MOLDINO
The Edge To Innovation

ET-PN / EDT-TH
EDT-(N)PT-ATH

Carbide Thread Mill series

32 New Long-Neck 3D/3.5D Products Added to Range

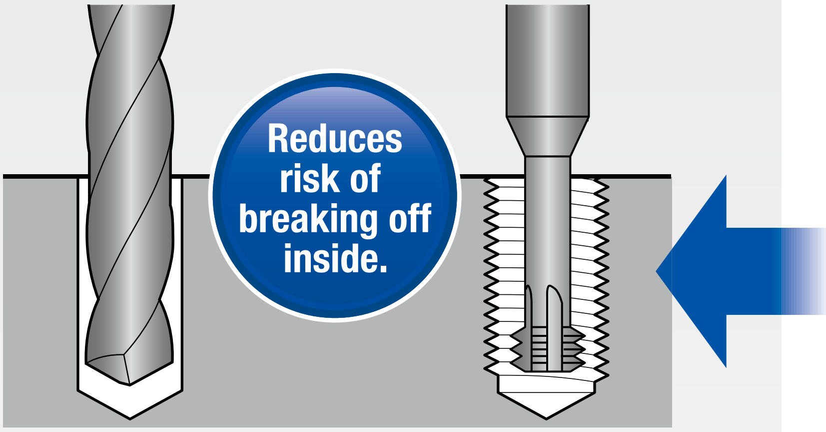
MOLDINO Tool Engineering, Ltd.
New Product News | No.1305E-14 | 2023-11

Allowing thread milling in hardened steel.
Supports NC automation of threading.

Eliminate tapping worries

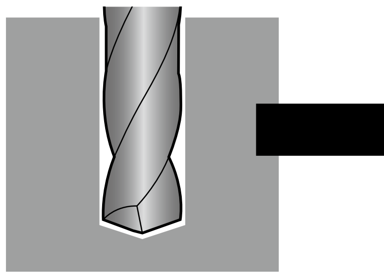
PN Coating

Epoch Thread Mill



Good chip evacuation

Drilling



Worries about taps

Large numbers of tools

Difficulties of tapping

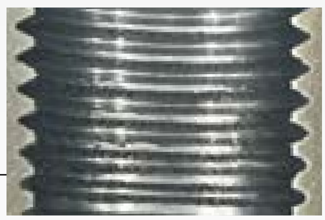
Effective thread

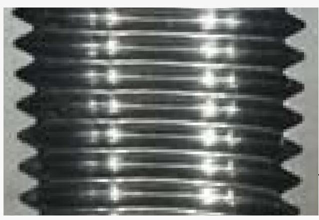
Tap causes tearing and

Ensures a high-quality finished surface!

Finer chips minimize tearing and gouging. This is especially effective in preventing leaks from pipe screws.

Conventional tap



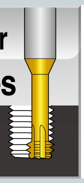


Thread Mill

One tool - various types of thread milling

Right hand, left-hand and fine thread milling can be performed by just changing the NC program.

NC program support software for
"Epoch Thread Mill" series
Click here to go



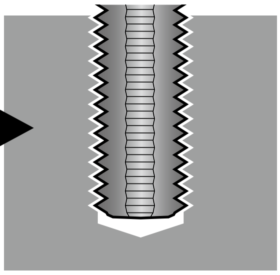
Easily Create
NC Programs Online
You can create NC programs on our website!
www.moldino.com/en/technical/nc-et/

with thread mills!

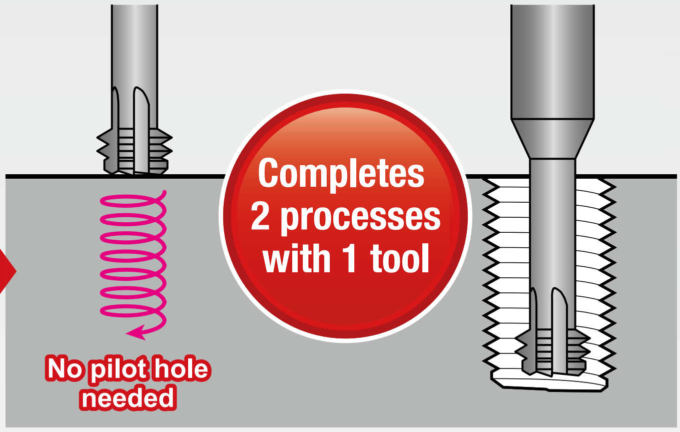
ATH Coating

Epoch D Thread Mill

Tapping



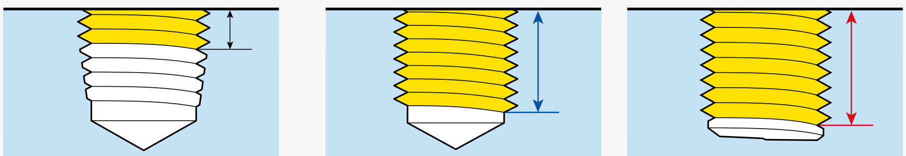
- breaking off inside...
- and processes required...
- hardened steel...
- is too short...
- gouging on machined surface...



Simultaneous helical boring and threading.

Threads can be cut close to end!

Ideal for machining when pilot hole depth allows no margins



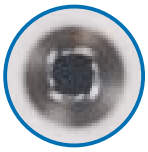
Conventional tap | Epoch Thread Mill (No incomplete thread) | Epoch D Thread Mill (1 incomplete thread)

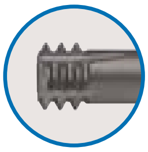
Cutting conditions can be freely set (Helical milling)

Unlike when using taps, synchronizing the rotation and feed rates is not necessary.
Since the load is small, these tools can be used even on machines having low-powered spindle.

Left-hand cutting tool
- Reverse spindle rotation should be used.

Epoch Thread Mill





ET- ○.○○-○○.○-PN

Unit : mm　Carbide　PN　h5

	Item code	Stock	Thread dia. D_1	Pitch TP	Tool dia. DC	Under neck length LU	Overall length OAL	Shank dia. DCONMS	Oil hole
For Metric threads 2D type	ET-0.4-4-PN	□	M2	0.4	1.4	4.5 (4)	50	6	-
	ET-0.45-4.4-PN	□	M2.2	0.45	1.6	4.9 (4.4)	50	6	-
Under neck length: 2 × D_1	ET-0.45-5-PN	□	M2.5	0.45	1.8	5.5 (5)	50	6	-
	ET-0.5-6-PN	●	M3	0.5	2.4	6.5 (6)	50	6	-
	ET-0.7-8-PN	●	M4	0.7	3.1	9 (8)	50	6	-
	ET-0.8-10-PN	●	M5	0.8	3.8	11 (10)	50	6	-
	ET-1.0-12-PN	●	M6	1	4.6	13 (12)	50	6	-
	ET-1.25-16-PN	●	M8	1.25	6.2	17 (16)	70	10	-
	ET-1.5-20-PN	●	M10	1.5	7.5	21 (20)	70	10	-
	ET-1.75-24-PN	●	M12	1.75	9	25 (24)	80	10	-
	ET-2-32-PN	□	M16	2	11.5	33 (32)	100	12	-
	ET-2.5-36-PN	□	M18	2.5	14	37 (36)	135	16	○
	ET-2.5-40-PN	□	M20	2.5	15	41 (40)	135	16	○
For Metric threads 2.5D type	ET-0.4-5-PN	□	M2	0.4	1.4	5.5 (5)	50	6	-
	ET-0.45-5.5-PN	□	M2.2	0.45	1.6	6 (5.5)	50	6	-
	ET-0.45-6.25-PN	□	M2.5	0.45	1.8	6.75 (6.25)	50	6	-
Under neck length: 2.5 × D_1	ET-0.5-7.5-PN	●	M3	0.5	2.4	8 (7.5)	50	6	-
	ET-0.7-10-PN	●	M4	0.7	3.1	11 (10)	50	6	-
	ET-0.8-12.5-PN	●	M5	0.8	3.8	13.5 (12.5)	50	6	-
	ET-1.0-15-PN	●	M6	1	4.6	16 (15)	50	6	-
	ET-1.25-20-PN	●	M8	1.25	6.2	21 (20)	70	10	-
	ET-1.5-25-PN	●	M10	1.5	7.5	26 (25)	70	10	-
	ET-1.75-30-PN	●	M12	1.75	9	31 (30)	80	10	-
	ET-2-40-PN	□	M16	2	11.5	41 (40)	100	12	-
	ET-2.5-45-PN	□	M18	2.5	14	46 (45)	135	16	○
	ET-2.5-50-PN	□	M20	2.5	15	51 (50)	135	16	○
For Metric threads 3D type	ET-0.5-9-PN	●	M3	0.5	2.4	9.5 (9)	55	6	-
	ET-0.7-12-PN	●	M4	0.7	3.1	13 (12)	55	6	-
	ET-0.8-15-PN	●	M5	0.8	3.8	16 (15)	60	6	-
Under neck length: 3 × D_1	ET-1.0-18-PN	●	M6	1	4.6	19 (18)	60	6	-
	ET-1.25-24-PN	●	M8	1.25	6.2	25 (24)	80	10	-
	ET-1.5-30-PN	●	M10	1.5	7.5	31 (30)	80	10	-
	ET-1.75-36-PN	●	M12	1.75	9	37 (36)	95	10	-
	ET-2-48-PN	●	M16	2	11.5	49 (48)	120	12	-
For Metric threads 3.5D type	ET-0.5-10.5-PN	●	M3	0.5	2.4	11 (10.5)	55	6	-
	ET-0.7-14-PN	●	M4	0.7	3.1	15 (14)	55	6	-
	ET-0.8-17.5-PN	●	M5	0.8	3.8	18.5 (17.5)	60	6	-
Under neck length: 3.5 × D_1	ET-1.0-21-PN	●	M6	1	4.6	22 (21)	60	6	-
	ET-1.25-28-PN	●	M8	1.25	6.2	29 (28)	80	10	-
	ET-1.5-35-PN	●	M10	1.5	7.5	36 (35)	80	10	-
	ET-1.75-42-PN	●	M12	1.75	9	43 (42)	95	10	-
	ET-2-56-PN	●	M16	2	11.5	57 (56)	120	12	-

( ) : Effective neck length

※For information about tool diameter correction, refer to p7, P19.

●:Stocked items.　□:Stocked by specified distributor. Contact with our sales department.

