

NEW



VARDEX

Advanced Threading Solutions

MAIN CATALOG **SUPPLEMENT**

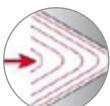
2020 | METRIC

MAIN CATALOG **SUPPLEMENT** 2020

Thread Turning

	External Thread Turning Holders with Coolant Thru* Two High Pressure Coolant Outlets	3
	External Oil & Gas Thread Turning Holders with Coolant Thru* High Pressure Coolant	5

Thread Milling

	MiTM Offset Fast Machining for Large Pitches in Deep Holes	8
	TM Solid MultiFlute Increased Number of Flutes for Faster Machining.....	14
	VARGUS GENius™ Thread Milling CNC Program Generator with Multiple Passes.....	17
	TM Solid TMDR Drilling, Thread Milling & Chamfering - Expansion: BSP (G), NPT, ISO	19
	TM Solid HCR Helical Flutes with Radial Cooling - Expansion: ISO, UN, BSP (G), NPT, BSPT, UNJ	23
	TM Solid MilliPro Dental Reinforced Miniature Thread Mills for Dental Implants	28

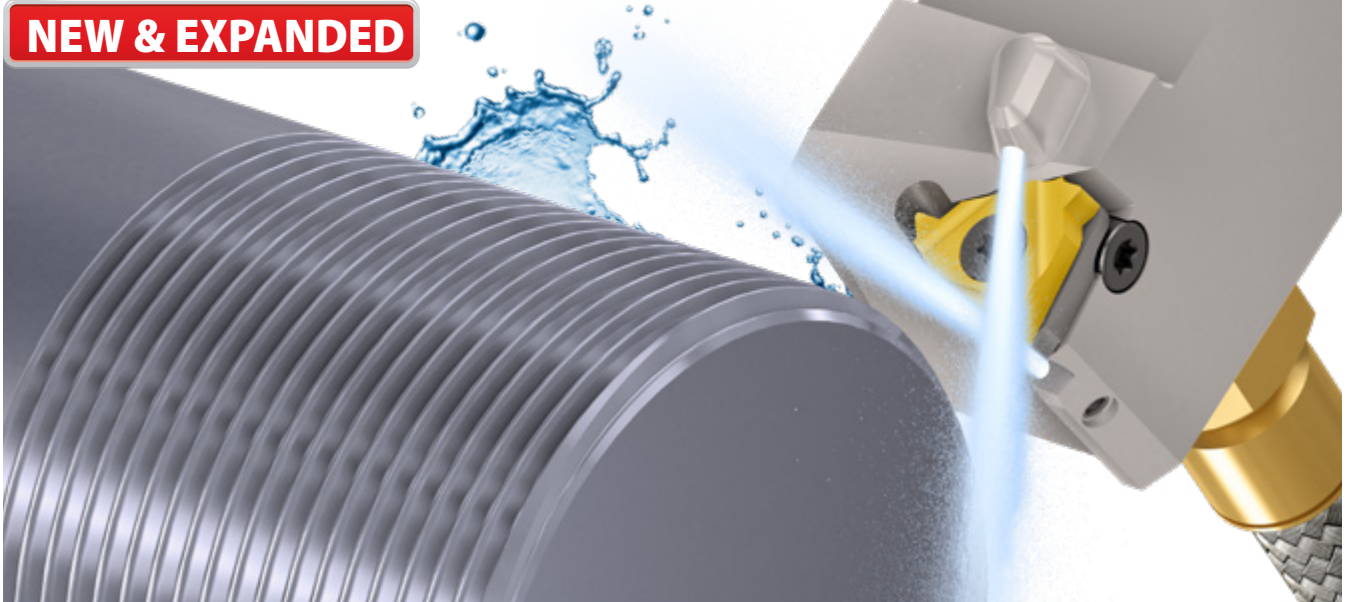
*** High Pressure Coolant (HPC):**

All HPC tools are up to 70 Bar

Thread Turning

External Thread Turning Toolholders with Two High Pressure Coolant Outlets

NEW & EXPANDED



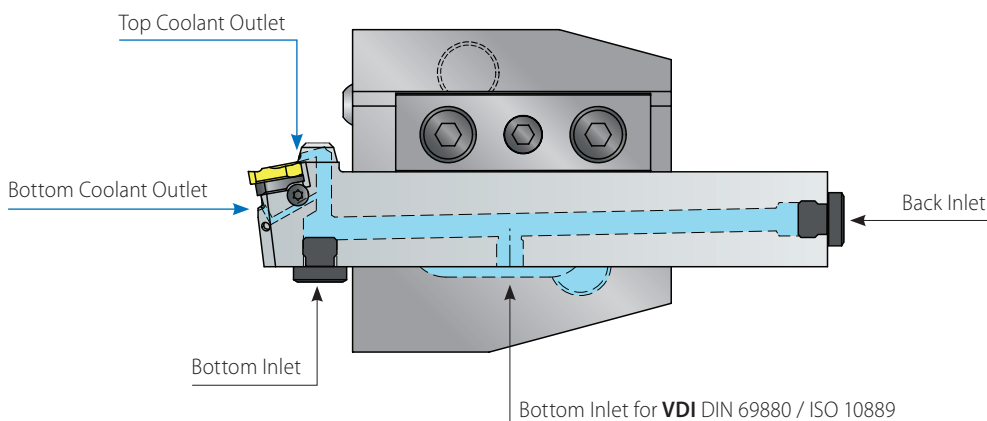
Features and Benefits

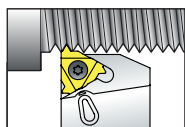
- Two precise high pressure coolant outlets, designed to cool down the top and bottom of the insert for longer tool life
- Up to 70 Bar
- Three different coolant inlets available:
 - Bottom inlet, specially designed for **VDI DIN 69880 / ISO 10889**
 - Back inlet
 - Bottom inlet
- Nickel coating for better wear resistance and anti-corrosion protection
- Greater range of holders for standard insert sizes: 3/8", 1/2", & 5/8"
- Left Hand holders are available as standard

NEW

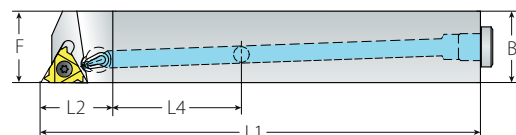
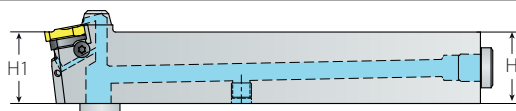
NEW

NEW





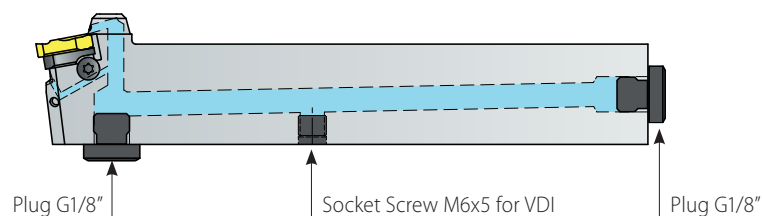
External Toolholders



Standard with HPC

Spare Parts

Insert Size Ordering Code Dimensions mm								Spare Parts						
														
IC	RH	LH	H=H1=B	F	L1	L2	L4	Insert Screw	Anvil Screw	Torx Key	Anvil RH	Anvil LH	Plug Screw x2	Plug Screw
3/8"	ALCN16-3	ALCN16-3LH	16	16	100.0	25.1	25	SA3T	SY3T	K3T	YE3	YI3	Plug G1/8"	Socket Screw M6x5
	ALCN20-3	ALCN20-3LH	20	20	127.0		30							
	ALCN25-3	ALCN25-3LH	25	25	155.0		35							
	ALCN32-3	ALCN32-3LH	32	32	175.0		40							
1/2"	ALCN25-4	ALCN25-4LH	25	25	155.0	30.2	35	SA4T	SY4T	K4T	YE4	YI4		
	ALCN32-4	ALCN32-4LH	32	32	175.0		40							
5/8"	ALCN25-5	ALCN25-5LH	25	25	155.0	35.1	35	SA5T	SY5T	K5T	YE5	YI5		
	ALCN32-5	ALCN32-5LH	32	32	175.0		40							



The following HPC accessories (not included) can be ordered separately:

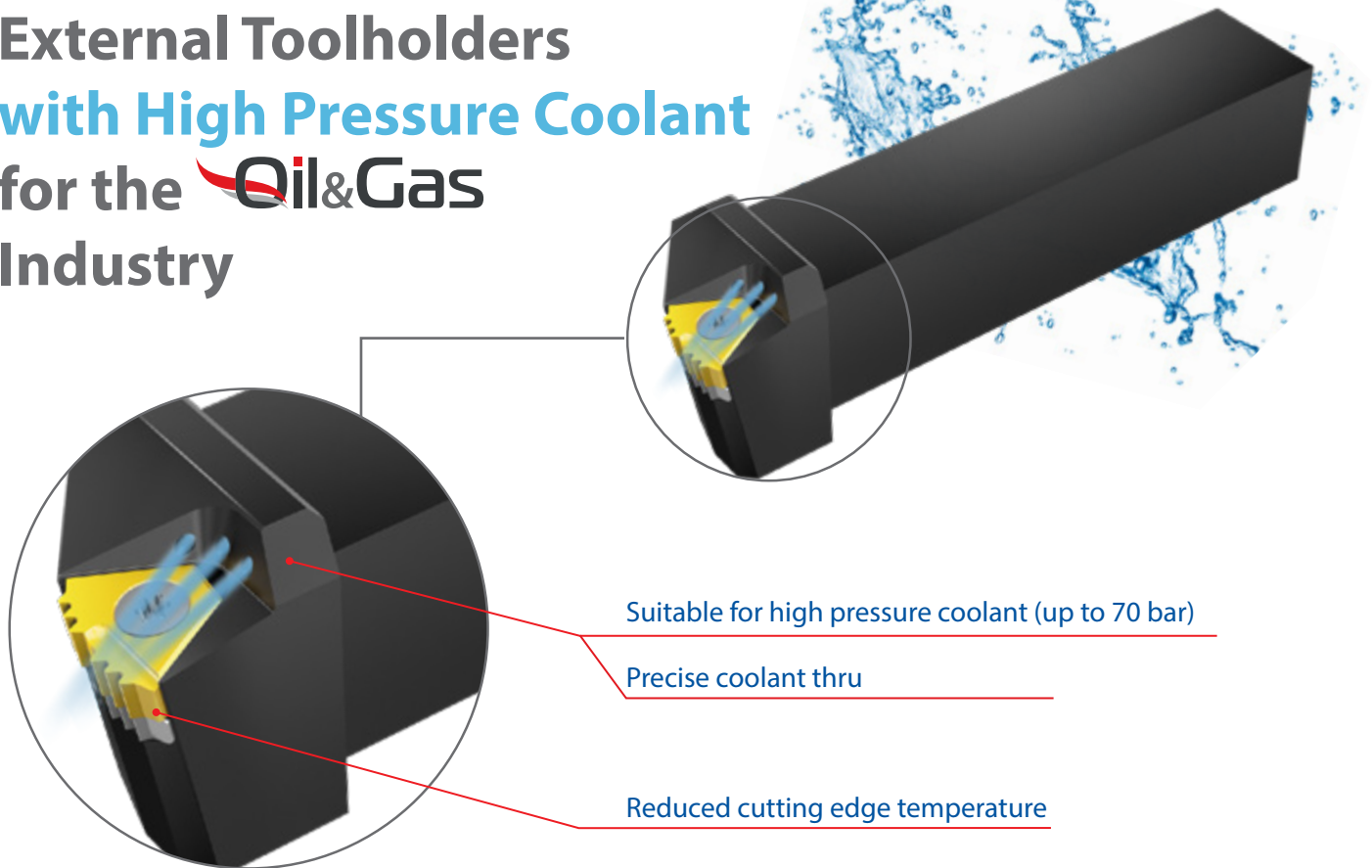
Image	Ordering Code	Item Number	QTY
	Tube Connector 25-6P	013-00941	1
	Angled Fitting G1_8x6P	013-00947	2
	Straight Fitting G1_8x6P	013-00942	

The NEW External Thread Turning Toolholders with HPC are fully supported by VARGUS GENius™, the most advanced Tool Selector and CNC Program Generator in the metal cutting industry



Thread Turning

External Toolholders with High Pressure Coolant for the Oil & Gas Industry



Suitable for high pressure coolant (up to 70 bar)

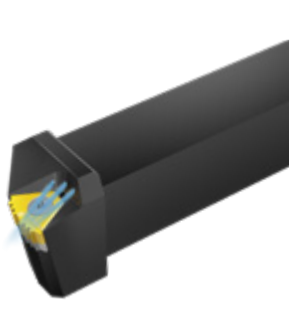
Precise coolant thru

Reduced cutting edge temperature

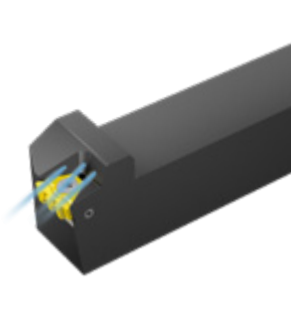
Features and Benefits

- Precise coolant thru, designed to efficiently cool down the cutting edge
- Suitable for high pressure coolant (up to 70 bar)
- Reduced cutting edge temperature for better tool life
- Better chip evacuation and improved chip control and flow

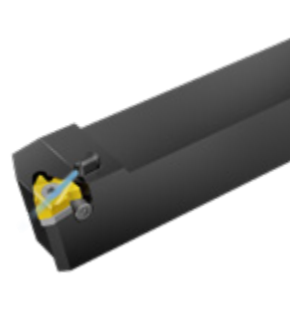
External holders with coolant are fully supported by **VARGUS GENius™**, the most advanced Tool Selector and CNC Program Generator in the metal cutting industry



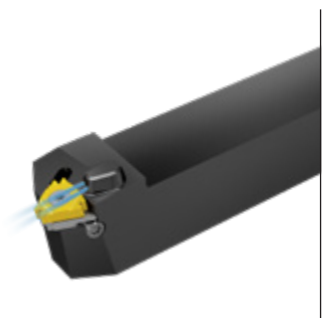
14D Standard with coolant



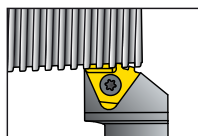
T+ Style with coolant



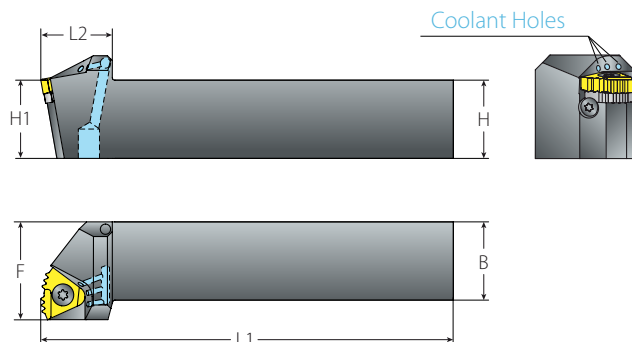
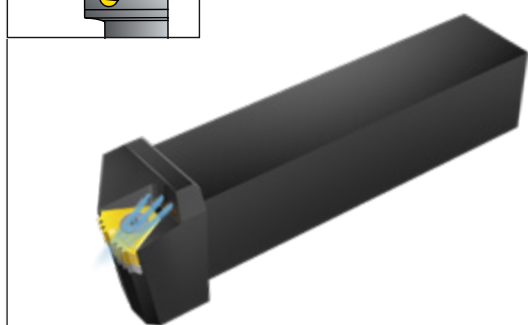
API with coolant



Z+ Style with coolant



External Toolholders

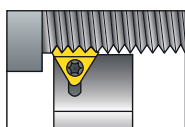


14D Standard with HPC

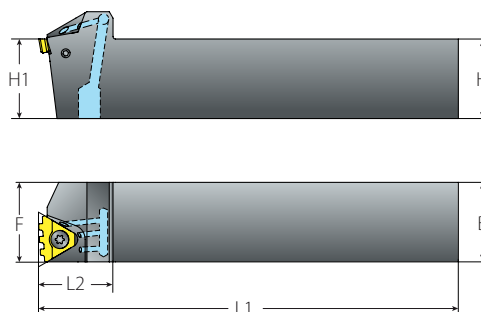
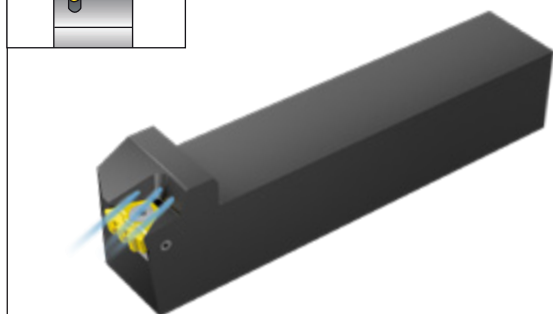
Spare Parts

Insert Size		Ordering Code		Dimensions mm							
IC	RH	H=H1=B	F	L1	L2		Insert Screw	Anvil Screw	Torx Key	Anvil Key	Anvils
14D	ALC32-14D	32	32	170	30		SA5T	M4X6(14D)	KT15	K5T	Y14DER-10APIRD; Y14DER-8APIRD;
	ALC40-14D	40	40	200	30						Y14DER-5BUT; Y14DER-10APIRD-3+; Y14DER-5BUT-0.4N

Left Hand tools are available upon request.



