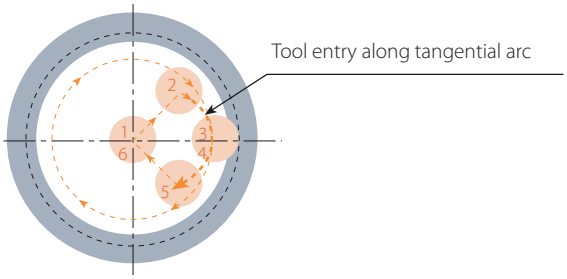
Recommended Cutting Speeds Vc [ft/min] and Feed f [inch/tooth] (Not Including HTC & MilliPro HD)

Material Group	Vargus No.	Material		Hardness Brinell HB	Vc [ft/min]			Feed [inch/tooth]				
					Helicool, HCR, HCC, Helical, Sraight, Deep Threading		MilliPro	He-Lex	Straight	Deep Threading	Helicool HCC HCR	MilliPro
					VTH	VTS	VTH					
P Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	262-820	164-590	197-393	.0012-.0031	.0012-.0031	.0039-.0138	.0012-.0031	.0008-.0063
	2		Medium Carbon (C=0.25-0.55%)	150	262-754	164-459	197-393	.0012-.0031	.0012-.0031	.0031-.0118	.0012-.0031	.0008-.0063
	3		High Carbon (C=0.55-0.85%)	170	262-656	164-393	197-295	.0012-.0031	.0012-.0024	.0031-.0118	.0012-.0031	.0008-.0063
	4	Low Alloy Steel (alloying elements≤5%)	Non Hardened	180	197-590	197-557	197-295	.0012-.0031	.0012-.0028	.0031-.0118	.0012-.0031	.0008-.0063
	5		Hardened	275	197-557	197-525	164-262	.0012-.0028	.0012-.0028	.0031-.0118	.0012-.0028	.0008-.0028
	6		Hardened	350	197-525	197-492	164-262	.0008-.002	.0008-.0016	.002-.0059	.0008-.0024	.0008-.0012
	7	High Alloy Steel (alloying elements>5%)	Annealed	200	131-328	131-295	164-262	.0012-.0028	.0012-.0028	.0039-.0094	.0012-.0028	.0008-.0035
	8		Hardened	325	98-262	98-230	164-262	.0008-.0016	.0008-.002	.002-.0059	.0012-.0024	.0008-.0012
	9	Cast Steel	Low Alloy (alloying elements <5%)	200	262-820	230-656	230-295	.0012-.0031	.0012-.0024	.0031-.0118	.0012-.0028	.0008-.0063
	10		High Alloy (alloying elements >5%)	225	197-557	197-492	197-262	.0012-.002	.0012-.0024	.002-.0059	.0012-.0028	.0008-.0012
M Stainless Steel	11	Stainless Steel Ferritic	Non Hardened	200	197-492	164-459	197-295	.0016-.0028	.0008-.002	.0043-.0138	.0012-.0031	.0008-.0063
	12		Hardened	330	197-393	164-361	164-262	.0008-.0024	.0004-.0012	.002-.0094	.0012-.0024	.0008-.0012
	13	Stainless Steel Austenitic	Austenitic	180	197-459	197-426	197-295	.0012-.0031	.0008-.002	.0043-.0138	.0012-.0031	.0008-.0063
	14		Super Austenitic	200	197-426	164-393	164-262	.0012-.0031	.0008-.002	.0043-.0138	.0012-.0024	.0008-.0063
	15	Stainless Steel Cast Ferritic	Non Hardened	200	197-525	164-492	197-295	.0012-.0031	.0008-.002	.0043-.0138	.0012-.0024	.0008-.0063
	16		Hardened	330	197-361	164-328	164-262	.0008-.002	.0008-.0012	.0039-.0094	.0008-.002	.0008-.0012
	17	Stainless Steel Cast Austenitic	Austenitic	200	197-492	164-459	197-295	.0012-.0031	.0008-.0024	.0043-.0138	.0008-.002	.0008-.0063
	18		Hardened	330	197-328	164-295	164-262	.0008-.002	.0004-.0012	.0039-.0094	.0008-.0016	.0008-.0012
K Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	197-230	197-492	164-262	.0012-.0031	.0012-.0031	.002-.0059	.0012-.0031	.0008-.0012
	29		Pearlitic (long chips)	230	197-492	262-328	197-295	.0012-.0031	.0012-.0024	.0039-.0094	.0012-.0028	.0008-.0047
	30	Grey Cast Iron	Low Tensile Strength	180	230-525	164-459	230-328	.0012-.0031	.0012-.0024	.0035-.0098	.0012-.0028	.0008-.0063
	31		High Tensile Strength	260	131-393	131-361	197-295	.0008-.0024	.0008-.002	.0039-.0094	.0012-.0028	.0008-.0047
	32	Nodular Sg Iron	Ferritic	160	131-361	131-328	230-328	.0012-.0031	.0012-.0028	.0035-.0098	.0012-.0031	.0008-.0063
	33		Pearlitic	260	131-328	131-295	197-295	.0008-.0024	.0008-.002	.0039-.0094	.0012-.0028	.0008-.0047
N Non-Ferrous Metals	34	Aluminium Alloys Wrought	Non Aging	60	656-984	492-820	197-820	.002-.0047	.002-.0059	.0047-.0157	.0016-.0039	.0012-.0059
	35		Aged	100	492-820	328-721	197-492	.002-.0047	.0012-.0039	.0039-.0126	.0012-.0039	.0012-.0063
	36	Aluminium Alloys	Cast	75	328-656	262-492	197-820	.002-.0047	.002-.0059	.0039-.0126	.0012-.0039	.0012-.0063
	37		Cast & Aged	90	393-721	295-525	197-492	.002-.0047	.0012-.0039	.0039-.0118	.0024-.0047	.0008-.0063
	38	Aluminium Alloys	Cast Si 13-22%	130	656-984	492-820	820	.002-.0047	.002-.0059	.0039-.0126	.002-.0047	.0012-.0059
	39	Copper and Copper Alloys	Brass	90	656-984	492-820	197-820	.0024-.0051	.002-.0059	.0047-.0157	.002-.0047	.0012-.0063
	40		Bronze And Non Leaded Copper	100	492-820	328-721	197-492	.002-.0047	.0012-.0039	.0039-.0126	.002-.0047	.0012-.0059
S Heat Resistant Material	19	High Temperature Alloys	Annealed (iron based)	200	98-197	98-164	197	.0012-.0028	.0008-.0016	.0043-.0138	.0012-.0276	.0008-.0063
	20		Aged (iron based)	280	66-164	66-131	164	.0008-.0016	.0004-.0012	.002-.0059	.0012-.0024	.0008-.0012
	21		Annealed (nickel or cobalt based)	250	49-115	49-98	115	.0008-.0016	.0004-.0012	.002-.0059	.0012-.0024	.0008-.0012
	22		Aged (nickel or cobalt based)	350	49-98	49-82	98	.0008-.0016	.0004-.0012	.002-.0059	.0008-.002	.0008-.0012
	23	Titanium Alloys	Pure 99.5 Ti	400Rm	131-262	98-230	98-164	.0008-.0016	.0004-.0012	.0039-.0094	.0008-.002	.0008-.0028
	24		α+β Alloys	1050Rm	66-164	66-148	82-115	.0008-.0016	.0004-.0008	.0039-.0094	.0008-.0016	.0008-.0028
H Hardened Material	25	Extra Hard Steel	Hardened & Tempered	45-50HRc	49-148	49-115	148	.0008-.0012	.0008	.0012-.0024	.0008-.0012	-
	26			51-55HRc	49-131	49-98	98	.0008-.0012	.0004	.0012-.0024	.0008-.0012	-

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

Example:
Threading Feed: .012[inch/tooth]
Tool entry Feed: .0035[inch/tooth]



MilliPro HD
Cutting Speeds Vc [ft/min] and Feed f [inch/tooth]

