SmiCut™ STS

ThreadBurr

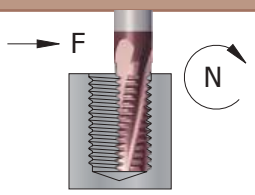
The Master of Threading

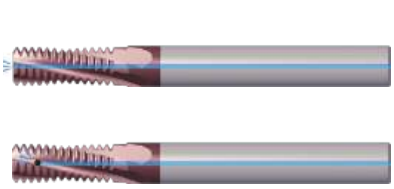
Threading and deburring
in one operation

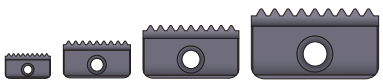
No additional time
for deburring

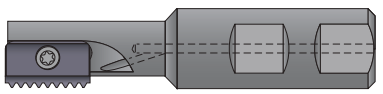
THREAD MILLING

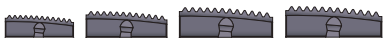
CONTENTS

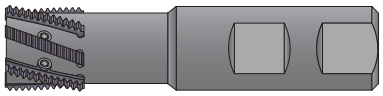


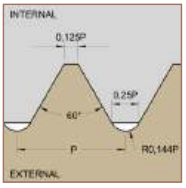










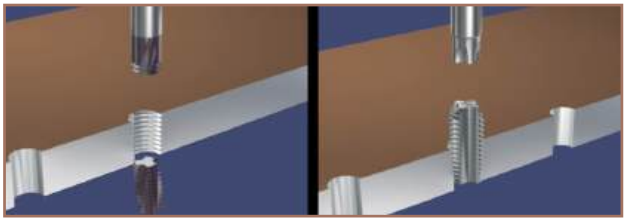


Why choose Thread Milling instead of Tapping?

1. A secure machining operation

Minimal risk of machine stoppages as the cutting forces are low and the chips are short. The work piece will not be destroyed in case of tool failure, as the tool will not get stuck since the diameter of the thread mill is smaller than the thread.

Tap breakage can easily destroy expensive workpieces, since threading is often the last operation on the part.



Milling *Tapping*

2. Difficult machined materials

The excellent cutting conditions with low cutting forces makes it possible to thread mill materials such as hardened steel up to HRC 65, Titanium and other difficult machined materials.

Laser cut holes becomes more common. Threading with a tap is difficult because the surface has become hard, but with a thread mill it is easily done.

Milling *Tapping*

3. Different tolerances

Very tight tolerances are possible to get by using radius correction in the CNC-program.

With taps you need different tools for different tolerances. The tap is used up after wear, but with a thread mill you can continue threading after adjusting with radius compensation.

If you make a surface treatment, special taps must be used, if not the threading has to be made afterwards to get correct tolerance. With a thread mill, the thread can be made before treatment. No machining is needed after the treatment and the thread is protected against rust and wear.

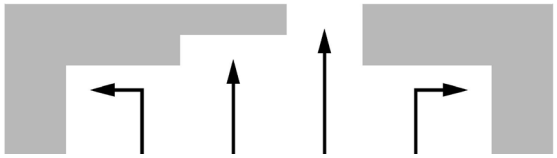
4. Better thread quality

The cutting conditions are optimal when thread milling. The chip evacuation is very good as the tool diameter is smaller than the the thread diameter. The thread will have very good surface finish and quality.

When tapping, the tool size is the same as the thread size and the tap has to force the chip through the thread. The result is a thread that may not be good enough.

5. Flexible tool

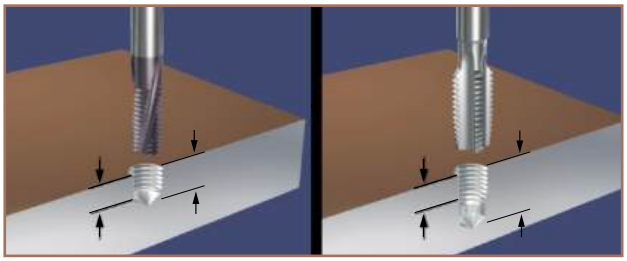
Same cutter can be used for both right hand and left hand threads. Threads with different diameters and tolerances can be made with the same tool as long as the pitch is the same. The same thread mill can be used for blind holes and through holes. W, BSPT, PG, NPT, NPTF and NPSF are thread profiles where you can use the same tool for external and internal threads.



6. Threading in blind holes

With thread milling, a full thread profile is obtained all the way to the bottom of the hole. This allows you to make a thread where it is usually not possible.

With tapping it is necessary to drill much deeper as it is only from the third thread you get the complete thread profile.

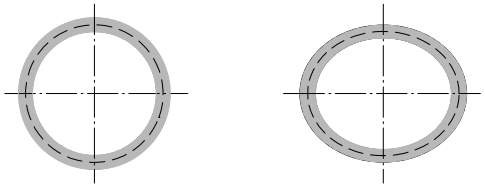


Milling *Tapping*

Why choose Thread Milling instead of Tapping?

7. Threading in thin-walled components

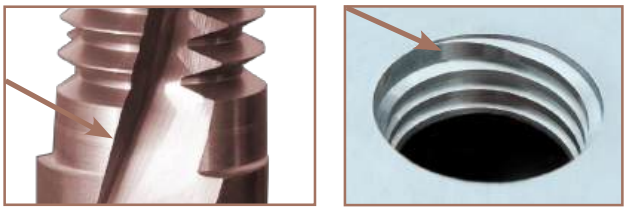
No deflection of the material when thread milling thin-walled components as the cutting forces are low.



Milling *Tapping*

8. Threading without burrs

The thread entrance will be burr free when using ThreadBurr. Threading and deburring in one operation. No additional time for deburring.



9. Shorter machining time

Tapping is normally considered as a quicker method than milling. That is correct in small coarse threads if you do not take in consideration the time for chamfering.

The machining time will be short while using ThreadBurr as the thread will be deburred when threading, so chamfering is not necessary to get a good thread. Big diameters, fine pitches and long threads saves most time compared with tapping.

If you have threads with the same pitch you will save time in tool changes as you can use the same thread mill for different diameters.

10. Threading in smaller machines

As the cutting forces are low it is possible to make large threads and big pitches in less powerful machines.

11. Less wear on the machine spindle

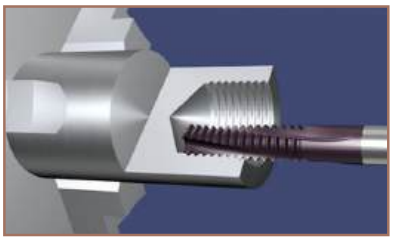
Thread milling result in longer service life of the machine spindle compared with tapping as the rotation on the spindle does not need to be stopped and reversed for every thread.

12. Energy-saving production

Low energy consumption as the machine spindle does not need to be stopped and started for reversing.

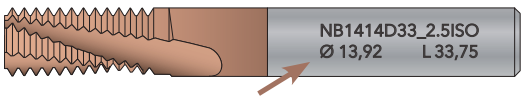
13. Threading in a lathe with live tools

Thread milling reduce machining time compared with thread turning. Excellent chip control minimizes the risk of tool failure.



14. Correct Thread Diameter right away

The Pitch diameter has been optically measured on thread mills from SmiCut and the theoretical external diameter has been individually laser marked on each cutter so you get a thread in tolerance right away. When the tool starts to wear it is possible to make adjustments in the CNC-program.

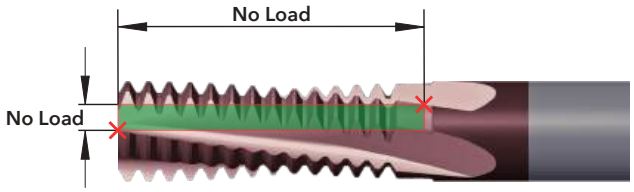


Theoretical external diameter is laser marked

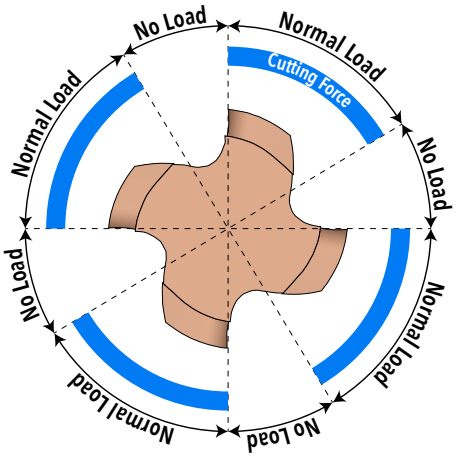
How Tool Design Impacts Vibrations

To achieve a vibration-free tool, it is important to maintain consistent cutting force and tool load throughout the entire process.

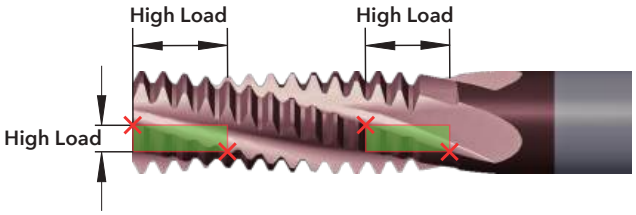
If the cutting edge leaves too early, it will result in an irregular tool load, causing vibrations.



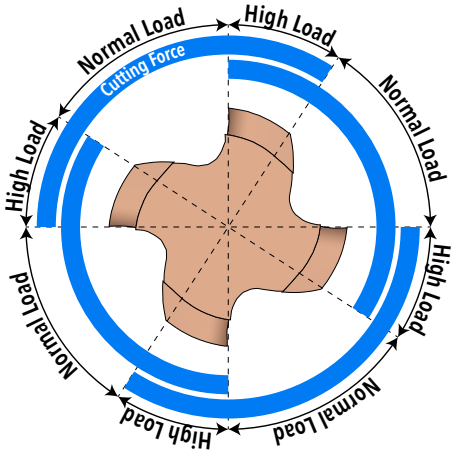
This Thread Mill is not Vibration-Free



If it leaves too late, in addition to the irregular load, you will experience a very high load due to two flutes cutting simultaneously.

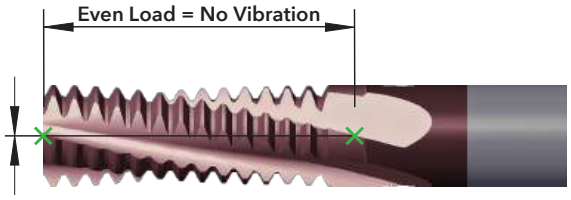


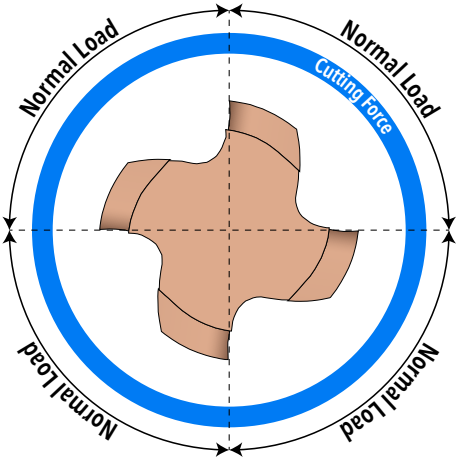
This Thread Mill is not Vibration-Free



SOLUTION

To achieve a vibration-free tool, the cutting edge should not leave the material until the cutting edge from the next flute starts entering the material.





This Thread Mill has the optimal helix angle, tool diameter and number of flutes to ensure Vibration-Free machining when using the entire cutting length.

How SmiCut Design Vibration-Free Thread Mills

The following parameters will affect whether the tool can achieve vibration-free machining:

- **Thread Length** Thread length is difficult to change, as it is mostly determined by the drawing.
- **Tool Diameter** Tool diameter is always the same for coarse threads since they are designed to be as strong as possible.
- **Number of Flutes** It is possible to increase the number of flutes for vibration-free machining, but keep in mind that some materials may present chip flow problems.
- **Helix Angle of Tool** The helix angle of the tool can be varied slightly. Our experience shows that 15° is optimal, but good results can be obtained between 12° and 18°.

With this in mind, SmiCut has designed new tools that, under the appropiate conditions will provide vibration-free machining when used at the correct thread length. Short thread lengths should have more flutes.

Thread Length	New Design	Old Design	
1,5xD	5 flutes	3 flutes	2 flutes more
2xD	4 flutes	3 flutes	1 flute more
2,5xD	3 flutes	3 flutes	Same as before
3xD	3 flutes	3 flutes	Same as before

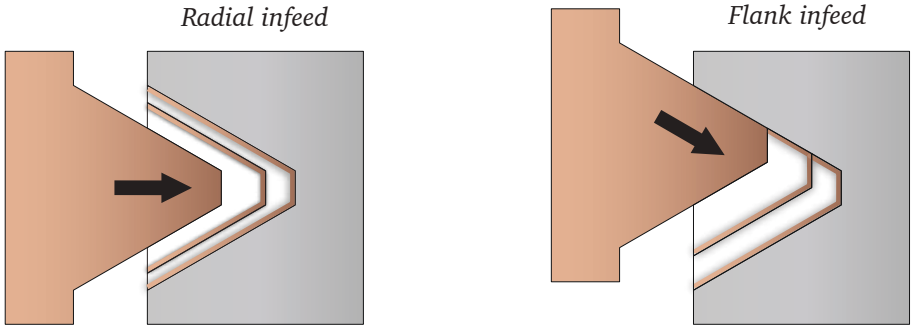
With more flutes, you will experience less vibration, shorter machining time, longer tool life, and better economy.

Reduce Vibrations with Proper Programming

When you have problems with vibrations you normally increase number of passes. Instead of making the thread in one pass you may do it in two or three passes.

The most common way is to make the first pass at a smaller diameter and then increase the diameter to the correct size for the last pass. This will result in a radial infeed with chips that are difficult to break and may not reduce the vibrations as much as you want.

To avoid this you should not only change the diameter for the extra passes. You should as well change the level for them (Z). If you do this you will get a flank infeed with easily broken chips and less vibrations. The software SmiProg will give you correct infeed for multipasses.

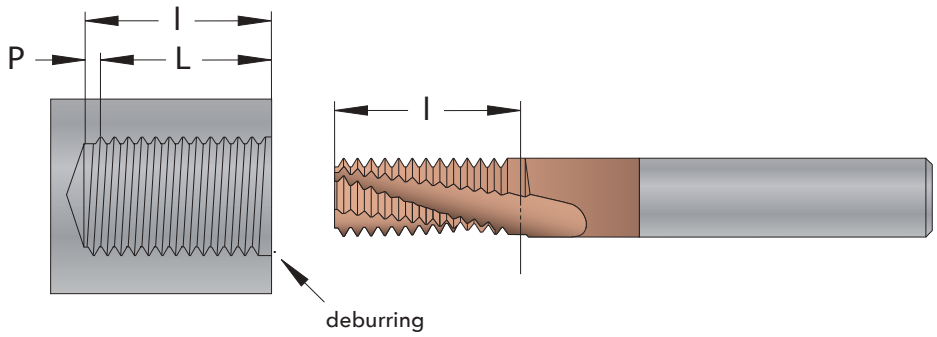


Thread Milling with three passes. Use flank infeed to reduce vibrations. SmiProg gives the data for flank infeed when you make the thread in multipasses.

Threading & Deburring in one operation

The advantage with ThreadBurr is that you can thread and deburr in one operation. No additional time for deburring and countersink is needed. The deburring operation is made automatically when thread milling, which gives you the deburring without any extra costs.

There is no disadvantage to use the ThreadBurr, even if you do not use the deburring function. ThreadBurr is standard on all thread mills from SmiCut.

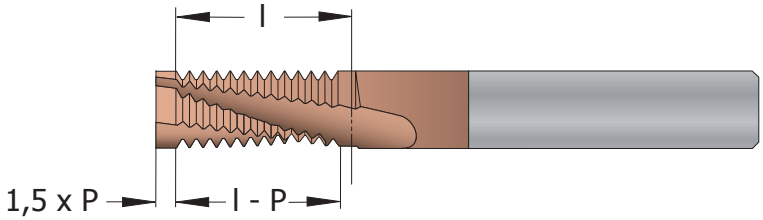


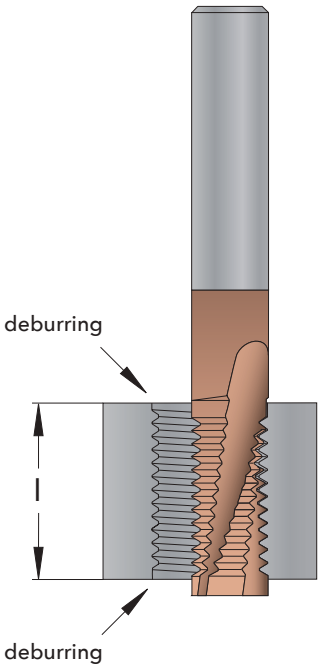
To get a nice entry and a burr free thread you need to start out with going to full depth (l) in to the hole before starting the threading operation. The thread length (L) will be the cutting length (l) minus one pitch (P).

