

MTS0250C15 64 UN

MTS0250C17 56 UN

MTS0250C20 48 UN

MTS0250C25 40 UN

MTS0250C28 40 UN

MTS0250C28 32 UN

Mini Mill-Thread + **HARDCUT**



Carmex
Precision Tools Ltd.

Inch
2008-2009

Specially designed solid-carbide thread mills for internal threads from very small bores

Due to the unique tool design, accurate geometries and high quality grade, the following are achieved:

- Threading from 0-80 UNF (bore diameter $\varnothing.05$).
- Working in high cutting speed.
- Short machining time.
- Low cutting forces thanks to the short profile.
- No broken taps.
- Threading up to shoulder in blind holes.
- Machining of hardened materials.

The tools are offered in Carmex advanced MT7 Carbide Grade, a Sub-Micron grade with Titanium Aluminum Nitride multilayer coating (ISO K10 - K20) to be run at medium to high cutting speeds. General purpose for all materials.

Carmex is an exclusive producer of solid carbide thread mills to produce MJ & UNJ threads.

The tools are offered in Carmex advanced MT8 Carbide Grade.

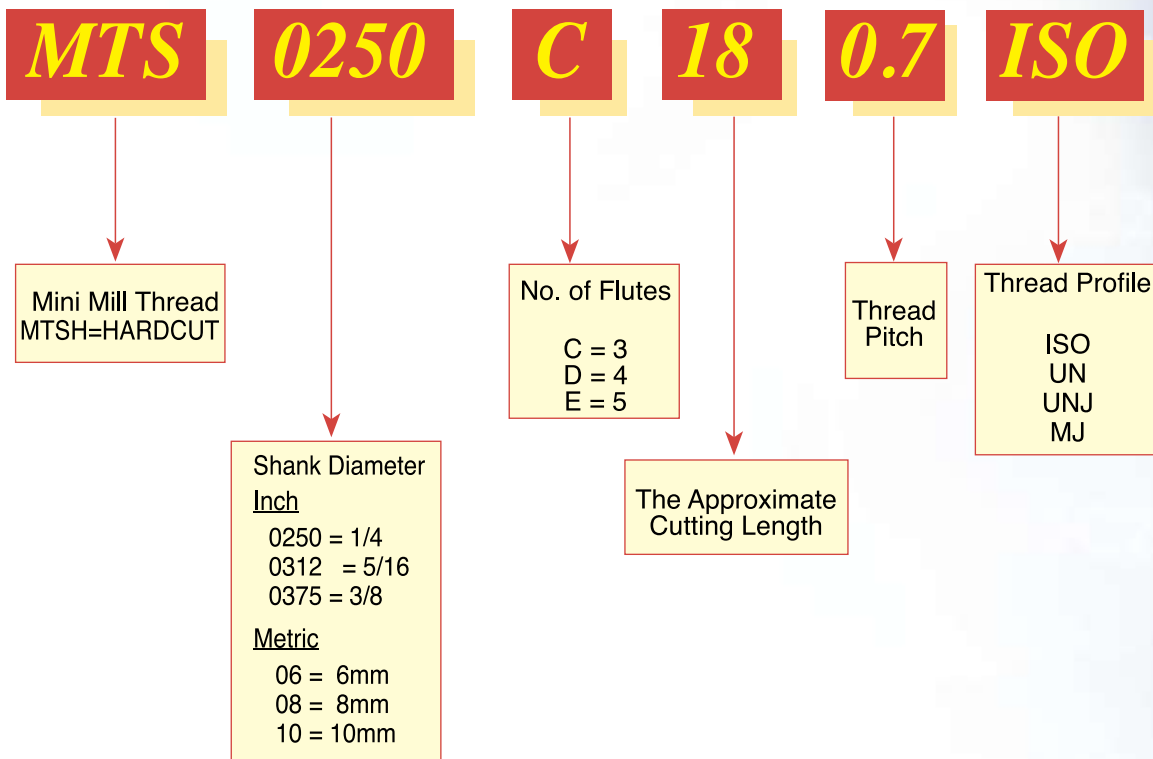
This grade delivers Extremely high heat resistant and smooth cutting operation, for high performance, and normal machining conditions. General purpose for all materials.