External Toolholders



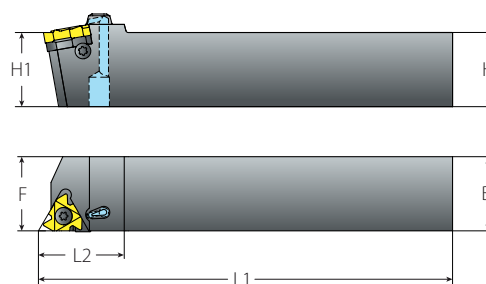
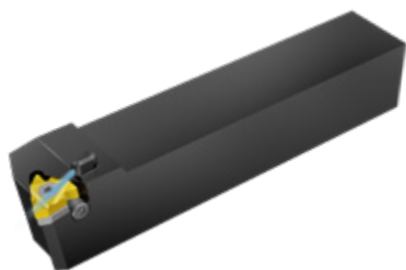
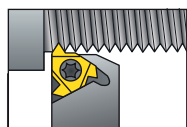
T+ Style with HPC

Spare Parts

Insert Size		Ordering Code		Dimensions mm							
IC	RH	H=H1=B	F	L1	L2		Insert Screw	Anvil Screw	Torx Key	Anvil Key	Anvil RH
1/2" T	ALC32-4T	32	32	170	30		SA4T	SY4K2	K4T	K2	Y4T
	ALC40-4T	40	40	200	30						

All T Style toolholders have a 0° helix angle.
Left Hand tools are available upon request.

External Toolholders

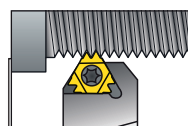


API with HPC

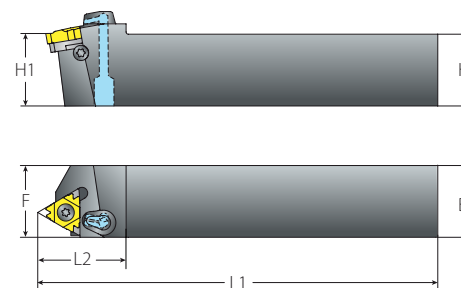
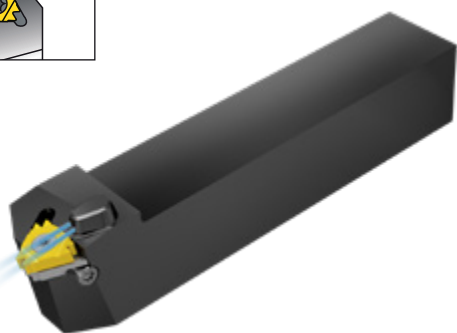
Spare Parts

Insert Size	Ordering Code	Dimensions mm							
IC	RH	H=H1=B	F	L1	L2	Insert Screw	Anvil Screw	Torx Key	Anvil RH
1/2"	ALC32-4-5BUT/API	32	32	177	37	SA4T	SY4T	K4T	YEI4-API-1P YEI4-5BUT
	ALC40-4-5BUT/API	40	40	205	37				

All API holders have a 0° helix angle.
Left Hand tools are available upon request.



External Toolholders



Z+ Style with HPC

Spare Parts

Insert Size	Ordering Code	Dimensions mm							
IC	RH	H=H1=B	F	L1	L2	Insert Screw	Anvil Screw	Torx Key	Anvil RH
1/2"Z	ALC32-4Z	32	32	178	37	SA4T	SY4T	K4T	YE4Z
	ALC40-4Z	40	40	208	37				

All Z Style toolholders have a 1.5° helix angle.
Left Hand tools are available upon request.

Thread Milling

MiTM Offset

NEW

Fast Machining for Large
Pitches in Deep Holes

Available Q4 2019

PATENT
PENDING



Features and Benefits

- Reduced machining times: Two cutting rows, with each row machining half the thread simultaneously

Inserts:

- Two sizes: MiTM 25 and MiTM 41
- Two types of inserts are available:
 - **Single tooth** inserts are recommended for 2 to 2.5xDo (thread diameter)
 - **Double tooth** inserts are recommended for up to 2xDo (thread diameter)
- Two cutting edges per insert
- MiTM Offset inserts can also be used with standard MiTM holders in order to reduce cutting forces
- Thread standards: ISO Metric and American UN
- Grades:
 - **VTX**: TiAlN coated carbide grade. Ideal for stainless steel
 - **VBX**: TiCN coated carbide grade. Excellent grade for steel and general use

Holders:

- Cylindrical steel holders and shell mills are available
- Up to 6 flutes for faster machining
- Cylindrical steel holders' length can be modified for increased stability
- Shell Mill holders can also be used with standard MiTM inserts
- All holders are available with coolant thru for increased tool life

MiTM Offset tools are fully supported by **VARGUS GENius™**,
the most advanced Tool Selector and CNC Program Generator
in the metal cutting industry



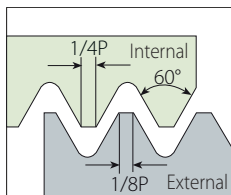
Single Tooth Insert: ...TM-1...

For Thread Length: 2.5xDo Max

Double Tooth Insert: ...TM-2...

For Thread Length: 2.0xDo Max

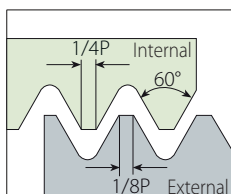
ISO Metric



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

Insert Style	Pitch	Ordering Code	Cutting Edge	Teeth	Toolholder
L	mm	Internal	Le	Zt	
25	3	R25I3.00ISOTM-1...	2	24.0	1
	3	R25I3.00ISOTM-2...	2	24.0	2
	3.5	R41I3.50ISOTM-1...	2	38.5	1
	3.5	R41I3.50ISOTM-2...	2	38.5	2
41	4	R41I4.00ISOTM-1...	2	40.0	1
	4	R41I4.00ISOTM-2...	2	40.0	2
	4.5	R41I4.50ISOTM-1...	2	40.5	1
	4.5	R41I4.50ISOTM-2...	2	40.5	2
	5	R41I5.00ISOTM-1...	2	40.0	1
	5	R41I5.00ISOTM-2...	2	40.0	2
	5.5	R41I5.50ISOTM-1...	2	38.5	1
	5.5	R41I5.50ISOTM-2...	2	38.5	2
	6	R41I6.00ISOTM-1...	2	36.0	1
	6	R41I6.00ISOTM-2...	2	36.0	2

American UN

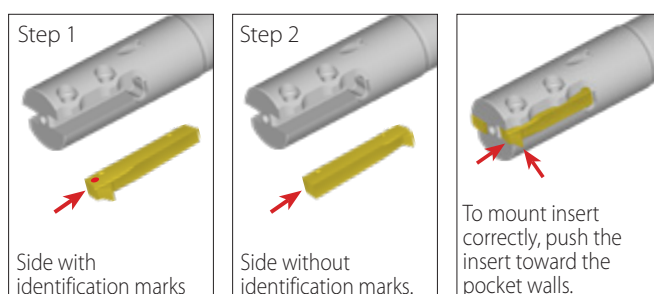


Defined by: ANSI B1.1:74
Tolerance class: 2A/2B

Insert Style	Pitch	Ordering Code	Cutting Edge	Teeth	Toolholder
L	TPI	Internal	Le	Zt	
25	8	R25I8UNTM-1...	2	22.23	1
	8	R25I8UNTM-2...	2	22.23	2
	7	R41I7UNTM-1...	2	39.92	1
41	7	R41I7UNTM-2...	2	39.92	2
	6	R41I6UNTM-1...	2	38.10	1
	6	R41I6UNTM-2...	2	38.10	2

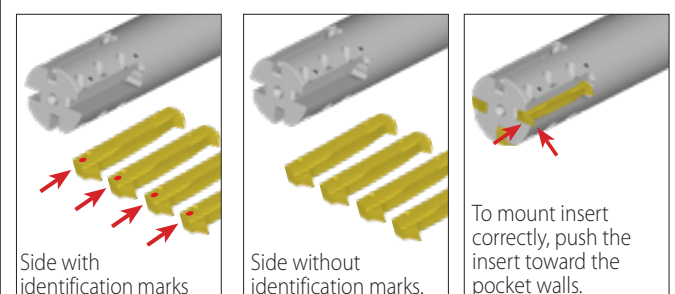
Placing single tooth inserts correctly

Alternate between each cutting side, beginning with placing the insert tooth at the front of the holder (Step 1). Then place the next insert in the opposite direction (Step 2). Repeat process if necessary. Process is applicable for steel shanks and shell mill holders.



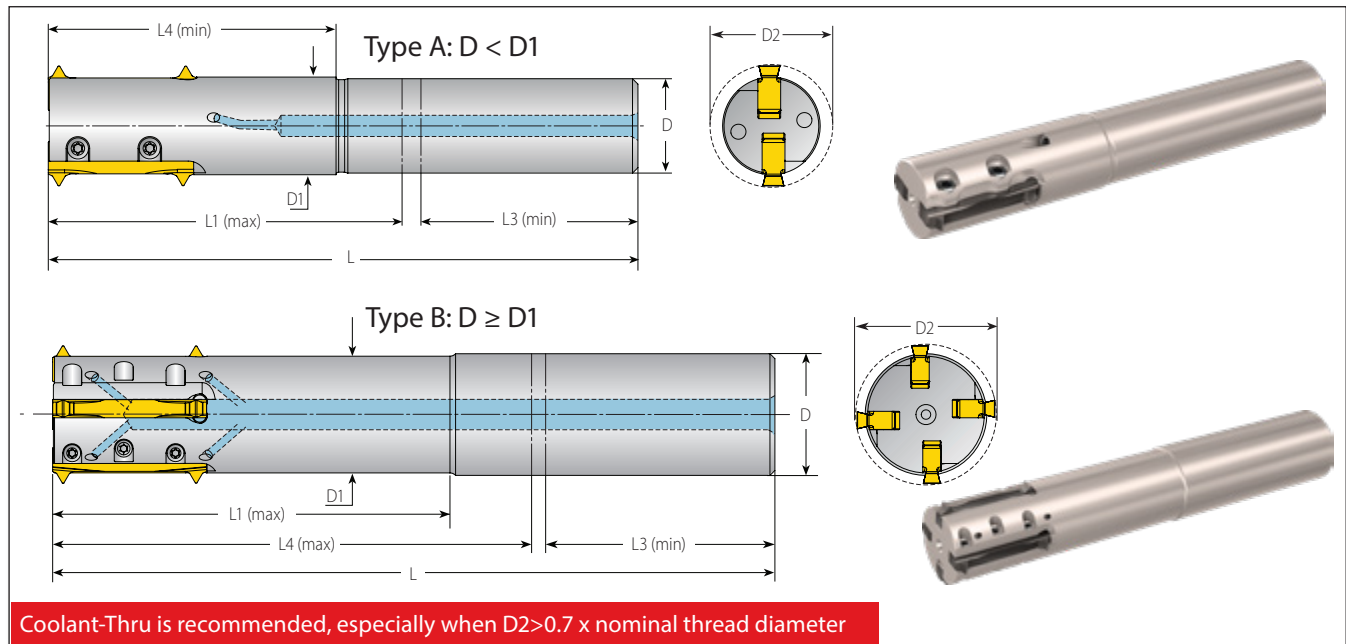
Placing double tooth inserts correctly

Always mount all inserts with the identification mark on the same side.
Process is applicable for steel cylindrical shanks and shell mill holders.



