

Market position

Mixed milling in small to medium sized machining centres.
Focus areas are general engineering, aerospace, automotive and oil & gas.

Application area

The primary target area of CoroMill® MS20 is shoulder milling applications in ISO M and ISO S materials. Although primarily developed for all types of shoulder milling applications, the concept is extremely versatile, also handling face milling, pocket milling, corner machining, ramping, helical ramping, full slotting, and plunge milling operations. For roughing to finishing operations.

- CoroMill® MS20 to be used as first-choice solution for true 90 deg shoulder milling in ISO M and S applications
- CoroMill® MS20 is recommended as the preferred concept in repeated shoulder milling operations with higher accuracy and surface finish demand
- CoroMill® MS20 will be best positioned in rough milling operations demanding higher edge line security and overall process security, especially when the existing CoroMill® 390-11 is not competitive enough
- CoroMill® 390-07 complements CoroMill® MS20 in ISO M and S applications requiring a smaller diameter tool, higher number of inserts per cutter body, and/or lower feed per tooth

Assortment overview, cutter body

Cutter diameter range	15.8–84 mm (inch equivalent)		
Cutter body interface	Cylindrical shank, Coromant® EH, MSSC, Arbor, Coromant Capto® and Weldon (inch)	119 articles	CP24.2 introduction
Cutter body interface	CIS and Weldon (metric)	13 articles	Level 3 introduction

Tailor Made: CAPP family M253 is available for cutter bodies.

Cutter body

Material: Uddeholm Balder
Heat treatment: 43 ± 2 HRC

Coolant

Through coolant on all cutter bodies

Assortment overview, inserts

Insert IC size	IC10
Insert geometry	E-L50, M-M20 and M-M30
Insert corner radius	0.2, 0.4, 0.8 and 1.6
Insert grade	1040, 2040, S30T and S40T

Key competitors

Seco, Mitsubishi, Tungaloy, Ceratizit
Above competitors have been identified as the most competitive in terms of overall performance in ISO M and S applications.

Tips and tricks

(Axial tilt (GAMP) : +10°)
(Radial tilt (GAMF): - 13°)
Value of the offset for a_p : 25–75% of APMX (for variable depth of cut strategy)
When used at $a_p \leq 85\%$ RE, the notch wear characteristic is minimized
When used at $a_p \leq 50\%$ RE, high-feed milling strategies can be applied

Compared to the CoroMill® 390, the CoroMill® MS20 tip seat offers improved contact with the insert seat, resulting in greater radial stability, enhanced repeatability over extended periods, as well as increased reliability and tool body lifespan.

Tips for machining in ISO M

- Use M-M20 geometry for excellent chip formation and evacuation in sticky materials
- M-M30 geometry gives higher security in tougher materials (Duplex)
- Higher edge line toughness of the geometry allows the insert to be used with higher productivity (high cutting data) in stable operations
- Use E-L50 geometry for long overhang applications where a sharper and hence lighter cutting edge will help reducing vibrations
- Robust steel shank design ensures better stability and less deflection
- The two cutting edges have equal tool life and the M-M20 geometry provides predictable and gradual wear characteristics, especially in austenitic stainless steels

Tips for machining in ISO S

- Use E-L50 geometry for excellent chip formation and evacuation in sticky materials
- M-M20 and M-M30 geometries give higher security in tougher applications in titanium and Inconel, respectively
- Higher edge line toughness of these geometries allows the inserts to be used with higher productivity (high cutting data) in stable operations
- Robust steel shank design ensures better stability and less deflection. The improved tool body material can withstand chip rubbing better

Scan to learn more about CoroMill® MS20:



C-1040:347 en-GB – Pocket guide
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CoroMill® MS20



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Accuracy

Run-out over master inserts = 0.015 mm (0.0006 inch)
Cutter diameter (DC) = +0.00/-0.10 mm (+0.00/-0.04 inch)

