



Automotive solutions

Aluminium machining

Safety first

At Sandvik Coromant safety is our top priority



Emergency Exit



Assembly Point



Emergency Number



Protective Equipment

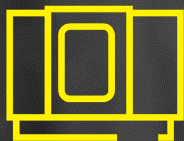


First Aid Kit



Alarm

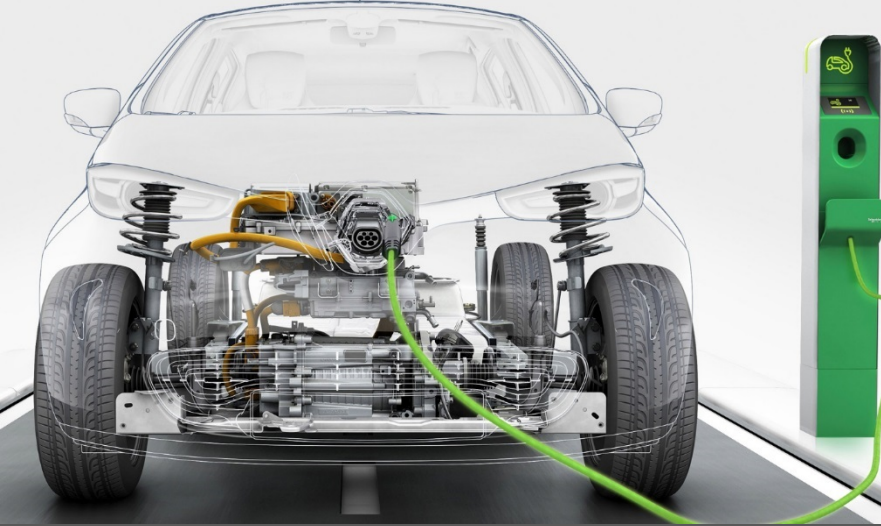
Automotive engine – into the future



- Call for substantial CO₂ reductions
 - Reduced weight on engine, transmission components and suspension parts
 - Hybrids – smaller internal combustion engines (ICE) but also additional electrified driveline components
 - Fully electric powertrains (BEV)
- Aluminium is replacing cast iron in passenger cars and light vehicles



- High metal removal
 - For most metals, fast spindle speeds are combined with a small depth of cut. For aluminium, high speed machining do not require reduced depth of cut
 - Vibration is often a challenge, as well as scratches, burrs or chipping



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The trend: e-mobility

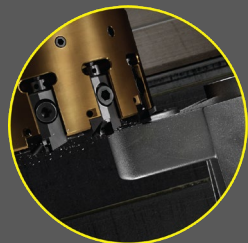
Electro mobility (e-mobility) is a general term for the development of electric-powered drivetrains designed to shift vehicle design away from the use of fossil fuels and carbon gas emissions. Definition from Techopedia

As a consequence, the number of lighter aluminium components is increasing on every vehicle. Traditional internal combustion engines are however forecasted to dominate until 2030.

A complete offer for automotive aluminium machining



M5Q90



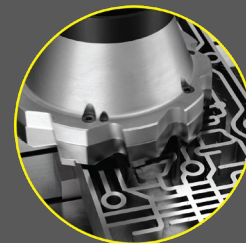
M5R90



M5C90



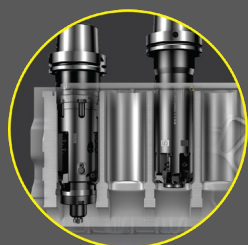
M5F90



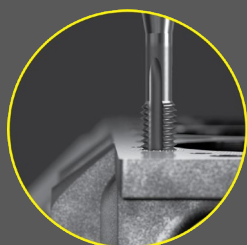
M5B90



CoroMill® Century



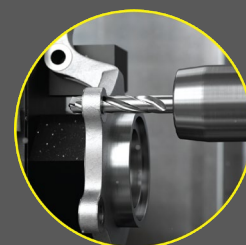
B685/ B687



CoroTap®



M610



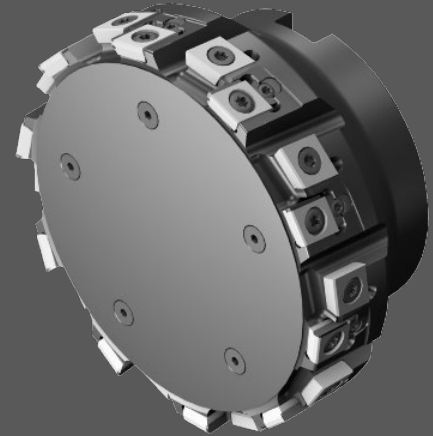
CoroDrill®

M5Q90

Developed for first stage roughing operations

M5Q90 is a roughing tangential milling cutter, designed to clean the surfaces in the first machining stage on newly casted aluminium parts in a single operation without burring.

