Using These Tables. The Speeds & Feeds listed below are conservative recommendations for initial setup. In actual use, depending on the machining environment and workpiece material, significantly higher speeds and feeds may be achievable. Using the below as a starting point, cutting speed/feed can be gradually adjusted upwords until the optimum settings per application are found. Questions? Contact us by telephone at (800) 776-6170.

Series # 4109 body (7xD) with # 4112 insert

Material group	Hardness	SFM	Feed Rate - IPR									
			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. 12.700mm	5/8 in. 15.870mm	3/4 in. 19.050mm	1 in. 25.400mm	1 1/4 in. 31.75mm	1 1/2 in. 38.10mm
Common structural steels	≤ 100 BHN	425	•	•	•	•	0.008	0.010	0.012	0.016	0.016	0.020
	100-260 BHN	360	•	•	•	•	0.006	0.008	0.010	0.012	0.012	0.016
Free-cutting steels	≤ 24 HRC	425	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025
	24-30 HRC	360	•	•	•	•	0.008	0.010	0.012	0.016	0.016	0.020
Unalloyed heat-treatable steels	≤ 16 HRC	425	•	•	•	•	0.008	0.010	0.012	0.016	0.016	0.020
	16-24 HRC	410	•	•	•	•	0.008	0.010	0.012	0.016	0.016	0.020
	24-30 HRC	360	•	•	•	•	0.006	0.008	0.010	0.012	0.012	0.016
Alloyed heat-treatable steels	24-30 HRC	360	•	•	•	•	0.008	0.010	0.012	0.016	0.016	0.020
	30-38 HRC	295	•	•	•	•	0.006	0.008	0.010	0.012	0.012	0.016
Unalloyed case hardened steels	≤ 230 BHN	425	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025
Alloyed case hardened steels	24-30 HRC	360	•	•	•	•	0.008	0.010	0.012	0.016	0.016	0.020
	30-38 HRC	230	•	•	•	•	0.006	0.008	0.010	0.012	0.012	0.016
Nitriding steels	24-30 HRC	345	•	•	•	•	0.006	0.008	0.010	0.012	0.012	0.016
	30-38 HRC	230	•	•	•	•	0.005	0.006	0.008	0.010	0.010	0.012
Tool steels	≤ 24 HRC	195	•	•	•	•	0.006	0.008	0.010	0.012	0.012	0.016
	24-30 HRC	180	•	•	•	•	0.005	0.006	0.008	0.010	0.010	0.012
High speed steels	14-30 HRC	180	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.010
Spring steels	≤ 330 BHN	165	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.010
Stainless steels sulphured	≤ 24 HRC	180	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.010
austenitic	≤ 24 HRC	130	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.010
martensitic	≤ 24 HRC	115	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.010
Hardened steels	40-48 HRC	80	•	•	•	•	0.003	0.004	0.005	0.006	0.006	0.008
	48-60 HRC	•	•	•	•	•	•	•	•	•	•	•
Special alloys	≤ 38 HRC	80	•	•	•	•	0.003	0.004	0.005	0.006	0.006	0.008
Ti and Ti-alloys	≤ 24 HRC	130	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.010
	24-38 HRC	115	•	•	•	•	0.003	0.004	0.005	0.006	0.006	0.008

Series # 4109 body (7xD) with # 4113 insert

Material group	Hardness	SFM	Feed Rate - IPR									
			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
Cast iron	≤240 Bhn	330	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025
	240-300 Bhn	295	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025
New Cast Materials CGI & ADI	240-300 Bhn	260	•	•	•	•	0.008	0.010	0.012	0.016	0.016	0.020
New Cast Materials CGI & ADI	350-410 Bhn	260	•	•	•	•	0.008	0.010	0.012	0.016	0.016	0.020
Spheroidal graphite iron and malleable cast iron	≤240 Bhn	395	•	•	•	•	0.012	0.016	0.020	0.025	0.025	0.031
	240-300 Bhn	330	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025

Series # 4109 body (7xD) with # 4114 insert

Material group	Hardness	SFM	Feed Rate - IPR									
			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
Aluminium and Al-alloys	≤120 Bhn	655	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025
Al wrought alloys	≤150 Bhn	590	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025
Al cast alloys ≤ 10% Si	≤200 Bhn	490	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025
≤ 24% Si	≤200 Bhn	395	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025
Magnesium alloys	≤150 Bhn	590	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025
Copper, low-alloyed	≤120 Bhn	230	•	•	•	•	0.008	0.010	0.012	0.016	0.016	0.020
Brass, short-chipping	≤200 Bhn	590	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025
long-chipping	≤200 Bhn	395	•	•	•	•	0.008	0.010	0.012	0.016	0.016	0.020
Bronze, short-chipping	≤200 Bhn	230	•	•	•	•	0.008	0.010	0.012	0.016	0.016	0.020
	200-260 Bhn	165	•	•	•	•	0.008	0.010	0.012	0.016	0.016	0.020
Bronze, long-chipping	24 Hrc	150	•	•	•	•	0.008	0.010	0.012	0.016	0.016	0.020
	24-30 Hrc	115	•	•	•	•	0.006	0.008	0.010	0.012	0.012	0.016

Series # 4109 body (7xD) with # 4115 insert

Material group	Hardness	SFM	Feed Rate - IPR									
			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
Stainless steels, sulphured	≤24 Hrc	180	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.010
austenitic	≤24 Hrc	130	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.010
martensitic	≤24 Hrc	115	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.010
Hardened steels	40-48 Hrc	80	•	•	•	•	0.003	0.004	0.005	0.006	0.006	0.008
	48-60 Hrc	•	•	•	•	•	•	•	•	•	•	•
Special alloys	≤38 Hrc	80	•	•	•	•	0.003	0.004	0.005	0.006	0.006	0.008
Chilled cast iron	≤350 Bhn	295	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025
Ti and Ti-alloys	≤24 Hrc	130	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.010
	24-38 Hrc	115	•	•	•	•	0.003	0.004	0.005	0.006	0.006	0.008