

# HIGH-PERFORMANCE THREAD MILLS

## Greenfield LIGHTNING® SERVICE

*Rely on Greenfield's Lightning® Service program to deliver the special taps you need, when and where you need them, via your local authorized distributor. Within minutes of a call, Greenfield can quote, process, and release your order to the factory. This rapid response allows us to make and ship your order quickly, often with only a 24-hour lead time.*

*Greenfield special taps can be used for tapping popular materials such as Steels, Cast Iron, Aluminum, or Brass. We can also custom design tools to thread even the most difficult materials such as Inconel, Titanium, and other High-Temperature Alloys. When success is measured by accurate thread pitch diameters and proper gage fits, you can depend on Greenfield Tap and Die for special taps made to your order.*

*Let Greenfield's Lightning Service program spark your production. Contact your authorized Greenfield distributor for details.*

**Greenfield LIGHTNING®  
SERVICE Available**

## ▶ QUICK REFERENCE

### Solid Thread Mills

Solid Carbide, Helical Flute . . . . . 53

Powder Metal, Helical Flute . . . . . 55

Sets . . . . . 59

Solid Carbide, Straight Flute . . . . . 60

### Indexable Thread Mills

Solid Carbide Inserts . . . . . 62

Holders . . . . . 65

### Technical Information

Starting Speeds and  
Feeds for Solid Thread Mills . . . . . 66

Thread Mill Programming  
Request Form . . . . . 67



## HIGH-PERFORMANCE THREAD MILLS

- One tool generates right- or left-hand threads for both internal and external threading applications requiring coarse or fine pitch threads
- Helical carbide thread mills are manufactured from micrograin carbide for excellent resistance to wear and shock loading, and feature PVD TiAlN coating standard
- Helical PM Plus™ thread mills reduce chatter, are constructed from powder metal to minimize breakage, and feature TiAlN coating standard
- Operate at up to 40% higher feed rates with up to 50% longer tool life than comparable thread mills
- Quick ship and specials programs for carbide and PM thread mills ensure you get the product you need, when you need it



### Alternate Coatings Available

Greenfield's in-house tool coating capabilities lead the industry! Choose from Titanium Nitride (TiN), Titanium Carbonitride (TiCN), Titanium Nitride and Chromium Carbide Carbon (TiN + CrC/C), Titanium Aluminum Nitride (TiAlN), and Chromium Nitride (CrN). Available in full package quantities only. Contact your authorized Greenfield distributor for details.

### Alternate Coatings Available.

(Full package quantities only)



### Helical Flute Solid Carbide Thread Mills

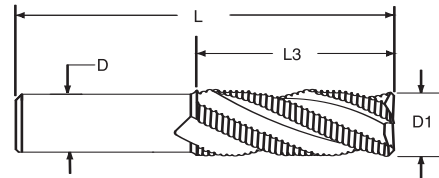
#### Features/Benefits:

- manufactured from proprietary 12% cobalt micrograin carbide with excellent wear resistance and superior resistance to shock loading
- PVD TiAlN coating standard
- helical flute design reduces chatter
- solid carbide thread mills produce full threads to within one pitch of a shoulder, 100% thread height to UN specifications
- more cost effective than indexable thread mills
- same tool can produce
  - right or left hand threads
  - single or multiple lead threads
  - internal or external threads
- threads smaller than 1/2" (12,00mm) have reinforced shanks to minimize deflection

#### Application Information:

- steel
- stainless steel
- titanium
- high-temperature alloys
- non-ferrous materials

<b>P</b>	Steel
<b>M</b>	Stainless Steel
<b>K</b>	Cast Iron
<b>N</b>	Non-Ferrous
<b>S</b>	High-Temp Alloys
<b>H</b>	Hardened Materials



D1 = Cutter Diameter    D = Shank Diameter  
L = Overall Length    L3 = Thread Length

### Solid Carbide Thread Mills

#### Series TMH-UN UNC/UNF Internal Threads

Standard Thread Size	TPI	D1	L	L3	D	Flutes	EDP Number
8-10	32	.125	2.000	.375	.188	2	22602
10	24	.125	2.000	.375	.188	2	22604
1/4	28	.188	2.500	.562	.250	3	22603
1/4	20	.188	2.500	.562	.250	3	22606
5/16	18	.250	2.500	.750	.312	3	22608
5/16 & 3/8	24	.250	2.500	.750	.312	3	22605
3/8	16	.250	2.500	.750	.312	3	22610
7/16	14	.312	2.750	.875	.312	4	22612
7/16	14	.312	2.750	.875	.375	4	22622
7/16 & 1/2	20	.312	2.750	.875	.312	4	22607
7/16 & 1/2	20	.312	2.750	.875	.375	4	22621
1/2	13	.312	2.750	.875	.312	4	22614
1/2	13	.312	2.750	.875	.375	4	22623
5/8	11	.375	2.750	1.125	.375	4	22617
9/16 & 5/8	18	.375	2.750	1.125	.375	4	22609
9/16	12	.375	2.750	1.125	.375	4	22615
3/4	12	.500	3.250	1.250	.500	4	22616
3/4	10	.500	3.250	1.250	.500	4	22618
13/16 +	16	.500	3.250	1.250	.500	4	22611
7/8	14	.500	3.250	1.250	.500	4	22613
1	8	.625	3.625	1.563	.625	4	22620

Greenfield LIGHTNING®  
SERVICE Available

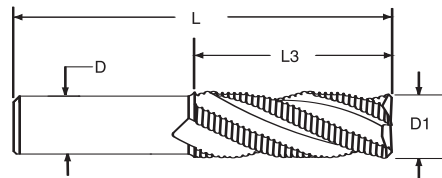
# Solid Thread Mills



## Solid Carbide Helical Flute

### Metric Solid Carbide Thread Mills

#### Series TMH-ISO Internal Threads



D1 = Cutter Diameter    D = Shank Diameter  
L = Overall Length    L3 = Thread Length