Double ThreadBurr

It is possible to get the thread deburred on both sides. For this operation you need to use a special tool as thread length depends on the thickness of the material. Have in mind the following when you order a tool for deburring on both sides.

- The cutting length (l) should be equivalent to the thickness of the material.





Example

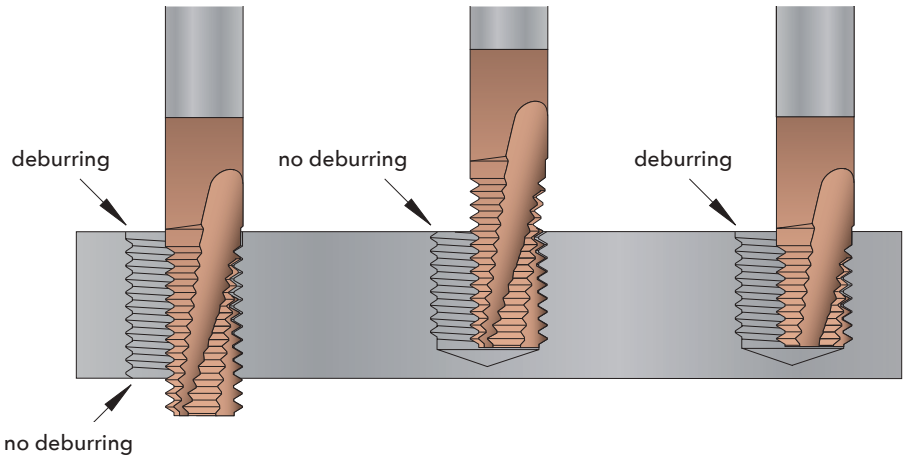
M30x3 thread length 40 mm

40 / 3 = 13,3 Number of pitches
13 x 3 = 39,0 mm Cutting length (l)

Thread Milling with NBB2020D39_3.0ISO_AC (l = 39,0 mm)

SmiCut STS

ThreadBurr



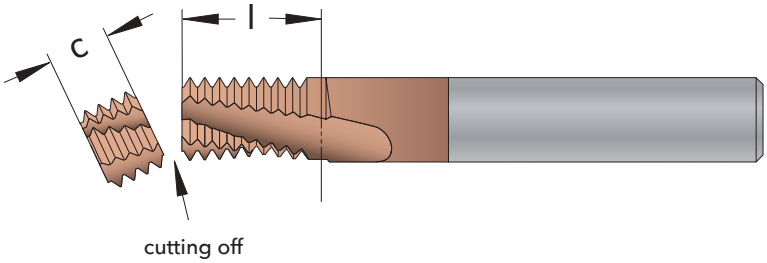
Through Holes

You can always use a standard tool for through holes. Please take in mind you should use a tool as short as possible to get best stability and economy.

Blind Holes

With blind holes it is important to have the correct cutting length (l) on the tool to get the thread deburred. Normally you will find a suitable standard tool. If not, we will cut the tool to the correct length with extremely short delivery time and at a reasonable price. Have in mind the following when you order a tool for blind holes.

- The cutting length (l) should be required thread length (L) plus one pitch (P).
- The distance to cut off (c) has to be dividable by the pitch (P).



Example

M16x1,5 thread length 24 mm
Thread Milling with NB1212D29_1.5ISO_AC (L = 29,25 mm)

24 + 1,5 = 25,5 mm	Required cutting length (l)
29,25 -25,5 = 3,75 mm	Maximum cutting off
3,75 / 1,5 = 2,5	Number of pitches to cut off
2 x 1,5 = 3,0 mm	Distance to cut off (c)
29,25 - 3,0 = 26,25 mm	Cutting length (l) after cutting off
26,25 - 1,5 = 24,75 mm	Thread length (L) after cutting off

You only need to cut off the tool when you want to use the deburring function on blind holes and if there is no standard tool with suitable cutting length.

How to choose correct Thread Mill Diameter

When thread milling, the diameter of the tool has to be smaller than the thread diameter. The reason for this is that the thread has a helix angle, but the tool is straight. If the tool is too big there will be a deviation on the thread profile. The size of this deviation depends on several parameters.

1. Thread diameter
2. Cutter diameter
3. Profile angle
4. Pitch

Big cutter diameter compared to thread diameter, small profile angle, and big pitch are parameters that give greater deviation.

There are three alternatives too choose correct thread mill diameter.

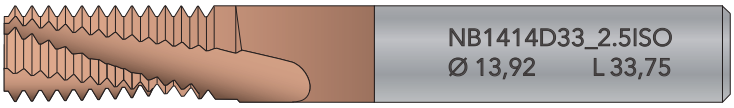
1. SmiCut Catalogue
2. SmiCut Online Store, smicut.store (see page 11)
3. SmiProg Software, smicut.com (see page 12)

How to get correct Thread Diameter

The pitch diameter of thread mills from SmiCut has been optically measured and the theoretical external diameter has been individually laser marked on each cutter. This diameter is what you should use in your program to get a correct diameter on your thread.

For coarse threads you are normally in the middle of the tolerance if you use the laser marked value.

Fine threads may be a little bit tight as you get a very small thread profile deviation on these threads (see above). If this is the case you can mill again after adjusting the diameter in your program.



How to get a burr free Thread

Thread Mills from SmiCut (ThreadBurr) will give you a nice entry and a burr free thread. The cutting length is laser marked on the tool and you can find it as well in the catalogue. This is the distance you should go in to the hole from the surface to get a perfect entry.

Select correct Thread Mill

SmiCut Store helps you find suitable tools

If you need a Thread Mill for a specific thread and you need help to find the correct tool, just go to smicut.store and you will very quickly find suitable tools.

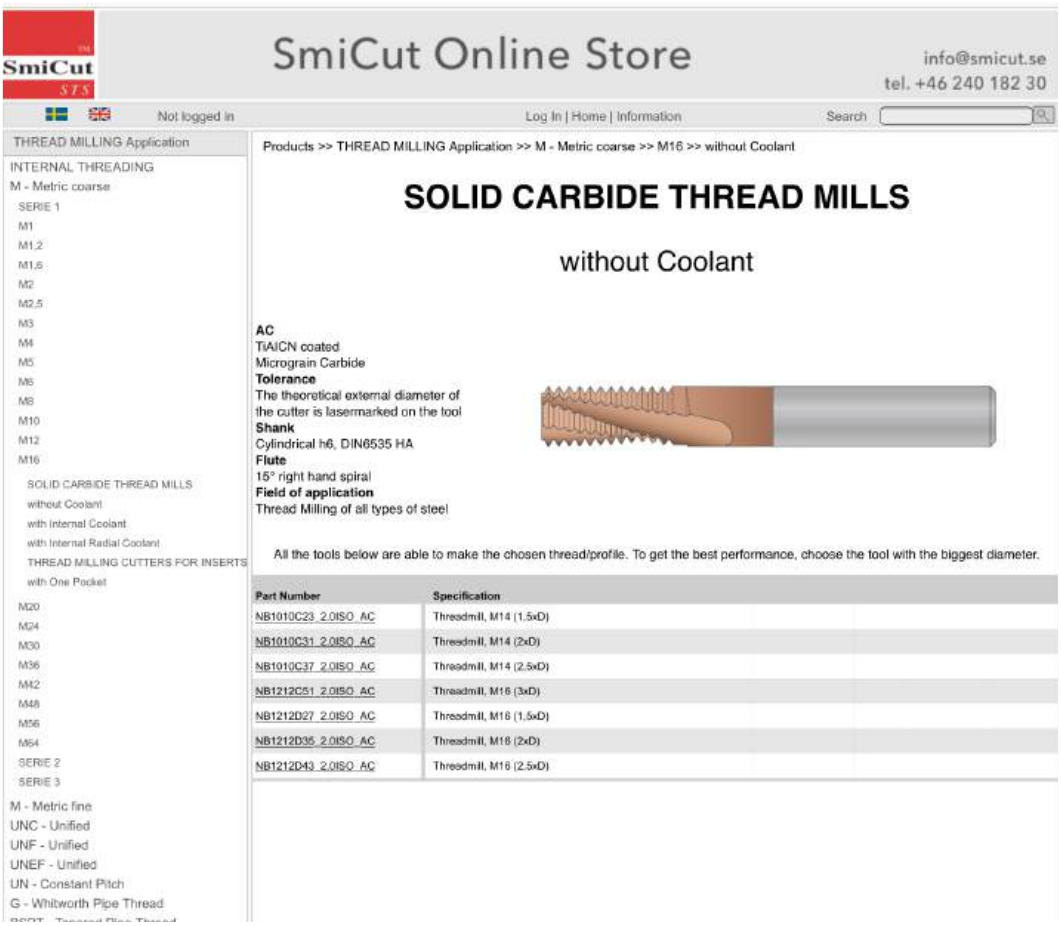
Example: M16 with thread length 32 mm

1. Choose THREAD MILLING Application on the left side
2. Choose M - Metric coarse
3. Choose M16
4. Choose what kind of tool you want, for example without coolant

Now you can see all solid carbide thread mills without coolant that are able to produce M16. From these ones you have to take a tool with a cutting length of at least 32 mm. You can see the cutting length on the part number (see page 13 for more information about ”code key”). The most suitable tool is NB1212D35_2.0ISO_AC. If you want complete information about the dimensions press on the part number of the tool.

You are as well able to do this thread with a tool with a smaller diameter or longer thread length, but this result in longer machining time and/or not as good cutting conditions. Sometimes you choose this anyhow as you may already have the tool, the price is less or you want to have a tool that can make different sizes of threads.

To check machining time and cutting conditions for different tools, please use ”SmiProg” (see next page).

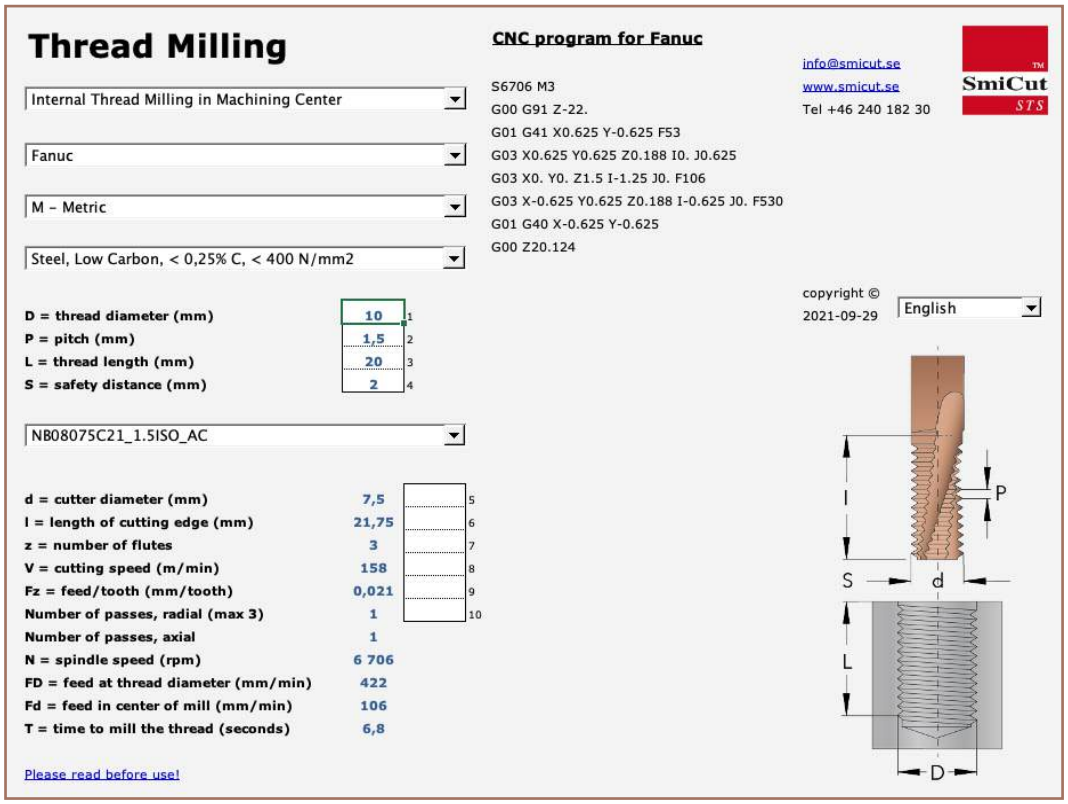


SMIPROG

Software for Thread Milling

SmiProg makes it easy to Thread Mill

Specify control system, material, thread diameter, pitch and thread length. The program will recommend suitable tools. Choose one and you will recieve suggested cutting data, time to mill the thread and CNC programming code. The software is made in excel and includes 22 different languages. Download SmiProg free of charge at smicut.com. SmiProg is also available as a web app which makes it easy to use on a wide range of devices.



Choose among these languages

Chinese (simp.)
Chinese (trad.)
Czech
Danish
Dutch
English
Estonian
Euskera
Finish
French
German
Hungarian
Italian
Japanese
Korean
Norweigan
Polish
Portugese
Romanian
Russian
Spanish
Swedish

SmiProg - Tutorial Video Series

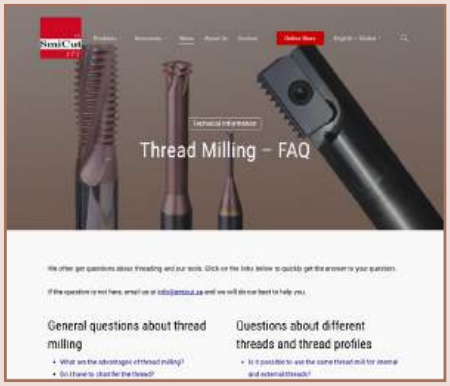
Learn how to use SmiProg and our Thread Mills with video tutorials. They are available in various languages.

Part 1: Introduction (2:38)
Part 2: The Basic Features (6:23)
Part 3: ThreadBurr & Correct Diameter (4:49)

Thread Milling - FAQ

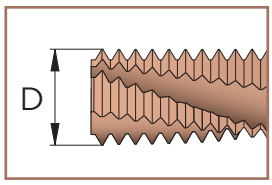
Visit our website and check out the valuable FAQ page that provides many good answers to questions about thread milling. This webpage, available in many languages, includes the following categories:

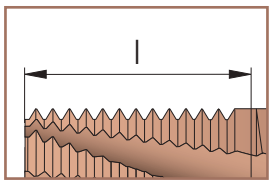
· General questions about thread milling
· Questions about different threads and thread profiles
· Questions about different types of thread mills

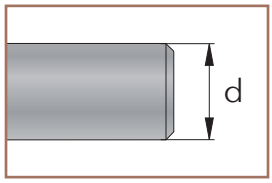


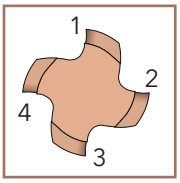
Code Key

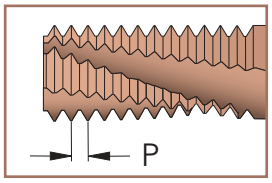
Smart Part Numbers with Tool Specifications











NB	12	12	D	35	2.0	ISO	AC
type of tool	shank dimension	cutter diameter	no. of flutes	cutting length	pitch	thread profile	carbide grade

N = internal threading
E = external threading
X = in- and external threading
B = deburring
BB = deburring on both sides
F = chamfering
S = with one tooth
M = with two teeth
K = internal axial coolant
T = internal radial coolant

C = three flute
D = four flute
E = five flute
F = six flute
G = seven flute
H = eight flute

see page 129

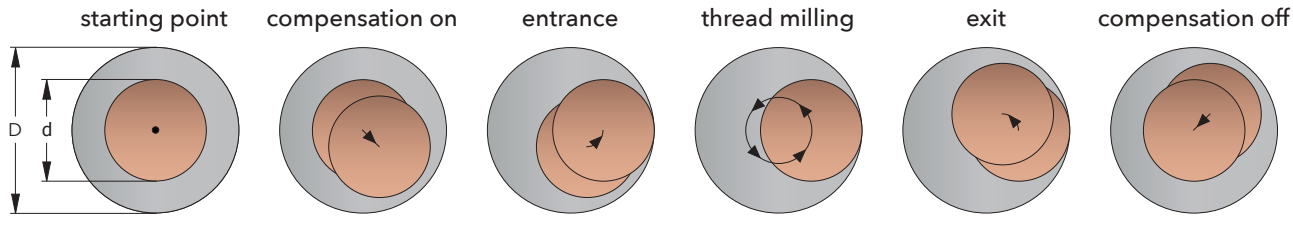
AC = TiAlCN coated Micrograin Carbide. All-round grade with low friction.

