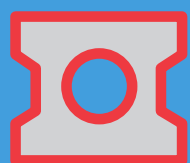




ThreadMill[®]

For Thread Milling



**Scandinavian
Tool Systems**



Scandinavian Tools System AB

Our business idea is to offer the best rigid threading system to our customer and to be in the front line of cutting tool development.

The company

Was founded in 1989 as a company for producing and selling threading tools. QuadCut and QuadCut Off are two products that were developed very early by the company, and during these years ThreadMill was added to the product range. We are represented in 27 countries around the world.

Scandinavian Tools System AB

Has had its present structure since 1995 when the Ostling Group bought it.

Surroundings

Our head office is situated in Insjön in the middle of Sweden in an area called Dalecarlia. There is a big lake called Siljan and the area surrounding the lake is famous for its old houses, culture and the wooden horses that have been made here since the first part of the 19th century. Painting wooden horses is a very old tradition in Sweden, at least 400 years. The Dala horse became a world celebrity at the 1939 World Exhibition in New York. A lot of Swedes come here to celebrate the Midsummer festival in the end of June. This is the lightest time of the year in Sweden, when the sun is shining for about 22 hours a day in the area.

Solid thread-milling cutters

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Solid thread-milling cutters



Solid thread-milling cutters are available in the following variants:

- 15° spiral with short and long cutting edge
- 15° spiral with chamfer
- 15° spiral with internal cooling
- 15° spiral mini

Most dimensions and profiles are available with both short and long cutting edge. The shortest possible length should be chosen for best stability and length of life. Using cutters that also have a chamfer edge saves time and tool costs if the hole is to be chamfered.

**Internal cooling not only lowers the temperature.
Swarf in blind holes is also washed away effectively.**

Indexable thread-cutters



Using our indexable thread-cutters makes it possible to produce different pitches simply by changing the threading insert. Cutter shanks available in the following variants:

- With one seat
- With two seats
- With four seats
- With carbide shank

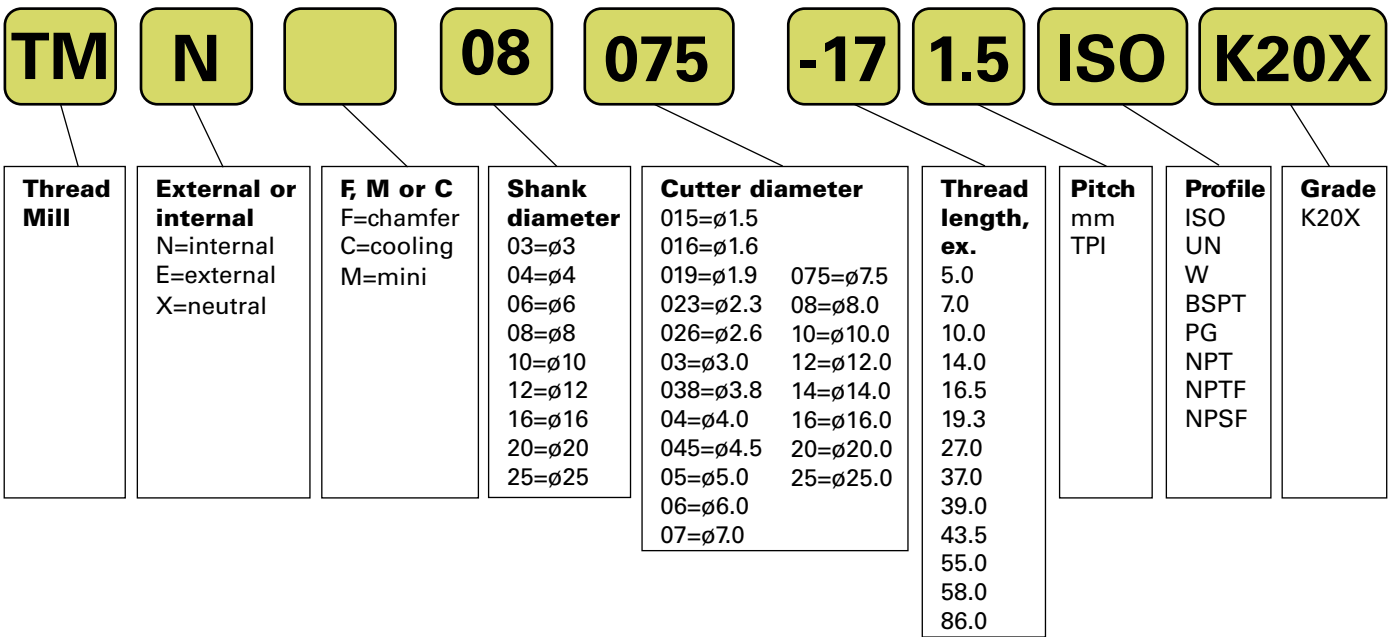
Same milling shank can be used for right and left hand thread, and also for both internal and external threads; all you need to do is change the thread milling inserts.

Thread milling inserts available in four sizes:

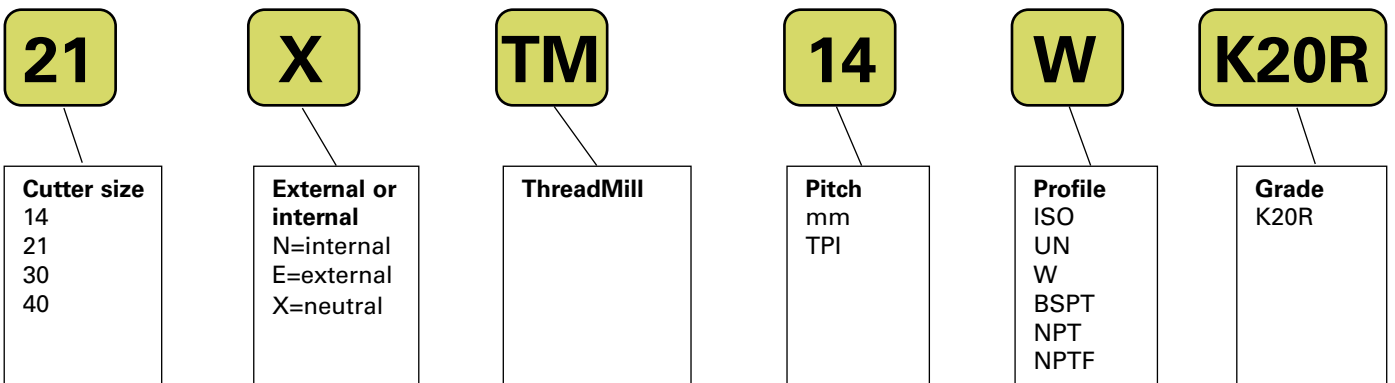
- 14
- 21
- 30
- 40

**ThreadMill indexable thread-cutters can be used
for both internal and external threads.**

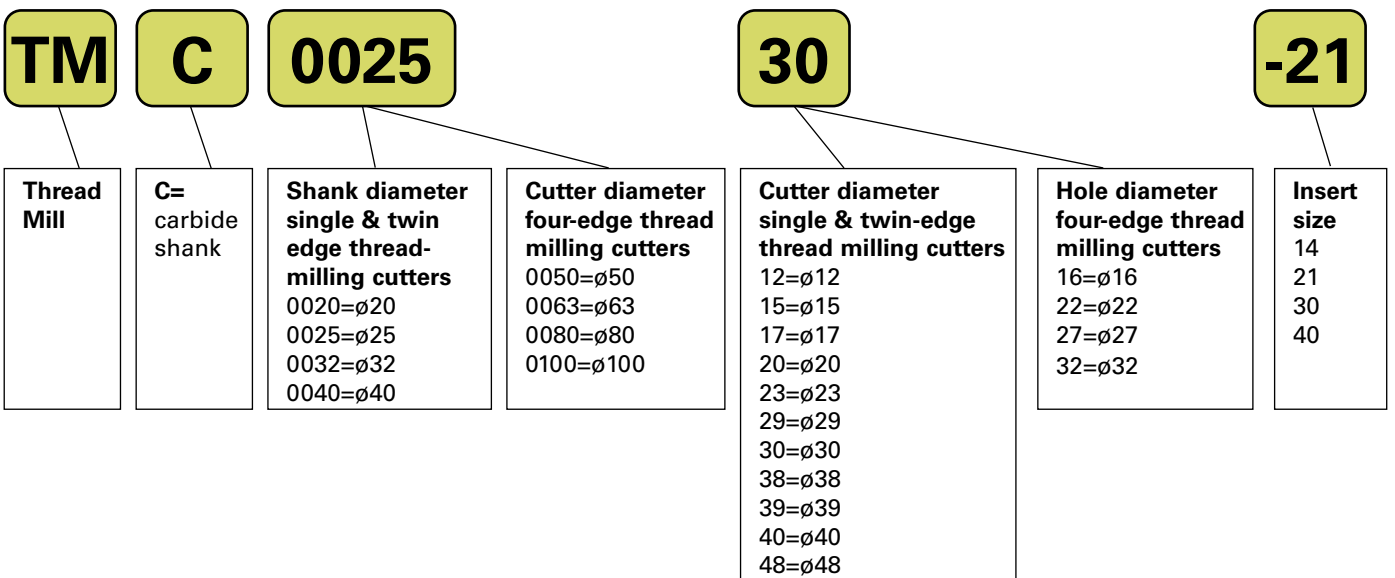
SOLID THREAD-MILLING CUTTERS



THREAD MILLING INSERTS



THREAD MILLING CUTTERS



Solid thread-milling cutters

Solid thread-milling cutters are designed mainly for internal thread-milling of small diameters, in modern CNC multi-operation machines in which speed of the spindle and the control system facilitate the use of carbide tools.

The solid thread-milling cutters have two or more spiral flutes which lead to shorter machining times, compared to tools that have only a single edge.

All of our solid thread-milling cutters have 15° helical angle and are available for the following types of thread.

M	Metric Metric with chamfer Metric with internal cooling Metric Mini
UN	Unified
G	Pipe thread, Whitworth
BSPT	Pipe thread, BSPT
NPT	Pipe thread, NPT
NPTF	Pipe thread, NPTF Dryseal
PG	Conduit thread
NPSF	Pipe thread NPSF



Solid thread-milling cutter



Solid thread-milling cutter with chamfer

K20X
Carbide with TiAlCN coating

Tolerance
D 1.0–7.0 +0/-0.050
D 8.0–25.0 +0/-0.075

Shank
Cylindrical with h6 tolerance

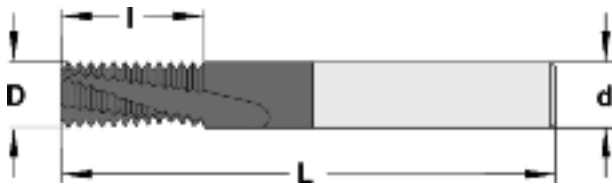
Range of use
Thread milling in all types of material



Solid thread-milling cutter with internal cooling

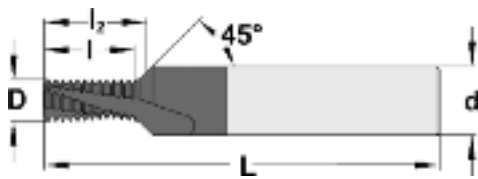


Solid thread-milling cutter Mini



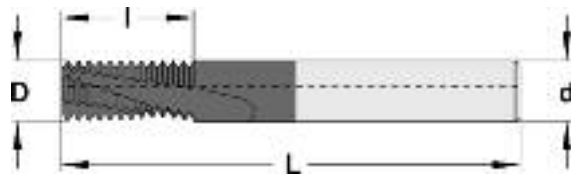
Metric (M)

Pitch mm	Thread coarse	Thread fine	Catalogue number	Dimensions mm				Number of flutes	Price group
				d	D	I	L		
0.5	M3	≥ Ø 4	TMN03023-5 0.5ISO	3	2.3	5.25	39	3	552
0.5	M3	≥ Ø 4	TMN03023-7 0.5ISO	3	2.3	7.25	39	3	554
0.5		≥ Ø 4	TMN06038-10 0.5ISO	6	3.8	10.25	64	3	558
0.7	M4		TMN0303-7 0.7ISO	3	3	7.35	39	3	552
0.7	M4		TMN0303-10 0.7ISO	3	3	10.15	39	3	554
0.75		Ø 6	TMN06045-10 0.75ISO	6	4.5	10.12	64	3	555
0.75		Ø 6	TMN06045-16 0.75ISO	6	4.5	16.12	64	3	558
0.8	M5		TMN04038-9 0.8ISO	4	3.8	9.2	51	3	553
0.8	M5		TMN04038-12 0.8ISO	4	3.8	12.4	51	3	556
1.0	M6 - M7	Ø 8	TMN06045-10 1.0ISO	6	4.5	10.5	64	3	555
1.0	M6 - M7	Ø 8	TMN06045-14 1.0ISO	6	4.5	14.5	64	3	558
1.0	M6	Ø 8	TMN06045-19 1.0ISO	6	4.5	19.5	64	3	561
1.0		Ø 8	TMN0606-12 1.0ISO	6	6	12.5	64	3	555
1.0		Ø 10	TMN0808-16 1.0ISO	8	8	16.5	64	4	560
1.25	M8 - M9	Ø 10	TMN0606-14 1.25ISO	6	6	14.38	64	3	555
1.25	M8 - M9	Ø 10	TMN0606-19 1.25ISO	6	6	19.38	64	3	558
1.25	M8	Ø 10	TMN0606-25 1.25ISO	6	6	25.62	76	3	561
1.5	M10 - M11	Ø 12	TMN08075-17 1.5ISO	8	7.5	17.25	64	3	560
1.5	M10 - M11	Ø 12	TMN08075-24 1.5ISO	8	7.5	24.75	76	3	563
1.5	M10	Ø 12	TMN08075-32 1.5ISO	8	7.5	32.25	76	3	566
1.5		Ø 14	TMN1010-21 1.5ISO	10	10	21.75	76	4	564
1.5		Ø 16	TMN1212-27 1.5ISO	12	12	27.75	76	4	569
1.5		Ø 20	TMN1616-33 1.5ISO	16	16	33.75	100	6	577
1.75	M12		TMN0808-20 1.75ISO	8	8	20.13	64	3	560
1.75	M12		TMN0808-28 1.75ISO	8	8	28.88	76	3	563
1.75	M12		TMN1009-20 1.75ISO	10	9	20.13	76	3	564
1.75	M12		TMN1009-28 1.75ISO	10	9	28.88	100	3	568
1.75	M12		TMN1009-37 1.75ISO	10	9	37.62	100	3	572
2.0	M14 - M16	Ø 18	TMN1010-27 2.0ISO	10	10	27	76	3	564
2.0	M14 - M16	Ø 18	TMN1010-39 2.0ISO	10	10	39	100	3	568
2.0	M16	Ø 18	TMN1212-27 2.0ISO	12	12	27	76	4	569
2.0	M16	Ø 18	TMN1212-39 2.0ISO	12	12	39	100	4	573
2.0	M16	Ø 18	TMN1212-51 2.0ISO	12	12	51	100	3	576
2.0		Ø 20	TMN1616-37 2.0ISO	16	16	37	100	5	577
2.0		Ø 24	TMN2020-41 2.0ISO	20	20	41	100	6	581
2.0		Ø 30	TMN2525-55 2.0ISO	25	25	55	130	6	585
2.5	M18 - M22		TMN1212-31 2.5ISO	12	12	31.25	100	3	571
2.5	M18 - M22		TMN1212-43 2.5ISO	12	12	43.75	100	3	574
2.5	M20 - M22		TMN1414-33 2.5ISO	14	14	33.75	89	4	574
2.5	M20 - M22		TMN1414-48 2.5ISO	14	14	48.75	100	4	578
2.5	M20		TMN1615-63 2.5ISO	16	15	63.75	120	3	579
3.0	M24 - M27	Ø 30	TMN1616-40 3.0ISO	16	16	40.5	100	3	579
3.0	M24 - M27	Ø 30	TMN1616-58 3.0ISO	16	16	58.5	120	3	580
3.0		Ø 30	TMN2020-43 3.0ISO	20	20	43.5	100	4	580
3.0		Ø 33	TMN2525-58 3.0ISO	25	25	58.5	130	4	584
3.5	M30 - M33		TMN2020-50 3.5ISO	20	20	50.75	120	3	582
3.5	M30 - M33		TMN2020-71 3.5ISO	20	20	71.75	150	3	583
4.0	M36 - M39	Ø 42	TMN2525-58 4.0ISO	25	25	58	130	3	584
4.0	M36 - M39	Ø 42	TMN2525-86 4.0ISO	25	25	86	150	3	586



