ADVENT TOOL, INC.

2008 ISO Metric Calalog

Advent® Tool and Manufacturing Inc.

The Thread Milling Specialists

Specializing in Solid and Replaceable Thread and Form Mill Tooling

call toll-free

1.800.THREAD4

or visit our website at

www.advent-threadmill.com

Mission Statement

It is the primary goal of Advent Tool & Manufacturing, Inc. to be the customer - needs driven, preferred, world class manufacturer / supplier of the finest quality thread milling / form milling / specialty milling systems and solutions, to the machining, metalworking, and manufacturing industry, for the next millennium.

Welcome to 2008

Thread Milling is no longer a black art and Helical Interpolation is now included as a standard feature within your machine control. High performance form milling is now within your reach.

Advent Tool & Manufacturing is pleased to offer the finest, proven and well-engineered form milling tooling in the industry. Made by craftspeople for craftspeople, we feel our tools are so well made that the only regret you'll have buying our mills is that you'll eventually have to use them instead of displaying them!!!

ADVENT TOOL CATALOG 2008
ISO METRIC
Table of Contents

Select the Proper Thread Mill For Your Application

Choose an Advent Thread Mill that best fits your application. Consider the number of parts being made. For a large production run where cycle times are of the utmost importance, a multi-flute thread mill would be your best choice for speed and thread quality. Also consider the diameter of the thread form being cut along with the length of the form and the pitch. The machine tool holders should also be considered so as not to choose too large of a thread mill in relation to your holder. Keep in mind that the thread mill must fit inside the minor diameter of your thread form. In most cases the first two numbers of our tools represents the smallest thread form that it is able to cut, always check for the cutter diameter in the catalog to ensure proper clearance. Also, note the ST and the OS notations in the catalog, it states the tool diameter with the deeper form, which requires a larger insert. This may indicate that you require the smaller tool holder so as to fit into the minor diameter. If you should need any assistance in selecting a thread mill for your application answer the questions on our request form in catalog and fax it to us at (847) 549-9714 or give us a call at (800) THREAD-4 *(800-847-3234)* or (847) 549-9737 and ask for technical assistance.

ADVENT TOOL

Replaceable Insert Thread Mill Designation

1	2	3	4	5
105	**– TA –**	**50**	**– F3 –**	**9**

Column 1: Minimum Size Thread with Standard Pitch Inserts

12 = 12,0 mm
20 = 20,0 mm
25 = 25,0 mm
32 = 32,0 mm
40 = 40,0 mm
50 = 50,0 mm

Column 3: TA - Weldon Shank Replaceable Insert Thread Mill

Column 3: Tool Weldon Shank Size

12 = Shank Ø 12,0 mm
20 = Shank Ø 20,0 mm
25 = Shank Ø 25,0 mm
32 = Shank Ø 32,0 mm
40 = Shank Ø 40,0 mm
50 = Shank Ø 50,0 mm

Column 4: Number of Flutes

F2 = 2 Flutes Tool
F3 = 3 Flutes Tool
F4 = 4 Flutes Tool
F5 = 5 Flutes Tool
F6 = 6 Flutes Tool
F8 = 8 Flutes Tool
F10 = 10 Flutes Tool
F12 = 12 Flutes Tool
F14 = 14 Flutes Tool
F16 = 16 Flutes Tool
F20 = 20 Flutes Tool
F24 = 24 Flutes Tool

Column 5: Tool Length Weldon Shank Tools: Over All Length (OAL) (Extended Length Tools only)

9 = 9" OAL - Extended Length Tool

TECH TIP:

Minimum size threads are, by default, listed in this catalog to 'standard pitch inserts.' Please keep this in mind when picking an Advent Tool; especially for your I.D. thread form. Too large a cutter diameter relative to the minor diameter of your thread form will have adverse effects on every aspect of your thread/form milling operation(s).

For example, a #125-TA-78-F3 tool (see page 3, right) loaded with 12 pitch inserts has a cutter diameter of 24.62mm. The same tool loaded with 8 pitch (or even tapered form inserts) has a cutter diameter of 27.92mm! In cases like these, with your minor diameter in mind, you may opt to choose a smaller diameter Advent Tool: But by all means contact us or your local representative for guidance!

MINIMUM SIZE THREADS

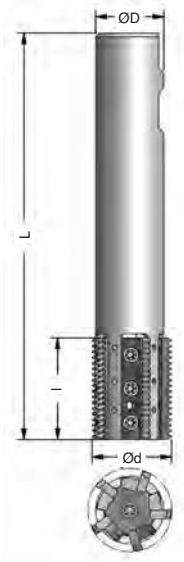
ADVENT TOOL

Replaceable Insert Thread Mills, Metric Shank

† Standard Pitches **ST** *40UN - 10UN And M1.0 - M2.75*

Oversized Inserts **OS** *Cover All Large Pitches: 9UN - 4UN, M3.0 and Up, And All Tapered Forms*

- Through Coolant
- Hardened and CNC Ground
- Standard Weldon Shanks
- Additional Option (SEE BELOW)



Dimensions in mm

**Min I.D. Thread Metric*	*Tool Number*	*Cutter Diameter (d)*		*Insert Number*	*Length of Cut (l)*	*Number of Flutes*	*Tool (L) Length*	*Shank (D) Diameter*
		Standard	*Oversice*					
M22	**EM22-TA-12-F2**	17.78	20.83	ATM-38A	25	2	102	12
M24	**EM24-TA-20-F2** **EM24-TA-20-F2-6**	19.05	22.10	ATM-38A	25	2	102 152	20
M27	**EM27-TA-20-F3** **EM27-TA-20-F3-9**	21.44	24.49	ATM-38B	38	3	102 229	20
M33	**EM33-TA-20-F3** **EM33-TA-20-F3-9**	24.64	27.94	ATM-410A	38	3	108 229	20
M35	**EM35-TA-25-F4** **EM35-TA-25-F4-7** **EM35-TA-25-F4-9**	29.97	33.27	ATM-410A	38	4	114 178 229	25
M39	**EM39-TA-25-F5** **EM39-TA-25-F5-9**	30.99	34.29	ATM-410A	38	5	114 229	25
M45	**EM45-TA-32-F5** **EM45-TA-32-F5-9**	37.34	40.64	ATM-410A	38	5	114 229	32
M52	**EM52-TA-32-F6** **EM52-TA-32-F6-9**	43.69	46.99	ATM-410A	38	6	127 229	32
M64	**EM64-TA-32-F8** **EM64-TA-32-F8-9**	53.85	57.15	ATM-410A	38	8	127 229	32
M76	**EM76-TA-40-F12** **EM76-TA-40-F12-9**	66.55	69.85	ATM-410A	38	12	152 229	40
M90	**EM90-TA-40-F14** **EM90-TA-40-F14-9**	79.25	82.55	ATM-410A	38	14	152 229	40
M105	**EM105-TA-50-F16** **EM105-TA-50-F16-12**	91.95	95.25	ATM-410A	38	16	178 305	50
M130	**EM130-TA-50-F20** **EM130-TA-50-F20-12**	117.35	120.65	ATM-410A	38	20	229 305	50
M160	**EM160-TA-50-F24**	142.11	145.42	ATM-410A	38	24	279	50

*** SEE TECH TIP on Page 2**

Option -

1) *Round shank only available for hydraulic and shrink fit applications.*

Replacement Parts

Tool Number	*Locating Pin** Locating Disk*	*Wedge*	*Torx Screw*	*Torx Plus Screw*
** **EM22-TA-12-F2**	** ATM-PIN78F2	ATM-38AWN	PT464	PT464-8IP
** **EM24-TA-20-F2**	** ATM-PIN01F2	ATM-38AWN	PT464	PT464-8IP
** **EM27-TA-20-F3**	** ATM-PIN01F3	ATM-38BWN	PT464	PT464-8IP
EM33-TA-20-F3	ATM-125LD	ATM-410WS	PT483S	PT483S-15IP
EM35-TA-25-F4	ATM-138LD	ATM-410WS	PT483T	PT483T-15IP
EM39-TA-25-F5	ATM-150LD	ATM-410WS	PT483T	PT483T-15IP
EM45-TA-32-F5	ATM-175LD	ATM-410WS	PT483T	PT483T-15IP
EM52-TA-32-F6	ATM-200LD	ATM-410WL	PT483T	PT483T-15IP
EM64-TA-32-F8	ATM-250LD	ATM-410WL	PT483T	PT483T-15IP
EM76-TA-40-F12	ATM-300LD	ATM-410WL	PT483T	PT483T-15IP
EM90-TA-40-F14	ATM-350LD	ATM-410WL	PT483T	PT483T-15IP
EM105-TA-50-F16	ATM-400LD	ATM-410WL	PT483T	PT483T-15IP
EM130-TA-50-F20	ATM-500LD	ATM-410WL	PT483T	PT483T-15IP
EM160-TA-50-F24	ATM-600LD	ATM-410WL	PT483T	PT483T-15IP

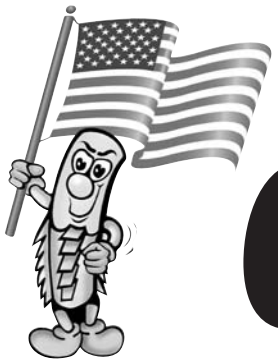
** Version of the tools with locating pin

Ordering Information

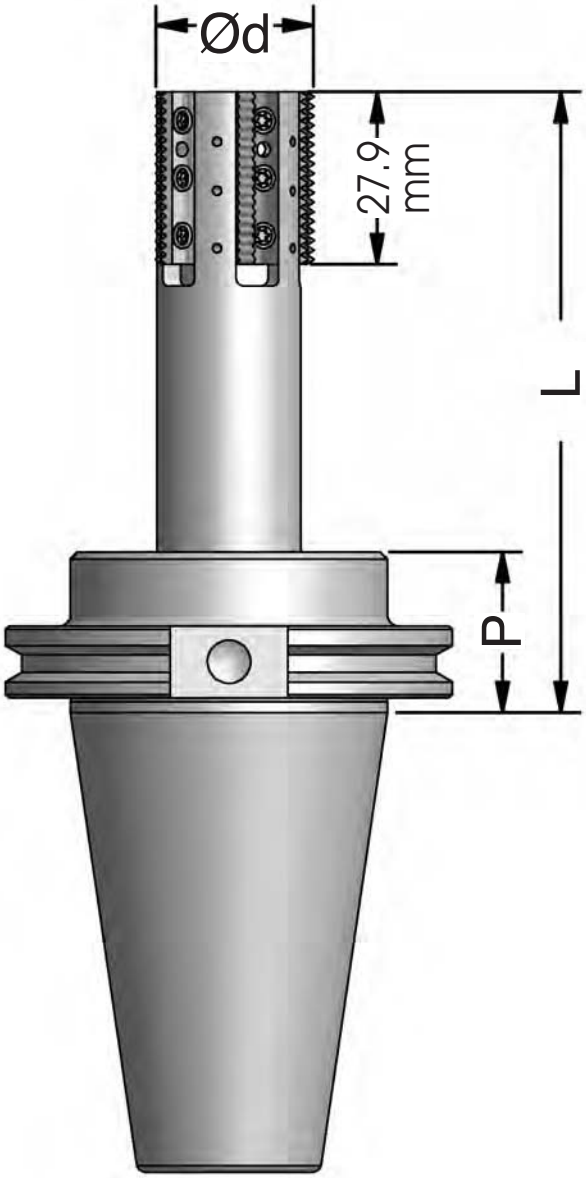
When ordering an Advent Replaceable Insert Thread Mill, always check minor diameter of hole, then compare appropriate diameter of Tool (dependent upon thread pitch chosen) with size of hole to check for proper clearance.

Ordering Sample:

To cut a M33 x 1.5 - Tool #:
EM33-TA-20-F3*, with insert # ATM-410A 1.5mm*
To cut a M42 x 4.5 - Tool #:
EM33-TA-20-F3*, with insert # ATM-410A 4.5mm*
EM35-TA-25-F4*, with insert # ATM-410A 4.5mm*



"Advantage" Custom V/Flange



Create your own custom integral shank "V" flange Threadmill, using our ***Advantage Custom "V" Flange*** system.

Simply complete the form below, fax a copy to **847/549-9714**, or email us at info@Advent-Threadmill.com and we will create a quotation for price and delivery of your custom tool.

