

158 Recommended Cutting Data - Cutting Conditions - Lower RPM (n) / High Feed (vf) Inch

Workpiece Material Group	Examples	Coolant ● Preferred ○ Possible x Not Possible			Tool Overhang	End Mill Diameter																
		Max.	Air	MMS		.1181 X R .0315 (3.0 x R 0.8mm)				.2362 X R .059 (6.0 x R 1.5mm)				.315 X R .0787 (8.0 x R 2.0mm)				.3937 X R .0787 (10.0 x R 2.0mm)				
						Axial Depth (ap)	Radial Depth (ae)	RPM (n)	IPM (vf)	Axial Depth (ap)	Radial Depth (ae)	RPM (n)	IPM (vf)	Axial Depth (ap)	Radial Depth (ae)	RPM (n)	IPM (vf)	Axial Depth (ap)	Radial Depth (ae)	RPM (n)	IPM (vf)	
Steels	P	Cast Iron/ Carbon Steels/ Alloy Steels 150-250 HB	●	●	●	5 x D	.0094	.0275	8,000	239	.0170	.0590	4,000	264	.0236	.0787	3,000	264	.0236	.1180	2,400	264
						6 X D	.0085	.0275			.0159	.0590			.0210	.0787			.0212	.1180		
						7 X D	.0078	.0275			.0147	.0590			.0196	.0787			.0196	.1180		
						8 X D	.0072	.0275			.0135	.0590			.0181	.0787			.0181	.1180		
						9 X D	.0059	.0275			.0112	.0590			.0149	.0787			.0149	.1180		
						10 X D	.0047	.0275			.0088	.0590			.0118	.0787			.0118	.1180		
Steels	P	Tool Steels 25-35 Rc	●	●	●	5 x D	.0094	.0275	7,400	200	.0170	.0590	3,700	224	.0236	.0787	2,800	225	.0236	.1180	2,200	222
						6 X D	.0085	.0275			.0159	.0590			.0210	.0787			.0212	.1180		
						7 X D	.0078	.0275			.0147	.0590			.0196	.0787			.0196	.1180		
						8 X D	.0072	.0275			.0135	.0590			.0181	.0787			.0181	.1180		
						9 X D	.0059	.0275			.0112	.0590			.0149	.0787			.0149	.1180		
						10 X D	.0047	.0275			.0088	.0590			.0118	.0787			.0118	.1180		
Hardened Steels	H	35-45 Rc H13/D2 P20/4140 8620	●	○	○	5 x D	.0094	.0275	6,900	146	.0170	.0590	3,400	160	.0236	.0787	2,600	164	.0236	.1180	2,100	165
						6 X D	.0085	.0275			.0159	.0590			.0210	.0787			.0212	.1180		
						7 X D	.0078	.0275			.0147	.0590			.0196	.0787			.0196	.1180		
						8 X D	.0072	.0275			.0135	.0590			.0181	.0787			.0181	.1180		
						9 X D	.0059	.0275			.0112	.0590			.0149	.0787			.0149	.1180		
						10 X D	.0047	.0275			.0088	.0590			.0118	.0787			.0118	.1180		
Hardened Steels	H	45 - 55 Rc H13/D2 P20/4140 8620	●	○	○	5 x D	.0066	.0275	5,300	112	.0124	.0590	2,700	127	.0165	.0787	2,000	125	.0165	.1180	1,600	125
						6 X D	.0059	.0275			.0111	.0590			.0148	.0787			.0148	.1180		
						7 X D	.0055	.0275			.0103	.0590			.0137	.0787			.0137	.1180		
						8 X D	.0050	.0275			.0095	.0590			.0126	.0787			.0126	.1180		
						9 X D	.0041	.0275			.0078	.0590			.0104	.0787			.0104	.1180		
						10 X D	.0033	.0275			.0062	.0590			.0082	.0787			.0082	.1180		
Hardened Steels	H	55-60 Rc H13/D2 P20/4140 8620	●	○	○	5 x D	.0047	.0275	5,300	45	.0088	.0590	2,700	50	.0118	.0787	2,000	50	.0118	.1180	1,600	50
						6 X D	.0042	.0275			.0079	.0590			.0106	.0787			.0106	.1180		
						7 X D	.0039	.0275			.0073	.0590			.0098	.0787			.0098	.1180		
						8 X D	.0036	.0275			.0067	.0590			.0090	.0787			.0090	.1180		
						9 X D	.0029	.0275			.0056	.0590			.0074	.0787			.0074	.1180		
						10 X D	.0023	.0275			.0044	.0590			.0059	.0787			.0059	.1180		

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.




