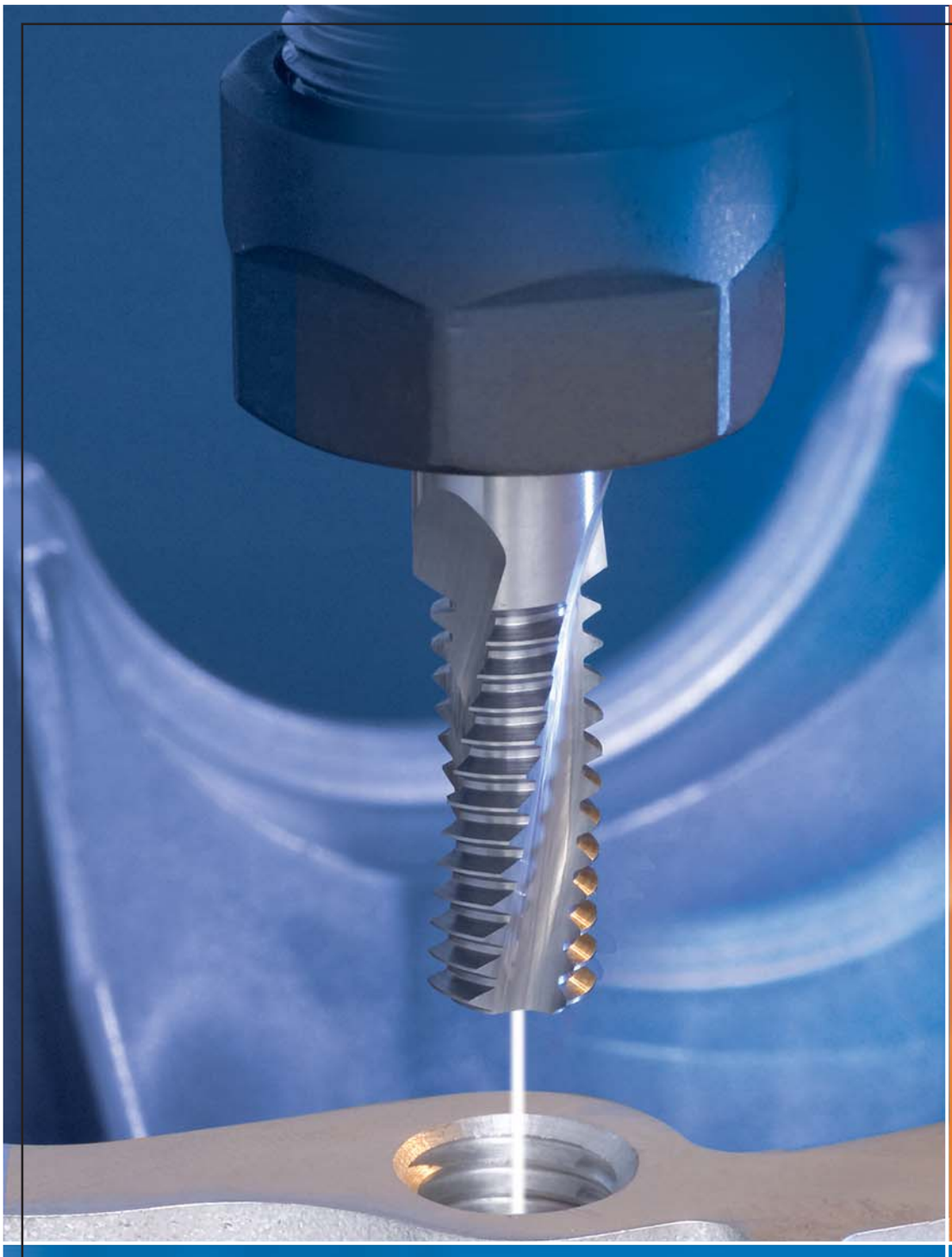
VARGUS



Solid Carbide

Thread Milling Tools

VARDEX Threading Solutions

Metric

A Complete Range of Solid Carbide Thread Milling Solutions!

Helicool

Helical Flutes With Thru-Hole Coolant

- Axial coolant-thru
- Ideal for blind holes

page 5

- Radial coolant for effective chip evacuation in thru-holes

page 10

- Axial coolant-thru
- Thread and Chamfer in one tool !

page 11

- Drill, Thread and Chamfer in one tool!

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Helical

Helical flutes

- Economical tool for thru-holes

page 13

Deep Threading

Straight Flutes For Deep Holes

- Long reaching up to 3xDo

page 17

MilliPro

Miniature Thread Mills

- Minimum Thread M1.6x0.35 No.1-72UN

page 18

- Specially designed for hard materials up to 62 HRc

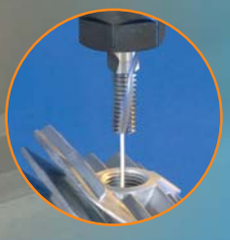
page 20

Straight

Straight Flutes

- Very economical tool for light jobs and soft materials

page 22



Technical Information

- Cutting Data

page 28

- TM Gen Software for tool selection and CNC programming

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Vardex Ordering Code System

TM Solid Carbide

HC		10	082	L15	-	I	1.50	ISO	TM		VTH
1	2	3	4	5		6	7	8	9	10	11

1 - Line	2 - No. of Teeth	3 - Shank Dia.	4 - Cutting Dia.	5 - Tool Cutting Length	6 - Type of Tool
HC - HeliCool **HCR** - HeliCool R **HCC** - HeliCool C **H** - HeliCal **S** - Straight Flutes **D** - Deep Threading or MilliPro	**1T** - 1 Tooth (Deep Threading) **3T** - 3 Teeth (MilliPro) **2L** - 2 Teeth LH (MilliPro HD)	**03** - 3.0 mm **04** - 4.0 **06** - 6.0 **08** - 8.0 **10** - 10.0 **12** - 12.0 **14** - 14.0 **16** - 16.0 **18** - 18.0 **20** - 20.0	1.2 - 19.9 mm	Up to 3D_o	**E** - External **I** - Internal **EI** - External + Internal

7 - Pitch		8 - Standard	9 - System	10 - No. of Flutes	11 - Carbide Grade
Full Profile - Pitch Range		**ISO** - ISO Metric **UN** - American UN **UNC** - UN Coarse **UNF** - UN Fine **UNEF** - UN Extra Fine **BSW** - Whit. Coarse **BSP** - BSP **BSF** - Whit. Fine **BSPT** - BSPT **NPT** - NPT **NPTF** - NPTF **PG** - PG	**TM**	**3** - 3 Flutes **5** - 5 Flutes **Straight Flute, when two options are available**	**VTS** **VTH**
mm	tpi				
0.35 - 6.0	72 - 4.5				

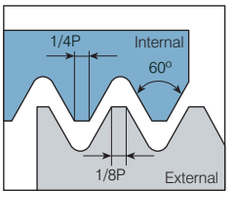
HTC - Thriller

HTC	M6	1.0	2D	VTN
1	2	3	4	5

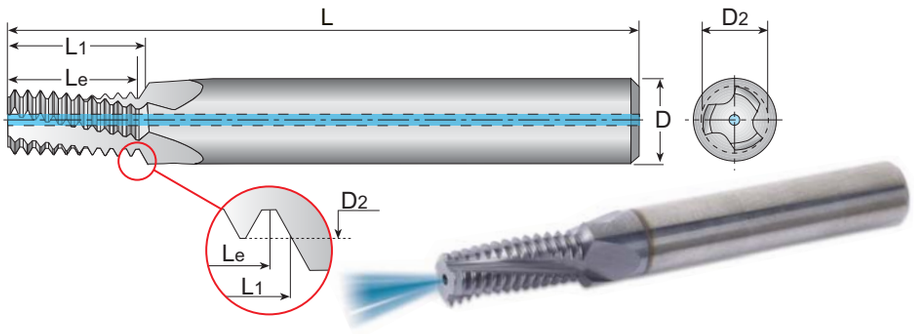
1 - Line	2 - Thread Diameter	3 - Pitch	4 - Thread Length	5 - Carbide Grade
HTC - Thriller	M6 - M12	1 - 1.75mm	**2D** **2.5D**	**VTN** **VTS**

ISO Metric

Internal



Defined by: R262 (DIN 13)
Tolerance class: 6H



Helical Flutes with Axial Coolant-Thru

1.5 x D_0 (L1 ≤ 1.5 x Thread Diameter)

Thread		Pitch	Ordering Code	Dimensions mm					No. of Flutes	Teeth	Bore Dia.*
M Coarse	M Fine	mm	Internal	D	D2	L	Le	L1	Z	Zt	mm
M3x0.5	M3.5-M16x0.5	0.5	HC04024L04-I0.50ISO TM...	4	2.40	45	4.5	4.7	3	9	2.5
M4x0.7		0.7	HC04031L06-I0.70ISO TM...	4	3.15	45	6.3	6.6	3	9	3.3
M5x0.8		0.8	HC04039L07-I0.80ISO TM...	4	3.90	45	7.2	7.6	3	9	4.2
M6X1.0	M8-M40x1.0	1.0	HC06048L09-I1.00ISO TM...	6	4.80	57	9.0	9.5	3	9	5.0
M8x1.25		1.25	HC08065L13-I1.25ISO TM...	8	6.50	61	12.5	13.1	3	10	6.8
M10x1.5	M12-M48X1.5	1.5	HC10082L15-I1.50ISO TM...	10	8.20	73	15.0	15.7	3	10	8.5
M12X1.75		1.75	HC10099L18-I1.75ISO TM...	10	9.90	73	17.5	18.4	4	10	10.2
M14x2.0	M17-M80x2.0	2.0	HC12116L21-I2.00ISO TM...	12	11.60	73	20.0	21.0	4	10	12.0
M16x2.0	M17-M80x2.0	2.0	HC14136L25-I2.00ISO TM...	14	13.60	92	24.0	25.0	4	12	14.0

Helical Flutes with Thru-Hole Coolant

2 x D_0 (L1 ≤ 2 x Thread Diameter)

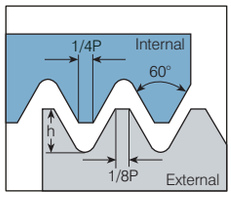
Thread		Pitch	Ordering Code	Dimensions mm					No. of Flutes	Teeth	Bore Dia.*
M Coarse	M Fine	mm	Internal	D	D2	L	Le	L1	Z	Zt	mm
M3x0.5	M3.5-M16x0.5	0.5	HC04024L06-I0.50ISO TM...	4	2.40	45	6.0	6.2	3	12	2.5
	M4x0.5	0.5	HC04032L08-I0.50ISO TM...	4	3.20	45	8.0	8.2	3	16	3.5
	M5x0.5	0.5	HC06042L10-I0.50ISO TM...	6	4.20	57	10.0	10.2	3	20	4.5
M4x0.7		0.7	HC04031L08-I0.70ISO TM...	4	3.15	45	8.4	8.7	3	12	3.3
	M6x0.75	0.75	HC06050L12-I0.75ISO TM...	6	5.00	57	12.0	12.4	3	16	5.3
M5x0.8		0.8	HC04039L10-I0.80ISO TM...	4	3.90	45	10.4	10.8	3	13	4.2
M6x1.0	M8-M40x1.0	1.0	HC06048L12-I1.00ISO TM...	6	4.80	57	12.0	12.5	3	12	5.0
	M8x1.0	1.0	HC08067L16-I1.00ISO TM...	8	6.70	61	16.0	16.5	3	16	7.0
	M10x1.0	1.0	HC10087L20-I1.00ISO TM...	10	8.70	73	20.0	20.5	3	20	9.0
	M12x1.0	1.0	HC12107L24-I1.00ISO TM...	12	10.70	73	24.0	24.5	4	24	11.0
M8x1.25		1.25	HC08065L16-I1.25ISO TM...	8	6.50	61	16.2	16.9	3	13	6.8
	M10x1.25	1.25	HC10085L20-I1.25ISO TM...	10	8.50	73	20.0	20.6	3	16	8.8
M10x1.5	M12-M48x1.5	1.5	HC10082L20-I1.50ISO TM...	10	8.20	73	19.5	20.2	3	13	8.5
	M12x1.5	1.5	HC10099L24-I1.50ISO TM...	10	9.90	73	24.0	24.7	4	16	10.5
	M14x1.5	1.5	HC12119L29-I1.50ISO TM...	12	11.90	80	28.5	29.2	4	19	12.5
	M16x1.5	1.5	HC14139L32-I1.50ISO TM...	14	13.90	92	31.5	32.2	4	21	14.5
M12x1.75		1.75	HC10099L25-I1.75ISO TM...	10	9.90	73	24.5	25.4	4	14	10.2
M14x2.0	M17-M80x2.0	2.0	HC12116L29-I2.00ISO TM...	12	11.60	80	28.0	29.0	4	14	12.0
M16x2.0	M17-M80x2.0	2.0	HC14136L33-I2.00ISO TM...	14	13.60	92	32.0	33.0	4	16	14.0
M18x2.5		2.5	HC16148L36-I2.50ISO TM...	16	14.80	92	35.0	36.2	4	14	15.5
M20x2.5		2.5	HC18171L41-I2.50ISO TM...	18	17.10	102	40.0	41.2	4	16	17.5
M24x3.0		3.0	HC20199L49-I3.00ISO TM...	20	19.90	102	48.0	49.5	4	16	21.0

*Bore Diameter applies to smallest thread Dia.

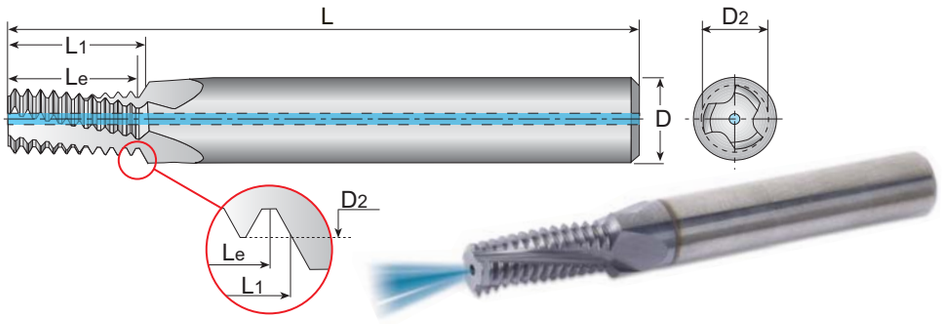
Maximum thread length = L1 - $\frac{\text{Pitch}}{4}$

American UN

Internal



Defined by: ANSI B1.1.74
Tolerance class: 2B



Helical Flutes with Thru-Hole Coolant — 1.5 x D0 (L1 ≤ 1.5 x Thread Diameter)

Thread			Pitch	Ordering Code	Dimensions mm					No. of Flutes	Teeth	Bore Dia.*
UNC	UNF	UNEF	tpi	Internal	D	D2	L	Le	L1	Z	Zt	mm
No.10-24	5/16" ,3/8"x24	9/16"-11/16"x24	24	HC04035L07-I24UNC TM...	4	3.58	45	7.4	7.9	3	7	3.8
No.12-24	5/16" ,3/8"x24	9/16"-11/16"x24	24	HC06041L08-I24UNC TM...	6	4.15	57	8.5	9.0	3	8	4.5
1/4"x20	7/16" ,1/2"x20	3/4"-1"x20	20	HC06048L09-I20UNC TM...	6	4.88	57	8.9	9.5	3	7	5.2
5/16"x18	9/16" ,5/8"x18	11/16"-1 11/16" x18	18	HC08061L11-I18UNC TM...	8	6.15	61	11.3	12.0	3	8	6.5
3/8"x16	3/4"x16		16	HC08076L15-I16UNC TM...	8	7.65	61	14.3	15.1	3	9	8.0
7/16"x14	7/8"x14		14	HC10090L17-I14UNC TM...	10	9.00	73	16.3	17.2	3	9	9.3
1/2"x13			13	HC12104L20-I13UNC TM...	12	10.35	73	19.5	20.5	4	10	10.8
9/16"x12	1"-1 1/2"x12		12	HC12118L22-I12UNC TM...	12	11.80	73	21.2	22.2	4	10	12.3