Adjustments

Fixed pockets

Max. RPM

24500–56600 (laser marked on the cutter body)

Spare parts

Insert screw: 5513 020-90
TORX PLUS® key: 5680 100-04 (9IP)
Bit: 5680 084-05 (long), 5680 084-20 (short)
Torque wrench: 5680 105-02 Nm, 5680 105-04 lbs.in

Torque value

Recommended tightening torque: 1.6 Nm (14.161 lbs.in)

Limits

APMX: 9 mm (0.354 inch), recommended a_p : 4 mm (0.157 inch)

Cutting data, linear ramping

DCX, metric	DCX, inch	RMPX (deg)	Lm, mm (inch)
	5⁄8"	7.8	65.7 (2.85)
16 mm		7.7	66.6 (2.61)
	¾"	5.4	95.2 (2.57)
20 mm		4.9	105 (4.13)
25 mm		3.3	156.1 (6.15)
	1"	3.2	161 (6.34)
	1 ¼"	2.2	234.3 (9.21)
32 mm		2.2	234.3 (9.21)
	1 ½"	1.7	303.2 (11.94)
40 mm		1.6	322.2 (12.68)
50 mm		1.2	429.7 (16.92)
	2"	1.2	429.7 (16.92)

ISO area	h_{ex} recommendations, mm (inch)		
	E-L50	M-M20	M-M30
M1.0.Z.AQ (316L) Austenitic	0.1 (0.05–0.15)	0.1 (0.08–0.15)	
M3.2.Z.AQ (SAF2205) Duplex	0.08 (0.05–0.12)	0.08 (0.05–0.12)	
S4.2.Z.AN (TiAl6V4) Titanium	0.1 (0.05–0.15)	0.1 (0.08–0.15)	0.13 (0.08–0.2)
S2.0.Z.AG (Inconel 718)	0.08 (0.05–0.12)	0.08 (0.05–0.12)	0.12 (0.08–0.15)

ISO area	Grade	v_c recommendations, m/min (ft/min)
M1.0.Z.AQ (316L) Austenitic	1040	135 (115 – 155)
	2040	120 (105 – 135)
	S30T	135 (115 – 155)
	S40T	210 (185 – 235)
M3.2.Z.AQ (SAF2205) Duplex	1040	105 (90 – 110)
	2040	125 (110 – 130)
	S30T	120 (105 – 130)
	S40T	120 (110 – 130)
S4.2.Z.AN (TiAl6V4) Titanium	2040	40 (35 – 45)
	S30T	50 (40 – 65)
	S40T	40 (35 – 45)
S2.0.Z.AG (Inconel 718)	2040	35 (35 – 40)
	S30T	35 (30 – 35)
	S40T	30 (25 – 35)

Cutting data, helical ramping

DCX, metric	DCX, inch	RMPX (deg)	Max Dm, mm (inch)	Flat min Dm, mm (inch)	Min Dm, mm (inch)
	5⁄8"	7.8	30.15 (1.19)	27.75 (1.08)	23.75 (0.93)
16 mm		7.7	30.4 (1.2)	28 (1.10)	25 (0.97)
	¾"	5.4	36.5 (1.44)	34.1 (1.33)	30.1 (1.18)
20 mm		4.9	38.4 (1.50)	36 (1.42)	33 (1.3)
25 mm		3.3	48.4 (1.91)	46 (1.80)	43 (1.68)
	1"	3.2	46.8 (1.82)	46.8 (1.83)	42.8 (1.68)
	1 ¼"	2.2	61.9 (2.44)	59.5 (2.33)	55.5 (2.18)
32 mm		2.2	62.4 (2.46)	60 (2.35)	57 (2.23)
	1 ½"	1.7	72.2 (2.83)	72.2 (2.83)	68.2 (2.68)
40 mm		1.6	78.4 (3.09)	76 (2.98)	73 (2.86)
50 mm		1.2	98.4 (3.86)	96 (3.78)	93 (3.65)
	2"	1.2	97.6 (3.83)	97.6 (3.83)	93.6 (3.68)

