Threading holder code system

E R H 10 (N) - 11 (C)

1	2	3	4	5	6	7
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

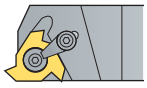
2 Hand of insert
E R H 10 (N) - 11 (C)

R: Right handed L: Left handed

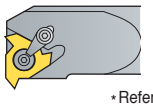
3 Name
E R H 10 (N) - 11 (C)

H: Holder

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

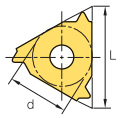
*Refer to the specification for shank diameter information

5 Shim
E R H 10 (N) - 11 (C)

No code: Shim required
N: No shim required

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



7 Clmaping system
E R H 10 (N) - 11 (C)

No code: Screw on system
C: Clamp on system

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

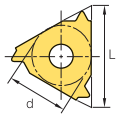
R: Right handed L: Left handed

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	
mm	tpi
0.35-6.0	72-3

Partial profile		
	mm	tpi
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

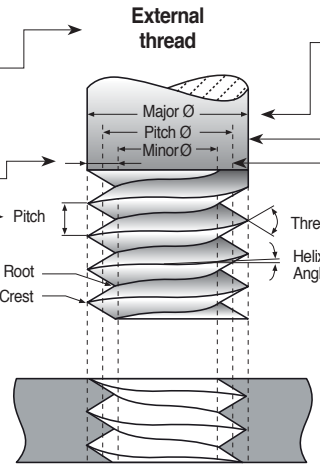
Special features

External thread
A thread on the external surface of a cylinder screw or cone

Depth of thread
The distance between the crest and root measured from normal to theaxis

Pitch
The distance between the corresponding points on adjacent thread forms measured parallel to the axis. This distance can be defined in millimeters or by the tpi (threads per inch), which is the reciprocal of the pitch

Nominal diameter
The diameter of which the diameter limits are derived by the application of deviation allowances and tolerances



Internal thread
A thread on the internal surface of a cylinder or cone

Major diameter
The largest diameter of a screw thread

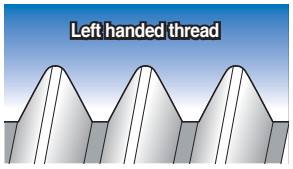
Pitch diameter
On a straight thread, the diameter of an imaginary cylinder, the surface of which cuts the thread forms where the width of the thread and groove are equal

Minor diameter
The smallest diameter of a screw thread

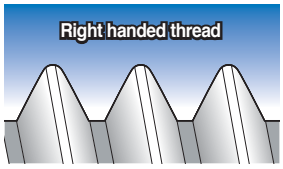
Helix angle
For a straight thread, where the lead of the thread and the pitch diameter circle circumference form a right angled triangle, the helix angle is the angle opposite of the lead

Straight thread
A thread formed on a cylinder

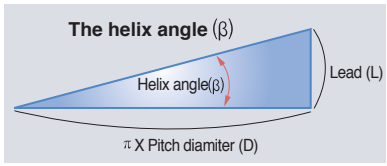
Taper thread
A thread formed on a cone



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

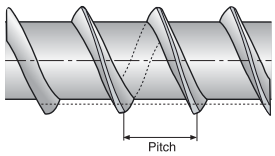


For a straight thread, where the lead of the thread and the pitch diameter circle circumference form a right angled triangle, the helix angle is the angle opposite of the lead

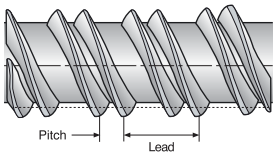
Machining a multi-start thread

- 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

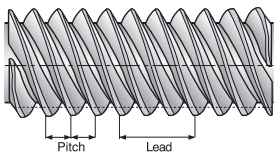
First start machined



Second start machined

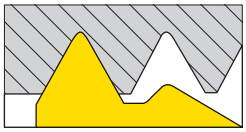


Third start machined (Final, 3 starts thread)



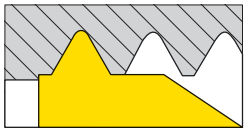
Insert profile style

Partial profile



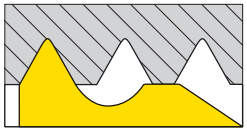
The V partial profile insert cuts without topping the outer diameter of the thread. The same insert can be used for a range of different thread pitches which have a common thread angle

Full profile



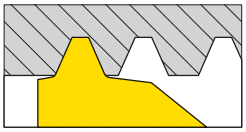
The full profile insert will form a complete thread profile including the crest. For every thread pitch and standard, a separate insert is required

Full profile for fine pitches



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

Semifull

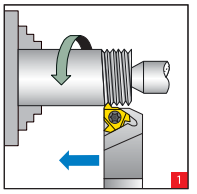


The Semi profile insert will form a complete thread including crest radius but without topping the outer diameter Mainly used for trapezoidal profiles

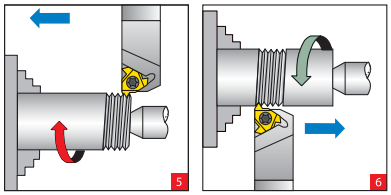
Thread turning method

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

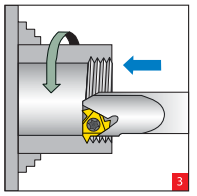
External RH thread



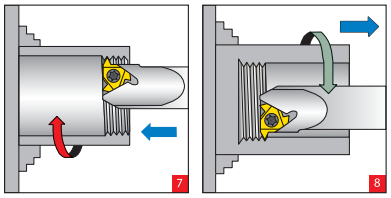
External LH thread



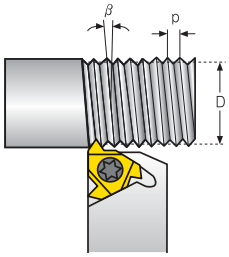
Internal RH thread



Internal LH thread



Calculating the helix angle (β)



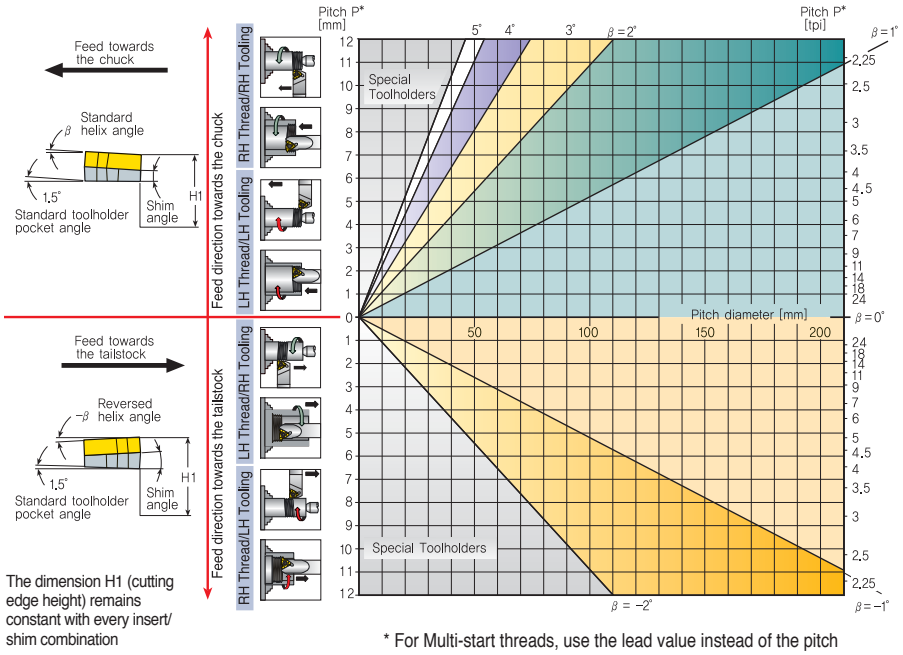
• The helix angle is calculated by the following formula:

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

β: Helix angle (°)
P: Pitch (mm)
N: No. of starts
D: Pitch diameter (mm)
Lead = P x N

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

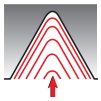
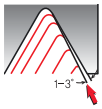
Helix angle diagram



The dimension H1 (cutting edge height) remains constant with every insert/ shim combination

* For Multi-start threads, use the lead value instead of the pitch

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

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 AiTN 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)

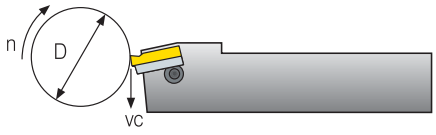
Workpiece		● ◄·····► ✱
P	Carbon steel, Alloy steel, Cast Steel	PC5300 PC3030T
M	Stainless steel, Heat resistant steel, Titanium alloy steel	PC5300 PC3030T PC9070
K	Carbon Iron, Aluminum, Cast Steel, Copper	PC5300 PC3030T

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]

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



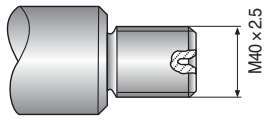
n: Revolution Per Minute [min^{-1}]
vc: Cutting Speed [m/min]
D: Workpiece Diameter [mm]

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)

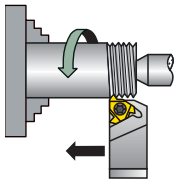
Step by step thread turning



Application

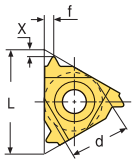
- Thread: External right hand ISO metric M40x2.5
- Material: 4140 (25 HRC)

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

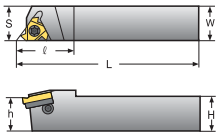
2 Choose the insert size



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

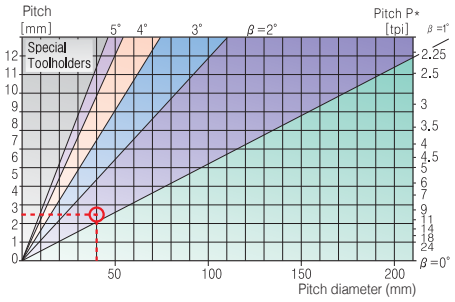
3 Choose the tool holder



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

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

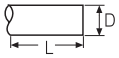
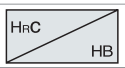
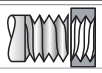
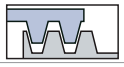
Pitch	mm	1.50	1.75	2.00	2.50	3.00	3.50	4.00
	tpi	16	14	12	10	8	7	6
No.of passes		6~10	7~12	7~12	8~14	9~16	10~18	11~18

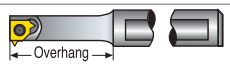
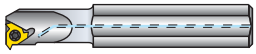
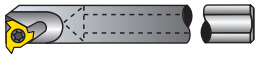
- Carbide grade chosen: PC3030T
- Cutting speed: 140m/min

8 Summary

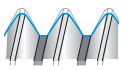
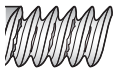
Thread type	ISO M40 x 2.5 External right hand
1. Feed direction	Towards the chuck
2. Insert and grade	ER16-2.5ISO, PC3030T
3. Tool holder	ERH25-16
4. Helix angle	1.5°
5. Shim	ATE16
6. Cutting speed	140m/min
7. Number of passes	10

Cutting condition depending on

Workpiece	Material type	
	Material dimension	
	Diameter and length chipflow character	
	Material hardness	
Thread application	External or internal	
	Profile shape	
	Surface finish	
Machine	Machine stability	
	Max. RPM	
	Clamping system stability	

Coolant	Coolant type	
Holders	Holder cross section area	
	Holder overhang	
	Through coolant option	
	Shank type: Carbide, alloy,	
Insert	Carbide implant grade	P M K
	Profile shape: Pitch and depth	
	Nose radius	
	Chip breaker style	

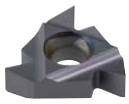
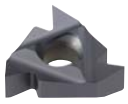
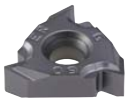
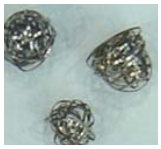
Trouble shooting

Problem	Possible cause	Solution
 **Increased flank wear**	Cutting speed too high	Reduce cutting speed/use coated insert
	Depth of cut too low/too many passes	Increase the depth of cut per pass
	Unsuitable carbide grade	Use a coated carbide grade
	Insufficient cooling	Increase coolant flow rate
 **Uneven cutting edge wear**	Incorrect helix angle	Choose the correct shim
	Wrong infeed method	Use the Alternating Flank Infeed method
 **Extreme plastic deformation**	Depth of cut too large	Decrease depth of cut/ increase number of passes
	Insufficient cooling	Increase coolant flow rate
	Cutting speed too high	Reduce cutting speed
	Unsuitable carbide grade	Use a tougher carbide
	Nose radius too small	Use an insert with a larger radius, if possible
 **Cutting edge breakage**	Depth of cut too large	Decrease depth of cut/ increase number of passes.
	Extreme plastic deformation	Use a tougher carbide
	Insufficient cooling	Increase flow rate and/ or correct flow direction
	Unsuitable ca rbide grade	Use a tougher carbide
	Instability	Check stability of the system
 **Built-up edge**	Incorrect cutting speed	Change the cutting speed
	Unsuitable carbide grade	Use a coated carbide
 **Thread profile is too shallow**	The tool is not at the workpiece axis height	Change tool height
	Insert is not machining the thread crest	Measure the workpiece diameter
	Worn insert	Change the cutting edge sooner
 **Poor surface quality**	Too low cutting speed	Increase cutting speed
	Wrong shim	Choose correct shim
	Flank infeed method is not appropriate	Use the alternate flank or radial infeed method

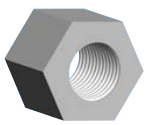
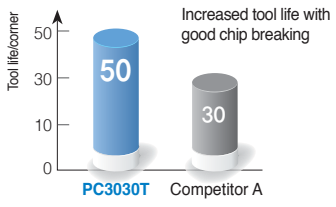
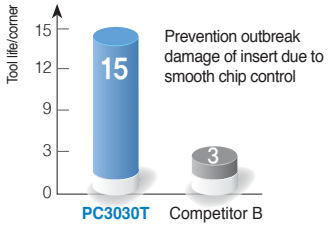
Threading insert with chip breaker

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

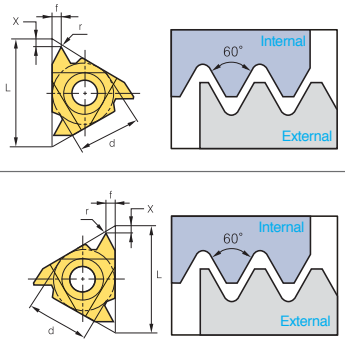
Type	Ground insert		Insert with a chip breaker			
C/B Code	None		None		U	
Designation	ER16-1.5ISO		ERM16-1.5ISO		ERM16-1.5ISO-U	
Machining	External	Internal	External	Internal	External	Internal
Insert Shape						
Chip Shape						
Class	P, M, K, N, S		P, M, K		P, M, K	
Application	G-Class		M-Class		M-Class	
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			

Partial profile 60°

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (mm)	Pitch (tpi)	d	L	r	x	f	Picture
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	

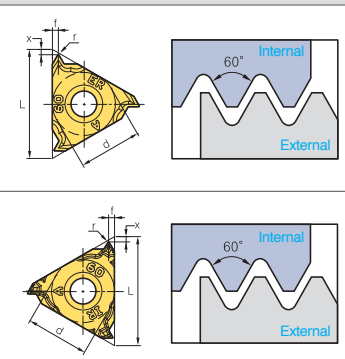


Applicable holders **D31, D32**

●: Stock item

Partial profile 60° (M chip breaker)

