GWS TOOL GROUP

SOLID CARBIDE THREAD MILLS

48-72 HOUR SHIPPING

Finally…Thread Mills from the People Who Know Threads Best!

Do you have a three axis (or more) CNC machine? Is that machine modern enough to have a circular interpolation program already installed? Can you manually install a program to run thread mills? If you can say yes, you can use thread mills to some significant advantages over traditional tapping applications.

Thread mills help you and your shop in a variety of ways:

- Exceptional quality threads on a variety of materials including specific styles for exotic materials and aluminum.
- Depending on the work in your shop, fewer thread mills may be required to produce threads than the number of taps needed for the same jobs
  (no need for taper, plug and bottom forms).
- Tap breakage (caught in piece part hole) is virtually eliminated.
- Less horsepower is required for similar jobs, smaller chips, less stress on tool.
- Thread mills are particularly well-suited for thin walled work pieces versus taps.
- Multiple H Limits can be achieved with the same tool based on programming expertise.
- Cut RH and LH threads with the same tool.
- Thread blind holes to the bottom.
- Eliminates the need for expensive taps and tapping chucks.
- Helical form disperses the chip load more efficiently to allow for a smoother cut and finish on piece part.
- When the length of the tapped hole exceeds the ideal recommendations from engineering, thread mills can reach deeper without similar consequences.
- Taps may be used up to 45 R^C with few issues. 45 R^C to 50 R^C may require special geometry to accommodate. Carbide thread mills will handle material up to 60 R^C and could be modified to tackle up to 65 R^C.

Contents

Advantages of GWS Tool Group Thread Mills

- **Premium micro-grain carbide construction**
- **Spiral Flutes eliminate chatter** (except Single Profile design)
- **Designed for Internal Threads** Many thread mills can produce internal or external threads. However, 90% of all applications are internal. Therefore, North American Tool's thread mills are designed to work better producing internal threads. Because we use a larger truncation in the root, the tool is less susceptible to breakage. We will make you an external thread tool as a non-stock standard when you need an external thread.
- **A minimum of three axis CNC machines are required to utilize all thread mills.** Thread milling requires utilization of a CNC machine capable of helical interpolation which is the simultaneous movement of three axis (X, Y and Z). The X and Y move in a circular motion while the Z moves in a linear motion. The movement of X and Y will determine the thread diameter, whereas the movement of Z along with the tool (exception is single profile) will determine the pitch, or lead during thread production.
- **May reduce the number of setups required for a job.** If the same number of threads (TPI) are needed for multiple diameters, there is no need to change the tool.
- **Eliminates the need to reverse the spindle** as is the case with conventional tapping applications
- **One thread mill will handle various bore diameters** so long as the pitch is the one required
- **Internal thread can be produced all the way to the bottom of the hole**
- **Exceptional thread quality** on a wide variety of materials including specific designs for aluminum and exotic materials
- **Better rigidity than HSS or HSSE**
- **Standard coolant tools are axial,** but radial coolant holes are available as specials.

Before Requesting a Quote

GWS Tool Group has an unmatched reputation for Special Taps. Special Thread Mills is the next logical step.

In order to quote, here are some of the most important consideration:

1. Thread diameter and Threads Per Inch (TPI) or pitch
   - Major and minor pitch diameters IF different than standard
   - Special root and crest requirements IF different than standard
2. Length of thread required
3. Shank and overall length required
4. Material to be machined and hardness
5. Miscellaneous part considerations
   - Thin walls
   - Cross holes
   - Reach to piece part
6. Is coolant through spindle available? Does this job require coolant?
7. Coating preferences or we can recommend based on information provided
8. Any operations we can combine?
   - Drill
   - Chamfer
   - Spot face
   - Counterbore
9. Quantity

3 Kinds of Special Thread Mills

GWS Tool Group will work with you to create a Special Thread Mill for virtually any application. Aerospace, Medical, Energy or Job Shop—we are here to help.

Modified Standards

(48 hours to ship)

– Extend thread length by grinding neck of tool

– Add coolant grooves along the shank

– Shorten the length of cut to improve rigidity

Non-Stock Standards

(48 hours to ship)

– UN Standard Pitch on Standard Blank

– Metric Standard Pitch on a Standard Blank

Complete Special

(Lead Time Determined at Time of Quotation)

– Add features to combine operations
   - Drill
   - Chamfer
   - Spot face
   - Counterbore
   - Your ideas

– Request Special Carbide Grade

– Polishing, Edge Prep, Coatings

– Build to suit your high volume application

– Radial or Axial coolant through holes on request

– Smaller Minimum Thread Diameters down to #4 UN or M3 in Metric

Fractional • UN • Solid Carbide 15° Helix 2XD Bright Finish & TiAlN Coated

General Purpose Thread Mills
These solid carbide tools are made with multiple spiral flutes for smooth, chatter-free cutting and can be applied to most materials with adjustments in SFM and feed rates. These tools are made with a cutting length that is 2X diameter for strength and stability. Bright finish featured in first column.

Add the available TiAlN coating for enhanced performance with most of your threading needs.

