Thread milling cutters & gauges series

THREAD MILLS

Volume 5

INDEX

THREAD MILLING (Pre-drilled hole necessary)

Metric, metric fine

Unified

G

Rc

NPT

THREAD MILLING (No pre-drilled hole necessary)

Metric, metric fine

U, UNJ, UNC, UNJC, UNF, UNJF

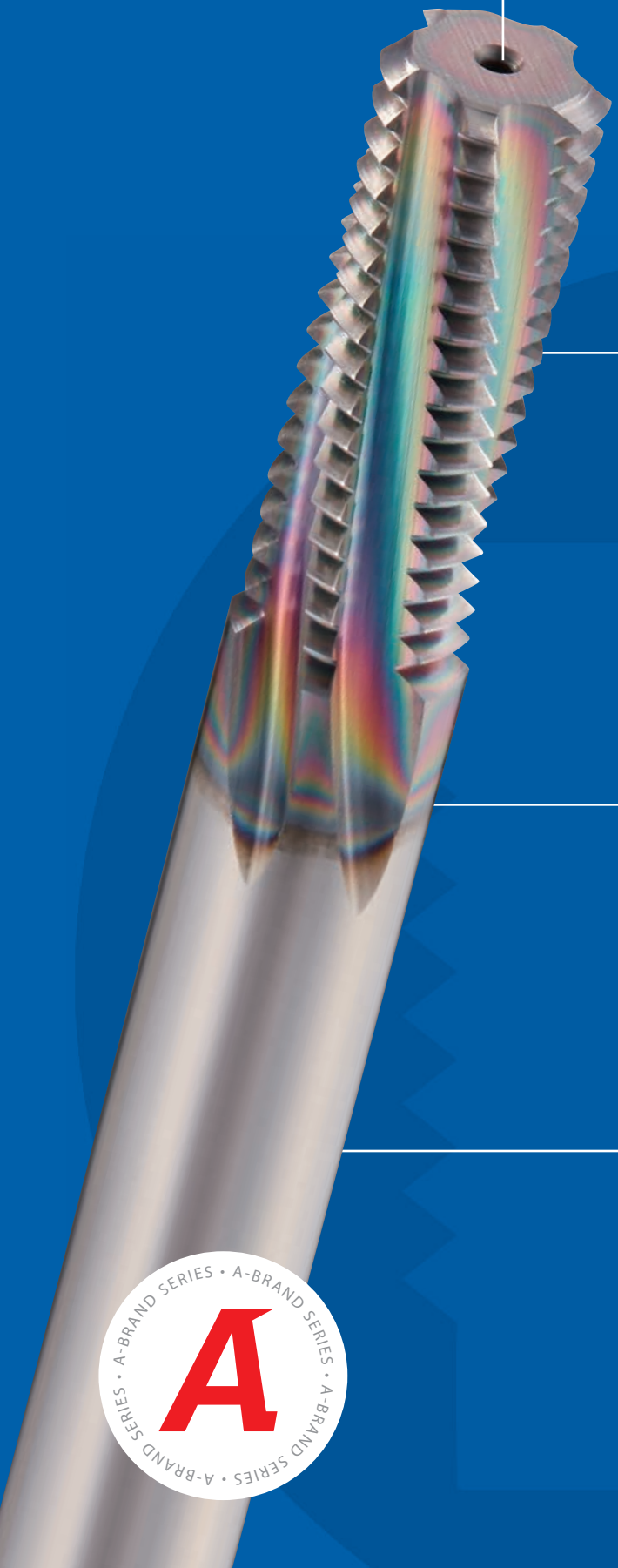
THREAD GAUGES

THREAD MILLS OVERVIEW & WORK MATERIALS

		AT-1	WX-PNC	WXO-ST-PNC	WX-ST-PNC-3P	WH-VM-PNC	AT-2	WH-EM-PNC	WHO-EM-PNC
									
Thread types		M, MF, U, UNJ, UNC, UNJC, UNF, UNJF, Rc, G, NPT	M, MF, UNJ, UNC, UNF, UNJC, UNJF, G, Rc, NPT	M, MF	M, MF, G	M, MF, U, UNJ, UNC, UNJC, UNF, UNJF	M, MF U, UNJ, UNC, UNJC, UNF, UNJF	M, MF	M, MF
Oil hole		-	-	Y	-		Y (M10, M12)	-	Y
LxD		2xD	2xD	2xD	2,5xD	2xD	2xD, 2,5xD	2xD	2xD
Chamfer		-	-	-	-	-	-	Y	Y
Threading without pre-drilled hole		-	-	-	-	-	Y	Y	Y
P	C:≤0,2%	⦿	○	○	○	○			
P	C:0,25-0,45%	⦿	○	⦿	○	○			
P	C:≥0,45%	⦿	○	⦿	○	○	○	○	○
P	SCM	⦿	○	⦿	○	○	○	○	○
M	INOX	⦿	○	○	○	○			
K	GG	⦿	○	○	○	○			
K	GGG	⦿	○	○	○	○			
N	Al	⦿	○	○	○	○			
N	AC, ADC	⦿	○	○	○	○			
S	Ti		⦿		⦿	⦿	○	○	○
S	Ni		⦿		⦿	⦿	○	○	○
H	25~35HRC	⦿	○	⦿	⦿	⦿	⦿	⦿	⦿
H	35~45HRC	⦿	○	⦿	⦿	⦿	⦿	⦿	⦿
H	45~52HRC						⦿	⦿	⦿
H	52~62HRC						○	○	○

○ :Good ⦿ :Very Good

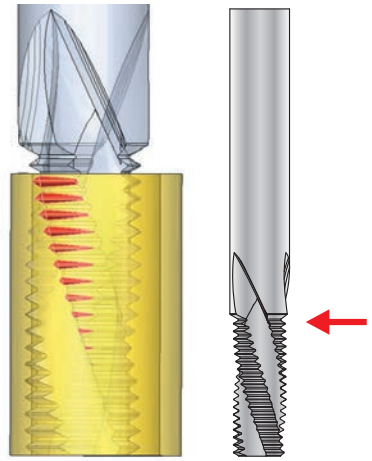
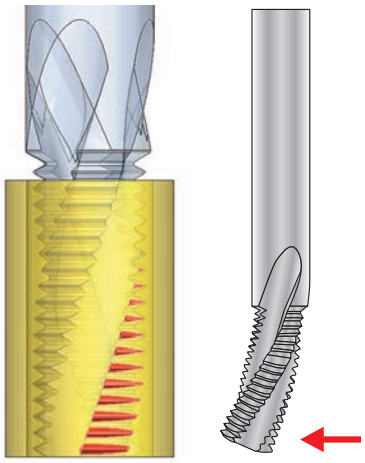
KEY FEATURES: AT-1



1. Unequal spacing with variable lead flute reduces vibration
2. Right-hand cut & left-hand helix geometry prevents bending
3. EgiAs coating with exceptional wear resistance and toughness
4. Ultra-Fine Grain Carbide with high wear resistance and toughness

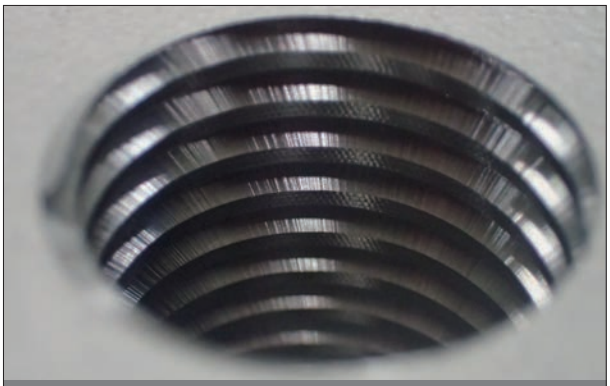
The secret to 1-pass cutting

Evolution from conventional 2-pass cutting to 1-pass cutting by preventing bending, reducing cutting time.

AT-1 Left Hand Helix	Conventional Thread Mill Right Hand Helix
	
Starts cutting from the shank side **Reduced deflection** Climb milling recommended	Starts cutting from the tip **Big deflection**

High quality internal threading

AT-1
1-Pass



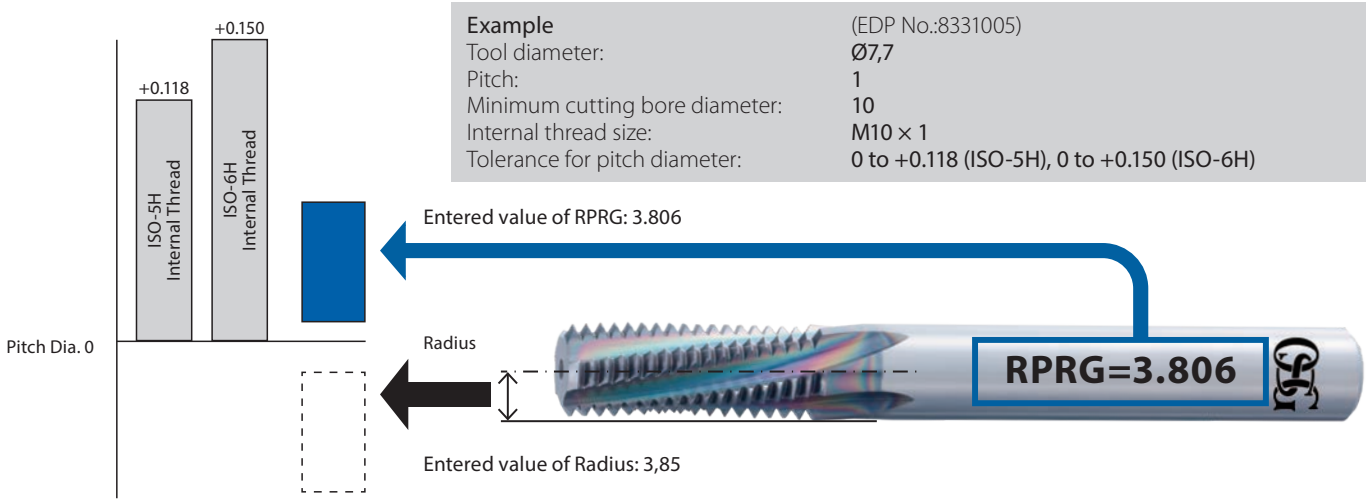
Conventional
2-Pass

Size	Ø19,7 × 54 P3 6F
Work Material	SUS304
Cutting Speed	40 m/min (646min^{-1})
Feed	14 mm/min (0,02mm/t)
Internal Thread Size	M24 x 3
Tapping length	45 mm
Coolant	Water-Soluble
Machine	Horizontal Machining Center

SUPPORT TOOLS FOR YOUR THREAD MILLING NEEDS

1 RPRG

Use RPRG to reduce the workload. RPRG is the reference value of tool radius offset.



Example	(EDP No.:8331005)
Tool diameter:	Ø7,7
Pitch:	1
Minimum cutting bore diameter:	10
Internal thread size:	M10 × 1
Tolerance for pitch diameter:	0 to +0.118 (ISO-5H), 0 to +0.150 (ISO-6H)

Notes

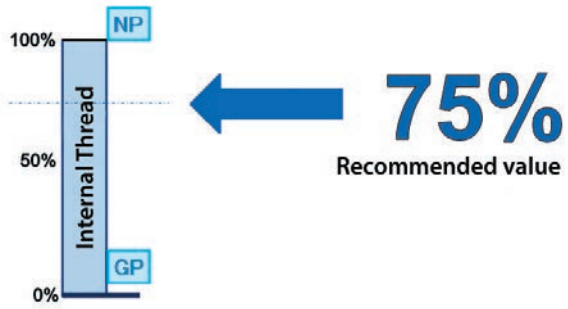
1. RPRG are reference values. Optimal values for actual cutting depend on the machining environment. Determine optimal values after trial cutting.
2. RPRG values are optimally established to achieve ISO:5H (formerly Grade 1) internal thread limits for metric threads and ANSI:3B internal thread limits for unified threads. RPRG values established for taper pipes (R/Rc) are effective when using the thread milling NC code generator software ThreadPro available on our website.
3. For diameters of thread mills, RPRG values are calculated based on the minimum cutting bore diameter (the minimum cutting internal thread size of the tool diameter). To cut other diameters, it is necessary to use a smaller value than RPRG.