These thread mills are offered with internal coolant through the flutes.



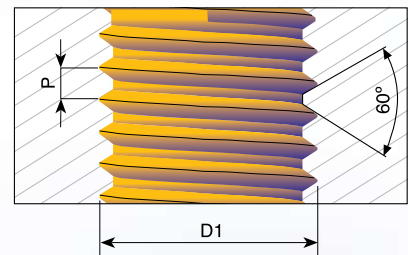
Product Identification

Mini Mill-Thread Ordering Codes



ISO

Tools for Internal Thread



For thread depth up to $2xD1$

Pitch mm	D1	Ordering Code	d	D	No. of flutes	I	L
0.25	M1.0	MTS03007C2 0.25 ISO	3mm	.028	3	.10	1.5
0.25	M1.2	MTS03009C3 0.25 ISO	3mm	.035	3	.12	1.5
0.4	M2	MTS0250C18 0.4 ISO	1/4	.061	3	.18	2.5
0.45	M2.2	MTS0250C20 0.45 ISO	1/4	.065	3	.20	2.5
0.45	M2.5	MTS0250C22 0.45 ISO	1/4	.077	3	.22	2.5
0.5	M3	MTS0250C26 0.5 ISO	1/4	.093	3	.26	2.5
0.6	M3.5	MTS0250C30 0.6 ISO	1/4	.108	3	.30	2.5
0.7	M4	MTS0250C35 0.7 ISO	1/4	.122	3	.35	2.5
0.8	M5	MTS0250C49 0.8 ISO	1/4	.150	3	.49	2.5
1.0	M6	MTS0250C55 1.0 ISO	1/4	.183	3	.55	2.5
1.25	M8	MTS0250C71 1.25 ISO	1/4	.234	3	.71	2.5
1.5	M10	MTS0312C91 1.5 ISO	5/16	.307	3	.91	2.5
1.75	M12	MTS0375C10 1.75 ISO	3/8	.354	3	1.02	3.0
2.0	M16	MTS0500D13 2.0 ISO	1/2	.465	4	1.38	3.5
2.5	M20	MTS0625E16 2.5 ISO	5/8	.591	5	1.69	4.0

For thread depth up to $3xD1$

Pitch mm	D1	Ordering Code	d	D	No. of flutes	I	L
* 0.3	M1.4	MTS03011C4 0.3 ISO	3mm	.041	3	.16	1.5
* 0.35	M1.6	MTS03012C5 0.35 ISO	3mm	.047	3	.19	1.5
* 0.4	M2	MTS03016C6 0.4 ISO	3mm	.061	3	.24	1.5
0.45	M2.5	MTS0250C30 0.45 ISO	1/4	.077	3	.30	2.5
0.5	M3	MTS0250C37 0.5 ISO	1/4	.093	3	.37	2.5
0.7	M4	MTS0250C49 0.7 ISO	1/4	.122	3	.49	2.5
0.8	M5	MTS0250C63 0.8 ISO	1/4	.150	3	.63	2.5
1.0	M6	MTS0250C79 1.0 ISO	1/4	.183	3	.79	2.5
1.25	M8	MTS0250C94 1.25 ISO	1/4	.234	3	.94	2.5

Order example: MTS 0250C26 0.5 ISO MT7

***Specially designed for the production of dental implants**

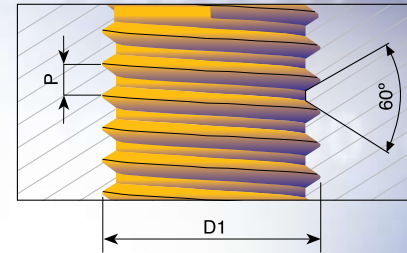
Machining Titanium, surgical stainless steels and hardened materials.

