

GC4330 and GC4340

New steel milling grades

Secure steel milling

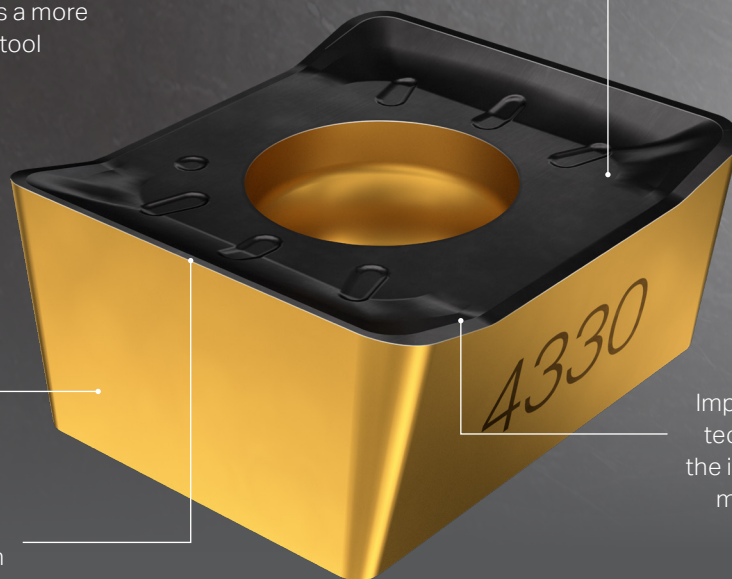
In-depth research and a focus on applying new production technologies have brought further advances in steel milling insert development.

The new CVD grades GC4330 and GC4340 offer substantially increased tool life and improved process security.

Technical features

New substrate in grade GC4330 with well-controlled grain size distribution, which offers a more reliable and predictable tool behaviour.

Inveio® coating for high wear resistance and long tool life.

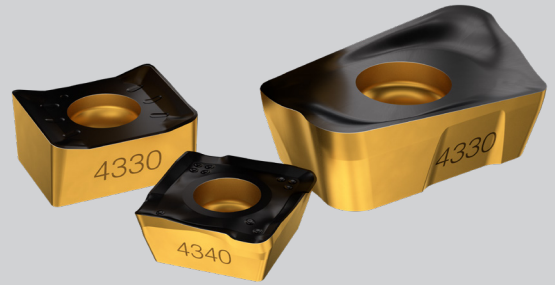


Improved post treatment technology strengthens the insert by modifying its mechanical properties.

More consistent tool life with more narrow edge rounding (ER) tolerance.

Benefits

- Increased tool life provides a reduced cost per component
- Improved process security ensures a predictable performance and less downtime
- High component quality



Application

- Optimized for steel milling
- GC4330: First choice for roughing to semi-finish face milling
- GC4340: First choice for rough shoulder milling and groove milling
- Wet and dry machining (dry is recommended)

Customer case CoroMill® 490 with size 14 inserts

Component: Fixture

Operation: Face milling

Machine: Mori Seiki NH4000DCG

Material: Unalloyed steel P1.2.Z.AN (CMC 01.2)



	GC4230	GC4330
Tool	490-080Q27-14M	490-080Q27-14M
Insert	490R-140408M-PM	490R-140408M-PM
Z_n	6	6
n r/min	900	900
v_c m/min (ft/min)	226 (741)	226 (741)
v_f mm/min (inch/min)	1000 (39.3)	1000 (39.3)
f_z mm/z (in/z)	0.19 (0.007)	0.19 (0.007)
a_p mm (inch)	2 (0.079)	2 (0.079)
a_e mm (inch)	70 (2.75)	70 (2.75)
Tool life (components)	32	45
Surface roughness criteria reached		