ITEM NUMBER BRIGHT	ITEM NUMBER COATED	DESCRIPTION	MINIMUM THREAD DIAMETER	PITCH	CUTTER DIA	SHANK DIA	LENGTH OF CUT	NO. OF FLUTES	OVERALL LENGTH
14300	14300-TIALN	TMGP #6 X 32 .100	#6	32	0.100	3/16	0.297	3	2.0
14301	14301-TIALN	TMGP #8 X 32 .120	#8	32	0.120	3/16	0.328	3	2.0
14302	14302-TIALN	TMGP #10 X 24 .140	#10	24	0.140	3/16	0.396	3	2.5
14303	14303-TIALN	TMGP #10 X 32 .140	#10	32	0.140	3/16	0.391	3	2.5
14304	14304-TIALN	TMGP 1/4" X 20 .180	1/4"	20	0.180	3/16	0.525	3	2.5
14305	14305-TIALN	TMGP 1/4" X 28 .180	1/4"	28	0.180	3/16	0.518	3	2.5
14306	14306-TIALN	TMGP 5/16" X 18 .235	5/16"	18	0.235	1/4	0.639	3	2.5
14307	14307-TIALN	TMGP 5/16" X 24 .235	5/16"	24	0.235	1/4	0.646	3	2.5
14308	14308-TIALN	TMGP 3/8" X 16 .300	3/8"	16	0.300	5/16	0.781	4	3.0
14309	14309-TIALN	TMGP 3/8" X 24 .300	3/8"	24	0.300	5/16	0.771	4	3.0
14310	14310-TIALN	TMGP 7/16" X 14 .345	7/16"	14	0.345	3/8	0.893	4	3.5
14311	14311-TIALN	TMGP 7/16" X 20 .345	7/16"	20	0.345	3/8	0.875	4	3.5
14312	14312-TIALN	TMGP 1/2" X 13 .370	1/2"	13	0.370	3/8	1.038	4	3.5
14313	14313-TIALN	TMGP 1/2" X 20 .370	1/2"	20	0.370	3/8	1.025	4	3.5
14314	14314-TIALN	TMGP 9/16" X 12 .450	9/16"	12	0.450	1/2	1.125	4	3.5
14315	14315-TIALN	TMGP 9/16" X 18 .450	9/16"	18	0.450	1/2	1.139	4	3.5
14316	14316-TIALN	TMGP 5/8" X 11 .490	5/8"	11	0.490	1/2	1.318	4	3.5
14317	14317-TIALN	TMGP 5/8" X 16 .490	5/8"	16	0.490	1/2	1.281	4	3.5
14318	14318-TIALN	TMGP 5/8" X 18 .490	5/8"	18	0.490	1/2	1.250	4	3.5
14319	14319-TIALN	TMGP 3/4" X 10 .585	3/4"	10	0.585	5/8	1.550	4	4.0
14320	14320-TIALN	TMGP 3/4" X 16 .585	3/4"	16	0.585	5/8	1.531	4	4.0
14321	14321-TIALN	TMGP 7/8" X 9 .620	7/8"	9	0.620	5/8	1.833	4	4.0
14322	14322-TIALN	TMGP 7/8" X 14 .620	7/8"	14	0.620	5/8	1.750	4	4.0
14323	14323-TIALN	TMGP 1" X 8 .740	1"	8	0.740	3/4	2.063	4	5.0
14324	14324-TIALN	TMGP 1" X 12 .740	1"	12	0.740	3/4	2.042	4	5.0

Fractional • UN • Coolant Through • Solid Carbide 15° Helix 2XD Bright Finish & TiAlN Coated

General Purpose Thread Mills with Coolant Through
Designed with the same characteristics as our General Purpose tools, these standard UN Fractional products feature Axial Coolant off the shelf. This feature is important if your machining center only has through the spindle coolant, or if high heat is present in the cut and coolant reduces the temperature and aids with chip evacuation. Bright finish is featured in first column.

Add the available TiAlN coating for enhanced performance with most of your threading needs.

ITEM NUMBER BRIGHT	ITEM NUMBER COATED	DESCRIPTION	MINIMUM THREAD DIAMETER	PITCH	CUTTER DIA	SHANK DIA	LENGTH OF CUT	NO. OF FLUTES	OVERALL LENGTH
14350	**14350-TIALN**	TMGC #10 X 24 .140	#10	24	0.140	3/16	0.396	3	2.5
14351	**14351-TIALN**	TMGC #10 X 32 .140	#10	32	0.140	3/16	0.391	3	2.5
14352	**14352-TIALN**	TMGC 1/4" X 20 .180	1/4"	20	0.180	3/16	0.525	3	2.5
14353	**14353-TIALN**	TMGC 1/4" X 28 .180	1/4"	28	0.180	3/16	0.518	3	2.5
14354	**14354-TIALN**	TMGC 5/16" X 18 .235	5/16"	18	0.235	1/4	0.639	3	2.5
14355	**14355-TIALN**	TMGC 5/16" X 24 .235	5/16"	24	0.235	1/4	0.646	3	2.5
14356	**14356-TIALN**	TMGC 3/8" X 16 .300	3/8"	16	0.300	5/16	0.781	4	3.0
14357	**14357-TIALN**	TMGC 3/8" X 24 .300	3/8"	24	0.300	5/16	0.771	4	3.0
14358	**14358-TIALN**	TMGC 7/16" X 14 .345	7/16"	14	0.345	3/8	0.893	4	3.5
14359	**14359-TIALN**	TMGC 7/16" X 20 .345	7/16"	20	0.345	3/8	0.875	4	3.5
14360	**14360-TIALN**	TMGC 1/2" X 13 .370	1/2"	13	0.370	3/8	1.038	4	3.5
14361	**14361-TIALN**	TMGC 9/16" X 18 .450	9/16"	18	0.450	1/2	1.139	4	3.5
14362	**14362-TIALN**	TMGC 5/8" X 11 .490	5/8"	11	0.490	1/2	1.318	4	3.5
14363	**14363-TIALN**	TMGC 3/4" X 10 .585	3/4"	10	0.585	5/8	1.550	4	4.0
14364	**14364-TIALN**	TMGC 3/4" X 16 .585	3/4"	16	0.585	5/8	1.531	4	4.0