(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 $2xD1$

Pitch TPI	UNC	UNF	Ordering Code	d	D	No. of Flutes	I	L
72		1	MTS0250C15 72 UN	1/4	.057	3	.15	2.5
64	1	2	MTS0250C15 64 UN	1/4	.055	3	.15	2.5
56	2	3	MTS0250C17 56 UN	1/4	.065	3	.17	2.5
48	3	4	MTS0250C20 48 UN	1/4	.075	3	.20	2.5
40	4		MTS0250C25 40 UN	1/4	.083	3	.25	2.5
40	5	6	MTS0250C28 40 UN	1/4	.096	3	.28	2.5
36		8	MTS0250C35 36 UN	1/4	.130	3	.35	2.5
32	6		MTS0250C28 32 UN	1/4	.100	3	.28	2.5
32	8		MTS0250C37 32 UN	1/4	.126	3	.37	2.5
32		10	MTS0250C41 32 UN	1/4	.146	3	.41	2.5
28		12	MTS0250C43 28 UN	1/4	.165	3	.43	2.5
28		1/4	MTS0250C57 28 UN	1/4	.197	3	.57	2.5
24	10,12		MTS0250C42 24 UN	1/4	.138	3	.42	2.5
24		5/16,3/8	MTS0312C67 24 UN	5/16	.260	3	.67	2.5
20	1/4		MTS0250C55 20 UN	1/4	.187	3	.55	2.5
20		7/16	MTS0312C98 20 UN	5/16	.312	3	.98	2.5
18	5/16		MTS0250C67 18 UN	1/4	.236	3	.67	2.5
18	5/8		MTS0500D14 18 UN	1/2	.500	4	1.38	3.5
16	3/8		MTS0312C87 16 UN	5/16	.264	3	.87	2.5
14	7/16		MTS0312C98 14 UN	5/16	.303	3	.98	2.5
13	1/2		MTS0375C10 13 UN	3/8	.362	3	1.08	3.0
12	9/16		MTS0500C12 12 UN	1/2	.413	3	1.24	3.5
11	5/8		MTS0500C13 11 UN	1/2	.449	3	1.36	3.5
10	3/4		MTS0625D16 10 UN	5/8	.567	4	1.63	4.0

Order example: MTS0250C28 40UN MT7

For thread depth up to $3xD1$

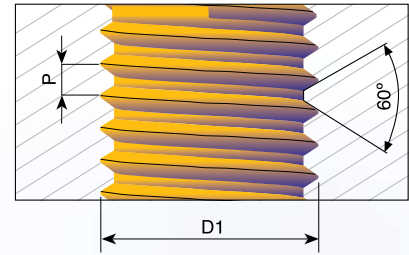
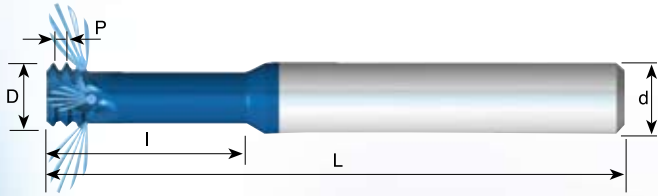
Pitch TPI	UNC	UNF	Ordering Code	d	D	No. of Flutes	I	L
80		0	MTS0250C16 80 UN	1/4	.045	3	.16	2.5
*72		1	MTS03015C6 72 UN	3mm	.057	3	.24	1.5
56	2	3	MTS0250C26 56 UN	1/4	.065	3	.26	2.5
40	4		MTS0250C31 40 UN	1/4	.083	3	.31	2.5
40	5	6	MTS0250C38 40 UN	1/4	.096	3	.38	2.5
32	6		MTS0250C40 32 UN	1/4	.100	3	.41	2.5
32	8		MTS0250C49 32 UN	1/4	.126	3	.49	2.5
32		10	MTS0250C59 32 UN	1/4	.146	3	.59	2.5
28		1/4	MTS0250C75 28 UN	1/4	.197	3	.75	2.5
24		5/16, 3/8	MTS0312C94 24 UN	5/16	.260	3	.94	2.5
20	1/4		MTS0250C75 20 UN	1/4	.187	3	.75	2.5
18	5/16		MTS0250C91 18 UN	1/4	.236	3	.91	2.5

*Specially designed for the production of dental implants

- Machining Titanium, surgical stainless steels and hardened materials.
- 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.

