Milling RPM Starting Points by Material (Carbide 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	900	57600	28800	14400	9600	7200	4800	3600	1800	1200
Aluminum 7075	750	48000	24000	12000	8000	6000	4000	3000	1500	1000
Brass (Free Cutting)	600	38400	19200	9600	6400	4800	3200	2400	1200	800
Bronze (Phosphor)	300	19200	9600	4800	3200	2400	1600	1200	600	400
Bronze (Aluminum)	450	28800	14400	7200	4800	3600	2400	1800	900	600
Copper	450	28800	14400	7200	4800	3600	2400	1800	900	600
Mild Steel (1018)	300	19200	9600	4800	3200	2400	1600	1200	600	400
Mild Steel (1045)	270	17280	8640	4320	2880	2160	1440	1080	540	360
Tool Steel (O1)	180	11520	5760	2880	1920	1440	960	720	360	240
Tool Steel (A2)	150	9600	4800	2400	1600	1200	800	600	300	200
Stainless (304)	240	15360	7680	3840	2560	1920	1280	960	480	320
Stainless (316)	210	13440	6720	3360	2240	1680	1120	840	420	280
Cast Iron (Gray)	150	9600	4800	2400	1600	1200	800	600	300	200
Cast Iron (Ductile)	180	11520	5760	2880	1920	1440	960	720	360	240
Titanium	180	11520	5760	2880	1920	1440	960	720	360	240
Plastics (Delrin)	1200	76800	38400	19200	12800	9600	6400	4800	2400	1600
Plastics (Nylon)	900	57600	28800	14400	9600	7200	4800	3600	1800	1200
Plastics (Acrylic)	600	38400	19200	9600	6400	4800	3200	2400	1200	800

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.