2005 CATALOG

OMNIthread

THREAD MILLING

A Cole TOOLING SYSTEMS CO.

THREAD MILLING PRODUCTS

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OMNIthread THREAD MILLING

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OMNIthread THREAD MILLING
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Solid Carbide Thread Mill Identification System

TM N 1/2 x .470 - 14 UN

TM	N	1/2	0.470	14	UN
Denotes Thread Mill	N=Internal E=External X=Internal Or External	Denotes Shank Diameter In Common Fractions Of An Inch	Denotes Tool Cutter Diameter In Thousandths Of An Inch	Denotes Pitch In Threads Per Inch, ISO Pitch In mm	Denotes Thread Form Type

Carbide Grades

OT20C

The OT20C grade utilizes an ISO OT20 carbide base grade but has the added benefit of a PVDTiN (Titanium Nitride) coating. OT20C is our standard stocked grade and satisfies the greatest range of material applications. OT20C should be the first choice for most applications.

OT30C

OT30C grade is a TiAlN (Titanium Aluminum Nitride), PVD coated grade recommended for difficult to machine alloys having work-hardening or abrasive wear characteristics. This could improve wear life in materials such as stainless steels, nickel alloys, most cast irons as well as graphite resin composites.

Tool Selection

There are 3 critical steps required for optimizing a thread milling operation for any thread to be produced.

1. Tool Selection
2. Speed & Feed Selection
3. Preparing the CNC Program

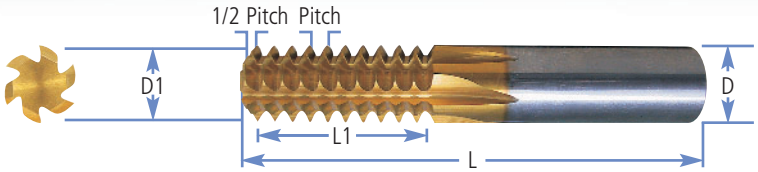
Selecting the best tool for a given job is made easier when all information is available.

Our technical service engineers will help you with any application you are considering and will guide you through every step of the process at no charge to you.

If you wish, you can fax a request by copying the Program Request form and request a suggested tool and cycle time for any application. (See page 22 for form)

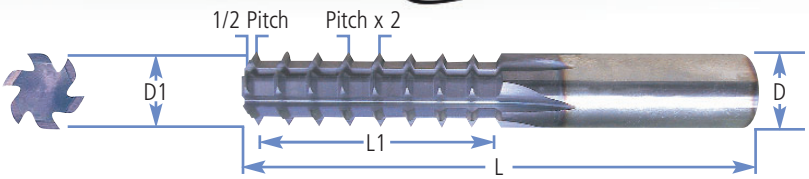
Please fill out the information along with your fax number and a recommendation will be returned to you within 24 hours.

UN Internal Threads Standard Length



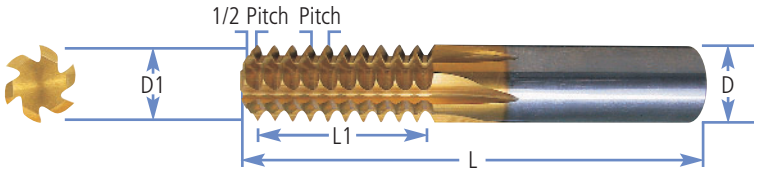
Min. Size	Tool Description	OT20C	OT30C	Pitch	Flutes	D	D1	L	L1
# 2 - 64	TMN 1/8 x .060 - 64 UN	0270100	0378100	64	3	0.125	0.060	1.50	0.1250
# 2 - 56	TMN 1/8 x .060 - 56 UN	0270101	0378101	56	3	0.125	0.060	1.50	0.1250
# 3 - 48	TMN 1/8 x .060 - 48 UN	0270102	0378102	48	3	0.125	0.060	1.50	0.1458
# 5 - 44	TMN 1/8 x .085 - 44 UN	0270103	0378103	44	3	0.125	0.085	1.50	0.1818
# 4 - 40	TMN 1/8 x .080 - 40 UN	0270138	0378138	40	3	0.125	0.080	1.50	0.1750
5/16"- 40	TMN 1/4 x .240 - 40 UN	0270142	0378142	40	5	0.250	0.240	2.25	0.3750
# 8 - 36	TMN 1/8 x .120 - 36 UN	0270105	0378105	36	3	0.125	0.120	1.50	0.2500
# 6 - 32	TMN 1/8 x .085 - 32 UN	0270106	0378106	32	3	0.125	0.085	1.50	0.2188
# 8 - 32	TMN 1/8 x .120 - 32 UN	0270107	0378107	32	3	0.125	0.120	1.50	0.2500
# 10 - 32	TMN 3/16 x .140 - 32 UN	0270143	0378143	32	3	0.187	0.140	1.65	0.3438
3/8"- 32	TMN 1/4 x .240 - 32 UN	0270108	0378108	32	5	0.250	0.240	2.25	0.5625
1/2"- 32	TMN 3/8 x .370 - 32 UN	0270139	0378139	32	5	0.375	0.370	2.84	0.9688
# 12 - 28	TMN 3/16 x .145 - 28 UN	0270109	0378109	28	3	0.187	0.145	1.65	0.3214
3/8"- 28	TMN 1/4 x .240 - 28 UN	0270144	0378144	28	5	0.250	0.240	2.25	0.5714
7/16"- 28	TMN 5/16 x .310 - 28 UN	0270110	0378110	28	5	0.312	0.310	2.48	0.7857
7/16"- 27	TMN 5/16 x .310 - 27 UN	0270145	0378145	27	5	0.312	0.310	2.48	0.7778
# 12 - 24	TMN 3/16 x .140 - 24 UN	0270140	0378140	24	3	0.187	0.140	1.65	0.4167
1/4"- 24	TMN 3/16 x .160 - 24 UN	0270111	0378111	24	3	0.187	0.160	1.65	0.3333
5/16"- 24	TMN 1/4 x .200 - 24 UN	0270112	0378112	24	3	0.250	0.200	2.25	0.5000
3/8"- 24	TMN 1/4 x .240 - 24 UN	0270135	0378135	24	5	0.250	0.240	2.25	0.5833
1/2"- 24	TMN 3/8 x .370 -24 UN	0270136	0378136	24	5	0.375	0.370	2.84	0.9585
1/4"- 20	TMN 3/16 x .160 - 20 UN	0270113	0378113	20	3	0.187	0.160	1.65	0.4000
5/16"- 20	TMN 1/4 x .187 - 20 UN	0270137	0378137	20	3	0.250	0.187	2.25	0.5000
7/16"- 20	TMN 5/16 x .310 - 20 UN	0270114	0378114	20	5	0.312	0.310	2.48	0.7500
9/16"- 20	TMN 3/8 x .370 - 20 UN	0270115	0378115	20	5	0.375	0.370	2.84	0.9000
5/8"- 20	TMN 1/2 x .470 - 20 UN	0270141	0378141	20	5	0.500	0.470	3.27	1.0500
5/16"- 18	TMN 1/4 x .200 - 18 UN	0270116	0378116	18	3	0.250	0.200	2.25	0.5000
9/16"- 18	TMN 3/8 x .370 - 18 UN	0270117	0378117	18	5	0.375	0.370	2.84	0.9444
5/8"- 18	TMN 1/2 x .437 - 18 UN	0270134	0378134	18	5	0.500	0.437	3.27	1.0000
3/8"- 16	TMN 1/4 x .240 -16 UN	0270118	0378118	16	5	0.250	0.240	2.25	0.5625
11/16"- 16	TMN 1/2 x .470 - 16 UN	0270119	0378119	16	5	0.500	0.470	3.27	1.1250
7/16"- 14	TMN 5/16 x .310 - 14 UN	0270120	0378120	14	5	0.312	0.310	2.48	0.6429
1/2"- 14	TMN 3/8 x .370 - 14 UN	0270146	0378146	14	5	0.375	0.370	2.84	0.9286
7/8"- 14	TMN 1/2 x .470 - 14 UN	0270121	0378121	14	5	0.500	0.470	3.27	1.1429
1/2"- 13	TMN 5/16 x .310 - 13 UN	0270122	0378122	13	5	0.312	0.310	2.48	0.7693
9/16"- 12	TMN 3/8 x .370 - 12 UN	0270123	0378123	12	5	0.375	0.370	2.84	0.9167
3/4"- 12	TMN 1/2 x .470 - 12 UN	0270124	0378124	12	5	0.500	0.470	3.27	1.1667
9/16"- 11	TMN 3/8 x .370 -11 UN	0270125	0378125	11	5	0.375	0.370	2.84	0.9091
5/8"- 11	TMN 1/2 x .437 - 11 UN	0270126	0378126	11	5	0.500	0.437	3.27	1.0901
3/4"- 10	TMN 1/2 x .470 - 10 UN	0270127	0378127	10	5	0.500	0.470	3.27	1.1000
7/8"- 9	TMN 5/8 x .620 - 9 UN	0270128	0378128	9	6	0.625	0.620	3.62	1.3333
1"- 8	TMN 5/8 x .620 - 8 UN	0270129	0378129	8	6	0.625	0.620	3.62	1.5000
1-1/8"- 7	TMN 5/8 x .620 - 7 UN	0270130	0378130	7	6	0.625	0.620	3.62	1.4286
1-3/8"- 6	TMN 3/4 x .745 - 6 UN	0270131	0378131	6	6	0.750	0.745	4.10	1.5000
1-3/4"- 5	TMN 3/4 x .745 - 5 UN	0270132	0378132	5	6	0.750	0.745	4.10	1.4000
2"- 4.5	TMN 3/4 x .745 - 4.5 UN	0270133	0378133	4.5	6	0.750	0.745	4.10	1.5555

UN Internal Threads T2 Long Length



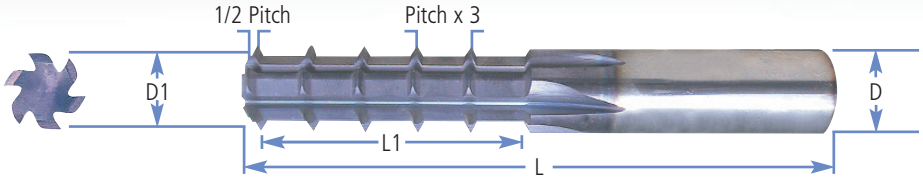
Min. Size	Tool Description	OT20C	OT30C	Pitch	Flutes	D	D1	L	L1
#4 - 40	TMN 1/8 x .080 - 40 UN-T2	0270800	0378800	40	3	0.125	0.085	1.50	0.224
#6 - 32	TMN 1/8 x .085 - 32 UN-T2	0270801	0378801	32	3	0.125	0.085	1.50	0.250
#8 - 32	TMN 1/8 x .120 - 32 UN-T2	0270802	0378802	32	3	0.125	0.120	1.50	0.328
1/4"- 28	TMN 3/16 x .160 - 28 UN-T2	0270813	0378813	28	3	0.188	0.160	1.97	0.500
1/4"- 28	TMN 1/4 x .180 - 28 UN-T2	0270814	0378814	28	3	0.250	0.180	2.95	0.786
#10 - 24	TMN 1/8 x .120 - 24 UN-T2	0270821	0378821	24	3	0.125	0.120	1.50	0.250
#12 - 24	TMN 3/16 x .140 - 24 UN-T2	0270815	0378815	24	3	0.187	0.140	2.56	0.500
5/16"- 24	TMN 1/4 x .200 - 24 UN-T2	0270816	0378816	24	3	0.250	0.200	2.56	0.833
3/8"- 24	TMN 1/4 x .240 - 24 UN-T2	0270822	0378822	24	5	0.250	0.240	2.56	0.750
1/4"- 20	TMN 3/16 x .160 - 20 UN-T2	0270803	0378803	20	3	0.187	0.160	2.56	0.500
7/16"- 20	TMN 5/16 x .310 - 20 UN-T2	0270817	0378817	20	5	0.313	0.310	3.35	1.000
5/16"- 18	TMN 1/4 x .200 - 18 UN-T2	0270804	0378804	18	3	0.250	0.200	2.95	0.625
5/8"- 18	TMN 1/2 x .437 - 18 UN-T2	0270819	0378819	18	5	0.500	0.437	3.94	1.375
3/8"- 16	TMN 1/4 x .240 - 16 UN-T2	0270805	0378805	16	5	0.250	0.240	2.95	0.750
11/16"- 16	TMN 1/2 x .470 - 16 UN-T2	0270820	0378820	16	5	0.500	0.470	3.94	1.375
7/16"- 14	TMN 5/16 x .310 - 14 UN-T2	0270806	0378806	14	5	0.313	0.310	3.35	0.875
1/2"- 13	TMN 5/16 x .310 - 13 UN-T2	0270807	0378807	13	5	0.313	0.310	3.35	1.000
9/16"- 12	TMN 3/8 x .370 - 12 UN-T2	0270808	0378808	12	5	0.375	0.370	3.35	1.125
3/4"- 12	TMN 1/2 x .470 - 12 UN-T2	0270818	0378818	12	5	0.500	0.470	3.94	1.500
5/8"- 11	TMN 1/2 x .437 - 11 UN-T2	0270809	0378809	11	5	0.500	0.437	3.94	1.250
3/4"- 10	TMN 1/2 x .470 - 10 UN-T2	0270810	0378810	10	5	0.500	0.470	3.94	1.500
7/8"- 9	TMN 5/8 x .620 - 9 UN-T2	0270811	0378811	9	6	0.625	0.620	4.50	1.750
1"- 8	TMN 5/8 x .620 - 8 UN-T2	0270812	0378812	8	6	0.625	0.620	4.50	2.000
1-1/8"- 7	TMN 5/8 x .620 - 7 UN-T2	0270823	0378823	7	6	0.625	0.620	4.50	1.857

