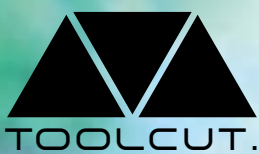
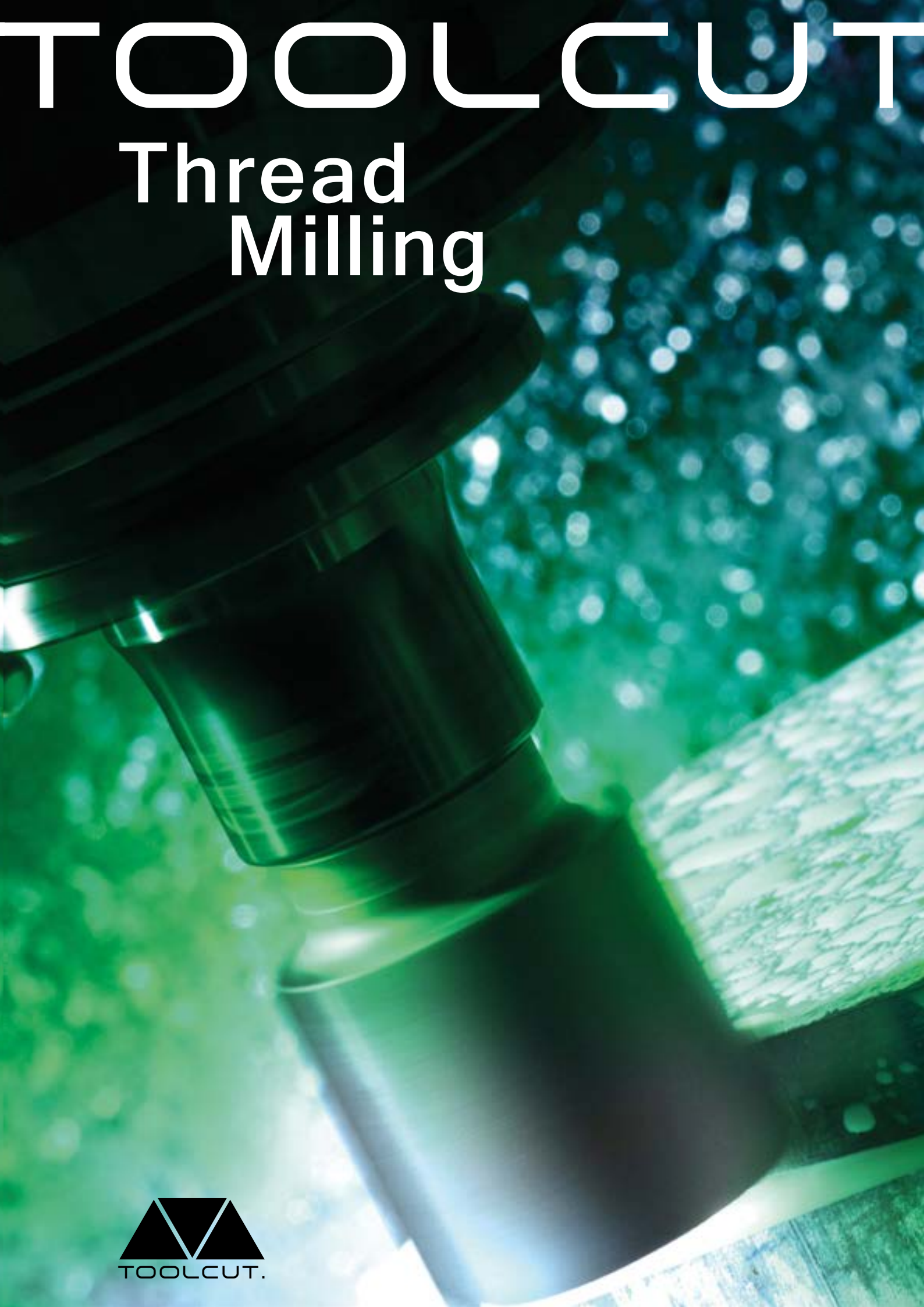


TOOLCUT

Thread Milling



TOOLCUT

SCHWARZ beliefert als Hersteller seine Kunden weltweit mit hochpräzisen Zerspanungswerkzeugen und garantiert Ihnen eine hohe Qualität und Standzeit. Namhafte Unternehmen aus fast jeder Branche der Industrie wissen bereits unsere Technologie hoch zu schätzen.

Wir arbeiten ständig an individuellen und innovativen Lösungen und möchten Ihnen unsere neue Produktpalette Toolcut präsentieren. In unserem Katalog finden Sie Fräsplatten sowie Werkzeughalter und VHM-Gewindefräser.

Toolcut ist unsere Premiumlinie im Gewindebereich.

Unsere Werkzeuge werden mit höchster Präzision nach DIN ISO 9001:2008 gefertigt und erfüllen die strengsten Industriestandards. Um bestehende und zukünftige Bedürfnisse unserer Kunden zufrieden stellen zu können, entwickeln wir uns ständig weiter und sorgen für beste Leistung und innovative Technologie.

SCHWARZ steht nicht nur für ausgezeichnete Qualität und hohe Standzeit, sondern legt auch viel Wert darauf, einen wertvollen Beitrag für die Umwelt zu leisten, indem wir bei der Herstellung ausschließlich grüne und saubere Technologien einsetzen.

Wir freuen uns, Ihre Produktionsabläufe mit unseren Werkzeugen optimieren zu dürfen!

As a manufacturer **SCHWARZ** supplies its customers worldwide with high-precision cutting tools and guarantees high quality and long durability. Well-known companies from almost every industry sector appreciates our technology.

We constantly work on individual and innovative solutions and present you our new product range **Toolcut**. In our catalogue you will find thread milling tools, tool holders and Solid carbide thread mills. **Toolcut** is a premium line for threading tools.

We produce our tools with highest precision in accordance with DIN ISO 9001:2008 and fulfill all strict industrial standards. Furthermore, we are always in development of new technologies to meet all present and future needs of our customers.

SCHWARZ has excellent quality and high durability and also pays attention to the protection of our environment through exclusive use of clean and green technologies in our production processes.

We are looking forward to optimize your production with our tools!

TOOLCUT

CONTENTS

PAGE

MILL THREAD INDEXABLE	6 - 20
PRODUCT IDENTIFICATION - INSERTS	7
ISO	8
UN - UNC, UNF, UNEF, UNS	9
WHIT - BSW, BSF, BSP	10
BSPT	10
NPT	11
NPTF	11
NPS	12
NPSF	12
PG	13
PRODUCT IDENTIFICATION - TOOLHOLDERS	14
SINGLE INSERT TOOLHOLDERS	15
LONG SHANK TOOLHOLDERS	16
TWIN INSERT TOOLHOLDERS	16
MULTI INSERT TOOLHOLDERS	17
EXTERNAL MULTI INSERT TOOLHOLDERS	17
LONG CARBIDE SHANK TEST REPORT	18
TECHNICAL SECTION	19 - 20
MILL THREAD SOLID CARBIDE	21 - 42
PRODUCT IDENTIFICATION	22
ISO	23 - 26
G55° - BSF, BSP	27 - 28
WHITWORTH - BSW	28
UN	29 - 32
BSPT - BSW	33 - 34
NPT	35 - 36
NPTF	36 - 37
NPS	38
NPSF	38
PG	39
SOLID CARBIDE TAPERED END MILLS	40
TECHNICAL SECTION	41 - 42

TOOLCUT

CONTENTS	PAGE
MINI MILL THREAD	43 - 52
PRODUCT IDENTIFICATION	44
ISO	45 - 47
UN	48 - 51
G55° - BSF, BSP	51
TECHNICAL SECTION	52
HARDCUT	53 - 58
PRODUCT IDENTIFICATION	54
ISO	55
UN - UNC, UNF, UNEF, UNS	56 - 57
TECHNICAL SECTION	58
T - LINE INDEXABLE	59 - 70
PRODUCT IDENTIFICATION	60 - 62
UN - BOLT	63
ISO - BOLT	64
BSPP - BOLT	64
TOOLHOLDERS - BOLT	65
SCREWS - BOLT	65
UN - PIN	66 - 67
ISO - PIN	68
TOOLHOLDERS - PIN	69
SCREWS - PIN	69
PINS	69
TECHNICAL SECTION	70
T - LINE SOLID CARBIDE	71 - 77
PRODUCT IDENTIFICATION	72
UN - BOLT	73 - 74
BSP	75
BSW	75
TECHNICAL SECTION	76 - 77

TOOOLCUT



TOOOLCUT

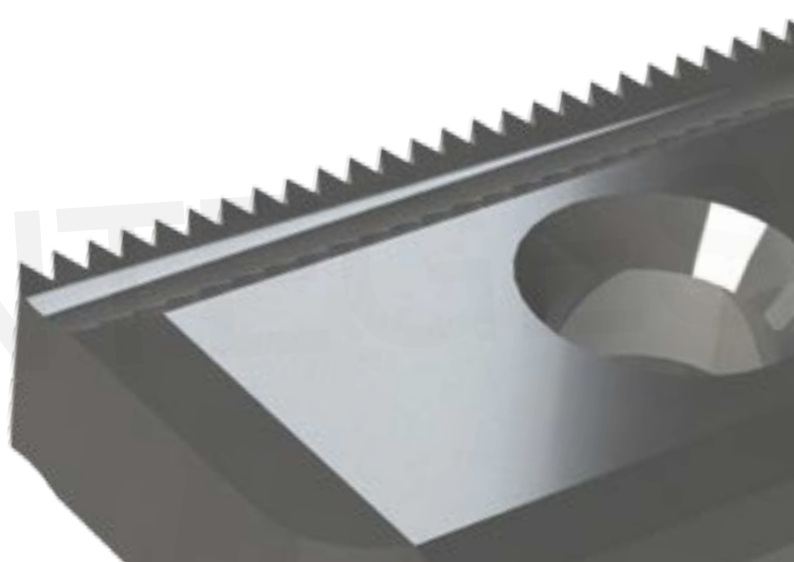
MILL-THREAD TOOLS

Mill - Thread tools for threading on CNC milling machines by using helical interpolation programs

ADVANTAGES

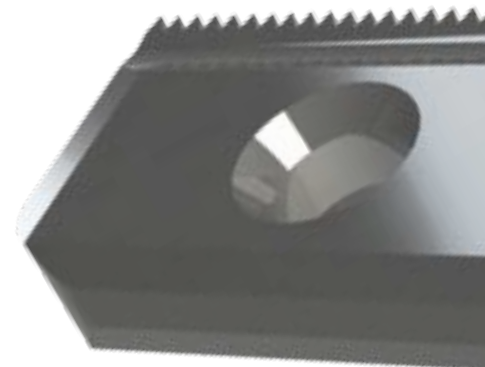
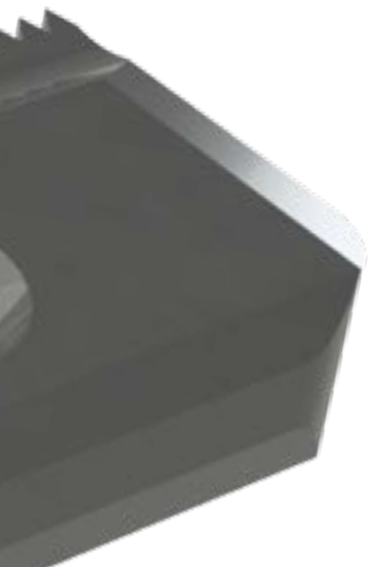
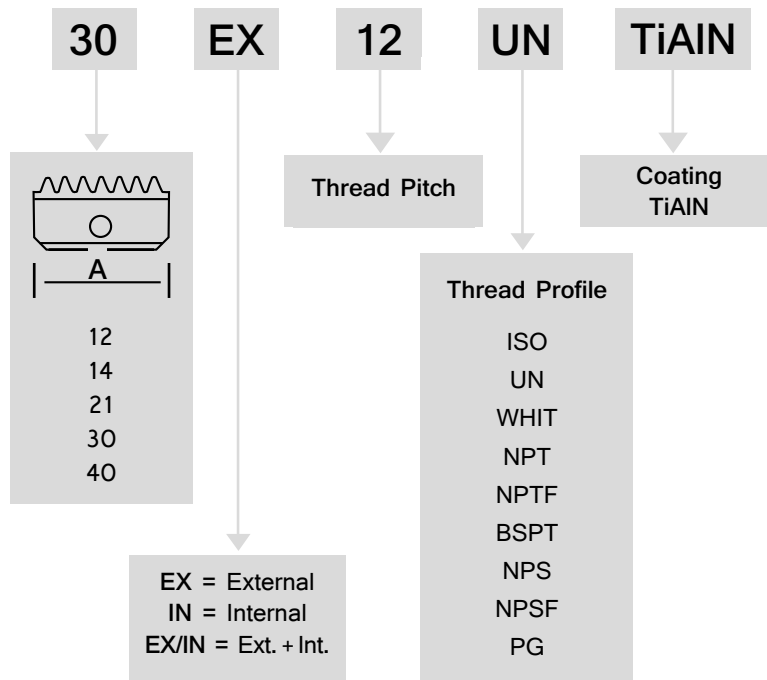
- LOWER TOOLING COSTS, CONSIDERABLY LESS EXPENSIVE THAN USING TAPS AND DIES
- LONGER TOOL LIFE THANKS TO A SPECIAL MULTILAYER COATING PROCESS
- MOST INSERTS & TOOLHOLDER CAN PRODUCE A GIVEN THREAD ON MANY DIAMETERS
- SAME TOOLHOLDER AND INSERT CAN PRODUCE BOTH RIGHT-HAND AND LEFT-HAND THREADS
- SINCE LOWER MACHINE POWER IS REQUIRED, A SMALLER MACHINE CAN PRODUCE LARGER THREADS IN A SINGLE OPERATION WITH LESS IDLE TIME AND TOOL CHANGES
- IMPROVED PRODUCTIVITY THANKS TO INCREASED CUTTING SPEEDS AND MULTITOOTH TYPE CARBIDE INSERTS
- MT TOOLS CAN PRODUCE TAPERED THREADS
- A SINGLE INSERT & TOOLHOLDER CAN PRODUCE A GIVEN THREAD ON MANY DIAMETERS (EXTERNAL & INTERNAL)
- PRISMATIC SHAPE OF INSERTS TAIL ENSURES EXACT AND RELIABLE CLAMPING ON TOOLHOLDERS
- THREADING TO ONE PITCH OF A SHOULDER IN A BLIND HOLE

ADVANTAGES
OF MILL-THREAD TOOLS

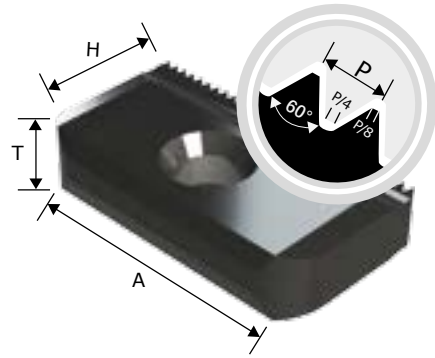


PRODUCT - IDENTIFICATION

Mill - Thread Inserts Ordering Codes



ISO - DOUBLE SIDED INSERTS

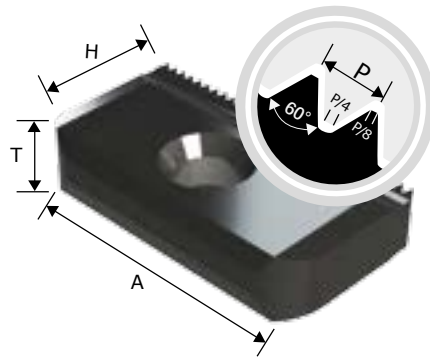


P			€		€		€		€		€
PITCH		12	PRICE	14	PRICE	21	PRICE	30	PRICE	40	PRICE
in mm			PER		PER		PER		PER		PER
			PIECE		PIECE		PIECE		PIECE		PIECE
0.5	EXT.										
0.5	INT.	*12IN0.5ISO		14IN0.5ISO							
0.75	EXT.			14EX0.75ISO							
0.75	INT.	*12IN0.75ISO		14IN0.75ISO							
1.0	EXT.			14EX1.0ISO		21EX1.0ISO					
1.0	INT.	*12IN1.0ISO		14IN1.0ISO		21IN1.0ISO					
1.25	EXT.			14EX1.25ISO							
1.25	INT.	*12IN1.25ISO		14IN1.25ISO							
1.5	EXT.			14EX1.5ISO		21EX1.5ISO		30EX1.5ISO		40EX1.5ISO	
1.5	INT.	*12IN1.5ISO		14IN1.5ISO		21IN1.5ISO		30IN1.5ISO		40IN1.5ISO	
1.75	EXT.			14EX1.75ISO							
1.75	INT.			14IN1.75ISO		21IN1.75ISO					
2.0	EXT.			14EX2.0ISO		21EX2.0ISO		30EX2.0ISO		40EX2.0ISO	
2.0	INT.			14IN2.0ISO		21IN2.0ISO		30IN2.0ISO		40IN2.0ISO	
2.5	EXT.			14EX2.5ISO		21EX2.5ISO					
2.5	INT.			14IN2.5ISO		21IN2.5ISO					
3.0	EXT.					21EX3.0ISO		30EX3.0ISO		40EX3.0ISO	
3.0	INT.					21IN3.0ISO		30IN3.0ISO		40IN3.0ISO	
3.5	EXT.							30EX3.5ISO		40EX3.5ISO	
3.5	INT.					21IN3.5ISO		30IN3.5ISO		40IN3.5ISO	
4.0	EXT.							30EX4.0ISO		40EX4.0ISO	
4.0	INT.							30IN4.0ISO		40IN4.0ISO	
4.5	EXT.										
4.5	INT.							30IN4.5ISO		40IN4.5ISO	
5.0	EXT.										
5.0	INT.							30IN5.0ISO		40IN5.0ISO	
5.5	EXT.										
5.5	INT.									40IN5.5ISO	
6.0	EXT.									40EX6.0ISO	
6.0	INT.									40IN6.0ISO	
H		6.3		7.5		12		16		20	
T		2.9		3.1		4.7		5.5		6.3	

* One cutting edge

Order example: 12IN1.5ISO TiAlN

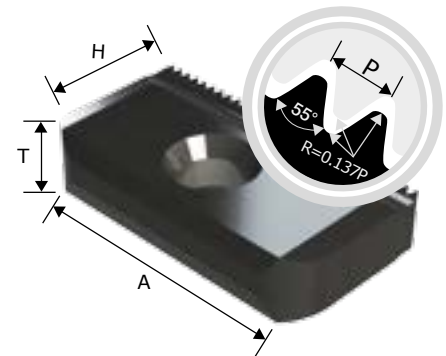
UN UNC, UNF, UNEF, UNS - DOUBLE SIDED INSERTS



P			€		€		€		€		
PITCH		12	PRICE PER PIECE	14	PRICE PER PIECE	21	PRICE PER PIECE	30	PRICE PER PIECE	40	PRICE PER PIECE
in TPI											
32	EXT.			14EX32UN							
32	INT.	*12IN32UN		14IN32UN							
28	EXT.			14EX28UN							
28	INT.	*12IN28UN		14IN28UN							
27	EXT.										
27	INT.			14IN27UN							
24	EXT.			14EX24UN		21EX24UN					
24	INT.	*12IN24UN		14IN24UN		21IN24UN					
20	EXT.			14EX20UN		21EX20UN		30EX20UN			
20	INT.	*12IN20UN		14IN20UN		21IN20UN		30IN20UN			
18	EXT.			14EX18UN		21EX18UN		30EX18UN			
18	INT.	*12IN18UN		14IN18UN		21IN18UN		30IN18UN			
16	EXT.			14EX16UN		21EX16UN		30EX16UN		40EX16UN	
16	INT.	*12IN16UN		14IN16UN		21IN16UN		30IN16UN		40IN16UN	
14	EXT.			14EX14UN		21EX14UN		30EX14UN		40EX14UN	
14	INT.			14IN14UN		21IN14UN		30IN14UN		40IN14UN	
12	EXT.			14EX12UN		21EX12UN		30EX12UN		40EX12UN	
12	INT.			14IN12UN		21IN12UN		30IN12UN		40IN12UN	
11	EXT.										
11	INT.			14IN11UN							
10	EXT.					21EX10UN		30EX10UN		40EX10UN	
10	INT.			14IN10UN		21IN10UN		30IN10UN		40IN10UN	
8	EXT.							30EX8UN		40EX8UN	
8	INT.					21IN8UN		30IN8UN		40IN8UN	
7	EXT.										
7	INT.					21IN7UN					
6	EXT.							30EX6UN		40EX6UN	
6	INT.							30IN6UN		40IN6UN	
5	EXT.										
5	INT.							30IN5UN			
4.5	EXT.										
4.5	INT.									40IN4.5UN	
4	EXT.										
4	INT.									40IN4UN	
H		6.3		7.5		12		16		20	
T		2.9		3.1		4.7		5.5		6.3	

* One cutting edge
Order example: 30EX14UN TiAlN

WHIT BSW, BSF, BSP - DOUBLE SIDED INSERTS

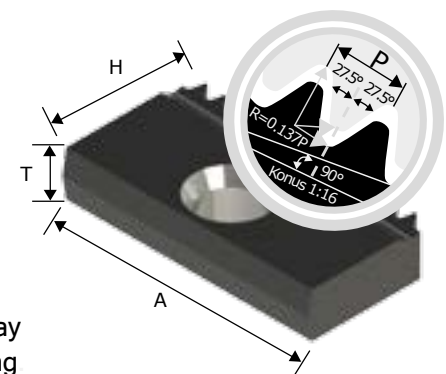


Same insert for external and internal thread.

PITCH in TPI	12	€ PRICE PER PIECE	14	€ PRICE PER PIECE	21	€ PRICE PER PIECE	30	€ PRICE PER PIECE	40	€ PRICE PER PIECE
24			14EX/IN24W							
20			14EX/IN20W		21EX/IN20W					
19	* 12EX/IN19W		14 EX/IN19W		21 EX/IN19W					
16			14 EX/IN16W		21EX/IN16W		30EX/IN16W			
14			14EX/IN14W		21EX/IN14W		30EX/IN14W			
11			14EX/IN11W		21EX/IN11W		30EX/IN11W		40EX/IN11W	
8									40EX/IN8W	
H	6.3		7.5		12		16		20	
T	2.9		3.1		4.7		5.5		6.3	

* One cutting edge
Order example: 14EX/IN24W TiAIN

BSPT

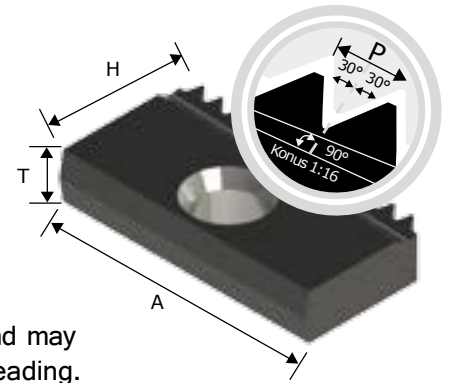


Conical pipe thread inserts are one sided and may be used for both external and internal threading

PITCH in TPI	12	€ PRICE PER PIECE	14	€ PRICE PER PIECE	21	€ PRICE PER PIECE	30	€ PRICE PER PIECE	40	€ PRICE PER PIECE
19	12EX/IN19BSPT		14EX/IN19BSPT							
14			14EX/IN14BSPT		21EX/IN14BSPT					
11					21EX/IN11BSPT		30EX/IN11BSPT		40EX/IN11BSPT	
H	6.3		7.5		12		16		20	
T	2.9		3.1		4.7		5.5		6.3	

Order example: 12EX/IN19BSPT TiAIN
For conical preparation end mills see page 40

NPT

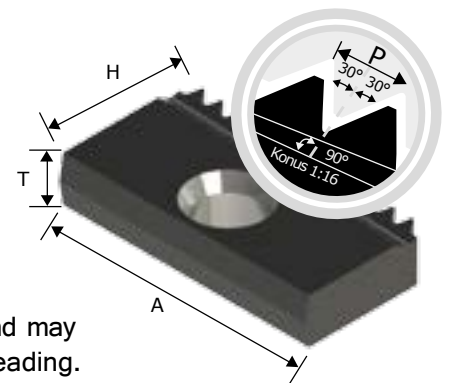


Conical pipe thread inserts are one sided and may be used for both external and internal threading.

PITCH in TPI	12	€ PRICE PER PIECE	14	€ PRICE PER PIECE	21	€ PRICE PER PIECE	30	€ PRICE PER PIECE	40	€ PRICE PER PIECE
18	12EX/IN18NPT		14EX/IN18 NPT							
14			14EX/IN14 NPT		21EX/IN14NPT					
11.5					21EX/IN11.5NPT		30EX/IN11.5NPT		40EX/IN11.5NPT	
8							30EX/IN8NPT		40EX/IN8NPT	
H	6.3		7.5		12		16		20	
T	2.9		3.1		4.7		5.5		6.3	

Order example: 21EX/IN11.5NPT TiAIN

NPTF

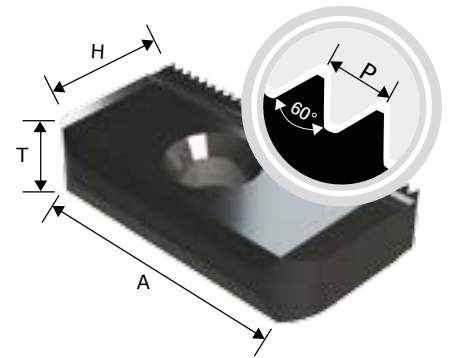


Conical pipe thread inserts are one sided and may be used for both external and internal threading.

PITCH in TPI	12	€ PRICE PER PIECE	14	€ PRICE PER PIECE	21	€ PRICE PER PIECE	30	€ PRICE PER PIECE	40	€ PRICE PER PIECE
18	12EX/IN18NPTF		14EX/IN18 NPTF							
14			14EX/IN14 NPTF		21EX/IN14NPTF					
11.5					21EX/IN11.5NPTF		30EX/IN11.5NPT		40EX/IN11.5NPTF	
8							30EX/IN8NPT		40EX/IN8NPTF	
H	6.3		7.5		12		16		20	
T	2.9		3.1		4.7		5.5		6.3	

Order example: 12EX/IN18NPTF TiAIN

NPS - DOUBLE SIDED INSERTS



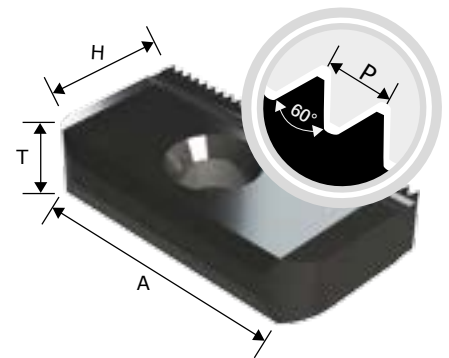
Same insert for external and internal thread.

