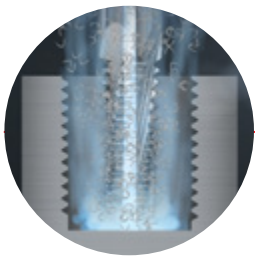


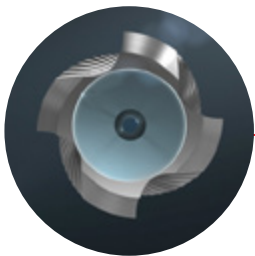
Improved Cutting Edge & Reinforced Geometry

For high loads



Coolant Thru

For better chip flow and surface finish



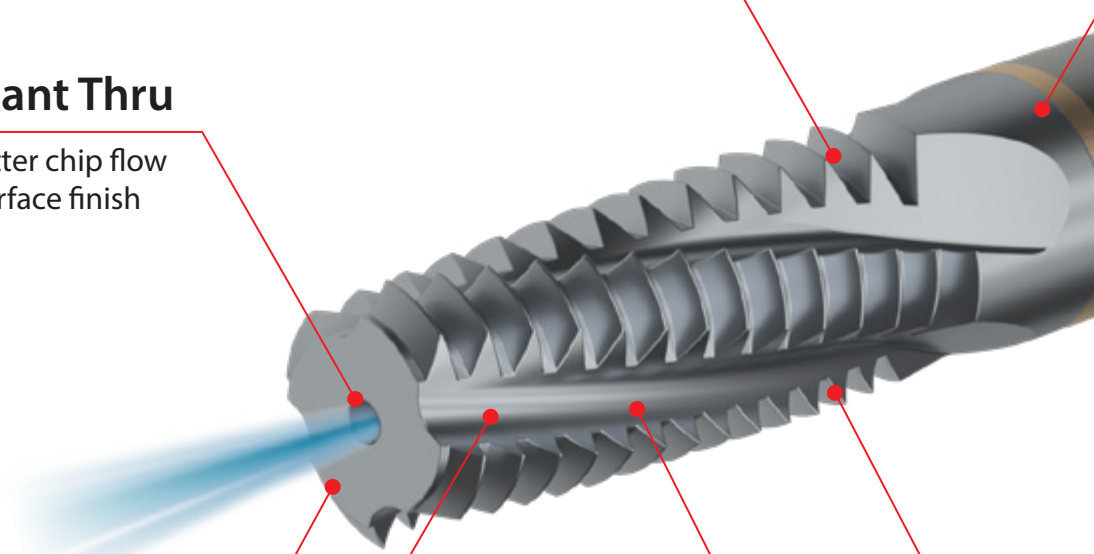
Large Core Diameter

For increased stability



Additional Flutes

For higher feed rate

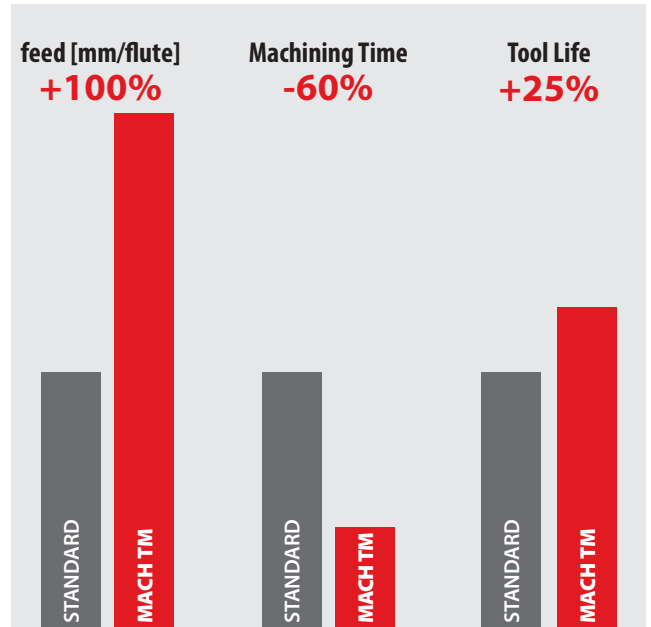