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (mm)	Pitch (tpi)	d	L	r	x	f	Picture
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	

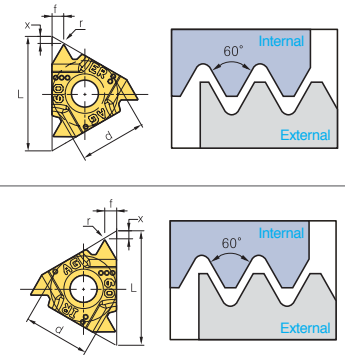


Applicable holders **D31, D32**

●: Stock item

Partial profile 60° (U chip breaker) new

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (mm)	Pitch (tpi)	d	L	r	x	f	Picture
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	

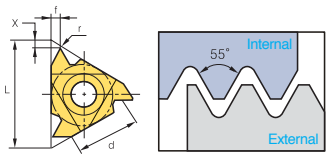


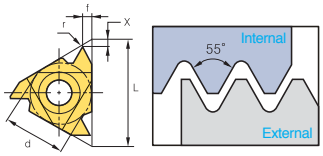
Applicable holders **D31, D32**

●: Stock item

Partial profile 55°

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (mm)	Pitch (tpi)	d	L	r	x	f	Picture
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	



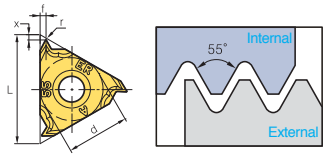


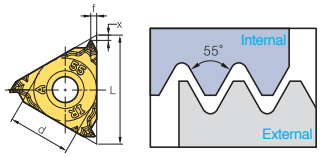
Applicable holders **D31, D32**

●: Stock item

Partial profile 55° (M chip breaker)

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (mm)	Pitch (tpi)	d	L	r	x	f	Picture
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	



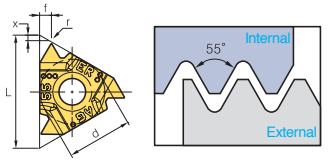


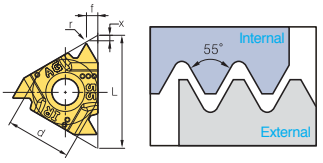
Applicable holders **D31, D32**

●: Stock item

Partial profile 55° (U chip breaker) new

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (mm)	Pitch (tpi)	d	L	r	x	f	Picture
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	

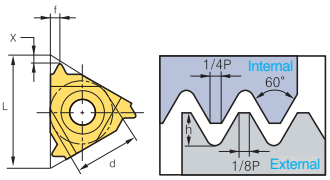




Applicable holders **D31, D32**

●: Stock item

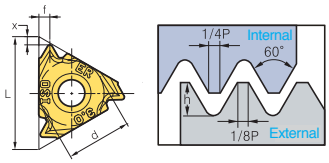
ISO Metric

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (mm)	Dimensions (mm) d	L	hmin	X	f	Picture
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

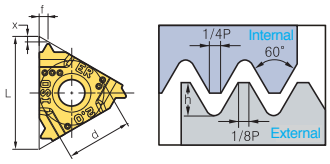
ISO Metric (M chip breaker)

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (mm)	Dimensions (mm) d	L	hmin	X	f	Picture
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

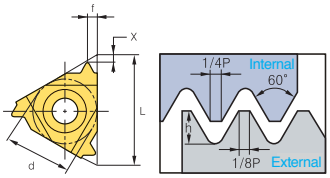
ISO Metric (U chip breaker) new

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (mm)	Dimensions (mm) d	L	hmin	X	f	Picture
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

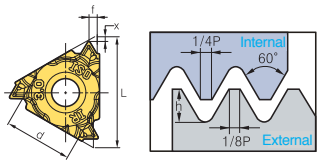
ISO Metric

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (mm)	Dimensions (mm) d	L	hmin	X	f	Picture
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

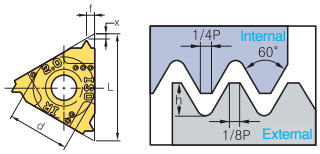
ISO Metric (M chip breaker)

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (mm)	Dimensions (mm) d	L	hmin	X	f	Picture
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

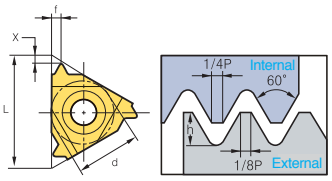
ISO Metric (U chip breaker) new

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (mm)	Dimensions (mm) d	L	hmin	X	f	Picture
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

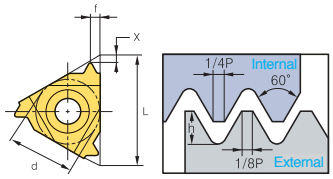
American UN (UN, UNC, UNF, UNEF, UNS)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm) d	L	hmin	X	f	Picture
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

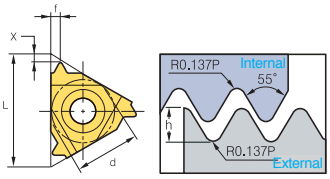
American UN (UN, UNC, UNF, UNEF, UNS)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch	Dimensions (mm)					Picture
							(tpi)	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

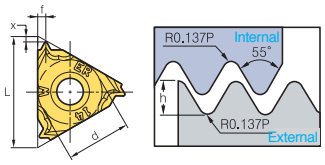
Whitworth (BSW, BSF, BSP, BSB)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch	Dimensions (mm)					Picture
							(tpi)	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

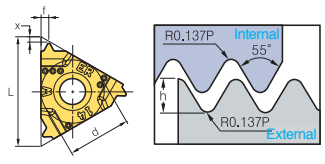
Whitworth (M chip breaker) new

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (tpi)	Dimensions (mm) d	L	hmin	X	f	Picture
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

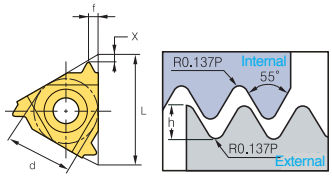
Whitworth (U chip breaker) new

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (tpi)	Dimensions (mm) d	L	hmin	X	f	Picture
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

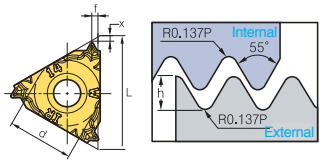
Whitworth (BSW, BSF, BSP, BSB)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch	Dimensions (mm)					Picture
							(tpi)	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

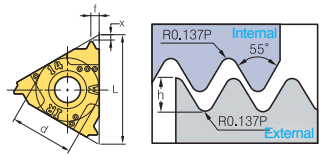
Whitworth (M chip breaker) new

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (Left)	Dimensions (mm) d	L	hmin	X	f	Picture
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

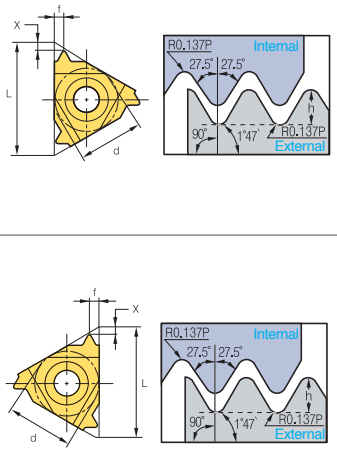
Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (tpi)	Dimensions (mm) d	L	hmin	X	f	Picture
Internal	IRM 16-14W-U					14	9.525	16	1.16	1.0	1.2	
	16-11W-U					11	9.525	16	1.48	1.1	1.5	

Applicable holders **D32**

●: Stock item

British Standard Pipe Thread (BSPT)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm) d	L	hmin	X	f	Picture
External	ER 11-28BSPT			EL 11-28BSPT			28	6.35	11	0.58	0.6	0.6	
	11-19BSPT			11-19BSPT			19	6.35	11	0.86	0.8	0.9	
	11-14BSPT			11-14BSPT			14	6.35	11	1.16	0.9	1.0	
	16-28BSPT			16-28BSPT			28	9.525	16	0.58	0.6	0.6	
	16-19BSPT		●	16-19BSPT			19	9.525	16	0.86	0.8	0.9	
	16-14BSPT		●	16-14BSPT			14	9.525	16	1.16	1.0	1.2	
	16-11BSPT	●	●	16-11BSPT			11	9.525	16	1.48	1.1	1.5	
Internal	IR 11-28BSPT			IL 11-28BSPT			28	6.35	11	0.58	0.6	0.6	
	11-19BSPT		●	11-19BSPT			19	6.35	11	0.86	0.8	0.9	
	11-14BSPT		●	11-14BSPT			14	6.35	11	1.16	0.9	1.0	
	16-28BSPT			16-28BSPT			28	9.525	16	0.58	0.6	0.6	
	16-19BSPT	●	●	16-19BSPT			19	9.525	16	0.86	0.8	0.9	
	16-14BSPT	●	●	16-14BSPT			14	9.525	16	1.16	1.0	1.2	
	16-11BSPT		●	16-11BSPT			11	9.525	16	1.48	1.1	1.5	

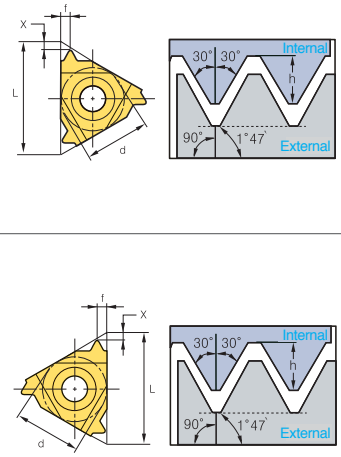


Applicable holders **D31, D32**

●: Stock item

National Pipe Thread (NPT)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm) d	L	hmin	X	f	Picture
External	ER 11-27NPT			EL 11-27NPT			27	6.35	11	0.66	0.7	0.8	
	11-18NPT			11-18NPT			18	6.35	11	1.01	0.8	1.0	
	11-14NPT			11-14NPT			14	6.35	11	1.33	0.8	1.0	
	16-27NPT			16-27NPT			27	9.525	16	0.66	0.7	0.8	
	16-18NPT	●	●	16-18NPT			18	9.525	16	1.01	0.8	1.0	
	16-14NPT	●	●	16-14NPT			14	9.525	16	1.33	0.9	1.2	
	16-11.5NPT	●		16-11.5NPT			11.5	9.525	16	1.64	1.1	1.5	
	16-8NPT	●		16-8NPT			8	9.525	16	2.42	1.3	1.8	
Internal	IR 11-27NPT			IL 11-27NPT			27	6.35	11	0.66	0.7	0.8	
	11-18NPT	●		11-18NPT			18	6.35	11	1.01	0.8	1.0	
	11-14NPT	●	●	11-14NPT	●		14	6.35	11	1.33	0.8	1.0	
	16-27NPT			16-27NPT			27	9.525	16	0.66	0.7	0.8	
	16-18NPT			16-18NPT			18	9.525	16	1.01	0.8	1.0	
	16-14NPT	●	●	16-14NPT			14	9.525	16	1.33	0.9	1.2	
	16-11.5NPT	●	●	16-11.5NPT	●		11.5	9.525	16	1.64	1.1	1.5	
	16-8NPT	●		16-8NPT	●		8	9.525	16	2.42	1.3	1.8	

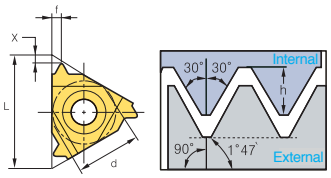


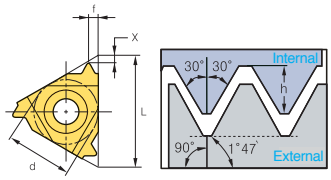
Applicable holders **D31, D32**

●: Stock item

National Pipe Threads-Dryseal (NPTF)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm) d	L	hmin	X	f	Picture
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	



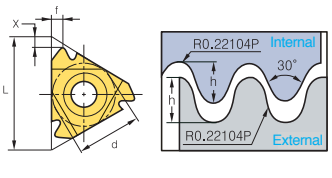


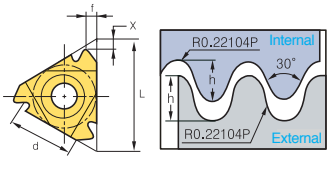
Applicable holders **D31, D32**

●: Stock item

Round DIN 405

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm) d	L	hmin	X	f	Picture
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	



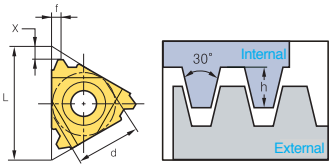


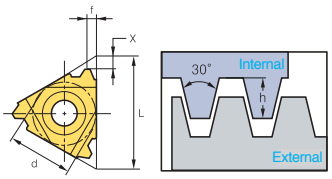
Applicable holders **D31, D32**

●: Stock item

Trapez DIN 103 (TR)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (mm)	Dimensions (mm) d	L	hmin	X	f	Picture
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	



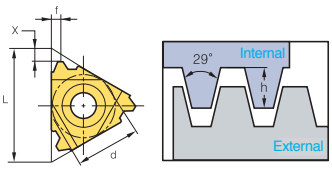


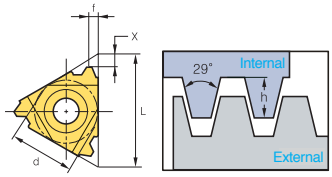
Applicable holders **D31, D32**

●: Stock item

American ACME (ACME)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm) d	L	hmin	X	f	Picture
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	

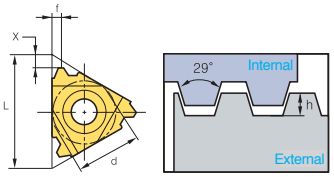
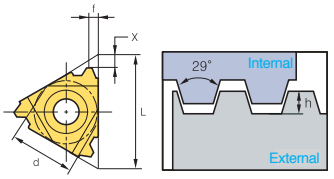




Applicable holders **D31, D32**

●: Stock item

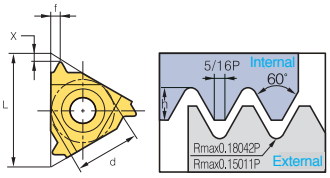
Stub ACME (STACME)

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

Applicable holders **D31, D32**

●: Stock item

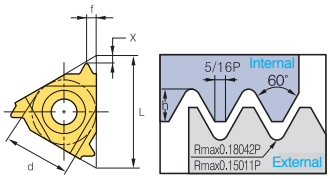
UNJ (Unified constant thread)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm) d	L	hmin	X	f	Picture
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)

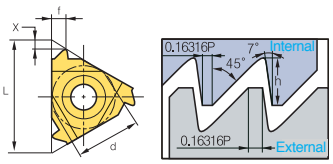
Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm) d	L	hmin	X	f	Picture
Internal	IR 11-48UNJ			IL 11-48UNJ			48	6.35	11	0.28	0.6	0.5	
	11-44UNJ			11-44UNJ			44	6.35	11	0.30	0.6	0.6	
	11-40UNJ			11-40UNJ			40	6.35	11	0.33	0.6	0.6	
	11-36UNJ			11-36UNJ			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	