UNJ With internal coolant through the flutes

Tools for Internal Thread - Metric shanks



For thread depth up to $2.5 \times D1$

Pitch TPI	UNJC	UNJF	Ordering Code	d mm	D	No. of Flutes	I	L
*32	8	10	MTS06033C10 32 UNJ	6	.130	3	.41	2.3
28		1/4	MTS08051C16 28 UNJ	8	.201	3	.63	2.5
24		5/16, 3/8	MTS08067C20 24 UNJ	8	.264	3	.79	2.5
*20	1/4		MTS06049C16 20 UNJ	6	.193	3	.63	2.3
20		7/16	MTS0808C28 20 UNJ	8	.315	3	1.10	2.5
18	5/16		MTS08061C20 18 UNJ	8	.242	3	.79	2.5
16	3/8		MTS08069C24 16 UNJ	8	.272	3	.94	2.5
14	7/16		MTS08079C25 14 UNJ	8	.311	3	.98	2.5
13	1/2		MTS10094C27 13 UNJ	10	.370	3	1.08	2.9

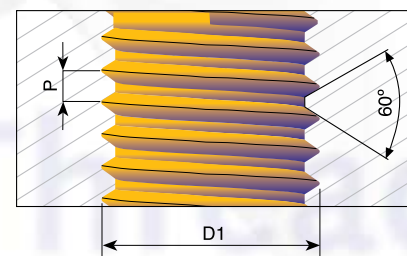
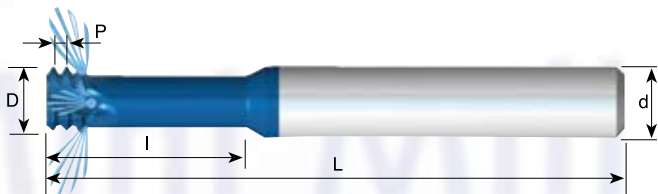
* without coolant

Order example: MTS06049C16 20UNJ MT8

Carbide grade MT8 Sub Micron grade with Aluminium Titanium Nitride (AlTiN) multi-layer coating (ISO K10-K20). Extremely high heat resistant and smooth cutting operation, for high performance, and normal machining conditions. General purpose for all materials.

MJ With internal coolant through the flutes

Tools for Internal Thread - Metric shanks



For thread depth up to $2.5 \times D1$

Pitch mm	D1	Ordering Code	d mm	D	No. of Flutes	I	L
* 0.7	MJ4	MTS06032C10 0.7 MJ	6	.126	3	.39	2.3
* 0.8	MJ5	MTS06039C12 0.8 MJ	6	.154	3	.49	2.3
* 1.0	MJ6	MTS06048C15 1.0 MJ	6	.189	3	.59	2.3
1.25	MJ8	MTS08061C20 1.25 MJ	8	.240	3	.79	2.5
1.5	MJ10	MTS0808C25 1.5 MJ	8	.315	3	.98	2.5
1.75	MJ12	MTS10092C30 1.75 MJ	10	.362	3	1.18	2.9
2.0	MJ14, MJ16	MTS1010C35 2.0 MJ	10	.394	3	1.38	2.9