Steel Cylindrical Shanks for MiTM Offset

MiTM



MiTM Offset RTMOC

Insert Style	Ordering Code	Holder Type	Dimensions mm									No. of Flutes			
			L	L1 (max)	L3 (min)	L4 (min)	L4 (max)	D	D1	D2	Z	Location Screw x2	Clamping Screw	Torx+ Screwdriver	
25	RTMOC16C20-60S2	A	106	60	44	43	-	16	16.6	20.5	2	SLD4IP8 (M4x0.7)	-	KIP8	
41	RTMOC20C26-75B2	A	125	75	46	61	-	20	20.7	26.0	2	SLD4IP8A (M4x0.7)	SCD4IP8	KIP8	
	RTMOC25C30-90B4	B	145	90	51	-	-	25	25.0	30.5	4				
	RTMOC32C37-105B4	B	192	84	69	-	105	32	30.7	37.0	4				
	RTMOC32C41-120B6	A	194	120	69	96	-	32	34.2	41.0	6				

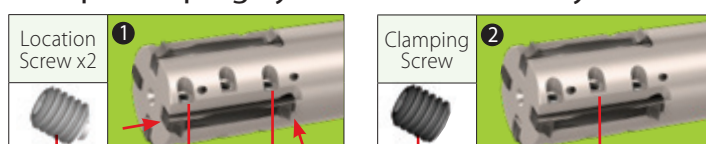
Thread Application for MiTM Offset (RTMOC) Cylindrical Toolholders - for Offset Inserts

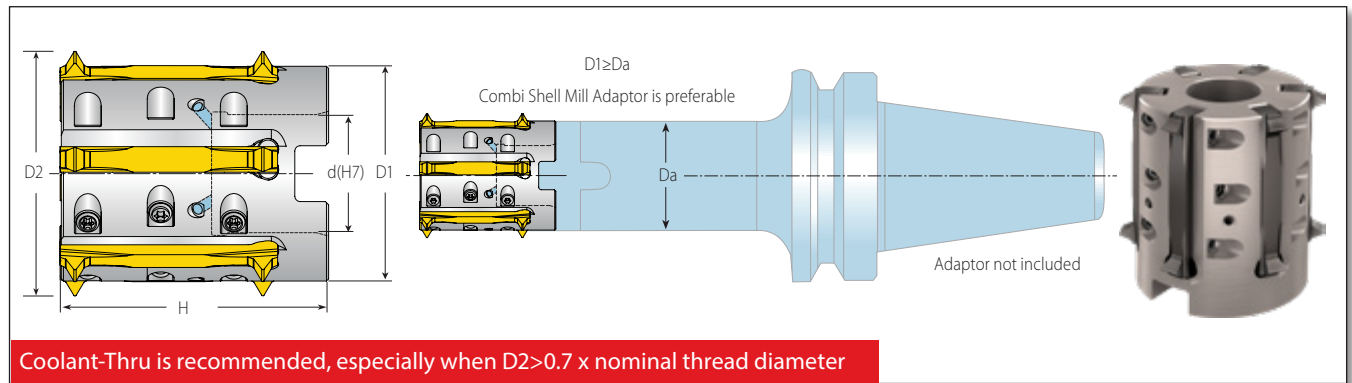
Toolholder		Min. Thread Dia.			
	D2 (mm)	ISO (coarse)	ISO (fine)	UNC	UN/UNF/UNEF/UNS
RTMOC16C20-60S2	20.5	M24x3	M30x3	1-8	1 1/16-8UN
RTMOC20C26-75B2	26.0	M30x3.5; M36x4	M42x4	1 1/4-7; 1 3/8-6	1 7/16-6UN
RTMOC25C30-90B4	30.5	M36x4	M36x3.5; M42x4	-	1 7/16-7UN; 1 7/16-6UN
RTMOC32C37-105B4	37.0	M42x4.5; M48x5	M42x3.5; M45x4	-	1 11/16-7UN; 1 11/16-6UN
RTMOC32C41-120B6	41.0	M48x5; M56x5.5	M48x4	-	1 7/8-7UN; 1 7/8-6UN

Thread Application for MiTM Standard (RTMC) Weldon Toolholders - for Offset Inserts

Toolholder		Min. Thread Dia.			
	D2 (mm)	ISO (coarse)	ISO (fine)	UNC	UN/UNF/UNEF/UNS
RTMC2519-32S2; RTMC2519-44S2	19.0	M24x3	M30x3	1-8	1 1/16-8UN
RTMC2520-37S3; RTMC2520-44S3	20.5	M24x3	M30x3	1-8	1 1/16-8UN
RTMC2522-43S3; RTMC2522-55S3	22.0	M27x3	M30x3	-	1 1/16-8UN
RTMC2530-55S5; RTMC2530-80S4	30.0	-	M34x3	-	1 3/8-8UN
RTMC2521-45B1	21.2	M30x3.5; M36x4	M42x4	1 1/8-7	-
RTM2524-43B2	24.5	M30x3.5; M36x4	M36x3.5; M42x4	1 1/4-7	-
RTMC3230-43B3; RTMC3230-65B3	30.0	M36x4; M42x4.5	M36x3.5; M42x4	-	1 7/16-7UN; 1 7/16-6UN
RTMC3236-43B5; RTMC3236-65B4	35.9	M42x4.5; M48x5; M56x5.5; M64x6	M40x3.5; M42x4	-	1 11/16-7UN; 1 5/8-6UN

2 Step Clamping System for MiTM 41 Cylindrical Shanks





Standard Shell Mill

Spare Parts

Insert Style	Ordering Code	Dimensions mm				No. of Flutes				
		D1	D2	d(H7)	H	Z	Location Screw x2	Clamping Screw	Torx+ Screwdriver	Holder Screw
41	RTMC-D48-22-41B6	40	48.0	22	50	6	SLD4IP8A	SCD4IP8	KIP8	M10x1.5x40
	RTMC-D58-27-41B6*	50	57.9	27	50	6				M12x1.75x40

* Standard Shell Mill holder, available in Vardex Main Catalog

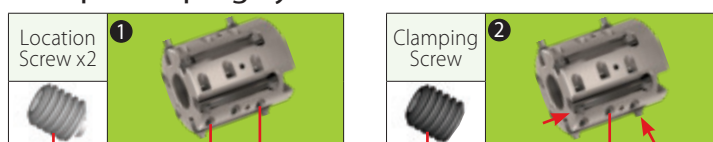
Thread Application for MiTM Offset Shell Mill

Toolholder		Min. Thread Dia.				
	D2 (mm)	ISO (coarse)	ISO (fine)	UNC	UN/UNF/UNEF/UNS	
		Offset & Standard Inserts		Standard Inserts	Offset Inserts	Standard Inserts
RTMC-D48-22-41B6	48.0	M56x5.5; M64x6	M56x4; M70x6	2 1/4-4.5; 2 1/2-4	2 1/8-7UN; 2 1/8-6UN	2 1/8-8UN; 2 1/8-7UN; 2 1/8-6UN
RTMC-D58-27-41B6	57.9	M68x6	M64x4; M70x6	2 3/4-4	2 1/2-7UN; 2 1/2-6UN	2 1/2-8UN; 2 1/2-7UN; 2 1/2-6UN

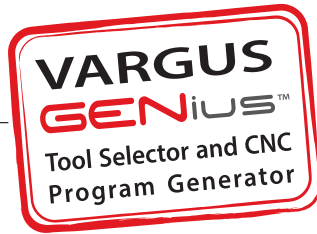
Thread Application for MiTM Standard (RTMC) Shell Mill - for Offset Inserts

Toolholder		Min. Thread Dia.			
	D2 (mm)	ISO (coarse)	ISO (fine)	UNC	UN/UNF/UNEF/UNS
RTMC-D36-16-25S5	36.0	-	M40x3	-	1 5/8-8UN
RTMC-D44-22-25S6	44.0		M48x3		1 15/16-8UN
RTMC-D52-27-25S8	52.0		M56x3		2 1/4-8UN
RTMC-D48-22-41B5	47.9	M56x5.5; M64x6	M56x4; M70x6		2 1/8-7UN; 2 1/8-6UN
RTMC-D58-27-41B6	57.9	M68x6	M64x4; M70x6		2 1/2-7UN; 2 1/2-6UN

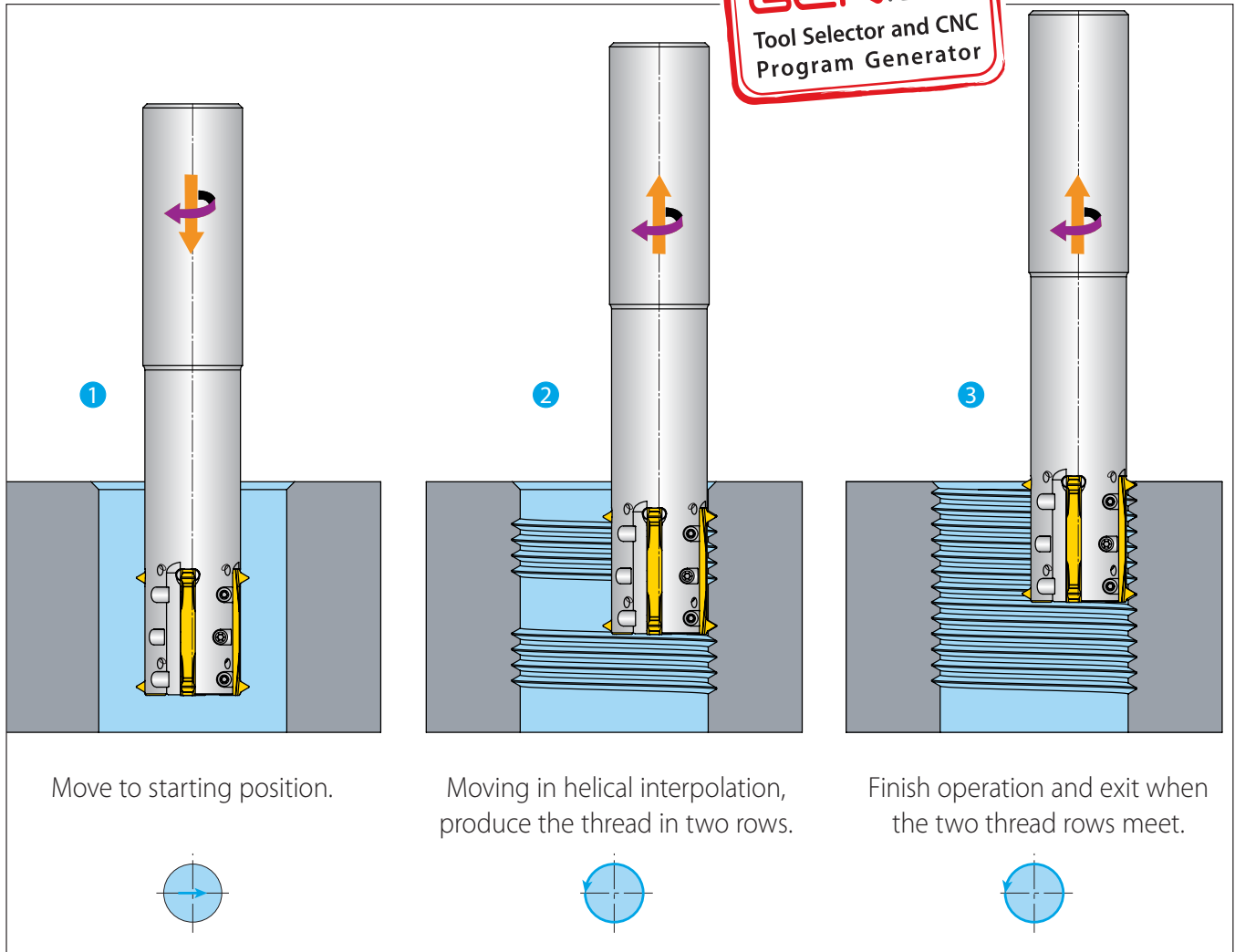
2 Step Clamping System for Shell Mill Holders



MiTM Offset - Operating Cycle

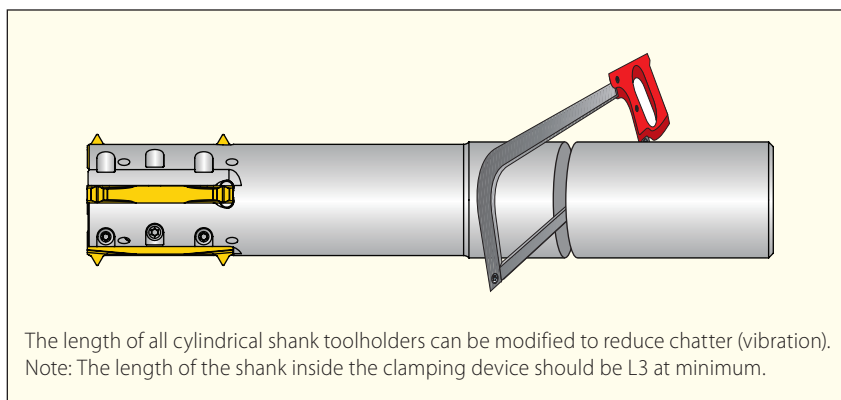


MiTM



Grades

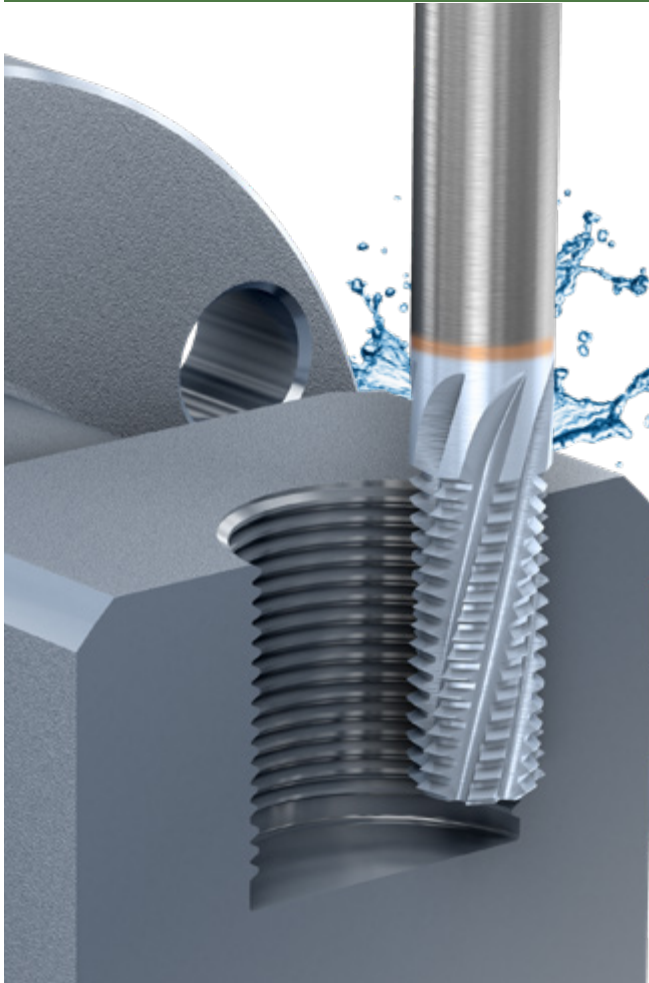
Grade	Application	Sample
VBX	TiCN coated carbide grade. Excellent grade for steels and general use .	
VTX	TiAlN coated carbide grade. Ideal for Stainless Steels .	