Metric with chamfer (M)

Pitch mm	M coarse	Catalogue number	Dimensions mm					Number of flutes	Price group
			d	D	l	l ₂	L		
0.5	M3	TMNF06023-5 0.5ISO	6	2.3	5.25	5.9	64	3	555
0.5	M3	TMNF06023-7 0.5ISO	6	2.3	7.25	7.9	64	3	558
0.5	M3	TMNF06023-9 0.5ISO	6	2.3	9.75	10.4	64	3	561
0.7	M4	TMNF0603-7 0.7ISO	6	3	7.35	8.3	64	3	555
0.7	M4	TMNF0603-10 0.7ISO	6	3	10.15	11.1	64	3	558
0.7	M3	TMNF0603-12 0.7ISO	6	3	12.95	13.9	64	3	561
0.8	M5	TMNF06038-9 0.8ISO	6	3.8	9.2	10.3	64	3	555
0.8	M5	TMNF06038-12 0.8ISO	6	3.8	12.4	13.5	64	3	558
0.8	M5	TNMF06038-16 0.8ISO	6	3.8	16.4	17.5	64	3	561
1.0	M6	TMNF08045-10 1.0ISO	8	4.5	10.5	12	64	3	560
1.0	M6	TMNF08045-14 1.0ISO	8	4.5	14.5	16	64	3	563
1.25	M8	TMNF1006-14 1.25ISO	10	6	14.38	16.51	76	3	564
1.25	M8	TMNF1006-19 1.25ISO	10	6	19.38	21.51	76	3	568
1.5	M10	TMNF12075-17 1.5ISO	12	7.5	17.25	19.5	76	3	569
1.5	M10	TMNF12075-24 1.5ISO	12	7.5	24.75	27	76	3	573
1.75	M12	TMNF1409-20 1.75ISO	14	9	20.13	23.01	89	3	574
1.75	M12	TMNF1409-28 1.75ISO	14	9	28.88	31.76	89	3	578



Metric with internal cooling (M)

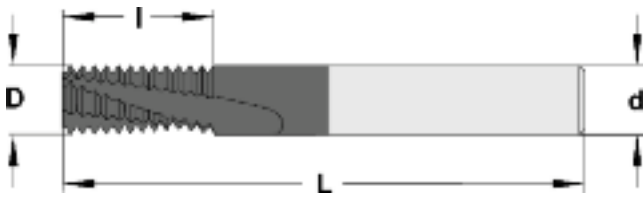
Pitch mm	Thread coarse	Thread fine	Catalogue number	Dimensions mm				Number of flutes	Price group
				d	D	l	L		
1.25	M8 - M9	Ø 10	TMNC0606-14 1.25ISO	6	6	14.38	64	3	557
1.25	M8 - M9	Ø 10	TMNC0606-19 1.25ISO	6	6	19.38	64	3	559
1.25	M8	Ø 10	TMNC0606-25 1.25ISO	6	6	25.62	76	3	563
1.5	M10 - M11	Ø 12	TMNC08075-17 1.5ISO	8	7.5	17.25	76	3	562
1.5	M10 - M11	Ø 12	TMNC08075-24 1.5ISO	8	7.5	24.75	76	3	565
1.5	M10	Ø 12	TMNC08075-32 1.5ISO	8	7.5	32.25	76	3	568
1.75	M12		TMNC0808-20 1.75ISO	8	8	20.13	76	3	562
1.75	M12		TMNC0808-28 1.75ISO	8	8	28.88	76	3	565
1.75	M12		TMNC1009-20 1.75ISO	10	9	20.13	100	3	567
1.75	M12		TMNC1009-28 1.75ISO	10	9	28.88	100	3	570
1.75	M12		TMNC1009-37 1.75ISO	10	9	37.62	100	3	573
2.0	M14 - M16	Ø 18	TMNC1010-27 2.0ISO	10	10	27	100	3	567
2.0	M14 - M16	Ø 18	TMNC1010-39 2.0ISO	10	10	39	100	3	570
2.0	M14 - M16	Ø 18	TMNC1212-27 2.0ISO	12	12	27	100	4	571
2.0	M14 - M16	Ø 18	TMNC1212-39 2.0ISO	12	12	39	100	4	575
2.0	M12	Ø 18	TMNC1212-51 2.0ISO	12	12	51	100	3	577



Metric Mini (M)

Pitch mm	M coarse	Catalogue number	Dimensions mm				Number of flutes	Price group
			d	D	l	L		
0.4	M2	TMNM03015-3 0.4ISO	3	1.5	3.4	39	3	550
0.4	M2	TMNM03015-5 0.4ISO	3	1.5	5	39	3	550
0.45	M2.2	TMNM03016-3 0.45ISO	3	1.6	3.8	39	3	550
0.45	M2.2	TMNM03016-5 0.45ISO	3	1.6	5.4	39	3	550
0.45	M2.5	TMNM03019-4 0.45ISO	3	1.9	4.2	39	3	550
0.45	M2.5	TMNM03019-6 0.45ISO	3	1.9	6.1	39	3	550
0.5	M3	TMNM03023-5 0.5ISO	3	2.3	5	39	3	550
0.5	M3	TMNM03023-7 0.5ISO	3	2.3	7.3	39	3	550
0.6	M3.5	TMNM03026-6 0.6ISO	3	2.6	6	39	3	550
0.6	M3.5	TMNM03026-8 0.6ISO	3	2.6	8.5	39	3	550
0.7	M4	TMNM0303-7 0.7ISO	3	3	7	39	3	550
0.7	M4	TMNM0303-10 0.7ISO	3	3	10	39	3	550
0.8	M5	TMNM04038-9 0.8ISO	4	3.8	9	51	3	551
0.8	M5	TMNM04038-12 0.8ISO	4	3.8	12.1	51	3	551
1.0	M6	TMNM06045-10 1.0ISO	6	4.5	10	64	3	551
1.0	M6	TMNM06045-14 1.0ISO	6	4.5	14.5	64	3	551
1.25	M8	TMNM0606-14 1.25ISO	6	6	14	64	3	551
1.25	M8	TMNM0606-19 1.25ISO	6	6	19.3	64	3	551

Solid thread-milling cutters



Unified (UN)

Pitch tpi	UNC	UNF	UNEF	Catalogue number	Dimensions mm				Number of flutes	Price group
					d	D	l	L		
28		1/4	7/16 - 1/2	TMN0604-11 28UN	6	4	11.34	64	3	555
24		5/16 - 3/8	9/16 - 5/8	TMN0605-14 24UN	6	5	14.29	64	3	555
24		3/8	9/16 - 5/8	TMN0807-21 24UN	8	7	21.70	64	3	560
20	1/4			TMN06045-12 20UN	6	4.5	12.07	64	3	555
20	1/4			TMN06045-15 20UN	6	4.5	15.88	64	3	558
20		7/16 - 1/2		TMN0807-21 20UN	8	7	20.96	64	3	560
20			3/4 - 1	TMN1212-27 20UN	12	12	27.31	76	5	569
18	5/16			TMN0605-14 18UN	6	5	14.82	64	3	555
18	5/16			TMN0605-19 18UN	6	5	19.05	64	3	558
18		9/16 - 5/8	1 1/8 - 1 5/8	TMN1010-26 18UN	10	10	26.11	76	4	564
16	3/8			TMN0606-16 16UN	6	6	16.67	64	3	555
16	3/8			TMN0606-23 16UN	6	6	23.02	76	3	558
16		3/4		TMN1212-31 16UN	12	12	30.95	100	4	569
14	7/16			TMN0807-20 14UN	8	7	20.87	64	3	560
14	7/16			TMN0807-28 14UN	8	7	28.11	76	3	563
14		7/8		TMN1615-37 14UN	16	15	37.20	100	5	577
13	1/2			TMN0808-22 13UN	8	8	22.47	64	3	560
13	1/2			TMN0808-32 13UN	8	8	32.24	76	3	563
12	9/16			TMN1010-26 12UN	10	10	26.46	76	3	564
12	9/16			TMN1010-34 12UN	10	10	34.94	100	3	568
12		1 - 1 1/2		TMN1616-41 12UN	16	16	41.28	100	5	577
11	5/8			TMN1010-28 11UN	10	10	28.86	76	3	564
11	5/8			TMN1010-40 11UN	10	10	40.41	100	3	568
10	3/4			TMN1212-34 10UN	12	12	34.29	76	3	569
10	3/4			TMN1212-47 10UN	12	12	46.99	100	3	573
9	7/8			TMN1615-38 9UN	16	15	38.10	100	3	577
9	7/8			TMN1615-55 9UN	16	15	55.02	120	3	579
8	1			TMN1616-42 8UN	16	16	42.87	100	3	577
8	1			TMN1616-61 8UN	16	16	61.92	120	3	579

