
		16-16STACME				16-16STACME	16	9.525	16	0.60	1.0	1.0	
		16-14STACME				16-14STACME	14	9.525	16	0.67	1.1	1.1	
		16-12STACME				16-12STACME	12	9.525	16	0.76	1.1	1.2	
		16-10STACME				16-10STACME	10	9.525	16	1.02	1.2	1.3	
		16-8STACME				16-8STACME	8	9.525	16	1.21	1.4	1.5	
		16-6STACME				16-6STACME	6	9.525	16	1.52	1.7	1.8	
		22-6STACME				22-6STACME	6	12.7	22	1.52	1.7	1.8	
		22-5STACME				22-5STACME	5	12.7	22	1.78	2.1	2.3	
		27-4STACME				27-4STACME	4	15.875	27	2.16	2.3	2.4	
		27-3STACME				27-3STACME	3	15.875	27	2.79	2.9	2.9	

➔ Applicable holders D31, D32

●: Stock item

UNJ (Unified constant thread)

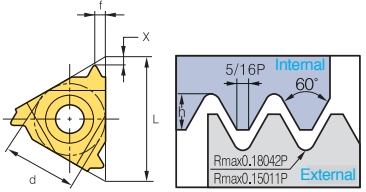
Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm)					Picture
								d	L	hmin	X	f	
External	ER 11-48UNJ			EL 11-48UNJ			48	6.35	11	0.31	0.6	0.5	
	11-44UNJ			11-44UNJ			44	6.35	11	0.33	0.6	0.6	
	11-40UNJ			11-40UNJ			40	6.35	11	0.37	0.6	0.6	
	11-36UNJ			11-36UNJ			36	6.35	11	0.41	0.6	0.6	
	11-32UNJ			11-32UNJ			32	6.35	11	0.46	0.6	0.7	
	11-28UNJ			11-28UNJ			28	6.35	11	0.52	0.7	0.7	
	11-24UNJ			11-24UNJ			24	6.35	11	0.61	0.7	0.8	
	11-20UNJ			11-20UNJ			20	6.35	11	0.73	0.8	0.9	
	11-18UNJ			11-18UNJ			18	6.35	11	0.81	0.8	1.0	
	11-16UNJ			11-16UNJ			16	6.35	11	0.92	0.9	1.1	
	11-14UNJ			11-14UNJ			14	6.35	11	1.05	1.0	1.2	
	16-48UNJ			16-48UNJ			48	9.525	16	0.31	0.6	0.5	
	16-44UNJ			16-44UNJ			44	9.525	16	0.33	0.6	0.6	
	16-40UNJ			16-40UNJ			40	9.525	16	0.37	0.6	0.6	
	16-36UNJ			16-36UNJ			36	9.525	16	0.41	0.6	0.6	
	16-32UNJ			16-32UNJ			32	9.525	16	0.46	0.6	0.7	
	16-28UNJ			16-28UNJ			28	9.525	16	0.52	0.7	0.7	
	16-24UNJ			16-24UNJ			24	9.525	16	0.61	0.7	0.8	
	16-20UNJ			16-20UNJ			20	9.525	16	0.73	0.8	0.9	
	16-18UNJ			16-18UNJ			18	9.525	16	0.81	0.8	1.0	
	16-16UNJ			16-16UNJ			16	9.525	16	0.92	0.9	1.1	
	16-14UNJ			16-14UNJ			14	9.525	16	1.05	1.0	1.2	
	16-13UNJ			16-13UNJ			13	9.525	16	1.13	1.0	1.3	
	16-12UNJ			16-12UNJ			12	9.525	16	1.22	1.1	1.3	
	16-11UNJ			16-11UNJ			11	9.525	16	1.33	1.2	1.5	
	16-10UNJ			16-10UNJ			10	9.525	16	1.47	1.2	1.5	
	16-9UNJ			16-9UNJ			9	9.525	16	1.63	1.3	1.7	
	16-8UNJ			16-8UNJ			8	9.525	16	1.83	1.2	1.6	
	22-7UNJ			22-7UNJ			7	12.7	22	2.09	1.7	2.3	
	22-6UNJ			22-6UNJ			6	12.7	22	2.44	1.7	2.3	
	22-5UNJ			22-5UNJ			5	12.7	22	2.93	1.8	2.5	
	27-4.5UNJ			27-4.5UNJ			4.5	15.875	27	3.26	2.0	2.7	
	27-4UNJ			27-4UNJ			4	15.875	27	3.67	2.2	3.0	

Applicable holders D31

●: Stock item



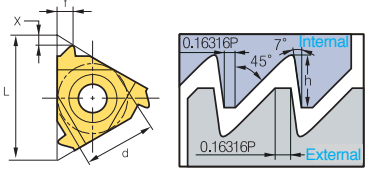
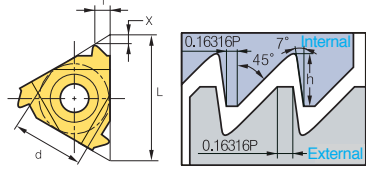
UNJ (Unified constant thread)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm)					Picture
								d	L	hmin	X	f	
Internal	IR 11-48UNJ			IL 11-48UNJ			48	6.35	11	0.28	0.6	0.5	
	11-44UNJ			11-44UNJ			44	6.35	11	0.30	0.6	0.6	
	11-40UNJ			11-40UNJ			40	6.35	11	0.33	0.6	0.6	
	11-36UNJ			11-36UNJ			36	6.35	11	0.37	0.6	0.6	
	11-32UNJ			11-32UNJ			32	6.35	11	0.42	0.6	0.7	
	11-28UNJ			11-28UNJ			28	6.35	11	0.47	0.7	0.7	
	11-24UNJ			11-24UNJ			24	6.35	11	0.55	0.7	0.8	
	11-20UNJ			11-20UNJ			20	6.35	11	0.66	0.8	0.9	
	11-18UNJ			11-18UNJ			18	6.35	11	0.74	0.8	1.0	
	11-16UNJ			11-16UNJ			16	6.35	11	0.83	0.9	1.1	
	11-14UNJ			11-14UNJ			14	9.525	11	0.95	1.0	1.2	
	16-48UNJ			16-48UNJ			48	9.525	16	0.28	0.6	0.5	
	16-44UNJ			16-44UNJ			44	9.525	16	0.30	0.6	0.6	
	16-40UNJ			16-40UNJ			40	9.525	16	0.33	0.6	0.6	
	16-36UNJ			16-36UNJ			36	9.525	16	0.37	0.6	0.6	
	16-32UNJ			16-32UNJ			32	9.525	16	0.42	0.6	0.7	
	16-28UNJ			16-28UNJ			28	9.525	16	0.47	0.7	0.7	
	16-24UNJ			16-24UNJ			24	9.525	16	0.55	0.7	0.8	
	16-20UNJ			16-20UNJ			20	9.525	16	0.66	0.8	0.9	
	16-18UNJ			16-18UNJ			18	9.555	16	0.74	0.8	1.0	
	16-16UNJ			16-16UNJ			16	9.525	16	0.83	0.9	1.1	
	16-14UNJ			16-14UNJ			14	9.525	16	0.95	1.0	1.2	
	16-13UNJ			16-13UNJ			13	9.525	16	1.02	1.0	1.3	
	16-12UNJ			16-12UNJ			12	9.525	16	1.11	1.1	1.3	
	16-11UNJ			16-11UNJ			11	9.525	16	1.21	1.2	1.5	
	16-10UNJ			16-10UNJ			10	9.525	16	1.33	1.2	1.5	
	16-9UNJ			16-9UNJ			9	9.525	16	1.48	1.3	1.7	
	16-8UNJ			16-8UNJ			8	9.525	16	1.66	1.2	1.6	
	22-7UNJ			22-7UNJ			7	12.7	22	1.90	1.7	2.3	
	22-6UNJ			22-6UNJ			6	12.7	22	2.21	1.7	2.3	
	22-5UNJ			22-5UNJ			5	12.7	22	2.66	1.8	2.5	
	27-4.5UNJ			27-4.5UNJ			4.5	15.875	27	2.95	2.0	2.7	
	27-4UNJ			27-4UNJ			4	15.875	27	3.32	2.2	3.0	

Applicable holders D32

●: Stock item

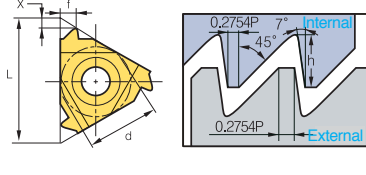
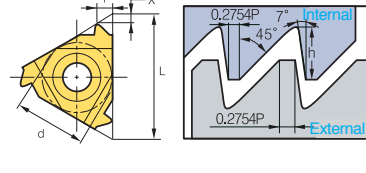
American Buttress (ABUT)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm)					Picture
								d	L	hmin	X	f	
External	ER 11-20ABUT			EL 11-20ABUT			20	6.35	11	0.84	1.0	1.4	
	11-16ABUT			11-16ABUT			16	6.35	11	1.05	1.3	1.9	
	16-20ABUT			16-20ABUT			20	9.525	16	0.84	1.0	1.4	
	16-16ABUT			16-16ABUT			16	9.525	16	1.05	1.3	1.9	
	16-12ABUT			16-12ABUT			12	9.525	16	1.40	1.4	2.0	
	16-10ABUT			16-10ABUT			10	9.525	16	1.68	1.5	2.3	
	22-8ABUT			22-8ABUT			8	12.7	22	2.10	2.0	3.2	
	22-6ABUT			22-6ABUT			6	12.7	22	2.80	2.2	3.5	
Internal	IR 11-20ABUT			IL 11-20ABUT			20	6.35	11	0.84	1.0	1.4	
	11-16ABUT			11-16ABUT			16	6.35	11	1.05	1.3	1.9	
	16-20ABUT			16-20ABUT			20	9.525	16	0.84	1.0	1.4	
	16-16ABUT			16-16ABUT			16	9.525	16	1.05	1.3	1.9	
	16-12ABUT			16-12ABUT			12	9.525	16	1.40	1.4	2.0	
	16-10ABUT			16-10ABUT			10	9.525	16	1.68	1.5	2.3	
	22-8ABUT			22-8ABUT			8	12.7	22	2.10	2.0	3.2	
	22-6ABUT			22-6ABUT			6	12.7	22	2.80	2.2	3.5	

➔ Applicable holders D31, D32

● Stock item

British Buttress (BBUT)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm)					Picture
								d	L	hmin	X	f	
External	ER 16-16BBUT			EL 16-16BBUT			16	9.525	16	0.80	1.1	1.6	
	16-12BBUT			16-12BBUT			12	9.525	16	1.07	1.4	2.1	
	16-10BBUT			16-10BBUT			10	9.525	16	1.28	1.4	2.2	
	16-8BBUT			16-8BBUT			8	9.525	16	1.61	1.6	2.5	
	22-8BBUT			22-8BBUT			8	12.7	22	1.61	1.6	2.5	
Internal	IR 16-16BBUT			IL 16-16BBUT			16	9.525	16	0.80	1.1	1.6	
	16-12BBUT			16-12BBUT			12	9.525	16	1.07	1.4	2.1	
	16-10BBUT			16-10BBUT			10	9.525	16	1.28	1.4	2.2	
	16-8BBUT			16-8BBUT			8	9.525	16	1.61	1.6	2.5	
	22-8BBUT			22-8BBUT			8	12.7	22	1.61	1.6	2.5	

➔ Applicable holders D31, D32

● Stock item



Metric Buttress (SAGE)

Type	Designation (Right)		PC3030T	PC9070T	Designation (Left)		Pitch (mm)	Dimensions (mm)					Picture
								d	L	hmin	X	f	
External	ER	16-2.0SAGE			EL	16-2.0SAGE	2.0	9.525	16	1.74	1.47	2.08	
		22-2.0SAGE				22-2.0SAGE	2.0	12.7	22	1.74	1.47	2.08	
		22-3.0SAGE	●			22-3.0SAGE	3.0	12.7	22	2.60	1.79	2.60	
		27-4.0SAGE				27-4.0SAGE	4.0	15.875	27	3.55	1.93	3.20	
Internal	IR	16-2.0SAGE			IL	16-2.0SAGE	2.0	9.525	16	1.50	1.52	2.2	
		22-3.0SAGE				22-3.0SAGE	3.0	12.7	22	2.25	1.66	2.9	
		27-4.0SAGE				27-4.0SAGE	4.0	5/8	27	3.09	2.12	3.2	

➔ Applicable holders D31, D32

● Stock item

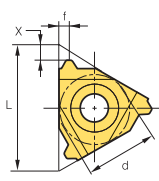
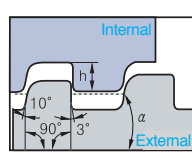
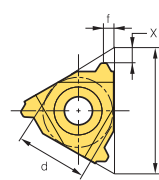
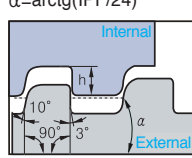
API

Type	Designation (Right)		PC3030T	PC9070T	Designation (Left)		Pitch (tpi)	Dimensions (mm)					Picture
								d	L	hmin	X	f	
External	ER	22-4API382			EL	22-4API382	4	12.7	22	3.09	2.1	2.8	
		22-4API383				22-4API383	4	12.7	22	3.08	2.1	2.8	
		22-4API502				22-4API502	4	12.7	22	3.75	2.0	2.9	
		22-4API503				22-4API503	4	12.7	22	3.74	2.0	2.9	
		22-5API403				22-5API403	5	12.7	22	2.99	1.8	2.6	
		22-6API551				22-6API551	6	12.7	22	1.41	2.6	2.0	
		27-4API382				27-4API382	4	15.875	27	3.09	2.1	2.8	
		27-4API383				27-4API383	4	15.875	27	3.08	2.1	2.8	
		27-4API502				27-4API502	4	15.875	27	3.75	2.1	3.1	
		27-4API503				27-4API503	4	15.875	27	3.74	2.1	3.1	
		27-5API403				27-5API403	5	15.875	27	2.99	1.9	2.7	
Internal	IR	22-4API382			IL	22-4API382	4	12.7	22	3.09	2.1	2.8	
		22-4API383				22-4API383	4	12.7	22	3.08	2.1	2.8	
		22-4API502				22-4API502	4	12.7	22	3.75	2.1	3.1	
		22-4API503				22-4API503	4	12.7	22	3.74	2.0	2.9	
		22-5API403	●			22-5API403	5	12.7	22	2.99	1.8	2.6	
		22-6API551				22-6API551	6	12.7	22	1.41	2.6	2.0	
		27-4API382				27-4API382	4	15.875	27	3.09	2.1	2.8	
		27-4API383				27-4API383	4	15.875	27	3.08	2.1	2.8	
		27-4API502				27-4API502	4	15.875	27	3.75	2.1	3.1	
		27-4API503				27-4API503	4	15.875	27	3.74	2.1	3.1	
		27-5API403				27-5API403	5	15.875	27	2.99	1.9	2.7	

➔ Applicable holders D31, D32

● Stock item

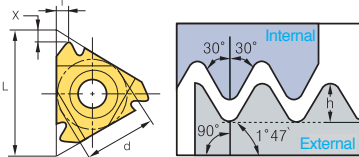
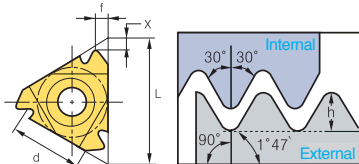
API Buttress Casing (BUT)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm)						Picture
								IPF	d	L	hmin	X	f	
External	ER 22-5BUT75			EL 22-5BUT75			5	0.75	12.7	22	1.55	3.1	1.9	 
	22-5BUT1			22-5BUT1			5	1	12.7	22	1.55	3.1	1.9	
Internal	IR 22-5BUT75			IL 22-5BUT75			5	0.75	12.7	22	1.55	2.8	1.9	 
	22-5BUT1			22-5BUT1			5	1	12.7	22	1.55	2.8	1.9	

Applicable holders D31, D32

● Stock item

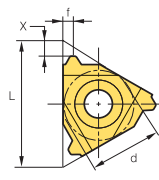
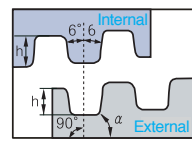
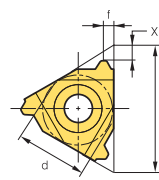
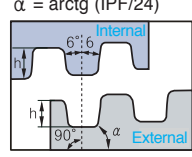
API Round Casing & Tubing (APIRD)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch	Dimensions (mm)					Picture
							(mm)	d	L	hmin	X	f	
External	ER 16-10APIRD	●		EL 16-10APIRD			10	9.525	16	1.41	1.2	1.4	
	16-8APIRD	●		16-8APIRD			8	9.525	16	1.81	1.3	1.5	
Internal	IR 16-10APIRD	●		IL 16-10APIRD			10	9.525	16	1.41	1.2	1.4	
	16-8APIRD	●		16-8APIRD			8	9.525	16	1.81	1.3	1.5	