Recommended MiTM Offset Inserts, Cutting Speeds Vc [m/min] and Feed f [mm/tooth]

Material Group	Vargus No.	Material		Hardness Brinell HB	MiTM Offset Holders			MiTM Standard Holders			
					Vc [m/min]		Feed f [mm/tooth]	Vc [m/min]		Feed f [mm/tooth]	
					VBX	VTX		VBX	VTX	Standard	Shell Mill
P Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	100-210	90-180	0.1-0.35	100-210	90-180	0.30-0.50	0.30-0.75
	2		Medium Carbon (C=0.25-0.55%)	150	100-180	90-170	0.1-0.4	100-180	90-170	0.30-0.50	0.30-0.75
	3		High Carbon (C=0.55-0.85%)	170	90-150	90-160	0.1-0.35	100-170	90-160	0.25-0.35	0.25-0.52
	4	Low Alloy Steel (alloying elements ≤ 5%)	Non Hardened	180	80-130	80-130	0.1-0.4	60-90	90-155	0.28-0.45	0.28-0.67
	5		Hardened	275	80-130	80-130	0.1-0.35	80-150	80-160	0.25-0.45	0.25-0.67
	6		Hardened	350	70-120	70-130	0.1-0.3	70-140	70-150	0.25-0.40	0.25-0.60
	7	High Alloy Steel (alloying elements > 5%)	Annealed	200	60-110	65-115	0.1-0.35	60-130	70-115	0.20-0.30	0.20-0.45
	8		Hardened	325	70-115	70-115	0.1-0.2	70-110	60-100	0.18-0.30	0.18-0.45
	9	Cast Steel	Low Alloy (alloying elements < 5%)	200	90-150	90-160	0.1-0.3	100-170	100-170	0.20-0.30	0.20-0.45
	10		High Alloy (alloying elements > 5%)	225	65-115	70-120	0.1-0.2	70-120	70-130	0.17-0.30	0.17-0.45
M Stainless Steel	11	Stainless Steel Ferritic	Non Hardened	200	90-150	90-160	0.1-0.3	100-170	120-180	0.22-0.34	0.22-0.50
	12		Hardened	330	90-150	90-160	0.1-0.2	100-170	120-180	0.21-0.32	0.21-0.48
	13	Stainless Steel Austenitic	Austenitic	180	70-120	70-130	0.1-0.3	70-140	100-140	0.25-0.40	0.25-0.60
	14		Super Austenitic	200	70-120	70-130	0.1-0.2	70-140	100-140	0.17-0.26	0.17-0.39
	15	Stainless Steel Cast Ferritic	Non Hardened	200	70-120	70-130	0.1-0.3	70-140	100-140	0.25-0.37	0.25-0.55
	16		Hardened	330	70-120	70-130	0.1-0.2	70-140	100-140	0.17-0.26	0.17-0.39
	17	Stainless Steel Cast Austenitic	Austenitic	200	65-115	70-120	0.1-0.3	70-120	100-120	0.20-0.30	0.20-0.45
	18		Hardened	330	65-115	70-120	0.1-0.2	70-120	100-120	0.17-0.26	0.17-0.39
K Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	60-110	65-115	0.05-0.16	60-130	100-120	0.25-0.37	0.25-0.55
	29		Pearlitic (long chips)	230	60-110	65-115	0.04-0.1	60-120	80-100	0.20-0.30	0.20-0.45
	30	Grey Cast Iron	Low Tensile Strength	180	60-110	65-115	0.1-0.3	60-130	80-100	0.22-0.34	0.22-0.50
	31		High Tensile Strength	260	60-100	70-100	0.1-0.2	60-100	80-100	0.20-0.30	0.20-0.45
	32	Nodular Sg Iron	Ferritic	160	60-110	65-115	0.1-0.3	60-125	80-100	0.15-0.25	0.15-0.37
	33		Pearlitic	260	50-90	60-90	0.1-0.2	50-90	60-90	0.20-0.30	0.20-0.45
N Non-Ferrous Metals	34	Aluminum Alloys Wrought	Non Aging	60	100-200	-	0.15-0.55	100-250	-	0.60-1.00	0.60-1.50
	35		Aged	100	100-180	-	0.15-0.5	100-180	-	0.50-0.90	0.50-1.20
	36	Aluminum Alloys	Cast	75	100-200	-	0.15-0.5	150-400	-	0.50-0.90	0.50-1.20
	37		Cast & Aged	90	100-200	-	0.1-0.4	150-280	-	0.40-0.60	0.40-0.90
	38	Aluminum Alloys	Cast Si 13-22%	130	80-130	80-130	0.15-0.5	80-150	-	0.50-0.90	0.50-1.20
	39	Copper and Copper Alloys	Brass	90	100-180	100-200	0.15-0.5	120-210	100-200	0.60-1.00	0.60-1.50
	40		Bronze And Non Leaded Copper	100	100-200	100-200	0.1-0.4	120-210	100-200	0.50-0.90	0.50-1.20
S Heat Resistant Material	19	High Temperature Alloys	Annealed (iron based)	200	20-45	20-40	0.1-0.2	20-45	20-40	0.12-0.22	0.12-0.33
	20		Aged (iron based)	280	20-30	20-30	0.04-0.1	20-30	20-30	0.10-0.20	0.10-0.30
	21		Annealed (nickel or cobalt based)	250	15-20	15-20	0.04-0.1	15-20	15-20	0.08-0.20	0.08-0.30
	22		Aged (nickel or cobalt based)	350	10-15	10-15	0.04-0.1	10-15	10-15	0.08-0.20	0.08-0.30
	23	Titanium Alloys	Pure 99.5 Ti	400Rm	70-120	70-130	0.04-0.1	70-140	70-120	0.10-0.20	0.10-0.30
	24		α+β Alloys	1050Rm	20-50	20-50	0.04-0.1	20-50	20-50	0.10-0.20	0.10-0.30
H Hardened Material	25	Extra Hard Steel	Hardened & Tempered	45-50HRC	15-45	15-45	0.06-0.12	15-45	15-45	0.05-0.18	0.05-0.27
	26			51-55HRC	15-40	15-40	0.04-0.08	15-40	15-40	0.05-0.18	0.05-0.27

Thread Milling



NEW

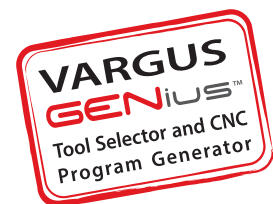
TM Solid MultiFlute Helicool Tools

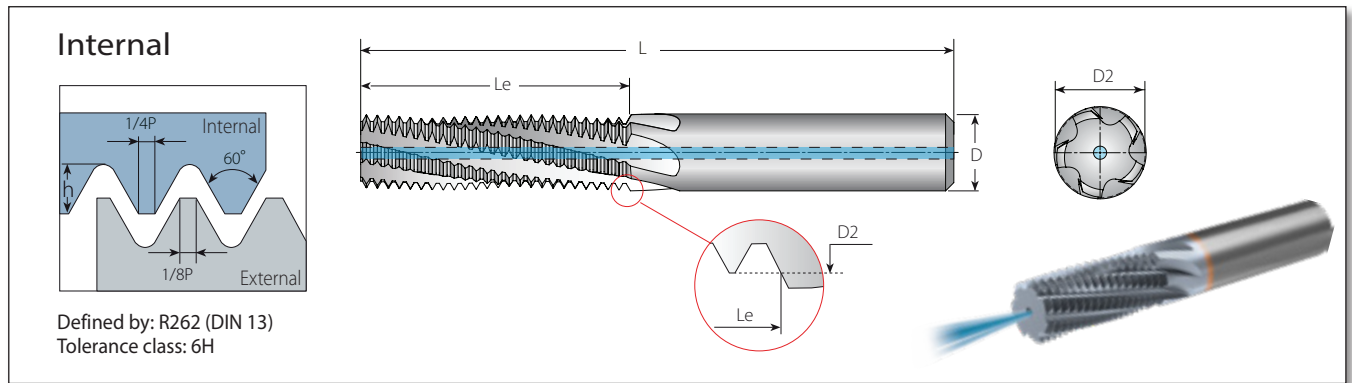
Increased Number
of Flutes for Faster
Machining

Features and Benefits

- Reduced machining times: Up to 40%!
- Large number of flutes (max 7)
- Available in 2xDo and 3xDo (thread diameter)
- Thread Standards:
ISO Metric (mm shank): M3x0.5 to M16x2.0
- VTH Grade:
General-purpose, heavy duty thread milling grade, TiCN coated for high resistance to wear
- For better chip evacuation in high feeds, radial multi-pass machining is required

Helicool MultiFlute Tools are fully supported by **VARGUS GENius™**, the most advanced Tool Selector and CNC Program Generator in the metal cutting tools industry.





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	HC04024L06-I0.50ISOTM5...	4	2.40	45	6.2	5	12	2.5
	M4x0.5	0.5	HC04032L08-I0.50ISOTM6...	4	3.20	45	8.2	6	16	3.5
	M4x0.7	0.7	HC04031L08-I0.70ISOTM5...	4	3.15	45	8.7	5	12	3.3
	M6x0.75	0.75	HC06050L12-I0.75ISOTM6...	6	5.00	57	12.4	6	16	5.3
	M5x0.8	0.8	HC04039L10-I0.80ISOTM6...	4	3.90	45	10.8	6	13	4.2
M6x1.0	M8-M40x1.0	1.0	HC06048L12-I1.00ISOTM6...	6	4.80	57	12.5	6	12	5.0
	M8x1.25	1.25	HC08065L16-I1.25ISOTM6...	8	6.50	61	16.9	6	13	6.8
M10x1.5	M12-M48x1.5	1.5	HC10082L20-I1.50ISOTM7...	10	8.20	73	20.2	7	13	8.5
	M12x1.75	1.75	HC10099L25-I1.75ISOTM7...	10	9.90	73	25.4	7	14	10.2
M14x2.0	M17-M80x2.0	2.0	HC12116L29-I2.00ISOTM6...	12	11.60	80	29.0	6	14	12.0
M16x2.0	M17-M80x2.0	2.0	HC14136L33-I2.00ISOTM7...	14	13.60	92	33.0	7	16	14.0

Helical Flutes with Thru-Hole Coolant

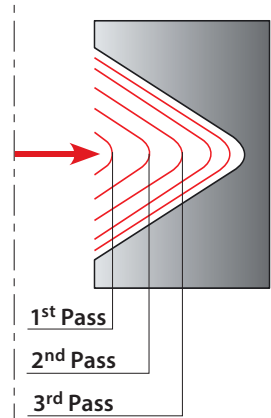
3x Do ($Le \leq 3 \times \text{Thread Diameter}$)

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	HC04024L09-I0.50ISOTM4...	4	2.40	45	9.3	4	18	2.5
	M4x0.5	0.5	HC04032L12-I0.50ISOTM5...	4	3.20	45	12.2	5	24	3.5
	M4x0.7	0.7	HC04031L12-I0.70ISOTM4...	4	3.15	47	13.0	4	18	3.3
	M6x0.75	0.75	HC06050L18-I0.75ISOTM5...	6	5.00	60	18.4	5	24	5.3
	M5x0.8	0.8	HC04039L15-I0.80ISOTM5...	4	3.90	50	15.6	5	19	4.2
M6x1.0	M8-M40x1.0	1.0	HC06048L18-I1.00ISOTM5...	6	4.80	60	18.5	5	18	5.0
	M8x1.25	1.25	HC08065L25-I1.25ISOTM5...	8	6.50	66	25.7	5	20	6.8
M10x1.5	M12-M48x1.5	1.5	HC10082L30-I1.50ISOTM5...	10	8.20	75	30.8	5	20	8.5
	M12x1.75	1.75	HC10099L36-I1.75ISOTM5...	10	9.90	86	37.7	5	21	10.2
M14x2.0	M17-M80x2.0	2.0	HC12116L42-I2.00ISOTM5...	12	11.60	102	43.0	5	21	12.0
M16x2.0	M17-M80x2.0	2.0	HC14136L48-I2.00ISOTM5...	14	13.60	108	49.0	5	24	14.0

* Bore diameter applies to smallest thread dia.

Efficient Multi-passes Machining Method

Due to the high volume of chips, thinner chips are required. This is achieved by radial multi-pass machining, which reduces the accumulation of chips, and thereby enables higher speeds and feed rates.



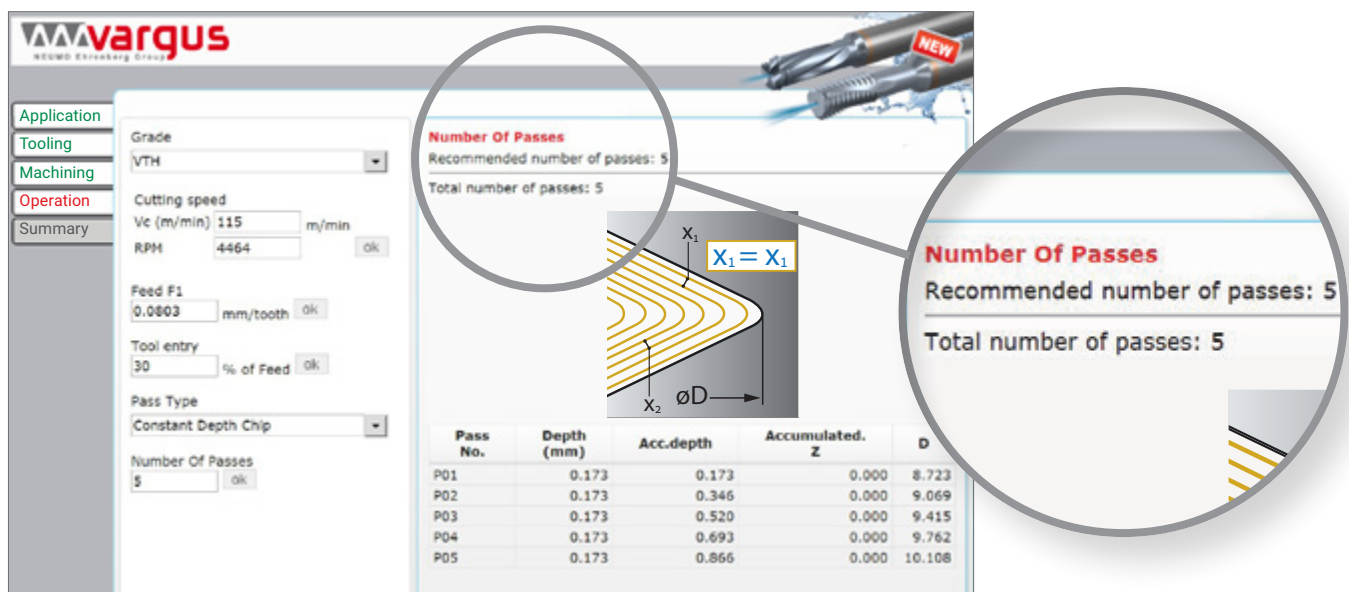
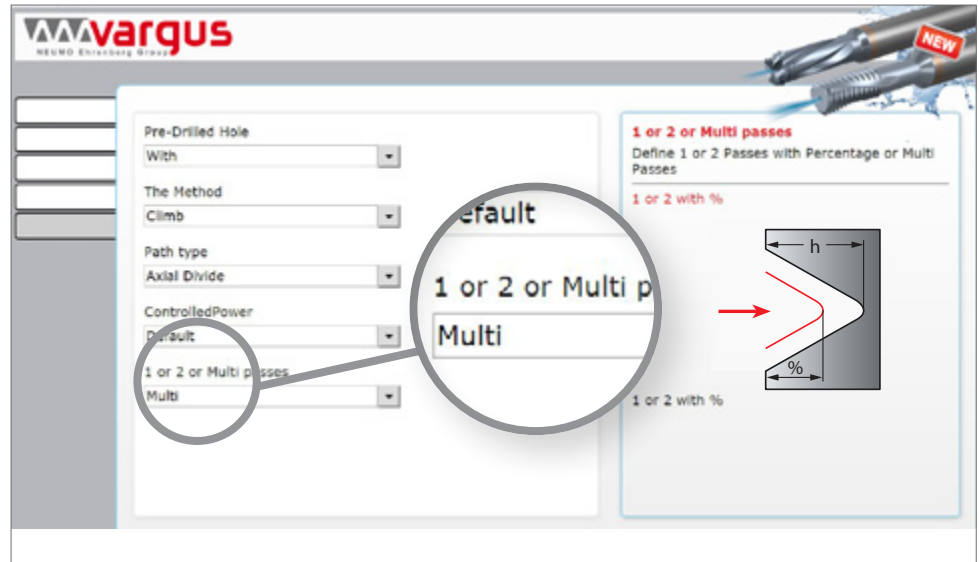
Recommended No. of Passes According to Pitch

Pitch TPI	48	32	24	20	16	14	12	10	8
Pitch mm	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.50	3.00
No. of Passes	2-3	2-3	3-4	4-5	5-6	5-6	6-7	7-8	7-9