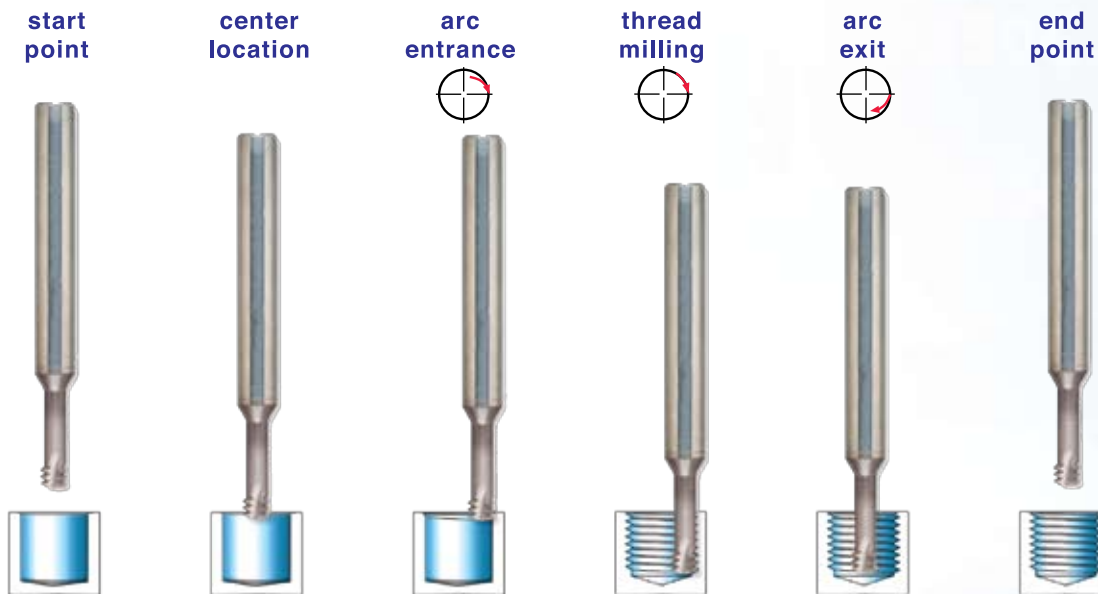
* without coolant

Order example: MTS06048C15 1.0 MJ MT8

Carbide grade MT8 Sub Micron grade with Aluminium Titanium Nitride (AlTiN) multi-layer coating (ISO K10-K20). Extremely high heat resistant and smooth cutting operation, for high performance, and normal machining conditions. General purpose for all materials.

Cutting Data

ISO Standard	Materials	Cutting Speed ft/min	Feed inch/tooth												
			Cutting Diameter												
			Ø .06	Ø .08	Ø .12	Ø .16	Ø .20	Ø .24	Ø .28	Ø .31	Ø .35	Ø .39	Ø .47	Ø .55	Ø .59
P	Low and Medium Carbon Steels	200-390	.0018	.0021	.0028	.0035	.0043	.0050	.0057	.0060	.0062	.0064	.0067	.0070	.0071
	High Carbon Steels	200-300	.0016	.0019	.0024	.0030	.0035	.0041	.0046	.0050	.0054	.0057	.0062	.0067	.0069
	Alloy Steels, Treated Steels	160-260	.0015	.0017	.0019	.0021	.0024	.0026	.0028	.0033	.0037	.0041	.0047	.0052	.0055
M	Stainless Steels	200-300	.0011	.0013	.0016	.0019	.0022	.0025	.0026	.0031	.0035	.0038	.0044	.0049	.0051
	Cast Steels	230-300	.0015	.0017	.0019	.0021	.0024	.0026	.0028	.0033	.0037	.0041	.0047	.0052	.0055
K	Cast Iron	130-260	.0018	.0021	.0028	.0035	.0043	.0050	.0057	.0060	.0062	.0064	.0067	.0070	.0071
N	Aluminum	260-490	.0018	.0021	.0028	.0035	.0043	.0050	.0057	.0060	.0062	.0064	.0067	.0070	.0071
	Synthetics, Duroplastics, Thermoplastics	160-660	.0038	.0042	.0049	.0056	.0063	.0070	.0073	.0074	.0075	.0075	.0077	.0078	.0078
S	Nickel Alloys, Titanium Alloys	70-130	.0011	.0013	.0015	.0017	.0020	.0022	.0024	.0025	.0026	.0027	.0029	.0031	.0031