UN External Threads Standard Length



Min. Size	Tool Description	OT20C	OT30C	Pitch	Flutes	D	D1	L	L1
ALL 36 UN	TME 1/4 x .240 - 36 UN	0270208	0378208	36	5	0.250	0.240	2.25	0.2778
ALL 32 UN	TME 1/4 x .240 - 32 UN	0270200	0378200	32	5	0.250	0.240	2.25	0.5625
ALL 32 UN	TME 3/8 x .370 - 32 UN	0270209	0378209	32	5	0.375	0.370	2.84	0.9375
ALL 28 UN	TME 5/16 x .310 - 28 UN	0270201	0378201	28	5	0.312	0.310	2.48	0.7857
ALL 24 UN	TME 5/16 x .310 - 24 UN	0270210	0378210	24	5	0.312	0.310	2.48	0.7917
ALL 24 UN	TME 3/8 x .370 - 24 UN	0270211	0378211	24	5	0.375	0.370	2.84	1.0000
ALL 20 UN	TME 3/8 x .370 - 20 UN	0270202	0378202	20	5	0.375	0.370	2.84	0.9000
ALL 18 UN	TME 3/8 x .370 - 18 UN	0270203	0378203	18	5	0.375	0.370	2.84	0.9444
ALL 16 UN	TME 1/2 x .470 - 16 UN	0270204	0378204	16	5	0.500	0.470	3.27	1.1250
ALL 14 UN	TME 5/16 x .310 - 14 UN	0270212	0378212	14	5	0.312	0.310	2.48	1.6429
ALL 14 UN	TME 1/2 x .470 - 14 UN	0270213	0378213	14	5	0.500	0.470	3.27	1.1429
ALL 12 UN	TME 1/2 x .470 - 12 UN	0270205	0378205	12	5	0.500	0.470	3.27	1.1670
ALL 8 UN	TME 5/8 x .620 - 8 UN	0270206	0378206	8	6	0.625	0.620	3.62	1.5000
ALL 6 UN	TME 3/4 x .745 - 6 UN	0270207	0378207	6	6	0.750	0.745	4.10	1.5000

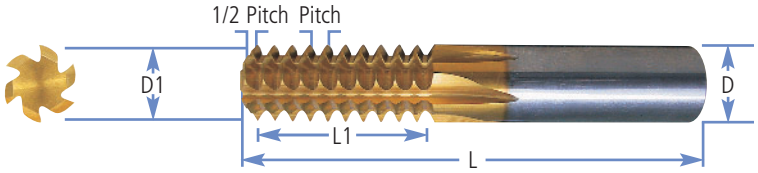
UN Internal Threads T3 Extra Long Length



Min. Size	Tool Description	OT20C	OT30C	Pitch	Flutes	D	D1	L	L1
# 4 - 40	TMN 1/8 x .080 - 40 UN-T3	0270900	0378900	40	3	0.125	0.080	1.65	0.336
# 6 - 32	TMN 1/8 x .085 - 32 UN-T3	0270901	0378901	32	3	0.125	0.085	1.65	0.375
# 8 - 32	TMN 1/8 x .120 - 32 UN T3	0270902	0378902	32	3	0.125	0.120	1.65	0.492
# 12 - 28	TMN 3/16 x .160 - 28 UN-T3	0270913	0378913	28	3	0.187	0.160	2.37	0.750
1/4"- 28	TMN 1/4 x .180 - 28 UN-T3	0270904	0378904	28	3	0.250	0.180	2.90	0.750
# 10 - 24	TMN 1/8 x .120 - 24 UN-T3	0270921	0378921	24	3	0.125	0.120	1.50	0.375
# 12 - 24	TMN 3/16 x .140 - 24 UN- T3	0270915	0378915	24	3	0.187	0.140	2.56	0.625
5/16"- 24	TMN 1/4 x .200 - 24 UN-T3	0270916	0378916	24	3	0.250	0.200	2.75	0.958
3/8"- 24	TMN 1/4 x .240 - 24 UN-T3	0270920	0378920	24	5	0.250	0.240	2.95	1.000
1/4"- 20	TMN 3/16 x .160 - 20 UN-T3	0270903	0378903	20	3	0.187	0.160	2.56	0.750
7/16"- 20	TMN 5/16 x .310 - 20 UN-T3	0270917	0378917	20	5	0.312	0.310	3.35	1.200
5/16"- 18	TMN 1/4 x .200 - 18 UN -T3	0270904	0378904	18	3	0.250	0.200	2.95	0.937
3/8"- 16	TMN 1/4 x .240 - 16 UN-T3	0270905	0378905	16	5	0.250	0.240	2.95	1.125
7/16"- 14	TMN 5/16 x .310 - 14 UN-T3	0270906	0378906	14	5	0.312	0.310	3.35	1.286
1/2"- 13	TMN 5/16 x .310 - 13 UN-T3	0270907	0378907	13	5	0.312	0.310	3.35	1.500
9/16"- 12	TMN 3/8 x .370 - 12 UN-T3	0270908	0378908	12	5	0.375	0.370	3.35	1.687
3/4"- 12	TMN 1/2 x .470 - 12 UN-T3	0270918	0378918	12	5	0.500	0.470	3.94	2.000
5/8"- 11	TMN 1/2 x .437 - 11 UN-T3	0270909	0378909	11	5	0.500	0.437	4.35	1.909
3/4"- 10	TMN 1/2 x .470 - 10 UN-T3	0270910	0378910	10	5	0.500	0.470	3.94	2.250
7/8"- 9	TMN 5/8 x .620 - 9 UN-T3	0270911	0378911	9	6	0.625	0.620	5.13	2.333
1"- 8	TMN 5/8 x .620 - 8 UN-T3	0270912	0378912	8	6	0.625	0.620	4.10	1.875
1-1/8"- 7	TMN 5/8 x .620 - 7 UN-T3	0270919	0378919	7	6	0.625	0.620	4.10	2.000

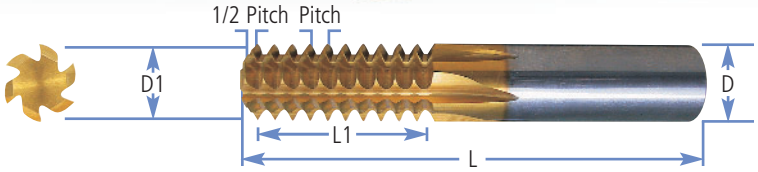
Min. Size: This is the smallest internal major thread diameter a tool of specific pitch and cutting diameter can produce. Any internal mill can be used to produce larger thread diameters as long as the L1 dimension exceeds the required length of full thread. Good machining practices dictate selecting a tool having sufficient mass to mill the desired pitch, thus reducing deflection and premature tool failure.

UNJ External Threads Standard Length



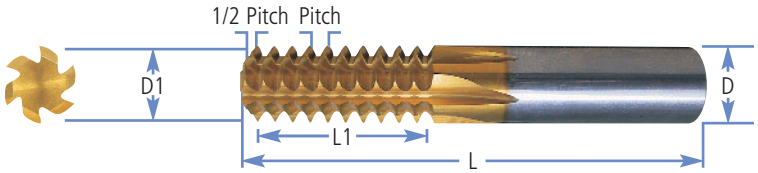
Min. Size	Tool Description	OT20C	OT30C	Pitch	Flutes	D	D1	L	L1
ALL 32 UNJ	TME 1/4 x .240 - 32 UNJ	0271000	0371800	32	5	0.250	0.240	2.25	0.5313
ALL 24 UNJ	TME 3/8 x .370 - 24 UNJ	0271001	0371801	24	5	0.375	0.370	2.84	0.9583
ALL 20 UNJ	TME 3/8 x .370 - 20 UNJ	0271002	0371802	20	5	0.375	0.370	2.84	0.9000
ALL 18 UNJ	TME 5/16 x .310 - 18 UNJ	0271003	0371803	18	5	0.312	0.310	2.48	0.7778
ALL 18 UNJ	TME 1/2 x .470 - 18 UNJ	0271004	0371804	18	5	0.500	0.470	3.27	1.1111
ALL 16 UNJ	TME 5/16 x .310 - 16 UN	0271005	0371805	16	5	0.312	0.310	2.48	1.0000
ALL 16 UNJ	TME 1/2 x .470 - 16 UNJ	0271006	0371806	16	5	0.500	0.470	3.27	1.1250
ALL 14 UNJ	TME 1/2 x .470 - 14 UNJ	0271007	0371807	14	5	0.500	0.470	3.27	1.1428
ALL 12 UNJ	TME 1/2 x .470 - 12 UNJ	0271008	0371808	12	5	0.500	0.470	3.27	1.1667

ISO Metric External Threads Standard Length



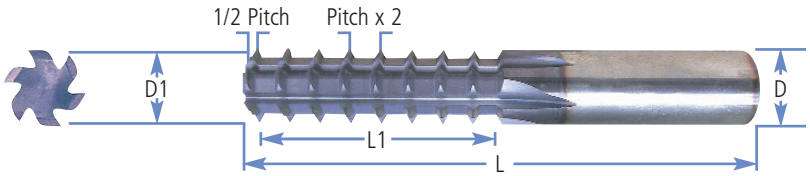
Min. Size	Tool Description	OT20C	OT30C	Pitch	Flutes	D	D1	L	L1
ALL 0.50 ISO	TME 1/4 x .240 - 0.50 ISO	0270500	0378500	0.50	5	0.250	0.240	2.25	0.5906
ALL 0.75 ISO	TME 5/16 x .310 - 0.75 ISO	0270501	0378501	0.75	5	0.312	0.310	2.48	0.7677
ALL 1.00 ISO	TME 3/8 x .370 - 1.00 ISO	0270502	0378502	1.00	5	0.375	0.370	2.84	0.9449
ALL 1.5 ISO	TME 1/2 x .470 - 1.50 ISO	0270503	0378503	1.50	5	0.500	0.470	3.27	1.1811
ALL 2.00 ISO	TME 1/2 x .470 - 2.00 ISO	0270504	0378504	2.00	5	0.500	0.470	3.27	1.1811
ALL 3.00 ISO	TME 5/8 x .620 - 3.00 ISO	0270505	0378505	3.00	6	0.625	0.620	3.62	1.4173
ALL 4.00 ISO	TME 5/8 x .620 - 4.00 ISO	0270506	0378506	4.00	6	0.625	0.620	3.62	1.5748
ALL 6.00 ISO	TME 3/4 x .745 - 6.00 ISO	0270507	0378507	6.00	6	0.750	0.745	4.10	1.4173

ISO Metric Internal Threads Standard Length



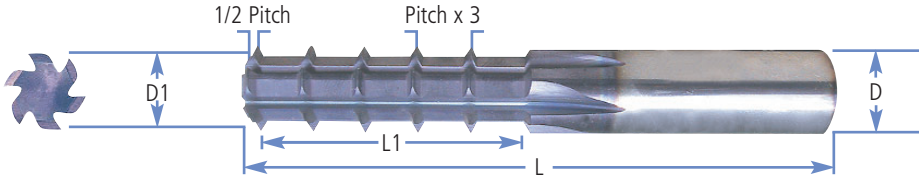
Min. Size	Tool Description	OT20C	OT30C	Pitch	Flutes	D	D1	L	L1
M 1.6	TMN 1/8 x .040 - 0.35 ISO	0270400	0378400	0.35	3	0.125	0.040	1.50	0.0959
M 2	TMN 1/8 x .050 - 0.40 ISO	0270401	0378401	0.40	3	0.125	0.050	1.50	0.1260
M 2.5	TMN 1/8 x .060 - 0.45 ISO	0270402	0378402	0.45	3	0.125	0.060	1.50	0.1417
M 3	TMN 1/8 x .085 - 0.50 ISO	0270403	0378403	0.50	3	0.125	0.085	1.50	0.1772
M 4	TMN 1/8 x .105 - 0.70 ISO	0270404	0378404	0.70	3	0.125	0.105	1.50	0.2657
M 4.5	TMN 1/8 x .120 - 0.75 ISO	0270405	0378405	0.75	3	0.125	0.120	1.50	0.2657
M 8	TMN 1/4 x .240 - 0.75 ISO	0270406	0378406	0.75	5	0.250	0.240	2.25	0.5906
M 5	TMN 3/16 x .145 - 0.80 ISO	0270407	0378407	0.80	3	0.187	0.145	1.65	0.3149
M 6	TMN 3/16 x .160 - 1.00 ISO	0270408	0378408	1.00	3	0.187	0.160	1.65	0.3543
M 10	TMN 1/4 x .240 - 1.00 ISO	0270424	0378424	1.00	5	0.250	0.240	2.25	0.5906
M 12	TMN 5/16 x .310 - 1.00 ISO	0270409	0378409	1.00	5	0.312	0.310	2.48	0.7874
M 16	TMN 1/2 x .470 - 1.00 ISO	0270410	0378410	1.00	5	0.500	0.470	3.27	1.1811
M 8	TMN 1/4 x .200 - 1.25 ISO	0270411	0378411	1.25	3	0.250	0.200	2.25	0.4921
M 10	TMN 1/4 x .240 - 1.50 ISO	0270412	0378412	1.50	5	0.250	0.240	2.25	0.5906
M 14	TMN 3/8 x .370 - 1.50 ISO	0270413	0378413	1.50	5	0.375	0.370	2.84	0.9449
M 18	TMN 1/2 x .470 - 1.50 ISO	0270414	0378414	1.50	5	0.500	0.470	3.27	1.1811
M 12	TMN 5/16 x .310 - 1.75 ISO	0270415	0378415	1.75	5	0.312	0.310	2.48	0.7578
M 14	TMN 3/8 x .370 - 2.00 ISO	0270416	0378416	2.00	5	0.375	0.370	2.84	0.9449
M 16	TMN 1/2 x .437 - 2.00 ISO	0270425	0378428	2.00	5	0.500	0.437	3.27	1.1811
M 18	TMN 1/2 x .470 - 2.00 ISO	0270417	0378417	2.00	5	0.500	0.470	3.27	1.1811
M 20	TMN 1/2 x .470 - 2.50 ISO	0270418	0378418	2.50	5	0.500	0.470	3.27	1.1811
M 24	TMN 5/8 x .620 - 3.00 ISO	0270419	0378419	3.00	6	0.625	0.620	3.62	1.4173
M 30	TMN 5/8 x .620 - 3.50 ISO	0270420	0378420	3.50	6	0.625	0.620	3.62	1.5157
M 36	TMN 5/8 x .620 - 4.00 ISO	0270421	0378421	4.00	6	0.625	0.620	3.62	1.5748
M 48	TMN 3/4 x .745 - 5.00 ISO	0270422	0378422	5.00	6	0.750	0.745	4.10	1.5748
M 64	TMN 3/4 x .745 - 6.00 ISO	0270423	0378423	6.00	6	0.750	0.745	4.10	1.4173