ET-U○○-○○.○-PN

Unit : mm

	Item code	Stock	Thread dia.		Pitch	Tool dia.	Under neck length	Overall length	Shank dia.	Oil hole
			D_1		TP	DC	LU	OAL	DCONMS	
For Unified threads 2D type Under neck length: 2 × D_1	ET-U64-3.7-PN	□	No.1-64UNC	1.854	0.397	1.4	4.2 (3.7)	50	6	-
	ET-U56-4.4-PN	□	No.2-56UNC	2.184	0.454	1.65	4.9 (4.4)	50	6	-
	ET-U48-5-PN	□	No.3-48UNC	2.515	0.529	1.9	5.5 (5)	50	6	-
	ET-U40-5.7-PN	□	No.4-40UNC	2.845	0.635	2.1	6.2 (5.7)	50	6	-
	ET-U32-7-PN	□	No.6-32UNC	3.505	0.794	2.55	7.5 (7)	50	6	-
	ET-U36-8.3-PN	□	No.8-36UNF	4.166	0.706	3.3	8.8 (8.3)	50	6	-
	ET-U24-9.7-PN	□	No.10-24UNC	4.826	1.058	3.5	10.7 (9.7)	70	6	-
	ET-U20-12.7-PN	□	¼-20UNC	6.35	1.27	4.75	13.7 (12.7)	70	6	-
	ET-U28-12.7-PN	□	¼-28UNF	6.35	0.907	5	13.7 (12.7)	70	6	-
	ET-U18-15.9-PN	□	5/16-18UNC	7.938	1.411	6	16.9 (15.9)	80	10	-
	ET-U16-19.1-PN	□	⅜-16UNC	9.525	1.588	6.7	20.1 (19.1)	80	10	-
	ET-U14-22.2-PN	□	7/16-14UNC	11.112	1.814	7.7	23.2 (22.2)	80	10	-
	ET-U13-25.4-PN	□	½-13UNC	12.7	1.954	9.2	26.4 (25.4)	80	10	-
	ET-U12-28.6-PN	□	9/16-12UNC	14.288	2.117	10.5	29.6 (28.6)	100	12	-
	ET-U11-31.8-PN	□	⅝-11UNC	15.875	2.309	11.4	32.8 (31.8)	100	12	-
For Unified threads 2.5D type Under neck length: 2.5 × D_1	ET-U64-4.6-PN	□	No.1-64UNC	1.854	0.397	1.4	5.1 (4.6)	50	6	-
	ET-U56-5.5-PN	□	No.2-56UNC	2.184	0.454	1.65	6 (5.5)	50	6	-
	ET-U48-6.3-PN	□	No.3-48UNC	2.515	0.529	1.9	6.8 (6.3)	50	6	-
	ET-U40-7.1-PN	□	No.4-40UNC	2.845	0.635	2.1	7.6 (7.1)	50	6	-
	ET-U32-8.8-PN	□	No.6-32UNC	3.505	0.794	2.55	9.3 (8.8)	50	6	-
	ET-U36-10.4-PN	□	No.8-36UNF	4.166	0.706	3.3	10.9 (10.4)	50	6	-
	ET-U24-12.1-PN	□	No.10-24UNC	4.826	1.058	3.5	13.1 (12.1)	70	6	-
	ET-U20-15.9-PN	□	¼-20UNC	6.35	1.27	4.75	16.9 (15.9)	70	6	-
	ET-U28-15.9-PN	□	¼-28UNF	6.35	0.907	5	16.9 (15.9)	70	6	-
	ET-U18-19.8-PN	□	5/16-18UNC	7.938	1.411	6	20.8 (19.8)	80	10	-
	ET-U16-23.8-PN	□	⅜-16UNC	9.525	1.588	6.7	24.8 (23.8)	80	10	-
	ET-U14-27.8-PN	□	7/16-14UNC	11.112	1.814	7.7	28.8 (27.8)	80	10	-
	ET-U13-31.8-PN	□	½-13UNC	12.7	1.954	9.2	32.8 (31.8)	80	10	-
	ET-U12-35.7-PN	□	9/16-12UNC	14.288	2.117	10.5	36.7 (35.7)	100	12	-
	ET-U11-39.7-PN	□	⅝-11UNC	15.875	2.309	11.4	40.7 (39.7)	100	12	-

( ) : Effective neck length

Recommended pilot hole dia.

Metric threads

Thread size	Recommended pilot hole dia. (mm)
M2×0.4	1.6
M2.2×0.45	1.75
M2.5×0.45	2.05
M3×0.5	2.5
M4×0.7	3.3
M5×0.8	4.2
M6×1	5
M8×1.25	6.75
M10×1.5	8.5
M12×1.75	10.25
M16×2	14
M18×2.5	15.5
M20×2.5	17.5

※Recommended pilot hole diameters refer to former JIS Class 2 and JIS Class 2B.

Unified threads

Thread size	Recommended pilot hole dia. (mm)
No.1-64UNC	1.51
No.2-56UNC	1.79
No.3-48UNC	2.05
No.4-40UNC	2.27
No.6-32UNC	2.77
No.8-36UNF	3.51
No.10-24UNC	3.83
1/4-20UNC	5.12
1/4-28UNF	5.47
5/16-18UNC	6.57
3/8-16UNC	7.98
7/16-14UNC	9.35
1/2-13UNC	10.81
9/16-12UNC	12.2
5/8-11UNC	13.6

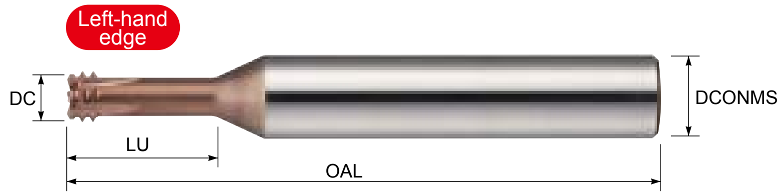
Please use these tools for pilot hole machining.
(For details, please refer to MOLDINO's New Product News or Cutting Tools Products Catalogue.)

Product Name	Item code	News No.
● Carbide Non Step Borer series	WHNSB-TH WNSB-TH	No.2103
● Carbide Oil Hole Non Step Borer H for High Hardness Material	NSBH-ATH	No.2103
● Miniature Drill WHMB	WHMB-TH	No.2103

Epoch D Thread Mill

4 flutes

1 incomplete thread and
2 complete threads



EDT-○○.○○-○○.○-TH

Carbide ATH h5

Unit : mm

	Item code	Stock	Thread dia. D_1	Pitch TP	Tool dia. DC	Under neck length LU	Overall length OAL	Shank dia. DCONMS	Oil hole
For Metric threads 2D type Under neck length: 2 × D_1	EDT-0.4-4-TH	□	M2	0.4	1.4	4.5 (4)	50	6	-
	EDT-0.45-4.4-TH	□	M2.2	0.45	1.6	4.9 (4.4)	50	6	-
	EDT-0.45-5-TH	□	M2.5	0.45	1.8	5.5 (5)	50	6	-
	EDT-0.5-6-TH	●	M3	0.5	2.4	6.5 (6)	50	6	-
	EDT-0.7-8-TH	●	M4	0.7	3.1	9 (8)	50	6	-
	EDT-0.8-10-TH	●	M5	0.8	3.8	11 (10)	50	6	-
	EDT-1.0-12-TH	●	M6	1	4.6	13 (12)	50	6	-
	EDT-1.25-16-TH	●	M8	1.25	6.2	17 (16)	70	10	-
	EDT-1.5-20-TH	●	M10	1.5	7.5	21 (20)	70	10	○
	EDT-1.75-24-TH	●	M12	1.75	9	25 (24)	80	10	○
	EDT-2-32-TH	□	M16	2	11.5	33 (32)	100	12	○
	EDT-2.5-36-TH	□	M18	2.5	14	37 (36)	135	16	○
	EDT-2.5-40-TH	□	M20	2.5	15	41 (40)	135	16	○
For Metric threads 2.5D type Under neck length: 2.5 × D_1	EDT-0.4-5-TH	□	M2	0.4	1.4	5.5 (5)	50	6	-
	EDT-0.45-5.5-TH	□	M2.2	0.45	1.6	6 (5.5)	50	6	-
	EDT-0.45-6.25-TH	□	M2.5	0.45	1.8	6.75 (6.25)	50	6	-
	EDT-0.5-7.5-TH	●	M3	0.5	2.4	8 (7.5)	50	6	-
	EDT-0.7-10-TH	●	M4	0.7	3.1	11 (10)	50	6	-
	EDT-0.8-12.5-TH	●	M5	0.8	3.8	13.5 (12.5)	50	6	-
	EDT-1.0-15-TH	●	M6	1	4.6	16 (15)	50	6	-
	EDT-1.25-20-TH	●	M8	1.25	6.2	21 (20)	70	10	-
	EDT-1.5-25-TH	●	M10	1.5	7.5	26 (25)	70	10	○
	EDT-1.75-30-TH	●	M12	1.75	9	31 (30)	80	10	○
	EDT-2-40-TH	□	M16	2	11.5	41 (40)	100	12	○
	EDT-2.5-45-TH	□	M18	2.5	14	46 (45)	135	16	○
	EDT-2.5-50-TH	□	M20	2.5	15	51 (50)	135	16	○
	EDT-3.0-60-TH	□	M24	3	15	61 (60)	135	16	○
For Metric threads 3D type Under neck length: 3 × D_1	EDT-0.5-9-TH	●	M3	0.5	2.4	9.5 (9)	55	6	-
	EDT-0.7-12-TH	●	M4	0.7	3.1	13 (12)	55	6	-
	EDT-0.8-15-TH	●	M5	0.8	3.8	16 (15)	60	6	-
	EDT-1.0-18-TH	●	M6	1	4.6	19 (18)	60	6	-
	EDT-1.25-24-TH	●	M8	1.25	6.2	25 (24)	80	10	-
	EDT-1.5-30-TH	●	M10	1.5	7.5	31 (30)	80	10	○
	EDT-1.75-36-TH	●	M12	1.75	9	37 (36)	95	10	○
	EDT-2-48-TH	●	M16	2	11.5	49 (48)	120	12	○
For Metric threads 3.5D type Under neck length: 3.5 × D_1	EDT-0.5-10.5-TH	●	M3	0.5	2.4	11 (10.5)	55	6	-
	EDT-0.7-14-TH	●	M4	0.7	3.1	15 (14)	55	6	-
	EDT-0.8-17.5-TH	●	M5	0.8	3.8	18.5 (17.5)	60	6	-
	EDT-1.0-21-TH	●	M6	1	4.6	22 (21)	60	6	-
	EDT-1.25-28-TH	●	M8	1.25	6.2	29 (28)	80	10	-
	EDT-1.5-35-TH	●	M10	1.5	7.5	36 (35)	80	10	○
	EDT-1.75-42-TH	●	M12	1.75	9	43 (42)	95	10	○
	EDT-2-56-TH	●	M16	2	11.5	57 (56)	120	12	○

( ) : Effective neck length

※For information about tool diameter correction, refer to p7, P19.

