Milling RPM Starting Points by Material (HSS Tooling)

Formula: RPM = (SFM × 4) ÷ Cutter Diameter (inches)

Material	SFM	0.06"	0.12"	0.25"	0.38"	0.50"	0.75"	1.00"	2.00"	3.00"
Aluminum 6061	300	19200	9600	4800	3200	2400	1600	1200	600	400
Aluminum 7075	250	16000	8000	4000	2667	2000	1333	1000	500	333
Brass (Free Cutting)	200	12800	6400	3200	2133	1600	1067	800	400	267
Bronze (Phosphor)	100	6400	3200	1600	1067	800	533	400	200	133
Bronze (Aluminum)	150	9600	4800	2400	1600	1200	800	600	300	200
Copper	150	9600	4800	2400	1600	1200	800	600	300	200
Mild Steel (1018)	100	6400	3200	1600	1067	800	533	400	200	133
Mild Steel (1045)	90	5760	2880	1440	960	720	480	360	180	120
Tool Steel (O1)	60	3840	1920	960	640	480	320	240	120	80
Tool Steel (A2)	50	3200	1600	800	533	400	267	200	100	67
Stainless (304)	80	5120	2560	1280	853	640	427	320	160	107
Stainless (316)	70	4480	2240	1120	747	560	373	280	140	93
Cast Iron (Gray)	50	3200	1600	800	533	400	267	200	100	67
Cast Iron (Ductile)	60	3840	1920	960	640	480	320	240	120	80
Titanium	60	3840	1920	960	640	480	320	240	120	80
Plastics (Delrin)	400	25600	12800	6400	4267	3200	2133	1600	800	533
Plastics (Nylon)	300	19200	9600	4800	3200	2400	1600	1200	600	400
Plastics (Acrylic)	200	12800	6400	3200	2133	1600	1067	800	400	267

Practical Note: Mill RPM values are theoretical maximums based on surface speed and cutter diameter. In practice, your spindle’s max RPM, tool balance, and rigidity will often limit how fast you can run. If your machine tops out before the listed value, just run at its maximum safe RPM and adjust feed rate and depth of cut accordingly. Also account for flute count, coolant use, and tool manufacturer recommendations.