TAPER SIZE _____

DIAMETER (d) _____

GAUGE LENGTH (L) _____

PROJECTION (P) _____
Specify or use standard 1.38"

OTHER INFORMATION _____

_____

_____

**** BT, ISO, HSK available upon request***

ADVENT TOOL

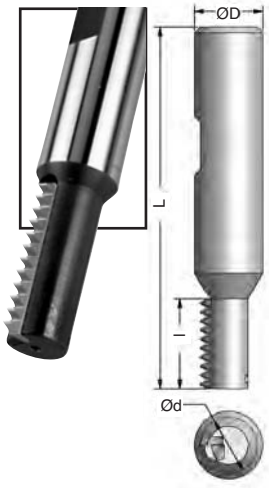
Single Flute Replaceable Insert Thread Mills

- Economical Alternative for Short Run Jobs
- Uses Standard Advent Inserts
- Hardened Tool Steel Body
- Additional Options (SEE BELOW)

† Standard Pitches **ST** *40UN - 10UN And M1.0 - M2.75*

Oversized Inserts **OS** *Cover All Large Pitches: 9UN - 4UN, M3.0 and Up, And All Tapered Forms*

Round shank only is available for hydraulic and shrink fit applications.



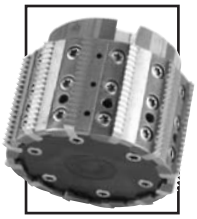
Standard Form, Metric Shank

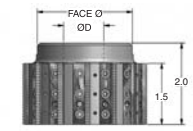
Dimensions in mm

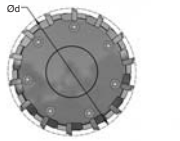
**Min I.D. Thread Metric*	*Tool Number*	*Cutter Diameter†(d) Standard*	*Cutter Diameter†(d) Oversize*	*Insert Number*	*Length of Cut (l)*	*Tool (L) Length*	*Shank (D) Diameter*
M12	**EM12-TA-12**	8.89 mm	N/A	ATM-83A	19 mm	76 mm	12
M15	**EM15-TA-12**	11.43 mm	N/A	ATM-83T	19 mm	89 mm	12
M20	**EM20-TA-20**	15.88 mm	19.05 mm	ATM-38A	25 mm	102 mm	20
M24	**EM24-TA-20**	19.05 mm	22.10 mm	ATM-38B	38 mm	114 mm	20
M27	**EM27-TA-25**	21.44 mm	24.49 mm	ATM-38B	38 mm	114 mm	25
M33	**EM33-TA-25**	24.64 mm	27.94 mm	ATM-410A	38 mm	114 mm	25

NPT Form, Metric Shank

**Min I.D. Thread NPT*	*Tool Number*	*Cutter Diameter†(d) Oversize*	*Insert Number*	*Length of Cut (l)*	*Tool (L) Length*	*Shank (D) Diameter*
1/4", 3/8" - 18NPT	**14-TA-12MMNPT**	10.80 mm	ATM-83A	19 mm	76 mm	12
1/2", 3/4" - 14NPT	**12-TA-20MMNPT**	17.53 mm	ATM-38A	25 mm	102 mm	20
3/4" - 14NPT, 1" - 11.5NPT	**EM24-TA-20**	22.10 mm	ATM-38B	38 mm	114 mm	20
1"-11.5NPT	**EM27-TA-25**	24.49 mm	ATM-38B	38 mm	114 mm	25
1-1/4"-11.5NPT	**EM33-TA-25**	27.94 mm	ATM-410A	38 mm	114 mm	25







Shell Mill Replaceable Insert Thread

- 1.5" Length of Cut
- Through Coolant Holders Available
- Fits Standard Shell Mill Adaptors
- 2.0" Overall Length
- Additional Option (SEE BELOW)

All Shell Mill Tools Use ***ATM-410A*** Insert

Dimensions in mm

**Min I.D. Thread Metric*	*Tool Number*	*Cutter Diameter†(d) Standard*	*Cutter Diameter†(d) Oversize*	*Face Diameter*	*Number of Flutes*	*Hole Diameter (D)*	*Slot Width*
M64	**SMEM64TA-F12**	53.85 mm	57.15 mm	48.22	8	16 mm	8
M76	**SMEM76TA-F12**	66.55 mm	69.85 mm	50.76	12	22 mm	10
M90	**SMEM90TA-F14**	79.25 mm	82.55 mm	60.28	14	27 mm	12
M105	**SMEM105TA-F16**	91.95 mm	95.25 mm	60.28	16	27 mm	12

*** SEE TECH TIP on Page 2**

* Concentricity of cutters is subject to quality of tool holder used.

* For non-coolant thru applications specify "LDH" locating discs with thru hole.

Option - 1) *Round shank only without flat for hydraulic and shrink fit applications.*

Replacement Parts

Tool Number	*Locating Disk*	*Wedge*	*Torx Screw*	*Torx Plus Screw*
EM12-TA-12			PT464	PT464-8IP
EM15-TA-12			PT464	PT464-8IP
EM20-TA-20	ATM-PIN34F1	ATM-38AWN	PT464	PT464-8IP
EM24-TA-20	ATM-PIN78F1	ATM-38BWN	PT464	PT464-8IP
EM27-TA-25	ATM-PIN01F1	ATM-38BWN	PT464	PT464-8IP
EM33-TA-25	ATM-PIN125F1	ATM-410WS	PT483T	PT483T-15IP

Tool Number	*Locating Disk*	*Wedge*	*Torx Screw*	*Torx Plus Screw*
14-TA-12MMNPT			PT464	PT464-8IP
12-TA-20MMNPT	ATM-PIN12NPTF1	ATM-38AWN	PT464	PT464-8IP
SMEM64TA-F8	ATM-250LD	ATM-410WL	PT483T	PT483T-15IP
SMEM76TA-F12	ATM-300LD	ATM-410WL	PT483T	PT483T-15IP
SMEM90TA-F14	ATM-350LD	ATM-410WL	PT483T	PT483T-15IP
SMEM105TA-F16	ATM-400LD	ATM-410WL	PT483T	PT483T-15IP

ADVENT TOOL

Solid Carbide Form and Cam Ground Replaceable Inserts

ATM38A - ATM410A

Special and Standard Form Introduction

Long known for thread milling, Advent Tool & Manufacturing has established themselves as leader in the field with patentable technologies, precision ground tools and stable milling platforms. But we have always known that threads are simply a form, nothing more and nothing less. Over the past three years we have developed and perfected a range of milling products somewhat outside of the box; but still using our current line of toolholders — sometimes with small modifications.

If you have a medium to long run of workpieces and need to reduce cycle time and increase throughput, copy and fill out the form on the inside of the 2008 catalog and send us a part print and specs on your machine tool(s). We have engineers standing by to duplicate your form on our platform. Your production rates will never be the same again!

Insert 1

This is one of our 410A class skipped tooth inserts. Designed for tougher materials with coarser pitches and/or longer thread depths, this design helps reduce side load pressure on the tool and spindle, ensuring better finish and longer tool life.

Insert 2

A newer design, this insert is for face and bottom finish milling. This double ended insert was designed to be flipped over in the pocket (for two cutting edges per insert) and with a .040" corner radius. Used in conjunction with our mill bodies suited to this type of milling, we provide a completely ground indexable cutting tool with more inserts in the cut than any other design on the market. Tool life, finish and part quality are greatly enhanced with precision tools of this type. Combined with wiper designs, what surface finish, exactly, would you like?

Insert 3

In production for two years now, this design has two identical forms due to the length of the insert. The workpiece milled here is the inside of the ear of a drive shaft yoke. With one end, we circular interpolate the front chamfer, groove and back chamfer, all in one pass. When the workpiece indexes, the other end of the insert goes to work — evening out wear. Tool changes and cycle time were drastically decreased and tool life tripled.

Insert 4

This is a prime example of a special form. This insert, used with a shell mill body replaced a broaching operation on ductile iron parts. Due to the precision ground structure of the mill body, the insert and the way it is located, tracking of the inserts (14 in 2.5" Diameter in this case) was dead on. With that platform, one body roughs and one body finishes the parts. We can't print the tool life here as it might be regarded as a typo!

Insert 5

An Advent Tool classic! 8NPT form in our 410A class insert. Why a classic? It is within our top 5 selling inserts. Why? We get the whole NPT thread depth in one pass. Drill a straight hole, use our body and this tapered insert and you are done!

Insert 6

Once a special, this 410A class insert is now a standard. This 8 Pitch Buttress thread form is becoming more and more common. Advent Tool has them in stock!

Insert 7

A real problem solver. Face milling up against a short shoulder with .040" corner radius and a 30° chamfer on another shoulder. This double ended 410A class insert is actually combined in one cutter body with three (3) other inserts to do a multitude of operations; all with one tool change and a lot of flutes in the cut to balance the tool. Oh yes, we also made this tool to fit the popular Kaiser CKB/CKS modular tooling system.

Insert 8

An example of one of our standard 410A class inserts. 1.5" long, it's sole purpose is to mill 6UN thread forms time and time again. Available in several forms, including positive rake, cam ground or form ground, we have the insert available for whatever material your workpiece is made of.

Insert 9

A double ended 410A class insert like no other. Designed to chamfer a 45 degree shoulder in the bottom of a bore, mill a special groove, and chamfer/mill the backside of a bore, this tool was designed in conjunction with other inserts to reduce tool changes and increase throughput. Completely precision ground, the inserts track perfectly due to our patented tool design and benefit from coolant through designed toolholders. Not designed to alter the minor diameter of the bore, through circular interpolation this tool puts in the final form.

Insert 10

Did we mention Metric thread forms? We've got it. This 410A class insert is for an internal thread. All of our inserts are available in a multitude of pitches; standard and not yet thought of!

Insert 11

A modified ATM38A class insert, with 1.0" length of cut. Inspired by the frustrations of one of our customers with multiple radii callouts on his print, this insert is held at 45 degree to the work piece and allows corner chamfering or any of 7 different radii to be milled on the corner of the workpiece. With a drawing of where the centers are, you can mill 5/32" to 1/32" in one setup!

Insert 12

Lots of our competitors market inserts that are useable on both sides; but one of the major failure modes with inserts is losing teeth in materials that tend to vary over time (i.e. castings). When you lose teeth with any insert, you are effectively finished with that insert (or load of inserts). With our design (given a short thread length) we have a real "flippable" insert — with two real cutting edges!

ADVENT TOOL

Indexable Tool Available Formats

Special and Standard Form Introduction

While we wish our standard platforms could be every thing to every application, every once in a while a new platform has to be created to achieve the right throughput. Below are several examples of tools that were a work in process and some of them may well become standards in the near future based on their initial success!

Face Grooving Tool

This tool was created to mill a specific form on top of a connecting rod for a combustion engine. The mating form was generated on the cap in order to facilitate a perfect mate; and precluding any shifting between the two surfaces. The form was generated by plunging in the Z-Axis down onto the part.

Stubby Tool - ATM-38A Inserts

Lots of our customers really appreciate the fact that we have long inserts available for their threading applications. But what about those customers that have short threads? Enter the 1.0" long insert in larger bodies for short threads. With this tool we now have more inserts in the cut, standard inserts and a short, stubby tool to cut short thread forms with.

Face and End Milling Tool

Utilizing a modified shell mill from our standard stock, this face mill has coolant through down at the bottom corners. See Insert 2 (left) for details. The insert locating pin is further down in the body facilitating the "flippable" design. These types of tools have been in ductile iron applications for years and work very well for finish milling of various surfaces in a large variety of applications. As everything, including the inserts and tool bodies are ground, tool life is exceptional.

Adjustable Insert Face Grooving Tool, Shell Mill Mount

Using Advent 410 Inserts, this tool is used by plunging into the workpiece in the Z Axis only. Pipe flanges in industry vary widely in diameter, so this tool is designed for some compensation in mind. If you look closely you can see how the wedge and the insert can be moved away from the tool centerline for different part arrangements. Using inserts with your specific form in mind, getting surfaces and gaskets to seal the first time is now within reach.

Combination Tool

Every week, we get a call for tools exactly like this. Smaller thread form further inside a bore, with another thread form in the same bore or nearby! Need we say more?

Double Sided Insert Tool

Similar to Stubby Tool (middle left), the main difference is that this tool has "flippable" inserts for short threads, rather than shorter inserts. The main advantage? See Insert 12 (left) for details. These 410A class inserts have much more mass and are much more durable than the rest. Besides, unlike our competition, if you chip one tooth, you really have another edge that is useable! So much for the "flippable" inserts brand X and Y have!

