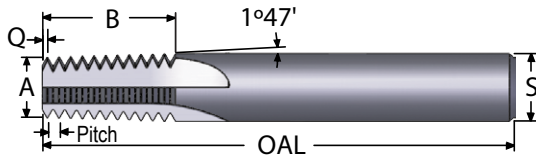


THREAD MILLS - NPT - STRAIGHT FLUTE SOLID CARBIDE (NATIONAL PIPE TAPER)

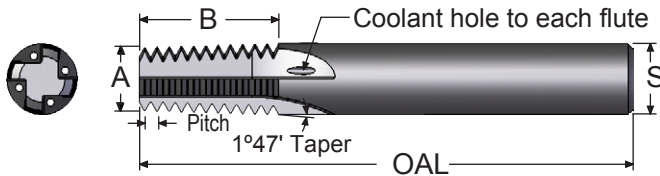


- Made with premium submicron grade carbide
- ALTiN+ coated for higher cutting speed

STRAIGHT FLUTE - NPT

THREAD DIA. / PITCH	"A" TOOL DIA.	"B" LENGTH OF CUT	"Q" LENGTH	"S" SHANK DIA.	OAL	FLUTES	ORDER #		EDP #	
							UNCOATED	ALTiN+	UNCOATED	ALTiN+
							INTERNAL OR EXTERNAL THREADS			
1/16, 1/8-27	0.218	0.534	0.018	0.2500	2.50	4	TM218-27NPT	TM218-27NPT-A	101001	101013
1/8-27	0.280	0.758	0.018	0.3750	3.50	4	TM280-27NPT	TM280-27NPT-A	101019	101043
1/4, 3/8-18	0.330	0.693	0.027	0.3750	3.50	4	TM330-18NPT	TM330-18NPT-A	101025	101049
1/4, 3/8-18	0.382	0.800	0.027	0.4375	3.50	4	TM382-18NPT	TM382-18NPT-A	101055	101067
1/2, 3/4-14	0.430	1.105	0.035	0.5000	3.50	4	TM430-14NPT	TM430-14NPT-A	101073	101085
1 to 2-11½	0.650	1.605	0.043	0.7500	4.00	5	TM650-11.5NPT	TM650-11.5NPT-A	101091	101109
2½ up-8	0.650	1.560	0.062	0.7500	4.00	5	TM650-8NPT	TM650-8NPT-A	101097	101115

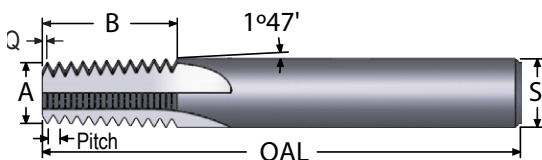
For increased performance, use with tapered pipe reamer on page 103.



- Coolant to each flute
- Cuts internal or external threads

COOLANT THROUGH STRAIGHT FLUTE - NPT

MIN IN THREAD/ PITCH	"A" TOOL DIA.	"B" LENGTH OF CUT	"Q" LENGTH	"S" SHANK DIA.	OAL	FLUTES	ORDER #		EDP #	
							UNCOATED	ALTiN+	UNCOATED	ALTiN+
							INTERNAL OR EXTERNAL THREADS			
1/16, 1/8-27	0.218	0.534	0.018	0.250	2.50	3	TMC218-27NPT	TMC218-27NPT-A	101151	101154
1/4, 3/8-18	0.330	0.693	0.027	0.375	3.50	4	TMC330-18NPT	TMC330-18NPT-A	101157	101160
1/2, 3/4-14	0.430	1.105	0.035	0.500	3.50	4	TMC430-14NPT	TMC430-14NPT-A	101163	101166
1 to 2-11½	0.550	1.172	0.043	0.625	3.50	6	TMC550-11.5NPT	TMC550-11.5NPT-A	101169	101172