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CoroMill® MH20

High feed milling

Best-in-class high-feed pocketing

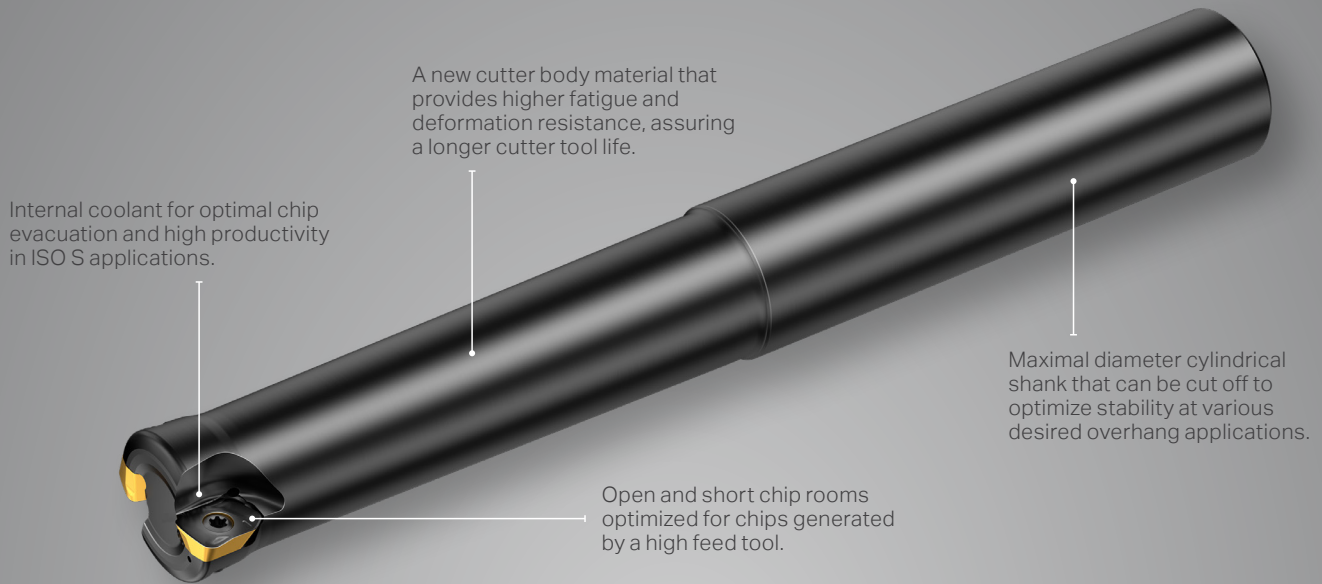
Time to level up your high-feed milling operations with best-in-class CoroMill® MH20. This is a versatile tool with a large application area, but is primarily designed for pocketing applications in ISO S, M and P materials.

Thanks to its light-cutting action, in combination with a robust shank design, CoroMill® MH20 ensures secure and vibration-free machining, even with long overhangs.