Cutting Speed (V_c) and Material Factor (F_m)

MATERIAL		Hardness HB	Tensile Strenght N/mm²	Cutting Speed (V_c) m/min	Material Factor (F_m)
Steel	Low carbon, C < 0,25%	< 120	< 400	150 - 200	1,2
	Medium carbon, C < 0,55%	< 200	< 700	120 - 170	1,1
	High carbon, C < 0,85%	< 250	< 850	110 - 150	1,0
	Low alloy	< 250	< 850	100 - 140	1,0
	High alloy	< 350	< 1200	70 - 110	0,9
	Hardened, HRC < 45			60 - 100	0,8
	Hardened, HRC < 55			30 - 60	0,7
	Hardened, HRC < 65			20 - 40	0,6
Cast iron	Lamellar graphite	< 150	< 500	130 - 180	1,2
	Lamellar graphite	< 300	< 1000	100 - 150	1,1
	Nodular graphite, malleable	< 200	< 700	100 - 150	1,0
	Nodular graphite, malleable	< 300	< 1000	80 - 120	0,9
Stainless steel	Free machining	< 250	< 850	130 - 180	1,0
	Austenitic	< 250	< 850	90 - 140	0,9
	Ferritic and austenitic	< 300	< 1000	80 - 120	0,8
Titanium	Unalloyed	< 200	< 700	60 - 80	0,8
	Alloyed	< 270	< 900	50 - 70	0,7
	Alloyed	< 350	< 1250	30 - 50	0,6
Nickel	Unalloyed	< 150	< 500	80 - 120	0,8
	Alloyed	< 270	< 900	60 - 80	0,7
	Alloyed	< 350	< 1250	50 - 70	0,6
Copper	Unalloyed	< 100	< 350	150 - 250	1,0
	Brass, bronze	< 200	< 700	130 - 180	1,0
	High strength bronze	< 470	< 1500	60 - 80	0,8
Aluminium	Unalloyed	< 100	< 350	500 - 900	1,4
	Alloyed, Si < 0.5%	< 150	< 500	400 - 800	1,3
	Alloyed, Si < 10%	< 120	< 400	300 - 500	1,2
	Alloyed, Si > 10%	< 120	< 400	200 - 400	1,1
Inconel	718	< 370		50 - 70	0,6
Graphite				300 - 500	1,0

Engagement Factor (F_e)

	B/d = 0,05	B/d = 0,06	B/d = 0,07	B/d = 0,08	B/d = 0,09	B/d = 0,10	B/d = 0,12	B/d = 0,14	B/d = 0,16
L / d = 1,0	1,75	1,59	1,45	1,31	1,20	1,09	0,99	0,90	0,82
L / d = 1,25	1,52	1,38	1,25	1,14	1,04	0,94	0,86	0,78	0,70
L / d = 1,5	1,31	1,20	1,09	0,99	0,90	0,82	0,74	0,67	0,61
L / d = 1,75	1,20	1,09	0,99	0,90	0,82	0,74	0,67	0,61	0,56
L / d = 2,0	1,09	0,99	0,90	0,82	0,74	0,67	0,61	0,56	0,51
L / d = 2,25	0,99	0,90	0,82	0,74	0,67	0,61	0,56	0,51	0,46
L / d = 2,5	0,90	0,82	0,74	0,67	0,61	0,56	0,51	0,46	0,42
L / d = 3,0	0,78	0,70	0,64	0,58	0,53	0,48	0,44	0,40	0,36
L / d = 3,5	0,67	0,61	0,56	0,51	0,46	0,42	0,38	0,35	0,31
L / d = 4,0	0,61	0,56	0,51	0,46	0,42	0,38	0,35	0,31	0,29



Diameter Factor (F_d)

d	Diameter Factor (F_d)
1,5	0,010
2,0	0,011
3,0	0,015
4,0	0,019
5,0	0,024
6,0	0,028
8,0	0,036
10,0	0,044
12,0	0,052
14,0	0,060
16,0	0,067
18,0	0,075
20,0	0,082
25,0	0,101
32,0	0,126
40,0	0,156

Example

M24x3,0 thread length 36 mm
Carbon Steel, up to 400 N/mm²
Thread Milling with NB1616C40_3.0ISO_AC
B = 0,54 x 3 = 1,62 mm
B/d = 1,62/16 = 0,10
L/d = 36/16 = 2,25
F_z = 1,2 x 0,61 x 0,067 = 0,049
n = (160 x 1000) / (π x 16) = 3183 rpm
V_{fD} = 0,049 x 3 x 3183 = 468 mm/min
V_{fd} = 468 x (24-16) / 24 = 156 mm/min
T = (278 x 24) / 468 = 14 seconds

$$B = 0{,}54 \times P$$

$$F_z = F_m \times F_e \times F_d$$

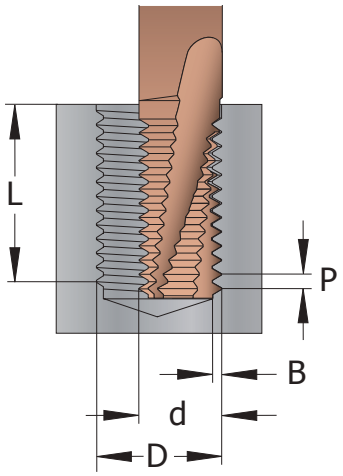
$$n = \frac{V_c \times 1000}{\pi \times d}$$

$$V_{fD} = F_z \times z \times n$$

$$V_{fd} = V_{fD} \times \frac{(D - d)}{D}$$

$$T = 278 \times \frac{D}{V_{fD}}$$

D = thread diameter (mm)
L = thread lenght (mm)
d = cutter diameter (mm)
B = depth of profile (mm)
P = pitch (mm)
z = no. of flutes
F_z = feed / flute (mm/flute)
n = spindle speed (rpm)
V_c = cutting speed (m/min)
V_{fD} = feed at thread diameter Ø (mm/min)
V_{fd} = feed at center of mill (mm/min)
T = time to mill the thread (seconds)



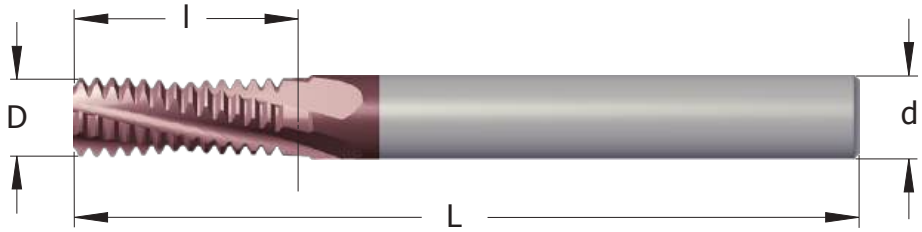
Carbide Grades

AC Micrograin Carbide with TiAlCN coating.
All-round grade with low friction.
Use cutting data according to the tables.

FC Micrograin Carbide with TiAlN coating.
All-round grade with high heat resistance.
Use cutting data according to the tables.

ThreadBurr for Internal Threading

AC
TiAlCN coated, Micrograin Carbide
Tolerance
The theoretical external diameter of the cutter is lasermarked on the tool.
Shank
Cylindrical h6, DIN6535 HA
Flute
Between 12° and 18°
Field of application
Thread Milling of all types of steel

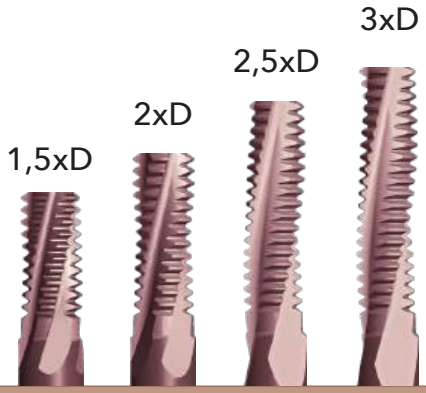


M

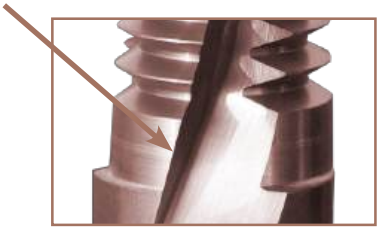
METRIC

Pitch mm	M coarse	M fine	Vib. free	INTERNAL Part Number	d mm	D mm	Z flutes	l mm	L mm
0,4	M2 (1,5xD)			NB04015C3_0.4ISO_AC	4	1,5	3	3,4	50
0,4	M2 (2xD)			NB04015C4_0.4ISO_AC	4	1,5	3	4,6	50
0,45	M2,2 (1,5xD)			NB04016C3_0.45ISO_AC	4	1,65	3	3,82	50
0,45	M2,2 (2xD)		VF	NB04016C5_0.45ISO_AC	4	1,65	3	5,17	50
0,45	M2,5 (1,5xD)			NB04019C4_0.45ISO_AC	4	1,9	3	4,27	50
0,45	M2,5 (2xD)			NB04019C5_0.45ISO_AC	4	1,9	3	5,62	50
0,5	M3 (1,5xD)	≥ M3,5		NB04023C5_0.5ISO_AC	4	2,3	3	5,25	50
0,5	M3 (1,5xD)	≥ M3,5	VF	NB04023E5_0.5ISO_AC	4	2,3	5	5,25	50
0,5	M3 (2xD)	≥ M3,5		NB04023C6_0.5ISO_AC	4	2,3	3	6,75	50
0,5	M3 (2xD)	≥ M3,5	VF	NB04023D6_0.5ISO_AC	4	2,3	4	6,75	50
0,5	M3 (2,5xD)	≥ M3,5	VF	NB04023C8_0.5ISO_AC	4	2,3	3	8,25	50
0,5	M3 (1,5xD)	≥ M3,5		NB06023C5_0.5ISO_AC	6	2,3	3	5,25	63
0,5	M3 (2xD)	≥ M3,5		NB06023C6_0.5ISO_AC	6	2,3	3	6,75	63
0,5	M3 (2,5xD)	≥ M3,5	VF	NB06023C8_0.5ISO_AC	6	2,3	3	8,25	63
0,5		≥ M5		NB04038C10_0.5ISO_AC	4	3,8	3	10,75	50
0,5		≥ M5		NB06038C10_0.5ISO_AC	6	3,8	3	10,75	63
0,6	M3,5 (1,5xD)			NB04026C6_0.6ISO_AC	4	2,6	3	6,3	50
0,6	M3,5 (2xD)			NB04026C8_0.6ISO_AC	4	2,6	3	8,1	50
0,7	M4 (1,5xD)			NB0403C7_0.7ISO_AC	4	3	3	7,35	50
0,7	M4 (1,5xD)		VF	NB0403E7_0.7ISO_AC	4	3	5	7,35	50
0,7	M4 (2xD)			NB0403C8_0.7ISO_AC	4	3	3	8,75	50
0,7	M4 (2xD)		VF	NB0403D8_0.7ISO_AC	4	3	4	8,75	50
0,7	M4 (2,5xD)		VF	NB0403C10_0.7ISO_AC	4	3	3	10,85	50
0,7	M4 (1,5xD)			NB0603C7_0.7ISO_AC	6	3	3	7,35	63
0,7	M4 (2xD)			NB0603C8_0.7ISO_AC	6	3	3	8,75	63
0,7	M4 (2,5xD)		VF	NB0603C10_0.7ISO_AC	6	3	3	10,85	63
0,75	M4,5 (1,5xD)	≥ M5		NB04034C7_0.75ISO_AC	4	3,4	3	7,87	50
0,75	M4,5 (2xD)	≥ M5		NB04034C10_0.75ISO_AC	4	3,4	3	10,12	50
0,75		≥ M6		NB06045C10_0.75ISO_AC	6	4,5	3	10,87	63
0,75		≥ M6	VF	NB06045C16_0.75ISO_AC	6	4,5	3	16,87	63
0,75		≥ M6	VF	NB06048E10_0.75ISO_ AC	6	4,8	5	10,87	63
0,8	M5 (1,5xD)			NB04038C8_0.8ISO_AC	4	3,8	3	8,4	50
0,8	M5 (1,5xD)		VF	NB04038E8_0.8ISO_AC	4	3,8	5	8,4	50
0,8	M5 (2xD)			NB04038C10_0.8ISO_AC	4	3,8	3	10,8	50
0,8	M5 (2xD)		VF	NB04038D10_0.8ISO_AC	4	3,8	4	10,8	50
0,8	M5 (2,5xD)		VF	NB04038C13_0.8ISO_AC	4	3,8	3	13,2	50
0,8	M5 (1,5xD)			NB06038C8_0.8ISO_AC	6	3,8	3	8,4	63
0,8	M5 (2xD)			NB06038C10_0.8ISO_AC	6	3,8	3	10,8	63
0,8	M5 (2,5xD)		VF	NB06038C13_0.8ISO_AC	6	3,8	3	13,2	63
1	M6 (1,5xD)	≥ M8		NB06045C10_1.0ISO_AC	6	4,5	3	10,5	63
1	M6 (1,5xD)	≥ M8	VF	NB06045E10_1.0ISO_AC	6	4,5	5	10,5	63
1	M6 (2xD)	≥ M8		NB06045C13_1.0ISO_AC	6	4,5	3	13,5	63
1	M6 (2xD)	≥ M8	VF	NB06045D13_1.0ISO_AC	6	4,5	4	13,5	63
1	M6 (2,5xD)	≥ M8	VF	NB06045C16_1.0ISO_AC	6	4,5	3	16,5	63
1	M6 (3xD)	≥ M8	VF	NB06045C19_1.0ISO_AC	6	4,5	3	19,5	63
1		≥ M8		NB0606C10_1.0ISO_AC	6	6	3	10,5	63
1		≥ M8		NB0606C13_1.0ISO_AC	6	6	3	13,5	63
1		≥ M8	VF	NB0606E14_1.0ISO_ AC	6	6	5	14,5	63

VF = Vibration-Free if you use the entire cutting length, see page 6.