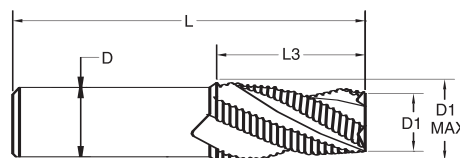
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

#### Alternate Coatings Available.

(Full package quantities only)



Standard Thread Size	D1	L	L3	D	Flutes	EDP Number
M4,5 x 0,75	.125	2.000	.375	.188	2	22637
M6 x 1	.188	2.500	.562	.250	3	22640
M8-M11 x 0,75	.250	2.500	.750	.312	3	22638
M8 x 1,25	.188	2.500	.562	.250	3	22642
M10 x 1,5	.250	2.500	.750	.312	3	22643
M12-M30 x 1	.312	2.750	.875	.312	4	22641
M12 x 1,75	.312	2.750	.875	.312	4	22646
M14-M80 x 1,5	.375	2.750	1.125	.375	4	22644
M16 x 2	.375	2.750	1.125	.375	4	22647
M18-M150 x 1,5	.500	3.250	1.250	.500	4	22645
M20 x 2,5	.500	3.250	1.250	.500	4	22648
M24 x 3	.625	3.625	1.563	.625	4	22649



D1 = Cutter Diameter at small end    D1MAX = Cutter Diameter at large end  
D = Shank Diameter    L = Overall Length    L3 = Thread Length

### Taper Pipe Size Solid Carbide Thread Mills

#### Series TMH-NPT and TMH-NPTF Internal and External Threads

Standard Thread Size	TPI	D1*	D1MAX*	L	L3	D	Flutes	EDP Number	
								NPT	NPTF
1/16 & 1/8	27	.217	.248	2.500	.500	.250	3	22624	22630
1/4 & 3/8	18	.275	.320	2.500	.750	.375	4	22625	22631
1/2 & 3/4	14	.438	.500	2.500	1.000	.500	4	22626	22632
1/2 & 3/4	14	.438	.500	3.000	1.000	.500	4	22636	22651
1-2	11 1/2	.550	.620	2.750	1.125	.625	4	22627	22634
1-2	11 1/2	.550	.620	3.500	1.125	.625	4	22650	22639

\* D1 represents the small end diameter and D1MAX represents the large end diameter; helical NPT/NPTF thread mills are tapered.

### ■ PM Plus™ Powder Metal Thread Mills

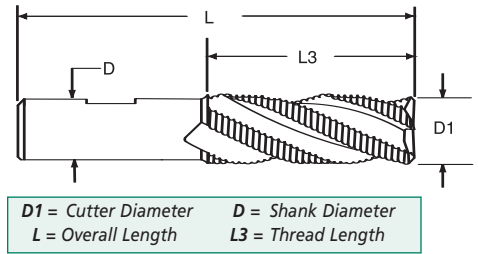
P	Steel
K	Cast Iron
N	Non-Ferrous

#### Features/Benefits:

- patent-pending helical flute design that reduces thread chatter, improving product thread finish and quality
- made from high-quality powder metal material
- standard TiAlN coating allows faster speed and feed rates for higher productivity
- same tool is capable of generating
  - both right hand and left hand threads
  - several thread diameters for the same TPI
  - different class of fits with a CNC offset
  - both bottoming and through hole threads
- provide a greater percentage of engagement than HSS or carbide taps
- perform well in materials < 30 Rc

#### Application Information:

- superior performance over carbide thread mills in these applications:
  - interrupted cuts - chipping is less likely to occur due to tougher PM substrate
  - less than ideal machining conditions, i.e., slower spindle speeds
  - small job/lot sizes where tool cost does not justify use of a carbide threadmill
- the ideal choice when:
  - material has proven difficult to tap *and is* < 30 Rc, including:
    - non-ferrous materials
    - low carbon steels
    - ductile cast iron
  - thread specification calls for full threads close to bottom of hole
  - thread specification requires a special tap
  - small lot size to be threaded



### PM Plus Powder Metal Solid Thread Mills

#### ■ Series PMTME-UN UNC/UNF External Threads

Standard Thread Size	D1	L	L3	D	Flutes	EDP Number
32	.310	2.500	.625	.375	4	20400
28	.375	2.500	.750	.375	4	20401
20	.435	2.500	.812	.375	4	20402
18	.500	3.000	1.000	.500	4	20403
16	.500	3.000	1.000	.500	4	20404
12	.750	3.500	1.250	.750	4	20405
10	1.000	4.500	2.000	1.000	5	20406
8	1.000	4.500	2.000	1.000	5	20407

Greenfield LIGHTNING®  
SERVICE Available

# Solid Thread Mills



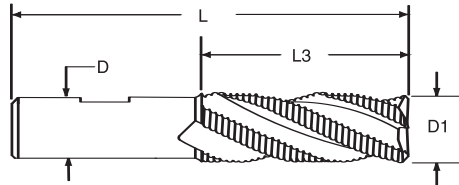
## Powder Metal Helical Flute

### PM Plus™ Powder Metal Solid Thread Mills

#### Series PMTMN-UN UNC/UNF Internal Threads

- P** Steel
- K** Cast Iron
- N** Non-Ferrous

< 30 Rc only



D1 = Cutter Diameter    D = Shank Diameter  
L = Overall Length    L3 = Thread Length