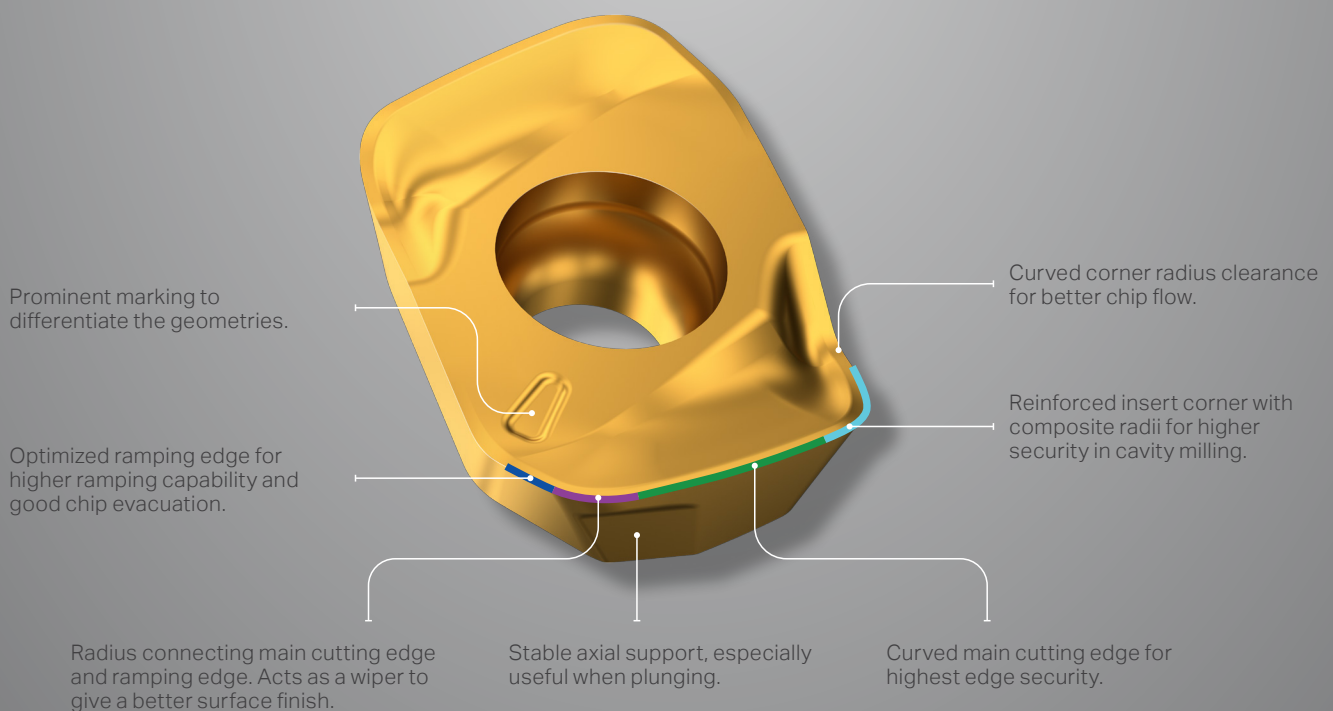
Robust cutter body

The robust cutter body with increased strength assures a longer tool life and excellent stability at long overhangs. An open insert pocket design and a secure insert position ensure reliable machining with excellent chip evacuation and less vibration.



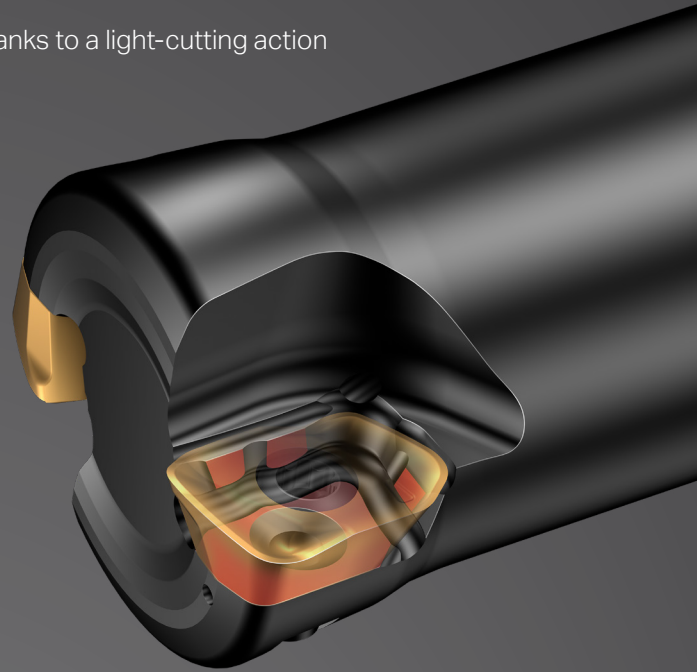
Curved insert design

The single-sided two-edged positive insert has a curved and strong edge with a reinforced corner radius, ensuring secure and reliable machining against shoulders and corners in pocketing. A sloped edge for gradual cutting engagement into the workpiece ensures a gradual chip load on the cutting zone and improves chip formation. This design generates lower cutting forces and leads them in a favourable direction to keep vibration to a minimum.



Features and benefits

- High-feed concept suitable for many milling operations helps to reduce the number of tools, thus reduce the cycle time
- Excellent stability at long overhangs with minimum vibrations thanks to a light-cutting action and a robust tool design
- Optimized edge-line security for reliable corner machining and pocket milling makes unsupervised machining possible
- Open insert pocket design for excellent chip evacuation
- Light-cutting action ensures less power consumption and hence enables the use of smaller machines
- Creates better surface finish with smaller cusps leaving less stock for the next operation
- Optimized geometries for high performance in ISO S, M and P materials



Application areas

- High feed pocket milling, corner machining, ramping, helical ramping, full slotting, plunge milling, shoulder milling and face milling
- For roughing and semi-finishing
- Main industry segments and components
 - Aerospace: Frame, landing gear, engine casing
 - Oil and gas: Valve body, spools, connectors
 - Die and mould: Forging dies, moulds, press tools



SMPH

ISO application area

Customer challenges in ISO S

Applications

- Aerospace frame open and closed pocket milling
- Full slotting and hole making with helical ramping cycles
- Long overhang cavity milling
- Low engagement shoulder milling
- Multi-task turn milling

