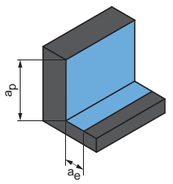
Cutting data recommendations for shoulder milling cutters

Feed and cutting speed

Roughing



Next page:
Finishing

OptiMill-Hardened | SCM102, 103

MMG*			Workpiece material	Strength/hardness [N/mm²] [HRC]	Cooling			a_p [mm] in % of D	a_e [mm] in % of D	v_c [m/min]	f_z [mm] Diameter of milling cutter [mm]							
					MQL/Air	Dry	Coolant				4.00	5.00	6.00	8.00	10.00	12.00	16.00	20.00
P	P1	P1.1	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700	✓	✓	✓	50	8	**180 - 200**	0.032	0.040	0.048	0.055	0.075	0.095	0.110	0.140
		P1.2	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200	✓	✓	✓	50	8	**160 - 180**	0.030	0.038	0.046	0.052	0.071	0.090	0.105	0.133
	P2	P2.1	Nitrided, case hardened and heat-treated steels, alloy	< 900	✓	✓	✓	50	8	**170 - 190**	0.032	0.040	0.048	0.055	0.075	0.095	0.110	0.140
		P2.2	Nitrided, case hardened and heat-treated steels, alloy	< 1400	✓	✓	✓	50	8	**150 - 170**	0.030	0.038	0.046	0.052	0.071	0.090	0.105	0.133
	P3	P3.1	Tool, bearing, spring and high-speed steels**	< 800	✓	✓	✓	50	8	**170 - 190**	0.032	0.040	0.048	0.055	0.075	0.095	0.110	0.140
		P3.2	Tool, bearing, spring and high-speed steels**	< 1000	✓	✓	✓	50	7	**150 - 170**	0.030	0.038	0.046	0.052	0.071	0.090	0.105	0.133
		P3.3	Tool, bearing, spring and high-speed steels**	< 1500	✓	✓	✓	50	7	**130 - 150**	0.027	0.034	0.041	0.047	0.064	0.081	0.094	0.119
	P4	P4.1	Stainless steels, ferritic and martensitic		✓		✓	50	7	**130 - 150**	0.027	0.034	0.041	0.047	0.064	0.081	0.094	0.119
	P5	P5.1	Cast steel		✓		✓	50	7	**130 - 150**	0.027	0.034	0.041	0.047	0.064	0.081	0.094	0.119
	P6	P6.1	Stainless cast steel, ferritic and martensitic		✓		✓	50	8	**140 - 160**	0.029	0.036	0.043	0.050	0.068	0.086	0.099	0.126
H	H1	H1.1	Hardened steel / cast steel	< 44	✓	✓		50	2	**100 - 125**	0.027	0.034	0.041	0.047	0.064	0.081	0.094	0.119
		H1.2	Hardened steel / cast steel	< 55	✓	✓		50	1.5	**80 - 100**	0.022	0.028	0.034	0.039	0.053	0.067	0.077	0.098
	H2	H2.1	Hardened steel / cast steel	< 60	✓			50	1.2	**60 - 80**	0.019	0.024	0.029	0.033	0.045	0.057	0.066	0.084

* MAPAL machining groups
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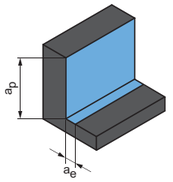
Cutting data recommendations for shoulder milling cutters