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

Material Group	Vargus No.	Material	Hardness Brinell HB	2xDo Tools					3xDo Tools			
				Vc [m/min]	Feed f [mm/tooth] by Cutter Dia. = D2			Vc [m/min]	Feed f [mm/tooth] by Cutter Dia. = D2			
				VTH	2.4-4.0	4.0-9.0	>9.0	VTH	2.4-4.0	4.0-9.0	>9.0	
P Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	145-185	0.07-0.13	0.14-0.23	0.20-0.28	70-110	0.025-0.06	0.10-0.15	0.18-0.28
	2		Medium Carbon (C=0.25-0.55%)	150	135-175	0.07-0.13	0.14-0.23	0.20-0.28	70-110	0.025-0.06	0.10-0.15	0.18-0.28
	3		High Carbon (C=0.55-0.85%)	170	120-160	0.07-0.13	0.14-0.23	0.20-0.28	65-105	0.025-0.06	0.10-0.15	0.18-0.28
	4	Low Alloy Steel (alloying elements≤5%)	Non Hardened	180	100-140	0.07-0.13	0.14-0.23	0.20-0.28	65-105	0.025-0.06	0.10-0.15	0.18-0.28
	5		Hardened	275	95-135	0.07-0.12	0.14-0.22	0.20-0.27	65-105	0.025-0.05	0.10-0.14	0.18-0.27
	6		Hardened	350	90-130	0.05-0.09	0.13-0.18	0.15-0.20	60-100	0.02-0.035	0.075-0.11	0.14-0.20
	7	High Alloy Steel (alloying elements>5%)	Annealed	200	50-90	0.07-0.12	0.14-0.22	0.20-0.27	50-90	0.025-0.05	0.10-0.14	0.18-0.27
	8		Hardened	325	40-80	0.05-0.08	0.13-0.17	0.15-0.19	40-80	0.02-0.035	0.075-0.11	0.14-0.20
	9	Cast Steel	Low Alloy (alloying elements <5%)	200	145-185	0.07-0.13	0.14-0.24	0.16-0.25	70-110	0.025-0.06	0.10-0.15	0.18-0.28
	10		High Alloy (alloying elements >5%)	225	95-135	0.05-0.09	0.13-0.18	0.15-0.20	65-105	0.02-0.035	0.075-0.11	0.14-0.20
M Stainless Steel	11	Stainless Steel Ferritic	Non Hardened	200	85-125	0.05-0.09	0.13-0.18	0.15-0.20	60-100	0.02-0.035	0.075-0.11	0.14-0.20
	12		Hardened	330	70-110	0.05-0.10	0.13-0.19	0.15-0.21	60-100	0.02-0.04	0.075-0.13	0.14-0.22
	13	Stainless Steel Austenitic	Austenitic	180	80-120	0.07-0.13	0.14-0.24	0.18-0.26	60-100	0.025-0.06	0.10-0.15	0.18-0.28
	14		Super Austenitic	200	75-115	0.07-0.13	0.14-0.24	0.18-0.26	60-100	0.025-0.06	0.10-0.15	0.18-0.28
	15	Stainless Steel Cast Ferritic	Non Hardened	200	90-130	0.07-0.13	0.14-0.24	0.18-0.26	60-100	0.025-0.06	0.10-0.15	0.18-0.28
	16		Hardened	330	65-105	0.05-0.09	0.13-0.18	0.15-0.20	60-100	0.02-0.035	0.075-0.11	0.14-0.20
	17	Stainless Steel Cast Austenitic	Austenitic	200	85-125	0.07-0.13	0.14-0.24	0.18-0.26	60-100	0.025-0.06	0.10-0.15	0.18-0.28
	18		Hardened	330	60-100	0.05-0.09	0.13-0.18	0.15-0.20	60-100	0.02-0.035	0.075-0.11	0.14-0.20
K Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	60-70	0.07-0.13	0.14-0.24	0.18-0.26	60-100	0.025-0.06	0.10-0.15	0.18-0.28
	29		Pearlitic (long chips)	230	85-125	0.07-0.13	0.14-0.24	0.18-0.26	60-100	0.025-0.06	0.10-0.15	0.18-0.28
	30	Grey Cast Iron	Low Tensile Strength	180	95-135	0.07-0.13	0.14-0.24	0.18-0.26	65-105	0.025-0.06	0.10-0.15	0.18-0.28
	31		High Tensile Strength	260	60-100	0.05-0.09	0.13-0.18	0.15-0.20	70-110	0.02-0.035	0.075-0.11	0.14-0.20
	32	Nodular Sg Iron	Ferritic	160	55-95	0.07-0.13	0.14-0.24	0.18-0.26	40-80	0.025-0.06	0.10-0.15	0.18-0.28
	33		Pearlitic	260	50-90	0.05-0.09	0.13-0.18	0.15-0.20	40-80	0.02-0.035	0.075-0.11	0.14-0.20
N Non-Ferrous Metals	34	Aluminum Alloys Wrought	Non Aging	60	200-300	0.09-0.18	0.22-0.3	0.18-0.35	70-110	0.04-0.08	0.15-0.23	0.25-0.35
	35		Aged	100	150-250	0.09-0.18	0.22-0.3	0.18-0.35	70-110	0.04-0.08	0.15-0.23	0.25-0.35
	36	Aluminum Alloys	Cast	75	100-200	0.09-0.18	0.22-0.3	0.18-0.35	70-110	0.04-0.08	0.15-0.23	0.25-0.35
	37		Cast & Aged	90	120-220	0.09-0.18	0.22-0.3	0.18-0.35	70-110	0.04-0.08	0.15-0.23	0.25-0.35
	38	Aluminum Alloys	Cast Si 13-22%	130	200-300	0.09-0.18	0.22-0.3	0.18-0.35	70-110	0.04-0.08	0.15-0.23	0.25-0.35
	39	Copper and Copper Alloys	Brass	90	200-300	0.09-0.20	0.22-0.32	0.18-0.37	70-110	0.04-0.10	0.15-0.26	0.25-0.38
40	Bronze And Non Leaded Copper		100	150-250	0.09-0.18	0.22-0.3	0.18-0.35	70-110	0.04-0.08	0.15-0.23	0.25-0.35	

The VARGUS GENius™
automatically
generates
the recommended
number of passes
for the application!



Features and Benefits

- The VARGUS GENius™ now offers unlimited multiple radial passes for thread milling applications
- The software automatically generates the recommended number of passes required based on the machining data that is entered
- The new update allows for complete control of the number of passes, as the well as depth of the last pass
- Specially designed for TM Solid MultiFlute
- Highly recommended for applications such as long threads, difficult to machine applications, and hard materials

Thread Milling

TM Solid **TMDR**

Drilling, Thread Milling & Chamfering

EXPANDED LINE

Now Available in Full Profiles BSP & NPT

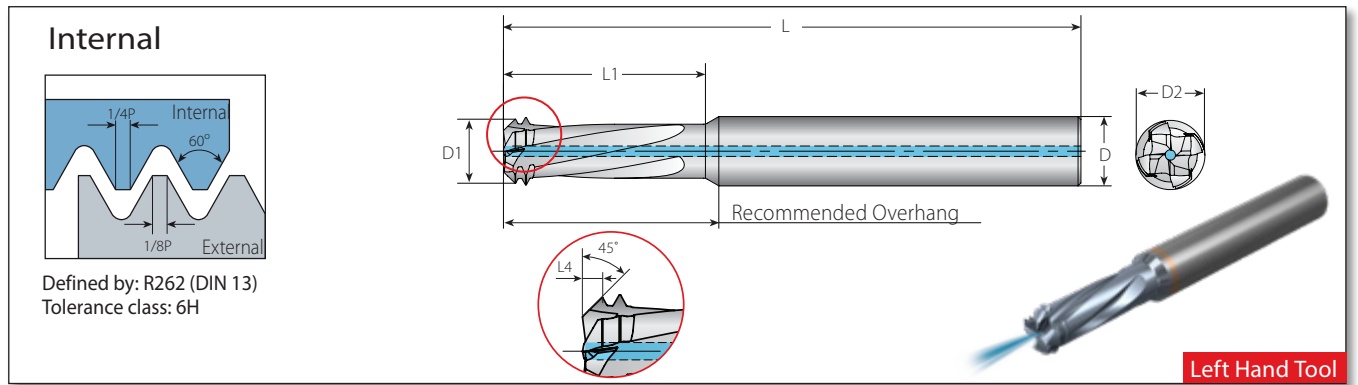


Features and Benefits

- TMDR tools drill, thread and chamfer all in one tooling operation
- Pre-drilled holes are no longer required!
- Drilling and thread milling is done simultaneously, while chamfering is produced at the end of the operation
- All tools are left handed, and are suitable for right and left hand threads
- All expansion tools are available with coolant thru
- Expansion Includes:
 - ISO Metric: M10, M12, M16 & M24 tools for 2.5xDo
 - BSP: 28, 19 & 14 TPI
 - NPT: 27, 18 & 14 TPI
- VTS Grade:
A general-purpose, heavy duty thread milling grade. TiAlN coated for high resistance to wear

The **TMDR** is fully supported by **VARGUS GENius™**, the most advanced Tool Selector and CNC Program Generator in the metal cutting tools industry.



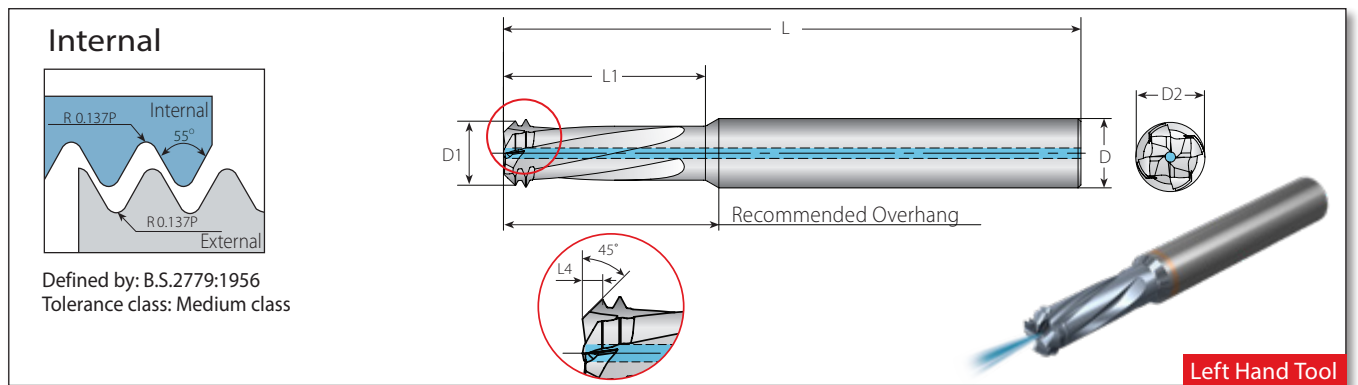


TMDR - Drilling, Thread Milling & Chamfering

2.5 x Do ($L1 \leq 2.5 \times \text{Thread Diameter}$)

Thread		Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth		
M Coarse	M Fine	mm	Internal	D	D2	L	L1	Z	Zt	L4*	D1
With Coolant											
M10x1.5	M11-M14x1.5	1.50	TDC2L08078L280-I1.50ISO...	8	7.8	64	28.0	4	2	1.12	7.24
M12x1.75		1.75	TDC2L10090L320-I1.75ISO...	10	9.0	80	32.0	4	2	1.20	8.35
M16x2.0	M17-M23x2.0	2.00	TDC2L12118L430-I2.00ISO...	12	11.8	100	43.0	4	2	2.00	11.13
M24x3.0		3.00	TDC2L18178L650-I3.00ISO...	18	17.8	135	65.0	4	2	2.50	16.90

BSP (G)

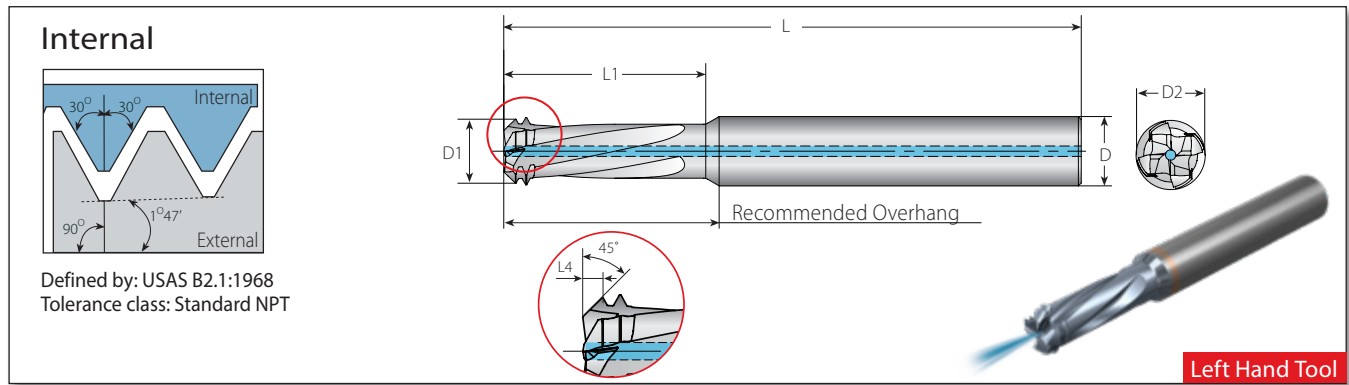


TMDR - Drilling, Thread Milling & Chamfering

2 x Do ($L1 \leq 2 \times \text{Thread Diameter}$)

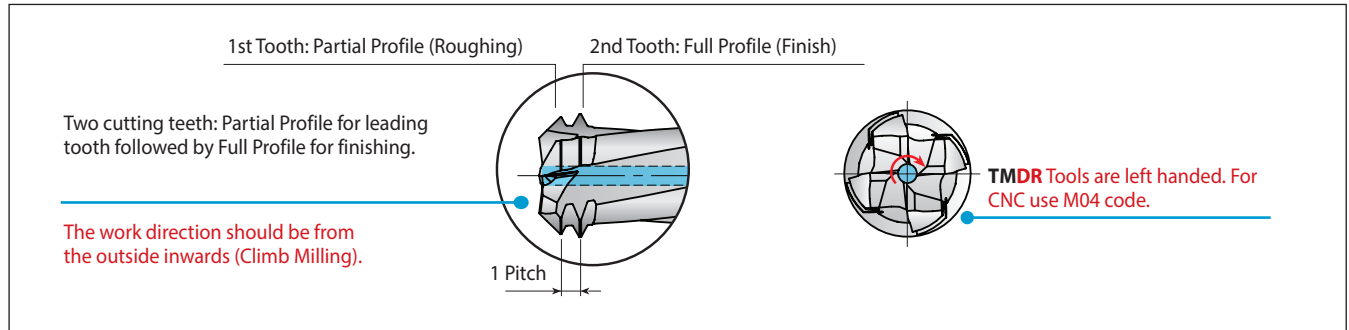
Thread		Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth		
Standard	TPI		Internal	D	D2	L	L1	Z	Zt	L4*	D1
With Coolant											
1/16"x28	28		TDC2L08059L175-I28BSP...	8	5.9	64	17.5	4	2	0.60	5.50
1/8"x28	28		TDC2L08078L230-I28BSP...	8	7.8	64	23.0	4	2	0.60	7.28
1/4"x19	19		TDC2L12105L320-I19BSP...	12	10.5	80	32.0	4	2	0.80	10.00
3/8"x19	19		TDC2L14126L380-I19BSP...	14	12.6	100	38.0	4	2	0.80	12.04
1/2"x14	14		TDC2L16158L456-I14BSP...	16	15.8	135	45.6	4	2	1.27	15.16