Pipe thread, Whitworth (G)

Pitch mm	Norm	Catalogue number	Dimensions mm				Number of flutes	Price group
			d	D	l	L		
28	G 1/8	TMX0606-9 28W	6	6	9.53	64	3	555
19	G 1/4 - 3/8	TMX0808-14 19W	8	8	14.04	64	3	560
19	G 1/4 - 3/8	TMX1010-20 19W	10	10	20.72	76	4	564
14	G 1/2 - 7/8	TMX1212-19 14W	12	12	19.05	76	4	569
14	G 1/2 - 7/8	TMX1212-26 14W	12	12	26.31	76	4	573
14	G 1/2 - 7/8	TMX1616-26 14W	16	16	26.31	100	5	577
11	G 1 - 1 1/2	TMX1212-24 11W	12	12	24.25	76	3	569
11	G 1 - 3	TMX1616-38 11W	16	16	38.1	100	4	577
11	G ≥1	TMX2020-47 11W	20	20	47.34	100	5	580

Pipe thread, BSPT (BSPT)

Pitch mm	Norm	Catalogue number	Dimensions mm				Number of flutes	Price group
			d	D	l	L		
28	Rc 1/8	TMX0606-9 28BSPT	6	6	9.53	64	3	558
19	Rc 1/4 - 3/8	TMX0808-14 19BSPT	8	8	14.04	64	3	563
14	Rc 1/2 - 7/8	TMX1212-19 14BSPT	12	12	19.05	76	4	573
11	Rc 1 - 2	TMX1616-28 11BSPT	16	16	28.86	100	4	579

Pipe thread, NPT (NPT)

Pitch mm	Norm	Catalogue number	Dimensions mm				Number of flutes	Price group
			d	D	l	L		
27	5/16 - 1/8	TMX0606-9 27NPT	6	6	9.88	64	3	558
18	1/4 - 3/8	TMX0808-14 18NPT	8	8	14.82	64	3	563
14	1/2 - 3/4	TMX1212-20 14NPT	12	12	20.86	76	4	573
14	3/4	TMX1616-20 14NPT	16	16	20.86	100	4	579
11.5	1 - 2	TMX1616-27 11.5NPT	16	16	27.61	100	4	579
8	2 1/2	TMX2020-39 8NPT	20	20	39.69	100	4	583

Pipe thread, NPTF Dryseal (NPTF)

Pitch mm	Norm	Catalogue number	Dimensions mm				Number of flutes	Price group
			d	D	l	L		
27	1/16 - 1/8	TMX0606-9 27NPTF	6	6	9.88	64	3	558
18	1/4 - 3/8	TMX0808-14 18NPTF	8	8	14.82	64	3	563
14	1/2 - 3/4	TMX1212-20 14NPTF	12	12	20.86	76	4	573
11.5	1 - 2	TMX1616-27 11.5NPTF	16	16	27.61	100	4	579
8	2 1/2	TMX2020-39 8NPTF	20	20	39.69	100	4	583

Pipe thread, NPSF (NPSF)

Pitch mm	Norm	Catalogue number	Dimensions mm				Number of flutes	Price group
			d	D	l	L		
27	1/16 - 1/8	TMX0606-11 27NPSF	6	6	11.76	64	3	558
18	1/4 - 3/8	TMX0808-14 18NPSF	8	8	14.82	64	3	563
14	1/2 - 3/4	TMX1212-20 14NPSF	12	12	20.86	76	4	573
11.5	1	TMX1616-27 11.5NPSF	16	16	27.61	100	4	579

Conduit thread (PG)

Pitch mm	Norm	Catalogue number	Dimensions mm				Number of flutes	Price group
			d	D	l	L		
20	Pg 7	TMX0808-19 20PG	8	8	19.69	64	3	563
18	Pg 9-16	TMX1010-26 18PG	10	10	26.11	76	3	568
16	Pg 21-48	TMX1212-29 16PG	12	12	29.37	76	4	573

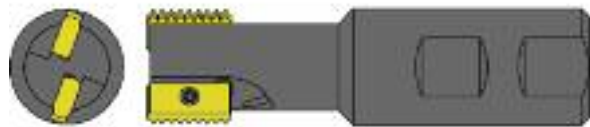
The indexable thread-cutters are designed so that they can be used for both internal and external thread milling. The high indexing precision permits changing of inserts without altering the machine setting or the program.

Our thread milling cutters are available for the following types of thread.

M	Metric
UN	Unified
G	Pipe thread, Whitworth
BSPT	Pipe thread, BSPT
NPT	Pipe thread, NPT
NPTF	Pipe thread, NPTF Dryseal



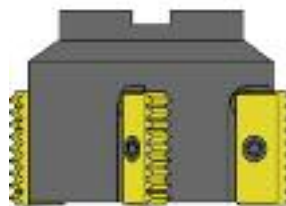
With one seat



With two seats



With carbide shank



With four seats



Thread milling cutter

Cutter shanks

Cutter shanks are available in four models, for one to four inserts. Production time is halved by using two inserts instead of one. A channel in the cutter shank leads coolant to the insert.

Thread milling cutters

Most cutters have two precision-ground edges and can therefore be used on two sides. Some of the "coarse" pitches are excluded and also cutters for taper threads, such as NPT, NPTF, BSPT, etc. The thread milling cutters are available in four sizes: 14, 21, 30 and 40 mm.

Tolerance

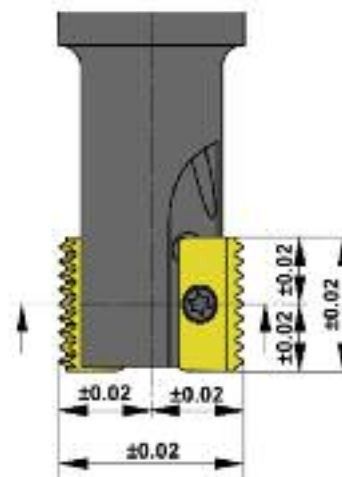
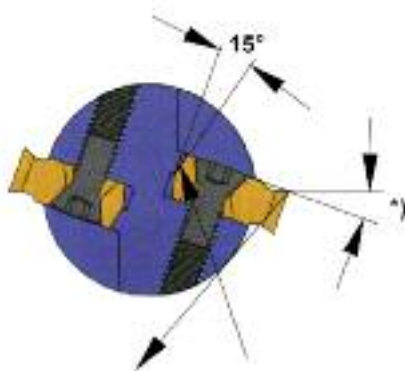
The close tolerances of the cutter and its inserts facilitate the use of more than one insert, without jeopardising tolerances of the finished part.