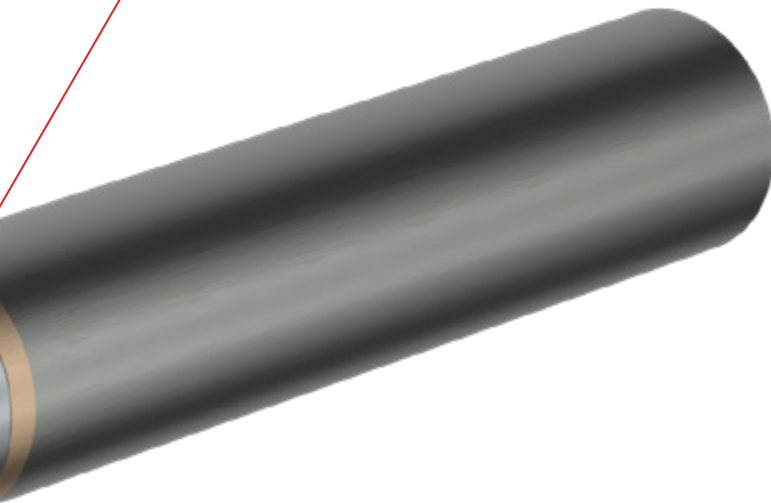
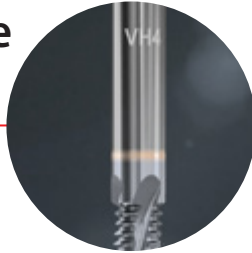




UNMATCHED PRODUCTIVITY

New Innovative VH4 Grade

High wear resistance
for general purpose
applications - TiCN PVD
Coating

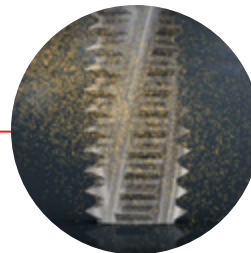


ADVANTAGES

- ✓ High feed mm/flute
- ✓ Dramatically decreases machining time
- ✓ Extended tool life
- ✓ Excellent surface finish