Challenges

- Chip evacuation
- Insert security and reliability
- Tool life
- Cutter body damage (chip rubbing)

CoroMill® MH20 solution

- Use E-L30 geometry for excellent chip formation and evacuation in sticky materials.
- The curved main cutting edge provides maximum security against notch wear and the reinforced insert corner makes corner machining reliable. The improved tool body material ensures less insert seat deformation and better mounting repeatability.
- The sloped edge gives a gradual and positive cutting engagement which regulates the cutting force and minimizes the impact load. Periphery ground E-L30 geometry gives predictable and gradual wear characteristics.
- The improved tool body material can withstand chip rubbing better.



Customer challenges in ISO M

Applications

- Oil and gas open and closed pocket milling
- Full slotting and hole making with helical ramping cycles
- Long overhang cavity milling
- Low engagement shoulder milling
- Multi-task turn milling



Challenges

- Chip formation
- Insert security and reliability
- Long overhang machining
- Predictable and repeated tool life

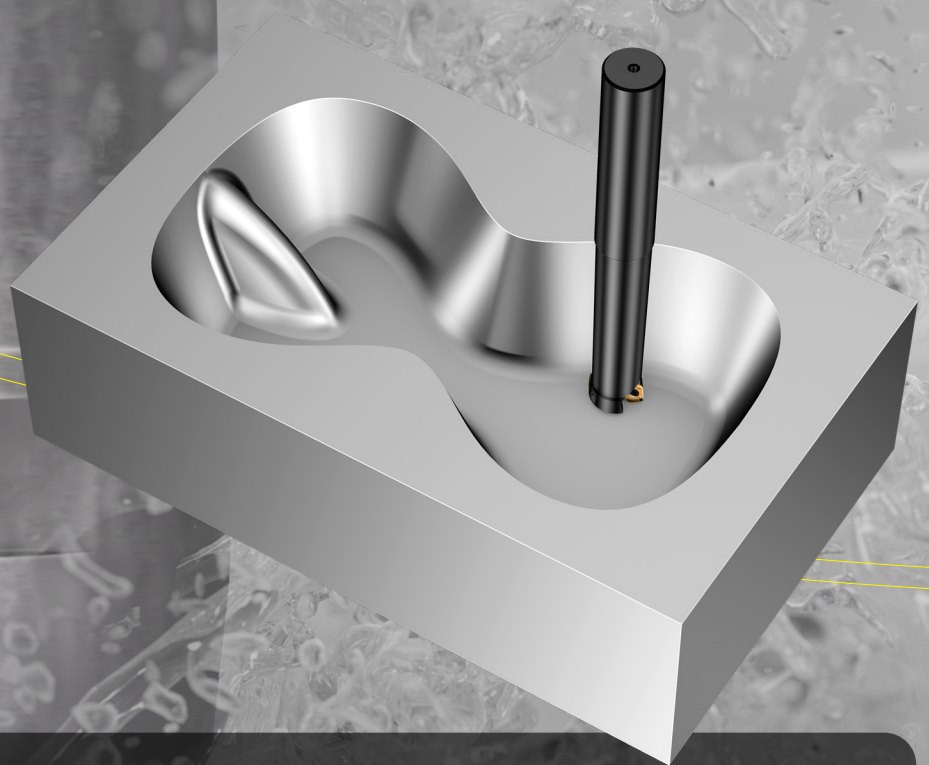
CoroMill® MH20 solution

- Use E-L30 geometry for excellent chip formation and evacuation in sticky materials.
- The curved main cutting edge provides maximum security against notch wear and the reinforced insert corner makes corner machining reliable. The improved tool body material ensures less insert seat deformation and better mounting repeatability.
- Robust steel shank design ensures better stability and less deflection.
- The two cutting edges have equal tool life and the E-L30 geometry provides predictable and gradual wear characteristics.