PITCH in TPI	12	€ PRICE PER PIECE	14	€ PRICE PER PIECE	21	€ PRICE PER PIECE	30	€ PRICE PER PIECE	40	€ PRICE PER PIECE
18	*12EX/IN18NPS		14EX/IN18NPS							
14			14EX/IN14NPS		21EX/IN14NPS					
11.5					21EX/IN11.5NPS		30EX/IN11.5NPS		40EX/IN11.5NPS	
8							30EX/IN8NPS		40EX/IN8NPS	
H	6.3		7.5		12		16		20	
T	2.9		3.1		4.7		5.5		6.3	

Order example: 40EX/IN11.5NPS TiAIN

*One cutting edge

NPSF - DOUBLE SIDED INSERTS



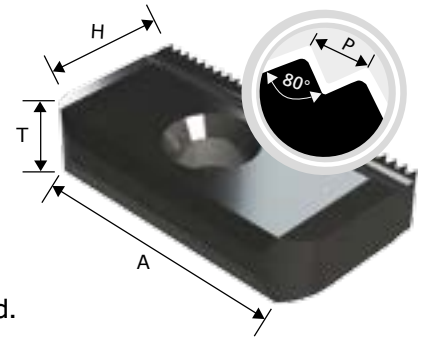
Same insert for external and internal thread.

PITCH in TPI	12	€ PRICE PER PIECE	14	€ PRICE PER PIECE	21	€ PRICE PER PIECE	30	€ PRICE PER PIECE	40	€ PRICE PER PIECE
18	*12EX/IN18NPSF		14EX/IN18NPSF							
14			14EX/IN18NPSF		21EX/IN14NPSF					
11.5					21EX/IN11.5NPSF		30EX/IN11.5NPSF		40EX/IN11.5NPSF	
8							30EX/IN8NPSF		40EX/IN8NPSF	
H	6.3		7.5		12		16		20	
T	2.9		3.1		4.7		5.5		6.3	

Order example: 30EX/IN8NPSF TiAIN

*One cutting edge

PG DIN 40430 - DOUBLE SIDED INSERTS



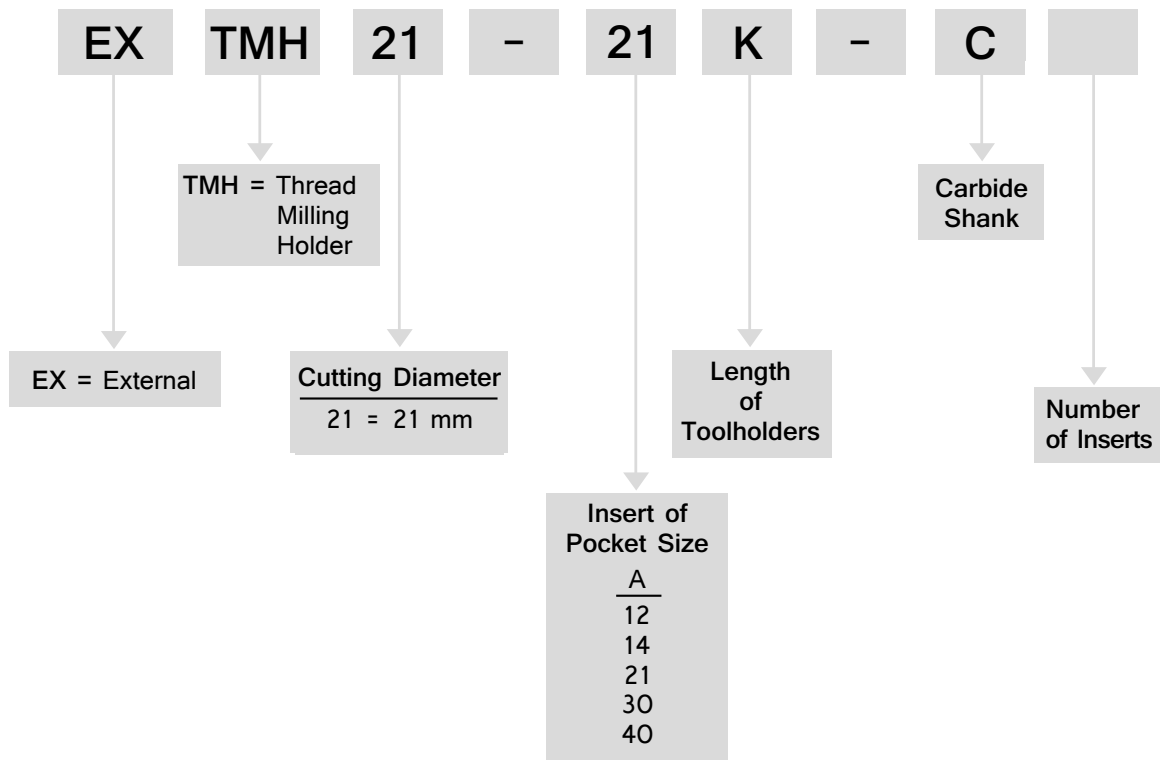
Same insert for external and internal thread.

P PITCH in TPI	14	€ PRICE PER PIECE	21	€ PRICE PER PIECE	30	€ PRICE PER PIECE
18	14EX/IN18 PG (PG 9, 11, 13.5, 16)		21EX/IN18 PG (PG 16)			
16			21EX/IN16 PG (PG 21, 29, 36, 42, 48)		30EX/IN16 PG (PG 36, 42, 48)	
H	7.5		12		16	
T	3.1		4.7		5.6	

Order example: 14EX/IN18PG TiAlN

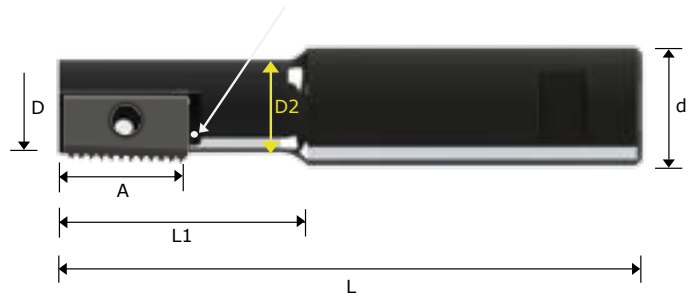
PRODUCT - IDENTIFICATION

Mill - Thread Toolholders Ordering Codes



SINGLE INSERT TOOLHOLDERS

WITH INTERNAL COOLANT BORE



L	L1	ARTICLE NUMBER	A in mm	D in mm	d in mm	D2 in mm	INSERT SCREW	TORX KEY	€ PRICE PER PIECE
85	14	TMH09 - 12H	12	9.5	20	7.5	S12	K12	
85	16	TMH10 - 12H	12	9.9	20	7.6	S12	K12	
75	20	TMH12 - 14F	14	12.0	20	8.9	S14	K14	
85	25	TMH14 - 14H	14	14.5	20	11.2	S14	K14	
85	30	TMH17 - 14H	14	17.0	20	13.4	S14	K14	
85	30	* TMH18 - 21H	21	18.0	20	14.4	S21	K21	
94	40	TMH21 - 21H	21	21.0	20	16.5	S21	K21	
110	50	TMH29 - 30J	30	29.0	25	22.4	S30	K30	
153	78	TMH48 - 40M	40	48.0	40	35.0	S40	K40	

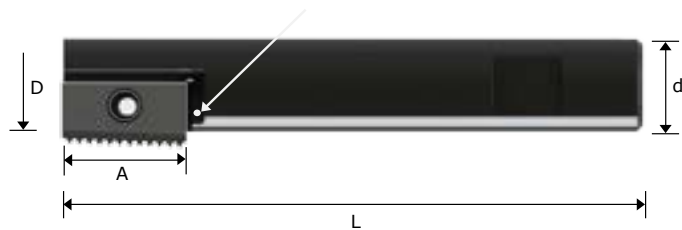
Order example: TMH48 - 40M

* Can not be used with the following inserts:

21IN3.5ISO, 21IN8UN, 21IN7UN, 21EX/IN11BSPT, 21EX/IN11.5NPT, 21EX/IN11.5NPTF

LONG SHANK TOOLHOLDERS

WITH INTERNAL COOLANT BORE



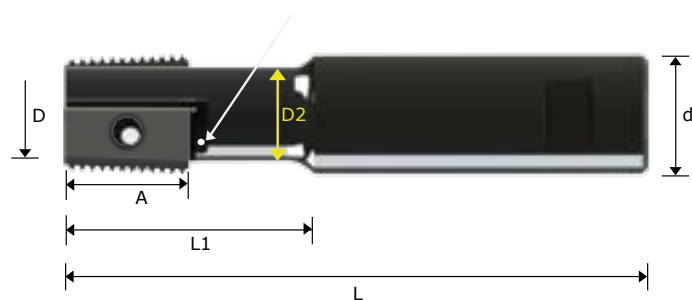
L	ARTICLE NUMBER	A in mm	D in mm	d in mm	INSERT SCREW	TORX KEY	€ PRICE PER PIECE
125	TMH25-21K	21	25	20	S21	K21	
150	TMH31-30M	30	31	25	S30	K30	
150	TMH38-30M	30	38	32	S30	K30	
210	TMH48-40R	40	48	40	S40	K40	

Order example: TMH25-21K

For holders with long overhang reduce the cutting speed and feed rate between 20% to 40% (depends on workpiece material, pitch and overhang)

TWIN INSERT TOOLHOLDERS

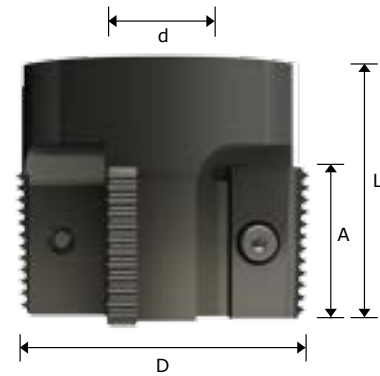
WITH INTERNAL COOLANT BORE



L	L1	ARTICLE NUMBER	A in mm	D in mm	d in mm	D2 in mm	INSERT SCREW	TORX KEY	NO. of INSERTS	€ PRICE PER PIECE
93	41	TMH20-14H-2	14	20	20	16	S14	K14	2	
108	52	TMH30-21J-2	21	30	25	24	S21	K21	2	
130	70	TMH40-30L-2	30	40	32	30	S30	K30	2	
153	78	TMH50-40M-2	40	50	40	38	S40	K40	2	

Order example: TMH20-14H-2

MULTI INSERT TOOLHOLDERS

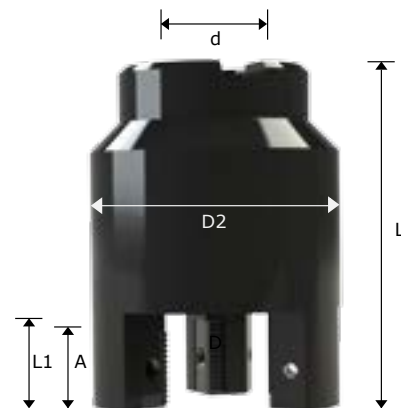


L	ARTICLE NUMBER	A in mm	D in mm	d in mm	INSERT SCREW	TORX KEY	NO. of INSERTS	€ PRICE PER PIECE
50	TMH63-21C-5	21	63	22	S21	K21	5	
50	TMH63-30C-4	30	63	22	S30	K30	4	
55	TMH80-30D-4	30	80	27	S30	K30	4	
60	TMH100-30D-4	30	100	32	S30	K30	4	
65	TMH80-40D-4	40	80	27	S40	K40	4	
70	TMH100-40E-4	40	100	32	S40	K40	4	

Order example: TMH100-40E-4

EXTERNAL MULTI INSERT TOOLHOLDERS

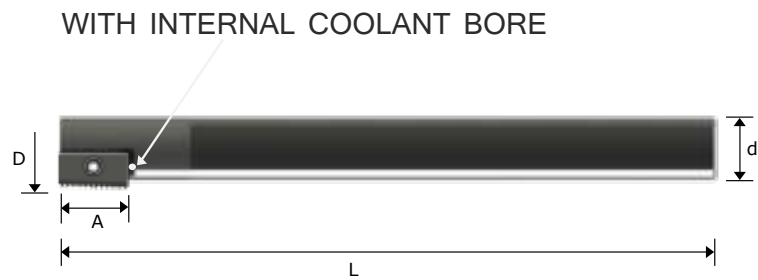
- REDUCED MACHINING TIME
- OPTIMAL COOLANT SUPPLY



L	L1	ARTICLE NUMBER	A in mm	D in mm	d in mm	D2 in mm	INSERT SCREW	TORX KEY	NO. of INSERTS	€ PRICE PER PIECE
65	25	EXTMH20-21D-3	21	20	22	58	S21	K21	3	
65	25	EXTMH30-21D-3	21	30	22	68	S21	K21	3	
70	25	EXTMH45-21E-4	21	45	27	83	S21	K21	4	

Order example: EXTMH45-21E-4

LONG CARBIDE SHANK TOOLHOLDERS



L	ARTICLE N UMBER	A in mm	D in mm	d in mm	INSERT SCREW	TORX KEY	€ PRICE PER PIECE
125	* TMH10-12KC	12	9.9	8	S12	K12	
110	TMH13-14HC	14	13.2	10	S14	K14	
150	TMH13-14JC	14	13.2	10	S14	K14	
175	TMH15-14KC	14	15.2	12	S14	K14	
130	TMH21-21KC	21	21.0	16	S21	K21	
200	TMH21-21MC	21	21.0	16	S21	K21	
270	TMH27-30SC	30	27.0	20	S30	K30	

Order example: TMH10-12KC

* Without coolant bore

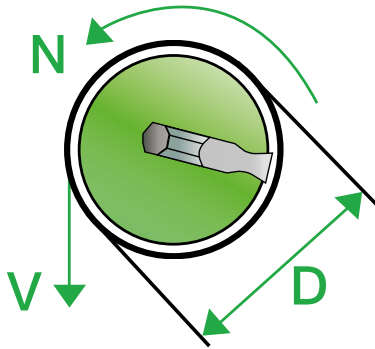
For holders with long overhang reduce the cutting speed between 20% to 40% (depends on workpiece, material, pitch and overhang).

TEST REPORT

Internal thread	M42 x 3
Thread depth	30.0 mm
Material	Stainless Steel: 1.4571
Tool	Holder: TMH21-21H Insert: 21IN3.0ISO
Cutting data	Vc: 135 m/min Fz: 0.072 mm/Z
Coolant	Emulsion
Endurance	443 Pieces (both cutting edges were used)

CONVERSION OF CUTTING SPEED TO ROTATIONAL SPEED

Conversion of selected cutting speed to rotational speed is calculated by the following formula:

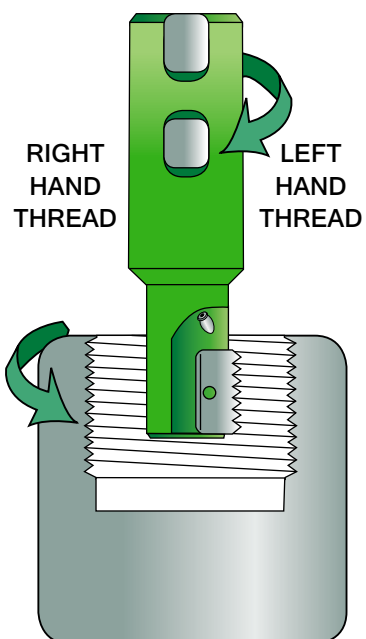


$$N = \frac{V \times 1000}{\pi \times D} = \frac{120 \times 1000}{3.14 \times 30} = 1274 \text{ RPM}$$

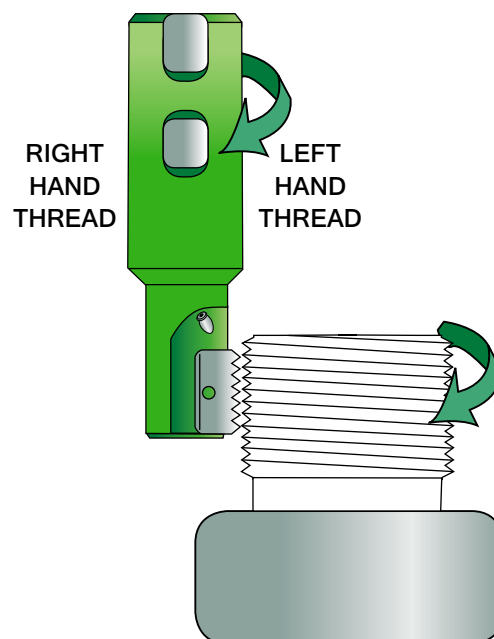
Example: $V=120 \text{ m/min}$
 $D=30 \text{ mm}$

D =Cutting Diameter

INTERNAL THREAD



EXTERNAL THREAD



TOOL SELECTION

FOR INDEXABLE AND SOLID CARBIDE MILL THREADS

Any tool with a small cutting diameter can produce large diameter threads.

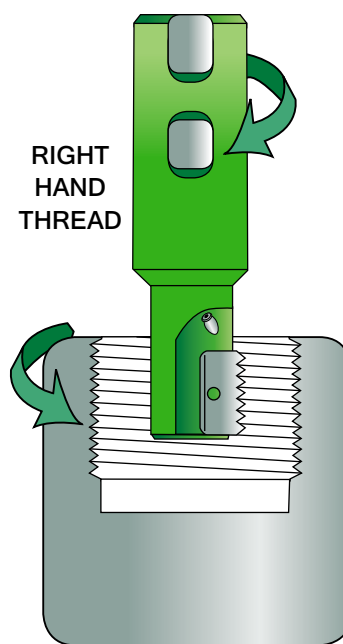
Example: Internal thread M30 x 1.5:

Find a Milling Tool to produce $d=30$ mm internal right hand ISO thread with a thread pitch $P=1.5$ mm.

Chosen toolholder: TMH21-21H

Insert: 21IN1.5ISO TIALN

If you need assistance, please call your local distributor and ask for help in selecting the appropriate tool as well as for a CNC program to suit your CNC milling machine.



MILL THREAD INSERTS SPEED AND FEED SELECTION

TIALN Sub-Micron Grade with Titanium Aluminium Nitride multi-layer coating (ISO K10-K20). This is a general purpose grade, which can be used with all materials; it should be run at medium to high cutting speeds.

RECOMMENDED FEED RATE: 0.05 - 0.15 mm

ISO	Material	Cutting Speed m/min TiAlN
P	Low and Medium Carbon Steels High Carbon Steels Alloy Steels, Treated Steels	115 - 280 130 - 200 105 - 180
M	Stainless Steel Cast Steel	130 - 190 150 - 190
K	Cast Iron	80 - 170
N	Non-Ferrous and Aluminum Synthetics, Duroplastics, Thermoplastics	180 - 340 115 - 460
S	Nickel Alloys, Titanium Alloys	25 - 90

MILL - THREAD SOLID CARBIDE

Mill - Thread tools for threading on CNC milling machines by using helical interpolation

ADVANTAGES

- SAME TOOL CAN BE USED FOR A VARIETY OF MATERIALS
- 2.2 MM AND UP CUTTING DIAMETER
- LONGER TOOL LIFE THANKS TO A SPECIAL MULTI-LAYER COATING PROCESS
- SAME TOOL USED FOR R.H. & L.H. THREADS
- SPIRAL FLUTES ALLOWS SMOOTH CUTTING ACTION
- SHORTER MACHINING TIME DUE TO MULTI 3 TO 6 FLUTES
- THREAD IS GENERATED IN ONE PASS
- LOW CUTTING PRESSURE ALLOWS THIN WALL MACHINING
- THREADS UP TO SHOULDER IN BLIND HOLE
- EXCELLENT SURFACE FINISH

- TMC** - Thread Mills without internal coolant bore
- TMCC** - Thread Mills with internal coolant bore for blind holes
- TMCF** - Thread Mills with internal coolant through the flutes
- TMCL** - Thread Mills that include relieved neck for deep work pieces

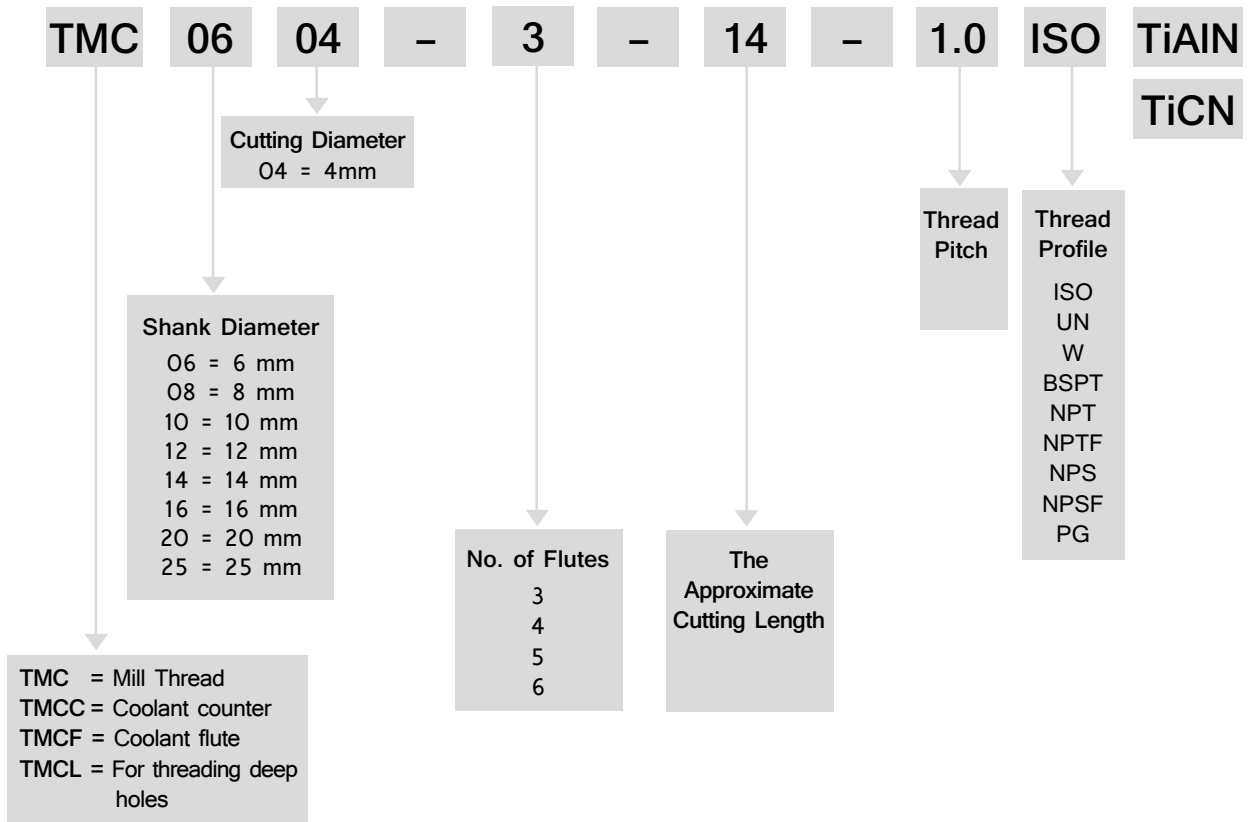


ADVANTAGES

OF MILL THREAD SOLID CARBIDE

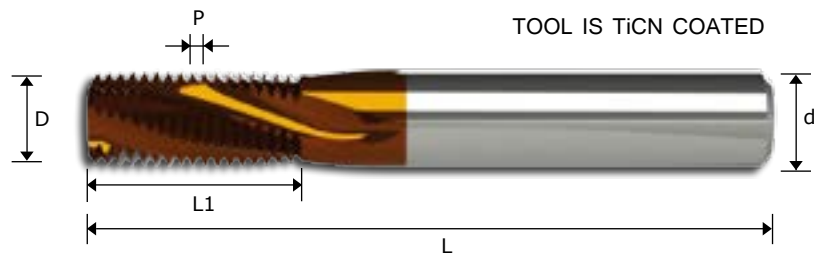
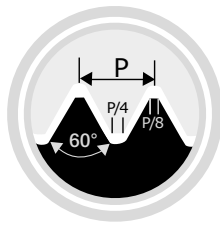
PRODUCT - IDENTIFICATION