Helical Flutes with Thru-Hole Coolant — 2 x D0 (L1≤ 2 x Thread Diameter)

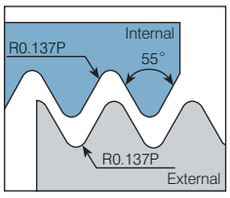
Thread			Pitch	Ordering Code	Dimensions mm					No. of Flutes	Teeth	Bore Dia.*
UNC	UNF	UNEF	tpi	Internal	D	D2	L	Le	L1	Z	Zt	mm
	No.10-32	No.12-3/8"x32	32	HC04038L09-I32UNF TM...	4	3.80	45	9.5	9.9	3	12	4.0
		No.12-3/8"x32	32	HC06044L11-I32UNEF TM...	6	4.40	57	11.1	11.5	3	14	4.7
	No.12, 1/4"x28	7/16"; 1/2"x28	28	HC06043L11-I28UNF TM...	6	4.30	57	10.9	11.3	3	12	4.6
	1/4"x28	7/16"; 1/2"x28	28	HC06052L13-I28UNF TM...	6	5.15	57	12.7	13.1	3	14	5.5
		7/16"; 1/2"x28	28	HC10099L22-I28UNEF TM...	10	9.90	73	21.8	22.2	3	24	10.2
No.10-24	5/16", 3/8"x24	9/16"-11/16"x24	24	HC04035L10-I24UNC TM...	4	3.58	45	9.5	10.0	3	9	3.8
No.12-24	5/16", 3/8"x24	9/16"-11/16"x24	24	HC06041L11-I24UNC TM...	6	4.15	57	10.6	11.1	3	10	4.5
	5/16", 3/8"x24	9/16"-11/16"x24	24	HC08066L16-I24UNF TM...	8	6.68	61	15.9	16.4	3	15	6.8
	3/8"x24	9/16"-11/16"x24	24	HC10082L19-I24UNF TM...	10	8.20	73	19.0	19.6	3	18	8.5
		9/16"-11/16"x24	24	HC14129L29-I24UNEF TM...	14	12.90	92	28.6	29.1	4	27	13.2
1/4"x20	7/16", 1/2"x20	3/4"-1"x20	20	HC06048L13-I20UNC TM...	6	4.88	57	12.7	13.3	3	10	5.2
	7/16", 1/2"x20	3/4"-1"x20	20	HC10096L22-I20UNF TM...	10	9.60	73	21.6	22.2	3	17	9.8
	1/2"x20	3/4"-1"x20	20	HC12111L26-I20UNF TM...	12	11.10	80	25.4	26.0	3	20	11.5
		3/4"-1"x20	20	HC18174L38-I20UNEF TM...	18	17.40	102	38.1	38.7	4	30	17.8
5/16"x18	9/16", 5/8"x18	11/16"-1 11/16"x18	18	HC08061L16-I18UNC TM...	8	6.15	61	15.5	16.2	3	11	6.5
	9/16", 5/8"x18	11/16"-1 11/16"x18	18	HC14125L28-I18UNF TM...	14	12.50	92	28.2	28.9	4	20	12.8
	5/8"x18	11/16"-1 11/16"x18	18	HC16141L31-I18UNF TM...	16	14.10	92	31.0	31.7	4	22	14.5
3/8"x16	3/4"x16		16	HC08076L19-I16UNC TM...	8	7.65	61	19.0	19.8	3	12	8.0
	3/4"x16		16	HC18170L38-I16UNF TM...	18	17.00	102	38.1	38.8	4	24	17.5
7/16"x14	7/8"x14		14	HC10090L22-I14UNC TM...	10	9.00	73	21.8	22.7	3	12	9.3
	7/8"x14		14	HC20199L44-I14UNF TM...	20	19.90	102	43.5	44.4	4	24	20.5
1/2"x13			13	HC12104L26-I13UNC TM...	12	10.35	80	25.4	26.4	4	13	10.8
9/16"x12	1"-1 1/2"x12		12	HC12118L28-I12UNC TM...	12	11.80	80	27.5	28.6	4	13	12.3
	1"-1 1/2"x12		12	HC20199L51-I12UNF TM...	20	19.90	102	50.8	51.9	4	24	23.5
5/8"x11			11	HC14131L33-I11UNC TM...	14	13.10	92	32.3	33.5	4	14	13.5
3/4"x10			10	HC16159L39-I10UNC TM...	16	15.90	92	38.1	39.4	4	15	16.5
7/8"x9			9	HC20190L46-I9UNC TM...	20	19.00	102	45.2	46.6	4	16	19.5
1"x8			8	HC20199L52-I8UNC TM...	20	19.90	102	50.8	52.4	4	16	22.0

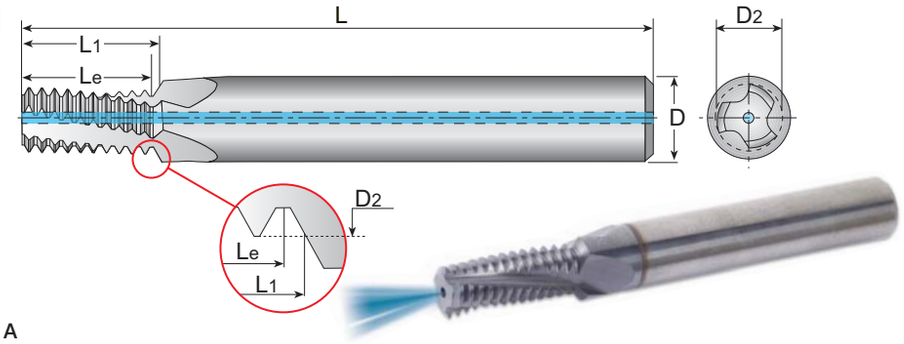
*Bore Diameter applies to smallest thread Dia.

Maximum thread length = L1 - $\frac{\text{Pitch}}{4}$

Whitworth

External / Internal





Defined by: B.S.84:1956,
DIN 259, ISO228/1:1982

Tolerance class: Medium class A

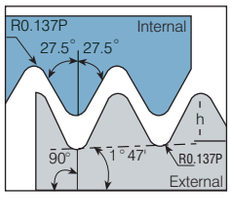
Helical Flutes with Thru-Hole Coolant

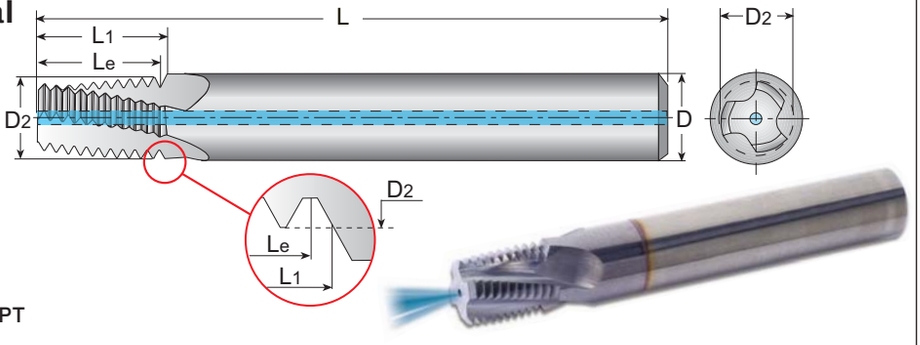
2 x D_0 (L1 ≤ 2 x Thread Diameter)

Thread		Pitch	Ordering Code	Dimensions mm					No. of Flutes	Teeth	Bore Dia.*
BSW	BSF	tpi	External / Internal	D	D2	L	Le	L1	Z	Zt	mm
	1/4"x26	26	HC06050L13-EI26BSF TM...	6	5.00	57	12.7	13.2	3	13	5.3
	5/16"x22	22	HC08063L16-EI22BSF TM...	8	6.35	61	16.2	16.7	3	14	6.7
1/4"x20	3/8"x20	20	HC06044L13-EI20BSW TM...	6	4.45	57	12.7	13.3	3	10	5.0
	3/8"x20	20	HC08076L19-EI20BSF TM...	8	7.65	61	19.0	197	3	15	8.2
5/16"x18	7/16"x18	18	HC06058L16-EI18BSW TM...	6	5.85	57	15.5	16.2	3	11	6.5
	7/16"x18	18	HC10092L23-EI18BSF TM...	10	9.20	73	22.6	23.3	3	16	9.7
3/8"x16	1/2",9/16"x16	16	HC08072L19-EI16BSW TM...	8	7.20	61	19.0	19.8	3	12	7.9
	1/2",9/16"x16	16	HC12105L26-EI16BSF TM...	12	10.50	80	25.4	26.2	4	16	11.1
	9/16"x16	16	HC14122L29-EI16BSF TM...	14	12.15	92	28.6	29.4	4	18	12.6
7/16"x14	5/8",11/16"x14	14	HC10085L22-EI14BSW TM...	10	8.50	73	21.8	22.7	3	12	9.2
	5/8",11/16"x14	14	HC14134L31-EI14BSF TM...	14	13.40	92	30.8	31.7	4	17	14.0
	11/16"x14	14	HC16150L35-EI14BSF TM...	16	15.00	92	34.5	35.4	4	19	15.6
1/2"x12	3/4"x12	12	HC10096L26-EI12BSW TM...	10	9.65	73	25.4	26.5	3	12	10.5
9/16"x12	3/4"x12	12	HC12113L28-EI12BSW TM...	12	11.25	80	27.5	28.6	4	13	12.1
	3/4"x12	12	HC18162L39-EI12BSF TM...	18	16.20	102	38.1	39.2	4	18	16.8
5/8"x11	7/8"x11	11	HC14126L33-EI11BSW TM...	14	12.60	92	32.3	33.5	4	14	13.4
11/16"x11		11	HC16142L35-EI11BSW TM...	16	14.20	92	34.6	35.8	4	15	15.0

BSPT

External / Internal





Defined by: B.S.21:1985
Tolerance class: Standard BSPT

Helical Flutes with Thru-Hole Coolant

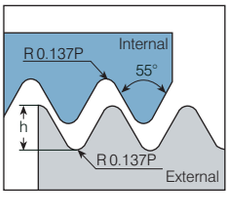
Thread	Pitch	Ordering Code	Dimensions mm					No. of Flutes	Teeth	Bore Dia.*
Standard	tpi	External / Internal	D	D2	L	Le	L1	Z	Zt	mm
1/16"x28	28	HC06059L10-EI28BSPT TM...	6	5.90	57	10.0	10.2	3	11	6.7
1/8"x28	28	HC08076L10-EI28BSPT TM...	8	7.65	61	10.0	10.2	3	11	8.7
1/4"x19	19	HC10099L15-EI19BSPT TM...	10	9.90	73	14.7	15.4	3	11	11.8
3/8"x19	19	HC12111L15-EI19BSPT TM...	12	11.15	73	14.7	15.4	4	11	15.2
1/2", 3/4"x14	14	HC16142L22-EI14BSPT TM...	16	14.25	92	21.8	22.7	4	12	19.0
1", 1 1/2", 2", 2 1/2"x11	11	HC20196L28-EI11BSPT TM...	20	19.60	102	27.7	28.9	4	12	30.7

*Bore Diameter applies to smallest thread Dia.

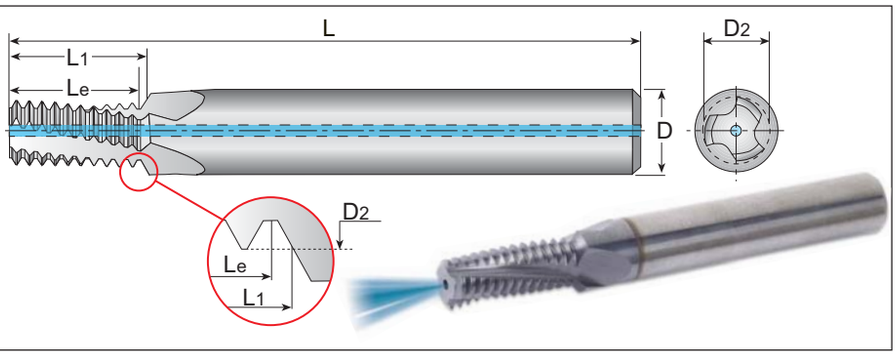
Maximum thread length = L1 - $\frac{\text{Pitch}}{4}$

BSP(G)

External / Internal



Defined by: B.S.2779:1956
Tolerance class: Medium class



Helical Flutes with Thru-Hole Coolant — 1.5 x D0 (L1 ≤ 1.5 x Thread Diameter)

Thread	Pitch	Ordering Code	Dimensions mm					No. of Flutes	Teeth	Bore Dia.*
Standard	tpi	External / Internal	D	D2	L	Le	L1	Z	Zt	mm
1/16", 1/8"x28	28	HC08064L12-EI28BSP TM...	8	6.40	61	11.8	12.2	3	13	6.7
1/8"x28	28	HC10082L15-EI28BSP TM...	10	8.20	73	14.5	15.0	3	16	8.7
1/4", 3/8"x19	19	HC12110L20-EI19BSP TM...	12	11.00	80	20.0	20.7	4	15	11.8
3/8"x19	19	HC16145L26-EI19BSP TM...	16	14.50	92	25.4	26.1	4	19	15.2
1"-4"x11	11	HC20199L42-EI11BSP TM...	20	19.90	102	41.6	42.7	4	18	30.7

Helical Flutes with Thru-Hole Coolant — 2 x D0 (L1 ≤ 2 x Thread Diameter)

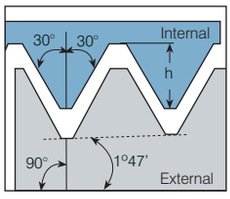
Thread	Pitch	Ordering Code	Dimensions mm					No. of Flutes	Teeth	Bore Dia.*
Standard	tpi	External / Internal	D	D2	L	Le	L1	Z	Zt	mm
1/16" , 1/8"x28	28	HC08064L15-EI28BSP TM...	8	6.40	61	15.4	15.9	3	17	6.7
1/8"x28	28	HC10082L19-EI28BSP TM...	10	8.20	73	19.0	19.5	3	21	8.7
1/4" , 3/8"x19	19	HC12110L27-EI19BSP TM...	12	11.00	80	26.7	27.4	4	20	11.8
3/8"x19	19	HC16145L34-EI19BSP TM...	16	14.50	92	33.4	34.1	4	25	15.2
1/2"-7/8"x14	14	HC18179L42-EI14BSP TM...	18	17.90	102	41.7	42.6	4	23	19.0

*Bore Diameter applies to smallest thread Dia.