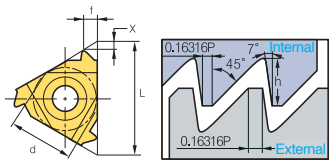
Applicable holders **D32**

●: Stock item

American Buttress (ABUT)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm) d	L	hmin	X	f	Picture
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	



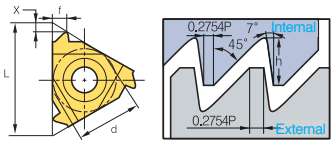


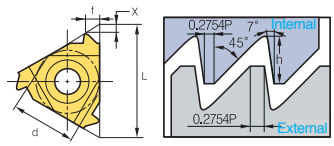
Applicable holders **D31, D32**

●: Stock item

British Buttress (BBUT)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm) d	L	hmin	X	f	Picture
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	

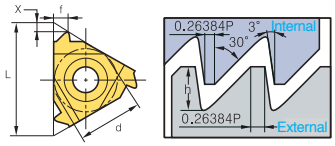
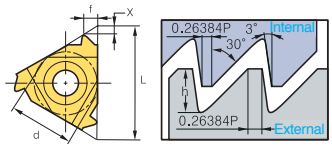




Applicable holders **D31, D32**

●: Stock item

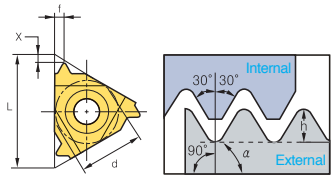
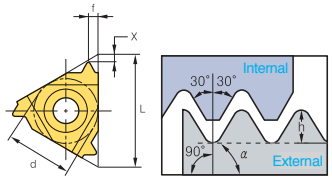
Metric Buttress (SAGE)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (mm)	Dimensions (mm) d	L	hmin	X	f	Picture
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

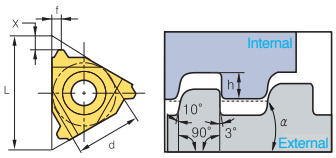
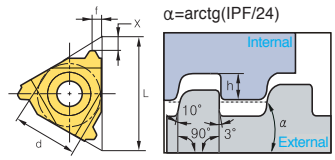
API

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm) d	L	hmin	X	f	Picture
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

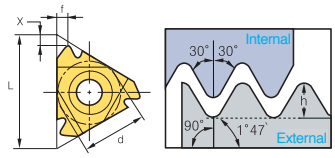
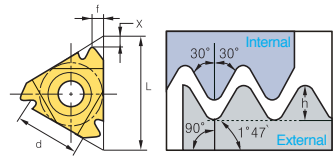
API Buttress Casing (BUT)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch	Dimensions (mm)						Picture
							(tpi)	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

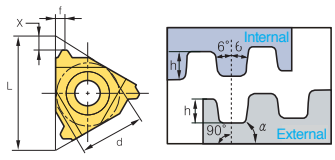
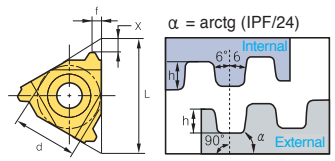
API Round Casing & Tubing (APIRD)

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)

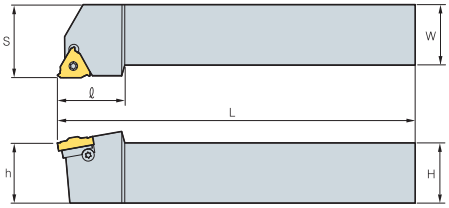
Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch	Dimensions (mm)						Picture
							(tpi)	IPF	d	L	hmin	X	f	
External	ER 22-6EL15			EL 22-6EL15			6	1.5	12.7	22	1.21	1.9	1.9	
	22-5EL125			22-5EL125			5	1.25	12.7	22	1.71	2.3	2.4	
Internal	IR 22-6EL15			IL 22-6EL15			6	1.5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

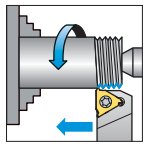
Applicable holders **D31, D32**

●: 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					

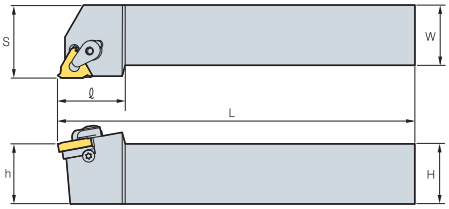
Applicable inserts **D10~D13, D16, D18, D19, D22, D23~D26**

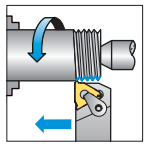
• Helix angle is 1.5° for all holders

• No shim needed for N type holder

ER(L)H-C

(Clamp on system)





Righthand drawing

(mm)

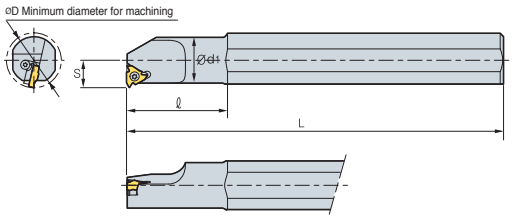
Designation		Inscribed circle	H	W	L	S	H	ℓ	Shim screw	Clamp	Screw RH	Screw LH	Wrench
ER(L)H	20-16C	9.525	20	20	128.6	20	20	30	STA16	CTH16	ATE16	ATI16	TW10P TW15P
	25-16C	9.525	25	25	153.6	25	25	30					
	32-16C	9.525	32	32	173.6	32	32	30					
	25-22C	12.7	25	25	155.7	25	25	36	STA22	CTH22	ATE22	ATI22	TW20P
	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					

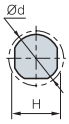
Applicable inserts **D10~D13, D16, D18, D19, D22, D23~D26**

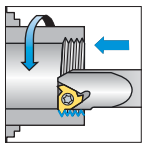
• Helix angle is 1.5° for all holders

IR(L)H

(Screw on system)







Righthand drawing

(mm)

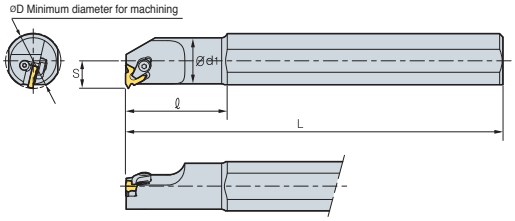
	Designation	Inscribed circle	ØD	Ød	Ød1	H	L	S	ℓ	Insert screw	Shim screw	Screw RH	Screw LH	Wrench
IR(L)H	10DN-11	6.35	13	10	10.0	9.5	100	7.3	-	ST11N	-	-	-	TW08P
	10N-11	6.35	13	20	10.0	18.0	180	7.3	25					
	13N-11	6.35	16	20	13.0	18.0	180	8.9	32					
	13N-16	9.525	17	20	12.7	18.0	180	10.3	32	ST16N	-	-	-	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					

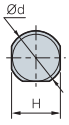
Applicable inserts **D10, D11, D14, D15, D17, D20~D25, D27~D30**

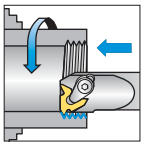
• Helix angle is 1.5° for all holders • No shim needed for N type holder

IR(L)H-C

(Clamp on system)







Righthand drawing

(mm)

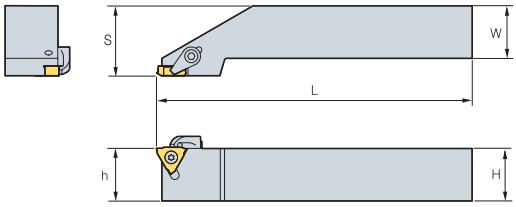
	Designation	Inscribed circle	ØD	Ød	Ød1	H	L	S	ℓ	Shim screw	Clamp	Screw RH	Screw LH	Wrench
IR(L)H	20-16C	9.525	24	20	20.0	18.0	180	13.4	50	STA16	CTH16	ATI16	ATE16	TW10P TW15P
	25-16C	9.525	29	32	25.0	28.0	250	16.3	60					
	25D-16C	9.525	29	25	24.6	22.6	200	16.1	45					
	32-16C	9.525	36	32	32.0	29.0	250	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	STA27	CTH27	ATI27	ATE27	TW25L
	40-27C	15.875	48	40	40.0	36.0	300	26.4	60					
	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					

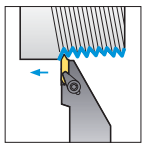
Applicable inserts **D10, D11, D14, D15, D17, D20~D25, D27~D30**

• Helix angle is 1.5° for all holders

VTH

VETR



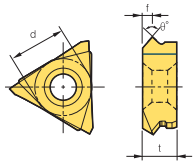


Righthand drawing

(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

Thread Milling Holder

2 Holders style
TM S R L 25 - 11

S: Shank Type

3 Hand
TM S R L 25 - 11

R: Right Hand L: Left Hand

4 Shank type
TM S R L 25 - 11

None: Standard
L: Long Type
T: Taper Type

5 Shank dia.
TM S R L 25 - 11

25: 25.0

6 Cutting edge length
TM S R L 25 - 11

10: 10.4
11: 11
16: 16
22: 22
27: 27
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

Thread Milling Holder

2 Cutting edge
TM 2 I 16 - 1.5 ISO

None: 1 cutting edge
2: 2 cutting edge

3 Type of insert
TM 2 I 16 - 1.5 ISO

I: Internal
E: External
EI: External & Internal

4 Cutting edge length
TM 2 I 16 - 1.5 ISO

10: 10.4
11: 11
16: 16
22: 22
27: 27
38: 38.5

5 Pitch
TM 2 I 16 - 1.5 ISO

mm: 0.5~6.0 tpi: 48~6

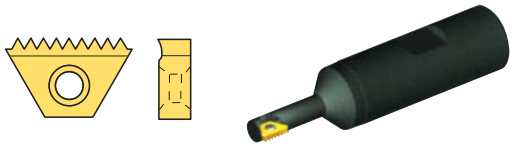
6 Type
TM 2 I 16 - 1.5 ISO

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

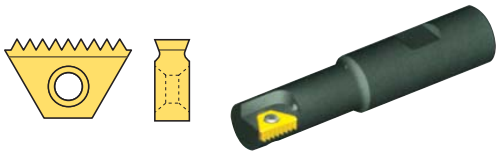
The right tool for the job

Small diameter type



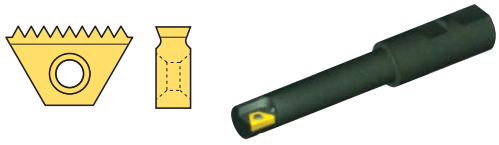
Tool holder: TMSR **Insert**: TM L = 10.4 mm
For small bore diameters down to 9.5 mm

Standard type



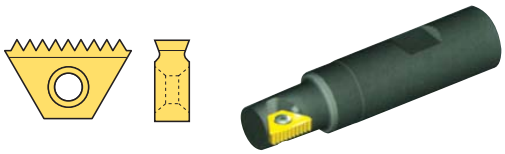
Tool holder: TMSR **Insert**: TM2
For standard length threads

Long type



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

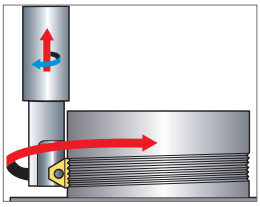
Tapered type



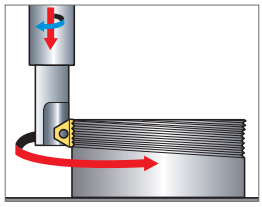
Tool holder: TMSR **Insert**: TM2 (BSPT, NPT, NPTF)
For standard length threads

Thread milling methods

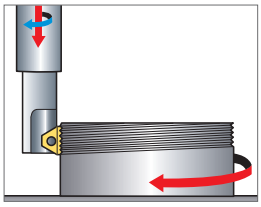
External threading



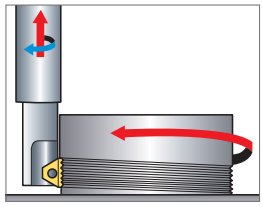
Right handed thread
conventional milling



Left handed thread
down milling

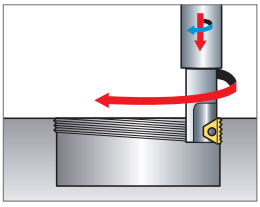


Right handed thread
down milling

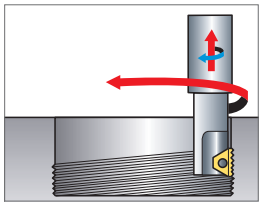


Left handed thread
conventional milling

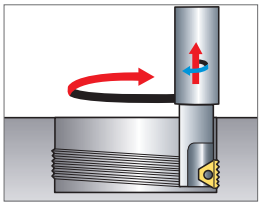
Internal threading



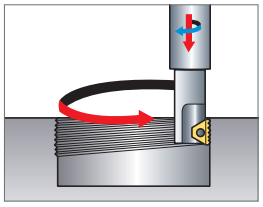
Right handed thread
down milling



Left handed thread
conventional milling

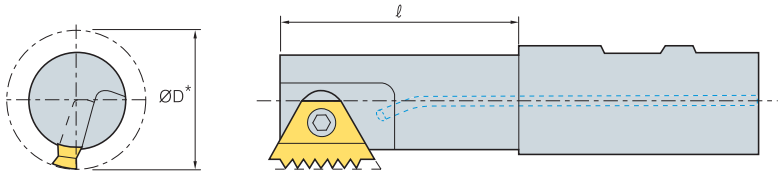


Right handed thread
conventional milling



Left handed thread
down milling

Tooling recommendation for given internal thread specification

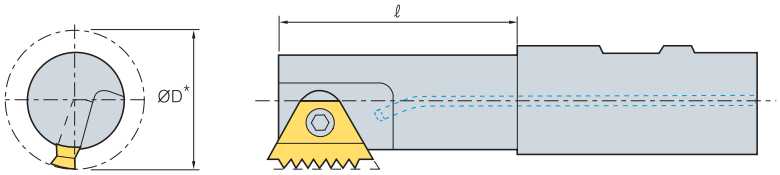


ISO

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	
4.0	45-52	TMSR 25-27	TM2I 27-4.0ISO	52.0	30.0	2.31
	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

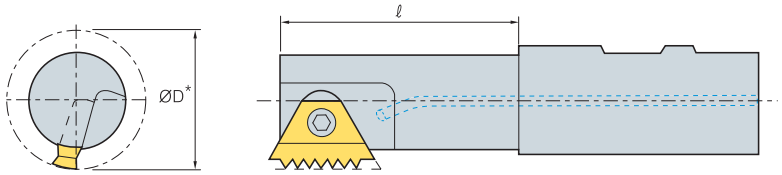


UN

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	115	
	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