Plunge milling

ISO area	Reference material	Max a_e , mm (inch)	Feed, mm/z (in/z)
ISO M	M1.0.Z.AQ (1.4404 / 316L)	4 (0.157)	0.10 (0.08–0.15) (0.004 (0.003–0.006))
ISO M	M3.2.Z.AQ (SAF2205)	4 (0.157)	0.08 (0.05–0.12) (0.003 (0.002–0.0004))
ISO S	S4.2.Z.AN (TiAl6V4)	3 (0.118)	0.08 (0.05–0.12) (0.003 (0.002–0.0004))
ISO S	S2.0.Z.AG (Inconel 718)	3 (0.118)	0.08 (0.05–0.12) (0.003 (0.002–0.0004))

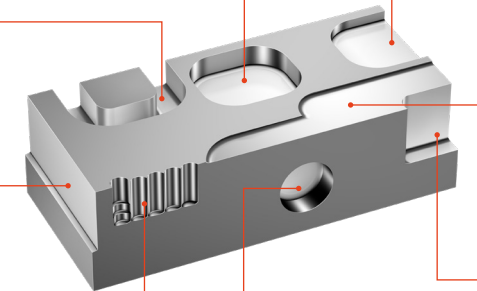
Tool positioning/applications

Full slotting		
Large Ø	Small Ø	Long overhang
MS20	CM390-07	CM390-11
MS20	MS20	MS20

a_e < 30% shoulder milling		
Large Ø	Small Ø	Long overhang
MS20	CM390-07	MS20
MS20	MS20	MS20

Plunge milling	
Overhang (L/D<4)	Small Ø
CM390-11 ($a_e \leq 2.0$ mm (0.079 inch)) MS20 ($a_e \leq 4.0$ mm (0.157 inch))	MS20
MS20	MS20

First choice for high metal removal rate
First choice for security



Helical ramping		
Large Ø	Small Ø	Long overhang
CM390-11	MS20 (high ramping) CM390-07 (high z_n)	CM390-11 (large a_e) MS20 (small a_e)
MS20	MS20	MS20

Open and closed pocket		
Large Ø	Small Ø	Long overhang
MS20	MS20 / CM390-11 (high ramping) CM390-07 (high z_n)	CM390-11 (large a_e) MS20 (small a_e)
MS20	MS20	MS20

Feed face milling		
Large Ø	Small Ø	Long overhang
MS20	CM390-07	CM390-11
MS20	CM390-07	MS20

a_e < 60% shoulder milling		
Large Ø	Small Ø	Long overhang
MS20	CM390-07 (high z_n)	MS20
MS20	MS20	MS20
a_e < 60% shoulder milling		
MS20	CM390-07 (high z_n)	MS20
MS20	MS20	MS20

Cutter bodies

Article code	Non-coolant bolt	Article code	Coolant bolt
MS20-R040Q16-10H	3212 010-413	MS20-R040Q16-10H	5512 073-03
MS20-R050Q22-10H	3212 010-463	MS20-R050Q22-10H	5512 073-01
MS20-R063Q22-10H	3212 010-463	MS20-R063Q22-10H	5512 073-01
MS20-R080Q27-10H	3212 010-514	MS20-R080Q27-10H	5512 073-02
MS20-AR038R19-10M	5512 065-01	MS20-AR038R19-10M	5512 074-03
MS20-AR051R19-10H	3212 030-606	MS20-AR051R19-10H	5512 074-01
MS20-AR076R25-10H	3212 030-707	MS20-AR076R25-10H	5512 074-02

Insert geometry

CoroMill® MS20 geometry	CoroMill® 390-11 equivalent geometry
E-L50	E-PL, E-ML
M-M20	E-MM, M-MM
M-M30	E-PM, M-PM, E-MM, M-MM