PCD tangential inserts provide a smooth cutting action, which lowers power consumption and eliminates vibration. This ensures a reliable performance, improved tool life and increased number of components machined per insert.



M5R90

Face and shoulder milling concept

M5R90 is a first choice solution for roughing to semi-finishing in shoulder milling operations of automotive aluminium components, such as cylinder blocks, cylinder heads and transmission housings.

The cutter works with adjustable cartridges. For high demands in surface finishing or waviness, choose the M5B90 concept.

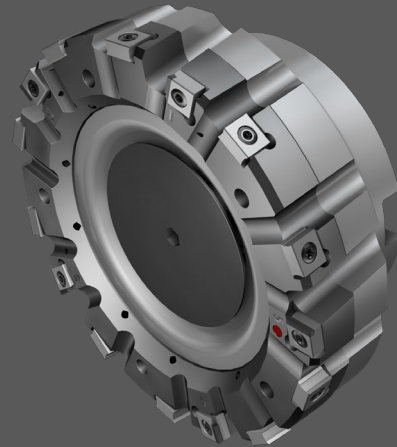


M5C90

Concept for high speed direct finishing

M5C90 is a face milling concept for high speed direct finishing of aluminium automotive parts with wide cutter engagement (not applicable for thin walls). It can replace the need for both roughing and finishing, thus only one operation is needed.

M5C90 is an engineered solution with no need for insert adjustment, making milling of aluminium parts fast and easy. M5C90 works with a reduced number of teeth compared to conventional cutters, thanks to the unique radial and axial positioning of the inserts. This positioning ensures burr-free milling and outstanding surface finish without scratches and breakages, while maintaining exceptional tool life.



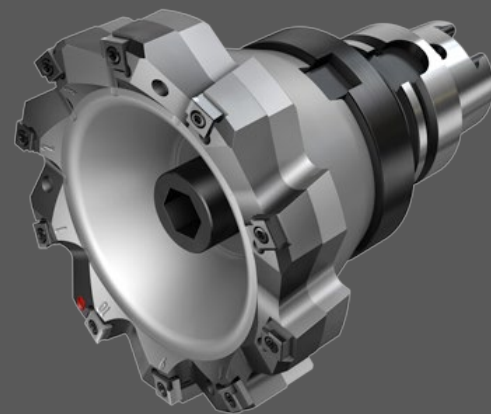
M5B90

Surface quality in face milling operations

M5B90 is an engineered face milling cutter that offers outstanding surface quality, minimized cycle times, close component tolerances and high-volume production.

No adjustment of inserts is necessary, enabling substantially reduced set-up times and high feed machining, resulting in a reduction in cost per part.

The unique axial and radial positioning of inserts allows M5B90 to operate with a reduced number of teeth compared with conventional cutters. This, together with the wiper insert, ensures burr-free cutting and an outstanding surface finish.

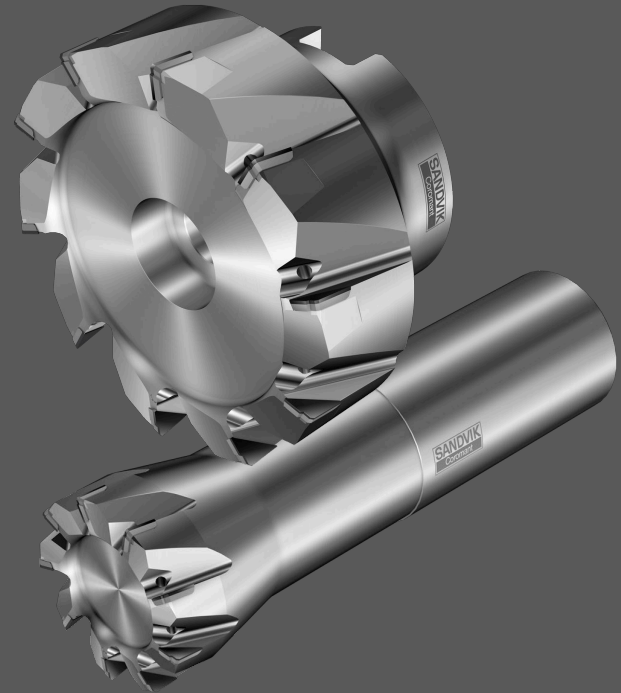


M5F90

One-shot roughing and finishing

Machining parts without burring, scratching or chipping, M5F90 is a concept face-milling cutter that enables roughing and finishing in a single operation.