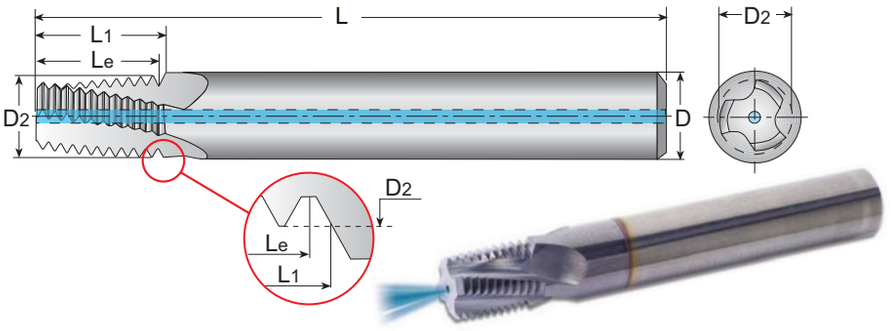
Maximum thread length = L1 - $\frac{\text{Pitch}}{4}$

NPT

External / Internal



Defined by: USAS B2.1:1968
Tolerance class: Standard NPT

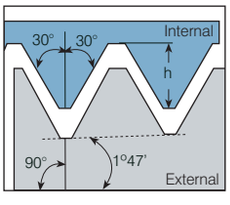


Helical Flutes with Thru-Hole Coolant

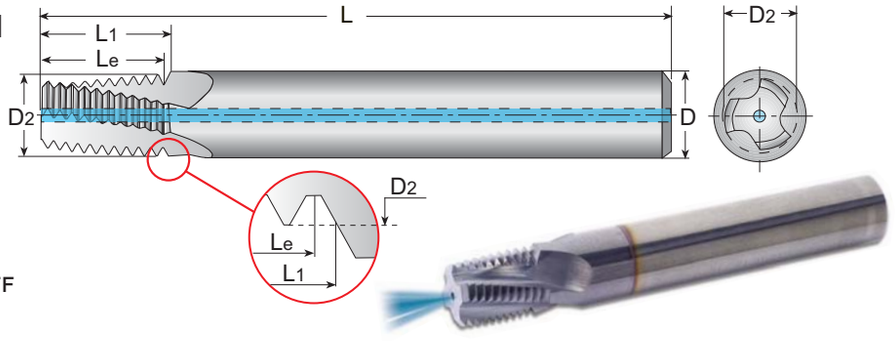
Thread	Pitch	Ordering Code	Dimensions mm					No. of Flutes	Teeth	Bore Dia.*
Standard	tpi	External / Internal	D	D2	L	Le	L1	Z	Zt	mm
1/16"x27	27	HC06059L09-EI27NPT TM...	6	5.90	57	9.4	9.9	3	10	6.3
1/8"x27	27	HC08076L09-EI27NPT TM...	8	7.65	61	9.4	9.9	3	10	8.5
1/4"x18	18	HC10099L14-EI18NPT TM...	10	9.90	73	14.1	14.8	3	10	11.1
3/8"x18	18	HC12111L14-EI18NPT TM...	12	11.15	73	14.1	14.8	4	10	14.5
1/2" , 3/4"x14	14	HC16142L19-EI14NPT TM...	16	14.25	92	18.1	19.0	4	10	17.7, 23.0
1",1 1/4",1 1/2" ,2"x11.5	11.5	HC20196L23-EI11.5NPT TM...	20	19.60	102	22.1	23.2	4	10	29.0, 37.7, 44.0, 56.0
2 1/2"x8 ; 3"x8	8	HC20196L33-EI8NPT TM...	20	19.60	102	31.7	33.3	4	10	66.5, 82.1

NPTF

External / Internal



Defined by: ANSI 1.20.3-1976
Tolerance class: Standard NPTF



Helical Flutes with Thru-Hole Coolant

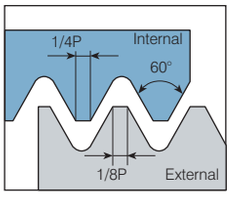
Thread	Pitch	Ordering Code	Dimensions mm					No. of Flutes	Teeth	Bore Dia.*
Standard	tpi	External / Internal	D	D2	L	Le	L1	Z	Zt	mm
1/16"x27	27	HC06059L09-EI27NPTF TM...	6	5.90	57	9.4	9.9	3	10	6.3
1/8"x27	27	HC08076L09-EI27NPTF TM...	8	7.65	61	9.4	9.9	3	10	8.4
1/4"x18	18	HC10099L14-EI18NPTF TM...	10	9.90	73	14.1	14.8	3	10	11.1
3/8"x18	18	HC12111L14-EI18NPTF TM...	12	11.15	73	14.1	14.8	4	10	14.7
1/2", 3/4"x14	14	HC16142L19-EI14NPTF TM...	16	14.25	92	18.1	19.0	4	10	17.9, 23.4
1", 1 1/4", 1 1/2", 2"x11.5	11.5	HC20196L23-EI11.5NPTF TM...	20	19.60	102	22.1	23.2	4	10	29.0, 37.7, 43.7, 55.6
2 1/2"x8; 3"x8	8	HC20196L33-EI8NPTF TM...	20	19.60	102	31.7	33.3	4	10	66.3, 82.1

*Bore Diameter applies to smallest thread Dia.

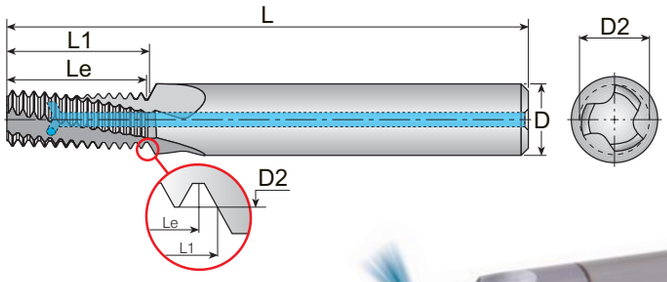
Maximum thread length = L1 - $\frac{\text{Pitch}}{4}$

ISO Metric

Internal



Defined by: R262 (DIN 13)
Tolerance class: 6H



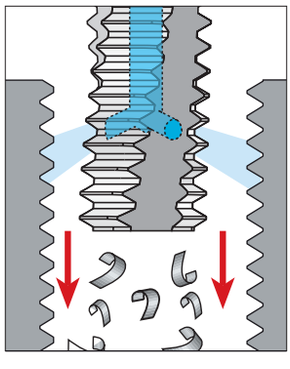
NEW!

HeliCool-R (HCR)

Helical Flutes with Radial Cooling

2 x D_0 (L1 ≤ 2 x Thread Diameter)

Thread		Pitch	Ordering Code	Dimensions [mm]					No. of Flutes	Teeth	Bore Dia.*
M Coarse	M Fine	mm	Internal	D	D2	L	Le	L1	Z	Zt	mm
M6x1.0	M8-M40x1.0	1.0	HCR06048L12-I1.00ISO TM...	6	4.8	57	12.0	12.5	3	12	5.0
	M10x1.0	1.0	HCR10087L20-I1.00ISO TM...	10	8.7	73	20.0	20.5	3	20	9.0
	M12x1.0	1.0	HCR12107L24-I1.00ISO TM...	12	10.7	73	24.0	24.5	4	24	11.0
M8x1.25		1.25	HCR08065L16-I1.25ISO TM...	8	6.5	64	16.3	16.9	3	13	6.8
M10x1.5	M12-M48x1.5	1.5	HCR10082L20-I1.50ISO TM...	10	8.2	73	19.5	20.3	3	13	8.5
	M12x1.5	1.5	HCR10099L24-I1.50ISO TM...	10	9.9	73	24.0	24.8	4	16	10.5
	M14x1.5	1.5	HCR12119L29-I1.50ISO TM...	12	11.9	84	28.5	29.3	4	19	12.5
	M16x1.5	1.5	HCR14139L32-I1.50ISO TM...	14	13.9	84	31.5	32.3	4	21	14.5
M12x1.75		1.75	HCR10099L25-I1.75ISO TM...	10	9.9	73	24.5	25.4	4	14	10.2



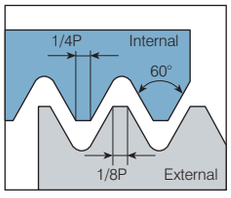
Helicool-R for Improved Chip Evacuation for Thru-Holes.

*Bore Diameter applies to smallest thread Dia.

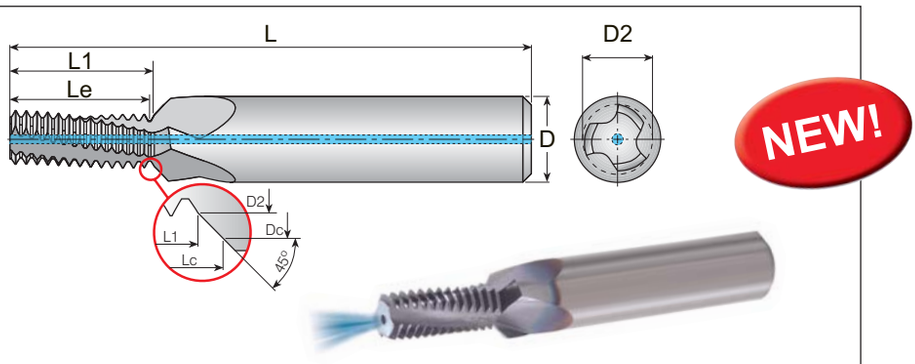
Maximum thread length = L1 - $\frac{\text{Pitch}}{4}$

ISO Metric

Internal



Defined by: R262 (DIN 13)
Tolerance class: 6H



NEW!

Dc = Minimum recommended chamfer diameter

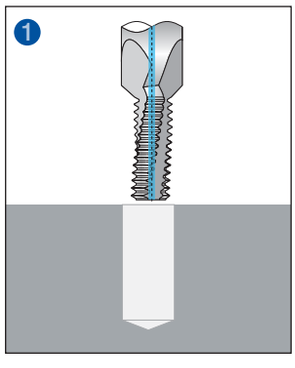
HeliCool-C (HCC)

Helical Flutes with Axial Coolant - Thru & Chamfer

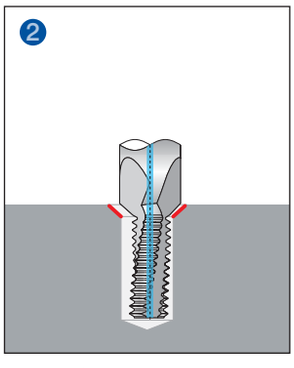
2 x D_0 (L1 ≤ 2 x Thread Diameter)

Thread		Pitch	Ordering Code	Dimensions [mm]							No. of Flutes	Teeth	Bore Dia.*
M Coarse	M Fine	mm	Internal	D	D2	Dc	L	Le	L1	Lc	Z	Zt	mm
M6x1.0	M8-M40x1.0	1.0	HCC08048L12-I1.00ISO TM...	8	4.8	6.3	61	12.0	12.5	13.3	3	12	5.0
	M10x1.0	1.0	HCC12087L20-I1.00ISO TM...	12	8.7	10.3	73	20.0	20.5	21.3	3	20	9.0
	M12x1.0	1.0	HCC14107L24-I1.00ISO TM...	14	10.7	12.3	80	24.0	24.5	25.3	4	24	11.0
M8x1.25		1.25	HCC10065L16-I1.25ISO TM...	10	6.5	8.3	73	16.3	16.9	17.8	3	13	6.8
M10x1.5	M12-M48x1.5	1.5	HCC12082L20-I1.50ISO TM...	12	8.2	10.3	80	19.5	20.3	21.3	3	13	8.5
	M12x1.5	1.5	HCC14099L24-I1.50ISO TM...	14	9.9	12.3	80	24.0	24.8	26.0	4	16	10.5
	M14x1.5	1.5	HCC16119L29-I1.50ISO TM...	16	11.9	14.3	92	28.5	29.3	30.5	4	19	12.5
	M16x1.5	1.5	HCC18139L32-I1.50ISO TM...	18	13.9	16.3	92	31.5	32.3	33.5	4	21	14.5
M12x1.75		1.75	HCC14099L25-I1.75ISO TM...	14	9.9	12.3	80	24.5	25.4	26.6	4	14	10.2

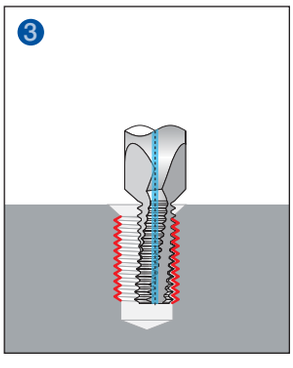
Helicool-C Operating Cycle



Positioning



Chamfering



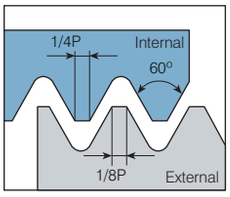
Thread Milling

*Bore Diameter applies to smallest thread Dia.

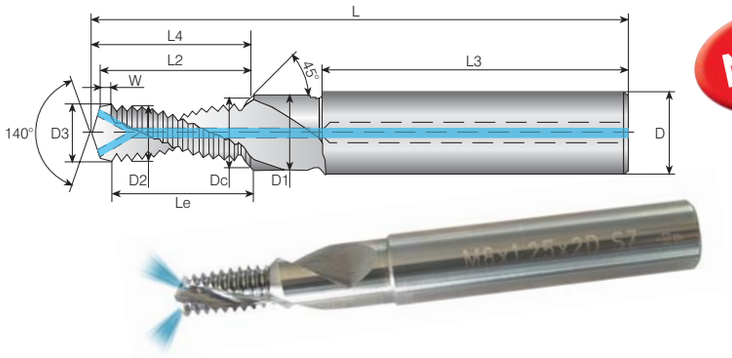
Maximum thread length = L1 - $\frac{\text{Pitch}}{4}$

ISO Metric

Internal



Defined by: R262 (DIN 13)
Tolerance class: 6H



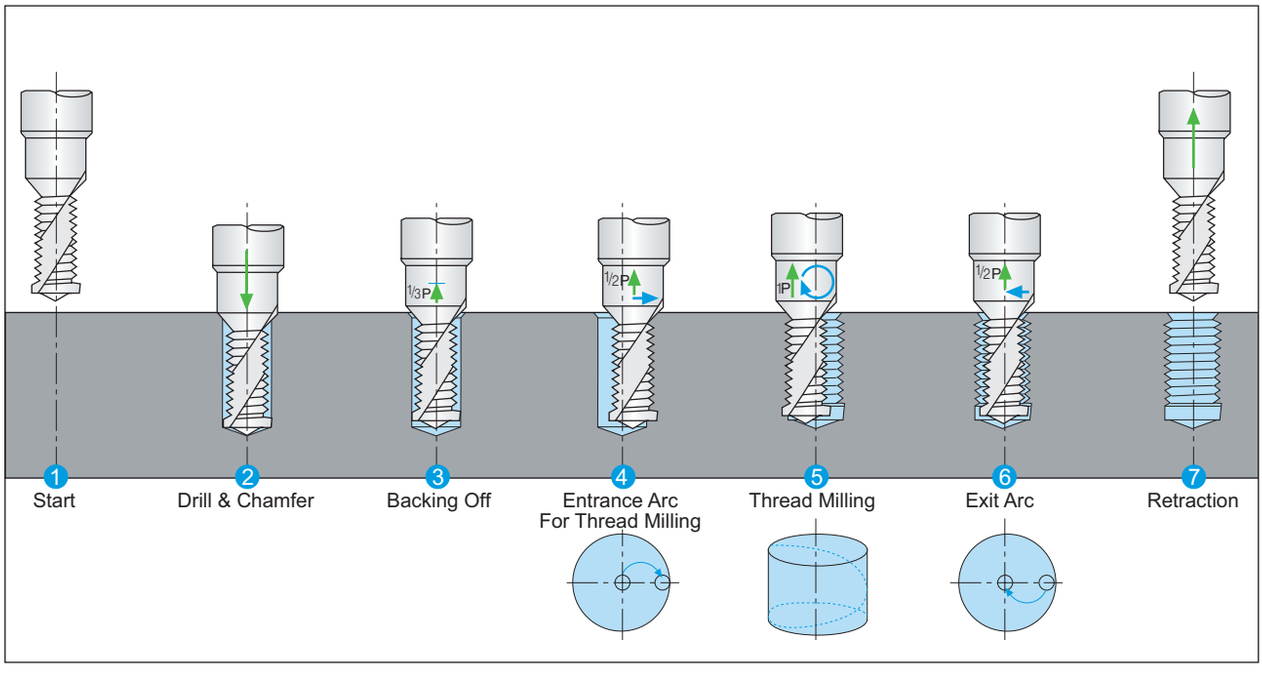
NEW!