Metric • Solid Carbide 15° Helix 2XD
Bright Finish & TiAlN Coated

General Purpose Thread Mills
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ITEM NUMBER		DESCRIPTION	MINIMUM THREAD DIAMETER	PITCH	CUTTER DIA	SHANK DIA	LENGTH OF CUT	NO. OF FLUTES	OVERALL LENGTH
BRIGHT	COATED								
14375	**14375-TIALN**	TMGP M4 X 0.7 .115	M4	0.7	0.115	3/16	0.317	3	2.0
14376	**14376-TIALN**	TMGP M5 X 0.8 .145	M5	0.8	0.145	3/16	0.394	3	2.5
14377	**14377-TIALN**	TMGP M6 X 0.75 .170	M6	0.75	0.170	3/16	0.487	3	2.5
14378	**14378-TIALN**	TMGP M6 X 1 .170	M6	1	0.170	3/16	0.492	3	2.5
14379	**14379-TIALN**	TMGP M8 X 1 .235	M8	1	0.235	1/4	0.650	3	2.5
14380	**14380-TIALN**	TMGP M8 X 1.25 .235	M8	1.25	0.235	1/4	0.664	3	2.5
14381	**14381-TIALN**	TMGP M10 X 1 .300	M10	1	0.300	5/16	0.807	4	3.0
14382	**14382-TIALN**	TMGP M10 X 1.5 .300	M10	1.5	0.300	5/16	0.797	4	3.0
14383	**14383-TIALN**	TMGP M12 X 1 .370	M12	1	0.370	3/8	0.965	4	3.5
14384	**14384-TIALN**	TMGP M12 X 1.5 .370	M12	1.5	0.370	3/8	0.974	4	3.5
14385	**14385-TIALN**	TMGP M12 X 1.75 .370	M12	1.75	0.370	3/8	0.999	4	3.5
14386	**14386-TIALN**	TMGP M14 X 1.5 .420	M14	1.5	0.420	1/2	1.152	4	3.5
14387	**14387-TIALN**	TMGP M14 X 2 .420	M14	2	0.420	1/2	1.142	4	3.5
14388	**14388-TIALN**	TMGP M16 X 1.5 .490	M16	1.5	0.490	1/2	1.270	4	3.5
14389	**14389-TIALN**	TMGP M16 X 2 .490	M16	2	0.490	1/2	1.299	4	3.5

Metric • Coolant Through • Solid Carbide 15° Helix 2XD Bright Finish & TiAlN Coated

General Purpose Thread Mills with Coolant Through
Designed with the same characteristics as our General Purpose tools, these standard products feature Axial Coolant off the shelf. This feature is important if your machining center only has through the spindle coolant, or if high heat is present in the cut and coolant reduces the temperature and aids with chip evacuation. Bright finish is featured in first column.

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ITEM NUMBER		DESCRIPTION	MINIMUM THREAD DIAMETER	PITCH	CUTTER DIA	SHANK DIA	LENGTH OF CUT	NO. OF FLUTES	OVERALL LENGTH
BRIGHT	COATED								
14400	**14400-TIALN**	TMGC M5 X 0.8 .145	M5	0.8	0.145	3/16	.394	3	2.5
14401	**14401-TIALN**	TMGC M6 X 0.75 .170	M6	0.75	0.170	3/16	.487	3	2.5
14402	**14402-TIALN**	TMGC M6 X 1 .170	M6	1	0.170	3/16	.492	3	2.5
14403	**14403-TIALN**	TMGC M8 X 1 .235	M8	1	0.235	1/4	.650	3	2.5
14404	**14404-TIALN**	TMGC M8 X 1.25 .235	M8	1.25	0.235	1/4	.664	3	2.5
14405	**14405-TIALN**	TMGC M10 X 1 .300	M10	1	0.300	5/16	.807	4	3.0
14406	**14406-TIALN**	TMGC M10 X 1.5 .300	M10	1.5	0.300	5/16	.797	4	3.0
14407	**14407-TIALN**	TMGC M12 X 1 .370	M12	1	0.370	3/8	.965	4	3.5
14408	**14408-TIALN**	TMGC M12 X 1.5 .370	M12	1.5	0.370	3/8	.974	4	3.5
14409	**14409-TIALN**	TMGC M12 X 1.75 .370	M12	1.75	0.370	3/8	.999	4	3.5
14410	**14410-TIALN**	TMGC M14 X 1.5 .420	M14	1.5	0.420	1/2	1.152	4	3.5
14411	**14411-TIALN**	TMGC M14 X 2 .420	M14	2	0.420	1/2	1.142	4	3.5
14412	**14412-TIALN**	TMGC M16 X 1.5 .490	M16	1.5	0.490	1/2	1.270	4	3.5
14413	**14413-TIALN**	TMGC M16 X 2 .490	M16	2	0.490	1/2	1.299	4	3.5

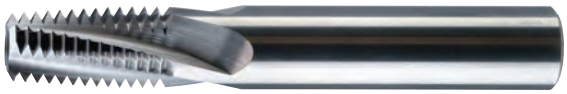
Pipe Sizes • NPT/NPTF • Solid Carbide
Bright Finish & TiAlN Coated

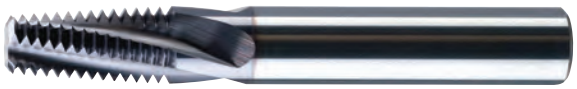
Pipe – NPT – Bright Finish – Solid Carbide
Tapered 1" of diameter for every 16" of length (or 62.5mm/m), American National Standard Taper Pipe Thread thread mills provide a piece part that forms a seal when the flanks of the part are mated. It is usually recommended that a sealant be used in these joints to prevent leakage of liquids, steam, hydraulic fluid or gases.

Pipe – NPT – TiALN Coated – Solid Carbide
Same features as NPT bright finish with TiAlN coating to enhance life in most applications.

Pipe – NPTF – Bright Finish – Solid Carbide
Dryseal American National Standard Taper Pipe Threads are designed to provide additional protection against leakage because the root and crest heights of the threads have been adjusted to provide what is commonly referred to as an “interference” fit. Sealants are still recommended, but may not be required.

Pipe – NPTF – TiALN Coated – Solid Carbide
Same features as NPTF bright finish with TiAlN coating to enhance life in most applications.