Tooling recommendation for given internal thread specification



UNJ

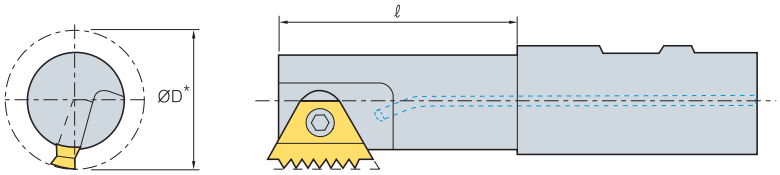
Pitch (tpi)	Nominal dia. (inch)	Holder	Insert	ℓ-Tool holder overhang	D-Tool cutting dia.*	Min.Thread depth (Profile depth)
24	9/16-11/16	TMSR 12-11	TM2I 11-24UNJ	12.0	11.5	0.55
20	1/2	TMSR 12-10	TMI 10-20UNJ	12.0	9.0	0.66
	3/4-13/16	TMSR 12-11	TM2I 11-20UNJ	12.0	11.5	
	7/8	TMSR 16-16	TM2I 16-20UNJ	22.0	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

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

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

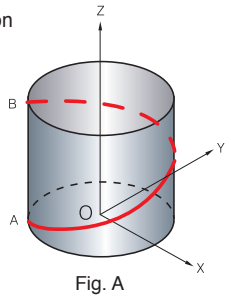


Fig. A

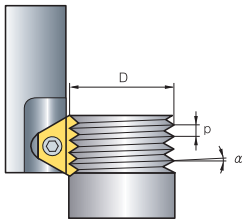


Fig. B

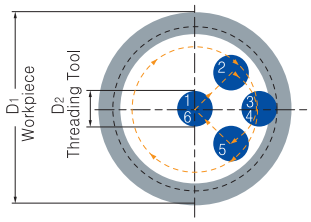
- The thread milling operation (Fig. B) consists of circular rotation of fhe tool around its own axis togerther with an orbiting motion along the bore or workpiece circumference. During one such orbit, the tool will shift vertically one pitch length. These movements combined with the insert geometry 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

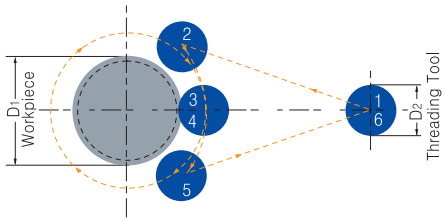
Tangential arc approach

- 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

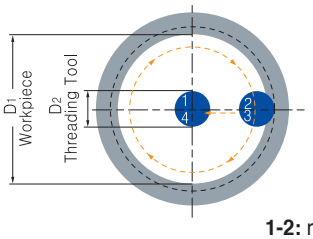


1-2: rapid approach
2-3: tool entry along tangential arc, with simultaneous feed along z-axis
3-4: helical movement during one full orbit (360°)
4-5: tool exit along tangential arc, with continuing feed along z-axis
5-6: rapid return

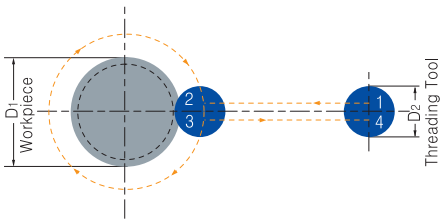
Radial approach

- 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

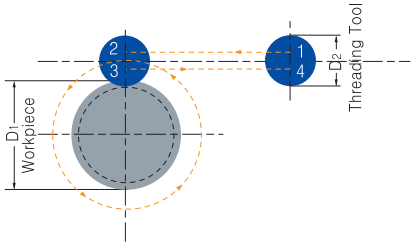


1-2: radial entry
2-3: helical movement during one full orbit (360°)
3-4: radial exit

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

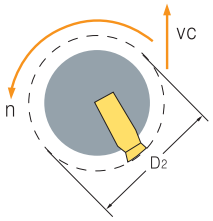
External thread



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



$$n = \frac{vc \times 1000}{\pi \times D2}$$

$$vc = \frac{n \times \pi \times D2}{1000}$$

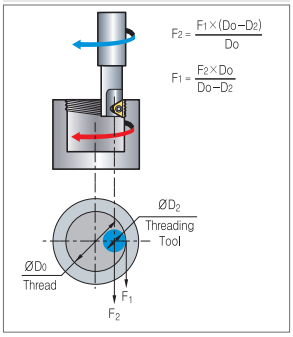
$$F1 = n \times z \times fn$$

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]

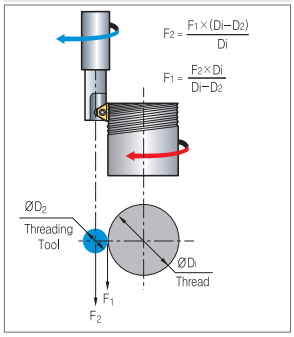
Calculation of feed rates at the tool center line

- 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

Internal thread



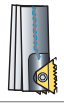
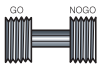
External thread



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

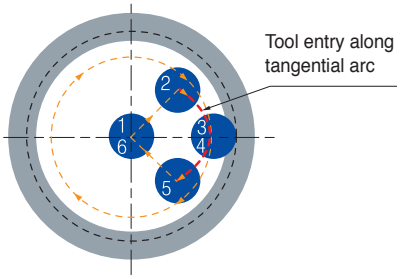
Problem		Possible	Solution
	**Increased insert flank wear**	Cutting speed too high Chip is too thin Insufficient coolant	Reduce cutting speed/use coated insert Increase feed rate Increase coolant flow rate
	**Chipping of cutting edge**	Chip is too thick Vibration	Reduce feed rate/Use the tangential arc 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

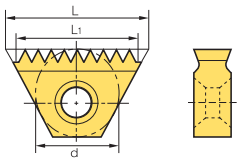
Example

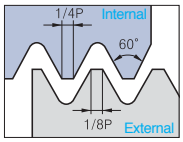
- At tool entry, set the Feed fz [mm/tooth] to 70% lower than the threading Feed
- Threading Feed: 0.3 [mm/t]
- Tool entry Feed: 0.09 [mm/t]



ISO Metric

External/Internal





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

(mm)

Insert size d	Insert size L	Pitch (mm)	Designation External		PC9570T	Designation Internal		PC9570T	L_1	Tooth	Tool holder
6.0	10.4	0.5		-		TMI	10-0.5ISO	●	10.0	20	TMSR-10
		0.75		-			10-0.75ISO		9.75	13	
		1.0		-			10-1.0ISO	●	9.0	9	
		1.25		-			10-1.25ISO		8.75	7	
		1.5		-			10-1.5ISO		9.0	6	
6.35	11	0.5		-		TM2I	11-0.5ISO		10.0	20	TMSR-11
		0.75	TM2E	11-0.75ISO			11-0.75ISO	●	10.5	14	
		1.0		11-1.0ISO			11-1.0ISO	●	10.0	10	
		1.25		11-1.25ISO			-		10.0	8	
		1.25		-			11-1.25ISO		8.75	7	
		1.5		11-1.5ISO			-		9.0	6	
		1.5		-			11-1.5ISO	●	10.5	7	
9.525	16	0.5		-		TM2I	16-0.5ISO		15.0	30	TMSR-16
		0.75	TM2E	16-0.75ISO			16-0.75ISO		15.0	20	
		0.8		-			16-0.8ISO		14.4	18	
		1.0		16-1.0ISO			-		14.0	14	
		1.0		-			16-1.0ISO		15.0	15	
		1.25		16-1.25ISO			16-1.25ISO		15.0	12	
		1.5		16-1.5ISO			16-1.5ISO	●	15.0	10	
		1.75		16-1.75ISO			16-1.75ISO		14.0	8	
		2.0		16-2.0ISO			16-2.0ISO	●	14.0	7	
9.525B	22	1.0	TM2E	22-1.0ISO		TM2I	22-1.0ISO		22.0	22	TMSR-22
		1.25		22-1.25ISO			22-1.25ISO		21.25	17	
		1.5		22-1.5ISO			22-1.5ISO	●	21.0	14	
		1.75		22-1.75ISO			22-1.75ISO		21.0	12	
		2.0		22-2.0ISO	●		22-2.0ISO	●	22.0	11	
15.875	27	1.0	TM2E	27-1.0ISO		TM2I	27-1.0ISO		26.0	26	TMSR-27
		1.25		27-1.25ISO			27-1.25ISO		25.0	20	
		1.5		27-1.5ISO			27-1.5ISO	●	25.5	17	
		1.75		27-1.75ISO			27-1.75ISO		24.5	14	
		2.0		27-2.0ISO			27-2.0ISO	●	24.0	12	
		2.5		27-2.5ISO			27-2.5ISO		25.0	10	
		3.0		27-3.0ISO			27-3.0ISO	●	24.0	8	
		3.5		27-3.5ISO			27-3.5ISO		24.5	7	
		4.0		27-4.0ISO			27-4.0ISO	●	24.0	6	
		4.5		27-4.5ISO			27-4.5ISO		22.5	5	
19.05B	38.5	1.5	TM2E	38-1.5ISO		TM2I	38-1.5ISO		36.0	24	TMSR-38
		2.0		38-2.0ISO			38-2.0ISO		36.0	18	
		3.0		38-3.0ISO			38-3.0ISO		36.0	12	
		4.0		38-4.0ISO			38-4.0ISO		32.0	8	
		4.5		38-4.5ISO			38-4.5ISO		31.5	7	
		5.0		38-5.0ISO			38-5.0ISO		30.0	6	
		5.5		38-5.5ISO			38-5.5ISO		33.0	6	
		6.0		38-6.0ISO			38-6.0ISO		30.0	5	

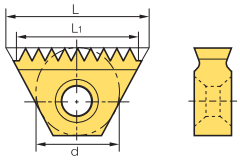
Applicable holders D49

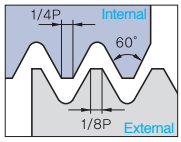
All inserts except TMI10 code have 2 cutting edges

●: Stock item

American UN

External/Internal





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

(mm)

Insert size d	Insert size L	Pitch (mm)	Designation External		PC9570T	Designation Internal		PC9570T	L1	Tooth	Tool holder
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	

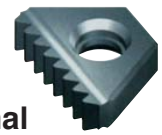
Applicable holders D49

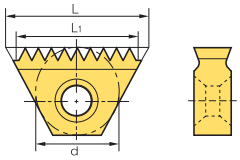
All inserts except TMI10 code have 2 cutting edges

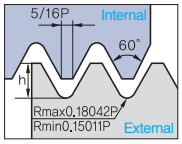
●: Stock item

UNJ (Unified constant thread)

External/Internal







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

(mm)

Insert size		Pitch (tpi)	Designation						L_1	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	

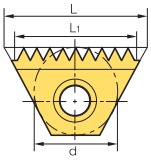
Applicable holders D49

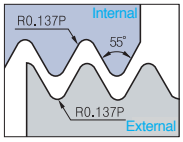
All inserts except TMI10 code have 2 cutting edges

●: Stock item

Whitworth (BSW, BSF, BSP, BSB)

External/Internal





BSW Defined by: B.S.84:1956, DIN 259, ISO228/1: 1982
BSP Defind by: B.S.2779: 1956
Tolerance class: BSW-Medium class A, BSP-Medium class

(mm)

Insert size		Pitch (tpi)	Designation			L_1	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		-	-	

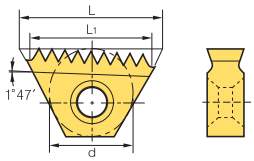
Applicable holders D49

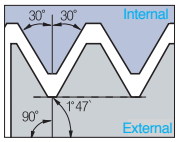
All inserts except TMI10 code have 2 cutting edges

●: Stock item

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		

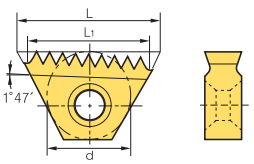
Applicable holders D49

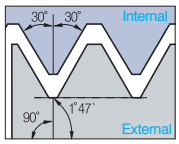
* TM2E16–18NPT is for external threading

●: Stock item

NPTF

External/Internal





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

(mm)

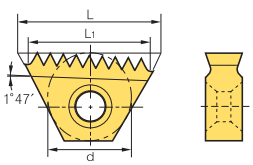
Insert size		Pitch (tpi)	Designation			L1	Tooth	Tool holder	
d	L		External+Internal		PC9570T			RH	LH
9.525	16	14	TM2EI	16-14NPTF	●	14.51	8	TMSRT - 16	TMSLT - 16
		11.5		16-11.5NPTF		13.25	6		
9.525B	22	14	TM2EI	22-14NPTF		21.77	12	TMSRT - 22	TMSLT - 22
		11.5		22-11.5NPTF		19.88	9		
15.875	27	11.5	TM2EI	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		

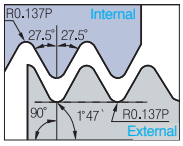
Applicable holders D49

●: Stock item

BSPT

External/Internal





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

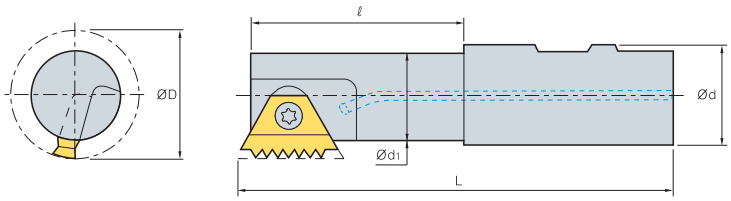
(mm)

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

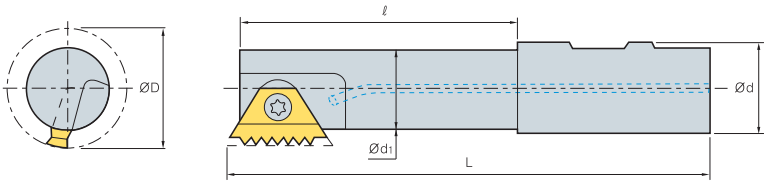


(mm)

Insert size d	Designation		ØD	Ød	Ød1	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

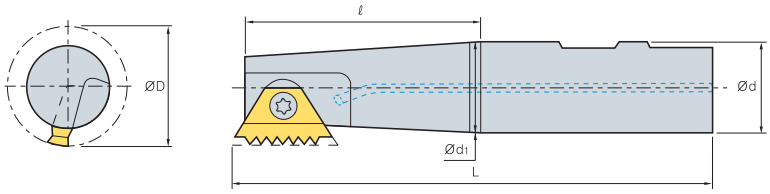


(mm)

Insert size d	Designation		ØD	Ød	Ød1	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



(mm)

Insert size d	Designation		ØD	Ød	Ød1	ℓ	L	Screw	Wrench
9.525	TMSRT	16-16	15.5	16	12.5	22.0	90.0	STM1622 STMT16	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

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

3 No. of flutes

STM D 3T 03 012 L034 - I 0.35 ISO

3T: 3 Flutes 2L: 4 Flutes, Left Flutes

4 Shank dia.

STM D 3T 03 012 L034 - I 0.35 ISO

03: 3.0

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

7 Type of tool

STM D 3T 03 012 L034 - I 0.35 ISO

I: Internal

8 Pitch

STM D 3T 03 012 L034 - I 0.35 ISO

mm: 0.35~3.0 tpi: 72~12

9 Type

STM D 3T 03 012 L034 - I 0.35 ISO

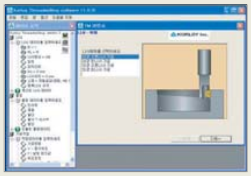
ISO Metric
American UN
Cutting edge Length UNJ
Whit Worth (BSW, BSF, BSP, BSB)
National Pipe Thread (NPT)
National Pipe Thread (NPTF)
British Standard Pipe Thread (BSPT)