Dedicated to thin wall aluminium parts and one-shot machining, this cutter body is designed for brazed PCD tips with no need for adjustment. It allows for high feed rates without cutting vibration. The M5F90 cutter is patent pending.



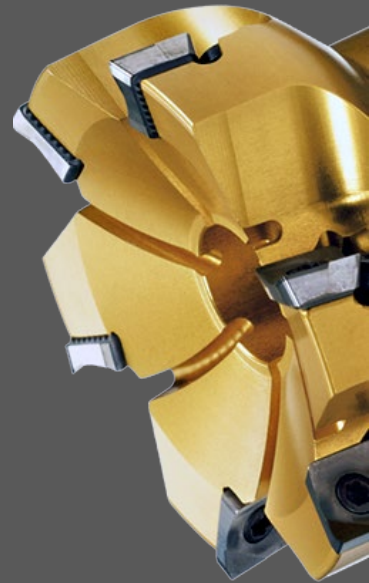
CoroMill® Century

High speed face and square milling

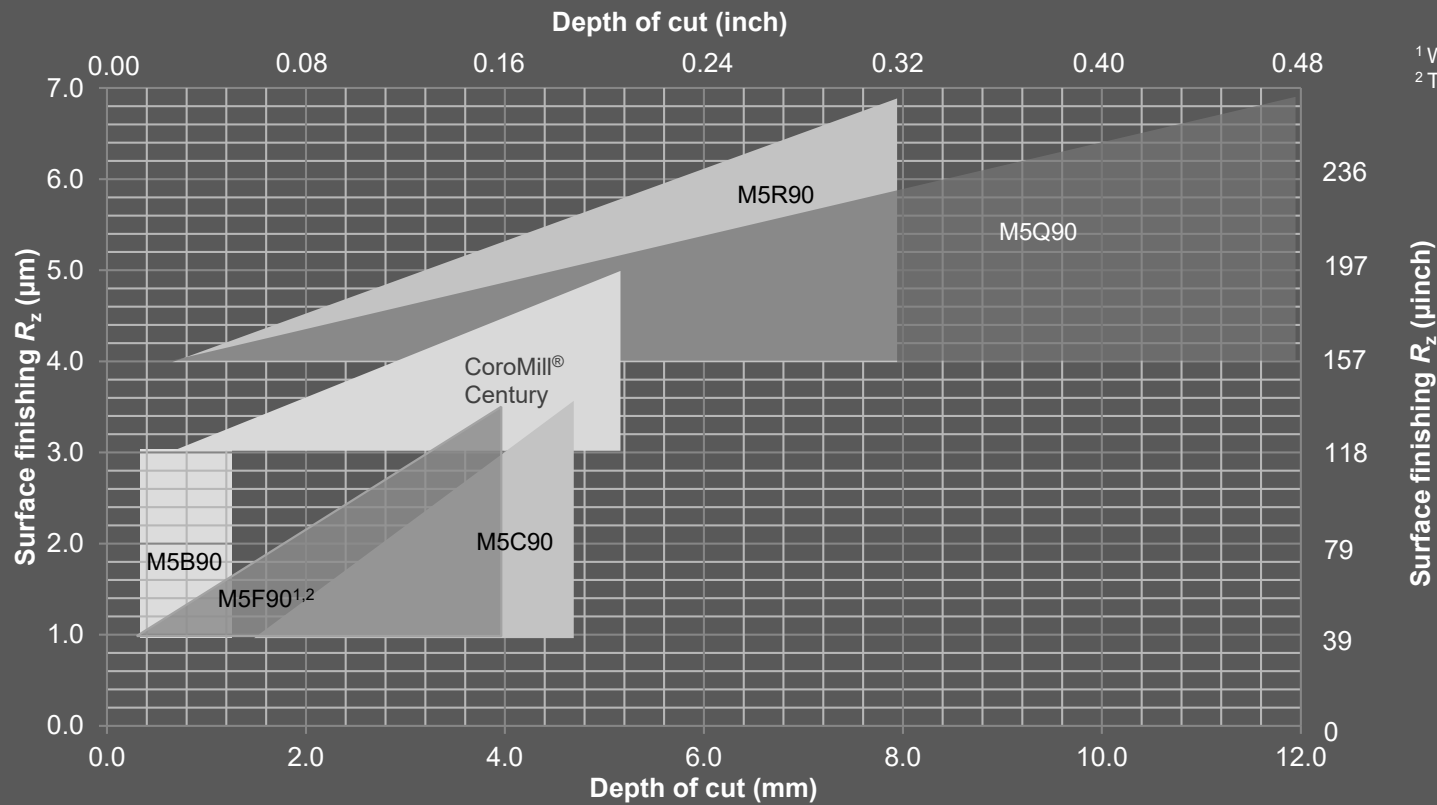
CoroMill® Century is a face mill concept with aluminium or steel body for high speed machining. The tool is designed with serrated insert interface for safe performance and reduced run-out.