Applicable holders D31, D32

● Stock item

Extreme Line Casing (EL)

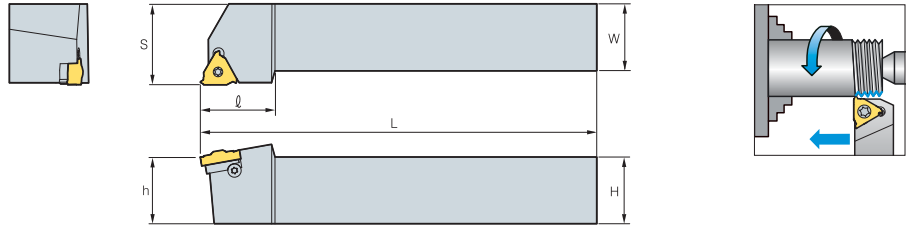
Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm)						Picture
								IPF	d	L	hmin	X	f	
External	ER 22-6EL15			EL 22-6EL15			6	1.5	12.7	22	1.21	1.9	1.9	 
	22-5EL125			22-5EL125			5	1.25	12.7	22	1.71	2.3	2.4	
Internal	IR 22-6EL15			IL 22-6EL15			6	1.5	12.7	22	1.39	1.8	1.9	 
	22-5EL125			22-5EL125			5	1.25	12.7	22	1.91	2.2	2.4	

Applicable holders D31, D32

● Stock item

ER(L)H

(Screw on system)



Righthand drawing

(mm)

Designation		Inscribed circle	H	W	L	S	H	ℓ	Insert screw	Shim screw	Screw RH	Screw LH	Wrench
ER(L)H	08N-11	6.35	8	8	136.4	11	8	17.5	ST11N	-	-	-	TW08P
	10N-11	6.35	10	10	70.0	11	10	17.5					
	12N-11	6.35	12	12	80.0	12	12	17.5					
	12N-16	9.525	12	12	83.2	16	12	22	ST16N	-	-	-	TW10P
	09-16	9.525	9.52	9.52	63.6	16	9.52	20.5	ST16	STA16	ATE16	ATI22	TW10P
	12-16	9.525	12	12	83.2	16	12	22					
	16-16	9.525	16	16	100.0	16	16	20.5					
	20-16	9.525	20	20	128.6	20	20	30					
	25-16	9.525	25	25	153.6	25	25	30					
	32-16	9.525	32	32	173.6	32	32	30					
	25-22	12.7	25	25	155.7	25	25	36	ST22	STA22	ATE22	ATI22	TW20P
	32-22	12.7	32	32	175.7	32	32	36					
	40-22	12.7	40	40	205.7	40	40	36					
	25-27	15.875	25	25	151.6	32	25	35	ST27	STA27	ATE27	ATI27	TW25L
	32-27	15.875	32	32	176.6	32	32	40					
	40-27	15.875	40	40	206.6	40	40	40					
	50-27	15.875	50	50	256.6	50	50	40					

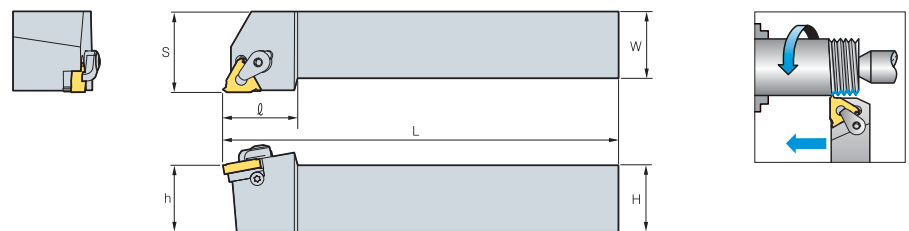
➡ Applicable inserts D10~D13, D16, D18, D19, D22, D23~D26

• Helix angle is 1.5° for all holders

• No shim needed for N type holder

ER(L)H-C

(Clamp on system)



Righthand drawing

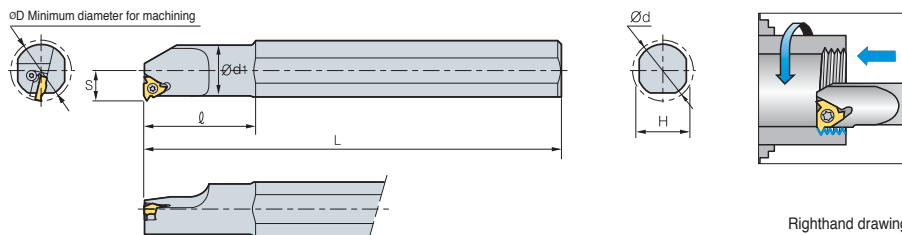
(mm)

Designation		Inscribed circle	H	W	L	S	H	ℓ	Shim screw 	Clamp 	Screw RH 	Screw LH 	Wrench 
ER(L)H	20-16C	9.525	20	20	128.6	20	20	30	STA16	CTH16	ATE16	ATI16	TW10P TW15P
	25-16C	9.525	25	25	153.6	25	25	30					
	32-16C	9.525	32	32	173.6	32	32	30					
	25-22C	12.7	25	25	155.7	25	25	36	STA22	CTH22	ATE22	ATI22	TW20P
	32-22C	12.7	32	32	175.7	32	32	36					
	40-22C	12.7	40	40	205.7	40	40	36					
	25-27C	15.875	25	25	151.6	25	25	35	STA27	CTH27	ATE27	ATI27	TW25L
	32-27C	15.875	32	32	176.6	32	32	40					
	40-27C	15.875	40	40	206.6	40	40	40					
	50-27C	15.875	50	50	256.6	50	50	40					

➡ Applicable inserts D10~D13, D16, D18, D19, D22, D23~D26

• Helix angle is 1.5° for all holders

IR(L)H (Screw on system)



Righthand drawing

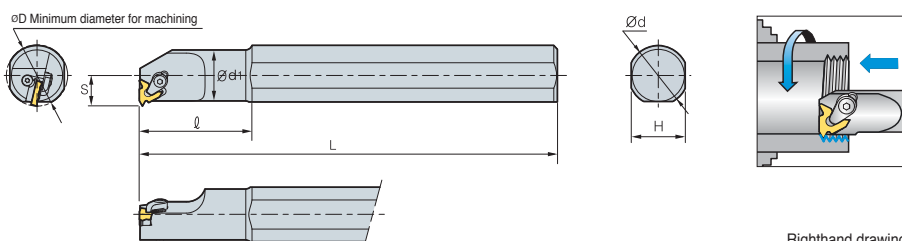
(mm)

Designation		Inscribed circle	ØD	Ød	Ød ₁	H	L	S	ℓ	Insert screw 	Shim screw 	Screw RH 	Screw LH 	Wrench 
IR(L)H	10DN-11	6.35	13	10	10.0	9.5	100	7.3	-	ST11N	-	-	-	TW08P
	10N-11	6.35	13	20	10.0	18.0	180	7.3	25					
	13N-11	6.35	16	20	13.0	18.0	180	8.9	32					
	13N-16	9.525	17	20	12.7	18.0	180	10.3	32	ST16N	-	-	-	TW10P
	16N-16	9.525	20	20	16.0	18.0	180	11.5	40					
	16DN-16	9.525	20	16	16.0	15.2	150	11.3	32					
	20-16	9.525	24	20	20.0	18.0	180	13.4	40	ST16	STA16	ATI16	ATE16	TW10P
	25-16	9.525	29	32	25.0	29.0	250	16.3	60					
	25D-16	9.525	29	25	24.5	22.6	200	16.1	45					
	32-16	9.525	36	32	32.0	29.0	250	19.6	60					
	40-16	9.525	44	40	40.0	36.0	300	23.8	60					
	20N-22	12.7	27	20	20.0	18.0	180	15.6	50	ST22N	-	-	-	TW20P
	25-22	12.7	32	32	25.0	29.0	250	17.4	60	ST22	STA22	ATI22	ATE22	TW20P
	25D-22	12.7	32	25	24.6	22.6	200	17.2	45					
	32-22	12.7	39	32	32.0	29.0	250	21.5	60					
	40-22	12.7	47	40	40.0	36.0	300	25.8	60					
	32-27	15.875	40	32	32.0	29.0	250	22.4	60	ST27	STA27	ATI27	ATE27	TW25L
	40-27	15.875	48	40	40.0	36.0	300	26.4	60					
	50-27	15.875	58	50	50.0	45.0	350	31.4	75					
	60-27	15.875	69	60	60.0	54.0	400	36.4	75					

➔ Applicable inserts D10, D11, D14, D15, D17, D20~D25, D27~D30

• Helix angle is 1.5° for all holders • No shim needed for N type holder

IR(L)H-C (Clamp on system)



Righthand drawing

(mm)

Designation		Inscribed circle	ØD	Ød	Ød ₁	H	L	S	ℓ	Shim screw 	Clamp 	Screw RH 	Screw LH 	Wrench 
IR(L)H	20-16C	9.525	24	20	20.0	18.0	180	13.4	50	STA16	CTH16	ATI16	ATE16	TW10P TW15P
	25-16C	9.525	29	32	25.0	28.0	250	16.3	60					
	25D-16C	9.525	29	25	24.6	22.6	200	16.1	45					
	32-16C	9.525	36	32	32.0	29.0	250	19.6	60					
	40-16C	9.525	44	40	40.0	36.0	300	23.8	60					
	25-22C	12.7	32	32	25.0	29.0	250	17.4	60	STA22	CTH22	ATI22	ATE22	TW20P
	25D-22C	12.7	32	25	24.6	22.6	200	17.2	45					
	32-22C	12.7	39	32	32.0	29.0	250	21.5	60					
	40-22C	12.7	47	40	40.0	36.0	300	25.8	60					
	32-27C	15.875	40	32	32.0	29.0	250	22.4	60					
	40-27C	15.875	48	40	40.0	36.0	300	26.4	60	STA27	CTH27	ATI27	ATE27	TW25L
	50-27C	15.875	58	50	50.0	45.0	350	31.4	75					
60-27C	15.875	69	60	60.5	54.0	400	36.4	75						

➔ Applicable inserts D10, D11, D14, D15, D17, D20~D25, D27~D30

• Helix angle is 1.5° for all holders



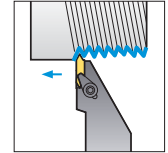
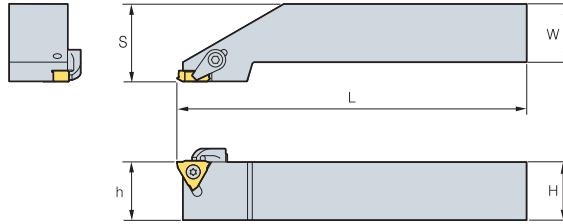
D

Threading

VTH



VETR



Righthand drawing
(mm)

Designation	H = (h)	W	L	S	Insert	Clamp	Clamp screw	Screw	Wrench
VTH 2020R	20	20	125	26.4	VETR	CS6R1	DHA0617	FTKA03510	TW15P, HW30L
2525R	25	25	150	33.4					
3225R	32	25	170	33.4					

Vertical type thread insert

Picture	Designation	Cermet	Uncoated	Dimensions			Configuration
		CN20	ST10	Pitch (mm)	θ	f	
	VETR 080			0.8	60°	1.4	 d : 9.525 t : 4.76
	100		●	1.0	60°	1.4	
	125			1.25	60°	1.4	
	150		●	1.5	60°	1.2	
	175			1.75	60°	1.2	
	200		●	2.0	60°	1.2	
	250			2.5	60°	1.4	
	300		●	3.0	60°	1.6	
	150F	●	●	0.8~1.5	60°	1.4	
	300F	●	●	1.5~3.0	60°	1.6	

● : Stock item

Thread milling holders code system

TM	S	R	L	25	-	11
1	2	3	4	5		6
Insert style	Holder style	Hand	Shank type	Shank dia.		Cutting edge length
1 Insert style TM S R L 25 - 11	2 Holders style TM S R L 25 - 11	3 Hand TM S R L 25 - 11	4 Shank type TM S R L 25 - 11	5 Shank dia. TM S R L 25 - 11		6 Cutting edge length TM S R L 25 - 11
Thread Milling Holder	S: Shank Type	R: Right Hand L: Left Hand	None: Standard L: Long Type T: Taper Type	25: 25.0		10: 10.4 22: 22 11: 11 27: 27 16: 16 38: 38.5

Thread milling inserts code system

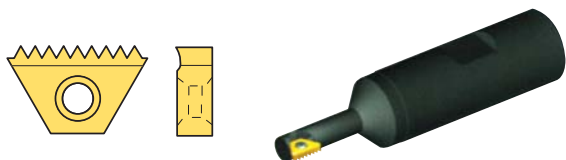
TM	2	I	16	-	1.5	ISO
1	2	3	4	5		6
Insert style	Cutting edge	Type of insert	Cutting edge length	Pitch		Type
1 Insert style TM 2 I 16 - 1.5 ISO	2 Cutting edge TM 2 I 16 - 1.5 ISO	3 Type of insert TM 2 I 16 - 1.5 ISO	4 Cutting edge length TM 2 I 16 - 1.5 ISO	5 Pitch TM 2 I 16 - 1.5 ISO		6 Type TM 2 I 16 - 1.5 ISO
Thread Milling Holder	None: 1 cutting edge 2: 2 cutting edge	I: Internal E: External EI: External & Internal	10: 10.4 11: 11 16: 16 22: 22 27: 27 38: 38.5	mm: 0.5~6.0 tpi: 48~6		ISO Metric American UN (UNC, UNF, UNEF) UNJ Whit Worth (BSW, BSF, BSP, BSB) National Pipe Thread (NPT) National Pipe Thread (NPTF) British Standard Pipe Thread (BSPT)



Thread milling

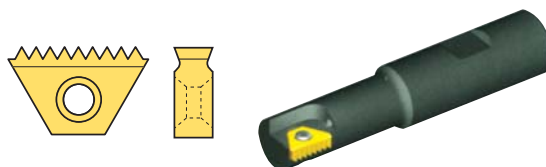
➤ The right tool for the job

Small diameter type



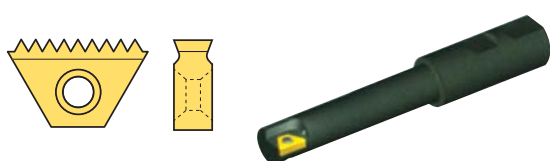
Tool holder: TMSR **Insert:** TM L = 10.4 mm
For small bore diameters down to 9.5 mm

Standard type



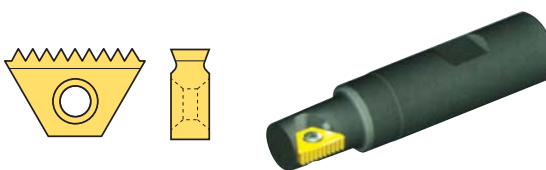
Tool holder: TMSR **Insert:** TM2
For standard length threads

Long type



Tool holder: TMSR **Insert:** TM2
For long or remote threads

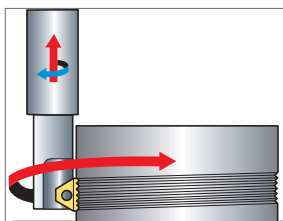
Tapered type



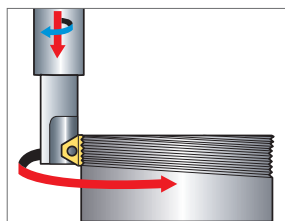
Tool holder: TMSR **Insert:** TM2 (BSPT, NPT, NPTF)
For standard length threads

➤ Thread milling methods

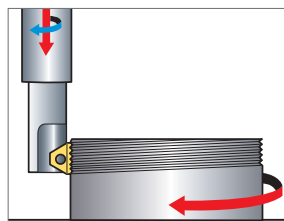
External threading



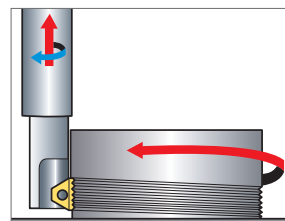
Right handed thread
conventional milling