2 Revamped Thread Milling NC Code Generator Software "ThreadPro"

Create machining programs at ease with OSG's revamped NC code generator software ThreadPro.

3 Achieve stable tool life with the DCT for accurate diameter measurement

The internal thread effective diameter, which used to be difficult to determine, can now be measured with readable values.



Troubled by the following problems?

Unsure of diameter correction value. Increase passes which results in longer setup time.	An incorrect diameter correction that result in a defective internal thread (gauge-out).	Unstable tool life

Solved with the Diameter Correction Tool

DCT

Simple measurement of pitch diameter by visual judgment

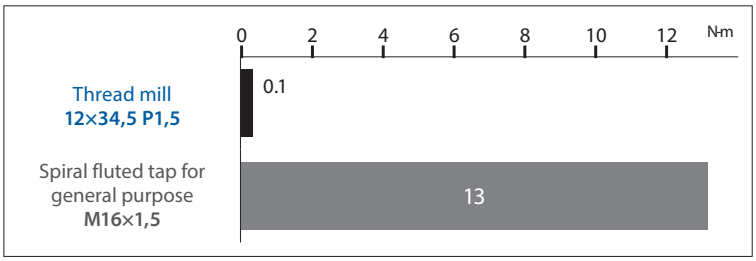
Visibility of internal thread pitch diameter at entry enables the reduction of passes to minimize setup time significantly. Moreover, the DCT is able to measure pitch diameter smaller than the tolerance limit. The DCT can measure the pitch diameter of the female internal thread even if it does not fit into the Go-Gauge.	Visibility of internal thread pitch diameter at entry enables reliable diameter corrections. The DCT is useful for reducing defective workpieces.	Digitized measurement ensures consistent internal thread pitch diameters after tool changes. The same starting and finishing position ensures consistent and stable tool life.

A single tool cuts various sizes of diameters

A single tool can cut different threads such as M10 × 1.5, M12 × 1.5, and M16 × 1.5 if their pitch is the same.

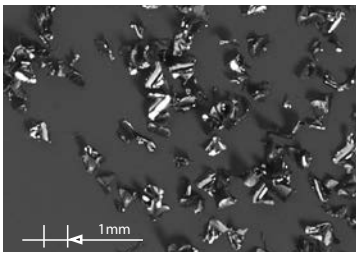
Cuts large-diameter threads on low-power machine

The internal thread effective diameter, which used to be difficult to determine, can now be measured with readable values.

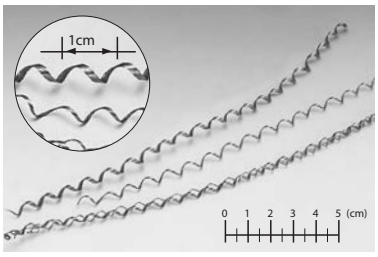


Smooth handling of chips to reduce problems

Thread mills break chips into small pieces and eject them smoothly, ensuring stable, problem-free thread cutting.



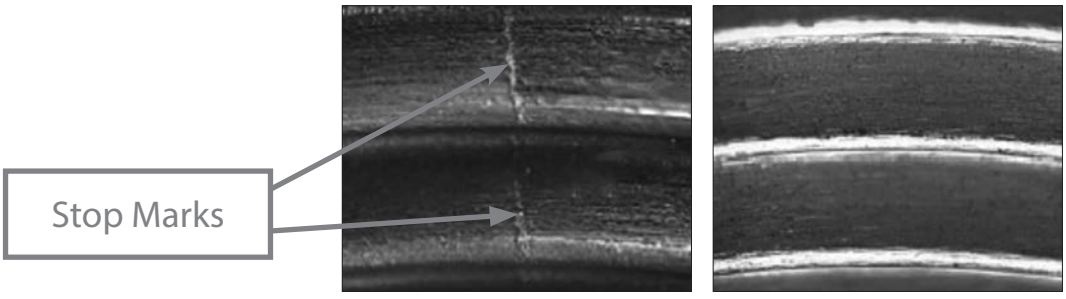
Thread mill chips
Material S45C



Spiral fluted tap chips

High-precision taper pipe threading (no stop marks)

Airtight threads by having no stop marks.



Thread cutting in drill holes with little allowance

Thread milling cuts the thread closer to the bottom of a hole than tapping, leaving only one incomplete crest of thread

Effects of left-hand helix

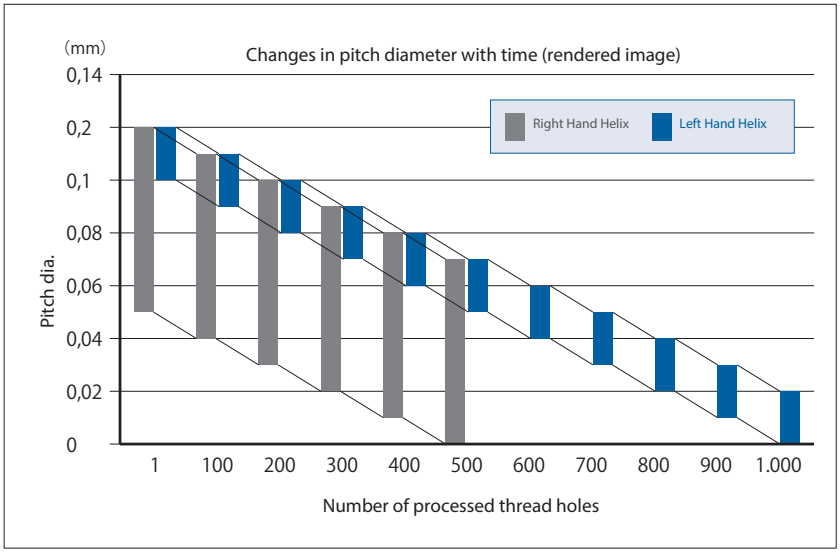
Comparison of differences in internal thread pitch diameter at initial cutting stage.

Size	Ø7,7 × 22 P1 4F
Work Material	SCM440 (30 HRC)
Cutting Speed	100 m/min (4.136min^{-1})
Feed	380 mm/min (0,1mm/t)
Internal Thread Size	M10 x 1 mm
Drill Hole Size	Ø9 × 18 mm (Through)
Threading Length	15 mm
Machining Method	Climb milling 1-Pass
Coolant	Water-Soluble
Machine	Vertical Machining Center

The left-hand helix's small pitch diameter difference between the hole entry and inner hole allows a delay in gauge-out failure. Moreover, longer tool life can be achieved with "zero cutting" for correcting bending being eliminated.

	Hole Entry	Inner Hole Area	Dia. Difference
Right Hand Helix	+0,120 ~ +0,140	+0,040 ~ +0,060	0,060 ~ 0,100
Left Hand Helix	+0,120 ~ +0,140	+0,120 ~ +0,140	**0 ~ +0,020**

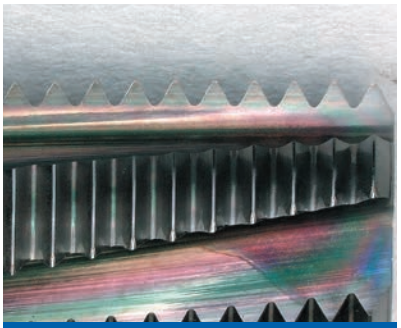
Pitch diameter measurement method : Step gauge



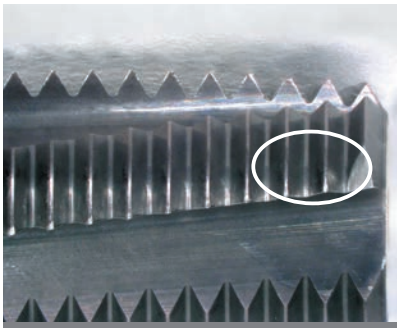
Effects of EgiAs coating

Cutting edge after threading 2.000 holes.

Size	Ø7,7 × 22 P1 4F
Work Material	SCM440 (30 HRC)
Cutting Speed	100 m/min (4.136min^{-1})
Feed	380 mm/min (0,1mm/t)
Internal Thread Size	M10 x 1 mm
Drill Hole Size	Ø9 × 18 mm (Through)
Threading Length	15 mm
Coolant	Water-Soluble
Machine	Vertical Machining Center



EgiAs Coating



WX Coating

CUTTING DATA

Work materials ❶ to ❷ are machined under the conditions shown below.

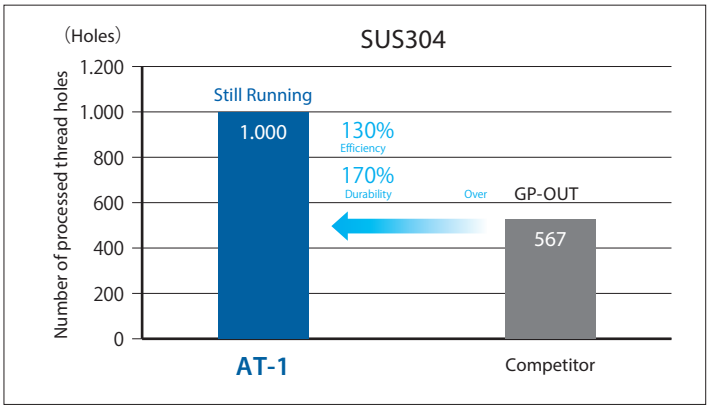
Internal Thread Size	M10 x 1 mm
Drill Hole Size	Ø9 × 25 mm (Blind)
Threading Length	19 mm
Coolant	Water-Soluble
Machine	Vertical Machining Center

1. Internal thread pitch diameter difference between hole entry and inner hole area: 20µm or less
   Eg: +0.080 step gauge passes completely, +0.100 step gauge stops less than or equal to one revolution.

2. Fastest cutting condition (including number of passes) while fulfilling the requirement of Condition 1.

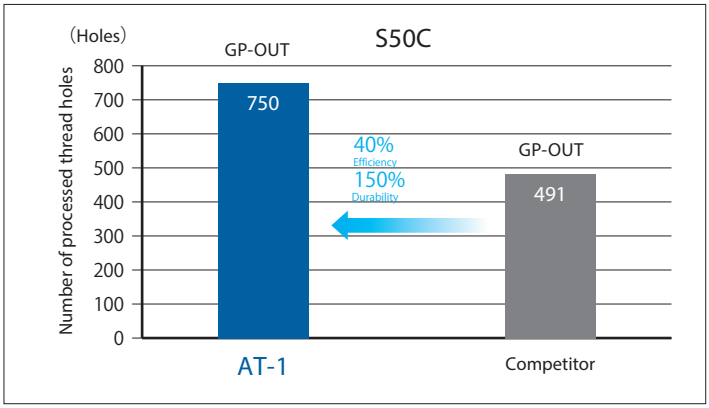
❶ Machining SUS304

Tool	AT-1 Ø7,7×22 P1 4F	Competitor
Cutting Speed	120m/min (4.961min^{-1})	140m/min (5.122min^{-1})
Feed	228mm/min (0,05mm/t)	200mm/min (0,1mm/t)
Number of Passes	1-Pass	2-Passes
Cutting Time	2,26 sec	3,03 sec