Deburring of the thread



Threading without burrs

M METRIC

Pitch mm	M coarse	M fine	Vib. free	INTERNAL Part Number	d mm	D mm	Z flutes	l mm	L mm
1		≥ M10		NB0808D10_1.0ISO_AC	8	8	4	10,5	63
1		≥ M10		NB0808D13_1.0ISO_AC	8	8	4	13,5	63
1		≥ M10	VF	NB0808F16_1.0ISO_AC	8	8	6	16,5	63
1		≥ M10		NB0808D17_1.0ISO_AC	8	8	4	17,5	63
1		≥ M12		NB1010E14_1.0ISO_ AC	10	10	5	14,5	76
1		≥ M12	VF	NB1010G17_1.0ISO_ AC	10	10	7	17,5	76
1		≥ M12	VF	NB1010E19_1.0ISO_AC	10	10	5	19,5	76
1		≥ M14		NB1212F15_1.0ISO_AC	12	12	6	15,5	83
1		≥ M14	VF	NB1212H18_1.0ISO_AC	12	12	8	18,5	83
1		≥ M14	VF	NB1212F21_1.0ISO_AC	12	12	6	21,5	83
1,25	M8 (1,5xD)	≥ M10		NB0606C14_1.25ISO_AC	6	6	3	14,37	63
1,25	M8 (1,5xD)	≥ M10	VF	NB0606E14_1.25ISO_AC	6	6	5	14,37	63
1,25	M8 (2xD)	≥ M10		NB0606C18_1.25ISO_AC	6	6	3	18,12	63
1,25	M8 (2xD)	≥ M10	VF	NB0606D18_1.25ISO_AC	6	6	4	18,12	63
1,25	M8 (2,5xD)	≥ M10	VF	NB0606C21_1.25ISO_AC	6	6	3	21,87	63
1,25	M8 (3xD)	≥ M10	VF	NB0606C25_1.25ISO_AC	6	6	3	25,62	76
1,5	M10 (1,5xD)	≥ M12		NB08075C17_1.5ISO_AC	8	7,5	3	17,25	63
1,5	M10 (1,5xD)	≥ M12	VF	NB08075E17_1.5ISO_AC	8	7,5	5	17,25	63
1,5	M10 (2xD)	≥ M12		NB08075C21_1.5ISO_AC	8	7,5	3	21,75	76
1,5	M10 (2xD)	≥ M12	VF	NB08075D21_1.5ISO_AC	8	7,5	4	21,75	76
1,5	M10 (2,5xD)	≥ M12	VF	NB08075C27_1.5ISO_AC	8	7,5	3	27,75	76
1,5	M10 (3xD)	≥ M12	VF	NB08075C32_1.5ISO_AC	8	7,5	3	32,25	76
1,5		≥ M14		NB1010D17_1.5ISO_AC	10	10	4	17,25	76
1,5		≥ M14	VF	NB1010F20_1.5ISO_AC	10	10	6	20,25	76
1,5		≥ M14		NB1010D23_1.5ISO_AC	10	10	4	23,25	76
1,5		≥ M16		NB1212E15_1.5ISO_AC	12	12	5	15,75	83
1,5		≥ M16		NB1212E21_1.5ISO_AC	12	12	5	21,75	83
1,5		≥ M16	VF	NB1212G21_1.5ISO_AC	12	12	7	21,75	83
1,5		≥ M16	VF	NB1212E29_1.5ISO_AC	12	12	5	29,25	83
1,5		≥ M20		NB1616F18_1.5ISO_AC	16	16	6	18,75	89
1,5		≥ M20	VF	NB1616H24_1.5ISO_AC	16	16	8	24,75	89
1,5		≥ M20	VF	NB1616F26_1.5ISO_AC	16	16	6	26,25	89
1,5		≥ M20	VF	NB1616F35_1.5ISO_AC	16	16	6	35,25	100
1,75	M12 (1,5xD)			NB0808C20_1.75ISO_AC	8	8	3	20,12	76
1,75	M12 (2xD)		VF	NB0808C27_1.75ISO_AC	8	8	3	27,12	76
1,75	M12 (1,5xD)			NB1009C20_1.75ISO_AC	10	9	3	20,12	76
1,75	M12 (1,5xD)		VF	NB1009E20_1.75ISO_AC	10	9	5	20,12	76
1,75	M12 (2xD)			NB1009C27_1.75ISO_AC	10	9	3	27,12	76
1,75	M12 (2xD)		VF	NB1009D27_1.75ISO_AC	10	9	4	27,12	76
1,75	M12 (2,5xD)		VF	NB1009C32_1.75ISO_AC	10	9	3	32,37	100
1,75	M12 (3xD)		VF	NB1009C37_1.75ISO_AC	10	9	3	37,62	100
2	M14 (1,5xD)	≥ M18		NB1010C23_2.0ISO_AC	10	10	3	23	76
2	M14 (2xD)	≥ M18		NB1010C31_2.0ISO_AC	10	10	3	31	100
2	M14 (2,5xD)	≥ M18	VF	NB1010C37_2.0ISO_AC	10	10	3	37	100
2	M16 (1,5xD)	≥ M18		NB1212D27_2.0ISO_AC	12	12	4	27	83
2	M16 (1,5xD)	≥ M18	VF	NB1212E27_2.0ISO_AC	12	12	5	27	83
2	M16 (2xD)	≥ M18	VF	NB1212D35_2.0ISO_AC	12	12	4	35	100
2	M16 (2,5xD)	≥ M18	VF	NB1212D43_2.0ISO_AC	12	12	4	43	100
2	M16 (3xD)	≥ M18	VF	NB1212C51_2.0ISO_AC	12	12	3	51	100

M METRIC

Pitch mm	M coarse	M fine	Vib. free	INTERNAL Part Number	d mm	D mm	Z flutes	l mm	L mm
2		≥ M20		NB1616E29_2.0ISO_AC	16	16	5	29	89
2		≥ M20	VF	NB1616E39_2.0ISO_AC	16	16	5	39	100
2		≥ M24	VF	NB2020F43_2.0ISO_AC	20	20	6	43	100
2		≥ M24		NB2020F57_2.0ISO_AC	20	20	6	57	120
2,5	M18 (1,5xD)			NB1212C31_2.5ISO_AC	12	12	3	31,25	100
2,5	M18 (2xD)		VF	NB1212C38_2.5ISO_AC	12	12	3	38,75	100
2,5	M18 (2,5xD)		VF	NB1212C48_2.5ISO_AC	12	12	3	48,75	100
2,5	M20 (1,5xD)			NB1414D33_2.5ISO_AC	14	14	4	33,75	89
2,5	M20 (1,5xD)		VF	NB1414E33_2.5ISO_AC	14	14	5	33,75	89
2,5	M20 (2xD)		VF	NB1414D43_2.5ISO_AC	14	14	4	43,75	100
2,5	M20 (2,5xD)		VF	NB1615D53_2.5ISO_AC	16	15	4	53,75	120
2,5	M20 (3xD)		VF	NB1615C63_2.5ISO_AC	16	15	3	63,75	120
3	M24 (1,5xD)	≥ M30		NB1616C40_3.0ISO_AC	16	16	3	40,5	100
3	M24 (2xD)	≥ M30	VF	NB1616C52_3.0ISO_AC	16	16	3	52,5	120
3	M24 (2,5xD)	≥ M30	VF	NB1818C64_3.0ISO_AC	18	18	3	64,5	130
3		≥ M30		NB2020D46_3.0ISO_AC	20	20	4	46,5	120
3		≥ M30	VF	NB2020D61_3.0ISO_AC	20	20	4	61,5	150
3,5	M30 (1,5xD)			NB2020C50_3.5ISO_AC	20	20	3	50,75	120
3,5	M30 (2xD)		VF	NB2020C64_3.5ISO_AC	20	20	3	64,75	150
3,5	M30 (2,5xD)		VF	NB2020C78_3.5ISO_AC	20	20	3	78,75	150
4	M36 (1,5xD)	≥ M42		NB2020C58_4.0ISO_AC	20	20	3	58	150

ThreadBurr for External Threading

M METRIC

Pitch mm	Vib. free	EXTERNAL Part Number	d mm	D mm	Z flutes	l mm	L mm
1,0	VF	EB1010E21_1.0ISO_AC	10	10	5	21,5	76
1,5	VF	EB1212E26_1.5ISO_AC	12	12	5	26,25	83
2,0	VF	EB1212E25_2.0ISO_AC	12	12	5	25	83
2,0	VF	EB1616E35_2.0ISO_AC	16	16	5	35	100

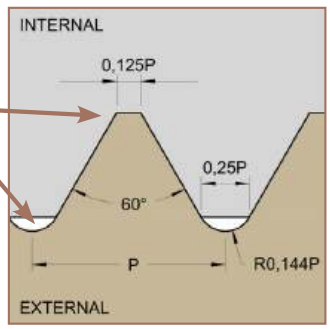
Is it possible to use internal thread mills for external threads?

You can not use internal thread mills for external threads when threading Metrical (M) and Unified (UN) threads. They have different profile for internal and external. The internal thread has a bigger crest than root and for the external thread it is the opposite, the root is bigger than the crest.

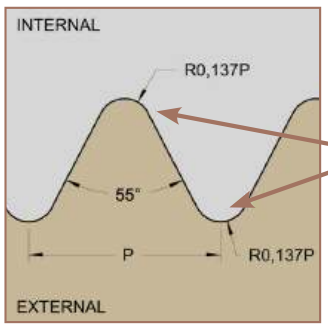
Profiles such as W, BSPT, PG, NPT, NPTF and NPSF has the same crest as root and because of this it is possible for these profiles to use the same thread mill for internal and external threads.

different crest and root

ISO (M) and UN



Whitworth (W)

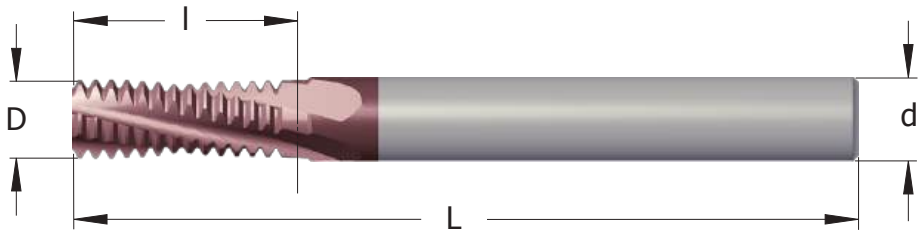


same crest and root

SmiCut STS

ThreadBurr

AC
TiAlCN coated, Micrograin Carbide
Tolerance
The theoretical external diameter of the cutter is laser marked on the tool.
Shank
Cylindrical h6, DIN6535 HA
Flute
Between 12° and 18°
Field of application
Thread Milling of all types of steel



G/Rp WHITWORTH PIPE THREAD

Pitch TPI	Standard	Vib. free	INTERNAL / EXTERNAL Part Number	d mm	D mm	Z flutes	l mm	L mm
28	G 1/16 - 1/8		XB0606C10_28W_AC	6	6	3	10,43	63
28	G 1/16 - 1/8	VF	XB0606F10_28W_AC	6	6	6	10,43	63
28	G 1/8		XB0808D14_28W_AC	8	8	4	14,06	63
28	G 1/8	VF	XB0808G14_28W_AC	8	8	7	14,06	63
19	G 1/4 - 3/8		XB0808C15_19W_AC	8	8	3	15,37	63
19	G 1/4 - 3/8	VF	XB0808F15_19W_AC	8	8	6	15,37	63
19	G 1/4 - 3/8		XB1010D22_19W_AC	10	10	4	22,06	76
19	G 1/4 - 3/8	VF	XB1010F22_19W_AC	10	10	6	22,06	76
14	G 1/2 - 7/8		XB1212D20_14W_AC	12	12	4	20,86	83
14	G 1/2 - 7/8	VF	XB1212G20_14W_AC	12	12	7	20,86	83
14	G 1/2 - 7/8		XB1212D28_14W_AC	12	12	4	28,12	83
14	G 1/2 - 7/8		XB1616E28_14W_AC	16	16	5	28,12	89
14	G 1/2 - 7/8	VF	XB1616G28_14W_AC	16	16	7	28,12	89
11	G 1 - 1 1/2		XB1212C26_11W_AC	12	12	3	26,55	83
11	G 1 - 1 1/2	VF	XB1212E26_11W_AC	12	12	5	26,55	83
11	G 1 - 3	VF	XB1616D40_11W_AC	16	16	4	40,41	100
11	G ≥ 1	VF	XB2020E49_11W_AC	20	20	5	49,65	120

R/Rc BSPT PIPE THREAD

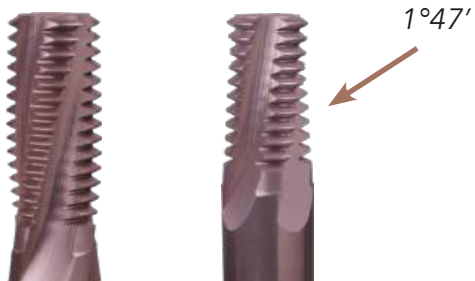
Pitch TPI	Standard	Vib. free	INTERNAL / EXTERNAL Part Number	d mm	D mm	Z flutes	l mm	L mm
28	Rc 1/16 - 1/8		XB0606C10_28BSPT_AC	6	6	3	10,43	63
28	Rc 1/8		XB0808D14_28BSPT_AC	8	8	4	14,06	63
19	Rc 1/4 - 3/8		XB0808C15_19BSPT_AC	8	8	3	15,37	63
19	Rc 1/4 - 3/8		XB1010D22_19BSPT_AC	10	10	4	22,06	76
14	Rc 1/2 - 7/8		XB1212D20_14BSPT_AC	12	12	4	20,86	83
11	Rc 1 - 2		XB1616D31_11BSPT_AC	16	16	4	31,17	89

PG STEEL CONDUIT THREAD DIN 40430

Pitch TPI	Standard	Vib. free	INTERNAL / EXTERNAL Part Number	d mm	D mm	Z flutes	l mm	L mm
20	Pg 7		XB0808C21_20PG_AC	8	8	3	20,96	63
18	Pg 9 - 16		XB1010C27_18PG_AC	10	10	3	27,52	76
16	Pg 21- 48	VF	XB1212D31_16PG_AC	12	12	4	30,96	83

VF = Vibration-Free if you use the entire cutting length, see page 6.

W (straight) BSPT (tapered)



How to know if I need W or BSPT?

Whitworth is a profile that is mainly used for pipe threads. When it is a straight thread it is W and when it is tapered BSPT.

G thread → W
Rp thread → W
Rc thread → BSPT
R thread → BSPT

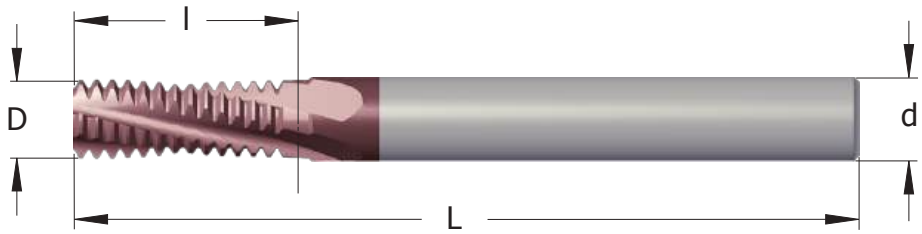
For more information see page 128.

SmiCut STS

SOLID CARBIDE THREAD MILLS *TiAlCN*

ThreadBurr for Internal Threading

AC
TiAlCN coated, Micrograin Carbide
Tolerance
The theoretical external diameter of the cutter is laser marked on the tool.
Shank
Cylindrical h6, DIN6535 HA
Flute
Between 12° and 18°
Field of application
Thread Milling of all types of steel



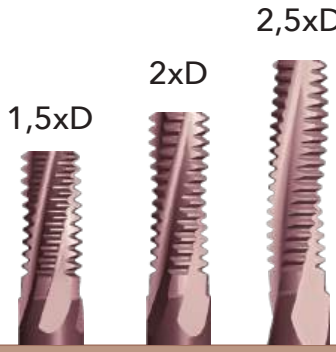
UN

UNIFIED

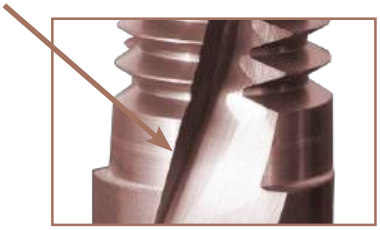
Pitch TPI	UNC	UNF	Vib. free	INTERNAL Part Number	d mm	D mm	Z flutes	l mm	L mm
64		No. 2 (1,5xD)		NB04017C3_64UN_AC	4	1,7	3	3,77	50
64		No. 2 (2xD)		NB04017C5_64UN_AC	4	1,7	3	4,96	50
56	No. 2 (1,5xD)			NB04016C3_56UN_AC	4	1,6	3	3,86	50
56	No. 2 (2xD)		VF	NB04016C5_56UN_AC	4	1,6	3	5,22	50
56		No. 3 (1,5xD)		NB04019C4_56UN_AC	4	1,9	3	4,31	50
56		No. 3 (2xD)		NB04019C5_56UN_AC	4	1,9	3	5,67	50
48	No. 3 (1,5xD)			NB04019C4_48UN_AC	4	1,9	3	4,5	50
48	No. 3 (2xD)			NB04019C5_48UN_AC	4	1,9	3	5,56	50
48		No. 4 (1,5xD)		NB04021C5_48UN_AC	4	2,1	3	5,03	50
48		No. 4 (2xD)		NB04021C6_48UN_AC	4	2,1	3	6,61	50
44		No.5 (1,5xD)		NB04024C5_44UN_AC	4	2,4	3	5,48	50
44		No.5 (2xD)		NB04024C7_44UN_AC	4	2,4	3	7,22	50
40	No. 4 (1,5xD)			NB04021C5_40UN_AC	4	2,1	3	5,4	50
40	No. 4 (2xD)			NB04021C6_40UN_AC	4	2,1	3	6,67	50
40	No.5 (1,5xD)			NB04023C5_40UN_AC	4	2,3	3	5,4	50
40	No.5 (2xD)			NB04023C7_40UN_AC	4	2,3	3	7,3	50
40	No.5 (2,5xD)		VF	NB04023C8_40UN_AC	4	2,3	3	8,57	50
40		No.6 (1,5xD)		NB04026C6_40UN_AC	4	2,6	3	6,03	50
40		No.6 (2xD)		NB04026C8_40UN_AC	4	2,6	3	7,94	50
36		No.8 (1,5xD)		NB04031C7_36UN_AC	4	3,1	3	7,41	50
36		No.8 (2xD)		NB04031C9_36UN_AC	4	3,1	3	9,53	50
32	No.6 (1,5xD)			NB04025C6_32UN_AC	4	2,5	3	6,75	50
32	No.6 (2xD)		VF	NB04025C8_32UN_AC	4	2,5	3	8,33	50
32	No.6 (2,5xD)		VF	NB04025C10_32UN_AC	4	2,5	3	9,92	50
32	No.8 (1,5xD)			NB0403C7_32UN_AC	4	3	3	7,54	50
32	No.8 (2xD)			NB0403C9_32UN_AC	4	3	3	9,13	50
32	No.8 (2,5xD)		VF	NB0403C11_32UN_AC	4	3	3	11,51	50
32		No.10 (1,5xD)		NB04036C8_32UN_AC	4	3,6	3	8,33	50
32		No.10 (2xD)		NB04036C10_32UN_AC	4	3,6	3	10,72	50
32				NB0606D13_32UN_AC	6	6	4	13,1	63
28		No.12 (1,5xD)		NB0404C9_28UN_AC	4	4	3	9,52	50
28		No.12 (2xD)		NB0404C12_28UN_AC	4	4	3	12,25	50
28		1/4 (1,5xD)		NB0605C10_28UN_AC	6	5	3	10,43	63
28		1/4 (2xD)		NB0605C14_28UN_AC	6	5	3	14,06	63
28				NB0808D17_28UN_AC	8	8	4	17,69	63
24	No.10 (1,5xD)			NB04036C9_24UN_AC	4	3,6	3	9	50
24	No.10 (2xD)			NB04036C11_24UN_AC	4	3,6	3	11,11	50
24	No.10 (2,5xD)		VF	NB04036C13_24UN_AC	4	3,6	3	13,23	50
24	No.12 (1,5xD)			NB0404C10_24UN_AC	4	4	3	10,05	50
24	No.12 (2xD)			NB0404C12_24UN_AC	4	4	3	12,17	50
24	No.12 (2,5xD)		VF	NB0404C15_24UN_AC	4	4	3	15,35	50
24		5/16 (1,5xD)		NB0606C13_24UN_AC	6	6	3	13,23	63
24		5/16 (2xD)		NB0606C17_24UN_AC	6	6	3	17,46	63
24		3/8 (1,5xD)		NB08076C15_24UN_AC	8	7,6	3	15,35	63
24		3/8 (2xD)		NB08076C20_24UN_AC	8	7,6	3	20,64	76
20	1/4 (1,5xD)			NB06045C10_20UN_AC	6	4,5	3	10,8	63
20	1/4 (2xD)		VF	NB06045C14_20UN_AC	6	4,5	3	14,6	63
20	1/4 (2,5xD)		VF	NB06045C17_20UN_AC	6	4,5	3	17,15	63

VF = Vibration-Free if you use the entire cutting length, see page 6.

