

# Series # 1452

Material group	Hardness		SFM	Feed Rate - IPR									
	HRC	BHN		1/16 in. 1.590 mm	1/8 in. 3.170 mm	1/4 in. 6.350 mm	3/8 in. 9.520 mm	1/2 in. 12.700 mm	5/8 in. 15.870 mm	3/4 in. 19.050 mm	1 in. 25.400 mm	1 1/4 in. 31.750 mm	1 1/2 in. 38.100 mm
Common structural steels	- ≤ 32	≤ 150 ≤ 301	280 250		0.0030 0.0025	0.0050 0.0040	0.0065 0.0050	0.0080 0.0065	0.0080 0.0065				
Free-cutting steels	≤ 25 ≤ 32	≤ 255 ≤ 301	300 220		0.0040 0.0030	0.0065 0.0050	0.0080 0.0065	0.0100 0.0080	0.0100 0.0080				
Unalloyed heat-treatable steels	≤ 20 ≤ 25 ≤ 32	≤ 220 ≤ 255 ≤ 301	195 185 170		0.0030 0.0030 0.0030	0.0050 0.0050 0.0050	0.0065 0.0065 0.0065	0.0080 0.0080 0.0080	0.0080 0.0080 0.0080				
Alloyed heat-treatable steels	≤ 32 ≤ 43	≤ 301 ≤ 402	170 140		0.0030 0.0025	0.0050 0.0040	0.0065 0.0050	0.0080 0.0065	0.0080 0.0065				
Unalloyed case hardened steels	≤ 25	≤ 255	195		0.0040	0.0065	0.0080	0.0100	0.0100				
Alloyed case hardened steels	≤ 32 ≤ 43	≤ 301 ≤ 402	170 140		0.0030 0.0025	0.0050 0.0040	0.0065 0.0050	0.0080 0.0065	0.0080 0.0065				
Nitriding steels	≤ 32 ≤ 43	≤ 301 ≤ 402	185 155		0.0025 0.0025	0.0040 0.0040	0.0050 0.0050	0.0065 0.0065	0.0065 0.0065				
Tool steels	≤ 25 ≤ 43	≤ 255 ≤ 402	95 80		0.0025 0.0025	0.0040 0.0040	0.0050 0.0050	0.0065 0.0065	0.0065 0.0065				
High speed steels	≤ 43	≤ 402	70		0.0020	0.0030	0.0040	0.0050	0.0050				
Spring steels	≤ 38	≤ 354											
Hardened steels	≤ 48 ≤ 66	≤ 460 -											
Stainless steels, sulphured austenitic	≤ 28 ≤ 36	≤ 273 ≤ 337	55 55		0.0030 0.0030	0.0050 0.0050	0.0065 0.0065	0.0080 0.0080	0.0080 0.0080				
Stainless steels, sulphured martensitic	≤ 46	≤ 435	40		0.0025	0.0040	0.0050	0.0065	0.0065				
Cast iron	≤ 23 ≤ 38	≤ 242 ≤ 354	360 255		0.0050 0.0050	0.0080 0.0080	0.0100 0.0100	0.0125 0.0125	0.0125 0.0125				
Spheroidal graphite iron and malleable cast iron	≤ 23 ≤ 38	≤ 242 ≤ 354	255 230		0.0050 0.0050	0.0080 0.0080	0.0100 0.0100	0.0125 0.0125	0.0125 0.0125				
Chilled cast iron	≤ 38	≤ 354											
New cast materials GGV	≤ 20 ≤ 32	≤ 220 ≤ 301											
New cast materials ADI	≤ 32 ≤ 43	≤ 301 ≤ 402											
Special alloys	≤ 54	≤ 549											
Ti and Ti-alloys	≤ 25 ≤ 43	≤ 255 ≤ 402	50 40		0.0030 0.0025	0.0050 0.0040	0.0065 0.0050	0.0080 0.0065	0.0080 0.0065				
Aluminium and Al-alloys	-	≤ 120	435		0.0065	0.0100	0.0125	0.0160	0.0160				