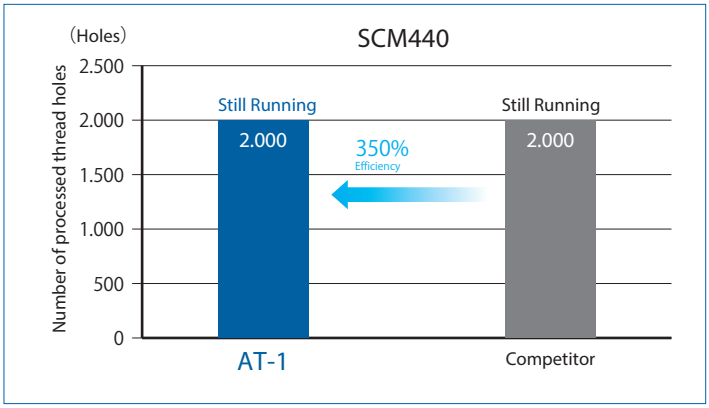
❷ Machining S50C

Tool	AT-1 Ø7,7×22 P1 4F	Competitor
Cutting Speed	160m/min (6.614min^{-1})	140m/min (5.122min^{-1})
Feed	122mm/min (0,02mm/t)	200mm/min (0,1mm/t)
Number of Passes	1-Pass	3-Passes
Cutting Time	4,28 sec	45,4 sec



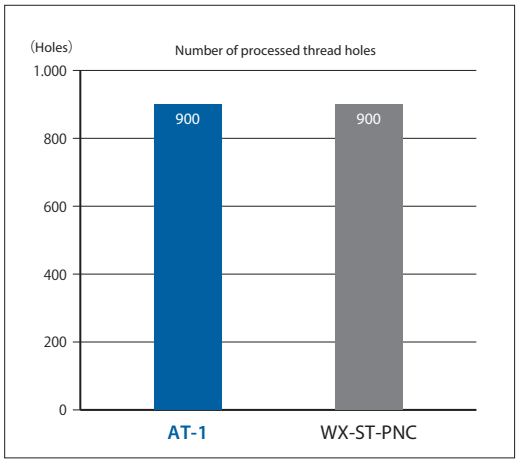
❸ Machining SCM440

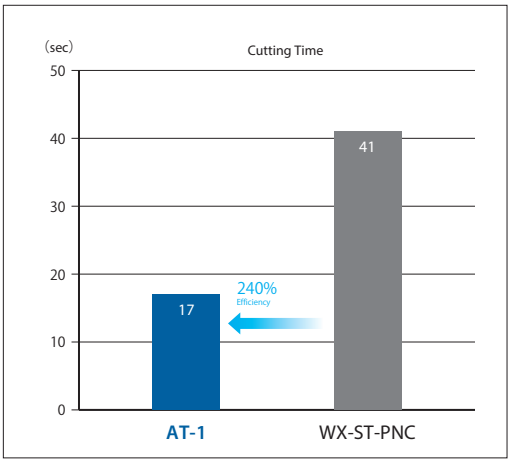
Tool	AT-1 Ø7,7×22 P1 4F	Competitor
Cutting Speed	80m/min (3.307min^{-1})	140m/min (5.122min^{-1})
Feed	30mm/min (0,01mm/t)	200mm/min (0,1mm/t)
Number of Passes	1-Pass	4-Passes
Cutting Time	17,12 sec	60,54 sec



SUS304 durability test result

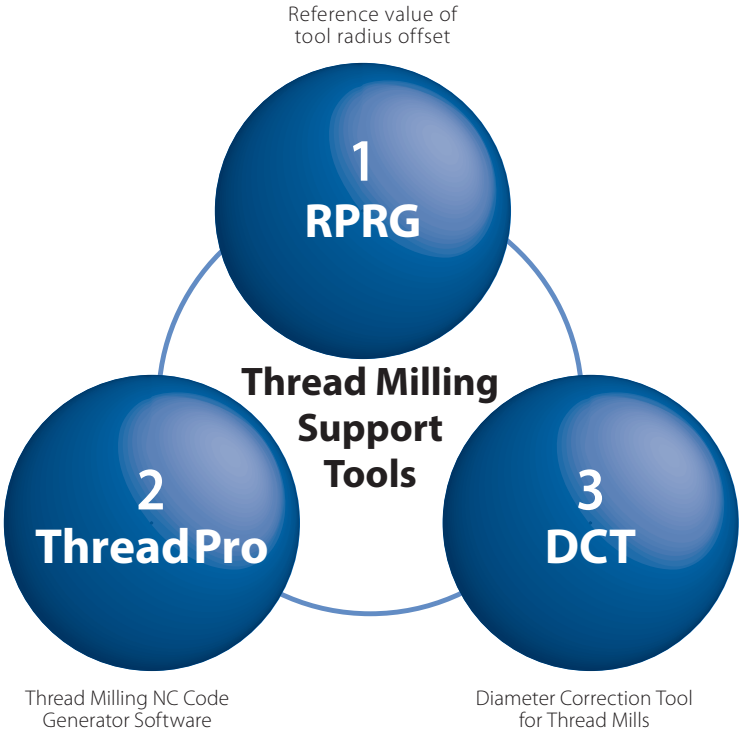
Tool	AT-1	WX-ST-PNC
Work Material	SUS304	
Cutting Speed	100m/min	120m/min
Feed	12,5mm/min	42mm/min
Internal Thread Size	M12 x 1,5	
Drill Hole Size	Ø10,5 × 25 mm (Through)	
Threading Length	22,5 mm	
Coolant	Water-Soluble	
Machine	Vertical Machining Center	
Number of Passes	1-Pass	2-Passes





SUPPORT TOOLS FOR YOUR THREAD MILLING NEEDS

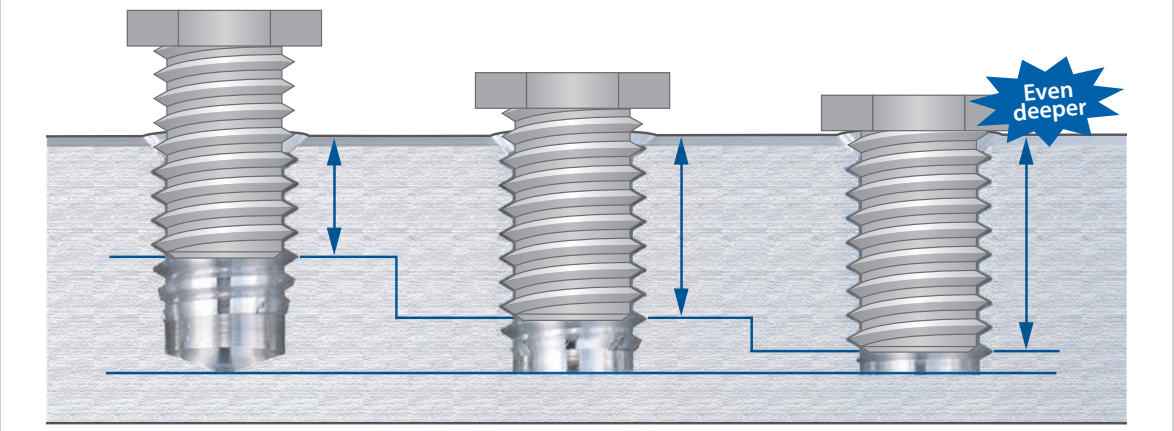
Reduce setup, machining time, and achieve stable tool life with these 3 support tools.



Machining Tips

Taps and drill combination

Carbide Drill **AD-2D ⌀ 5** + Spiral Fluted Tap **A-SFT M6x1 (2,5P)**	Carbide Flat Drill **ADF-2D ⌀ 5** + Spiral Fluted Tap **A-SFT M6x1 (1P)**	Carbide Flat Drill **ADF-2D ⌀ 5** + Thread Mill **AT-1 4,5X14 P1**



Greater tapping depth can be achieved based on combination

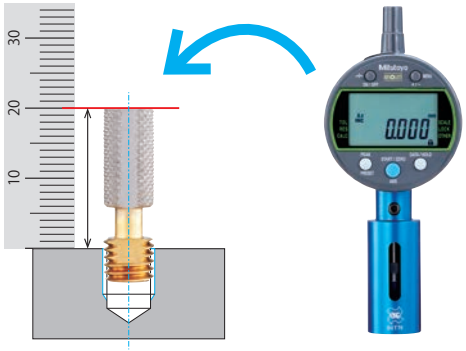
Solve them with the Diameter Correction Tool (DCT)

DCT

Simple measurement of pitch diameter by visual judgment

DCT75

Low-cost type
Measurement and calculation system



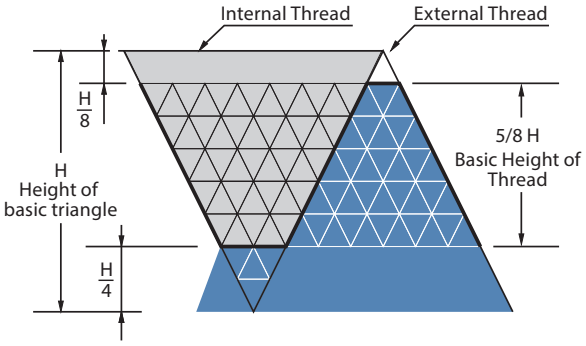
High-performance type
Digital display system

Eliminate measurement and calculation with the combination of a digital display.

Q&A FAQ ABOUT THREAD MILLING

Why internal thread cutting tools cannot be used to cut external threads?

Metric and unified threads have different thread profiles between internal and external threads. For these threads, internal thread cutting tools cannot be used to cut external threads because in their basic thread profiles, the crest and root shapes are not uniform. However, for pipe threads, which have uniform crests and roots, thread cutting tools can be shared for internal and external thread cutting.



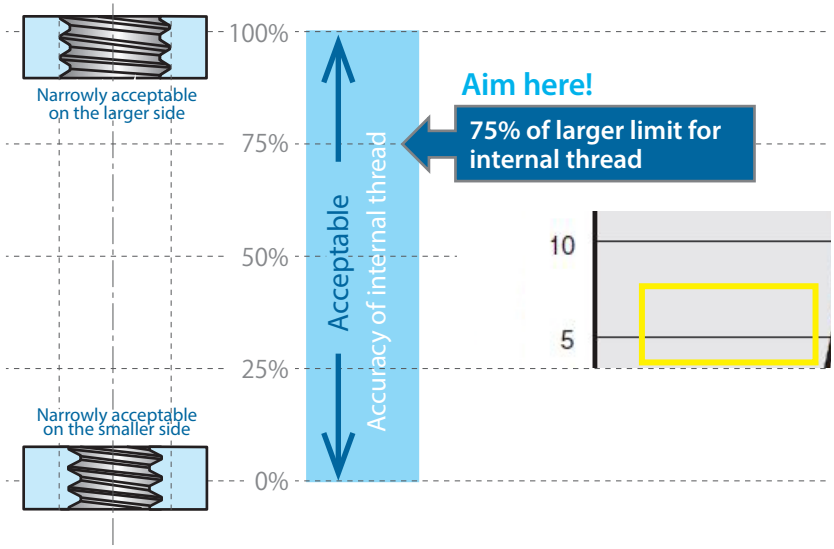
Compare the shapes of internal and external threads.

? Height cut off from crest:	1/8 H External Thread	1/4 H Internal Thread	Both threads have the same basic height of thread (5/8H). However, their shapes are different from each other.
? Height cut off at root:	1/4 H External Thread	1/8 H Internal Thread	

Example of basic thread profile (metric thread)

What does the number "75" under "Fit %" mean, which is displayed on the data entry screen of ThreadPro?

It means to aim at the acceptable range of threads. Default values are 75% (larger side) for internal threads and 25% (smaller side) for external threads in light of their engagement. You can change these to your desired values.



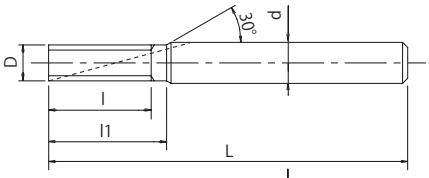
Is ThreadPro compatible with NC programs developed for custom-made thread mills ?

Yes, please consult our sales representatives.