Mill - Thread Solid Carbide Ordering Codes



ISO

Tools for internal thread



P	M	M	ARTICLE NUMBER	d	D	NO. of FLUTES	L1	L	€
PITCH	COARSE	FINE		in mm	in mm		LENGTH	LENGTH	
in mm						in mm	in mm		
0.5	M3	Ø ≥ 4	TMC 06022-3-5-0.5 ISO	6	2.2	3	5.3	58	
0.5		Ø ≥ 5	TMC 06038-3-10-0.5 ISO	6	3.8	3	10.3	58	
0.7	M4	Ø ≥ 5	TMC 06031-3-7-0.7 ISO	6	3.1	3	7.4	58	
0.75		Ø ≥ 6	TMC 06045-3-10-0.75 ISO	6	4.5	3	10.1	58	
0.8	M5	Ø ≥ 6	TMC 06036-3-9-0.8 ISO	6	3.6	3	9.2	58	
1.0	M6	Ø ≥ 7	TMC 0604-3-10-1.0 ISO	6	4.0	3	10.5	58	
1.0	M6	Ø ≥ 7	TMC 0604-3-14-1.0 ISO	6	4.0	3	14.5	58	
1.0		Ø ≥ 9	TMC 0606-3-12-1.0 ISO	6	6.0	3	12.5	58	
1.0		Ø ≥ 10	TMC 0808-4-16-1.0 ISO	6	8.0	4	16.5	64	
1.25	M8	Ø ≥ 10	TMC 0605-3-14-1.25 ISO	6	5.0	3	14.4	58	
1.25	M8	Ø ≥ 10	TMC 0605-3-19-1.25 ISO	6	5.0	3	19.4	58	
1.5	M10	Ø ≥ 12	TMC 0807-3-17-1.5 ISO	8	7.0	3	17.3	64	
1.5	M10	Ø ≥ 12	TMC 0807-3-24-1.5 ISO	8	7.0	3	24.8	76	
1.5		Ø ≥ 14	TMC 1010-4-21-1.5 ISO	10	10.0	4	21.8	73	
1.5		Ø ≥ 20	TMC 1616-6-33-1.5 ISO	16	16.0	6	33.8	105	
1.75	M12	Ø ≥ 14	TMC 0808-3-20-1.75 ISO	8	8.0	3	20.1	64	
1.75	M12	Ø ≥ 14	TMC 0808-3-28-1.75 ISO	8	8.0	3	28.9	76	
2.0	M16	Ø ≥ 17	TMC 1010-3-27-2.0 ISO	10	10.0	3	27.0	73	
2.0	M16	Ø ≥ 17	TMC 1010-3-39-2.0 ISO	10	10.0	3	39.0	105	
2.0		Ø ≥ 18	TMC 1212-4-27-2.0 ISO	12	12.0	4	27.0	84	
2.0		Ø ≥ 26	TMC 2020-6-41-2.0 ISO	20	20.0	6	41.0	105	
2.5	M20	Ø ≥ 22	TMC 1414-4-33-2.5 ISO	14	14.0	4	33.8	84	
2.5	M20	Ø ≥ 22	TMC 1414-4-48-2.5 ISO	14	14.0	4	48.8	105	
3.0	M24	Ø ≥ 25	TMC 1616-3-40-3.0 ISO	16	16.0	3	40.5	105	
3.0	M24	Ø ≥ 25	TMC 1616-3-58-3.0 ISO	16	16.0	3	58.5	120	
3.0	M27	Ø ≥ 28	TMC 2020-4-43-3.0 ISO	20	20.0	4	43.5	105	

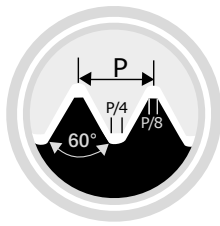
Order example: TMC 06031-3-7-0.7 ISO TiCN

For thread mills with coolant bore see following pages

For small thread mills see page 45-47

ISO with internal coolant bore

Tools for internal thread



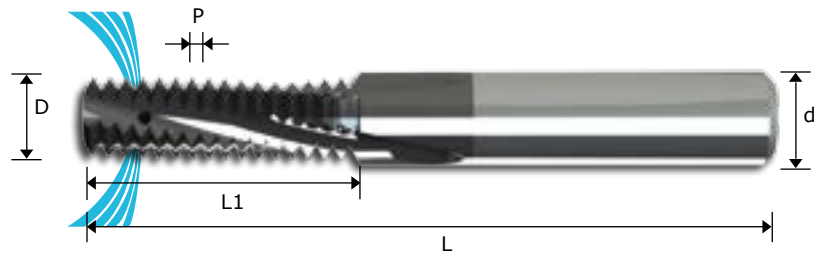
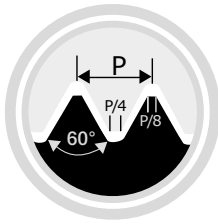
P	ISO	M	ARTICLE NUMBER	d	D	NO. of FLUTES	L1	L	€
PITCH		FINE		in mm	in mm		LENGTH	LENGTH	PRICE PER PIECE
in mm							in mm	in mm	
0.5		$\varnothing \geq 5$	TMCC 06038 -3 -10 -0.5 ISO	6	3.8	3	10.3	58	
0.7	M4	$\varnothing \geq 5$	TMCC 06031 -3 - 7 -0.7 ISO	6	3.1	3	7.4	58	
0.75		$\varnothing \geq 6$	TMCC 06045 -3 -10 -0.75 ISO	6	4.5	3	10.1	58	
0.75		$\varnothing \geq 12$	TMCC 1010 -4 -24 -0.75 ISO	10	10.0	4	24.4	73	
0.8	M5	$\varnothing \geq 6$	TMCC 06038 -3 - 9 -0.8 ISO	6	3.8	3	9.2	58	
1.0	M6	$\varnothing \geq 7$	TMCC 06046 -3 -10 -1.0 ISO	6	4.6	3	10.5	58	
1.0	M6	$\varnothing \geq 7$	TMCC 06046 -3 -14 -1.0 ISO	6	4.6	3	14.5	58	
1.0		$\varnothing \geq 9$	TMCC 0606 -3 -12 -1.0 ISO	6	6.0	3	12.5	58	
1.0		$\varnothing \geq 10$	TMCC 0808 -4 -16 -1.0 ISO	8	8.0	4	16.5	64	
1.0		$\varnothing \geq 12$	TMCC 1010 -4 -24 -1.0 ISO	10	10.0	4	24.5	73	
1.25	M8	$\varnothing \geq 10$	TMCC 0606 -3 -14 -1.25 ISO	6	6.0	3	14.4	58	
1.25	M8	$\varnothing \geq 10$	TMCC 0606 -3 -19 -1.25 ISO	6	6.0	3	19.4	58	
1.5	M10	$\varnothing \geq 12$	TMCC 08078 -3 -17 -1.5 ISO	8	7.8	3	17.0	64	
1.5	M10	$\varnothing \geq 12$	TMCC 08078 -3 -24 -1.5 ISO	8	7.8	3	24.8	76	
1.5		$\varnothing \geq 14$	TMCC 1010 -4 -21 -1.5 ISO	10	10.0	4	21.8	73	
1.5		$\varnothing \geq 16$	TMCC 1212 -4 -26 -1.5 ISO	12	12.0	4	26.3	84	
1.5		$\varnothing \geq 20$	TMCC 1616 -6 -33 -1.5 ISO	16	16.0	6	33.8	105	
1.75	M12	$\varnothing \geq 12$	TMCC 1009 -3 -20 -1.75 ISO	10	9.0	3	20.1	73	
1.75	M12	$\varnothing \geq 12$	TMCC 1009 -3 -28 -1.75 ISO	10	9.0	3	28.9	73	
2.0	M14	$\varnothing \geq 15$	TMCC 1010 -3 -27 -2.0 ISO	10	10.0	3	27.0	73	
2.0	M16	$\varnothing \geq 17$	TMCC 12118 -4 -27 -2.0 ISO	12	11.8	4	27.0	84	
2.0	M16	$\varnothing \geq 17$	TMCC 12118 -4 -39 -2.0 ISO	12	11.8	4	39.0	105	
2.0		$\varnothing \geq 26$	TMCC 2020 -6 -41 -2.0 ISO	20	20.0	6	41.0	105	
2.5	M20	$\varnothing \geq 22$	TMCC 1615 -5 -33 -2.5 ISO	16	15.0	5	33.8	105	
2.5	M20	$\varnothing \geq 22$	TMCC 1615 -5 -48 -2.5 ISO	16	15.0	5	48.8	105	
3.0	M24	$\varnothing \geq 25$	TMCC 2018 -4 -40 -3.0 ISO	20	18.0	4	40.5	105	
3.0	M24	$\varnothing \geq 25$	TMCC 2018 -4 -58 -3.0 ISO	20	18.0	4	58.5	120	
3.0	M27	$\varnothing \geq 27$	TMCC 2020 -4 -43 -3.0 ISO	20	20.0	4	43.5	105	

Order example: TMCC 2018 -4 -40 -3.0 ISO TiAlN

For small thread mills see page 45-47

ISO with internal coolant through the flutes

Tools for internal thread



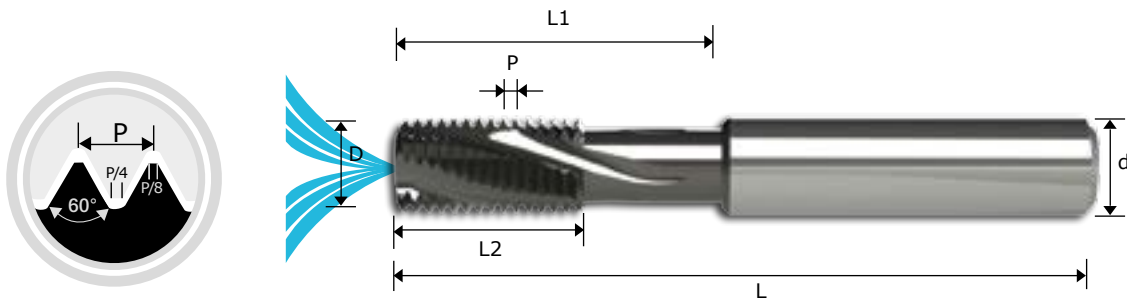
P	ISO	M		d	D		L1	L	€
PITCH		FINE	ARTICLE NUMBER	in mm	in mm	NO. of FLUTES	LENGTH	LENGTH	PRICE PER PIECE
in mm							in mm	in mm	
1.0	M6	$\varnothing \geq 7$	TMCF 06048-3-10-1.0 ISO	6	4.8	3	10.5	58	
1.0		$\varnothing \geq 9$	TMCF 0606-3-12-1.0 ISO	6	6.0	3	12.5	58	
1.0		$\varnothing \geq 10$	TMCF 0808-4-16-1.0 ISO	8	8.0	4	16.5	64	
1.25	M8	$\varnothing \geq 10$	TMCF 0606-3-14-1.25 ISO	6	6.0	3	14.4	58	
1.25	M8	$\varnothing \geq 10$	TMCF 0606-3-19-1.25 ISO	6	6.0	3	19.4	58	
1.5	M10	$\varnothing \geq 12$	TMCF 08078-3-17-1.5 ISO	8	7.8	3	17.0	64	
1.5		$\varnothing \geq 14$	TMCF 1010-4-21-1.5 ISO	10	10.0	4	21.8	73	
1.5		$\varnothing \geq 16$	TMCF 1212-4-26-1.5 ISO	12	12.0	4	26.3	84	
1.5		$\varnothing \geq 20$	TMCF 1616-5-33-1.5 ISO	16	16.0	5	33.8	101	
1.75	M12	$\varnothing \geq 12$	TMCF 1009-3-20-1.75 ISO	10	9.0	3	20.1	73	
1.75	M12	$\varnothing \geq 12$	TMCF 1009-3-28-1.75 ISO	10	9.0	3	28.9	73	
2.0	M14	$\varnothing \geq 15$	TMCF 1010-3-27-2.0 ISO	10	10.0	3	27.0	73	
2.0	M16	$\varnothing \geq 17$	TMCF 12118-4-27-2.0 ISO	12	11.8	4	27.0	84	
2.5	M20	$\varnothing \geq 22$	TMCF 1615-5-33-2.5 ISO	16	15.0	5	33.8	101	

Order example: TMCF 06048-3-10-1.0 ISO TiAlN

For small thread mills see page 45-47

ISO with relieved neck and internal coolant bore

Tools for internal thread



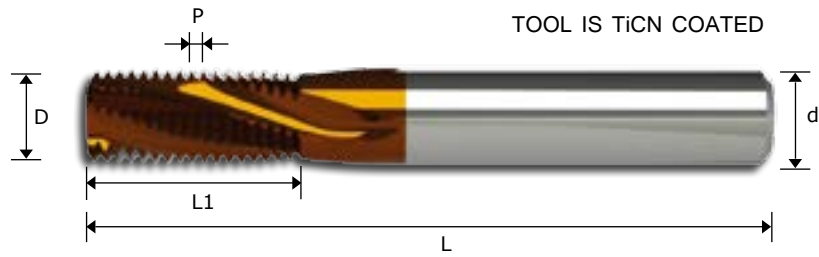
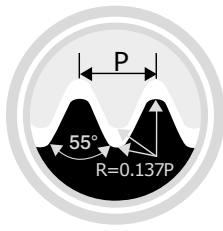
P	M	ARTICLE NUMBER	d	D	NO. of FLUTES	L2	L1	L	€
PITCH	FINE		in mm	in mm		INSERT LENGTH	LENGTH	LENGTH	
in mm						in mm	in mm	in mm	
1.0	$\emptyset \geq 12$	TMCL 1010-4-32-1.0 ISO	10	10.0	4	18.0	32.0	73	
1.0	$\emptyset \geq 14$	TMCL 1212-4-38-1.0 ISO	12	12.0	4	21.0	38.0	84	
1.0	$\emptyset \geq 18$	TMCL 1616-6-45-1.0 ISO	16	16.0	6	26.0	45.0	105	
1.5	$\emptyset \geq 13$	TMCL 1010-4-30-1.5 ISO	10	10.0	4	18.0	30.0	73	
1.5	$\emptyset \geq 15$	TMCL 1212-4-34-1.5 ISO	12	12.0	4	19.5	34.5	84	
1.5	$\emptyset \geq 19$	TMCL 1616-6-43-1.5 ISO	16	16.0	6	25.5	43.5	105	
1.5	$\emptyset \geq 23$	TMCL 2020-6-60-1.5 ISO	20	20.0	6	36.0	60.0	105	
2.0	$\emptyset \geq 16$	TMCL 1212-4-42-2.0 ISO	12	12.0	4	24.0	42.0	84	
2.0	$\emptyset \geq 20$	TMCL 1616-5-45-2.0 ISO	16	16.0	5	26.0	45.0	105	
2.0	$\emptyset \geq 24$	TMCL 2020-6-56-2.0 ISO	20	20.0	6	34.0	56.0	105	
3.0	$\emptyset \geq 22$	TMCL 1616-4-45-3.0 ISO	16	16.0	4	30.0	45.0	105	
3.0	$\emptyset \geq 26$	TMCL 2020-5-54-3.0 ISO	20	20.0	5	33.0	54.0	105	
3.5	$\emptyset \geq 26$	TMCL 2020-4-45-3.5 ISO	20	20.0	4	28.0	45.5	105	
4.0	$\emptyset \geq 31$	TMCL 2525-4-64-4.0 ISO	25	25.0	4	40.0	64.0	160	

Order example: TMCL 1212-4-38-1.0 ISO TiAlN

For small thread mills see page 45-47

G55° BSF, BSP

Same tool for internal and external thread

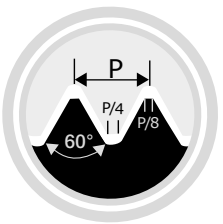


P PITCH in TPI	STANDARD	ARTICLE NUMBER	d in mm	D in mm	NO. of FLUTES	L1 LENGTH in mm	L LENGTH in mm	€ PRICE PER PIECE
28	G1/8	TMC 0606 - 3 - 9 - 28 W	6	6.0	3	9.5	58	
19	G1/4 - 3/8	TMC 0808 - 3 - 14 - 19 W	8	8.0	3	14.0	64	
14	G1/2 - 7/8	TMC 1212 - 4 - 19 - 14 W	12	12.0	4	19.0	84	
14	G1/2 - 7/8	TMC 1212 - 4 - 26 - 14 W	12	12.0	4	26.3	84	
11	G1/2 - 11/2	TMC 1212 - 3 - 24 - 11 W	12	12.0	3	24.2	84	
11	G1 - 3	TMC 1616 - 4 - 38 - 11 W	16	16.0	4	38.1	105	
11	G ≥ 1	TMC 2020 - 5 - 47 - 11 W	20	20.0	5	47.3	105	

Order example: TMC 0808 - 3 - 14 - 19 W TiCN
For small thread mills see page 51

G55° BSF, BSP with internal coolant bore

Same tool for internal and external thread

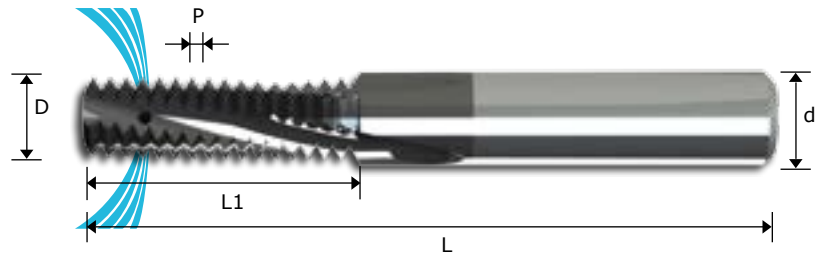
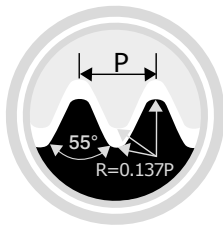


P PITCH in TPI	STANDARD	ARTICLE NUMBER	d in mm	D in mm	NO. of FLUTES	L1 LENGTH in mm	L LENGTH in mm	€ PRICE PER PIECE
28	G1/8	TMCC 08078 - 3 - 14 - 28 W	8	7.8	3	14.1	64	
19	G1/4 - 3/8	TMCC 1010 - 4 - 16 - 19 W	10	10.0	4	16.7	73	
14	G1/2 - 7/8	TMCC 1616 - 5 - 26 - 14 W	16	16.0	5	26.3	105	
11	G ≥ 1	TMCC 1616 - 4 - 38 - 11 W	16	16.0	4	38.1	105	
11	G ≥ 1	TMCC 2020 - 5 - 47 - 11 W	20	20.0	5	47.3	105	

Order example: TMCC 1616 - 5 - 26 - 14 W TiAlN
For small thread mills see page 51

G55° BSF, BSP with internal coolant through the flutes

Same tool for internal and external thread



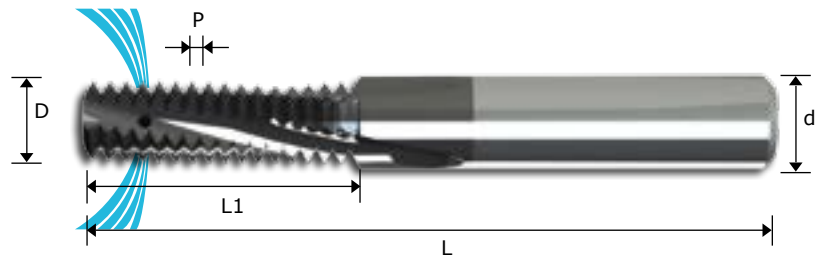
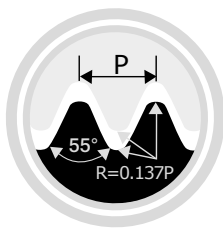
P PITCH in TPI	STANDARD	ARTICLE NUMBER	d in mm	D in mm	NO. of FLUTES	L1 LENGTH in mm	L LENGTH in mm	€ PRICE PER PIECE
28	G1/8	TMCF 08078 - 3 - 14 - 28 W	8	7.8	3	14.1	64	
19	G1/4 - 3/8	TMCF 1010 - 4 - 16 - 19 W	10	10.0	4	16.7	73	
14	G1/2 - 7/8	TMCF 1616 - 5 - 26 - 14 W	16	16.0	5	26.3	101	
11	G ≥ 1	TMCF 1616 - 4 - 38 - 11 W	16	16.0	4	38.1	101	

Order example: TMCF 1010 - 4 - 16 - 19 W TiAlN

For small thread mills see page 51

WHITWORTH BSW with internal coolant through the flutes

Same tool for internal and external thread



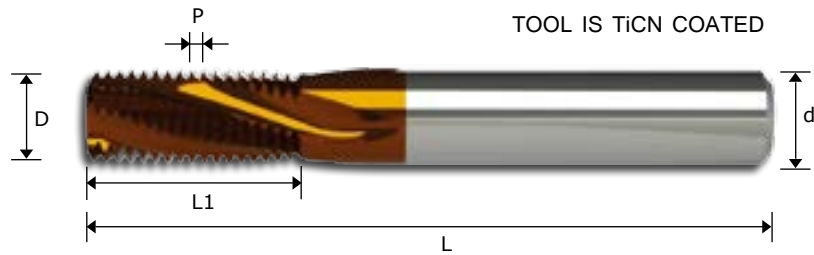
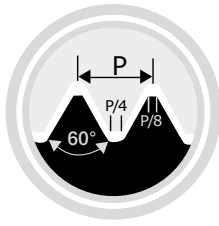
P PITCH in TPI	STANDARD	ARTICLE NUMBER	d in mm	D in mm	NO. of FLUTES	L1 LENGTH in mm	L LENGTH in mm	€ PRICE PER PIECE
*20	1/4	TMCF 06046 - 3 - 12 - 20 W	6	4.6	3	12.1	58	
18	5/16	TMCF 06053 - 3 - 14 - 18 W	6	5.3	3	14.8	58	
16	3/8	TMCF 08068 - 3 - 16 - 16 W	8	6.8	3	16.7	64	
16	1/2	TMCF 10092 - 4 - 24 - 16 W	10	9.2	4	24.6	73	
14	7/16	TMCF 08078 - 4 - 20 - 14 W	8	7.8	4	20.9	64	
12	1/2	TMCF 10086 - 4 - 24 - 12 W	10	8.6	4	24.4	73	
11	5/8	TMCF 12109 - 4 - 28 - 11 W	12	10.9	4	28.9	84	

Order example: TMCF 06046 - 3 - 12 - 20 W TiAlN

*Cutter without coolant

UN

Tools for internal thread



P PITCH in TPI	UNC	UNF	UNEF	ARTICLE NUMBER	d in mm	D in mm	NO. of FLUTES	L1 LENGTH in mm	L LENGTH in mm	€ PRICE PER PIECE
40	5			TMC 06025 - 3 - 6 - 40 UN	6	2.5	3	6.0	58	
32	8	10	12	TMC 06032 - 3 - 6 - 32 UN	6	3.2	3	6.8	58	
28		1/4		TMC 0604 - 3 - 11 - 28 UN	6	4.0	3	11.3	58	
28			7/16-1/2	TMC 0606 - 3 - 14 - 28 UN	6	6.0	3	14.1	58	
24		5/16		TMC 0605 - 3 - 14 - 24 UN	6	5.0	3	14.3	58	
24		3/8	9/16-5/8	TMC 0807 - 3 - 21 - 24 UN	8	7.0	3	20.6	64	
20	1/4			TMC 06045 - 3 - 12 - 20 UN	6	4.5	3	12.1	58	
20		7/16-1/2		TMC 0807 - 3 - 21 - 20 UN	8	7.0	3	21.0	64	
20			3/4 - 1	TMC 1212 - 5 - 27 - 20 UN	12	12.0	5	27.3	84	
18	5/16			TMC 0605 - 3 - 14 - 18 UN	6	5.0	3	14.8	58	
18		9/16-5/8	1 1/8 - 1 5/8	TMC 1010 - 4 - 26 - 18 UN	10	10.0	4	26.1	73	
16	3/8			TMC 0606 - 3 - 16 - 16 UN	6	6.0	3	16.7	58	
16		3/4		TMC 1212 - 4 - 31 - 16 UN	12	12.0	4	31.0	84	
14	7/16			TMC 0807 - 3 - 20 - 14 UN	8	7.0	3	20.9	64	
14		7/8		TMC 1615 - 5 - 37 - 14 UN	16	15.0	5	37.2	105	
13	1/2			TMC 0808 - 3 - 22 - 13 UN	8	8.0	3	22.5	64	
12	9/16			TMC 1010 - 3 - 26 - 12 UN	10	10.0	3	26.5	73	
12		1 - 1 1/2		TMC 1616 - 5 - 41 - 12 UN	16	16.0	5	41.3	105	
11	5/8			TMC 1010 - 3 - 28 - 11 UN	10	10.0	3	28.9	73	
10	3/4			TMC 1212 - 3 - 34 - 10 UN	12	12.0	3	34.3	84	
9	7/8			TMC 1615 - 3 - 38 - 9 UN	16	15.0	3	38.1	150	
8	1			TMC 1616 - 3 - 42 - 8 UN	16	16.0	3	42.9	105	
7	1 1/8 - 1 1/4			TMC 2020 - 4 - 45 - 7 UN	20	20.0	4	45.3	105	

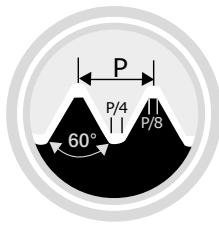
Order example: TMC 1212 - 5 - 27 - 20 UN TiCN

For thread mills with coolant bore see following pages

For small thread mills see page 48-51

UN with internal coolant bore

Tools for internal thread



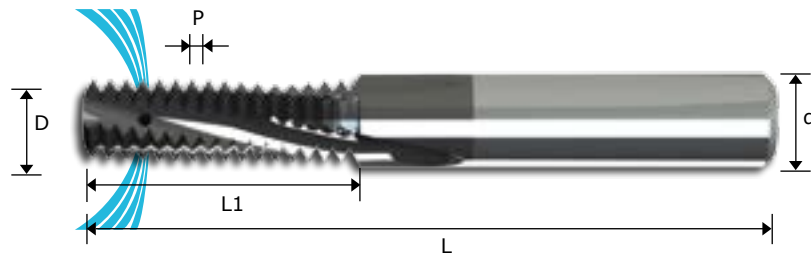
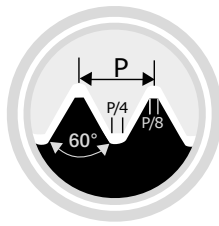
P PITCH in TPI	UNC	UNF	UNEF	ARTICLE NUMBER	d in mm	D in mm	NO. of FLUTES	L1 LENGTH in mm	L LENGTH in mm	€ PRICE PER PIECE
32	8	10	12	TMCC 06032 - 3 - 6 - 32 UN	6	3.2	3	6.8	58	
32			5/16	TMCC 0606 - 3 - 14 - 32 UN	6	6.0	3	14.7	58	
32			3/8	TMCC 0808 - 4 - 18 - 32 UN	8	8.0	4	18.7	64	
28		1/4		TMCC 0605 - 3 - 11 - 28 UN	6	5.0	3	11.3	58	
28			7/16-1/2	TMCC 0606 - 3 - 14 - 28 UN	6	6.0	3	14.1	58	
24		5/16		TMCC 08066 - 3 - 14 - 24 UN	8	6.6	3	14.3	64	
24		3/8	9/16-5/8	TMCC 0808 - 4 - 21 - 24 UN	8	8.0	4	20.6	64	
20	1/4			TMCC 06047 - 3 - 12 - 20 UN	6	4.7	3	12.1	58	
20		7/16		TMCC 0808 - 3 - 21 - 20 UN	8	8.0	3	21.0	64	
20		1/2		TMCC 1010 - 4 - 22 - 20 UN	10	10.0	4	22.3	73	
20			3/4 - 1	TMCC 1212 - 5 - 27 - 20 UN	12	12.0	5	27.3	84	
18	5/16			TMCC 06056 - 3 - 14 - 18 UN	6	5.6	3	14.8	58	
18		9/16-5/8	1 1/8 - 1 1/4	TMCC 12113 - 4 - 26 - 18 UN	12	11.3	4	26.1	84	
16	3/8			TMCC 08067 - 3 - 16 - 16 UN	8	6.7	3	16.7	64	
16		3/4		TMCC 1212 - 4 - 31 - 16 UN	12	12.0	4	31.0	84	
14	7/16			TMCC 08077 - 3 - 20 - 14 UN	8	7.7	3	20.9	64	
14		7/8		TMCC 1616 - 5 - 37 - 14 UN	16	16.0	5	37.2	105	
13	1/2			TMCC 10092 - 3 - 22 - 13 UN	10	9.2	3	22.5	73	
12	9/16			TMCC 12105 - 3 - 26 - 12 UN	12	10.5	3	26.5	84	
12		1 - 1 1/2		TMCC 1616 - 5 - 41 - 12 UN	16	16.0	5	41.3	105	
11	5/8			TMCC 12114 - 3 - 28 - 11 UN	12	11.4	3	28.9	84	
10	3/4			TMCC 16144 - 4 - 34 - 10 UN	16	14.4	4	34.3	105	
9	7/8			TMCC 1616 - 3 - 38 - 9 UN	16	16.0	3	38.1	105	
8	1			TMCC 20195 - 4 - 42 - 8 UN	20	19.5	4	42.9	105	
7	1 1/8 - 1 1/4			TMCC 2020 - 4 - 45 - 7 UN	20	20.0	4	45.3	105	