ADVENT TOOL

Threadmill Insert Designation

1			2		3		4		5	6
A	**T**	**M**	**–**	**4**	**1**	**0**	**A**	**8**	**N**	**P**	**T**	**P**	**C**

Column 1: ***ATM*** = Standard Insert Form
SATM = Special Form

Column 2: Insert Size

83A = 2.11 mm Insert Thickness
19.04 mm Insert Length

83T = 2.11mm Insert Thickness
19.04 mm Insert Length

38A = 2.36 mm Insert Thickness
28.56 mm Insert Length

38B = 2.36 mm Insert Thickness
38.07 mm Insert Length

410A = 3.30 mm Insert Thickness
38.07 mm Insert Length

Column 3: Thread per Inch

Specify Thread Pitch.
Example ***8*** = 8 Pitch
1.5MM = 1.5mm Pitch

Column 4: Thread Form

Standard Thread Form for
Internal and External Threads
A = External Thread Form ONLY
B = Internal Thread Form ONLY
NPT = NPT Standard Taper Pipe Thread Form
NPTF = NPTF Dryseal Taper Pipe Thread Form
NH = National Hose Thread Form
NPSF = Straight Dryseal Pipe Thread Form
NPSM = Straight Pipe for Mechanical Joints
FA = Full Acme Thread Form
SA = Stub Acme Thread Form
API = API Round Thread Form
BSP = BSP British Standard Pipe Thread Form
BSPT = BSPT British Standard Taper Pipe Thread Form
MM = Metric Thread Form
E2 = One Skipped Tooth

Column 5: Rake Angle

"-" = Neutral Rake Angle

CR = Cam Ground - Good insert form recommended for harder workpieces, including high temperature alloys, M2 and D2. By "Rounding"the relief of the form of the insert, less chipping and cracking occurs as the insert becomes stronger due to greater mass behind the cutting edge of the insert.

P = Positive - Recommended for non-ferrous or gummy materials, like 1018 steel or 318 stainless. By producing an insert form with a positive shearing action, a freer cut is produced, providing for lower horsepower consumption and less application sensitivity.

Column 6: Coating

"-" = Uncoated

C = TIN - General purpose, 'Gold' coating. Recommended for straightforward applications where adequate flood coolant is available.

Y = TICN - General purpose, 'Blue Grey' coating. Highly recommended for flood and coolant through applications and slightly harder than TiN coating.

Z = Futura / TiALN - "Violet" color high heat coating. Recommended for cutting in abrasive and difficult to machine materials. Harder yet than TiCN, this coating works best in applications where high heat is generated in the cut. Otherwise, we recommend TiCN coating.

X = Hard Lube - "Dark Grey" color coating for high heat applications. Recommended for dry cutting conditions in tough materials and where long chips are generated.

V = X.treme - "Violet-Grey" color coating that is the hardest coating available. Recommended for high heat, dry cutting conditions in tough materials.

NON-STOCK COATINGS
available
in 10 days

Ordering Examples:

ATM-410A12PC

12 pitch UN form with 5 degree positive rake & TiN coating

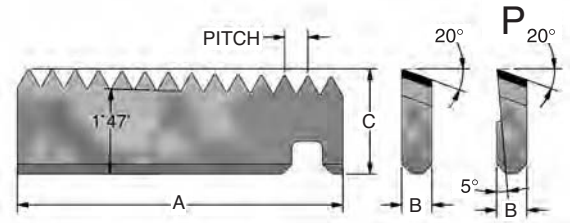
ATM-38B11.5NPTFZ

11.5 pitch NPTF form with TiALN coating

ADVENT TOOL

Solid Carbide Form Ground Replaceable Inserts

National Taper Pipe (NPT) Threads



Dimensions in mm

Insert Number	*Pitch*	*Flank Angle*	*Measurements*			*Clearance Angle*	*Coatings Available***				
			A	B	C		C	Z	Y	X	V
							TiN	TiAlN	TiCN	Hard Lube	Xtreme
ATM-83A27NPT	27NPT	60	19.0	2.11	6.35	10	X	O	O	O	O
ATM-83A18NPT	18NPT	60	19.0	2.11	6.35	10	X	O	O	O	O
ATM-38A27NPTCR	27NPT	60	25.4	2.36	7.87	10	X	O	O	O	O
ATM-38A27NPTCRP	27NPT	60	25.4	2.36	7.87	10	X	O	O	O	O
ATM-38A18NPT*	18NPT	60	25.4	2.36	7.87	20	X	O	O	O	O
ATM-38A18NPTP*	18NPT	60	25.4	2.36	7.87	20	X	O	O	O	O
ATM-38A14NPT*	14NPT	60	25.4	2.36	7.87	20	X	X	O	O	O
ATM-38A14NPTP*	14NPT	60	25.4	2.36	7.87	20	X	O	O	O	O
ATM-38A115NPT*	11.5NPT	60	25.4	2.36	7.87	20	X	X	O	O	O
ATM-38A115NPTP*	11.5NPT	60	25.4	2.36	7.87	20	X	O	O	O	O
ATM-38B18NPT*	18NPT	60	38.07	2.36	7.87	20	X	O	O	O	O
ATM-38B18NPTP*	18NPT	60	38.07	2.36	7.87	20	X	O	O	O	O
ATM-38B14NPT*	14NPT	60	38.07	2.36	7.87	20	X	X	O	O	O
ATM-38B14NPTP*	14NPT	60	38.07	2.36	7.87	20	X	O	O	O	O
ATM-38B115NPT*	11.5NPT	60	38.07	2.36	7.87	20	X	X	O	O	O
ATM-38B115NPTP*	11.5NPT	60	38.07	2.36	7.87	20	X	O	O	O	O
ATM-38B8NPT*	8NPT	60	38.07	2.36	7.87	20	X	X	O	O	O
ATM-38B8NPTP*	8NPT	60	38.07	2.36	7.87	20	X	O	O	O	O
ATM-410A18NPT*	18NPT	60	38.07	3.30	9.52	20	X	X	O	O	O
ATM-410A18NPTP*	18NPT	60	38.07	3.30	9.52	20	X	O	O	O	O
ATM-410A14NPT*	14NPT	60	38.07	3.30	9.52	20	X	X	O	O	O
ATM-410A14NPTP*	14NPT	60	38.07	3.30	9.52	20	X	O	O	O	O
ATM-410A115NPT	11.5NPT	60	38.07	3.30	9.52	20	X	X	O	O	O
ATM-410A115NPTP	11.5NPT	60	38.07	3.30	9.52	20	X	O	O	O	O
ATM-410A115NPTCR	11.5NPT	60	38.07	3.30	9.52	10	X	X	O	O	O
ATM-410A115NPTCRP	11.5NPT	60	38.07	3.30	9.52	10	X	O	O	O	O
ATM-410A8NPT	8NPT	60	38.07	3.30	9.52	20	X	X	O	O	O
ATM-410A8NPTP	8NPT	60	38.07	3.30	9.52	20	X	O	O	O	O
ATM-410A8NPTCR	8NPT	60	38.07	3.30	9.52	10	X	X	O	O	O
ATM-410A8NPTCRP	8NPT	60	38.07	3.30	9.52	10	X	O	O	O	O

* CR Style Insert Upon Request

** For Coatings: **X** - Stocked Coating, **O** - Not stocked, Call for delivery

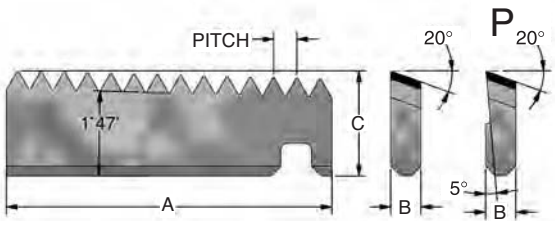
for Insert ATM-83A_NPT use Tool Holder 14-TA-12NPT or 14-TA-12MMNPT only

NON-STOCK COATINGS
available in 10 days

ADVENT TOOL

Solid Carbide Form Ground Replaceable Inserts

Dryseal Pipe (NPTF) Threads



Dimensions in mm

Insert Number	*Pitch*	*Flank Angle*	*Measurements*			*Clearance Angle*	*Coatings Available***				
			A	B	C		C	Z	Y	X	V
							TiN	TiAlN	TiCN	Hard Lube	Xtreme
ATM-83A27NPTF	27NPTF	60	19.0	2.11	6.35	10	X	O	O	O	O
ATM-83A18NPTF	18NPTF	60	19.0	2.11	6.35	10	X	O	O	O	O
ATM-38A27NPTFCR	27NPTF	60	25.4	2.36	7.87	10	X	O	O	O	O
ATM-38A27NPTFCRP	27NPTF	60	25.4	2.36	7.87	10	X	O	O	O	O
ATM-38A18NPTF*	18NPTF	60	25.4	2.36	7.87	20	X	O	O	O	O
ATM-38A18NPTFP*	18NPTF	60	25.4	2.36	7.87	20	X	O	O	O	O
ATM-38A14NPTF*	14NPTF	60	25.4	2.36	7.87	20	X	X	O	O	O
ATM-38A14NPTFP*	14NPTF	60	25.4	2.36	7.87	20	X	O	O	O	O
ATM-38A115NPTF*	11.5NPTF	60	25.4	2.36	7.87	20	X	X	O	O	O
ATM-38A115NPTFP*	11.5NPTF	60	25.4	2.36	7.87	20	X	O	O	O	O
ATM-38B18NPTF*	18NPTF	60	38.07	2.36	7.87	20	X	O	O	O	O
ATM-38B18NPTFP*	18NPTF	60	38.07	2.36	7.87	20	X	O	O	O	O
ATM-38B14NPTF*	14NPTF	60	38.07	2.36	7.87	20	X	X	O	O	O
ATM-38B14NPTFP*	14NPTF	60	38.07	2.36	7.87	20	X	O	O	O	O
ATM-38B115NPTF*	11.5NPTF	60	38.07	2.36	7.87	20	X	X	O	O	O
ATM-38B115NPTFP*	11.5NPTF	60	38.07	2.36	7.87	20	X	O	O	O	O
ATM-38B8NPTF*	8NPTF	60	38.07	2.36	7.87	20	X	X	O	O	O
ATM-38B8NPTFP*	8NPTF	60	38.07	2.36	7.87	20	X	O	O	O	O
ATM-410A18NPTF*	18NPTF	60	38.07	3.30	9.52	20	X	X	O	O	O
ATM-410A18NPTFP*	18NPTF	60	38.07	3.30	9.52	20	X	O	O	O	O
ATM-410A14NPTF*	14NPTF	60	38.07	3.30	9.52	20	X	X	O	O	O
ATM-410A14NPTFP*	14NPTF	60	38.07	3.30	9.52	20	X	O	O	O	O
ATM-410A115NPTF	11.5NPTF	60	38.07	3.30	9.52	20	X	X	O	O	O
ATM-410A115NPTFP	11.5NPTF	60	38.07	3.30	9.52	20	X	O	O	O	O
ATM-410A115NPTFCR	11.5NPTF	60	38.07	3.30	9.52	10	X	X	O	O	O
ATM-410A115NPTFCRP	11.5NPTF	60	38.07	3.30	9.52	10	X	O	O	O	O
ATM-410A8NPTF	8NPTF	60	38.07	3.30	9.52	20	X	X	O	O	O
ATM-410A8NPTFP	8NPTF	60	38.07	3.30	9.52	20	X	O	O	O	O
ATM-410A8NPTFCR	8NPTF	60	38.07	3.30	9.52	10	X	X	O	O	O
ATM-410A8NPTFCRP	8NPTF	60	38.07	3.30	9.52	10	X	O	O	O	O

* CR Style Insert Upon Request

** For Coatings: **X** - Stocked Coating, **O** - Not stocked, Call for delivery

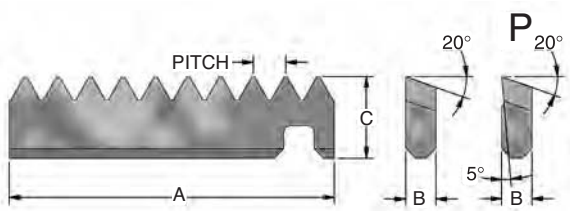
for Insert ATM-83A_NPTF use Tool Holder 14-TA-12NPT or 14-TA-12MMNPT only