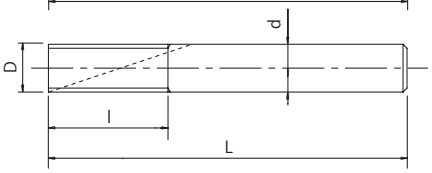
AT-1

Threading | Thread milling | Metric & Metric Fine

Type 1



Type 2



- First choice in quality and performance
- One pass thread mill
- EgiAs coating
- Milling for internal thread

P ◉ C: ≤0,2%	P ◉ C: 0,25-0,4%	P ◉ C: ≥0,45%	P ◉ SCM	M ◉ INOX	K ○ GG	K ○ GGG	N ○ Al	N ◉ AC,ADC	H ◉ 25-35 HRC	H ◉ 35-45 HRC	
80-160	80-160	80-160	60-120	60-120	80-160	60-120	80-160	100-300	80-200	80-200	m/min

A	M	MF	MJ	CARBIDE	EgiAs	9°~13°	h6

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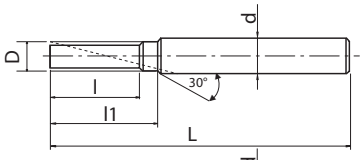
EDP	Min. cutting bore ⦸	P	D	L	l	l1	d	Z	Type	Price
8331000	M6	0,75	4,5	75	13,5	16	6	4	1	
8331001	M6	1	4,5	75	14	16	6	4	1	
8331002	M8	0,5	5,7	75	17	-	6	4	2	
8331003	M8	1	5,7	75	18	-	6	4	2	
8331004	M8	1,25	5,7	75	18,75	-	6	4	2	
8331005	M10	1	7,7	85	22	-	8	4	2	
8331006	M10	1,25	7,7	85	22,5	-	8	4	2	
8331007	M10	1,5	7,7	85	24	-	8	4	2	
8331008	M12	1	9,7	100	26	-	10	5	2	
8331009	M12	1,25	9,7	100	27,5	-	10	5	2	
8331010	M12	1,5	9,7	100	27	-	10	5	2	
8331011	M12	1,75	9,7	100	28	-	10	5	2	
8331012	M14	0,5	11,7	120	29	-	12	5	2	
8331013	M14	0,75	11,7	120	30	-	12	5	2	
8331014	M14	1	11,7	120	30	-	12	5	2	
8331015	M14	1,5	10,7	120	31,5	34,5	12	5	1	
8331016	M14	2	9,7	100	32	-	10	5	2	
8331017	M16	1	13,7	135	34	39	16	5	1	
8331018	M16	1,5	13,7	135	36	39	16	5	1	
8331019	M16	2	11,7	120	36	-	12	5	2	
8331020	M18	2,5	11,7	120	42,5	-	12	5	2	
8331021	M20	1,5	15,7	135	43,5	-	16	5	2	
8331022	M20	2,5	13,7	135	45	50	16	5	1	
8331023	M24	1,5	19,7	150	51	-	20	6	2	
8331024	M24	2	19,7	150	52	-	20	6	2	
8331025	M24	3	19,7	150	54	-	20	6	2	

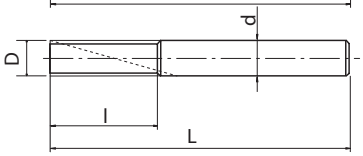
WX-PNC

Threading | Thread milling | Metric & Metric Fine

Type 1



Type 2



- Carbide thread milling cutter
- WX coating
- For all materials
- "ThreadPro" NC code generator software available

P ○	P ○	P ○	P ○	M ○	K ○	K ○	N ○	N ○	S ◉	S ◉	H ○	H ○	
C <0,2%	0,25<C<0,4	C>0.45%	SCM	INOX	GG	GGG	Al	AC,ADC	Ti	Ni	25-35 HRC	35-45 HRC	
50-75	50-75	40-70	15-30	20-40	50-100	50-65	50-70	65-130	20-60	20-60	15-30	15-30	m/min

M | MF | MJ | CARBIDE | WX | 30° | h6

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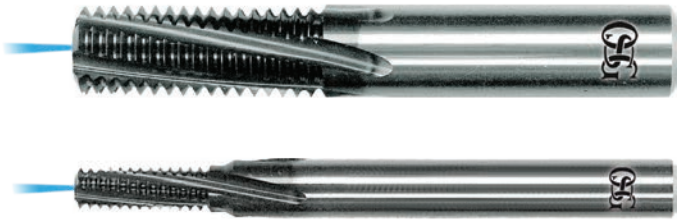
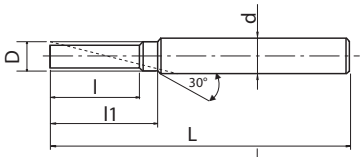
EDP	D	Minimum cutting bore Ø	P	L	l	l1	d	Z	Type	Price
3900001	4,5	M6	1	60	13	15	6	3	1	
3900011	6	M8	1	65	17	-	6	3	2	
3900012	6	M8	1,25	65	17,5	-	6	3	2	
3900021	7,5	M10	1	70	21	26	8	3	1	
1004470640	7,5	M10	1,25	70	21,3	26	8	3	1	
3900023	7,5	M10	1,5	70	22,5	26	8	3	1	
3900032	9,5	M12	1,25	85	26,3	28	10	4	1	
3900033	9,5	M12	1,5	85	25,5	28	10	4	1	
3900034	9,5	M12	1,75	85	26,3	28	10	4	1	
3900042	10	M14	1	85	29	-	10	4	2	
3900043	10	M14	1,5	85	30	-	10	4	2	
3900044	10	M14	2	85	30	-	10	4	2	
3900052	12	M16	1	95	33	-	12	4	2	
3900053	12	M16	1,5	95	34,5	-	12	4	2	
3900054	12	M16	2	95	34	-	12	4	2	
3900073	16	M20	1,5	105	42	-	16	4	2	
3900075	16	M20	2,5	105	42,5	-	16	4	2	
3900083	20	M27	1,5	120	49,5	-	20	5	2	
3900084	20	M27	2	120	50	-	20	5	2	
3900086	20	M27	3	120	51	-	20	5	2	

WXO-ST-PNC

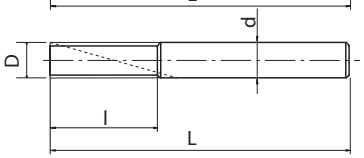
Threading | Thread milling | Metric & Metric Fine



Type 1



Type 2



- Carbide thread milling cutter with Centre through coolant
- WX coating
- For all materials and hardened steels up to 45 HRC
- "ThreadPro" NC code generator software available

P ○	P ◉	P ◉	P ◉	M ○	K ○	K ○	N ○	N ○	H ◉	H ◉
C <0,2%	0,25<C<0,4	C>0.45%	SCM	INOX	GG	GGG	AI	AC,ADC	25-35 HRC	35-45 HRC
80-120	80-120	80-120	80-120	40-80	50-100	50-65	50-70	65-130	60-100	60-100

m/min

M | MF | MJ | CARBIDE | WX | 11° | h6

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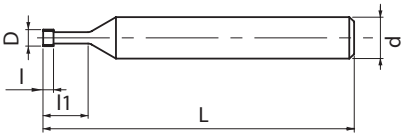
EDP	D	Minimum cutting bore Ø	P	L	l	l1	d	Z	Type	Price
8304700	4,5	M6	0,75	60	12,8	15	6	4	1	
8304701	4,5	M6	1	60	13	15	6	4	1	
8304710	6	M8	0,5	65	16,5	-	6	4	2	
8304711	6	M8	1	65	17	-	6	4	2	
8304712	6	M8	1,25	65	17,5	-	6	4	2	
8304721	7,5	M10	1	70	21	26	8	4	1	
8304723	7,5	M10	1,5	70	22,5	26	8	4	1	
8304732	9,5	M12	1,25	85	26,3	28	10	5	1	
8304733	9,5	M12	1,5	85	25,5	28	10	5	1	
8304734	9,5	M12	1,75	85	26,3	28	10	5	1	
8304740	10	M14	0,5	85	28,5	-	10	5	2	
8304741	10	M14	0,75	85	29,3	-	10	5	2	
8304742	10	M14	1	85	29	-	10	5	2	
8304743	10	M14	1,5	85	30	-	10	5	2	
8304744	10	M14	2	85	30	-	10	5	2	
8304752	12	M16	1	95	33	-	12	5	2	
8304753	12	M16	1,5	95	34	-	12	5	2	
8304754	12	M16	2	95	34	-	12	5	2	
8304773	16	M20	1,5	105	42	-	16	5	2	
8304775	16	M20	2,5	105	42,5	-	16	5	2	
8304783	20	M27	1,5	120	49,5	-	20	6	2	
8304784	20	M27	2	120	50	-	20	6	2	
8304786	20	M27	3	120	51	-	20	6	2	

WX-ST-PNC-3P

Threading | Thread milling | Metric & Metric Fine



- Carbide thread milling cutter with 3 crest thread length
- WXS coating
- For all materials and hardened steels up to 50 HRC
- "ThreadPro" NC code generator software available

P C <0,2%	P 0,25<C<0,4	P C>0.45%	P SCM	M INOX	K GG	K GGG	N Al	N AC,ADC	S Ti	S Ni	H 25-35 HRC	H 35-45 HRC	
60-90	60-90	60-90	30-60	60-90	50-100	50-70	50-100	50-100	20-60	20-60	30-60	30-60	m/min

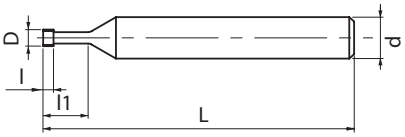
M | MF | MJ | CARBIDE | SC (D≤1,3) | WXS (1,5≤D) | 11° | h6

page 24

EDP	D	Minimum cutting bore Ø	P	L	l	l1	d	Z	Price
48216000	1,3	M1,8	0,35	40	1,05	5,4	3	3	
48216001	1,5	M2	0,4	40	1,2	6	3	3	
48216002	1,9	M2,5	0,45	40	1,35	7,5	6	3	
48216003	2,4	M3	0,5	60	1,5	9,5	6	3	
48216004	3,1	M4	0,7	60	2,1	12,7	6	3	
48216005	4	M5	0,8	60	2,4	15,8	6	3	
48216006	4,5	M6	1	60	3	20	6	4	
48216007	6	M8	1,25	60	3,75	24	6	4	
48216008	7,5	M10	1,5	80	4,5	33	8	4	
48216009	12	M16	1,5	100	4,5	50	12	5	
48216010	16	M20	1,5	100	4,5	50	16	5	
48216011	9,5	M12	1,75	80	5,25	38	10	5	
48216012	12	M16	2	100	6	50	12	5	
48216013	16	M20	2	100	6	50	16	5	
48216014	16	M20	2,5	100	7,5	50	16	5	

WH-VM-PNC

Threading | Thread milling | Metric & Metric Fine



- Carbide thread milling cutter for small sizes
- WXS coating1,5 ≤ D, SC coating Dc ≤ 1,3
- For all materials and hardened steels up to 50 HRC
- "ThreadPro " NC code generator software available

P C <0,2%	P 0,25<C<0,4	P C>0.45%	P SCM	M INOX	K GG	K GGG	N Al	N AC,ADC	S Ti	S Ni	H 25-35 HRC	H 35-45 HRC	
60-90	60-90	60-90	30-60	60-90	50-100	50-70	50-100	50-100	20-60	20-60	30-60	30-60	m/min