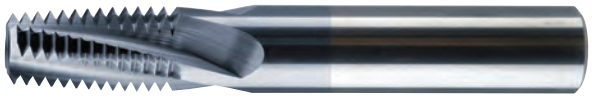


ITEM NUMBER BRIGHT	ITEM NUMBER COATED	DESCRIPTION	MINIMUM THREAD DIAMETER	PITCH	CUTTER DIA	SHANK DIA	LENGTH OF CUT*	NO. OF FLUTES	OVERALL LENGTH
Pipe - NPT - Solid Carbide									
14500	**14500-TIALN**	TMPT 1/16" X 27 NPT .245	1/16"	27	0.245	1/4	(13).481	3	2.5
14501	**14501-TIALN**	TMPT 1/8" X 27 NPT .300	1/8"	27	0.300	5/16	(16).592	4	3.0
14502	**14502-TIALN**	TMPT 1/4" X 18 NPT .360	1/4"	18	0.360	3/8	(11).611	4	3.5
14503	**14503-TIALN**	TMPT 3/8" X 18 NPT .427	3/8"	18	0.427	1/2	(13).722	4	3.5
14504	**14504-TIALN**	TMPT 1/2" X 14 NPT .490	1/2"	14	0.490	1/2	(14)1.000	4	3.5
14505	**14505-TIALN**	TMPT 1" X 11.5 NPT .620	1"	11.5	0.620	5/8	(13)1.130	4	4.0
14506	**14506-TIALN**	TMPT 2 1/2" X 8 NPT .740	2 1/2"	8	0.740	3/4	(12)1.500	4	5.0
Pipe - NPTF - Solid Carbide									
14510	14510-TIALN	TMPT 1/16" X 27 NPTF .245	1/16"	27	0.245	1/4	(13).481	3	2.5
14511	14511-TIALN	TMPT 1/8" X 27 NPTF .300	1/8"	27	0.300	5/16	(16).592	4	3.0
14512	14512-TIALN	TMPT 1/4" X 18 NPTF .360	1/4"	18	0.360	3/8	(11).611	4	3.5
14513	14513-TIALN	TMPT 1/2" X 14 NPTF .490	1/2"	14	0.490	1/2	(14)1.000	4	3.5
14514	14514-TIALN	TMPT 1" X 11.5 NPTF .620	1"	11.5	0.620	5/8	(13)1.130	4	4.0
14515	**14515-TIALN**	TMPT 2 1/2" X 8 NPTF .740	2 1/2"	8	0.740	3/4	(12)1.500	4	5.0

* The parenthetical number represents the number of threads on the tool.

Pipe Sizes • NPT/NPTF • Solid Carbide for Exotics AlCrN Coated

Pipe - NPT - EX - AlCrN Coated - Solid Carbide
Recommended when your pipe fittings are made of Stainless Steel, Titanium or other hard to machine materials. The cutting geometry is modified to increase life and performance.



Pipe - NPTF - EX - AlCrN Coated - Solid Carbide
Dryseal American National Standard Taper Pipe Threads are designed to provide additional protection against leakage because the root and crest heights of the threads have been adjusted to provide what is commonly referred to as an “interference” fit. Sealants are still recommended, but may not be required. The cutting geometry is modified to increase life and performance.

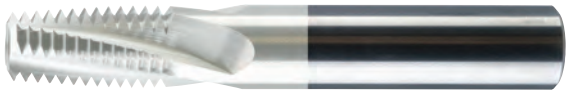
ITEM NUMBER	DESCRIPTION	MINIMUM THREAD DIA	PITCH	CUTTER DIA	SHANK DIA	LENGTH OF CUT*	NO. OF FLUTES	OVERALL LENGTH
Pipe - NPT - Solid Carbide								
14520-ALCRN	TMEX 1/16" X 27 NPT .245	1/16"	27	0.245	1/4	(13).481	3	2.5
14521-ALCRN	TMEX 1/8" X 27 NPT .300	1/8"	27	0.300	5/16	(16).592	4	3.0
14522-ALCRN	TMEX 1/4" X 18 NPT .360	1/4"	18	0.360	3/8	(11).611	4	3.5
14523-ALCRN	TMEX 3/8" X 18 NPT .427	3/8"	18	0.427	1/2	(13).722	4	3.5
14524-ALCRN	TMEX 1/2" X 14 NPT .490	1/2"	14	0.490	1/2	(14)1.000	4	3.5
14525-ALCRN	TMEX 1" X 11.5 NPT .620	1"	11.5	0.620	5/8	(13)1.130	4	4.0
14526-ALCRN	TMEX 2 1/2" X 8 NPT .740	2 1/2"	8	0.740	3/4	(12)1.500	4	5.0
Pipe - NPTF - Solid Carbide								
14530-ALCRN	TMEX 1/16" X 27 NPTF .245	1/16"	27	0.245	1/4	(13).481	3	2.5
14531-ALCRN	TMEX 1/8" X 27 NPTF .300	1/8"	27	0.300	5/16	(16).592	3	3.0
14532-ALCRN	TMEX 1/4" X 18 NPTF .360	1/4"	18	0.360	3/8	(11).611	4	3.5
14533-ALCRN	TMEX 1/2" X 14 NPTF .490	1/2"	14	0.490	1/2	(14)1.000	4	3.5
14534-ALCRN	TMEX 1" X 11.5 NPTF .620	1"	11.5	0.620	5/8	(13)1.130	4	4.0
14535-ALCRN	TMEX 2 1/2" X 8 NPTF .740	2 1/2"	8	0.740	3/4	(12)1.500	4	5.0

* The parenthetical number represents the number of threads on the tool.

Pipe Sizes • NPT/NPTF • Solid Carbide for Aluminum ZrN Coated

Pipe - NPT - AL - ZrN Coated - Solid Carbide
Same features as NPT, but with ZrN coating to enhance life in applications where Aluminum is used. Special thread mill features have been used to make these perform better than standard general purpose tools.