Left handed thread
down milling

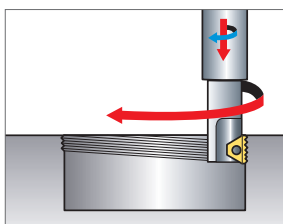


Right handed thread
down milling

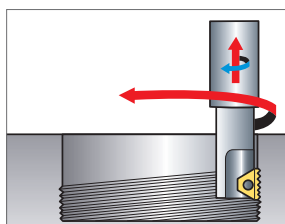


Left handed thread
conventional milling

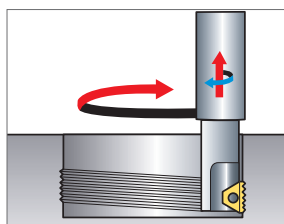
Internal threading



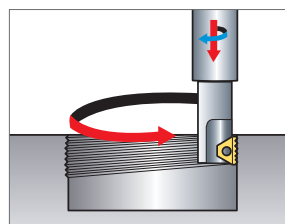
Right handed thread
down milling



Left handed thread
conventional milling



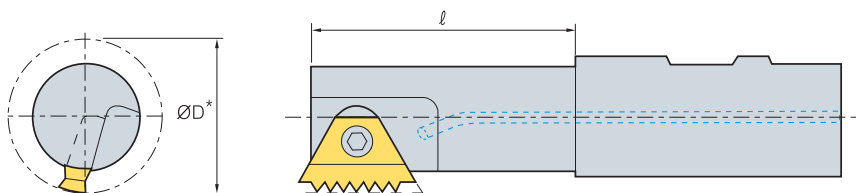
Right handed thread
conventional milling



Left handed thread
down milling

D Technical Information for Thread Milling

Tooling recommendation for given internal thread specification



ISO

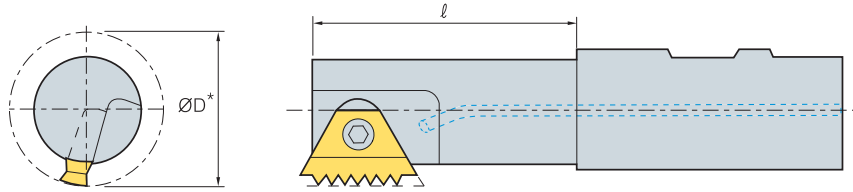
Pitch (mm)	Nominal dia. (mm)	Holder	Insert	ℓ-Tool holder overhang	D-Tool cutting dia.*	Min.Thread depth (Profile depth)
0.75	11	TMSR 12-10	TM2I 10-0.75ISO	12.0	9.0	0.43
1.0	12-14	TMSR 12-10	TM2I 10-1.0ISO	12.0	9.0	0.58
	15-18	TMSR 12-11	TM2I 11-1.0ISO	12.0	11.5	
	20	TMSR 16-16	TM2I 16-1.0ISO	22.0	17.0	
	22	TMSR 20-22	TM2I 22-1.0ISO	29.0	19.0	
	24	TMSR 20-16	TM2I 16-1.0ISO	43.0	20.0	
	25-28	TMSRL 25-16	TM2I 16-1.0ISO	25.0	22.0	
1.25	14	TMSR 12-10	TM2I 10-1.25ISO	12.0	9.0	0.72
1.5	14-15	TMSR 12-10	TM2I 10-1.5ISO	12.0	9.0	0.87
	16-20	TMSR 12-11	TM2I 11-1.5ISO	12.0	11.5	
	22	TMSR 16-16	TM2I 16-1.5ISO	22.0	17.0	
	24	TMSR 20-22	TM2I 22-1.5ISO	29.0	19.0	
	25-26	TMSR 20-16	TM2I 16-1.5ISO	43.0	20.0	
	27-30	TMSRL 25-16	TM2I 16-1.5ISO	25.0	22.0	
	35-42	TMSR 25-27	TM2I 27-1.5ISO	52.0	30.0	
	45	TMSR 32-27	TM2I 27-1.5ISO	58.0	37.0	
2.0	22	TMSRT 16-16	TM2I16-2.0ISO	22.0	15.5	1.15
	24	TMSR 16-16	TM2I 16-2.0ISO	22.0	17.0	
	25	TMSR 20-22	TM2I 22-2.0ISO	29.0	19.0	
	27	TMSR 20-16	TM2I 16-2.0ISO	43.0	20.0	
	28-32	TMSRL 25-16	TM2I 16-2.0ISO	25.0	22.0	
	39-42	TMSR 25-27	TM2I 27-2.0ISO	52.0	30.0	
	45-48	TMSR 32-27	TM2I 27-2.0ISO	58.0	37.0	
3.0	42-48	TMSR 25-27	TM2I 27-3.0ISO	52.0	30.0	1.73
	50-52	TMSR 32-27	TM2I 27-3.0ISO	58.0	37.0	
	45-52	TMSR 25-27	TM2I 27-4.0ISO	52.0	30.0	2.31
4.0	55	TMSR 32-38	TM2I 38-4.0ISO	55.0	35.0	
	56-58	TMSR 32-27	TM2I 27-4.0ISO	58.0	37.0	
	60-65	TMSR 40-38	TM2I 38-4.0ISO	65.0	46.0	
5.0	48-52	TMSR 32-38	TM2I 38-5.0ISO	55.0	35.0	2.89
5.5	56	TMSR 32-38	TM2I 38-5.5ISO	55.0	35.0	3.17
	60	TMSR 40-38	TM2I 38-5.5ISO	65.0	46.0	
6.0	64-68	TMSR 40-38	TM2I 38-6.0ISO	65.0	46.0	3.46

• The recommended holder is the largest for the given thread specification

* Holder with smaller or equal cutting diameters (D2) can also be used



Tooling recommendation for given internal thread specification



UN

Pitch (tpi)	Nominal dia. (inch)	Holder	Insert	ℓ-Tool holder overhang	D-Tool cutting dia.*	Min.Thread depth (Profile depth)
32	7/16-1/2	TMSR 12-10	TMI 10-32UN	12.0	9.0	0.46
	9/16-11/16	TMSR 12-11	TM2I 11-32UN	12.0	11.5	
	3/4-13/16	TMSR 16-16	TM2I 16-32UN	22.0	17.0	
	7/8-15/16	TMSR 20-16	TM2I 16-32UN	43.0	20.0	
	1	TMSR 25-16	TM2I 16-32UN	25.0	22.0	
28	7/16-1/2	TMSR 12-10	TMI 10-28UN	12.0	9.0	0.52
	9/16-3/4	TMSR 12-11	TM2I 11-28UN	12.0	11.5	
	13/16-7/8	TMSR 16-16	TM2I 16-28UN	22.0	17.0	
	15/16	TMSR 20-16	TM2I 16-28UN	43.0	20.0	
	1-1 1/8	TMSRL 25-16	TM2I 16-28UN	25.0	22.0	
24	9/16-11/16	TMSR 12-11	TM2I 11-24UN	12.0	11.5	0.61
20	1/2-9/16	TMSR 12-10	TMI 10-20UN	12.0	9.0	0.73
	5/8-13/16	TMSR 12-11	TM2I 11-20UN	12.0	11.5	
	7/8	TMSR 16-16	TM2I 16-20UN	22.0	17.0	
	15/16-1	TMSR 20-16	TM2I 16-20UN	43.0	20.0	
	1 1/16-1 1/8	TMSRL 25-16	TM2I 16-20UN	25.0	22.0	
	1 3/8-1 5/8	TMSR 25-27	TM2I 27-20UN	52.0	30.0	
	1 11/16-1 13/16	TMSR 32-27	TM2I 27-20UN	28.0	37.0	
18	5/8	TMSR 12-11	TM2I 11-18UN	12.0	11.5	0.81
	1 1/16-1 3/16	TMSRL 25-16	TM2I 16-18UN	25.0	22.0	
	1 7/16-1 5/8	TMSR 25-27	TM2I 27-18UN	52.0	30.0	
	1 11/16	TMSR 32-27	TM2I 27-18UN	58.0	37.0	
16	11/16-13/16	TMSR 12-11	TM2I 11-16UN	12.0	11.5	0.92
	7/8-15/16	TMSR 16-16	TM2I 16-16UN	22.0	17.0	
	1	TMSR 20-16	TM2I 16-16UN	43.0	20.0	
	1 1/16-1 3/16	TMSRL 25-16	TM2I 16-16UN	25.0	22.0	
	1 7/16-1 5/8	TMSR 25-27	TM2I 27-16UN	52.0	30.0	
	1 11/16-1 7/8	TMSR 32-27	TM2I 27-16UN	58.0	37.0	
14	7/8	TMSR 12-11	TM2I 11-14UN	12.0	11.5	1.05
12	7/8	TMSRT 16-16	TM2I 16-12UN	22.0	15.5	1.22
	15/16	TMSR 16-16	TM2I 16-12UN	22.0	17.0	
	1	TMSR 20-22	TM2I 22-12UN	29.0	19.0	
	1 1/16	TMSR 20-16	TM2I 16-12UN	43.0	20.0	
	1 1/8-1 1/4	TMSRL 25-16	TM2I 16-12UN	25.0	22.0	
	1 1/2-1 11/16	TMSR 25-27	TM2I 27-12UN	52.0	30.0	
	1 3/4-1 15/16	TMSR 32-27	TM2I 27-12UN	58.0	37.0	
8	1 11/16-1 15/16	TMSR 25-27	TM2I 27-8UN	52.0	30.0	1.83
	2-1 1/8	TMSR 32-27	TM2I 27-8UN	58.0	37.0	
6	2-2 1/8	TMSR 25-27	TM2I 27-6UN	52.0	30.0	2.44
	2 1/4	TMSR 32-27	TM2I 27-6UN	58.0	37.0	
	2 3/8-2 1/2	TMSR 40-38	TM2I 38-6UN	65.0	46.0	
4.5	2-2 1/4	TMSR 32-38	TM2I 38-4.5UN	55.0	35.0	3.26
4	2 1/2	TMSR 40-38	TM2I 38-4UN	65.0	46.0	3.67

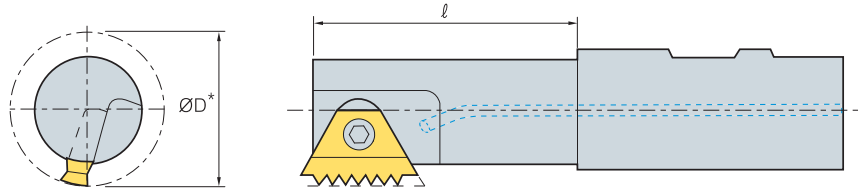
• The recommended holder is the largest for the given thread specification

* Holder with smaller or equal cutting diameters (D2) can also be used

D Technical Information for Thread Milling

Tooling recommendation for given internal thread specification

UNJ



Pitch (tpi)	Nominal dia. (inch)	Holder	Insert	ℓ-Tool holder overhang	D-Tool cutting dia.*	Min.Thread depth (Profile depth)
24	9/16-11/16	TMSR 12-11	TM2I 11-24UNJ	12.0	11.5	0.55
20	1/2	TMSR 12-10	TMI 10-20UNJ	12.0	9.0	0.66
	3/4-13/16	TMSR 12-11	TM2I 11-20UNJ	12.0	11.5	
	7/8	TMSR 16-16	TM2I 16-20UNJ	22.0	17.0	
	15/16-1	TMSR 20-16	TM2I 16-20UNJ	43.0	20.0	
18	5/8	TMSR 12-11	TM2I 11-18UNJ	12.0	11.5	0.74
	1 1/16-1 3/16	TMSRL 25-16	TM2I 16-18UNJ	25.0	22.0	
16	11/16-13/16	TMSR 12-11	TM2I 11-16UNJ	12.0	11.5	0.83
	7/8-15/16	TMSR 16-16	TM2I 16-16UNJ	22.0	17.0	
	1	TMSR 20-16	TM2I 16-16UNJ	43.0	20.0	
	1 1/16-1 3/16	TMSRL 25-16	TM2I 16-16UNJ	25.0	22.0	
	1 7/16-1 5/8	TMSR 25-27	TM2I 27-16UNJ	52.0	30.0	
	1 11/16-1 7/8	TMSR 32-27	TM2I 27-16UNJ	58.0	37.0	
14	7/8	TMSR 12-11	TM2I 11-14UNJ	12.0	11.5	0.95
12	7/8	TMSRT 16-16	TM2I 16-12UNJ	22.0	15.5	1.11
	15/16-1	TMSR 16-16	TM2I 16-12UNJ	22.0	17.0	
	1 1/16	TMSR 20-16	TM2I 16-12UNJ	43.0	20.0	
	1 1/8-1 1/4	TMSRL 25-16	TM2I 16-12UNJ	25.0	22.0	
	1 1/2-1 11/16	TMSR 25-27	TM2I 27-12UNJ	52.0	30.0	
	1 3/4-1 15/16	TMSR 32-27	TM2I 27-12UNJ	58.0	37.0	

W

Pitch (tpi)	Nominal dia. (inch)	Holder	Insert	ℓ-Tool holder overhang	D-Tool cutting dia.*	Min.Thread depth (Profile depth)
26	1/2-9/16	TMSR 12-10	TMEI 10-26W	12.0	9.0	0.63
	5/8-3/4	TMSR 12-11	TM2EI 11-26 W	12.0	11.5	
	13/16-7/8	TMSR 16-16	TM2EI 16-26W	22.0	17.0	
	15/16-1	TMSR 20-16	TM2EI 16-26W	43.0	20.0	
	1 1/16-1 1/8	TMSRL 25-16	TM2EI 16-26W	25.0	22.0	
20	9/16	TMSR 12-10	TM2EI 10-20W	12.0	9.0	0.81
	5/8-13/16	TMSR 12-11	TM2EI 11-20W	12.0	11.5	
	7/8-15/16	TMSR 16-16	TM2EI 16-20W	22.0	17.0	
	1	TMSR 20-16	TM2EI 16-20W	43.0	20.0	
	1 1/16-1 3/16	TMSRL 25-16	TM2EI 16-20W	25.0	22.0	
16	13/16	TMSR 16-16	TM2EI 16-16W	22.0	15.5	1.02
	7/8-15/16	TMSR 16-16	TM2EI 16-16W	22.0	17.0	
	1-1 1/16	TMSR 20-16	TM2EI 16-16W	43.0	20.0	
	1 1/8-1 1/4	TMSRL 25-16	TM2EI 16-16W	25.0	22.0	
	1.4-1 5/8	TMSR 25-27	TM2EI 27-16W	52.0	30.0	
	1 3/4-1.9	TMSR 32-27	TM2EI 27-16W	28.0	37.0	
12	1 1/2-1 3/4	TMSR 25-27	TM2EI 27-12W	52.0	30.0	1.36
	1 7/8	TMSR 32-27	TM2EI 27-12W	58.0	37.0	
8	1 7/8-1.9	TMSR 25-27	TM2EI 27-8W	52.0	30.0	2.03
	2.1-2 1/8	TMSR 32-27	TM2EI 27-8W	58.0	37.0	
7	2	TMSR 25-27	TM2EI 27-7W	52.0	30.0	2.32
6	2.1-2 1/8	TMSR 25-27	TM2EI 27-6W	52.0	30.0	2.71
	2 1/4	TMSR 32-38	TM2EI 38-6W	55.0	35.0	
	2 3/8-2.6	TMSR 32-27	TM2EI 27-6W	58.0	37.0	
	2 5/8-2 3/4	TMSR 40-38	TM2EI 38-6W	65.0	46.0	
5	3	TMSR 40-38	TM2EI 38-5W	65.0	46.0	3.25
4.5	3 1/2	TMSR 40-38	TM2EI 38-4.5W	65.0	46.0	3.61

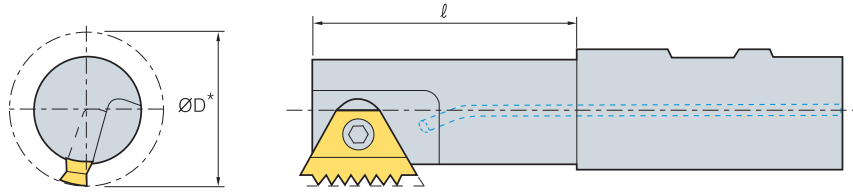
* The recommended holder is the largest for the given thread specification
 * Holder with smaller or equal cutting diameters (D2) can also be used