M | MF | MJ | CARBIDE | SC (D≤1,3) | WXS (1,5≤D) | 11° | h6

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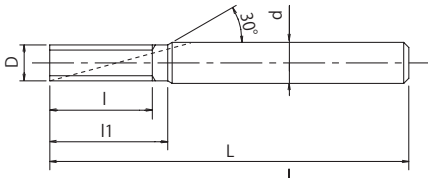
EDP	D	Minimum cutting bore Ø	Thread per flute	P	L	l	l1	d	Z	Price
3900495	0,72	M1	1	0,25	40	0,25	2,75	3	3	
3900496	0,92	M1,2	1	0,25	40	0,25	3,25	3	3	
3900497	1,05	M1,4	1	0,3	40	0,3	3,8	3	3	
3900498	1,2	M1,6	1	0,35	40	0,35	4,35	3	3	
3900499	1,3	M1,7 ~ M1,8	1	0,35	40	0,35	4,85	3	3	
3900500	1,5	M2	3	0,4	40	1,2	4,4	6	3	
3900501	1,9	M2,5 ~ M2,6	3	0,45	40	1,4	5,6	6	3	
3900502	2,4	M3	3	0,5	40	1,5	6,5	6	3	
3900503	3,1	M4	3	0,7	40	2,1	8,7	6	3	
3900504	4	M5	3	0,8	40	2,4	10,8	6	3	

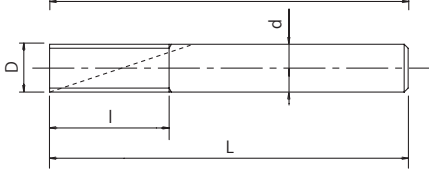
AT-1

Threading | Thread milling | U UNJ UNC UNJC UNF UNJF

Type 1



Type 2



- First choice in quality and performance
- One pass thread mill
- EgiAs coating
- Milling for internal thread

P C: ≤0,2%	P C: 0,25-0,4%	P C: ≥0,45%	P SCM	M INOX	K GG	K GGG	N Al	N AC,ADC	H 25-35 HRC	H 35-45 HRC	
80-160	80-160	80-160	60-120	60-120	80-160	60-120	80-160	100-300	80-200	80-200	m/min

A | U | UNJ | UNC | UNJC | UNF | UNJF | CARBIDE | EgiAs | 9°~13° | h6

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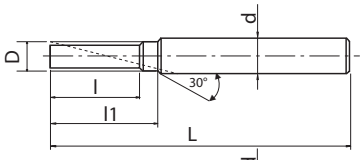
EDP	Min. cutting bore ⦰	TPI	D	L	l	l1	d	Z	Type	Price
8331026	1/4	20	4,55	75	15,24	17,78	6	4	1	
8331027	1/4	28	4,55	75	15,42	17,23	6	4	1	
8331028	5/16	18	5,7	75	19,75	-	6	4	2	
8331029	5/16	24	5,7	75	19,04	-	6	4	2	
8331030	5/16	32	5,7	75	17,47	-	6	4	2	
8331031	3/8	16	6,7	85	22,23	25,41	8	4	1	
8331032	3/8	24	6,7	85	22,22	24,33	8	4	1	
8331033	3/8	32	6,7	85	20,64	22,23	8	4	1	
8331034	7/16	14	7,7	85	27,21	-	8	4	2	
8331035	7/16	20	7,7	85	25,40	-	8	4	2	
8331036	1/2	13	8,7	100	29,31	33,22	10	5	1	
8331037	1/2	20	8,7	100	27,94	30,48	10	5	1	
8331038	1/2	28	8,7	100	28,12	29,93	10	5	1	
8331039	9/16	12	9,7	100	33,87	-	10	5	2	
8331040	9/16	18	9,7	100	32,45	-	10	5	2	
8331041	5/8	11	10,7	120	36,94	41,56	12	5	1	
8331042	5/8	18	10,7	120	35,28	38,10	12	5	1	
8331043	5/8	24	10,7	120	34,91	37,03	12	5	1	
8331044	3/4	10	11,7	120	43,18	-	12	5	2	
8331045	3/4	16	11,7	120	41,29	-	12	5	2	
8331046	7/8	9	13,7	135	50,80	56,44	16	5	1	
8331047	7/8	14	13,7	135	48,98	52,61	16	5	1	
8331048	1	8	18,7	150	57,15	63,50	20	6	1	
8331049	1	20	18,7	150	53,34	55,88	20	6	1	

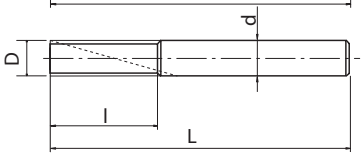
WX-PNC

Threading | Thread milling | UNC, UNF, UNJC & UNJF

Type 1



Type 2



- Carbide thread milling cutter
- WX coating
- For all materials
- "ThreadPro" NC code generator software available

P ○	P ○	P ○	P ○	M ○	K ○	K ○	N ○	N ○	S ◉	S ◉	H ○	H ○	
C <0,2%	0,25<C<0,4	C>0.45%	SCM	INOX	GG	GGG	Al	AC,ADC	Ti	Ni	25-35 HRC	35-45 HRC	
50-75	**50-75**	**40-70**	**15-30**	**20-40**	**50-100**	**50-65**	**50-70**	**65-130**	**20-60**	**20-60**	**15-30**	**15-30**	m/min

UNC **UNF** **UNJC** **UNJF** **CARBIDE** **WX** **30°** **h6**

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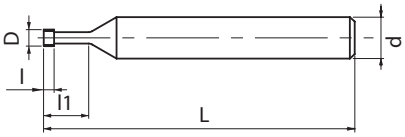
EDP	D	Minimum cutting bore Ø	P	L	l	l1	d	Z	Type	Price
3900350	4,55	1/4	20	60	10,2	11,4	6	3	1	
3900351	4,55	1/4	28	60	10	10,9	6	3	1	
3900355	6,2	5/16	18	65	12,7	14,1	8	3	1	
3900356	6,2	5/16	24	65	12,7	14,1	8	3	1	
3900360	7,6	3/8	16	65	14,3	-	8	3	2	
3900361	7,6	3/8	24	65	14,8	-	8	3	2	
3900365	8,8	7/16	14	75	18,1	19,9	10	3	1	
3900366	8,8	7/16	20	75	17,8	19,1	10	3	1	
3900370	9,4	1/2	13	75	19,5	21,5	10	4	1	
3900371	9,4	1/2	20	75	19,1	20,4	10	4	1	
3900375	10,9	9/16	12	85	23,3	25,4	12	4	1	
3900380	11,4	9/16	18	85	22,6	24	12	4	1	
3900390	18,9	7/8	12	110	33,9	36	20	4	1	

WH-VM-PNC

Threading | Thread milling | U UNJ UNF UNJF



- Carbide thread milling cutter for small sizes
- SC coating Dc ≤ 1,3
- For all materials and hardened steels up to 50 HRC
- "ThreadPro" NC code generator software available

P C <0,2%	P 0,25<C<0,4	P C>0.45%	P SCM	M INOX	K GG	K GGG	N Al	N AC,ADC	S Ti	S Ni	H 25-35 HRC	H 35-45 HRC	
60-90	60-90	60-90	30-60	60-90	50-100	50-70	50-100	50-100	20-60	20-60	30-60	30-60	m/min

U | UNJ | UNF | UNJF | CARBIDE | WXS | 11° | h6

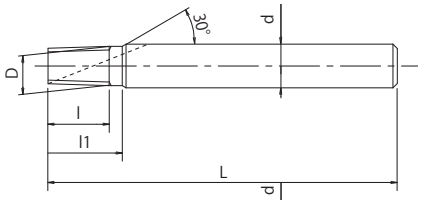
page 24

EDP	D	Minimum cutting bore Ø	Thread per flute	P	L	l	l1	d	Z	Price
3900513	3,2	N°8	3	32	40	2,4	9,1	6	3	

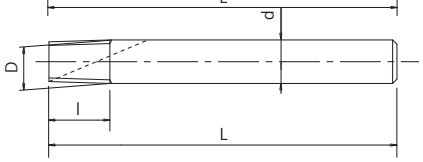
AT-1 NEW

Threading | Thread milling | R (PT), Rc (PT), Rp (PS), G (PF), NPT

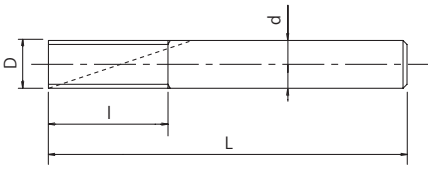
Type 1



Type 2



Type 3



- First choice in quality and performance
- One pass thread mill
- EgiAs coating
- Milling for internal thread

P C: ≤0,2%	P C: 0,25-0,4%	P C: ≥0,45%	P SCM	M INOX	K GG	K GGG	N Al	N AC,ADC	H 25-35 HRC	H 35-45 HRC	
80-160	80-160	80-160	60-120	60-120	80-160	60-120	80-160	100-300	80-200	80-200	m/min

A | Rc (PT) | R (PT) | CARBIDE | EgiAs | 9°~13° | h6

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EDP	Range of thread size ⦸	TPI	D	L	l	l1	d	Z	Type	Price
8331075	1/16 1/8	28	5,67	60	9,1	-	6	4	2	
8331076	1/8	28	7,67	60	9,1	12,7	8	4	1	
8331077	1/4 3/8	19	9,67	75	14,7	-	10	5	2	
8331078	3/8	19	11,67	85	14,7	20	12	5	1	
8331079	1/2 3/4	14	11,67	85	20	-	12	5	2	
8331080	3/4	14	15,67	95	20	-	16	5	2	
8331081	1 ~ 2	11	19,67	105	27,7	-	20	6	2	

A | Rp (PS) | G (PF) | CARBIDE | EgiAs | 9°~13° | h6

EDP	Range of thread size ⦸	TPI	D	L	l	l1	d	Z	Type	Price
8331082	1/16 1/8	28	5,67	60	11,8	-	6	4	3	
8331083	1/8	28	7,67	65	14,5	-	8	4	3	
8331084	1/4 3/8	19	9,67	80	20,1	-	10	5	3	
8331085	3/8	19	11,67	100	25,4	-	12	5	3	
8331086	1/2 7/8	14	11,67	100	32,7	-	12	5	3	
8331087	3/4 7/8	14	15,67	115	39,9	-	16	5	3	
8331088	1 ~ 2	11	19,67	130	50,8	-	20	6	3	

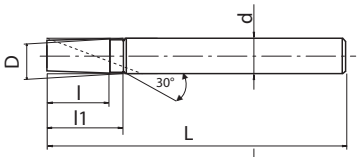
A | NPT | CARBIDE | EgiAs | 9°~13° | h6

EDP	Range of thread size ⦸	TPI	D	L	l	l1	d	Z	Type	Price
8331089	1/16 1/8	27	5,67	60	10,35	-	6	4	2	
8331090	1/8	27	7,67	60	10,35	-	8	4	2	
8331091	1/4 3/8	18	9,67	75	15,52	-	10	5	2	
8331092	3/8	18	11,67	85	15,52	-	12	5	2	
8331093	1/2 3/4	14	15,67	95	19,96	-	16	5	2	
8331094	1 ~ 2	11,5	18,72	105	24,3	28,7	20	6	1	

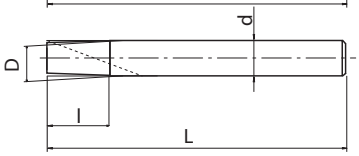
WX-PNC

Threading | Thread milling | G

Type 1



Type 2



- Carbide thread milling cutter
- WX coating
- For all materials
- "ThreadPro" NC code generator software available

P ○	P ○	P ○	P ○	M ○	K ○	K ○	N ○	N ○	S ◉	S ◉	H ○	H ○	
C <0,2%	0,25<C<0,4	C>0.45%	SCM	INOX	GG	GGG	Al	AC,ADC	Ti	Ni	25-35 HRC	35-45 HRC	
50-75	**50-75**	**40-70**	**15-30**	**20-40**	**50-100**	**50-65**	**50-70**	**65-130**	**20-60**	**20-60**	**15-30**	**15-30**	m/min