TM-INFO User guide

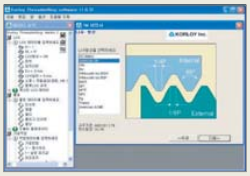
CNC Program composition
TM-INFO composes CNC program for thread milling process in a short time

- ▶Multilingual
- ▶Window operation

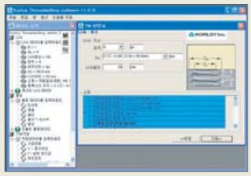
1 Select thread type



2 Select thread standard



3 Select thread type

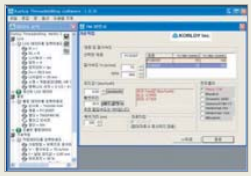


4 Input thread parameter

5 Select working way

6 Select tool

7 Confirm the working data & controler



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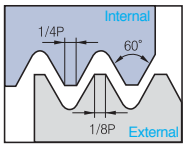
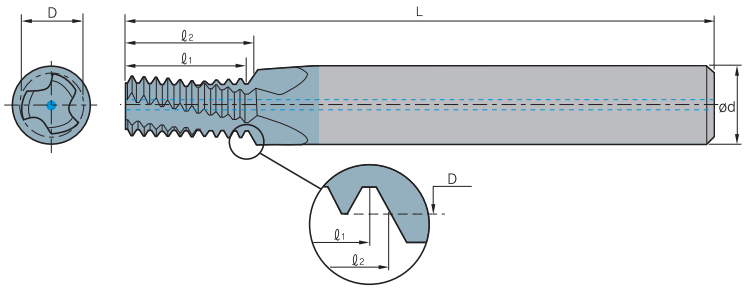
ISO Metric

Helical flutes with thru-hole coolant

Internal



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



(ℓ2≤1.5×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	z	zt	mm
M3×0.5	M3.5~M16×0.5	0.5	STMHC	04024L04-I0.50ISO		4	2.40	45	4.5	4.7	3	9	2.5
M4×0.7		0.7		04031L06-I0.70ISO		4	3.15	45	6.3	6.6	3	9	3.3
M5×0.8		0.8		04039L07-I0.80ISO		4	3.90	45	7.2	7.6	3	9	4.2
M6×1.0	M8~M40×1.0	1.0		06048L09-I1.00ISO		6	4.80	57	9.0	9.5	3	9	5.0
M8×1.25		1.25		08065L13-I1.25ISO		8	6.50	61	12.5	13.1	3	10	6.8
M10×1.5	M12~M48×1.5	1.5		10082L15-I1.50ISO		10	8.20	73	15.0	15.7	3	10	8.5
M12×1.75		1.75		10099L18-I1.75ISO		10	9.90	73	17.5	18.4	4	10	10.2
M14×2.0	M17~M80×2.0	2.0		12116L21-I2.00ISO		12	11.60	73	20.0	21.0	4	10	12.0
M16×2.0	M17~M80×2.0	2.0		14136L25-I2.00ISO		14	13.60	92	24.0	25.0	4	12	14.0

(ℓ2≤2×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	z	zt	mm
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

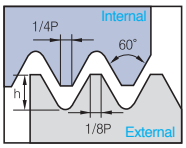
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

●: Stock item

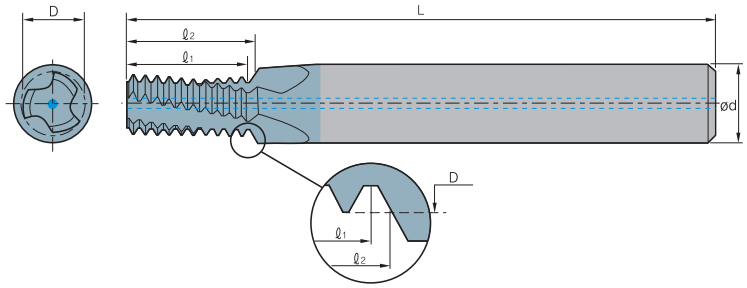
American UN

Helical flutes with thru-hole coolant

Internal



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



(ℓ2≤1.5×Thread Diameter)

Thread			Pitch (tpi)	Designation			Dimensions (mm)					No.of flute	Tooth	*Bore dia.
UNC	UNF	UNEF			Internal	PC9070M	Ød	D	L	ℓ1	ℓ2	z	zt	mm
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

(ℓ2≤2×Thread Diameter)

Thread			Pitch (tpi)	Designation			Dimensions (mm)					No.of flute	Tooth	*Bore dia.
UNC	UNF	UNEF			Internal	PC9070M	Ød	D	L	ℓ1	ℓ2	z	zt	mm
	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

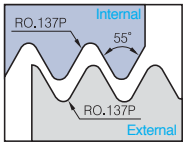
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

●: Stock item

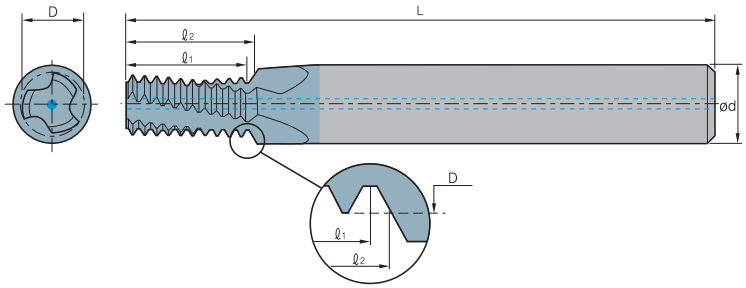
Whitworth

Helical flutes with thru-hole coolant

External/Internal



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



(ℓ2≤2×Thread Diameter)

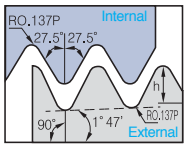
Thread		Pitch (tpi)	Designation			Dimensions (mm)					No.of flute	Tooth	*Bore dia.
BSW	BSF		External/Internal		PC9070M	Ød	D	L	ℓ1	ℓ2	z	zt	mm
	1/4″×26	26	STMHC	06050L13-EI26BSF		6	5.00	57	12.7	13.2	3	13	5.3
	5/16″×22	22		08063L16-EI22BSF		8	6.35	61	16.2	16.7	3	14	6.7
1/4″×20	3/8″×20	20		06044L13-EI20BSW		6	4.45	57	12.7	13.3	3	10	5.0
	3/8″×20	20		08076L19-EI20BSF		8	7.65	61	19.0	197	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

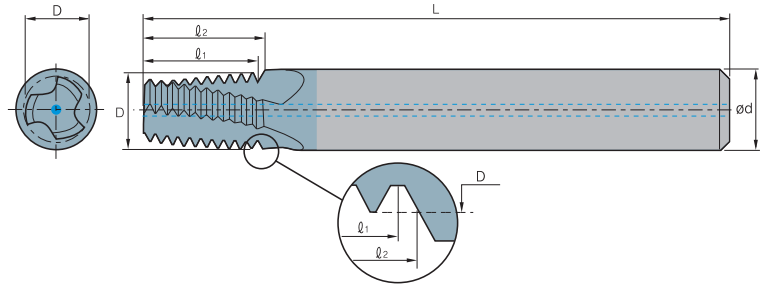
BSPT

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	Tooth	*Bore dia.
Standard		Internal		PC9070M	Ød	D	L	ℓ1	ℓ2	z	zt	mm
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

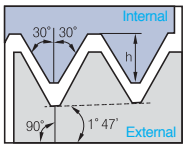
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

●: Stock item

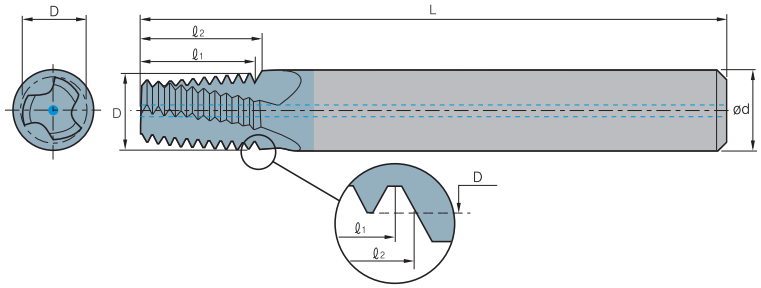
NPT

Helical flutes with thru-hole coolant

External/Internal



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

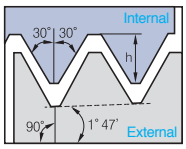


Thread	Pitch	Designation			Dimensions (mm)					No.of flute	Tooth	*Bore dia.
Standard	(tpi)	Internal		PC9070M	Ød	D	L	ℓ1	ℓ2	z	zt	mm
1/16″×27	27	STMHC	06059L09-EI27NPT		6	5.90	57	9.4	9.9	3	10	6.3
1/8″×27	27		08076L09-EI27NPT		8	7.65	61	9.4	9.9	3	10	8.5
1/4″×18	18		10099L14-EI18NPT	●	10	9.90	73	14.1	14.8	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 1/14, 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

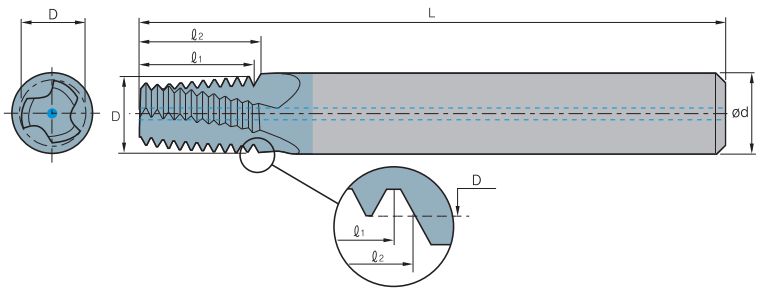
NPTF

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 1/14, 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

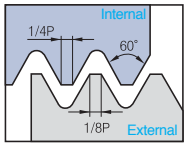
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

●: Stock item

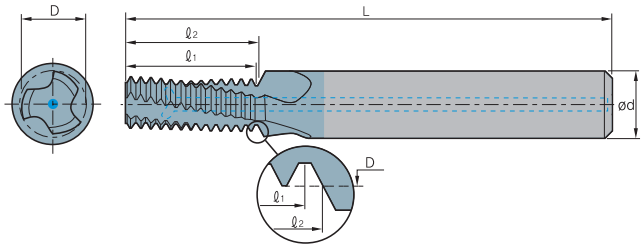
ISO Metric

Helical flutes with radial cooling

Internal



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



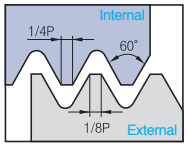
(ℓ2≤2×Thread Diameter)

Thread		Pitch (mm)	Designation			Dimensions (mm)					No.of flute	Tooth	*Bore dia.
M Coarse	M Fine			Internal	PC9070M	Ød	D	L	ℓ1	ℓ2	z	zt	mm
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

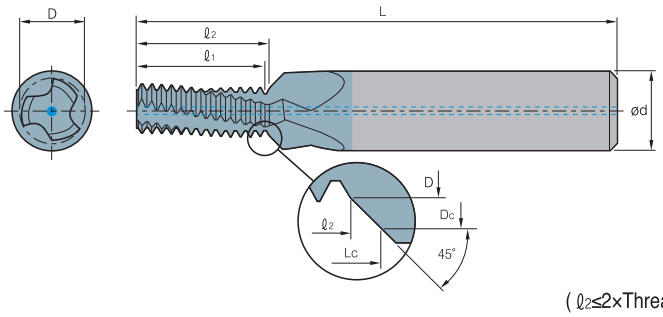
ISO Metric

Helical flutes with thru-hole coolant -thru & Chamfer

Internal



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



(ℓ2≤2×Thread Diameter)

Thread		Pitch (mm)	Designation			Dimensions (mm)							No.of flute	Tooth	*Bore dia.
M Coarse	M Fine			Internal	PC9070M	Ød	D	Dc	L	ℓ1	ℓ2	Lc	z	zt	mm
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

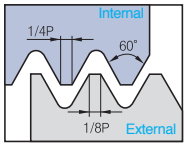
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

●: Stock item

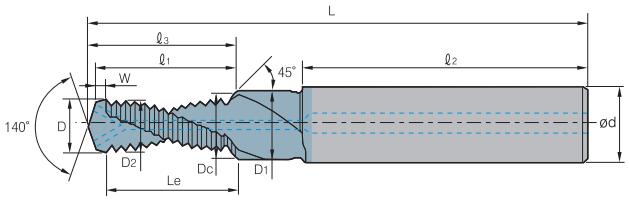
ISO Metric

Drill, Chamfer & Thread with thru-hole coolant

Internal



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



Thread	Pitch	Designation			Dimensions (mm)											No.of flute	Tooth
ISO 2D M Coarse	(mm)		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	Designation			Dimensions (mm)											No.of flute	Tooth
ISO 2.5D M Coarse	(mm)		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

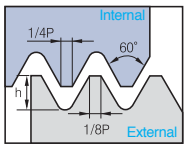
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

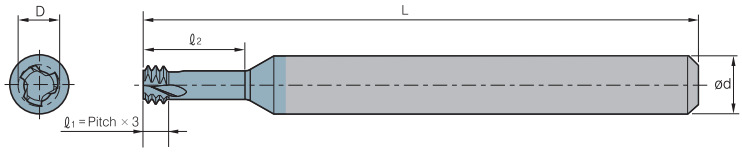
●: Stock item

ISO Metric

Deep threading

Internal





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

(ℓ2≤2×Thread Diameter)

Thread		Pitch (mm)	Designation			Dimensions (mm)				No.of flute	Tooth	*Bore dia.
M Coarse	M Fine			Internal	PC9070M	Ød	D	L	ℓ2	z	zt	mm
M1.6×0.35		0.35	STMD3T	03012L034-I0.35ISO		3	1.20	30	3.4	3	3	1.25
M2×0.4		0.4		06015L042-I0.4ISO		6	1.55	57	4.2	3	3	1.6
M2.2×0.45		0.45		06016L046-I0.45ISO		6	1.65	57	4.6	3	3	1.75
M2.5×0.45		0.45		06019L052-I0.45ISO		6	1.95	57	5.2	3	3	2.05
M3×0.5	M3.5~M16×0.5	0.5		06024L062-I0.5ISO		6	2.40	57	6.2	3	3	2.5
M3.5×0.6		0.6		06027L073-I0.6ISO		6	2.75	57	7.3	3	3	2.9
M4×0.7		0.7		06031L083-I0.7ISO		6	3.15	57	8.3	3	3	3.3
M5×0.8		0.8		06040L104-I0.8ISO		6	4.05	57	10.4	3	3	4.2
M6×1.0	M8~M40×1.0	1.0		06048L125-I1.0ISO		6	4.80	57	12.5	3	3	5.0
M8×1.25		1.25		08065L166-I1.25ISO		8	6.50	63	16.6	3	3	6.8
M10×1.5	M12~M48×1.50	1.5		10082L208-I1.50ISO		10	8.20	73	20.8	3	3	8.5
M12×1.75		1.75		10099L250-I1.75ISO		10	9.90	73	25.0	3	3	10.3

3d (ℓ2≤3×Thread Diameter)