NON-STOCK COATINGS
available in 10 days

ADVENT TOOL

Solid Carbide Form Ground Replaceable Inserts

National Straight Pipe (NPS) Threads



Dimensions in mm

Insert Number	*Pitch*	*Flank Angle*	*Measurements*			*Clearance Angle*	*Coatings Available***				
			A	B	C		C	Z	Y	X	V
							TiN	TiAIN	TiCN	Hard Lube	Xtreme
ATM-83A27NPS	27NPS	60	19.0	2.11	6.35	10	X	O	O	O	O
ATM-83A18NPS	18NPS	60	19.0	2.11	6.35	10	X	O	O	O	O
ATM-38A27NPSCR	27NPS	60	25.4	2.36	6.35	10	X	O	O	O	O
ATM-38A27NPSCRP	27NPS	60	25.4	2.36	6.35	10	X	O	O	O	O
ATM-38A18NPS*	18NPS	60	25.4	2.36	6.35	20	X	O	O	O	O
ATM-38A18NPSP*	18NPS	60	25.4	2.36	6.35	20	X	O	O	O	O
ATM-38A14NPS*	14NPS	60	25.4	2.36	6.35	20	X	O	O	O	O
ATM-38A14NPSP*	14NPS	60	25.4	2.36	6.35	20	X	O	O	O	O
ATM-38A115NPS*	11.5NPS	60	25.4	2.36	6.35	20	X	O	O	O	O
ATM-38A115NPSP*	11.5NPS	60	25.4	2.36	6.35	20	X	O	O	O	O
ATM-38B18NPS*	18NPS	60	38.07	2.36	6.35	20	X	O	O	O	O
ATM-38B18NPSP*	18NPS	60	38.07	2.36	6.35	20	X	O	O	O	O
ATM-38B14NPS*	14NPS	60	38.07	2.36	6.35	20	X	O	O	O	O
ATM-38B14NPSP*	14NPS	60	38.07	2.36	6.35	20	X	O	O	O	O
ATM-38B115NPS*	11.5NPS	60	38.07	2.36	6.35	20	X	O	O	O	O
ATM-38B115NPSP*	11.5NPS	60	38.07	2.36	6.35	20	X	O	O	O	O
ATM-38B8NPS*	8NPS	60	38.07	2.36	7.87	20	X	O	O	O	O
ATM-38B8NPSP*	8NPS	60	38.07	2.36	7.87	20	X	O	O	O	O
ATM-410A18NPS*	18NPS	60	38.07	3.30	7.87	20	X	O	O	O	O
ATM-410A18NPSP*	18NPS	60	38.07	3.30	7.87	20	X	O	O	O	O
ATM-410A14NPS*	14NPS	60	38.07	3.30	7.87	20	X	O	O	O	O
ATM-410A14NPSP*	14NPS	60	38.07	3.30	7.87	20	X	O	O	O	O
ATM-410A115NPS*	11.5NPS	60	38.07	3.30	7.87	20	X	O	O	O	O
ATM-410A115NPSP*	11.5NPS	60	38.07	3.30	7.87	20	X	O	O	O	O
ATM-410A8NPS*	8NPS	60	38.07	3.30	9.52	20	X	O	O	O	O
ATM-410A8NPSP*	8NPS	60	38.07	3.30	9.52	20	X	O	O	O	O

* CR Style Insert Upon Request

** For Coatings: **X** - Stocked Coating, **O** - Not stocked, Call for delivery

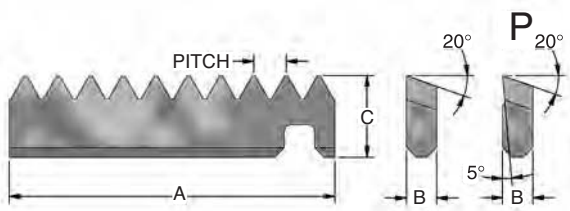
for Insert ATM-83A_NPS use Tool Holder 716-TA-05 or EM12-TA-12 only

NON-STOCK COATINGS
available in 10 days

ADVENT TOOL

Solid Carbide Form Ground Replaceable Inserts

Dryseal Straight Pipe (NPSF) Threads



Dimensions in mm

Insert Number	*Pitch*	*Flank Angle*	*Measurements*			*Clearance Angle*	*Coatings Available***				
			A	B	C		C	Z	Y	X	V
							TiN	TiAIN	TiCN	Hard Lube	Xtreme
ATM-83A27NPSF	27NPSF	60	19.0	2.11	6.35	10	X	O	O	O	O
ATM-83A18NPSF	18NPSF	60	19.0	2.11	6.35	10	X	O	O	O	O
ATM-38A27NPSFCR	27NPSF	60	25.4	2.36	6.35	10	X	O	O	O	O
ATM-38A27NPSFCRP	27NPSF	60	25.4	2.36	6.35	10	X	O	O	O	O
ATM-38A18NPSF*	18NPSF	60	25.4	2.36	6.35	20	X	O	O	O	O
ATM-38A18NPSFP*	18NPSF	60	25.4	2.36	6.35	20	X	O	O	O	O
ATM-38A14NPSF*	14NPSF	60	25.4	2.36	6.35	20	X	O	O	O	O
ATM-38A14NPSFP*	14NPSF	60	25.4	2.36	6.35	20	X	O	O	O	O
ATM-38A115NPSF*	11.5NPSF	60	25.4	2.36	6.35	20	X	O	O	O	O
ATM-38A115NPSFP*	11.5NPSF	60	25.4	2.36	6.35	20	X	O	O	O	O
ATM-38B18NPSF*	18NPSF	60	38.07	2.36	6.35	20	X	O	O	O	O
ATM-38B18NPSFP*	18NPSF	60	38.07	2.36	6.35	20	X	O	O	O	O
ATM-38B14NPSF*	14NPSF	60	38.07	2.36	6.35	20	X	O	O	O	O
ATM-38B14NPSFP*	14NPSF	60	38.07	2.36	6.35	20	X	O	O	O	O
ATM-38B115NPSF*	11.5NPSF	60	38.07	2.36	6.35	20	X	O	O	O	O
ATM-38B115NPSFP*	11.5NPSF	60	38.07	2.36	6.35	20	X	O	O	O	O
ATM-38B8NPSF*	8NPSF	60	38.07	2.36	7.87	20	X	O	O	O	O
ATM-38B8NPSFP*	8NPSF	60	38.07	2.36	7.87	20	X	O	O	O	O
ATM-410A18NPSF*	18NPSF	60	38.07	3.30	7.87	20	X	O	O	O	O
ATM-410A18NPSFP*	18NPSF	60	38.07	3.30	7.87	20	X	O	O	O	O
ATM-410A14NPSF*	14NPSF	60	38.07	3.30	7.87	20	X	O	O	O	O
ATM-410A14NPSFP*	14NPSF	60	38.07	3.30	7.87	20	X	O	O	O	O
ATM-410A115NPSF*	11.5NPSF	60	38.07	3.30	7.87	20	X	O	O	O	O
ATM-410A115NPSFP*	11.5NPSF	60	38.07	3.30	7.87	20	X	O	O	O	O
ATM-410A8NPSF*	8NPSF	60	38.07	3.30	9.52	20	X	O	O	O	O
ATM-410A8NPSFP*	8NPSF	60	38.07	3.30	9.52	20	X	O	O	O	O

* CR Style Insert Upon Request

** For Coatings: **X** - Stocked Coating, **O** - Not stocked, Call for delivery

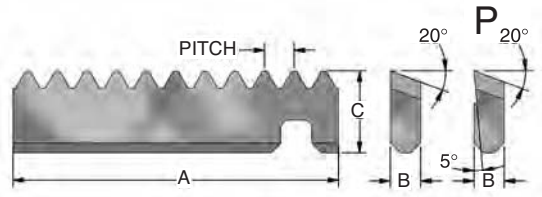
for Insert ATM-83A_NPSF use Tool Holder 716-TA-05 or EM12-TA-12 only

NON-STOCK COATINGS available in 10 days

ADVENT TOOL

Solid Carbide Form Ground Replaceable Inserts

British Standard Pipe (BSP) Threads



Dimensions in mm

Insert Number	*Pitch*	*Flank Angle*	*Measurements*			*Clearance Angle*	*Coatings Available***				
			A	B	C		C	Z	Y	X	V
							TiN	TiAlN	TiCN	Hard Lube	Xtreme
ATM-38A14BSP*	14BSP	55	25.4	2.36	6.35	20	X	O	O	O	O
ATM-38A14BSPP*	14BSP	55	25.4	2.36	6.35	20	X	O	O	O	O
ATM-38A11BSP*	11BSP	55	25.4	2.36	6.35	20	X	O	O	O	O
ATM-38A11BSPP*	11BSP	55	25.4	2.36	6.35	20	X	O	O	O	O
ATM-38B14BSP*	14BSP	55	38.07	2.36	6.35	20	X	O	O	O	O
ATM-38B14BSPP*	14BSP	55	38.07	2.36	6.35	20	X	O	O	O	O
ATM-38B11BSP*	11BSP	55	38.07	2.36	6.35	20	X	O	O	O	O
ATM-38B11BSPP*	11BSP	55	38.07	2.36	6.35	20	X	O	O	O	O
ATM-410A14BSP*	14BSP	55	38.07	3.30	7.87	20	X	O	O	O	O
ATM-410A14BSPP*	14BSP	55	38.07	3.30	7.87	20	X	O	O	O	O
ATM-410A11BSP*	11BSP	55	38.07	3.30	7.87	20	X	O	O	O	O
ATM-410A11BSPP*	11BSP	55	38.07	3.30	7.87	20	X	O	O	O	O

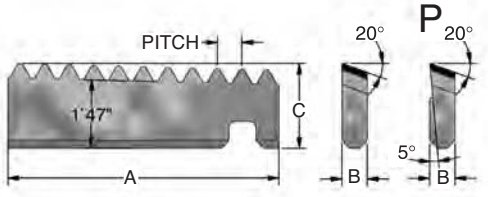
* CR Style Insert Upon Request

** For Coatings: **X** - Stocked Coating, **O** - Not stocked, Call for delivery

ADVENT TOOL

Solid Carbide Form Ground Replaceable Inserts

British Standard Taper Pipe (BSPT) Threads



Dimensions in Inches

Insert Number	*Pitch*	*Flank Angle*	*Measurements*			*Clearance Angle*	*Coatings Available***				
			A	B	C		C	Z	Y	X	V
							TiN	TiAlN	TiCN	Hard Lube	Xtreme
ATM-38A14BSPT*	14BSP	55	25.4	2.36	7.87	20	X	O	O	O	O
ATM-38A14BSPTP*	14BSP	55	25.4	2.36	7.87	20	X	O	O	O	O
ATM-38A11BSPT*	11BSP	55	25.4	2.36	7.87	20	X	O	O	O	O
ATM-38A11BSPTP*	11BSP	55	25.4	2.36	7.87	20	X	O	O	O	O
ATM-38B14BSPT*	14BSP	55	38.07	2.36	7.87	20	X	O	O	O	O
ATM-38B14BSPTP*	14BSP	55	38.07	2.36	7.87	20	X	O	O	O	O
ATM-38B11BSPT*	11BSP	55	38.07	2.36	7.87	20	X	O	O	O	O
ATM-38B11BSPTP*	11BSP	55	38.07	2.36	7.87	20	X	O	O	O	O
ATM-410A14BSPT*	14BSP	55	38.07	3.30	9.52	20	X	O	O	O	O
ATM-410A14BSPTP*	14BSP	55	38.07	3.30	9.52	20	X	O	O	O	O
ATM-410A11BSPT*	11BSP	55	38.07	3.30	9.52	20	X	O	O	O	O
ATM-410A11BSPTP*	11BSP	55	38.07	3.30	9.52	20	X	O	O	O	O

* CR Style Insert Upon Request

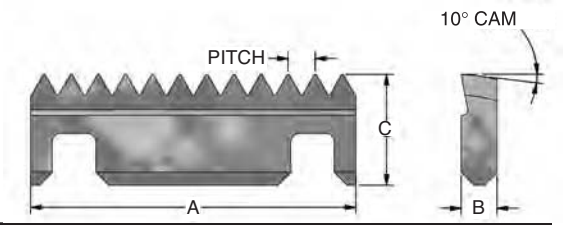
** For Coatings: **X** - Stocked Coating, **O** - Not stocked, Call for delivery