HTC (Thriller)

Drill, Chamfer & Thread with Coolant-Thru

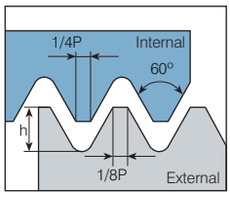
Thread	Ordering Code	Pitch	Dimensions											No. of Flutes	Teeth
ISO 2xDo Coarse	**Internal**	**mm**	**L**	**L4**	**L2**	**L3**	**W**	**Le**	**D3**	**D**	**D1**	**Dc**	**D2**	**Z**	**Zt**
M6x1.0	HTC M6x1.0x2D…	1.00	62.0	14.5	13.7	36	1.0	12.7	5.0	8	6.6	6.3	4.85	2	11
M8x1.25	HTC M8x1.25x2D …	1.25	74.0	18.2	17.1	40	1.3	15.8	6.8	10	9.0	8.3	6.45	2	11
M10x1.5	HTC M10x1.5x2D …	1.50	79.0	23.4	22.1	45	1.5	20.6	8.5	12	11.0	10.3	8.08	2	12
M12x1.75	HTC M12x1.75x2D…	1.75	89.0	27.1	25.5	45	1.5	24.0	10.3	14	13.5	12.3	9.74	2	12
ISO 2.5xDo Coarse															
M6x1.0	HTC M6x1.0x2.5D …	1.00	62.0	16.5	15.7	36	1.0	14.7	5.0	8	6.6	6.3	4.85	2	13
M8x1.25	HTC M8x1.25x2.5D…	1.25	74.0	23.2	22.1	40	1.3	20.8	6.8	10	9.0	8.3	6.45	2	15
M10x1.5	HTC M10x1.5x2.5D…	1.50	79.0	27.9	26.6	45	1.5	25.1	8.5	12	11.0	10.3	8.08	2	15

HTC - Thriller Operating Cycle

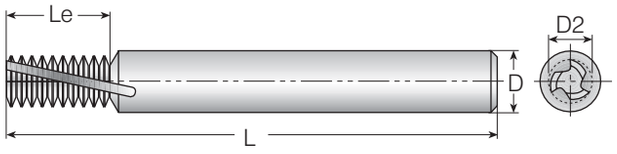


ISO Metric

Internal



NEW!



Defined by: R262 (DIN 13)
Tolerance class: 6g/6H

Helical Flutes - Internal

2 x D_0 (Le ≤ 2 x Thread Diameter)

Thread		Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
M Coarse	M Fine	mm	Internal	D	D2	L	Le	Z	Zt	mm
M3x0.5	M3.5-M16x0.5	0.5	H04022L06-I0.5ISO TM...	4	2.2	45	6.0	3	12	2.5
	M4x0.5	0.5	H04030L08-I0.5ISO TM...	4	3.0	45	8.0	3	16	3.5
	M5x0.5	0.5	H04039L10-I0.5ISO TM...	4	3.9	45	10.0	3	20	4.5
M4x0.7		0.7	H04028L08-I0.7ISO TM...	4	2.8	45	8.4	3	12	3.3
	M6x0.75	0.75	H04039L12-I0.75ISO TM...	4	3.9	45	12.0	3	16	5.3
M5x0.8		0.8	H04035L10-I0.8ISO TM...	4	3.5	45	10.4	3	13	4.2
M6x1.0	M8-M40x1.0	1.0	H04039L12-I1.0ISO TM...	4	3.9	45	12.0	3	12	5.0
	M8x1.0	1.0	H06059L16-I1.0ISO TM...	6	5.9	57	16.0	3	16	7.0
	M10x1.0	1.0	H08079L20-I1.0ISO TM...	8	7.9	63	20.0	3	20	9.0
	M12x1.0	1.0	H10099L24-I1.0ISO TM...	10	9.9	73	24.0	4	24	11.0
M8x1.25		1.25	H06058L16-I1.25ISO TM...	6	5.8	57	16.25	3	13	6.8
	M10x1.25	1.25	H08077L20-I1.25ISO TM...	8	7.7	63	20.0	3	16	8.8
M10x1.5	M12-M48x1.5	1.5	H08077L21-I1.5ISO TM...	8	7.7	63	21.0	3	14	8.5
	M12x1.5	1.5	H10094L24-I1.5ISO TM...	10	9.4	73	24.0	4	16	10.5
	M14x1.5	1.5	H12112L28-I1.5ISO TM...	12	11.2	83	28.5	4	19	12.5
	M16x1.5	1.5	H12119L33-I1.5ISO TM...	12	11.9	83	33.0	4	22	14.5
M12x1.75		1.75	H10087L24-I1.75ISO TM...	10	8.7	73	24.5	4	14	10.2
M14x2.0	M17-M80x2.0	2.0	H10099L28-I2.0ISO TM...	10	9.9	73	28.0	4	14	12.0
M16x2.0	M17-M80x2.0	2.0	H12119L32-I2.0ISO TM...	12	11.9	83	32.0	4	16	14.0
M18-M22x2.5		2.5	H16139L40-I2.5ISO TM...	16	13.9	92	40.0	5	16	15.5
M24x3.0		3.0	H16159L42-I3.0ISO TM...	16	15.9	92	42.0	4	14	21

Helical Flutes - External

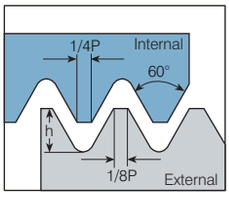
2 x D_0 (Le ≤ 2 x Thread Diameter)

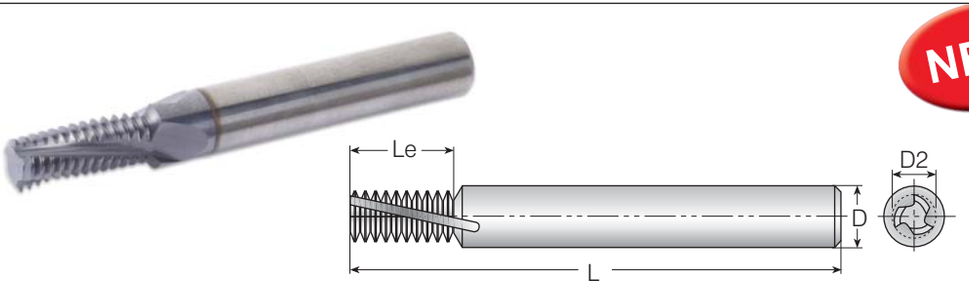
Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth
M Coarse	mm	External	D	D2	L	Le	Z	Zt
M3x0.5	0.5	H04039L06-E0.5ISO TM...	4	3.9	45	6.0	3	12
M4.5x0.75	0.75	H04039L09-E0.75ISO TM...	4	3.9	45	9.0	3	12
M6x1.0	1.0	H04039L12-E1.0ISO TM...	4	3.9	45	12.0	3	12
M8x1.25	1.25	H06059L16-E1.25ISO TM...	6	5.9	57	16.25	3	13
M10x1.5	1.5	H08079L21-E1.5ISO TM...	8	7.9	63	21.0	3	14
M14x2.0	2.0	H10099L28-E2.0ISO TM...	10	9.9	73	28.0	4	14

*Bore Diameter applies to smallest thread Dia.

American UN

Internal





NEW!

Defined by: ANSI B1.1.74
Tolerance class: 2A/2B

Helical Flutes - Internal

2 x D₀ (Le ≤ 2 x Thread Diameter)

Thread			Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
UNC	UNF	UNEF	tpi	Internal	D	D2	L	Le	Z	Zt	mm
	No.8-36		36	H04030L09-I36UNF TM…	4	3.0	45	8.5	3	12	3.5
	No.10-32	No.12-3/8"x32	32	H04033L11-I32UNF TM…	4	3.3	45	11.1	3	14	4
	No.12-28,1/4"x28	7/16", 1/2"x28	28	H04038L12-I28UNF TM…	4	3.8	45	11.8	3	13	4.6
	1/4"x28	7/16", 1/2"x28	28	H06046L13-I28UNF TM…	6	4.6	57	12.7	3	14	5.5
		7/16", 1/2"x28	28	H10092L23-I28UNEF TM…	10	9.2	73	22.7	4	25	10.2
No.10-24	5/16", 3/8"x24	9/16"-11/16"x24	24	H04029L11-I24UNC TM…	4	2.9	45	10.6	3	10	3.8
No.12-24	5/16", 3/8"x24	9/16"-11/16"x24	24	H04035L12-I24UNC TM…	4	3.5	45	11.6	3	11	4.5
	5/16", 3/8"x24	9/16"-11/16"x24	24	H06057L16-I24UNF TM…	6	5.7	57	15.9	3	15	6.8
	3/8"x24	9/16"-11/16"x24	24	H08074L19-I24UNF TM…	8	7.4	63	19.1	3	18	8.5
		9/16"-11/16"x24	24	H12119L29-I24UNEF TM…	12	11.9	83	28.6	4	27	13.2
1/4"x20	7/16", 1/2"x20	3/4"-1"x20	20	H04039L13-I20UNC TM…	4	3.9	45	12.7	3	10	5.2
	7/16", 1/2"x20	3/4"-1"x20	20	H10085L23-I20UNF TM…	10	8.5	73	22.9	4	18	9.8
	1/2"x20	3/4"-1"x20	20	H10099L26-I20UNF TM…	10	9.9	73	25.4	4	20	11.5
		3/4"-1"x20	20	H16159L38-I20UNEF TM…	16	15.9	92	38.1	5	30	17.8
5/16"x18	9/16", 5/8"x18	11/16"-1 11/16"x18	18	H06052L17-I18UNC TM…	6	5.2	57	16.9	3	12	6.5
	9/16", 5/8"x18	11/16"-1 11/16"x18	18	H12113L30-I18UNF TM…	12	11.3	83	29.6	4	21	12.8
	5/8"x18	11/16"-1 11/16"x18	18	H12119L33-I18UNF TM…	12	11.9	83	32.5	4	23	14.5
3/8"x16	3/4"x16		16	H08067L19-I16UNC TM…	8	6.7	63	19.1	3	12	8
	3/4"x16		16	H16159L38-I16UNF TM…	16	15.9	92	38.1	4	24	17.5
7/16"x14	7/8"x14		14	H08076L24-I14UNC TM…	8	7.6	63	23.6	4	13	9.3
	7/8"x14		14	H20187L44-I14UNF TM…	20	18.7	104	44.4	4	24	20.5
1/2"x13			13	H10089L26-I13UNC TM…	10	8.9	73	25.4	4	13	10.8
9/16"x12	1"-1 1/2"x12		12	H12103L30-I12UNC TM…	12	10.3	83	29.6	4	14	12.3
	1"-1 1/2"x12		12	H20199L51-I12UNF TM…	20	19.9	104	50.8	5	24	23.5
5/8"x11			11	H12110L32-I11UNC TM…	12	11.0	83	32.3	4	14	13.5
3/4"x10			10	H16135L38-I10UNC TM…	16	13.5	92	38.1	5	15	16.5
7/8"x9			9	H16152L45-I9UNC TM…	16	15.2	92	45.2	4	16	19.5
1"x8			8	H20170L51-I8UNC TM…	20	17.0	104	50.8	4	16	22.0

Helical Flutes - External

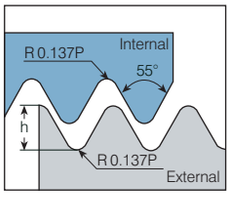
2 x D₀ (Le ≤ 2 x Thread Diameter)

Thread		Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth
UNC	UNF	tpi	External	D	D2	L	Le	Z	Zt
No.8-32		32	H04039L09-E32UNC TM…	4	3.9	45	8.7	3	11
	No.12-28	28	H04039L12-E28UNF TM…	4	3.9	45	11.8	3	13
No.12-24		24	H04039L12-E24UNC TM…	4	3.9	45	11.6	3	11
1/4"x20		20	H04039L13-E20UNC TM…	4	3.9	45	12.7	3	10
5/16"x18		18	H06059L17-E18UNC TM…	6	5.9	57	16.9	3	12
3/8"x16		16	H08079L19-E16UNC TM…	8	7.9	63	19.1	3	12
9/16"x12		12	H12119L30-E12UNC TM…	12	11.9	83	29.6	4	14

*Bore Diameter applies to smallest thread Dia.

BSP(G)

External / Internal



NEW!

Defined by: B.S.2779:1956
Tolerance class: Medium class

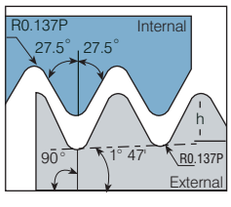
Helical Flutes

2 x D₀ (Le ≤ 2 x Thread Diameter)

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
Standard	tpi	External / Internal	D	D2	L	Le	Z	Zt	mm
1/16"x28, 1/8"x28	28	H06058L16-EI28BSP TM...	6	5.8	57	16.3	3	18	6.7
1/8"x28	28	H08077L20-EI28BSP TM...	8	7.7	63	20.0	3	22	8.7
1/4"x19, 3/8"x19	19	H10099L27-EI19BSP TM...	10	9.9	73	26.7	4	20	11.8
3/8"x19	19	H16134L33-EI19BSP TM...	16	13.4	92	33.4	4	25	15.2
1/2", 3/4"x14	14	H16157L44-EI14BSP TM...	16	15.7	92	43.5	5	24	19
1", 1 1/2", 2", 2 1/2"x11	11	H20199L42-EI11BSP TM...	20	19.9	104	41.6	5	18	30.7

BSPT

External / Internal



NEW!

Defined by: B.S.21:1985
Tolerance class: Standard BSPT

Helical Flutes

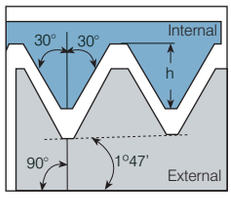
Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
Standard	tpi	External / Internal	D	D2	L	Le	Z	Zt	mm
1/16"x28	28	H06058L16-EI28BSPT TM...	6	5.8	57	16.3	3	18	6.7
1/8"x28	28	H08077L20-EI28BSPT TM...	8	7.7	63	20.0	3	22	8.7
1/4"x19	19	H10099L27-EI19BSPT TM...	10	9.9	73	26.7	4	20	11.8
3/8"x19	19	H16134L33-EI19BSPT TM...	16	13.4	92	33.4	4	25	15.2
1/2", 3/4"x14	14	H16157L44-EI14BSPT TM...	16	15.7	92	43.5	5	24	19
1", 1 1/2" ,2" , 2 1/2"x11	11	H20199L42-EI11BSPT TM...	20	19.9	104	41.6	5	18	30.7

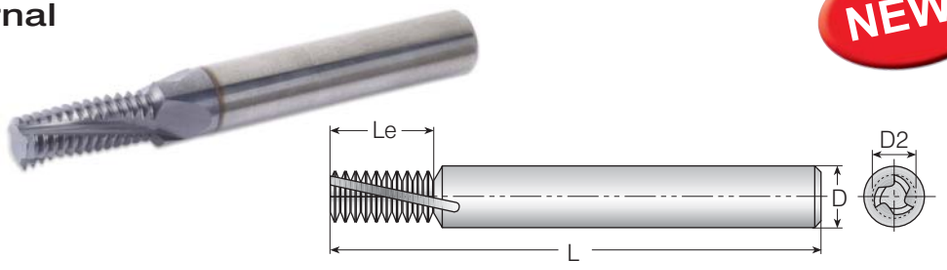
*Bore Diameter applies to smallest thread Dia.

NPT

External / Internal

NEW!