Thread		Pitch (mm)	Designation			Dimensions (mm)				No.of flute	Tooth	*Bore dia.
M Coarse	M Fine			Internal	PC9070M	Ød	D	L	ℓ2	z	zt	mm
M1.6×0.35		0.35	STMD3T	03012L050-I0.35ISO		3	1.20	30	5.0	3	3	1.25
M2×0.4		0.4		06015L062-I0.4ISO		6	1.55	57	6.2	3	3	1.6
M2.5×0.45		0.45		06019L077-I0.45ISO		6	1.95	57	7.0	3	3	2.05
M3×0.5	M3.5~M16×0.5	0.5		06024L092-I0.5ISO		6	2.40	57	9.2	3	3	2.5
M4×0.7		0.7		06031L123-I0.7ISO		6	3.15	57	12.3	3	3	3.3
M5×0.8		0.8		06040L154-I0.8ISO		6	4.05	57	15.4	3	3	4.2
M6×1.0	M8~M40×1.0	1.0		06048L185-I1.0ISO		6	4.80	57	18.5	3	3	5.0
M8×1.25		1.25		08065L246-I1.25ISO		8	6.50	63	24.6	3	3	6.8

* Bore Diameter applies to smallest thread Dia

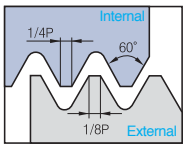
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

●: Stock item

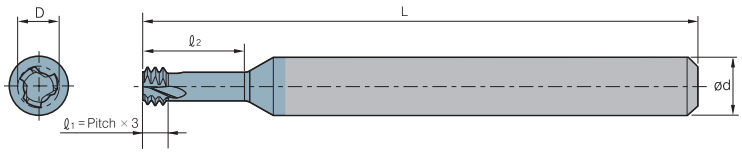
American UN

Deep threading

Internal



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



(ℓ2≤2×Thread Diameter)

Thread		Pitch (tpi)	Designation			Dimensions (mm)				No.of flute	Tooth	*Bore dia.
UNC	UNF		Internal		PC9070M	Ød	D	L	ℓ2	z	zt	mm
	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″×28	28		06052L132-I28UN		6	5.25	57	13.2	3	3	5.5
No.10~24	5/16″×24	24		06035L102-I24UN		6	3.58	57	10.2	3	3	3.9
	5/16″×24	24		08066L165-I24UN		8	6.68	63	16.5	3	3	6.9
1/4″×20	7/16″×20	20		06048L134-I20UN		6	4.88	57	13.4	3	3	5.2
	7/16″×20	20		010095L230-I20UN		10	9.55	73	23.0	3	3	9.9
3/8″×16		16		08067L191-I16UN		8	6.70	63	19.1	3	3	8.0
7/16″×14		14		10090L233-I14UN		10	9.00	73	23.3	3	3	9.4

(ℓ2≤3×Thread Diameter)

Thread		Pitch (tpi)	Designation			Dimensions (mm)				No.of flute	Tooth	*Bore dia.
UNC	UNF		Internal		PC9070M	Ød	D	L	ℓ2	z	zt	mm
	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″×24	24		08066L245-I24UN		8	6.68	63	24.5	3	3	6.9
1/4″×20	7/16″×20	20		06048L198-I20UN		6	4.88	57	19.8	3	3	5.1

* Bore Diameter applies to smallest thread Dia

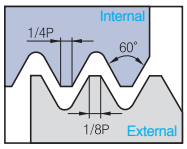
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

●: Stock item

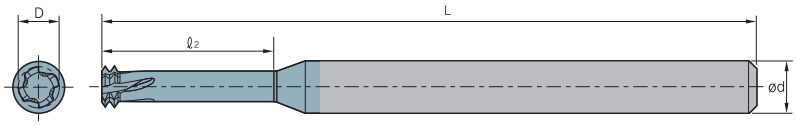
ISO Metric

Deep threading for hard materials (~HRC62)

Internal



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



(ℓ2≤2×Thread Diameter)

Thread		Pitch (mm)	Designation			Dimensions (mm)				No.of flute	Tooth	*Bore dia.
M Coarse	M Fine		Internal		PC9070M	Ød	D	L	ℓ2	z	zt	mm
M2×0.4		0.4	STMD2L	06015L042-I0.4ISO		6	1.55	76	4.60	4	2	1.6
M2.2×0.45		0.45		06016L046-I0.45ISO		6	1.65	76	5.05	4	2	1.8
M2.5×0.45		0.45		06019L052-I0.45ISO		6	1.95	76	5.65	4	2	2.05
M3×0.5	M3.5~M16×0.5	0.5		06024L062-I0.5ISO		6	2.40	76	6.75	4	2	2.55
M3.5×0.6		0.6		06027L073-I0.6ISO		6	2.75	76	7.90	4	2	2.95
M4×0.7		0.7		06031L083-I0.7ISO		6	3.15	76	9.05	4	2	3.35
M5×0.8		0.8		06040L104-I0.8ISO		6	4.05	76	11.20	4	2	4.3
M6×1.0	M8~M40×1.0	1.0		06048L125-I1.0ISO		6	4.80	76	13.50	4	2	5.1
M8×1.25		1.25		08065L166-I1.25ISO		8	6.50	80	17.85	4	2	6.8
M10×1.5	M12~M48×1.50	1.5		08079L208-I1.50ISO		8	7.90	80	22.30	4	2	8.6
M12×1.75		1.75		10099L250-I1.75ISO		10	9.90	101	26.75	4	2	10.4

(ℓ2≤3×Thread Diameter)

Thread		Pitch (mm)	Designation			Dimensions (mm)				No.of flute	Tooth	*Bore dia.
M Coarse	M Fine		Internal		PC9070M	Ød	D	L	ℓ2	z	zt	mm
M2×0.4		0.4	STMD2L	06015L062-I0.4ISO		6	1.55	76	6.60	4	2	1.6
M2.2×0.45		0.45		06019L077-I0.45ISO		6	1.95	76	8.15	4	2	2.05
M3×0.5	M3.5~M16×0.5	0.5		06024L092-I0.5ISO		6	2.40	76	9.75	4	2	2.55
M4×0.7		0.7		06031L123-I0.7ISO		6	3.15	76	13.05	4	2	3.35
M5×0.8		0.8		06040L154-I0.8ISO		6	4.05	76	16.20	4	2	4.3
M6×1.0	M8~M40×1.0	1.0		06048L185-I1.0ISO		6	4.80	76	19.50	4	2	5.1
M8×1.25		1.25		08065L246-I1.25ISO		8	6.50	80	25.85	4	2	6.8

* Bore Diameter applies to smallest thread Dia

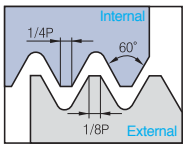
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

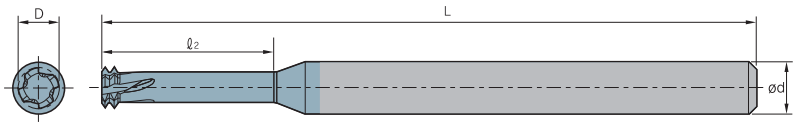
●: Stock item

American UN

Deep threading for hard materials (~HRC62)

Internal





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

(ℓ2≤2×Thread Diameter)

Thread		Pitch (tpi)	Designation			Dimensions (mm)				No.of flute	Tooth	*Bore dia.
UNC	UNF		Internal		PC9070M	Ød	D	L	ℓ2	z	zt	mm
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

(ℓ2≤3×Thread Diameter)

Thread		Pitch (tpi)	Designation			Dimensions (mm)				No.of flute	Tooth	*Bore dia.
UNC	UNF		Internal		PC9070M	Ød	D	L	ℓ2	z	zt	mm
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 = $\ell_2 - \frac{\text{Pitch}}{4}$

●: Stock item

High performance carbide tap and HSS tap

TAP

- Highly durable carbide tap and HSS tap
- A variety of taps including point taps, spiral taps, straight taps, roll taps, and more to meet a wide range of requirements, available for JIS and DIN standards in metric threads
- Custom orders can be made for powder HSS and taps under M3

Features

- Carbide type and HSS type
  - Carbide Taps: High toughness substrate
  - HSS: High vanadium substrate
- Applicable to various workpiece forms
  - A wide selection composed of point taps, spiral taps, straight taps, roll taps and more
- Metric threads standardized
  - JIS, DIN standard and special tools
- Broad line-ups per type and size
  - A wide choice with various types and sizes

Code system

M3 x 0.5 - ST 25 (S) - (120)

Metric coarse screw threads and thread size

Appearance
- ST: Straight Tap
- PT: Point Tap
- SP: Spiral Tap
- RT: Roll Tap
- SR: Spiral roll Tap
- STD: Straight Tap(DIN)
- PTD: Point Tap(DIN)
- SPD: Spiral Tap(DIN)
- RTD: Roll Tap(DIN)

Incomplete thread length

Roll Tap
- S: Single
- M: Multi

Overall length
- Special type

Grade system

Carbide Tap		HSS Tap	
FN30T	Carbide, Uncoated	HN30T	HSS, Uncoated
PC20T	Carbide, TiN coating	HC20T	HSS, TiN coating
PC10T	Carbide, TiCN coating	HC10T	HSS, TiCN coating
-	-	HH30T	HSS, Steam Oxide

Carbide tap

Tap type		Picture	Features	Grade	Size
ST	Straight tap		• For through holes and mass production • For cast iron, medium carbon steel and non-ferrous metal	FN30T	M3~M12
				PC10T	M3~M12
				PC20T	M3~M12
SP	Spiral tap		• For blind holes • Better chip evacuation through flutes	FN30T	M3~M12
				PC10T	M3~M12
RT	Roll tap		• For non-ferrous metal • For through holes and blind holes	FN30T	M3~M12
				PC10T	M3~M12
SR	Spiral roll tap		• For non-ferrous metal, Al and magnesium	FN30T	M3~M6
				PC10T	M3~M6

HSS tap

Tap type		Picture	Features	Grade	Size
ST	Straight tap		• For through holes and mass production • For cast iron, medium carbon steel and non-ferrous metal	HN30T	M3~M20
				HC20T	M3~M20
				HC10T	M3~M20
				HH30T	M3~M20
PT	Point tap		• For through holes and mass production • Similar shape to the straight type but specialized with easier chip evacuation	HN30T	M3~M20
				HC20T	M3~M20
				HC10T	M3~M20
				HH30T	M3~M20
SP	Spiral tap		• For blind holes • Chip evacuation through flutes	HN30T	M3~M20
				HC20T	M3~M20
				HC10T	M3~M20
				HH30T	M3~M24
RT	Roll tap		• For non-ferrous metal • For through holes and blind holes	HN30T	M3~M12
				HC20T	M3~M12
				HC10T	M3~M12
SR	Spiral roll tap		• For non-ferrous metal, Al and magnesium	HN30T	M3~M6
				HC20T	M3~M6
				HC10T	M3~M6

Recommended cutting speeds and cutting fluid

- For machining cold/hot forging steel and sintered ferrous alloy in high feed, high depth of cut and highly interrupted conditions
- Excellent resistance to chipping, fracture and thermal cracks
- Improved surface finish due to optimized cutting edges

ISO	Workpiece		Cutting speed, vc (m/min)					Cutting fluid			
			Straight tap	Spiral tap	Point tap	Carbide tap	Roll tap	Insoluble	Water soluble emulsion	Semi dry	Dry
P	Low carbon steel	≥ 0.25 %C	8~13	8~13	15~25	-	8~13	◎	○	△	△
	Medium carbon steel	≥ 0.25~0.45 %C	7~12	7~12	10~15	-	7~10	◎	○	△	△
	High carbon steel	≥ 0.45 %C	6~9	6~9	8~13	-	5~8	◎	○	△	△
	Alloy steel	SCM	7~12	7~12	10~15	-	5~8	◎	△	△	△
	Quenched and tempered steel	25~45HRC	3~5	3~5	4~6	-	-	◎	△	-	-
	Tool steel	SKD	6~9	6~9	7~10	-	-	◎	-	-	-
	Cast steel	SCM	6~11	6~11	10~15	-	-	◎	○	-	-
M	Stainless steel	SUS	4~7	5~8	8~13	-	5~10	◎	○	-	-
	Precipitation hardened stainless steel	SUS630 SUS631	3~5	3~5	4~6	-	-	◎	-	-	-
K	Cast iron	GC	10~15	-	-	10~20	-	◎	○	○	○
	Ductile cast iron	GCD	7~12	7~12	10~20	10~20	-	◎	○	○	-
N	Copper	Cu	6~9	6~11	7~12	10~20	7~12	○	○	-	-
	Brass, brass-cast	Bs Bsc	10~15	10~20	15~25	15~25	7~12	○	○	○	○
	Bronze, bronze-cast	PB PBC	6~11	6~11	10~20	10~20	7~12	○	○	-	-
	Rolled aluminum	Al	10~20	10~20	15~25	-	10~20	◎	○	△	-
	Aluminum-cast, alloyed	AC ACD	10~15	10~15	15~20	10~20	10~25	◎	○	△	-
	Magnesium-cast, alloyed	MC	7~12	7~12	10~15	10~20	-	◎	○	○	-
	Zinc-cast, alloyed	ZDC	1~12	7~12	10~15	10~20	7~12	◎	○	△	-
	Thermosetting plastics	Bakelite phenol epoxy	10~20	-	-	15~25	-	-	○	○	○
	Thermoplastics	Nylon vinyl chloride	10~20	10~15	10~20	10~20	-	-	○	○	○

◎ Recommended ○ Applicable △ Usable - unusable

Recommended drill diameter [On 2nd class thread basis]

[Straight tap & Spiral tap]

Thread size	Drill diameter		
	Min	Recommended	Max
M3X0.5	2.459	2.5	2.599
M4X0.7	3.242	3.3	3.422
M5X0.8	4.134	4.2	4.334
M6X1.0	4.917	5.0	5.153
M8X1.25	6.647	6.8	6.912
M10X1.25	8.647	8.8	8.912
M10X1.5	8.376	8.5	8.676
M12X1.0	10.917	11.0	11.153
M12X1.25	10.647	10.8	10.912
M12X1.5	10.376	10.5	10.676

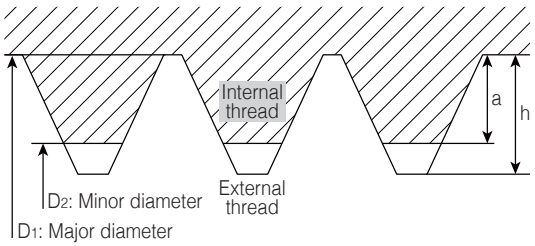
Thread size	Drill diameter		
	Min	Recommended	Max
M12X1.75	10.106	10.3	10.441
M14X1.5	12.376	12.5	12.676
M14X2.0	11.835	12.0	12.21
M16X1.5	14.376	14.5	14.676
M16X2.0	13.835	14.0	14.21
M18X1.5	16.376	16.5	16.676
M18X2.5	15.294	15.5	15.744
M20X1.5	18.376	18.5	18.676
M20X2.5	17.294	17.5	17.744
-	-	-	-

[Roll tap]

Thread size	Drill diameter		
	Min	Recommended	Max
M3X0.5	2.76	2.8	2.81
M4X0.7	3.65	3.7	3.7
M5X0.8	4.59	4.6	4.66
M6X1.0	5.48	5.5	5.57
M8X1.25	7.34	7.4	7.41
M10X1.25	9.34	9.4	9.41

Thread size	Drill diameter		
	Min	Recommended	Max
M10X1.5	9.18	9.2	9.28
M12X1.0	11.48	11.5	11.57
M12X1.25	11.34	11.4	11.41
M12X1.5	11.18	11.2	11.28
M12X1.75	11.05	11.1	11.15
-	-	-	-

[Fig] In case that a external thread has a standard shape



- Pre-hole diameter = D1: Major diameter
  D2: Minor diameter
- a = 1/2 x (D1 - D2)
- h = Height of fundamental triangle
- Rate of threading engagement = a/h x 100 (%)

$$\text{* Rate of threading engagement} = \frac{\text{Major diameter} - \text{Pre-hole diameter}}{2 \times (\text{Height of fundamental triangle})}$$

$$\text{* Pre-hole diameter} = d - 2 \times H \times \frac{\text{rate of threading engagement}}{100}$$

- d: Major diameter
- H (Rate of threading engagement's Height): 0.541266P
- P: Pitch (mm)

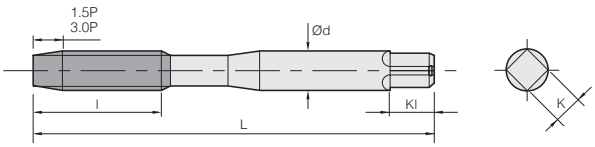
* Recommended bottom hole diameters follow the JIS2 standard for a nut. (Nuts outside the JIS standard are excluded)

$$\text{* Drill diameter} = D - 0.0068 \times P \times 65$$

- D: Nominal diameter
- P: Pitch (mm)
- 65 = 65% of the thread height

* Nut's bottom hole diameters outside the JIS standard are only for reference.