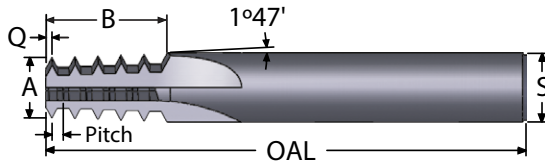
- ALTiN+ coating for improved surface finish
- Polished flute face for optimum performance

STRAIGHT FLUTE - DRYSEAL - NPTF

THREAD DIA. / PITCH	"A" TOOL DIA.	"B" LENGTH OF CUT	"Q" LENGTH	"S" SHANK DIA.	OAL	FLUTES	ORDER #		EDP #	
							UNCOATED	ALTiN+	UNCOATED	ALTiN+
							INTERNAL OR EXTERNAL THREADS			
1/16, 1/8-27	0.218	0.534	0.018	0.250	2.50	4	TM218-27NPTF	TM218-27NPTF-A	101004	101016
1/8-27	0.280	0.758	0.018	0.375	3.50	4	TM280-27NPTF	TM280-27NPTF-A	101022	101046
1/4, 3/8-18	0.330	0.693	0.027	0.375	3.50	4	TM330-18NPTF	TM330-18NPTF-A	101028	101052
1/4, 3/8-18	0.382	0.800	0.027	0.4375	3.50	4	TM382-18NPTF	TM382-18NPTF-A	101058	101070
1/2, 3/4-14	0.430	1.105	0.035	0.500	3.50	4	TM430-14NPTF	TM430-14NPTF-A	101076	101088
1 to 2-11½	0.650	1.605	0.043	0.750	4.00	5	TM650-11.5NPTF	TM650-11.5NPTF-A	101094	101112
2½ up-8	0.650	1.560	0.062	0.750	4.00	5	TM650-8NPTF	TM650-8NPTF-A	101100	101121

All NPT thread mills are crest cutting (full profile)

THREAD MILLS - NPT - STRAIGHT FLUTE STAGGERED TOOTH - SOLID CARBIDE (NATIONAL PIPE TAPER)



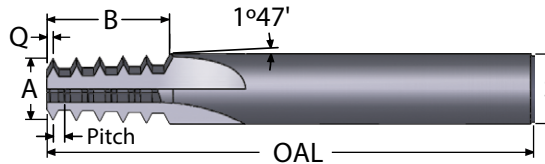
- Staggered tooth design reduces tool pressure
- ALTiN+ coating extends tool life

STRAIGHT FLUTE - STAGGERED TOOTH - NPT

THREAD DIA. / PITCH	"A" TOOL DIA.	"B" LENGTH OF CUT	"Q" LENGTH	"S" SHANK DIA.	OAL	FLUTES	ORDER #		EDP #	
							UNCOATED	ALTiN	UNCOATED	ALTiN+
<i>INTERNAL OR EXTERNAL THREADS</i>										
1/16, 1/8-27	0.220	0.534	0.019	0.250	2.50	4	TM220-27NPT	TM220-27NPT-A	101181	101193
1/8-27	0.275	0.758	0.019	0.375	3.50	4	TM275-27NPT	TM275-27NPT-A	101199	101223
1/4, 3/8-18	0.335	0.693	0.028	0.375	3.50	4	TM335-18NPT	TM335-18NPT-A	101205	101229
1/4, 3/8-18	0.387	0.805	0.028	0.4375	3.50	4	TM387-18NPT	TM387-18NPT-A	101235	101247
1/2, 3/4-14	0.435	1.034	0.036	0.500	3.50	4	TM435-14NPT	TM435-14NPT-A	101253	101265
1/2, 3/4-14	0.440	1.034	0.036	0.750	6.00	4	◆ TM440-14NPT	◆ TM440-14NPT-A	◆ 101271	◆ 101283
1¼ to 2-11½	1.000	1.742	0.044	1.000	6.00	6	▲ TM1.0-11.5NPT	▲ TM1.0-11.5NPT-A	▲ 101289	▲ 101301

For increased performance, use with tapered pipe reamer on page 103.