Customer challenges in ISO P

Applications

- Mould cavity pocket milling up to HRC 48
- Mould base deep cavity milling
- Die block corner machining
- Low engagement shoulder milling



Challenges

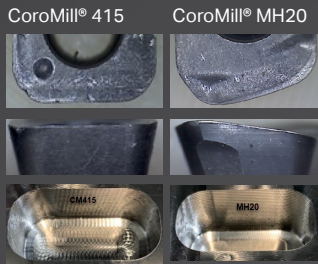
- High cutting forces
- Long overhang machining
- High metal removal rates
- Long contact time
- Higher hardness

CoroMill® MH20 solution

- M-M20 and M-M50 geometries are optimized for higher edge-line security in high-alloy ISO P applications.
- Use light cutting geometry M-M20 for trouble-free machining at long overhangs. The robust shank design ensures better stability and less deflection.
- Use strong M-M50 geometry for the highest metal removal rates in stable applications.
- Use grade GC4340 for high security in long-contact applications.
- Use M-M20 with GC1010 for high hardness in stable applications. Use M-M50 with GC1130 for high hardness in unstable set-ups.

Performance test, ISO S

Component: Aerospace wing support
 Material: S4.3.Z.AN (Ti6Al4V)
 Operation: Pocketing
 Machine: Okuma M560V-Genos, CAT40 BIG-PLUS®



	CoroMill® 415	CoroMill® MH20
Tool	415-016A12-05H, $z_n: 3$	MH20-AR016O16-06L, $z_n: 2$
Insert	415N-050212E-M30 S30T	M20-060320E-L30 S30T
Tool overhang, mm (inch)	40 (1.575)	40 (1.575)
v_c , m/min (ft/min)	69 (226)	69 (226)
n , rpm	1000	1000
f_z , mm (inch)	0.51 (0.020)	0.51 (0.020)
v_r , mm/min (in/min)	1530 (60.2)	1016 (40.0)
a_p / a_{e_r} , mm (inch)	0.8 / 16 (0.031 / 0.630)	0.8 / 15.8 (0.031 / 0.622)
Tool life, min	49	64.5

Result: With CoroMill® MH20, the customer improved tool life by 32% and achieved a much higher component surface quality. The insert corner of CoroMill® MH20 showed better edge-line security and less vibration tendency.

Performance test, ISO M

Component: Food processing machine component
 Material: M1.0.Z.AQ (AISI 304)
 Operation: Side and face milling
 Machine: DMG MORI NT4250, Coromant Capto® C6



	Competitor	Sandvik Coromant
Tool	DCX: 25 mm (1 inch), $z_n: 4$	MH20-025A25-06H, $z_n: 4$
Insert	-	MH20-06 03 20E-L30 1040
Tool overhang, mm (inch)	Chuck+70 (2.76) = 160 (6.30)	Chuck+90 (3.54) = 180 (7.09)
v_c , m/min (ft/min)	120 (394)	120 (394)
n , rpm	1530	1530
f_z , mm (inch)	0.85 (0.033)	0.85 (0.033)
v_r , mm/min (in/min)	5200 (205)	5200 (205)
a_p / a_{e_r} , mm (inch)	0.75 / 20 (0.030 / 0.787)	0.75 / 20 (0.030 / 0.787)
Tool life, min	3 components / 49.5 min	3 components / 49.5 min

Result: After machining three components, the competitor insert clearly showed notch wear and micro chipping. The CoroMill® MH20 insert had less wear proving a reliable cutting edge with a secure and better edge-line quality.

Performance test, ISO P

Component: Axis
 Material: P2.1.Z.AN (30CrMnSiNi2A), non-hardened
 Operation: Deep slotting and cut off
 Machine: Haitian HISION GLU16 VMC, BT50



	Competitor	Sandvik Coromant
Tool	DCX: 25 mm (1 inch), $z_n: 3$	MH20-R025A25-08M, $z_n: 3$
Insert	-	MH20-08 04 25M-M50 4340
Tool overhang, mm (inch)	Chuck+122 (4.80)	Chuck+110 (4.33)
v_c , m/min (ft/min)	142 (466)	142 (466)
n , rpm	1800	1800
f_z , mm (inch)	0.426 (0.017)	0.481 (0.019)
v_r , mm/min (in/min)	2300 (90.6)	2600 (102)
a_p / a_{e_r} , mm (inch)	0.5 / 25 (0.020 / 0.984)	0.5 / 25 (0.020 / 0.984)
Tool life, min	1 component / 348 min	1 component / 308 min

Result: CoroMill® MH20 could increase productivity by 22% and showed less wear than the competitor, proving a secure and reliable performance.