●:Stocked items. □:Stocked by specified distributor. Contact with our sales department.

EDT-U○○.○○-○○.○-TH

Unit : mm

Carbide / ATH / h5

	Item code	Stock	Thread dia.		Pitch	Tool dia.	Under neck length	Overall length	Shank dia.	Oil Hole
			D_1		TP	DC	LU	OAL	DCONMS	
For Unified threads 2D type Under neck length: 2 × D_1	EDT-U64-3.7-TH	☐	No.1-64UNC	**1.854**	**0.397**	1.4	4.2 (3.7)	50	6	-
	EDT-U56-4.4-TH	☐	No.2-56UNC	**2.184**	**0.454**	1.65	4.9 (4.4)	50	6	-
	EDT-U48-5-TH	☐	No.3-48UNC	**2.515**	**0.529**	1.9	5.5 (5)	50	6	-
	EDT-U40-5.7-TH	☐	No.4-40UNC	**2.845**	**0.635**	2.1	6.2 (5.7)	50	6	-
	EDT-U32-7-TH	☐	No.6-32UNC	**3.505**	**0.794**	2.55	7.5 (7)	50	6	-
	EDT-U36-8.3-TH	☐	No.8-36UNF	**4.166**	**0.706**	3.3	8.8 (8.3)	50	6	-
	EDT-U24-9.7-TH	☐	No.10-24UNC	**4.826**	**1.058**	3.5	10.7 (9.7)	70	6	-
	EDT-U20-12.7-TH	☐	¼-20UNC	**6.35**	**1.27**	4.75	13.7 (12.7)	70	6	-
	EDT-U28-12.7-TH	☐	¼-28UNF	**6.35**	**0.907**	5	13.7 (12.7)	70	6	-
	EDT-U18-15.9-TH	☐	5/16-18UNC	**7.938**	**1.411**	6	16.9 (15.9)	80	10	-
	EDT-U16-19.1-TH	☐	⅜-16UNC	**9.525**	**1.588**	6.7	20.1 (19.1)	80	10	-
	EDT-U14-22.2-TH	☐	7/16-14UNC	**11.112**	**1.814**	7.7	23.2 (22.2)	80	10	○
	EDT-U13-25.4-TH	☐	½-13UNC	**12.7**	**1.954**	9.2	26.4 (25.4)	80	10	○
	EDT-U12-28.6-TH	☐	9/16-12UNC	**14.288**	**2.117**	10.5	29.6 (28.6)	100	12	○
	EDT-U11-31.8-TH	☐	⅝-11UNC	**15.875**	**2.309**	11.4	32.8 (31.8)	100	12	○
For Unified threads 2.5D type Under neck length: 2.5 × D_1	EDT-U64-4.6-TH	☐	No.1-64UNC	**1.854**	**0.397**	1.4	5.1 (4.6)	50	6	-
	EDT-U56-5.5-TH	☐	No.2-56UNC	**2.184**	**0.454**	1.65	6 (5.5)	50	6	-
	EDT-U48-6.3-TH	☐	No.3-48UNC	**2.515**	**0.529**	1.9	6.8 (6.3)	50	6	-
	EDT-U40-7.1-TH	☐	No.4-40UNC	**2.845**	**0.635**	2.1	7.6 (7.1)	50	6	-
	EDT-U32-8.8-TH	☐	No.6-32UNC	**3.505**	**0.794**	2.55	9.3 (8.8)	50	6	-
	EDT-U36-10.4-TH	☐	No.8-36UNF	**4.166**	**0.706**	3.3	10.9 (10.4)	50	6	-
	EDT-U24-12.1-TH	☐	No.10-24UNC	**4.826**	**1.058**	3.5	13.1 (12.1)	70	6	-
	EDT-U20-15.9-TH	☐	¼-20UNC	**6.35**	**1.27**	4.75	16.9 (15.9)	70	6	-
	EDT-U28-15.9-TH	☐	¼-28UNF	**6.35**	**0.907**	5	16.9 (15.9)	70	6	-
	EDT-U18-19.8-TH	☐	5/16-18UNC	**7.938**	**1.411**	6	20.8 (19.8)	80	10	-
	EDT-U16-23.8-TH	☐	⅜-16UNC	**9.525**	**1.588**	6.7	24.8 (23.8)	80	10	-
	EDT-U14-27.8-TH	☐	7/16-14UNC	**11.112**	**1.814**	7.7	28.8 (27.8)	80	10	○
	EDT-U13-31.8-TH	☐	½-13UNC	**12.7**	**1.954**	9.2	32.8 (31.8)	80	10	○
	EDT-U12-35.7-TH	☐	9/16-12UNC	**14.288**	**2.117**	10.5	36.7 (35.7)	100	12	○
	EDT-U11-39.7-TH	☐	⅝-11UNC	**15.875**	**2.309**	11.4	40.7 (39.7)	100	12	○

( ) : Effective neck length

About tool diameter correction

Corrections may be needed when threading with thread mill. The internal thread diameter is reduced due to the tool deflection induced by cutting resistance.

The figures in the following tables are provided for reference purposes. Use them as a guide when adjusting tool diameter correction values.

Metric threads

Thread size	Adjustment amounts (mm)
M2×0.4	0.026
M2.2×0.45	0.036
M2.5×0.45	0.036
M3×0.5	0.038
M4×0.7	0.044
M5×0.8	0.047
M6×1	0.045
M8×1.25	0.049
M10×1.5	0.053
M12×1.75	0.060
M16×2	0.064
M18×2.5	0.071
M20×2.5	0.071
M24×3.0	0.075

Unified threads

Thread size	Adjustment amounts (mm)
No.1-64UNC	0.024
No.2-56UNC	0.026
No.3-48UNC	0.028
No.4-40UNC	0.031
No.6-32UNC	0.035
No.8-36UNF	0.034
No.10-24UNC	0.041
1/4-20UNC	0.046
1/4-28UNF	0.040
5/16-18UNC	0.050
3/8-16UNC	0.054
7/16-14UNC	0.058
1/2-13UNC	0.062
9/16-12UNC	0.065
5/8-11UNC	0.068

The adjustment amounts are set for an effective diameter tolerance of 75 % with former JIS Class 2 and JIS Class 2B internal threads.

Example：M3×0.5　former JIS Class 2 effective diameter tolerance 0 ～ +0.100

0.100×75%÷2（conversion to radius）≒0.038

Refer to P.19 for the specific correction procedure.

Epoch Thread Mill

Work material		Cast Irons, Carbon steels, Stainless steels 150～200HB FC250,S50C SUS304			Tool steels 25～35HRC SCM440, HPM7			Pre-hardened steels 35～45HRC HPM-MAGIC,CENA1		
Cutting speed v_c (m/min)		80～**85**～90			70～**75**～80			60～**65**～70		
Thread dia. D_1	Tool dia. DC (mm)	Revolution *n* (min^{-1})	Feed rate *vf* (mm/min)	Feed per tooth *fz* (mm/t)	Revolution *n* (min^{-1})	Feed rate *vf* (mm/min)	Feed per tooth *fz* (mm/t)	Revolution *n* (min^{-1})	Feed rate *vf* (mm/min)	Feed per tooth *fz* (mm/t)
M2	1.4	19,300	208	0.009	17,100	164	0.008	14,800	142	0.008
M2.2	1.6	16,900	203	0.011	14,900	163	0.01	12,900	141	0.01
M2.5	1.8	15,000	202	0.012	13,300	164	0.011	11,500	142	0.011
M3	2.4	11,300	154	0.017	9,900	127	0.016	8,600	103	0.015
M4	3.1	8,700	188	0.024	7,700	152	0.022	6,700	127	0.021
M5	3.8	7,100	198	0.029	6,300	163	0.027	5,400	130	0.025
M6	4.6	5,900	204	0.037	5,200	170	0.035	4,500	134	0.032
M8	6.2	4,400	198	0.05	3,900	165	0.047	3,300	128	0.043
M10	7.5	3,600	216	0.06	3,200	179	0.056	2,800	148	0.053
M12	9	3,000	216	0.072	2,700	184	0.068	2,300	145	0.063
M16	11.5	2,400	235	0.087	2,100	194	0.082	1,800	154	0.076
M18	14	1,900	171	0.101	1,700	144	0.095	1,500	117	0.088
M20	15	1,800	184	0.102	1,600	154	0.096	1,400	125	0.089
No.1-64UNC	1.4	19,300	170	0.009	17,100	134	0.008	14,800	116	0.008
No.2-56UNC	1.65	16,400	176	0.011	14,500	156	0.011	12,500	122	0.01
No.3-48UNC	1.9	14,200	181	0.013	12,600	148	0.012	10,900	117	0.011
No.4-40UNC	2.1	12,900	203	0.015	11,400	167	0.014	9,900	135	0.013
No.6-32UNC	2.55	10,600	208	0.018	9,400	174	0.017	8,100	141	0.016
No.8-36UNF	3.3	8,200	170	0.025	7,200	144	0.024	6,300	115	0.022
No.10-24UNC	3.5	7,700	228	0.027	6,800	187	0.025	5,900	149	0.023
1/4-20UNC	4.75	5,700	218	0.038	5,000	181	0.036	4,400	146	0.033
1/4-28UNF	5	5,400	184	0.04	4,800	155	0.038	4,100	122	0.035
5/16-18UNC	6	4,500	211	0.048	4,000	176	0.045	3,400	139	0.042
3/8-16UNC	6.7	4,000	256	0.054	3,600	214	0.05	3,100	173	0.047
7/16-14UNC	7.7	3,500	267	0.062	3,100	221	0.058	2,700	179	0.054
1/2-13UNC	9.2	2,900	237	0.074	2,600	198	0.069	2,200	155	0.064
9/16-12UNC	10.5	2,600	221	0.08	2,300	183	0.075	2,000	148	0.07
5/8-11UNC	11.4	2,400	235	0.087	2,100	192	0.081	1,800	154	0.076

