## Target areas

- Optimized for true 90-degree shoulder milling and repeated passes in side milling
- Secondary application areas are face milling, full slot milling and plunge milling
- For roughing and finishing operations
- Main industry segments to target are general engineering and automotive
- Components such as housings/casings in HRSA, cylinder head and engine block in cast iron, fixturing devices in several materials

## Features and benefits

- True 90-degree shoulder milling solution, optimized for side milling and repeated passes
- Achieves excellent wall quality, roughness and perpendicularity when using repeated passes thanks to precise edge line overlapping
- Tool body with high stiffness thanks to tangential interface design gives superior reliability and security
- Stable insert positions with wide support faces for long and predictable tool life
- Optimized chip pockets for excellent chip control while machining against a wall and during repeated shoulder milling
- Inserts with four cutting edges that are easy to index thanks to accessible screws from the side
- Available in a wide range of grades and geometries to cover materials such as ISO P, M, K and S

## Handling and spare parts

**Insert size 09** – Insert screw (9IP) 5513 020-95
Recommended tightening torque is 1.4 Nm (12.4 lbs.in)
**Insert size 13** – Insert screw (15IP) 5513 020-96
Recommended tightening torque is 3.0 Nm (26.6 lbs.in)

| | **Insert size 09** | **Insert size 13** |
|---|---|---|
| Torque wrench TORX PLUS® | 5680 100-04 (9IP) | 5680 100-06 (15IP) |
| Adjustable torque wrench for bits | 5680 105-02 (Nm) or 5680 105-04 (lbs.in) | 5680 105-02 (Nm) or 5680 105-04 (lbs.in) |
| Bit, short (included) | 5680 084-20 | 5680 084-15 |
| Bit, long | 5680 084-05 | 5680 084-02 |

## Inserts and geometries

| | | | |
|---|---|---|---|
| |  |  |  |
| Insert size **09**<br>Insert size **13** | MS40-090404 **E-L30**<br>MS40-130608 **E-L40** | MS40-090404 **E-M40**<br>MS40-130608 **E-M50** | MS40-090404 **M-M40**<br>MS40-130608 **M-M50** |
| | Periphery-ground geometry | Periphery-ground geometry | Direct-pressed geometry |
| | • Light cutting<br>• Closer tolerance ensures better component quality and higher insert tool life<br>• Regulates chip formation and evacuation in sticky/long-chipping materials<br>• Optimized geometry for ISO M - Stainless Steel applications<br>• Good edge-line security and trouble-free machining at long overhangs | • Versatile geometry for all kind of materials<br>• Preferred geometry for roughing in austenitic stainless steel materials<br>• Ground reinforced edge for a predictable and gradual wear characteristics<br>• Closer tolerance ensures better component quality and higher insert tool life | • Reinforced geometry for medium and heavy applications ISO P & K<br>• Strong radius for higher security around the corner<br>• Highest metal removal rate in stable applications |

## Assortment overview, cutter body

| | Cutter diameter range, mm (inch) | Pitch | APMX, mm (inch) | Coupling |
|---|---|---|---|---|
| Insert size SSC 09 | 25–32 (1–1 ¼) | M, H (M) | 8 (0.315) | Cylindrical shank |
| | 40–63 (1½–2) | M, H (M) | 8 (0.315) | Arbor |
| Insert size SSC 13 | 40–160* (2–6) | M, H (M) | 12 (0.472) | Arbor |
| | * Internal coolant up to Ø125 mm (5 inch) | M pitch: differential pitch<br>H pitch: even pitch | | |

## Assortment overview, inserts

| | **Insert size 09** (APMX: 8.0 mm (0.315 inch)) | **Insert size 13** (APMX: 12.0 mm (0.472 inch)) |
|---|---|---|
| Insert geometry | E-L30, M-M40 and M-M40 | E-L40, M-M50 and M-M50 |
| Insert corner radius | 0.4 and 0.8 mm (0.0157 and 0.0315 inch) | 0.8 mm (0.0315 inch) |
| Insert grade | 1040, 2040, 1230, 4330, 3330 | 1040, 2040, 1230, 4330, 3330 |