* Please use the VARGUS GENius™ for Chamfer recommendations



TMDR - Drilling, Thread Milling & Chamfering

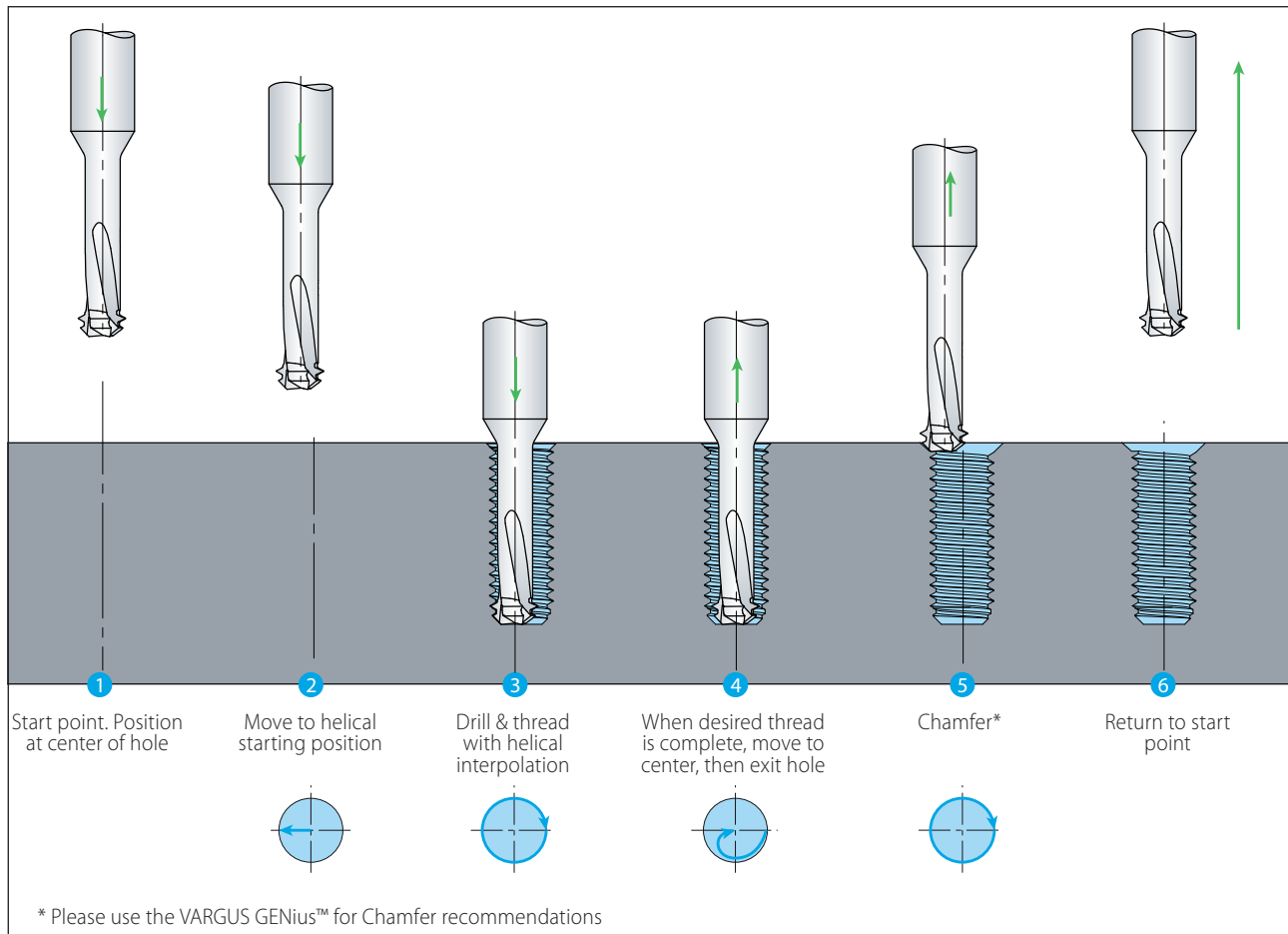
Thread	Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth		
Standard	TPI	Internal	D	D2	L	L1	Z	Zt	L4*	D1
With Coolant										
1/16"x27	27	TDC2L08056L112-I27NPT...	8	5.6	64	11.2	4	2	0.60	5.07
1/8"x27	27	TDC2L08075L112-I27NPT...	8	7.5	64	11.2	4	2	0.60	6.97
1/4"x18	18	TDC2L10094L164-I18NPT...	10	9.4	80	16.4	4	2	1.00	8.67
3/8"x18	18	TDC2L12119L164-I18NPT...	12	11.9	100	16.4	4	2	1.00	11.19
1/2"x14	14	TDC2L16153L286-I14NPT...	16	15.3	100	28.6	6	2	1.50	14.41



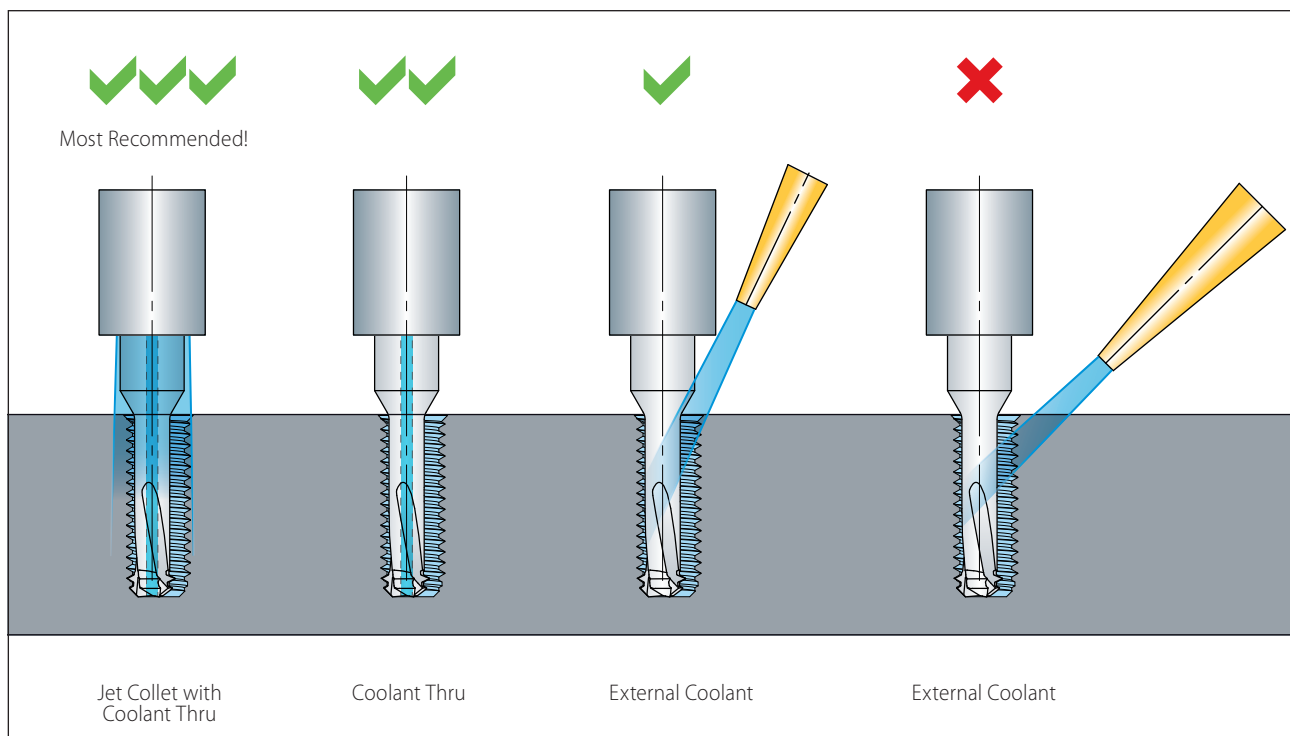
* Please use the VARGUS GENius™ for Chamfer recommendations

TMDR - Operating Cycle

TMDR



TMDR - Coolant Use for Best Chip Evacuation



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

Material Group	Vargus No.	Material		Hardness Brinell HB	Vc [mm/min]	Feed f [mm/tooth]
					VTS	
P Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	60-120	0.02-0.12
	2		Medium Carbon (C=0.25-0.55%)	150	60-120	0.02-0.12
	3		High Carbon (C=0.55-0.85%)	170	60-90	0.02-0.12
	4	Low Alloy Steel (alloying elements ≤ 5%)	Non Hardened	180	60-90	0.02-0.12
	5		Hardened	275	50-80	0.02-0.05
	6		Hardened	350	50-80	0.02-0.03
	7	High Alloy Steel (alloying elements > 5%)	Annealed	200	50-80	0.02-0.07
	8		Hardened	325	50-80	0.02-0.03
	9	Cast Steel	Low Alloy (alloying elements < 5%)	200	70-90	0.02-0.12
	10		High Alloy (alloying elements > 5%)	225	60-80	0.02-0.03
M Stainless Steel	11	Stainless Steel Ferritic	Non Hardened	200	60-90	0.02-0.12
	12		Hardened	330	50-80	0.02-0.03
	13	Stainless Steel Austenitic	Austenitic	180	60-90	0.02-0.12
	14		Super Austenitic	200	50-80	0.02-0.12
	15	Stainless Steel Cast Ferritic	Non Hardened	200	60-90	0.02-0.12
	16		Hardened	330	50-80	0.02-0.03
	17	Stainless Steel Cast Austenitic	Austenitic	200	60-90	0.02-0.12
	18		Hardened	330	50-80	0.02-0.03
K Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	50-80	0.02-0.03
	29		Pearlitic (long chips)	230	60-90	0.02-0.09
	30	Grey Cast Iron	Low Tensile Strength	180	70-100	0.02-0.12
	31		High Tensile Strength	260	60-90	0.02-0.09
	32	Nodular Sg Iron	Ferritic	160	70-100	0.02-0.12
	33		Pearlitic	260	60-90	0.02-0.09
N Non-Ferrous Metals	34	Aluminum Alloys Wrought	Non Aging	60	60-250	0.03-0.11
	35		Aged	100	60-150	0.03-0.12
	36	Aluminum Alloys	Cast	75	60-250	0.03-0.12
	37		Cast & Aged	90	60-150	0.02-0.12
	38	Aluminum Alloys	Cast Si 13-22%	130	250	0.03-0.11
	39	Copper and Copper Alloys	Brass	90	60-250	0.03-0.12
	40		Bronze And Non Leaded Copper	100	60-150	0.03-0.11
S Heat Resistant Material	19	High Temperature Alloys	Annealed (iron based)	200	60	0.02-0.12
	20		Aged (iron based)	280	50	0.02-0.03
	21		Annealed (nickel or cobalt based)	250	35	0.02-0.03
	22		Aged (nickel or cobalt based)	350	30	0.02-0.03
	23	Titanium Alloys	Pure 99.5 Ti	400Rm	30-50	0.02-0.05
	24		α+β Alloys	1050Rm	25-35	0.02-0.05
H Hardened Material	25	Extra Hard Steel	Hardened & Tempered	45-50HRC	-	-
	26			51-55HRC	-	-

Thread Milling

Helicool-R (HCR)

Helical Thread Mill Flutes with Radial Cooling

EXPANDED LINE

Now Available in Additional Threading Standards



Features and Benefits

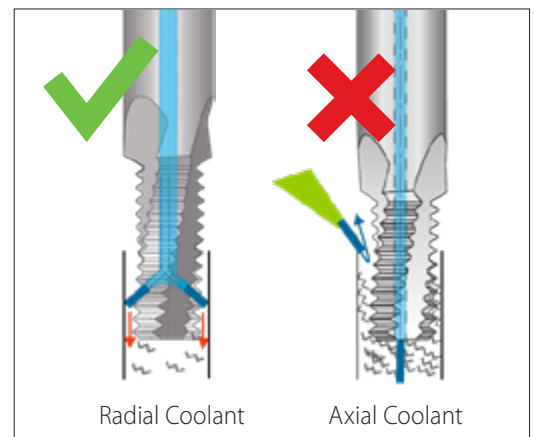
- Effective coolant in thru holes
- Delivering coolant directly to the cutting area
- Good solution when external cooling is not available or ineffective

Expansion Includes:

Metric Shanks:

- ISO Metric
- American UN
- BSP (G)
- NPT
- BSPT
- UNJ

Chip Evacuation in Thru Holes
using Axial & Radial Coolant

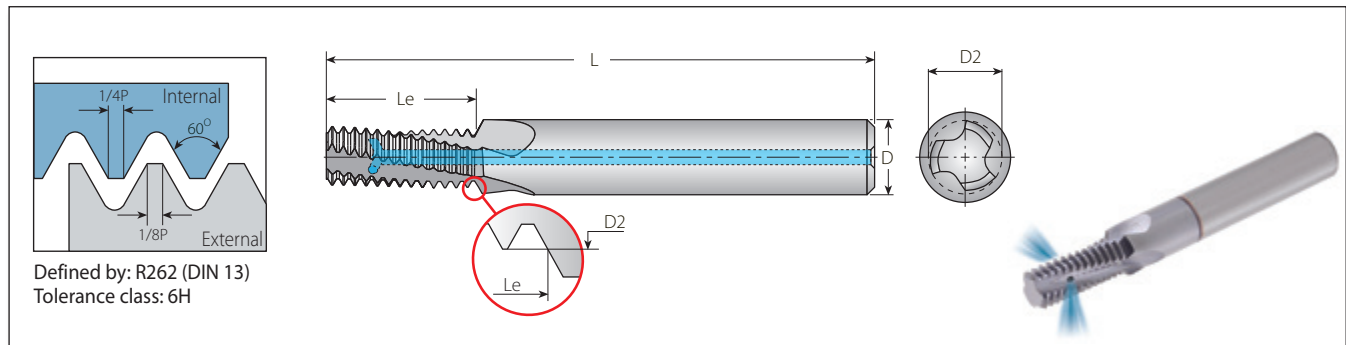


The new **HCR tools** are fully supported by **VARGUS GENius™**, the most advanced Tool Selector and CNC Program Generator in the metal cutting tools industry



ISO Metric

Helicool-R (HCR)

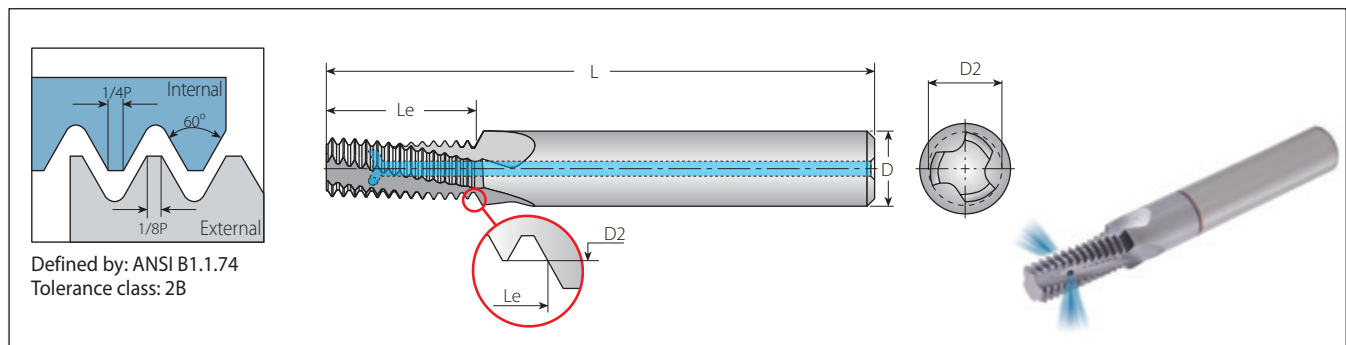


Helicool-R (HCR)