Defined by: USAS B2.1:1968
Tolerance class: Standard NPT

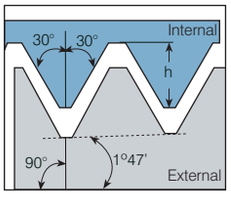
Helical Flutes

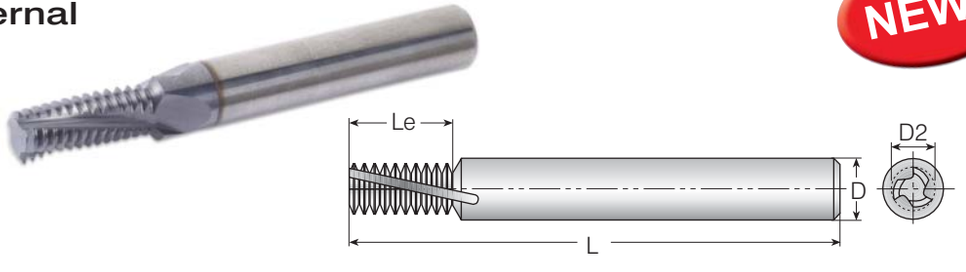
Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
Standard	**tpi**	**External / Internal**	**D**	**D2**	**L**	**Le**	**Z**	**Zt**	**mm**
1/16"x27	27	H06053L09-EI27NPT TM...	6	5.3	57	9.4	3	10	6.3
1/8"x27	27	H08075L09-EI27NPT TM...	8	7.5	63	9.4	4	10	8.5
1/4"x18	18	H10094L14-EI18NPT TM...	10	9.4	73	14.1	4	10	11.1
3/8"x18	18	H12119L14-EI18NPT TM...	12	11.9	83	14.1	4	10	14.5
1/2",3/4"x14	14	H16155L25-EI14NPT TM...	16	15.5	92	25.4	5	14	17.7, 23.0
1-2"x11.5	11.5	H20199L33-EI11.5NPT TM...	20	19.9	104	33.1	5	15	29.0-56.0
2 1/2",3"x8	8	H20199L38-EI8NPT TM...	20	19.9	104	38.1	4	12	66.5

NPTF

External / Internal

NEW!





Defined by: ANSI 1.20.3-1976
Tolerance class: Standard NPTF

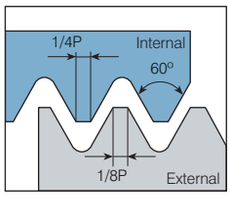
Helical Flutes

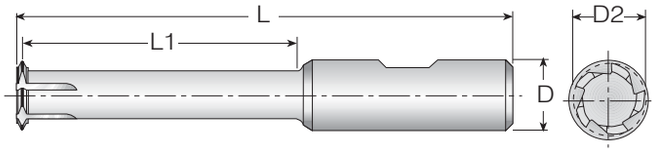
Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
Standard	**tpi**	**External / Internal**	**D**	**D2**	**L**	**Le**	**Z**	**Zt**	**mm**
1/16"x27	27	H06053L09-EI27NPTF TM...	6	5.3	57	9.4	3	10	6.3
1/8"x27	27	H08075L09-EI27NPTF TM...	8	7.5	63	9.4	4	10	8.4
1/4"x18	18	H10094L14-EI18NPTF TM...	10	9.4	73	14.1	4	10	11.1
3/8"x18	18	H12119L14-EI18NPTF TM...	12	11.9	83	14.1	4	10	14.7
1/2",3/4"x14	14	H16155L25-EI14NPTF TM...	16	15.5	92	25.4	5	14	17.9, 23.4
1"-2"x11.5	11.5	H20199L33-EI11.5NPTF TM...	20	19.9	104	33.1	5	15	29.4-56.2
2 1/2",3"x8	8	H20199L38-EI8NPTF TM...	20	19.9	104	38.1	4	12	67.0

*Bore Diameter applies to smallest thread Dia.

ISO Metric

Internal





Defined by: R262 (DIN 13)
Tolerance class: 6H

Deep Threading

Long Tools for Deep Holes

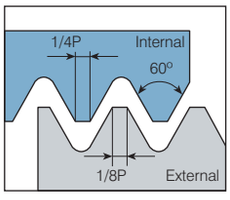
3 x D_0 (L1 ≤ 3 x Thread Diameter)

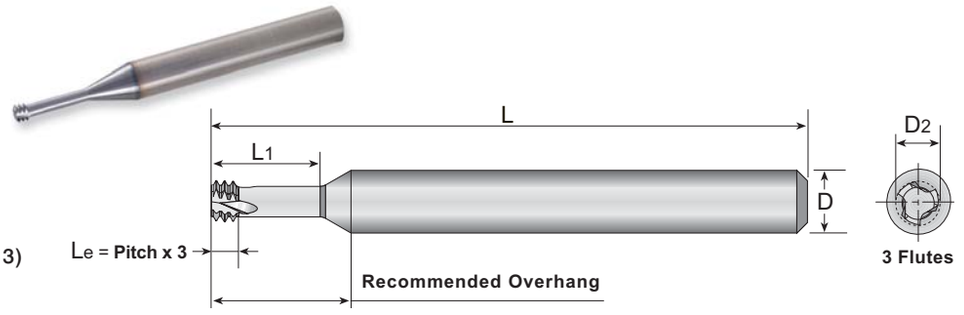
Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.
M Coarse	**mm**	**Internal**	**D**	**D2**	**L**	**L1**	**Z**	**Zt**	**mm**
M6x1	1.0	D1T08041-I1.0ISO TM...	8	4.1	63	19	3	1	5.0
M8x1.25	1.25	D1T10058-I1.25ISO TM...	10	5.8	73	26	3	1	6.8
M10x1.5	1.50	D1T10077-I1.50ISO TM...	10	7.7	73	32	3	1	8.5
M12x1.5	1.50	D1T12094-I1.50ISO TM...	12	9.4	83	38	4	1	10.5
M12x1.75	1.75	D1T12087-I1.75ISO TM...	12	8.7	83	38	4	1	10.2
M14x2	2.0	D1T16102-I2.0ISO TM...	16	10.2	92	44	4	1	12.0
M16x2	2.0	D1T16122-I2.0ISO TM...	16	12.2	100	50	4	1	14.0
M18x2.5	2.50	D1T16129-I2.5ISO TM...	16	12.9	108	57	5	1	15.5
M20x2.5	2.50	D1T16148-I2.5ISO TM...	16	14.8	114	63	5	1	17.5

Note: Additional tools are available upon request.

ISO Metric

Internal





Defined by: R262 (DIN 13)
Tolerance class: 6H

MilliPro

Miniature Thread Mills

2 x D_0 (L1 ≤ 2 x Thread Diameter)

Thread		Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
M Coarse	M Fine	mm	Internal	D	D2	L	L1	Z	Zt	mm
M1.6x0.35		0.35	D3T03012L034-I0.35ISO TM...	3	1.20	30	3.4	3	3	1.25
M2x0.4		0.4	D3T06015L042-I0.4ISO TM...	6	1.55	57	4.2	3	3	1.6
M2.2x0.45		0.45	D3T06016L046-I0.45ISO TM...	6	1.65	57	4.6	3	3	1.75
M2.5x0.45		0.45	D3T06019L052-I0.45ISO TM...	6	1.95	57	5.2	3	3	2.05
M3x0.5	M3.5-M16x0.5	0.5	D3T06024L062-I0.5ISO TM...	6	2.40	57	6.2	3	3	2.5
M3.5x0.6		0.6	D3T06027L073-I0.6ISO TM...	6	2.75	57	7.3	3	3	2.9
M4x0.7		0.7	D3T06031L083-I0.7ISO TM...	6	3.15	57	8.3	3	3	3.3
M5x0.8		0.8	D3T06040L104-I0.8ISO TM...	6	4.05	57	10.4	3	3	4.2
M6x1.0	M8-M40 x1.0	1.00	D3T06048L125-I1.0ISO TM...	6	4.80	57	12.5	3	3	5.0
M8x1.25		1.25	D3T08065L166-I1.25ISO TM...	8	6.50	63	16.6	3	3	6.8
M10x1.5	M12-M48 x1.50	1.50	D3T10082L208-I1.50ISO TM...	10	8.20	73	20.8	3	3	8.5
M12x1.75		1.75	D3T10099L250-I1.75ISO TM...	10	9.90	73	25.0	3	3	10.3

MilliPro

Miniature Thread Mills

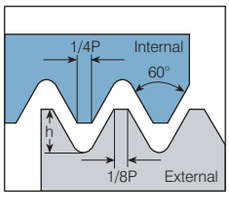
3 x D_0 (L1 ≤ 3 x Thread Diameter)

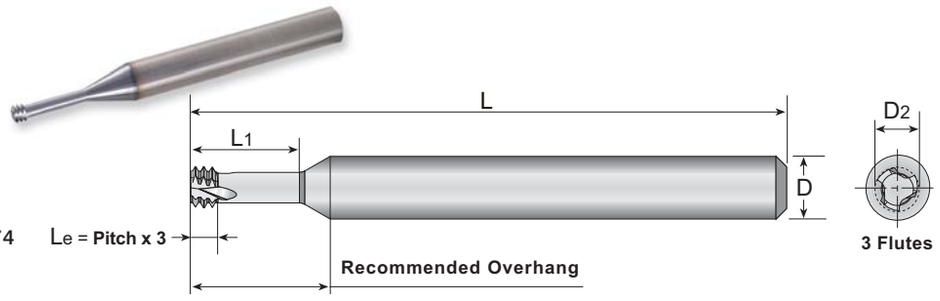
Thread		Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
M Coarse	M Fine	mm	Internal	D	D2	L	L1	Z	Zt	mm
M1.6X0.35		0.35	D3T03012L050-I0.35ISO TM...	3	1.20	30	5.0	3	3	1.25
M2X0.4		0.4	D3T06015L062-I0.4ISO TM...	6	1.55	57	6.2	3	3	1.6
M2.5x0.45		0.45	D3T06019L077-I0.45ISO TM...	6	1.95	57	7.0	3	3	2.05
M3x0.5	M3.5-M16x0.5	0.5	D3T06024L092-I0.5ISO TM...	6	2.40	57	9.2	3	3	2.5
M4x0.7		0.7	D3T06031L123-I0.7ISO TM...	6	3.15	57	12.3	3	3	3.3
M5x0.8		0.8	D3T06040L154-I0.8ISO TM...	6	4.05	57	15.4	3	3	4.2
M6x1.0	M8-M40 x1.0	1.00	D3T06048L185-I1.0ISO TM...	6	4.80	57	18.5	3	3	5.0
M8x1.25		1.25	D3T08065L246-I1.25ISO TM...	8	6.50	63	24.6	3	3	6.8

*Bore Diameter applies to smallest thread Dia.

American UN

Internal





Defined by: ANSI B1.1.74
Tolerance class: 2B

MilliPro

Miniature Thread Mills

2 x D_0 (L1 ≤ 2 x Thread Diameter)

Thread		Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
UNC	**UNF**	**tpi**	**Internal**	**D**	**D2**	**L**	**L1**	**Z**	**Zt**	**mm**
	No.1-72	72	D3T06014L039-I72UN TM...	6	1.45	57	3.9	3	3	1.6
No.1-64	No.2-64	64	D3T06014L042-I64UN TM...	6	1.40	57	4.2	3	3	1.5
No.2-56	No.3-56	56	D3T06016L050-I56UN TM...	6	1.65	57	5.0	3	3	1.8
No.3-48	No.4-48	48	D3T06019L060-I48UN TM...	6	1.90	57	6.0	3	3	2.1
No.4, No.5-40	No.6-40	40	D3T06021L060-I40UN TM...	6	2.10	57	6.0	3	3	2.3
No.5-40	No.6-40	40	D3T06024L072-I40UN TM...	6	2.45	57	7.2	3	3	2.6
	No.8-36	36	D3T06033L087-I36UN TM...	6	3.30	57	8.7	3	3	3.5
No.6, No.8-32	No.10-32	32	D3T06025L074-I32UN TM...	6	2.55	57	7.4	3	3	2.8
No.8-32	No.10-32	32	D3T06032L100-I32UN TM...	6	3.20	57	10.0	3	3	3.5
	1/4”x28	28	D3T06052L132-I28UN TM...	6	5.25	57	13.2	3	3	5.5
No.10-24	5/16”x24	24	D3T06035L102-I24UN TM...	6	3.58	57	10.2	3	3	3.9
	5/16”x24	24	D3T08066L165-I24UN TM...	8	6.68	63	16.5	3	3	6.9
1/4”x20	7/16”x20	20	D3T06048L134-I20UN TM...	6	4.88	57	13.4	3	3	5.2
	7/16”x20	20	D3T010095L230-I20UN TM...	10	9.55	73	23.0	3	3	9.9
3/8”x16		16	D3T08067L191-I16UN TM...	8	6.70	63	19.1	3	3	8.0
7/16”x14		14	D3T10090L233-I14UN TM...	10	9.00	73	23.3	3	3	9.4

MilliPro

Miniature Thread Mills

3 x D_0 (L1 ≤ 3 x Thread Diameter)

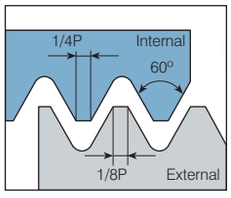
Thread		Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
UNC	**UNF**	**tpi**	**Internal**	**D**	**D2**	**L**	**L1**	**Z**	**Zt**	**mm**
	No.1-72	72	D3T06014L057-I72UN TM...	6	1.45	57	5.75	3	3	1.6
No.4, No.5-40	No.6-40	40	D3T06021L090-I40UN TM...	6	2.10	57	9.0	3	3	2.3
No.5-40	No.6-40	40	D3T06024L100-I40UN TM...	6	2.45	57	10.0	3	3	2.6
No.6, No.8-32	No.10-32	32	D3T06025L110-I32UN TM...	6	2.55	57	11.0	3	3	2.8
No.8-32	No.10-32	32	D3T06032L130-I32UN TM...	6	3.20	57	13.0	3	3	3.4
	1/4”x28	28	D3T06052L196-I28UN TM...	6	5.25	57	19.6	3	3	5.5
	5/16”x24	24	D3T08066L245-I24UN TM...	8	6.68	63	24.5	3	3	6.9
1/4”x20	7/16”x20	20	D3T06048L198-I20UN TM...	6	4.88	57	19.8	3	3	5.1

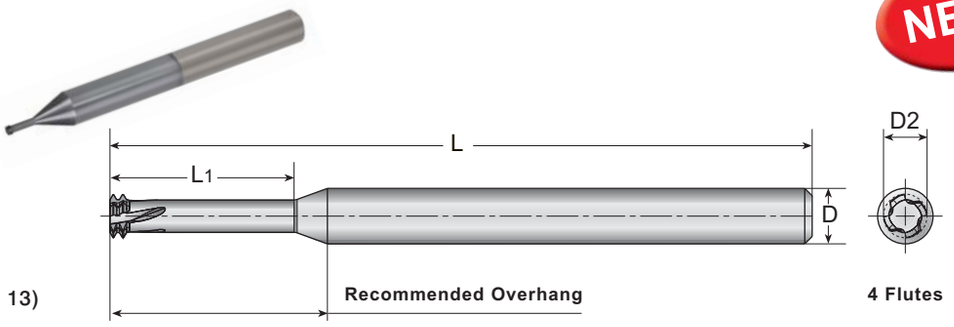
*Bore Diameter applies to smallest thread Dia.

ISO Metric

Internal

NEW!