Order example: TMCC 10092 - 3 - 22 - 13 UN TiAlN

For small thread mills see page 48-51

UN with internal coolant through the flutes

Tools for internal thread



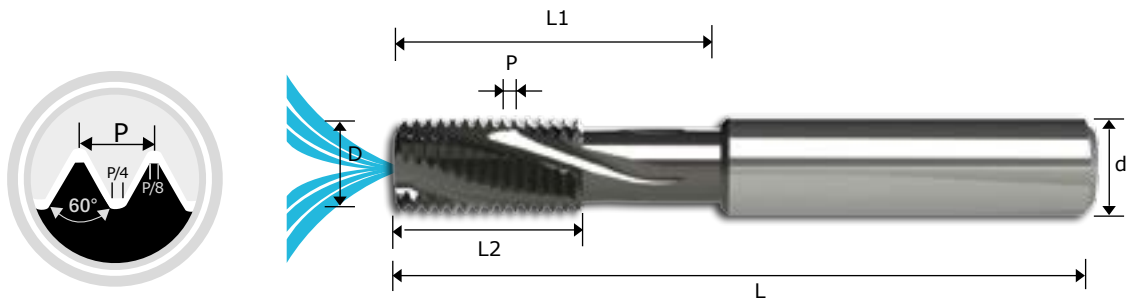
P	UNC	UNF	UNEF	ARTICLE NUMBER	d	D	NO. of FLUTES	L1	L	€
PITCH					in mm	in mm		LENGTH	LENGTH	PRICE PER
in TPI								in mm	in mm	PIECE
28		1/4		TMCF 0605 - 3-11-28 UN	6	5.0	3	11.3	58	
28			7/16-1/2	TMCF 0606 - 3-14-28 UN	6	6.0	3	14.1	58	
24		5/16		TMCF 08066 - 3-14-24 UN	8	6.6	3	14.3	64	
24		3/8	9/16-5/8	TMCF 0808 - 4-21-24 UN	8	8.0	4	20.6	64	
20		7/16		TMCF 0808 - 3-21-20 UN	8	8.0	3	21.0	64	
20		1/2		TMCF 1010 - 4-22-20 UN	10	10.0	4	22.3	73	
20			3/4-1	TMCF 1212 - 5-27-20 UN	12	12.0	5	27.3	84	
18	5/16			TMCF 06056 - 3-14-18 UN	6	5.6	3	14.8	58	
18		9/16-5/8	1 1/8 - 1 5/8	TMCF 12113 - 4-26-18 UN	12	11.3	4	26.1	84	
16	3/8			TMCF 08067 - 3-16-16 UN	8	6.7	3	16.7	64	
16		3/4		TMCF 1212 - 4-31-16 UN	12	12.0	4	31.0	84	
14	7/16			TMCF 08077 - 3-20-14 UN	8	7.7	3	20.9	64	
14		7/8		TMCF 1616 - 5-37-14 UN	16	16.0	5	37.2	101	
13	1/2			TMCF 10092 - 3-22-13 UN	10	9.2	3	22.5	73	
12	9/16			TMCF 12105 - 3-26-12 UN	12	10.5	3	26.5	84	
11	5/8			TMCF 12114 - 3-28-11 UN	12	11.4	3	28.3	84	
10	3/4			TMCF 16144 - 4-34-10 UN	16	14.4	4	34.3	101	

Order example: TMCF 1010-4-22-20 UN TiAlN

For small thread mills see page 48-51

UN with relieved neck and internal coolant bore

Tools for internal thread



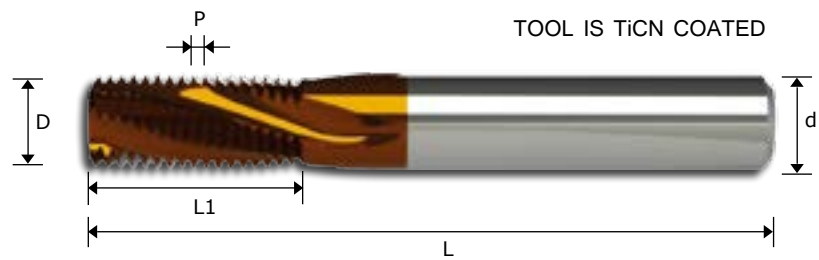
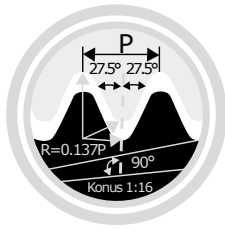
P	M	ARTICLE NUMBER	d	D	NO. of FLUTES	L2	L1	L	€
PITCH in TPI	FINE		in mm	in mm		INSERT LENGTH in mm	LENGTH in mm	LENGTH in mm	
20	$\varnothing \geq 12$	TMCL 1010 - 4 - 30 - 20 UN	10	10.0	4	17.8	30.5	73	
20	$\varnothing \geq 14$	TMCL 1212 - 5 - 35 - 20 UN	12	12.0	5	20.3	35.6	84	
20	$\varnothing \geq 18$	TMCL 1616 - 6 - 43 - 20 UN	16	16.0	6	25.4	43.2	105	
18	$\varnothing \geq 15$	TMCL 1212 - 4 - 35 - 18 UN	12	12.0	4	19.7	35.3	84	
16	$\varnothing \geq 15$	TMCL 1212 - 4 - 35 - 16 UN	12	12.0	4	20.7	35.0	84	
16	$\varnothing \geq 19$	TMCL 1616 - 5 - 42 - 16 UN	16	16.0	5	25.4	42.9	105	
16	$\varnothing \geq 23$	TMCL 2020 - 6 - 58 - 16 UN	20	20.0	6	36.5	58.8	105	
14	$\varnothing \geq 20$	TMCL 1616 - 5 - 45 - 14 UN	16	16.0	5	25.4	45.3	105	
12	$\varnothing \geq 16$	TMCL 1212 - 4 - 42 - 12 UN	12	12.0	4	25.4	42.3	84	
12	$\varnothing \geq 24$	TMCL 2020 - 5 - 55 - 12 UN	20	20.0	5	33.9	55.1	105	

Order example: TMCL 1616 - 6 - 43 - 20 UN TiAIN

For small thread mills see page 48-51

BSPT

Same tool for internal and external thread



TOOL IS TiCN COATED

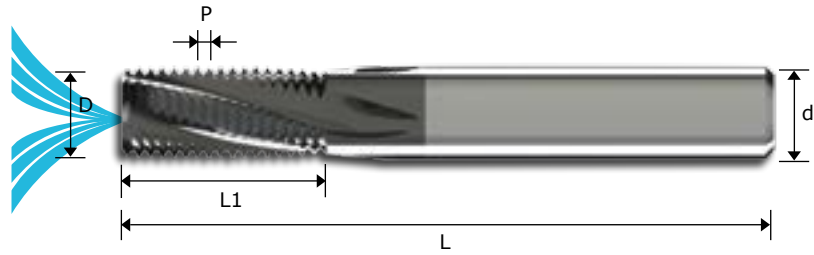
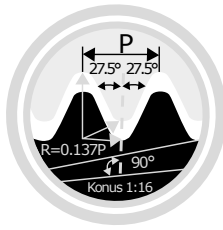
P	STANDARD	ARTICLE NUMBER	d	D	NO. of FLUTES	L1	L	€
PITCH			in mm	in mm		LENGTH	LENGTH	PRICE PER PIECE
in TPI						in mm	in mm	
28	RC 1/16 - 1/8	TMC 0606 - 3 - 9 - 28 BSPT	6	6.0	3	9.5	58	
19	RC 1/4 - 3/8	TMC 0808 - 3 - 14 - 19 BSPT	8	8.0	3	14.0	64	
14	RC 1/2 - 7/8	TMC 1212 - 4 - 19 - 14 BSPT	12	12.0	4	19.1	84	
11	RC 1 - 2	TMC 1616 - 4 - 28 - 11 BSPT	16	16.0	4	28.9	105	

Order example: TMC 0606 - 3 - 9 - 28 BSPT TiCN

For conical preparation end mills see page 40

BSPT with internal coolant bore

Same tool for internal and external thread

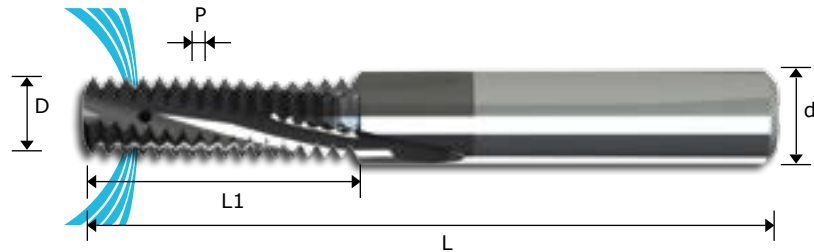
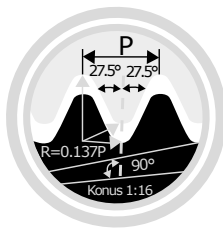


PITCH in TPI	STANDARD	ARTICLE NUMBER	d in mm	D in mm	NO. of FLUTES	L1 LENGTH in mm	L LENGTH in mm	€ PRICE PER PIECE
28	RC 1/8	TMCC 08078 - 3 - 14 - 28 BSPT	8	7.8	3	14.1	64	
19	RC 1/4 - 3/8	TMCC 1010 - 4 - 16 - 19 BSPT	10	10.0	4	16.7	73	
14	RC 1/2 - 7/8	TMCC 1616 - 5 - 26 - 14 BSPT	16	16.0	5	26.3	105	
11	RC 1 - 2	TMCC 1616 - 4 - 28 - 11 BSPT	16	16.0	4	28.9	105	

Order example: TMCC 1616 - 4 - 28 - 11 BSPT TiAIN
For conical preparation end mills see page 40

BSPT with internal coolant bore through the flutes

Same tool for internal thread and external thread

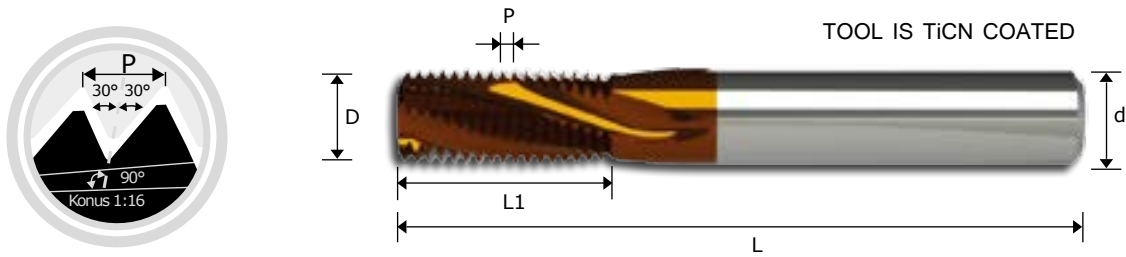


PITCH in TPI	STANDARD	ARTICLE NUMBER	d in mm	D in mm	NO. of FLUTES	L1 LENGTH in mm	L LENGTH in mm	€ PRICE PER PIECE
28	RC 1/8	TMCF 08078 - 3 - 14 - 28 BSPT	8	7.8	3	14.1	64	
19	RC 1/4 - 3/8	TMCF 1010 - 4 - 16 - 19 BSPT	10	10.0	4	16.7	73	
14	RC 1/2 - 7/8	TMCF 1616 - 5 - 26 - 14 BSPT	16	16.0	5	26.3	101	
11	RC 1 - 2	TMCF 1616 - 4 - 28 - 11 BSPT	16	16.0	4	28.9	101	

Order example: TMCC 1616 - 4 - 28 - 11 BSPT TiAIN
For conical preparation end mills see page 40

NPT

Same tool for internal and external thread

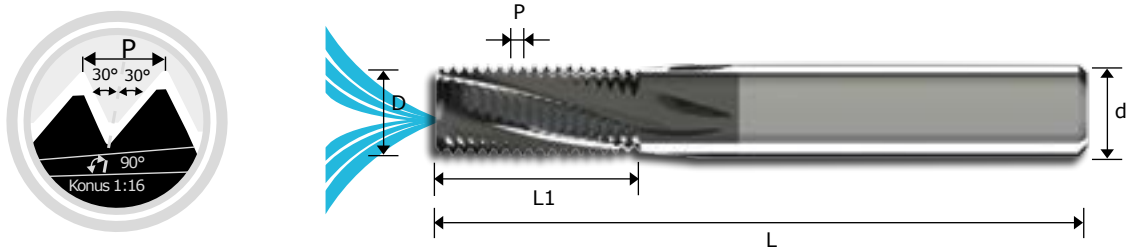


P PITCH in TPI	STANDARD	ARTICLE NUMBER	d in mm	D in mm	NO. of FLUTES	L1 LENGTH in mm	L LENGTH in mm	€ PRICE PER PIECE
27	1/16 - 1/8	TMC 0606 - 3 - 9-27 NPT	6	6.0	3	9.9	58	
18	1/4 - 3/8	TMC 0808 - 3 - 14-18 NPT	8	8.0	3	14.8	64	
14	1/2 - 3/4	TMC 1212 - 4-20-14 NPT	12	12.0	4	20.9	84	
11.5	1 - 2	TMC 1616 - 4-27-11.5 NPT	16	16.0	4	27.6	105	
8	≥ 2 1/2	TMC 2020 - 4-39- 8 NPT	20	20.0	4	39.7	105	

Order example: TMC 0606 - 3 - 9 - 27 NPT TiCN For conical
For conical preparation end mills see page 40

NPT with internal coolant bore

Same tool for internal and external thread

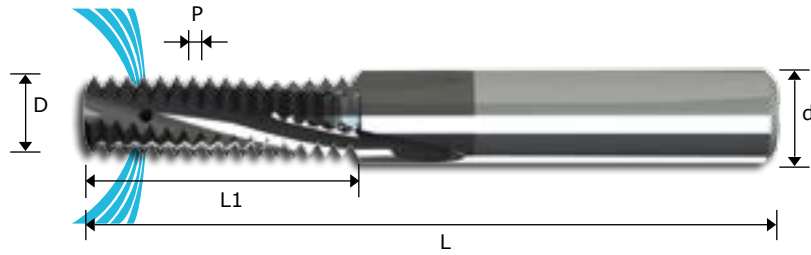
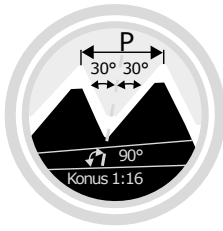


P PITCH in TPI	STANDARD	ARTICLE NUMBER	d in mm	D in mm	NO. of FLUTES	L1 LENGTH in mm	L LENGTH in mm	€ PRICE PER PIECE
27	1/16 - 1/8	TMCC 08076 - 3 - 10-27 NPT	8	7.6	3	10.8	64	
18	1/4 - 3/8	TMCC 1010 - 4 - 16-18 NPT	10	10.0	4	16.2	73	
14	1/2 - 3/4	TMCC 16155 - 4 - 22-14 NPT	16	15.5	4	22.7	105	
11.5	1 - 2	TMCC 2020 - 4-29-11.5 NPT	20	20.0	4	29.8	105	
8	≥ 2 1/2	TMCC 2020 - 4-39- 8 NPT	20	20.0	4	39.7	105	

Order example: TMCC 08076 - 3 - 10 - 27 NPT TiAlN
For conical preparation end mills see page 40

NPT with internal coolant bore through the flutes

Same tool for internal and external thread

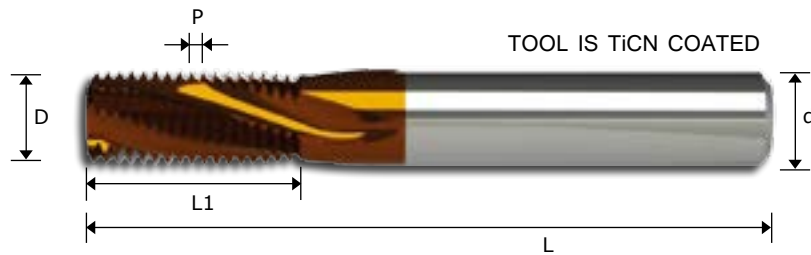
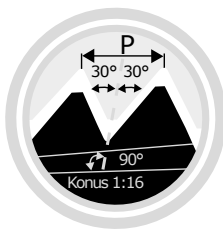


P PITCH in TPI	STANDARD	ARTICLE NUMBER	d in mm	D in mm	NO. of FLUTES	L1 LENGTH in mm	L LENGTH in mm	€ PRICE PER PIECE
27	1/8	TMCF 08076 - 3-10-27 NPT	8	7.6	3	10.8	64	
18	1/4 - 3/8	TMCF 1010 - 4-16-18 NPT	10	10.0	4	16.2	73	
14	1/2 - 3/4	TMCF 16155 - 4-22-14 NPT	16	15.5	4	22.7	101	

Order example: TMCF 08076-3-10-27 NPT TiAlN
For conical preparation end mills see page 40

NPTF

Same tool for internal and external thread

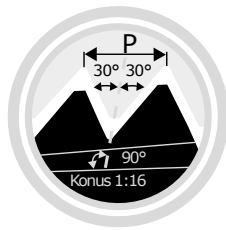


P PITCH in TPI	STANDARD	ARTICLE NUMBER	d in mm	D in mm	NO. of FLUTES	L1 LENGTH in mm	L LENGTH in mm	€ PRICE PER PIECE
27	1/16 - 1/8	TMC 0606 - 3-9-27 NPTF	6	6.0	3	9.9	58	
18	1/4 - 3/8	TMC 0808 - 3-14-18 NPTF	8	8.0	3	14.8	64	
14	1/2 - 3/4	TMC 1212 - 4-20-14 NPTF	12	12.0	4	20.9	84	
11.5	1 - 2	TMC 1616 - 4-27-11.5 NPTF	16	16.0	4	27.6	105	
8	≥ 2 1/2	TMC 2020 - 4-39-8 NPTF	20	20.0	4	39.7	105	

Order example: TMC 0606-3-9-27 NPTF TiCN
For thread mills with coolant see following pages
For conical preparation end mills see page 40

NPTF with internal coolant bore

Same tool for internal and external thread

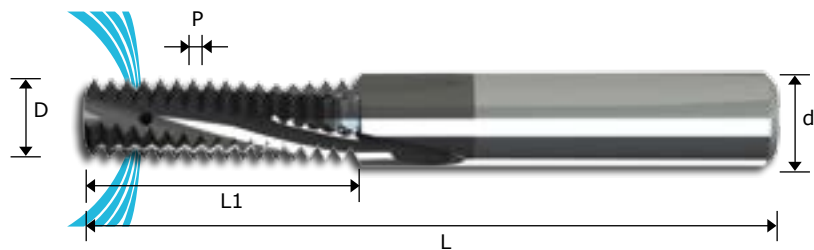
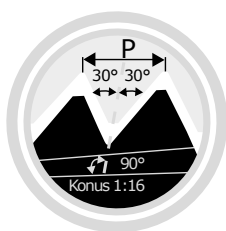


PITCH in TPI	STANDARD	ARTICLE NUMBER	d in mm	D in mm	NO. of FLUTES	L1 LENGTH in mm	L LENGTH in mm	€ PRICE PER PIECE
27	1/8	TMCC 08076 - 3-10-27 NPTF	8	7.6	3	10.8	64	
18	1/4 - 3/8	TMCC 1010 - 4-16-18 NPTF	10	10.0	4	16.2	73	
14	1/2 - 3/4	TMCC 16155 - 4-22-14 NPTF	16	15.5	4	22.7	105	
11.5	1 - 2	TMCC 2020 - 4-29-11.5 NPTF	20	20.0	4	29.8	105	

Order example: TMCC 1010 - 4 - 16 - 18 NPTF TiAIN
For conical preparation end mills see page 40

NPTF with internal coolant through the flutes

Same tool for internal and external thread

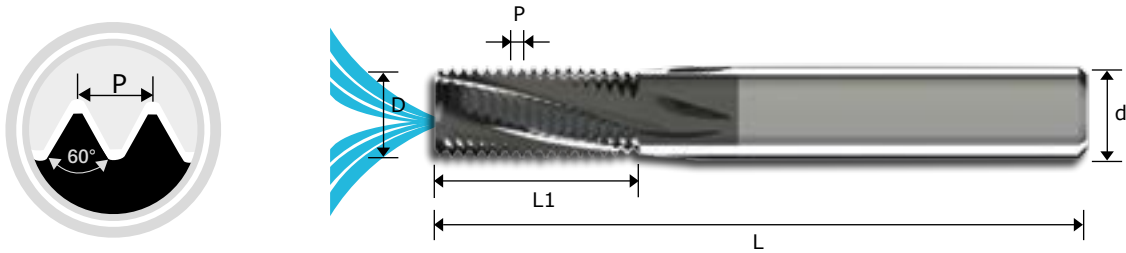


PITCH in TPI	STANDARD	ARTICLE NUMBER	d in mm	D in mm	NO. of FLUTES	L1 LENGTH in mm	L LENGTH in mm	€ PRICE PER PIECE
27	1/8	TMCF 08076 - 3-10-27 NPTF	8	7.6	3	10.8	64	
18	1/4 - 3/8	TMCF 1010 - 4-16-18 NPTF	10	10.0	4	16.2	73	
14	1/2 - 3/4	TMCF 16155 - 4-22-14 NPTF	16	15.5	4	22.7	101	

Order example: TMCF 16155 - 4 - 22 - 14 NPTF TiAIN
For conical preparation end mills see page 40

NPS with internal coolant bore

Same tool for internal and external thread - inch Shank

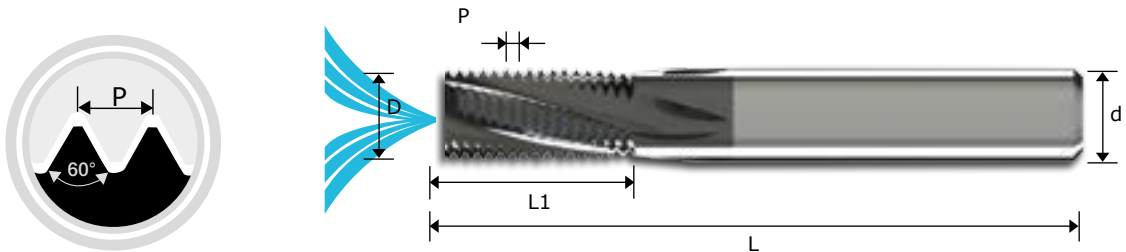


P PITCH in TPI	STANDARD	ARTICLE NUMBER	d in inch	D in mm	NO. of FLUTES	L1 LENGTH in mm	L LENGTH in mm	€ PRICE PER PIECE
27	1/8	TMCC 0312 - 3-04-27 NPS	5/16	7.6	3	10.8	63	
18	1/4 - 3/8	TMCC 0375 - 4-06-18 NPS	3/8	9.5	4	16.2	76	
14	1/2 - 3/4	TMCC 0625 - 4-08-14 NPS	5/8	15.5	4	22.7	101	
11.5	1 - 2	TMCC 0750 - 4-11-11.5 NPS	3/4	19.0	4	29.8	101	

Order example: TMCC 0625 - 4-08-14 NPS TiAlN

NPSF with internal coolant bore

Same tool for internal and external thread - inch Shank

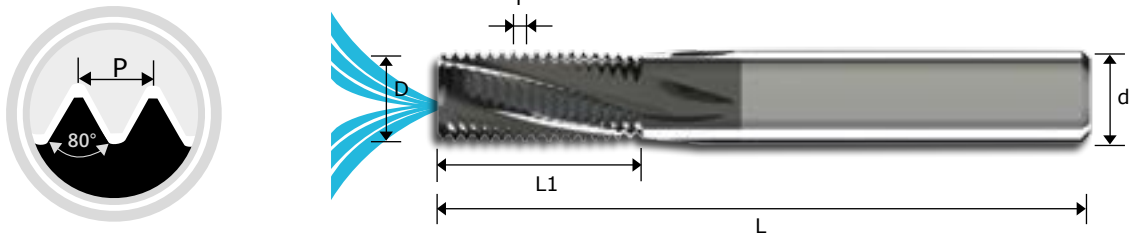


P PITCH in TPI	STANDARD	ARTICLE NUMBER	d in inch	D in mm	NO. of FLUTES	L1 LENGTH in mm	L LENGTH in mm	€ PRICE PER PIECE
27	1/8	TMCC 0312 - 3-04-27 NPSF	5/16	7.6	3	10.8	63	
18	1/4 - 3/8	TMCC 0375 - 4-06-18 NPSF	3/8	9.5	4	16.2	76	
14	1/2 - 3/4	TMCC 0625 - 4-08-14 NPSF	5/8	15.5	4	22.7	101	
11.5	1 - 2	TMCC 0750 - 4-11-11.5 NPSF	3/4	19.0	4	29.8	101	

Order example: TMCC 0750 - 4-11-11.5 NPSF TiAlN

PG DIN 40430 - with internal coolant bore

Same tool for internal and external thread



P PITCH in TPI	STANDARD	ARTICLE NUMBER	d in mm	D in mm	NO. of FLUTES	L1 LENGTH in mm	L LENGTH in mm	€ PRICE PER PIECE
20	Pg 7	TMCC 1010 - 4-19-20 PG	10	10.0	4	19.7	73	
18	Pg 9, 11, 13.5, 16	TMCC 1212 - 4-20-18 PG	12	12.0	4	20.5	84	
16	Pg 21, 29, 36, 42, 48	TMCC 1212 - 4-23-16 PG	12	12.0	4	23.0	84	

Order example: TMCC 1010- 4-19-20 PG TiAlN

TEST REPORT

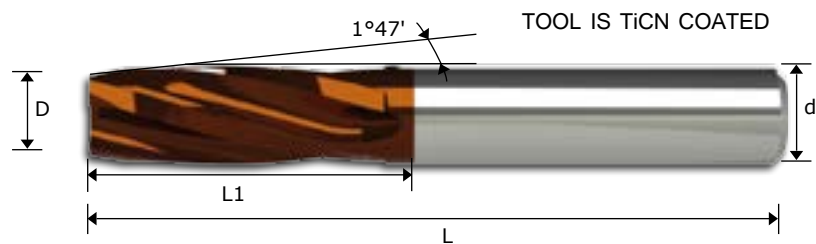
Internal thread	M10 x 1
Thread depth	10.0 mm
Material	34CrNiMo6 (1.6582)
Tool	TMCC 0606-3-12-1.0 ISO
Cutting data	Vc: 100 m/min Fz: 0.02 mm/Z
Coolant	Emulsion
Endurance	758 Pieces

SOLIDE CARBIDE TAPERED END MILLS

Solid carbide tapered end mills are used for milling preparation of conical threads before the thread milling operation

Advantages

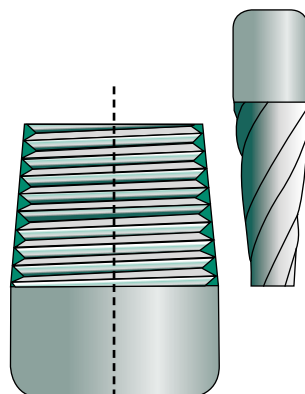
- Increases the tool life of mill thread cutters and indexable inserts.
- Equal and uniform load along the cutting edge of the mill thread cutter.
- Shorter machining time during the mill thread operation, due to the tapered preparation.