ISO Metric Internal Threads T2 Long Length



Min. Size	Tool Description	OT20C	OT30C	Pitch	Flutes	D	D1	L	L1
M 4	TMN 1/8 x .105 - 0.70 ISO-T2	0270850	0378850	0.70	3	0.125	0.105	1.50	0.315
M 8	TMN 1/4 x .240 - 0.75 ISO-T2	0270859	0378859	0.75	5	0.250	0.240	2.44	0.630
M 5	TMN 3/16 x .145 - 0.80 ISO-T2	0270851	0378851	0.80	3	0.187	0.145	1.65	0.394
M 6	TMN 3/16 x .160 - 1.00 ISO-T2	0270852	0378852	1.00	3	0.187	0.160	2.24	0.472
M 12	TMN 5/16 x .310 - 1.00 ISO-T2	0270860	0378860	1.00	5	0.312	0.310	2.90	0.945
M 16	TMN 1/2 x .470 - 1.00 ISO-T2	0270861	0378861	1.00	5	0.500	0.470	3.74	1.260
M 8	TMN 1/4 x .200 - 1.25 ISO-T2	0270853	0378853	1.25	3	0.250	0.200	2.44	0.630
M 10	TMN 1/4 x .240 - 1.50 ISO-T2	0270854	0378854	1.50	5	0.250	0.240	2.44	0.787
M 14	TMN 3/8 x .370 - 1.50 ISO-T2	0270862	0378862	1.50	5	0.375	0.370	3.35	1.102
M 18	TMN 1/2 x .470 - 1.50 ISO-T2	0270863	0378863	1.50	5	0.500	0.470	3.74	1.417
M 12	TMN 5/16 x .310 - 1.75 ISO-T2	0270855	0378855	1.75	5	0.312	0.310	2.90	0.945
M 14	TMN 3/8 x .370 - 2.00 ISO-T2	0270856	0378856	2.00	5	0.375	0.370	3.35	1.102
M 16	TMN 1/2 x .437 - 2.00 ISO-T2	0270857	0378857	2.00	5	0.500	0.437	3.74	1.260
M 18	TMN 1/2 x .470 - 2.00 ISO-T2	0270864	0378864	2.00	5	0.500	0.470	3.74	1.260
M 20	TMN 1/2 x .470 - 2.50 ISO-T2	0270858	0378858	2.50	5	0.500	0.470	3.74	1.575
M 24	TMN 5/8 x .620 - 3.00 ISO-T2	0270865	0378865	3.00	6	0.625	0.620	4.10	1.890

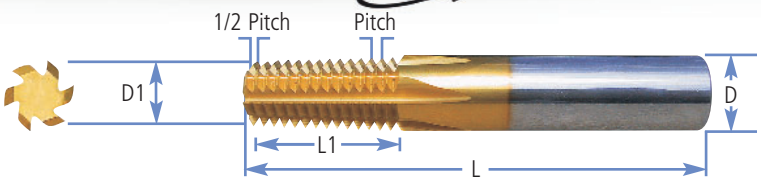
ISO Metric Internal Threads T3 Extra Long Length



Min. Size	Tool Description	OT20C	OT30C	Pitch	Flutes	D	D1	L	L1
M 4	TMN 1/8 x .105 - 0.70 ISO-T3	0270950	0378950	0.70	3	0.125	0.105	1.65	0.472
M 8	TMN 1/4 x .240 - 0.75 ISO-T3	0270959	0378959	0.75	5	0.250	0.240	2.95	0.944
M 5	TMN 3/16 x .145 - 0.80 ISO-T3	0270951	0378951	0.80	3	0.187	0.145	1.85	0.590
M 6	TMN 3/16 x .160 - 1.00 ISO-T3	0270952	0378952	1.00	3	0.187	0.160	2.36	0.709
M 12	TMN 5/16 x .310 - 1.00 ISO-T3	0270960	0378960	1.00	5	0.312	0.310	3.35	1.417
M 16	TMN 1/2 x .470 - 1.00 ISO-T3	0270961	0378961	1.00	5	0.500	0.470	4.50	1.889
M 8	TMN 1/4 x .200 - 1.25 ISO-T3	0270953	0378953	1.25	3	0.250	0.200	2.56	0.944
M 10	TMN 1/4 x .240 - 1.50 ISO-T3	0270954	0378954	1.50	5	0.250	0.240	2.83	1.181
M 14	TMN 3/8 x .370 - 1.50 ISO-T3	0270962	0378962	1.50	5	0.375	0.370	3.74	1.654
M 18	TMN 1/2 x .470 - 1.50 ISO-T3	0270963	0378963	1.50	5	0.500	0.470	4.50	2.126
M 12	TMN 5/16 x .310 - 1.75 ISO-T3	0270955	0378955	1.75	5	0.312	0.310	3.38	1.417
M 14	TMN 3/8 x .370 - 2.00 ISO-T3	0270956	0378956	2.00	5	0.375	0.370	3.74	1.654
M 16	TMN 1/2 x .437 - 2.00 ISO-T3	0270957	0378957	2.00	5	0.500	0.437	4.50	1.890
M 18	TMN 1/2 x .470 - 2.00 ISO-T3	0270964	0378964	2.00	5	0.500	0.470	4.50	1.890
M 20	TMN 1/2 x .470 - 2.50 ISO-T3	0270958	0378958	2.50	5	0.500	0.470	4.50	2.362
M 24	TMN 5/8 x .620 - 3.00 ISO-T3	0270965	0378965	3.00	6	0.625	0.620	4.10	2.126

Min. Size: This is the smallest internal major thread diameter a tool of specific pitch and cutting diameter can produce. Any internal mill can be used to produce larger thread diameters as long as the L1 dimension exceeds the required length of full thread. Good machining practices dictate selecting a tool having sufficient mass to mill the desired pitch, thus reducing deflection and premature tool failure.

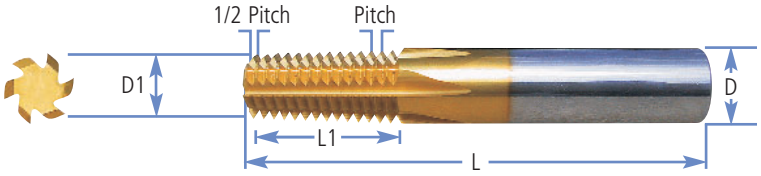
NPT (National Pipe) Threads Internal & External



Min. Size	Tool Description	OT20C	OT30C	Pitch	Flutes	D	D1	L	L1
1/16" & 1/8" NPT	TMX 1/4 x .240 - 27 NPT	0270300	0378300	27	5	0.250	0.240	2.25	0.3703
1/4" & 3/8" NPT	TMX 5/16 x .310 - 18 NPT	0270301	0378301	18	5	0.312	0.310	2.48	0.5556
1/2" & 3/4" NPT	TMX 1/2 x .470 - 14 NPT	0270302	0378302	14	5	0.500	0.470	3.27	0.7857
1" thru 2" NPT	TMX 5/8 x .620 - 11.5 NPT	0270303	0378303	11.5	6	0.625	0.620	3.62	1.0434
2-1/2" thru 6" NPT	TMX 5/8 x .620 - 8 NPT	0270304	0378304	8	6	0.625	0.620	3.62	1.2500
2-1/2" thru 6" NPT	TMX 3/4 x .745 - 8 NPT	0270305	0378305	8	6	0.750	0.745	4.10	1.5000
For 1" thru 2" API Line Pipe, (11.5 Pitch Applications)*									
11.5 API Line Pipe	TMX 5/8 x .620 - 11.5 API	0270305	0378305	11.5	6	0.625	0.620	3.62	1.2174

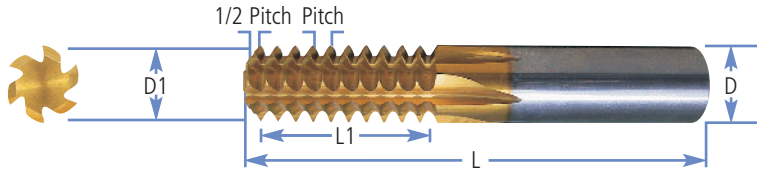
* API 11.5 pitch thread form is identical to NPT form. The same tool can be used to produce both thread specifications.

NPTF (Dryseal) Pipe Threads Internal & External



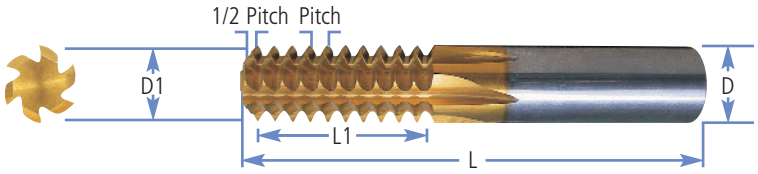
Min. Size	Tool Description	OT20C	OT30C	Pitch	Flutes	D	D1	L	L1
1/16" & 1/8" NPTF	TMX 1/4 x .240 - 27 NPTF	0270306	0378306	27	5	0.250	0.240	2.25	0.3703
1/4" & 3/8" NPTF	TMX 5/16 x .310 - 18 NPTF	0270307	0378307	18	5	0.312	0.310	2.48	0.5556
1/2" & 3/4" NPTF	TMX 1/2 x .470 - 14 NPTF	0270308	0378308	14	5	0.500	0.470	3.27	0.7857
1" thru 2" NPTF	TMX 5/8 x .620 - 11.5 NPTF	0270309	0378309	11.5	6	0.620	0.620	3.62	1.0434
2-1/2" thru 6" NPTF	TMX 5/8 x .620 - 8 NPTF	0270310	0378310	8	6	0.620	0.620	3.62	1.2500
2-1/2" thru 6" NPTF	TMX 3/4 x .745 - 8 NPTF	0270311	0378311	8	6	0.750	0.745	4.10	1.5000

NPSM Internal Pipe Threads (Straight Pipe Mechanical) Internal



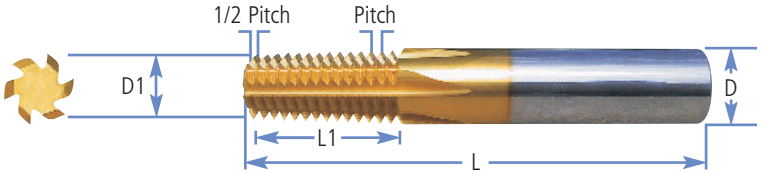
Min. Size	Tool Description	OT20C	OT30C	Pitch	Flutes	D	D1	L	L1
1/16" & 1/8" NPSM	TMX 1/4 x .240 . 27 NPSM	0270306	0378306	27	5	0.250	0.240	2.25	0.5926
1/4" & 3/8" NPSM	TMX 5/16 x .310 - 18 NPSM	0270307	0378307	18	5	0.312	0.310	2.48	0.7222
1/2" & 3/4" NPSM	TMX 1/2 x .470 - 14 NPSM	0270308	0378308	14	5	0.500	0.470	3.27	1.1428
1" thru 2" NPSM	TMX 5/8 .620 - 11.5 NPSM	0270309	0378309	11.5	6	0.620	0.620	3.62	1.3913
2-1/2" thru 6" NPSM	TMX 5/8 x .620 - 8 NPSM	0270310	0378310	8	6	0.620	0.620	3.62	1.2500
2-1/2" thru 6" NPSM	TMX 3/4 x .745 - 8 NPSM	0270311	0378311	8	6	0.750	0.745	4.10	1.5000