2 x Do (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
M14x2.0	M17-M80x2.0	2.0	HCR12116L29-I2.00ISOTM...	12	11.6	80	29.0	4	14	12.0
M16x2.0	M17-M80x2.0	2.0	HCR14136L33-I2.00ISOTM...	14	13.6	92	33.0	4	16	14.0
M20x2.5		2.5	HCR18171L41-I2.50ISOTM...	18	17.1	102	41.2	4	16	17.5

American UN



Helicool-R (HCR)

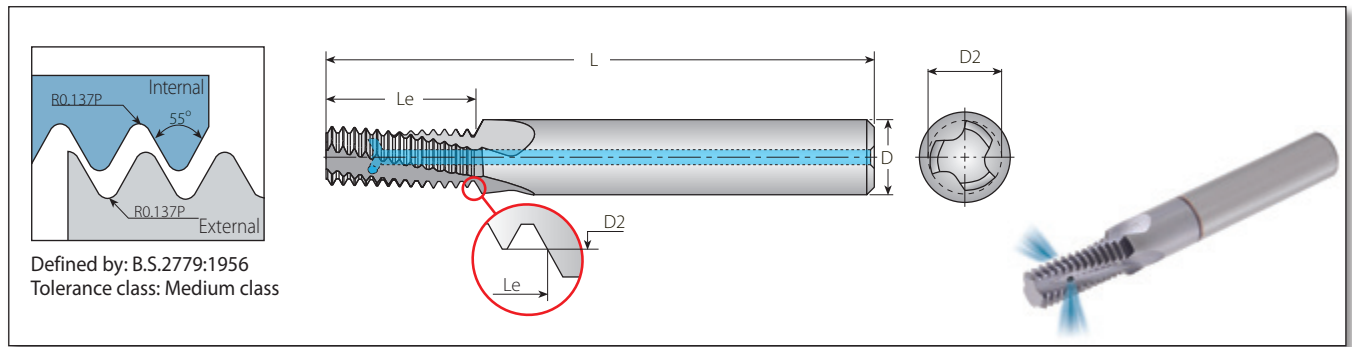
2 x Do (Le ≤ 2 x Thread Diameter)

Thread			Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
UNC	UNF	UNEF	TPI	Internal	D	D2	L	Le	Z	Zt	mm
	1/4"x28	7/16", 1/2"x28	28	HCR06052L13-I28UNFTM...	6	5.15	57	13.1	3	14	5.5
	5/16", 3/8"x24	9/16"-11/16"x24	24	HCR08066L16-I24UNFTM...	8	6.68	61	16.4	3	15	6.8
	3/8"x24	9/16"-11/16"x24	24	HCR10082L19-I24UNFTM...	10	8.20	73	19.6	3	18	8.5
1/4"x20	7/16", 1/2"x20	3/4"-1"x20	20	HCR06048L13-I20UNCTM...	6	4.88	57	13.3	3	10	5.2
	7/16", 1/2"x20	3/4"-1"x20	20	HCR10096L22-I20UNFTM...	10	9.60	73	22.2	3	17	9.8
5/16"x18	9/16", 5/8"x18	11/16"-1 11/16"x18	18	HCR08061L16-I18UNCTM...	8	6.15	61	16.2	3	11	6.5
3/8"x16	3/4"x16		16	HCR08076L19-I16UNCTM...	8	7.65	61	19.8	3	12	8.0
7/16"x14	7/8"x14		14	HCR10090L22-I14UNCTM...	10	9.00	73	22.7	3	12	9.3
1/2"x13			13	HCR12104L26-I13UNCTM...	12	10.35	80	26.4	4	13	10.8
9/16"x12	1"-1 1/2"x12		12	HCR12118L28-I12UNCTM...	12	11.80	80	28.6	4	13	12.3
5/8"x11			11	HCR14131L33-I11UNCTM...	14	13.10	92	33.5	4	14	13.5
3/4"x10			10	HCR16159L39-I10UNCTM...	16	15.90	92	39.4	4	15	16.5
1"x8			8	HCR20199L52-I8UNCTM...	20	19.90	102	52.4	4	16	22.0

* Bore diameter applies to smallest thread dia.

BSP (G)

Helicool-R (HCR)

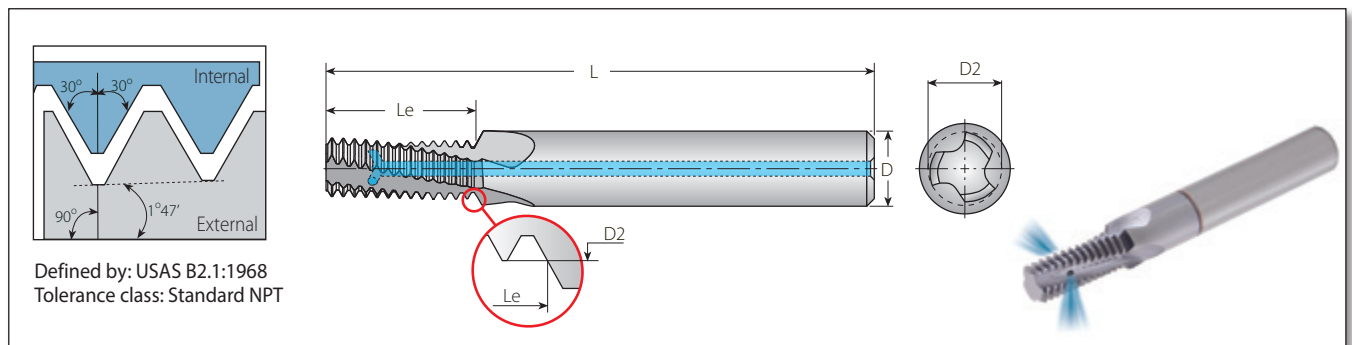


Helicool-R (HCR)

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

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	HCR10082L19-EI28BSPTM...	10	8.20	73	19.5	3	21	8.7
1/4", 3/8"x19	19	HCR12110L27-EI19BSPTM...	12	11.00	80	27.4	4	20	11.8
1/2"-7/8"x14	14	HCR18179L42-EI14BSPTM...	18	17.90	102	42.6	4	23	19.0

NPT



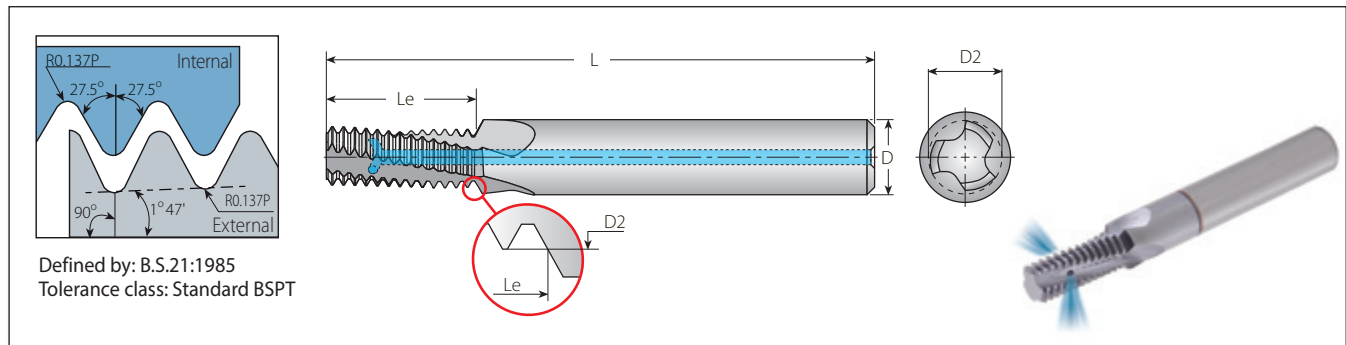
Helicool-R (HCR)

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	HCR06059L09-EI27NPT-TM...	6	5.90	57	9.9	3	10	6.3
1/8"x27	27	HCR08076L09-EI27NPT-TM...	8	7.65	61	9.9	3	10	8.5
1/4"x18	18	HCR10099L14-EI18NPT-TM...	10	9.90	73	14.8	3	10	11.1
3/8"x18	18	HCR12111L14-EI18NPT-TM...	12	11.15	73	14.8	4	10	14.5
1/2", 3/4"x14	14	HCR16142L19-EI14NPT-TM...	16	14.25	92	19.0	4	10	17.7, 23.0
1", 1 1/4", 1 1/2", 2"x11.5	11.5	HCR20196L23-EI11.5NPT-TM...	20	19.60	102	23.2	4	10	29.0, 37.7, 44.0, 56.0

* Bore diameter applies to smallest thread dia.

BSPT

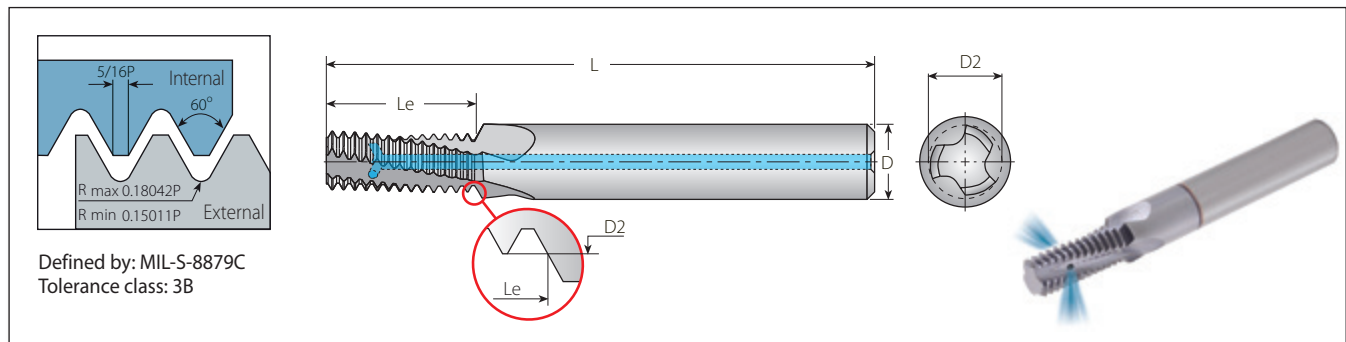
Helicool-R (HCR)



Helicool-R (HCR)

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	HCR08076L10-EI28BSPT-TM...	8	7.65	61	10.2	3	11	8.7
1/4"x19	19	HCR10099L15-EI19BSPT-TM...	10	9.90	73	15.4	3	11	11.8
3/8"x19	19	HCR12111L15-EI19BSPT-TM...	12	11.15	73	15.4	4	11	15.2
1/2", 3/4"x14	14	HCR16142L22-EI14BSPT-TM...	16	14.25	92	22.7	4	12	19.0

UNJ



Helicool-R (HCR)

2 x Do (Le ≤ 2 x Thread Diameter)

Thread				Pitch	Ordering Code	Dimensions mm				No. of Flutes	Teeth	Bore Dia.*
UNJC	UNJF	UNJEF	UNJ	TPI	Internal	D	D2	L	Le	Z	Zt	mm
-	0.250"(1/4")	0.4375"(7/16")	0.5625"(9/16")	28	HCR06054L13-I28UNJTM...	6	5.40	57	13.1	3	14	5.6
-	0.3125"(5/16")	0.5625"(9/16")	-	24	HCR08067L15-I24UNJTM...	8	6.70	61	16.4	3	15	7.0
-	0.4375"(7/16")	0.750"(3/4")	0.5625"(9/16")	20	HCR10096L21-I20UNJTM...	10	9.60	73	22.2	4	17	10.0
0.3125"(5/16")	0.5625"(9/16")	1.0625"(1 1/16")	-	18	HCR08064L15-I18UNJTM...	8	6.40	61	16.2	3	11	6.75
0.375"(3/8")	0.750"(3/4")	-	0.4375"(7/16")	16	HCR08077L19-I16UNJTM...	8	7.70	61	19.8	3	12	8.1

* Bore diameter applies to smallest thread dia.

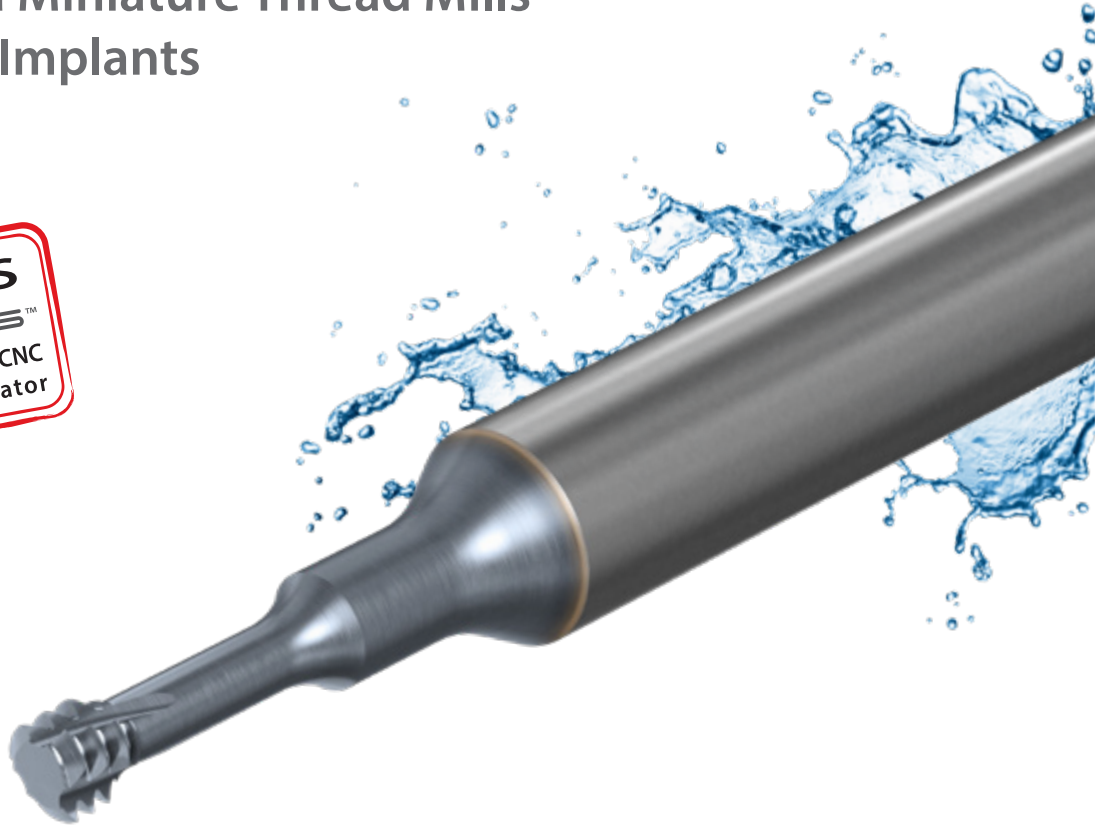
Recommended Cutting Speeds Vc [mm/min] and Feed f [mm/tooth]