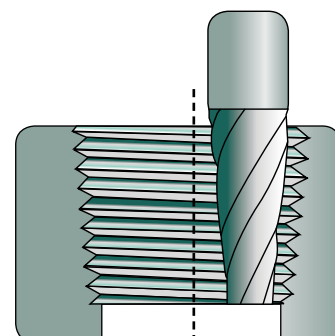
SIZE	d	D	NO. of FLUTES	L1	L	ARTICLE NUMBER	€ PRICE PER PIECE
	in inch	in mm		LENGTH in mm	LENGTH in mm		
NPT 1/16" - 1/8" NPTF 1/16" - 1/8" BSPT 1/16" - 1/8"	6	5.2	4	12	58	CC0652-4-12	
NPT 1/8" - 1" NPTF 1/8" - 1" BSPT 1/8" - 1"	10	8.5	4	24	73	CC1085-4-24	
NPT 1/4" - 3" NPTF 1/4" - 3" BSPT 1/4" - 3"	12	10.0	4	32	84	CC1210-4-32	

Order example: CC1210-4-32 TiCN

Carbide grade: TiCN



EXTERNAL MACHINING



INTERNAL MACHINING

TMC

TiCN Sub Micron Grade with Titancarbonitrid mult-layer coating (ISO K10-K20).

This is an excellent coating when working with Aluminum, bronze, brass and plastic.

ISO	Material	Cutting Speed m/min TiAlN	Feed mm/tooth										
			ø2	ø3	ø4	ø6	ø8	ø10	ø12	ø14	ø16	ø20	ø25
P	Low and Medium Carbon Steels<0.55%C High Carbon Steels≥0.55%C Alloy Steels, Treated Steels	100 - 250	0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18
		110 - 180	0.02	0.03	0.03	0.05	0.06	0.07	0.08	0.09	0.10	0.12	0.15
		90 - 160	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.10
N	Aluminum≤12%Si, Cooper Aluminum<12%Si Synthetics, Duroplastics	150 - 350	0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18
		100 - 250	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.10
		100 - 400	0.05	0.06	0.07	0.08	0.10	0.11	0.12	0.13	0.15	0.18	0.22

For cutters with long cutting length reduce feed rate by 40%

TMCC, TMCF

TiAlN Sub Micron Grade with Titanium Aluminum Nitride multi-layer coating

(ISO K10-K20).This is a general purpose grade, which can be used with all materials;

it should be run at medium to high cutting speeds

ISO	Material	Cutting Speed m/min TiAlN	Feed mm/tooth										
			ø2	ø3	ø4	ø6	ø8	ø10	ø12	ø14	ø16	ø20	ø25
P	Low and Medium Carbon Steels<0.55%C High Carbon Steels≥0.55%C Alloy Steels, Treated Steels	100 - 250	0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18
		110 - 180	0.02	0.03	0.03	0.05	0.06	0.07	0.08	0.09	0.10	0.12	0.15
		90 - 160	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.10
M	Stainless Steels - Free Cutiing Cast Steel - Austenitic	60 - 160	0.02	0.03	0.03	0.04	0.05	0.06	0.06	0.07	0.08	0.09	0.11
		60 - 120	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.10
		130 - 170	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.10
K	Cast Steel Cast Iron	70 - 150	0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18
N	Aluminum≤12%Si, Cooper Aluminum<12%Si Synthetics, Duroplastics	150 - 350	0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18
		100 - 250	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.10
		100 - 400	0.05	0.06	0.07	0.08	0.10	0.11	0.12	0.13	0.15	0.18	0.22
S	Thermoplastics Alloy and Nickel Alloys Titanium Alloys	20 - 80	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.05

For cutters with long cutting length reduce feed rate by 40%

TMCL

TiAlN Sub Micron Grade with Titanium Aluminum Nitride multi-layer coating (ISO K10-K20). This is a general purpose grade, which can be used with all materials; it should be run at medium to high cutting speeds

ISO	Material	Cutting Speed m/min TiAlN	Feed mm/tooth					
			ø10	ø12	ø14	ø16	ø20	ø25
P	Low and Medium Carbon Steels <0.55%C High Carbon Steels ≥0.55%C Alloy Steels, Treated Steels	100 - 250	0.06	0.07	0.07	0.08	0.10	0.12
		110 - 180	0.05	0.05	0.06	0.07	0.09	0.10
		90 - 160	0.03	0.04	0.04	0.05	0.06	0.07
M	Stainless Steels - Free Cutting Stainless Steels - Austenitic Cast Steel	60 - 160	0.04	0.04	0.05	0.06	0.06	0.08
		60 - 120	0.04	0.04	0.04	0.05	0.06	0.07
		130 - 170	0.03	0.04	0.04	0.05	0.06	0.07
K	Cast Steel Cast Iron	70 - 150	0.06	0.07	0.07	0.08	0.10	0.12
N	Aluminum ≤12%Si, Cooper Aluminum <12%Si Synthetics, Duroplastics, Thermoplastics	150 - 350	0.06	0.07	0.07	0.08	0.10	0.12
		100 - 250	0.03	0.04	0.04	0.05	0.06	0.07
		100 - 400	0.08	0.09	0.10	0.11	0.13	0.15
S	Nickel Alloys Titanium Alloys	20 - 80	0.02	0.02	0.02	0.03	0.03	0.03

For cutters with long cutting length reduce feed rate by 40%

Thread mills with relieved neck and internal coolant for milling medium and large threads on relatively deep work pieces.

CARBIDE GRADE: TiAlN

- To perform medium and large threads on relatively deep work pieces.
- To use overhang according to the application.
- To perform deep threads at the bottom of the application

ADVANTAGES

- Provides high rigidity and stability (no vibrations)
- Accomplishes deep threads in one pass.
- Relatively low cutting forces due to short cutting length which enables reduction of the radial infeed required.
- Threads up to 3xD.

MINI - MILL THREAD



ADVANTAGES

- SAME TOOL CAN PRODUCE A WIDE RANGE OF THREADS AND PITCHES
- SPIRAL FLUTES ALLOWS SMOOTH CUTTING ACTION
- SAME TOOL CAN PRODUCE BOTH EXTERNAL & INTERNAL THREADS
- SHORTER MACHINING TIME DUE TO MULTI 3 TO 5 FLUTES
- ENABLES MACHINING IN DEEP HOLES
- THREAD LENGTH UP TO 5XD
- LOW CUTTING FORCES THANKS TO THE SHORT PROFILE

TMCM

- Threading from ISO M1 x 0.25 and 0.08UN
- Working in high cutting speed
- Short machining time
- No broken taps
- Maching of hardened materials up to 45 HRc

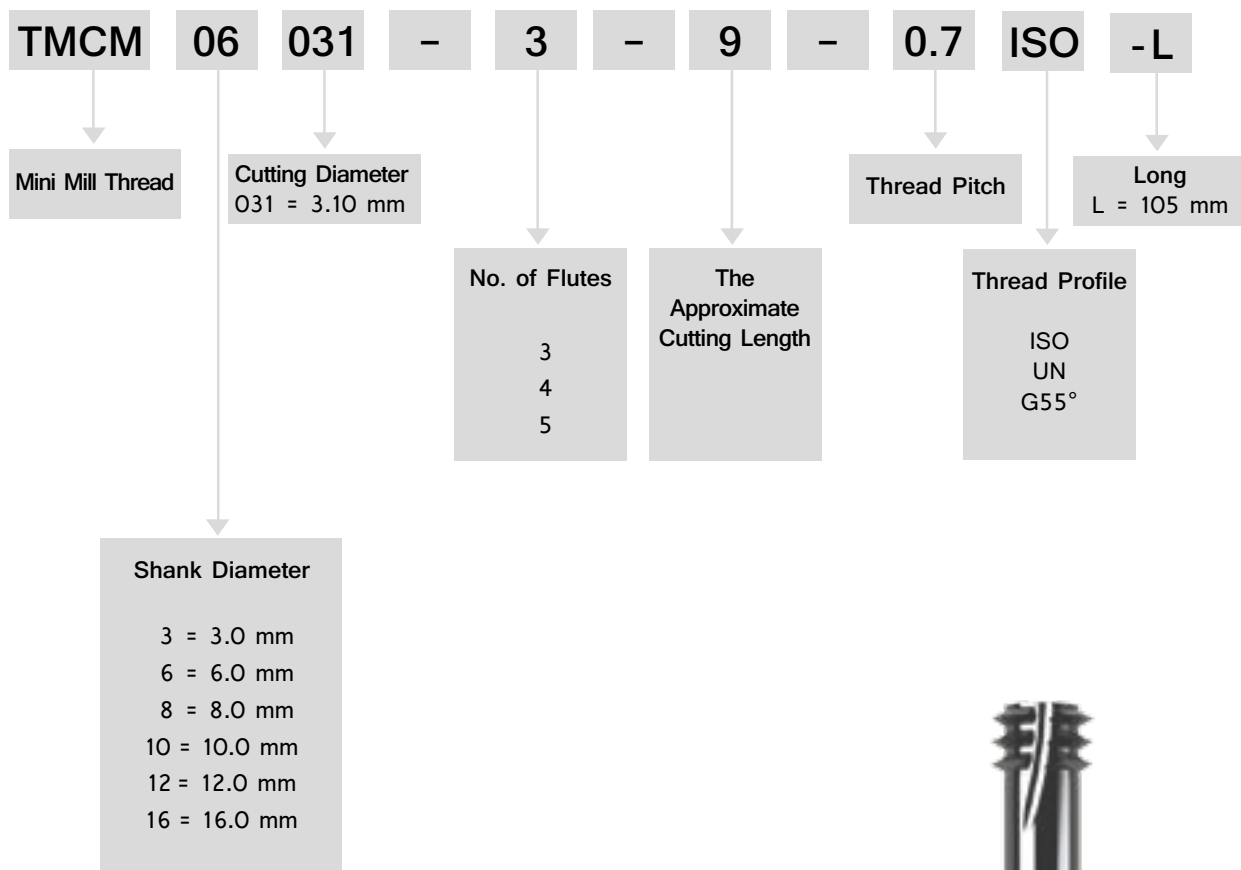
COATING TiAlN

Titanium Aluminum Nitride multy-layer coating (ISO K10 - K20). To be run at medium to high cutting speeds. General purpose for all materials.

ADVANTEGES
OF MINI - MILL-THREAD

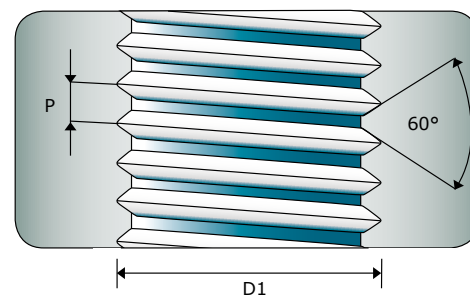
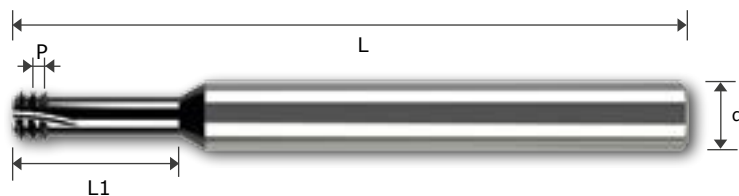
PRODUCT - IDENTIFICATION

Mini Mill - Thread TCMC Ordering Codes



ISO

Tools for internal thread



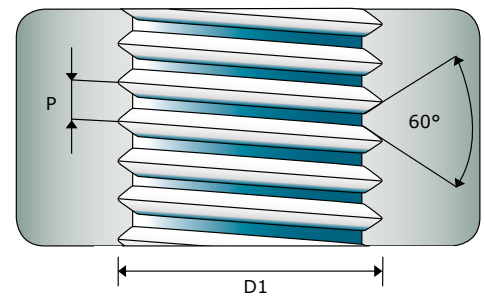
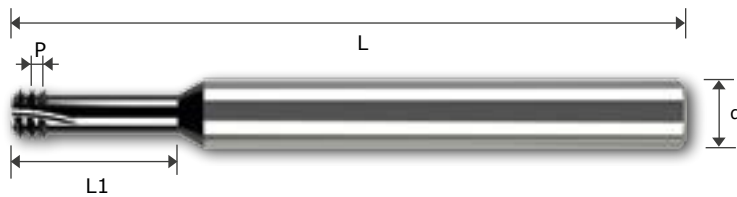
For thread depth up to 2 x D1

P	L	ARTICLE NUMBER	D1	d	D	L1	NO. of FLUTES	€
PITCH	LENGTH		in mm	in mm	in mm	LENGTH		
in mm	in mm				in mm			
0.25	39	TMCM 03007 - 3 - 2 - 0.25 ISO	M1	3	0.72	2.5	3	
0.25	39	TMCM 03009 - 3 - 3 - 0.25 ISO	M1.2	3	0.90	3.0	3	
0.35	58	TMCM06045 - 4 - 14 - 0.35 ISO	M5	6	4.5	14.5	4	
0.4	58	TMCM 06016 - 3 - 4 - 0.4 ISO	M2	6	1.53	4.5	3	
0.4	105	TMCM 06016 - 3 - 4 - 0.4 ISO-L	M2	6	1.53	4.5	3	
0.45	58	TMCM 06017 - 3 - 5 - 0.45 ISO	M2.2	6	1.65	5.0	3	
0.45	58	TMCM 0602 - 3 - 5 - 0.45 ISO	M2.5	6	1.95	5.5	3	
0.45	105	TMCM 0602 - 3 - 5 - 0.45 ISO-L	M2.5	6	1.95	5.5	3	
0.5	58	TMCM 06024 - 3 - 6 - 0.5 ISO	M3	6	2.37	6.5	3	
0.5	105	TMCM 06024 - 3 - 6 - 0.5 ISO-L	M3	6	2.37	6.5	3	
0.6	58	TMCM 06028 - 3 - 7 - 0.6 ISO	M3.5	6	2.75	7.5	3	
0.7	58	TMCM 06031 - 3 - 9 - 0.7 ISO	M4	6	3.10	9.0	3	
0.75	64	TMCM 0808 - 4 - 25 - 0.75 ISO	M10	8	8.00	25.0	4	
0.8	58	TMCM 06038 - 3 - 12 - 0.8 ISO	M5	6	3.80	12.5	3	
1.0	58	TMCM 06047 - 3 - 14 - 1.0 ISO	M6	6	4.65	14.0	3	
1.25	58	TMCM 0606 - 3 - 18 - 1.25 ISO	M8	6	6.00	18.0	3	
1.5	64	TMCM 08078 - 3 - 23 - 1.5 ISO	M10	8	7.80	23.0	3	
1.75	73	TMCM 1009 - 3 - 26 - 1.75 ISO	M12	10	9.00	26.0	3	
2.0	84	TMCM 12118 - 4 - 35 - 2.0 ISO	M16	12	11.80	35.0	4	
2.5	105	TMCM 1615 - 5 - 43 - 2.5 ISO	M20	16	15.00	43.0	5	

Order example: TMCM 1615 - 5- 43 - 2.5 ISO TiAIN

ISO

Tools for internal thread



For thread depth up to 3 x D1

P	L	ARTICLE NUMBER	D1	d	D	L1	NO. of FLUTES	€
PITCH	LENGTH							
in mm	in mm		in mm	in mm	in mm	in mm		
* 0.3	39	TMCM 03011 - 3 - 4 - 0.3 ISO	M1.4	3	1.05	4.0	3	
* 0.35	39	TMCM 03012 - 3 - 5 - 0.35 ISO	M1.6	3	1.20	4.8	3	
* 0.4	39	TMCM 03016 - 3 - 6 - 0.4 ISO	M2	3	1.53	6.0	3	
*0.45	39	TMCM 03017 - 3 - 7 - 0.45 ISO	M2.2	3	1.65	7.0	3	
0.45	58	TMCM 0602 - 3 - 7 - 0.45 ISO	M2.5	6	1.95	7.5	3	
0.5	58	TMCM 06024 - 3 - 9 - 0.5 ISO	M3	6	2.37	9.5	3	
0.5	105	TMCM 06024 - 3 - 9 - 0.5 ISO-L	M3	6	2.37	9.5	3	
0.5	58	TMCM 06054 - 4 - 20 - 0.5 ISO	M6, M7	6	5.35	20.0	4	
0.6	58	TMCM 06028 - 3 - 10 - 0.6 ISO	M3.5	6	2.75	10.5	3	
0.7	58	TMCM 06031 - 3 - 12 - 0.7 ISO	M4	6	3.10	12.5	3	
0.7	105	TMCM 06031 - 3 - 12 - 0.7 ISO-L	M4	6	3.10	12.5	3	
0.8	58	TMCM 06038 - 3 - 16 - 0.8 ISO	M5	6	3.80	16.0	3	
0.8	105	TMCM 06038 - 3 - 16 - 0.8 ISO-L	M5	6	3.80	16.0	3	
1.0	58	TMCM 06047 - 3 - 20 - 1.0 ISO	M6	6	4.65	20.0	3	
1.0	105	TMCM 06047 - 3 - 20 - 1.0 ISO-L	M6	6	4.65	20.0	3	
1.25	58	TMCM 0606 - 3 - 24 - 1.25 ISO	M8	6	6.00	24.0	3	
1.5	64	TMCM 08078 - 3 - 31 - 1.5 ISO	M10	8	7.80	31.5	3	
1.75	73	TMCM 1009 - 3 - 37 - 1.75 ISO	M12	10	9.00	37.8	3	
2.0	105	TMCM 12118 - 4 - 50 - 2.00 ISO	M16	12	11.80	50.0	4	

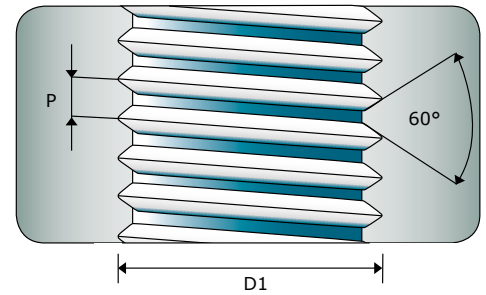
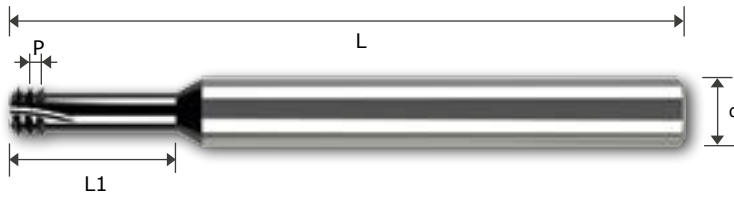
Order example: TMCM 0602-3-7-0.45 ISO TiAIN

* Specially designed for the production of dental implants

- Machining Titanium, surgical stainless steels and hardened materials up to 45 HRc.
- Suitable for high speed air turbine machines (30,000 - 40,000 RPM) and for standard machining centers (6,000 RPM and higher).
- Can also be used for general purpose threading.

ISO

Tools for internal thread



For thread depth up to $4 \times D1$

P	L	ARTICLE NUMBER	D1	d	D	L1	NO. of FLUTES	€
PITCH	LENGTH		in mm	in mm	in mm	LENGTH		
in mm	in mm				in mm			
0.5	39	TMCM 03024 - 3 - 12 - 0.5 ISO	M3	3	2.40	12.5	3	
0.7	58	TMCM 06031 - 3 - 16 - 0.7 ISO	M4	6	3.10	16.7	3	
0.8	58	TMCM 0604 - 3 - 20 - 0.8 ISO	M5	6	4.00	20.8	3	
1.0	58	TMCM 06048 - 3 - 25 - 1.0 ISO	M6	6	4.80	25.0	3	

Order example: TMCM 0604 - 3 - 20 - 0.8 TiAIN

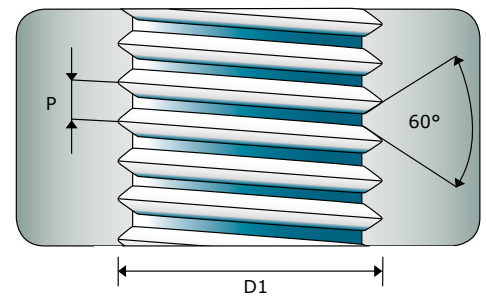
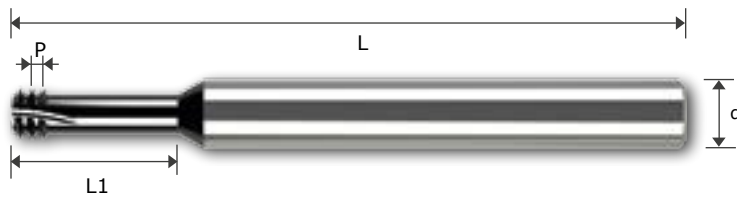
For thread depth up to $5 \times D1$

P	L	ARTICLE NUMBER	D1	d	D	L1	NO. of FLUTES	€
PITCH	LENGTH		in mm	in mm	in mm	LENGTH		
in mm	in mm				in mm			
0.5	39	TMCM 03024 - 3 - 15 - 0.5 ISO	M3	3	2.40	15.5	3	

Order example: TMCM 03024 - 3 - 15 - 0.5 ISO TiAIN

UN

Tools for internal thread



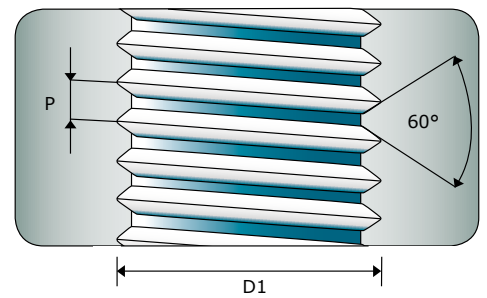
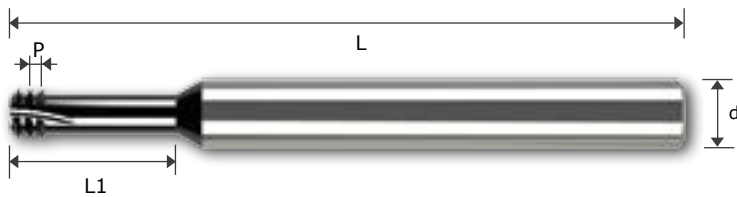
For thread depth up to 2 x D1

P	L	ARTICLE NUMBER	UNC	UNF	d	D	L1	NO. of FLUTES	€
PITCH inTPI	LENGTH in mm								
72	58	TMCM 06014 - 3 - 3 - 72 UN		1	6	1.45	3.7	3	
64	58	TMCM 06014 - 3 - 3 - 64 UN	1	2	6	1.40	3.8	3	
56	58	TMCM 06016 - 3 - 4 - 56 UN	2	3	6	1.65	4.4	3	
48	58	TMCM 06019 - 3 - 5 - 48 UN	3	4	6	1.90	5.2	3	
40	58	TMCM 06021 - 3 - 6 - 40 UN	4		6	2.10	6.3	3	
40	105	TMCM 06021 - 3 - 6 - 40 UN-L	4		6	2.10	6.3	3	
40	58	TMCM 06024 - 3 - 7 - 40 UN	5	6	6	2.45	7.0	3	
36	58	TMCM 06033 - 3 - 9 - 36 UN		8	6	3.30	9.0	3	
32	58	TMCM 06025 - 3 - 7 - 32 UN	6		6	2.55	7.1	3	
32	105	TMCM 06025 - 3 - 7 - 32 UN-L	6		6	2.55	7.1	3	
32	58	TMCM 06032 - 3 - 9 - 32 UN	8		6	3.20	9.5	3	
32	105	TMCM 06032 - 3 - 9 - 32 UN-L	8		6	3.20	9.5	3	
32	58	TMCM 06037 - 3 - 10 - 32 UN		10	6	3.70	10.5	3	
28	58	TMCM 06042 - 3 - 11 - 28 UN		12	6	4.20	11.0	3	
28	58	TMCM 0605 - 3 - 14 - 28 UN		1/4	6	5.00	14.5	3	
24	58	TMCM 06035 - 3 - 10 - 24 UN	10,12		6	3.50	10.6	3	
24	64	TMCM 08066 - 3 - 17 - 24 UN		5/16, 3/8	8	6.60	17.0	3	
20	58	TMCM 06047 - 3 - 14 - 20 UN	1/4		6	4.75	14.0	3	
20	64	TMCM 0808 - 3 - 25 - 20 UN		7/16	8	8.00	25.0	3	
18	58	TMCM 0606 - 3 - 17 - 18 UN	5/16		6	6.00	17.0	3	
18	84	TMCM 1212 - 4 - 35 - 18 UN		5/8	12	12.00	35.0	4	
16	64	TMCM 08067 - 3 - 22 - 16 UN	3/8		8	6.70	22.0	3	
14	64	TMCM 08077 - 3 - 25 - 14 UN	7/16		8	7.70	25.0	3	
13	73	TMCM 10092 - 3 - 27 - 13 UN	1/2		10	9.20	27.5	3	
12	84	TMCM 12105 - 3 - 31 - 12 UN	9/16		12	10.50	31.5	3	
11	84	TMCM 12114 - 3 - 34 - 11 UN	5/8		12	11.40	34.5	3	
10	105	TMCM 16144 - 4 - 41 - 10 UN	3/4		16	14.40	41.5	4	