**Alternate Coatings Available.**  
(Full package quantities only)



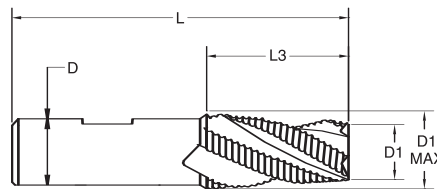
Standard Thread Size	TPI	D1	L	L3	D	Flutes	EDP Number
8-10	32	.120	2.250	.250	.375	2	20350
10	24	.125	2.375	.250	.375	2	20372
12	28	.150	2.250	.312	.375	2	20352
12	24	.160	2.250	.312	.375	2	20354
1/4	20	.160	2.250	.312	.375	2	20356
5/16 & 3/8	24	.185	2.250	.375	.375	3	20355
5/16	18	.185	2.250	.375	.375	3	20359
3/8	16	.260	2.500	.625	.375	3	20361
7/16 +	32	.260	2.500	.625	.375	3	20351
7/16 +	28	.310	2.500	.625	.375	4	20353
7/16 & 1/2	20	.310	2.500	.625	.375	4	20357
7/16	14	.310	2.500	.625	.375	4	20363
1/2	13	.310	2.500	.625	.375	4	20365
9/16 +	20	.375	2.500	.750	.375	4	20358
9/16 & 5/8	18	.375	2.500	.750	.375	4	20360
9/16	12	.375	2.500	.750	.375	4	20366
5/8	11	.435	2.500	.812	.375	4	20368
3/4	16	.500	3.000	1.000	.500	4	20362
3/4	12	.500	3.000	1.000	.500	4	20367
3/4	10	.500	3.000	1.000	.500	4	20369
7/8	14	.500	3.000	1.000	.500	4	20364
7/8	9	.625	3.250	1.125	.625	4	20370
1	8	.625	3.250	1.125	.625	4	20371

**Greenfield LIGHTNING®**  
SERVICE Available

### PM Plus™ Powder Metal NPT and NPTF Taper Pipe Thread Mills

#### Series PMTMX Internal and External Threads

**P** Steel  
**K** Cast Iron  
**N** Non-Ferrous  
*< 30 Rc only*



*D1* = Cutter Diameter at small end    *D1MAX* = Cutter Diameter at large end    *D* = Shank Diameter  
*L* = Overall Length    *L3* = Thread Length

Standard Thread Size	TPI	D1*	D1MAX*	L	L3	D	Flutes	EDP Number	
								NPT	NPTF
1/16 & 1/8	27	.220	.240	2.250	.375	.375	3	20450	20455
1/4 & 3/8	18	.275	.310	2.310	.562	.375	4	20451	20456
1/2 & 3/4	14	.440	.490	2.750	.750	.500	4	20452	20457
1-2	11 1/2	.550	.620	3.250	1.125	.625	4	20453	20458
2 1/2-6	8	.900	1.000	4.000	1.500	1.000	5	20454	20459

\* D1 represents the small end diameter and D1MAX represents the large end diameter; helical NPT/NPTF thread mills are tapered.

### PM Plus™ Powder Metal NPSM Straight Pipe Thread Mills

#### Series PMTMN Internal Threads

Standard Thread Size	TPI	D1	L	L3	D	Flutes	EDP Number
1/16 & 1/8	27	.260	2.500	.625	.375	3	21981
1/4 & 3/8	18	.310	2.500	.625	.375	4	21982
1/2 & 3/4	14	.500	3.000	1.000	.500	4	21983
1-2	11 1/2	.625	3.250	1.125	.625	4	21984
2 1/2-6	8	.750	3.500	1.250	1.000	5	21985



### THREADING: Controlled Feed Rates When Thread Milling

For thread milling applications, we recommend setting controlled feed rates within the program for the centerline of the spindle or tool. This method ensures absolute feed control of the tool through the entire thread milling operation.

As the tool moves around the centerline of the bore, the tool centerline must traverse at a slower IPM rate than the periphery of the tool at the cutting edge or major thread diameter. If the standard feed rate of RPM x feed per flute x number of flutes was applied to the spindle centerline, the tool would have an effective feed rate at the cutting edge that may exceed the capability of the thread mill, resulting in poor tool life and possible breakage. The programmed feed rate for the centerline is based upon the thread mill diameter selected. The larger the tool diameter, the greater the reduction required to ensure the proper operating parameters on the periphery.

*Feed Compensation Formula for Internal Threading:*

$$\text{Centerline IPM}_2 = \frac{\text{IPM}_1 \times (\text{Major Thread Diameter} - \text{Tool Cutting Diameter})}{\text{Major Thread Diameter}}$$

*Feed Compensation Formula for External Threading:*

$$\text{Centerline IPM}_2 = \frac{\text{IPM}_1 \times (\text{Major Thread Diameter} + \text{Tool Cutting Diameter})}{\text{Major Thread Diameter}}$$

# Solid Thread Mills



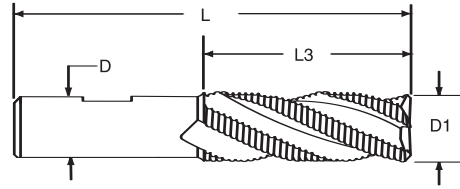
## Powder Metal Helical Flute

### PM Plus™ Powder Metal Metric Solid Thread Mills

#### Series PMTMN-ISO Internal Metric Threads

- P** Steel
- K** Cast Iron
- N** Non-Ferrous

< 30 Rc only



**D1** = Cutter Diameter    **D** = Shank Diameter  
**L** = Overall Length    **L3** = Thread Length

#### Alternate Coatings Available.

(Full package quantities only)



Standard Thread Size	D1	L	L3	D	Flutes	EDP Number
M4,5 x 0,75	.120	2.250	.250	.375	2	21961
M8 x 0,75	.250	2.500	.625	.375	3	21962
M6 x 1	.160	2.250	.312	.375	2	21963
M8 x 1,25	.185	2.250	.375	.375	3	21965
M12 x 1	.310	2.500	.625	.375	4	21964
M10 x 1,5	.260	2.500	.625	.375	3	21966
M14 x 1,5	.375	2.500	.750	.375	4	21967
M18 x 1,5	.500	3.000	1.000	.500	4	21968
M12 x 1,75	.310	2.500	.625	.375	4	21969
M16 x 2	.375	2.500	.750	.375	4	21970
M20 x 2,5	.500	3.000	1.000	.500	4	21971
M24 x 3	.625	3.250	1.125	.625	4	21972