158 Recommended Cutting Data - Cutting Conditions - Lower RPM (n) / High Feed (vf) Inch Continued

Workpiece Material Group	Examples	Coolant ● Preferred ○ Possible x Not Possible			Tool Overhang	End Mill Diameter											
		Max.	Air	MMS		.4724 x R .0787 (12.0 x R 2.0mm)				.6299 X R .1181 (16.0 x R 3.0mm)				.7874 X R .1181 (20.0 x R 3.0mm)			
						Axial Depth (ap)	Radial Depth (ae)	RPM (n)	IPM (vf)	Axial Depth (ap)	Radial Depth (ae)	RPM (n)	IPM (vf)	Axial Depth (ap)	Radial Depth (ae)	RPM (n)	IPM (vf)
Steels	P	●	●	●	5 x D	.0236	.1574	2,000	250	.0354	.1968	1,500	210	.0354	.2755	1,200	172
					6 X D	.0212	.1574			.0318	.1968			.0318	.2755		
					7 X D	.0196	.1574			.0295	.1968			.0295	.2755		
					8 X D	.0181	.1574			.0271	.1968			.0271	.2755		
					9 X D	.0149	.1574			.0224	.1968			.0226	.2755		
					10 X D	.0118	.1574			.0177	.1968			.0177	.2755		
Steels	P	●	●	●	5 x D	.0236	.1574	1,900	218	.0354	.1968	1,400	180	.0354	.2755	1,100	144
					6 X D	.0212	.1574			.0318	.1968			.0318	.2755		
					7 X D	.0196	.1574			.0295	.1968			.0295	.2755		
					8 X D	.0181	.1574			.0271	.1968			.0271	.2755		
					9 X D	.0149	.1574			.0224	.1968			.0226	.2755		
					10 X D	.0118	.1574			.0177	.1968			.0177	.2755		
Hardened Steels	H	●	○	○	5 x D	.0236	.1574	1,700	153	.0354	.1968	1,300	131	.0354	.2755	1,000	102
					6 X D	.0212	.1574			.0318	.1968			.0318	.2755		
					7 X D	.0196	.1574			.0295	.1968			.0295	.2755		
					8 X D	.0181	.1574			.0271	.1968			.0271	.2755		
					9 X D	.0149	.1574			.0224	.1968			.0226	.2755		
					10 X D	.0118	.1574			.0177	.1968			.0177	.2755		
Hardened Steels	H	●	○	○	5 x D	.0165	.1574	1,300	116	.0248	.1968	1,000	100	.0248	.2755	800	82
					6 X D	.0148	.1574			.0223	.1968			.0223	.2755		
					7 X D	.0137	.1574			.0206	.1968			.0206	.2755		
					8 X D	.0126	.1574			.0190	.1968			.0190	.2755		
					9 X D	.0104	.1574			.0157	.1968			.0157	.2755		
					10 X D	.0082	.1574			.0124	.1968			.0124	.2755		
Hardened Steels	H	●	○	○	5 x D	.0118	.1574	1,300	47	.0177	.1968	1,000	40	.0177	.2755	800	32
					6 X D	.0106	.1574			.0159	.1968			.0159	.2755		
					7 X D	.0098	.1574			.0147	.1968			.0147	.2755		
					8 X D	.0090	.1574			.0135	.1968			.0135	.2755		
					9 X D	.0074	.1574			.0112	.1968			.0112	.2755		
					10 X D	.0059	.1574			.0088	.1968			.0088	.2755		

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.




For product information, call your local distributor.