Defined by: R262 (DIN 13)
Tolerance class: 6H

Left Hand Tool

MilliPro HD

Miniature Thread Mills for Hard Materials

2 x D_0 (L1 ≤ 2 x Thread Diameter)

Thread		Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
M Coarse	Fine	mm	Internal	D	D2	L	L1	Z	Zt	mm
M2x0.4		0.4	D2L06015L042-I0.4ISO TM...	6	1.55	76	4.60	4	2	1.6
M2.2x0.45		0.45	D2L06016L046-I0.45ISO TM...	6	1.65	76	5.05	4	2	1.8
M2.5x0.45		0.45	D2L06019L052-I0.45ISO TM...	6	1.95	76	5.65	4	2	2.05
M3x0.5	M3.5-M16x0.5	0.5	D2L06024L062-I0.5ISO TM...	6	2.40	76	6.75	4	2	2.55
M3.5x0.6		0.6	D2L06027L073-I0.6ISO TM...	6	2.75	76	7.90	4	2	2.95
M4x0.7		0.7	D2L06031L083-I0.7ISO TM...	6	3.15	76	9.05	4	2	3.35
M5x0.8		0.8	D2L06040L104-I0.8ISO TM...	6	4.05	76	11.20	4	2	4.3
M6x1.0	M8x-M40x1.0	1.0	D2L06048L125-I1.0ISO TM...	6	4.80	76	13.50	4	2	5.1
M8x1.25		1.25	D2L08065L166-I1.25ISO TM...	8	6.50	80	17.85	4	2	6.8
M10x1.5	M12-M48x1.50	1.5	D2L08079L208-I1.50ISO TM...	8	7.90	80	22.30	4	2	8.6
M12x1.75		1.75	D2L10099L250-I1.75ISO TM...	10	9.90	101	26.75	4	2	10.4

MilliPro HD

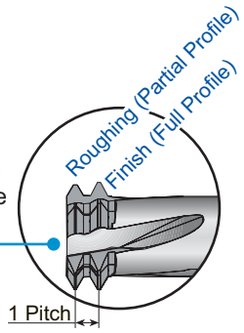
Miniature Thread Mills for Hard Materials

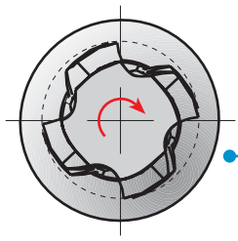
3 x D_0 (L1 ≤ 3 x Thread Diameter)

Thread		Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
M Coarse	Fine	mm	Internal	D	D2	L	L1	Z	Zt	mm
M2x0.4		0.4	D2L06015L062-I0.4ISO TM...	6	1.55	76	6.60	4	2	1.6
M2.5x0.45		0.45	D2L06019L077-I0.45ISO TM...	6	1.95	76	8.15	4	2	2.05
M3x0.5	M3.5-M16x0.5	0.5	D2L06024L092-I0.5ISO TM...	6	2.40	76	9.75	4	2	2.55
M4x0.7		0.7	D2L06031L123-I0.7ISO TM...	6	3.15	76	13.05	4	2	3.35
M5x0.8		0.8	D2L06040L154-I0.8ISO TM...	6	4.05	76	16.20	4	2	4.3
M6x1.0	M8-M40x1.0	1.0	D2L06048L185-I1.0ISO TM...	6	4.80	76	19.50	4	2	5.1
M8x1.25		1.25	D2L08065L246-I1.25ISO TM...	8	6.50	80	25.85	4	2	6.8

Two cutting teeth: Partial Profile for leading tooth followed by Full Profile for Finishing.

The work direction should be from the top to the bottom.



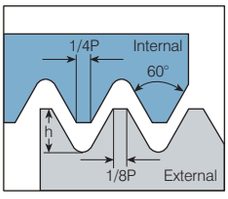


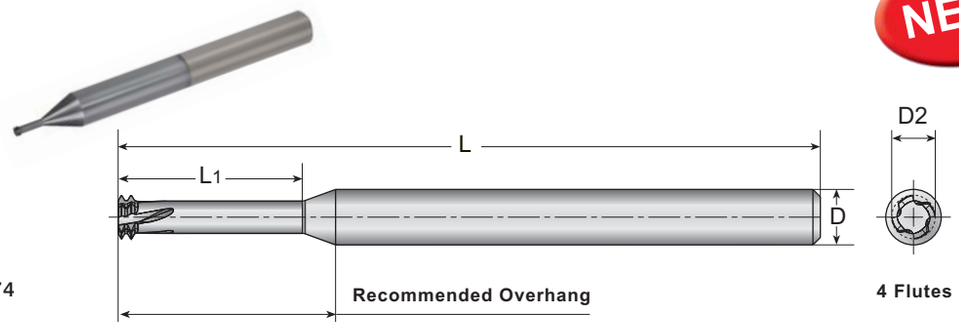
MilliPro HD Tools are left handed. For CNC use M04 code.

*Bore Diameter applies to smallest thread Dia.

American UN

Internal





NEW!

Defined by: ANSI B1.1.74
Tolerance class: 2B

Left Hand Tool

MilliPro HD

Miniature Thread Mills for Hard Materials

2 x D0 (L1≤ 2 x Thread Diameter)

Thread		Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
UNC	UNF	tpi	Internal	D	D2	L	L1	Z	Zt	mm
No.2-56	No. 3-56	56	D2L06016L050-I56UN TM...	6	1.65	76	5.45	4	2	1.80
No. 3-48	No. 4-48	48	D2L06019L060-I48UN TM...	6	1.90	76	6.53	4	2	2.10
No. 4-40 ; No. 5-40	No. 6-40	40	D2L06021L060-I40UN TM...	6	2.10	76	6.64	4	2	2.35
No. 5-40	No. 6-40	40	D2L06024L072-I40UN TM...	6	2.45	76	7.84	4	2	2.65
	No. 8-36	36	D2L06033L087-I36UN TM...	6	3.30	76	9.41	4	2	3.55
No. 6-32 ; No. 8-32	No. 10-32	32	D2L06025L074-I32UN TM...	6	2.55	76	8.20	4	2	2.85
No. 8-32	No. 10-32	32	D2L06032L100-I32UN TM...	6	3.20	76	10.79	4	2	3.50
	1/4"-28	28	D2L06052L132-I28UN TM...	6	5.25	76	14.11	4	2	5.55
No. 10-24	5/16"-24	24	D2L06035L102-I24UN TM...	6	3.58	76	11.26	4	2	3.90
	5/16"-24	24	D2L08066L165-I24UN TM...	8	6.68	80	17.56	4	2	7.00
1/4"-20	7/16"-20	20	D2L06048L134-I20UN TM...	6	4.88	76	14.67	4	2	5.20
	7/16"-20	20	D2L10095L230-I20UN TM...	10	9.55	101	24.27	4	2	9.90
3/8"x16		16	D2L08076L197-I16UN TM...	8	7.65	80	21.29	4	2	8.00
7/16"-14		14	D2L10090L233-I14UN TM...	10	9.00	101	25.11	4	2	9.50
1/2"-13		13	D2L10099L256-I13UN TM...	10	9.90	101	27.55	4	2	10.90

MilliPro HD

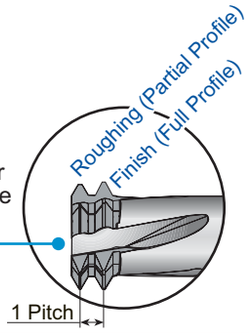
Miniature Thread Mills for Hard Materials

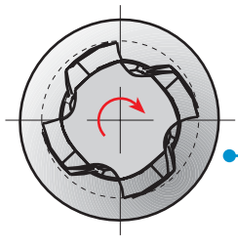
3 x D0 (L1≤ 3 x Thread Diameter)

Thread		Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
UNC	UNF	tpi	Internal	D	D2	L	L1	Z	Zt	mm
No. 4-40, No. 5-40	No. 6-40	40	D2L06021L090-I40UN TM...	6	2.10	76	9.64	4	2	2.35
No. 5-40	No. 6-40	40	D2L06024L100-I40UN TM...	6	2.45	76	10.64	4	2	2.65
No. 6-32, No. 8-32	No. 10-32	32	D2L06025L110-I32UN TM...	6	2.55	76	11.79	4	2	2.85
No. 8-32	No. 10-32	32	D2L06032L130-I32UN TM...	6	3.20	76	13.79	4	2	3.50
	1/4"-28	28	D2L06052L196-I28UN TM...	6	5.25	76	20.51	4	2	5.55
	5/16"-24	24	D2L08066L245-I24UN TM...	8	6.68	80	25.56	4	2	7.00
1/4"-20	7/16"-20	20	D2L06048L198-I20UN TM...	6	4.88	76	21.07	4	2	5.20
7/16"-14		14	D2L10090L335-I14UN TM...	10	9.00	101	35.31	4	2	9.50

Two cutting teeth: Partial Profile for leading tooth followed by Full Profile for Finishing.

The work direction should be from the top to the bottom.



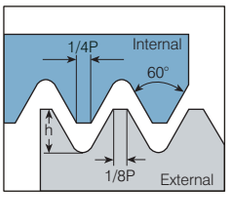


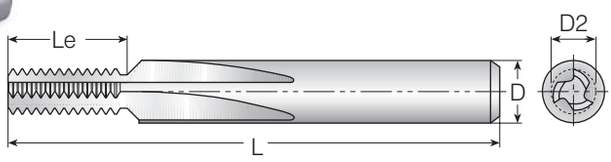
MilliPro HD Tools are left handed. For CNC use M04 code.

*Bore Diameter applies to smallest thread Dia.

ISO Metric

External / Internal





Defined by: R262 (DIN 13)
Tolerance class: 6g/6H

Straight Flutes - External

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	
Min. Dia.	**mm**	**External**	**D**	**D2**	**L**	**Le**	**Z**	**Zt**	**h** mm
M3	0.50	S06059-E0.5ISO TM...	6	5.90	57	15.0	3	30	0.31
M4.5	0.75	S08079-E0.75ISO TM...	8	7.90	63	19.5	3, 5 *	26	0.46
M6	1.00	S10099-E1.0ISO TM...	10	9.90	72	24.0	5	24	0.61
M10	1.50	S12119-E1.5ISO TM...	12	11.90	83	30.0	5	20	0.92
M14	2.00	S12119-E2.0ISO TM...	12	11.90	83	30.0	5	15	1.23
M24	3.00	S16159-E3.0ISO TM...	16	15.90	92	36.0	5	12	1.84
M36	4.00	S16159-E4.0ISO TM...	16	15.90	92	40.0	5	10	2.45
M64	6.00	S20199-E6.0ISO TM...	20	19.90	104	36.0	5	6	3.68

* Available with 3 and 5 flutes. Add 3 or 5 to the ordering code (TM3.../TM5...)

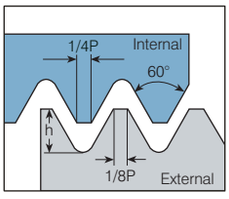
Straight Flutes - Internal

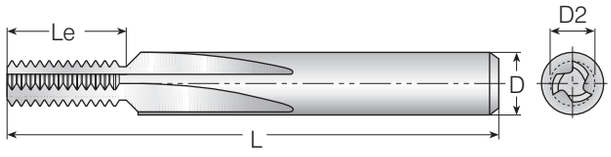
Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	
Min. Dia.	**mm**	**Internal**	**D**	**D2**	**L**	**Le**	**Z**	**Zt**	**h** mm
M4.5	0.75	S04030-I0.75ISO TM...	4	3.00	42	6.7	3	9	0.43
M8	0.75	S06059-I0.75ISO TM...	6	5.90	57	15.0	3	20	0.43
M5	0.80	S04036-I0.8ISO TM...	4	3.60	42	8.0	3	10	0.46
M6	1.00	S06040-I1.0ISO TM...	6	4.00	57	9.0	3	9	0.58
M12	1.00	S08079-I1.0ISOTM...	8	7.90	63	20.0	3, 5 *	20	0.58
M8	1.25	S06050-I1.25ISO TM...	6	5.00	57	12.5	3	10	0.72
M10	1.50	S06059-I1.5ISO TM...	6	5.90	57	15.0	3	10	0.87
M14	1.50	S10099-I1.5ISO TM...	10	9.90	72	24.0	5	16	0.87
M18	1.50	S12119-I1.5ISO TM...	12	11.90	83	30.0	5	20	0.87
M12	1.75	S08079-I1.75ISO TM...	8	7.90	63	19.2	3, 5 *	11	1.01
M16	2.00	S10099-I2.0ISO TM...	10	9.90	72	24.0	5	12	1.15
M18	2.00	S12119-I2.0ISO TM...	12	11.90	83	30.0	5	15	1.15
M20	2.50	S12119-I2.5ISO TM...	12	11.90	83	30.0	5	12	1.44
M24	3.00	S16159-I3.0ISO TM...	16	15.90	92	36.0	5	12	1.73
M30	3.50	S16159-I3.5ISO TM...	16	15.90	92	38.5	5	11	2.02
M36	4.00	S16159-I4.0ISO TM...	16	15.90	92	40.0	5	10	2.31
M48	5.00	S20199-I5.0ISO TM...	20	19.90	104	40.0	5	8	2.89
M64	6.00	S20199-I6.0ISO TM...	20	19.90	104	36.0	5	6	3.46

* Available with 3 and 5 flutes. Add 3 or 5 to the ordering code (TM3.../TM5...)

American UN

External / Internal





Defined by: ANSI B1.174
Tolerance class: 2A/2B

Straight Flutes - External

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	
Min. Dia.	**tpi**	**External**	**D**	**D2**	**L**	**Le**	**Z**	**Zt**	**h** mm
No.6	32	S06059-E32UN TM...	6	5.90	57	14.3	3	18	0.49
No.12	28	S08079-E28UN TM...	8	7.90	63	19.9	3, 5 *	22	0.56
1/4”	20	S10099-E20UN TM...	10	9.90	72	22.9	5	18	0.78
5/16”	18	S10099-E18UN TM...	10	9.90	72	24.0	5	17	0.87
3/8”	16	S12119-E16UN TM...	12	11.90	83	28.6	5	18	0.97
9/16”	12	S12119-E12UN TM...	12	11.90	83	29.6	5	14	1.30
1”	8	S16159-E8UN TM...	16	15.90	92	38.1	5	12	1.95
1 3/8”	6	S20199-E6UN TM...	20	19.90	104	38.1	5	9	2.60

* Available with 3 and 5 flutes. Add 3 or 5 to the ordering code (TM3.../TM5...)

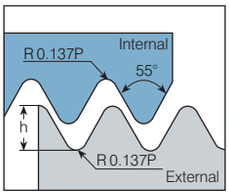
Straight Flutes - Internal

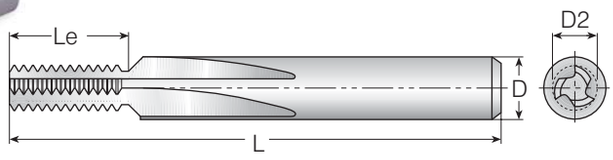
Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	
Min. Dia.	**tpi**	**Internal**	**D**	**D2**	**L**	**Le**	**Z**	**Zt**	**h** mm
No.8	36	S04030-I36UN TM...	4	3.00	42	6.3	3	9	0.41
No.8	32	S04030-I32UN TM...	4	3.00	42	6.3	3	8	0.46
5/16”	32	S06059-I32UN TM...	6	5.90	57	14.3	3	18	0.46
No.12	28	S04036-I28UN TM...	4	3.60	42	8.2	3	9	0.52
7/16”	28	S08079-I28UN TM...	8	7.90	63	19.9	3 , 5*	22	0.52
No.12	24	S06040-I24UN TM...	6	4.00	57	8.5	3	8	0.61
1/4”	20	S06040-I20UN TM...	6	4.00	57	10.2	3	8	0.73
9/16”	20	S10099-I20UN TM...	10	9.90	72	22.9	5	18	0.73
5/16”	18	S06050-I18UN TM...	6	5.00	57	12.7	3	9	0.81
9/16”	18	S10099-I18UN TM...	10	9.90	72	24.0	5	17	0.81
3/8”	16	S06059-I16UN TM...	6	5.90	57	14.3	3	9	0.92
3/4”	16	S12119-I16UN TM...	12	11.90	83	28.6	5	18	0.92
7/16”	14	S08079-I14UN TM...	8	7.90	63	18.1	3 , 5*	10	1.05
1/2”	13	S08079-I13UN TM...	8	7.90	63	19.5	3 , 5*	10	1.13
9/16”	12	S10099-I12UN TM...	10	9.90	72	23.3	5	11	1.22
1”	12	S12119-I12UN TM...	12	11.90	83	29.6	5	14	1.22
5/8”	11	S10099-I11UN TM...	10	9.90	72	23.1	5	10	1.33
3/4”	10	S12119-I10UN TM...	12	11.90	83	27.9	5	11	1.47
7/8”	9	S16159-I9UN TM...	16	15.90	92	33.3	5	12	1.63
1”	8	S16159-I8UN TM...	16	15.90	92	38.1	5	12	1.83
1 1/8”	7	S16159-I7UN TM...	16	15.90	92	36.3	5	10	2.09
1 3/8”	6	S20199-I6UN TM...	20	19.90	104	38.1	5	9	2.44
1 3/4”	5	S20199-I5UN TM...	20	19.90	104	40.6	5	8	2.93
2”	4.5	S20199-I4.5UN TM...	20	19.90	104	39.5	5	7	3.26

* Available with 3 and 5 flutes. Add 3 or 5 to the ordering code (TM3.../TM5...)