- Ground and direct-pressed geometries to cover a wide variety of applications
- Five grades to be competitive across all materials

## Inserts geometries, details – Real cutting rake

| | | | **Insert in hand** | **Real radical rake angle on tool** |
|---|---|---|---|---|
| **Insert size 09** | MS40-090404 E-L30 | T-land angle | - | - |
| | | Primary cutting rake | +30° | +10° |
| | MS40-090404 E-M40 | T-land angle, mm (inch) | 0.1 x +10° (0.004 x +10°) | 0.1 x -10° (0.0039 x -10°) |
| | | Primary cutting rake | +35° | +15° |
| | MS40-090404 M-M40 | T-land angle, mm (inch) | 0.1 x +10° (0.004 x +10°) | 0.1 x -10° (0.0039 x -10°) |
| | | Primary cutting rake | +35° | +15° |
| **Insert size 13** | MS40-130608 E-L40 | T-land angle | - | - |
| | | Primary cutting rake | +30° | +14° |
| | MS40-130608 E-M50 | T-land angle, mm (inch) | 0.12 x +10° (0.0047 x +10°) | 0.12 x -6° (0.0047 x -10°) |
| | | Primary cutting rake | +35° | +19° |
| | MS40-130608 M-M50 | T-land angle, mm (inch) | 0.13 x +10° (0.0051 x +10°) | 0.13 x -6° (0.0051 x -10°) |
| | | Primary cutting rake | +35° | +19° |

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C-1040:361 en-GB – Pocket guide

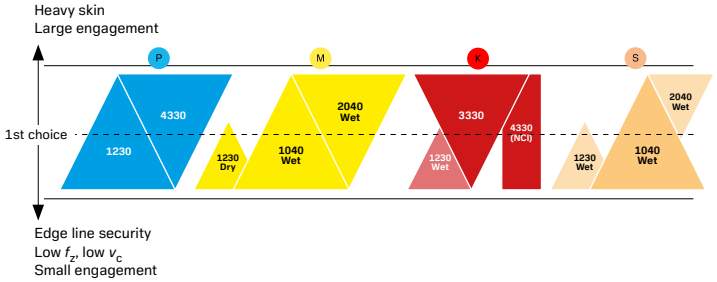

# CoroMill® MS40


SANDVIK coromant

## Cutting data, $v_c$ recommendations

| ISO Area | Reference material | Grade | $v_c$ recommendations | |
|---|---|---|---|---|
| | | | m/min | ft/min |
| ISO P | P2.1.Z.AN | GC1230 | 360 (330–380) | 1180 (1080–1250) |
| | | GC4330 | 295 (260–355) | 970 (850–1100) |
| ISO M | M1.0.Z.AQ | GC1040 | 170 (155–175) | 560 (510–575) |
| | | GC2040 | 140 (135–145) | 460 (440–475) |
| ISO K | K2.2.C.UT | GC3330 | 245 (215–270) | 805 (705–885) |
| | | GC4330 | 215 (200–220) | 705 (655–720) |
| ISO S (nickel based) | S2.0.Z.AG | GC1040 | 32 (33–34) | 105 (108–112) |
| | | GC2040 | 32 (33–34) | 105 (108–112) |
| | | GC1230 | 38 (37–39) | 125 (121–128) |

## Grade choice




## Grade choice – operations


**GC1230**

- For light roughing to finishing operations, in ISO P, M and S milling
- Wear resistance for safe and predictable milling processes
- Short engagement time generates lower heat impacts


**GC4330**

- CVD grade optimized for steel milling, offering reliable tool life and process security
- First choice for roughing to semi-finishing face milling in ISO P


**GC2040**

- CVD grade optimized for milling of stainless steels with abrasive tendencies
- Reliable for small batch production
- First choice for roughing to semi-finishing face milling in ISO M


**GC1040**

- For light roughing to finishing operations, in ISO M and S milling
- Wear resistance for safe and predictable milling processes
- First choice with coolant machining
- Short engagement time generates lower heat impacts


**GC3330**

- First choice for ISO K milling
- Wide application range in all types of cast iron