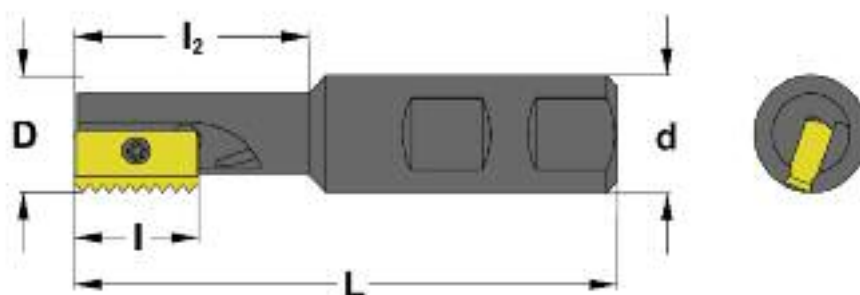
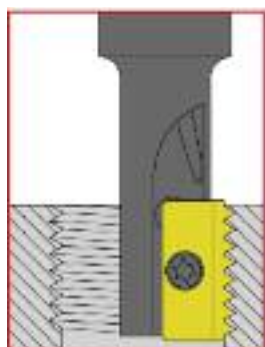
*) Clearance angles are achieved by tipping the cutter 20° for cutter sizes 14 and 21 and 15° for size 30 and 40. The significant cutting forces that occur tend to lift the insert. We have solved this with a 15° oblique contact surface that counteracts the force. Consequently, you can increase the rate of feed without risking that the clamping screw will fracture.

Range of use

Thread milling in all types of material

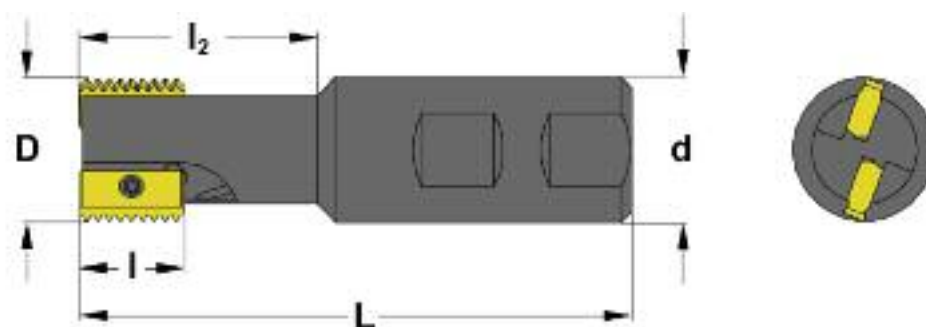
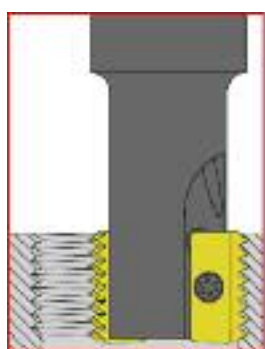
Tolerances





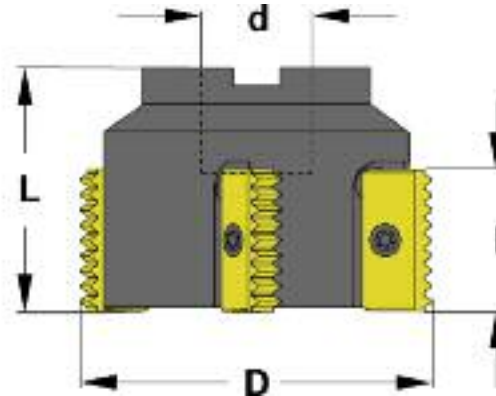
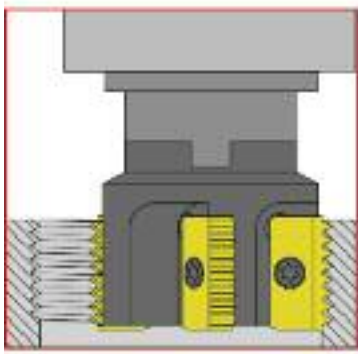
With one insert seat

Insert	Catalogue number	Dimensions mm					Price group
		d	D	l	l ₂	L	
14...	TM000812-14-L120	8	12	14	65	120	520
14...	TM001014-14-L120	10	14	14	65	120	520
14...	TM001216-14-L120	12	16	14	65	120	520
14...	TM002012-14	20	12	14	20	75	520
14...	TM002015L75-14	20	15	14	20	75	520
14...	TM002015L85-14	20	15	14	30	85	520
14...	TM002017-14	20	17	14	30	85	520
21...	TM002020L85-21	20	20	21	25	85	520
21...	TM002020-21	20	20	21	40	93	520
21...	TM002023L96-21	20	23	21	45	96	520
30...	TM002529-30	25	29	30	50	108	521
30...	TM003239-30	32	39	30	70	130	521
40...	TM003238L140-40	32	38	40	78	140	522
40...	TM004048-40	40	48	40	78	153	522



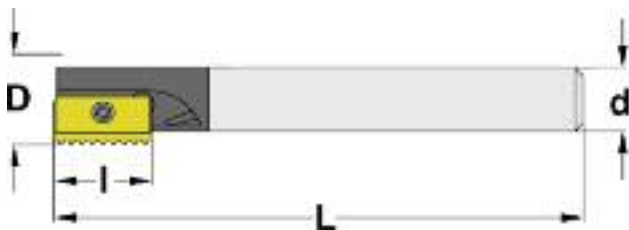
With two insert seats

Insert	Catalogue number	Dimensions mm					Price group
		d	D	l	l ₂	L	
14...	TM002020-14	20	20	14	40	93	522
21...	TM002530-21	25	30	21	50	108	523
30...	TM003240-30	32	40	30	70	130	524
30...	TM003240L165-30	32	40	30	105	165	529
40...	TM004050-40	40	50	40	83	153	525
40...	TM004050L185-40	40	50	40	115	185	530



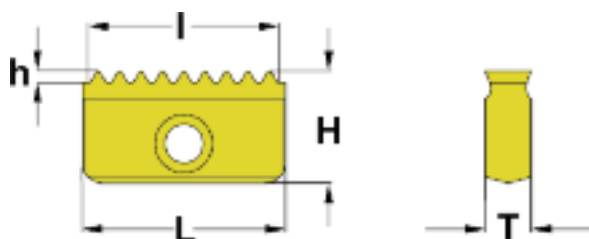
With four insert seats

Insert	Catalogue number	Dimensions mm				Price group
		d	D	l	L	
21...	TM005016-21	16	50	21	40	526
30...	TM006322-30	22	63	30	50	526
30...	TM008027-30	27	80	30	55	527
30...	TM010032-30	32	100	30	60	528
40...	TM008027-40	27	80	40	65	527
40...	TM010032-40	32	100	40	70	528



With carbide shank

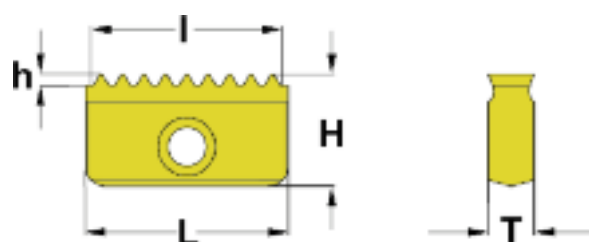
Insert	Catalogue number	Dimensions mm				Price group
		d	D	l	L	
14...	TMC001013-14	10	13	14	150	531
14...	TMC001215-14	12	15	14	180	532
21...	TMC001621-21	16	21	21	200	533
30...	TMC002027-30	20	27	30	260	534
30...	TMC002533-30	25	33	30	260	535