D

Threading

Tooling recommendation for given internal thread specification



BSPT

Pitch (tpi)	Nominal dia. (inch)	Holder	Insert	ℓ-Tool holder overhang	D-Tool cutting dia.*	Min.Thread depth (Profile depth)
19	3/8	TMSR 21-11	TM2EI 11-19 BSPT	20.0	11.5	0.86
14	1/2-3/4	TMSRT 16-11	TM2EI 16-14 BSPT	22.0	15.5	1.16
11	1-1 1/4	TMSRT 20-16	TM2EI 16-11 BSPT	23.0	19.0	1.48
	1 1/2	TMSR 25-27	TM2EI 27-11 BSPT	52.0	30.0	
	2-6	TMSRT 32-27	TM2EI 27-11 BSPT	58.0	37.0	

NPT

Pitch (tpi)	Nominal dia. (inch)	Holder	Insert	ℓ-Tool holder overhang	D-Tool cutting dia.*	Min.Thread depth (Profile depth)
14	1/2	TMSRT 16-16	TM2EI 16-14 NPT	22.0	15.5	1.33
	3/4	TMSRT 20-16	TM2EI 16-14 NPT	23.0	19.0	
11.5	1	TMSRT 20-16	TM2EI 16-11.5 NPT	23.0	19.0	1.64
	1 1/4	TMSR 25-27	TM2EI 27-11.5 NPT	52.0	30.0	
	1 1/2-2	TMSRT 32-27	TM2EI 27-11.5 NPT	58.0	37.0	
8	2 1/2	TMSRT 32-27	TM2EI 27-8 NPT	58.0	37.0	2.42
	3-24	TMSR 40-38	TM2EI 38-8 NPT	65.0	46.0	

NPTF

Pitch (tpi)	Nominal dia. (inch)	Holder	Insert	ℓ-Tool holder overhang	D-Tool cutting dia.*	Min.Thread depth (Profile depth)
14	1/2	TMSRT 16-16	TM2EI 16-14 NPTF	22.0	15.5	1.35
	3/4	TMSRT 20-16	TM2EI 16-14 NPTF	23.0	19.0	
11.5	1	TMSRT 20-16	TM2EI 16-11.5 NPTF	23.0	19.0	1.63
	1 1/2	TMSR 25-27	TM2EI 27-11.5 NPTF	52.0	30.0	
	2	TMSRT 32-27	TM2EI 27-11.5 NPTF	58.0	37.0	
8	2 1/2	TMSRT 32-27	TM2EI 27-8 NPTF	58.0	37.0	2.38
	3	TMSR 40-38	TM2EI 38-8 NPTF	65.0	46.0	

* The recommended holder is the largest for the given thread specification
 * Holder with smaller or equal cutting diameters (D2) can also be used

D Technical Information for Thread Milling

Minimum bore diameters for thread milling

Pitch		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	-
	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
Holder designation	diameter	Minimum diameter for machining																				
TMSR 12-10	9.0	9.5	9.7	9.9	10.0	10.4	10.7	11.4	12.0													
TMSR 20-10	9.0	9.5	9.7	9.9	10.0	10.4	10.7	11.4	12.0													
TMSR 12-11	11.5	12.0	12.2	12.4	12.5	12.9	13.2	13.9	14.5	15.1												
TMSR 20-11	11.5	12.0	12.2	12.4	12.5	12.9	13.2	13.9	14.5	15.1												
TMSRL 25-11	11.5	12.0	12.2	12.4	12.5	12.9	13.2	13.9	14.5	15.1												
TMSRT 16-16	15.5	16.0	16.2	16.4	16.5	16.9	17.2	17.9	18.5	19.0	19.5	20.0										
TMSR 16-16	17.0	17.6	17.8	18.0	18.2	18.7	19.0	19.6	20.0	20.5	21.0	21.5										
TMSR 16-22	17.0	17.6	17.8	18.0	18.2	18.7	19.0	19.6	20.0	20.5	21.0	21.5										
TMSR 20-22	19.0	19.7	20.0	20.2	20.4	20.8	21.0	21.6	22.0	22.5	23.0	23.5										
TMSRT 20-16	19.0	19.7	20.0	20.2	20.4	20.8	21.0	21.6	22.0	22.5	23.0	23.5										
TMSR 20-16	20.0	20.7	21.0	21.2	21.4	21.8	22.0	22.6	23.0	23.5	24.0	24.5										
TMSRW 25-22	22.0	22.7	23.0	23.2	23.4	23.8	24.0	24.6	25.0	25.5	26.0	26.5										
TMSRL 25-22	22.0	22.7	23.0	23.2	23.4	23.8	24.0	24.6	25.0	25.5	26.0	26.5										
TMSRL 25-16	22.0	22.7	23.0	23.2	23.4	23.8	24.0	24.6	25.0	25.5	26.0	26.5										
TMSR 25-27	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					
TMSRL 25-27	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					
TMSR 32-38	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
TMSR 32-27	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					
TMSRL 32-27	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					
TMSRT 32-27	37.0	38.0	38.2	38.4	38.6	39.1	39.5	40.0	41.0	41.5	42.0	43.0	44.0	46.5	49.0	52.0	55.5					
TMSR 40-38	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
TMSRL 40-38	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

- In order to perform a thread milling operation, a milling machine with three-axis control capability 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 x-y 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

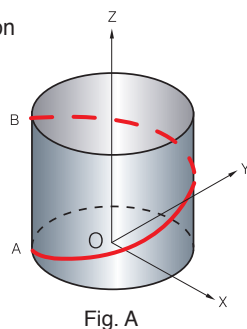


Fig. A

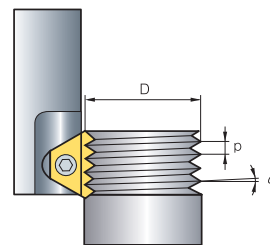


Fig. B

- 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:

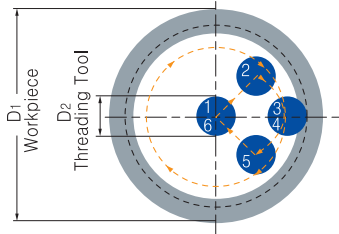
1. Tangential Arc Approach
2. Radial Approach
3. Tangential Line Approach



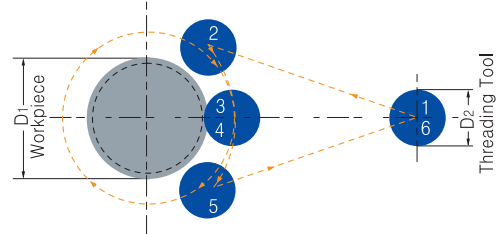
Tangential arc approach

- 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

Internal thread



External thread

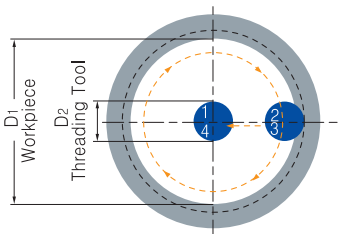


- 1-2: rapid approach
- 2-3: tool entry along tangential arc, with simultaneous feed along z-axis
- 3-4: helical movement during one full orbit (360°)
- 4-5: tool exit along tangential arc, with continuing feed along z-axis
- 5-6: rapid return

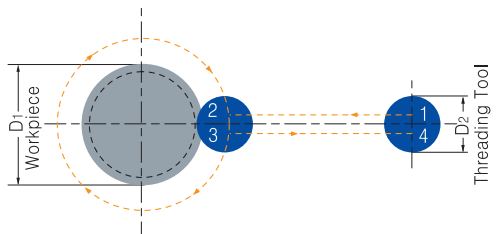
Radial approach

- This is the simplest method. There are two characteristics worth nothing about the radial approach:
 - A. a small vertical mark may be lift at the entry (and exit) point. This is of no significance to the thread itself
 - B. 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

Internal thread



External thread

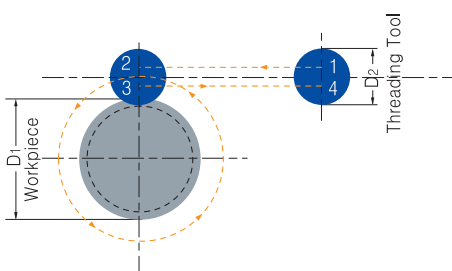


- 1-2: radial entry
- 2-3: helical movement during one full orbit (360°)
- 3-4: radial exit

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

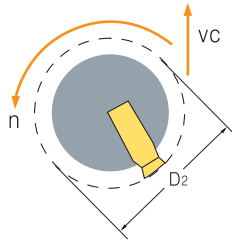
External thread



- 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

➤ Calculation of rotational velocity and feed at the cutting edge



$$n = \frac{vc \times 1000}{\pi \times D_2}$$

$$vc = \frac{n \times \pi \times D_2}{1000}$$

$$F_1 = n \times z \times f_n$$

n: Rotational Velocity [R.P.M]

vc: Cutting Speed [m/min]

D2: Tool holder Cutting Dia. [mm]

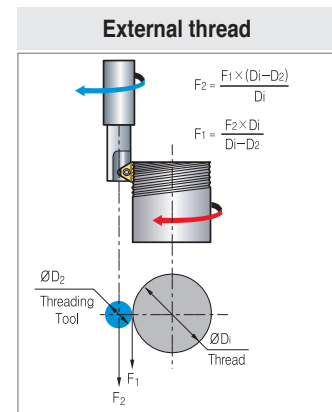
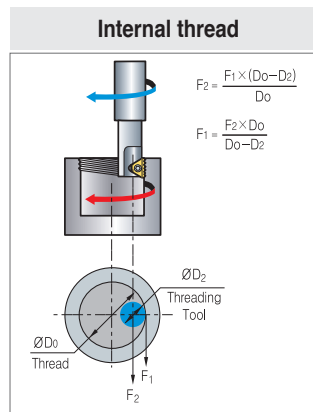
F1: Real Feed rate at the Cutting edges [mm/min]

z: No. of Cutting Edges

fn: Feed per Rooth per Rotation [mm/rev]

➤ Calculation of feed rates 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, but with circular tool movement this is not the case. The equations define the relationship between feed rates at the cutting edge and at the tool center line.



➤ Grades and applications

- Grade: PC9570T
- Application: First Choice for steel and cast iron. A tough sub-micron substrate with TiCN coating. Provides good fracture toughness and excellent wear resistance.

➤ Trouble shooting

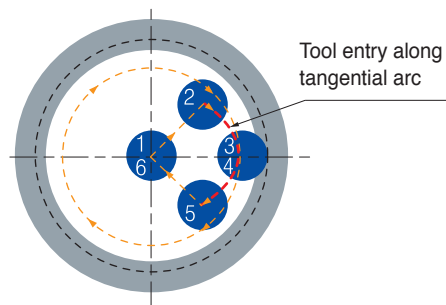
Problem	Possible	Solution
Increased insert flank wear	Cutting speed too high> Chip is too thin> Insufficient coolant>	Reduce cutting speed/use coated insert Increase feed rate Increase coolant flow rate
Chipping of cutting edge	Chip is too thick> Vibration>	Reduce feed rate/Use the tangential arc method Increase RPM Check stability
Material built-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

Recommended cutting condition

Workpiece			Hardness brinell HB	vc (m/min)		Feed fz (mm/t)	
				Grade		Indexable insert	Solid endmill
				PC9570T	PC9070M		
P	Unalloyed steel	Low carbon (C+0.1-0.25%)	125	100~210	80~250	0.05~0.3	0.03~0.15
		Medium carbon (C = 0.25-0.55%)	150	100~180	80~230	0.05~0.25	0.03~0.1
		High carbon (C = 0.55-0.85%)	170	100~170	80~200	0.05~0.2	0.03~0.08
	Low alloy steel (alloying elements≤5%)	Non-hardened	180	90~160	60~180	0.05~0.25	0.03~0.1
		Hardened	275	80~150	60~170	0.05~0.2	0.03~0.07
		Hardened	350	70~140	60~160	0.05~0.15	0.01~0.03
	High alloy steel	Annealed	200	60~130	40~100	0.05~0.2	0.03~0.05
		Hardened	325	70~110	30~80	0.05~0.1	0.01~0.03
	Cast steel	Low alloy (alloying elements<5%)	200	100~170	80~250	0.05~0.15	0.03~0.1
		High alloy (alloying elements>5%)	225	70~120	60~170	0.05~0.1	0.01~0.03
M	Stainless steel ferritic	Non-hardened	200	100~170	60~150	0.05~0.15	0.04~0.1
		Hardened	330	100~170	60~120	0.05~0.1	0.01~0.05
	Stainless steel Austenitic	Austenitic	180	70~140	60~140	0.05~0.15	0.04~0.1
		Super austenitic	200	70~140	60~130	0.05~0.1	0.04~0.1
	Stainless steel cast ferritic	Non-hardened	200	70~140	60~160	0.05~0.15	0.04~0.1
		Hardened	330	70~140	60~110	0.05~0.1	0.03~0.05
	Stainless steel cast austenitic	Austenitic	200	70~120	60~150	0.05~0.15	0.04~0.1
		Hardened	330	70~120	60~100	0.05~0.1	0.03~0.05
	High temperature alloys	Annealed (Iron based)	200	20~45	30~60	0.05~0.1	0.04~0.1
		Aged (Iron based)	280	20~30	20~50	0.02~0.05	0.01~0.03
		Annealed (Nickel or Cobalt based)	250	15~20	15~35	0.02~0.05	0.01~0.03
		Aged (Nickel or Cobalt based)	350	10~15	15~30	0.02~0.05	0.01~0.03
	Titanium alloys	Pure 99.5 Ti	400Rm	70~140	40~80	0.02~0.05	0.03~0.05
		α+β alloys	1050Rm	20~50	20~50	0.02~0.05	0.03~0.05
K	Extra hard steel	Hardened & tempered	55HrC	20~45	15~45	0.01~0.03	0.005~0.01
	Malleable cast iron	Ferritic (short chips)	130	60~130	70~160	0.02~0.08	0.01~0.03
		Pearlitic (long chips)	230	60~120	60~150	0.02~0.05	0.03~0.05
	Grey cast iron	Low tensile strength	180	60~130	70~160	0.05~0.15	0.05~0.1
		High tensile strength	260	60~100	40~120	0.05~0.1	0.03~0.05
	Nodular SG iron	Ferritic	160	60~125	40~110	0.05~0.15	0.05~0.1
		Pearlitic	260	50~90	40~100	0.05~0.1	0.03~0.05
	Aluminum alloys Wrought	Non-aging	60	100~250	200~300	0.1~0.4	0.1~0.25
		Aged	100	100~180	150~250	0.1~0.3	0.1~0.2
	Aluminum alloys	Cast	75	150~400	100~200	0.1~0.3	0.1~0.2
		Cast & aged	90	150~280	120~220	0.05~0.25	0.1~0.15
		Cast Si 13-22%	130	80~150	200~300	0.1~0.3	0.1~0.2
	Copper and copper alloys	Brass	90	120~210	200~300	0.1~0.3	0.1~0.25
		Bronze and non-leaded copper	100	120~210	150~250	0.05~0.25	0.1~0.2

Example

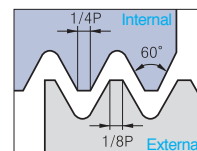
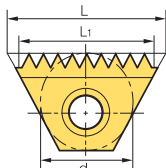
- At tool entry, set the Feed fz [mm/tooth] to 70% lower than the threading Feed
- Threading Feed: 0.3 [mm/t]
- Tool entry Feed: 0.09 [mm/t]



D Thread Milling Inserts

ISO Metric

External/Internal



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

(mm)