- ◆ Tool is steel shank with a solid carbide head
- ▲ Tool is carbide tipped with coolant hole to each flute



- Made from premium submicron carbide
- ALTiN+ coated tool for higher cutting speed

STRAIGHT FLUTE - STAGGERED TOOTH- DRYSEAL - NPTF

THREAD DIA. / PITCH	"A" TOOL DIA.	"B" LENGTH OF CUT	"Q" LENGTH	"S" SHANK DIA.	OAL	FLUTES	ORDER #		EDP #	
							UNCOATED	ALTiN+	UNCOATED	ALTiN+
<i>INTERNAL OR EXTERNAL THREADS</i>										
1/16, 1/8-27	0.220	0.534	0.019	0.250	2.50	4	TM220-27NPTF	TM220-27NPTF-A	101184	101196
1/8-27	0.275	0.758	0.019	0.375	3.50	4	TM275-27NPTF	TM275-27NPTF-A	101202	101226
1/4, 3/8-18	0.335	0.693	0.028	0.375	3.50	4	TM335-18NPTF	TM335-18NPTF-A	101208	101232
1/4, 3/8-18	0.387	0.805	0.028	0.4375	3.50	4	TM387-18NPTF	TM387-18NPTF-A	101238	101250
1/2, 3/4-14	0.435	1.034	0.036	0.500	3.50	4	TM435-14NPTF	TM435-14NPTF-A	101256	101268
1/2, 3/4-14	0.440	1.034	0.036	0.750	6.00	4	◆ TM440-14NPTF	◆ TM440-14NPTF-A	◆ 101274	◆ 101286
1¼ to 2-11½	1.000	1.700	0.044	1.00	6.00	6	▲ TM1.0-11.5NPTF	▲ TM1.0-11.5NPTF-A	▲ 101292	▲ 101304

- ◆ Tool is steel shank with a solid carbide head
- ▲ Tool is carbide tipped with coolant hole to each flute

All NPT thread mills are crest cutting (full profile)

THREAD MILLS NPT

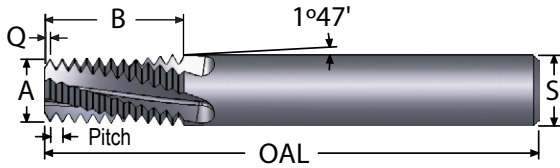
SINGLE POINT

INDEXABLE TOOLS

PORT - CAVITY

SPECIALTY

THREAD MILLS - NPT - HELICAL - CARBIDE (NATIONAL PIPE TAPER)

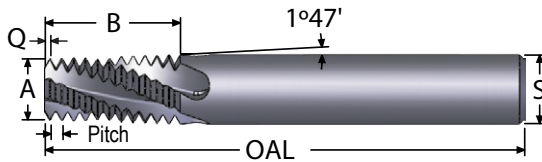


- Made with premium submicron grade carbide
- ALTiN+ coating for improved surface finish

15° HELICAL FLUTE- NPT

THREAD DIA./PITCH	"A" TOOL DIA.	"B" LENGTH OF CUT	"Q" LENGTH	"S" SHANK DIA.	OAL	FLUTES	ORDER #		EDP #	
							UNCOATED	ALTiN+	UNCOATED	ALTiN+
							INTERNAL OR EXTERNAL THREADS			
1/16, 1/8-27	0.222	0.461	0.018	0.250	2.50	3	TMX222-27-H	TMX222-27-HA	101351	101354
1/4, 3/8-18	0.270	0.636	0.027	0.312	2.50	4	TMX270-18-H	TMX270-18-HA	101357	101360
1/2, 3/4-14	0.440	0.890	0.035	0.500	4.00	4	TMX440-14-H	TMX440-14-HA	101363	101366
1" to 2"-11.5	0.550	1.171	0.043	0.625	4.00	4	TMX550-11.5-H	TMX550-11.5-HA	101369	101372

For increased performance, use with tapered pipe reamer on page 103.

