

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)											
						GP2115			GA4225			GA4230			GM2140		
						f_z (inch)			f_z (inch)			f_z (inch)			f_z (inch)		
						.035	.050	.065	.035	.050	.065	.035	.050	.065	.035	.045	.055
P Steel	P0	Low-Carbon Steels, Long Chipping (C < .25%) Ex. A36, 1008, 1010, 1018, 1108, 1117	<125		<530	920	810	640	860	760	600	830	730	580			
	P1	Low-Carbon Steels, Short Chipping, Free Machining (C < .25%) Ex. 10L18, 1200 Series, 1213, 12L14	<125		<530	860	760	600	780	680	530	740	650	510			
	P2	Medium- and High-Carbon Steels (C > .25%) Ex. 1035, 1045, 10L45, 1080, 1137, 1144, 1525, 1572	<220	<25	>530	780	680	530	660	560	450	630	540	430			
	P3	Alloy Steels and Tool Steels (C > .25%) Ex. P20, 1300, 2000, 3000, 4000, 5000, 8000, SAE A, D, H, O, S, M, T	<330	<35	600-850	660	560	450	600	500	400	570	480	390			
	P4	High-Strength Alloy Steels and Tool Steels (C > .25%) Ex. P20, 1300, 2000, 3000, 4000, 5000, 8000, SAE A, D, H, O, S, M, T	340-450	35-48	850-1400	600	500	400	540	440	360	515	425	340			
	P5	Ferritic, Martensitic and PH Stainless Steels Ex. 13-8 PH, 15-5 PH, 17-4 PH, 400 and 500 Series	<330	<35	600-900				490	400	330	450	380	310	540	440	360
	P6	High-Strength Ferritic, Martensitic and PH Stainless Steels Ex. 13-8 PH, 15-5 PH, 17-4 PH, 400 and 500 Series	340-450	35-48	900-1350				400	340	275	380	320	260	450	380	310

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)											
						GA4225			GA4230			GS4130			GM2140		
						f_z (inch)			f_z (inch)			f_z (inch)			f_z (inch)		
						.025	.035	.045	.025	.035	.045	.025	.035	.045	.025	.035	.045
M Stainless Steel	M1	Austenitic Stainless Steels Ex. 200 Series, 301, 302, 304, 304L, 309	130-200		<600	530	430	340	490	405	325	490	405	325	570	480	390
	M2	High-Strength Austenitic Stainless and Cast Stainless Steels Ex. 310, 316, 316L, 321, 347, 384	150-230	<25	600-800	480	410	325	450	380	305	450	380	305	530	440	350
	M3	Duplex Stainless Steels Ex. 323, 329, F55, 2205	135-275	<30	<800	420	340	275	380	310	260	380	310	260	450	380	310

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)								
						GA4225			GA4230					
						f_z (inch)			f_z (inch)					
						.035	.050	.065	.035	.050	.065			
K Cast Iron	K1	Gray Cast Iron Ex. Class 20, 25, 30, 35, 40, 45, 50, 55, 60, G1800, G3000, G3500, G4000	120-290	<32	125-500	715	635	555	680	605	530			
	K2	Ductile Cast Irons (Nodular Irons) and Compacted Graphite Irons (CGI) Ex. 60-40-18, 65-45-12, 80-55-06, SAE J434: D4018, D4512, D5506	130-260	<28	<600	555	490	435	530	470	415			
	K3	High-Strength Ductile Irons and Austempered Ductile Irons (ADI) Ex. ASTM A536: 100-70-03, 120-90-02, SAE J434: D7003	180-350	<43	>600	490	420	370	470	400	355			
ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)								
						GA4230			GS4130			GM2140		
						f_z (inch)			f_z (inch)			f_z (inch)		
						.008	.016	.024	.008	.016	.024	.008	.016	.024
S High Temp Alloys	S1	Iron-Based Heat-Resistant Alloys Ex. A286, A608, INCOLOY 800 Series, N-155, Haynes 556, Discaloy	200-280	<30	600-1000	210	140	100	210	140	100	230	160	110
	S2	Cobalt-Based Heat-Resistant Alloys Ex. Haynes 25 (L605), Haynes 188, Stellite, MAR-M302, MAR-M509	250-350	<35	800-1200	180	120	80	180	120	80	200	130	90
	S3	Nickel-Based Heat-Resistant Alloys Ex. Astroloy, Hastelloy X, INCONEL 600 and 700 Series, Waspalloy	250-350	<35	800-1200	180	120	80	180	120	80	200	130	90
	S4	Titanium and Titanium Alloys Ex. Commercially Pure Ti, Ti-5Al-2.5Sn, Ti-6Al-4V, Ti-3Al-8V-6Cr-4Zr-4Mo	300-400	33-48	900-1600	200	130	90	200	130	90	215	145	100
ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)								
						GA4230								
						f_z (inch)								
						.006	.012	.020						
H Hardened Steels	H1	Hardened Alloy Steels and Tool Steels Ex. H13,D2, D3, 4340,P20		44-48		320	260	210						
	H2	Hardened Alloy Steels and Tool Steels Ex. H13,D2, D3, 4340,P20		48-55		260	210	165						
	H3	Hardened Alloy Steels and Tool Steels Ex. H13,D2, D3, 4340,P20		56-60										
	H4	Hardened Alloy Steels and Tool Steels Ex. H13,D2, D3, 4340,P20		>60										