Feed and cutting speed

Finishing



OptiMill-Hardened | SCM102, 103

MMG*		Workpiece material	Strength/hardness [N/mm²] [HRC]	Cooling			a_p [mm] in % of D	a_e [mm] in % of D	v_c [m/min]	f_z [mm] Diameter of milling cutter [mm]							
				MQL/Air	Dry	Coolant				4.00	5.00	6.00	8.00	10.00	12.00	16.00	20.00
P	P1	P1.1	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700	✓	✓	✓	100	2	**200 - 220**	0.025	0.030	0.040	0.050	0.065	0.075	0.090	0.105
		P1.2	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200	✓	✓	✓	100	2	**180 - 200**	0.024	0.029	0.038	0.048	0.062	0.071	0.086	0.100
	P2	P2.1	Nitrided, case hardened and heat-treated steels, alloy	< 900	✓	✓	✓	100	2	**180 - 200**	0.025	0.030	0.040	0.050	0.065	0.075	0.090	0.105
		P2.2	Nitrided, case hardened and heat-treated steels, alloy	< 1400	✓	✓	✓	100	2	**160 - 180**	0.024	0.029	0.038	0.048	0.062	0.071	0.086	0.100
	P3	P3.1	Tool, bearing, spring and high-speed steels**	< 800	✓	✓	✓	100	2	**180 - 200**	0.025	0.030	0.040	0.050	0.065	0.075	0.090	0.105
		P3.2	Tool, bearing, spring and high-speed steels**	< 1000	✓	✓	✓	100	2	**160 - 180**	0.024	0.029	0.038	0.048	0.062	0.071	0.086	0.100
		P3.3	Tool, bearing, spring and high-speed steels**	< 1500	✓	✓	✓	100	2	**140 - 160**	0.021	0.026	0.034	0.043	0.055	0.064	0.077	0.089
	P4	P4.1	Stainless steels, ferritic and martensitic		✓		✓	100	2	**140 - 160**	0.021	0.026	0.034	0.043	0.055	0.064	0.077	0.089
	P5	P5.1	Cast steel		✓		✓	100	2	**140 - 160**	0.021	0.026	0.034	0.043	0.055	0.064	0.077	0.089
	P6	P6.1	Stainless cast steel, ferritic and martensitic		✓		✓	100	2	**150 - 170**	0.023	0.027	0.036	0.045	0.059	0.068	0.081	0.095
M	M1	M1.1	Stainless steels, austenitic	< 700			✓	100	1.5	**110 - 130**	0.023	0.027	0.036	0.045	0.059	0.068	0.081	0.095
		M1.2	Stainless steels, ferritic/austenitic (duplex)	< 1000			✓	100	1.5	**90 - 110**	0.021	0.026	0.034	0.043	0.055	0.064	0.077	0.089
	M2	M2.1	Stainless/heat-resistant cast steel, austenitic	< 700			✓	100	1.5	**110 - 130**	0.023	0.027	0.036	0.045	0.059	0.068	0.081	0.095
	M3	M3.1	Stainless cast steel, ferritic/austenitic (duplex)	< 1000			✓	100	1.5	**90 - 130**	0.021	0.026	0.034	0.043	0.055	0.064	0.077	0.089
K	K1	K1.1	Cast iron with lamellar graphite (grey cast iron), GJL	< 300	✓	✓	✓	100	2.5	**200 - 220**	0.025	0.030	0.040	0.050	0.065	0.075	0.090	0.105
	K2	K2.1	Cast iron with spheroidal graphite, GJS	< 500	✓	✓	✓	100	2.5	**180 - 200**	0.024	0.029	0.038	0.048	0.062	0.071	0.086	0.100
		K2.2	Cast iron with spheroidal graphite, GJS	≤ 800	✓	✓	✓	100	2.5	**180 - 200**	0.024	0.029	0.038	0.048	0.062	0.071	0.086	0.100
		K2.3	Cast iron with spheroidal graphite, GJS	> 800	✓	✓	✓	100	2.5	**170 - 190**	0.023	0.027	0.036	0.045	0.059	0.068	0.081	0.095
	K3	K3.1	Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	< 500	✓	✓	✓	100	2.5	**200 - 220**	0.025	0.030	0.040	0.050	0.065	0.075	0.090	0.105
		K3.2	Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	> 500	✓	✓	✓	100	2.5	**180 - 200**	0.024	0.029	0.038	0.048	0.062	0.071	0.086	0.100
H	H1	H1.1	Hardened steel / cast steel	< 44	✓	✓		100	1.5	**110 - 130**	0.021	0.026	0.034	0.043	0.055	0.064	0.077	0.089
		H1.2	Hardened steel / cast steel	< 55	✓	✓		100	1.2	**90 - 115**	0.018	0.021	0.028	0.035	0.046	0.053	0.063	0.074
	H2	H2.1	Hardened steel / cast steel	< 60	✓			100	0.8	**70 - 90**	0.015	0.018	0.024	0.030	0.039	0.045	0.054	0.063

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