Work material		Hardened steels 45～55HRC SKD61,HPM38			Hardened steels 55～62HRC SKD11,YXR3			Hardened steels 62～66HRC SKH51,HAP40		
Cutting speed v_c (m/min)		50～**55**～60			40～**45**～50			30～**35**～40		
Thread dia. D_1	Tool dia. DC (mm)	Revolution *n* (min^{-1})	Feed rate *vf* (mm/min)	Feed per tooth *fz* (mm/t)	Revolution *n* (min^{-1})	Feed rate *vf* (mm/min)	Feed per tooth *fz* (mm/t)	Revolution *n* (min^{-1})	Feed rate *vf* (mm/min)	Feed per tooth *fz* (mm/t)
M2	1.4	12,500	105	0.007	10,200	73	0.006	8,000	58	0.006
M2.2	1.6	10,900	107	0.009	9,000	69	0.007	7,000	53	0.007
M2.5	1.8	9,700	109	0.01	8,000	72	0.008	6,200	56	0.008
M3	2.4	7,300	82	0.014	6,000	53	0.011	4,600	40	0.011
M4	3.1	5,600	96	0.019	4,600	62	0.015	3,600	49	0.015
M5	3.8	4,600	102	0.023	3,800	66	0.018	2,900	50	0.018
M6	4.6	3,800	106	0.03	3,100	67	0.023	2,400	52	0.023
M8	6.2	2,800	101	0.04	2,300	64	0.031	1,800	50	0.031
M10	7.5	2,300	113	0.049	1,900	72	0.038	1,500	57	0.038
M12	9	1,900	112	0.059	1,600	72	0.045	1,200	54	0.045
M16	11.5	1,500	120	0.071	1,200	74	0.055	1,000	62	0.055
M18	14	1,300	95	0.082	1,000	56	0.063	800	45	0.063
M20	15	1,200	100	0.083	1,000	64	0.064	700	45	0.064
No.1-64UNC	1.4	12,500	86	0.007	10,200	60	0.006	8,000	47	0.006
No.2-56UNC	1.65	10,600	93	0.009	8,700	60	0.007	6,800	47	0.007
No.3-48UNC	1.9	9,200	90	0.01	7,500	59	0.008	5,900	46	0.008
No.4-40UNC	2.1	8,300	104	0.012	6,800	64	0.009	5,300	50	0.009
No.6-32UNC	2.55	6,900	113	0.015	5,600	67	0.011	4,400	53	0.011
No.8-36UNF	3.3	5,300	88	0.02	4,300	57	0.016	3,400	45	0.016
No.10-24UNC	3.5	5,000	121	0.022	4,100	77	0.017	3,200	60	0.017
1/4-20UNC	4.75	3,700	116	0.031	3,000	73	0.024	2,300	56	0.024
1/4-28UNF	5	3,500	98	0.033	2,900	62	0.025	2,200	47	0.025
5/16-18UNC	6	2,900	110	0.039	2,400	70	0.03	1,900	56	0.03
3/8-16UNC	6.7	2,600	136	0.044	2,100	85	0.034	1,700	69	0.034
7/16-14UNC	7.7	2,300	141	0.05	1,900	91	0.039	1,400	67	0.039
1/2-13UNC	9.2	1,900	126	0.06	1,600	81	0.046	1,200	61	0.046
9/16-12UNC	10.5	1,700	117	0.065	1,400	74	0.05	1,100	58	0.05
5/8-11UNC	11.4	1,500	118	0.07	1,300	79	0.054	1,000	61	0.054

With cutting materials exceeding 55HRC, the maximum machining depth should not exceed 2.5D for under neck length 3D and 3.5D type tools.

【Note】

1.Epoch Thread Mill is an only for threading the inside of holes.
2.The above cutting conditions are for the thread diameters stated in the table. Cutting conditions for other thread diameters should be calculated taking into consideration the Cautions on use (p.19).
3.The feed rate stated in the above conditions table is the feed rate at the tool center during threading. In addition, the per-tooth feed rate is the numerical value at the cutting point.
4.Since there is a risk of cutting chips getting inside the machine, when using tools equipped with oil holes, be sure to use the oil holes.
5.Use the appropriate coolant for the work material and machining shape.
6.These conditions are for general guidance; in actual machining conditions adjust the parameters according to your actual machine conditions.

Epoch D Thread Mill

Work material		Cast Irons, Carbon steels 150～200HB FC250,S50C			Tool steels 25～35HRC SCM440,HPM7			Pre-hardened steels 35～45HRC HPM-MAGIC,CENA1		
Cutting speed v_c (m/min)		80～**85**～90			70～**75**～80			60～**65**～70		
Thread dia. D_1	Tool dia. DC (mm)	Revolution n (min^{-1})	Feed rate v_f (mm/min)	Feed per tooth f_z (mm/t)	Revolution n (min^{-1})	Feed rate v_f (mm/min)	Feed per tooth f_z (mm/t)	Revolution n (min^{-1})	Feed rate v_f (mm/min)	Feed per tooth f_z (mm/t)
M2	1.4	19,300	139	0.006	17,100	123	0.006	14,800	107	0.006
M2.2	1.6	16,900	129	0.007	14,900	114	0.007	12,900	99	0.007
M2.5	1.8	15,000	134	0.008	13,300	119	0.008	11,500	103	0.008
M3	2.4	11,300	99	0.011	9,900	87	0.011	8,600	76	0.011
M4	3.1	8,700	117	0.015	7,700	104	0.015	6,700	90	0.015
M5	3.8	7,100	123	0.018	6,300	109	0.018	5,400	93	0.018
M6	4.6	5,900	127	0.023	5,200	112	0.023	4,500	97	0.023
M8	6.2	4,400	123	0.031	3,900	109	0.031	3,300	92	0.031
M10	7.5	3,600	137	0.038	3,200	122	0.038	2,800	106	0.038
M12	9	3,000	135	0.045	2,700	122	0.045	2,300	104	0.045
M16	11.5	2,400	149	0.055	2,100	130	0.055	1,800	111	0.055
M18	14	1,900	106	0.063	1,700	95	0.063	1,500	84	0.063
M20	15	1,800	115	0.064	1,600	102	0.064	1,400	90	0.064
M24	15	1,800	115	0.043	1,600	102	0.043	1,400	90	0.043
No.1-64UNC	1.4	19,300	113	0.006	17,100	100	0.006	14,800	87	0.006
No.2-56UNC	1.65	16,400	112	0.007	14,500	99	0.007	12,500	86	0.007
No.3-48UNC	1.9	14,200	111	0.008	12,600	99	0.008	10,900	85	0.008
No.4-40UNC	2.1	12,900	122	0.009	11,400	107	0.009	9,900	93	0.009
No.6-32UNC	2.55	10,600	127	0.011	9,400	113	0.011	8,100	97	0.011
No.8-36UNF	3.3	8,200	109	0.016	7,200	96	0.016	6,300	84	0.016
No.10-24UNC	3.5	7,700	144	0.017	6,800	127	0.017	5,900	110	0.017
1/4-20UNC	4.75	5,700	138	0.024	5,000	121	0.024	4,400	106	0.024
1/4-28UNF	5	5,400	115	0.025	4,800	102	0.025	4,100	87	0.025
5/16-18UNC	6	4,500	132	0.03	4,000	117	0.03	3,400	100	0.03
3/8-16UNC	6.7	4,000	161	0.034	3,600	145	0.034	3,100	125	0.034
7/16-14UNC	7.7	3,500	168	0.039	3,100	148	0.039	2,700	129	0.039
1/2-13UNC	9.2	2,900	147	0.046	2,600	132	0.046	2,200	112	0.046
9/16-12UNC	10.5	2,600	138	0.05	2,300	122	0.05	2,000	106	0.05
5/8-11UNC	11.4	2,400	146	0.054	2,100	128	0.054	1,800	110	0.054

Work material		Hardened steels 45～55HRC SKD61,HPM38			Hardened steels 55～62HRC SKD11,YXR3			Hardened steels / Stainless steels 62～66HRC / SUS304 SKH51,HAP40		
Cutting speed v_c (m/min)		50～**55**～60			40～**45**～50			30～**35**～40		
Thread dia. D_1	Tool dia. DC (mm)	Revolution n (min^{-1})	Feed rate v_f (mm/min)	Feed per tooth f_z (mm/t)	Revolution n (min^{-1})	Feed rate v_f (mm/min)	Feed per tooth f_z (mm/t)	Revolution n (min^{-1})	Feed rate v_f (mm/min)	Feed per tooth f_z (mm/t)
M2	1.4	12,500	90	0.006	10,200	73	0.006	8,000	58	0.006
M2.2	1.6	10,900	83	0.007	9,000	69	0.007	7,000	53	0.007
M2.5	1.8	9,700	87	0.008	8,000	72	0.008	6,200	56	0.008
M3	2.4	7,300	64	0.011	6,000	53	0.011	4,600	40	0.011
M4	3.1	5,600	76	0.015	4,600	62	0.015	3,600	49	0.015
M5	3.8	4,600	79	0.018	3,800	66	0.018	2,900	50	0.018
M6	4.6	3,800	82	0.023	3,100	67	0.023	2,400	52	0.023
M8	6.2	2,800	78	0.031	2,300	64	0.031	1,800	50	0.031
M10	7.5	2,300	87	0.038	1,900	72	0.038	1,500	57	0.038
M12	9	1,900	86	0.045	1,600	72	0.045	1,200	54	0.045
M16	11.5	1,500	93	0.055	1,200	74	0.055	1,000	62	0.055
M18	14	1,300	73	0.063	1,000	56	0.063	800	45	0.063
M20	15	1,200	77	0.064	1,000	64	0.064	700	45	0.064
M24	15	1,200	77	0.043	1,000	64	0.043	700	45	0.043
No.1-64UNC	1.4	12,500	73	0.006	10,200	60	0.006	8,000	47	0.006
No.2-56UNC	1.65	10,600	73	0.007	8,700	60	0.007	6,800	47	0.007
No.3-48UNC	1.9	9,200	72	0.008	7,500	59	0.008	5,900	46	0.008
No.4-40UNC	2.1	8,300	78	0.009	6,800	64	0.009	5,300	50	0.009
No.6-32UNC	2.55	6,900	83	0.011	5,600	67	0.011	4,400	53	0.011
No.8-36UNF	3.3	5,300	71	0.016	4,300	57	0.016	3,400	45	0.016
No.10-24UNC	3.5	5,000	93	0.017	4,100	77	0.017	3,200	60	0.017
1/4-20UNC	4.75	3,700	89	0.024	3,000	73	0.024	2,300	56	0.024
1/4-28UNF	5	3,500	74	0.025	2,900	62	0.025	2,200	47	0.025
5/16-18UNC	6	2,900	85	0.03	2,400	70	0.03	1,900	56	0.03
3/8-16UNC	6.7	2,600	105	0.034	2,100	85	0.034	1,700	69	0.034
7/16-14UNC	7.7	2,300	110	0.039	1,900	91	0.039	1,400	67	0.039
1/2-13UNC	9.2	1,900	96	0.046	1,600	81	0.046	1,200	61	0.046
9/16-12UNC	10.5	1,700	90	0.05	1,400	74	0.05	1,100	58	0.05
5/8-11UNC	11.4	1,500	91	0.054	1,300	79	0.054	1,000	61	0.054

With cutting materials exceeding 55HRC, the maximum machining depth should not exceed 2.5D for under neck length 3D and 3.5D type tools.