NON-STOCK COATINGS
available in 10 days

ADVENT TOOL

Solid Carbide CAM Ground Replaceable Inserts

ATM-83A, ATM-83T - Metric (M) Threads



Dimensions in mm

Insert Number	*Pitch*	*Flank Angle*	*Measurements*			*Clearance Angle*	*Coatings Available***				
			A	B	C		C	Z	Y	X	V
							TiN	TiAlN	TiCN	Hard Lube	Xtreme
ATM-83A1.5MM	1.5MM	60	19.0	2.11	5.33	10	X	N/A	N/A	N/A	N/A
ATM-83A1.25MM	1.25MM	60	19.0	2.11	5.33	10	X	N/A	N/A	N/A	N/A
ATM-83A1.0MM	1.0MM	60	19.0	2.11	5.33	10	X	N/A	N/A	N/A	N/A
ATM-83A0.75MM	0.75MM	60	19.0	2.11	5.33	10	X	N/A	N/A	N/A	N/A
ATM-83T2.0MM	2.0MM	60	19.0	2.11	6.09	10	X	N/A	N/A	N/A	N/A
ATM-83T1.75MM	1.75MM	60	19.0	2.11	6.09	10	X	N/A	N/A	N/A	N/A
ATM-83T1.5MM	1.5MM	60	19.0	2.11	6.09	10	X	N/A	N/A	N/A	N/A
ATM-83T1.25MM	1.25MM	60	19.0	2.11	6.09	10	X	N/A	N/A	N/A	N/A
ATM-83T1.0MM	1.0MM	60	19.0	2.11	6.09	10	X	N/A	N/A	N/A	N/A
ATM-83T0.75MM	0.75MM	60	19.0	2.11	6.09	10	X	N/A	N/A	N/A	N/A

** TiN Stocked Coating only

for Insert ATM-83A - use Tool Holder EM12-TA-12 only

for Insert ATM-83T - use Tool Holder EM15-TA-12 only

ADVENT TOOL

Sample Tool & Inserts to cut 1 Pitch Buttress Thread 0/45

Tool Number - SM401BFL

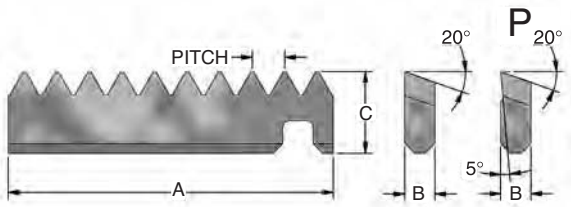
Insert Number - SATM-1B-0/45Z

NON-STOCK COATINGS available in 10 days

ADVENT TOOL

Solid Carbide Form Ground Replaceable Inserts

ATM-38A - Metric (M) Threads



Dimensions in mm

Insert Number	*Pitch*	*Flank Angle*	*Measurements*			*Clearance Angle*	*Coatings Available***				
			A	B	C		C	Z	Y	X	V
							TiN	TiAlN	TiCN	Hard Lube	Xtreme
ATM-38A4.0MM	4.0MM	60	25.4	2.36	7.87	20	X	O	O	O	O
ATM-38A4.0MMP	4.0MM	60	25.4	2.36	7.87	20	X	O	O	O	O
ATM-38A3.5MM	3.5MM	60	25.4	2.36	7.87	20	X	O	O	O	O
ATM-38A3.5MMP	3.5MM	60	25.4	2.36	7.87	20	X	O	O	O	O
ATM-38A3.0MM	3.0MM	60	25.4	2.36	7.87	20	X	O	O	O	O
ATM-38A3.0MMP	3.0MM	60	25.4	2.36	7.87	20	X	O	O	O	O
ATM-38A2.5MM	2.5MM	60	25.4	2.36	6.35	20	X	O	O	O	O
ATM-38A2.5MMP	2.5MM	60	25.4	2.36	6.35	20	X	O	O	O	O
ATM-38A2.0MM	2.0MM	60	25.4	2.36	6.35	20	X	O	O	O	O
ATM-38A2.0MMP	2.0MM	60	25.4	2.36	6.35	20	X	O	O	O	O
ATM-38A1.75MM	1.75MM	60	25.4	2.36	6.35	20	X	O	O	O	O
ATM-38A1.75MMP	1.75MM	60	25.4	2.36	6.35	20	X	O	O	O	O
ATM-38A1.5MM	1.5MM	60	25.4	2.36	6.35	20	X	O	O	O	O
ATM-38A1.5MMP	1.5MM	60	25.4	2.36	6.35	20	X	O	O	O	O
ATM-38A1.25MM	1.25MM	60	25.4	2.36	6.35	20	X	O	O	O	O
ATM-38A1.25MMP	1.25MM	60	25.4	2.36	6.35	20	X	O	O	O	O
ATM-38A1.0MM	1.0MM	60	25.4	2.36	6.35	20	X	O	O	O	O
ATM-38A1.0MMP	1.0MM	60	25.4	2.36	6.35	20	X	O	O	O	O

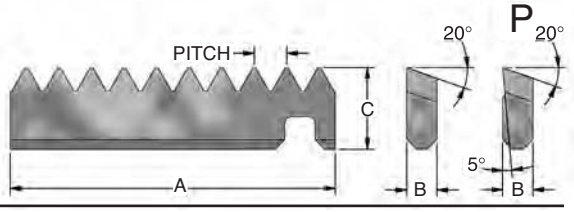
* CR Style Insert Upon Request

** For Coatings: **X** - Stocked Coating, **O** - Not stocked, Call for delivery

ADVENT TOOL

Solid Carbide Form Ground Replaceable Inserts

ATM-38B - Metric (M) Threads



Dimensions in mm

Insert Number	*Pitch*	*Flank Angle*	*Measurements*			*Clearance Angle*	*Coatings Available***				
			A	B	C		C	Z	Y	X	V
							TiN	TiAlN	TiCN	Hard Lube	Xtreme
ATM-38B4.0MM	4.0MM	60	38.07	7.36	7.87	20	X	O	O	O	O
ATM-38B4.0MMP	4.0MM	60	38.07	7.36	7.87	20	X	O	O	O	O
ATM-38B3.5MM	3.5MM	60	38.07	7.36	7.87	20	X	O	O	O	O
ATM-38B3.5MMP	3.5MM	60	38.07	7.36	7.87	20	X	O	O	O	O
ATM-38B3.0MM	3.0MM	60	38.07	7.36	7.87	20	X	O	O	O	O
ATM-38B3.0MMP	3.0MM	60	38.07	7.36	7.87	20	X	O	O	O	O
ATM-38B2.5MM	2.5MM	60	38.07	7.36	6.35	20	X	O	O	O	O
ATM-38B2.5MMP	2.5MM	60	38.07	7.36	6.35	20	X	O	O	O	O
ATM-38B2.0MM	2.0MM	60	38.07	7.36	6.35	20	X	O	O	O	O
ATM-38B2.0MMP	2.0MM	60	38.07	7.36	6.35	20	X	O	O	O	O
ATM-38B1.75MM	1.75MM	60	38.07	7.36	6.35	20	X	O	O	O	O
ATM-38B1.75MMP	1.75MM	60	38.07	7.36	6.35	20	X	O	O	O	O
ATM-38B1.5MM	1.5MM	60	38.07	7.36	6.35	20	X	O	O	O	O
ATM-38B1.5MMP	1.5MM	60	38.07	7.36	6.35	20	X	O	O	O	O
ATM-38B1.25MM	1.25MM	60	38.07	7.36	6.35	20	X	O	O	O	O
ATM-38B1.25MMP	1.25MM	60	38.07	7.36	6.35	20	X	O	O	O	O
ATM-38B1.0MM	1.0MM	60	38.07	7.36	6.35	20	X	O	O	O	O
ATM-38B1.0MMP	1.0MM	60	38.07	7.36	6.35	20	X	O	O	O	O

* CR Style Insert Upon Request

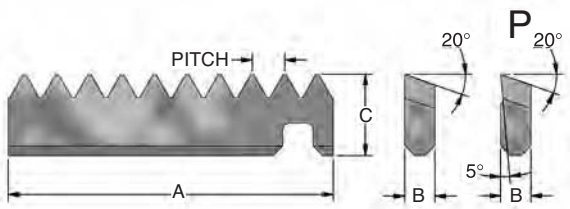
** For Coatings: **X** - Stocked Coating, **O** - Not stocked, Call for delivery

NON-STOCK COATINGS
available in 10 days

ADVENT TOOL

Solid Carbide Form Ground Replaceable Inserts

ATM-410A - Metric (M) Threads



Dimensions in mm

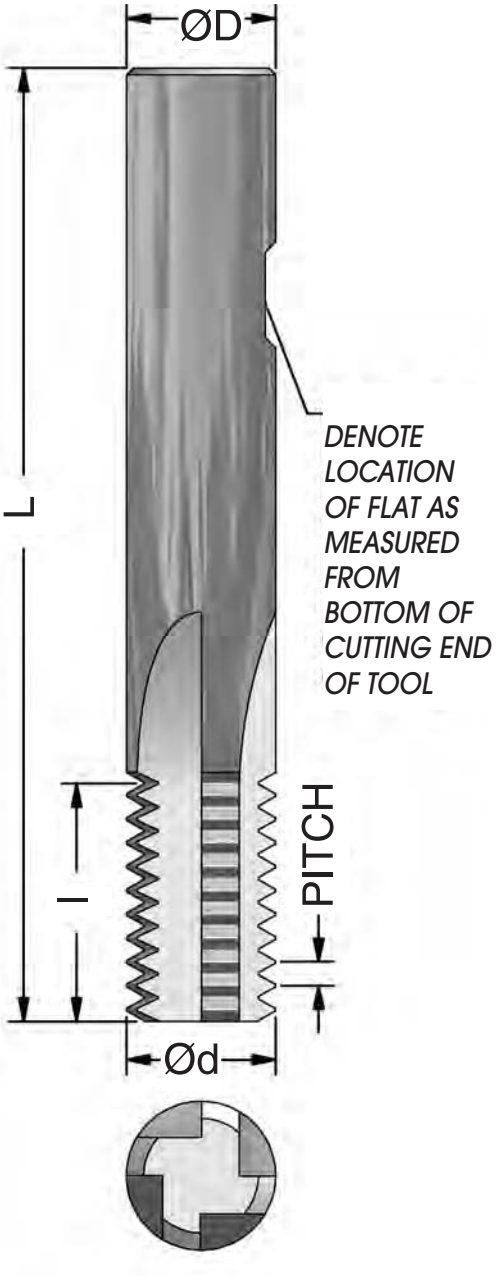
Insert Number	*Pitch*	*Flank Angle*	*Measurements*			*Clearance Angle*	*Coatings Available***				
			A	B	C		C	Z	Y	X	V
							TiN	TiAlN	TiCN	Hard Lube	Xtreme
ATM-410A6.0BMM	6.0MM INT	60	38.07	3.30	9.52	20	X	O	O	O	O
ATM-410A6.0BMMP	6.0MM INT	60	38.07	3.30	9.52	20	X	O	O	O	O
ATM-410A6.0AMM	6.0MM EXT	60	38.07	3.30	9.52	20	X	O	O	O	O
ATM-410A6.0AMMP	6.0MM EXT	60	38.07	3.30	9.52	20	X	O	O	O	O
ATM-410A5.0MM	5.0MM	60	38.07	3.30	9.52	20	X	O	O	O	O
ATM-410A5.0MMP	5.0MM	60	38.07	3.30	9.52	20	X	O	O	O	O
ATM-410A4.5MM	4.5MM	60	38.07	3.30	9.52	20	X	O	O	O	O
ATM-410A4.5MMP	4.5MM	60	38.07	3.30	9.52	20	X	O	O	O	O
ATM-410A4.0MM	4.0MM	60	38.07	3.30	9.52	20	X	O	O	O	O
ATM-410A4.0MMP	4.0MM	60	38.07	3.30	9.52	20	X	O	O	O	O
ATM-410A3.5MM	3.5MM	60	38.07	3.30	9.52	20	X	O	O	O	O
ATM-410A3.5MMP	3.5MM	60	38.07	3.30	9.52	20	X	O	O	O	O
ATM-410A3.0MM	3.0MM	60	38.07	3.30	9.525	20	X	O	O	O	O
ATM-410A3.0MMP	3.0MM	60	38.07	3.30	9.52	20	X	O	O	O	O
ATM-410A2.5MM	2.5MM	60	38.07	3.30	7.87	20	X	O	O	O	O
ATM-410A2.5MMP	2.5MM	60	38.07	3.30	7.87	20	X	O	O	O	O
ATM-410A2.0MM	2.0MM	60	38.07	3.30	7.87	20	X	O	O	O	O
ATM-410A2.0MMP	2.0MM	60	38.07	3.30	7.87	20	X	O	O	O	O
ATM-410A1.75MM	1.75MM	60	38.07	3.30	7.87	20	X	O	O	O	O
ATM-410A1.75MMP	1.75MM	60	38.07	3.30	7.87	20	X	O	O	O	O
ATM-410A1.5MM	1.5MM	60	38.07	3.30	7.87	20	X	O	O	O	O
ATM-410A1.5MMP	1.5MM	60	38.07	3.30	7.87	20	X	O	O	O	O
ATM-410A1.25MM	1.25MM	60	38.07	3.30	7.87	20	X	O	O	O	O
ATM-410A1.25MMP	1.25MM	60	38.07	3.30	7.87	20	X	O	O	O	O
ATM-410A1.0MM	1.0MM	60	38.07	3.30	7.87	20	X	O	O	O	O
ATM-410A1.0MMP	1.0MM	60	38.07	3.30	7.87	20	X	O	O	O	O

* CR Style Insert Upon Request

** For Coatings: **X** - Stocked Coating, **O** - Not stocked, Call for delivery

NON-STOCK COATINGS
available in 10 days

"Advantage" CustomToolDesigner



NON-STOCK COATINGS available in 10 days

Create your own custom tool, using our ***Advantage Custom Tool Service***

Simply complete the form below, fax a copy to **847/549-9714**, and we will provide a quotation for the custom tool.