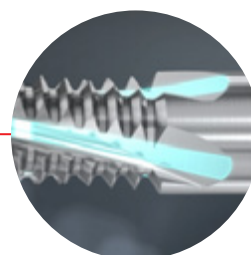
Advanced Surface Treatment

Reinforced cutting edge and improved surface
finish



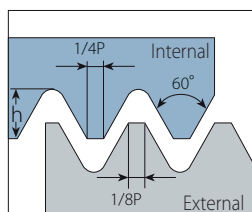
Optimal Flute Length

For higher rigidity and efficient chip
evacuation

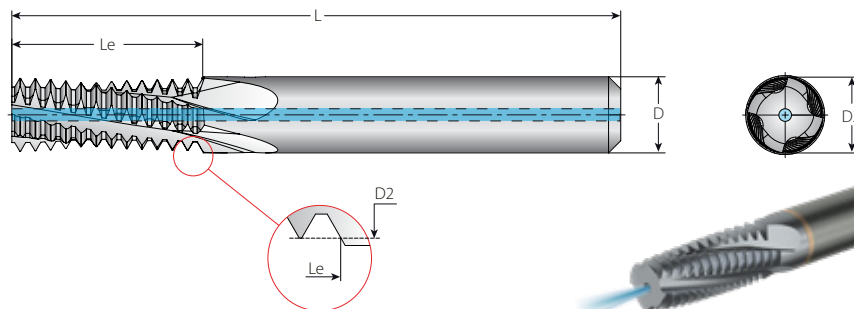


ISO Metric

Internal



Defined by: DIN 13
Tolerance class: 6H



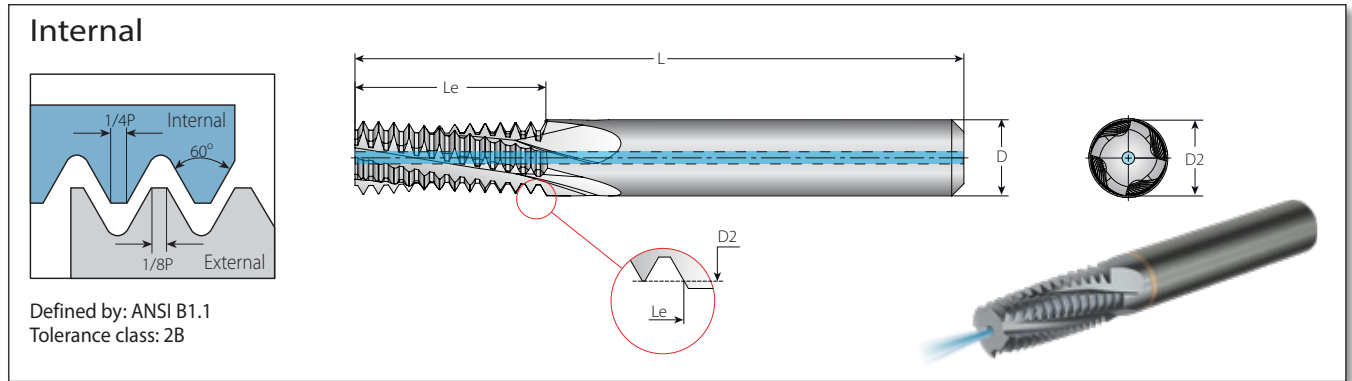
Helical Flutes with Thru-Hole Coolant

2 x Do ($Le \leq 2 \times \text{Thread Diameter}$)

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	HCF03024L06-I0.50ISOTM4	3	2.4	28.0	6.2	4	12	2.5
	M4x0.5	0.5	HCF03029L08-I0.50ISOTM4...	3	2.9	28.0	8.2	4	16	3.5
M4x0.7		0.7	HCF03029L08-I0.70ISOTM4...	3	2.9	30.0	8.7	4	12	3.3
	M6x0.75	0.75	HCF05049L12-I0.75ISOTM4...	5	4.9	40.0	12.4	4	16	5.3
M5x0.8		0.8	HCF04039L10-I0.80ISOTM4...	4	3.9	35.0	10.8	4	13	4.2
M6x1.0	M8-M40x1.0	1.0	HCF05048L12-I1.00ISOTM4...	5	4.8	41.0	12.5	4	12	5.0
M8x1.25		1.25	HCF06059L16-I1.25ISOTM4...	6	5.9	61.0	16.9	4	13	6.8
M10x1.5	M12-M48x1.5	1.5	HCF08079L20-I1.50ISOTM4...	8	7.9	64.0	20.2	4	13	8.5
M12x1.75		1.75	HCF10099L25-I1.75ISOTM5...	10	9.9	73.0	25.4	5	14	10.2
M14x2.0	M17-M80x2.0	2.0	HCF12116L29-I2.00ISOTM5...	12	11.6	80.0	29.0	5	14	12.0
M16x2.0	M17-M80x2.0	2.0	HCF12119L33-I2.00ISOTM5...	12	11.9	92.0	33.0	5	16	14.0
M20x2.5		2.5	HCF16159L41-I2.50ISOTM5...	16	15.9	102.0	41.2	5	16	17.5