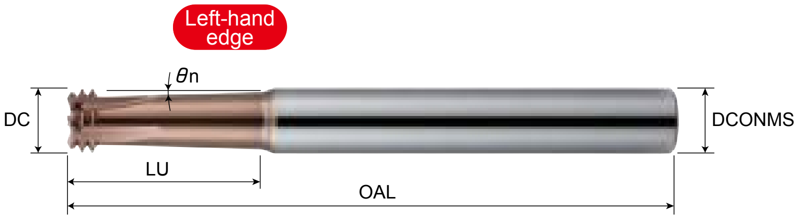
【Note】

1.Epoch D Thread Mill is capable of simultaneous boring and threading.
2.The above cutting conditions are for the thread diameters stated in the table. Cutting conditions for other thread diameters should be calculated taking into consideration the Cautions on use (p. 19).
3.The feed rate stated in the above conditions table is the feed rate at the tool center during threading. In addition, the per-tooth feed rate is the numerical value at the cutting point.
4.Since there is a risk of cutting chips getting inside the machine, when using tools equipped with oil holes, be sure to use the oil holes.
5.Use the appropriate coolant for the work material and machining shape.
6.These conditions are for general guidance; in actual machining conditions adjust the parameters according to your actual machine conditions.

Epoch D Thread Mill for PT,NPT Threads

4 flutes

1 incomplete thread and 2 complete threads



Neck angle θn : 1.7°
※The neck angle (θn) of EDT-PT1(NPT1)-45-ATH is 0° (straight neck).

EDT-PT○○-○○-ATH

Carbide ATH h5

Unit : mm

for PT(Rc) threads Item code	Stock	Thread dia. Pilot hole not required D_1	Thread dia. Pilot hole required (pilot hole diameter) D_1	Pitch TP	Reference dia. DC	Under neck length LU	Overall length OAL	Shank dia. DCONMS	Oil Hole	Thread diameter compensation value D_2
EDT-PT1/16-18-ATH	●	PT1/16-28 7.723	PT1/8-28(ϕ4以上) 9.728	0.9071	4.8	18	70	6	–	0.029
EDT-PT1/8-19-ATH	●	PT1/8-28 9.728	–	0.9071	5.7	19	70	6	–	0.029
EDT-PT1/4-28-ATH	●	PT1/4-19 13.157	PT3/8-19(ϕ6以上) 16.662	1.3368	7.9	28	80	10	–	0.043
EDT-PT3/8-28-ATH	●	PT3/8-19 16.662	–	1.3368	9.6	28	80	10	–	0.043
EDT-PT1/2-35-ATH	●	PT1/2-14 20.955	PT3/4-14(ϕ8以上) 26.441	1.8143	11.5	35	110	12	–	0.058
EDT-PT1-45-ATH	●	–	PT1-11(ϕ10以上) 33.249	2.3091	15.4	45	135	16	–	0.074

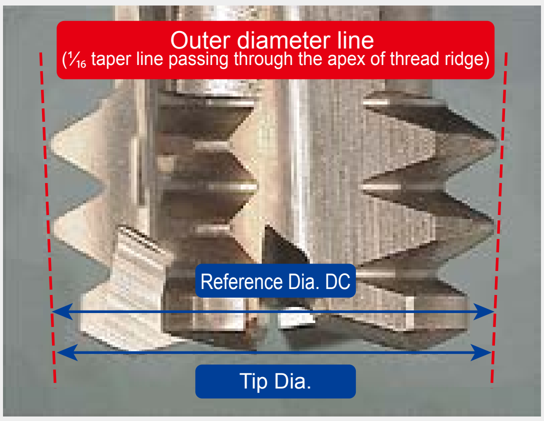
EDT-NPT○○-○○-ATH

for NPT threads Item code	Stock	Thread dia. Pilot hole not required D_1	Thread dia. Pilot hole required (pilot hole diameter) D_1	Pitch TP	Reference dia. DC	Under neck length LU	Overall length OAL	Shank dia. DCONMS	Oil Hole	Thread diameter compensation value D_2
EDT-NPT1/16-18-ATH	●	NPT1/16-27 7.895	NPT1/8-27(ϕ4以上) 10.242	0.9407	4.8	18	70	6	–	0.03
EDT-NPT1/8-19-ATH	●	NPT1/8-27 10.242	–	0.9407	5.7	19	70	6	–	0.03
EDT-NPT1/4-28-ATH	●	NPT1/4-18 13.616	NPT3/8-18(ϕ6以上) 17.055	1.4111	7.9	28	80	10	–	0.045
EDT-NPT3/8-28-ATH	●	NPT3/8-18 17.055	–	1.4111	9.6	28	80	10	–	0.045
EDT-NPT1/2-35-ATH	●	NPT1/2-14 21.224	NPT3/4-14(ϕ8以上) 26.569	1.8143	11.5	35	110	12	–	0.058
EDT-NPT1-45-ATH	●	–	NPT1-11.5(ϕ10以上) 33.228	2.2087	15.4	45	135	16	–	0.071

● : Stocked items.

Thread diameter which requires pilot hole can not be used without larger pilot hole than the values shown in the table.

Cautions when creating NC program for PT, NPT threads



Reference Dia. DC:
diameter at the virtual crest position of the first thread

Tip Dia. :
diameter at the tool tip position

Since the reference diameter DC and the tool tip diameter are different, it is necessary to correct the thread diameter D_1 and program.
The thread diameter D_1 corresponds to the reference diameter of the groove of the internal thread (reference diameter of the tap).

Example

PT1/4 thread milling with EDT-PT1/4-28-ATH

Thread diameter D_1 + compensation value D_2 = setup thread diamter
13.157 + 0.043 = 13.2

* The NC program provided by MOLDINO already incorporates the D_2 thread diameter compensation value.

Epoch D Thread Mill for PT, NPT Threads

Work material		Cast Irons, Carbon steels 150 ～ 200HB FC250,S50C			Tool steels 25 ～ 35HRC SCM440,HPM7			Pre-hardened steels 35 ～ 45HRC HPM-MAGIC,NAK80		
Cutting speed *vc* (m/min)		80 ～ **85** ～ 90			70 ～ **75** ～ 80			60 ～ **65** ～ 70		
Thread dia. *D1*	Reference dia. DC(mm)	Revolution *n* (min⁻¹)	Feed rate *vf* (mm/min)	Feed per tooth *fz* (mm/t)	Revolution *n* (min⁻¹)	Feed rate *vf* (mm/min)	Feed per tooth *fz* (mm/t)	Revolution *n* (min⁻¹)	Feed rate *vf* (mm/min)	Feed per tooth *fz* (mm/t)
PT1/16-28	4.8	5,600	146	0.024	5,000	131	0.024	4,300	112	0.024
PT1/8-28	5.7	4,700	181	0.029	4,200	162	0.029	3,600	139	0.029
PT1/4-19	7.9	3,400	167	0.04	3,000	148	0.04	2,600	128	0.04
PT3/8-19	9.6	2,800	192	0.048	2,500	171	0.048	2,200	150	0.048
PT1/2-14	11.5	2,400	204	0.055	2,100	179	0.055	1,800	153	0.055
PT3/4-14	11.5	2,400	278	0.055	2,100	243	0.055	1,800	208	0.055
PT1-11	15.4	1,800	231	0.065	1,600	206	0.065	1,300	167	0.065
NPT1/16-27	4.8	5,600	156	0.024	5,000	140	0.024	4,300	120	0.024
NPT1/8-27	5.7	4,700	202	0.029	4,200	180	0.029	3,600	155	0.029
NPT1/4-18	7.9	3,400	182	0.04	3,000	160	0.04	2,600	139	0.04
NPT3/8-18	9.6	2,800	200	0.048	2,500	179	0.048	2,200	157	0.048
NPT1/2-14	11.5	2,400	209	0.055	2,100	183	0.055	1,800	157	0.055
NPT3/4-14	11.5	2,400	279	0.055	2,100	244	0.055	1,800	209	0.055
NPT1-11.5	15.4	1,800	231	0.065	1,600	205	0.065	1,300	167	0.065

Work material		Hardened steels 45 ～ 55HRC SKD61,HPM38,STAVAX			Hardened steels 55 ～ 62HRC SKD11,YXR3			Hardened steels 62～66HRC SKH51,HAP40 / Stainless steels SUS304		
Cutting speed *vc* (m/min)		50 ～ **55** ～ 60			40 ～ **45** ～ 50			30 ～ **35** ～ 40		
Thread dia. *D1*	Reference dia. DC(mm)	Revolution *n* (min⁻¹)	Feed rate *vf* (mm/min)	Feed per tooth *fz* (mm/t)	Revolution *n* (min⁻¹)	Feed rate *vf* (mm/min)	Feed per tooth *fz* (mm/t)	Revolution *n* (min⁻¹)	Feed rate *vf* (mm/min)	Feed per tooth *fz* (mm/t)
PT1/16-28	4.8	3,600	94	0.024	3,000	78	0.024	2,300	60	0.024
PT1/8-28	5.7	3,100	120	0.029	2,500	96	0.029	2,000	77	0.029
PT1/4-19	7.9	2,200	108	0.04	1,800	89	0.04	1,400	69	0.04
PT3/8-19	9.6	1,800	123	0.048	1,500	103	0.048	1,200	82	0.048
PT1/2-14	11.5	1,500	128	0.055	1,200	102	0.055	1,000	85	0.055
PT3/4-14	11.5	1,500	174	0.055	1,200	139	0.055	1,000	116	0.055
PT1-11	15.4	1,100	141	0.065	900	116	0.065	700	90	0.065
NPT1/16-27	4.8	3,600	101	0.024	3,000	84	0.024	2,300	64	0.024
NPT1/8-27	5.7	3,100	133	0.029	2,500	107	0.029	2,000	86	0.029
NPT1/4-18	7.9	2,200	118	0.04	1,800	96	0.04	1,400	75	0.04
NPT3/8-18	9.6	1,800	129	0.048	1,500	107	0.048	1,200	86	0.048
NPT1/2-14	11.5	1,500	131	0.055	1,200	105	0.055	1,000	87	0.055
NPT3/4-14	11.5	1,500	174	0.055	1,200	139	0.055	1,000	116	0.055
NPT1-11.5	15.4	1,100	141	0.065	900	116	0.065	700	90	0.065

【Note】

1. Epoch D Thread Mill is capable of simultaneous boring and threading.
2. The above cutting conditions are for the thread diameters stated in the table. Cutting conditions for other thread diameters should be calculated taking into consideration the Cautions on use (p.19).
3. The feed rate stated in the above conditions table is the feed rate at the tool center during tapping. In addition, the per-tooth feed rate is the numerical value at the cutting point.
4. Since there is a risk of cutting chips getting inside the machine, when using tools equipped with oil holes, be sure to use the oil holes.
5. Use the appropriate coolant for the work material and machining shape.
6. These conditions are for general guidance; in actual machining conditions adjust the parameters according to your actual machine conditions.