Insert size		Pitch (mm)	Designation				L1	Tooth	Tool holder
d	L		External	PC9570T	Internal	PC9570T			
6.0	10.4	0.5	-		TMI	10-0.5ISO	●	10.0	TMSR-10
		0.75	-			10-0.75ISO		9.75	
		1.0	-			10-1.0ISO	●	9.0	
		1.25	-			10-1.25ISO		8.75	
		1.5	-			10-1.5ISO		9.0	
6.35	11	0.5	-		TM2I	11-0.5ISO		10.0	TMSR-11
		0.75	TM2E	11-0.75ISO		11-0.75ISO	●	10.5	
		1.0		11-1.0ISO		11-1.0ISO	●	10.0	
		1.25		11-1.25ISO		-		10.0	
		1.25	-			11-1.25ISO		8.75	
		1.5		11-1.5ISO		-		9.0	
		1.5	-			11-1.5ISO	●	10.5	
9.525	16	0.5	-		TM2I	16-0.5ISO		15.0	TMSR-16
		0.75	TM2E	16-0.75ISO		16-0.75ISO		15.0	
		0.8	-			16-0.8ISO		14.4	
		1.0		16-1.0ISO		-		14.0	
		1.0	-			16-1.0ISO		15.0	
		1.25		16-1.25ISO		16-1.25ISO		15.0	
		1.5		16-1.5ISO		16-1.5ISO	●	15.0	
		1.75		16-1.75ISO		16-1.75ISO		14.0	
		2.0		16-2.0ISO		16-2.0ISO	●	14.0	
9.525B	22	1.0	TM2E	22-1.0ISO		TM2I	22-1.0ISO		TMSR-22
		1.25		22-1.25ISO			22-1.25ISO		
		1.5		22-1.5ISO		●	22-1.5ISO		
		1.75		22-1.75ISO			22-1.75ISO		
		2.0		22-2.0ISO	●	●	22-2.0ISO		
15.875	27	1.0	TM2E	27-1.0ISO		TM2I	27-1.0ISO		TMSR-27
		1.25		27-1.25ISO			27-1.25ISO		
		1.5		27-1.5ISO		●	27-1.5ISO		
		1.75		27-1.75ISO			27-1.75ISO		
		2.0		27-2.0ISO		●	27-2.0ISO		
		2.5		27-2.5ISO			27-2.5ISO		
		3.0		27-3.0ISO		●	27-3.0ISO		
		3.5		27-3.5ISO			27-3.5ISO		
		4.0		27-4.0ISO		●	27-4.0ISO		
		4.5		27-4.5ISO			27-4.5ISO		
19.05B	38.5	1.5	TM2E	38-1.5ISO		TM2I	38-1.5ISO		TMSR-38
		2.0		38-2.0ISO			38-2.0ISO		
		3.0		38-3.0ISO			38-3.0ISO		
		4.0		38-4.0ISO			38-4.0ISO		
		4.5		38-4.5ISO			38-4.5ISO		
		5.0		38-5.0ISO			38-5.0ISO		
		5.5		38-5.5ISO			38-5.5ISO		
		6.0		38-6.0ISO			38-6.0ISO		

Applicable holders D49

All inserts except TMI10 code have 2 cutting edges

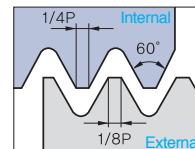
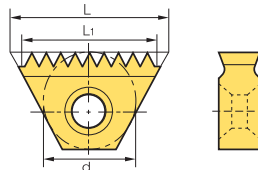
●: Stock item



D

Threading

American UN



Defined by: ANSI B1.1.74
Tolerance class: Class 2A/2B (mm)

External/Internal

Insert size		Pitch (mm)	Designation				L1	Tooth	Tool holder
d	L		External	PC9570T	Internal	PC9570T			
6.0	10.4	32	-		TMI	10-32UN	9.53	12	TMSR-10
		28	-			10-28UN	9.07	10	
		24	-			10-24UN	9.53	9	
		20	-			10-20UN	8.89	7	
		18	-			10-18UN	8.47	6	
		16	-			10-16UN	7.94	5	
6.35	11	48	-		TM2I	11-48UN	10.05	19	TMSR-11
		40	-			11-40UN	10.16	16	
		32	-			11-32UN	10.32	13	
		28	TM2E	11-28UN		11-28UN	9.98	11	
		27		11-27UN		11-27UN	10.35	11	
		24		11-24UN		11-24UN	9.53	9	
		20		11-20UN		11-20UN	10.16	8	
		18		11-18UN		11-18UN	9.88	7	
		16		11-16UN		11-16UN	9.53	6	
		14		11-14UN		11-14UN	9.07	5	
9.525	16	40	-		TM2I	16-40UN	14.61	40	TMSR-16
		32	-			16-32UN	15.08	32	
		28	TM2E	16-28UN		16-28UN	14.51	28	
		27		16-27UN		16-27UN	14.11	27	
		24		16-24UN		16-24UN	14.82	24	
		20		16-20UN		16-20UN	13.97	20	
		18		16-18UN		16-18UN	14.11	18	
		16		16-16UN	●	16-16UN	14.29	16	
		14		16-14UN		16-14UN	14.51	14	
		13		16-13UN		16-13UN	13.68	13	
		12		16-12UN	●	16-12UN	14.82	12	
		11.5		16-11.5UN		16-11.5UN	13.25	11.5	
9.525B	22	24	TM2E	22-24UN	TM2I	22-24UN	21.16	20	TMSR-22
		20		22-20UN		22-20UN	21.59	17	
		18		22-18UN		22-18UN	21.17	15	
		16		22-16UN		22-16UN	20.64	13	
		14		22-14UN		22-14UN	21.77	12	
		13		22-13UN		22-13UN	21.49	11	
		12		22-12UN		22-12UN	21.17	10	
15.875	27	24	TM2E	27-24UN	TM2I	27-24UN	25.40	24	TMSR-27
		20		27-20UN		27-20UN	25.40	20	
		18		27-18UN		27-18UN	25.40	18	
		16		27-16UN		27-16UN	25.40	16	
		14		27-14UN		27-14UN	25.40	14	
		13		27-13UN		27-13UN	25.40	13	
		12		27-12UN		27-12UN	25.40	12	
		11.5		27-11.5UN		27-11.5UN	24.30	11	
		11		27-11UN		27-11UN	25.40	11	
		10		27-10UN		-	22.86	9	
		10		-		27-10UN	25.40	10	
		9		27-9UN		27-9UN	22.58	8	
		8		27-8UN		27-8UN	22.23	7	
		7		27-7UN		-	21.77	6	
		7		-		27-7UN	25.40	7	
		6		27-6UN		-	21.17	5	
		6		-		27-6UN	25.40	6	
19.05	38.5	6	TM2E	38-6UN	TM2I	38-6UN	38.87	8	TMSR-38
		5		38-5UN		38-5UN	30.48	6	
		4.5		38-4.5UN		38-4.5UN	33.87	6	
		4		38-4UN		38-4UN	31.75	5	

➔ Applicable holders **D49**

All inserts except TMI10 code have 2 cutting edges

●: Stock item

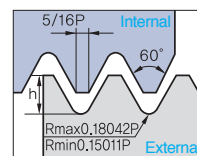
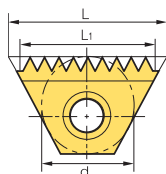
Threading



D

UNJ (Unified constant thread)

External/Internal



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

(mm)

Insert size		Pitch (tpi)	Designation				L1	Tooth	Tool holder
d	L		External	PC9570T	Internal	PC9570T			
6.0	10.4	24	-		TMI	10-24UNJ	9.53	9	TMSR-10
		20	-			10-20UNJ	8.89	7	
		18	-			10-18UNJ	8.47	6	
		16	-			10-16UNJ	9.53	8	
6.35	11	24	TM2E	11-24UNJ	TM2I	11-24UNJ	9.53	9	TMSR-11
		20		11-20UNJ		11-20UNJ	10.16	8	
		18		-		11-18UNJ	9.88	7	
		16		11-16UNJ		11-16UNJ	9.53	6	
		14		11-14UNJ		11-14UNJ	9.07	5	
9.525	16	24	TM2E	16-24UNJ	TM2I	16-24UNJ	14.82	14	TMSR-16
		20		16-20UNJ		16-20UNJ	13.97	11	
		18		16-18UNJ		16-18UNJ	14.11	10	
		16		16-16UNJ		16-16UNJ	14.29	9	
		14		16-14UNJ		16-14UNJ	14.51	8	
		13		16-13UNJ		-	13.68	7	
		12		16-12UNJ		16-12UNJ	14.82	7	
15.875	27	16	TM2E	27-16UNJ	TM2I	27-16UNJ	25.40	16	TMSR-27
		12		27-12UNJ		27-12UNJ	25.40	12	
		11		27-11UNJ		27-11UNJ	25.40	11	

Applicable holders **D49**

All inserts except TMI10 code have 2 cutting edges

●: Stock item

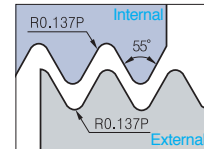
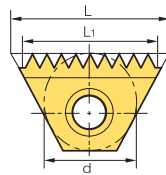


D

Threading

Whitworth (BSW, BSF, BSP, BSB)

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

(mm)

Insert size		Pitch (tpi)	Designation		L1	Tooth	Tool holder
d	L		External+Internal	PC9570T			
6.0	10.4	28	TMEI 10-28W		9.07	10	TMSR-10
		26	10-26W		8.79	9	
		24	10-24W		9.53	9	
		20	10-20W		8.89	7	
		19	10-19W		9.36	7	
6.35	11	28	TM2EI 11-28W		9.98	11	TMSR-11
		26	11-26W		9.77	10	
		24	11-24W		9.53	9	
		20	11-20W		10.16	8	
		19	11-19W		9.36	7	
		14	11-14W		9.07	5	
9.525	16	26	TM2EI 16-26W		14.65	15	TMSR-16
		24	16-24W		14.82	14	
		20	16-20W		13.97	11	
		19	16-19W		14.71	11	
		18	16-18W		14.11	10	
		16	16-16W		14.29	9	
		14	16-14W		14.51	8	
		12	16-12W		14.82	7	
		11	16-11W	●	13.85	6	
9.525B	22	24	TM2EI 22-24W		21.17	20	TMSR-22
		20	22-20W		21.59	17	
		19	22-19W		21.39	16	
		18	22-18W		21.17	15	
		16	22-16W		20.64	13	
		14	22-14W		21.77	12	
		12	22-12W		21.17	10	
		11	22-11W		20.78	9	
15.875	27	16	TM2EI 27-16W		25.4	16	TMSR-27
		14	27-14W		25.4	14	
		12	27-12W		23.28	11	
		11	27-11W		23.09	10	
		10	27-10W		25.40	10	
		9	27-9W		22.58	8	
		8	27-8W		22.23	7	
		7	27-7W		21.77	6	
		6	27-6W		21.17	5	
19.05B	38.5	11	TM2EI 38-11W		34.64	15	TMSR-38
		6	38-6W		33.87	8	
		5	38-5W		30.48	6	
		4.5	38-4.5W		33.87	6	
		-	38-15W		-	-	

➔ Applicable holders **D49**

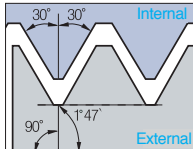
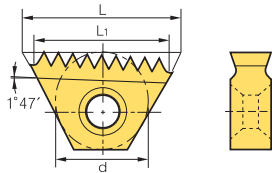
All inserts except TM10 code have 2 cutting edges

● Stock item

D Thread Milling Inserts

NPT

External/Internal



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

(mm)

Insert size		Pitch (tpi)	Designation		L1	Tooth	Tool holder	
d	L		External+Internal	PC9570T			RH	LH
9.525	16	18	TM2E 16-18NPT *		14.11	10	TMSRT-16	TMSLT-16
		14	TM2EI 16-14NPT		14.51	8		
		11.5	16-11.5NPT		13.25	6		
9.525B	22	14	TM2EI 22-14NPT		21.77	12	TMSRT-22	TMSLT-22
15.875	27	11.5	TM2EI 27-11.5NPT	●	24.30	11	TMSR-27	TMSL-27
		8	27-8NPT	●	22.23	7		
19.05B	38.5	11.5	TM2EI 38-11.5NPT		35.34	16	TMSR-38	TMSL-38
		8	38-8NPT		31.75	10		

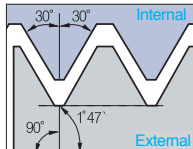
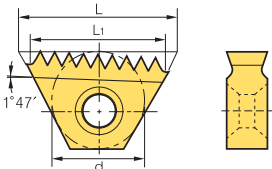
➡ Applicable holders D49

* TM2E16–18NPT is for external threading

●: Stock item

NPTF

External/Internal



Defined by: ANSI 1.20.3-1976
Tolerance class: Standard NPTF

(mm)

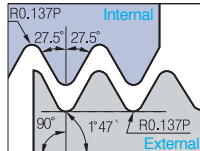
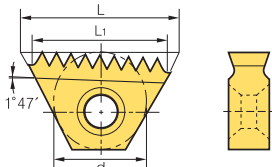
Insert size		Pitch (tpi)	Designation		L1	Tooth	Tool holder	
d	L		External+Internal	PC9570T			RH	LH
9.525	16	14	TM2EI 16-14NPTF	●	14.51	8	TMSRT - 16	TMSLT - 16
		11.5	16-11.5NPTF		13.25	6		
9.525B	22	14	TM2EI 22-14NPTF		21.77	12	TMSRT - 22	TMSLT - 22
		11.5	22-11.5NPTF		19.88	9		
15.875	27	11.5	TM2EI 27-11.5NPTF		24.30	11	TMSR - 27	TMSL - 27
		8	27-8NPTF		22.23	7		
19.05B	38.5	11.5	TM2EI 38-11.5NPTF		35.34	16	TMSR - 38	TMSL - 38
		8	38-8NPTF		31.75	10		

➡ Applicable holders D49

●: Stock item

BSPT

External/Internal



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

(mm)

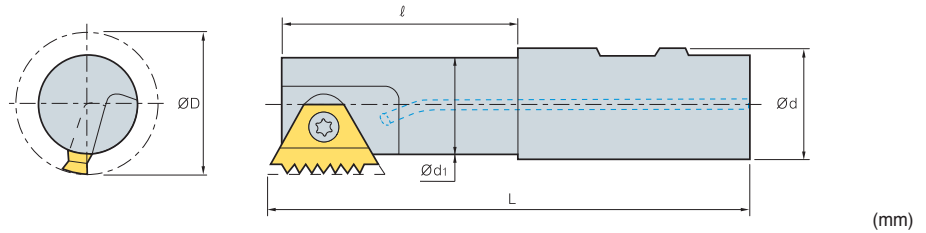
Insert size		Pitch (tpi)	Designation		L1	Tooth	Tool holder	
d	L		External+Internal	PC9570T			RH	LH
6.35	11	19	TM2EI 11-19BSPT		9.36	7	TMSR - 10	TMSL - 10
9.525	16	14	TM2EI 16-14BSPT		14.51	8	TMSRT - 16	TMSLT - 16
		11	16-11BSPT		13.85	6		
15.875	27	11	TM2EI 27-11BSPT		23.09	10	TMSR - 27	TMSL - 27

➡ Applicable holders D49

●: Stock item



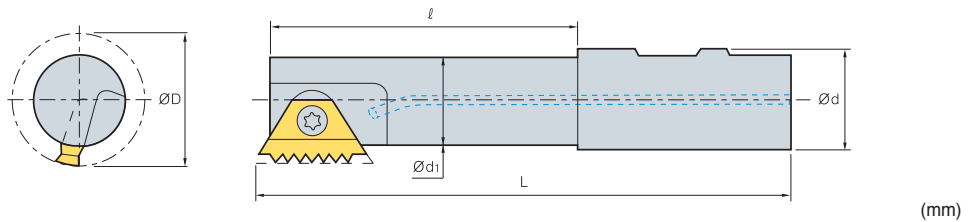
Standard Type



Insert size d	Designation	ØD	Ød	Ød ₁	ℓ	L	Screw	Wrench
6.0	TMSR 12-10	9.0	12	6.8	12.0	69.0	STM10	TW07P
	20-10	9.0	20	6.8	17.0	84.0		
6.35	TMSR 12-11	11.5	12	8.9	12.0	70.0	STM11	TW08P
	20-11	11.5	20	8.9	20.0	85.0		
9.525	TMSR 16-16	17.0	16	13.6	22.0	90.0	STM1622	TW10P
	20-16	20.0	20	16.6	43.0	95.0		
9.525B	TMSR 16-22	17.0	16	13.5	29.0	79.5	STM1622	TW10P
	20-22	19.0	20	15.5	29.0	81.5		
	25-22	19.0	25	15.5	30.0	92.3		
	TMSRW 25-22	22.0	25	18.5	30.0	90.8		
15.875	TMSR 25-27	30.0	25	24.0	52.0	110.0	STM27	TW25L
	TMSL 25-27	30.0	25	24.0	52.0	110.0		
	TMSR 32-27	37.0	32	31.0	58.0	120.0		
19.05	TMSR 32-38	35.0	32	27.0	53.0	115.0	STM38	TW30L
	40-38	46.0	40	38.0	63.0	135.0		