### PM Plus™ Powder Metal Metric Solid Thread Mills

#### Series PMTME-ISO External Metric Threads

Standard Thread Size	D1	L	L3	D	Flutes	EDP Number
M4,5 x 0,75	.310	2.500	.625	.375	4	21973
M6 x 1	.375	2.500	.750	.375	4	21974
M10 x 1,5	.500	3.000	1.000	.500	4	21975
M14 x 2	.500	3.000	1.000	.500	4	21976
M24 x 3	.625	3.250	1.125	.625	4	21977

**Greenfield LIGHTNING®**  
**SERVICE Available**

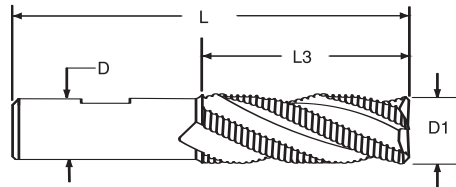


### PM Plus™ Powder Metal British Standard Pipe Straight "G" Thread Mills

#### Series PMTME-BSPF Internal Threads

<b>P</b>	Steel
<b>K</b>	Cast Iron
<b>N</b>	Non-Ferrous

< 30 Rc only



**D1** = Cutter Diameter      **D** = Shank Diameter  
**L** = Overall Length      **L3** = Thread Length

Standard Thread Size	TPI	D1	L	L3	D	Flutes	EDP Number
1/8	18	.125	2.250	10.000	.375	4	20449
1/4 & 3/8	19	.250	2.480	10.000	.375	4	20448
1/2 & 3/4	14	.500	3.270	10.000	.500	4	20447
1 & 1 1/4	11	.625	3.620	10.000	.625	4	20446
1 1/2	11	.750	3.620	10.000	.750	4	20445
1 3/4 & 2	11	1.000	3.620	10.000	1.000	4	20444

### PM Plus™ Thread Mill Sets

- Our most popular sizes packaged for your convenience
- UNC, UNF, NPT, NPTF thread style sets

Series Number	Set Description	Standard Thread Sizes	EDP Number
PMTMN-SET	UNCSET-4PC	8 & 10-32; 1/4-20; 3/8-16; 1/2-13	21987
PMTMN-SET	UNFSET-4PC	5/16-24 & 3/8-24; 7/16-20 & 1/2-20; 9/16-18 & 5/8-18; 3/4-16	21989
PMTMN-SET	UNCSET-7PC	8 & 10-32; 10-24; 1/4-20; 5/16-18; 3/8-16; 7/16-14; 1/2-13	21978
PMTMX-SET	NPTSET-4PC	1/16 & 1/8-27; 1/4 & 3/8-18; 1/2 & 3/4-14; 1-2	21979
PMTMX-SET	NPTFSET-4PC	1/16 & 1/8-27; 1/4 & 3/8-18; 1/2 & 3/4-14; 1-2	21988



# Solid Thread Mills

## Solid Carbide Straight Flute

HIGH-PERFORMANCE TAPS

THREAD MILLS

PRODUCTION TAPS

MAINTENANCE TOOLS

GAGES

TECHNICAL INFORMATION & INDEX

### Solid Carbide Thread Mills UN Threads

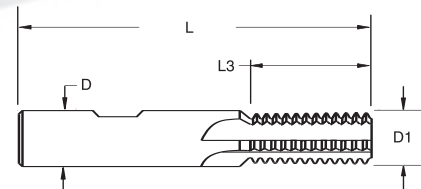
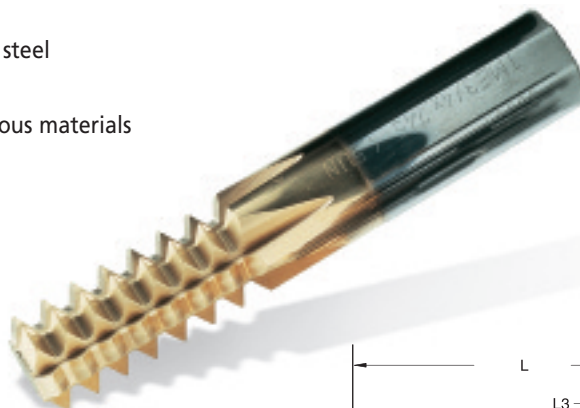
#### Features/Benefits:

- manufactured from a 10% cobalt micrograin carbide with excellent wear resistance and good resistance to shock loading
- PVD TiN coating is standard
- solid carbide thread mills produce full threads to within one pitch of a shoulder, 100% thread height to UN specifications
- more cost effective than indexable thread mills
- same tool can produce
  - right or left hand threads
  - single or multiple lead threads

#### Application Information:

- use in materials up to 62 Rc hardness
- steel
- stainless steel
- cast iron
- non-ferrous materials

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials



D1 = Cutter Diameter    D = Shank Diameter  
L = Overall Length    L3 = Thread Length

