

Technical Information

Material Group	Hardness SFM	HSS SFM	COBALT SFM	T-15 SFM	CARBIDE SFM	Drill Diameter Feed Rate - IPR					
						Up to 1/8"	Up to 1/4"	Up to 3/8"	Up to 1/2"	Up to 5/8"	Up to 3/4"
Aluminum & Al-alloys	≤ 120 HB	230	260	290	350	0.003	0.004	0.005	0.007	0.009	0.010
Al Cast Alloys: ≤ 10% Si	≤ 180 HB	165	195	215	250	0.003	0.004	0.005	0.007	0.009	0.010
Al Cast Alloys: ≤ 24% Si	≤ 180 HB	165	195	215	300	0.002	0.003	0.004	0.006	0.008	0.009
Brass: Short Chipping	≤ 180 HB	195	230	250	300	0.003	0.005	0.008	0.010	0.012	0.014
Brass: Long Chipping	≤ 180 HB	130	150	150	200	0.003	0.005	0.008	0.010	0.012	0.014
Bronze: Short Chipping	≤ 180 HB	100	115	130	150	0.003	0.005	0.008	0.010	0.012	0.014
	≤ 25 HRC	80	110	125	145	0.003	0.005	0.008	0.010	0.012	0.014
Bronze: Long Chipping	≤ 25 HRC	50	65	75	90	0.003	0.004	0.006	0.008	0.008	0.010
	≤ 32 HRC	40	50	55	65	0.003	0.004	0.006	0.008	0.008	0.010
Cast Iron	≤ 38 HRC	100	110	120	150	0.003	0.005	0.007	0.008	0.010	0.012
Copper	≤ 80 HB	195	215	235	275	0.003	0.004	0.005	0.007	0.009	0.010
Magnesium	≤ 120 HB	230	230	250	300	0.003	0.005	0.006	0.008	0.010	0.012
Thermoplastic	≤ 120 HB	100	120	130	150	0.003	0.005	0.008	0.008	0.010	0.012
Common Structural Steels	≤ 20 HRC	100	115	125	145	0.003	0.004	0.006	0.008	0.010	0.012
	≤ 32 HRC	80	100	110	130	0.002	0.003	0.005	0.007	0.009	0.011
Free-cutting Steels	≤ 25 HRC	105	130	140	165	0.003	0.004	0.006	0.008	0.010	0.012
	≤ 32 HRC	100	130	140	165	0.002	0.003	0.005	0.007	0.009	0.011
Unalloyed Heat-Treatable Steels	≤ 20 HRC	80	115	125	145	0.003	0.004	0.006	0.008	0.010	0.012
	≤ 25 HRC	80	115	125	145	0.002	0.004	0.006	0.008	0.010	0.012
	≤ 32 HRC	65	100	110	130	0.002	0.003	0.005	0.006	0.008	0.010
Alloyed Heat-Treatable Steels	≤ 32 HRC	50	70	75	90	0.003	0.004	0.005	0.007	0.008	0.010
	≤ 42 HRC	40	55	60	70	0.002	0.003	0.004	0.005	0.006	0.008
Unalloyed Case Hardened Steels	≤ 25 HRC	100	110	120	140	0.003	0.004	0.006	0.008	0.010	0.012
Alloyed Case Hardened Steels	≤ 32 HRC	50	65	70	80	0.003	0.004	0.006	0.006	0.008	0.010
	≤ 42 HRC	25	50	55	65	0.002	0.003	0.005	0.005	0.006	0.008
Tool Steels	≤ 25 HRC	50	60	65	75	0.003	0.004	0.006	0.006	0.008	0.010
Stainless Steels: Sulphured	≤ 25 HRC	35	40	45	55	0.002	0.003	0.005	0.005	0.006	0.008
Stainless Steels: Austenitic	≤ 35 HRC	25	35	40	50	0.002	0.003	0.005	0.005	0.006	0.008
Stainless Steels: Martensitic	≤ 45 HRC	25	35	40	50	0.002	0.003	0.005	0.005	0.006	0.008

Speeds and Feeds are suggested starting points.

SFM: Surface Feet per Minute  
 RPM: Revolutions per Minute  
 IPT: Inches per Tooth  
 IPR: Inches per Revolution  
 IPM: Inches per Minute

$RPM = 3.82 \times (SFM \div Diameter)$   
 $IPM = IPT \times \# \text{ of Flutes} \times RPM$   
 $IPR = IPM \div RPM$   
 $SFM = RPM \times Diameter \div 3.82$

Tools with TiN Coat: Increase SFM above 5-10%  
 Tools with TiAlN/AlTiN Coat: Increase SFM above 15-20%

WARNING: Any cutting tool may break or shatter under improper or severe use. Use appropriate safety equipment at all times in the vicinity of their use.