➔ Applicable inserts D44~48

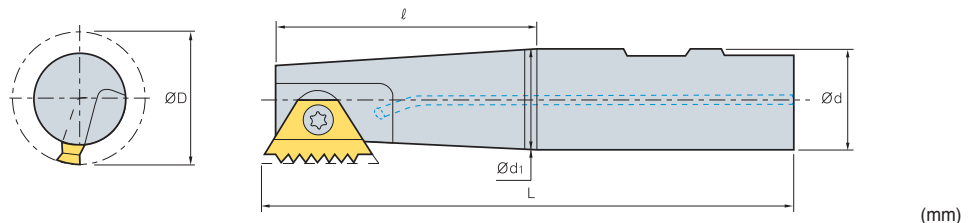
Long Type



Insert size d	Designation	ØD	Ød	Ød ₁	ℓ	L	Screw	Wrench
6.35	TMSRL 25-11	11.5	25	8.9	17.0	125.0	STM11	TW08P
9.525B	TMSRL 25-16	22.0	25	18.6	25.0	125.0	STM1622	TW10P
9.525B	TMSRL 20-22	19.0	20	15.5	44.0	96.5	STM1622	TW10P
	25-22	22.0	25	18.6	63.5	125.0		
15.875	TMSRL 25-27	30.0	25	24.0	92.0	150.0	STM27	TW25L
	32-27	37.0	32	31.0	98.0	160.0		
19.05B	TMSRL 40-38	46.0	40	38.0	93.0	168.0	STM38	TW30L

➔ Applicable inserts D44~48

Tapered Type



Insert size d	Designation	ØD	Ød	Ød ₁	ℓ	L	Screw	Wrench
9.525	TMSRT 16-16	15.5	16	12.5	22.0	90.0	STM1622	TW10P
	20-16	19.0	20	15.0	23.0	85.0		
9.525B	TMSRT 16-22	17.0	16	13.5	29.0	79.5	STM1622	TW10P
	20-22	19.0	20	15.5	29.0	81.5		
15.875	TMSRT 32-27	37.0	32	31.0	58.0	120.0	STM27	TW25L

➔ Applicable inserts D44~48

Solid threading endmills code system

STM D 3T 03 012 L034 - I 0.35 ISO

1 2 3 4 5 6 7 8 9
Type Flute style No. of flutes Shank dia. Cutting dia. Cutting edge length Type of tool Pitch Type

1 Type
STM D 3T 03 012 L034 - I 0.35 ISO
Solid Threading Endmill

4 Shank dia.
STM D 3T 03 012 L034 - I 0.35 ISO
03: 3.0

8 Pitch
STM D 3T 03 012 L034 - I 0.35 ISO
mm: 0.35~3.0 tpi: 72~12

2 Flute style
STM D 3T 03 012 L034 - I 0.35 ISO
HC: Heli Cool
HCR: Heli Radial Cooling
HCC: Heli Cool Chamfering
HCD: Heli Cool C/F & Drilling
D: Deep Threading

5 Cutting dia.
STM D 3T 03 012 L034 - I 0.35 ISO
012: 1.20

6 Cutting edge length
STM D 3T 03 012 L034 - I 0.35 ISO
L034: 3.4

9 Type
STM D 3T 03 012 L034 - I 0.35 ISO
ISO Metric
American UN
Cutting edge Length UNJ
Whit Worth (BSW, BSF, BSP, BSB)
National Pipe Thread (NPT)
National Pipe Thread (NPTF)
British Standard Pipe Thread (BSPT)

3 No. of flutes
STM D 3T 03 012 L034 - I 0.35 ISO
3T: 3 Flutes 2L: 4 Flutes, Left Flutes

7 Type of tool
STM D 3T 03 012 L034 - I 0.35 ISO
I: Internal

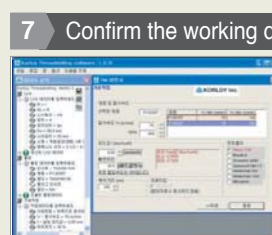
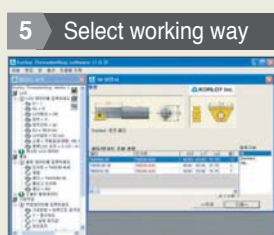
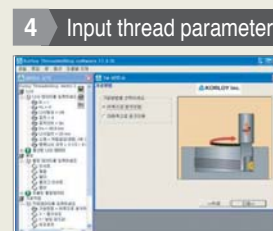
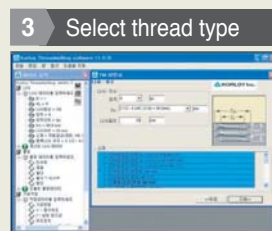
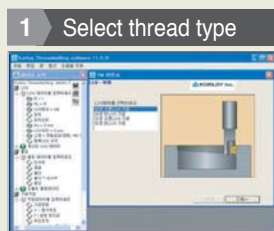
TM-INFO User guide

CNC Program composition

TM-INFO composes CNC program for thread milling process in a short time

► Multilingual

► Window operation

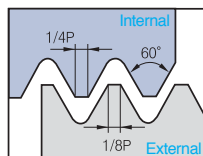


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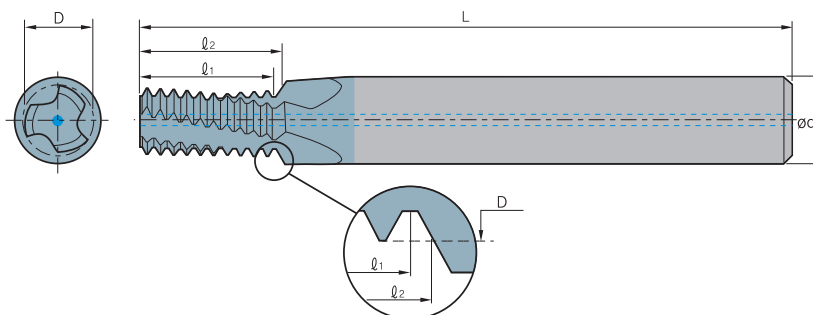
ISO Metric

Helical flutes with thru-hole coolant

Internal



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



($l_2 \leq 1.5 \times \text{Thread Diameter}$)

Thread		Pitch (mm)	Designation		Dimensions (mm)					No. of flute z	Tooth zt	*Bore dia. mm
M Coarse	M Fine		Internal	PC9070M	Ød	D	L	l1	l2			
M3x0.5	M3.5~M16x0.5	0.5	STMHC	04024L04-I0.50ISO	4	2.40	45	4.5	4.7	3	9	2.5
M4x0.7		0.7		04031L06-I0.70ISO	4	3.15	45	6.3	6.6	3	9	3.3
M5x0.8		0.8		04039L07-I0.80ISO	4	3.90	45	7.2	7.6	3	9	4.2
M6x1.0	M8~M40x1.0	1.0		06048L09-I1.00ISO	6	4.80	57	9.0	9.5	3	9	5.0
M8x1.25		1.25		08065L13-I1.25ISO	8	6.50	61	12.5	13.1	3	10	6.8
M10x1.5	M12~M48x1.5	1.5		10082L15-I1.50ISO	10	8.20	73	15.0	15.7	3	10	8.5
M12x1.75		1.75		10099L18-I1.75ISO	10	9.90	73	17.5	18.4	4	10	10.2
M14x2.0	M17~M80x2.0	2.0		12116L21-I2.00ISO	12	11.60	73	20.0	21.0	4	10	12.0
M16x2.0	M17~M80x2.0	2.0		14136L25-I2.00ISO	14	13.60	92	24.0	25.0	4	12	14.0

($l_2 \leq 2 \times \text{Thread Diameter}$)

Thread		Pitch (mm)	Designation			Dimensions (mm)					No.of flute	Tooth	*Bore dia.
M Coarse	M Fine		Internal	PC9070M	Ød	D	L	ℓ1	ℓ2				
M3×0.5	M3.5~M16×0.5	0.5	STMHC	04024L06-I0.50ISO		4	2.40	45	6.0	6.2	3	12	2.5
	M4×0.5	0.5		04032L08-I0.50ISO		4	3.20	45	8.0	8.2	3	16	3.5
	M5×0.5	0.5		06042L10-I0.50ISO		6	4.20	57	10.0	10.2	3	20	4.5
M4×0.7		0.7		04031L08-I0.70ISO		4	3.15	45	8.4	8.7	3	12	3.3
	M6×0.75	0.75		06050L12-I0.75ISO		6	5.00	57	12.0	12.4	3	16	5.3
M5×0.8		0.8		04039L10-I0.80ISO		4	3.90	45	10.4	10.8	3	13	4.2
M6×1.0	M8~M40×1.0	1.0		06048L12-I1.00ISO	●	6	4.80	57	12.0	12.5	3	12	5.0
	M8×1.0	1.0		08067L16-I1.00ISO		8	6.70	61	16.0	16.5	3	16	7.0
	M10×1.0	1.0		10087L20-I1.00ISO		10	8.70	73	20.0	20.5	3	20	9.0
	M12×1.0	1.0		12107L24-I1.00ISO	●	12	10.70	73	24.0	24.5	4	24	11.0
M8×1.25		1.25	08065L16-I1.25ISO	●	8	6.50	61	16.2	16.9	3	13	6.8	
	M10×1.25	1.25	10085L20-I1.25ISO	●	10	8.50	73	20.0	20.6	3	16	8.8	
M10×1.5	M12~M48×1.5	1.5	10082L20-I1.50ISO	●	10	8.20	73	19.5	20.2	3	13	8.5	
	M12×1.5	1.5	10099L24-I1.50ISO	●	10	9.90	73	24.0	24.7	4	16	10.5	
	M14×1.5	1.5	12119L29-I1.50ISO		12	11.90	80	28.5	29.2	4	19	12.5	
	M16×1.5	1.5	14139L32-I1.50ISO		14	13.90	92	31.5	32.2	4	21	14.5	
M12×1.75		1.75	10099L25-I1.75ISO		10	9.90	73	24.5	25.4	4	14	10.2	
M14×2.0	M17~M80×2.0	2.0	12116L29-I2.00ISO		12	11.60	80	28.0	29.0	4	14	12.0	
M16×2.0	M17~M80×2.0	2.0	14136L33-I2.00ISO		14	13.60	92	32.0	33.0	4	16	14.0	
M18×2.5		2.5	16148L36-I2.50ISO		16	14.80	92	35.0	36.2	4	14	15.5	
M 20×2.5		2.5	18171L41-I2.50ISO		18	17.10	102	40.0	41.2	4	16	17.5	
M 24×3.0		3.0	20199L49-I3.00ISO		20	19.90	102	48.0	49.5	4	16	21.0	

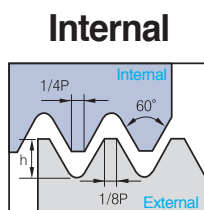
* Bore Diameter applies to smallest thread Dia

Maximum thread length = $l_2 - \frac{\text{Pitch}}{4}$

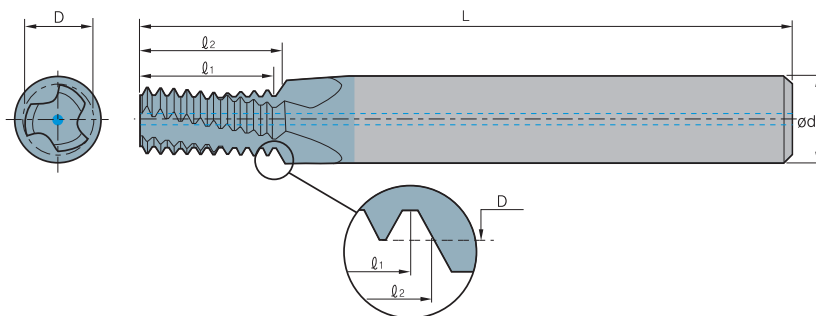
●: Stock item

American UN

Helical flutes with thru-hole coolant



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



($\ell_2 \leq 1.5 \times \text{Thread Diameter}$)

Thread			Pitch (tpi)	Designation		Dimensions (mm)					No. of flute	Tooth	*Bore dia. mm
UNC	UNF	UNEF		Internal	PC9070M	Ød	D	L	ℓ ₁	ℓ ₂			
No.10~24	5/16", 3/8"×24	9/16"~11/16"×24	24	STMHC	04035L07-I24UNC	4	3.58	45	7.4	7.9	3	7	3.8
No.10~24	5/16", 3/8"×24	9/16"~11/16"×24	24		06041L08-I24UNC	6	4.15	57	8.5	9.0	3	8	4.5
1/4"×20	7/16", 1/2"×20	3/4"~1"×20	20		06048L09-I20UNC	6	4.88	57	8.9	9.5	3	7	5.2
5/16"×18	9/16", 5/8"×18	11/16"~1 11/16"×18	18		08061L11-I18UNC	8	6.15	61	11.3	12.0	3	8	6.5
3/8"×16	3/4"×16		16		08076L15-I16UNC	8	7.65	61	14.3	15.1	3	9	8.0
7/16"×14	7/8"×14		14		10090L17-I14UNC	10	9.00	73	16.3	17.2	3	9	9.3
1/2"×13			13		12104L20-I13UNC	12	10.35	73	19.5	20.5	4	10	10.8
9/16"×12	1"~1 1/2"×12		12		12118L22-I12UNC	12	11.80	73	21.2	22.2	4	10	12.3

($\ell_2 \leq 2 \times \text{Thread Diameter}$)

Thread			Pitch (tpi)	Designation		Dimensions (mm)					No. of flute	Tooth	*Bore dia. mm
UNC	UNF	UNEF		Internal	PC9070M	Ød	D	L	ℓ ₁	ℓ ₂			
	No.10~32	No. 12~3/8"×32	32	STMHC	04038L09-I32UNF	4	3.80	45	9.5	9.9	3	12	4.0
		No. 12~3/8"×32	32		06044L11-I32UNEF	6	4.40	57	11.1	11.5	3	14	4.7
	No.12, 1/4"×28	7/16"; 1/2"×28	28		06043L11-I28UNF	6	4.30	57	10.9	11.3	3	12	4.6
	1/4"×28	7/16"; 1/2"×28	28		06052L13-I28UNF	6	5.15	57	12.7	13.1	3	14	5.5
		7/16"; 1/2"×28	28		10099L22-I28UNEF	10	9.90	73	21.8	22.2	3	24	10.2
No.10~24	5/16", 3/8"×24	9/16"~11/16"×24	24		04035L10-I24UNC	4	3.58	45	9.5	10.0	3	9	3.8
No.12~24	5/16", 3/8"×24	9/16"~11/16"×24	24		06041L11-I24UNC	6	4.15	57	10.6	11.1	3	10	4.5
	5/16", 3/8"×24	9/16"~11/16"×24	24		08066L16-I24UNF	8	6.68	61	15.9	16.4	3	15	6.8
	3/8"×24	9/16"~11/16"×24	24		10082L19-I24UNF	10	8.20	73	19.0	19.6	3	18	8.5
		9/16"~11/16"×24	24		14129L29-I24UNEF	14	12.90	92	28.6	29.1	4	27	13.2
1/4"×20	7/16", 1/2"×20	3/4"~1"×20	20		06048L13-I20UNC	6	4.88	57	12.7	13.3	3	10	5.2
	7/16", 1/2"×20	3/4"~1"×20	20		10096L22-I20UNF	10	9.60	73	21.6	22.2	3	17	9.8
	1/2"×20	3/4"~1"×20	20		12111L26-I20UNF	12	11.10	80	25.4	26.0	3	20	11.5
		3/4"~1"×20	20		18174L38-I20UNEF	18	17.40	102	38.1	38.7	4	30	17.8
5/16"×18	9/16", 5/8"×18	11/16"~1 11/16"×18	18		08061L16-I18UNC	8	6.15	61	15.5	16.2	3	11	6.5
	9/16", 5/8"×18	11/16"~1 11/16"×18	18		14125L28-I18UNF	14	12.50	92	28.2	28.9	4	20	12.8
	5/8"×18	11/16"~1 11/16"×18	18		16141L31-I18UNF	16	14.10	92	31.0	31.7	4	22	14.5
3/8"×16	3/4"×16		16		08076L19-I16UNC	8	7.65	61	19.0	19.8	3	12	8.0
	3/4"×16		16		18170L38-I16UNF	18	17.00	102	38.1	38.8	4	24	17.5
7/16"×14	7/8"×14		14		10090L22-I14UNC	10	9.00	73	21.8	22.7	3	12	9.3
	7/8"×14		14		20199L44-I14UNF	20	19.90	102	43.5	44.4	4	24	20.5
1/2"×13			13		12104L26-I13UNC	12	10.35	80	25.4	26.4	4	13	10.8
9/16"×12	1"~1 1/2"×12		12		12118L28-I12UNC	12	11.80	80	27.5	28.6	4	13	12.3
	1"~1 1/2"×12		12		20199L51-I12UNF	20	19.90	102	50.8	51.9	4	24	23.5
5/8"×11			11		14131L33-I11UNC	14	13.10	92	32.3	33.5	4	14	13.5
3/4"×10			10		16159L39-I10UNC	16	15.90	92	38.1	39.4	4	15	16.5
7/8"×9			9		20190L46-I9UNC	20	19.00	102	45.2	46.6	4	16	19.5
1"×8			8		20199L52-I8UNC	20	19.90	102	50.8	52.4	4	16	22.0