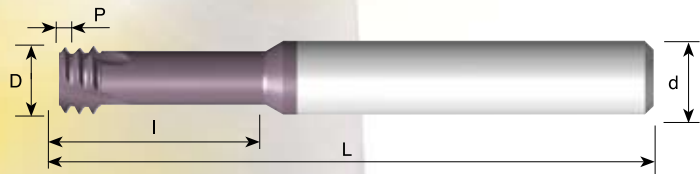
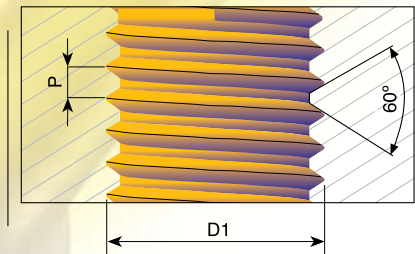
Mini Mill-Thread vs. Taps

Features	Mini Mill-Thread	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 Almost not	Short
Tool breakage	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

HARDCUT

A unique line of thread milling tools designed specifically for the machining of hardened materials up to 62HRc.

These tools provide high performance, improved cut and an excellent surface finish.



- Threading from 0-80 UNF
- Perfect solution for the Die and Mold industry
- Working at high cutting speeds
- Short machining time
- Low cutting forces thanks to the short profile
- Threading up to shoulder in blind holes

The tools are offered in Carmex advanced MT9 Carbide grade, a *Sub-micron carbide grade with advanced Titanium Aluminium Nitride coating.*



ISO

Tools for Internal Thread

For thread depth up to $2xD1$

Pitch mm	D1	Ordering Code	d	D	No. of flutes	I	L
0.4	M2	MTSH0250C18 0.4 ISO	1/4	.061	3	.18	2.5
0.45	M2.2	MTSH0250C20 0.45 ISO	1/4	.065	3	.19	2.5
0.45	M2.5	MTSH0250C22 0.45 ISO	1/4	.077	3	.22	2.5
0.5	M3	MTSH0250C26 0.5 ISO	1/4	.093	3	.26	2.5
0.6	M3.5	MTSH0250C30 0.6 ISO	1/4	.108	3	.30	2.5
0.7	M4	MTSH0250C35 0.7 ISO	1/4	.122	3	.35	2.5
0.8	M5	MTSH0250C49 0.8 ISO	1/4	.150	3	.49	2.5
1.0	M6	MTSH0250C55 1.0 ISO	1/4	.183	3	.55	2.5
1.25	M8	MTSH0250C71 1.25 ISO	1/4	.234	3	.71	2.5
1.5	M10	MTSH0312C91 1.5 ISO	5/16	.307	3	.91	2.5
1.75	M12	MTSH0375C10 1.75 ISO	3/8	.354	3	1.02	3.0
2	M16	MTSH12118D35 2.00 ISO	12mm	.465	4	1.38	3.3