### Solid Carbide UN Straight Flute Thread Mills

#### Series TMN-UN UNC/UNCF Internal Threads

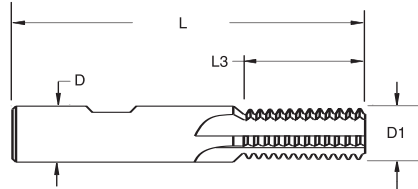
Standard Thread Size	TPI	D1	L	L3	D	Flutes	EDP Number
2 & 3	56	.060	1.500	.125	.125	3	85071
4 - 6	40	.085	1.500	.175	.125	3	85074
8	36	.120	1.500	.250	.125	3	85094
6	32	.085	1.500	.219	.125	3	85008
8-10	32	.120	1.500	.250	.125	3	85009
7/16-1	32	.240	2.250	.563	.250	5	85013
12	28	.145	1.650	.321	.187	3	85010
7/16-1 1/2	28	.310	2.480	.786	.312	5	85017
12	24	.160	1.650	.333	.187	3	85011
5/16 & 3/8	24	.200	2.250	.500	.250	3	85014
1/4	20	.060	1.650	.400	.187	3	85012
7/16 & 1/2	20	.310	2.480	.750	.312	5	85018
9/16	20	.370	2.840	.900	.375	5	85021
5/16	18	.200	2.250	.500	.250	3	85015
9/16	18	.370	2.840	.944	.375	5	85022
5/8	18	.470	3.270	1.111	.500	5	85024
3/8 & 3/4	16	.240	2.250	.562	.250	5	85016
13/16-6	16	.470	3.270	1.125	.500	5	85025
7/16 & 7/8	14	.310	2.480	.642	.312	5	85019
7/8	14	.470	3.270	1.143	.500	5	85026
1/2	13	.310	2.480	.769	.312	5	85020
9/16	12	.370	2.840	.916	.375	5	85023
3/4	12	.470	3.270	1.167	.500	5	85027
5/8	11	.470	3.270	1.091	.500	5	85028
3/4	10	.470	3.270	1.100	.500	5	85029
1	8	.620	3.620	1.500	.625	6	85030

Note: Thread mills with shank diameter (D) less than 0.375" do not have flat on shank.  
Metric and pipe sizes begin on the next page.



### Solid Carbide ISO Metric Straight Flute Thread Mills

■ Series TMN Internal Threads



**D1 = Cutter Diameter**    **D = Shank Diameter**  
**L = Overall Length**    **L3 = Thread Length**

<b>P</b>	Steel
<b>M</b>	Stainless Steel
<b>K</b>	Cast Iron
<b>N</b>	Non-Ferrous
<b>S</b>	High-Temp Alloys
<b>H</b>	Hardened Materials

**Alternate Coatings Available.**  
 (Full package quantities only)



Standard Thread Size	D1	L	L3	D	Flutes	EDP Number
M4 x 0,7	.105	1.500	.248	.125	3	85125
M6 x 1	.160	1.650	.354	.187	3	85056
M12 x 1	.310	2.480	.787	.312	5	85060
M16 x 1	.470	3.270	1.181	.500	5	85127
M8 x 1,25	.200	2.250	.492	.250	3	85058
M10 x 1,5	.240	2.250	.590	.250	5	85059
M14 x 1,5	.370	2.840	.945	.376	5	85062
M18 x 1,5	.470	3.270	1.181	.500	5	85064
M12 x 1,75	.310	2.480	.758	.312	5	85061
M16 x 2	.370	2.840	.945	.375	5	85063
M18 x 2	.470	3.270	1.181	.500	5	85065
M24 x 3	.620	3.620	1.417	.625	6	85067

Note: Thread mills with shank diameter (D) less than 0.375" do not have flat on shank.

### Solid Carbide NPT and NPTF Straight Flute Thread Mills

■ Series TMX Internal or External Threads

Standard Thread Size	TPI	D1	L	L3	D	Flutes	EDP Number	
							NPT	NPTF
1/16 & 1/8	27	.240	2.250	.370	.250	5	85035	85040
1/4 & 3/8	18	.310	2.480	.555	.312	5	85036	85041
1/2 & 3/4	14	.470	3.270	.785	.500	5	85037	85042
1-2	11 1/2	.620	3.620	1.043	.625	6	85038	85043
2 1/2-6	8	.620	3.620	1.250	.625	6	85039	—
2 1/2-6	8	.745	4.100	1.500	.750	6	85098	—

Note: Thread mills with shank diameter (D) less than 0.375" do not have flat on shank.

### Solid Carbide NPSM Straight Flute Thread Mills

■ Series TMX Mechanical Internal Threads

Standard Thread Size	TPI	D1	L	L3	D	Flutes	EDP Number
1/16 & 1/8	27	.240	2.250	.550	.250	5	85045
1/4 & 3/8	18	.310	2.480	.555	.312	5	85046
1/2 & 3/4	14	.470	3.270	.785	.500	5	85047

Note: Thread mills with shank diameter (D) less than 0.375" do not have flat on shank.



# Indexable Thread Mills

## Solid Carbide Inserts

HIGH-PERFORMANCE TAPS

THREAD MILLS

PRODUCTION TAPS

MAINTENANCE TOOLS

GAGES

TECHNICAL INFORMATION & INDEX

## Indexable Thread Mill Inserts - UN Threads

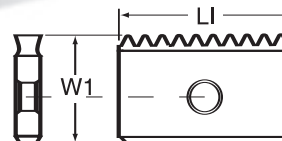
### Features/Benefits:

- one grade machines all materials
- precision ground inserts and milled pockets ensure accurate thread form alignment with 2 flute holders
- produce threads in materials up to 62 Rc hardness
- ground to CNC tolerances for exact repeatability
- positive cutting geometry
- chamfered side, secure locking in dovetail pocket
- single screw and fixed pocket design, no presetting
- 100% thread form geometry
- produces most accurate thread form in the industry

### Application Information:

- steel
- stainless steel
- cast iron
- non-ferrous materials

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials



L1 = Length of Insert    W1 = Width of Insert

### External UN Inserts

#### 14mm UN External

External TPI	LI	W1	EDP Number
32	.551	.295	85151
28	.551	.295	85152
24	.551	.295	85154
20	.551	.295	85155
18	.551	.295	85156
16	.551	.295	85157

#### 21mm UN External

External TPI	LI	W1	EDP Number
20	.827	.472	85170
18	.827	.472	85171
16	.827	.472	85172
14	.827	.472	85173
12	.827	.472	85174
10	.827	.472	85175
8	.827	.472	85176