BSW

External / Internal





Defined by: B.S.84:1956, DIN 259, ISO228/1:1982
Tolerance class: Medium class A

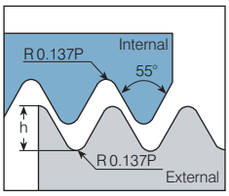
Straight Flutes

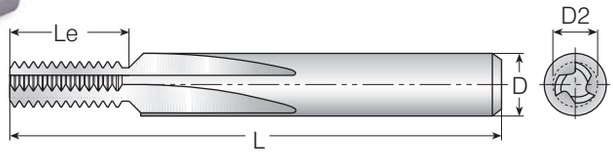
Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	
Min. Dia.	**tpi**	**External / Internal**	**D**	**D2**	**L**	**Le**	**Z**	**Zt**	**h** mm
1/4"	20	S06040-EI20BSW TM...	6	4.00	57	10.16	3	8	0.81
5/16"	18	S06050-EI18BSW TM...	6	5.00	57	11.29	3	8	0.90
3/8"	16	S06059-EI16BSW TM...	6	5.90	57	14.29	3	9	1.02
7/16"	14	S08079-EI14BSW TM...	8	7.90	63	18.14	3 , 5*	10	1.16
1/2"	12	S08079-EI12BSW TM...	8	7.90	63	19.05	3 , 5*	9	1.36
5/8"	11	S10099-EI11BSW TM...	10	9.90	72	23.09	5	10	1.48
3/4"	10	S12119-EI10BSW TM...	12	11.90	83	27.94	5	11	1.63
7/8"	9	S12119-EI9BSW TM...	12	11.90	83	28.22	5	10	1.81
1"	8	S16159-EI8BSW TM...	16	15.90	92	38.10	5	12	2.03
1 1/8"	7	S16159-EI7BSW TM...	16	15.90	92	36.29	5	10	2.32
1 3/8"	6	S16159-EI6BSW TM...	16	15.90	92	38.10	5	9	2.71
1 5/8"	5	S20199-EI5BSW TM...	20	19.90	104	40.64	5	8	3.25
1 7/8"	4.5	S20199-EI4.5BSW TM...	20	19.90	104	39.51	5	7	3.61

* Available with 3 and 5 flutes. Add 3 or 5 to the ordering code (TM3.../TM5...)

BSP

External / Internal





Defined by: B.S.2779:1956
Tolerance class: Medium class

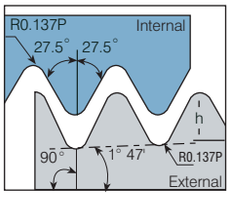
Straight Flutes

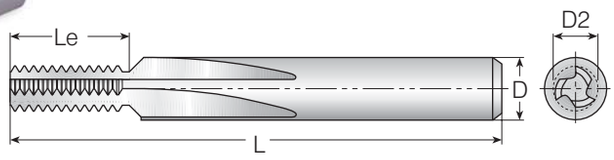
Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	
Min. Dia.	**tpi**	**External / Internal**	**D**	**D2**	**L**	**Le**	**Z**	**Zt**	**h** mm
1/16"	28	S06059-EI28BSP TM...	6	5.90	57	14.51	3	16	0.58
1/4"	19	S08079-EI19BSP TM...	8	7.90	63	18.72	3 , 5*	14	0.86
1/2"	14	S12119-EI14BSP TM...	12	11.90	83	29.03	5	16	1.16
1"	11	S16159-EI11BSP TM...	16	15.90	92	34.64	5	15	1.48

* Available with 3 and 5 flutes. Add 3 or 5 to the ordering code (TM3.../TM5...)

BSPT

External / Internal





Defined by: B.S.21:1985
Tolerance class: Standard BSPT

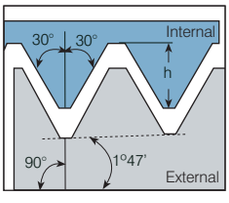
Straight Flutes

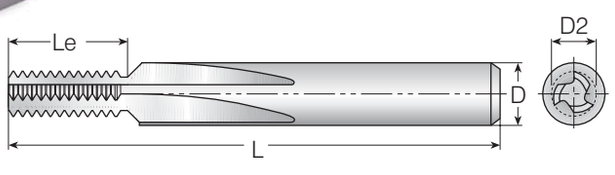
Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	
Min. Dia.	**tpi**	**External / Internal**	**D**	**D2**	**L**	**Le**	**Z**	**Zt**	**h** mm
1/16"	28	S06059-EI28BSPT TM...	6	5.90	57	9.98	3	11	0.58
1/4"	19	S08079-EI19BSPT TM...	8	7.90	63	14.71	3 , 5*	11	0.86
1/2"	14	S12119-EI14BSPT TM...	12	11.90	83	19.96	5	11	1.16
1"	11	S16159-EI11BSPT TM...	16	15.90	92	39.25	5	17	1.48

* Available with 3 and 5 flutes. Add 3 or 5 to the ordering code (TM3.../TM5...)

NPT

External / Internal





Defined by: USAS B2.1:1968
Tolerance class: Standard NPT

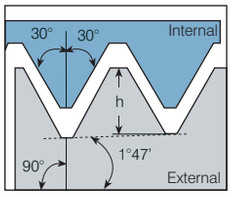
Straight Flutes

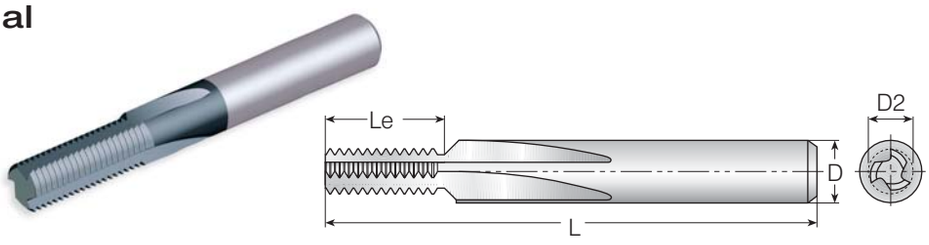
Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	
Min. Dia.	**tpi**	**External / Internal**	**D**	**D2**	**L**	**Le**	**Z**	**Zt**	**h** mm
1/16"	27	S06059-EI27NPT TM...	6	5.90	57	9.41	3	10	0.66
1/4"	18	S08079-EI18NPT TM...	8	7.90	63	14.11	3 , 5*	10	1.01
1/2"	14	S12119-EI14NPT TM...	12	11.90	83	19.96	5	11	1.33
1"	11.5	S16159-EI11.5NPT TM...	16	15.90	92	26.51	5	12	1.64
2 1/2"	8	S16159-EI8NPT TM...	16	15.90	92	38.10	5	12	2.42

* Available with 3 and 5 flutes. Add 3 or 5 to the ordering code (TM3.../TM5...)

NPTF

External / Internal





Defined by: ANSI 1.20.3-1976
Tolerance class: Standard NPTF

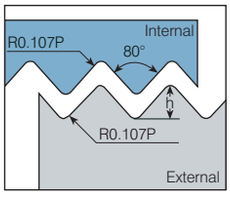
Straight Flutes

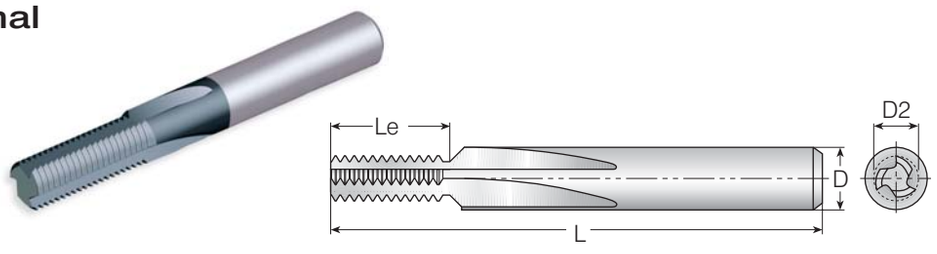
Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	
Min. Dia.	**tpi**	**External / Internal**	**D**	**D2**	**L**	**Le**	**Z**	**Zt**	**h** mm
1/16"	27	S06059-EI27NPTF TM...	6	5.90	57	9.41	3	10	0.64
1/4"	18	S08079-EI18NPTF TM...	8	7.90	63	14.11	3 , 5*	10	1.0
1/2"	14	S12119-EI14NPTF TM...	12	11.90	83	19.96	5	11	1.35
1"	11.5	S16159-EI11.5NPTF TM...	16	15.90	92	26.51	5	12	1.63
2 1/2"	8	S16159-EI8NPTF TM...	16	15.90	92	38.10	5	12	2.38

* Available with 3 and 5 flutes. Add 3 or 5 to the ordering code (TM3.../TM5...)

Pg

External / Internal





Defined by: DIN 40430
Tolerance class: Standard

Straight Flutes

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	
	tpi	**External / Internal**	**D**	**D2**	**L**	**Le**	**Z**	**Zt**	**h** mm
Pg7	20	S08079-EI20PG TM...	8	7.90	63	19.05	3 , 5*	15	0.61
Pg9, 11, 13.5, 16	18	S10099-EI18PG TM...	10	9.90	72	23.99	5	17	0.67
Pg21, 29, 36, 42, 48	16	S12119-EI16PG TM...	12	11.90	83	28.58	5	18	0.76

* Available with 3 and 5 flutes. Add 3 or 5 to the ordering code (TM3.../TM5...)

About Thread Milling

In order to perform a thread milling operation, a milling machine with three-axis control capable of helical interpolation is required. Helical interpolation is a CNC function producing tool movement along a helical path. This helical motion combines circular movement in one plane with a simultaneous linear motion in a plane perpendicular to the first. For example, the path from point A to point B (Fig. A) on the envelope of the cylinder combines a circular movement in the xy plane with a linear displacement in the z direction.
On most CNC systems this function can be executed in two different ways:

GO2: Helical interpolation in a clockwise direction
GO3: Helical interpolation in a counter-clockwise direction

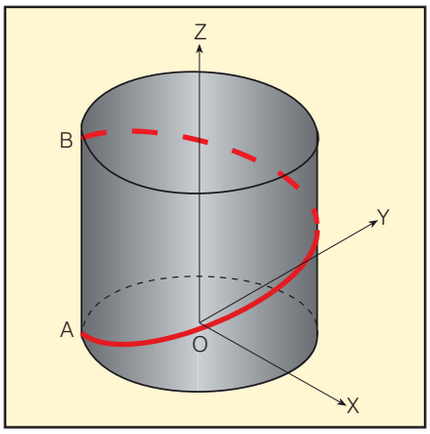


Fig. A

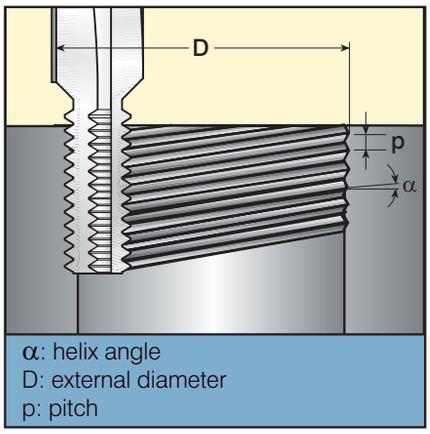


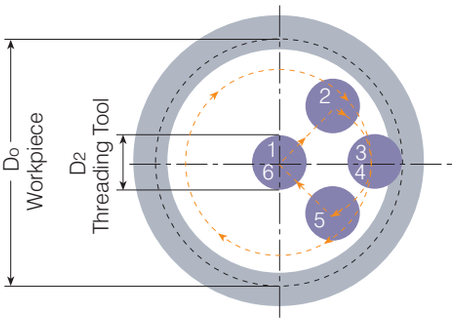
Fig. B

The thread milling operation (Fig. B) consists of circular rotation of the tool around its own axis together with an orbiting motion along the bore or workpiece circumference. During one such orbit, the tool will shift vertically one pitch length. These movements combined with the insert geometry create the required thread form.
There are two acceptable ways of approaching the workpiece with the tool to initiate production of the thread: tangential arc approach and radial approach.

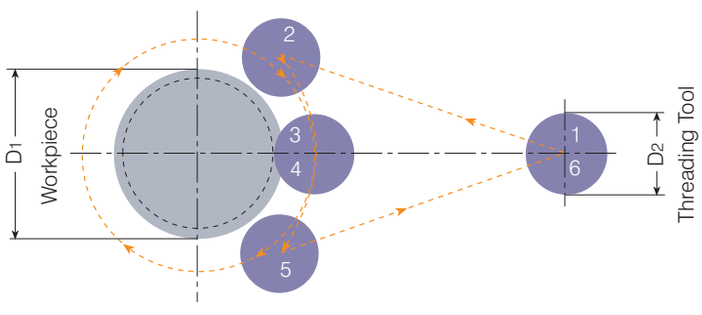
Tangential Arc Approach

With this method, the tool enters and exits the workpiece smoothly. No marks are left on the workpiece and there is no vibration, even with harder materials. Although it requires slightly more complex programming than the radial approach (see below), this is the method recommended for machining the highest quality threads.