Order example: TMCM 06042 - 3 - 11 - 28 UN TiAIN

UN

Tools for internal thread



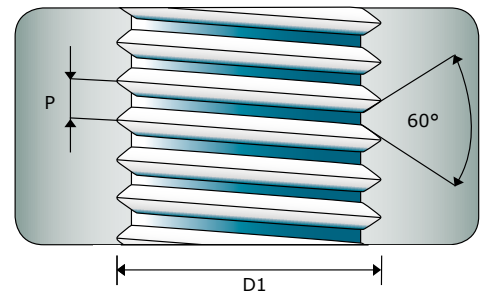
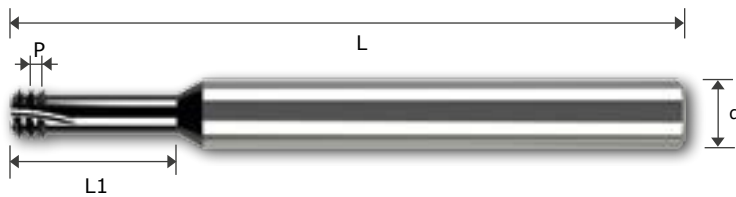
For thread depth up to 3 x D1

P	L	ARTICLE NUMBER	UNC	UNF	d	D	L1	NO. of FLUTES	€
PITCH	LENGTH								
in TPI	in mm				in mm	in mm	in mm		PRICE PER PIECE
80	58	TMCM 06012 - 3 - 4 - 80 UN		0	6	1.15	4.0	3	
*72	39	TMCM 03015 - 3 - 6 - 72 UN		1	3	1.45	6.0	3	
56	39	TMCM 03016 - 3 - 6 - 56 UN	2	3	3	1.65	6.6	3	
56	58	TMCM 06016 - 3 - 6 - 56 UN	2	3	6	1.65	6.6	3	
56	105	TMCM 06016 - 3 - 6 - 56 UN-L	2	3	6	1.65	6.6	3	
40	39	TMCM 03021 - 3 - 8 - 40 UN	4		3	2.10	8.0	3	
40	58	TMCM 06021 - 3 - 8 - 40 UN	4		6	2.10	8.0	3	
40	105	TMCM 06021 - 3 - 8 - 40 UN-L	4		6	2.10	8.0	3	
40	58	TMCM 06024 - 3 - 9 - 40 UN	5	6	6	2.45	9.6	3	
32	39	TMCM 03025 - 3 - 10 - 32 UN	6		3	2.55	10.5	3	
32	58	TMCM 06025 - 3 - 10 - 32 UN	6		6	2.55	10.5	3	
32	105	TMCM 06025 - 3 - 10 - 32 UN-L	6		6	2.55	10.5	3	
32	58	TMCM 06032 - 3 - 12 - 32 UN	8		6	3.20	12.5	3	
32	105	TMCM 06032 - 3 - 12 - 32 UN-L	8		6	3.20	12.5	3	
32	58	TMCM 06037 - 3 - 15 - 32 UN		10	6	3.70	15.0	3	
32	105	TMCM 06037 - 3 - 15 - 32 UN-L		10	6	3.70	15.0	3	
28	58	TMCM 0605 - 3 - 19 - 28 UN		1/4	6	5.00	19.0	3	
28	105	TMCM 0605 - 3 - 19 - 28 UN-L	1/4		6	5.00	19.0	3	
24	58	TMCM 06035 - 3 - 15 - 24 UN	10,12		6	3.50	15.5	3	
24	64	TMCM 08066 - 3 - 24 - 24 UN		5/16 3/8	8	6.60	24.0	3	
20	58	TMCM 06047 - 3 - 19 - 20 UN	1/4		6	4.75	19.0	3	
20	105	TMCM 06047 - 3 - 19 - 20 UN-L	1/4		6	4.75	19.0	3	
20	64	TMCM 0808 - 3 - 34 - 20 UN		7/16	8	8.00	34.6	3	
13	73	TMCM 10092 - 3 - 27 - 13 UN	1/2		10	9.20	27.5	3	

Order example: TMCM 10092 - 3 - 27 - 13 UN TiAIN

UN

Tools for internal thread



For thread depth up to 3 x D1

P	L	ARTICLE NUMBER	UNC	UNF	d	D	L1	NO. of FLUTES	€
PITCH	LENGTH				in mm	in mm	LENGTH		
inTPI	in mm						in mm		
18	58	TMCM 0606 - 3 - 23 - 18 UN	5/16		6	6.00	23.0	3	
18	105	TMCM 1212 - 4 - 49 - 18 UN		5/8	12	12.00	49.0	4	
16	64	TMCM 08067 - 3 - 30 - 16 UN	3/8		8	6.70	30.2	3	
14	64	TMCM 08077 - 3 - 35 - 14 UN	7/16		8	7.70	35.2	3	
13	73	TMCM 10092 - 3 - 40 - 13 UN	1/2		10	9.20	40.1	3	
12	105	TMCM 12105 - 3 - 45 - 12 UN	9/16		12	10.50	45.0	3	
11	105	TMCM 12114 - 3 - 50 - 11 UN	5/8		12	11.40	50.0	3	
10	105	TMCM 16144 - 4 - 59 - 10 UN	3/4		16	14.40	59.7	4	

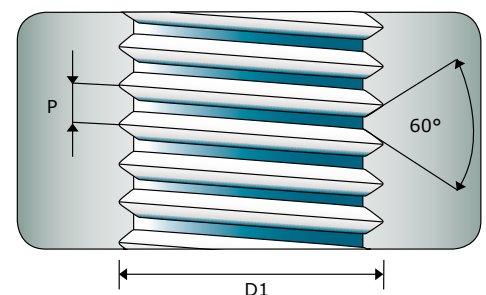
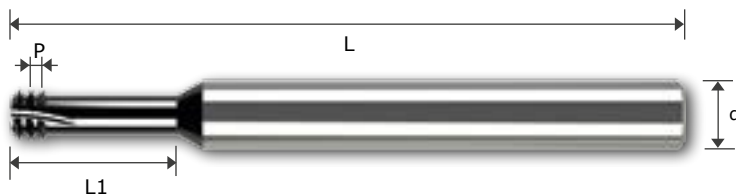
Order example: TMCM 0606 - 3 - 23 - 18 UN TiAIN

* Specially designed for the production of dental implants

- Machining Titanium, surgical stainless steels and hardened materials up to 45 HRC.
- Suitable for high speed air turbine machines (30,000 - 40,000 RPM) and for standard machining centers (6,000 RPM and higher).
- Can also be used for general purpose threading.

UN

Tools for internal thread



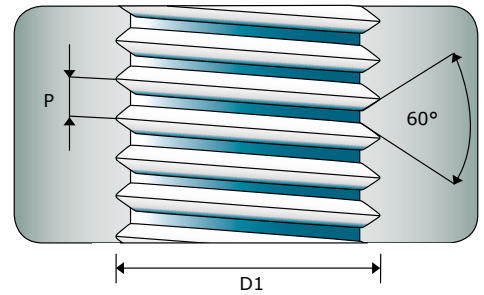
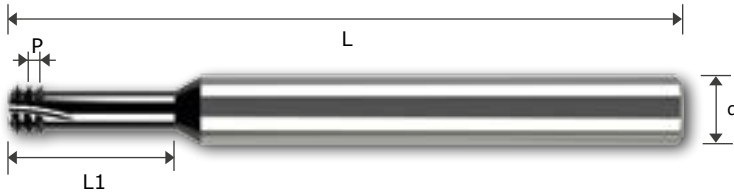
For thread depth up to 4 x D1

P	L	ARTICLE NUMBER	UNC	UNF	d	D	L1	NO. of FLUTES	€
PITCH	LENGTH				in mm	in mm	LENGTH		
inTPI	in mm						in mm		
56	39	TMCM 03016 - 3 - 9 - 56 UN	2	3	3	1.65	9.2	3	
40	39	TMCM 03021 - 3 - 12 - 40 UN	4		3	2.10	12.0	3	
32	39	TMCM 03025 - 3 - 14 - 32 UN	6		3	2.55	14.8	3	

Order example: TMCM 03021 - 3 - 12 - 40 UN TiAIN

UN

Tools for internal thread



For thread depth up to 5 x D1

P	L	ARTICLE NUMBER	UNC	UNF	d	D	L1	NO. of FLUTES	€
PITCH	LENGTH				in mm	in mm	LENGTH		
inTPI	in mm						in mm		
80	39	TMCM 03012 - 3 - 8 - 80 UN		0	3	1.15	8.0	3	
56	39	TMCM 03016 - 3 - 11 - 56 UN	2	3	3	1.65	11.4	3	

Order example: TMCM 03012 - 3 - 8 - 80 UN TiAlN

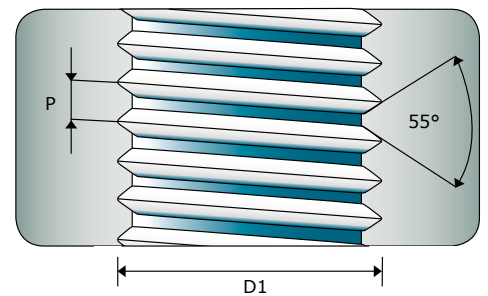
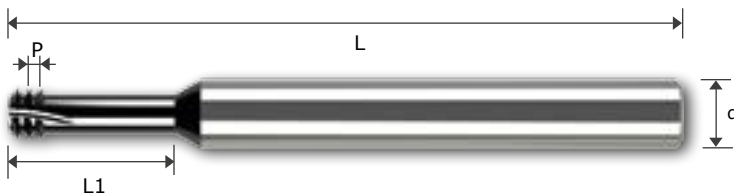
Carbide Grade: TiAlN

Sub-Micron grade with Titanium Aluminium Nitride multy-layer coating (ISO K10 - K20).

To be run at medium to high cutting speeds. General purpose for all materials.

G 55° BSW, BSP

Same tool for internal and external thread



For thread depth up to 2 x D1

P	L	ARTICLE NUMBER	STANDARD	d	D	L1	NO. of FLUTES	€
PITCH	LENGTH			in mm	in mm	LENGTH		
inTPI	in mm					in mm		
28	64	TMCM 08078 - 3 - 19 - 28 W	G 1/8	8	7.8	19.5	3	
19	73	TMCM 1010 - 4 - 30 - 19 W	G 1/4 - 3/8	10	10.0	30.0	4	
14	84	TMCM 1212 - 4 - 37 - 14 W	G 1/2 - 7/8	12	12.0	37.0	4	
11	105	TMCM 1616 - 4 - 44 - 11 W	G ≥ 1	16	16.0	44.0	4	

Order example: TMCM 1616 - 4 - 44 - 11 W TiAlN

MINI MILL THREAD TMCM

TiALN Sub Micron Grade with Titanium Aluminum Nitride multi-layer coating (ISO K10-K20). This is a general purpose grade, which can be used with all materials; it should be run at medium to high cutting speeds

ISO	Material	Cutting Speed m/min	Feed mm/tooth													
			ø1	ø1.5	ø2	ø3	ø4	ø5	ø6	ø7	ø8	ø9	ø10	ø12	ø14	ø16
P	Low and Medium Carbon Steel <0.55%C	60 - 120	0.04	0.05	0.05	0.07	0.09	0.11	0.13	0.14	0.15	0.16	0.16	0.17	0.18	0.18
	High Carbon Steels ≥0.55%C	60 - 90	0.03	0.04	0.05	0.06	0.08	0.09	0.10	0.12	0.13	0.14	0.14	0.16	0.17	0.18
	Alloy Steels, Treated Steels	50 - 80	0.03	0.04	0.04	0.05	0.05	0.06	0.07	0.07	0.08	0.09	0.10	0.12	0.13	0.14
M	Stainless Steels - Free Cutting	70 - 100	0.02	0.03	0.03	0.04	0.05	0.06	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13
	Stainless Steels - Austenitic	60 - 90	0.02	0.03	0.03	0.04	0.05	0.06	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13
	Cast Steel	70 - 90	0.03	0.04	0.04	0.05	0.05	0.06	0.07	0.07	0.08	0.09	0.10	0.12	0.13	0.14
K	Cast Iron	40 - 80	0.04	0.05	0.05	0.07	0.09	0.11	0.13	0.14	0.15	0.16	0.16	0.17	0.18	0.18
N	Aluminum ≤12%Si, Cooper	100 - 200	0.04	0.05	0.05	0.07	0.09	0.11	0.13	0.14	0.15	0.16	0.16	0.17	0.18	0.18
	Aluminum <12%Si	60 - 140	0.03	0.03	0.03	0.04	0.05	0.06	0.06	0.07	0.08	0.09	0.10	0.11	0.13	0.14
	Synthetics, Duroplastics	50 - 200	0.09	0.10	0.11	0.12	0.14	0.16	0.18	0.19	0.19	0.19	0.19	0.19	0.20	0.20
S	Nickel Alloys Titanium Alloys	20 - 40	0.03	0.03	0.03	0.04	0.04	0.05	0.06	0.06	0.06	0.07	0.07	0.07	0.08	0.08

MINI MILL - THREAD VS. TAPS

MINI MILL - THREAD	FEATURES	TAPS
Thread surface quality	High	Medium
Thread geometry	Very accurate	Medium
Thread tolerances	4H, 5H, 6H with std cutter	6H with standard tap, 4H with specific tap
Machining time	Same as tap or shorter	Short
Tool breakage	Almost not possible	Could happen often
Machining load	Very low	High
Range of thread diameters	Wide range of diameters	Specific tap for each diameter
Right/left hand threading	Same cutter	Specific tap for each
Geometric shape	Full profile	Partial profile

TEST REPORT

Internal thread	M5 x 0.8
Thread depth	10.0 mm
Material	Stainless Steel: 1.4305
Tool	TMCM 06038-3-12-0.8 ISO
Cutting data	Vc: 80 m/min Fz: 0.05 mm/Z
Coolant	Emulsion
Endurance	1183 Pieces

HARDCUT

Mill Thread Solid Carbide for Machining hard materials

ADVANTAGES

- LOW CUTTING FORCES THANKS TO THE SHORT PROFILE
- PERFECT SOLUTION FOR THE DIE AND MOLD INDUSTRY
- THREADING FROM ISO M1.4x0.3 AND 0-80 UN
- THREAD LENGTH UP TO 2xD
- SHORT CHIPS ARE PRODUCED, INSURE HIGH PROCESS SECURITY
- SHORT MACHINING TIME
- WORKING AT HIGH CUTTING SPEEDS
- INCREASED CUTTING DIAMETER - BETTER RIGIDITY AND STABILITY
- SHORT CYCLE TIME - INCREASE PRODUCTIVITY
- ULTRA FINE GRADE - DEDICATED FOR HARDENED MATERIALS
- COATING PROVIDES HIGH WEAR AND HEAT RESISTANCE

TMCMH

- Mills designed specifically for the machining of hardened materials up to 62HRc. These tools provide high performance, improved cut and excellent surface.

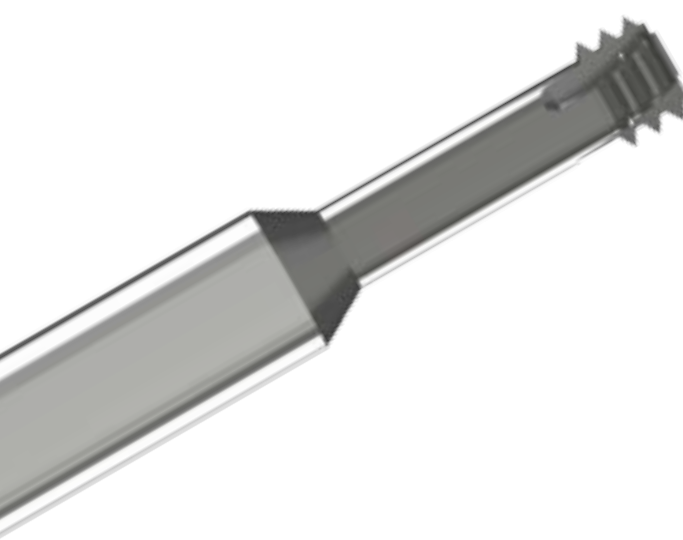
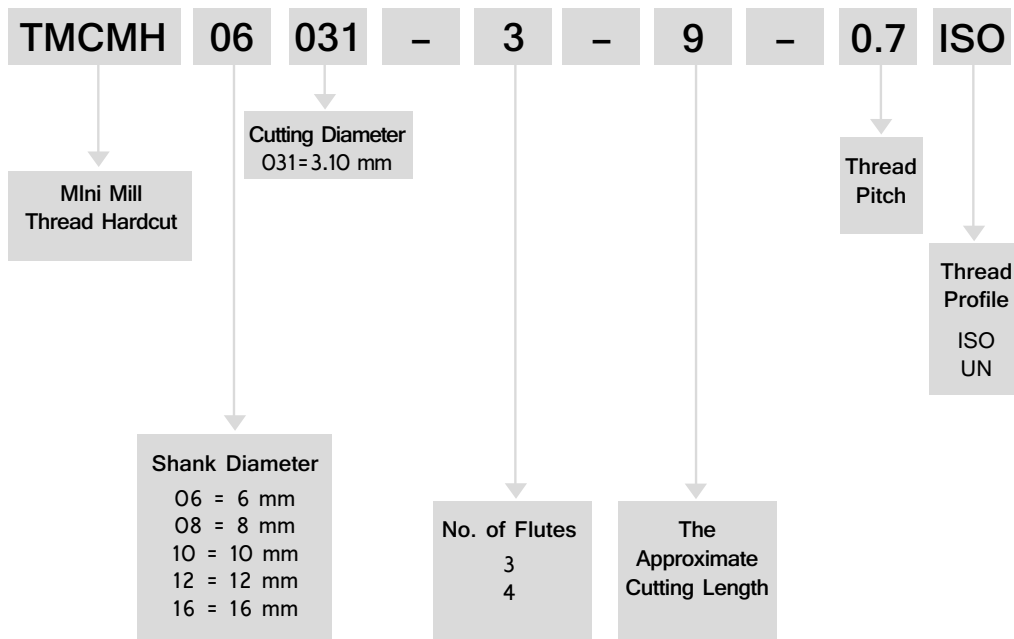
COATING TiAlN

Ultra fine sub-micron grade with advanced PVD triple coating.

ADVANTEGES
OF HARDCUT

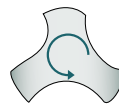
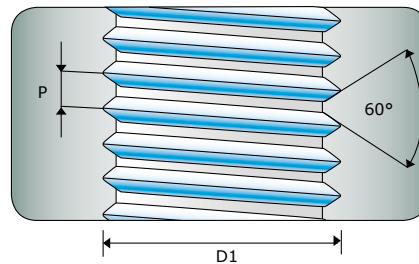
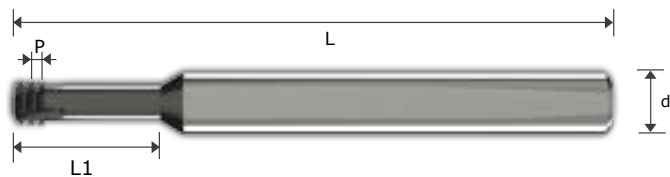
PRODUCT - IDENTIFICATION

Mill - Thread Solid Carbide Ordering Codes



ISO

Tools for internal thread



**LEFT HAND CUTTING
FOR CNC CODE USE M04**

For thread depth up to 2 x D1

P	L	ARTICLE NUMBER	D1	d	D	L1	NO. of FLUTES	€
PITCH	LENGTH		in mm	in mm	in mm	LENGTH		
in mm	in mm		in mm	in mm	in mm	in mm		PRICE PER PIECE
0.4	58	TMCMH 06016 - 3 - 4 - 0.4 ISO	6	M2	1.53	4.5	3	
0.45	58	TMCMH 06017 - 3 - 5 - 0.45 ISO	6	M2.2	1.65	5.0	3	
0.45	58	TMCMH 0602 - 3 - 5 - 0.45 ISO	6	M2.5	1.95	5.5	3	
0.5	58	TMCMH 06024 - 3 - 6 - 0.5 ISO	6	M3	2.37	6.5	3	
0.6	58	TMCMH 06028 - 3 - 7 - 0.6 ISO	6	M3.5	2.75	7.5	3	
0.7	58	TMCMH 06031 - 3 - 9 - 0.7 ISO	6	M4	3.10	9.0	3	
0.8	58	TMCMH 06038 - 3 - 12 - 0.8 ISO	6	M5	3.80	12.5	3	
1.0	58	TMCMH 06047 - 3 - 14 - 1.0 ISO	6	M6	4.65	14.0	3	
1.25	58	TMCMH 0606 - 3 - 18 - 1.25 ISO	6	M8	6.00	18.0	3	
1.5	64	TMCMH 08078 - 3 - 23 - 1.5 ISO	8	M10	7.80	23.0	3	
1.75	73	TMCMH 1009 - 3 - 26 - 1.75 ISO	10	M12	9.00	26.0	3	
2.0	84	TMCMH 12118 - 4 - 35 - 2.0 ISO	12	M16	11.80	35.0	4	

Order example: TMCMH 08078 - 3 - 23 - 1.5 ISO TiAIN

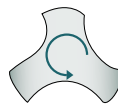
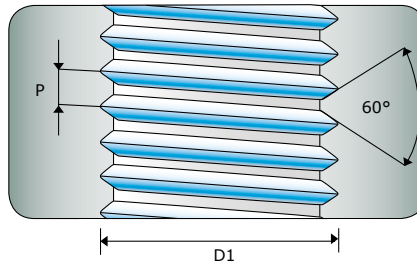
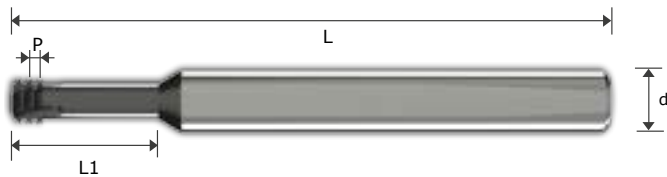
For thread depth up to 3 x D1

P	L	ARTICLE NUMBER	D1	d	D	L1	NO. of FLUTES	€
PITCH	LENGTH		in mm	in mm	in mm	LENGTH		
in mm	in mm		in mm	in mm	in mm	in mm		PRICE PER PIECE
0.3	39	TMCMH 03011 - 3 - 4 - 0.3 ISO	3	M1.4	1.05	4.0	3	
0.35	39	TMCMH 03012 - 3 - 5 - 0.35 ISO	3	M1.6	1.20	4.8	3	
0.4	39	TMCMH 03016 - 3 - 6 - 0.4 ISO	3	M2	1.53	6.0	3	
0.45	58	TMCMH 0602 - 3 - 7 - 0.45 ISO	6	M2.5	1.95	7.5	3	
0.5	58	TMCMH 06024 - 3 - 9 - 0.5 ISO	6	M3	2.37	9.5	3	
0.7	58	TMCMH 06031 - 3 - 12 - 0.7 ISO	6	M4	3.20	12.5	3	
0.8	58	TMCMH 06038 - 3 - 16 - 0.8 ISO	6	M5	3.80	16.0	3	
1.0	58	TMCMH 06047 - 3 - 20 - 1.0 ISO	6	M6	4.65	20.0	3	
1.25	58	TMCMH 0606 - 3 - 24 - 1.25 ISO	6	M8	6.00	24.0	3	

Order example: TMCMH 06038 - 3 - 16 - 0.8 ISO TiAIN

UN

Tools for internal thread



**LEFT HAND CUTTING
FOR CNC CODE USE M04**

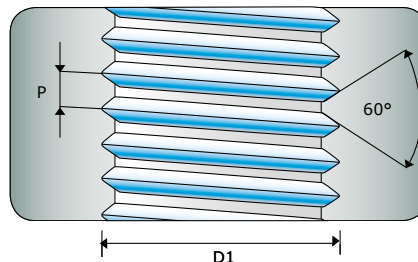
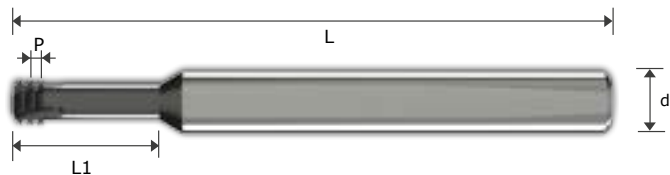
For thread depth up to 2 x D1

P	L	ARTICLE NUMBER	UNC	UNF	d	D	L1	NO. of FLUTES	€
PITCH inTPI	LENGTH in mm				in mm	in mm	LENGTH in mm		
72	58	TMCMH 06014 - 3 - 3 - 72 UN		1	6	1.45	3.7	3	
64	58	TMCMH 06014 - 3 - 3 - 64 UN	1	2	6	1.40	3.8	3	
56	58	TMCMH 06016 - 3 - 4 - 56 UN	2	3	6	1.65	4.4	3	
48	58	TMCMH 06019 - 3 - 5 - 48 UN	3	4	6	1.90	5.2	3	
40	58	TMCMH 06021 - 3 - 6 - 40 UN	4		6	2.10	6.3	3	
40	58	TMCMH 06024 - 3 - 7 - 40 UN	5	6	6	2.45	7.0	3	
36	58	TMCMH 06033 - 3 - 9 - 36 UN		8	6	3.30	9.0	3	
32	58	TMCMH 06025 - 3 - 7 - 32 UN	6		6	2.55	7.1	3	
32	58	TMCMH 06032 - 3 - 9 - 32 UN	8		6	3.20	9.5	3	
32	58	TMCMH 06037 - 3 - 10 - 32 UN		10	6	3.70	10.5	3	
28	58	TMCMH 06042 - 3 - 11 - 28 UN		12	6	4.20	11.0	3	
28	58	TMCMH 0605 - 3 - 14 - 28 UN		1/4	6	5.00	14.5	3	
24	58	TMCMH 06035 - 3 - 10 - 24 UN	10, 12		6	3.50	10.6	3	
24	64	TMCMH 08066 - 3 - 17 - 24 UN		5/16, 3/8	8	6.60	17.0	3	
20	58	TMCMH 06047 - 3 - 14 - 20 UN	1/4		6	4.75	14.0	3	
20	64	TMCMH 0808 - 3 - 25 - 20 UN		7/16	8	8.00	25.0	3	
18	58	TMCMH 0606 - 3 - 17 - 18 UN	5/16		6	6.00	17.0	3	
18	84	TMCMH 1212 - 3 - 35 - 18 UN		5/8	12	12.00	35.0	4	
16	64	TMCMH 08067 - 3 - 22 - 16 UN	3/8		8	6.70	22.0	3	
14	64	TMCMH 08077 - 3 - 25 - 14 UN	7/16		8	7.70	25.0	3	
13	73	TMCMH 10092 - 3 - 27 - 13 UN	1/2		10	9.20	27.5	3	
12	84	TMCMH 12105 - 3 - 31 - 12 UN	9/16		12	10.50	31.5	3	
11	84	TMCMH 12114 - 3 - 34 - 11 UN	5/8		12	11.40	34.5	3	

Order example: TMCMH 12114 - 3 - 34 - 11 UN TiAIN

UN

Tools for internal thread



**LEFT HAND CUTTING
FOR CNC CODE USE M04**

For thread depth up to 3 x D1

P	L	ARTICLE NUMBER	UNC	UNF	d	D	L1	NO. of FLUTES	€
PITCH	LENGTH								
inTPI	in mm				in mm	in mm	in mm		
80	58	TMCMH 06012 - 3 - 4 - 80 UN		0	6	1.15	4.0	3	
72	39	TMCMH 03015 - 3 - 6 - 72 UN		1	3	1.45	6.0	3	
56	58	TMCMH 06016 - 3 - 6 - 56 UN	2	3	6	1.65	6.6	3	
40	58	TMCMH 06021 - 3 - 8 - 40 UN	4		6	2.10	8.0	3	
40	58	TMCMH 06024 - 3 - 9 - 40 UN	5	6	6	2.45	9.6	3	
32	58	TMCMH 06025 - 3 - 10 - 32 UN	6		6	2.55	10.5	3	
32	58	TMCMH 06032 - 3 - 12 - 32 UN	8		6	3.20	12.5	3	
32	58	TMCMH 06037 - 3 - 15 - 32 UN		10	6	3.70	15.0	3	
28	58	TMCMH 0605 - 3 - 19 - 28 UN		1/4	6	5.00	19.0	3	
24	64	TMCMH 08066 - 3 - 24 - 24 UN		5/16, 3/8	8	6.60	24.0	3	
20	58	TMCMH 06047 - 3 - 19 - 20 UN	1/4		6	4.75	19.0	3	
18	58	TMCMH 0606 - 3 - 23 - 18 UN	5/16		6	6.00	23.0	3	

Order example: TMCMH 06012 - 3 - 4 - 80 UN TiAIN

TEST REPORT

Internal thread	M4 x 0.7
Thread depth	8.0 mm
Material	Tool Steel: 1.2379
Tool	TMCMH 06031-3-9-0.7 ISO
Cutting data	Vc: 44m/min Fz: 0.03 mm/Z
Coolant	Emulsion
Endurance	84 Pieces

MINI MILL THREAD TMCMH TYPE

TiALN Sub Micron Grade with advanced PVD triple coating.