### Internal UN Inserts

#### 14mm UN Internal

Internal TPI	LI	W1	EDP Number
40	.551	.295	85160
28	.551	.295	85162
24	.551	.295	85164
20	.551	.295	85165
18	.551	.295	85166
16	.551	.295	85167
14	.551	.295	85168
12	.551	.295	85169

#### 21mm UN Internal

Internal TPI	LI	W1	EDP Number
32	.827	.472	85146
20	.827	.472	85177
18	.827	.472	85178
16	.827	.472	85179
14	.827	.472	85180
12	.827	.472	85181
8	.827	.472	85183

#### 30mm UN Internal

Internal TPI	LI	W1	EDP Number
16	1.181	.630	85194
12	1.181	.630	85196
8	1.181	.630	85198
6	1.181	.630	85200

#### 40mm UN Internal

Internal TPI	LI	W1	EDP Number
16	1.575	.787	85214
4.5	1.575	.787	85221



## NPT Pipe Thread Inserts and NPTF (Dryseal)

Internal and External

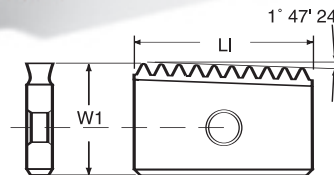
### Features/Benefits:

- one grade machines all materials
- precision ground inserts and milled pockets ensure accurate thread form alignment with 2 flute holders
- produce threads in materials up to 62 Rc hardness
- ground to CNC tolerances for exact repeatability
- positive cutting geometry
- chamfered side, secure locking in dovetail pocket
- single screw and fixed pocket design, no presetting
- 100% thread form geometry
- produces most accurate thread form in the industry

### Application Information:

- steel
- stainless steel
- cast iron
- non-ferrous materials

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials



L1 = Length of Insert    W1 = Width of Insert

### Internal or External NPT Inserts

#### 14mm NPT

TPI	LI	W1	EDP Number
18	.551	.295	85257
14	.551	.295	85258

#### 21mm NPT

TPI	LI	W1	EDP Number
18	.827	.472	85259
14	.827	.472	85260
12	.827	.472	85261

#### 30mm NPT

TPI	LI	W1	EDP Number
11 1/2	1.181	.630	85262
8	1.181	.630	85263

#### 40mm NPT

TPI	LI	W1	EDP Number
11 1/2	1.575	.787	85264
8	1.575	.787	85265

### Internal or External NPTF Inserts

#### 14mm NPTF

TPI	LI	W1	EDP Number
18	.551	.295	85266
14	.551	.295	85267

#### 21mm NPTF

TPI	LI	W1	EDP Number
18.0	.827	.472	85268
14.0	.827	.472	85269
11.5	.827	.472	85270

#### 30mm NPTF

TPI	LI	W1	EDP Number
11 1/2	1.181	.630	85271

#### 40mm NPTF

TPI	LI	W1	EDP Number
8	1.575	.787	85274



# Indexable Thread Mills

## Solid Carbide Inserts

HIGH-PERFORMANCE TAPS

THREAD MILLS

PRODUCTION TAPS

MAINTENANCE TOOLS

GAGES

TECHNICAL INFORMATION & INDEX

### ISO Metric Thread Mill Inserts - Internal

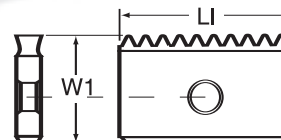
#### Features/Benefits:

- one grade machines all materials
- precision ground inserts and milled pockets ensure accurate thread form alignment with 2 flute holders
- produce threads in materials up to 62 Rc hardness
- ground to CNC tolerances for exact repeatability
- positive cutting geometry
- chamfered side, secure locking in dovetail pocket
- single screw and fixed pocket design, no presetting
- 100% thread form geometry
- produces most accurate thread form in the industry

#### Application Information:

- steel
- stainless steel
- cast iron
- non-ferrous materials

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials



LI = Length of Insert    W1 = Width of Insert

### Internal ISO Metric Inserts

#### 14mm ISO

Thread Pitch mm	LI	W1	EDP Number
1	.551	.295	85227
1,5	.551	.295	85228
2	.551	.295	85229

#### 21mm ISO

Thread Pitch mm	LI	W1	EDP Number
1	.827	.472	85236
1,5	.827	.472	85237
2	.827	.472	85238
3	.827	.472	85240
3,5	.827	.472	85241

#### 30mm ISO

Thread Pitch mm	LI	W1	EDP Number
1,5	1.181	.630	85248
2	1.181	.630	85249
3	1.181	.630	85251
4	1.181	.630	85253
4,5	1.181	.630	85254
5	1.181	.630	85255

## Indexable Thread Mill Holders

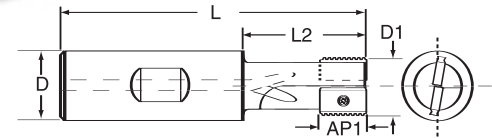
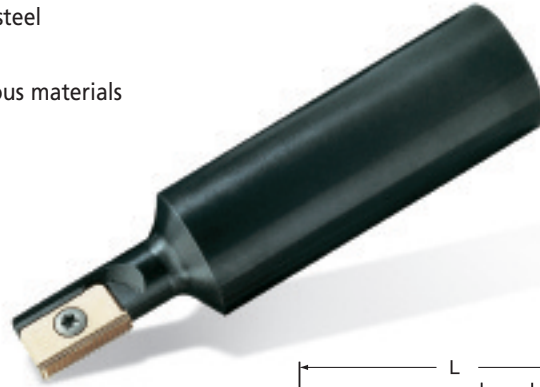
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