Thread milling inserts, Metric (M)

internal thread cutting

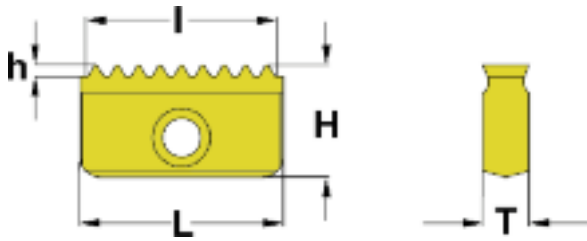
Pitch mm	M coarse	M fine	Catalogue number	Dimensions mm					Number of edges	Price group
				I	L	T	H	h		
1.0		≥ Ø 16	14NTM 1.0ISO	14	14	3.1	7.5	0.58	2	500
1.5		≥ Ø 16	14NTM 1.5ISO	13.5	14	3.1	7.5	0.88	2	500
2.0	M18-M22	≥ Ø 18	14NTM 2.0ISO	14	14	3.1	7.5	1.17	2	500
2.5			14NTM 2.5ISO	12.5	14	3.1	7.5	1.46	2	500
1.0		≥ Ø 24	21NTM 1.0ISO	21	21	4.7	12	0.58	2	501
1.5		≥ Ø 24	21NTM 1.5ISO	21	21	4.7	12	0.88	2	501
2.0		≥ Ø 24	21NTM 2.0ISO	20	21	4.7	12	1.17	2	501
3.0		≥ Ø 30	21NTM 3.0ISO	21	21	4.7	12	1.75	2	501
3.5	M30-M33		21NTM 3.5ISO	21	21	4.7	12	2.05	2	501
1.5		≥ Ø 35	30NTM 1.5ISO	30	30	5.5	16	0.88	2	502
2.0		≥ Ø 36	30NTM 2.0ISO	30	30	5.5	16	1.17	2	502
3.0		≥ Ø 36	30NTM 3.0ISO	30	30	5.5	16	1.75	2	502
4.0	M36-M39	≥ Ø 42	30NTM 4.0ISO	28	30	5.5	16	2.34	2	502
4.5	M42-M45		30NTM 4.5ISO	27	30	5.5	16	2.63	2	502
2.0		≥ Ø 56	40NTM 2.0ISO	40	40	6.3	20	1.17	2	503
3.0		≥ Ø 58	40NTM 3.0ISO	39	40	6.3	20	1.75	2	503
4.0		≥ Ø 64	40NTM 4.0ISO	40	40	6.3	20	2.34	2	503
5.0			40NTM 5.0ISO	40	40	6.3	20	2.92	2	503
6.0		≥ Ø 72	40NTM 6.0ISO	36	40	6.3	20	3.5	2	503



Thread milling inserts, Metric (M)

external thread cutting

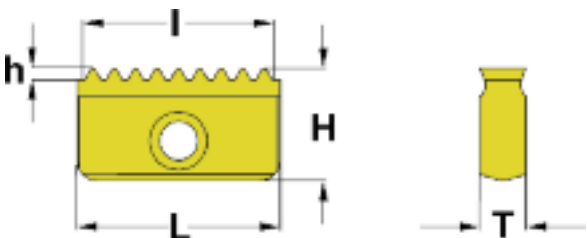
Pitch mm	M coarse	M fine	Catalogue number	Dimensions mm					Number of edges	Price group
				I	L	T	H	h		
1.0		≥ Ø 24	21ETM 1.0ISO	21	4.76	13	0.63	2	501	
1.5		≥ Ø 24	21ETM 1.5ISO	21	4.76	13	0.94	2	501	
2.0		≥ Ø 24	21ETM 2.0ISO	21	4.76	13	1.25	2	501	
1.5		≥ Ø 35	30ETM 1.5ISO	30	5.56	17	0.94	2	502	
2.0		≥ Ø 36	30ETM 2.0ISO	30	5.56	17	1.25	2	502	
3.0		≥ Ø 3	30ETM 3.0ISO	30	5.56	17	1.88	2	502	
4.0		≥ Ø 64	40ETM 4.0ISO	40	6.35	21	2.51	2	503	
5.0			40ETM 5.0ISO	40	6.35	21	3.13	2	503	
6.0		≥ Ø 72	40ETM 6.0ISO	40	6.35	21	3.76	2	503	



Thread milling inserts, Unified (UN)

internal thread cutting

Pitch tpi	UNC	UNF	UNEF	Catalogue number	Dimensions mm				Number of edges	Price group	
					I	L	T	H			
24			$\frac{5}{8}$	14NTM 24UN	13.75	14	3.1	7.5	0.62	2	500
20			$\frac{3}{4}-1$	14NTM 20UN	13.97	14	3.1	7.5	0.74	2	500
18		$\frac{5}{8}$	$1\frac{1}{8}-1\frac{5}{8}$	14NTM 18UN	14.00	14	3.1	7.5	0.83	2	500
16		$\frac{3}{4}$		14NTM 16UN	12.70	14	3.1	7.5	0.93	2	500
14		$\frac{7}{8}$		14NTM 14UN	12.70	14	3.1	7.5	1.06	2	500
12		$1-1\frac{1}{2}$		14NTM 12UN	12.70	14	3.1	7.5	1.24	2	500
20			1	21NTM 20UN	20.32	21	4.7	12	0.74	2	501
18			$1\frac{1}{8}-1\frac{5}{8}$	21NTM 18UN	21.00	21	4.7	12	0.83	2	501
16				21NTM 16UN	20.64	21	4.7	12	0.93	2	501
12			$1\frac{1}{8}-1\frac{1}{2}$	21NTM 12UN	21.00	21	4.7	12	1.24	2	501
8				21NTM 8UN	19.05	21	4.7	12	1.86	2	501
16				30NTM 16UN	30.00	30	5.5	16	0.93	2	502
12		$1\frac{1}{2}$		30NTM 12UN	29.63	30	5.5	16	1.24	2	502
8				30NTM 8UN	28.57	30	5.5	16	1.86	2	502
6	$1\frac{1}{2}$			30NTM 6UN	29.63	30	5.5	16	2.48	2	502
5				30NTM 5UN-S	30.00	30	5.5	16	2.97	1	502
12				40NTM 12UN	40.00	40	6.3	20	1.24	2	503
8				40NTM 8UN	38.10	40	6.3	20	1.86	2	503
6				40NTM 6UN	38.10	40	6.3	20	2.48	2	503



Thread milling inserts, Unified (UN)

external thread cutting

Pitch tpi	UNC	UNF	UNEF	Catalogue number	Dimensions mm				Number of edges	Price group
					I	L	T	H		
32				14ETM 32UN	14	4.7	13	0.50	2	500
24			$\frac{5}{8}$	14ETM 24UN	14	4.7	13	0.66	2	500
20			$\frac{3}{4}-1$	14ETM 20UN	14	4.7	13	0.80	2	500
18		$\frac{5}{8}$	$1\frac{1}{8}-1\frac{5}{8}$	14ETM 18UN	14	4.7	13	0.88	2	500
16				21ETM 16UN	21	5.5	17	0.99	2	501
12		$1-1\frac{1}{2}$		21ETM 12UN	21	5.5	17	1.33	2	501
16				30ETM 16UN	30	6.3	21	0.99	2	502
12		$1\frac{1}{2}$		30ETM 12UN	30	6.3	21	1.33	2	502

Thread milling inserts, Whitworth (BSW, BSP)

Internal and external thread cutting

Pitch mm	Norm	Catalogue number	Dimensions mm					Number of edges	Price group
			I	L	T	H	h		
19	G $\frac{3}{8}$	14XTM 19W	13.37	14	3.1	7.5	0.87	2	500
14	G $\frac{1}{2} - \frac{5}{8}$	14XTM 14W	12.70	14	3.1	7.5	1.18	2	500
11	–	14XTM 11W-S	14.00	14	3.1	7.5	1.18	1	500
14	G $\frac{3}{4} - \frac{7}{8}$	21XTM 14W	19.96	21	4.7	12	1.18	2	501
11	G 1	21XTM 11W	20.78	21	4.7	12	1.50	2	501
11	G $1\frac{1}{8}$	30XTM 11W	30.00	30	5.5	16	1.50	2	502
11	$\geq G 2$	40XTM 11W	39.25	40	6.3	20	1.50	2	503

Thread milling inserts, BSPT

Internal and external thread cutting

Pitch mm	Norm	Catalogue number	Dimensions mm					Number of edges	Price group
			I	L	T	H	h		
19	Rc $\frac{3}{8}$	14XTM 19BSPT-S	13.37	14	3.1	7.5		1	500
14	Rc $\frac{1}{2} - \frac{5}{8}$	14XTM 14BSPT-S	12.70	14	3.1	7.5	1.21	1	500
14	Rc $\frac{3}{4} - \frac{7}{8}$	21XTM 14BSPT-S	19.96	21	4.7	12	1.21	1	501
11	Rc 1	21XTM 11BSPT-S	20.78	21	4.7	12	1.54	1	501
11	Rc $1\frac{1}{8}$	30XTM 11BSPT-S	30.00	30	5.5	16	1.54	1	502
11	Rc ≥ 2	40XTM 11BSPT-S	39.25	40	6.3	20	1.54	1	503