** Bore diameter applies to smallest thread dia.

American UN

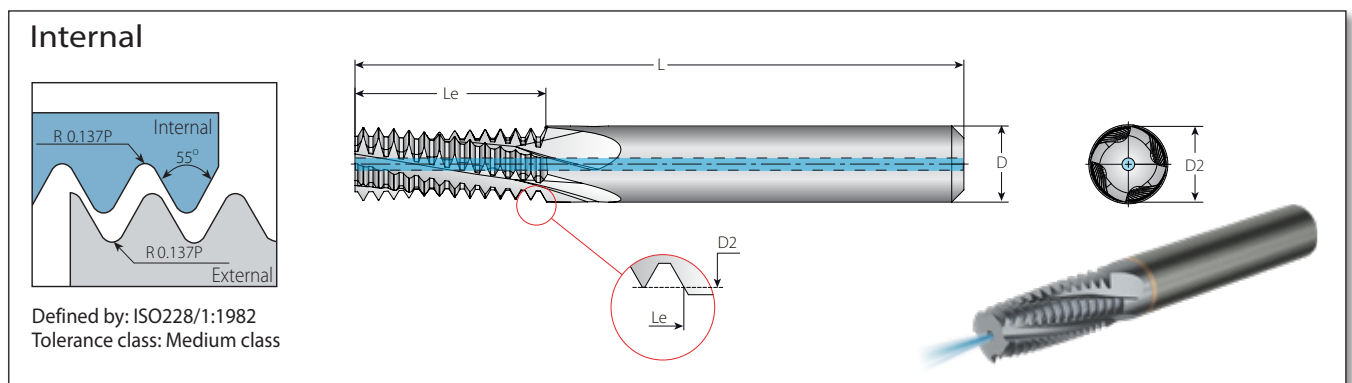


Helical Flutes with Thru-Hole Coolant

$2 \times D_o$ ($Le \leq 2 \times \text{Thread Diameter}$)

Thread			Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.**
UNC	UNF	UNEF	TPI	Internal	D	D2	L	Le	Z	Zt	mm
	1/4"x28	7/16"-1/2"x28	28	HCF05049L13-I28UNTM4... *	5	4.90	40	13.1	4	14	5.5
	5/16"; 3/8"x24	9/16"-11/16"x24	24	HCF06059L16-I24UNTM4... *	6	5.90	59	16.4	4	15	6.8
	3/8"x24	9/16"-11/16"x24	24	HCF08079L19-I24UNTM4... *	8	7.90	62	19.6	4	18	8.5
1/4"-20	7/16"; 1/2"x20	3/4"-1"x20	20	HCF05049L13-I20UNTM4... *	5	4.90	41	13.3	4	10	5.2
	7/16"; 1/2"x20	3/4"-1"x20	20	HCF10096L22-I20UNTM4... *	10	9.60	72	22.2	4	17	9.8
5/16"x18	9/16"; 5/8"x18	11/16"-1 11/16"x18	18	HCF06059L16-I18UNTM4... *	6	5.90	59	16.2	4	11	6.5
3/8"x16	3/4"x16		16	HCF08076L19-I16UNTM4... *	8	7.60	64	19.8	4	12	8.0
7/16"x14	7/8"x14		14	HCF08078L22-I14UNTM4... *	8	7.80	67	22.7	4	12	9.3
1/2"x13			13	HCF10099L26-I13UNTM5... *	10	9.90	75	26.4	5	13	10.8
9/16"x12	1"-1 1/2"x12		12	HCF12118L28-I12UNTM5... *	12	11.80	83	28.6	5	13	12.3
5/8"x11			11	HCF14131L33-I11UNTM5... *	14	13.10	90	33.5	5	14	13.5
3/4"x10			10	HCF16159L39-I10UNTM5... *	16	15.90	98	39.4	5	15	16.5
1x8"			8	HCF20199L52-I8UNTM5... *	20	19.90	107	52.4	5	16	22.0