ST Straight Tap



3 | 4 | H·A 0° | Carbide | Uncoated FN30T | TiCN PC10T | TiN PC20T

(mm)

Flutes	Designation		Thread size	L	l	d	K	Kl	Limits
	1.5P	3P							
3	M3X0.5-ST15	M3X0.5-ST30	M3X0.5	46	11	4.0	3.2	6	KH3
	M4X0.7-ST15	M4X0.7-ST30	M4X0.7	52	13	5.0	4.0	7	KH3
	M5X0.8-ST15	M5X0.8-ST30	M5X0.8	60	16	5.5	4.5	7	KH3
	M6X1.0-ST15	M6X1.0-ST30	M6X1.0	62	19	6.0	4.5	7	KH3
4	M8X1.0-ST15	M8X1.0-ST30	M8X1.0	70	22	6.2	5.0	8	KH3
	M8X1.25-ST15	M8X1.25-ST30	M8X1.25	70	22	6.2	5.0	8	KH4
	M10X1.0-ST15	M10X1.0-ST30	M10X1.0	75	24	7.0	5.5	8	KH3
	M10X1.25-ST15	M10X1.25-ST30	M10X1.25	75	24	7.0	5.5	8	KH4
	M10X1.5-ST15	M10X1.5-ST30	M10X1.5	75	24	7.0	5.5	8	KH4
	M12X1.0-ST15	M12X1.0-ST30	M12X1.0	82	29	8.5	6.5	9	KH3
	M12X1.25-ST15	M12X1.25-ST30	M12X1.25	82	29	8.5	6.5	9	KH4
	M12X1.5-ST15	M12X1.5-ST30	M12X1.5	82	29	8.5	6.5	9	KH4
	M12X1.75-ST15	M12X1.75-ST30	M12X1.75	82	29	8.5	6.5	9	KH5

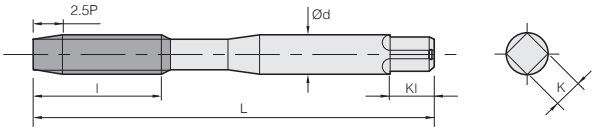
※ Ideal for mass tapping operations of general cast iron, ductile cast iron, brass-cast, thermosetting plastics, etc

※ Wear resistance highly improved by the use of TiCN, TiN coating for high efficiency tapping operations

Applicable workpiece range

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stain-less steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass-cast	Bronze	Rolled aluminum	Aluminum-cast, alloyed	Magnesium -cast, alloyed	Zinc-cast, alloyed	Titanium alloy		Thermo-setting plastics	Thermo-plastics
	C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRC	45~55 HRC	50~60 HRC	SUS	SKD	SC	GC	GCD	Cu	Bs	BsC	PB	Al	AC ADC	MC	ZDC	Ti	Ni	-	-
FN30T											◎	○		○	○	◎		○	○	○			◎	
PC10T											◎	○		○	○	◎		○	○	○			◎	
PC20T											◎	○		○	○	◎		○	○	○			◎	

SP Spiral Tap



3 | H·A 15° | Carbide | Uncoated FN30T | TiCN PC10T

(mm)

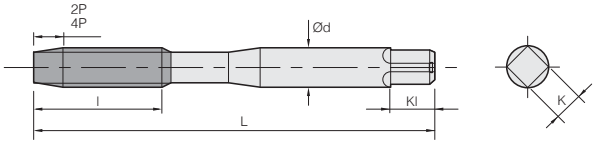
Flutes	Designation 2.5P	Thread size	L	l	d	K	Kl	Limits
3	M3X0.5-SP25	M3X0.5	46	11	4.0	3.2	6	KH3
	M4X0.7-SP25	M4X0.7	52	13	5.0	4.0	7	KH3
	M5X0.8-SP25	M5X0.8	60	16	5.5	4.5	7	KH3
	M6X1.0-SP25	M6X1.0	62	19	6.0	4.5	7	KH3
	M8X1.0-SP25	M8X1.0	70	22	6.2	5.0	8	KH3
	M8X1.25-SP25	M8X1.25	70	22	6.2	5.0	8	KH4
	M10X1.0-SP25	M10X1.0	75	24	7.0	5.5	8	KH3
	M10X1.25-SP25	M10X1.25	75	24	7.0	5.5	8	KH4
	M10X1.5-SP25	M10X1.5	75	24	7.0	5.5	8	KH4
	M12X1.0-SP25	M12X1.0	82	29	8.5	6.5	9	KH3
	M12X1.25-SP25	M12X1.25	82	29	8.5	6.5	9	KH4
	M12X1.5-SP25	M12X1.5	82	29	8.5	6.5	9	KH4
	M12X1.75-SP25	M12X1.75	82	29	8.5	6.5	9	KH5

※ Ideal for making blind holes in quantity on general cast iron, ductile cast iron, brass-cast, thermosetting plastics, etc
※ Wear resistance highly improved by the use of TiCN coating for high efficiency tapping operations

Applicable workpiece range

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stain-less steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass-cast	Bronze	Rolled aluminum	Aluminum-cast, alloyed	Magnesium-cast, alloyed	Zinc-cast, alloyed	Titanium alloy		Thermo-setting plastics	Thermo-plastics
	C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRC	45~55 HRC	50~60 HRC	SUS	SKD	SC	GC	GCD	Cu	Bs	BsC	PB	Al	AC ADC	MC	ZDC	Ti	Ni	-	-
FN30T											○	◎	◎	◎	◎	○	○	○	○	○				◎
PC10T											○	◎	◎	◎	◎	○	○	◎	◎	◎			○	◎

RT Roll Tap



Carbide | Uncoated FN30T | TiCN PC10T

(mm)

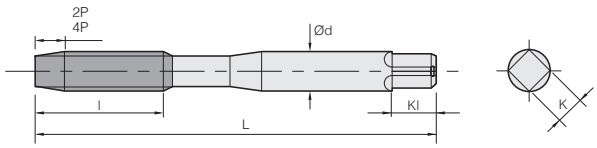
Flutes	Designation		Thread size	L	l	d	K	Kl	Limits
	2P	4P							
1	**M3X0.5-RT20(S)**	-	M3X0.5	46	11	4.0	3.2	6	GH5
4	**M3X0.5-RT20(M)**	**M3X0.5-RT40(M)**	M3X0.5	46	11	4.0	3.2	6	GH5
1	**M4X0.7-RT20(S)**	-	M4X0.7	52	13	5.0	4.0	7	GH6
4	**M4X0.7-RT20(M)**	**M4X0.7-RT40(M)**	M4X0.7	52	13	5.0	4.0	7	GH6
1	**M5X0.8-RT20(S)**	-	M5X0.8	60	16	5.5	4.5	7	GH6
4	**M5X0.8-RT20(M)**	**M5X0.8-RT40(M)**	M5X0.8	60	16	5.5	4.5	7	GH6
1	**M6X1.0-RT20(S)**	-	M6X1.0	62	19	6.0	4.5	7	GH7
4	**M6X1.0-RT20(M)**	**M6X1.0-RT40(M)**	M6X1.0	62	19	6.0	4.5	7	GH7
1	**M8X1.25-RT20(S)**	-	M8X1.25	70	22	6.2	5.0	8	GH7
4	**M8X1.25-RT20(M)**	**M8X1.25-RT40(M)**	M8X1.25	70	22	6.2	5.0	8	GH7
1	**M10X1.25-RT20(S)**	-	M10X1.25	75	24	7.0	5.5	8	GH7
4	**M10X1.25-RT20(M)**	**M10X1.25-RT40(M)**	M10X1.25	75	24	7.0	5.5	8	GH7
1	**M12X1.0-RT20(S)**	-	M12X1.0	82	29	8.5	6.5	9	GH7
4	**M12X1.0-RT20(M)**	**M12X1.0-RT40(M)**	M12X1.0	82	29	8.5	6.5	9	GH7
1	**M12X1.25-RT20(S)**	-	M12X1.25	82	29	8.5	6.5	9	GH7
4	**M12X1.25-RT20(M)**	**M12X1.25-RT40(M)**	M12X1.25	82	29	8.5	6.5	9	GH7
1	**M12X1.5-RT20(S)**	-	M12X1.5	82	29	8.5	6.5	9	GH7
4	**M12X1.5-RT20(M)**	**M12X1.5-RT40(M)**	M12X1.5	82	29	8.5	6.5	9	GH7
1	**M12X1.75-RT20(S)**	-	M12X1.75	82	29	8.5	6.5	9	GH8
4	**M12X1.75-RT20(M)**	**M12X1.75-RT40(M)**	M12X1.75	82	29	8.5	6.5	9	GH8

※ For general use on both steels and non-ferrous metal
※ Wear resistance highly improved by the use of TiCN coating for high efficiency tapping operations
※ Ideal for making both through holes and blind holes on non-ferrous metals

Applicable workpiece range

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stain-less steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass-cast	Bronze	Rolled aluminum	Aluminum-cast, alloyed	Magnesium -cast, alloyed	Zinc-cast, alloyed	Titanium alloy		Thermo-setting plastics	Thermo-plastics
	C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRC	45~55 HRC	50~60 HRC	SUS	SKD	SC	GC	GCD	Cu	Bs	BsC	PB	Al	AC ADC	MC	ZDC	Ti	Ni	-	-
FN30T													◎	◎	◎		◎	◎		◎				
PC10T	◎	◎	○	○				◎					◎	◎	◎		◎	◎		◎				

SR Spiral Roll Tap



Carbide | Uncoated FN30T | TiCN PC10T

(mm)

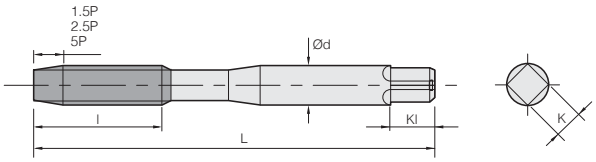
Designation		Thread size	L	l	d	K	Kl	Limits
2P	4P							
M3X0.5-SR20	**M3X0.5-SR40**	M3X0.5	46	18	4.0	3.2	6	GH6
M3.5X0.6-SR20	**M3.5X0.6-SR40**	M3.5X0.6	46	18	4.0	3.2	6	GH6
M4X0.7-SR20	**M4X0.7-SR40**	M4X0.7	52	20	5.0	4.0	7	GH7
M5X0.8-SR20	**M5X0.8-SR40**	M5X0.8	60	22	5.5	4.5	7	GH7
M6X1.0-SR20	**M6X1.0-SR40**	M6X1.0	62	24	6.0	4.5	7	GH7

※ For general use for tapping aluminum, magnesium and zinc as well as non-ferrous metal
※ Ideal for tapping steel, non-ferrous materials and stainless steel
※ Wear resistance highly improved by the use of TiCN coating for high efficiency tapping operations

Applicable workpiece range

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stain-less steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass-cast	Bronze	Rolled aluminum	Aluminum-cast, alloyed	Magnesium-cast, alloyed	Zinc-cast, alloyed	Titanium alloy		Thermo-setting plastics	Thermo-plastics
	C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRC	45~55 HRC	50~60 HRC	SUS	SKD	SC	GC	GCD	Cu	Bs	BsC	PB	Al	AC ADC	MC	ZDC	Ti	Ni	-	-
FN30T													◎	◎	◎		◎	◎		◎				
PC10T	◎	◎	○	○				◎					◎	◎	◎		◎	◎		◎				

ST Straight Tap



3 | 4 | H·A 0° | HSSE | Uncoated HN30T | TiN HC20T | TiCN HC10T | Steam Oxide HH30T

(mm)

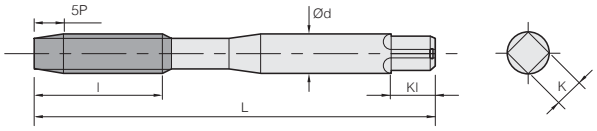
Flutes	Designation			Thread size	L	l	d	K	Kl	Limits
	1.5P	2.5P	5P							
3	M3X0.5-ST15	M3X0.5-ST25	M3X0.5-ST50	M3X0.5	46	11	4.0	3.2	6	KH2
	M4X0.7-ST15	M4X0.7-ST25	M4X0.7-ST50	M4X0.7	52	13	5.0	4.0	7	KH2
	M5X0.8-ST15	M5X0.8-ST25	M5X0.8-ST50	M5X0.8	60	16	5.5	4.5	7	KH2
	M6X1.0-ST15	M6X1.0-ST25	M6X1.0-ST50	M6X1.0	62	19	6.0	4.5	7	KH2
4	M8X1.25-ST15	M8X1.25-ST25	M8X1.25-ST50	M8X1.25	70	22	6.2	5.0	8	KH2
	M10X1.25-ST15	M10X1.25-ST25	M10X1.25-ST50	M10X1.25	75	24	7.0	5.5	8	KH2
	M10X1.5-ST15	M10X1.5-ST25	M10X1.5-ST50	M10X1.5	75	24	7.0	5.5	8	KH3
	M12X1.0-ST15	M12X1.0-ST25	M12X1.0-ST50	M12X1.0	82	29	8.5	6.5	9	KH2
	M12X1.25-ST15	M12X1.25-ST25	M12X1.25-ST50	M12X1.25	82	29	8.5	6.5	9	KH2
	M12X1.5-ST15	M12X1.5-ST25	M12X1.5-ST50	M12X1.5	82	29	8.5	6.5	9	KH3
	M12X1.75-ST15	M12X1.75-ST25	M12X1.75-ST50	M12X1.75	82	29	8.5	6.5	9	KH3
	M14X1.5-ST15	M14X1.5-ST25	M14X1.5-ST50	M14X1.5	88	30	10.5	8.0	11	KH3
	M14X2.0-ST15	M14X2.0-ST25	M14X2.0-ST50	M14X2.0	88	30	10.5	8.0	11	KH3
	M16X1.5-ST15	M16X1.5-ST25	M16X1.5-ST50	M16X1.5	95	32	12.5	10.0	13	KH3
	M16X2.0-ST15	M16X2.0-ST25	M16X2.0-ST50	M16X2.0	95	32	12.5	10.0	13	KH3
	M18X1.5-ST15	M18X1.5-ST25	M18X1.5-ST50	M18X1.5	100	37	14.0	11.0	14	KH3
	M18X2.5-ST15	M18X2.5-ST25	M18X2.5-ST50	M18X2.5	100	37	14.0	11.0	14	KH3
	M20X1.5-ST15	M20X1.5-ST25	M20X1.5-ST50	M20X1.5	105	37	15.0	12.0	15	KH3
	M20X2.5-ST15	M20X2.5-ST25	M20X2.5-ST50	M20X2.5	105	37	15.0	12.0	15	KH3