NPSF (Dryseal) Pipe Threads Straight Pipe Internal & External



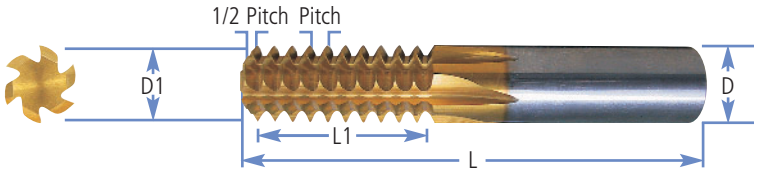
Min. Size	Tool Description	OT20C	OT30C	Pitch	Flutes	D	D1	L	L1
1/16" & 1/8" NPSF	TMX 1/4 x .240 - 27 NPSF	0270312	0378312	27	5	0.250	0.240	2.25	0.5926
1/4" & 3/8" NPSF	TMX 5/16 x .310 - 18 NPSF	0270313	0378313	18	5	0.312	0.310	2.48	0.6667
1/2" & 3/4" NPSF	TMX 1/2 x .470 - 14 NPSF	0270314	0378314	14	5	0.500	0.470	3.27	0.7857
1" thru 2" NPSF	TMX 5/8 x .620 - 11.5 NPSF	0270315	0378315	11.5	6	0.625	0.620	3.62	1.3913
2-1/2" thru 6" NPSF	TMX 5/8 x .620 - 8 NPSF	0270316	0378316	8	6	0.625	0.620	3.62	1.2500
2-1/2" thru 6" NPSF	TMX 3/4 x .745 - 8 NPSF	0270317	0378317	8	6	0.750	0.745	4.10	1.5000

BSPT British Standard Pipe Taper Internal & External



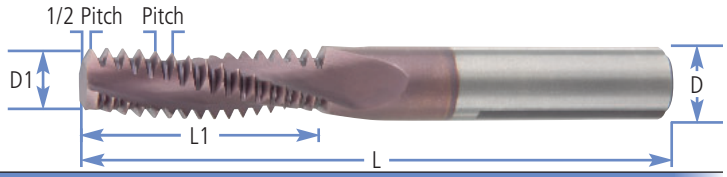
Min. Size	Tool Description	OT20C	OT30C	Pitch	Flutes	D	D1	L	L1
R 1/16" & R 1/8" BSPT	TMX 1/4 x .240 - 28 BSPT	0270328	0378328	28	5	0.250	0.240	2.25	0.3928
R 1/4" & R 3/8" BSPT	TMX 5/16 x .310 - 19 BSPT	0270329	0378329	19	5	0.312	0.310	2.48	0.5789
R 1/2" & R 3/4" BSPT	TMX 1/2 x .470 - 14 BSPT	0270330	0378330	14	5	0.500	0.470	3.27	0.7857
R 1" thru R 2" BSPT	TMX 5/8 x .620 - 11 BSPT	0270331	0378331	11	6	0.625	0.620	3.62	1.5454

BSP British Straight Pipe Internal & External



Min. Size	Tool Description	OT20C	OT30C	Pitch	Flutes	D	D1	L	L1
G 1/16" & G 1/8" BSP	TMX 1/4 x .240 - 28 BSP	0270328	0378328	28	5	0.250	0.240	2.25	0.5714
G 1/4" & G 3/8" BSP	TMX 5/16 x .310 - 19 BSP	0270325	0378325	19	5	0.312	0.310	2.48	0.7368
G 1/2" & G 3/4" BSP	TMX 1/2 x .470 - 14 BSP	0270326	0378326	14	5	0.500	0.470	3.27	1.1428
G 1" thru G 2" BSP	TMX 5/8 x .620 - 11 BSP	0270327	0378327	11	6	0.625	0.620	3.62	1.3636

Helical Flute Internal



Min. Size	Tool Description	OT20C	OT30C	Pitch	Flutes	D	D1	L	L1
10 - 32 UNC	TMN 1/8 x .120 - 32 UN HF	02H100	03H1000	32	3	0.125	0.120	2.00	0.3750
1/4"- 20 UNC	TMN 3/16 x .160 - 20 UN HF	02H1001	03H1001	20	3	0.187	0.160	2.00	0.5500
5/16"- 18 UNC	TMN 1/4 x .220 - 18 UN HF	02H1002	03H1002	18	3	0.250	0.220	2.50	0.6667
3/8"- 16 UNC	TMN 1/4 x .240 - 16 UN HF	02H1003	03H1003	16	3	0.250	0.240	2.50	0.7500
1/2"- 13 UNC	TMN 3/8 x .350 - 13 UN HF	02H1004	03H1004	13	3	0.375	0.350	3.00	1.0769
5/8"- 11 UNC	TMN 1/2 x .437 - 11 UN HF	02H1005	03H1005	11	4	0.500	0.437	3.50	1.4545
3/4"- 10 UNC	TMN 1/2 x .470 - 10 UN HF	02H1006	03H1006	10	4	0.500	0.470	3.50	1.6000
7/8"- 9 UNC	TMN 5/8 x .620 - 9 UN HF	02H1007	03H1007	9	4	0.625	0.620	4.50	1.7778
1"- 8 UNC	TMN 5/8 x .620 - 8 UN HF	02H1008	03H1008	8	4	0.625	0.620	4.50	2.0000

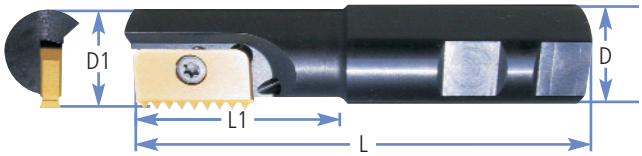
Indexable Thread Mill Holders Identification System

TM X 0075 - 79 - 2 - 14 - T

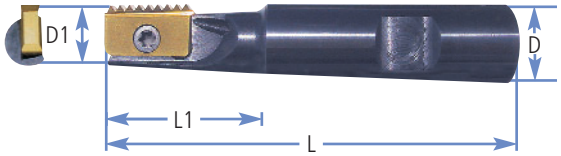
TM	X	0075	0079	2*	14	T**
Denotes Thread Mill	Denotes Internal Or External Application	Denotes Shank Diameter In Hundredths Of An Inch	Denotes Tool Cutter Diameter In Hundredths Of An Inch	Denotes Number Of Flutes	Denotes Length Of Insert In Millimeters	Denotes Taper Neck

* This position is omitted for single flute thread mills. ** This position omitted for straight neck thread mills.

Single Flute Holders



Standard Straight Neck Style
(For parallel thread applications.)

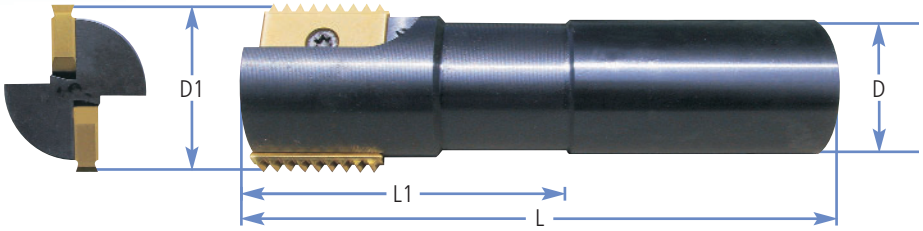


Tapered Neck "T" Style
(For tapered pipe thread applications.)

	Tool Description	EDP	D	D1	L	L1	Flutes	Screw	Insert
1	TMX 0075 - 45 - 14T*	1072120	0.75	0.450	3.39	1.000	1	T7 x M 2.5	14
	TMX 0075 - 50 - 14*	1072100	0.75	0.500	3.00	0.800	1	T7 x M 2.5	14
	TMX 0075 - 50 - 14HM*	1072101	0.75	0.500	3.35	1.000	1	T7 x M 2.5	14
	TMX 0075 - 54 - 14*	1072123	0.75	0.540	3.39	1.250	1	T7 x M 2.5	14
2	TMX 0075 - 54 - 14T*	1072121	0.75	0.540	3.39	1.250	1	T7 x M 2.5	14
	TMX 0075 - 57 - 14*	1072124	0.75	0.570	3.39	1.000	1	T7 x M 2.5	14
	TMX 0075 - 67 - 14*	1072102	0.75	0.670	3.39	1.180	1	T7 x M 2.5	14
3	TMX 0075 - 70 - 21T*	1072122	0.75	0.700	3.75	1.375	1	T20 x M 4	21
	TMX 0075 - 75 - 21**	1072104	0.75	0.750	3.75	1.575	1	T20 x M 4	21
	TMX 0075 - 88 - 21	1072115	0.75	0.880	3.75	1.575	1	T20 x M 4	21
	TMX 0100 - 114 - 30	1072107	1.00	1.140	4.37	1.968	1	T20 x M 5	30
	TMX 0150 - 173 - 40	1072112	1.50	1.730	6.00	3.070	1	T20 x M 5	40

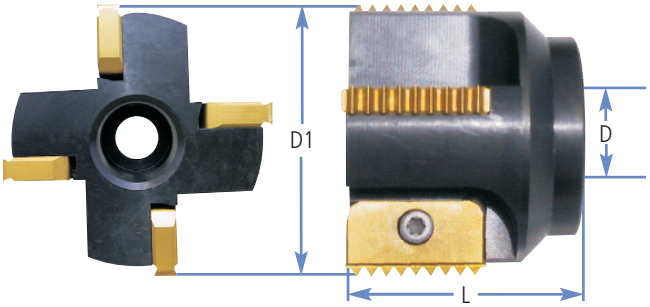
* These tool styles do not have through hole coolant. ** Tool not recommended for 1"- 8 UN internal thread application.
1 For 3/8"- 18 NPT **2** For 1/2"- 14 NPT **3** For 3/4"- 14 NPT. For larger NPT threads, use straight neck styles.

Two Flute Holders



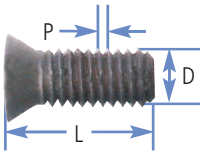
Tool Description	EDP	D	D1	L	L1	Flutes	Screw	Insert
TMX 0075 - 79 - 2 - 14	2072103	0.75	0.790	3.75	1.630	2	T7 x M 2.5	14
TMX 0100 - 118 - 2 - 21	2072106	1.00	1.180	4.25	2.000	2	T20 x M 4	21
TMX 0125 - 158 - 2 - 30	2072109	1.25	1.580	5.12	2.850	2	T20 x M 5	30
TMX 0150 - 197 - 2 - 40	2072113	1.50	1.970	6.00	3.250	2	T20 x M 5	40

Four Flute Shell Mill Holders



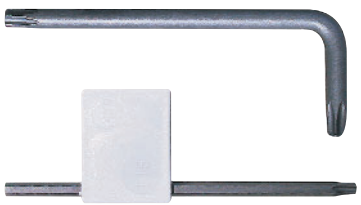
Tool Description	EDP	D	D1	L	L1	Flutes	Screw	Insert
TMX 0075 - 248 - 4 - 30	4072110	0.75	2.480	1.968	-	4	T20 x M 5	30
TMX 0100 - 315 - 4 - 30	4072111	1.00	3.150	2.165	-	4	T20 x M 5	30
TMX 0100 - 315 - 4 - 40	4072114	1.00	3.150	5.12	-	4	T20 x M 5	40

Screw



Insert Screw	EDP	L	D	P
T7 x M 2.5	SC73102	0.250	2.50 mm	0.45 mm
T20 x M 4	SC73103	0.400	4.00 mm	0.70 mm
T20 x M 5	SC73104	0.480	5.00 mm	0.80 mm

Wrench



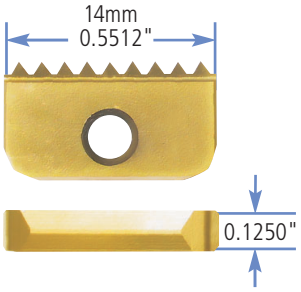
Wrench	EDP	Screw Size	Insert Size
T7	W73100	T7 x M 2.5	14mm
T20	W73101	T20 x M 4 & T20 x M 5	21, 30 & 40 mm

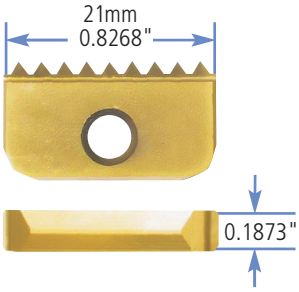
Indexable Thread Mill Insert Identification System

21 N TM - 14 UN - OT20C

21	N	TM	14	UN	OT20C
Denotes Insert Length In Millimeters	N=Internal E=External X=Internal Or External Application	Denotes Insert Style Used For Thread Milling	Denotes Pitch In Threads Per Inch ISO Pitch in mm	Thread Form UN=Unified ISO=Metric NPT=National Pipe Taper NPTF=Dryseal W=Whitworth	Carbide Grade OT20C = TiN PVD Coated OT30C = TiAlN PVD Coated

UN (Unified National), Thread Mill Inserts





14 mm External UN

For use with the following holders:

- TMX 0075 - 50 - 14
- TMX 0075 - 50 - 14 HM
- TMX 0075 - 54 - 14
- TMX 0075 - 57 - 14
- TMX 0075 - 67 - 14
- TMX 0075 - 79 - 2 - 14

Insert Description	OT20C	OT30C	TPI	Dec. Ptch
14 ETM - 48 UN	2074200	3076200	48	0.0208
14 ETM - 40 UN	2074201	3076201	40	0.0250
14 ETM - 32 UN	2074202	3076202	32	0.0313
14 ETM - 28 UN	2074203	3076203	28	0.0357
14 ETM - 27 UN	2074204	3076204	27	0.0370
14 ETM - 24 UN	2074205	3076205	24	0.0417
14 ETM - 20 UN	2074206	3076206	20	0.0500
14 ETM - 18 UN	2074208	3076208	18	0.0556
14 ETM - 16 UN	2074210	3076210	16	0.0625
14 ETM - 14 UN	2074212	3076212	14	0.0714
14 ETM - 12 UN	2074214	3076214	12	0.0833

21 mm External UN

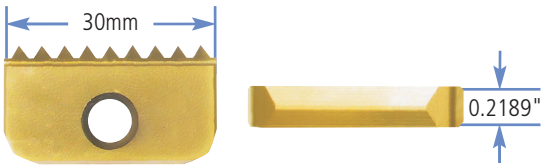
For use with the following holders:

- TMX 0075 - 75 - 21
- TMX 0100 - 118 - 2 - 21
- TMX 0075 - 88 - 21

Insert Description	OT20C	OT30C	TPI	Dec. Ptch
21 ETM - 20 UN	2074217	3076217	20	0.0500
21 ETM - 18 UN	2074219	3076219	18	0.0556
21 ETM - 16 UN	2074221	3076221	16	0.0625
21 ETM - 14 UN	2074223	3076223	14	0.0714
21 ETM - 12 UN	2074225	3076225	12	0.0833
21 ETM - 10 UN	2074227	3076227	10	0.1000
21 ETM - 9 UN	2074229	3076229	9	0.1111
21 ETM - 8 UN - S*	2074230	3076230	8	0.1250

* S denotes single side use only

UN (Unified National), Thread Mill Inserts



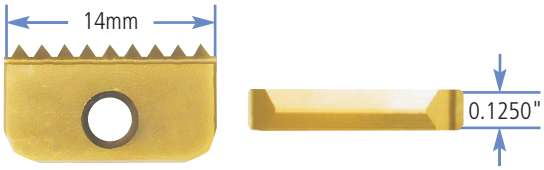
30 mm External UN

For use with the following holders:

- TMX 0075 - 248 - 30
- TMX 0125 - 158 - 2 - 30
- TMX 0100 - 114 - 30
- TMX 0100 - 315 - 4 - 30

Insert Description	OT20C	OT30C	TPI	Dec. Ptch
30 ETM - 18 UN	2074232	3076232	18	0.0556
30 ETM - 16 UN	2074234	3076234	16	0.0625
30 ETM - 14 UN	2074236	3076236	14	0.0714
30 ETM - 12 UN	2074238	3076238	12	0.0833
30 ETM - 10 UN	2074240	3076240	10	0.1000
30 ETM - 8 UN	2074242	3076242	8	0.1250
30 ETM - 7 UN	2074244	3076244	7	0.1429
30 ETM - 6 UN - S*	2074245	3076245	6	0.1667
30 ETM - 5 UN - S*	2074246	3076246	5	0.2000

* S denotes single side use only

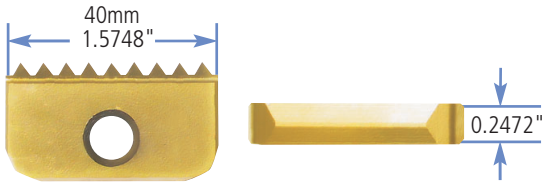


14 mm Internal UN

For use with the following holders:

- TMX 0075 - 50 - 14
- TMX 0075 - 57 - 14
- TMX 0075 - 54 - 14
- TMX 0075 - 79 - 2 - 14
- TMX 0075 - 67 - 14
- TMX 0075 - 50 - 14 HM

Insert Description	OT20C	OT30C	TPI	Dec. Ptch
14 NTM - 48 UN	2074100	3076100	48	0.0208
14 NTM - 40 UN	2074101	3076101	40	0.0250
14 NTM - 32 UN	2074102	3076102	32	0.0313
14 NTM - 28 UN	2074103	3076103	28	0.0357
14 NTM - 27 UN	2074104	3076104	27	0.0370
14 NTM - 24 UN	2074105	3076105	24	0.0417
14 NTM - 20 UN	2074106	3076106	20	0.0500
14 NTM - 18 UN	2074107	3076107	18	0.0556
14 NTM - 16 UN	2074108	3076108	16	0.0625
14 NTM - 14 UN	2074109	3076109	14	0.0714
14 NTM - 12 UN	2074110	3076110	12	0.0833

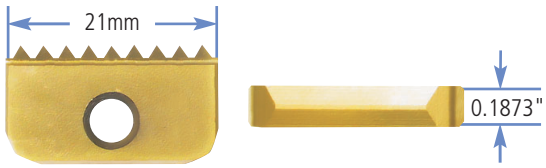


40 mm External UN

For use with the following holders:

- TMX 0100 - 315 - 4 - 40
- TMX 0150 - 173 - 40
- TMX 0150 - 197 - 2 - 40

Insert Description	OT20C	OT30C	TPI	Dec. Ptch
40 ETM - 18 UN	2074247	3076247	18	0.0556
40 ETM - 16 UN	2074248	3076248	16	0.0625
40 ETM - 14 UN	2074249	3076249	14	0.0714
40 ETM - 12 UN	2074250	3076250	12	0.0833
40 ETM - 10 UN	2074251	3076251	10	0.1000
40 ETM - 8 UN	2074252	3076252	8	0.1250
40 ETM - 7 UN	2074253	3076253	7	0.1429
40 ETM - 6 UN	2074254	3076254	6	0.1667
40 ETM - 5 UN	2074255	3076255	5	0.2000
40 ETM - 4.5 UN	2074256	3076256	4.5	0.2222
40 ETM - 4 UN - S*	2074257	3076257	4	0.2500
40 ETM - 3 UN - S*	2074258	3076258	3	0.3333



21 mm Internal UN

For use with the following holders:

- TMX 0075 - 75 - 21
- TMX 0100 - 118 - 2 - 21
- TMX 0075 - 88 - 21

Insert Description	OT20C	OT30C	TPI	Dec. Ptch
21 NTM - 32 UN	2074112	3076112	32	0.0313
21 NTM - 20 UN	2074113	3076113	20	0.0500
21 NTM - 18 UN	2074114	3076114	18	0.0556
21 NTM - 16 UN	2074115	3076115	16	0.0625
21 NTM - 14 UN	2074116	3076116	14	0.0714
21 NTM - 12 UN	2074117	3076117	12	0.0833
21 NTM - 10 UN	2074118	3076118	10	0.1000
21 NTM - 8 UN - S*	2074119	3076119	8	0.1250

* S denotes single side use only

30 mm Internal UN

For use with the following holders:

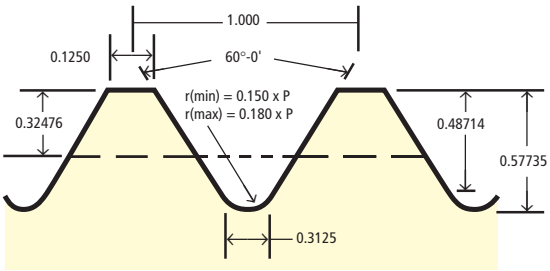
- TMX 0075 - 248 - 4 - 30
- TMX 0100 - 114 - 30
- TMX 0125 - 158 - 2 - 30
- TMX 0100 - 315 - 4 - 30

Insert Description	OT20C	OT30C	TPI	Dec. Ptch
30 NTM - 18 UN	2074120	3076120	18	0.0556
30 NTM - 16 UN	2074121	3076121	16	0.0625
30 NTM - 14 UN	2074122	3076122	14	0.0714
30 NTM - 12UN	2074123	3076123	12	0.0833
30 NTM - 10 UN	2074124	3076124	10	0.1000
30 NTM - 8 UN	2074125	3076125	8	0.1250
30 NTM - 7 UN	2074126	3076126	7	0.1429
30 NTM - 6 UN - S*	2074127	3076127	6	0.1667
30 NTM - 5 UN - S*	2074128	3076128	5	0.2000

* S denotes single side use only

External UNJ (Aerospace)

External UNJ thread forms are made to MIL-S-8879C specifications and are generally used in aerospace applications when a controlled root radius of the external thread is specified. Exact dimensions of the thread form can be determined by multiplying the decimal pitch times multipliers shown in the following drawing:



14 mm External UNJ

For use with the following holders:

- TMX 0075 - 50 - 14
- TMX 0075 - 50 - 14 HM
- TMX 0075 - 54 - 14
- TMX 0075 - 57 - 14
- TMX 0075 - 67 - 14
- TMX 0075 - 79 - 2 - 14

Insert Description	OT20C	OT30C	TPI	Dec. Ptch
14 ETM - 20 UNJ	2074207	3076207	20	0.0500
14 ETM - 18 UNJ	2074209	3076209	18	0.0556
14 ETM - 16 UNJ	2074211	3076211	16	0.0625
14 ETM - 14 UNJ	2074213	3076213	14	0.0714
14 ETM - 12 UNJ	2074216	3076216	12	0.0833

40 mm Internal UN

For use with the following holders:

- TMX 0100 - 315 - 4 - 40
- TMX 0150 - 173 - 40
- TMX 0150 - 197 - 2 - 40

Insert Description	OT20C	OT30C	TPI	Dec. Ptch
40 NTM - 18 UN	2074129	3076129	18	0.0556
40 NTM - 16 UN	2074130	3076130	16	0.0625
40 NTM - 12 UN	2074131	3076131	12	0.0833
40 NTM - 10 UN	2074132	3076132	10	0.1000
40 NTM - 8 UN	2074133	3076133	8	0.1250
40 NTM - 7 UN	2074134	3076134	7	0.1429
40 NTM - 6 UN	2074135	3076135	6	0.1667
40 NTM - 5 UN	2074136	3076136	5	0.2000
40 NTM - 4.5 UN	2074137	3076137	4.5	0.2222
40 NTM - 4 UN - S*	2074138	3076138	4	0.2500
40 NTM - 3 UN - S*	2074139	3076139	3	0.3333

0

21 mm External UNJ

For use with the following holders:

- TMX 0075 - 75 - 21
- TMX 0100 -118 - 2 - 21
- TMX 0075 - 88 - 21

Insert Description	OT20C	OT30C	TPI	Dec. Ptch
21 ETM - 20 UNJ	2074218	3076218	20	0.0500
21 ETM - 18 UNJ	2074220	3076220	18	0.0556
21 ETM - 16 UNJ	2074222	3076222	16	0.0625
21 ETM - 14 UNJ	2074224	3076224	14	0.0714
21 ETM - 12 UNJ	2074226	3076226	12	0.0833
21 ETM - 10 UNJ	2074228	3076228	10	0.1000
21 ETM - 8 UNJ - S*	2074231	3076231	8	0.1250

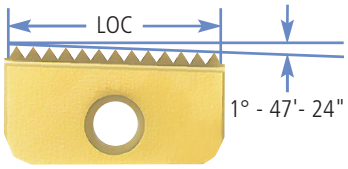
* S denotes single side use only

30 mm External UNJ

For use with the following holders:

- TMX 0075 - 248 - 4 - 30
- TMX 0100 - 114 - 30
- TMX 0125 - 158 - 2 - 30
- TMX 0100 - 315 - 4 - 30

Insert Description	OT20C	OT30C	TPI	Dec. Ptch
30 ETM - 18 UNJ	2074233	3076233	18	0.0556
30 ETM - 16 UNJ	2074235	3076235	16	0.0625
30 ETM - 14 UNJ	2074237	3076237	14	0.0714
30 ETM - 12 UNJ	2074239	3076239	12	0.0833
30 ETM - 10 UNJ	2074241	3076241	10	0.1000
30 ETM - 8 UNJ	2074243	3076243	8	0.1250



Internal Or External NPT (National Pipe Taper)

Insert Description	OT20C	OT30C	TPI	Dec. Ptch	NPT Size	Max Loc**	Recommended Tool Holder
14 mm Inserts							
14 XTM - 18 NPT - SXP*	2074360	3076360	18	0.0556	3/8"- 18 NPT	0.4626	TMX 0075 - 45 - 14T
14 XTM - 14 NPT - SXP*	2074361	3076361	14	0.0714	1/2"- 14 NPT	0.5000	TMX 0075 - 54 - 14T
21 mm Inserts							
21 XTM - 18 NPT - S*	2074302	3076302	18	0.0556	External use only	0.7778	TMX 0075 - 70 - 21T
21 XTM - 14 NPT - SXP*	2074362	3076362	14	0.0714	3/4"- 14 NPT	0.7857	TMX 0075 - 70 - 21T
21 XTM - 11.5 NPT - S*	2074304	3076304	11.5	0.0870	1" thru 2"- 11.5 NPT	0.7826	TMX 0075 - 88 - 21
30 mm Inserts							
30 XTM - 11.5 NPT - S*	2074305	3076305	11.5	0.0870	1-1/4"- 2"- 11.5 NPT	1.1304	TMX 0100 - 114 - 30
30 XTM - 8 NPT - S*	2074306	3076306	8	0.1250	2-1/2"- 8 NPT	1.1250	TMX 0125 - 158 - 2 - 30
40 mm Inserts							
40 XTM - 11.5 NPT - S*	2074307	3076307	11.5	0.1667	2"- 11.5 NPT	1.5652	TMX 0150 - 173 - 40
40 XTM - 8 NPT - S*	2074308	3076308	8	0.1250	2-1/2"- 8 NPT & UP	1.5000	TMX 0150 - 173 - 40 TMX 0150 - 197 - 2 - 40

* S denotes single side use only

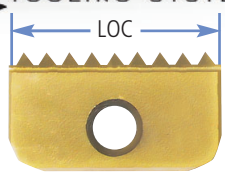
** Max. LOC refers to the maximum length of full threads available on the insert. To determine the actual length of full thread required for a given size NPT thread, please refer to page 20 of this catalog. In most cases, the standard L3 gage length plus one pitch is less than the maximum LOC of the insert.