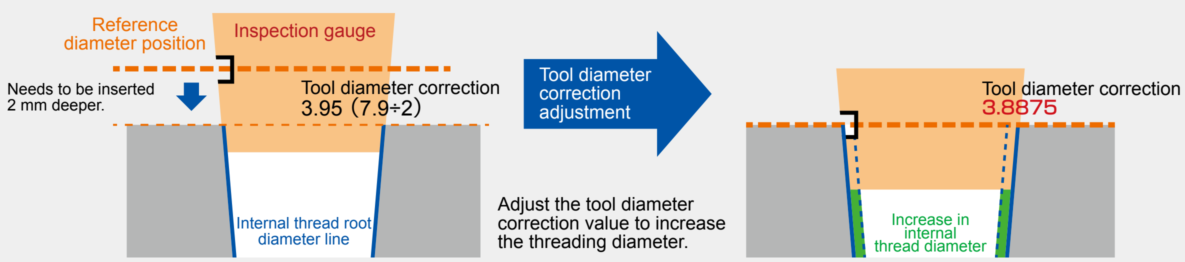
Reference diameter position adjustment procedure for PT, NPT threads

For the machining of tapered internal threads using a thread mill, in contrast to conventional taps, the reference diameter position is adjusted by adjusting the internal thread diameter with tool diameter correction. In the example shown in the following diagram, the tool diameter correction value is calculated as follows:

Example **PT1/4 thread milling with EDT-PT1/4-28-ATH**

(Reference Dia. DC ± reference diameter position adjustment amount × 1/16) ÷ 2 (conversion to radius)
(7.9 - 2 × 1/16) ÷ 2 =3.8875

A positive value indicates shallower cuts; a negative value indicates deeper cuts. In this case, the value will be 2 mm deeper.



※The example above illustrates corrections made using an NC program with a tool center datum.

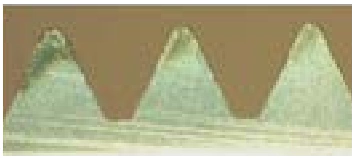
Technical data

Field data of Epoch Thread Mill

01 Threading of hardened steels (M4×0.7)

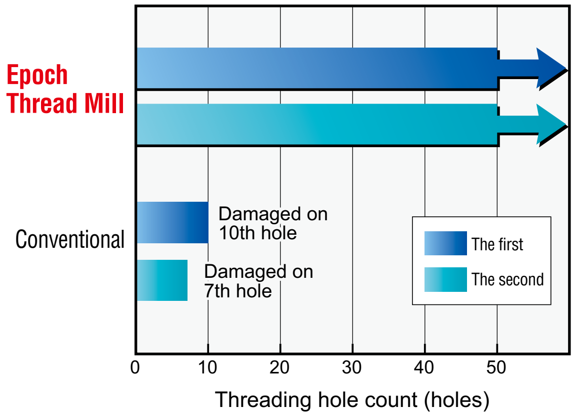
Cutting conditions

Work material：SKD11(60HRC) Tool：ET-0.7-8-PN
n=4,620min^{-1}(v_c=45m/min) v_f=62mm/min（f_z=0.015mm/t）
Threading depth：8mm Blind hole
Pilot hole dia.×Pilot hole depth：ϕ3.4×12mm
Coolant：Air-blow



Epoch Thread Mill after threading 50 holes

Conventional after threading 10 holes.

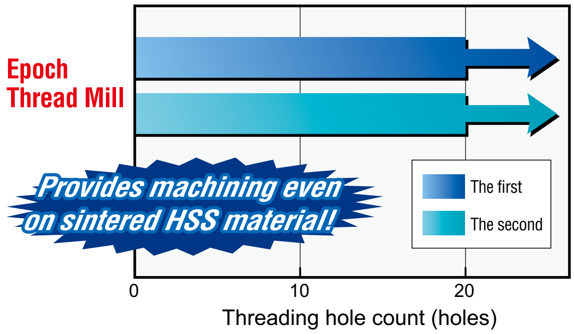


Machining up to 50 holes. NOT reached tool life.

02 Threading of sintered HSS material (M4×0.7)

Cutting conditions

Work material：HAP40(64HRC) Tool：ET-0.7-8-PN
n=4,620min^{-1}(v_c=45m/min) v_f=47mm/min(f_z=0.025mm/t)
Threading depth：7mm Through hole
Pilot hole dia.×Pilot hole depth：ϕ3.4×7mm
Coolant：Water-base



Machining up to 20 holes. NOT reached tool life.

03 Threading of pre-hardened steel (M12×1.75)

Cutting conditions

Work material：CENA1(40HRC) Tool：ET-1.75-24-PN
n=3,537min^{-1}(v_c=100m/min) v_f=311mm/min(f_z=0.088mm/t)
Threading depth：22mm Blind hole
Pilot hole dia.×Pilot hole depth：ϕ10.5×28mm
Coolant：Water-base

Epoch Thread Mill after threading 300 holes.

Machining up to 300 holes, NOT reached tool life.

04 Threading of stainless steel (M8×1.25)

Cutting conditions

Work material：SUS304 Tool：ET-1.25-20-PN
n=5,130min^{-1}(v_c=100m/min) v_f=277mm/min（f_z=0.06mm/t）
Threading depth：20mm Blind hole
Pilot hole dia.×Pilot hole depth：φ6.9×22mm
Coolant：Water-base

Epoch Thread Mill after threading 300 holes.

Machining up to 300 holes, NOT reached tool life.

05 Threading of superalloy (M6×1)

Cutting conditions

Work material：Inconel 718(40HRC) Tool：ET-1.0-12-PN
n=2,420min^{-1}(v_c=35m/min) v_f=56mm/min (f_z=0.025mm/t)
Threading depth：12mm Blind hole
Pilot hole dia.×Pilot hole depth：φ5.1×15mm
Coolant：Water-base

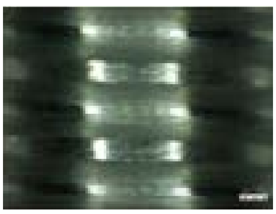
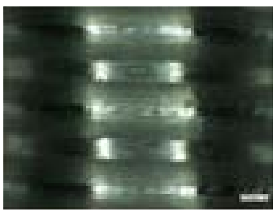
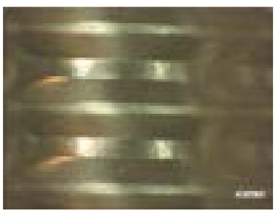
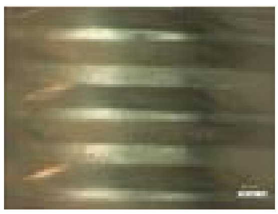
Epoch Thread Mill after threading 25 holes.

It is possible to thread superalloy which is difficult to tap.

06 Threading of non-ferrous (Aluminium alloy A7075, Acrylic resin) (M6×1)

Cutting conditions

Work material：Aluminium alloy A7075, Acrylic resin
Tool：ET-1.0-12-PN n=14,500min^{-1}(v_c=210m/min) v_f=540mm/min (f_z=0.04mm/t)
Threading depth：12mm Blind hole Pilot hole dia.×Pilot hole depth：φ5×15mm

Work material	Aluminium alloy A7075		Acrylic resin	
Coolant	Water-base	Air-blow	Water-base	Air-blow
Surface				

High efficiency threading is possible even in dry condition

*By using water-soluble cutting fluid, it is possible to obtain a glossy high-quality machined surface.
*By using water-soluble cutting fluid, Epoch D Thread Mill can be used with same cutting parameters.

Field data of Epoch D Thread Mill

01 Simultaneous threading and drilling on hardened steels (M3×0.5)

Cutting conditions

Work material：SKD11(60HRC)

Tool：EDT-0.5-7.5-TH

n=6,000min[-1](v_c=45m/min) v_f=53mm/min (f_z=0.011mm/t)

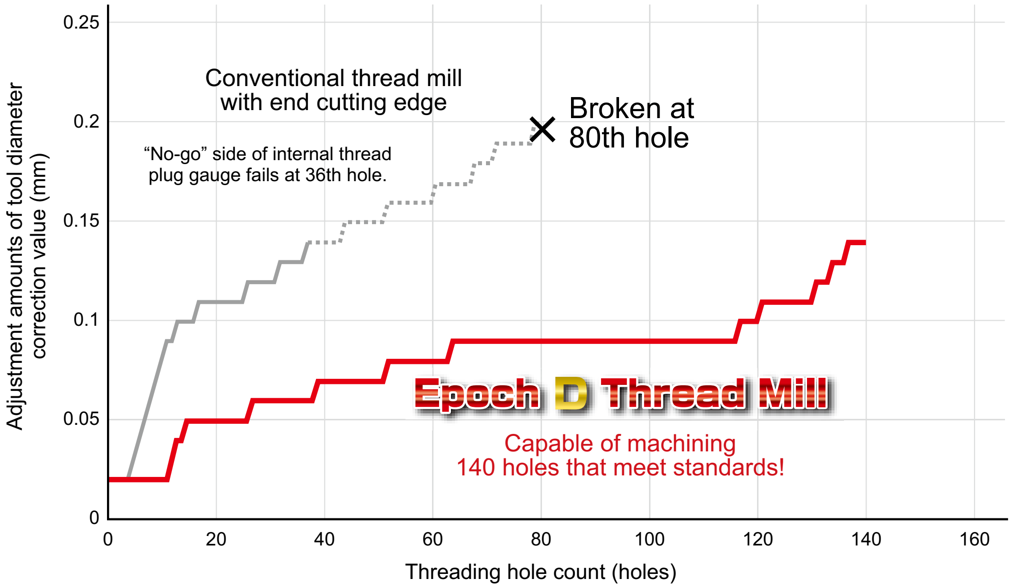
Threading depth：7.5mm Blind hole

Coolant：Air-blow

Cutting test evaluation method

- Inspected thread and internal diameter using corresponding plug gauge after machining.
- When the thread plug gauge at the “go” side does not pass after machining, adjusted tool diameter correction value

——— Conformant ········ Non-conformant



Allows longer service life than conventional tool when machining hardened steels!