Pipe - NPTF - AL - ZrN Coated - Solid Carbide
Same features as NPTF, but with ZrN coating to enhance life in applications where Aluminum is used. Special thread mill features have been used to make these perform better than standard general purpose tools when machining aluminum.



ITEM NUMBER	DESCRIPTION	MINIMUM THREAD DIA	PITCH	CUTTER DIA	SHANK DIA	LENGTH OF CUT*	NO. OF FLUTES	OVERALL LENGTH
Pipe - NPT - Solid Carbide								
14520-ZRN	TMAL 1/16" X 27 NPT .245 ZrN	1/16"	27	0.245	1/4	(13).481	3	2.5
14521-ZRN	TMAL 1/8" X 27 NPT .300 ZrN	1/8"	27	0.300	5/16	(16).592	4	3.0
14522-ZRN	TMAL 1/4" X 18 NPT .360 ZrN	1/4"	18	0.360	3/8	(11).611	4	3.5
14523-ZRN	TMAL 3/8" X 18 NPT .427 ZrN	3/8"	18	0.427	1/2	(13).722	4	3.5
14524-ZRN	TMAL 1/2" X 14 NPT .490 ZrN	1/2"	14	0.490	1/2	(14)1.000	4	3.5
14525-ZRN	TMAL 1" X 11.5 NPT .620 ZrN	1"	11.5	0.620	5/8	(13)1.130	4	4.0
14526-ZRN	TMAL 2 1/2" X 8 NPT .740 ZrN	2 1/2"	8	0.740	3/4	(12)1.500	4	5.0
Pipe - NPTF - Solid Carbide								
14530-ZRN	TMAL 1/16" X 27 NPTF .245 ZrN	1/16"	27	0.245	1/4	(13).481	3	2.5
14531-ZRN	TMAL 1/8" X 27 NPTF .300 ZrN	1/8"	27	0.300	5/16	(16).592	3	3.0
14532-ZRN	TMAL 1/4" X 18 NPTF .360 ZrN	1/4"	18	0.427	3/8	(11).611	4	3.5
14533-ZRN	TMAL 1/2" X 14 NPTF .490 ZrN	1/2"	14	0.490	1/2	(14)1.000	4	3.5
14534-ZRN	TMAL 1" X 11.5 NPTF .620 ZrN	1"	11.5	0.620	5/8	(13)1.130	4	4.0
14535-ZRN	TMAL 2 1/2" X 8 NPTF .740 ZrN	2 1/2"	8	0.740	3/4	(12)1.500	4	5.0

* The parenthetical number represents the number of threads on the tool.

Fractional • UN • Material Specific • Solid Carbide for Exotics AlCrN Coated

Embrace the high performance, application specific fractional UN thread mills designed with tough to machine materials in mind. Titanium, Inconel, stainless steel, and other tough materials can now be tamed with the use of these thread mills. Thread mills will allow you higher SFM and feed rates that will outperform general purpose tools. The **left hand helix, left hand cut** design feature permits the operator to attack the material from the top to the bottom of the hole and climb mill while creating a right hand thread. The AlCrN coating comes standard off the shelf, because you shouldn't settle for less. Get your thread mills from the people who understand threads best.

ITEM NUMBER	DESCRIPTION	MINIMUM THREAD DIAMETER	PITCH	CUTTER DIA	SHANK DIA	LENGTH OF CUT	NO. OF FLUTES	OVERALL LENGTH
14600-ALCRN	TMEX #2 X 56 .065 AlCrN	#2	56	0.065	1/4	0.17	3	2.5
14601-ALCRN	TMEX #3 X 48 .075 AlCrN	#3	48	0.075	1/4	0.20	3	2.5
14602-ALCRN	TMEX #4 X 40 .085 AlCrN	#4	40	0.085	1/4	0.25	3	2.5
14603-ALCRN	TMEX #6 X 32 .100 AlCrN	#6	32	0.100	1/4	0.28	3	2.5
14604-ALCRN	TMEX #8 X 32 .120 AlCrN	#8	32	0.120	1/4	0.37	3	2.5
14605-ALCRN	TMEX #10 X 24 .140 AlCrN	#10	24	0.140	1/4	0.42	3	2.5
14606-ALCRN	TMEX #10 X 32 .140 AlCrN	#10	32	0.140	1/4	0.42	3	2.5
14607-ALCRN	TMEX 1/4" X 20 .180 AlCrN	1/4"	20	0.180	1/4	0.55	3	2.5
14608-ALCRN	TMEX 1/4" X 28 .180 AlCrN	1/4"	28	0.180	1/4	0.55	3	2.5
14609-ALCRN	TMEX 5/16" X 18 .235 AlCrN	5/16"	18	0.235	1/4	0.68	3	2.5
14610-ALCRN	TMEX 5/16" X 24 .235 AlCrN	5/16"	24	0.235	1/4	0.68	3	2.5
14611-ALCRN	TMEX 3/8" X 16 .300 AlCrN	3/8"	16	0.300	3/8	0.84	4	3.0
14612-ALCRN	TMEX 3/8" X 24 .300 AlCrN	3/8"	24	0.300	3/8	0.84	4	3.0
14613-ALCRN	TMEX 7/16" X 14 .345 AlCrN	7/16"	14	0.345	3/8	0.98	4	3.0
14614-ALCRN	TMEX 7/16" X 20 .345 AlCrN	7/16"	20	0.345	3/8	0.98	4	3.0
14615-ALCRN	TMEX 1/2" X 13 .370 AlCrN	1/2"	13	0.370	3/8	1.08	4	3.0
14616-ALCRN	TMEX 9/16" X 18 .450 AlCrN	9/16"	18	0.450	1/2	1.24	4	3.5
14617-ALCRN	TMEX 5/8" X 11 .490 AlCrN	5/8"	11	0.490	1/2	1.36	4	3.5
14618-ALCRN	TMEX 3/4" X 10 .585 AlCrN	3/4"	10	0.585	5/8	1.63	4	4.0
14619-ALCRN	TMEX 3/4" X 16 .585 AlCrN	3/4"	16	0.585	5/8	1.63	4	4.0

Metric • Material Specific • Solid Carbide for Exotics AlCrN Coated

Embrace the high performance, application specific metric thread mills designed with tough to machine materials in mind. Titanium, Inconel, stainless steel, and other tough materials can now be tamed with the use of these thread mills. Thread mills will allow you higher SFM and feed rates that will outperform general purpose tools. The **left hand helix, left hand cut** design feature permits the operator to attack the material from the top to the bottom of the hole and climb mill while creating a right hand thread. The AlCrN coating comes standard off the shelf, because you shouldn't settle for less.
Get your thread mills from the people who understand threads best.