BSP



Helical Flutes with Thru-Hole Coolant

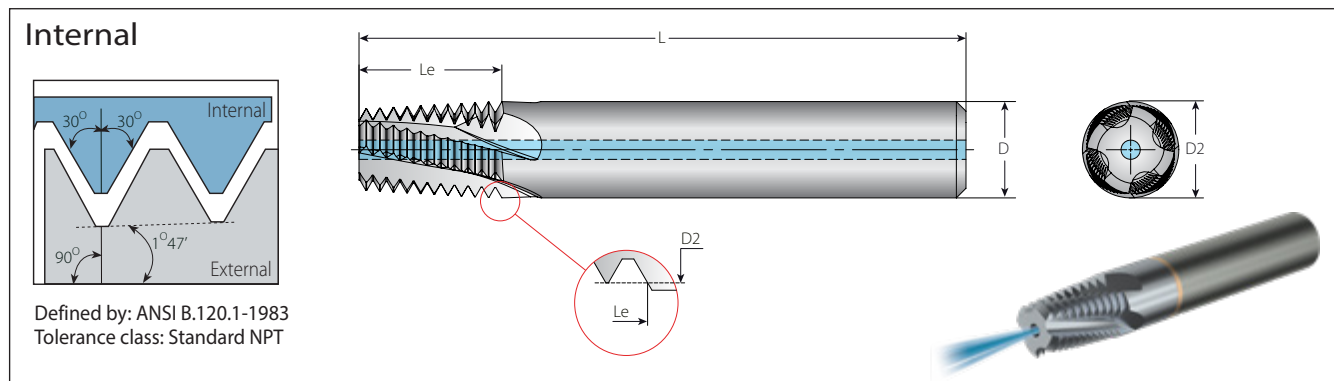
$2 \times D_o$ ($Le \leq 2 \times \text{Thread Diameter}$)

Thread	Pitch	Ordering Code	Dimensions mm			No. of Flutes	Teeth	Bore Dia.	
Standard	TPI	Internal	D	D2	L	Le	Z	Zt	mm
1/8"x28	28	HCF08079L19-EI28BSPTM4... *	8	7.90	62	19.5	4	21	8.7
1/4"x19, 3/8"x19	19	HCF10099L27-EI19BSPTM5... *	10	9.90	75	27.4	5	20	11.8, 15.2
1/2"x14, 3/4"x14	14	HCF16159L42-EI14BSPTM5... *	16	15.90	99	42.6	5	23	19.0, 24.4

* Available in Q1 2022

** Bore diameter applies to smallest thread dia.

NPT



Helical Flutes with Thru-Hole Coolant

Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.
Standard	TPI	Internal	D	D2	L	Le	Z	Zt	mm
1/16"x27	27	HCF06059L09-EI27NPT-TM4... *	6.00	5.90	53	9.9	4	10	6.3
1/8"x27	27	HCF08076L09-EI27NPT-TM4... *	8.00	7.65	53	9.9	4	10	8.5
1/4"x18, 3/8"x18	18	HCF10099L14-EI18NPT-TM4... *	10.00	9.90	63	14.8	4	10	11.1, 14.5
1/2"; 3/4"x14	14	HCF14139L19-EI14NPT-TM5... *	14.00	13.90	75	19.0	5	10	17.7, 23.0
1", 1 1/4", 1 1/2", 2", x11.5	11.5	HCF18179L23-EI11.5NPT-TM5... *	18.00	17.90	80	23.2	5	10	29.0, 37.7, 44.0, 56.0