### Features/Benefits:

- available in one- and two-flute styles
- precision milled pockets align inserts for accurate thread form production
- holders available to produce threads from 48 UN to 3 threads per inch
- can mill threads in materials up to 62 Rc hardness
- produce course threads using minimal horsepower
- allow low cost thread production for small lot runs
- produce internal or external, right or left hand threads with same tool holder
- produce single or multiple lead threads
- control pitch diameter or size to within 0.0001"
- produce 100% thread form height to UN specifications

### Application Information:

- steel
- stainless steel
- cast iron
- non-ferrous materials



L = Overall Length    L2 = Useable Length  
D = Shank Diameter    D1 = Head Diameter  
AP1 = Insert Length

## Single Flute Indexable Thread Mill Holders

D1	D	L	L2	Flutes	AP1	Insert Screw	EDP Number
.450	.750	3.390	1.000	1	14mm	85113	85099*
.500	.750	3.000	.800	1	14mm	85113	85100
.500	.750	3.350	1.000	1	14mm	85113	85101
.540	.750	3.390	1.250	1	14mm	85113	85116*
.540	.750	3.000	.880	1	14mm	85113	85117
.540	.750	3.390	1.000	1	14mm	85113	85118
.670	.750	3.390	1.180	1	14mm	85113	85102
.700	.750	3.750	1.375	1	21mm	85114	85119*
.750	.750	3.750	1.575	1	21mm	85114	85103
1.140	1.000	4.370	1.968	1	30mm	85115	85104
1.730	1.500	6.000	3.070	1	40mm	85115	85105

\* For taper pipe thread inserts only.

## Two-Flute Indexable Thread Mill Holders

D1	D	L	L2	Flutes	AP1	Insert Screw	EDP Number
.790	.750	3.750	1.630	2	14mm	85113	85106
1.180	1.000	4.250	2.000	2	21mm	85114	85107
1.580	1.250	5.120	2.850	2	30mm	85114	85108
1.970	1.500	6.000	3.250	2	40mm	85114	85109

## Insert Screws For Indexable Thread Mill Holders

Wrench Size	External Thread Size	Description	EDP Number
T7	M2.5	M2,5 x 0,45 ISO x 6,35 OAL	85113
T20	M4	M4x0,7 ISO x 10,15 OAL	85114
T20	M5	M5 x 0,8 ISO x 12,25	85115

# Thread Mill Technical Information



## Starting Speeds and Feeds for Solid Thread Mills

HIGH-PERFORMANCE TAPS

THREAD MILLS

PRODUCTION TAPS

MAINTENANCE TOOLS

GAGES

TECHNICAL INFORMATION & INDEX

Feed (inches per tooth)  
Cutter Diameter (D1)

Material Group	Classification	Typical Grades	Thread Mill Type	SFM	Feed (inches per tooth)							
					1/8" (.125")	3/16" (.187")	1/4" (.250")	5/16" (.312")	3/8" (.375")	1/2" (.500")	3/4" (.750")	1" (1.000")
steel	plain carbon and low carbon up to 22RC	AISI/SAE 1005-1020, 1108-1119, 1213-1215, 1513-1518, 4012, 5015, 9310	PM Plus	250	.0007	.0012	.0015	.0018	.0020	.0030	.0040	.0050
			Solid Carbide	600	.0003	.0003	.0005	.0006	.0007	.0010	.0015	.0020
medium carbon and alloy steel	heat treatable carbon and alloy steel from 22 to 32 Rc	AISI/SAE 1025-1095, 1130-1151, 1330-1345, 1520-1572, 4023-4063, 4120-4161, 4320-4340	PM Plus	175	.0005	.0007	.0010	.0012	.0015	.0020	.0030	.0040
			Solid Carbide	575	.0003	.0003	.0005	.0006	.0007	.0010	.0015	.0020
medium carbon and alloy steel	heat treatable carbon and alloy steel from 32 to 42 Rc	AISI/SAE 1040-1095, 1130-1151, 1330-1345, 1520-1572, 4023-4063, 4120-4161, 4320-4340, 4620-4640, 8620-8660, 8740-8750, 6150, 51000, 52100	PM Plus *	—	—	—	—	—	—	—	—	—
			Solid Carbide	525	.0003	.0003	.0005	.0006	.0007	.0010	.0015	.0020
stainless steel	austenitic	301-304, 310, 316, 321, 347	PM Plus	100	.0005	.0007	.0008	.0012	.0015	.0020	.0030	.0040
			Solid Carbide	525	.0003	.0003	.0005	.0006	.0007	.0010	.0015	.0020
stainless steel	martensitic	403, 410, 416, 420, 430, 431, 440C	PM Plus	125	.0005	.0007	.0008	.0012	.0015	.0018	.0025	.0035
			Solid Carbide	550	.0003	.0003	.0005	.0006	.0007	.0010	.0015	.0020
stainless steel	precipitation hardening	15-5PH, 17-4PH, AM350, AM355, AM363, 13-8Mo, 14-8Mo	PM Plus	75	.0005	.0007	.0008	.0012	.0015	.0020	.0030	.0040
			Solid Carbide	300	.0003	.0003	.0005	.0006	.0007	.0008	.0012	.0018
nickel	nickel and nickel base alloys	Udimet 500 & 700	PM Plus *	—	—	—	—	—	—	—	—	—
			Solid Carbide	120	.0003	.0003	.0005	.0006	.0007	.0008	.0010	.0015
titanium	titanium and titanium alloys	commercially pure, 6AL-4V, 8AL-1Mo, 7AL-4M0	PM Plus *	—	—	—	—	—	—	—	—	—
			Solid Carbide	100	.0003	.0003	.0005	.0006	.0007	.0007	.0007	.0010
cast iron	gray malleable, ductile (nodular)	ASTM A48, A220, A436, A319, A536, A602, SAE J158 and J434	PM Plus	150	.0007	.0012	.0015	.0018	.0020	.0030	.0040	.0060
			Solid Carbide	600	.0003	.0003	.0006	.0007	.0008	.0010	.0015	.0020
non-ferrous	wrought and low Si cast aluminum, brass	2024, 6061, 356, 360	PM Plus	700+	.0010	.0015	.0020	.0025	.0030	.0040	.0060	.0080
			Solid Carbide	1700	.0003	.0003	.006	.0007	.0008	.0010	.0015	.0020

\* Not recommended for these materials.