ITEM NUMBER	DESCRIPTION	MINIMUM THREAD DIAMETER	PITCH	CUTTER DIA	SHANK DIA	LENGTH OF CUT	NO. OF FLUTES	OVERALL LENGTH
14620-ALCRN	TMEX M2 X 0.4 .060 AlCrN	M2	0.4	0.060	1/4	0.180	3	2.5
14621-ALCRN	TMEX M2.5 X 0.45 .076 AlCrN	M2.5	0.45	0.076	1/4	0.220	3	2.5
14622-ALCRN	TMEX M3 X 0.5 .092 AlCrN	M3	0.5	0.092	1/4	0.260	3	2.5
14623-ALCRN	TMEX M3.5 X 0.6 .108 AlCrN	M3.5	0.6	0.108	1/4	0.300	3	2.5
14624-ALCRN	TMEX M4 X 0.7 .122 AlCrN	M4	0.7	0.122	1/4	0.350	3	2.5
14625-ALCRN	TMEX M5 X 0.8 .150 AlCrN	M5	0.8	0.150	1/4	0.44	3	2.5
14626-ALCRN	TMEX M6 X 0.75 .182 AlCrN	M6	0.75	0.182	1/4	0.53	3	2.5
14627-ALCRN	TMEX M6 X 1 .182 AlCrN	M6	1	0.182	1/4	0.53	3	2.5
14628-ALCRN	TMEX M8 X 1 .245 AlCrN	M8	1	0.245	1/4	0.7	3	2.5
14629-ALCRN	TMEX M8 X 1.25 .245 AlCrN	M8	1.25	0.245	1/4	0.7	3	2.5
14630-ALCRN	TMEX M10 X 1 .308 AlCrN	M10	1	0.308	3/8	0.88	4	3.0
14631-ALCRN	TMEX M10 X 1.5 .308 AlCrN	M10	1.5	0.308	3/8	0.88	4	3.0
14632-ALCRN	TMEX M12 X 1 .370 AlCrN	M12	1	0.370	3/8	1	4	3.0
14633-ALCRN	TMEX M12 X 1.5 .370 AlCrN	M12	1.5	0.370	3/8	1	4	3.0
14634-ALCRN	TMEX M12 X 1.75 .370 AlCrN	M12	1.75	0.370	3/8	1	4	3.0
14635-ALCRN	TMEX M14 X 1.5 .440 AlCrN	M14	1.5	0.440	1/2	1.18	4	3.5
14636-ALCRN	TMEX M14 X 2 .440 AlCrN	M14	2	0.440	1/2	1.18	4	3.5
14637-ALCRN	TMEX M16 X 1.5 .490 AlCrN	M16	1.5	0.490	1/2	1.36	4	3.5
14638-ALCRN	TMEX M16 X 2 .490 AlCrN	M16	2	0.490	1/2	1.36	4	3.5

Fractional • UN • Coolant Through • Material Specific • Solid Carbide for Aluminum ZrN Coated

Aluminum is popular in part due to ease of machinability. Why not take advantage of our application specific off the shelf thread mill for aluminum? Designed to machine standard fractional TPI and allow greater feeds and speeds than general purpose thread mills. You will see enhanced production and improved thread quality when you step up to the AL series provided with ZrN coating.

ITEM NUMBER	DESCRIPTION	MINIMUM THREAD DIAMETER	PITCH	CUTTER DIA	SHANK DIA	LENGTH OF CUT	NO. OF FLUTES	OVERALL LENGTH
14425-ZRN	TMAL #10 X 24 .140 ZrN	#10	24	0.140	3/16	0.396	3	2.5
14426-ZRN	TMAL #10 X 32 .140 ZrN	#10	32	0.140	3/16	0.391	3	2.5
14427-ZRN	TMAL 1/4" X 20 .180 ZrN	1/4"	20	0.180	3/16	0.525	3	2.5
14428-ZRN	TMAL 1/4" X 28 .180 ZrN	1/4"	28	0.180	3/16	0.518	3	2.5
14429-ZRN	TMAL 5/16" X 18 .235 ZrN	5/16"	18	0.235	1/4	0.639	3	2.5
14430-ZRN	TMAL 5/16" X 24 .235 ZrN	5/16"	24	0.235	1/4	0.646	3	2.5
14431-ZRN	TMAL 3/8" X 16 .300 ZrN	3/8"	16	0.300	5/16	0.781	3	3.0
14432-ZRN	TMAL 3/8" X 24 .300 ZrN	3/8"	24	0.300	5/16	0.771	3	3.0
14433-ZRN	TMAL 7/16" X 14 .345 ZrN	7/16"	14	0.345	3/8	0.893	3	3.5
14434-ZRN	TMAL 7/16" X 20 .345 ZrN	7/16"	20	0.345	3/8	0.875	3	3.5
14435-ZRN	TMAL 1/2" X 13 .370 ZrN	1/2"	13	0.370	3/8	1.038	3	3.5
14436-ZRN	TMAL 9/16" X 18 .450 ZrN	9/16"	18	0.450	1/2	1.139	3	3.5
14437-ZRN	TMAL 5/8" X 11 .490 ZrN	5/8"	11	0.490	1/2	1.318	3	3.5
14438-ZRN	TMAL 3/4" X 10 .585 ZrN	3/4"	10	0.585	5/8	1.550	3	4.0
14439-ZRN	TMAL 3/4" X 16 .585 ZrN	3/4"	16	0.585	5/8	1.531	3	4.0

Metric • Coolant Through • Material Specific • Solid Carbide for Aluminum ZrN Coated

Aluminum is popular in part due to ease of machinability. Why not take advantage of our application specific off the shelf thread mill for aluminum? Designed to provide metric standard threads and allow greater feeds and speeds than general purpose thread mills. You will see enhanced production and improved thread quality when you step up to the AL series provided with ZrN coating.