* Bore Diameter applies to smallest thread Dia

Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

●: Stock item



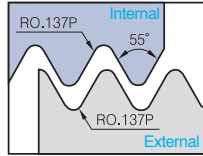
D

Threading

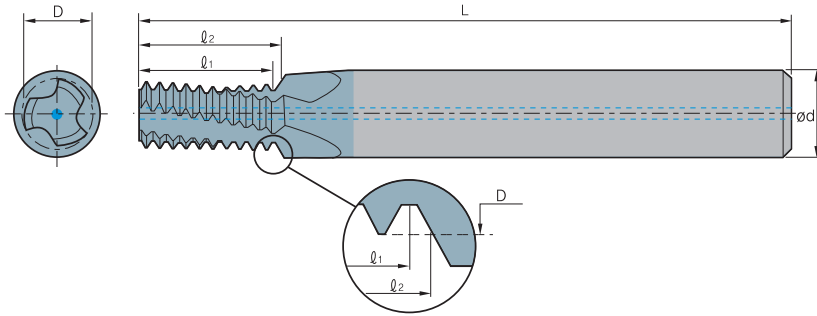
Whitworth

Helical flutes with thru-hole coolant

External/Internal



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



($l_2 \leq 2 \times \text{Thread Diameter}$)

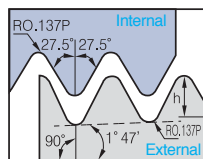
Thread		Pitch (tpi)	Designation		Dimensions (mm)					No. of flute z	Tooth zt	*Bore dia. mm
BSW	BSF		External/Internal	PC9070M	Ød	D	L	l1	l2			
	1/4"×26	26	STMHC	06050L13-EI26BSF	6	5.00	57	12.7	13.2	3	13	5.3
	5/16"×22	22		08063L16-EI22BSF	8	6.35	61	16.2	16.7	3	14	6.7
1/4"×20	3/8"×20	20		06044L13-EI20BSW	6	4.45	57	12.7	13.3	3	10	5.0
	3/8"×20	20		08076L19-EI20BSF	8	7.65	61	19.0	19.7	3	15	8.2
5/16"×18	7/16"×18	18		06058L16-EI18BSW	6	5.85	57	15.5	16.2	3	11	6.5
	7/16"×18	18		10092L23-EI18BSF	10	9.20	73	22.6	23.3	3	16	9.7
3/8"×16	1/2", 9/16"×16	16		08072L19-EI16BSW	8	7.20	61	19.0	19.8	3	12	7.9
	1/2", 9/16"×16	16		12105L26-EI16BSF	12	10.50	80	25.4	26.2	4	16	11.1
	9/16"×16	16		14122L29-EI16BSF	14	12.15	92	28.6	29.4	4	18	12.6
7/16"×14	5/8", 11/16"×14	14		10085L22-EI14BSW	10	8.50	73	21.8	22.7	3	12	9.2
	5/8", 11/16"×14	14		14134L31-EI14BSF	14	13.40	92	30.8	31.7	4	17	14.0
	11/16"×14	14		16150L35-EI14BSF	16	15.00	92	34.5	35.4	4	19	15.6
1/2"×12	3/4"×12	12		10096L26-EI12BSW	10	9.65	73	25.4	26.5	3	12	10.5
9/16"×12	3/4"×12	12		12113L28-EI12BSW	12	11.25	80	27.5	28.6	4	13	12.1
	3/4"×12	12		18162L39-EI12BSF	18	16.20	102	38.1	39.2	4	18	16.8
5/8"×11	7/8"×11	11		14126L33-EI11BSW	14	12.60	92	32.3	33.5	4	14	13.4
11/16"×11		11		16142L35-EI11BSW	16	14.20	92	34.6	35.8	4	15	15.0

●: Stock item

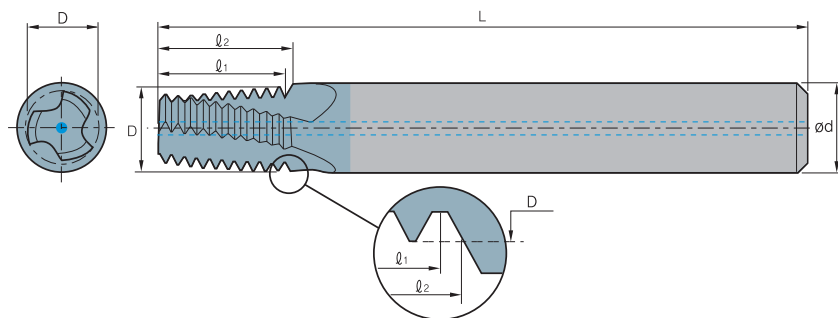
BSPT

Helical flutes with thru-hole coolant

External/Internal



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



Thread		Pitch (tpi)	Designation		Dimensions (mm)					No. of flute z	Tooth zt	*Bore dia. mm
Standard			Internal	PC9070M	Ød	D	L	l1	l2			
1/16"×28		28	STMHC	06059L10-EI28BSPT	6	5.90	57	10.0	10.2	3	11	6.7
1/8"×28		28		08076L10-EI28BSPT	8	7.65	61	10.0	10.2	3	11	8.7
1/4"×19		19		10099L15-EI19BSPT	10	9.90	73	14.7	15.4	3	11	11.8
3/8"×19		19		12111L15-EI19BSPT	12	11.15	73	14.7	15.4	4	11	15.2
1/2", 3/4"×14		14		16142L22-EI14BSPT	16	14.25	92	21.8	22.7	4	12	19.0
1", 1 1/2", 2", 2 1/2"×11		11		20196L28-EI11BSPT	20	19.60	102	27.7	28.9	4	12	30.7

* Bore Diameter applies to smallest thread Dia

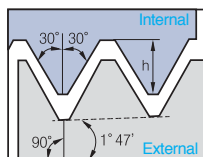
Maximum thread length = $l_2 - \frac{\text{Pitch}}{4}$

●: Stock item

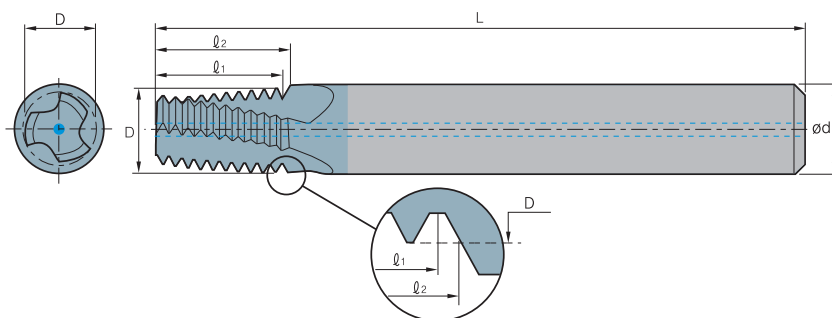
NPT

Helical flutes with thru-hole coolant

External/Internal



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

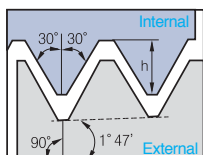


Thread	Pitch	Designation		Dimensions (mm)					No. of flute	Tooth	*Bore dia.
Standard	(tpi)	Internal	PC9070M	Ød	D	L	l1	l2	z	zt	mm
1/16"×27	27	STMHC	06059L09-EI27NPT	6	5.90	57	9.4	9.9	3	10	6.3
1/8"×27	27		08076L09-EI27NPT	8	7.65	61	9.4	9.9	3	10	8.5
1/4"×18	18		10099L14-EI18NPT	10	9.90	73	14.1	14.8	3	10	11.1
3/8"×18	18		12111L14-EI18NPT	12	11.15	73	14.1	14.8	4	10	14.5
1/2", 3/4"×14	14		16142L19-EI14NPT	16	14.25	92	18.1	19.0	4	10	17.7, 23.0
1", 1 1/4, 1 1/2", 2"×11.5	11.5		20196L23-EI11.5NPT	20	19.60	102	22.1	23.2	4	10	29.0, 37.7, 44.0, 56.0
2 1/2"×8 ; 3"×8	8		20196L33-EI8NPT	20	19.60	102	31.7	33.3	4	10	66.5, 82.1

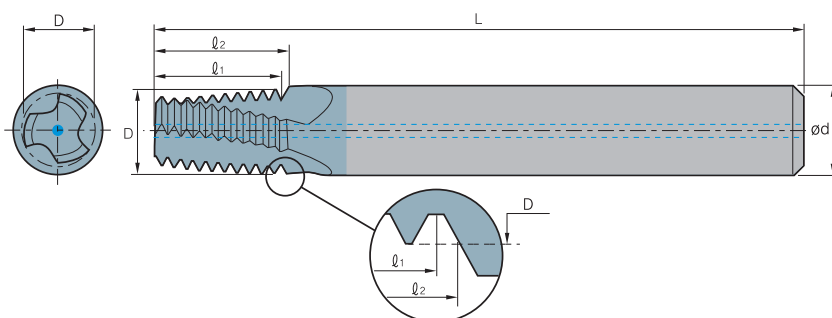
NPTF

Helical flutes with thru-hole coolant

External/Internal



Defined by: ANSI 1.20.3-1976
Tolerance class: Standard NPTF



Thread	Pitch	Designation		Dimensions (mm)					No. of flute	Tooth	*Bore dia.
Standard	(tpi)	Internal	PC9070M	Ød	D	L	l1	l2	z	zt	mm
1/16"×27	27	STMHC	06059L09-EI27NPTF	6	5.90	57	9.4	9.9	3	10	6.3
1/8"×27	27		08076L09-EI27NPTF	8	7.65	61	9.4	9.9	3	10	8.5
1/4"×18	18		10099L14-EI18NPTF	10	9.90	73	14.1	14.8	3	10	11.1
3/8"×18	18		12111L14-EI18NPTF	12	11.15	73	14.1	14.8	4	10	14.5
1/2", 3/4"×14	14		16142L19-EI14NPTF	16	14.25	92	18.1	19.0	4	10	17.7, 23.4
1", 1 1/4, 1 1/2", 2"×11.5	11.5		20196L23-EI11.5NPTF	20	19.60	102	22.1	23.2	4	10	29.0, 37.7, 43.7, 55.6
2 1/2"×8 ; 3"×8	8		20196L33-EI8NPTF	20	19.60	102	31.7	33.3	4	10	66.3, 82.1

* Bore Diameter applies to smallest thread Dia

$$\text{Maximum thread length} = l_2 - \frac{\text{Pitch}}{4}$$

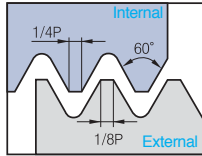
●: Stock item



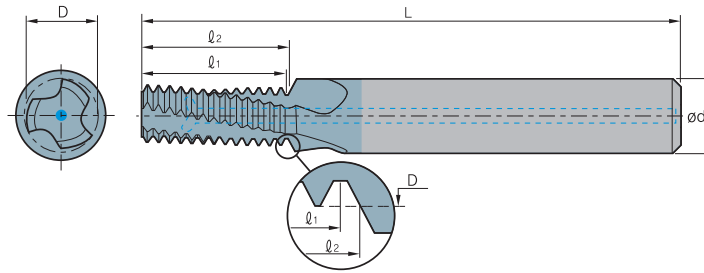
ISO Metric

Helical flutes with radial cooling

Internal



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



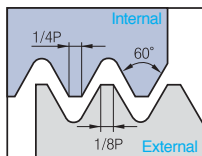
($L_2 \leq 2 \times \text{Thread Diameter}$)

Thread		Pitch (mm)	Designation		Dimensions (mm)					No. of flute	Tooth	*Bore dia. mm
M Coarse	M Fine		Internal	PC9070M	Ød	D	L	L ₁	L ₂			
M6×1.0	M8~M40×1.0	1.0	STMHCR	06048L12-I1.00ISO	6	4.8	57	12.0	12.5	3	12	5.0
	M10×1.0	1.0		10087L20-I1.00ISO	10	8.7	73	20.0	20.5	3	20	9.0
	M12×1.0	1.0		12107L24-I1.00ISO	12	10.7	73	24.0	24.5	4	24	11.0
M8×1.25		1.25		08065L16-I1.25ISO	8	6.5	64	16.3	16.9	3	13	6.8
M10×1.5	M12~M48×1.5	1.5		10082L20-I1.50ISO	10	8.2	73	19.5	20.3	3	13	8.5
	M12×1.5	1.5		10099L24-I1.50ISO	10	9.9	73	24.0	24.8	4	16	10.5
	M14×1.5	1.5		12119L29-I1.50ISO	12	11.9	84	28.5	29.3	4	19	12.5
	M16×1.5	1.5		14139L32-I1.50ISO	14	13.9	84	31.5	32.3	4	21	14.5
M12×1.75		1.75		10099L25-I1.75ISO	10	9.9	73	24.5	25.4	4	14	10.2

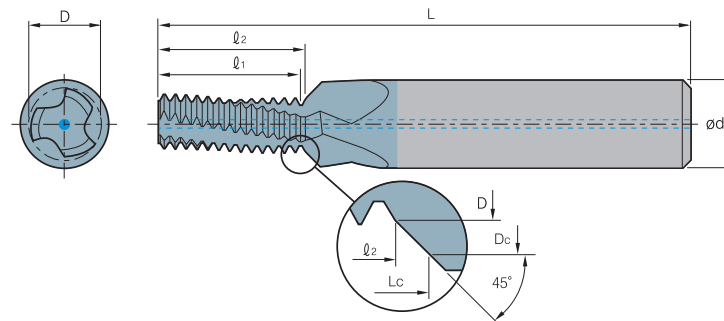
ISO Metric

Helical flutes with thru-hole coolant-thru & Chamfer

Internal



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



($L_2 \leq 2 \times \text{Thread Diameter}$)

Thread		Pitch (mm)	Designation		Dimensions (mm)							No. of flute	Tooth	*Bore dia. mm
M Coarse	M Fine		Internal	PC9070M	Ød	D	Dc	L	L ₁	L ₂	Lc			
M6×1.0	M8~M40×1.0	1.0	STMHCC	08048L12-I1.00ISO	8	4.8	6.3	61	12.0	12.5	13.3	3	12	5.0
	M10×1.0	1.0		12087L20-I1.00ISO	12	8.7	10.3	73	20.0	20.5	21.3	3	20	9.0
	M12×1.0	1.0		14107L24-I1.00ISO	14	10.7	12.3	80	24.0	24.5	25.3	4	24	11.0
M8×1.25		1.25		10065L16-I1.25ISO	10	6.5	8.3	73	16.3	16.9	17.8	3	13	6.8
M10×1.5	M12~M48×1.5	1.5		12082L20-I1.50ISO	12	8.2	10.3	80	19.5	20.3	21.3	3	13	8.5
	M12×1.5	1.5		14099L24-I1.50ISO	14	9.9	12.3	80	24.0	24.8	26.0	4	16	10.5
	M14×1.5	1.5		16119L29-I1.50ISO	16	11.9	14.3	92	28.5	29.3	30.5	4	19	12.5
	M16×1.5	1.5		18139L32-I1.50ISO	18	13.9	16.3	92	31.5	32.3	33.5	4	21	14.5
M12×1.75		1.75		14099L25-I1.75ISO	14	9.9	12.3	80	24.5	25.4	26.6	4	14	10.2

* Bore Diameter applies to smallest thread Dia

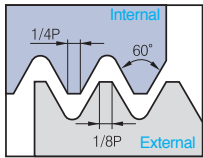
Maximum thread length = $L_2 - \frac{\text{Pitch}}{4}$