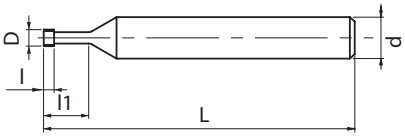
G | **CARBIDE** | **WX** | **30°** | **h6**

page 25

EDP	D	Minimum cutting bore Ø	P	L	l	l1	d	Z	Type	Price
3900299	5,9	1/16 - 1/8	28	60	11,8	-	6	3	2	
3900301	7,5	1/8	28	65	14,5	15,4	8	3	1	
3900311	10	1/4 - 3/8	19	75	20,1	-	10	4	2	
3900312	11	3/8	19	85	25,4	26,7	12	4	1	

WX-ST-PNC-3P

Threading | Thread milling | G



- Carbide thread milling cutter with 3 crest thread length
- WXS coating
- For all materials and hardened steels up to 50 HRC
- "ThreadPro" NC code generator software available

P C <0,2%	P 0,25<C<0,4	P C>0.45%	P SCM	M INOX	K GG	K GGG	N Al	N AC,ADC	S Ti	S Ni	H 25-35 HRC	H 35-45 HRC	
60-90	60-90	60-90	30-60	60-90	50-100	50-70	50-100	50-100	20-60	20-60	30-60	30-60	m/min

G | CARBIDE | WXS | 11° | h6

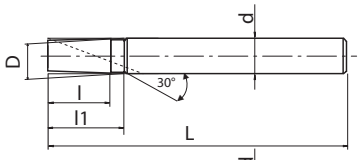
page 24

EDP	D	Minimum cutting bore Ø	P	L	l	l1	d	Z	Price
48216100	5,9	G1/8 G1/16	28	64	2,72	19,5	8	4	
48216101	10	G1/4 G3/8	19	80	4	30	10	5	
48216102	12	G1/2 G7/8	14	100	5,44	37	12	5	
48216103	16	G1 G2	11	100	6,93	48	16	5	

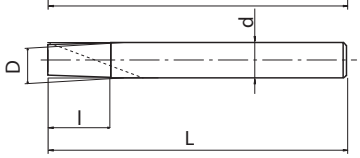
WX-PNC

Threading | Thread milling | RC

Type 1



Type 2



- Carbide thread milling cutter
- WX coating
- For all materials
- "ThreadPro" NC code generator software available

P ○	P ○	P ○	P ○	M ○	K ○	K ○	N ○	N ○	S ◉	S ◉	H ○	H ○	
C <0,2%	0,25<C<0,4	C>0.45%	SCM	INOX	GG	GGG	Al	AC,ADC	Ti	Ni	25-35 HRC	35-45 HRC	
50-75	50-75	40-70	15-30	20-40	50-100	50-65	50-70	65-130	20-60	20-60	15-30	15-30	m/min

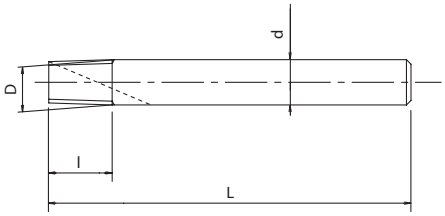
Rc (PT) | CARBIDE | WX | 30° | h6

page 25

EDP	D	Minimum cutting bore Ø	P	L	l	l1	d	Z	Type	Price
3900201	7,5	1/8	28	60	9,1	12,7	8	3	1	
3900211	10	1/4~3/8	19	75	14,7	-	10	4	2	
3900214	12	1/2~3/4	14	85	20	-	12	4	2	
3900218	20	1~2	11	95	27,7	-	20	5	2	

WX-PNC

Threading | Thread milling | NPT



- Carbide thread milling cutter
- WX coating
- For all materials
- "ThreadPro" NC code generator software available

P ○	P ○	P ○	P ○	M ○	K ○	K ○	N ○	N ○	S ◉	S ◉	H ○	H ○	
C <0,2%	0,25<C<0,4	C>0.45%	SCM	INOX	GG	GGG	Al	AC,ADC	Ti	Ni	25-35 HRC	35-45 HRC	
50-75	50-75	40-70	15-30	20-40	50-100	50-65	50-70	65-130	20-60	20-60	15-30	15-30	m/min

NPT | CARBIDE | WX | 30° | h6

page 25

EDP	D	Minimum cutting bore Ø	P	L	l	d	Z	Price
3900259	5,9	1/16~1/8	27	60	10,3	6	3	
3900261	10	1/4~3/8	18	75	15,5	10	4	
3900265	16	1/2~3/4	14	85	20	16	4	
3900268	20	1~2	11 1/2	95	24,3	20	5	

CUTTING CONDITIONS

AT-1

Work Material		Vc (m/min)	F (mm/tooth)
Low Tensile Strength Steel	C~0,25%	80~160	0,01~0,05
Medium Tensile Strength Steel	C~0,25% ~ 0,45%	80~160	0,01~0,05
High Tensile Strength Steel	C0,45%~	80~160	0,01~0,05
Alloy Steel	SCM	60~120	0,01~0,05
Hardened Steel	25~45 HRC	80~200	0,01~0,05
	45~55 HRC	-	-
	50~60 HRC	-	-
Stainless Steel	SUS	60~120	0,01~0,05
Tool Steel	SKD	-	-
Cast Steel	SC	60~120	0,01~0,05
Cast Iron	FC	80~160	0,01~0,05
Ductile Cast Iron	FCD	60~120	0,01~0,05
Copper	Cu	80~160	0,03~0,1
Brass	Bs	80~160	0,03~0,1
Brass Casting	BsC	80~160	0,03~0,1
Bronze	PB	80~160	0,03~0,1
Alumunium Rolled Steel	AL	80~160	0,03~0,1
Aluminium Alloy Casting	AC, ADC	100~300	0,05~0,2
Magnesium Alloy Casting	MC	100~300	0,05~0,2
Zinc Alloy Casting	ZDC	100~300	0,05~0,2
Titanium Alloys	Ti-6AL-4V	-	-
Nickel Alloys	Inconel®	-	-
Thermosetting plastic	-	80~160	0,03~0,1
Thermoplastic	-	80~160	0,03~0,1

1. The indicated speeds and feeds are for water-soluble oil.
2. Water-soluble oil is not suitable for tapping magnesium alloy.
3. Please adjust the cutting conditions depending on the rigidity of machine, tool holders, and workpiece clamping.
4. If the tapping length is long, or when machining a large-pitch thread, select a smaller feed rate and separate the machining process into a few segments.
5. If a machined parallel internal thread is tapered and prevents the go-gauge from going through, add a zero cut (finish machining).

Formula for calculating the feed rate of thread mill

$$v_f = \frac{f \times z \times n \times (D_m \pm D_c)}{D_m} \text{ (mm/min)}$$

v_f	Feed (mm/min)	z	Number of Flutes
D_m	Actual Dia. (mm)	f	Feed (mm/t)
D_c	Tool Dia. (mm)	n	Speed (min^{-1})

Note Internal: – External: +

For the arc cutting process of machining external and internal threads, the feed rate at the tool center can be obtained by multiplying the linear cut feed rate with a coefficient. The formulas for calculating coefficients vary between external and internal thread cutting. The formula listed left are for calculating the tool feed rate during arc-cutting, including calculating the coefficients to be used for multiplication with the linear-cut feed rate.

CUTTING CONDITIONS

WXO-ST-PNC

 Work Material		Vc (m/min)	F (mm/tooth)
Low Tensile Strength Steel	C~0,25%	80~120	0,04~0,1
Medium Tensile Strength Steel	C~0,25% ~ 0,45%	80~120	0,04~0,1
High Tensile Strength Steel	C0,45%~	80~120	0,04~0,1
Alloy Steel	SCM	80~120	0,02~0,08
Hardened Steel	25~45 HRC	60~100	0,02~0,08
	45~55 HRC	-	-
	50~60 HRC	-	-
Stainless Steel	SUS	40~80	0,02~0,06
Tool Steel	SKD	-	-
Cast Steel	SC	40~65	0,02~0,09
Cast Iron	FC	50~100	0,03~0,1
Ductile Cast Iron	FCD	50~65	0,03~0,1
Copper	Cu	65~130	0,03~0,1
Brass	Bs	65~130	0,03~0,1
Brass Casting	BsC	65~130	0,03~0,1
Bronze	PB	65~130	0,03~0,1
Alumunium Rolled Steel	AL	50~70	0,03~0,1
Aluminium Alloy Casting	AC, ADC	65~130	0,03~0,1
Magnesium Alloy Casting	MC	65~130	0,03~0,1
Zinc Alloy Casting	ZDC	65~130	0,03~0,1
Titanium Alloys	Ti-6AL-4V	20~60	0,02~0,06
Nickel Alloys	Inconel®	20~60	0,01~0,03
Thermosetting plastic	-	65~130	0,03~0,13
Thermoplastic	-	65~130	0,03~0,13

WX-PNC

 Work Material		Vc (m/min)	F (mm/tooth)
Low Tensile Strength Steel	C~0,25%	50~75	0,01~0,11
Medium Tensile Strength Steel	C~0,25% ~ 0,45%	40~70	0,01~0,11
High Tensile Strength Steel	C0,45%~	40~70	0,01~0,01
Alloy Steel	SCM	15~30	0,01~0,03
Hardened Steel	25~45 HRC	15~30	0,01~0,03
	45~55 HRC	-	-
	50~60 HRC	-	-
Stainless Steel	SUS	20~40	0,01~0,06
Tool Steel	SKD	-	-
Cast Steel	SC	40~65	0,02~0,09
Cast Iron	FC	50~100	0,03~0,1
Ductile Cast Iron	FCD	50~65	0,03~0,1
Copper	Cu	65~130	0,03~0,1
Brass	Bs	65~130	0,03~0,1
Brass Casting	BsC	65~130	0,03~0,1
Bronze	PB	65~130	0,03~0,1
Alumunium Rolled Steel	AL	50~70	0,03~0,1
Aluminium Alloy Casting	AC, ADC	65~130	0,03~0,1
Magnesium Alloy Casting	MC	65~130	0,03~0,1
Zinc Alloy Casting	ZDC	65~130	0,03~0,1
Titanium Alloys	Ti-6AL-4V	20~60	0,02~0,06
Nickel Alloys	Inconel®	20~60	0,01~0,03
Thermosetting plastic	-	65~130	0,03~0,13
Thermoplastic	-	65~130	0,03~0,13

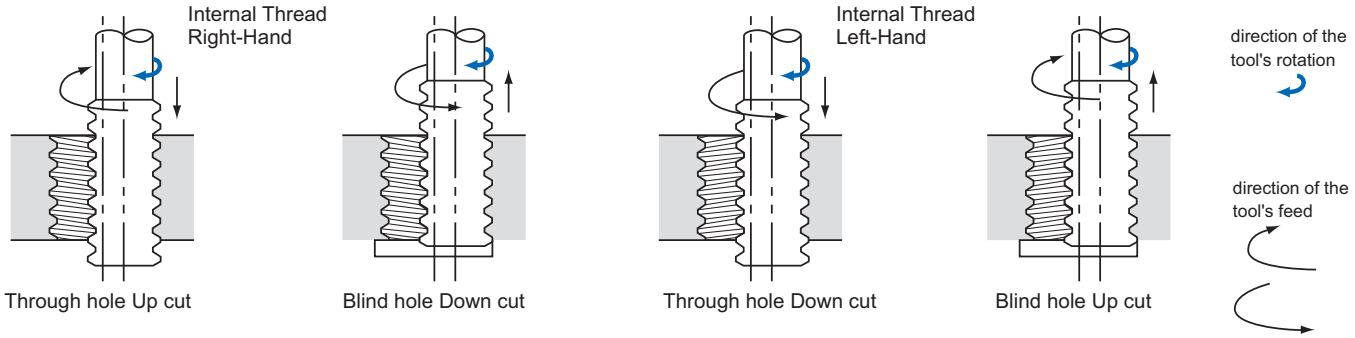
CUTTING CONDITIONS

WH-VM-PNC/WX-ST-PNC-3P

 Work Material		Vc (m/min)	F (mm/tooth)
Low Tensile Strength Steel	C~0,25%	60~90	0,02~0,08
Medium Tensile Strength Steel	C~0,25% ~ 0,45%	60~90	0,02~0,08
High Tensile Strength Steel	C0,45%~	60~90	0,02~0,08
Alloy Steel	SCM	30~60	0,01~0,03
Hardened Steel	25~45 HRC	30~60	0,01~0,03
	45~55 HRC	30~60	0,01~0,03
	50~60 HRC	-	-
Stainless Steel	SUS	60~90	0,02~008
Tool Steel	SKD	-	-
Cast Steel	SC	40~65	0,02~0,09
Cast Iron	FC	50~100	0,03~0,1
Ductile Cast Iron	FCD	50~70	0,03~0,1
Copper	Cu	-	-
Brass	Bs	-	-
Brass Casting	BsC	50~100	0,02~0,06
Bronze	PB	50~100	0,02~0,06
Alumunium Rolled Steel	AL	50~100	0,02~0,06
Aluminium Alloy Casting	AC, ADC	50~100	0,02~0,06
Magnesium Alloy Casting	MC	50~100	0,02~0,06
Zinc Alloy Casting	ZDC	50~100	0,02~0,06
Titanium Alloys	Ti-6AL-4V	20~60	0,01~0,03
Nickel Alloys	Inconel®	20~60	0,01~0,03
Thermosetting plastic	-	50~100	0,02~0,06
Thermoplastic	-	50~100	0,02~0,06