## Cutting data, $h_{ex}$ recommendations

| mm (inch) | | 0.02 (0.0008) | 0.04 (0.0016) | 0.06 (0.0024) | 0.08 (0.0031) | 0.1 (0.0039) | 0.12 (0.0047) | 0.14 (0.0055) | 0.16 (0.0063) | 0.18 (0.0071) | 0.2 (0.0079) | 0.22 (0.0087) | 0.24 (0.0094) | 0.26 (0.0102) | 0.28 (0.011) | 0.3 (0.0118) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P2.1.Z.AN 175 HB | E-L30 | | | | | | | | | | | | | | | |
| | E-M40 | | | | | | | | | | | | | | | |
| | M-M40 | | | | | | | | | | | | | | | |
| | E-L40 | | | | | | | | | | | | | | | |
| | E-M50 | | | | | | | | | | | | | | | |
| | M-M50 | | | | | | | | | | | | | | | |
| M1.0.Z.AQ 200 HB | E-L30 | | | | | | | | | | | | | | | |
| | E-M40 | | | | | | | | | | | | | | | |
| | M-M40 | | | | | | | | | | | | | | | |
| | E-L40 | | | | | | | | | | | | | | | |
| | E-M50 | | | | | | | | | | | | | | | |
| | M-M50 | | | | | | | | | | | | | | | |
| K2.2.C.UT 245 HB | E-M40 | | | | | | | | | | | | | | | |
| | M-M40 | | | | | | | | | | | | | | | |
| | M-M50 | | | | | | | | | | | | | | | |
| S2.0.Z.AG Nickel based 350 HB | E-L30 | | | | | | | | | | | | | | | |
| | E-M40 | | | | | | | | | | | | | | | |
| | M-M40 | | | | | | | | | | | | | | | |
| | E-L40 | | | | | | | | | | | | | | | |
| | E-M50 | | | | | | | | | | | | | | | |
| | M-M50 | | | | | | | | | | | | | | | |

Insert size 09 | Insert size 13

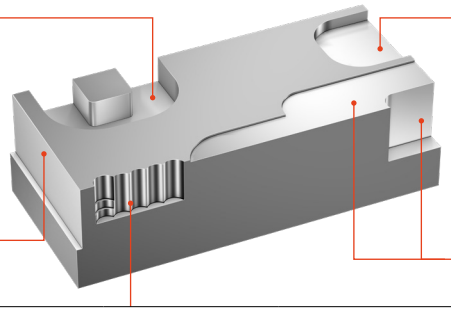
Scan to learn more about CoroMill® MS40:

## General recommendations – tool choice

| Full slotting | | |
|---|---|---|
| M pitch and odd $z$ preferred[1] | Short overhang | Long overhang |
| Small Ø | Trochoidal milling recommended, especially in ISO M and S | Trochoidal milling recommended |
| Large Ø | Ground geometry | Trochoidal milling recommended, especially in ISO M and S |

| $a_e$ < 30% shoulder milling | | |
|---|---|---|
| | Short overhang H pitch preferred | Long overhang M pitch preferred |
| Small Ø | High quality High productivity | Ground geometry |
| Large Ø | High quality High productivity | Ground geometry |

| Small Ø | Cylindrical shank |
|---|---|
| Large Ø | Arbor mounting |



| Plunge milling | | |
|---|---|---|
| | Max $a_e$ mm (inch) | |
| | Insert size 09 | Insert size 13 |
| ISO P, K | 3 (0.118) | 6 (0.0236) |
| ISO M, S | 2 (0.0787) | 4 (0.157) |

| Open pocket | | |
|---|---|---|
| | Short overhang | Long overhang M pitch preferred |
| Small Ø | Trochoidal milling recommended, especially in ISO M and S | Trochoidal milling recommended |
| Large Ø | General enlarging pocket cycle | Trochoidal milling recommended, especially in ISO M and S |

| Feed face milling $a_e$ > 66% shoulder milling | | |
|---|---|---|
| | Short overhang | Long overhang M pitch preferred |
| Small Ø | $a_p$ limited | Limited $a_p$ $a_e \leq$ 33% DCX |
| Large Ø | High productivity | Limited $a_p$ $a_e \leq$ 33% DCX |