Al wrought alloys	-	≤ 200	360		0.0050	0.0080	0.0100	0.0125	0.0125				
Al cast alloys ≤ 10 % Si ≤ 24 % Si	- -	≤ 180 ≤ 180	435 360		0.0065 0.0050	0.0100 0.0080	0.0125 0.0100	0.0160 0.0125	0.0160 0.0125				
Magnesium alloys	-	≤ 120	510		0.0050	0.0080	0.0100	0.0125	0.0125				
Copper, low-alloyed	-	≤ 150											
Brass, short-chipping	-	≤ 180	535		0.0050	0.0080	0.0100	0.0125	0.0125				
Brass, long-chipping	-	≤ 180	500		0.0040	0.0065	0.0080	0.0100	0.0100				
Bronze, short-chipping	-	≤ 180											
Bronze, long-chipping	≤ 25 ≤ 32	≤ 255 ≤ 301											
Duroplastics													
Thermoplastics													
Reinforced plastics - Kevlar													
Reinforced plastics - GFK / CFK													

# Series # 1662

Material group	Hardness		SFM	Feed Rate - IPR									
	HRC	BHN		1/16 in. 1.590 mm	1/8 in. 3.170 mm	1/4 in. 6.350 mm	3/8 in. 9.520 mm	1/2 in. 12.700 mm	5/8 in. 15.870 mm	3/4 in. 19.050 mm	1 in. 25.400 mm	1 1/4 in. 31.750 mm	1 1/2 in. 38.100 mm
Common structural steels	- ≤ 32	≤ 150 ≤ 301	360 295		0.0050 0.0040	0.0080 0.0065	0.0100 0.0080	0.0125 0.0100	0.0125 0.0100	0.0140 0.0110	0.0160 0.0125		
Free-cutting steels	≤ 25 ≤ 32	≤ 255 ≤ 301	425 360		0.0065 0.0065	0.0100 0.0100	0.0125 0.0125	0.0160 0.0160	0.0160 0.0160	0.0180 0.0180	0.0200 0.0200		
Unalloyed heat-treatable steels	≤ 20 ≤ 25 ≤ 32	≤ 220 ≤ 255 ≤ 301	325 310 295		0.0065 0.0050 0.0050	0.0100 0.0080 0.0080	0.0125 0.0100 0.0100	0.0160 0.0125 0.0125	0.0160 0.0125 0.0125	0.0180 0.0140 0.0140	0.0200 0.0160 0.0160		
Alloyed heat-treatable steels	≤ 32 ≤ 43	≤ 301 ≤ 402	295 260		0.0050 0.0050	0.0080 0.0080	0.0100 0.0100	0.0125 0.0125	0.0125 0.0125	0.0140 0.0140	0.0160 0.0160		
Unalloyed case hardened steels	≤ 25	≤ 255	360		0.0065	0.0100	0.0125	0.0160	0.0160	0.0180	0.0200		
Alloyed case hardened steels	≤ 32 ≤ 43	≤ 301 ≤ 402	295 210		0.0050 0.0030	0.0080 0.0050	0.0100 0.0065	0.0125 0.0080	0.0125 0.0080	0.0140 0.0090	0.0160 0.0100		
Nitriding steels	≤ 32 ≤ 43	≤ 301 ≤ 402	260 245		0.0050 0.0030	0.0080 0.0050	0.0100 0.0065	0.0125 0.0080	0.0125 0.0080	0.0140 0.0090	0.0160 0.0100		
Tool steels	≤ 25 ≤ 43	≤ 255 ≤ 402	180 130		0.0040 0.0030	0.0065 0.0050	0.0080 0.0065	0.0100 0.0080	0.0100 0.0080	0.0110 0.0090	0.0125 0.0100		
High speed steels	≤ 43	≤ 402	145		0.0025	0.0040	0.0050	0.0065	0.0065	0.0070	0.0080		