158 Recommended Cutting Data - Cutting Conditions - Lower RPM (n) / High Feed (vf) Metric

Workpiece Material Group	Examples	Coolant			Tool Overhang	End Mill Diameter (mm)															
		• Preferred ○ Possible x Not Possible				3.0 x R 0.8				6.0 x R 1.5				8.0 x R 2.0				10.0 x R 2.0			
		Max.	Air	MMS		Axial Depth (ap)	Radial Depth (ae)	RPM (n)	mm/min. (vf)	Axial Depth (ap)	Radial Depth (ae)	RPM (n)	mm/min. (vf)	Axial Depth (ap)	Radial Depth (ae)	RPM (n)	mm/min. (vf)	Axial Depth (ap)	Radial Depth (ae)	RPM (n)	mm/min. (vf)
																					
Steels	Cast Iron/ Carbon Steels/ Alloy Steels 150-250 HB	•	•	•	5 x D	0.24	0.7	8,000	6,080	0.45	1.5	4,000	6700	0.60	2.0	3,000	6,700	0.60	3.0	2,400	6,700
					6 X D	0.22	0.7			0.41	1.5			0.54	2.0			0.54	3.0		
					7 X D	0.20	0.7			0.38	1.5			0.50	2.0			0.50	3.0		
					8 X D	0.18	0.7			0.35	1.5			0.46	2.0			0.46	3.0		
					9 X D	0.15	0.7			0.29	1.5			0.38	2.0			0.38	3.0		
					10 X D	0.12	0.7			0.23	1.5			0.30	2.0			0.30	3.0		
Steels	Tool Steels 25-35 Rc	•	•	•	5 x D	0.24	0.7	7,400	5,100	0.45	1.5	3,700	5670	0.60	2.0	2,800	5,725	0.60	3.0	2,200	5,620
					6 X D	0.22	0.7			0.41	1.5			0.54	2.0			0.54	3.0		
					7 X D	0.20	0.7			0.38	1.5			0.50	2.0			0.50	3.0		
					8 X D	0.18	0.7			0.35	1.5			0.46	2.0			0.46	3.0		
					9 X D	0.15	0.7			0.29	1.5			0.38	2.0			0.38	3.0		
					10 X D	0.12	0.7			0.23	1.5			0.30	2.0			0.30	3.0		
Hardened Steels	35-45 Rc H13/D2 P20/4140 8620	•	○	○	5 x D	0.24	0.7	6,900	3,720	0.45	1.5	3,400	4050	0.60	2.0	2,600	4,150	0.60	3.0	2,100	4,200
					6 X D	0.22	0.7			0.41	1.5			0.54	2.0			0.54	3.0		
					7 X D	0.20	0.7			0.38	1.5			0.50	2.0			0.50	3.0		
					8 X D	0.18	0.7			0.35	1.5			0.46	2.0			0.46	3.0		
					9 X D	0.15	0.7			0.29	1.5			0.38	2.0			0.38	3.0		
					10 X D	0.12	0.7			0.23	1.5			0.30	2.0			0.30	3.0		
Hardened Steels	45 - 55 Rc H13/D2 P20/4140 8620	•	○	○	5 x D	0.17	0.7	5,300	2,850	0.32	1.5	2,700	3230	0.42	2.0	2,000	3,190	0.42	3.0	1,600	3,190
					6 X D	0.15	0.7			0.28	1.5			0.38	2.0			0.38	3.0		
					7 X D	0.14	0.7			0.26	1.5			0.35	2.0			0.35	3.0		
					8 X D	0.13	0.7			0.24	1.5			0.32	2.0			0.32	3.0		
					9 X D	0.11	0.7			0.20	1.5			0.27	2.0			0.27	3.0		
					10 X D	0.08	0.7			0.16	1.5			0.21	2.0			0.21	3.0		
Hardened Steels	55-60 Rc H13/D2 P20/4140 8620	•	○	○	5 x D	0.12	0.7	5,300	1,130	0.23	1.5	2,700	1295	0.30	2.0	2,000	1,275	0.30	3.0	1,600	1,275
					6 X D	0.11	0.7			0.20	1.5			0.27	2.0			0.27	3.0		
					7 X D	0.10	0.7			0.19	1.5			0.25	2.0			0.25	3.0		
					8 X D	0.09	0.7			0.17	1.5			0.23	2.0			0.23	3.0		
					9 X D	0.08	0.7			0.14	1.5			0.19	2.0			0.19	3.0		
					10 X D	0.06	0.7			0.11	1.5			0.15	2.0			0.15	3.0		

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.

