Solid Carbide

High Performance Roughing End Mills

CONVENTIONAL GEOMETRY

IMPROVED GEOMETRY WITH CHAMFER AND DUBBING

A range of high performance roughing end mills for rapid stock removal, with new geometry designed for very low cutting forces. These new roughers are for general engineering applications such as side cutting, slotting and ramping - and can be used on machines with medium to low rigidity.

The main features of these high performance roughing end mills include:

- Innovative new geometries designed in conjunction with our international development partners who have decades of design and development experience in the carbide tooling industry. The benefit is a range of state-of-the-art carbide cutting tools with superior performance.
- Chamfer and dubbing features to reinforce cutting tool corners for extended tool life and reduced cutting tool forces at higher speeds.
- Specially adapted Oerlikon Balzers coating which further improves operational performance and tool life.
- Sub-micron carbide grade of European origin.
- Shank tolerances to h6.
- The high performance rougher ranges consist of regular length, coarse and fine pitch, knuckle and flat crest forms, most with Balzers coating (only product group 03C is uncoated, suitable for aluminium machining applications).
- Designed to works standard over the 6mm to 20mm diameter range.

In combination, these features result in an extremely high performance carbide cutting tool range, which competes favourably with current global state-of-the-art solid carbide cutting tool designs. In some tested applications these new solid carbide end mills have outperformed competitive products by up to four times. High stock removal rates at high speeds and feeds, excellent finish quality and extended tool life are the major benefits of these new designs, in very hard work materials with complex applications.

SOLID CARBIDE HIGH PERFORMANCE ROUGHING END MILLS

SOMTA World Class Cutting Tools

OSG GROUP COMPANY

Manufacturers & Suppliers

of Drills, Reamers, End Mills,

Bore Cutters, Taps & Dies,

Toolbits, Solid Carbide Tooling,

Carbide Insert Tooling,

Custom Tools and

Surface Coatings

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OSG GROUP COMPANY

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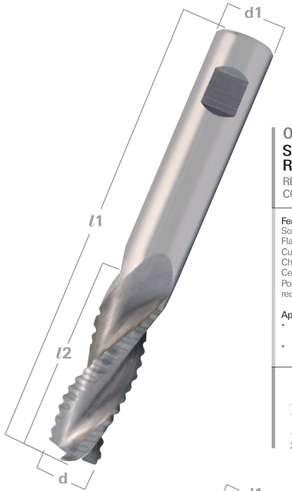
High Performance Roughing End Mills



03C
Solid Carbide 3 Flute Roughing End Mill

REGULAR LENGTH, KNUCKLE FORM, COARSE PITCH, UNCOATED (FOR ALUMINIUM)

Features:
Somta standard
Flatted shank with h6 tolerance
Cutting length to tolerance -0,020 / -0,070
Chamfer and dubbing to reinforce corner for a long tool life
Centre Cutting
Possible design modifications - neck according to customer request

Applications:
- Side cutting, slotting and ramping - special design for low cutting forces.
- For general engineering applications - can be used on machines with medium to low rigidity.

d	d1	l2	l1	CODE
6	6	13	57	03C0600
8	8	16	63	03C0800
10	10	22	72	03C1000
12	12	26	83	03C1200
16	16	32	92	03C1600
20	20	38	104	03C2000

03E
Solid Carbide 4 Flute Roughing End Mill

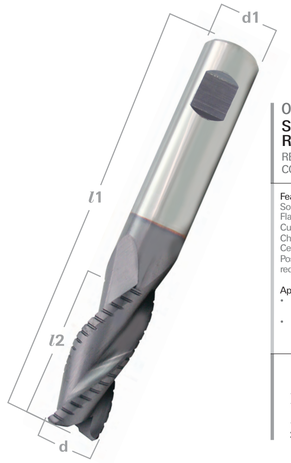
REGULAR LENGTH, KNUCKLE FORM, FINE PITCH, COATED

Fine-pitch producing a semi-finish surface which is acceptable for many applications

Features:
Somta standard
Flatted shank with h6 tolerance
Cutting length to tolerance -0,020 / -0,070
Chamfer and dubbing to reinforce corner for a long tool life
Centre Cutting
Possible design modifications - neck according to customer request

Applications:
- Side cutting, slotting and ramping - special design for low cutting forces combined with a semi-finish surface.
- For general engineering applications and die mould applications ‹ 42 HRC - can be used on machines with medium to low rigidity.

d	d1	l2	l1	CODE
6	6	13	57	03E0600X
8	8	16	63	03E0800X
10	10	22	72	03E1000X
12	12	26	83	03E1200X
16	16	32	92	03E1600X
20	20	38	104	03E2000X



03D
Solid Carbide 3 Flute Roughing End Mill

REGULAR LENGTH, FLAT CREST, COARSE PITCH, COATED

Features:
Somta standard
Flatted shank with h6 tolerance
Cutting length to tolerance -0,020 / -0,070
Chamfer and dubbing to reinforce corner for a long tool life
Centre Cutting
Possible design modifications - neck according to customer request

Applications:
- Side cutting, slotting and ramping - special design for low cutting forces combined with a semi-finish surface.
- For general engineering applications and die mould applications - can be used on machines with medium to low rigidity.

d	d1	l2	l1	CODE
6	6	10	57	03D0600X
8	8	16	63	03D0800X
10	10	19	72	03D1000X
12	12	22	83	03D1200X
16	16	32	92	03D1600X
20	20	38	104	03D2000X