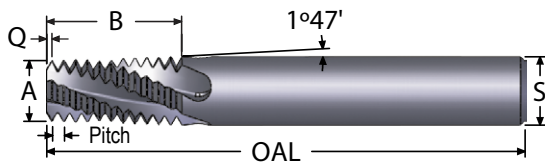


- ALTiN+ coating extends tool life
- Helical flute for reduced side cutting pressure

30° HELICAL FLUTE - NPT

THREAD DIA. / PITCH	"A" TOOL DIA.	"B" LENGTH OF CUT	"Q" LENGTH	"S" SHANK DIA.	OAL	FLUTES	ORDER #		EDP #	
							UNCOATED	ALTiN+	UNCOATED	ALTiN+
							INTERNAL OR EXTERNAL THREADS			
1/16, 1/8-27	0.218	0.534	0.018	0.250	2.50	4	TM218-27NPT-H	TM218-27NPT-HA	101404	101416
1/8-27	0.280	0.758	0.018	0.375	3.50	4	TM280-27NPT-H	TM280-27NPT-HA	101422	101446
1/4, 3/8-18	0.330	0.693	0.027	0.375	3.50	4	TM330-18NPT-H	TM330-18NPT-HA	101428	101452
1/4, 3/8-18	0.382	0.800	0.027	0.4375	3.50	4	TM382-18NPT-H	TM382-18NPT-HA	101458	101470
1/2, 3/4-14	0.430	1.105	0.035	0.500	3.50	4	TM430-14NPT-H	TM430-14NPT-HA	101476	101488

For increased performance, use with tapered pipe reamer on page 103.



- Polished flute face for optimum performance
- ALTiN+ coated tool for higher cutting speed

30° HELICAL FLUTE - NPTF - DRYSEAL

THREAD DIA. / PITCH	"A" TOOL DIA.	"B" LENGTH OF CUT	"Q" LENGTH	"S" SHANK DIA.	OAL	FLUTES	ORDER #		EDP #	
							UNCOATED	ALTiN+	UNCOATED	ALTiN+
							INTERNAL OR EXTERNAL THREADS			
1/16, 1/8-27	0.218	0.534	0.018	0.250	2.50	4	TM218-27NPTF-H	TM218-27NPTF-HA	101401	101413
1/8-27	0.280	0.758	0.018	0.375	3.50	4	TM280-27NPTF-H	TM280-27NPTF-HA	101419	101443
1/4, 3/8-18	0.330	0.693	0.027	0.375	3.50	4	TM330-18NPTF-H	TM330-18NPTF-HA	101425	101449
1/4, 3/8-18	0.382	0.800	0.027	0.4375	3.50	4	TM382-18NPTF-H	TM382-18NPTF-HA	101455	101467
1/2, 3/4-14	0.430	1.105	0.035	0.500	3.50	4	TM430-14NPTF-H	TM430-14NPTF-HA	101473	101485

All NPT thread mills are crest cutting (full profile)

