156 Recommended Cutting Data - Contouring

Inch

If axial depth (ap) is less than the ball diameter, the speed is figured using the effective cutting diameter.

Workpiece Material Group	ISO	Hardness	Coolant • Preferred o Possible x Not Possible			End Mill Diameter											
						1/32		1/16		3/32		1/8		5/32		1/4	
			Max.	Air	MMS	RPM (n)	IPM (vf)	RPM (n)	IPM (vf)	RPM (n)	IPM (vf)	RPM (n)	IPM (vf)	RPM (n)	IPM (vf)	RPM (n)	IPM (vf)
Tool Steels & Die Steels O7, M1, M2, M3, M4, M7, T1, T2, T4, T5, T8, T15, A2, A3, A6, A7, H10, H11, H12, H13, H19, H21, L3, L6, L7, P2, P20, S1, S5, S7, 52100, A128, D2, D3, D4, D5, D7	P	28 to 44 Rc	•	•	•	30000	26.9	30000	62	25000	84	17500	95	14000	120	8750	140
Hardened Steels	H	40-45 Rc	•	o	o	30000	24	23500	57	22000	96	14500	90	11500	90	72500	70
Hardened Steels		46-55 Rc				30000	18	23500	37	20000	35	12000	35	9600	37	6000	38
Hardened Steels		55-60 Rc				30000	15	15000	15	10000	15	7000	15	5600	20	3500	18
Stainless Steel - Ferritic / Martensitic / PH	M	over 28 Rc	•	x	o	30000	26	30000	62	25000	85	17500	95	14000	120	8750	140

Workpiece Material Group	ISO	Hardness	Coolant • Preferred o Possible x Not Possible			End Mill Diameter					
						5/16		3/8		1/2	
			Max.	Air	MMS	RPM (n)	IPM (vf)	RPM (n)	IPM (vf)	RPM (n)	IPM (vf)
Tool Steels & Die Steels O7, M1, M2, M3, M4, M7, T1, T2, T4, T5, T8, T15, A2, A3, A6, A7, H10, H11, H12, H13, H19, H21, L3, L6, L7, P2, P20, S1, S5, S7, 52100, A128, D2, D3, D4, D5, D7	P	28 to 44 Rc	•	•	•	7000	168	5800	125	4300	140
Hardened Steels	H	40-45 Rc	•	o	o	5800	68	4800	50	3625	45
Hardened Steels		46-55 Rc				4800	35	4000	30	3000	25
Hardened Steels		55-60 Rc				2800	15	2300	15	1750	10
Stainless Steel - Ferritic / Martensitic / PH	M	over 28 Rc	•	x	o	7000	170	5800	125	4300	140

Axial & Radial Depth - Roughing / Semi Finishing

30 - 40 Rc 10% of Diameter ap
40 - 50 Rc 5% of Diameter ap
50 - 60 Rc 4% of Diameter ap
Radial Step Over 25%-40% of Diameter

Axial & Radial Depth - Finishing

< 40 Rc 3% of Diameter ap
40 - 50 Rc 2% of Diameter ap
50 - 60 Rc 1% of Diameter ap
ae (step over) depends on finish requirement of the part.

156 Recommended Cutting Data - Contouring

Metric

If axial depth (ap) is less than the ball diameter, the speed is figured using the effective cutting diameter.

Workpiece Material Group	ISO	Hardness	Coolant • Preferred o Possible x Not Possible			End Mill Diameter (mm)											
						0.5		1.0		1.5		2.0		3.0		4.0	
			Max.	Air	MMS	RPM (n)	mm/min (vf)	RPM (n)	mm/min (vf)	RPM (n)	mm/min (vf)	RPM (n)	mm/min (vf)	RPM (n)	mm/min (vf)	RPM (n)	mm/min (vf)
Tool Steels & Die Steels O7, M1, M2, M3, M4, M7, T1, T2, T4, T5, T8, T15, A2, A3, A6, A7, H10, H11, H12, H13, H19, H21, L3, L6, L7, P2, P20, S1, S5, S7, 52100, A128, D2, D3, D4, D5, D7	P	28 to 44 Rc	•	•	•	30000	508	30000	683	25000	1575	17500	2133	14000	2392	8750	3050
Hardened Steels	H	40-45 Rc	•	o	o	30000	508	30000	608	23500	1450	22000	2442	14500	2283	11500	2233
Hardened Steels		46-55 Rc				30000	308	30000	458	23500	942	20000	892	12000	892	9600	942
Hardened Steels		55-60 Rc				30000	250	30000	383	15000	383	10000	383	7000	383	5600	508
Stainless Steel - Ferritic / Martensitic / PH	M	over 28 Rc	•	x	o	30000	508	30000	683	30000	1575	25000	2133	17500	2392	14000	3050

Workpiece Material Group	ISO	Hardness	Coolant • Preferred o Possible x Not Possible			End Mill Diameter (mm)							
						6.0		8.0		10.0		12.0	
			Max.	Air	MMS	RPM (n)	mm/min (vf)	RPM (n)	mm/min (vf)	RPM (n)	mm/min (vf)	RPM (n)	mm/min (vf)
Tool Steels & Die Steels O7, M1, M2, M3, M4, M7, T1, T2, T4, T5, T8, T15, A2, A3, A6, A7, H10, H11, H12, H13, H19, H21, L3, L6, L7, P2, P20, S1, S5, S7, 52100, A128, D2, D3, D4, D5, D7	P	28 to 44 Rc	•	•	•	7000	3558	5800	4267	4300	3175	4300	3558
Hardened Steels	H	40-45 Rc	•	o	o	7250	1775	5800	1725	4800	1292	3625	1167
Hardened Steels		46-55 Rc				6000	967	4800	892	4000	758	3000	633
Hardened Steels		55-60 Rc				3500	458	2800	383	2300	383	1750	250
Stainless Steel - Ferritic / Martensitic / PH	M	over 28 Rc	•	x	o	8750	3558	7000	4267	5800	3175	4300	3558

Axial & Radial Depth - Roughing / Semi Finishing

30 - 40 Rc 10% of Diameter ap
40 - 50 Rc 5% of Diameter ap
50 - 60 Rc 4% of Diameter ap
Radial Step Over 25%-40% of Diameter

Axial & Radial Depth - Finishing

< 40 Rc 3% of Diameter ap
40 - 50 Rc 2% of Diameter ap
50 - 60 Rc 1% of Diameter ap
ae (step over) depends on finish requirement of the part.