Internal Or External NPTF (Dryseal)

Insert Description	OT20C	OT30C	TPI	Dec. Ptch	NPT Size	Max Loc**	Recommended Tool Holder
14 mm Inserts							
14 XTM - 18 NPTF - SXP*	2074363	3076363	18	0.0556	3/8"- 18 NPTF	0.4626	TMX 0075 - 45 - 14T
14 XTM - 14 NPTF - SXP*	2074364	3076364	14	0.0714	1/2"- 14 NPTF	0.5000	TMX 0075 - 54 - 14T
21 mm Inserts							
21 XTM - 18 NPTF - S*	2074311	3076311	18	0.0556	External use only	0.7778	TMX 0075 - 70 - 21T
21 XTM - 14 NPTF - SXP*	2074365	3076365	14	0.0714	3/4"- 14 NPTF	0.7857	TMX 0075 - 70 - 21T
21 XTM - 11.5 NPTF - S*	2074313	3076313	11.5	0.0870	1" thru 2"- 11.5 NPTF	0.7826	TMX 0075 - 88 - 21
30 mm Inserts							
30 XTM - 11.5 NPTF - S*	2074314	3076314	11.5	0.0870	1-1/4" to 2"- 11.5 NPTF	1.1304	TMX 0100 - 114 - 30
30 XTM - 8 NPTF - S*	2074315	3076315	8	0.1250	2-1/2"- 8 NPTF	1.1250	TMX 0125 - 158 - 2 - 30
40 mm Inserts							
40 XTM - 11.5 NPTF - S*	2074316	3076316	11.5	0.1667	2"- 11.5 NPTF	1.5652	TMX 0150 - 173 - 40
40 XTM - 8 NPTF - S*	2074317	3076317	8	0.1250	2-1/2"- 8 NPTF & UP	1.5000	TMX 0150 - 173 - 40 TMX 0150 - 197 - 2 - 40

* S denotes single side use only

** Max. LOC refers to the maximum length of full threads available on the insert. To determine the actual length of full thread required for a given size NPT thread, please refer to page 20 of this catalog. In most cases, the standard L3 gage length plus one pitch is less than the maximum LOC of the insert.



Internal NPSM (National Pipe Straight Mechanical)

Insert Description	OT20C	OT30C	TPI	Dec. Ptch	NPSM Size	Max LOC	Recommended Tool Holder
14 mm Inserts							
14 NTM - 18 NPSM	2074318	3076318	18	0.0556	3/8"- 18 NPSM	0.4626	TMX 0075 - 50 - 14
14 NTM - 14 NPSM	2074319	3076319	14	0.0714	1/2"- 14 NPSM	0.5000	TMX 0075 - 54 - 14
21 mm Inserts							
21 NTM - 14 NPSM	2074321	3076362	14	0.0714	3/4"- 14 NPSM	0.7857	TMX 0075 - 75 - 21
21 NTM - 11.5 NPSM	2074322	3076304	11.5	0.0870	1" thru 2"- 11.5 NPSM	0.7826	TMX 0075 - 88 - 21
30 mm Inserts							
30 NTM - 11.5 NPSM	2074323	3076305	11.5	0.0870	1-1/4" thru 2"- 11.5 NPSM	1.1304	TMX 0100 - 114 - 30
30 NTM - 8 NPSM	2074324	3076306	8	0.1250	2-1/2"- 8 NPSM & UP	1.1250	TMX 0125 - 158 - 2 - 30

External NPSM (National Pipe Straight Mechanical)

Insert Description	OT20C	OT30C	TPI	Dec. Ptch	NPSM Size	Max LOC	Recommended Tool Holder
14 mm Inserts							
14 ETM - 18 NPSM	2074325	3076325	18	0.0556	3/8"- 18 NPSM	0.4626	TMX 0075 - 67 - 14
14 ETM - 14 NPSM	2074326	3076326	14	0.0714	1/2"- 14 NPSM	0.5000	TMX 0075 - 67 - 14
21 mm Inserts							
21 ETM - 18 NPSM	2074327	3076327	18	0.0556	External use only	0.7778	TMX 0075 - 75 - 21
21 ETM - 14 NPSM	2074328	3076328	14	0.0714	3/4"- 14 NPSM	0.7857	TMX 0075 - 75 - 21
21 ETM - 11.5 NPSM	2074329	3076329	11.5	0.0870	1" thru 2"- 11.5 NPSM	0.7826	TMX 0075 - 88 -21
30 mm Inserts							
30 ETM - 11.5 NPSM	2074330	3076330	11.5	0.0870	1" thru 2"- 11.5 NPSM	1.1304	TMX 0100 - 114 - 30
30 ETM - 8 NPSM	2074331	3076331	8	0.1250	2-1/2"- 8 NPSM & UP	1.1250	TMX 0125 - 158 - 2 - 30

Internal or External BSPT (British Standard Pipe Taper)

Insert Description	OT20C	OT30C	TPI	Dec. Ptch	NPT Size	Max LOC	Recommended Tool Holder
14 mm Inserts							
14 XTM - 14 BSPT - S*	2074349	3076349	14	0.0714	R 1/2" & R 3/4"- 14 BSPT	0.5000	TMX 0075 - 54 - 14T
21 mm Inserts							
21 XTM - 14 BSPT - S*	2074350	3076350	14	0.0714	R 3/4"- 14 BSPT	0.7857	TMX 0075 - 70 - 21T
21 XTM - 11 BSPT - S*	2074351	3076351	11	0.0909	R 1" thru R 2"- 11 BSPT	0.8182	TMX 0075 - 88 - 21
30 mm Inserts							
30 XTM - 11 BSPT - S*	2074352	3076352	11	0.0909	R 1-1/4" thru R 2"- 11 BSP	1.1811	TMX 0100 - 114 - 30
40 mm Inserts							
40 XTM - 11 BSPT - S*	2074353	3076353	11	0.0909	R 2"- 11 BSPT	1.5456	TMX 0150 - 173 - 40

* S denotes single side use only

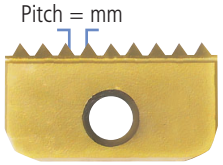
Internal Or External BSP (British Straight Pipe Parallel)*

* All BSP inserts below can also be used to produce standard Whitworth external or internal threads of the same pitch. Whitworth & BSP thread forms are identical thus making them interchangeable.

Insert Description	OT20C	OT30C	TPI	Dec. Ptch	NPT Size	Max LOC	Recommended Tool Holder
14 mm Inserts							
14 XTM - 19 BSP	2074341	3076341	19	0.0526	G 3/8"- 19 BSP	0.5263	TMX 0075 - 50 - 14
14 XTM - 14 BSP	2074342	3076342	14	0.0714	G 1/2" & G 3/4"- 14 BSP	0.5000	TMX 0075 - 67 - 14
14 XTM - 11 BSP - S*	2074343	3076343	11	0.0909	G 1" thru G 2"- 11 BSP	0.5455	TMX 0075 - 67 - 14
21 mm Inserts							
21 XTM - 14 BSP	2074344	3076344	14	0.0714	G 3/4"- 14 BSP	0.7857	TMX 0075 - 75 - 21
21 XTM - 11 BSP	2074345	3076345	11	0.0909	G 1" thru G 2"- 11 BSP	0.8182	TMX 0075 - 88 - 21
30 mm Inserts							
30 XTM - 14 BSP	2074347	3076347	11	0.0909	External use only	1.1429	TMX 0100 - 114 - 30
30 XTM - 11 BSP	2074346	3076346	11	0.0909	G 1-1/4" thru G 2"- 11 BSP	1.1811	TMX 0100 - 114 - 30
40 mm Inserts							
40 XTM - 11 BSP	2074348	3076348	11	0.0909	G 2"- 11 BSP Internal	1.5455	TMX 0150 - 173 - 40

External ISO (Metric)

• Order ISO Metric



14 mm External ISO

For use with the following holders:

- TMX 0075 - 50 - 14
- TMX 0075 - 50 - 14 - HM
- TMX 0075 - 54 - 14
- TMX 0075 - 57 - 14
- TMX 0075 - 67 - 14
- TMX 0075 - 79 - 2 - 14

Insert Description	OT20C	OT30C	Pitch*
14 ETM - 1.00 ISO	2074500	3076500	1.0 mm
14 ETM - 1.50 ISO	2074501	3076501	1.5 mm
14 ETM - 2.00 ISO	2074502	3076502	2.0 mm

21 mm External ISO

For use with the following holders:

- TMX 0075 - 75 - 21
- TMX 0100 - 118 - 2 - 21
- TMX 0075 - 88 - 21

Insert Description	OT20C	OT30C	Pitch*
21 ETM - 1.00 ISO	2074503	3076503	1.0 mm
21 ETM - 1.50 ISO	2074504	3076504	1.5 mm
21 ETM - 2.00 ISO	2074505	3076505	2.0 mm
21 ETM - 2.50 ISO	2074506	3076506	2.5 mm
21 ETM - 3.00 ISO	2074507	3076507	3.0 mm
21 ETM - 3.50 ISO	2074508	3076508	3.5 mm

30 mm External ISO

For use with the following holders:

- TMX 0075 - 248 - 4 - 30
- TMX 0100 - 114 - 30
- TMX 0100 - 315 - 4 - 30
- TMX 0125 - 158 - 2 - 30

Insert Description	OT20C	OT30C	Pitch*
30 ETM - 1.50 ISO	2074509	3076509	1.5 mm
30 ETM - 2.00 ISO	2074510	3076510	2.0 mm
30 ETM - 2.50 ISO	2074511	3076511	2.5 mm
30 ETM - 3.00 ISO	2074512	3076512	3.0 mm
30 ETM - 3.50 ISO	2074513	3076513	3.5 mm
30 ETM - 4.00 ISO - S*	2074514	3076514	4.0 mm

*S denotes single side use only

40 mm External ISO

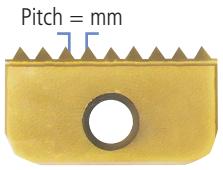
For use with the following holders:

- TMX 0100 - 315 - 4 - 40
- TMX 0150 - 173 - 40
- TMX 0150 - 197 - 2 - 40

Insert Description	OT20C	OT30C	Pitch*
40 ETM - 4.00 ISO	2074515	3076515	4.0 mm
40 ETM - 5.00 ISO	2074516	3076516	5.0 mm
40 ETM - 6.00 ISO	2074517	3076517	6.0 mm

Internal ISO (Metric)

• Order ISO Metric



14 mm Internal ISO

For use with the following holders:

- TMX 0075 - 50 - 14
- TMX 0075 - 50 - 14 - HM
- TMX 0075 - 54 - 14
- TMX 0075 - 57 - 14
- TMX 0075 - 67 - 14
- TMX 0075 - 79 - 2 - 14

Insert Description	OT20C	OT30C	Pitch*
14 NTM - 1.00 ISO	2074400	3076400	1.0 mm
14 NTM - 1.50 ISO	2074401	3076401	1.5 mm
14 NTM - 2.00 ISO - S*	2074402	3076402	2.0 mm

*S denotes single side use only

30 mm Internal ISO

For use with the following holders:

- TMX 0075 - 248 - 4 - 30
- TMX 0100 - 114 - 30
- TMX 0100 - 315 - 4 - 30
- TMX 0125 - 158 - 2 - 30

Insert Description	OT20C	OT30C	Pitch*
30 NTM - 1.50 ISO	2074410	3076410	1.5 mm
30 NTM - 2.00 ISO	2074411	3076411	2.0 mm
30 NTM - 2.50 ISO	2074412	3076412	2.5 mm
30 NTM - 3.00 ISO	2074413	3076413	3.0 mm
30 NTM - 3.50 ISO	2074414	3076414	3.5 mm
30 NTM - 4.00 ISO - S*	2074415	3076415	4.0 mm
30 NTM - 4.50 ISO - S*	2074416	3076416	4.5 mm
30 NTM - 5.00 ISO - S*	2074417	3076417	5.0 mm
30 NTM - 5.50 ISO - S*	2074418	3076418	5.5 mm

*S denotes single side use only

Other Thread Forms Available From Omnithread.