Internal Thread



External Thread



1-2: rapid approach
2-3: tool entry along tangential arc, with simultaneous feed along z-axis
3-4: helical movement during one full orbit (360°).
4-5: tool exit along tangential arc, with continuing feed along z-axis
5-6: rapid return

Note: **Perform dry run above the material, before machining.**

Cutting Speeds Vc [m/min] and Feed f [mm/tooth]
(Not Including HTC & MilliPro Hard)

	Material		Hardness Brinell HB	Vc[m/min]			Feed f [mm/tooth] *				
				Helical Flutes, Straight Flutes, Deep Threading, Helicool Line		MilliPro	Helical Flutes	Straight Flutes	Deep Threading	HeliCool Line	MilliPro
				Coated		Coated					
				VTH	VTS	VTH					
P	Unalloyed steel	Low carbon (C=0.1-0.25 %)	125	80-250	50-180	60-120	0.03-0.15	0.01-0.1	0.03-0.23	0.024-0.289	0.03-0.12
		Medium carbon (C=0.25-0.55 %)	150	80-230	50-140	60-120	0.03-0.1	0.01-0.08	0.03-0.15	0.021-0.26	0.03-0.12
		High carbon (C=0.55-0.85 %)	170	80-200	50-120	60-90	0.03-0.08	0.01-0.05	0.03-0.12	0.019-0.231	0.03-0.12
	Low alloy steel (alloying elements ≤ 5%)	Non hardened	180	60-180	60-170	60-90	0.03-0.1	0.03-0.07	0.03-0.15	0.018-0.217	0.03-0.1
		Hardened	275	60-170	60-160	50-80	0.03-0.07	0.03-0.07	0.03-0.11	0.012-0.145	0.03-0.07
		Hardened	350	60-160	60-150	50-80	0.01-0.03	0.005-0.01	0.01-0.05	0.009-0.101	0.03
	High alloy steel (alloying elements > 5%)	Annealed	200	40-100	40-90	50-80	0.03-0.05	0.01-0.03	0.03-0.08	0.011-0.13	0.03-0.05
		Hardened	325	30-80	30-70	50-80	0.01-0.03	0.005-0.01	0.01-0.05	0.01-0.116	0.03
	Cast steel	Low alloy (alloying elements <5%)	200	80-250	70-200	70-90	0.03-0.1	0.01-0.03	0.03-0.15	0.012-0.145	0.03-0.1
		High alloy (alloying elements >5%)	225	60-170	60-150	60-80	0.01-0.03	0.005-0.01	0.01-0.05	0.009-0.101	0.03
M	Stainless steel Ferritic	Non hardened	200	60-150	50-140	60-90	0.04-0.1	0.01-0.05	0.04-0.15	0.011-0.13	0.03-0.1
		Hardened	330	60-120	50-110	50-80	0.01-0.05	0.005-0.01	0.01-0.08	0.01-0.123	0.03
	Stainless steel Austenitic	Austenitic	180	60-140	60-130	60-90	0.04-0.1	0.007-0.02	0.04-0.15	0.01-0.116	0.03-0.1
		Super austenitic	200	60-130	50-120	50-80	0.04-0.1	0.007-0.02	0.04-0.15	0.009-0.101	0.03-0.1
	Stainless steel Cast ferritic	Non hardened	200	60-160	50-150	60-90	0.04-0.1	0.01-0.03	0.04-0.15	0.012-0.145	0.03-0.1
		Hardened	330	60-110	50-100	50-80	0.03-0.05	0.005-0.01	0.03-0.08	0.009-0.101	0.03
	Stainless steel Cast austenitic	Austenitic	200	60-150	50-140	60-90	0.04-0.1	0.01-0.03	0.04-0.15	0.01-0.116	0.03-0.1
		Hardened	330	60-100	50-90	50-80	0.03-0.05	0.005-0.01	0.03-0.08	0.009-0.101	0.03
	High temperature alloys	Annealed (Iron based)	200	30-60	30-50	60	0.04-0.1	0.007-0.02	0.04-0.15	0.007-0.087	0.03-0.1
		Aged (Iron based)	280	20-50	20-40	50	0.01-0.03	0.005-0.01	0.01-0.05	0.006-0.073	0.03
		Annealed (Nickel or Cobalt based)	250	15-35	15-30	35	0.01-0.03	0.005-0.01	0.01-0.05	0.005-0.058	0.03
		Aged (Nickel or Cobalt based)	350	15-30	15-25	30	0.01-0.03	0.005-0.01	0.01-0.05	0.005-0.058	0.03
	Titanium alloys	Pure 99.5 Ti	400Rm	40-80	30-70	30-50	0.03-0.05	0.007-0.02	0.03-0.08	0.006-0.073	0.03-0.06
		α+β alloys	1050Rm	20-50	20-45	25-35	0.03-0.05	0.007-0.02	0.03-0.08	0.006-0.073	0.03-0.07
K	Extra hard steel	Hardened & tempered	55HRc	15-45	15-35	45	0.005-0.01	0.003-0.006	0.005-0.02	0.004-0.044	0.01
	Malleable cast iron	Ferritic (short chips)	130	70-160	60-150	50-80	0.01-0.03	0.007-0.02	0.01-0.05	0.012-0.145	0.03
		Pearlitic (long chips)	230	60-150	100	60-90	0.03-0.05	0.005-0.01	0.03-0.08	0.01-0.116	0.05
	Grey cast iron	Low tensile strength	180	70-160	50-140	70-100	0.05-0.1	0.007-0.02	0.05-0.15	0.011-0.13	0.04-0.1
		High tensile strength	260	40-120	40-110	60-90	0.03-0.05	0.005-0.01	0.03-0.08	0.01-0.116	0.05
	Nodular SG iron	Ferritic	160	40-110	40-100	70-100	0.05-0.1	0.007-0.02	0.05-0.15	0.011-0.13	0.04-0.1
		Pearlitic	260	40-100	40-90	60-90	0.03-0.05	0.005-0.01	0.03-0.08	0.01-0.116	0.05
	Aluminium alloys Wrought	Non aging	60	200-300	150-250	60-250	0.1-0.25	0.05-0.15	0.10-0.38	0.035-0.433	0.05-0.15
		Aged	100	150-250	100-220	60-150	0.1-0.2	0.03-0.1	0.10-0.30	0.029-0.361	0.04-0.12
	Aluminium alloys	Cast	75	100-200	80-150	60-250	0.1-0.2	0.05-0.15	0.10-0.30	0.029-0.361	0.04-0.12
		Cast & aged	90	120-220	90-160	60-150	0.1-0.15	0.03-0.1	0.10-0.23	0.024-0.289	0.03-0.10
	Aluminium alloys	Cast Si 13-22%	130	200-300	150-250	250	0.1-0.2	0.05-0.15	0.10-0.30	0.029-0.361	0.05-0.1
	Copper and copper alloys	Brass	90	200-300	150-250	60-250	0.1-0.25	0.05-0.15	0.10-0.38	0.035-0.433	0.04-0.12
		Bronze and non leaded copper	100	150-250	100-220	60-150	0.1-0.2	0.03-0.1	0.10-0.30	0.029-0.361	0.05-0.1

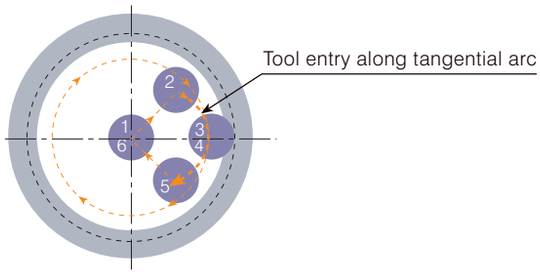
***Recommendation:**

At tool entry, set the Feed f [mm/tooth] to 70% lower than the threading Feed.

Example:

Threading Feed: 0.3[mm/tooth]

Tool entry Feed: 0.09[mm/tooth]



Grades and their Applications

Grade	Applications
VTH	A general-purpose, heavy duty thread milling grade. TiCN coated for high resistance to wear.

Helicool

New Helical

Deep Threading

HCR

HCC

MilliPro

MilliPro HD

Grade	Applications
VTS	A general-purpose grade, specially designed for TM Solid Straight Flute cutters. TiAlN coated for high resistance to wear.

Straight

Cutting Speeds Vc [m/min] and Feed f [mm/tooth]

(For MilliPro HD)

	Material		Hardness HB, HRC	Vc[m/min]	Feed f [mm/tooth] by Cutting Dia. =D2				
				MilliPro Hard / VTH	1.5-2.5	2.5-5	5-7	7-9	9-11
P	Low alloy steel (alloying elements ≤ 5%)	Hardened	350HB	25-160	0.04	0.05	0.06	0.07	0.08
P	High alloy steel (alloying elements > 5%)	Hardened	325HB	25-80					
M	Stainless steel Ferritic	Hardened	330HB	25-120	0.04	0.05	0.06	0.07	0.08
M	Stainless steel Cast ferritic	Hardened	330HB	25-110					
M	Stainless steel Cast austenitic	Hardened	330HB	25-100					
M	High temperature alloys	Annealed (Nickel or Cobalt based)	250HB	15-35	0.03	0.04	0.05	0.06	0.07
M		Aged (Nickel or Cobalt based)	350HB	15-30					
M	Titanium alloys	Pure 99.5 Ti	400Rm	25-70					
M		α+β alloys	1050Rm	20-50					
K	Extra hard steel	Hardened & tempered	40-50HRc	25-70	0.04	0.05	0.06	0.07	0.08
K			51-55HRc	25-60	0.03	0.04	0.05	0.06	0.07
K			56-62HRc	25-50	0.02	0.03	0.04	0.05	0.06
K	Malleable cast iron	Ferritic (short chips)	130HB	25-160	0.05	0.06	0.07	0.08	0.1
K		Pearlitic (long chips)	230HB	25-150	0.04	0.05	0.06	0.07	0.08
K	Grey cast iron	Low tensile strength	180HB	25-130	0.05	0.06	0.07	0.08	0.1
K		High tensile strength	260HB	25-100	0.04	0.05	0.06	0.07	0.08
K	Nodular SG iron	Ferritic	160HB	25-125	0.04	0.05	0.06	0.07	0.09
K		Pearlitic	260HB	25-90	0.03	0.04	0.05	0.06	0.07

HTC Technical Data

Recommended Grades, Cutting Speeds and Feeds

			Hardness Brinell (HB)	Strength (N-mm²)	Vc [m/min]		fb [mm/rev]		fz [mm/tooth]	
					VTN	VTS	≤6mm	≤12mm	≤6mm	≤12mm
K	Cast Iron	Grey cast iron	≤150	≤500	50-80	80-120	0.10-0.15	0.15-0.22	0.02-0.05	0.05-0.10
		Grey cast iron, heat treated	150-300	500-1000	50-80	80-120	0.10-0.15	0.15-0.22	0.02-0.05	0.05-0.10
		Spher. graph. Cast Iron	≤200	≤700	50-80	80-120	0.10-0.15	0.15-0.22	0.02-0.05	0.05-0.10
	Copper	Short Chips, Brass, Bronze, Red Brass	≤200	≤700	100-300	—	0.10-0.30	0.06-0.10	0.03-0.06	0.06-0.10
	Aluminum / Magnesium	Aluminum, Magnesium non-alloy	≤100	≤350	100-400	100-400	0.10-0.25	0.25-0.30	0.03-0.06	0.06-0.10
		Aluminum, Wrought Alloy, Breaking Strain (A5) < 14%	≤180	≤600	100-400	100-400	0.10-0.25	0.25-0.30	0.03-0.06	0.06-0.10
		Aluminum, Wrought Alloy, Breaking Strain (A5) ≥14%	≤180	≤600	100-400	100-400	0.03-0.06	0.06-0.12	0.03-0.06	0.06-0.10
		Aluminum, Cast Alloy, Si<10%	≤180	≤600	100-300	100-400	0.10-0.25	0.25-0.30	0.03-0.06	0.06-0.10
		Aluminum, Cast Alloy, Si≥10%	≤180	≤600	—	100-300	0.10-0.25	0.25-0.30	0.03-0.06	0.06-0.10
	Plastics	Thermoplastics	—	—	60-120	60-120	0.10-0.25	0.25-0.30	0.03-0.06	0.06-0.10
		Thermosetting plastic	—	—	60-100	60-100	0.10-0.25	0.25-0.30	0.03-0.06	0.06-0.10
		Fibre Reinforced Plastic	—	—	40-60	60-80	0.10-0.15	0.15-0.22	0.02-0.05	0.05-0.10

Vc - Cutting Speed [m/min]

f_b (Drilling) - Feed per Revolution [mm/rev]

f_z (Threading) - Feed per Tooth [mm/tooth]

Grade	Application	Sample
VTN	Uncoated grade, First choice for Aluminum and general use.	
VTS	TiAlN coated grade, First choice for Cast iron, and general use.	

Learn more about using Thread Milling Tools

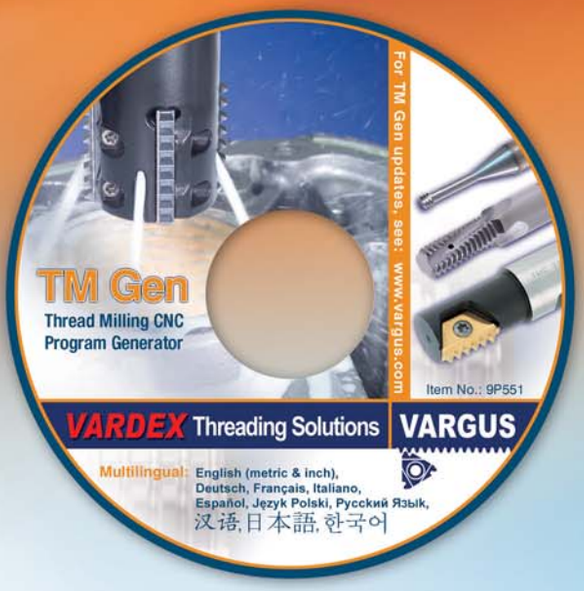
Thread Milling Advantages CD

Thread Milling Handbook

Also available on TM Gen CD!

www.vargus.com

VARGUS Makes Thread Milling Easy!



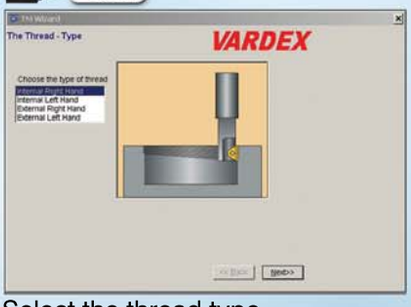
TM Gen
CNC Program Generator

VARDEX TM Gen generates the CNC program for your thread-milling application in just seconds.

- Multilingual
- Compatible with Windows
- Works with Fanuc, Mazatrol, Siemens, Mitsubishi and Heidenhain (horizontal & vertical)

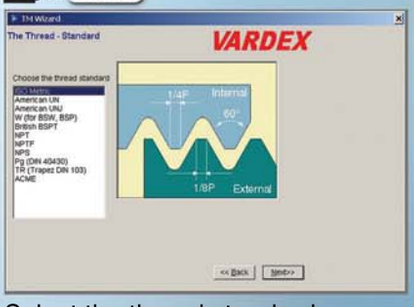
Six Clicks and You're Done!

Click



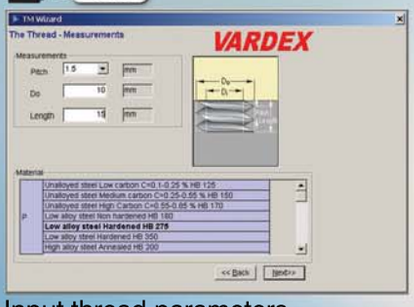
Select the thread type

Click



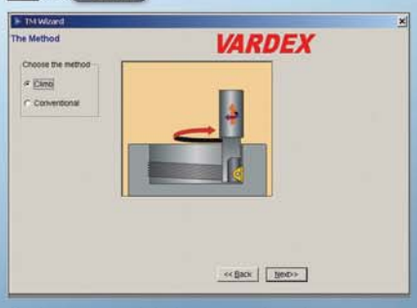
Select the thread standard

Click



Input thread parameters

Click



Select machining method

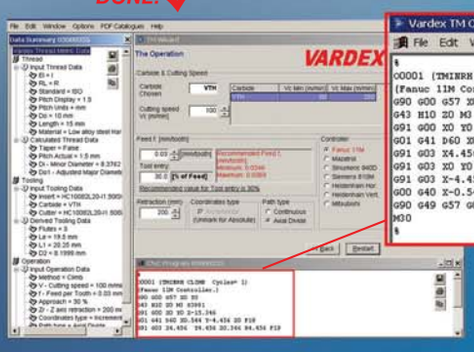
Click

Select a tool

Click

Define cutting data & controller

DONE!



Note: New versions and updates are provided regularly on the VARGUS website at:
www.vargus.com

Downloading TM Gen is easy too!
Just go to: **www.vargus.com**

Ask for the VARDEX General Catalog

TM Gen

VARDEX TM Gen software - the fast and easy way to select the right tool and generate your CNC milling program.

Software and updated versions can be downloaded from: www.vargus.com

VARDEX www.vargus.com

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