TOOL PART NUMBER(S) _____

_____

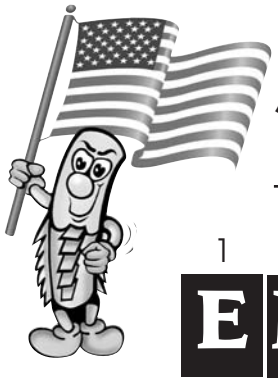
OTHER INFORMATION _____

_____

_____

_____

_____



ADVENT TOOL

Solid Carbide/Carbide Tipped Thread Mill Designation

1		2	3		4		5					
E	**M**	**6**	**0**	**.**	**7**	**5**	**0**	**6**	**1**	**C**	**S**	**B**	**H**	**Z**

Column 1: Minimum Size Thread

M6 = 6.0mm (Shank Diameter is in Inch Sizes)
M30 = 30.0mm (Shank Diameter is in Inch Sizes)
EM6 = 6.0mm (Shank Diameter is in MM Sizes)
EM30 = 30.0mm (Shank Diameter is in MM Sizes)

Column 2: Threads per Inch

(Pitch in mm - Metric Tools)

Column 3: Shank Size

Metric Shank Thread Mills (EM)

06 = Shank Ø6.0mm
08 = Shank Ø8.0mm
10 = Shank Ø10.0mm
12 = Shank Ø12.0mm
16 = Shank Ø16.0mm
20 = Shank Ø20.0mm
25 = Shank Ø25.0mm

Column 4: Tool Style Description

1CS = Solid Carbide Straight UN or MM Thread Form, 4 Flutes

1CSF6 = Solid Carbide Straight UN or MM Thread Form, 6 Flutes

1C = Carbide Cutting Edge Brazed on Steel Shank Straight UN or MM Thread Form, 4 Flutes

1CRL25 = Carbide Cutting Edge Brazed on Steel Shank Straight, Relief for 2.5" Reach, 4 Flutes

1CSSF6 = Solid Carbide Straight Brazed in Steel Shank, Coolant Through, 6 Flutes

1CSNPT = Solid Carbide Straight NPT Thread Form, 4 Flutes

1CSNPTF6 = Solid Carbide Straight NPT Thread Form, 6 Flutes

1CSNPTF = Solid Carbide Straight NPTF Thread Form, 4 Flutes

1CSNPTFF6 = Solid Carbide Straight NPTF Thread Form, 6 Flutes

1CSNPSF = Solid Carbide Straight NPSF Thread Form, 4 Flutes

1CNPSF = Carbide Cutting Edge Brazed on Steel Shank Straight NPSF Thread Form, 4 Flutes

1CSBSP = Solid Carbide Straight BSP Thread Form, 4 Flutes

1CBSP = Carbide Cutting Edge Brazed on Steel Shank Straight BSP Thread Form, 4 Flutes

1CSBSPT = Solid Carbide Straight BSPT Thread Form, 4 Flutes

1CBSPT = Carbide Cutting Edge Brazed on Steel Shank Straight BSPT Thread Form, 4 Flutes

1CSF3BH = Solid Carbide Helical UN or MM Internal Thread Form, 3 Flutes

1CSF3AH = Solid Carbide Helical UN or MM External Thread Form, 3 Flutes

1CSBH = Solid Carbide Helical UN or MM Internal Thread Form, 4 Flutes

1CSAH = Solid Carbide Helical UN or MM External Thread Form, 4 Flutes

1CSNPTH = Solid Carbide Helical NPT Thread Form, 4 Flutes

1CSBSPH = Solid Carbide Helical BSP Thread Form, 4 Flutes

1CSBSPTH = Solid Carbide Helical BSPT Thread Form, 4 Flutes

Column 5: Coating

"-" = Uncoated
C = TIN
Y = TICN
Z = Futura / TiALN
X = Hard Lube
V = X.treme

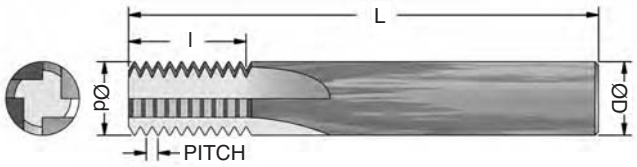
NON-STOCK COATINGS
available
in 10 days

ADVENT TOOL

Solid Carbide Straight Flute Thread Mills

British Standard Pipe (BSP) Threads, Metric Shank

WELDON FLATS INCLUDED



Dimensions in mm

Minimum Size	*Tool Number*	*Pitch*	*Cutter Diameter (d)*	*Length of Cut (l)*	*No. of Flutes*	*Length (L)*	*Shank Dia. (D)*	*Coatings Available***				
								C	Z	Y	X	V
								TiN	TiAlN	TiCN	Hard Lube	Xtreme
1/8"-28	182808MM-1CSBSP	28	7.6	19	4	76	(8)	O	O	O	O	O
1/4-3/8"-19	141910MM-1CSBSP	19	9.9	20	4	76	(10)	O	O	O	O	O
1/2"-14	121416MM-1CSBSP	14	15.9	25.4	4	90	(16)	O	O	O	O	O
3/4"-14	341420MM-1CSBSP	14	19.9	32.7	4	102	(20)	O	O	O	O	O
1"-11	011120MM-1CSBSP	11	19.9	32.3	4	102	(20)	O	O	O	O	O

Other Sizes Available Upon Request - Tools will cut internal & external thread

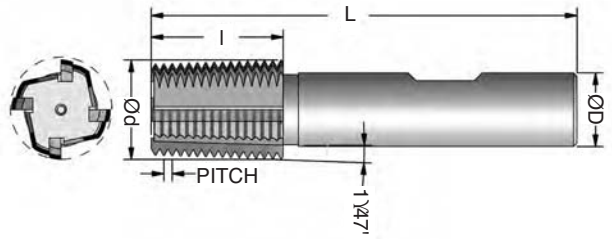
** For Coatings: **X** - Stocked Coating, **O** - Not stocked, Call for delivery

ADVENT TOOL

Solid Carbide Straight Flute Thread Mills

British Standard Pipe Tapered (BSPT) Threads, Metric Shank

WELDON FLATS INCLUDED



Dimensions in Inches (mm)

Minimum Size	*Tool Number*	*Pitch*	*Cutter Diameter (d)*	*Length of Cut (l)*	*No. of Flutes*	*Length (L)*	*Shank Dia. (D)*	*Coatings Available***				
								C	Z	Y	X	V
								TiN	TiAlN	TiCN	Hard Lube	Xtreme
1/8"-28	182808MM-1CSBSPT	28	7.6	19	4	76	(8)	O	O	O	O	O
1/4-3/8"-19	141910MM-1CSBSPT	19	9.9	20	4	76	(10)	O	O	O	O	O
1/2"-14	121416MM-1CSBSPT	14	15.9	25.4	4	90	(16)	O	O	O	O	O
3/4"-14	341420MM-1CSBSPT	14	19.9	32.7	4	102	(20)	O	O	O	O	O
1"-11	011120MM-1CSBSPT	11	19.9	32.3	4	102	(20)	O	O	O	O	O

Other Sizes Available Upon Request - Tools will cut internal & external thread

** For Coatings: **X** - Stocked Coating, **O** - Not stocked, Call for delivery

NON-STOCK COATINGS
available
in 10 days

ADVENT TOOL

Solid Carbide Helical Thread Mills

Metric (M) Internal Threads, Metric Shank

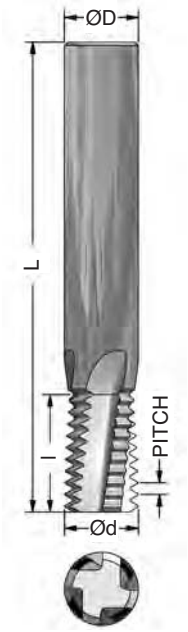
Custom Weldon Flats available in lieu of round shanks (see page 43)

Dimensions in mm

Minimum Size	*Tool Number*	*Pitch*	*Cutter Diameter (d)*	*Length of Cut (l)*	*No. of Flutes*	*Length (L)*	*Shank Dia. (D)*	*Coatings Available***				
								C	Z	Y	X	V
								TiN	TiAlN	TiCN	Hard Lube	Xtreme
M6x1.0	EM61.006-1CSF3BH	1.00	4.3	10	3	76	6	O	O	O	O	O
M6x0.75	EM60.7506-1CSF3BH	0.75	4.3	10.5	3	76	6	O	O	O	O	O
M8x1.25	EM81.2506-1CSF3BH	1.25	5.9	16.25	3	76	6	O	O	O	O	O
M8x1.0	EM81.006-1CSF3BH	1.00	5.9	16	3	76	6	O	O	O	O	O
M10x1.5	EM101.508-1CSF3BH	1.50	7.3	19.5	3	76	8	O	O	O	O	O
M10x1.25	EM101.2508-1CSF3BH	1.25	7.3	20	3	76	8	O	O	O	O	O
M12x1.75	EM121.7510-1CSF3BH	1.75	9.4	21	3	76	10	O	O	O	O	O
M12x1.25	EM121.2510-1CSF3BH	1.25	9.4	21.25	3	76	10	O	O	O	O	O
M14x2.0	EM142.012-1CSBH	2.00	10.9	26	4	90	12	O	O	O	O	O
M14x1.5	EM141.512-1CSBH	1.50	10.9	25.5	4	90	12	O	O	O	O	O
M18x2.5	EM182.512-1CSBH	2.50	11.9	25	4	90	12	O	O	O	O	O
M18x1.5	EM181.512-1CSBH	1.50	11.9	25.5	4	90	12	O	O	O	O	O
M24x3.0	EM243.016-1CSBH	3.00	15.9	27	4	90	16	O	O	O	O	O
M24x2.0	EM242.016-1CSBH	2.00	15.9	26	4	90	16	O	O	O	O	O
M30x3.5	EM303.520-1CSBH	3.50	19.9	31.5	4	102	20	O	O	O	O	O
M36x4.0	EM364.025-1CSF6BH	4.00	24.9	36	6	157	25	O	O	O	O	O

Other Sizes Available Upon Request - Tools will cut internal thread ONLY

** For Coatings: **X** - Stocked Coating, **O** - Not stocked, Call for delivery



ADVENT TOOL

Solid Carbide Helical Thread Mills

Metric (M) External Threads, Metric Shank

Custom Weldon Flats available in lieu of round shanks (see page 43)