● Stock item

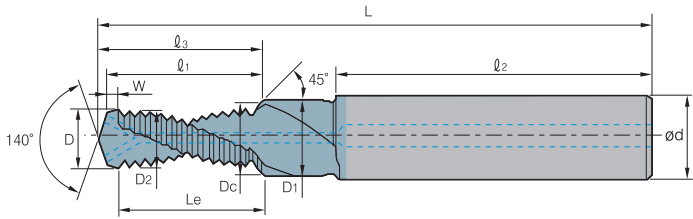
ISO Metric

Drill, Chamfer & Thread with thru-hole coolant

Internal



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



Thread	Pitch (mm)	Designation			Dimensions (mm)											No. of flute	Tooth
ISO 2D M Coarse		Internal	PC9070M	L	l3	l1	l2	W	Le	D	Ød	D1	Dc	D2	z	zt	
M6×1.0	1.0	STMHCD-	IM6×1.0ISO-2D	62.0	14.5	13.7	36	1.0	12.7	5.0	8	6.6	6.3	4.85	2	11	
M8×1.25	1.25		IM8×1.25ISO-2D	74.0	18.2	17.1	40	1.3	15.8	6.8	10	9.0	8.3	6.45	2	11	
M10×1.5	1.5		IM10×1.5ISO-2D	79.0	23.4	22.1	45	1.5	20.6	8.5	12	11.0	10.3	8.08	2	12	
M12×1.75	1.75		IM12×1.75ISO-2D	89.0	27.1	25.5	45	1.5	24.0	10.3	14	13.5	12.3	9.74	2	12	

Thread	Pitch (mm)	Designation			Dimensions (mm)										No. of flute	Tooth	
ISO 2.5D M Coarse		Internal	PC9070M	L	ℓ3	ℓ1	ℓ2	W	Le	D	Ød	D1	Dc	D2	z	zt	
M6×1.0	1.0	STMHCD-	IM6×1.0ISO-2.5D		62.0	16.5	15.7	36	1.0	14.7	5.0	8	6.6	6.3	4.85	2	13
M8×1.25	1.25		IM8×1.25ISO-2.5D		74.0	23.2	22.1	40	1.3	20.8	6.8	10	9.0	8.3	6.45	2	15
M10×1.5	1.5		IM10×1.5ISO-2.5D		79.0	27.9	26.6	45	1.5	25.1	8.5	12	11.0	10.3	8.08	2	15

Maximum thread length = $l_2 - \frac{\text{Pitch}}{4}$

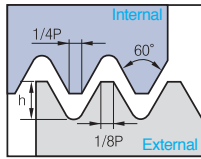
●: Stock item



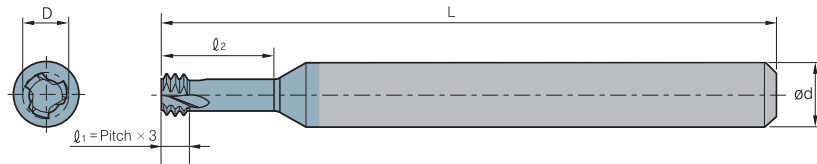
ISO Metric

Deep threading

Internal



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



($l_2 \leq 2 \times \text{Thread Diameter}$)

Thread		Pitch (mm)	Designation		Dimensions (mm)				No. of flute z	Tooth zt	*Bore dia. mm
M Coarse	M Fine		Internal	PC9070M	Ød	D	L	l2			
M1.6x0.35		0.35	STMD3T	03012L034-I0.35ISO	3	1.20	30	3.4	3	3	1.25
M2x0.4		0.4		06015L042-I0.4ISO	6	1.55	57	4.2	3	3	1.6
M2.2x0.45		0.45		06016L046-I0.45ISO	6	1.65	57	4.6	3	3	1.75
M2.5x0.45		0.45		06019L052-I0.45ISO	6	1.95	57	5.2	3	3	2.05
M3x0.5	M3.5~M16x0.5	0.5		06024L062-I0.5ISO	6	2.40	57	6.2	3	3	2.5
M3.5x0.6		0.6		06027L073-I0.6ISO	6	2.75	57	7.3	3	3	2.9
M4x0.7		0.7		06031L083-I0.7ISO	6	3.15	57	8.3	3	3	3.3
M5x0.8		0.8		06040L104-I0.8ISO	6	4.05	57	10.4	3	3	4.2
M6x1.0	M8~M40x1.0	1.0		06048L125-I1.0ISO	6	4.80	57	12.5	3	3	5.0
M8x1.25		1.25		08065L166-I1.25ISO	8	6.50	63	16.6	3	3	6.8
M10x1.5	M12~M48x1.50	1.5		10082L208-I1.50ISO	10	8.20	73	20.8	3	3	8.5
M12x1.75		1.75		10099L250-I1.75ISO	10	9.90	73	25.0	3	3	10.3

3d ($l_2 \leq 3 \times \text{Thread Diameter}$)

Thread		Pitch (mm)	Designation		Dimensions (mm)				No. of flute z	Tooth zt	*Bore dia. mm
M Coarse	M Fine		Internal	PC9070M	Ød	D	L	l2			
M1.6x0.35		0.35	STMD3T	03012L050-I0.35ISO	3	1.20	30	5.0	3	3	1.25
M2x0.4		0.4		06015L062-I0.4ISO	6	1.55	57	6.2	3	3	1.6
M2.5x0.45		0.45		06019L077-I0.45ISO	6	1.95	57	7.0	3	3	2.05
M3x0.5	M3.5~M16x0.5	0.5		06024L092-I0.5ISO	6	2.40	57	9.2	3	3	2.5
M4x0.7		0.7		06031L123-I0.7ISO	6	3.15	57	12.3	3	3	3.3
M5x0.8		0.8		06040L154-I0.8ISO	6	4.05	57	15.4	3	3	4.2
M6x1.0	M8~M40x1.0	1.0		06048L185-I1.0ISO	6	4.80	57	18.5	3	3	5.0
M8x1.25		1.25		08065L246-I1.25ISO	8	6.50	63	24.6	3	3	6.8

* Bore Diameter applies to smallest thread Dia

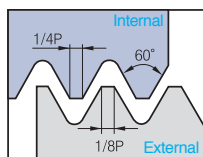
Maximum thread length = $l_2 - \frac{\text{Pitch}}{4}$

●: Stock item

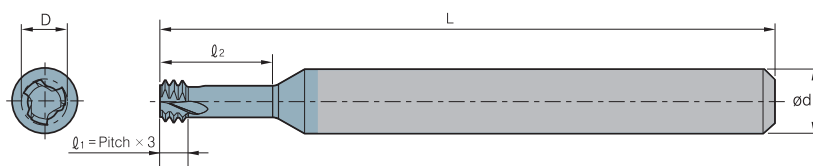
American UN

Deep threading

Internal



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



($L_2 \leq 2 \times \text{Thread Diameter}$)

Thread		Pitch (tpi)	Designation		Dimensions (mm)				No. of flute z	Tooth zt	*Bore dia. mm
UNC	UNF		Internal	PC9070M	Ød	D	L	L ₂			
	No.1~72	72	STMD3T	06014L039-I72UN	6	1.45	57	3.9	3	3	1.6
No.1~64	No.2~64	64		06014L042-I64UN	6	1.40	57	4.2	3	3	1.5
No.2~56	No.3~56	56		06016L050-I56UN	6	1.65	57	5.0	3	3	1.8
No.3~48	No.4~48	48		06019L060-I48UN	6	1.90	57	6.0	3	3	2.1
No.4, No.5~40	No.6~40	40		06021L060-I40UN	6	2.10	57	6.0	3	3	2.3
No.5~40	No.6~40	40		06024L072-I40UN	6	2.45	57	7.2	3	3	2.6
	No.8~36	36		06033L087-I36UN	6	3.30	57	8.7	3	3	3.5
No.6, No.8~32	No.10~32	32		06025L074-I32UN	6	2.55	57	7.4	3	3	2.8
No.8~32	No.10~32	32		06032L100-I32UN	6	3.20	57	10.0	3	3	3.5
	1/4" x 28	28		06052L132-I28UN	6	5.25	57	13.2	3	3	5.5
No.10~24	5/16" x 24	24		06035L102-I24UN	6	3.58	57	10.2	3	3	3.9
	5/16" x 24	24		08066L165-I24UN	8	6.68	63	16.5	3	3	6.9
1/4" x 20	7/16" x 20	20		06048L134-I20UN	6	4.88	57	13.4	3	3	5.2
	7/16" x 20	20		010095L230-I20UN	10	9.55	73	23.0	3	3	9.9
3/8" x 16		16		08067L191-I16UN	8	6.70	63	19.1	3	3	8.0
7/16" x 14		14		10090L233-I14UN	10	9.00	73	23.3	3	3	9.4

($L_2 \leq 3 \times \text{Thread Diameter}$)

Thread		Pitch (tpi)	Designation		Dimensions (mm)				No. of flute z	Tooth zt	*Bore dia. mm
UNC	UNF		Internal	PC9070M	Ød	D	L	L ₂			
	No.1~72	72	STMD3T	06014L057-I72UN	6	1.45	57	5.75	3	3	1.6
No.4, No.5~40	No.6~40	40		06021L090-I40UN	6	2.10	57	9.0	3	3	2.3
No.5~40	No.6~40	40		06024L100-I40UN	6	2.45	57	10.0	3	3	2.6
No.6, No.8~32	No.10~32	32		06025L110-I32UN	6	2.55	57	11.0	3	3	2.8
No.8~32	No.10~32	32		06032L130-I32UN	6	3.20	57	13.0	3	3	3.4
	1/4" 28	28		06052L196-I28UN	6	5.25	57	19.6	3	3	5.5
	5/16" x 24	24		08066L245-I24UN	8	6.68	63	24.5	3	3	6.9
1/4" x 20	7/16" x 20	20		06048L198-I20UN	6	4.88	57	19.8	3	3	5.1

* Bore Diameter applies to smallest thread Dia

Maximum thread length = $L_2 - \frac{\text{Pitch}}{4}$

●: Stock item



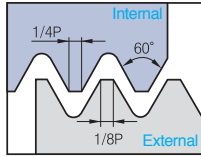
D

Threading

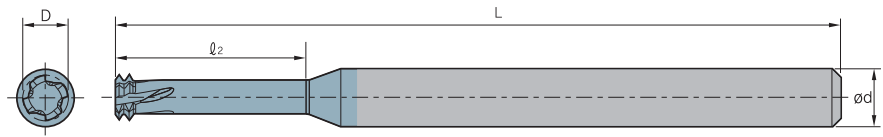
ISO Metric

Deep threading for hard materials (~HRC62)

Internal



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



($l_2 \leq 2 \times \text{Thread Diameter}$)

Thread		Pitch (mm)	Designation		Dimensions (mm)				No. of flute	Tooth	*Bore dia. mm
M Coarse	M Fine		Internal	PC9070M	Ød	D	L	l2			
M2x0.4		0.4	STMD2L	06015L042-I0.4ISO	6	1.55	76	4.60	4	2	1.6
M2.2x0.45		0.45		06016L046-I0.45ISO	6	1.65	76	5.05	4	2	1.8
M2.5x0.45		0.45		06019L052-I0.45ISO	6	1.95	76	5.65	4	2	2.05
M3x0.5	M3.5~M16x0.5	0.5		06024L062-I0.5ISO	6	2.40	76	6.75	4	2	2.55
M3.5x0.6		0.6		06027L073-I0.6ISO	6	2.75	76	7.90	4	2	2.95
M4x0.7		0.7		06031L083-I0.7ISO	6	3.15	76	9.05	4	2	3.35
M5x0.8		0.8		06040L104-I0.8ISO	6	4.05	76	11.20	4	2	4.3
M6x1.0	M8~M40x1.0	1.0		06048L125-I1.0ISO	6	4.80	76	13.50	4	2	5.1
M8x1.25		1.25		08065L166-I1.25ISO	8	6.50	80	17.85	4	2	6.8
M10x1.5	M12~M48x1.50	1.5		08079L208-I1.50ISO	8	7.90	80	22.30	4	2	8.6
M12x1.75		1.75		10099L250-I1.75ISO	10	9.90	101	26.75	4	2	10.4

($l_2 \leq 3 \times \text{Thread Diameter}$)

Thread		Pitch (mm)	Designation		Dimensions (mm)				No. of flute	Tooth	*Bore dia. mm
M Coarse	M Fine		Internal	PC9070M	Ød	D	L	l2			
M2x0.4		0.4	STMD2L	06015L062-I0.4ISO	6	1.55	76	6.60	4	2	1.6
M2.2x0.45		0.45		06019L077-I0.45ISO	6	1.95	76	8.15	4	2	2.05
M3x0.5	M3.5~M16x0.5	0.5		06024L092-I0.5ISO	6	2.40	76	9.75	4	2	2.55
M4x0.7		0.7		06031L123-I0.7ISO	6	3.15	76	13.05	4	2	3.35
M5x0.8		0.8		06040L154-I0.8ISO	6	4.05	76	16.20	4	2	4.3
M6x1.0	M8~M40x1.0	1.0		06048L185-I1.0ISO	6	4.80	76	19.50	4	2	5.1
M8x1.25		1.25		08065L246-I1.25ISO	8	6.50	80	25.85	4	2	6.8

* Bore Diameter applies to smallest thread Dia

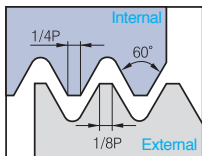
Maximum thread length = $l_2 - \frac{\text{Pitch}}{4}$

● Stock item

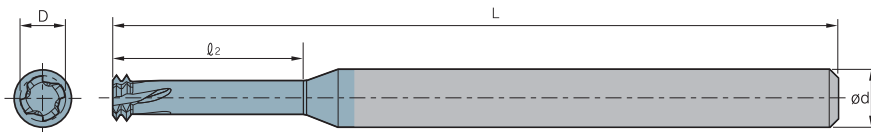
American UN

Deep threading for hard materials (~HRC62)

Internal



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



($l_2 \leq 2 \times \text{Thread Diameter}$)

Thread		Pitch (tpi)	Designation			Dimensions (mm)				No. of flute z	Tooth zt	*Bore dia. mm
UNC	UNF		Internal	PC9070M		Ød	D	L	l ₂			
No.2~56	No.3~56	56	STMD2L	06016L050-I56UN		6	1.65	76	5.45	4	2	1.80
No.3~48	No.4~48	48		06019L060-I48UN		6	1.90	76	6.53	4	2	2.10
No.4~40 ; No.5~40	No.6~40	40		06021L060-I40UN		6	2.10	76	6.64	4	2	2.35
No.5~40	No.6~40	40		06024L072-I40UN		6	2.45	76	7.84	4	2	2.65
	No.8~36	36		06033L087-I36UN		6	3.30	76	9.41	4	2	3.55
No.6~32 ; No.8~32	No.10~32	32		06025L074-I32UN		6	2.55	76	8.20	4	2	2.85
No.8~32	No.10~32	32		06032L100-I32UN		6	3.20	76	10.79	4	2	3.50
	1/4"×28	28		06052L132-I28UN		6	5.25	76	14.11	4	2	5.55
No.10~24	5/16"×24	24		06035L102-I24UN		6	3.58	76	11.26	4	2	3.90
	5/16"×24	24		08066L165-I24UN		8	6.68	76	17.56	4	2	7.00
1/4"×20	7/16"×20	20		06048L134-I20UN		6	4.88	76	14.67	4	2	5.20
	7/16"×20	20		10095L230-I20UN		10	9.55	101	24.27	4	2	9.90
3/8"×16		16		08076L197-I16UN		8	7.65	80	21.29	4	2	8.00
7/16"×14		14		10090L233-I14UN		10	9.00	101	25.11	4	2	9.50
1/2"×13		13		10099L256-I13UN		10	9.90	101	27.55	4	2	10.90

($l_2 \leq 3 \times \text{Thread Diameter}$)

Thread		Pitch (tpi)	Designation			Dimensions (mm)				No. of flute z	Tooth zt	*Bore dia. mm
UNC	UNF		Internal	PC9070M		Ød	D	L	l ₂			
No.4~40, No.5~40	No.6~40	40	STMD2L	06021L090-I40UN		6	2.10	76	9.64	4	2	2.35
No.5~40	No.6~40	40		06024L100-I40UN		6	2.45	76	10.64	4	2	2.65
No.6~32, No.8~32	No.10~32	32		06025L110-I32UN		6	2.55	76	11.79	4	2	2.85
No.8~32	No.10~32	32		06032L130-I32UN		6	3.20	76	13.79	4	2	3.50
	1/4"×28	28		06052L196-I28UN		6	5.25	76	20.51	4	2	5.55
	5/16"×24	24		08066L245-I24UN		8	6.68	80	25.56	4	2	7.00
1/4"~20	7/16"×20	20		06048L198-I20UN		6	4.88	76	21.07	4	2	5.20
7/16"×14		14		10090L335-I14UN		10	9.00	101	35.31	4	2	9.50

* Bore Diameter applies to smallest thread Dia

Maximum thread length = $l_2 - \frac{\text{Pitch}}{4}$

●: Stock item