Omnithread offers special thread forms available on a made to order basis.

Certain inserts may be available off the shelf. Just call our technical service facility at 586-574-0952. Be sure to provide the thread form type, major thread diameter, pitch, and length of full thread you need to produce. We will check our current inventory for availability.

21 mm Internal ISO

For use with the following holders:

- TMX 0075 - 75 - 21
- TMX 0100 -118 - 2 - 21
- TMX 0075 - 88 - 21

Insert Description	OT20C	OT30C	Pitch*
21 NTM - 1.00 ISO	2074403	3076403	1.0 mm
21 NTM - 1.25 ISO	2074404	3076404	1.25 mm
21 NTM - 1.50 ISO	2074405	3076405	1.5 mm
21 NTM - 2.00 ISO	2074406	3076406	2.0 mm
21 NTM - 2.50 ISO	2074407	3076407	2.5 mm
21 NTM - 3.00 ISO	2074408	3076408	3.0 mm
21 NTM - 3.50 ISO	2074409	3076409	3.5 mm

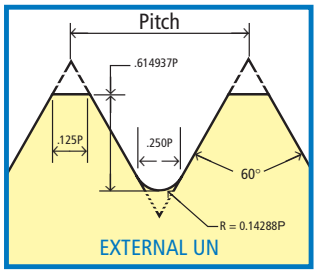
40 mm Internal ISO

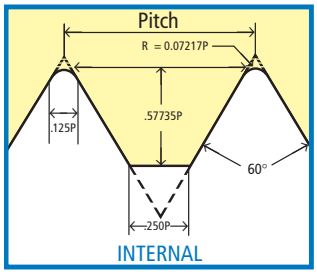
For use with the following holders:

- TMX 0100 - 315 - 4 - 40
- TMX 0150 - 173 - 40
- TMX 0150 - 197 - 2 - 40

Insert Description	OT20C	OT30C	Pitch*
40 NTM - 2.00 ISO	2074419	3076419	2.0 mm
40 NTM - 2.50 ISO	2074420	3076420	2.5 mm
40 NTM - 3.00 ISO	2074421	3076421	3.0 mm
40 NTM - 3.50 ISO	2074422	3076422	3.5 mm
40 NTM - 4.00 ISO	2074423	3076423	4.0 mm
40 NTM - 4.50 ISO	2074424	3076424	4.5 mm
40 NTM - 5.00 ISO	2074425	3076425	5.0 mm
40 NTM - 5.50 ISO	2074426	3076426	5.5 mm
40 NTM - 6.00 ISO	2074427	3076427	6.0 mm

UN Specifications





UN Thread Specifications

Decimal Thread Pitch:	1 ÷ Threads Per Inch
Theoretical Thread Height:	0.866025 x Decimal Pitch
*External Thread Height:	0.614937 x Decimal Pitch
*Internal Thread Height:	0.577350 x Decimal Pitch
External Crest Radius:	0.108253 x Decimal Pitch
Internal Crest Flat Width:	0.250 x Decimal Pitch
External Max. Root Radius:	0.142881 x Decimal Pitch
Internal Max. Root Radius:	0.072169 x Decimal Pitch

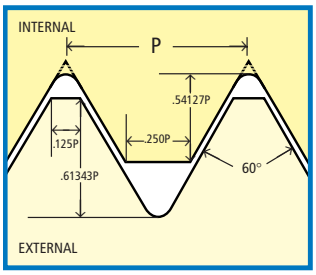
* External & Internal thread height based on maximum material condition full root radius and crest flat truncation as shown in the drawing above.

UN Thread Dimensions by Pitch

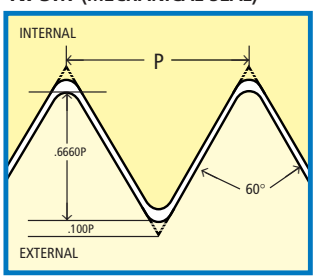
	Internal Thread			External Thread		
TPI	Dec. Pitch	Max Root R	Thd. Height	Max Root R	Crest Flat	Thd. Height
36	0.02778	0.0020	0.0160	0.0040	0.0035	0.0171
32	0.03125	0.0023	0.0180	0.0045	0.0039	0.0192
28	0.03571	0.0026	0.0206	0.0051	0.0045	0.0220
27	0.03704	0.0027	0.0214	0.0053	0.0046	0.0228
24	0.04167	0.0030	0.0241	0.0060	0.0052	0.0256
20	0.05000	0.0036	0.0289	0.0071	0.0063	0.0307
18	0.05556	0.0040	0.0321	0.0079	0.0069	0.0342
16	0.06250	0.0045	0.0361	0.0089	0.0078	0.0384
14	0.07143	0.0052	0.0412	0.0102	0.0089	0.0439
13	0.07692	0.0056	0.0444	0.0110	0.0096	0.0473
12	0.08333	0.0060	0.0481	0.0119	0.0104	0.0512
11	0.09091	0.0066	0.0525	0.0130	0.0114	0.0559
10	0.10000	0.0072	0.0577	0.0143	0.0125	0.0615
9	0.11111	0.0080	0.0642	0.0159	0.0139	0.0683
8	0.12500	0.0090	0.0722	0.0179	0.0156	0.0769
7	0.14286	0.0103	0.0825	0.0204	0.0179	0.0878
6	0.16667	0.0120	0.0962	0.0238	0.0208	0.1025
5	0.20000	0.0144	0.1155	0.0286	0.0250	0.1230
4.5	0.22222	0.0160	0.1283	0.0318	0.0278	0.1367
4	0.25000	0.0180	0.1443	0.0357	0.0313	0.1537

Thread Form Profiles

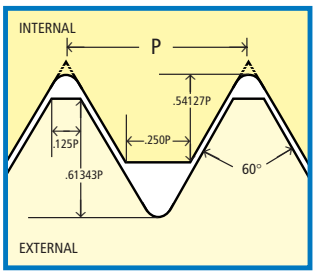
UNIFIED UN



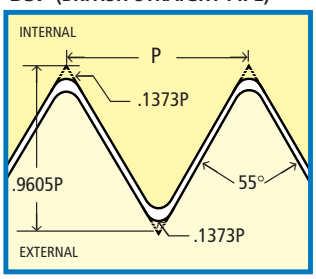
NPSM (MECHANICAL SEAL)



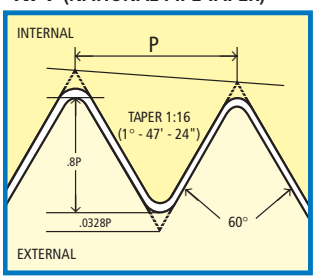
ISO



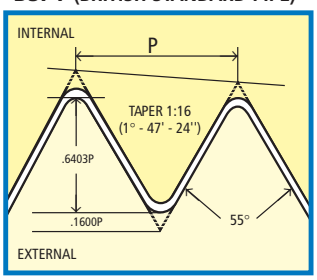
BSP (BRITISH STRAIGHT PIPE)



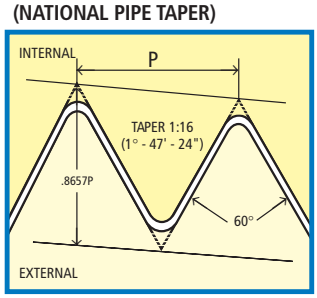
NPT (NATIONAL PIPE TAPER)



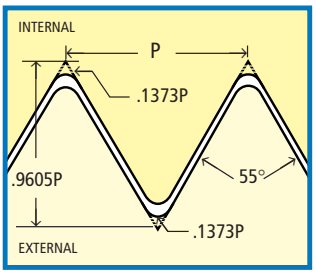
BSPT (BRITISH STANDARD PIPE)



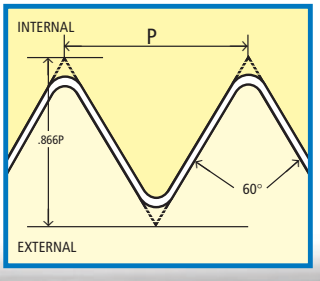
NPTF (DRYSEAL) (NATIONAL PIPE TAPER)



BSW (WHITWORTH)



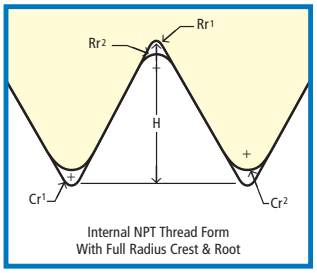
NPSF (DRYSEAL) (NATIONAL PIPE STRAIGHT)

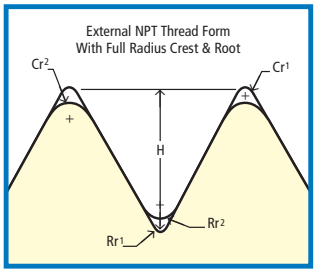


NPT Thread Specifications

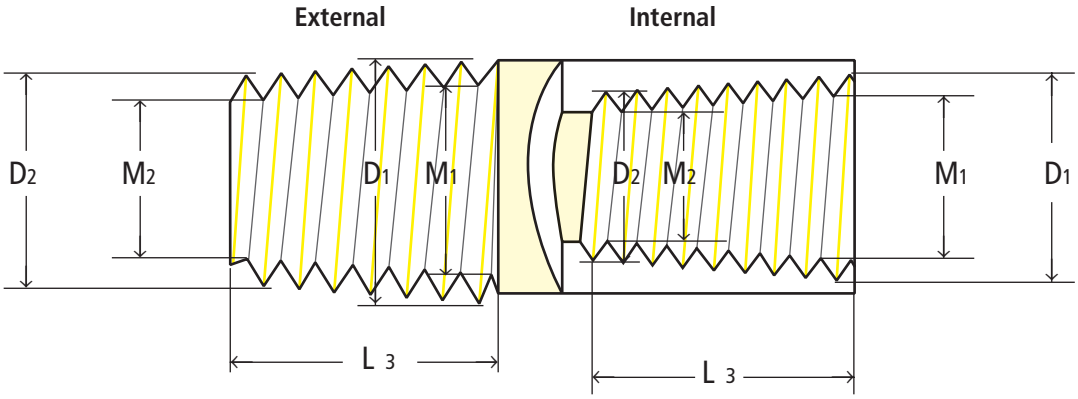
NPT Specifications For Radius Crest & Root

	Root Radius		Crest Radius	
Pitch	Rr^1	Rr^2	Cr^1	Cr^2
27 TPI	0.0008	0.0024	0.0012	0.0036
18 TPI	0.0012	0.0033	0.0018	0.0049
14 NPT	0.0016	0.0037	0.0024	0.0056
11.5 TPI	0.0019	0.0042	0.0029	0.0063
8 TPI	0.0027	0.0052	0.0041	0.0078





Nominal thread height shown as H above has been calculated on the mean of the minimum and maximum radius for the following pitch NPT forms: 27 TPI=0.02806", 18 TPI=0.04251", 14 TPI=0.05517", 11.5 TPI=0.06722", 8 TPI=0.09830".

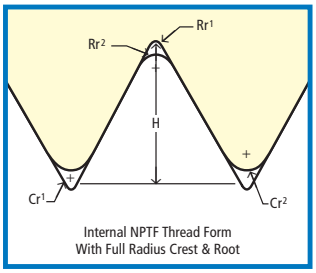


Nominal Size	Decimal Ptch	L3 Gage Length	L3 + 1 Pitch*	D1	D2	M1	M2
1/16"- 27	0.03704	0.271	0.3080	0.308	0.292	0.252	0.236
1/8"- 27	0.03704	0.273	0.3100	0.400	0.384	0.344	0.328
1/4"- 18	0.05556	0.395	0.4506	0.533	0.508	0.448	0.424
3/8"- 18	0.05556	0.407	0.4626	0.668	0.643	0.584	0.559
1/2"- 14	0.07143	0.534	0.6054	0.832	0.799	0.723	0.690
3/4"- 14	0.07143	0.553	0.6244	1.043	1.008	0.934	0.899
1"- 11.5	0.08696	0.661	0.7507	1.305	1.263	1.173	1.131
1-1/4"- 11.5	0.08696	0.681	0.7680	1.650	1.607	1.518	1.475
1-1/2"- 11.5	0.08696	0.681	0.7680	1.888	1.846	1.756	1.714
2"- 11.5	0.08696	0.697	0.7840	2.362	2.319	2.230	2.187
2-1/2"- 8	0.1250	1.057	1.1820	2.859	2.793	2.669	2.603
3"- 8	0.1250	1.141	1.2660	3.485	3.414	3.295	3.224
3-1/2"- 8	0.1250	1.250	1.3750	3.985	3.907	3.795	3.717
4"- 8	0.1250	1.300	1.4250	4.484	4.402	4.294	4.212
5"- 8	0.1250	1.406	1.5310	5.546	5.458	5.356	5.268

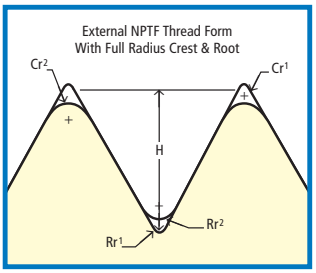
*L3 + 1 pitch dimension is maximum length of full thread to satisfy standard NPT or NPTF specifications.