Machining Technique

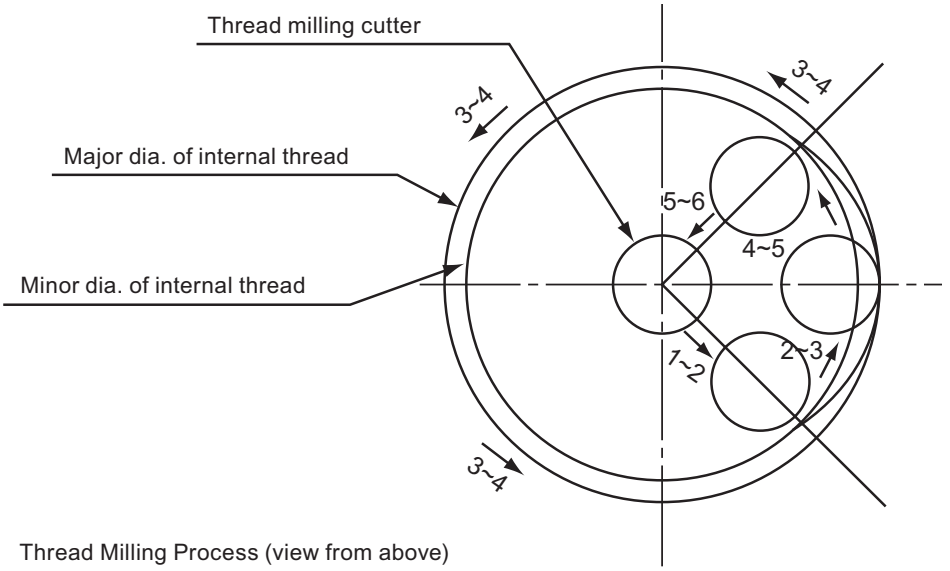
OSG's Thread Mills are developed for thread milling on a 3-Axis CNC controlled machine tool. Threads are produced by advancing one pitch feed per revolution in the axial direction, utilizing the planet-like rotation and revolution movements of the tool. Internal/external and right/left hand threads can all be produced with this one tool by simply changing the direction of rotation and/or feed



Threading Process

1-2	Move to edge (maintain clearance)
2-3	Cut with helical milling
3-4	Mill the circumference of the circle
4-5	Pull away from the edge
5-6	Remove tool

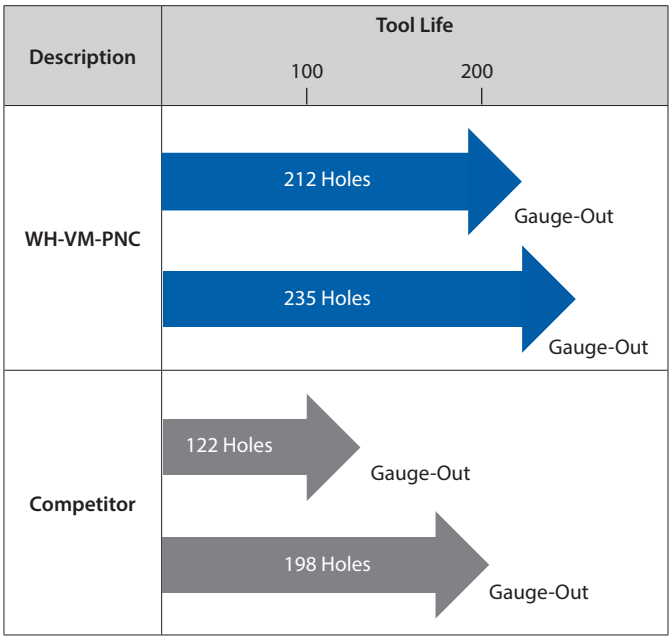
The transition between the start and finish of the milling operation must be smooth and the appropriate amount of feed is essential for minimizing milling resistance. There are many different methods for using this tool, but our research has shown that this technique provides the most precise and efficient operation.



Thread Milling Process (view from above)

Machining small diameter internal threads with stainless steel

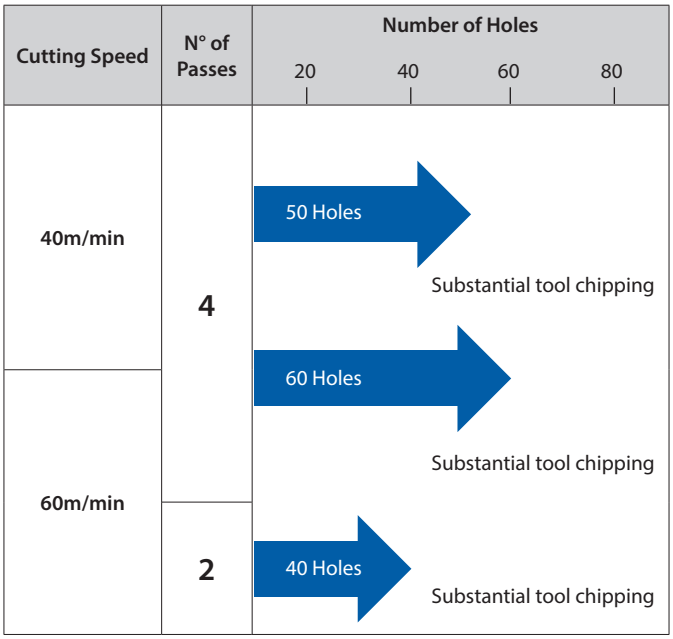
Tool	WH-VM-PNC 0,72 P0,25	Competitor
Work Material	SUS304	
Cutting Speed	80m/min (35.367min^{-1})	
Feed	594mm/min (0.02mm/t)	
Internal Thread Size	M1×0.25	
Drill Hole Size	φ0.78×2.5mm (Blind)	
Tapping Length	2mm (2D) (Blind)	
Machining Method	Up Cut 2 passes	
Coolant	Water Soluble	
Machine	(HSK-E25) Vertical Machining Center	



The WH-VM-PNC was able to perform stably with water-soluble coolant in stainless steel, a difficult process for cut taps. It was able to achieve long tool life and perform stably when tapping M1 threads. When processing threads with limited tap drill hole depth allowance for tap drill holes, the WH-VM-PNC was able to perform more stably than a conventional cut tap.

Machining small diameter internal threads with Inconel 718

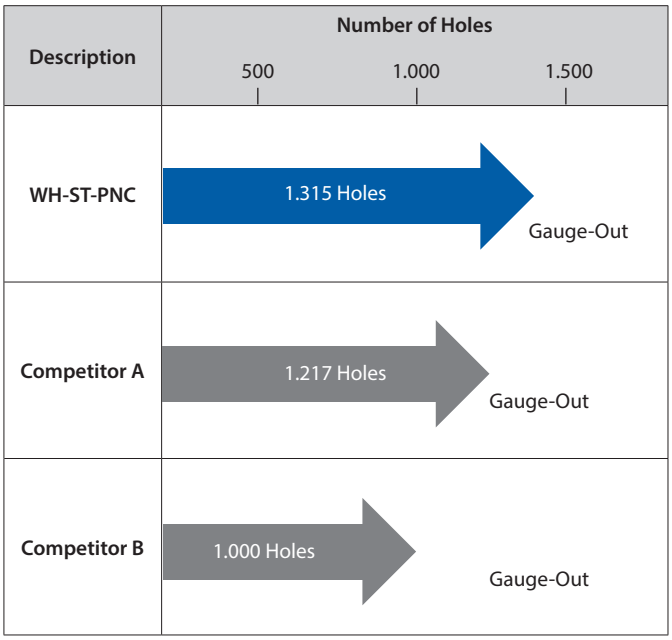
Tool	WH-VM-PNC 3,2 x 2,4 U32	
Work Material	Inconel 718 (40HRC)	
Cutting Speed	40m/min (3.980min^{-1})	60m/min (5.970min^{-1})
Feed	120mm/min (0,03mm/t)	180mm/min (0,03mm/t)
Internal Thread Size	N°10~32 UNF	
Drill Hole Size	φ4,1×14mm (Blind)	
Tapping Length	9mm (1,9D) (Blind)	
Machining Method	Down Cut 2-4 passes	
Coolant	Water Soluble	
Machine	(HSK-A40) Vertical Machining Center	



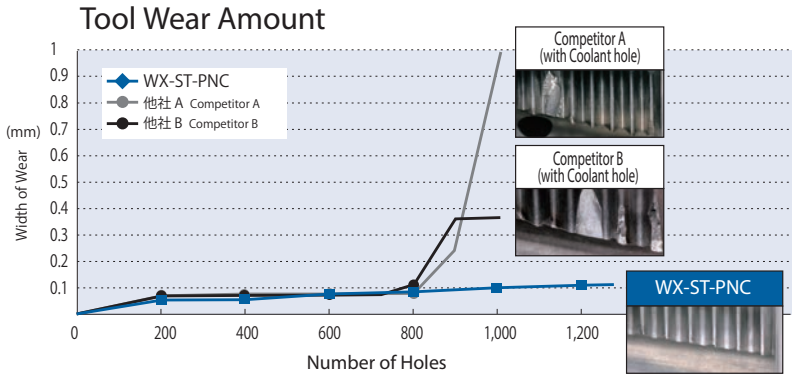
Compared to taps, thread mills have fewer cutting condition limitations. There are no worries about chip management or coolant lubricity, and stable tapping is possible. In this example, we were able to improve the yield rate of small diameter internal threads in a high value workpiece. Further durability improvements and cost reductions can be expected by adjusting the feed rate and number of passes, and changing the cutting fluid.