Thread milling inserts, NPT

Internal and external thread cutting

Pitch mm	Norm	Catalogue number	Dimensions mm					Number of edges	Price group
			I	L	T	H	h		
18	$\frac{3}{8}$	14XTM 18NPT-S	14.00	14	3.1	7.5	1.05	1	500
14	$\frac{1}{2} - \frac{5}{8}$	14XTM 14NPT-S	12.70	14	3.1	7.5	1.37	1	500
14	$\frac{3}{4} - \frac{7}{8}$	21XTM 14NPT-S	19.96	21	4.7	12	1.37	1	501
11.5	1	21XTM 11.5NPT-S	19.88	21	4.7	12	1.68	1	501
11.5	$1\frac{1}{4} - 2$	30XTM 11.5NPT-S	28.71	30	5.5	16	1.68	1	502
8	$\geq 2\frac{1}{2}$	40XTM 8NPT-S	38.10	40	6.3	20	2.43	1	503

Thread milling insert, NPTF Dryseal

Internal and external thread cutting

Pitch mm	Norm	Catalogue number	Dimensions mm					Number of edges	Price group
			I	L	T	H	h		
18	$\frac{3}{8}$	14XTM 18NPTF-S	14.00	14	3.1	7.5	1.05	1	500
14	$\frac{1}{2} - \frac{5}{8}$	14XTM 14NPTF-S	12.70	14	3.1	7.7	1.37	1	500
14	$\frac{3}{4} - \frac{7}{8}$	21XTM 14NPTF-S	19.96	21	4.7	12	1.37	1	501
11.5	1	21XTM 11.5NPTF-S	19.88	21	4.7	12	1.68	1	501
11.5	$1\frac{1}{4} - 2$	30XTM 11.5NPTF-S	28.71	30	5.5	16	1.68	1	502
8	$\geq 2\frac{1}{2}$	40XTM 8NPTF-S	38.10	40	6.3	20	2.43	1	503

Making a thread

1. Choice of thread milling insert

Since length of the thread is 35 mm we should choose a 40 mm insert so that we will only need to do one complete turn.

Op. 1, Choose 40NTM 4.0ISO K20C

Op. 2, Choose 40ETM 4.0ISO K20C

2. Choice of thread milling cutter

Op. 1 See page 18. M64 x 4 gives $d_{\text{cutter}} = 52.5 \text{ mm}$

Select TM004050-40

Op. 2 Since we have ample room all round we can choose a multi-edge thread milling cutter.

To keep the costs of stock down we choose the same cutter as in Op. 1, Choose TM004050-40

3. Choice of cutting data

The material is stainless SS 2343 and carbide grade K20R.

Choose $V = 190 \text{ m/min}$ and $s_{\text{tooth}} = 0.10 \text{ mm/tooth}$

4. Programming

$N = \text{spindle speed r/min}$

$V = \text{cutting speed m/min}$

$N = \frac{V \times 1000}{\pi \times \text{cutter}} = 1210 \text{ r/min}$

$f_{\text{thread}} = \text{rate of feed at thread diameter mm/min}$

$s_{\text{tooth}} = \text{feed mm/tooth}$

$Z = \text{number of cutter teeth}$

$f_{\text{thread}} = N \times s_{\text{tooth}} \times Z = 1210 \times 0.10 \times 2 = 242 \text{ mm/min}$

Op. 1

$f_{\text{cutter}} = \text{rate of feed at centre of cutter mm/min}$

$f_{\text{cutter}} = f_{\text{thread}} \times \frac{d_{\text{thread}} - d_{\text{cutter}}}{d_{\text{thread}}} = 242 \times \frac{64 - 50}{64} = 53 \text{ mm/min}$

d_{thread}

$H = \text{vertical movement in start block mm}$

$H = \frac{P}{8} = \frac{4}{8} = 0.5 \text{ mm}$

S1210 M13

G01 G41 G91 X3.5 Y-3.5 F200

G03 X3.5 Y3.5 Z0.5 I0 J3.5 F53

G03 XO Y0 Z4 I-7 J0

G03 X-3.5 Y3.5 Z0.5 I-3.5 J0

G01 G40 X-3.5 Y-3.5 F200

Op. 2

$f_{\text{cutter}} = \text{rate of feed at centre of cutter mm/min}$

$f_{\text{cutter}} = f_{\text{thread}} \times \frac{d_{\text{thread}} + d_{\text{cutter}}}{d_{\text{thread}}} = 242 \times \frac{90 + 50}{90} = 376 \text{ mm/min}$

$H = \text{vertical movement in start block mm}$

$H = \frac{P}{2\pi} = \frac{4}{2\pi} = 0.637 \text{ mm}$

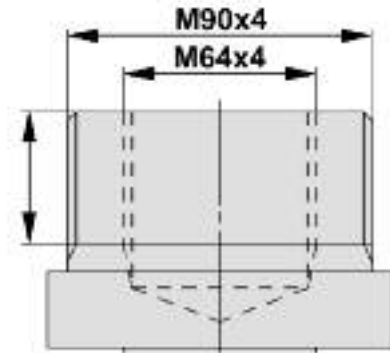
S1210 M13

G01 G41 G91 Y-67.835 Z-0.637 F363

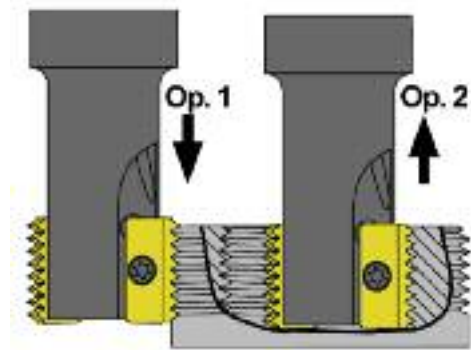
G02 X0 Y0 Z-4 I-42.835 J0

G01 G40 Y-67.835 Z-0.637

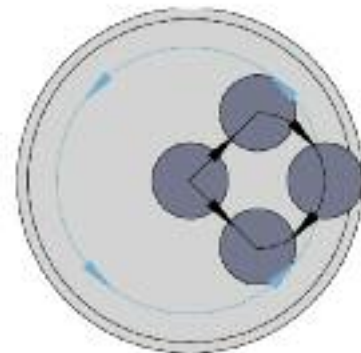
Drawing



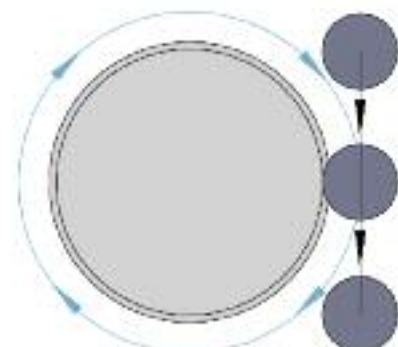
Machining operations



Internal thread cutting



External thread cutting



Machining data thread milling

Machining data recommendations for thread milling. Cutting speed/Rate of feed.