Minimum feed rate for any thread mill is 0.0003" per flute. If severe conditions are present, first reduce feed per tooth, then reduce speed. The speeds & feeds shown are recommended as starting parameters only. Condition of material, machine rigidity, part fixturing, tool overhang, and material hardness should all be considered before attempting any machining operation.

For indexable thread mills, refer to chart for starting speeds only. Feed rate should start at 0.0015" per flute for cutting diameters less than 1.00". For diameters 1.00" and larger, 0.0020" is recommended. For all taper pipe threads, reduce speed and feed chart values by 30%.



# Thread Mill Technical Information

## Thread Mill Programming Request

HIGH-PERFORMANCE TAPS

THREAD MILLS

PRODUCTION TAPS

MAINTENANCE TOOLS

GAGES

TECHNICAL INFORMATION & INDEX

**Greenfield Tap and Die offers free programming assistance to users of any Greenfield thread milling product. If you are not familiar with thread milling, we highly recommend you complete the program request form below and fax it to 1-888-GFI-FAXX (1-888-434-3299) or 706-860-8559. The technical department will return a suggested CNC program.**

Distributor or End User Purchase Order: \_\_\_\_\_

End User Company: \_\_\_\_\_ Contact: \_\_\_\_\_

E-mail: \_\_\_\_\_ Telephone: \_\_\_\_\_ Fax: \_\_\_\_\_

Street Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Distributor: \_\_\_\_\_ Contact: \_\_\_\_\_

E-mail: \_\_\_\_\_ Telephone: \_\_\_\_\_ Fax: \_\_\_\_\_

Street Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

GTD Salesperson: \_\_\_\_\_ Extension: \_\_\_\_\_

Deliver Completed Program to: \_\_\_\_\_ End User \_\_\_\_\_ GTD Salesperson \_\_\_\_\_ Distributor

Delivery Method (choose one): \_\_\_\_\_ Via Fax \_\_\_\_\_ Via E-mail

### Specifications:

### CNC Machine Information:

### Tool Specification:

Thread Type: \_\_\_\_\_ Brand or Make: \_\_\_\_\_ Description: \_\_\_\_\_

RH/LH: \_\_\_\_\_ Model: \_\_\_\_\_

Thread Diameter: \_\_\_\_\_ Contoller Model: \_\_\_\_\_ EDP Number: \_\_\_\_\_

TPI or mm Pitch: \_\_\_\_\_ Milling Machine Tool Diameter: \_\_\_\_\_

Class of Thread (2B, 3B, 3A, 2A): \_\_\_\_\_ Lathe Number of Flutes: \_\_\_\_\_

Minimum Drill Depth: \_\_\_\_\_ Is machine capable of helical Interpolation? \_\_\_\_ Yes \_\_\_\_ No

Full Thread Required: \_\_\_\_\_ Maximum RPM: \_\_\_\_\_

Material: \_\_\_\_\_

Hardness: \_\_\_\_\_



# Thread Mill Technical Information

## Thread Mill Selection

HIGH-PERFORMANCE TAPS

THREAD MILLS

PRODUCTION TAPS

MAINTENANCE TOOLS

GAGES

TECHNICAL INFORMATION & INDEX

### *Choose the proper style of thread mill for your application.*

#### PM Plus™ HSS

- Smaller lot quantities, short runs
- Materials < 30 Rc hardness
- Spindle speed limited, especially for small sizes
- Lower tool cost

#### Indexable Carbide

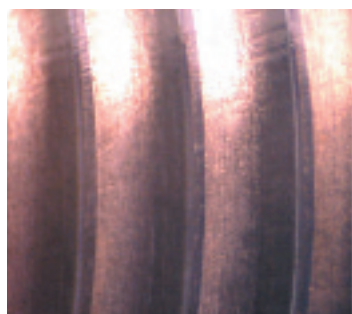
- Low production
- Harder materials
- Flexibility to mill a variety of threads per inch
- Thread sizes over 3/4"

#### Solid Carbide

- High speed, high production
- Hardened materials < 62 Rc
- Most efficient for small diameters
- Maximum tool life

### *Helical thread mills reduce chatter.*

In performance testing, helical flute thread mills outperformed conventional thread mills.



*The threads on the left were cut by a Greenfield helical thread mill, while the threads on the right were cut by a competitor's conventional thread mill. Notice the chatter on the competitor's workpiece. The helical tool was so quiet, the operator wasn't sure it was cutting!*

## THREADING: *Selecting Thread Mill Diameters*



When producing internal threads, selecting the right thread mill diameter is key to operating efficiency. Thread mills are usually offered in several cutting diameters for a given threads per inch (TPI).

Generally, for coarser pitches (coarser than 14 TPI), select a cutting diameter no larger than 70% of the nominal thread size to be produced. For finer pitches, the thread mill can be as large as 75% of the nominal diameter. Although the tool has radial clearances similar to end mills, if the tool diameter is too close to the thread diameter, the tool may rub and produce more heat, resulting in excessive wear. This rubbing may also distort the thread form affecting the thread angle.

When choosing a thread mill, it may not be necessary to use the largest one that will fit the hole. The larger diameter thread mill will minimize deflection, particularly on coarse thread series, but is more prone to rubbing and chip congestion. A smaller mill will remove more cubic inches of metal than a larger one, resulting in greater efficiency and productivity. There will be more clearance for the tool and more space for coolant and chips. However, for optimum results, the tool may need to rotate much faster than the capability of the machine. Also, the thread length of the tool may be too short for the thread depth required.