158 Recommended Cutting Data - Cutting Conditions - Lower RPM (n) / High Feed (vf) Metric Continued

Workpiece Material Group	Examples	Coolant ● Preferred ○ Possible x Not Possible			Tool Overhang	End Mill Diameter (mm)														
						12.0 x R 2.0				16.0 x R 3.0				20.0 x R 3.0						
						Max.	Air	MMS	Axial Depth (ap)	Radial Depth (ae)	RPM (n)	mm/min. (vf)	Axial Depth (ap)	Radial Depth (ae)	RPM (n)	mm/min. (vf)	Axial Depth (ap)	Radial Depth (ae)	RPM (n)	mm/min. (vf)
Steels	P Cast Iron/ Carbon Steels/ Alloy Steels 150-250 HB	●	●	●	5 x D	0.60	4.0	2,000	6,350	0.90	5.0	1,500	5,350	0.90	7.0	1,200	4,360			
					6 X D	0.54	4.0			0.81	5.0			0.81	7.0					
					7 X D	0.50	4.0			0.75	5.0			0.75	7.0					
					8 X D	0.46	4.0			0.69	5.0			0.69	7.0					
					9 X D	0.38	4.0			0.57	5.0			0.57	7.0					
					10 X D	0.30	4.0			0.45	5.0			0.45	7.0					
Steels	P Tool Steels 25-35 Rc	●	●	●	5 x D	0.60	4.0	1,900	5,530	0.90	5.0	1,400	4,580	0.90	7.0	1,100	3,650			
					6 X D	0.54	4.0			0.81	5.0			0.81	7.0					
					7 X D	0.50	4.0			0.75	5.0			0.75	7.0					
					8 X D	0.46	4.0			0.69	5.0			0.69	7.0					
					9 X D	0.38	4.0			0.57	5.0			0.57	7.0					
					10 X D	0.30	4.0			0.45	5.0			0.45	7.0					
Hardened Steels	H 35-45 Rc H13/D2 P20/4140 8620	●	○	○	5 x D	0.60	4.0	1,700	3,875	0.90	5.0	1,300	3,325	0.90	7.0	1,000	2,595			
					6 X D	0.54	4.0			0.81	5.0			0.81	7.0					
					7 X D	0.50	4.0			0.75	5.0			0.75	7.0					
					8 X D	0.46	4.0			0.69	5.0			0.69	7.0					
					9 X D	0.38	4.0			0.57	5.0			0.57	7.0					
					10 X D	0.30	4.0			0.45	5.0			0.45	7.0					
Hardened Steels	H 45 - 55 Rc H13/D2 P20/4140 8620	●	○	○	5 x D	0.42	4.0	1,300	2,950	0.63	5.0	1,000	2,550	0.63	7.0	800	2,070			
					6 X D	0.38	4.0			0.57	5.0			0.57	7.0					
					7 X D	0.35	4.0			0.53	5.0			0.53	7.0					
					8 X D	0.32	4.0			0.48	5.0			0.48	7.0					
					9 X D	0.27	4.0			0.40	5.0			0.40	7.0					
					10 X D	0.21	4.0			0.32	5.0			0.32	7.0					
Hardened Steels	H 55-60 Rc H13/D2 P20/4140 8620	●	○	○	5 x D	0.30	4.0	1,300	1,185	0.45	5.0	1,000	1,000	0.45	7.0	800	825			
					6 X D	0.27	4.0			0.41	5.0			0.41	7.0					
					7 X D	0.25	4.0			0.38	5.0			0.38	7.0					
					8 X D	0.23	4.0			0.35	5.0			0.35	7.0					
					9 X D	0.19	4.0			0.29	5.0			0.29	7.0					
					10 X D	0.15	4.0			0.23	5.0			0.23	7.0					

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.

For product information, call your local distributor.