Material groups	Breaking strength N/mm ²	Cutting speed V _c [m/min]	Rate of feed f _c [mm/tooth]
Steel			
Free-cutting steel	< 410 N/mm ²	130 - 180	0.02 - 0.15
Structural steel	< 740 N/mm ²	130 - 180	0.02 - 0.15
Carbon steel	< 750 N/mm ²	120 - 160	0.02 - 0.15
Low-alloy steel	< 750 N/mm ²	100 - 140	0.02 - 0.10
Tempered steel	< 1000 N/mm ²	80 - 120	0.01 - 0.08
High-alloy steel	< 1600 N/mm ²	60 - 100	0.01 - 0.08
Hardened			
Hardened steel HRC		30 - 60	0.01 - 0.10
Hardened steel HRC 55		20 - 40	0.01 - 0.10
Stainless			
Stainless free-cutting steel	< 750 N/mm ²	130 - 180	0.04 - 0.10
Stainless steel I	< 750 N/mm ²	100 - 140	0.04 - 0.08
Stainless steel II	< 1150 N/mm ²	80 - 120	0.04 - 0.07
Castings			
Cast iron, laminar graphite I	< 350 N/mm ²	130 - 180	0.05 - 0.15
Cast iron, laminar graphite II	< 450 N/mm ²	100 - 140	0.03 - 0.1
Tempered cast iron	< 750 N/mm ²	80 - 120	0.03 - 0.15
Graphite 500 - 900	0.03 - 0.25		
Aluminium			
Aluminium, Al Mg 3	< 200 N/mm ²	500 - 900	0.05 - 0.25
Aluminium, Si < 0.5%	< 220 N/mm ²	400 - 800	0.05 - 0.25
Cast aluminium, Si < 11%	< 260 N/mm ²	300 - 600	0.05 - 0.15
Cast aluminium, Si > 11%	< 170 N/mm ²	200 - 400	0.05 - 0.15

Choice of threading tools

Recommended cutter shank and inserts for different thread sizes

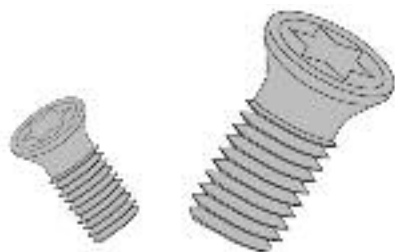
M Metric coarse threads ISO			UNC Coarse threads		
Thread size Series 1 Series 2	Cutter shank	Indexable cutter	Thread size	Cutter shank	Indexable cutter
M16	TM002012-14	14NTM2.0ISO	5/8	TM002012-14	14NTM 11UN
M18	TM002012-14	14NTM 2.5ISO	3/4	TM002015...-14	14NTM 10UN
M20	TM002015...-14	14NTM 2.5ISO	7/8		
M22	TM002015...-14	14NTM 2.5ISO	1 1/8	TM002020-21	21NTM 7UN
M24			1 1/4	TM002023L96-21	21NTM 7UN
M27	TM002020-21	21NTM 3.0ISO	1 3/8	TM002529-30	30NTM 6UN
M30	TM002023L96-21	21NTM 3.5ISO	1 1/2	TM002529-30	30NTM 6UN
M33	TM002023L96-21	21NTM 3.5ISO	1 3/4	TM002529-30	30NTM 5UN-S
M36	TM002529-30	30NTM 4.0ISO	2	TM003238-40	40NTM 4.5UN
M39	TM002529-30	30NTM 4.0ISO	2 1/4	TM003238-40	40NTM 4.5UN
M42	TM002529-30	30NTM 4.5ISO	2 1/2	TM004050...-40	40NTM 4UN
M45	TM002529-30	30NTM 4.5ISO			
M48	TM003238-40	40NTM 5.0ISO			
M52	TM003238-40	40NTM 5.0ISO			
M56	TM003238-40	40NTM 5.5ISO			
M60		40NTM 5.5ISO			
M64	TM004050...-40	40NTM 6.0ISO			

UNF Fine threads			UNEF Extra fine		
Thread size	Cutter shank	Indexable cutter	Thread size	Cutter shank	Indexable cutter
5/8	TM002012-14	14NTM 18UN	5/8	TM002012-14	14NTM 24UN
3/4	TM002015...-14	14NTM 16UN	3/4	TM002015...-14	14NTM 20UN
7/8	TM002017-14	14NTM 14UN	7/8	TM002017-14	14NTM 20UN
1	TM002017-14	14NTM 12UN	1	TM002017-14	14NTM 20UN
1 1/8	TM002023L96-21	21NTM 12UN	1 1/8	TM002023L96-21	21NTM 18UN
1 1/4	TM002023L96-21	21NTM 12UN	1 1/4	TM002023L96-21	21NTM 18UN
1 3/8	TM002529-30	30NTM 12UN	1 3/8	TM002023L96-21	21NTM 18UN
1 1/2	TM002529-30	30NTM 12UN	1 1/2	TM002530-21	21NTM 18UN
1 3/4	TM002529-30	30NTM 12UN	1 3/4	TM002530-21	21NTM 18UN
2	TM003240...-30	30NTM 12UN	2	TM002530-21	21NTM 18UN
2 1/4	TM003240...-30	30NTM 12UN	2 1/4	TM002530-21	21NTM 18UN
2 1/2	TM003240...-30	30NTM 12UN	2 1/2	TM002530-21	21NTM 18UN

Choice of threading tools

Recommended cutter shank and inserts for different thread sizes

G, Rp, R Pipe threads			NPT Pipe threads		
Thread size	Cutter shank	Indexable cutter	Thread size	Cutter shank	Indexable cutter
3/8	TM002012-14	14XTM 19W	3/8	TM002012-14	14XTM 18NPT-S
1/2	TM002015L75-14	14XTM 14W	1/2	TM002015L75-14	14XTM 14NPT-S
5/8	TM002015L75-14	14XTM 14W	5/8	TM002015L75-14	14XTM 14NPT-S
3/4	TM002020L85-21	21XTM 14W	3/4	TM002020L85-21	21XTM 14NPT-S
7/8	TM002020L85-21	21XTM 14W	7/8	TM002020L85-21	21XTM 14NPT-S
1	TM002020L85-21	21XTM 11W	1	TM002020L85-21	21XTM 11.5NPT-S
1 1/8	TM002529-30	30XTM 11W	1 1/8	TM002529-30	30XTM 11.5NPT-S
1 1/4	TM002529-30	30XTM 11W	1 1/4	TM002529-30	30XTM 11.5NPT-S
1 1/2	TM003240-30	30XTM 11W	1 1/2	TM003240-30	30XTM 11.5NPT-S
1 3/4	TM003240-30	30XTM 11W	1 3/4	TM003240-30	30XTM 11.5NPT-S
2	TM003240-30	30XTM 11W	2	TM003240-30	30XTM 11.5NPT-S
2 1/4	TM003240-30	30XTM 11W	2 1/4	TM003240-30	30XTM 11.5NPT-S
2 1/2	TM004050-40	40XTM 11W	2 1/2	TM004050-40	40XTM 8NPT-S



Screws

Catalogue number	Used for	Price group
STST7.5xM2.5	TM 14	221
STST20xM4	TM 21	221
STST20xM5	TM 31	221
STST20xM5	TM 40	221

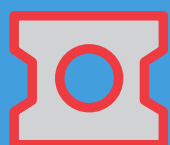
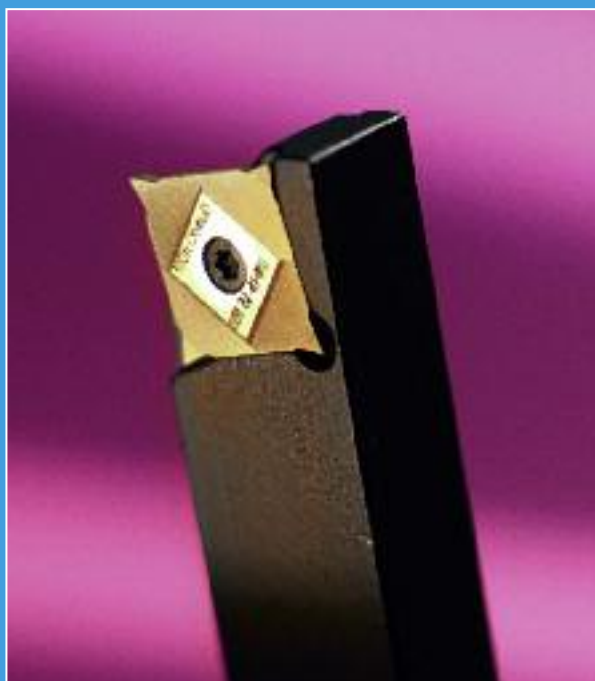


Keys

Catalogue number	Used for	Price group
Torx T7	STST7.5xM2.5	222
Torx T20	STST20xM4	222
Torx T20	STST20xM5	222

Advantages of thread milling





**Scandinavian
Tool Systems**

Scandinavian Tool Systems AB

Box 59, SE-793 12 Insjön, Sweden

Phone +46 (0)247 410 20 · Fax +46 (0)247 415 71
info@scandinavian-tool.se · www.scandinavian-tool.se