02 Simultaneous threading and drilling on hardened steels (M8×1.25)

Cutting conditions

Work material：SKD61(45HRC)

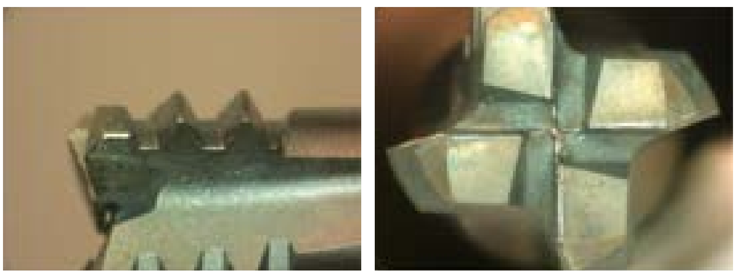
Tool：EDT-1.25-16-TH

n=2,820min[-1](v_c=55m/min)

v_f=75mm/min (f_z=0.03mm/t)

Threading depth：16mm Blind hole

Coolant：Air-blow



Epoch D Thread Mill after threading 150 holes.

Machining up to 150 holes, NOT reached tool life.

03 Simultaneous threading and drilling on pre-hardened steels (M4×0.7)

Cutting conditions

Work material：NAK80(40HRC)

Tool：EDT-0.7-10-TH
n=5,650min^{-1}(v_c=55m/min)
v_f=75mm/min (f_z=0.015mm/t)
Threading depth：10mm Blind hole
Coolant：Air-blow

Epoch D Thread Mill after threading 400 holes.

Machining up to 400 holes, NOT reached tool life.

04 Simultaneous threading and drilling on stainless steels (M4×0.7)

Cutting conditions

Work material：SUS304

Tool：EDT-0.7-10-TH
n=3,600min^{-1}(v_c=35m/min)
v_f=49mm/min (f_z=0.015mm/t)
Threading depth：10mm Blind hole
Coolant：Water-base

Epoch D Thread Mill after threading 600 holes.

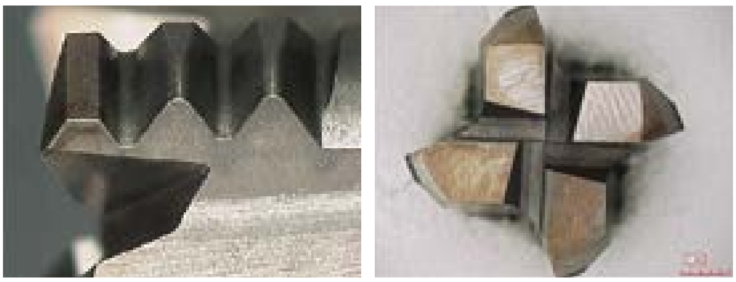
Machining up to 600 holes, NOT reached tool life.

05 Simultaneous threading and drilling on titanium alloys (M4×0.7)

Cutting conditions

Work material：Ti-6Al-4V

Tool：EDT-0.7-10-TH
n=3,600min^{-1}(v_c=35m/min)
v_f=49mm/min (f_z=0.015mm/t)
Threading depth：10mm Blind hole
Coolant：Water-base



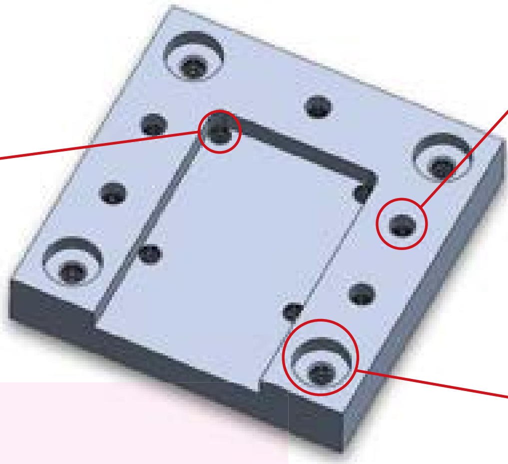
Epoch D Thread Mill after threading 64 holes.

Threading titanium alloy which is difficult to tap is possible without a pilot hole.

Field data involving machining a die structural component using a long neck type

Point ① Inner wall machining

Avoids interference



Point ② Bore end machining

Improves chip evacuation

Point ③ Threading + Chamfering

Burr and deformation-free threading

Cutting conditions

Work material：FCD600

Tool：EDT-1.75-42-TH

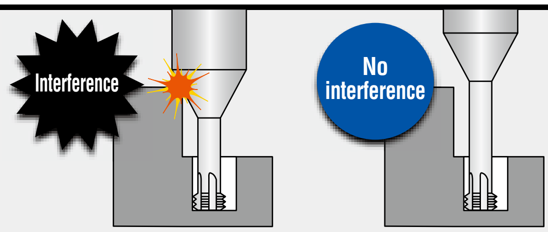
n=3,000min^{-1}(v_c=85m/min) v_f=135mm/min (f_z=0.045mm/t)

Threading depth：①20mm ②30mm ③42mm

Coolant：Water-base (internal)

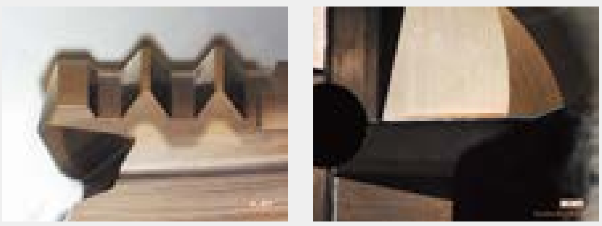
Point ① Inner wall machining

Allows machining with long-neck tools in cases in which a conventional under neck length would lead to interference.

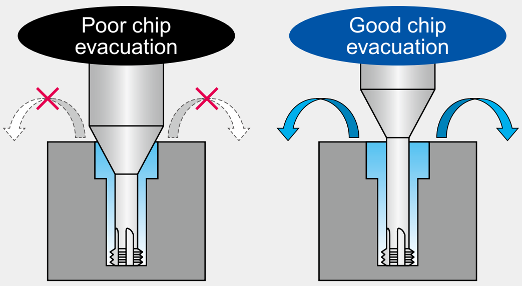


Point ② Bore end machining

Chip evacuation is poor when machining with conventional tools.
Long-neck tools allow consistent machining.



The photos above show tool conditions after machining 13 holes in FCD600 (no abnormal damage).

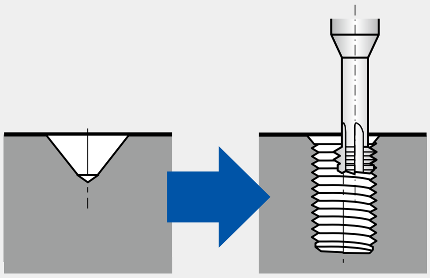


Point ③ Threading + Chamfering

Allows chamfering without deforming thread profiles using a D Thread Mill after centering with DN2HC-ATH.

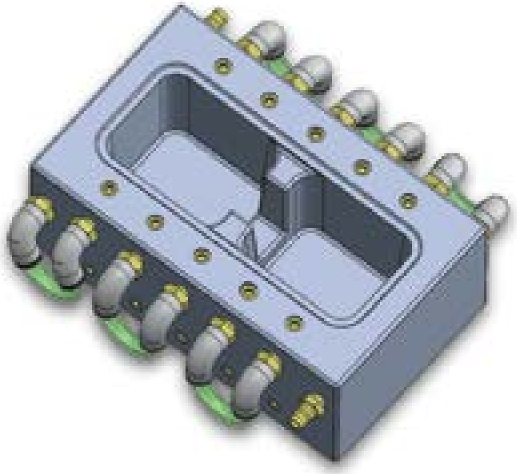
DN2HC-ATH features

- Provides long service life, even when machining hardened steel! (60HRC and above)
- Allows chamfering automation using NC!



Field data of pipe threading with EDT-PT

for PT,NPT Threads



Cutting conditions

Work material : STAVAX(50HRC)

Machining of sunk head plug mounting part

Tool : EDT-PT1/4-28-ATH
n=2,600min^{-1}(v_c=65m/min) v_f=128mm/min(f_z=0.04mm/t)
Coolant : Air blow

Machining of coupler/elbow mounting part

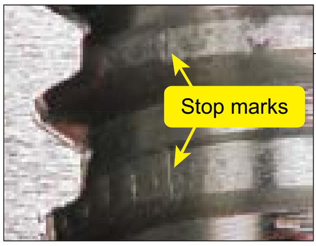
Tool : EDT-PT1/8-19-ATH
n=3,600min^{-1}(v_c=65m/min) v_f=139mm/min(f_z=0.029mm/t)
Coolant : Air blow

Point ① High-quality machine surface

Helps prevent fluid leaks from joints, a common issue when tapping pipe threads.

Epoch D Thread Mill

Good finished surface without tear



General tap

Tears easily and stop marks occurred

Point ② Fit adjustment

Enables NC machining of pipe threads instead of relying on experience.
Allows anyone to machine for correct fitting.

Too far in | Not in far enough | Just right

Simultaneous threading and drilling on hardened steel (PT1⁄16-28)

Cutting conditions

Work material : STAVAX(52HRC)

Tool : EDT-PT1/16-18-ATH
n=3,600min^{-1}(v_c=55m/min)
v_f=94mm/min(f_z=0.024mm/t)
Threading depth : 16mm
Coolant : Air-blow

Epoch D Thread Mill after threading 50 holes.

Machining up to 50 holes, NOT reached tool life.

Trouble shooting

Regarding thread diameter expansion/contraction

Suitable tool diameter correction should be performed according to the work material and tool wear condition. Also, please be careful not to forget to input the tool diameter correction value into the machine.