NPTF (Dryseal) Thread Specifications

NPTF Specifications For Radius Crest & Root				
	Root Radius		Crest Radius	
Pitch	Rr^1	Rr^2	Cr^1	Cr^2
27 TPI	0.0023	0.00035	0.0017	0.0035
18 TPI	0.0029	0.0041	0.0026	0.0043
14 NPT	0.0029	0.0041	0.0026	0.0043
11.5 TPI	0.0035	0.0052	0.0035	0.0052
8 TPI	0.0046	0.0063	0.0052	0.0069



Internal NPTF Thread Form
With Full Radius Crest & Root



External NPTF Thread Form
With Full Radius Crest & Root

Nominal thread height shown as H above has been calculated on the mean of the minimum and maximum radius for the following pitch NPT forms: 27 TPI=0.02657", 18 TPI=0.04118", 14 TPI=0.05492", 11.5 TPI=0.06660", 8 TPI=0.09670".

Drill Recommendation For Thread Milling NPT & NPTF Threads

Thread Size	Drill Size	Dec. Diameter
1/16"- 27	B	0.2380
1/8"- 27	21/64"	0.3281
1/4"- 18	27/64"	0.4219
3/8"- 18	9/16"	0.5625
1/2"- 14	17.5 mm	0.6890
3/4"- 14	23 mm	0.9055
1"- 11.5	1-1/8"	1.1250
1-1/4"- 11.5	-	1.4688
1-1/2"- 11.5	-	1.7132
2"- 11.5	-	2.1861
2-1/2"- 8	-	2.6072
3"- 8	-	3.2283
3-1/2"- 8	-	3.7252
4"- 8	-	4.2221

Production of full form internal or external NPT or NPTF threads by thread milling requires changing the minor diameter of the bore or the external major diameter prior to the final thread milling process.

Do not refer to tap drill charts for internal pipe tap applications. The internal minor diameter created using tap drill sizes will truncate the minor diameter crest beyond the maximum allowable limits with the exception of two turns from the end of the pipe.

The chart to the left recommends the ideal drill size for preparing the bore of an internal pipe thread milling application prior to taper reaming or before going straight to the thread milling operation without reaming the taper. This will produce full crest and root form threads to the L3 gage line.

CNC Programming Data For NPT & NPTF Threads

Pitch	Compensation Per 90 Of Arc
28 & 27	0.0003"
19 & 18	0.0004"
14	0.0006"
11.5 & 11	0.0007"
8	0.0010"

To produce accurate tapered threads for any pipe thread application having a 1: 16 or 3/4" per foot taper, the CNC program must incorporate an increase in arc radius as the centerline of the spindle moves around the internal centerline of the thread to be produced.

For straight threads, a 360° arc move is made around the center with a Z positive move up one pitch. If this were used for pipe threads, the end result would be an oval thread because the 1° - 47' 24" taper ground on the tool cutting edge will move away from the pitch diameter as the tool moves up.

To create a perfect pitch truncated cone pitch diameter for pipe threads, the X & Y arc tool path must also increase to match the taper of 1° - 47' 24" as the tool moves up the bore one pitch. This cannot be performed in one 360° G code line. The use of 4 separate lines using 90° of arc move are required. An ever increasing arc radius is incorporated based on the distance moved up (1/4 pitch) in Z. The end points of each arc move must also include this additional increase in X or Y.

The chart above indicates the exact amount of compensation required for each 90° arc move.

Thread Milling Speeds And Feeds

Formula To Determine RPM:

$$RPM = \frac{3.82 \times SFPM}{\text{Tool Cutter Diameter}}$$

Formula To Determine Surface Feet Per Minute:

$$SFPM = .262 \times RPM \times \text{Cutter Diameter}$$

Material To Be Thread Milled			Tool Shank Diameter & Number of Flutes Starting SFPM & Suggested Feed In Inches Per Flute						
Material Group	Classification	Typical Grades	1/8" 3	3/16" 3	1/4" 5	5/16" 5	3/8" 5	1/2" 5	3/4" 6
1. Steel	Plain Carbon & Low Carbon up to 22Rc	AIS/SAE Types: 1005-1020,1108-1119,1213-1215, 1513-1518, 4012, 5015, 9310	600 .0003"	600 .0003"	600 .0005"	600 .0006"	600 .0007"	600 .001"	600 .0015"
2. Medium Carbon & Alloy Steels	Heat Treatable Carbon & Alloys From 22 to 32Rc	AISI/SAE Types: 1025-1095, 1130-1151, 1330-1345, 1520-1572, 4023-4063, 4120-4161, 4320-4340, 4620-4640, 8620-8660, 8720-8750, 6150, 51000, 52100	575 .0003"	575 .0003"	575 .0005"	575 .0006"	575 .0007"	575 .001"	575 .0015"
3. Medium Carbon & Alloy Steels	Heat treatable Carbon & Alloys From 32 to 42Rc	AISI/SAE Types: 1040-1095, 1140-1151, 1330-1345, 1520-1572, 4023-4063, 4120-4161, 4330-4340, 4620-4640, 8620-8660, 8740-8750, 6150, 51000, 52100	525 .0003"	525 .0003"	525 .0005"	525 .0006"	525 .0007"	525 .001"	525 .0015"
4. Stainless Steels	Austentic Stainless Steels	Types: 301-304, 310, 316, 321, 347	525 .0003"	525 .0003"	525 .0005"	525 .0006"	525 .0007"	525 .001"	525 .0015"
5. Stainless Steels	Martensitic Stainless Steels	Types: 403, 410, 416, 420, 430, 431, 440C	550 .0003"	550 .0003"	550 .0005"	550 .0006"	550 .0007"	550 .0008"	550 .0015
6. Stainless Steels	Precipitation Hardening Stainless Steels	Types: 15-5PH, 17-4PH, AM350, AM355, AM363 PH13-8Mo, PH14-8Mo	300 .0003"	300 .0003"	300 .0005"	300 .0006"	300 .0007"	300 .0008"	300 .001"
7. Nickel	Nickel & Nickel Base Aloys	Inconel 700, 713C, 718, Inconel X, Monel 400, 401,404 & K, Rene 41, Rene 95, Waspoloy, Udimet 500 & 700	120 .0003"	120 .0003"	120 .0005"	120 .0006"	120 .0007"	120 .0008"	120 .001"
8. Titanium	Titanium & Titanium Alloys	Commercially Pure Ti, Ti-6A1-4V, Ti-8A1-1 Mo, Ti-7A1-4Mo	100 .0003"	100 .0003"	100 .0005"	100 .0006"	100 .0007"	100 .0007"	100 .0007"
9. Cast Iron	Gray, Malleable. Ductile (nodular)	ASTM A48, A220, A436, A319, A536, A602, SAE J158, SAE J434	600 .0003"	600 .0003"	600 .0006"	600 .0007"	600 .0008"	600 .001"	600 .0015
10. Non Ferrous	Wrought & Low Si Cast Aluminum	6061, Free Machining Brass	1,700 .0003"	1,700 .0003"	1,700 .0006"	1,700 .0007"	1,700 .0008"	1,700 .001"	1,700 .0015"

Programming Request Form

Copy this form, fill in the information then fax it to: 586-558-9481 • Contact Us At: 586-574-0952

Your Information

Company Name:

Contact:

Tooling Purchased From:

Date: / /

Telephone: ( )

Fax Number: ( )

Machine Information

Brand Make:

Model:

Spindle Taper: ❑ 35 Cat ❑ 40 Cat ❑ 50 Cat ❑ Other

Max RPM:

CNC Controller Information

Brand Make:

Model:

ISO - ASCII Compatible: ❑ Yes ❑ No ❑ Don't Know

Is Helical Option Available: ❑ Yes ❑ No ❑ Don't Know

Thread Specification To Be Produced:

Thread Specification:

Length Of Full Thread:

Thread Form: ❑ 100% ❑ 75% ❑ Other _____%

Thread: ❑ Internal ❑ External

Drill Size: _____" ❑ Thru ❑ Blind ❑ Counterbored

Material To Be Machined:

Material:

Hardness:

Condition: ❑ Annealed ❑ Normalized ❑ Heat Treated ❑ Cast ❑ Forged ❑ Rolled ❑ Plate ❑ Bar ❑ Pre-Machined ❑ Flame Cut ❑ Scale ❑ Sand

Thread Mill Selected:

❑ Solid Carbide ❑ Indexable

Tool Description:

Insert Selected (If Indexable):

Tool Purchased From:*

If you are not sure what tool to select, check one of the following and we will recommend a tool for you:

❑ Shortest Cycle Time ❑ Lowest Tooling Cost

Tool Recommended:

*Distributor you purchased tool from must be filled in to receive a program for your application, otherwise a tool recommendation will be faxed back with approximate cycle time given.

Programming Data:

Dimensions: ❑ Inch ❑ Metric

Program Values: ❑ Absolute (G90) ❑ Incremental (G91)

Arc Center: ❑ I & J ❑ R (Radius)

Tool Path: ❑ Offset ❑ No Offset

Arc Limitation: ❑ Full Circle ❑ Quadrant

K Value: ❑ Not Required ❑ Required

If Required: ❑ In Radians ❑ Per Revolution

Feed Direction: ❑ Climb Mill ❑ Conventional

Note: Climb Milling is always recommended for carbide tooling. In some cases where thin wall parts, long extensions or worn spindle bearings are encountered, conventional milling may be an option to produce a given thread.

Prices

Specifications and prices are subject to change without notice.

Payment Terms

30 days net (subject to credit approval). Invoices not paid within 30 days following invoice date are subject to a service charge of 1-1/2% per month (equal to 18% per annum).

Delivery Terms

F.O.B. Warren, Michigan. Delivery dates are approximate and estimated. Seller shall not be liable for failure to meet estimated delivery dates.

Over/Under Shipments

We reserve the right to over and under ship 10% of the specified quantity, and close orders with such overages and shortages.

Warranty

We shall replace any properly used material which is proven defective within 60 days after receipt of same by the customer, but no claim for labor or damage will be accepted. All claims for quantity and dimensional errors must be made in writing within 5 working days.

Returns

No materials can be returned without a returned goods authorization. Goods must be carefully packed and insured for shipment. A restocking charge of 10% may be implemented by our company. Returned goods authorization number must be printed on the outside of a package.

Cancellation

Orders already in production by us cannot be cancelled or changed without our written consent. A cancellation charge may be implemented by our company.

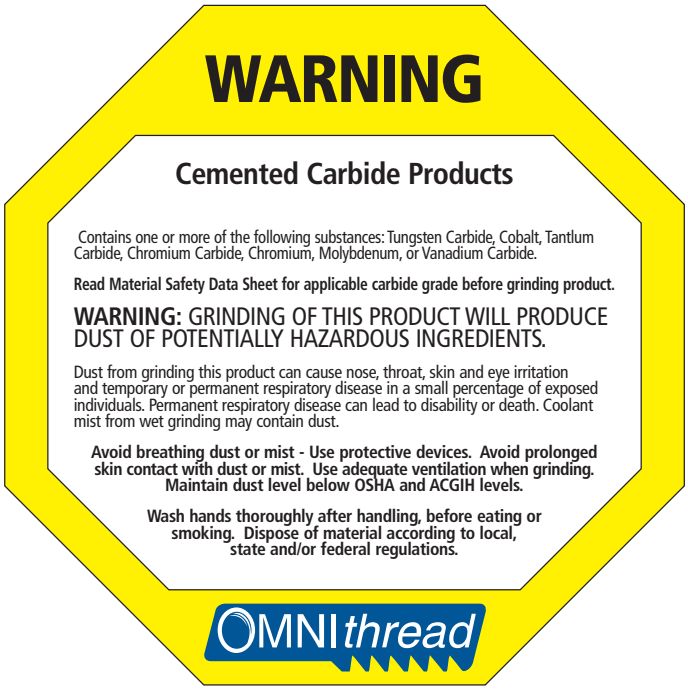
Terms and Conditions

All agreements are contingent upon strikes, accidents and other causes beyond our control.

Consequential Damages

Our company's sole liability for breach of warranty shall be limited to replacement of the product as provided above and customer waives all other remedies. Our company shall not be liable for loss of profits, loss of use, damage or injury to persons or property, or other consequential or incidental damages of any kind, nor shall we be liable for any costs of replacement incurred by customer in the absence of specific written authorization to make such replacement.

Notes


WARNING
Cemented Carbide Products
Contains one or more of the following substances: Tungsten Carbide, Cobalt, Tantlum Carbide, Chromium Carbide, Chromium, Molybdenum, or Vanadium Carbide.
Read Material Safety Data Sheet for applicable carbide grade before grinding product.
WARNING: GRINDING OF THIS PRODUCT WILL PRODUCE DUST OF POTENTIALLY HAZARDOUS INGREDIENTS.
Dust from grinding this product can cause nose, throat, skin and eye irritation and temporary or permanent respiratory disease in a small percentage of exposed individuals. Permanent respiratory disease can lead to disability or death. Coolant mist from wet grinding may contain dust.
Avoid breathing dust or mist - Use protective devices. Avoid prolonged skin contact with dust or mist. Use adequate ventilation when grinding. Maintain dust level below OSHA and ACGIH levels.
Wash hands thoroughly after handling, before eating or smoking. Dispose of material according to local, state and/or federal regulations.
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