SmiCut STS



Deburring of the thread



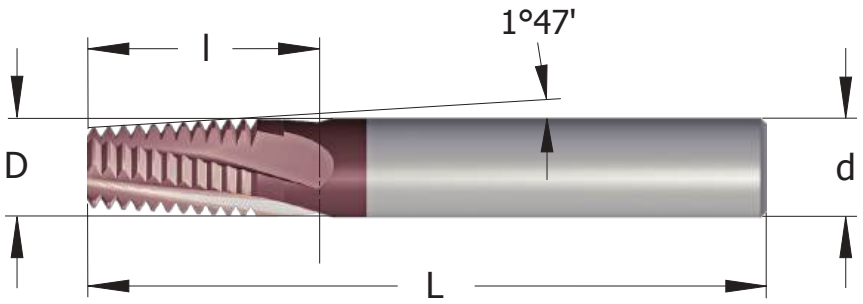
Threading without burrs

UN UNIFIED

Pitch TPI	UNC	UNF	Vib. free	INTERNAL Part Number	d mm	D mm	Z flutes	l mm	L mm
20		7/16 (1,5xD)		NB0808C18_20UN_AC	8	8	3	18,41	63
20		7/16 (2xD)		NB0808C23_20UN_AC	8	8	3	23,5	76
20		1/2 (1,5xD)		NB1010D21_20UN_AC	10	10	4	20,96	76
20		1/2 (2xD)	VF	NB1010D27_20UN_AC	10	10	4	27,31	76
20			VF	NB1212E28_20UN_AC	12	12	5	28,57	83
18	5/16 (1,5xD)			NB06058C13_18UN_AC	6	5,8	3	13,41	63
18	5/16 (2xD)			NB06058C17_18UN_AC	6	5,8	3	17,64	63
18	5/16 (2,5xD)		VF	NB06058C21_18UN_AC	6	5,8	3	21,87	63
18		9/16 (1,5xD)		NB1010D23_18UN_AC	10	10	4	23,28	76
18		9/16 (2xD)	VF	NB1010D30_18UN_AC	10	10	4	30,34	100
18		5/8 (1,5xD)		NB1212D26_18UN_AC	12	12	4	26,11	83
18		5/8 (2xD)	VF	NB1212D33_18UN_AC	12	12	4	33,16	100
16	3/8 (1,5xD)			NB0606C16_16UN_AC	6	6	3	16,67	63
16	3/8 (2xD)		VF	NB0606C21_16UN_AC	6	6	3	21,43	63
16	3/8 (2,5xD)		VF	NB0807C26_16UN_AC	8	7	3	26,19	76
16		3/4 (1,5xD)	VF	NB1212D31_16UN_AC	12	12	4	30,96	100
16		3/4 (2xD)	VF	NB1212D40_16UN_AC	12	12	4	40,48	100
16			VF	NB1616E35_16UN_AC	16	16	5	35,72	100
14	7/16 (1,5xD)			NB0808C19_14UN_AC	8	8	3	19,05	63
14	7/16 (2xD)			NB0808C24_14UN_AC	8	8	3	24,49	76
14	7/16 (2,5xD)		VF	NB0808C30_14UN_AC	8	8	3	29,94	76
14		7/8 (1,5xD)	VF	NB1616E35_14UN_AC	16	16	5	35,38	100
14		7/8 (2xD)	VF	NB1616E46_14UN_AC	16	16	5	46,26	120
13	1/2 (1,5xD)			NB0808C22_13UN_AC	8	8	3	22,47	76
13	1/2 (2xD)		VF	NB0808C28_13UN_AC	8	8	3	28,33	76
13	1/2 (2,5xD)		VF	NB10093C34_13UN_AC	10	9,3	3	34,19	100
12	9/16 (1,5xD)			NB1010C24_12UN_AC	10	10	3	24,34	76
12	9/16 (2xD)			NB1010C30_12UN_AC	10	10	3	30,69	100
12			VF	NB1616E43_12UN_AC	16	16	5	43,39	100
11	5/8 (1,5xD)			NB1010C26_11UN_AC	10	10	3	26,55	76
11	5/8 (2xD)		VF	NB1010C35_11UN_AC	10	10	3	35,79	100
11	5/8 (2,5xD)		VF	NB12117C42_11UN_AC	12	11,7	3	42,72	100
10	3/4 (1,5xD)			NB1212C31_10UN_AC	12	12	3	31,75	100
10	3/4 (2xD)		VF	NB1212C41_10UN_AC	12	12	3	41,91	100
9	7/8 (1,5xD)			NB1616C38_9UN_AC	16	16	3	38,1	100
9	7/8 (2xD)			NB1616C49_9UN_AC	16	16	3	49,39	120
8	1 (1,5xD)			NB1616C42_8UN_AC	16	16	3	42,86	100
8	1 (2xD)		VF	NB1616C55_8UN_AC	16	16	3	55,56	120
8			VF	NB2020D49_8UN_AC	20	20	4	49,21	120
7	1 1/8 - 1 1/4 (1,5xD)			NB2020C52_7UN_AC	20	20	3	52,61	120
6	1 3/8 - 1 1/2 (1,5xD)			NB2525C61_6UN_AC	25	25	3	61,38	130

ThreadBurr

AC
TiAlCN coated, Micrograin Carbide
Tolerance
D 6,0 - 12,0 +0 / -0,030
D 16,0 - 20,0 +0 / -0,050
Shank
Cylindrical h6, DIN6535 HA
Flute
Between 12° and 18°
Field of application
Thread Milling of all types of steel



NPT

NPT PIPE THREAD

Pitch TPI	Standard	Vib. free	INTERNAL / EXTERNAL Part Number	d mm	D mm	Z flutes	l mm	L mm
27	1/16 - 1/8		XB0606C10_27NPT_AC	6	6	3	10,82	63
27	1/16 - 1/8	VF	XB0606F10_27NPT_AC	6	6	6	10,82	63
18	1/4 - 3/8		XB0808C16_18NPT_AC	8	8	3	16,23	63
18	1/4 - 3/8	VF	XB0808F16_18NPT_AC	8	8	6	16,23	63
18	1/4 - 3/8		XB1010D16_18NPT_AC	10	10	4	16,23	76
14	1/2 - 3/4		XB1212D22_14NPT_AC	12	12	4	22,68	83
14	1/2 - 3/4	VF	XB1212F22_14NPT_AC	12	12	6	22,68	83
14	3/4		XB1616E22_14NPT_AC	16	16	5	22,68	89
11,5	1 - 2		XB1616D29_11.5NPT_AC	16	16	4	29,82	89
11,5	1 - 2	VF	XB1616F29_11.5NPT_AC	16	16	6	29,82	89
8	≥ 2 1/2		XB2020D42_8NPT_AC	20	20	4	42,86	100

NPTF

NPTF DRYSEAL PIPE THREAD

Pitch TPI	Standard	Vib. free	INTERNAL / EXTERNAL Part Number	d mm	D mm	Z flutes	l mm	L mm
27	1/16 - 1/8		XB0606C10_27NPTF_AC	6	6	3	10,82	63
18	1/4 - 3/8		XB0808C16_18NPTF_AC	8	8	3	16,23	63
14	1/2 - 3/4		XB1212D22_14NPTF_AC	12	12	4	22,68	83
11,5	1 - 2		XB1616D29_11.5NPTF_AC	16	16	4	29,82	89
8	≥ 2 1/2		XB2020D42_8NPTF_AC	20	20	4	42,86	100

NPSF

NPSF PIPE THREAD

Pitch TPI	Standard	Vib. free	INTERNAL / EXTERNAL Part Number	d mm	D mm	Z flutes	l mm	L mm
27	1/16 - 1/8		XB0606C12_27NPSF_AC	6	6	3	12,70	63
18	1/4 - 3/8		XB0808C16_18NPSF_AC	8	8	3	16,23	63
14	1/2 - 3/4		XB1212D22_14NPSF_AC	12	12	4	22,68	83
11,5	1		XB1616D29_11.5NPSF_AC	16	16	4	29,82	89

VF = Vibration-Free if you use the entire cutting length, see page 6.

What is the difference between NPT, NPTF and NPSF?

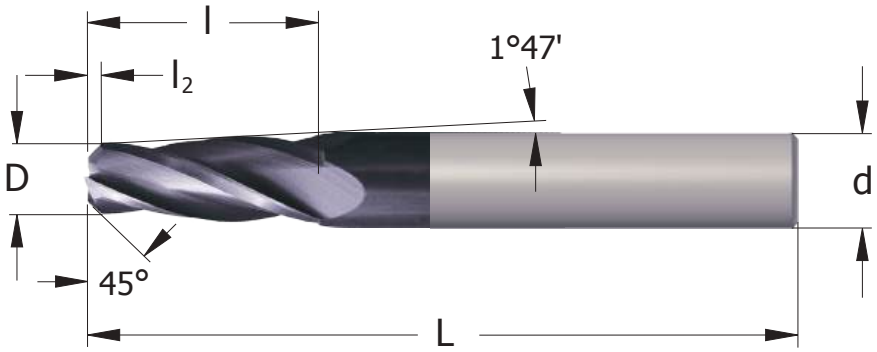
NPT and NPTF are tapered threads. NPSF is a straight thread. Leakage can occur on NPT threads which means that a thread seal tape or other thread sealant has to be used to get a leak-free thread.

To solve the problem of leakage, NPTF has been developed. This thread create full contact between the external and internal thread and will make a press fit. No other product for sealing is needed.

Another variation of dryseal is NPSF which is used for internal threads and is made to fit an external NPTF thread.

Tapered End Mills for NPT/NPTF/BSPT

FC
TiAlN coated, Micrograin Carbide
Tolerance
D 5,0 - 17,0 +0 / -0,050
Shank
Cylindrical h6, DIN6535 HA
Flute
30° right hand spiral
Field of application
Before Thread Milling of NPT/NPTF/BSPT



D mm	d mm	Part Number	Z flutes	l mm	l_2 mm	L mm
5	6	NPT0605D16_FC	4	16	1,0	63
8,5	10	NPT10085D24_FC	4	24	1,5	76
14	16	NPT1614D32_FC	4	32	2	89
17	20	NPT2017D48_FC	4	48	3	120

Do I need to premill a tapered hole before threading?

It is not necessary, but we strongly recommend it as there are two major advantages of premilling a tapered hole before threading.

1. Longer tool life of the thread mill.
2. Shorter machining time.

Without premilling you have to make the thread in one or two extra passes and reduce the feed, otherwise you will destroy the tool as the crest is very small on NPT and NPTF threads.

Premilling of conical holes result in longer tool life and shorter machining time

Chamfering of the thread

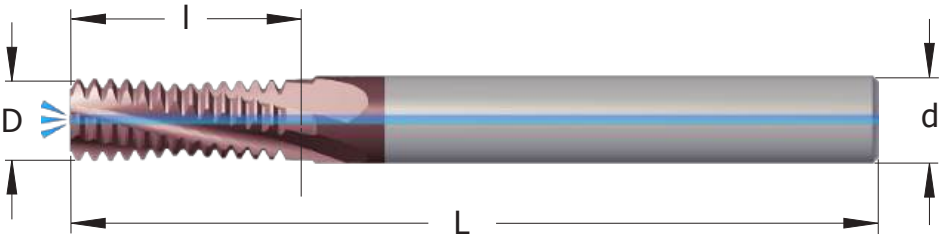
1°47'

SmiCut STS

SOLID CARBIDE THREAD MILLS *TiAlCN*

ThreadBurr with Internal Axial Coolant

AC
TiAlCN coated, Micrograin Carbide
Tolerance
The theoretical external diameter of the cutter is laser marked on the tool.
Shank
Cylindrical h6, DIN6535 HA
Flute
Between 12° and 18°
Field of application
Thread Milling of all types of steel



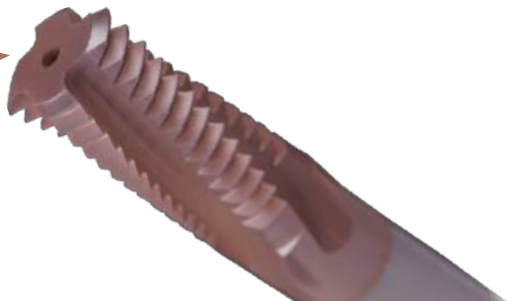
M

METRIC

Pitch mm	M coarse	M fine	Vib. free	INTERNAL Part Number	d mm	D mm	Z flutes	l mm	L mm
0,8	M5 (1,5xD)			NBK04038C8_0.8ISO_AC	4	3,8	3	8,4	50
0,8	M5 (2xD)			NBK04038C10_0.8ISO_AC	4	3,8	3	10,8	50
0,8	M5 (2,5xD)		VF	NBK04038C13_0.8ISO_AC	4	3,8	3	13,2	50
1,0	M6 (1,5xD)	≥ M8		NBK06045C10_1.0ISO_AC	6	4,5	3	10,5	63
1,0	M6 (2xD)	≥ M8		NBK06045C13_1.0ISO_AC	6	4,5	3	13,5	63
1,0	M6 (2,5xD)	≥ M8	VF	NBK06045C16_1.0ISO_AC	6	4,5	3	16,5	63
1,0		≥ M10		NBK0808D17_1.0ISO_AC	8	8	4	17,5	76
1,25	M8 (1,5xD)	≥ M10		NBK0606C14_1.25ISO_AC	6	6	3	14,37	63
1,25	M8 (2xD)	≥ M10		NBK0606C18_1.25ISO_AC	6	6	3	18,12	63
1,25	M8 (2,5xD)	≥ M10	VF	NBK0606C21_1.25ISO_AC	6	6	3	21,87	63
1,5	M10 (1,5xD)	≥ M12		NBK08075C17_1.5ISO_AC	8	7,5	3	17,25	76
1,5	M10 (2xD)	≥ M12		NBK08075C21_1.5ISO_AC	8	7,5	3	21,75	76
1,5	M10 (2,5xD)	≥ M12	VF	NBK08075C27_1.5ISO_AC	8	7,5	3	27,75	76
1,5	M10 (3xD)	≥ M12	VF	NBK08075C32_1.5ISO_AC	8	7,5	3	32,25	76
1,5		≥ M16	VF	NBK1212E29_1.5ISO_AC	12	12	5	29,25	100
1,5		≥ M20	VF	NBK1616F35_1.5ISO_AC	16	16	6	35,25	120
1,75	M12 (1,5xD)			NBK0808C20_1.75ISO_AC	8	8	3	20,12	76
1,75	M12 (2xD)		VF	NBK0808C27_1.75ISO_AC	8	8	3	27,12	76
1,75	M12 (1,5xD)			NBK1009C20_1.75ISO_AC	10	9	3	20,12	100
1,75	M12 (2xD)			NBK1009C27_1.75ISO_AC	10	9	3	27,12	100
1,75	M12 (2,5xD)		VF	NBK1009C32_1.75ISO_AC	10	9	3	32,37	100
1,75	M12 (3xD)		VF	NBK1009C37_1.75ISO_AC	10	9	3	37,62	100
2,0	M14 (1,5xD)	≥ M18		NBK1010C23_2.0ISO_AC	10	10	3	23	100
2,0	M14 (2xD)	≥ M18		NBK1010C31_2.0ISO_AC	10	10	3	31	100
2,0	M16 (1,5xD)	≥ M18		NBK1212D27_2.0ISO_AC	12	12	4	27	100
2,0	M16 (2xD)	≥ M18	VF	NBK1212D35_2.0ISO_AC	12	12	4	35	100
2,0	M16 (2,5xD)	≥ M18	VF	NBK1212D43_2.0ISO_AC	12	12	4	43	100
2,0	M16 (3xD)	≥ M18	VF	NBK1212C51_2.0ISO_AC	12	12	3	51	100
2,0		≥ M20	VF	NBK1616E39_2.0ISO_AC	16	16	5	39	120
2,5	M20 (1,5xD)			NBK1414D33_2.5ISO_AC	14	14	4	33,75	100
2,5	M20 (2xD)		VF	NBK1414D43_2.5ISO_AC	14	14	4	43,75	100
2,5	M20 (2,5xD)		VF	NBK1615D53_2.5ISO_AC	16	15	4	53,75	120
3,0	M24 (1,5xD)	≥ M30		NBK1616C40_3.0ISO_AC	16	16	3	40,5	120
3,0	M24 (2xD)	≥ M30	VF	NBK1616C52_3.0ISO_AC	16	16	3	52,5	120
3,5	M30 (1,5xD)			NBK2020C50_3.5ISO_AC	20	20	3	50,75	150
3,5	M30 (2xD)		VF	NBK2020C64_3.5ISO_AC	20	20	3	64,75	150