Dimensional accuracy worsens when moving toward the bottom of the hole (deflection)

A characteristic of the thread milling method is that tool deflection increases as the tool progresses toward the bottom of the hole.
It may be necessary to perform zero cutting in order to perform high-accuracy thread milling with low deflection.

Regarding tool breakage

As a countermeasure against tool breakage, performing processing with a reduced feed rate is effective. In addition, when processing with tool extended or when large rough cutting chips are produced, breakage due to chip clogging should be considered. In such cases, if processing is performed with a higher cutting speed, the cutting chips will be broken into smaller bits which may improve conditions.

Changes in cutting chip conditions due to different cutting speeds;
Simultaneous boring and thread milling (M8 × P 1.25) of carbon steel

The NC program created using MOLDINO's NC program creation software doesn't work properly.

There are differences in the programming code for the machine being used. Please contact the machine manufacturer for details.

Regarding upper limit on machinable thread diameters

Please note that since the Epoch D Thread Mill performs boring simultaneously, it cannot perform thread milling for diameters of more than 1.68 times the tool diameter DC.
There are no particular similar limitations on using the Epoch Thread Mill.
Also, please be aware that if screws of a size smaller than the thread diameter described in the line-up table are processed, there is a possibility of malfunctioning the screw shape.
Example) Threading M14×2 with ET-2-40-PN (designed for M16×2)

Cautions on use

About tool feed rate

When performing thread milling by helical interpolation, the cutting point feed rate should be multiplied by a coefficient to determine the tool center feed rate. The equation for calculating the tool center feed rate is shown at right.

The standard cutting conditions for PT and NPT threads are calculated based on the thread diameter D_1' at the machinable maximum depth (neck length) .

Example) Thread milling PT⅛ with EDT-PT1/8-19-ATH
D_1'= 9.728 (D_1) -19 (under neck length) × $\frac{1}{16}$ (thread taper angle) = 8.5405

$$v_f = f_z \times z \times n \times \frac{D_1 - DC}{D_1}$$

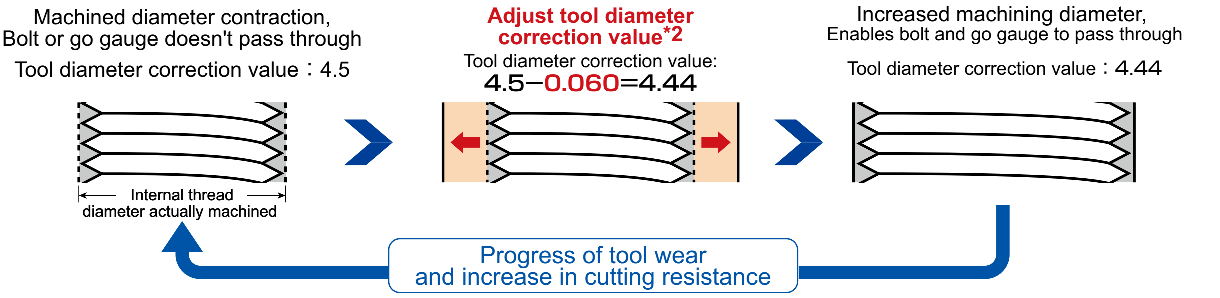
v_f	: Feed rate	(mm/min)
f_z	: Feed per tooth	(mm/t)
z	: No. of flutes	
n	: Rotation	(min^{-1})
D_1	: Thread diameter	(mm)
DC	: Tool diameter	(mm)

About tool diameter correction

The internal thread machining diameter with thread mill may need to be adjusted if reduced by wear and tool deflection. In such cases, the machining diameter can be adjusted by considering the adjustment amounts*1 described on Page 7 to the tool diameter correction value.

Example **Machining an M12 × 1.75 thread with EDT-1.75-30-TH when tool centerline datum NC program prompts a radius**

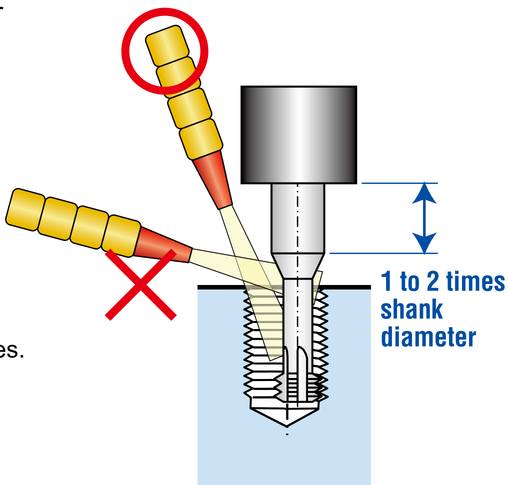
Tool Dia.：DC=9.0, Tool diameter correction value：4.5, Adjustment amount of tool diameter correction value：0.060



*1: Use these adjustment amounts only as guidelines. The adjustment amounts are set for an effective diameter tolerance of 75 % with former JIS Class 2 and JIS Class 2B internal threads.
*2: Make further adjustments if the bolt or go gauge still doesn't pass through after adjusting the tool diameter correction value.

About coolant

- The first recommended coolant shown in the table tends to have the superior tool life. When priority is given to finished surface quality, water-soluble cutting fluids are effective. Oil-based cutting fluids are not suitable because they degrade chip removal characteristics.
- The holder should grip the tool shank so that the holder does not block the hole and the shank projection amount is 1 to 2 times the shank diameter. The coolant nozzle should then be positioned so that the coolant will reach the bottom of the hole. In addition, coolant pressure should be adjusted so that it removes cutting chips. If the setting is bad, cutting chip clogging may lead to flute tip damage or tool breakage.
- Since there is a risk of cutting chips getting inside the machine, when using tools equipped with oil holes, be sure to perform processing using the oil holes.



Work material	ET		EDT	
	Air-blow	Water-base	Air-blow	Water-base
Hardened steel, Pre-hardened steel Tool steel, Cast iron, Carbon steel	◎	○	◎	△
Stainless steel	×	◎	×	◎
Super heat resistant alloy, Titanium alloy	×	◎	×	◎
Aluminium alloy, Copper alloy, Resin	○	◎	×	◎

◎: First recommended
○: Second recommended
△: Tendency to decrease tool life
×: Not recommended

MOLDINO

The Edge To Innovation

The diagrams and table data are examples of test results, and are not guaranteed values.
"MOLDINO" is a registered trademark of MOLDINO Tool Engineering, Ltd.

⚠ Attentions on Safety

1. Cautions regarding handling
(1) When removing the tool from its case (packaging), be careful that the tool does not pop out or is dropped. Be particularly careful regarding contact with the tool flutes.
(2) When handling tools with sharp cutting flutes, be careful not to touch the cutting flutes directly with your bare hands.

2. Cautions regarding mounting
(1) Before use, check the outside appearance of the tool for scratches, cracks, etc. and that it is firmly mounted in the collet chuck, etc.
(2) If abnormal chattering, etc. occurs during use, stop the machine immediately and remove the cause of the chattering.

3. Cautions during use
(1) Before use, confirm the dimensions and direction of rotation of the tool and milling work material.
(2) The numerical values in the standard cutting conditions table should be used as criteria when starting new work. The cutting conditions should be adjusted as appropriate when the cutting depth is large, the rigidity of the machine being used is low, or according to the conditions of the work material.
(3) Cutting tools are made of a hard material. During use, they may break and fly off. In addition, cutting chips may also fly off. Since there is a danger of injury to workers, fire, or eye damage from such flying pieces, a safety cover should be attached when work is performed and safety equipment such as safety goggles should be worn to create a safe environment for work.
(4) There is a risk of fire or inflammation due to sparks, heat due to breakage, and cutting chips. Do not use where there is a risk of fire or explosion. **Please caution of fire while using oil base coolant, fire prevention is necessary.**
(5) Do not use the tool for any purpose other than that for which it is intended.

4. Cautions regarding regrinding
(1) If regrinding is not performed at the proper time, there is a risk of the tool breaking. Replace the tool with one in good condition, or perform regrinding.
(2) Grinding dust will be created when regrinding a tool. When regrinding, be sure to attach a safety cover over the work area and wear safety clothes such as safety goggles, etc.
(3) This product contains the specified chemical substance cobalt and its inorganic compounds. When performing regrinding or similar processing, be sure to handle the processing in accordance with thelocal laws and regulations regarding prevention of hazards due to specified chemical substances.

MOLDINO Tool Engineering, Ltd.
Head Office
Hulic Ryogoku Bldg. 8F, 4-31-11, Ryogoku, Sumida-ku, Tokyo, Japan 130-0026
International Sales Dept. : TEL +81-3-6890-5103 FAX +81-3-6890-5128

Official Web Site
https://www.moldino.com
Database for selection Cutting Tool Products【TOOL SEARCH】
TOOLSEARCH Search Web

Europe **MOLDINO Tool Engineering Europe GmbH**
Itterpark 12, 40724 Hilden,Germany.
Tel +49-(0)2103-24820 Fax +49-(0)2103-248230

America **MITSUBISHI MATERIALS U.S.A. CORPORATION**
DETROIT OFFICE Customer service
41700 Gardenbrook Road, Suite 120, Novi, MI 48375-1320 U.S.A.
Tel +1(248) 308-2620 Fax +1(248) 308-2627

Mexico **MMC METAL DE MEXICO, S.A. DE C.V.**
Av. La Cañada No.16, Parque Industrial Bernardo Quintana, El Marques, Querétaro, CP 76246, México
Tel +52-442-1926800

Brazil **MMC METAL DO BRASIL LTDA.**
Rua Cincinato Braga, 340 13° andar.Bela Vista – CEP 01333-010 São Paulo – SP ., Brasil
Tel +55(11)3506-5600 Fax +55(11)3506-5677

Thailand **MMC Hardmetal (Thailand) Co.,Ltd. MOLDINO Division**
622 Emporium Tower, Floor 22/1-4, Sukhumvit Road, Klong Tan, Klong Toei,
Bangkok 10110, Thailand
TEL:+66-(0)2-661-8175 FAX:+66-(0)2-661-8176

India **MMC Hardmetal India Pvt Ltd.**
H.O.: Prasad Enclave, #118/119, 1st Floor, 2nd Stage, 5th main, BBMP Ward #11, (New #38),
Industrial Suburb, Yeshwanthpura, Bengaluru, 560 022, Karnataka, India.
Tel +91-80-2204-3600

DISTRIBUTED BY:

Specifications for the products listed in this catalog are subject to change without notice due to replacement or modification.

VEGETABLE OIL INK Printed using vegetable oil ink. Printed in JAPAN

2023-11 (K)
2013-4:FP