NON-STOCK COATINGS available in 10 days

Dimensions in mm

Minimum Size	*Tool Number*	*Pitch*	*Cutter Diameter (d)*	*Length of Cut (l)*	*No. of Flutes*	*Length (L)*	*Shank Dia. (D)*	*Coatings Available***				
								C	Z	Y	X	V
								TiN	TiAlN	TiCN	Hard Lube	Xtreme
M6x1.0	EM61.006-1CSF3AH	1.00	4.3	10	3	76	6	O	O	O	O	O
M6x0.75	EM60.7506-1CSF3AH	0.75	4.3	10.5	3	76	6	O	O	O	O	O
M8x1.25	EM81.2506-1CSF3AH	1.25	5.9	16.25	3	76	6	O	O	O	O	O
M8x1.0	EM81.006-1CSF3AH	1.00	5.9	16	3	76	6	O	O	O	O	O
M10x1.5	EM101.508-1CSF3AH	1.50	7.3	19.5	3	76	8	O	O	O	O	O
M10x1.25	EM101.2508-1CSF3AH	1.25	7.3	20	3	76	8	O	O	O	O	O
M12x1.75	EM121.7510-1CSF3AH	1.75	9.4	21	3	76	10	O	O	O	O	O
M12x1.25	EM121.2510-1CSF3AH	1.25	9.4	21.25	3	76	10	O	O	O	O	O
M14x2.0	EM142.012-1CSAH	2.00	10.9	26	4	90	12	O	O	O	O	O
M14x1.5	EM141.512-1CSAH	1.50	10.9	25.5	4	90	12	O	O	O	O	O
M18x2.5	EM182.512-1CSAH	2.50	11.9	25	4	90	12	O	O	O	O	O
M18x1.5	EM181.512-1CSAH	1.50	11.9	25.5	4	90	12	O	O	O	O	O
M24x3.0	EM243.016-1CSAH	3.00	15.9	27	4	90	16	O	O	O	O	O
M24x2.0	EM242.016-1CSAH	2.00	15.9	26	4	90	16	O	O	O	O	O
M30x3.5	EM303.520-1CSAH	3.50	19.9	31.5	4	102	20	O	O	O	O	O
M36x4.0	EM364.025-1CSF6AH	4.00	24.9	36	6	157	25	O	O	O	O	O

Other Sizes Available Upon Request - Tools will cut internal thread ONLY

** For Coatings: **X** - Stocked Coating, **O** - Not stocked, Call for delivery

ADVENT TOOL

Solid Carbide Helical Thread Mills

National Pipe (NPT) Threads, Metric Shank

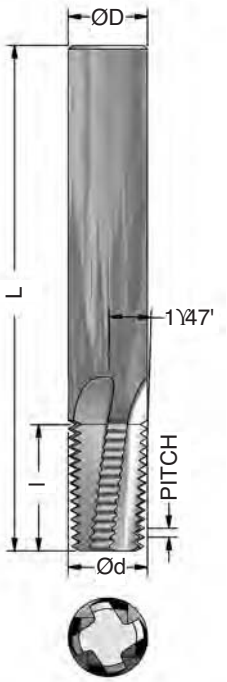
Custom Weldon Flats available in lieu of round shanks (see page 43)

Dimensions in mm

Minimum Size	Tool Number	Pitch	Cutter Diameter (d)	Length of Cut (l)	No. of Flutes	Length (L)	Shank Dia. (D)	Coatings Available**				
								C	Z	Y	X	V
								TiN	TiAlN	TiCN	Hard Lube	Xtreme
1/8"–27	E082708-1CSNPTF3H	27	7.90	18.82	3	76	8	O	O	O	O	O
1/4-3/8"–18	E101810-1CSNPTF3H	18	9.90	19.76	3	76	10	O	O	O	O	O
1/4-3/8"–18	E111812-1CSNPTH	18	10.90	19.76	4	90	12	O	O	O	O	O
1/2-3/4"-14	E121412-1CSNPTH	14	11.90	25.40	4	90	12	O	O	O	O	O
1/2-3/4"-14	E161416-1CSNPTH	14	15.90	25.40	4	90	16	O	O	O	O	O
1"-11.5	E2011520-1CSNPTF5H	11.5	19.90	26.52	5	102	20	O	O	O	O	O
1"-11.5	E2511525-1CSNPTF6H	11.5	24.90	35.33	6	127	25	O	O	O	O	O
2-1/2"-8	E200820-1CSNPTH	8	19.90	28.58	4	102	20	O	O	O	O	O
2-1/2"-8	E250825-1CSNPTF5H	8	24.90	38.10	5	127	25	O	O	O	O	O

Other Sizes Available Upon Request - Tools will cut internal & external thread

** For Coatings: **X** - Stocked Coating, **O** - Not stocked, Call for delivery



ADVENT TOOL

Solid Carbide Helical Thread Mills

British Standard Pipe Tapered (BSP) Threads, Metric Shank

Custom Weldon Flats available in lieu of round shanks (see page 43)

Dimensions in mm

Minimum Size	Tool Number	Pitch	Cutter Diameter (d)	Length of Cut (l)	No. of Flutes	Length (L)	Shank Dia. (D)	Coatings Available**				
								C	Z	Y	X	V
								TiN	TiAlN	TiCN	Hard Lube	Xtreme
1/8"-28	182808MM-1CSBSPF3H	28	7.6	19	3	76	8	O	O	O	O	O
1/4-3/8"-19	141910MM-1CSBSPF3H	19	9.9	20	3	76	10	O	O	O	O	O
1/2"-14	121416MM-1CSBSPH	14	15.9	25.4	4	90	16	O	O	O	O	O
3/4"-14	341420MM-1CSBSPH	14	19.9	32.7	4	102	20	O	O	O	O	O
1"-11	011120MM-1CSBSPH	11	19.9	32.3	4	102	20	O	O	O	O	O

ADVENT TOOL

Solid Carbide Helical Thread Mills

British Standard Pipe Tapered (BSPT) Threads, Metric Shank

Custom Weldon Flats available in lieu of round shanks (see page 43)

Dimensions in mm

Minimum Size	Tool Number	Pitch	Cutter Diameter (d)	Length of Cut (l)	No. of Flutes	Length (L)	Shank Dia. (D)	Coatings Available**				
								C	Z	Y	X	V
								TiN	TiAlN	TiCN	Hard Lube	Xtreme
1/8"-28	182808MM-1CSBSPTF3H	28	7.6	19	3	76	8	O	O	O	O	O
1/4-3/8"-19	141910MM-1CSBSPTF3H	19	9.9	20	3	76	10	O	O	O	O	O
1/2"-14	121416MM-1CSBSPTH	14	15.9	25.4	4	90	16	O	O	O	O	O
3/4"-14	341420MM-1CSBSPTH	14	19.9	32.7	4	102	20	O	O	O	O	O
1"-11	011120MM-1CSBSPTH	11	19.9	32.3	4	102	20	O	O	O	O	O

Other Sizes Available Upon Request - Tools will cut internal & external thread

** For Coatings: **X** - Stocked Coating, **O** - Not stocked, Call for delivery

NON-STOCK COATINGS available in 10 days

Internal thread: $F1 = \frac{F2 \times (Dw - Dc)}{Dw}$

External thread: $F1 = \frac{F2 \times (Dw + Dc)}{Dw}$

Where :
F1 = Programmed feed rate at the tool center (in/min)
F2 = Actual feed rate at the cutting edge
Dw = Diameter of the work piece, or thread diameter
Dc = Cutter diameter
The actual feed rate is calculated using the standard formula :
F = (RPM) X (Chip load) X (No. of teeth)

Thread Milling requires the use of a machining center capable of helical interpolation. This means that the machine must be capable of three axes simultaneous movement. Two of the axes perform circular interpolation, while the third axis moves perpendicular to the circular plane. On most CNC controls this is achieved with a G02, or a G03 code. There are other factors to consider when using a Thread Mill, the most important being fixturing, and tool length extension. Due to the cutting action of a Thread Mill the forces acting on the part differ greatly than those due to tapping. The more rigidly the part is fastened to the fixture the faster you can Thread Mill. The speeds and feeds are maximized when vibration of the part and fixture is minimized. The next factor of the utmost importance, is the tool, and tool holder. Speeds and feeds are reduced depending on the distance a tool is held from the spindle face. A positive lock end mill style holder is always recommended. Never use a collet style holder for a Thread Mill. If you consider the rigidity of your fixture, and the distance of the tool from gauge line, you should not have a problem with any thread milling operation.

Feed Rate Calculation

Due to the circular motion of the cutter as it forms a thread the actual feed rate at the cutting edge will be different from that which is programmed at the center of the tool. For an internal thread the feed rate at the edge increases as the cutter diameter increases. For an external thread the feed rate at the edge decreases as the cutter diameter increases. This can be shown as a direct relation between the size if the circle the cutter moves around, and the size of the circle cut.

Recommended Starting Cutting Conditions

MATERIAL	SPEED MMPM	TOOL DIAMETER - INCH .110-.125	0.14	.170-.187	0.25	0.35	0.50	0.75	FEED - INCH 1.00
Aluminum & Magnesium	800-UP	.0006-.0010	.0006-.0015	.0010-.0020	.0015-.0030	.002-.004	.003-.006	.004-.008	.006-.009
Brass	500-800	.0006-.0010	.0006-.0015	.0010-.0020	.0015-.0025	.002-.003	.003-.005	.004-.008	.005-.009
Bronze	400-600	.0005-.0010	.0005-.0015	.0010-.0020	.0015-.0025	.002-.003	.003-.005	.005-.007	.005-.008
Hard Bronze	230-290	.0004-.0008	.0004-.0009	.0005-.0013	.0007-.0015	.001-.002	.002-.003	.004-.006	.004-.007
Cast Iron-Soft	200-280	.0004-.0008	.0006-.0010	.0010-.0020	.0010-.0025	.002-.003	.002-.004	.003-.006	.004-.007
Cast Iron-Hard	190-260	.0003-.0007	.0005-.0010	.0006-.0015	.0007-.0015	.001-.002	.002-.003	.003-.004	.004-.005
Steel-Soft	230-400	.0006-.0010	.0007-.0015	.0010-.0020	.0010-.0025	.002-.003	.002-.004	.003-.005	.003-.005
Steel-Medium	200-350	.0004-.0008	.0006-.0015	.0007-.0013	.0008-.0020	.001-.003	.001-.003	.002-.004	.003-.005
Steel-Hard	120-220	.0003-.0006	.0004-.0010	.0005-.0010	.0007-.0015	.001-.002	.001-.003	.002-.004	.002-.004
Stainless Steel	120-220	.0003-.0010	.0004-.0010	.0005-.0010	.0007-.0015	.001-.002	.001-.003	.002-.004	.002-.004
Titanium	70-100	.0003-.0006	.0003-.0008	.0004-.0008	.0005-.0010	.001-.002	.001-.002	.002-.003	.002-.003
Inconel	70-100	.0003-.0006	.0003-.0007	.0004-.0007	.0005-.0010	.001-.002	.001-.002	.002-.003	.002-.003

MATERIAL	SPEED MMPM	TOOL DIAMETER - METRIC 2.79-3.17	3.56	4.32-4.75	6.35	8.89	12.70	19.00	FEED - METRIC 25.40
Aluminum & Magnesium	800-UP	0.02-0.03	0.02-0.04	0.03-0.05	0.04-0.08	0.05-0.12	0.07-0.15	0.10-0.20	0.15-0.23
Brass	500-800	0.02-0.03	0.02-0.04	0.03-0.05	0.04-0.07	0.05-0.07	0.07-0.13	0.10-0.20	0.13-0.23
Bronze	400-600	0.02-0.03	0.02-0.04	0.03-0.05	0.04-0.07	0.05-0.07	0.07-0.13	0.13-0.18	0.13-0.20
Hard Bronze	230-290	0.01-0.02	0.01-0.04	0.01-0.03	0.02-0.04	0.03-0.05	0.05-0.07	0.10-0.15	0.10-0.18
Cast Iron-Soft	200-280	0.01-0.02	0.02-0.03	0.01-0.05	0.03-0.06	0.05-0.08	0.05-0.10	0.08-0.15	0.10-0.18
Cast Iron-Hard	190-260	0.01-0.02	0.02-0.03	0.02-0.04	0.02-0.04	0.03-0.05	0.05-0.08	0.08-0.10	0.10-0.13
Steel-Soft	230-400	0.02-0.03	0.02-0.04	0.03-0.05	0.03-0.06	0.05-0.08	0.05-0.10	0.08-0.13	0.08-0.13
Steel-Medium	200-350	0.01-0.02	0.02-0.04	0.02-0.03	0.02-0.05	0.03-0.05	0.03-0.07	0.05-0.10	0.08-0.13
Steel-Hard	120-220	0.01-0.02	0.01-0.03	0.01-0.03	0.02-0.04	0.03-0.05	0.03-0.08	0.05-0.10	0.05-0.10
Stainless Steel	120-220	0.01-0.03	0.01-0.03	0.01-0.03	0.02-0.04	0.03-0.05	0.03-0.08	0.05-0.10	0.05-0.10
Titanium	70-100	0.01-0.02	0.01-0.02	0.01-0.20	0.01-0.03	0.03-0.05	0.03-0.05	0.05-0.08	0.05-0.08
Inconel	70-100	0.01-0.02	0.01-0.02	0.01-0.20	0.01-0.03	0.03-0.05	0.03-0.05	0.05-0.08	0.05-0.08

Thread Mill Programming

Internal Threads *(climb milling)*
The simplest method to produce a thread form using an Advent Thread Mill is as follows:

1. The center of the hole being the X-Y zero point. Move the cutter to the center of the hole, then to the thread depth required.
2. Move the cutter over a small distance (usually about .02"towards the three-o'clock position) to call up your cutter compensation.
3. Machine in a counter-clockwise direction generating a 1⁄2 circle and ending at the full thread depth at the nine-oíclock position. Simultaneously moving 1⁄2 pitch in the Z direction. The direction of the Z movement will determine the handedness of the thread.
4. Produce your thread by generating 1 full circle (counter-clockwise) around the center, while moving 1 full pitch in the Z direction.
5. After the full form has been machined, return to your starting position near the center of the hole. This is done by generating another 1/2 circle (counter-clockwise) combined with a 1/2 pitch move in Z direction.
6. Return to your hole center, and exit the hole.