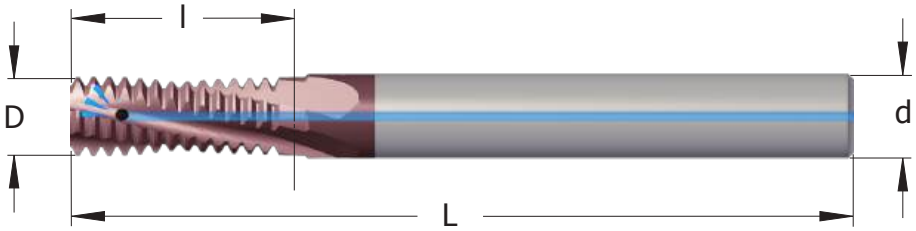
VF = Vibration-Free if you use the entire cutting length, see page 6.

Internal Axial Coolant is most suitable for blind holes



ThreadBurr with Internal Radial Coolant

AC
TiAlCN coated, Micrograin Carbide
Tolerance
The theoretical external diameter of the cutter is laser marked on the tool.
Shank
Cylindrical h6, DIN6535 HA
Flute
Between 12° and 18°
Field of application
Thread Milling of all types of steel



M

METRIC

Pitch mm	M coarse	M fine	Vib. free	INTERNAL Part Number	d mm	D mm	Z flutes	l mm	L mm
1,0		≥ M10		NBT0808D17_1.0ISO_AC	8	8	4	17,5	76
1,25	M8 (2xD)	≥ M10		NBT0606C18_1.25ISO_AC	6	6	3	18,12	76
1,5	M10 (2xD)	≥ M12		NBT08075C21_1.5ISO_AC	8	7,5	3	21,75	76
1,5		≥ M16	VF	NBT1212E29_1.5ISO_AC	12	12	5	29,25	100
1,75	M12 (2xD)		VF	NBT0808C27_1.75ISO_AC	8	8	3	27,12	76
1,75	M12 (2xD)			NBT1009C27_1.75ISO_AC	10	9	3	27,12	100
2,0	M14 (2xD)	≥ M18		NBT1010C31_2.0ISO_AC	10	10	3	31	100
2,0	M16 (2xD)	≥ M18	VF	NBT1212D35_2.0ISO_AC	12	12	4	35	100
2,0		≥ M20	VF	NBT1616E39_2.0ISO_AC	16	16	5	39	100

G/Rp

WHITWORTH PIPE THREAD

Pitch TPI	Standard	Vib. free	INTERNAL / EXTERNAL Part Number	d mm	D mm	Z flutes	l mm	L mm
28	G 1/16 - 1/8		XBT0606C10_28W_AC	6	6	3	10,43	76
19	G 1/4 - 3/8		XBT1010D22_19W_AC	10	10	4	22,06	100
14	G 1/2 - 7/8		XBT1212D28_14W_AC	12	12	4	28,12	100
11	G 1 - 3	VF	XBT1616D40_11W_AC	16	16	4	40,41	100

VF = Vibration-Free if you use the entire cutting length, see page 6.

Internal Radial Coolant is most suitable for through holes

Is it necessary to use a tool with Internal Coolant?

Most people use tools without Coolant as the price is lower and it is possible to use external Coolant with these tools. The carbide is solid to the center of the tool, making it a stronger tool with less risk for breakage.

In some cases when you have problems with chips you may want to use a tool with Internal Coolant as these tools gets the Coolant where you exactly want it and with higher pressure.

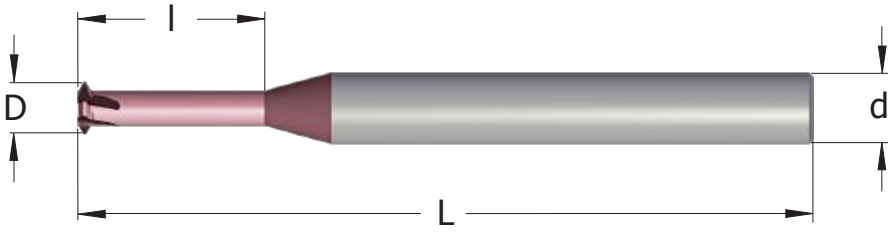
· Internal Axial Coolant (NBK) is most suitable for blind holes.
· Internal Radial Coolant (NBT) is most suitable for through holes.

SmiCut STS

SOLID CARBIDE THREAD MILLS

with One Tooth, partial profile

AC / LC
TiAlCN / AlCrN coated
Micrograin Carbide
Tolerance
D 0,3 - 6,0 +0 / -0,020
D 7,0 - 12,0 +0 / -0,030
Shank
Cylindrical h6, DIN6535 HA
Flute
15° right hand spiral
Field of application
Thread Milling of all types of steel



60°

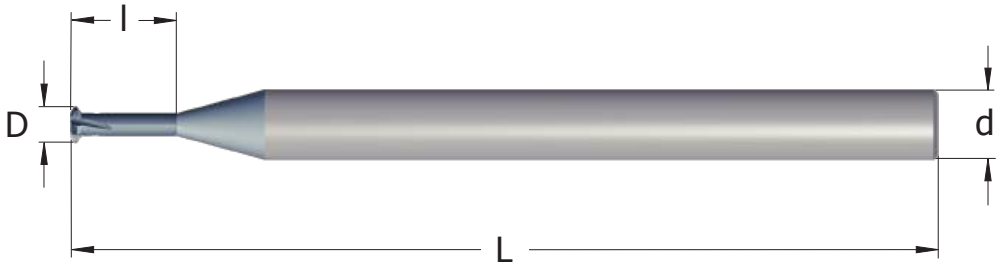
PARTIAL PROFILE 60°

M coarse	M pitch mm	UNC	UNF	UN pitch TPI	INTERNAL Part Number	d mm	D mm	Z flutes	l mm	L mm
M0,5 (2xD)	0,125		No. 0000	160	NS03003C1.3_P60_LC	3	0,37	3	1,3	39
M0,6 (2xD)	0,15				NS03004C1.5_P60_LC	3	0,44	3	1,5	39
M0,8 (2xD)	0,2		No. 000	120	NS03005C2.0_P60_LC	3	0,58	3	2	39
M0,8 (3xD)	0,2		No. 000	120	NS03005C2.7_P60_LC	3	0,58	3	2,7	39
M1 (2xD)	0,2 - 0,25				NS03007C2.5_P60_LC	3	0,72	3	2,5	39
M1 (3xD)	0,2 - 0,25				NS03007C3.2_P60_LC	3	0,72	3	3,2	39
M1,2 (2xD)	0,2 - 0,25		No. 00	95	NS03009C2.9_P60_LC	3	0,92	3	2,9	39
M1,2 (3xD)	0,2 - 0,25		No. 00	95	NS03009C3.9_P60_LC	3	0,92	3	3,9	39
M1,4 (2xD)	0,2 - 0,3				NS03010C3.3_P60_LC	3	1,06	3	3,3	39
M1,4 (3xD)	0,2 - 0,3				NS03010C4.4_P60_LC	3	1,06	3	4,4	39
M1,6 (2xD)	0,2 - 0,35		No. 0	80	NS03012D3.6_P60_LC	3	1,2	4	3,6	39
M1,6 (3xD)	0,2 - 0,35		No. 0	80	NS03012D5.1_P60_LC	3	1,2	4	5,1	39
M1,8 (2xD)	0,35 - 0,4	No. 1	No. 1	72 - 64	NS03014D4.2_P60_LC	3	1,4	4	4,2	39
M1,8 (3xD)	0,35 - 0,4	No. 1	No. 1	72 - 64	NS03014D5.6_P60_LC	3	1,4	4	5,6	39
M2 (2xD)	0,4		No. 2	64	NS03015D4.6_P60_LC	3	1,55	4	4,6	39
M2 (3xD)	0,4		No. 2	64	NS03015D6.2_P60_LC	3	1,55	4	6,2	39
M2 (2xD)	0,35 - 0,4		No. 2	64	NS04015D4_P60_AC	4	1,5	4	4,4	50
M2 (3xD)	0,35 - 0,4		No. 2	64	NS04015D6_P60_AC	4	1,5	4	6,4	50
M2,2 (2xD)	0,45	No. 2		56	NS04016D5_P60_AC	4	1,65	4	5	50
M2,2 (3xD)	0,45	No. 2		56	NS04016D7_P60_AC	4	1,65	4	7,1	50
M2,5 (2xD)	0,45 - 0,5	No. 3	No. 3 - 4	56 - 48	NS04019D5_P60_AC	4	1,9	4	5,5	50
M2,5 (3xD)	0,45 - 0,5	No. 3	No. 3 - 4	56 - 48	NS04019D8_P60_AC	4	1,9	4	8	50
		No. 4		40	NS04021D6_P60_AC	4	2,1	4	6,4	50
		No. 4		40	NS04021D9_P60_AC	4	2,1	4	9,2	50
M3 (2xD)	0,5 - 0,6	No. 5	No. 5	44 - 40	NS04023D6_P60_AC	4	2,3	4	6,5	50
M3 (3xD)	0,5 - 0,6	No. 5	No. 5	44 - 40	NS04023D9_P60_AC	4	2,3	4	9,5	50
M3,5 (2xD)	0,5 - 0,75	No. 6	No. 6	40 - 32	NS04026D7_P60_AC	4	2,6	4	7,6	50
M3,5 (3xD)	0,5 - 0,75	No. 6	No. 6	40 - 32	NS04026D11_P60_AC	4	2,6	4	11,1	50
M4 (2xD)	0,7 - 0,75	No. 8	No. 8	36 - 32	NS0403D9_P60_AC	4	3	4	9	50
M4 (3xD)	0,7 - 0,75	No. 8	No. 8	36 - 32	NS0403D13_P60_AC	4	3	4	13	50
M4,5 (2xD)	0,75 - 1,0	No. 10	No. 10	32 - 24	NS04036D10_P60_AC	4	3,6	4	10	50
M4,5 (3xD)	0,75 - 1,0	No. 10	No. 10	32 - 24	NS04036D14_P60_AC	4	3,6	4	14,3	50
M5 (2xD)	0,75 - 1,0	No. 12	No. 12 - 1/4	32 - 24	NS0404D11_P60_AC	4	4	4	11	50
M5 (3xD)	0,75 - 1,0	No. 12	No. 12 - 1/4	32 - 24	NS0404D16_P60_AC	4	4	4	16	50
M6 (2xD)	1,0 - 1,25	1/4	5/16 - 3/8	24 - 20	NS06045D13_P60_AC	6	4,5	4	13	63
M6 (3xD)	1,0 - 1,25	1/4	5/16 - 3/8	24 - 20	NS06045D19_P60_AC	6	4,5	4	19	76
M8 (2xD)	1,25	5/16	7/16 - 1/2	20 - 18	NS0606E17_P60_AC	6	6	5	17,3	63
M8 (3xD)	1,25	5/16	7/16 - 1/2	20 - 18	NS0606E25_P60_AC	6	6	5	25,3	76
M10 (2xD)	1,5	3/8	9/16 - 3/4	18 - 16	NS08075E22_P60_AC	8	7,5	5	22	63
M10 (3xD)	1,5	3/8	9/16 - 3/4	18 - 16	NS08075E32_P60_AC	8	7,5	5	32	76
M12 (2xD)	1,75	7/16 - 1/2	7/8	14 - 13	NS1009E26_P60_AC	10	9	5	26	76
M12 (3xD)	1,75	7/16 - 1/2	7/8	14 - 13	NS1009E38_P60_AC	10	9	5	38	100
M14 (2xD)	2,0	9/16	≥ 1	12	NS1010E30_P60_AC	10	10	5	30	76
M14 (3xD)	2,0	9/16	≥ 1	12	NS1010E44_P60_AC	10	10	5	44	100
M16 (2xD)	2,0	5/8	≥ 1	12 - 11	NS1212F34_P60_AC	12	12	6	34	83
M16 (3xD)	2,0	5/8	≥ 1	12 - 11	NS1212F50_P60_AC	12	12	6	50	100

SOLID CARBIDE THREAD MILLS

with One Tooth, full profile

LC
AlCrN coated
Micrograin Carbide
Tolerance
D 0,3 - 6,0 +0 / -0,020
Shank
Cylindrical h6, DIN6535 HA
Flute
15° right hand spiral
Field of application
Thread Milling of all types of steel



M

METRIC

Pitch mm	M coarse	M fine	INTERNAL Part Number	d mm	D mm	Z flutes	l mm	L mm
0,25	M1 (2xD)	≥ M1,4	NS03007C2_0.25ISO_LC	3	0,72	3	2,5	39
0,25	M1 (3xD)	≥ M1,4	NS03007C3_0.25ISO_LC	3	0,72	3	3,5	39
0,25	M1,2 (2xD)	≥ M1,4	NS03009C2_0.25ISO_LC	3	0,92	3	2,9	39
0,25	M1,2 (3xD)	≥ M1,4	NS03009C3_0.25ISO_LC	3	0,92	3	3,9	39
0,3	M1,4 (2xD)		NS03010C3_0.3ISO_LC	3	1,06	3	3,3	39
0,3	M1,4 (3xD)		NS03010C4_0.3ISO_LC	3	1,06	3	4,4	39
0,35	M1,6 (2xD)	≥ M2	NS03012D3_0.35ISO_LC	3	1,2	4	3,6	39
0,35	M1,6 (3xD)	≥ M2	NS03012D5_0.35ISO_LC	3	1,2	4	5,1	39
0,35	M1,8 (2xD)	≥ M2	NS03014D4_0.35ISO_LC	3	1,4	4	4,2	39
0,35	M1,8 (3xD)	≥ M2	NS03014D5_0.35ISO_LC	3	1,4	4	5,6	39
0,4	M2 (2xD)		NS03015D4_0.4ISO_LC	3	1,55	4	4,7	39
0,4	M2 (3xD)		NS03015D6_0.4ISO_LC	3	1,55	4	6,2	39

Partial Profile vs Full Profile

With a Partial Profile tool it is possible to do different pitches and profiles as the tool only has One Tooth and a profile that is designed to suite several threads.

Some producers make these tools with a very small crest and large profile height to be able to do as many different threads as possible. The disadvantage with this is that the crest will be fragile and the tool diameter small which result in short tool life and tool breakage. Because of this SmiCut produce the Partial Profile thread mills with a more limited area of use.

Full Profile tools will make a thread with higher quality and with these tools it is not so important to drill the exactly correct diameter before threading. Full Profile tools are recommended as first choice.

One Tooth vs Two Teeth

One Tooth has lower cutting forces and Two teeth has longer tool life.