For thread depth up to $3xD1$

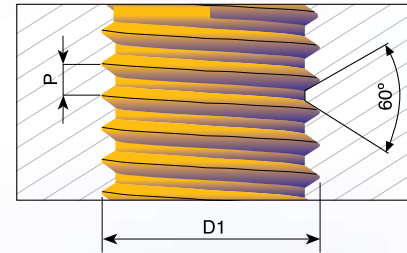
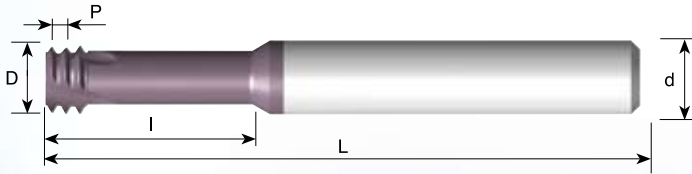
Pitch mm	D1	Ordering Code	d	D	No. of flutes	I	L
0.3	M1.4	MTSH03011C4 0.3 ISO	3mm	.041	3	.16	1.5
0.35	M1.6	MTSH03012C5 0.35 ISO	3mm	.047	3	.19	1.5
0.4	M2	MTSH03016C6 0.4 ISO	3mm	.061	3	.24	1.5
0.45	M2.5	MTSH0250C30 0.45 ISO	1/4	.044	3	.30	2.5
0.5	M3	MTSH0250C37 0.5 ISO	1/4	.093	3	.37	2.5
0.7	M4	MTSH0250C49 0.7 ISO	1/4	.122	3	.49	2.5
0.8	M5	MTSH0250C63 0.8 ISO	1/4	.150	3	.63	2.5
1.0	M6	MTSH0250C79 1.0 ISO	1/4	.183	3	.79	2.5
1.25	M8	MTSH0250C94 1.25 ISO	1/4	.234	3	.94	2.5

Order example: MTSH0250C35C 0.7 ISO MT9

HARDCUT

UN

Tools for Internal Thread



For thread depth up to $2 \times D1$

Pitch TPI	UNC	UNF	Ordering Code	d	D	No. of Flutes	I	L
72		1	MTSH0250C15 72 UN	1/4	.057	3	.15	2.5
64	1	2	MTSH0250C15 64 UN	1/4	.055	3	.15	2.5
56	2	3	MTSH0250C17 56 UN	1/4	.065	3	.17	2.5
48	3	4	MTSH0250C20 48 UN	1/4	.075	3	.20	2.5
40	4		MTSH0250C25 40 UN	1/4	.083	3	.25	2.5
40	5	6	MTSH0250C28 40 UN	1/4	.096	3	.28	2.5
36		8	MTSH0250C35 36 UN	1/4	.130	3	.35	2.5
32	6		MTSH0250C28 32 UN	1/4	.100	3	.28	2.5
32	8		MTSH0250C37 32 UN	1/4	.126	3	.37	2.5
32		10	MTSH0250C41 32 UN	1/4	.146	3	.41	2.5
28		12	MTSH0250C43 28 UN	1/4	.165	3	.43	2.5
28		1/4	MTSH0250C57 28 UN	1/4	.197	3	.57	2.5
24	10,12		MTSH0250C42 24 UN	1/4	.138	3	.42	2.5
24		5/16,3/8	MTSH0312C67 24 UN	5/16	.260	3	.67	2.5
20	1/4		MTSH0250C55 20 UN	1/4	.187	3	.55	2.5
20		7/16	MTSH0312C98 20 UN	5/16	.312	3	.98	2.5
18	5/16		MTSH0250C67 18 UN	1/4	.236	3	.67	2.5
16	3/8		MTSH0312C87 16 UN	5/16	.264	3	.87	2.5
14	7/16		MTSH0312C98 14 UN	5/16	.303	3	.98	2.5
13	1/2		MTSH0375C10 13 UN	3/8	.362	3	1.08	3.0
12	9/16		MTSH12105C31 12 UN	12mm	.413	3	1.24	3.3
11	5/8		MTSH12114C34 11 UN	12mm	.449	3	1.36	3.3