Left hand cutting for CNC code use M04

ISO	Material	Hardness HRC	Cutting Speed m/min	Feed mm/tooth													
				ø1	ø1.5	ø2	ø3	ø4	ø5	ø6	ø7	ø8	ø9	ø10	ø12	ø14	ø16
S	Nickel Alloys Titanium Alloys and High Temp. Alloys		20 - 40	0.03	0.03	0.03	0.04	0.04	0.05	0.06	0.06	0.06	0.07	0.07	0.07	0.08	0.08
H	Hardened Steels	45 - 50	60 - 70	0.03	0.04	0.04	0.05	0.05	0.06	0.06	0.07	0.07	0.08	0.08	0.09	0.10	0.11
		51 - 55	50 - 55	0.02	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.06	0.07	0.07	0.08	0.09	0.10
		56 - 62	40 - 50	0.01	0.02	0.02	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.06	0.07	0.08	0.09

T-LINE INDEXABLE

● T-LINE „BOLT-IN STYLE“ INDEXABLE

The T-LINE indexable bolt-in style is our general purpose economic system available in two insert lengths. The tool holders are manufactured from dampened stainless steel providing excellent rigidity when in contact with work pieces, helping to provide quality thread forms.

Can produce left or right hand threads.

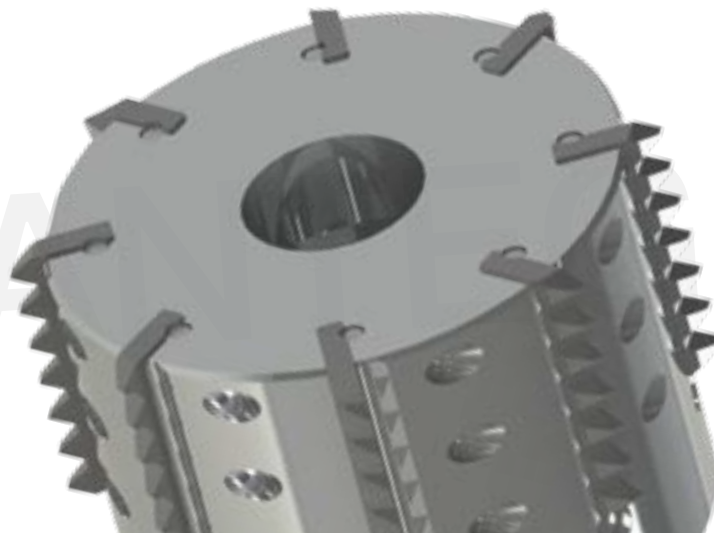
● T-LINE „PIN STYLE“ INDEXABLE

The T-LINE indexable pin style is designed to allow for a deeper working thread and higher rigidity, enabling economic and high productivity, extended tool life, and excellent performance when producing threads. The tool holders are manufactured from dampened stainless steel providing excellent rigidity when in contact with work pieces, helping to provide quality thread forms.

Can produce left or right hand threads.

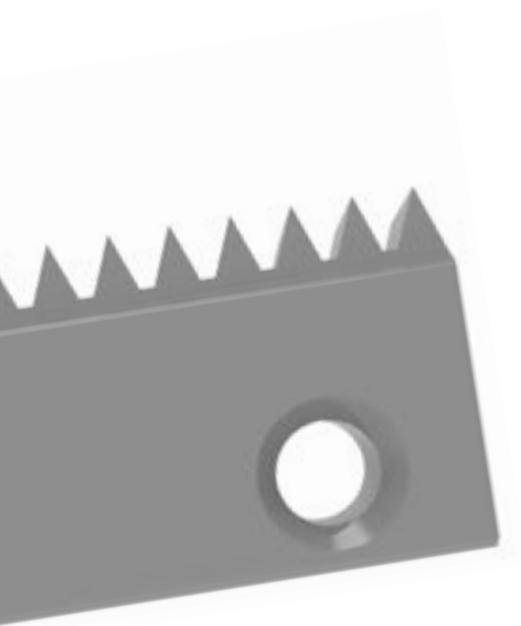
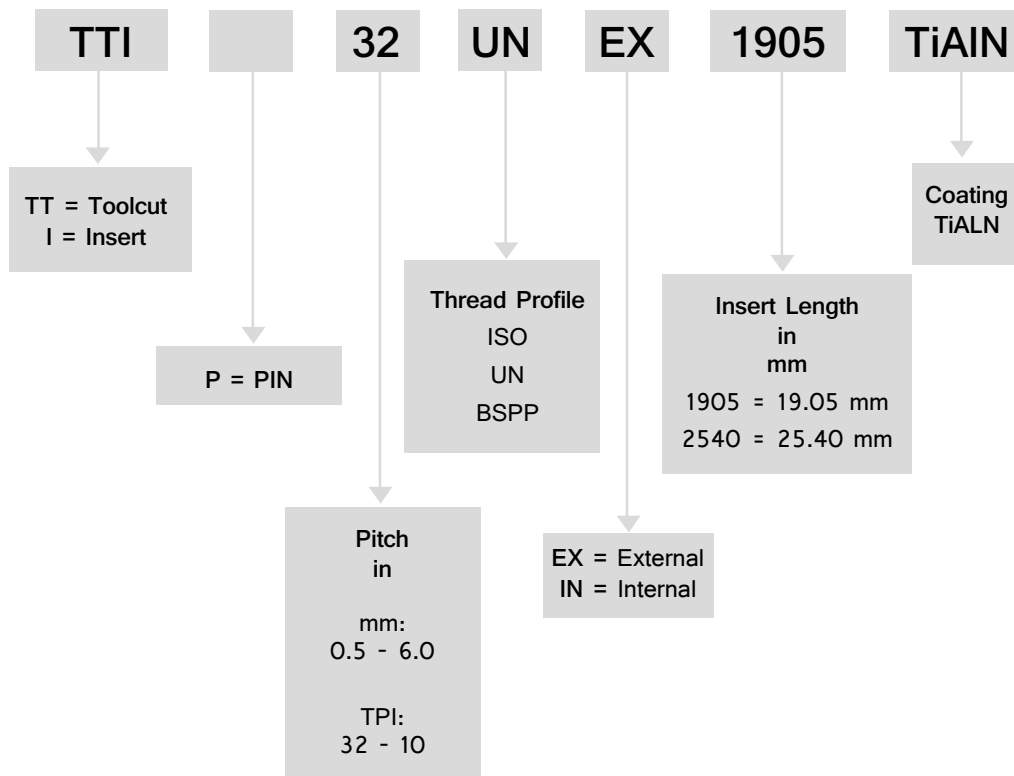
ADVANTAGES

- ECONOMIC TOOLS
- VARIETY OF THREAD FORMS INTERCHANGEABLE IN A SINGLE HOLDER
- LONGER TOOL LIFE THANKS TO A SPECIAL MULTI-LAYER COATING PROCESS (TiAlN)
- SAME TOOL CAN BE USED FOR A VARIETY OF MATERIALS
- BODY DESIGN ALLOWS FOR EXTENDED REACH FOR DEEPER APPLICATIONS
- SAME TOOL USED FOR R.H. & L.H. THREADS
- DAMPENED STAINLESS STEEL HOLDERS (LESS VIBRATION)



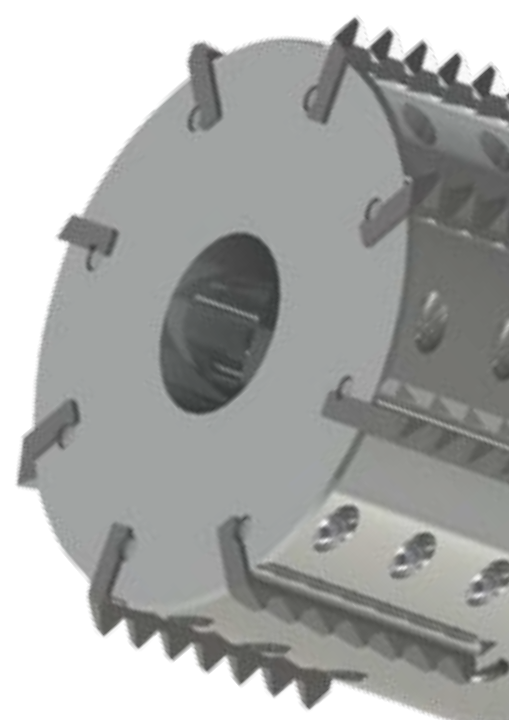
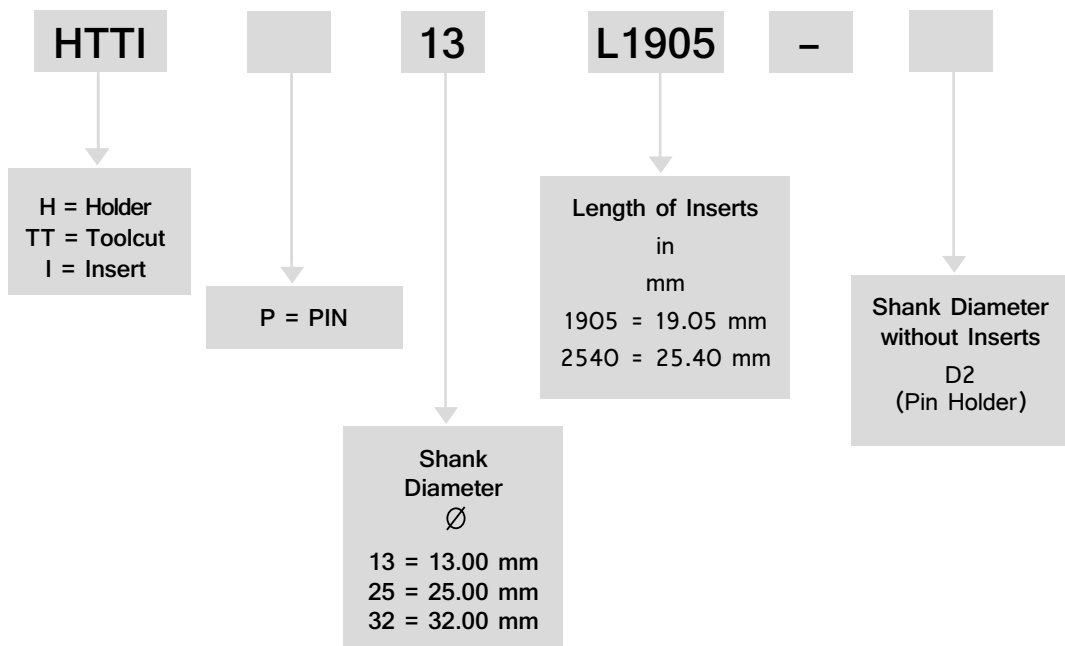
PRODUCT - IDENTIFICATION

T-Line Inserts Ordering Codes



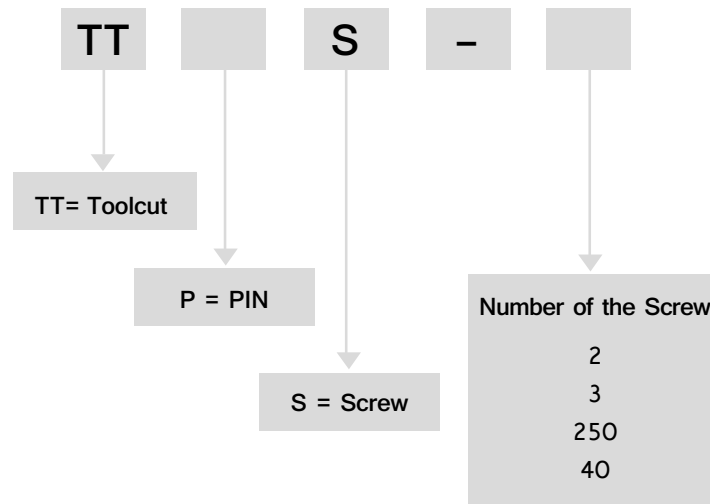
PRODUCT - IDENTIFICATION

T-Line Bolt Holder Ordering Codes



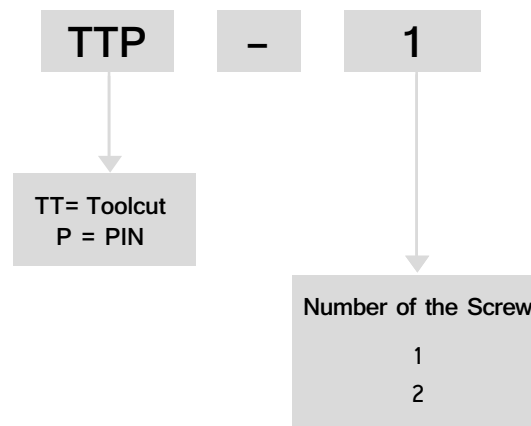
PRODUCT - IDENTIFICATION

T-Line Bolt and Pin Screws Ordering Codes

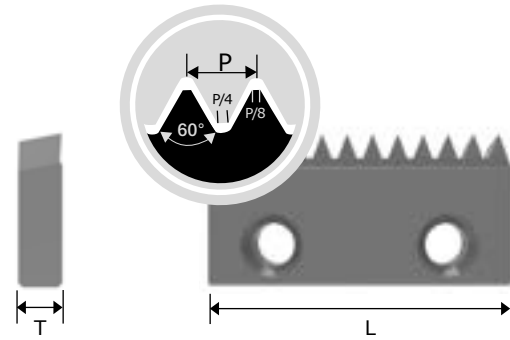


PRODUCT - IDENTIFICATION

T-Line Pin Ordering Codes



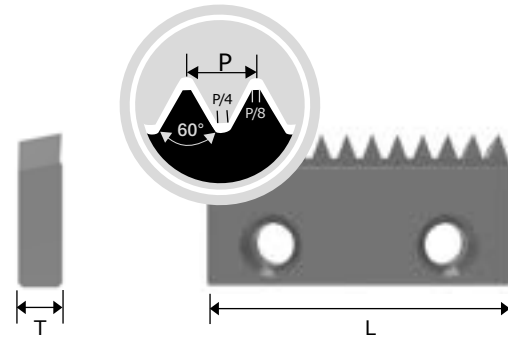
UN



P PITCH in TPI		ARTICLE NUMBER	T THICKNESS in mm	L INSERT LENGTH in mm	€ PRICE PER PIECE TiAIN
32	EXT.	TTI 32UN EX1905TiAIN	2.03	19.05	
32	INT.	TTI 32UN IN1905TiAIN	2.03	19.05	
24	EXT.	TTI 24UN EX1905TiAIN	2.03	19.05	
24	INT.	TTI 24UN IN1905TiAIN	2.03	19.05	
20	EXT.	TTI 20UN EX1905TiAIN	2.03	19.05	
20	INT.	TTI 20UN IN1905TiAIN	2.03	19.05	
18	EXT.	TTI 18UN EX1905TiAIN	2.03	19.05	
18	INT.	TTI 18UN IN1905TiAIN	2.03	19.05	
16	EXT.	TTI 16UN EX1905TiAIN	2.03	19.05	
16	INT.	TTI 16UN IN1905TiAIN	2.03	19.05	
32	EXT.	TTI 32UN EX254TiAIN	3.56	25.40	
32	INT.	TTI 32UN IN254TiAIN	3.56	25.40	
24	EXT.	TTI 24UN EX254TiAIN	3.56	25.40	
24	INT.	TTI 24UN IN254TiAIN	3.56	25.40	
20	EXT.	TTI 20UN EX254TiAIN	3.56	25.40	
20	INT.	TTI 20UN IN254TiAIN	3.56	25.40	
18	EXT.	TTI 18UN EX254TiAIN	3.56	25.40	
18	INT.	TTI 18UN IN254TiAIN	3.56	25.40	
16	EXT.	TTI 16UN EX254TiAIN	3.56	25.40	
16	INT.	TTI 16UN IN254TiAIN	3.56	25.40	
14	EXT.	TTI 14UN EX254TiAIN	3.56	25.40	
14	INT.	TTI 14UN IN254TiAIN	3.56	25.40	
12	EXT.	TTI 12UN EX254TiAIN	3.56	25.40	
12	INT.	TTI 12UN IN254TiAIN	3.56	25.40	
10	EXT.				
10	INT.	TTI 10UN IN254TiAIN	3.56	25.40	

Order example: TTI 32UN EX1905TiAIN

ISO

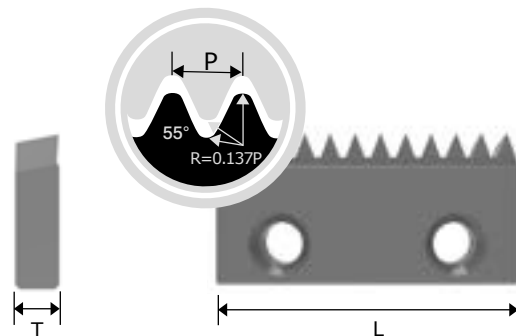


P PITCH in mm		ARTICLE NUMBER	T THICKNESS in mm	L INSERT LENGTH in mm	€ PRICE PER PIECE TiAlN
0.50	EXT.				
0.50	INT.	TTI 0.5ISO IN1905TiAlN	2.03	19.05	
1.00	EXT.				
1.00	INT.	TTI 1.0ISO IN1905TiAlN	2.03	19.05	
1.25	EXT.				
1.25	INT.	TTI 1.25ISO IN1905TiAlN	2.03	19.05	
1.50	EXT.				
1.50	INT.	TTI 1.5ISO IN1905TiAlN	2.03	19.05	
1.00	EXT.	TTI 1.0ISO EX254TiAlN	3.56	19.05	
1.00	INT.	TTI 1.0ISO IN254TiAlN	3.56	19.05	
1.50	EXT.	TTI 1.5ISO EX254TiAlN	3.56	25.40	
1.50	INT.	TTI 1.5ISO IN254TiAlN	3.56	25.40	
2.00	EXT.	TTI 2.0ISO EX254TiAlN	3.56	25.40	
2.00	INT.	TTI 2.0ISO IN254TiAlN	3.56	25.40	

Order example: TTI 1.5ISO IN1905TiAlN

BSPP

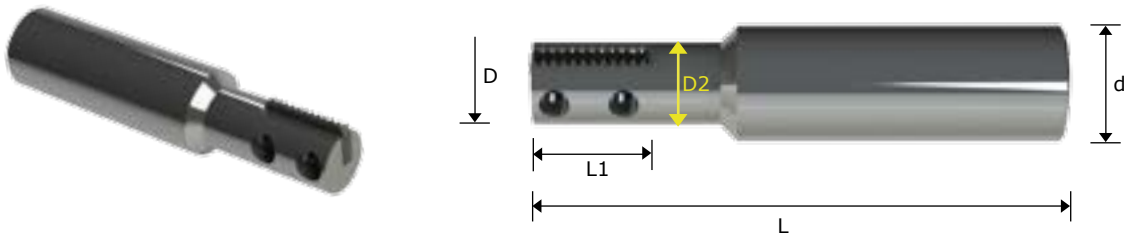
Tools for external and internal thread



P PITCH in TPI	ARTICLE NUMBER	T THICKNESS in mm	L INSERT LENGTH in mm	€ PRICE PER PIECE TiAlN
19	TTI 19BSPP1905TiAlN	2.03	19.05	
19	TTI 19BSPP254TiAlN	2.56	25.40	
14	TTI 14BSPP254TiAlN	2.56	25.40	

Order example: TTI 19BSPP1905TiAlN

TOOLHOLDERS



NO. of FLUTES	ARTICLE NUMBER	D2	D	d	SHANK STYLE	L	INSERT THICKNESS	INSERT LENGTH	€
		in mm	in mm	in mm		in mm			
1	HTTI13L1905	6.35	10.01	13.00	weldon	76.20	2.03	19.05	
1	HTTI25L2540	11.85	15.88	25.00	weldon	88.90	3.56	25.40	

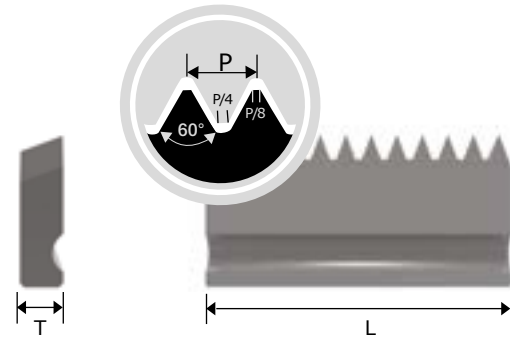
Order example: HTTI25L2540

SCREWS

ARTICLE NUMBER	THREADED TYPE	INSERT LENGTH in mm	€
			PRICE PER PIECE
TTS-250	M2,5 x 0,45	19,05	
TTS-40	#5-40	25,40	

Order example: TTS-40

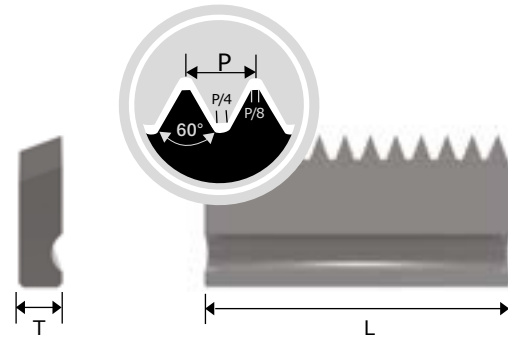
UN



P		ARTICLE NUMBER	T	L	€
PITCH			THICKNESS	INSERT LENGTH	PRICE PER PIECE
in TPI			in mm	in mm	TiAIN
32	EXT.	TTIP 32UN IN254TiAIN	3.56	25.40	
32	INT.	TTIP 32UN EX254TiAIN	3.56	25.40	
24	EXT.	TTIP 24UN IN254TiAIN	3.56	25.40	
24	INT.	TTIP 24UN EX254TiAIN	3.56	25.40	
20	EXT.	TTIP 20UN EX254TiAIN	3.56	25.40	
20	INT.	TTIP 20UN IN254TiAIN	3.56	25.40	
18	EXT.	TTIP 18UN EX254TiAIN	3.56	25.40	
18	INT.	TTIP 18UN IN254TiAIN	3.56	25.40	
16	EXT.	TTIP 16UN EX254TiAIN	3.56	25.40	
16	INT.	TTIP 16UN EX254TiAIN	3.56	25.40	
12	EXT.	TTIP12UN EX254TiAIN	3.56	25.40	
12	INT.	TTIP 12UN EX254TiAIN	3.56	25.40	
10	EXT.	TTIP 10UN EX254TiAIN	3.56	25.40	
10	INT.	TTIP 10UN IN254TiAIN	3.56	25.40	
8	EXT.	TTIP 8UN EX254TiAIN	3.56	25.40	
8	INT.	TTIP 8UN IN254TiAIN	3.56	25.40	
7	EXT.				
7	INT.	TTIP 7UN IN254TiAIN	3.56	25.40	