One Tooth is mainly used for extremely small threads and when Two Teeth is not available, for example UN profiles. Two Teeth tools are recommended as first choice.

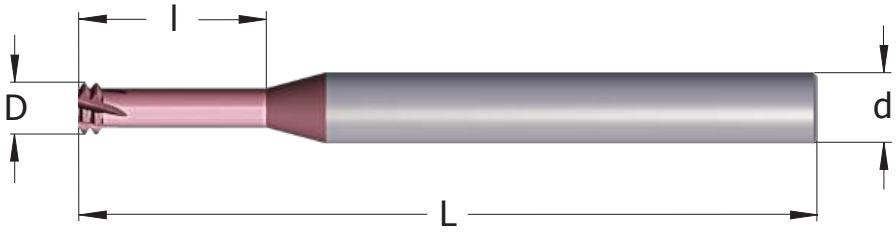
Thread Milling from M0,5

SmiCut STS

SOLID CARBIDE THREAD MILLS *TiAlCN*

with Two Teeth

AC
TiAlCN coated, Micrograin Carbide
Tolerance
The theoretical external diameter of the cutter is laser marked on the tool.
Shank
Cylindrical h6, DIN6535 HA
Flute
15° right hand spiral
Field of application
Thread Milling of all types of steel



M

METRIC

Pitch mm	M coarse	M fine	INTERNAL Part Number	d mm	D mm	Z flutes	l mm	L mm
0,4	M2 (2xD)		NM04015D4_0.4ISO_AC	4	1,5	4	4,4	50
0,4	M2 (3xD)		NM04015D6_0.4ISO_AC	4	1,5	4	6,4	50
0,45	M2,2 (2xD)		NM04016D5_0.45ISO_AC	4	1,65	4	5,0	50
0,45	M2,2 (3xD)		NM04016D7_0.45ISO_AC	4	1,65	4	7,1	50
0,45	M2,5 (2xD)		NM04019D5_0.45ISO_AC	4	1,9	4	5,5	50
0,45	M2,5 (3xD)		NM04019D8_0.45ISO_AC	4	1,9	4	8	50
0,5	M3 (2xD)	≥ M3,5	NM04023E6_0.5ISO_AC	4	2,3	5	6,5	50
0,5	M3 (3xD)	≥ M3,5	NM04023E9_0.5ISO_AC	4	2,3	5	9,5	50
0,6	M3,5 (2xD)		NM04026E7_0.6ISO_AC	4	2,6	5	7,6	50
0,6	M3,5 (3xD)		NM04026E11_0.6ISO_AC	4	2,6	5	11,1	50
0,7	M4 (2xD)		NM0403E9_0.7ISO_AC	4	3	5	9	50
0,7	M4 (3xD)		NM0403E13_0.7ISO_AC	4	3	5	13	50
0,75	M4,5 (2xD)	≥ M5	NM04034E10_0.75ISO_AC	4	3,4	5	10	50
0,75	M4,5 (3xD)	≥ M5	NM04034E14_0.75ISO_AC	4	3,4	5	14,3	50
0,8	M5 (2xD)		NM04038E11_0.8ISO_AC	4	3,8	5	11	50
0,8	M5 (3xD)		NM04038E16_0.8ISO_AC	4	3,8	5	16	50
1,0	M6 (2xD)	≥ M8	NM06045E13_1.0ISO_AC	6	4,5	5	13	63
1,0	M6 (3xD)	≥ M8	NM06045E19_1.0ISO_AC	6	4,5	5	19	76
1,25	M8 (2xD)	≥ M10	NM0606E17_1.25ISO_AC	6	6	5	17,3	63
1,25	M8 (3xD)	≥ M10	NM0606E25_1.25ISO_AC	6	6	5	25,3	76
1,5	M10 (2xD)	≥ M12	NM08075E22_1.5ISO_AC	8	7,5	5	22	63
1,5	M10 (3xD)	≥ M12	NM08075E32_1.5ISO_AC	8	7,5	5	32	76
1,75	M12 (2xD)		NM1009E26_1.75ISO_AC	10	9	5	26	76
1,75	M12 (3xD)		NM1009E38_1.75ISO_AC	10	9	5	38	100
2,0	M14 (2xD)	≥ M18	NM1010E30_2.0ISO_AC	10	10	5	30	76
2,0	M14 (3xD)	≥ M18	NM1010E44_2.0ISO_AC	10	10	5	44	100
2,0	M16 (2xD)	≥ M18	NM1212F34_2.0ISO_AC	12	12	6	34	83
2,0	M16 (3xD)	≥ M18	NM1212F50_2.0ISO_AC	12	12	6	50	100

Available from Ø1,5 to Ø12 mm

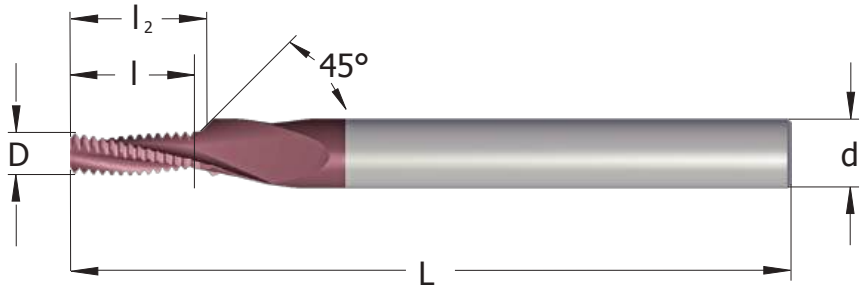
When should I use Two Teeth Thread Mills?

The first choice for thread milling is always ThreadBurr, NB-tools. They have the full thread length and deburr the entrance of the thread in the same operation.

In some cases when it is difficult to achieve good results, the NM-tools with Two Teeth can be a solution as the cutting forces are lower. For example, long threads and materials that are difficult to machine.

With NM-tools you make several passes axially instead of one, even so the machining time will not be so much longer as you can increase the feed and the tool has more flutes then the NB-tools.

AC
TiAlCN coated, Micrograin Carbide
Tolerance
The theoretical external diameter of the cutter is laser marked on the tool.
Shank
Cylindrical h6, DIN6535 HA
Flute
Between 12° and 18°
Field of application
Thread Milling of all types of steel

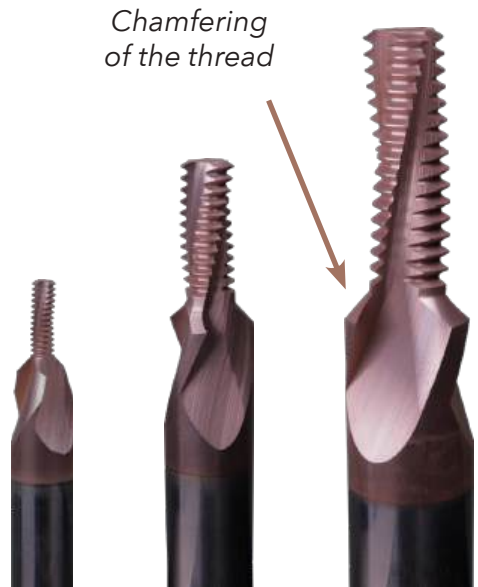


M

METRIC

Pitch mm	M coarse	Vib. free	INTERNAL Part Number	d mm	D mm	Z flutes	l mm	l_2 mm	L mm
0,5	M3 (1,5xD)		NF06023C5_0.5ISO_AC	6	2,3	3	5,25	5,85	63
0,5	M3 (2xD)		NF06023C6_0.5ISO_AC	6	2,3	3	6,75	7,35	63
0,5	M3 (2,5xD)	VF	NF06023C8_0.5ISO_AC	6	2,3	3	8,25	8,85	63
0,5	M3 (3xD)	VF	NF06023C9_0.5ISO_AC	6	2,3	3	9,75	10,35	63
0,7	M4 (1,5xD)		NF0603C7_0.7ISO_AC	6	3	3	7,35	8,2	63
0,7	M4 (2xD)		NF0603C8_0.7ISO_AC	6	3	3	8,75	9,6	63
0,7	M4 (2,5xD)	VF	NF0603C10_0.7ISO_AC	6	3	3	10,85	11,7	63
0,7	M4 (3xD)	VF	NF0603C12_0.7ISO_AC	6	3	3	12,95	13,8	63
0,8	M5 (1,5xD)		NF06038C8_0.8ISO_AC	6	3,8	3	8,4	9,4	63
0,8	M5 (2xD)		NF06038C10_0.8ISO_AC	6	3,8	3	10,8	11,8	63
0,8	M5 (2,5xD)	VF	NF06038C13_0.8ISO_AC	6	3,8	3	13,2	14,2	63
0,8	M5 (3xD)	VF	NF06038C16_0.8ISO_AC	6	3,8	3	16,4	17,4	63
1,0	M6 (1,5xD)		NF08045C10_1.0ISO_AC	8	4,5	3	10,5	11,75	63
1,0	M6 (2xD)		NF08045C13_1.0ISO_AC	8	4,5	3	13,5	14,75	63
1,0	M6 (2,5xD)	VF	NF08045C16_1.0ISO_AC	8	4,5	3	16,5	17,75	63
1,25	M8 (1,5xD)		NF1006C14_1.25ISO_AC	10	6	3	14,37	16	76
1,25	M8 (2xD)		NF1006C18_1.25ISO_AC	10	6	3	18,12	19,75	76
1,25	M8 (2,5xD)	VF	NF1006C21_1.25ISO_AC	10	6	3	21,87	23,5	76
1,5	M10 (1,5xD)		NF12075C17_1.5ISO_AC	12	7,5	3	17,25	19,25	83
1,5	M10 (2xD)		NF12075C21_1.5ISO_AC	12	7,5	3	21,75	23,75	83
1,5	M10 (2,5xD)	VF	NF12075C27_1.5ISO_AC	12	7,5	3	27,75	29,75	83
1,75	M12 (1,5xD)		NF1409C20_1.75ISO_AC	14	9	3	20,12	22,5	89
1,75	M12 (2xD)		NF1409C27_1.75ISO_AC	14	9	3	27,12	29,5	89
1,75	M12 (2,5xD)	VF	NF1409C32_1.75ISO_AC	14	9	3	32,37	34,75	89

VF = Vibration-Free if you use the entire cutting length, see page 6.

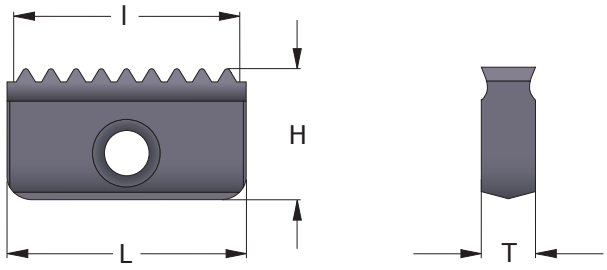


Do I have to chamfer the thread?

The answer is yes if it is on the drawing and you do not have the authority to change it.

In practical terms, it is not necessary as the thread mills from SmiCut (ThreadBurr) deburr the entrance of the thread in the same operation as it is milling the thread.

First choice is, try to avoid the unnecessary chamfering operation. Second choice is, use NF-tools to make the chamfer and the thread with the same tool.



M

METRIC

Pitch mm	M coarse	M fine	INTERNAL Part Number	l mm	L mm	T mm	H mm	Cutting Edges
0,5		≥ M13	14I_0.5ISO_FC	14	14	3,1	7,5	2
1,0		≥ M14	14I_1.0ISO_FC	14	14	3,1	7,5	2
1,0		≥ M22	21I_1.0ISO_FC	21	21	4,7	12	2
1,5		≥ M16	14I_1.5ISO_FC	13,5	14	3,1	7,5	2
1,5		≥ M22	21I_1.5ISO_FC	21	21	4,7	12	2
1,5		≥ M33	30I_1.5ISO_FC	30	30	5,5	16	2
2,0	M16	≥ M18	14I_2.0ISO_FC	14	14	3,1	7,5	2
2,0		≥ M22	21I_2.0ISO_FC	20	21	4,7	12	2
2,0		≥ M33	30I_2.0ISO_FC	30	30	5,5	16	2
2,0		≥ M56	40I_2.0ISO_FC	40	40	6,3	20	2
2,5	M18-M22		14I_2.5ISO_FC	12,5	14	3,1	7,5	2
3,0	M24	≥ M30	21I_3.0ISO_FC	21	21	4,7	12	2
3,0		≥ M36	30I_3.0ISO_FC	30	30	5,5	16	2
3,0		≥ M56	40I_3.0ISO_FC	39	40	6,3	20	2
3,5	M30-M33		21I_3.5ISO_FC	21	21	4,7	12	2
4,0	M36-M39	≥ M42	30I_4.0ISO_FC	28	30	5,5	16	2
4,0		≥ M60	40I_4.0ISO_FC	40	40	6,3	20	2
4,5	M42-M45		30I_4.5ISO_FC	27	30	5,5	16	2
5,0	M48-M52		30I_5.0ISO_FC	30	30	5,5	16	2
5,5	M56-M60		30I_5.5ISO_FC	27,5	30	5,5	16	2
6,0	M64-M68	≥ M72	40I_6.0ISO_FC	36	40	6,3	20	2

G/Rp

WHITWORTH PIPE THREAD

Pitch TPI	Standard	INTERNAL / EXTERNAL Part Number	l mm	L mm	T mm	H mm	Cutting Edges
19	G 3/8	14X_19W_FC	13,37	14	3,1	7,5	2
14	G 1/2 - 5/8	14X_14W_FC	12,7	14	3,1	7,5	2
14	G 5/8 - 7/8	21X_14W_FC	19,96	21	4,7	12	2
11	G 1	14X_11W_FC	13,85	14	3,1	7,5	1
11	G 1	21X_11W_FC	20,78	21	4,7	12	2
11	G 1 1/8	30X_11W_FC	30,02	30	5,5	16	2
11	G ≥ 2	40X_11W_FC	39,25	40	6,3	20	2

R/Rc

BSPT PIPE THREAD

Pitch TPI	Standard	INTERNAL / EXTERNAL Part Number	l mm	L mm	T mm	H mm	Cutting Edges
19	Rc 3/8	14X_19BSPT_FC	13,37	14	3,1	7,5	1
14	Rc 1/2	14X_14BSPT_FC	12,7	14	3,1	7,5	1
14	Rc 3/4	21X_14BSPT_FC	19,96	21	4,7	12	1
11	Rc 1	21X_11BSPT_FC	20,78	21	4,7	12	1
11	Rc 1 1/8	30X_11BSPT_FC	30,02	30	5,5	16	1
11	Rc ≥ 2	40X_11BSPT_FC	39,25	40	6,3	20	1

PG

STEEL CONDUIT THREAD DIN 40430

Pitch TPI	Norm	INTERNAL / EXTERNAL Part Number	l mm	L mm	T mm	H mm	Cutting Edges
18	Pg 9 - 16	14X_18PG_FC	14,11	14	3,1	7,5	2
18	Pg 13,5 - 16	21X_18PG_FC	21	21	4,7	12	2
16	Pg 21 - 48	21X_16PG_FC	20,64	21	4,7	12	2
16	Pg 29 - 48	30X_16PG_FC	30	30	5,5	16	2

UN

UNIFIED

Pitch TPI	UNC	UNF	UNEF	INTERNAL Part Number	l mm	L mm	T mm	H mm	Cutting Edges
32				14I_32UN_FC	13,49	14	3,1	7,5	2
28				14I_28UN_FC	13,61	14	3,1	7,5	2
24			9/16 - 5/8	14I_24UN_FC	13,75	14	3,1	7,5	2
20			3/4 - 1	14I_20UN_FC	13,97	14	3,1	7,5	2
20			7/8 - 1	21I_20UN_FC	20,32	21	4,7	12	2
20				30I_20UN_FC	29,21	30	5,5	16	2
18		5/8	11/16 -111/16	14I_18UN_FC	14,11	14	3,1	7,5	2
18			11/16 -111/16	21I_18UN_FC	21,17	21	4,7	12	2
18			11/4 -111/16	30I_18UN_FC	29,63	30	5,5	16	2
16		3/4		14I_16UN_FC	12,7	14	3,1	7,5	2
16				21I_16UN_FC	20,64	21	4,7	12	2
16				30I_16UN_FC	30,16	30	5,5	16	2
16				40I_16UN_FC	39,69	40	6,3	20	2
14		7/8		14I_14UN_FC	12,7	14	3,1	7,5	2
14		7/8		21I_14UN_FC	19,96	21	4,7	12	2
12		1-11/2		14I_12UN_FC	12,7	14	3,1	7,5	2
12		1-11/2		21I_12UN_FC	21,12	21	4,7	12	2
12		13/8 - 11/2		30I_12UN_FC	29,63	30	5,5	16	2
12				40I_12UN_FC	40,22	40	6,3	20	2
10	3/4			14I_10UN_FC	12,7	14	3,1	7,5	2
8	1			21I_8UN_FC	19,05	21	4,7	12	2
8				30I_8UN_FC	28,57	30	5,5	16	2
8				40I_8UN_FC	38,1	40	6,3	20	2
7	11/8-11/4			21I_7UN_FC	21,77	21	4,7	12	2
6	11/2			30I_6UN_FC	29,63	30	5,5	16	2
6				40I_6UN_FC	38,1	40	6,3	20	2
5	13/4			30I_5UN_FC	30,48	30	5,5	16	1
4	3 - 4			40I_4UN_FC	38,1	40	6,3	20	2