Outstanding Performance in Stainless with Water-Soluble Coolant

Tool	WX-ST-PNC 7,5x9,1RC 28
Work Material	SUS304
Cutting Speed	130m/min (9.970min^{-1})
Feed	607mm/min (0,1mm/t)
Internal Thread Size	Rc 1/8-28
Drill Hole Size	φ8,2×9mm (Though)
Tapping Length	6,2 mm
Machining Method	Down Cut
Coolant	Water Soluble
Machine	Vertical Machining Center

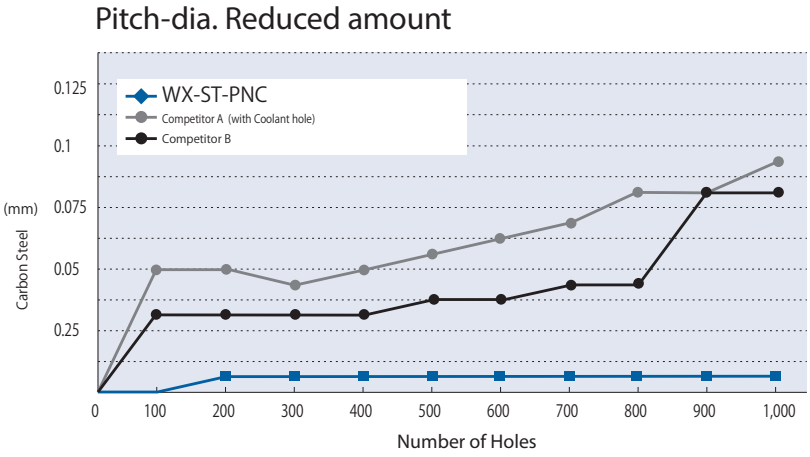


Tool life comparison against other competitors under identical cutting condition in SUS304. The tool life of the WX-ST-PNC was slightly higher than other competitors. Also, in terms of tool wear, it was the only tool that was in fair enough condition for regrinding.



Stable performance in S45C

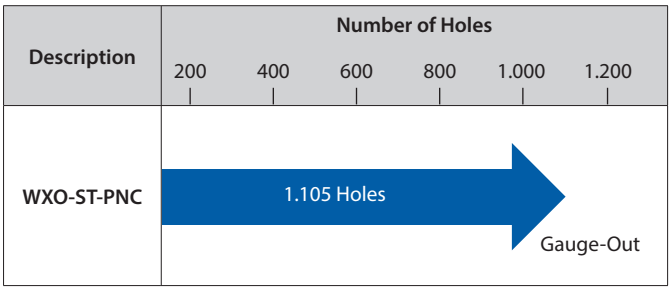
Tool	WX-ST-PNC 7,5x9,1RC 28
Work Material	S45C
Cutting Speed	100m/min (4.592min^{-1})
Feed	327mm/min (0,07mm/t)
Internal Thread Size	Rc 1/8-28
Drill Hole Size	φ8,2×9mm (Though)
Tapping Length	6,2 mm
Machining Method	Down Cut
Coolant	Water Soluble
Machine	Vertical Machining Center (BT30)



Cutting results in S45C. The WX-ST-PNC was able to stably process 1,000 holes with minimal changes in the effective diameter.

Long tool life when high-speed machining hardened steels

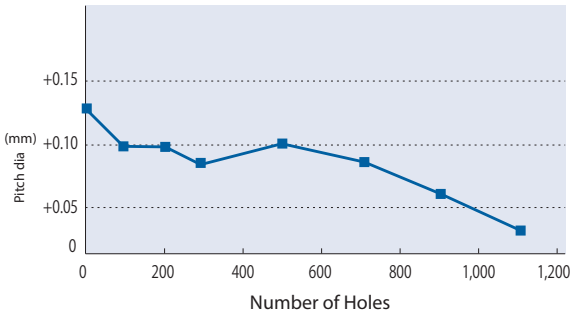
Tool	WXO-ST-PNC 9,5 x 26,3 P1,75
Work Material	SCM440 (40HRC)
Cutting Speed	100m/min (3.351min^{-1})
Feed	349mm/min (0.1mm/t)
Internal Thread Size	M12×1,75
Drill Hole Size	φ10,3
Tapping Length	20 mm
Machining Method	Down Cut 2 passes
Coolant	Water Soluble (10%) (Internal)
Machine	Vertical Machining Center



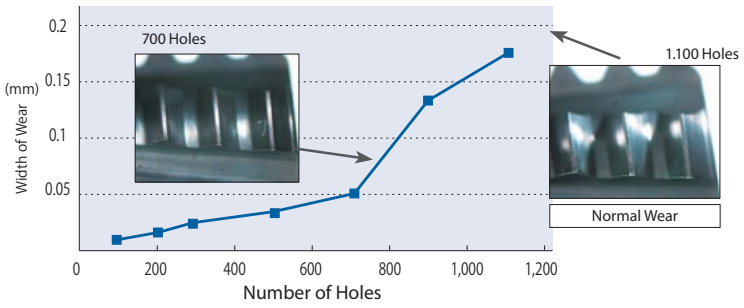
Machined continuously without making tool diameter corrections.

In this example, even when high-speed machining at 100m/min with internally supplied coolant, there was no chipping and long tool life was achieved. The internal threads' pitch diameter measurement was stable, demonstrating the effectiveness of this tool in mass production machining.

Pitch diameter of internal thread

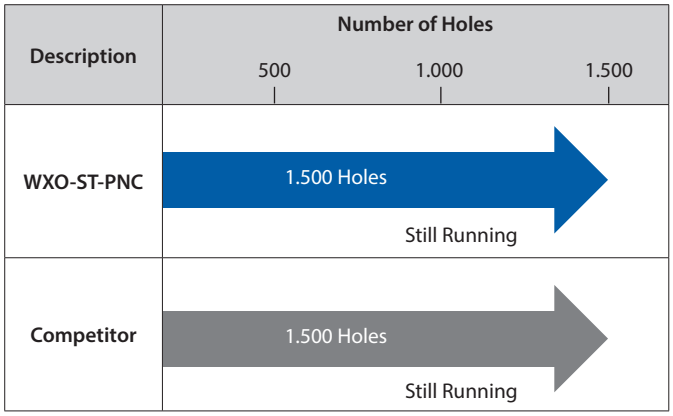


Changes in the extent of wear on the outer circumference



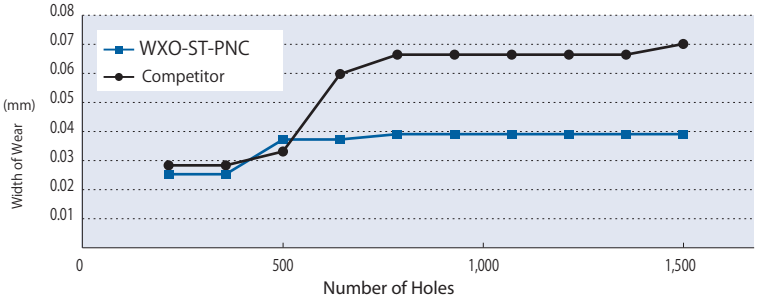
Stable machining in stainless steels, Wear is 40% less than the competitor

Tool	WXO-ST-PNC 9,5 x 26,6 P1,75
Work Material	SUS 304
Cutting Speed	80m/min (2.681min^{-1})
Feed	168mm/min (0,06 mm/t)
Internal Thread Size	M12×1,75
Tapping Length	23 mm
Coolant	Water Soluble
Machine	Vertical Machining Center (BT40)



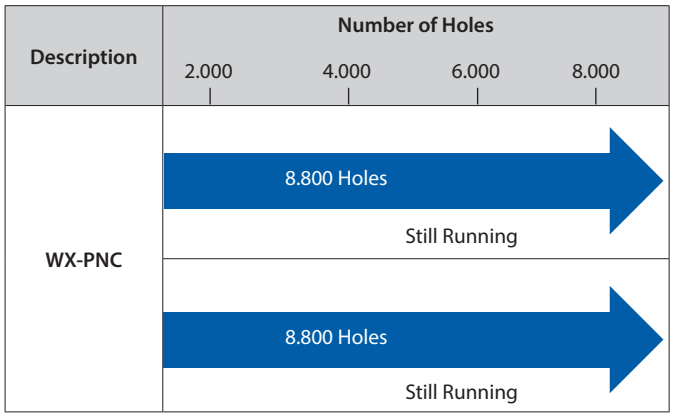
Even when machining stainless steel at 80m/min, it was possible to machine over 1,500 holes, and tool wear was 40% less than the competitor's product. Low wear, slow wear progression and long, stable machining of internal threads were achieved.

Changes in the extent of wear on the outer circumference

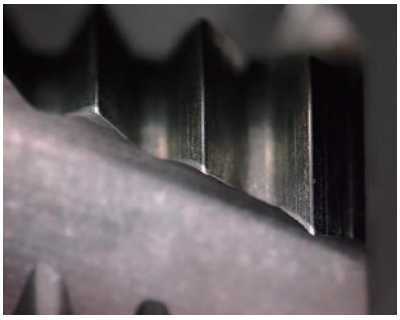


In non-ferrous materials, WX-PNC has excellent durabilty

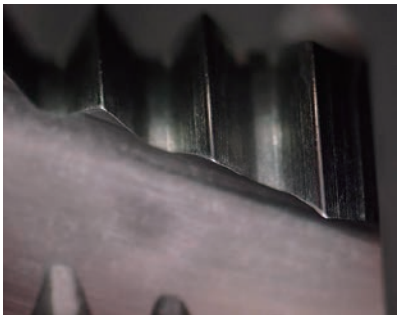
Tool	WX-PNC 7,6 x 14,3 U16
Work Material	A7075
Cutting Speed	160m/min (6.701min^{-1})
Feed	650mm/min (0,16 mm/t)
Internal Thread Size	3/8-16
Tapping Length	12 mm
Coolant	Water Soluble
Machine	Vertical Machining Center (BT40)



Even after machining 8,800 holes in A7075 with a cutting speed of 160m/min, tool wear was negligible. It was still possible for the WX-PNC to continue much more, effectively achieving stable machining of internal threads on a machining center.



No.1 (after cutting 8,800 threads)

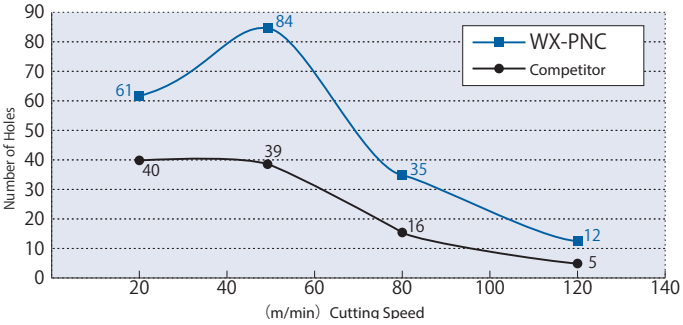


No.2 (after cutting 8,800 threads)

The WX-PNC is also for heat-resistant steels. It achieved twice the tool life of the competitor in Inconel 718

Tool	WX-PNC 4,55 x 10,8 U20
Work Material	Inconel 718 (43HRC)
Internal Thread Size	1/4--20 UNC
Tapping Length	9 mm
Feed per Tooth	0,03 mm/t
Coolant	Water Soluble (10%)
Machine	Horizontal Machining Center

Cutting Speed and Durability Count



These are the test results in Inconel® 718 at various cutting speeds. At cutting speeds under 50m/min, durability is better and this seems to be an effective machining range. The WX-PNC achieves twice the tool life of the competitor, no matter the cutting speed.

FEEDBACK FROM THREADPRO USERS

"An increased variety of NC machines to select from has helped me a lot." (User)

"The RPRG is very convenient! Before RPRG, I set the depth of cut on a trial-and-error basis for the first session. Now I can confidently set the depth correctly the first time." (User)

"I have no trouble selecting a tool, although it has been difficult for me to find the right combination of a holder and an insert . (Distributor)

"It is very convenient and easy to select the type of the tool or cutting edge according to the cutting context." (User)

"The search results show relevant tool profiles and dimensions, for which I am glad." (User)

VOICE OF THREADPRO DEVELOPER

In recent years, various theories concerning cutting have been proposed for end milling, considering load control and cutting efficiency. This is due to higher flexibility in end milling than in tapping. Thread mill is a thread cutting tool. However, as cutting methods it is closer to end mills than taps. Accordingly, to achieve optimal thread milling, parameters should include the cutting path as well as other cutting conditions. Nevertheless, because the workings of a thread mill are inherently complex, it is very difficult for the user to achieve the proper arrangement. OSG has radically updated the NC program development software to enable users to realize their ideas with increased ease and make more effective use of their tools than before.