* Available in Q1 2022

Recommended Cutting Speeds Vc [m/min] and Feed f [mm/tooth] for MACH TM

Material Group	Vargus No.	Material		Hardness Brinell HB	Vc [m/min]	Feed f [mm/tooth]		
					VH4	D2≤4 mm	D2≤8 mm	D2>8 mm
P Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	80-250	0.04-0.08	0.09-0.13	0.06-0.20
	2		Medium Carbon (C=0.25-0.55%)	150	80-230	0.04-0.08	0.09-0.13	0.06-0.20
	3		High Carbon (C=0.55-0.85%)	170	80-200	0.04-0.08	0.09-0.13	0.06-0.20
	4	Low Alloy Steel (alloying elements≤5%)	Non Hardened	180	60-180	0.04-0.08	0.09-0.13	0.06-0.20
	5		Hardened	275	60-170	0.04-0.08	0.09-0.13	0.06-0.20
	6	High Alloy Steel (alloying elements>5%)	Hardened	350	60-160	0.03-0.06	0.05-0.10	0.06-0.12
	7		Annealed	200	40-100	0.04-0.08	0.09-0.13	0.06-0.20
	8	Cast Steel	Hardened	325	30-80	0.03-0.06	0.05-0.10	0.06-0.12
	9		Low Alloy (alloying elements <5%)	200	80-250	0.04-0.08	0.09-0.13	0.06-0.20
	10		High Alloy (alloying elements >5%)	225	60-170	0.04-0.08	0.09-0.13	0.06-0.20
M Stainless Steel	11	Stainless Steel Ferritic	Non Hardened	200	60-150	0.03-0.06	0.05-0.10	0.06-0.12
	12		Hardened	330	60-120	0.015-0.03	0.03-0.05	0.02-0.06
	13	Stainless Steel Austenitic	Austenitic	180	60-140	0.04-0.08	0.09-0.13	0.06-0.20
	14		Super Austenitic	200	60-130	0.03-0.06	0.05-0.10	0.06-0.12
	15	Stainless Steel Cast Ferritic	Non Hardened	200	60-160	0.03-0.06	0.05-0.10	0.06-0.12
	16		Hardened	330	60-110	0.03-0.06	0.05-0.10	0.06-0.12
	17	Stainless Steel Cast Austenitic	Austenitic	200	60-150	0.03-0.05	0.05-0.10	0.05-0.11
	18		Hardened	330	60-100	0.015-0.03	0.03-0.05	0.02-0.06
K Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	60-70	0.04-0.08	0.09-0.13	0.06-0.20
	29		Pearlitic (long chips)	230	60-150	0.04-0.08	0.09-0.13	0.06-0.20
	30	Grey Cast Iron	Low Tensile Strength	180	70-160	0.04-0.08	0.09-0.13	0.06-0.20
	31		High Tensile Strength	260	40-120	0.03-0.06	0.05-0.10	0.06-0.12
	32	Nodular Sg Iron	Ferritic	160	40-110	0.04-0.08	0.09-0.13	0.06-0.20
	33		Pearlitic	260	40-100	0.03-0.06	0.05-0.10	0.06-0.12
N Non-Ferrous Metals	34	Aluminum Alloys Wrought	Non Aging	60	200-300	0.06-0.11	0.10-0.17	0.09-0.20
	35		Aged	100	150-250	0.03-0.09	0.05-0.12	0.05-0.14
	36	Aluminum Alloys	Cast	75	100-200	0.06-0.11	0.10-0.17	0.09-0.20
	37		Cast & Aged	90	120-220	0.03-0.09	0.05-0.12	0.05-0.14
	38	Aluminum Alloys	Cast Si 13-22%	130	200-300	0.06-0.11	0.10-0.17	0.09-0.20
	39	Copper and Copper Alloys	Brass	90	200-300	0.06-0.11	0.10-0.17	0.09-0.20
	40		Bronze And Non Lead Copper	100	150-250	0.03-0.09	0.05-0.12	0.05-0.14
S Heat Resistant Material	19	High Temperature Alloys	Annealed (iron based)	200	30-60	0.03-0.06	0.05-0.10	0.06-0.12
	20		Aged (iron based)	280	20-50	0.015-0.03	0.03-0.05	0.02-0.06
	21		Annealed (nickel or cobalt based)	250	15-35	0.015-0.03	0.03-0.05	0.02-0.06
	22		Aged (nickel or cobalt based)	350	15-30	0.015-0.03	0.03-0.05	0.02-0.06
	23	Titanium Alloys	Pure 99.5 Ti	400Rm	40-80	0.015-0.03	0.03-0.05	0.02-0.06
	24		α+β Alloys	1050Rm	20-50	0.015-0.03	0.03-0.05	0.02-0.06

Pitch		No. of Passes	
mm	TPI		
≤1.75	≤14	1	
≥1.75-2.0	≥14-12	2	
≥2.0	≥12	Multi-passes	

To use higher feed from the range, the depth of the pre-drilled hole is recommended to be increased by 2-3 pitches of thread.

Grade	Application	Sample
VH4	High wear resistance for general purpose applications. TiCN PVD Coating	