ITEM NUMBER	DESCRIPTION	MINIMUM THREAD DIAMETER	PITCH	CUTTER DIA	SHANK DIA	LENGTH OF CUT	NO. OF FLUTES	OVERALL LENGTH
14440-ZRN	TMAL M5 X 0.8 .145 ZrN	M5	0.8	0.145	3/16	0.394	3	2.5
14441-ZRN	TMAL M6 X 0.75 .170 ZrN	M6	0.75	0.170	3/16	0.487	3	2.5
14442-ZRN	TMAL M6 X 1 .170 ZrN	M6	1	0.170	3/16	0.492	3	2.5
14443-ZRN	TMAL M8 X 1 .235 ZrN	M8	1	0.235	1/4	0.650	3	2.5
14444-ZRN	TMAL M8 X 1.25 .235 ZrN	M8	1.25	0.235	1/4	0.664	3	2.5
14445-ZRN	TMAL M10 X 1 .300 ZrN	M10	1	0.300	5/16	0.807	3	3.0
14446-ZRN	TMAL M10 X 1.5 .300 ZrN	M10	1.5	0.300	5/16	0.797	3	3.0
14447-ZRN	TMAL M12 X 1 .370 ZrN	M12	1	0.370	3/8	0.965	3	3.5
14448-ZRN	TMAL M12 X 1.5 .370 ZrN	M12	1.5	0.370	3/8	0.974	3	3.5
14449-ZRN	TMAL M12 X 1.75 .370 ZrN	M12	1.75	0.370	3/8	0.999	3	3.5
14450-ZRN	TMAL M14 X 1.5 .420 ZrN	M14	1.5	0.420	1/2	1.152	3	3.5
14451-ZRN	TMAL M14 X 2 .420 ZrN	M14	2	0.420	1/2	1.142	3	3.5
14452-ZRN	TMAL M16 X 1.5 .490 ZrN	M16	1.5	0.490	1/2	1.270	3	3.5
14453-ZRN	TMAL M16 X 2 .490 ZrN	M16	2	0.490	1/2	1.299	3	3.5

Single Profile • Fractional • UN • Solid Carbide • Bright Finish & TiAlN Coated

Single Profile - Fractional - UN - Bright Finish - Solid Carbide

Your shop isn't called on to mass produce threads each and every day? Why not utilize the most versatile thread mill available? These general purpose single profile tools will allow you to create any TPI within the recommended range for a given size. You utilize circular interpolation settings on your three axis machine to create the TPI you need for prototypes, short runs and in shops where you never know what the next job (or thread) will be. You give up some speed, but you gain versatility. The perfect "save the day" tool for your circumstances.

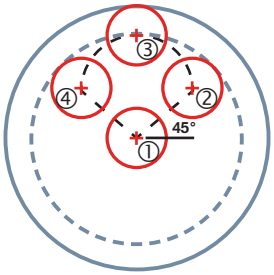
Single Profile - Fractional - UN - TiAlN Coated - Solid Carbide

All the advantages of the bright finish single profile tool with one more thrown in for good measure. TiAlN coating will enhance your speeds, feeds and finishes with most applications. Off the shelf for your convenience.