NPT

NPT PIPE THREAD

Pitch TPI	Standard	INTERNAL / EXTERNAL Part Number	l mm	L mm	T mm	H mm	Cutting Edges
18	3/8	14X_18NPT_FC	12,7	14	3,1	7,5	1
14	1/2 - 5/8	14X_14NPT_FC	12,7	14	3,1	7,5	1
14	3/4 - 7/8	21X_14NPT_FC	19,96	21	4,7	12	1
11,5	1	21X_11.5NPT_FC	19,88	21	4,7	12	1
11,5	1 1/4 - 2	30X_11.5NPT_FC	28,71	30	5,5	16	1
8	≥ 2 1/2	30X_8NPT_FC	28,58	30	5,5	16	1
8	≥ 2 1/2	40X_8NPT_FC	38,1	40	6,3	20	1

NPTF

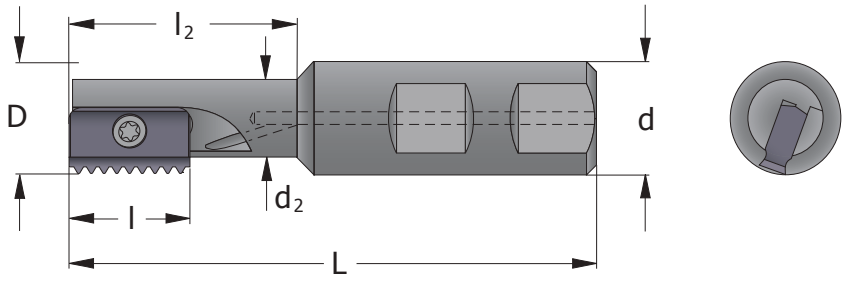
NPTF DRYSEAL PIPE THREAD

Pitch TPI	Standard	INTERNAL / EXTERNAL Part Number	l mm	L mm	T mm	H mm	Cutting Edges
18	3/8	14X_18NPTF_FC	12,7	14	3,1	7,5	1
14	1/2 - 5/8	14X_14NPTF_FC	12,7	14	3,1	7,5	1
14	3/4 - 7/8	21X_14NPTF_FC	19,96	21	4,7	12	1
11,5	1	21X_11.5NPTF_FC	19,88	21	4,7	12	1
11,5	1 1/4 - 2	30X_11.5NPTF_FC	28,71	30	5,5	16	1
8	≥ 2 1/2	30X_8NPTF_FC	28,58	30	5,5	16	1
8	≥ 2 1/2	40X_8NPTF_FC	38,1	40	6,3	20	1

- Part number with I is for internal thread profile.
- Part number with X is for in- and external thread profile.
- For external profile indicate E instead of I. The price is 10% higher for E.

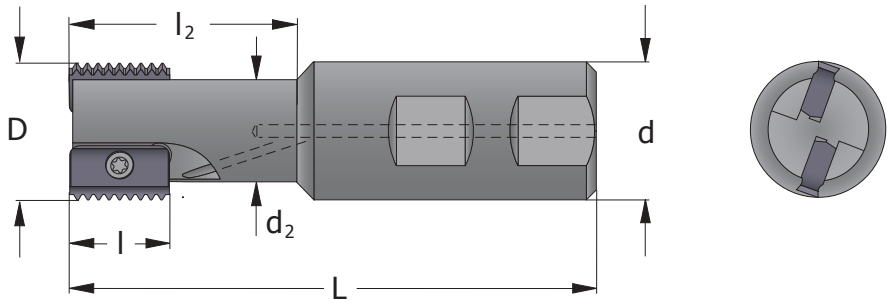
THREAD MILLING TOOLHOLDERS

Shank Toolholders with One Pocket



D mm	d mm	d_2 mm	Part Number	l mm	l_2 mm	L mm	No. of Inserts
12	20	8,9	SR0012F14	14	20	75	1
14,5	20	11,2	SR0014H14	14	25	85	1
17	20	13,4	SR0017H14	14	30	85	1
18	20	14,4	SR0018H21	21	30	85	1
21	20	16,5	SR0021H21	21	40	94	1
25	20	-	SR0025K21	21	-	125	1
29	25	22,4	SR0029J30	30	50	110	1
31	25	-	SR0031M30	30	-	150	1
38	32	-	SR0038M30	30	-	150	1
48	40	35	SR0048M40	40	78	153	1
48	40	-	SR0048R40	40	-	210	1

Shank Toolholders with Two Pockets



D mm	d mm	d_2 mm	Part Number	l mm	l_2 mm	L mm	No. of Inserts
20	20	16	SR0020H14-2	14	41	93	2
30	25	24	SR0030J21-2	21	52	108	2
40	32	30	SR0040L30-2	30	70	130	2
50	40	38	SR0050M40-2	40	78	153	2

When should I use Thread Milling Inserts?

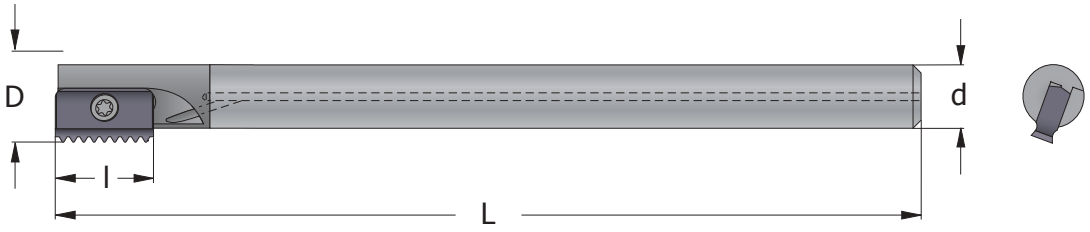
We recommend Solid Carbide Thread Mills as the first choice because they are much more efficient tools. In most cases, they will result in a lower cost per thread.

However, the advantage of an Indexable Thread Milling Cutter is that you can use inserts with different pitches and profiles on the same cutter body. This can be a good alternative if you only need to make a few threads.

· Solid Carbide Thread Mills are available up to 4,0 mm pitch.
· Thread Milling Inserts are available up to 6,0 mm pitch.

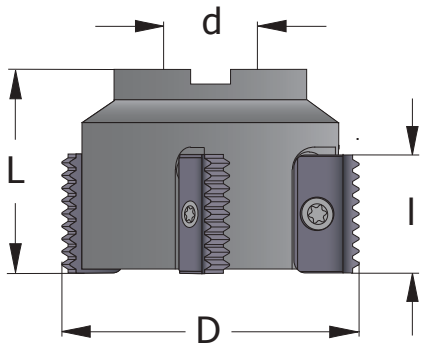
THREAD MILLING TOOLHOLDERS

Shank Toolholders in Carbide



D mm	d mm	Part Number	l mm	L mm	No. of Inserts
13	10	SR0013J14C	14	150	1
15	12	SR0015K14C	14	175	1
21	16	SR0021M21C	21	200	1
27	20	SR0027S30C	30	260	1
33	25	SR0033T30C	30	270	1

Face Mill Cutters

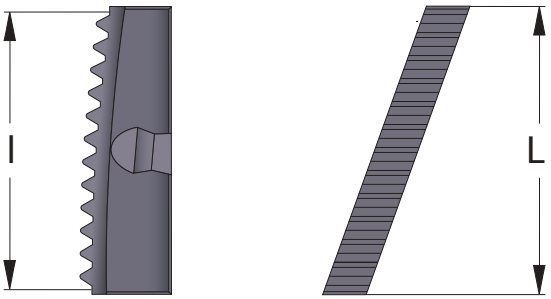


D mm	d mm	Part Number	l mm	L mm	No. of Inserts
63	22	SR0063C21-5	21	50	5
63	22	SR0063C30-4	30	50	4
80	27	SR0080D30-4	30	55	4
100	32	SR0100D30-4	30	60	4
80	27	SR0080D40-4	40	65	4
100	32	SR0100E40-4	40	70	4

Spare Parts

Insert mm	Screw to insert	Torx key
14	S14	K14
21	S21	K21
30	S30	K30
40	S40	K40

Spiral Fluted



M

METRIC

Pitch mm	M fine	INTERNAL Part Number	l mm	L mm	Cutting Edges
1,0	≥ M27	H23I_1.0ISO_FC	27	27	1
1,5	≥ M27	H23I_1.5ISO_FC	27	27	1
1,5	≥ M36	H32I_1.5ISO_FC	31,5	32	1
1,5	≥ M52	H45I_1.5ISO_FC	36	37	1
1,5	≥ M68	H63I_1.5ISO_FC	37,5	38	1
2,0	≥ M27	H23I_2.0ISO_FC	26	27	1
2,0	≥ M36	H32I_2.0ISO_FC	32	32	1
2,0	≥ M52	H45I_2.0ISO_FC	36	37	1
2,0	≥ M68	H63I_2.0ISO_FC	38	38	1
3,0	≥ M30	H23I_3.0ISO_FC	27	27	1
3,0	≥ M39	H32I_3.0ISO_FC	30	32	1
3,0	≥ M52	H45I_3.0ISO_FC	36	37	1
3,0	≥ M72	H63I_3.0ISO_FC	36	38	1
3,5	≥ M30	H23I_3.5ISO_FC	24,5	27	1
4,0	≥ M36	H23I_4.0ISO_FC	24	27	1
4,0	≥ M42	H32I_4.0ISO_FC	32	32	1
4,0	≥ M56	H45I_4.0ISO_FC	36	37	1
4,0	≥ M72	H63I_4.0ISO_FC	36	38	1
4,5	≥ M42	H32I_4.5ISO_FC	31,5	32	1
5,0	≥ M48	H32I_5.0ISO_FC	30	32	1
5,5	≥ M56	H45I_5.5ISO_FC	33	37	1
6,0	≥ M64	H45I_6.0ISO_FC	36	37	1
6,0	≥ M80	H63I_6.0ISO_FC	36	38	1

G/Rp

WHITWORTH PIPE THREAD

Pitch TPI	Standard	INTERNAL / EXTERNAL Part Number	l mm	L mm	Cutting Edges
14	G ≥ 7/8	H23X_14W_FC	25,4	27	1
11	G ≥ 1	H23X_11W_FC	25,4	27	1
11	G ≥ 1 1/8	H32X_11W_FC	30,02	32	1
11	G ≥ 1 3/4	H45X_11W_FC	36,95	37	1
11	G ≥ 2 1/2	H63X_11W_FC	36,95	38	1

R/Rc

BSPT PIPE THREAD

Pitch TPI	Standard	INTERNAL / EXTERNAL Part Number	l mm	L mm	Cutting Edges
11	Rc ≥ 1	H23X_11BSPT_FC	25,4	27	1
11	Rc ≥ 1 1/8	H32X_11BSPT_FC	30,02	32	1
11	Rc ≥ 1 3/4	H45X_11BSPT_FC	36,95	37	1
11	Rc ≥ 2 1/2	H63X_11BSPT_FC	36,95	38	1

NPT

NPT PIPE THREAD

Pitch TPI	Standard	INTERNAL / EXTERNAL Part Number	l mm	L mm	Cutting Edges
11,5	1 - 2	H23X_11.5NPT_FC	26,5	27	1
11,5	1 1/4 - 2	H32X_11.5NPT_FC	30,92	32	1
11,5	2	H45X_11.5NPT_FC	35,34	37	1
8	2 1/2	H45X_8NPT_FC	34,93	37	1
8	3	H63X_8NPT_FC	38,1	38	1

NPTF

NPTF PIPE THREAD

Pitch TPI	Standard	INTERNAL / EXTERNAL Part Number	l mm	L mm	Cutting Edges
11,5	1 - 2	H23X_11.5NPTF_FC	26,5	27	1
11,5	1 1/4 - 2	H32X_11.5NPTF_FC	30,92	32	1

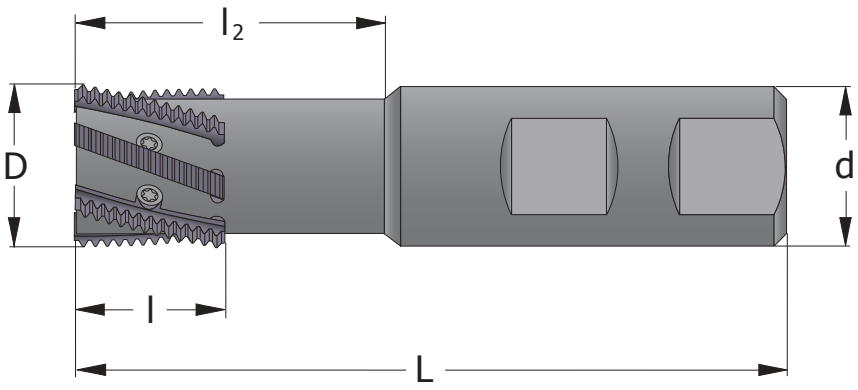
UN

UNIFIED

Pitch TPI	Standard	INTERNAL Part Number	l mm	L mm	Cutting Edges
24	≥ 1	H23I_24UN_FC	26,46	27	1
20	≥ 1 1/16	H23I_20UN_FC	26,67	27	1
20	≥ 1 3/8	H32I_20UN_FC	31,75	32	1
18	≥ 1 1/16	H23I_18UN_FC	26,81	27	1
18	≥ 1 3/8	H32I_18UN_FC	31,04	32	1
16	≥ 1 1/8	H23I_16UN_FC	26,99	27	1
16	≥ 1 1/2	H32I_16UN_FC	31,75	32	1
16	≥ 2	H45I_16UN_FC	36,51	37	1
16	≥ 2 5/8	H63I_16UN_FC	38,1	38	1
12	≥ 1 1/8	H23I_12UN_FC	25,4	27	1
12	≥ 1 1/2	H32I_12UN_FC	31,75	32	1
12	≥ 2	H45I_12UN_FC	35,98	37	1
12	≥ 2 3/4	H63I_12UN_FC	38,1	38	1
8	≥ 1 1/8	H23I_8UN_FC	25,4	27	1
8	≥ 1 1/2	H32I_8UN_FC	31,75	32	1
8	≥ 2 1/8	H45I_8UN_FC	34,93	37	1
8	≥ 2 3/4	H63I_8UN_FC	38,1	38	1
7	≥ 1 1/4	H23I_7UN_FC	25,4	27	1
6	≥ 1 5/8	H32I_6UN_FC	29,63	32	1
6	≥ 2 1/8	H45I_6UN_FC	33,97	37	1
6	≥ 2 7/8	H63I_6UN_FC	38,1	38	1
5	≥ 1 3/4	H32I_5UN_FC	30,48	32	1

THREAD MILLING TOOLHOLDERS

Spiral Fluted Shank Toolholders



D mm	d mm	Part Number	l mm	l_2 mm	L mm	No. of Inserts
23	25	SRH23-2	27	50	110	2
23	25	SRH23M-2	27	75	150	2
32	32	SRH32-5	32	60	130	5
32	32	SRH32P-5	32	90	180	5
45	32	SRH45-6	37	-	130	6

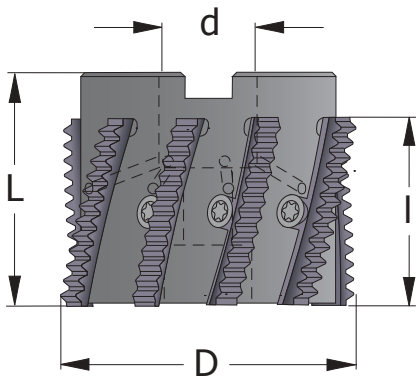
Spare Parts

Insert mm	Screw to insert	Torx key
H23	S23	K21
H32	S32	K22
H45	S45	K40

Spiral fluted for efficient machining

THREAD MILLING TOOLHOLDERS

Spiral Fluted Face Mill Cutters



D mm	d mm	Part Number	l mm	L mm	No. of Inserts
32	16	SRH32-5M	32	52	5
45	22	SRH45-6M	37	60	6
63	22	SRH63-9	38	50	9

Spare Parts

Insert mm	Screw to insert	Torx key
H32	S32S	K22
H45	S45S	K40
H63	S63	K40