Spring steels	≤ 38	≤ 354	145		0.0020	0.0030	0.0040	0.0050	0.0050	0.0055	0.0065		
Hardened steels	≤ 48 ≤ 66	≤ 460 -	130 80		0.0020 0.0015	0.0030 0.0025	0.0040 0.0030	0.0050 0.0040	0.0050 0.0040	0.0055 0.0045	0.0065 0.0050		
Stainless steels, sulphured austenitic	≤ 28 ≤ 36	≤ 273 ≤ 337	145 130		0.0030 0.0030	0.0050 0.0050	0.0065 0.0065	0.0080 0.0080	0.0080 0.0080	0.0090 0.0090	0.0100 0.0100		
Stainless steels, sulphured martensitic	≤ 46	≤ 435	110		0.0030	0.0050	0.0065	0.0080	0.0080	0.0090	0.0100		
Cast iron	≤ 23 ≤ 38	≤ 242 ≤ 354	620 360		0.0080 0.0080	0.0125 0.0125	0.0160 0.0160	0.0200 0.0200	0.0200 0.0200	0.0220 0.0220	0.0245 0.0245		
Spheroidal graphite iron and malleable cast iron	≤ 23 ≤ 38	≤ 242 ≤ 354	360 310		0.0080 0.0065	0.0125 0.0100	0.0160 0.0125	0.0200 0.0160	0.0200 0.0160	0.0220 0.0180	0.0245 0.0200		
Chilled cast iron	≤ 38	≤ 354	95		0.0020	0.0030	0.0040	0.0050	0.0050	0.0055	0.0065		
New cast materials GGV	≤ 20 ≤ 32	≤ 220 ≤ 301											
New cast materials ADI	≤ 32 ≤ 43	≤ 301 ≤ 402											
Special alloys	≤ 54	≤ 549	80		0.0025	0.0040	0.0050	0.0065	0.0065	0.0070	0.0080		
Ti and Ti-alloys	≤ 25 ≤ 43	≤ 255 ≤ 402	110 95		0.0025 0.0020	0.0040 0.0030	0.0050 0.0040	0.0065 0.0050	0.0065 0.0050	0.0070 0.0055	0.0080 0.0065		
Aluminium and Al-alloys	-	≤ 120	785		0.0080	0.0125	0.0160	0.0200	0.0200	0.0220	0.0245		
Al wrought alloys	-	≤ 200	785		0.0080	0.0125	0.0160	0.0200	0.0200	0.0220	0.0245		
Al cast alloys ≤ 10 % Si ≤ 24 % Si	- -	≤ 180 ≤ 180	655 555		0.0080 0.0080	0.0125 0.0125	0.0160 0.0160	0.0200 0.0200	0.0200 0.0200	0.0220 0.0220	0.0245 0.0245		
Magnesium alloys	-	≤ 120	750		0.0065	0.0100	0.0125	0.0160	0.0160	0.0180	0.0200		
Copper, low-alloyed	-	≤ 150	310		0.0050	0.0080	0.0100	0.0125	0.0125	0.0140	0.0160		
Brass, short-chipping	-	≤ 180	820		0.0065	0.0100	0.0125	0.0160	0.0160	0.0180	0.0200		
Brass, long-chipping	-	≤ 180	555		0.0050	0.0080	0.0100	0.0125	0.0125	0.0140	0.0160		
Bronze, short-chipping	-	≤ 180	310		0.0050	0.0080	0.0100	0.0125	0.0125	0.0140	0.0160		
Bronze, long-chipping	≤ 25 ≤ 32	≤ 255 ≤ 301	225 195		0.0040 0.0040	0.0065 0.0065	0.0080 0.0080	0.0100 0.0100	0.0100 0.0100	0.0110 0.0110	0.0125 0.0125		
Duroplastics													
Thermoplastics													
Reinforced plastics - Kevlar													
Reinforced plastics - GFK / CFK													