03F
Solid Carbide 4 Flute Roughing End Mill

REGULAR LENGTH, FLAT CREST, FINE PITCH, COATED

Flat profile producing a semi-finish surface which is acceptable for many applications

Features:
Somta standard
Flatted shank with h6 tolerance
Cutting length to tolerance -0,020 / -0,070
Chamfer and dubbing to reinforce corner for a long tool life
Centre Cutting
Possible design modifications - neck according to customer request

Applications:
- Side cutting, slotting and ramping - special design for low cutting forces.
- For general engineering applications - can be used on machines with medium to low rigidity.

d	d1	l2	l1	CODE
6	6	13	57	03F0600X
8	8	16	63	03F0800X
10	10	22	72	03F1000X
12	12	26	83	03F1200X
16	16	32	92	03F1600X
20	20	38	104	03F2000X

END MILL RANGES FEEDS AND SPEEDS

Material Type	Hardness HB	Tensile Strength N/mm²	Recommended Surface Speed in m/min		Recommended feed in mm per tooth for Carbide End Mills based on 1.0 x D cutting depth with 0.5 x D cutting width. For slotting up to 1.0 x D, reduce by 30% — End Mill Diameter in mm					
			min	max	6	8	10	12	16	20
03C Solid Carbide 3 Flute Roughing End Mill REGULAR LENGTH, KNUCKLE FORM, COARSE PITCH, UNCOATED (FOR ALUMINIUM)										
Aluminium wrought alloys	< 100	< 350	500	2000	0.066	0.088	0.110	0.132	0.176	0.220
Aluminium cast alloys > 5% Si < 10% Si	< 120	< 400	500	1500	0.059	0.079	0.099	0.119	0.158	0.198

Material Type	Hardness HB	Tensile Strength N/mm²	Recommended Surface Speed in m/min		Recommended feed in mm per tooth for Carbide End Mills based on 1.0 x D cutting depth with 0.5 x D cutting width. Reduce depth to 0.75 x D for slotting — End Mill Diameter in mm					
			min	max	6	8	10	12	16	20
03D Solid Carbide 3 Flute Roughing End Mill REGULAR LENGTH, FLAT CREST, COARSE PITCH, COATED **03F** Solid Carbide 4 Flute Roughing End Mill REGULAR LENGTH, FLAT CREST, FINE PITCH, COATED										
Free Cutting Carbon Steel	< 150	< 540	150	200	0.044	0.060	0.072	0.083	0.101	0.114
0.3 to 0.4% Carbon Steel	< 170	< 620	140	190	0.044	0.060	0.072	0.083	0.101	0.114
0.3 to 0.4% Carbon Steel	< 248	< 910	120	160	0.036	0.050	0.061	0.070	0.087	0.101
Alloy Steel	< 330	< 1150	90	150	0.033	0.045	0.054	0.062	0.077	0.088
Hardened Alloy Steel	< 400	-	100	140	0.033	0.045	0.054	0.062	0.077	0.088
Stainless Steel - Martensitic (400 Series)	< 248	< 810	60	100	0.029	0.040	0.048	0.056	0.070	0.081
Stainless Steel - Austenitic (300 Series)	< 300	< 1000	80	100	0.036	0.050	0.061	0.070	0.087	0.101
Grey Cast Irons			120	160	0.044	0.060	0.072	0.083	0.101	0.114
Nodular Cast Irons	110-300	-	110	140	0.036	0.050	0.061	0.070	0.087	0.101
Malleable Cast Irons			100	130	0.029	0.040	0.048	0.056	0.070	0.081
Heat Resisting Alloys	< 350	< 1200	20	40	0.019	0.026	0.032	0.037	0.046	0.054
Commercially Pure Titanium	< 275	< 1000	50	80	0.029	0.040	0.048	0.056	0.070	0.081
Commercially Alloyed Titanium	< 350	< 1200	45	65	0.026	0.037	0.045	0.052	0.064	0.074
03E Solid Carbide 4 Flute Roughing End Mill REGULAR LENGTH, KNUCKLE FORM, FINE PITCH, COATED										
Free Cutting Carbon Steel	< 150	< 540	150	200	0.036	0.049	0.059	0.072	0.087	0.098
0.3 to 0.4% Carbon Steel	< 170	< 620	140	190	0.036	0.049	0.059	0.072	0.087	0.098
0.3 to 0.4% Carbon Steel	< 248	< 910	120	160	0.030	0.041	0.049	0.061	0.075	0.087
Alloy Steel	< 330	< 1150	90	150	0.027	0.037	0.044	0.054	0.066	0.076
Hardened Alloy Steel	< 400	-	80	140	0.027	0.037	0.044	0.054	0.066	0.076
Stainless Steel - Martensitic (400 Series)	< 248	< 810	60	100	0.024	0.033	0.039	0.049	0.060	0.070
Stainless Steel - Austenitic (300 Series)	< 300	< 1000	80	100	0.030	0.041	0.049	0.061	0.075	0.087
Grey Cast Irons			120	160	0.036	0.049	0.059	0.072	0.087	0.098
Nodular Cast Irons	110-300	-	110	140	0.030	0.041	0.049	0.061	0.075	0.087
Malleable Cast Irons			100	130	0.024	0.033	0.039	0.049	0.060	0.070
Commercially Pure Titanium	< 275	< 1000	50	80	0.024	0.033	0.039	0.049	0.060	0.070

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