Material Group	Vargus No.	Material		Hardness Brinell HB	Vc [mm/min]	Feed f [mm/tooth]
					VTH	
P Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	80-250	0.03-0.08
	2		Medium Carbon (C=0.25-0.55%)	150	80-230	0.03-0.08
	3		High Carbon (C=0.55-0.85%)	170	80-200	0.03-0.08
	4	Low Alloy Steel (alloying elements≤5%)	Non Hardened	180	60-180	0.03-0.08
	5		Hardened	275	60-170	0.03-0.07
	6		Hardened	350	60-160	0.02-0.06
	7	High Alloy Steel (alloying elements>5%)	Annealed	200	40-100	0.03-0.07
	8		Hardened	325	30-80	0.03-0.06
	9	Cast Steel	Low Alloy (alloying elements <5%)	200	80-250	0.03-0.07
	10		High Alloy (alloying elements >5%)	225	60-170	0.03-0.07
M Stainless Steel	11	Stainless Steel Ferritic	Non Hardened	200	60-150	0.03-0.08
	12		Hardened	330	60-120	0.03-0.06
	13	Stainless Steel Austenitic	Austenitic	180	60-140	0.03-0.08
	14		Super Austenitic	200	60-130	0.03-0.06
	15	Stainless Steel Cast Ferritic	Non Hardened	200	60-160	0.03-0.06
	16		Hardened	330	60-110	0.02--0.05
	17	Stainless Steel Cast Austenitic	Austenitic	200	60-150	0.02-0.05
	18		Hardened	330	60-100	0.02-0.04
K Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	60-70	0.03-0.08
	29		Pearlitic (long chips)	230	60-150	0.03-0.07
	30	Grey Cast Iron	Low Tensile Strength	180	70-160	0.03-0.07
	31		High Tensile Strength	260	40-120	0.03-0.07
	32	Nodular Sg Iron	Ferritic	160	40-110	0.03-0.08
	33		Pearlitic	260	40-100	0.03-0.07
N Non-Ferrous Metals	34	Aluminum Alloys Wrought	Non Aging	60	200-300	0.04-0.1
	35		Aged	100	150-250	0.03-0.1
	36	Aluminum Alloys	Cast	75	100-200	0.03-0.1
	37		Cast & Aged	90	120-220	0.06-0.12
	38	Aluminum Alloys	Cast Si 13-22%	130	200-300	0.05-0.12
	39	Copper and Copper Alloys	Brass	90	200-300	0.05-0.12
S Heat Resistant Material	40		Bronze And Non Leaded Copper	100	150-250	0.05-0.12
	19	High Temperature Alloys	Annealed (iron based)	200	30-60	0.03-0.7
	20		Aged (iron based)	280	20-50	0.03-0.06
	21		Annealed (nickel or cobalt based)	250	15-35	0.03-0.06
	22		Aged (nickel or cobalt based)	350	15-30	0.02-0.05
	23	Titanium Alloys	Pure 99.5 Ti	400Rm	40-80	0.02-0.05
H Hardened Material	24		α+β Alloys	1050Rm	20-50	0.02-0.04
	25	Extra Hard Steel	Hardened & Tempered	45-50HRc	15-45	0.02-0.03
	26			51-55HRc	15-40	0.02-0.03

Thread Milling

NEW

MilliPro Dental Reinforced Miniature Thread Mills for Dental Implants

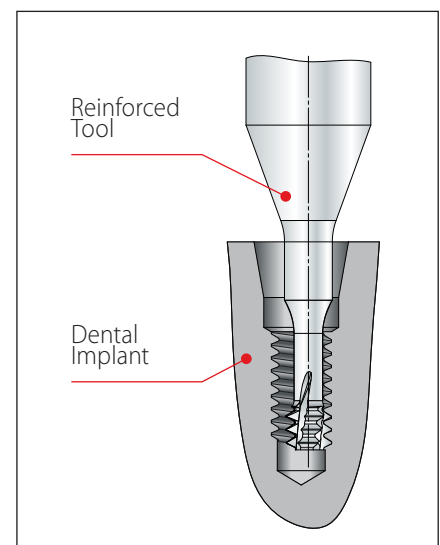


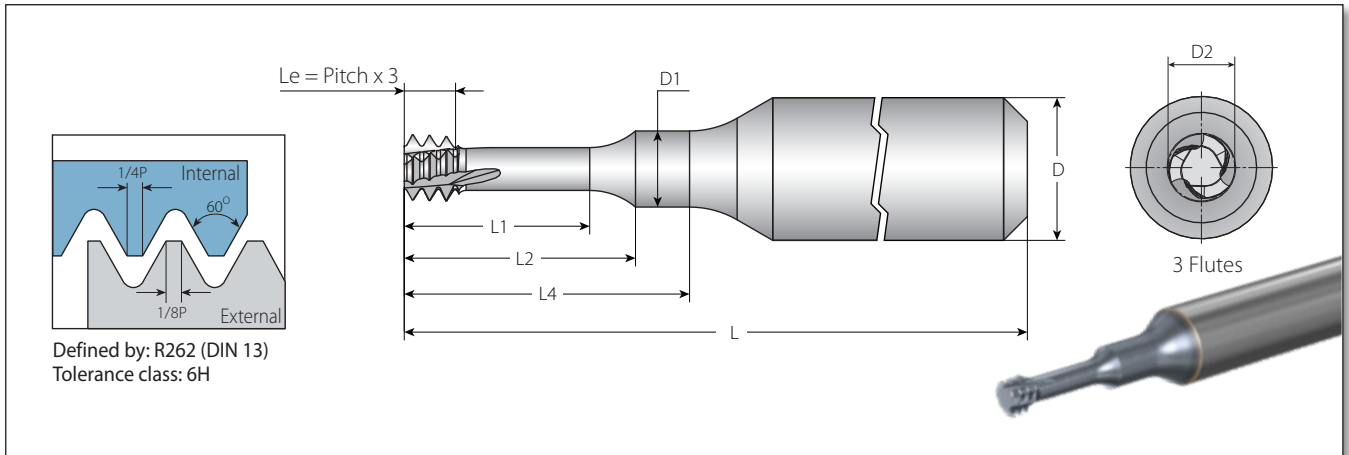
Features and Benefits

- Reinforced overhang for better stability
- Specifically designed for the dental implant industry
- Increased tool life
- Now with 3 flutes and 3 teeth
- Available in ISO Metric and American UN
- VTH Grade

The new **MilliPro Dental** is fully supported by **VARGUS GENiUS™**, the most advanced Tool Selector and CNC Program Generator in the metal cutting tools industry

Reinforced Overhang



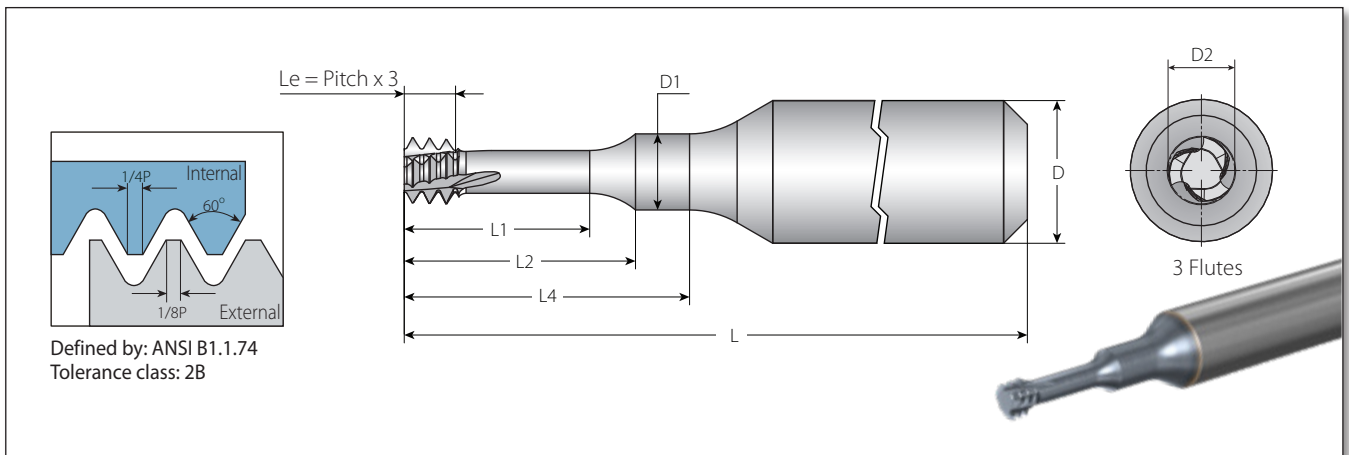


Miniature Thread Mills for Dental Implants

3 x Do (L4 ≥ 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	L2	L4	D1	Z	Zt	mm
M1.2x0.25	M1.4x0.25	0.25	DD3T03009L043-I0.25ISOTM...	3	0.90	39	2.5	3.3	4.3	0.95	3	3	0.97
M1.4x0.30		0.3	DD3T03011L050-I0.30ISOTM...		1.05		2.8	3.5	5.0	1.05			1.12
M1.6x0.35	M1.8x0.35	0.35	DD3T03012L058-I0.35ISOTM...		1.20		3.3	4.2	5.9	1.25			1.27
M1.8x0.35	M2.0x0.35	0.35	DD3T03014L065-I0.35ISOTM...		1.40		3.8	4.7	6.6	1.45			1.47
M2.0x0.4		0.4	DD3T03015L067-I0.40ISOTM...		1.54		3.9	4.9	6.7	1.70			1.63
M2.5x0.45		0.45	DD3T03019L082-I0.45ISOTM...		1.96		4.8	5.8	8.2	2.00			2.08

American UN



Miniature Thread Mills for Dental Implants

3xDo (L4 ≥ 3 x Thread Diameter)

Thread		Pitch	Ordering Code	Dimensions mm							No. of Flutes	Teeth	Bore Dia.
UNF	TPI		Internal	D	D2	L	L1	L2	L4	D1	Z	Zt	mm
0-80UN	80		DD3T03011L052-I80UNTM...	3	1.16	39	2.8	3.6	5.0	1.15	3	3	1.27
1-72UN	72		DD3T03014L065-I72UNTM...		1.44		3.9	4.9	6.5	1.60			1.56

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

Material Group	Vargus No.	Material		Hardness Brinell HB	Vc [mm/min]	Feed f [mm/tooth]
					VTS	
P Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	60-120	0.02-0.16
	2		Medium Carbon (C=0.25-0.55%)	150	60-120	0.02-0.16
	3		High Carbon (C=0.55-0.85%)	170	60-90	0.02-0.16
	4	Low Alloy Steel (alloying elements≤5%)	Non Hardened	180	60-90	0.02-0.16
	5		Hardened	275	50-80	0.02-0.07
	6		Hardened	350	50-80	0.02-0.03
	7	High Alloy Steel (alloying elements>5%)	Annealed	200	50-80	0.02-0.09
	8		Hardened	325	50-80	0.02-0.03
	9	Cast Steel	Low Alloy (alloying elements <5%)	200	70-90	0.02-0.16
	10		High Alloy (alloying elements >5%)	225	60-80	0.02-0.03
M Stainless Steel	11	Stainless Steel Ferritic	Non Hardened	200	60-90	0.02-0.16
	12		Hardened	330	50-80	0.02-0.03
	13	Stainless Steel Austenitic	Austenitic	180	60-90	0.02-0.16
	14		Super Austenitic	200	50-80	0.02-0.16
	15	Stainless Steel Cast Ferritic	Non Hardened	200	60-90	0.02-0.16
	16		Hardened	330	50-80	0.02-0.03
	17	Stainless Steel Cast Austenitic	Austenitic	200	60-90	0.02-0.16
	18		Hardened	330	50-80	0.02-0.03
K Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	50-80	0.02-0.03
	29		Pearlitic (long chips)	230	60-90	0.02-0.12
	30	Grey Cast Iron	Low Tensile Strength	180	70-100	0.02-0.16
	31		High Tensile Strength	260	60-90	0.02-0.12
	32	Nodular Sg Iron	Ferritic	160	70-100	0.02-0.16
	33		Pearlitic	260	60-90	0.02-0.12
N Non-Ferrous Metals	34	Aluminum Alloys Wrought	Non Aging	60	60-250	0.03-0.15
	35		Aged	100	60-150	0.03-0.16
	36	Aluminum Alloys	Cast	75	60-250	0.03-0.16
	37		Cast & Aged	90	60-150	0.02-0.16
	38	Aluminum Alloys	Cast Si 13-22%	130	250	0.03-0.15
	39	Copper and Copper Alloys	Brass	90	60-250	0.03-0.16
	40		Bronze And Non Leaded Copper	100	60-150	0.03-0.15
S Heat Resistant Material	19	High Temperature Alloys	Annealed (iron based)	200	60	0.02-0.16
	20		Aged (iron based)	280	50	0.02-0.03
	21		Annealed (nickel or cobalt based)	250	35	0.02-0.03
	22		Aged (nickel or cobalt based)	350	30	0.02-0.03
	23	Titanium Alloys	Pure 99.5 Ti	400Rm	30-50	0.02-0.07
	24		α+β Alloys	1050Rm	25-35	0.02-0.07
H Hardened Material	25	Extra Hard Steel	Hardened & Tempered	45-50HRc	45	-
	26			51-55HRc	30	-

With a network of 13 international companies and hundreds of distributors, warehouses and certified ISO 9001 manufacturing facilities, VARGUS Ltd. serves customers in more than 100 countries around the globe. A customer-focused organization, VARGUS Ltd. is committed to providing innovative products and solutions of the highest quality and excellent value, and is renowned for its technical expertise and uncompromising service.



VARGUS Ltd. - Global Headquarters +972 4 9855 101 | mrktg@vargus.com

EUROPE

 **DENMARK**
VARGUS Scandinavia
+45 8794 4100
vargus@vargus.dk

 **FRANCE**
VARGUS France
+33 1 4601 7060
commercial@vargus.fr

 **GERMANY**
VARGUS Germany
+49 7043 36 161
info@vargus.de

 **ISRAEL**
NEUMO-VARGUS
+972 3 537 3275
neumo@neumo-vargus.co.il

 **POLAND**
VARGUS Poland
+48 46 834 9904 / 46 831 5140
vargus@neumo.pl

 **SPAIN**
VARGUS Ibérica
+34 977 52 49 00
sales@vargus.es

 **SWITZERLAND**
VARGUS Switzerland
+41 41784 2121
info@vargus.ch

 **TURKEY**
VARGUS Turkey
+90 212 875 01 41
info@vargusturkey.com

 **UNITED KINGDOM**
VARGUS Tooling UK
+44 1952 583 222
tooling.uk@vargustooling.co.uk

ASIA

 **CHINA**
VARGUS China
+86 21 516 88300
info@varguschina.net

 **INDIA**
VARGUS India
+91 2135 654748
info@vargusindia.com

NORTH & LATIN AMERICA

 **BRAZIL**
VARGUS Brazil
+55 47 3084 8001
info@vargus.com.br

 **USA**
VARGUS USA
+1 800 828 8765 / 608 756 4930
sales@vargususa.com