※ Ideal for making both through holes and blind holes on carbon steel, alloy steel and non-ferrous metal
※ Wear resistance highly improved by the use of TiN, TiCN, Steam oxide coating for high efficiency tapping operations
※ Built-up edges are prevented thanks to a reduced coefficient of friction gained by using porous cutting fluid of Fe_3O_4
※ Ideal for tapping stainless steel, cast steel, carbon steel for machine structures, etc

Applicable workpiece range

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stain-less steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass-cast	Bronze	Rolled aluminum	Aluminum-cast, alloyed	Magnesium -cast, alloyed	Zinc-cast, alloyed	Titanium alloy		Thermo-setting plastics	Thermo-plastics
	C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRC	45~55 HRC	50~60 HRC	SUS	SKD	SC	GC	GCD	Cu	Bs	BsC	PB	Al	AC ADC	MC	ZDC	Ti	Ni	-	-
HN30T		○										○		○	○	○	○	○	○	○				
HC20T	○	○	○	○	○									○	○	○	○	○	○	○				
HC10T	○	○	○	○	○									○	○	○	○	○	○	○				
HH30T	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○												

PT Point Tap



3 | H·A 0° | HSSE | Uncoated HN30T | TiN HC20T | TiCN HC10T | Steam Oxide HH30T

(mm)

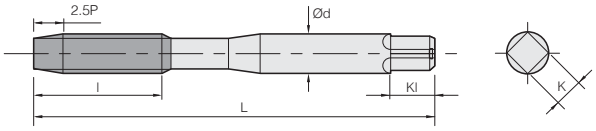
Flutes	Designation 5P	Thread size	L	l	d	K	Kl	Limits
3	M3X0.5-PT50	M3X0.5	46	11	4.0	3.2	6	KH2
	M4X0.7-PT50	M4X0.7	52	13	5.0	4.0	7	KH2
	M5X0.8-PT50	M5X0.8	60	16	5.5	4.5	7	KH2
	M6X1.0-PT50	M6X1.0	62	19	6.0	4.5	7	KH2
	M8X1.25-PT50	M8X1.25	70	22	6.2	5.0	8	KH3
	M10X1.25-PT50	M10X1.25	75	24	7.0	5.5	8	KH3
	M10X1.5-PT50	M10X1.5	75	24	7.0	5.5	8	KH3
	M12X1.0-PT50	M12X1.0	82	29	8.5	6.5	9	KH3
	M12X1.25-PT50	M12X1.25	82	29	8.5	6.5	9	KH3
	M12X1.5-PT50	M12X1.5	82	29	8.5	6.5	9	KH3
	M12X1.75-PT50	M12X1.75	82	29	8.5	6.5	9	KH4
	M14X1.5-PT50	M14X1.5	88	30	10.5	8.0	11	KH3
	M14X2.0-PT50	M14X2.0	88	30	10.5	8.0	11	KH4
	M16X1.5-PT50	M16X1.5	95	32	12.5	10.0	13	KH3
	M16X2.0-PT50	M16X2.0	95	32	12.5	10.0	13	KH4
	M18X1.5-PT50	M18X1.5	100	37	14.0	11.0	14	KH4
	M18X2.5-PT50	M18X2.5	100	37	14.0	11.0	14	KH4
	M20X1.5-PT50	M20X1.5	105	37	15.0	12.0	15	KH4
	M20X2.5-PT50	M20X2.5	105	37	15.0	12.0	15	KH4

※ Ideal for making through holes on carbon steel, alloy steel and non-ferrous metal
※ Wear resistance highly improved by the use of TiN, TiCN, Steam oxide coating for high efficiency tapping operations
※ Built-up edges are prevented thanks to a reduced coefficient of friction gained by using porous cutting fluid of Fe^3O^4
※ Ideal for tapping stainless steel, cast steel, carbon steel for machine structures, etc

Applicable workpiece range

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stain-less steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass-cast	Bronze	Rolled aluminum	Aluminum-cast, alloyed	Magnesium-cast, alloyed	Zinc-cast, alloyed	Titanium alloy		Thermo-setting plastics	Thermo-plastics
	C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRC	45~55 HRC	50~60 HRC	SUS	SKD	SC	GC	GCD	Cu	Bs	BsC	PB	Al	AC ADC	MC	ZDC	Ti	Ni	-	-
HN30T		○	○	◎							○	○	○	○	○	○	◎	○	○	○				○
HC20T	○	○	○	○				◎	○	○	○	○	○	○	○	○	○	○	○	○	○	○		○
HC10T	◎	◎	◎	○				○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		○
HH30T	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○												

SP Spiral Tap



3 | 4 | H·A 35° | HSSE | Uncoated HN30T | TiN HC20T | TiCN HC10T | Steam Oxide HH30T

(mm)

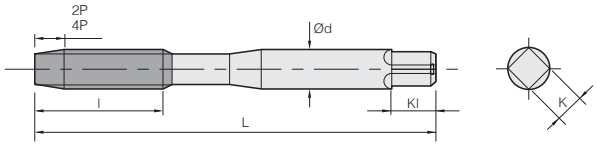
Flutes	Designation 2.5P	Thread size	L	l	d	K	Kl	Limits
3	M3X0.5-SP25	M3X0.5	46	11	4.0	3.2	6	KH2
	M4X0.7-SP25	M4X0.7	52	13	5.0	4.0	7	KH2
	M5X0.8-SP25	M5X0.8	60	16	5.5	4.5	7	KH2
	M6X1.0-SP25	M6X1.0	62	19	6.0	4.5	7	KH2
	M8X1.25-SP25	M8X1.25	70	22	6.2	5.0	8	KH2
	M10X1.25-SP25	M10X1.25	75	24	7.0	5.5	8	KH2
	M10X1.5-SP25	M10X1.5	75	24	7.0	5.5	8	KH2
	M12X1.0-SP25	M12X1.0	82	29	8.5	6.5	9	KH2
	M12X1.25-SP25	M12X1.25	82	29	8.5	6.5	9	KH2
	M12X1.5-SP25	M12X1.5	82	29	8.5	6.5	9	KH2
	M12X1.75-SP25	M12X1.75	82	29	8.5	6.5	9	KH2
	M14X1.5-SP25	M14X1.5	88	30	10.5	8.0	11	KH2
	M14X2.0-SP25	M14X2.0	88	30	10.5	8.0	11	KH2
	M16X1.5-SP25	M16X1.5	95	32	12.5	10.0	13	KH2
	M16X2.0-SP25	M16X2.0	95	32	12.5	10.0	13	KH2
4	M18X1.5-SP25	M18X1.5	100	37	14.0	11.0	14	KH2
	M18X2.5-SP25	M18X2.5	100	37	14.0	11.0	14	KH3
	M20X1.5-SP25	M20X1.5	105	37	15.0	12.0	15	KH3
	M20X2.5-SP25	M20X2.5	105	37	15.0	12.0	15	KH3

※ Ideal for making blind holes. Its flutes provide excellent chip evacuation in tapping carbon steel, alloy steel and non-ferrous materials
※ Wear resistance highly improved by the use of TiN, TiCN, Steam oxide coating for high efficiency tapping operations
※ Built-up edges are prevented thanks to a reduced coefficient of friction gained by using porous cutting fluid of Fe_3O_4
※ Ideal for tapping stainless steel, cast steel, carbon steel for machine structures, etc

Applicable workpiece range

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stain-less steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass-cast	Bronze	Rolled aluminum	Aluminum-cast, alloyed	Magnesium -cast, alloyed	Zinc-cast, alloyed	Titanium alloy		Thermo-setting plastics	Thermo-plastics
	C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRC	45~55 HRC	50~60 HRC	SUS	SKD	SC	GC	GCD	Cu	Bs	BsC	PB	Al	AC ADC	MC	ZDC	Ti	Ni	-	-
HN30T		○		◎								○	○	○	○	○	○	○	○	○				○
HC20T	○	○	○	○				○	○	○		○	○	○	○	○	○	○	○	○	○			○
HC10T	○	◎	◎	○				○	○	○		○	○	○	○	○	○	◎	○	○	○	○		○
HH30T	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○												

RT Roll Tap



HSSE | Uncoated HN30T | TiN HC20T | TiCN HC10T

(mm)

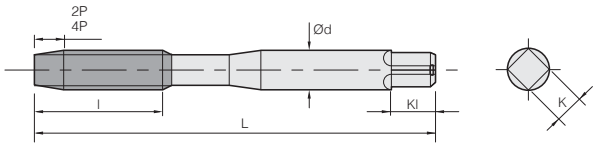
Flutes	Designation		Thread size	L	l	d	K	Kl	Limits
	2P	4P							
1	**M3X0.5-RT20(S)**	-	M3X0.5	46	11	4.0	3.2	6	GH5
4	**M3X0.5-RT20(M)**	**M3X0.5-RT40(M)**	M3X0.5	46	11	4.0	3.2	6	GH5
1	**M4X0.7-RT20(S)**	-	M4X0.7	52	13	5.0	4.0	7	GH6
4	**M4X0.7-RT20(M)**	**M4X0.7-RT40(M)**	M4X0.7	52	13	5.0	4.0	7	GH6
1	**M5X0.8-RT20(S)**	-	M5X0.8	60	16	5.5	4.5	7	GH6
4	**M5X0.8-RT20(M)**	**M5X0.8-RT40(M)**	M5X0.8	60	16	5.5	4.5	7	GH6
1	**M6X1.0-RT20(S)**	-	M6X1.0	62	19	6.0	4.5	7	GH7
4	**M6X1.0-RT20(M)**	**M6X1.0-RT40(M)**	M6X1.0	62	19	6.0	4.5	7	GH7
1	**M8X1.25-RT20(S)**	-	M8X1.25	70	22	6.2	5.0	8	GH7
4	**M8X1.25-RT20(M)**	**M8X1.25-RT40(M)**	M8X1.25	70	22	6.2	5.0	8	GH7
1	**M10X1.25-RT20(S)**	-	M10X1.25	75	24	7.0	5.5	8	GH7
4	**M10X1.25-RT20(M)**	**M10X1.25-RT40(M)**	M10X1.25	75	24	7.0	5.5	8	GH7
1	**M10X1.5-RT20(S)**	-	M10X1.5	75	24	7.0	5.5	8	GH7
4	**M10X1.5-RT20(M)**	**M10X1.5-RT40(M)**	M10X1.5	75	24	7.0	5.5	8	GH7
1	**M12X1.0-RT20(S)**	-	M12X1.0	82	29	8.5	6.5	9	GH7
4	**M12X1.0-RT20(M)**	**M12X1.0-RT40(M)**	M12X1.0	82	29	8.5	6.5	9	GH7
1	**M12X1.25-RT20(S)**	-	M12X1.25	82	29	8.5	6.5	9	GH7
4	**M12X1.25-RT20(M)**	**M12X1.25-RT40(M)**	M12X1.25	82	29	8.5	6.5	9	GH7
1	**M12X1.5-RT20(S)**	-	M12X1.5	82	29	8.5	6.5	9	GH7
4	**M12X1.5-RT20(M)**	**M12X1.5-RT40(M)**	M12X1.5	82	29	8.5	6.5	9	GH7
1	**M12X1.75-RT20(S)**	-	M12X1.75	82	29	8.5	6.5	9	GH8
4	**M12X1.75-RT20(M)**	**M12X1.75-RT40(M)**	M12X1.75	82	29	8.5	6.5	9	GH8

※ For general use for both steels and non-ferrous metal
※ Wear resistance highly improved by the use of TiN, TiCN coating for high efficiency tapping operations
※ Ideal for tapping non-ferrous alloys such as aluminum, zinc, copper, etc

Applicable workpiece range

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stain-less steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass-cast	Bronze	Rolled aluminum	Aluminum-cast, alloyed	Magnesium -cast, alloyed	Zinc-cast, alloyed	Titanium alloy		Thermo-setting plastics	Thermo-plastics
	C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRC	45~55 HRC	50~60 HRC	SUS	SKD	SC	GC	GCD	Cu	Bs	BsC	PB	Al	AC ADC	MC	ZDC	Ti	Ni	-	-
HN30T													○	○	○	○	○	○		◎				
HC20T	○	○	○	○				◎	○	○		○	○	○	○									
HC10T	◎	◎	○	○				◎					◎	◎	◎		◎	◎		◎				

SR Spiral Roll Tap



HSSE | Uncoated HN30T | TiN HC20T | TiCN HC10T

(mm)

Designation		Thread size	L	l	d	K	Kl	Limits
2P	4P							
M3X0.5-SR20	**M3X0.5-SR40**	M3X0.5	46	18	4.0	3.2	6	GH6
M3.5X0.6-SR20	**M3.5X0.6-SR40**	M3.5X0.6	48	18	4.0	3.2	6	GH6
M4X0.7-SR20	**M4X0.7-SR40**	M4X0.7	52	20	5.0	4.0	7	GH7
M5X0.8-SR20	**M5X0.8-SR40**	M5X0.8	60	22	5.5	4.5	7	GH7
M6X1.0-SR20	**M6X1.0-SR40**	M6X1.0	62	24	6.0	4.5	7	GH7

※ For general use for tapping aluminum, magnesium and zinc as well as non-ferrous metal
※ Wear resistance highly improved by the use of TiN, TiCN coating for high efficiency tapping operations
※ Ideal for tapping steel, non-ferrous materials and stainless steel

Applicable workpiece range

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stain-less steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass-cast	Bronze	Rolled aluminum	Aluminum-cast, alloyed	Magnesium -cast, alloyed	Zinc-cast, alloyed	Titanium alloy		Thermo-setting plastics	Thermo-plastics
	C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRC	45~55 HRC	50~60 HRC	SUS	SKD	SC	GC	GCD	Cu	Bs	BsC	PB	Al	AC ADC	MC	ZDC	Ti	Ni	-	-
HN30T													○	○	○	○	○	○		◎				
HC20T	○	○	○	○				◎	○	○		○	○	○	○									
HC10T	◎	◎	○	○				◎					◎	◎	◎		◎	◎		◎				