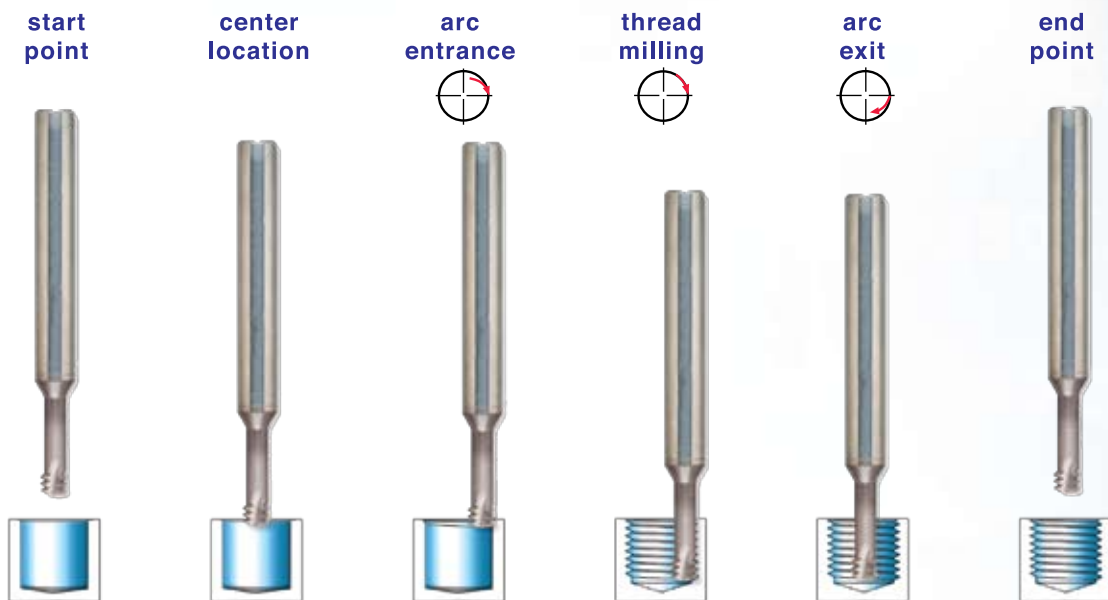
For thread depth up to $3 \times D1$

Pitch TPI	UNC	UNF	Ordering Code	d	D	No. of Flutes	I	L
80		0	MTSH0250C16 80 UN	1/4	.045	3	.16	2.5
72		1	MTSH03015C6 72 UN	3mm	.057	3	.24	1.5
56	2	3	MTSH0250C26 56 UN	1/4	.065	3	.26	2.5
40	4		MTSH0250C31 40 UN	1/4	.083	3	.31	2.5
40	5	6	MTSH0250C38 40 UN	1/4	.096	3	.38	2.5
32	6		MTSH0250C40 32 UN	1/4	.100	3	.41	2.5
32	8		MTSH0250C49 32 UN	1/4	.126	3	.49	2.5
32		10	MTSH0250C59 32 UN	1/4	.146	3	.59	2.5
28		1/4	MTSH0250C75 28 UN	1/4	.197	3	.75	2.5
24		5/16,3/8	MTSH0312C94 24 UN	5/16	.260	3	.94	2.5
20	1/4		MTSH0250C75 20 UN	1/4	.187	3	.75	2.5
18	5/16		MTSH0250C91 18 UN	1/4	.236	3	.91	2.5

Order example: MTSH0250C28 40 UN MT9

Cutting Data

ISO	Material	Hardness HRc	Cutting Speed ft/min	Feed inch/tooth									
				Cutting Diameter = D									
				ø.06	ø.08	ø.12	ø.16	ø.20	ø.24	ø.28	ø.31	ø.35	
H	Hardened Steels	45-50	200-230	.0016	.0016	.0020	.0020	.0024	.0024	.0028	.0028	.0031	
		51-55	160-200	.0012	.0012	.0016	.0016	.0020	.0020	.0024	.0024	.0028	
		56-62	130-160	.0008	.0008	.0012	.0012	.0016	.0016	.0020	.0020	.0024	



CASE STUDY

Application	Internal Thread M4 X 0.7
Thread Depth	.31 Inch
Workpiece Material	Tool Steel: D2
Hardness	60-62 (HRc)
Cutter Description	MTSH0250C35 0.7 ISO
Machining Conditions	Cutting Speed: 144 ft/min Feed: .0012 Inch/min
Machine	Mori Seiki VN5000
Control	Fanuc
Cooling Lubricant	Emulsion
Tool Life (No. of Threads)	84

Three



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E-Mail: sales@carmexusa.com Web Site: www.carmex.com



Carmex
Precision Tools Ltd.