Sustainability with CoroMill® MH20

New cutter body material increasing the strength, and inserts with high edge-line security, assure a longer tool life and reliable machining with less scrap. In addition, with less vibrations and a more reliable concept design, the risk of tool breakage is reduced, making the operator's and workplace environment safer.

With a better surface finish achieved, the need for a semi-finishing tool is greatly reduced. This also means fewer tools in use, fewer stoppages and a quicker machining process with less inventory.

Not least, this light-cutting concept uses less machine power, resulting in reduced energy consumption and reduced noise level.



For more information and assortment, contact your local Sandvik Coromant representative or visit www.sandvik.coromant.com/coromillmh20

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CoroMill® Plura HFS ISO S 5×Dc

Optimized solid carbide end mill for titanium pocketing

Optimized milling solution for titanium pockets

CoroMill® Plura HFS 5×D is a new solid carbide end mill dedicated for titanium pocketing that is available with tool length up to 5 times diameter.

Equipped with the innovative 'Form control' design, the end mill is ideal for machining high, thin walls in a stable manner without bending while yielding excellent surface finish.



Innovative features


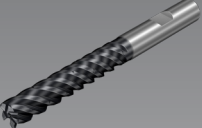

- Innovative patented geometry with helix angle dependent on the cutting depth
- Conical core for increased tool stiffness
- Corner radius specifically treated for Ti machining
- Uneven tooth pitch for reaching high speeds (up 230 m/min)
- Equipped with 1745 grade that is optimized for roughing Ti-based alloys
- Axial hole coolant and chip-breaker for safe chip evacuation

Why choose Coromill® Plura HFS 5×D?

- With length up to 5×D, this end mill allows you to machine pockets in a single high feed side milling step, avoiding mismatch, saving time and increasing productivity
- 'Form Control' design ensures reduced bending, maximum stability and excellent surface finish resulting in improved machining security and tool life
- With a single solid end mill suited for both roughing and finishing applications, you can reduce inventory



Choose the right end mill for your Ti machining in High Feed Side Milling

End mill	Cutting depth	Application
 <p>CoroMill® Plura HFS ISO S</p>	Up to 2×Dc	First choice for maximizing productivity
 <p>CoroMill® Plura HFS 5xDc ISO S</p>	Up to 5×Dc	Suitable for thin and high walls such as in pockets
 <p>CoroMill® 316 for ISO S</p>	Up to 1.5×Dc	Suitable for high overhangs thanks to EH Coromant coupling system

The Standard offer

Family	Dc range	Re/CHW	Shank	No. of flutes	Internal Coolant	Grade
2F380-ASD	2–20 mm	0.5–6.35 mm	Weldon	5	Axial	1745
2F380-ASD (inch)	0.25–1 inch	0.03–0.12 inch	Weldon	5	Axial	1745

Standard Assortment and Tailor Made are made the same

Thanks to Design Automation, using 3D model automatic generation, Standard and Tailor Made, are now following the same process for design and manufacturing.



Tailor Made offer means:

- No engineering time
- Instantaneous turnaround of design and quotation
- Reconditioning quote included
- Same Sandvik Coromant quality
- Delivery guaranteed from 3 to 5 weeks

Performance

+110%
MRR

+233%
Tool life

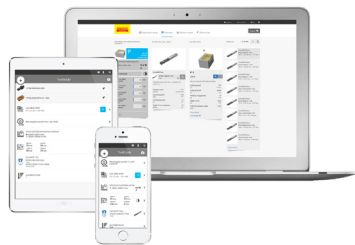
Component: Aerospace component - Housing
Material: Ti6Al4V
Operation: Side and face milling
Machine: BT50

	Competitor	Sandvik Coromant
Tool	Special cutter	2F380-1200-250ASD 1745
Z_n	4	5
n , rpm	1061	1061
v_c , m/min	40	40
v_f , mm/min	106.1	122
f_z , mm/z	0.025	0.023
a_p , mm	10	60
a_e , mm	0.16	0.16
MRR, cm³/min	1.8	3.8
Tool life, pcs	3	10

For more information, contact your local Sandvik Coromant representative or visit www.sandvik.coromant.com

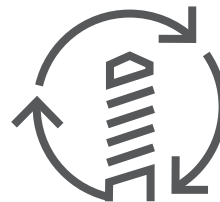
Valuable services

CoroPlus® ToolGuide



Find the right cutting conditions for your application.

Reconditioning



Reconditioning service is available.

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