Order example: TTI 20UN EX254TiAIN

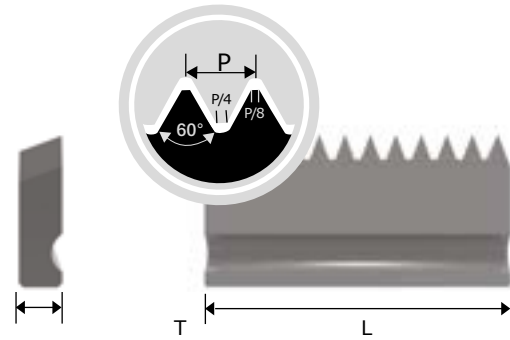
UN



P		ARTICLE NUMBER	T	L	€
PITCH			THICKNESS	INSERT LENGTH	PRICE PER PIECE
in TPI			in mm	in mm	TiAIN
24	EXT.	TTIP 24UN EX381TiAIN	3.56	38.10	
24	INT.	TTIP 24UN IN381TiAIN	3.56	38.10	
20	EXT.	TTIP 20UN EX381TiAIN	3.56	38.10	
20	INT.	TTIP 20UN IN381TiAIN	3.56	38.10	
18	EXT.	TTIP 18UN EX381TiAIN	3.56	38.10	
18	INT.	TTIP 18UN IN381TiAIN	3.56	38.10	
16	EXT.	TTIP 16UN EX381TiAIN	3.56	38.10	
16	INT.	TTIP 16UN IN381TiAIN	3.56	38.10	
14	EXT.				
14	INT.	TTIP 14UN IN381TiAIN	3.56	38.10	
12	EXT.	TTIP 12UN EX381TiAIN	3.56	38.10	
12	INT.	TTIP 12UN IN381TiAIN	3.56	38.10	
10	EXT.	TTIP 10UN EX381TiAIN	3.56	38.10	
10	INT.	TTIP 10UN IN381TiAIN	3.56	38.10	
8	EXT.	TTIP 8UN EX381TiAIN	3.56	38.10	
8	INT.	TTIP 8UN IN381TiAIN	3.56	38.10	
7	EXT.				
7	INT.	TTIP 7UN IN381TiAIN	3.56	38.10	
6	EXT.	TTIP 6UN EX381TiAIN	3.56	38.10	
6	INT.	TTIP 6UN IN381TiAIN	3.56	38.10	

Order example: TTIP 16UN IN381TiAIN

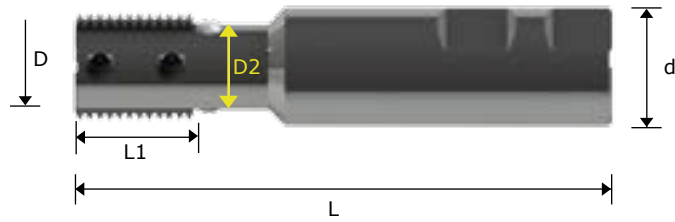
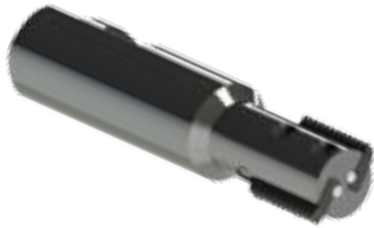
ISO



P			T	L	€
PITCH		ARTICLE NUMBER	THICKNESS	INSERT LENGTH	PRICE PER
in mm			in mm	in mm	PIECE
					TiAIN
1.50	EXT.				
1.50	INT.	TTIP 1.5ISO IN381TiAIN	3.56	38.10	
2.00	EXT.	TTIP 2.0ISO EX381TiAIN	3.56	38.10	
2.00	INT.	TTIP 2.0ISO IN381TiAIN	3.56	38.10	
2.50	EXT.				
2.50	INT.	TTIP 2.5ISO IN381TiAIN	3.56	38.10	
3.00	EXT.				
3.00	INT.	TTIP 3.0ISO IN381TiAIN	3.56	38.10	
3.50	EXT.				
3.50	INT.	TTIP 3.5ISO IN381TiAIN	3.56	38.10	
4.00	EXT.	TTIP 4.0ISO EX381TiAIN	3.56	38.10	
4.00	INT.	TTIP 4.0ISO IN381TiAIN	3.56	38.10	
4.50	EXT.	TTIP 4.5ISO EX381TiAIN	3.56	38.10	
4.50	INT.	TTIP 4.5UN IN254TiAIN	3.56	38.10	
5.00	EXT.	TTIP 5.00ISO EX381TiAIN	3.56	38.10	
5.00	INT.	TTIP 5.00ISO IN381TiAIN	3.56	38.10	
6.00	EXT.	TTIP 6.00ISO EX381TiAIN	3.56	38.10	
6.00	INT.	TTIP 6.00ISO IN381TiAIN	3.56	38.10	

Order example: TTI 3.5ISO IN381TiAIN

TOOLHOLDERS



NO. of FLUTES	ARTICLE NUMBER	D2	D	d	SHANK STYLE	SCREW	L	INSERT THICKNESS	L1	€
		in mm	in mm	in mm			in mm			
2	HTTIP25L2540-19	19.05	24.61	25.00	weldon	TTPS-3	114.30	3.56	25.40	
5	HTTIP32L2540-38	38.10	44.58	32.00	weldon	TTPS-2	101.60	3.56	25.40	
1	HTTIP25L3810-18	18.34	23.67	25.00	weldon	TTPS-2	114.30	3.56	38.10	
3	HTTIP25L3810-20	20.63	28.35	25.00	weldon	TTPS-3	114.30	3.56	38.10	
5	HTTIP32L3810-38	38.10	44.85	32.00	weldon	TTPS-2	114.30	3.56	38.10	
2	HTTIP25L3810-19	19.05	24.61	25.00	weldon	TTPS-3	114.30	3.56	38.10	

Order example: HTTIP25L3810-20

SHELL MILL ARBOR



NO. of FLUTES	ARTICLE NUMBER	D2	D	d	SHANK STYLE	SCREW	L	THICKNESS	L1	€
		in mm	in mm	in mm			in mm			
7	HTTIP27L3810-63	63.50	72.26	27.00	Shell Mill Arbor	TTPS-2	57.15	3.56	38.10	
8	HTTIP32L3810-76	76.20	84.84	32.00	Shell Mill Arbor	TTPS-2	57.15	3.56	38.10	

Order example: HTTIP32L3810-76

SCREWS

ARTICLE NUMBER	€
	PRICE PER PIECE
TTPS-2	
TTPS-3	

Order example: TTPS-2

PINS

ARTICLE NUMBER	L	€
	INSERT LENGTH	PRICE PER PIECE
	in mm	
TTP-1	25.40	
TTP-2	38.10	

Order example: TTP-2

T-LINE INDEXABLE

MATERIAL	HARDNESS ROCKWELL HRC	MACHIN- ABILITY	M/MIN	CHIPLOAD PER TOOTH (MM/TOOTH)							
				CUTTER DIAMETER (MM)							
				9,53 - 12,70	12,71 - 19,05	19,06 - 25,40	25,41 - 38,10	38,11 - 50,80	50,81 - 69,58	60,58 - 88,90	
Free Machining Steel for example: 1118, 1215, 12L14	<30HRc	Easy	152-274	0,020	0,025	0,030	0,038	0,051	0,064	0,076	
Low Carbon Steel for example: 1010, 1020, 1025, 1522, 1144	<30HRc	Average	152-274	0,020	0,025	0,030	0,038	0,051	0,064	0,076	
Medium Carbon Steel for example: 1010, 1040, 1050, 1527, 1140	<40HRc	Average	152-275	0,020	0,023	0,025	0,030	0,038	0,051	0,064	
Alloy Steel for example: 4140, 5140, 8640	<30HRc	Average	137-175	0,020	0,023	0,025	0,030	0,038	0,051	0,064	
	<40HRc	Difficult	114-122								
High Strength Alloy for example: 4340, 4330V, 300M	<35HRc	Average	137	0,020	0,023	0,025	0,030	0,038	0,051	0,064	
	<45HRc	Difficult	107-122								
Structural Steel for example: A36, A2B5, A516	<25HRc	Average	152-183	0,020	0,025	0,030	0,038	0,051	0,064	0,076	
	<40HRc	Difficult	137								
High Strength Alloy Hastelloy B, Inconel 600	<35HRc	Difficult	27-37	0,013	0,015	0,020	0,025	0,038	0,051	0,064	
Stainless Steel for example: (1.4305)	<30HRc	Difficult	152-160	0,013	0,018	0,023	0,038	0,051	0,064	0,076	
Stainless Steel PH for example: (1.2344-X40CMoV5.1)	<35HRc		65-91								
Tool Steel for example: (1.43542)	<35HRc		152-175								0,020
Cast Iron Gray, Ductile, Nodular	<35HRc	Easy	175-206	0,020	0,030	0,038	0,051	0,076	0,102	1,127	
		Average	145-152								
Wrought Aluminum 6061 T6	<20HRc	Easy	305-335	0,038	0,051	0,064	0,076	0,102	0,127	0,152	
*Cast Aluminum (up to 10% Si)			191								
Brass			335								0,051

T-LINE SOLID CARBIDE

• T-LINE - SOLID CARBIDE

The T-LINE Solid Carbide is manufactured from micro grain carbide and coated in TiAlN. This product is designed for economic demanding environment of high production threadmilling, providing extraordinary tool life and exceptionally high quality thread forms.

The T-LINE Solid Carbide is available as standard thread forms ISO, UN, BSPP and BSPT

ADVANTAGES

- ECONOMIC TOOLS
- TiAlN FOR IMPROVED TOOL LIFE AND HIGHER FEEDS
- SAME TOOL CAN BE USED FOR A VARIETY OF MATERIALS
- THICKER CORE FOR INCREASED STRENGTH
- SMALL DIAMETERS ARE POSSIBLE
- HELICAL FLUTES FOR INCREASED STABILITY

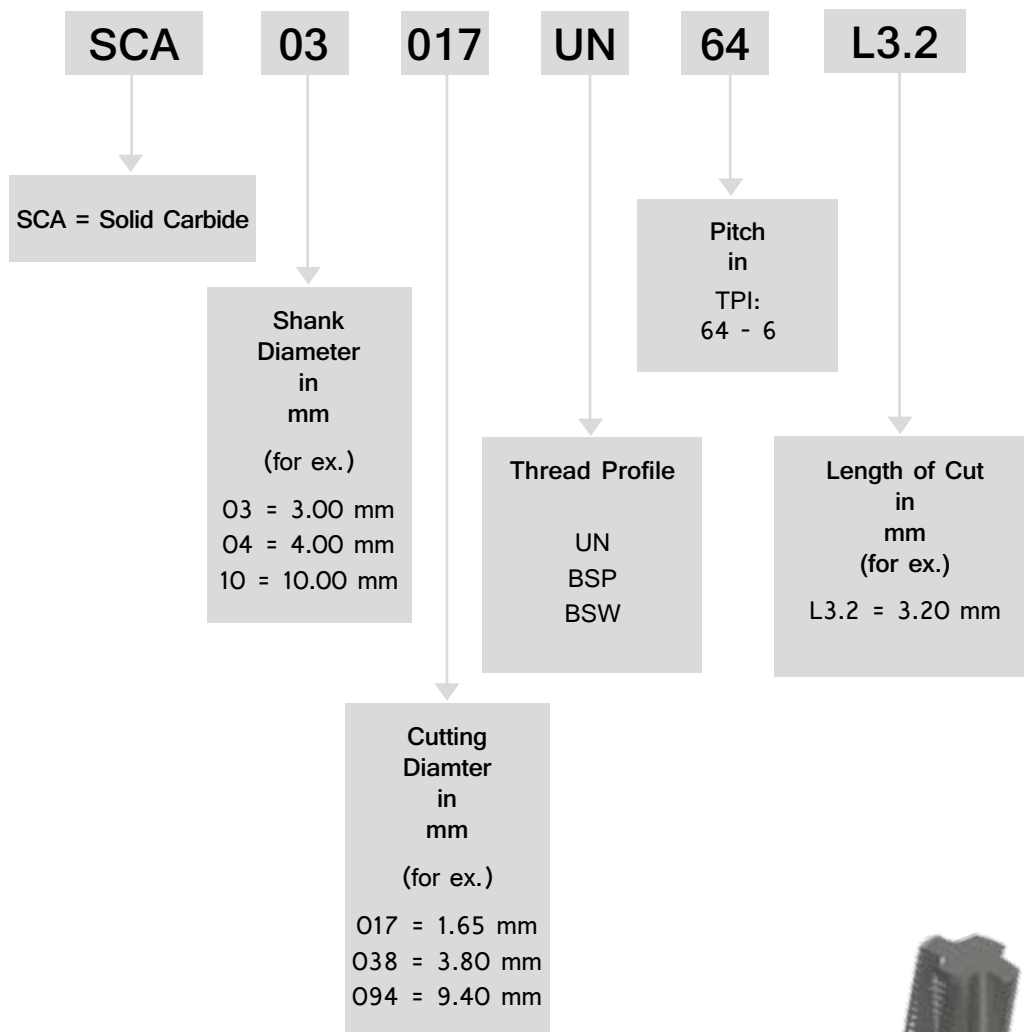


ADVANTAGES

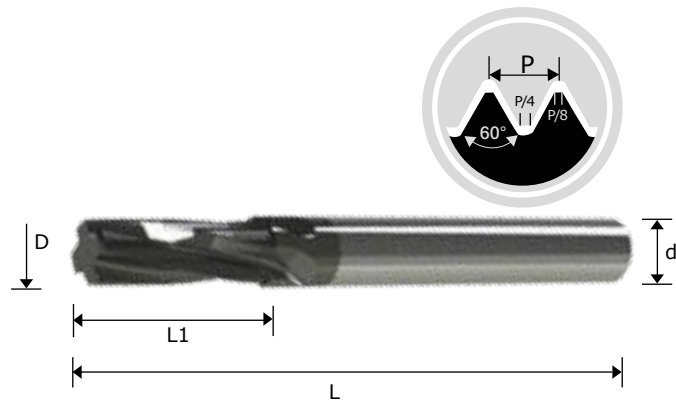
OF T - LINE INDEXABLE

PRODUCT - IDENTIFICATION

T-Line Solid Carbide Ordering Codes



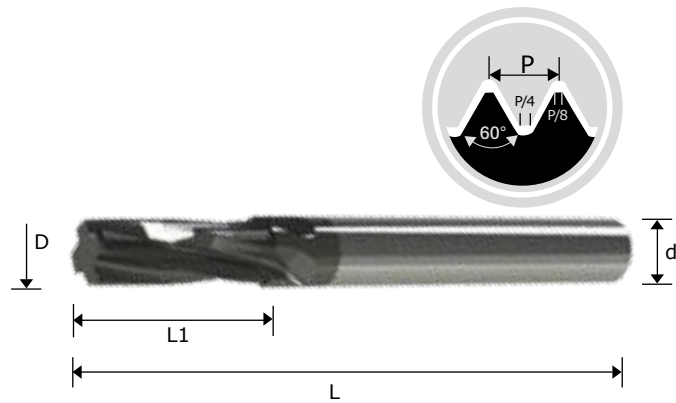
UN



P PITCH in TPI	ARTICLE NUMBER	NO. of FLUTES	MIN.THREAD SIZE	D in mm	d in mm	L1 in mm	L in mm	€ PRICE PER PIECE
64	SCA03017UN64L3.2	3	#2	1,65	3,00	3,20	39,00	
56	SCA03017UN56L3.2	3	#2	1,65	3,00	3,20	39,00	
48	SCA03018UN48L3.8	3	#3	1,80	3,00	3,75	39,00	
44	SCA03024UN44L4.7	3	#5	2,40	3,00	4,65	39,00	
40	SCA03020UN40L4.5	3	#4	2,20	3,00	4,45	39,00	
36	SCA04030UN36L6.4	3	#8	3,00	4,00	6,35	51,00	
32	SCA03025UN32L5.6	3	#6	2,50	3,00	5,55	39,00	
32	SCA04032UN32L6.4	3	#8	3,20	4,00	6,35	51,00	
32	SCA04038UN32L8	3	#10	3,80	4,00	7,95	51,00	
32	SCA10094UN32L25.4	3	1/2"	9,40	10,00	25,40	84,00	
28	SCA04038UN28L8.2	6	#10	3,80	4,00	8,20	51,00	
28	SCA06048UN28L12.7	3	1/4"	4,75	6,00	12,70	58,00	
28	SCA10094UN28L25.4	3	1/2"	9,40	10,00	25,40	84,00	
24	SCA04037UN24L8.5	6	#10	3,70	4,00	8,50	51,00	
24	SCA06060UN24L16	3	5/16"	5,95	6,00	16,00	58,00	
24	SCA08073UN24L19	3	3/8"	7,25	8,00	19,00	64,00	
24	SCA10094UN24L25.4	4	1/2"	9,40	10,00	25,40	84,00	
20	SCA06048UN20L12.7	6	1/4"	4,75	6,00	12,70	58,00	

Order example: SCA03017UN64L3.2

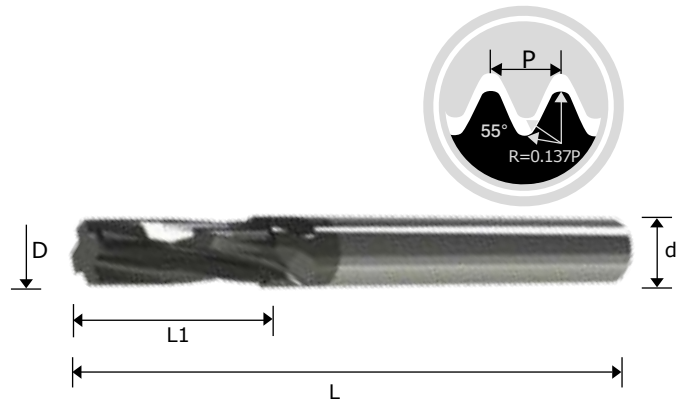
UN



P PITCH in TPI	ARTICLE NUMBER	NO. of FLUTES	MIN.THREAD SIZE	D in mm	d in mm	L1 in mm	L in mm	€ PRICE PER PIECE
20	SCA10088UN20L22.9	3	7/16"	8,75	10,00	22,85	84,00	
20	SCA10094UN20L25.4	4	1/2"	9,40	10,00	25,40	84,00	
18	SCA06060UN18L17	6	5/16"	5,95	6,00	17,00	58,00	
18	SCA10090UN18L22.7	3	9/16"	9,90	10,00	22,65	84,00	
16	SCA08073UN16L19	4	3/8"	7,25	8,00	19,00	64,00	
16	SCA12120UN16L31.8	4	3/4"	11,95	12,00	31,75	84,00	
14	SCA08078UN14L20	4	7/16"	7,75	8,00	20,00	64,00	
14	SCA12120UN14L32.7	4	7/8"	11,95	12,00	32,70	84,00	
13	SCA10094UN13L23.5	5	1/2"	9,40	10,00	23,50	84,00	
12	SCA10099UN12L23.4	4	9/16"	9,90	10,00	23,35	84,00	
12	SCA12120UN12L31.8	4	3/4"	11,95	12,00	31,75	84,00	
12	SCA20189UN12L38.1	6	1"	18,92	20,00	38,10	105,00	
11	SCA12120UN11L32.4	4	5/8"	11,95	12,00	32,40	84,00	
10	SCA12120UN10L33	4	3/4"	11,95	12,00	33,00	84,00	
9	SCA16158UN9L36.8	4	7/8"	15,75	16,00	36,75	93,00	
8	SCA16158UN8L35	4	1"	15,75	16,00	35,00	93,00	
7	SCA20199UN7L36.1	5	1-1/8"	19,90	20,00	36,10	105,00	
6	SCA20199UN6L38.1	5	1-3/8"	19,90	20,00	38,10	105,00	

Order example: SCA10088UN20L22.9

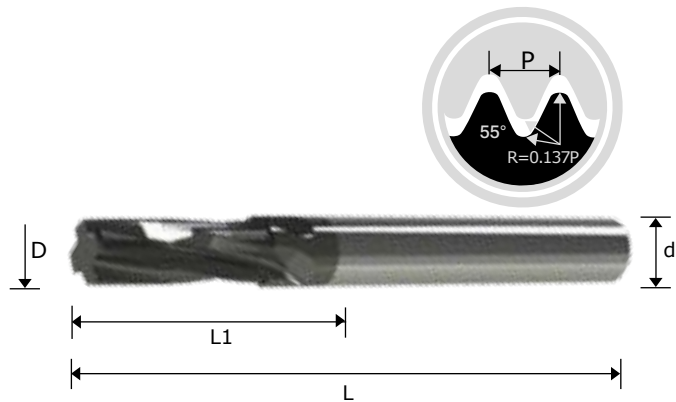
BSP



P PITCH in TPI	ARTICLE NUMBER	NO. of FLUTES	MIN. THREAD SIZE	D in mm	d in mm	L1 in mm	L in mm	€ PRICE PER PIECE
28	SCA06060BSPP28L14.5	3	1/16"	5,97	6,00	14,53	58,00	
19	SCA10099BSPP19L18.7	4	1/4"	9,91	10,00	18,72	84,00	
14	SCA12119BSPP14L29	4	1/2"	11,94	12,00	29,03	84,00	
11	SCA16158BSPP11L34.7	4	1"	15,75	16,00	4,65	93,00	

Order example: SCA10099BSPP19L18.7

BSW



P PITCH in TPI	ARTICLE NUMBER	NO. of FLUTES	MIN. THREAD SIZE	D in mm	d in mm	L1 in mm	L in mm	€ PRICE PER PIECE
20	SCA06045BSW20L10.2	3	1/4"	4,50	6,00	3,20	39,00	
18	SCA08050BSW18L11.3	3	5/16"	5,00	6,00	3,20	39,00	
16	SCA08070BSW16L14.3	5	3/8"	7,00	8,00	3,75	39,00	
14	SCA08079BSW14L18.2	5	7/16"	7,90	8,00	4,65	39,00	
12	SCA10090BSW12L19.1	5	1/2"	9,00	10,00	4,45	39,00	
11	SCA12119BSW11L23.1	5	5/8"	11,90	12,00	6,35	51,00	
10	SCA12119BSW10L27.9	5	3/4"	11,90	12,00	5,55	39,00	
9	SCA16159BSW9L28.2	5	7/8"	15,90	16,00	6,35	51,00	
8	SCA16159BSW8L34.9	6	1"	15,90	16,00	7,95	51,00	

Order example: SCA08070BSW16L14.3

T-LINE SOLID CARBIDE

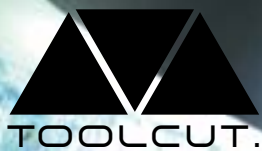
MATERIAL	HARDNESS ROCKWELL HRC	MACHIN- ABILITY	M/MIN	CHIPLOAD PER TOOTH (MM/TOOTH)							
				CUTTER DIAMETER (MM)							
				0,00 - 3,18	3,19 - 4,76	4,77 - 6,35	6,36 - 7,94	7,95 - 9,53	9,54 - 12,70	12,71 - 15,88	15,89 - 19,05
Free Machining Steel for example: 1118, 1215, 12L14	<30HRc	Easy	152-274	0,010	0,013	0,018	0,023	0,025	0,038	0,051	0,064
Low Carbon Steel for example: 1010, 1020, 1025, 1522, 1144	<30HRc	Average	152-274	0,010	0,013	0,018	0,023	0,025	0,038	0,051	0,064
Medium Carbon Steel for example: 1010, 1040, 1050, 1527, 1140	<40HRc	Average	152-275	0,010	0,013	0,015	0,020	0,025	0,033	0,046	0,051
Alloy Steel for example: 4140, 5140, 8640	<30HRc	Average	137-175	0,010	0,013	0,015	0,020	0,025	0,033	0,046	0,051
	<40HRc	Difficult	114-122								
High Strength Alloy for example: 4340, 4330V, 300M	<35HRc	Average	137	0,010	0,013	0,015	0,020	0,025	0,033	0,046	0,051
	<45HRc	Difficult	107-122								
Structural Steel for example: A36, A2B5, A516	<25HRc	Average	152-183	0,010	0,013	0,018	0,023	0,025	0,038	0,051	0,064
	<40HRc	Difficult	137								
High Strength Alloy Hastelloy B, Inconel 600	<35HRc	Difficult	27-37	0,008	0,010	0,015	0,020	0,023	0,025	0,038	0,051
Stainless Steel for example: (1.4305)	<30HRc	Difficult	152-160	0,010	0,013	0,015	0,020	0,023	0,025	0,038	0,051
Stainless Steel PH for example: (1.2344-X40CMoV5.1)	<35HRc		65-91								
Tool Steel for example: (1.43542)	<35HRc		152-175								
Cast Iron Gray, Ductile, Nodular	<35HRc	Easy	175-206	0,010	0,013	0,018	0,023	0,025	0,038	0,051	0,064
		Average	145-152								
Wrought Aluminum 6061 T6	<20HRc	Easy	305-335	0,013	0,015	0,023	0,025	0,038	0,051	0,064	0,076
*Cast Aluminum (up to 10% Si)			191								
Brass			335								

PASS CHARTS AND FORMULAS

UN BSP BSW			
PITCH SIZE	MATERIALS MACHINABILITY		
	EASY	AVERAGE	DIFFICULT
64	1	1	2
56	1	1	2
48	1	1	2
44	1	1	2
40	1	1	2
36	1	1	2
32	1	1	2
24	1	1	2
28	1	1	2
20	1	2	3
19	1	2	3
18	1	2	3
16	1	2	3
14	1	2	3
13	1	2	3
12	1	2	3
11	2	3	4
10	2	3	4
9	2	3	4
8	2	3	4
7	2	3	4
6	2	3	4

ISO			
PITCH SIZE	MATERIALS MACHINABILITY		
	EASY	AVERAGE	DIFFICULT
.40	1	1	2
.45	1	1	2
.50	1	1	2
.70	1	1	2
.75	1	1	2
.80	1	1	2
1.0	1	1	2
1.25	1	2	3
1.5	1	2	3
1.75	1	2	3
2.0	1	2	3
2.5	2	3	4
3.0	2	3	4
3.5	2	3	4
4.5	2	3	4
4.0	2	3	4
5.0	2	3	4
6.0	2	3	4

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