ITEM NUMBER BRIGHT	ITEM NUMBER COATED	DESCRIPTION	MINIMUM THREAD DIA	RECOMMENDED TPI RANGE	CUTTER DIA	NECK DIAMETER	NECK LENGTH	LENGTH OF CUT	NO. OF FLUTES	OVERALL LENGTH
3 FLUTE, 3/16" SHANK DIA., 2.5" OAL										
14550	**14550-TIALN**	TMSP #2 X 56-80 .060	#2	56-80	0.060	0.034	0.180	0.180	3	2.5
14551	**14551-TIALN**	TMSP #2 X 56-80 .060	#2	56-80	0.060	0.034	0.275	0.275	3	2.5
14552	**14552-TIALN**	TMSP #3 X 48-72 .072	#3	48-72	0.072	0.040	0.200	0.200	3	2.5
14553	**14553-TIALN**	TMSP #3 X 48-72 .072	#3	48-72	0.072	0.040	0.320	0.320	3	2.5
14554	**14554-TIALN**	TMSP #4 X 40-64 .080	#4	40-64	0.080	0.045	0.225	0.225	3	2.5
14555	**14555-TIALN**	TMSP #4 X 40-64 .080	#4	40-64	0.080	0.045	0.360	0.360	3	2.5
14556	**14556-TIALN**	TMSP #6 X 32-64 .098	#6	32-64	0.098	0.049	0.280	0.280	3	2.5
14557	**14557-TIALN**	TMSP #6 X 32-64 .098	#6	32-64	0.098	0.049	0.445	0.445	3	2.5
14558	**14558-TIALN**	TMSP #8 X 32-56 .120	#8	32-56	0.120	0.070	0.330	0.330	3	2.5
14559	**14559-TIALN**	TMSP #8 X 32-56 .120	#8	32-56	0.120	0.070	0.525	0.525	3	2.5
14560	**14560-TIALN**	TMSP #10 X 24-56 .135	#10	24-56	0.135	0.070	0.380	0.380	3	2.5
14561	**14561-TIALN**	TMSP #10 X 24-56 .135	#10	24-56	0.135	0.070	0.610	0.610	3	2.5
4 FLUTE, 1/4" SHANK DIA., 2.5" OAL										
14562	**14562-TIALN**	TMSP 1/4" X 20-56 .180	1/4"	20-56	0.180	0.105	0.500	0.500	4	2.5
14563	**14563-TIALN**	TMSP 1/4" X 20-56 .180	1/4"	20-56	0.180	0.105	0.775	0.775	4	2.5
14564	**14564-TIALN**	TMSP 5/16" X 18-48 .240	5/16"	18-48	0.240	0.160	0.625	0.625	4	2.5
14565	**14565-TIALN**	TMSP 5/16" X 18-48 .240	5/16"	18-48	0.240	0.160	0.965	0.965	4	2.5
4 FLUTE, 3/8" SHANK DIA., 3" OAL										
14566	**14566-TIALN**	TMSP 3/8" X 14-40 .290	3/8"	14-40	0.290	0.190	0.875	0.875	4	3.0
14567	**14567-TIALN**	TMSP 3/8" X 14-40 .290	3/8"	14-40	0.290	0.190	1.160	1.160	4	3.0
14568	**14568-TIALN**	TMSP 1/2" X 12-32 .372	1/2"	12-32	0.372	0.240	1.125	1.125	4	3.0
14569	**14569-TIALN**	TMSP 1/2" X 12-32 .372	1/2"	12-32	0.372	0.240	1.560	1.560	4	3.0
5 FLUTE, 1/2" SHANK DIA., 3.5" OAL										
14570	**14570-TIALN**	TMSP 5/8" X 11-32 .490	5/8"	11-32	0.490	0.350	1.375	1.375	5	3.5
14571	**14571-TIALN**	TMSP 5/8" X 12-32 .490	5/8"	11-32	0.490	0.350	1.940	1.940	5	3.5
6 FLUTE, 5/8" SHANK DIA., 4" OAL										
14572	**14572-TIALN**	TMSP 3/4" X 10-32 .595	3/4"	10-32	0.595	0.420	1.625	1.625	6	4.0
14573	**14573-TIALN**	TMSP 3/4" X 11-32 .595	3/4"	10-32	0.595	0.420	2.310	2.310	6	4.0
6 FLUTE, 3/4" SHANK DIA., 5" OAL										
14574	**14574-TIALN**	TMSP 7/8" X 8-24 .695	7/8"	8-24	0.695	0.490	1.750	1.750	6	5.0
14575	**14575-TIALN**	TMSP 1" X 6-32 .740	1"	6-32	0.740	0.490	2.000	2.000	6	5.0

How To Program Helical Interpolation for Thread Mills

Thread Mill Programming Example

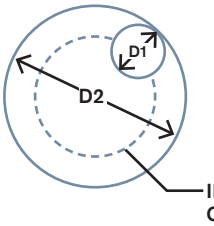


This example will produce an internal right hand thread.

- Position to ① (centerline of thread)
- G01 to desired Z depth
- G01 to ②
- G03 to ③ (while Z moves up 1/8 pitch)
- G03 to ③ (while Z moves up 1 pitch)
- G03 to ④ (while Z moves up 1/8 pitch)
- G01 to ①
- Retract from hole

Feed Rate Compensation

To obtain the correct feed rate for the centerline of the tool, multiply the desired feed rate at the cutting edge by the appropriate factor.



$$\text{INTERNAL} = \frac{D2 - D1}{D2}$$

D1 = TOOL CUTTING DIAMETER
D2 = THREAD DIAMETER

Recommended Speeds and Feeds

	SFM				FEED (INCHES/TOOTH)						
	Uncoated	TiALN	ALCrN	ZrN	3/16"	1/4"	5/16"	3/8"	1/2"	5/8"	3/4"
Aluminum	400-800	- -	- -	600-1400	0.0005	0.0008	0.0012	0.0015	0.0020	0.0025	0.0030
Brass	200-400	- -	- -	400-800	0.0005	0.0008	0.0012	0.0015	0.0020	0.0025	0.0030
Cast Iron	150-250	200-400	220-440	- -	0.0004	0.0005	0.0006	0.0007	0.0010	0.0015	0.0020
Carbon Steel	150-250	250-500	275-550	- -	0.0004	0.0005	0.0006	0.0007	0.0010	0.0015	0.0020
Stainless Steel	100-150	150-400	165-440	- -	0.0004	0.0005	0.0006	0.0007	0.0010	0.0015	0.0020
High Temp Alloy	50-100	80-150	90-165	- -	0.0004	0.0006	0.0007	0.0008	0.0009	0.0010	0.0012
Titanium	50-125	80-250	90-275	- -	0.0003	0.0004	0.0005	0.0006	0.0007	0.0008	0.0010

Troubleshooting

Number one issue: programming the thread mill with no feed rate compensation. If the operator/engineer/machinist programs the feed rate based on the tool at the center of the hole (before it begins to machine threads), then the rate will not be the same at the circumference of the hole when the tool is interpolating the thread. Use the program from the 3 axis (or more) machining center to compensate for the calculated feed.

SFM is too low

- Increase speed
  - For soft materials
  - Fine pitches
  - To reduce chipping
  - To improve the finish on work piece
- Decrease speed for
  - Hard or abrasive material
  - Coarse pitches
  - Where excessive wear is exhibited

Feed rate is too high

- Lower for
  - Frail work piece
  - To improve the finish
  - To reduce chipping
- Increase for
  - Abrasive materials
  - Coarse pitches
  - To reduce excessive wear
  - For free machining applications

Run out from toolholder/spindle

Selection of the wrong style of thread mill

Ensure the rigidity of set up

PROBLEM	CAUSE	SOLUTIONS
Poor thread finish	Deflection	Secure spindle fixture, if clamping is insufficient, reduce SFM, increase feed and try conventional milling
Go Gage won't go	Threads are too small Chips in thread	Improve the coolant flow Reduce the tool radius in the offset compensation

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