THREAD MILL FEED AND SPEED CHART

MATERIAL	HB/Rc	SPEED SFM* UNCOATED	SPEED SFM ALTiN+	FEED (INCHES PER TOOTH)					
				TOOL DIAMETER					
				.032 - .056	.059 - .090	.100 - .190	.200 - .350	.370 - .595	.600+
CAST IRON	160 HB	100-220	200-425	.0004-.001	.0004-.0008	.0004-.0014	.0004-.002	.0004-.0035	.0004-.006
CARBON STEEL	18 Rc	100-200	190-425	.0003-.001	.0003-.0008	.0003-.0014	.0003-.002	.0003-.005	.0003-.006
ALLOY STEEL	20 Rc	80-200	200-375	.0003-.001 2 Passes	.0003-.0008 3 Passes	.0003-.0014	.0003-.0024	.0003-.005	.0003-.006
TOOL STEEL	20 Rc	80-175	175-250	.0003-.0004 2 Passes	.0003-.0005 3 Passes	.0003-.0005	.0003-.0009	.0003-.0026	.0003-.004
300 STAINLESS STEEL	150 HB	90-120	120-255	.0003-.0005 2 Passes	.0003-.0006 3 Passes	.0003-.0007	.0003-.002	.0003-.0035	.0003-.0045
400 STAINLESS STEEL	195 HB	90-150	140-375	.0003-.0005 2 Passes	.0003-.0006 3 Passes	.0003-.0007	.0003-.002	.0003-.0026	.0003-.0045
HIGH TEMP ALLOY (Ni & Co BASE)	20 Rc	50-125	100-125	.0003-.0004 3 Passes	.0003-.00045 3 Passes	.0003-.0005 2 Passes	.0003-.0009	.0003-.0026	.0003-.004
TITANIUM	25 Rc	50-130	100-170	.0003-.0004 3 Passes	.0003-.00045 3 Passes	.0003-.001 2 Passes	.0003-.0009	.0003-.0015	.0003-.003
HEAT TREATED ALLOYS (38-45Rc)	40 Rc	50-90	90-150	.0003-.0004 3 Passes	.0003-.00045 3 Passes	.0003-.0005 2 Passes	.0003-.0008	.0003-.001	.0003-.0025
ALUMINUM	100 HB	100-800	100-1200	.0005-.0015	.0005-.002	.0005-.0025	.0005-.003	.0005-.006	.0005-.009
BRASS, ZINC	80 HB	200-350	200-750	.0005-.0015	.0005-.002	.0005-.0025	.0005-.003	.0005-.006	.0005-.009

*SFM = Surface Feet per Minute

**Parameters are a starting point based on machinability rating at hardness listed.
Check machinability rating of the material to be machined and adjust accordingly.**

THREAD MILL FEED AND SPEED APPLICATION



It may be necessary to use more radial depth passes than shown on the chart when cutting an unfavorable length-to-diameter ratio, coarse pitches, or hard materials. When cutting a thread with two passes, cut approximately **65% of the thread on the first pass and 35 percent on the finish pass.** For three passes, use a **50/30/20** ratio. For four passes, use a **40/27/20/13** ratio. The idea is to equalize the side cutting pressure.

Thread mills can sometimes be used to cut multiple start threads. Call engineering for assistance.

Thread mills can be cut off for shorter thread depths or necked back for deeper thread depths. Call for price and delivery.

In order to apply the Feed and Speed chart appropriately, it is necessary to understand that machining centers will apply the feed rate at the centerline of the spindle. It is correct to use a normal calculation and the following Feed & Speed Chart when cutting in a straight line; however, it is incorrect when cutting an internal thread. Therefore, the feed rate must be recalculated.

The following is an example of how to apply the feed rate correctly:

The tool is a TM290-24A cutting a 3/8-24 thread in stainless steel.

The outside diameter of the tool is 0.290.

The surface foot per minute (SFM) is 150.

The chip per tooth is 0.001. The tool has four flutes.

The revolutions per minute (RPM) equal the SFM x 3.82 divided by the outside diameter of the tool.

In this example: **$(150 \times 3.82) / 0.290$** , which equals 1975 RPM.

The RPM x feed (chip per tooth) x the number of flutes equals the Non-Adjusted Feed Rate or NAFR.

In this example: **$1975 \times 0.001 \times 4 = 7.9$ NAFR**

The major diameter of the thread is 0.375. We will call this D.

The outside diameter of the tool is 0.290. We will call this d.

We will call the Adjusted Feed Rate the AFR.

The formula for the AFR for internal interpolation is **$AFR = NAFR \times (D-d) \div D$**

In this example: **$AFR = 7.9 \times (0.375 - 0.290) \div 0.375$**

Therefore, the Adjusted Feed Rate equals 1.79. This is the feed rate that will equal 0.001 chip per tooth in the above example. This is the feed rate that must be used in the CNC program.