Material Group	Vargus No.	Material		Hardness Brinell HB	Vc [ft/min]	Feed f [inch/tooth] by Cutting Dia.=D2				
					VTH	.06-.10	.10-.20	.20-.30	.30-.35	.35-.45
P Steel	6	Low Alloy Steel (alloying elements≤5%)	Hardened	350	82-525	.0016	.0020	.0024	.0028	.0031
	8	High Alloy Steel (alloying elements>5%)	Hardened	325	82-591					
M Stainless Steel	12	Stainless Steel Ferritic	Hardened	330	82-394	.0016	.0020	.0024	.0028	.0031
	16	Stainless Steel Cast Ferritic	Hardened	330	82-361					
	18	Stainless Steel Cast Austenitic	Hardened	330	82-328					
K Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	82-525	.0020	.0024	.0028	.0031	.0039
	29		Pearlitic (long chips)	230	82-492	.0016	.0020	.0024	.0028	.0031
	30	Grey Cast Iron	Low Tensile Strength	180	82-427	.0020	.0024	.0028	.0031	.0039
	31		High Tensile Strength	260	82-328	.0016	.0020	.0024	.0028	.0031
	32	Nodular Sg Iron	Ferritic	160	82-410	.0016	.0020	.0024	.0028	.0035
	33		Pearlitic	260	82-295	.0012	.0016	.0020	.0024	.0028
S Heat Resistant Material	21	High Temperature Alloys	Annealed (nickel or cobalt based)	250	49-115	.0012	.0016	.0020	.0024	.0028
	22		Aged (nickel or cobalt based)	350	49-98					
	23	Titanium Alloys	Pure 99.5 Ti	400Rm	82-230					
	24		α+β alloys	1050Rm	82-164					
H Hardened Material	25	Extra Hard Steel	Hardened & Tempered	45-50HRc	82-230	.0016	.0020	.0024	.0028	.0031
	26			51-55HRc	82-197	.0012	.0016	.0020	.0024	.0028
	27			56-62HRc	82-164	.0008	.0012	.0016	.0020	.0024

HTC Recommended Grades, Cutting Speed and Feed

Material Group	Material		Hardness Brinell HB	Strength (N-mm2)	Vc[ft/min]		fb[Inch/rev]		fz[inch/tooth]	
					VTN	VTS	≤.24 inch	≤.47 inch	≤.24 inch	≤.47 inch
K Cast Iron	Cast Iron	Grey Cast Iron	≤150	≤500	164-262	262-394	.004-.006	.006-.009	.001-.002	.002-.004
		Grey Cast Iron, Heat Treated	150-300	500-1000	164-262	262-394	.004-.006	.006-.009	.001-.002	.002-.004
		Spher. Graph. Cast Iron	≤200	≤700	164-262	262-394	.004-.006	.006-.009	.001-.002	.002-.004
	Copper	Short Chips, Brass, Bronze, Red Brass	≤200	≤700	328-984	—	.002-.004	.004-.012	.001-.002	.002-.004
N Non-Ferrous Metals	Aluminium/ Magnesium	Aluminium, Magnesium Non-Alloy	≤100	≤350	328-1,312	328-1,312	.004-.010	.010-.012	.001-.002	.002-.004
		Aluminium, Wrought Alloy, Breaking Strain (A5) < 14%	≤180	≤600	328-1,312	328-1,312	.004-.010	.010-.012	.001-.002	.002-.004
		Aluminium, Wrought Alloy, Breaking Strain (A5) ≥ 14%	≤180	≤600	328-1,312	328-1,312	.001-.002	.002-.005	.001-.002	.002-.004
		Aluminium, Cast Alloy, Si<10%	≤180	≤600	328-984	328-1,312	.004-.010	.010-.012	.001-.002	.002-.004
		Aluminium, Cast Alloy, Si≥10%	≤180	≤600	—	328-984	.004-.010	.010-.012	.001-.002	.002-.004
K	Plastic	Thermo Plastics	—	—	197-394	197-394	.004-.010	.010-.012	.001-.002	.002-.004
		Thermosetting Plastic	—	—	197-328	197-328	.004-.010	.010-.012	.001-.002	.002-.004
		Fiber Reinforced Plastic	—	—	131-197	197-262	.004-.006	.006-.009	.001-.002	.002-.004

Vc - Cutting Speed [ft/min]
fb - (Drilling) - Feed per Revolution [inch/rev]
fz - (Threading) - Feed per Tooth [inch/tooth]