ADVENT TOOL

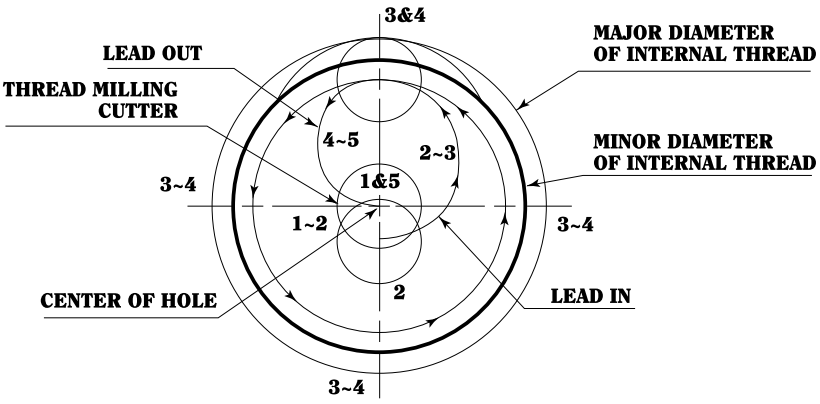
Tool Body and Insert Selection for Advent Tool Replaceable Insert Thread Mill

1. Select the thread form you desire to thread mill. (1.5" - 12UN internal)
2. Choose the tool body that will cut the thread form you need. (tool #15-TA-01-F5)
3. Check the diameter of tool with inserts.
   This depends on the thread form on the insert.
   - The "Standard" cutter diameter is applicable when the insert is 10UN - 32UN, and M1.0 - M2.75.
   - The "Oversize" cutter diameter is pitches 4UN - 9UN, and all NPT, and BSPT forms measured at large end.
   - Cutter diameters for specialized forms such as ACME, and Stub ACME should be checked with Advent Tool's technical department. (12UN is "standard" diameter form. Cutter diameter is 1.22")
4. Compare proper diameter of tool with minor diameter of thread, or drill size. The cutter diameter must not exceed minor diameter of thread, or drill size. (1.5" - 12UN minor diameter = 1.41")
5. Find insert style that fits body chosen.
6. Order insert by applying form to insert style. (insert #ATM-410A12)

ADVENT TOOL

Thread Mill Process - Internal Thread

(view from above)



STEP	FUNCTION
1	Z rapids in minus direction to depth
1~2	rapid in Y-axis to within 0.05 of minor diameter from pos. 1 to 2 and picks up cutter compensation.
2~3	feed from pos. 2 to 3 lead in as Z is moved up in the + direction 1/2 thread pitch
3~4	feeds 1 revolution from pos. 3 as Z is moved up in the + direction one thread pitch
4~5	feeds from pos. 4 to 5 lead out to the center of the hole as Z is moved up in the + direction 1/2 thread pitch all at a higher feed rate
5	Z will rapid to the top of the hole and remove cutter compensation

This programming method can be shown in standardized "G" code programming.

N10 (Incremental program)
N11 1"- 8 UNC (internal in aluminum alloy)
N12 (Tool # 780834-1CS (.745" diam))
N13 G00 G40 G80 G90 G17
N14 M06 T1
N15 G00 X0 Y0 M03 S5128 (X0-Y0 = center of hole)
N16 G43 H1 Z.5 M08 (Z0 being top of part)
N17 G91 G01 Z-1.0 F100.
N18 G01 G41 D1 X.02 F10. (0.0 in diam. offset)
N19 G03 X-.1475 Z.0625 I-.0738 F7.9
N20 G03 Z.125 I.1275 F7.9
N21 G03 X.1475 Z.0625 I.0738 F7.9
N22 G00 G40 X-.02
N23 G90 G00 Z.5 M09

- The actual cutting of the thread is only three lines of code.(N19-N21)
- The feed rate and RPM are calculated using the given surface footage, and chip load as dictated from the chart provided. (1000 SFM, and .0015 chip load)
- These starting conditions are then used with the equations provided to determine the programmed feed rate.

$$RPM = \frac{3.82 \times 1000(sfm)}{.745"} = 5128\ RPM$$

$$F(actual) = 5128(rpm) \times .0015(chip\ load) \times 4(\#\ of\ flutes) = 31.\ IPM$$

$$F(programmed) = \frac{31 \times (1.0 - .745)}{1.0} = 7.9\ IPM$$

NPT and NPTF

When programming an NPT or NPTF thread form, it may be necessary to program a correction factor to compensate for the tapered thread form. This is achieved by dividing the circular move into quarters or eighths, and moving the cutter out as the arc is generated so that the taper is included in the movement. The amount of the taper for a given form is determined as follows:

$$\text{Taper per pitch} = \frac{.0625"}{\text{pitch}}$$ *(amount of taper per inch on NPT form)* *(threads per inch)*

e.g. $0.0044" = \frac{.0625"}{14} / 2 = 0.0022\ RAD$

This amount of taper per pitch is a total. Divide it by two which will give you the amount per radian then dived this number by the number of programmed quadrants. This determines the radial amount that the cutter must be moved out as the cutter forms the thread.

N10 (absolute program)
N15 (1/2-14 NPT in 303 stainless)
N20 (Tool # 581458-1CSNPTCR (.62 diam.))
N25 (0.0007 chip load, and 300 SFM)
N30 G00 G40 G80 G90 G17
N35 M06 T1
N40 G00 X0. Y0. M03 S1850 (X0 Y0 = center of hole)
N45 G43 H1 Z0.5 M08 (Z0.0 being top of part)
N50 G01 Z-1.0 F100.0
N55 G01 G41 D1 X0.02 F10.0 (0.0 in diam. offset)
N60 G03 X 0.1 Y 0.0 Z-0.9643 I-0.06 F1.3
N65 G03 X 0.0 Y-0.1005 Z-0.9464 I 0.1
N70 G03 X 0.1011 Y 0.0 Z-0.9286 J0.1005
N75 G03 X 0.0 Y 0.1016 Z-0.9107 I 0.1011
N80 G03 X 0.1022 Y 0.0 Z-0.8929 J 0.1016
N85 G03 X 0.02 Y 0 Z-0.8571 I 0.0611
N90 G00 G40 X0.0
N95 G00 Z0.5 M09

Telephone Inquiry / Quote Request / Programming Assistance / Tool Testing Form

Advent's Technical Support Staff offers free programming assistance to first time users of any Advent Thread Milling product. If you are not familiar with thread milling, we highly recommend you copy the program request form below and fill out all information. You can then fax it to **1-847-549-9714** or email us at info@Advent-Threadmill.com and we will return a suggested CNC program. A free CD-ROM of programming software is available upon request.

Company Name : _____ Date : _____/_____/_____

Contact : _____ Phone : (_____)_____

Tooling Purchased From : _____ Fax : (_____)_____

Machine Information

Brand Make : _____

Model : _____

Spindle Taper : ☐ 35 Cat ☐ 40 Cat ☐ 50 Cat

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 Specifications : _____

Length of Full Thread : _____

Thread From : ☐ 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 ☐ 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 production of a given thread.*

PRODUCT INFO

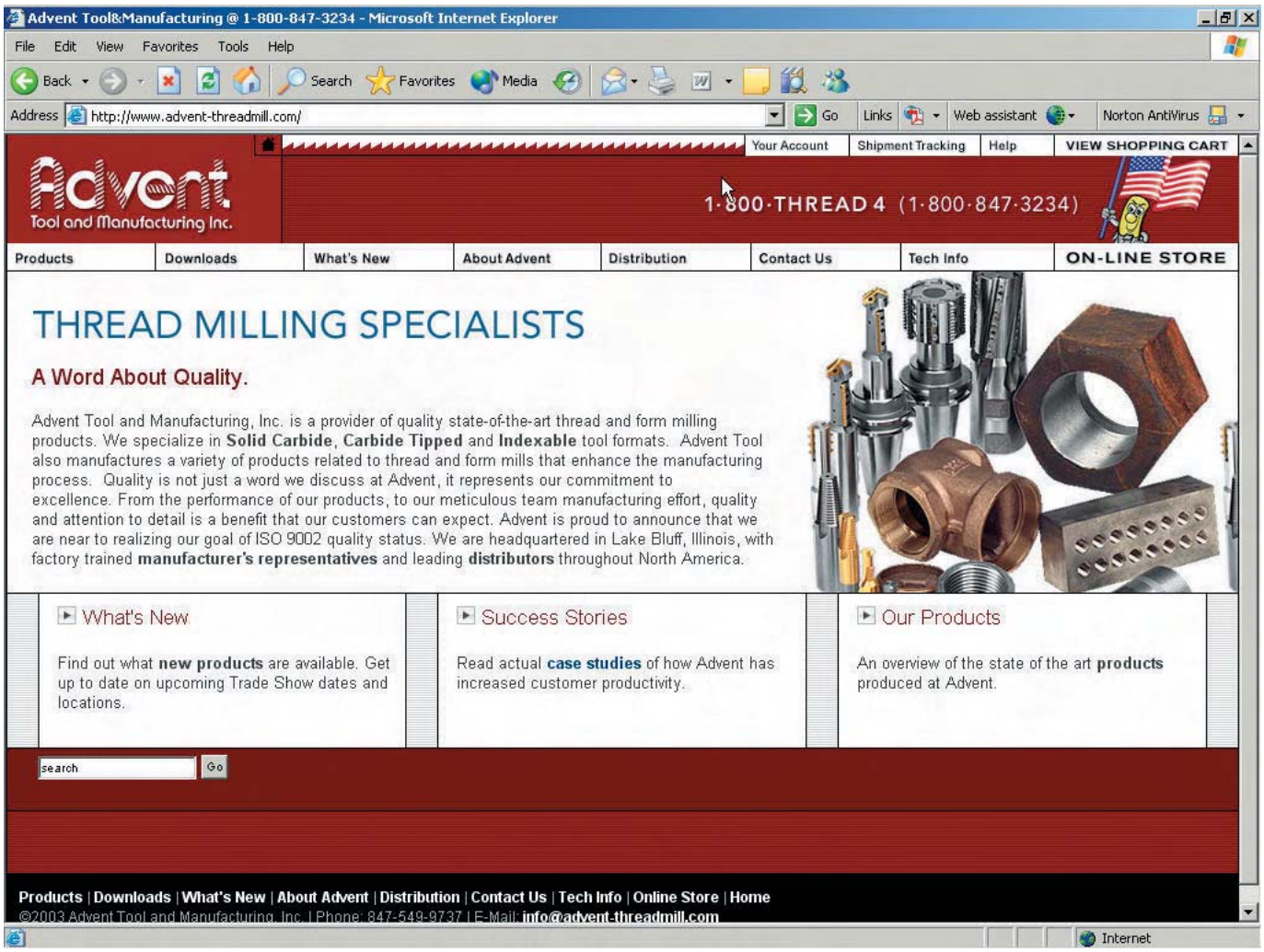
CASE STUDIES

NEW PRODUCTS

Visit our NEW web-site at...

www.Advent-Threadmill.com

TECHNICAL INFO



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PRODUCT UPDATES

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