The axial position of the inserts can easily be set to micro-precision.

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Working range in PCD cutting materials



¹Wide and low engagement material

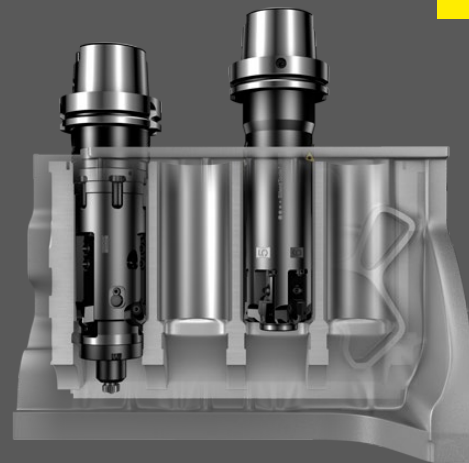
²Thin wall applications only

B685/ B687

Cylinder boring

High speed cylinder boring requires tools that can achieve tight tolerances. Until now, manual insert position adjustments have been time-consuming and has often required special devices. The B685 and B687 concepts offer easy set-up and produce excellent roundness and cylindricity.

Traditional manufacturing with the B681 cutter for roughing, B683 for semi-finishing and B687 for finishing is another option.



- B685 with an integrated Silent Tools™ function combines roughing and semi-finishing into one operation
- B687 is an adjustable finishing tool designed with a patented speed control unit

CoroTap[®]



Tapping of through and blind holes

Tap concepts designed for through and blind holes, and for form tapping are available off the shelf.

CoroTap[®] 100, straight flute

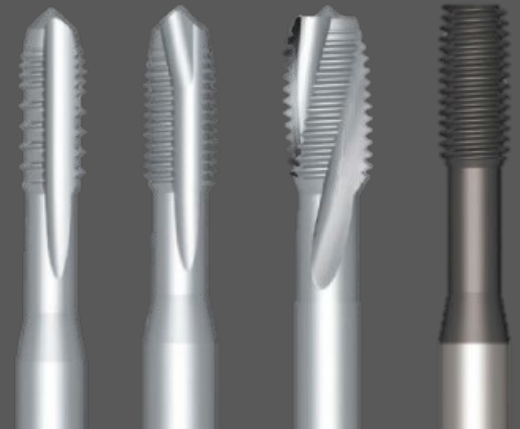
- Designed with interrupted threads for less torque and increased coolant penetration

CoroTap[®] 200, spiral point

CoroTap[®] 300, spiral flute

- High helix (35°) for sticky, low Si materials, uncoated
- Low helix (15°) for abrasive, high Si materials, coated and uncoated

CoroTap[®] 400, forming tap



CoroDrill[®] 400 and CoroDrill[®] 430

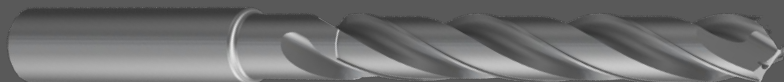
Complex multi-step form drills



CoroDrill[®] 400 with solid carbide grade



CoroDrill[®] 400 with PCD grade



CoroDrill[®] 430 with solid carbide grade

- Straight flute and three-flute geometries
- Optimized features, including polished flutes and precision coolant holes
- Minimum quantity lubrication (MQL) supported
- Available for multi-stepped holes

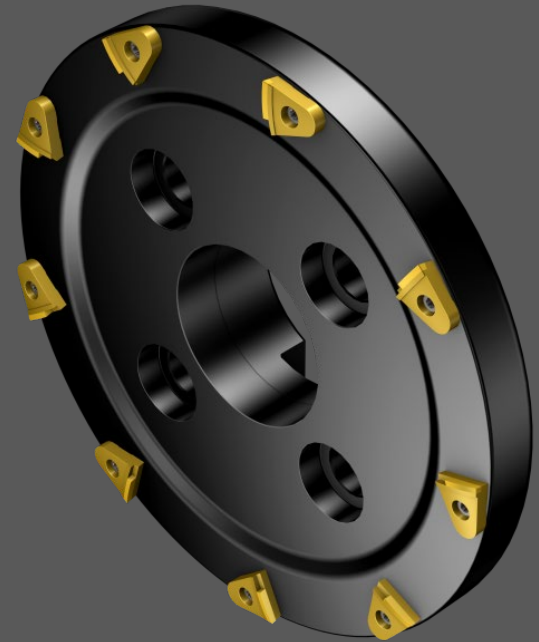
M610

Milling cutter for finishing bi-metal materials

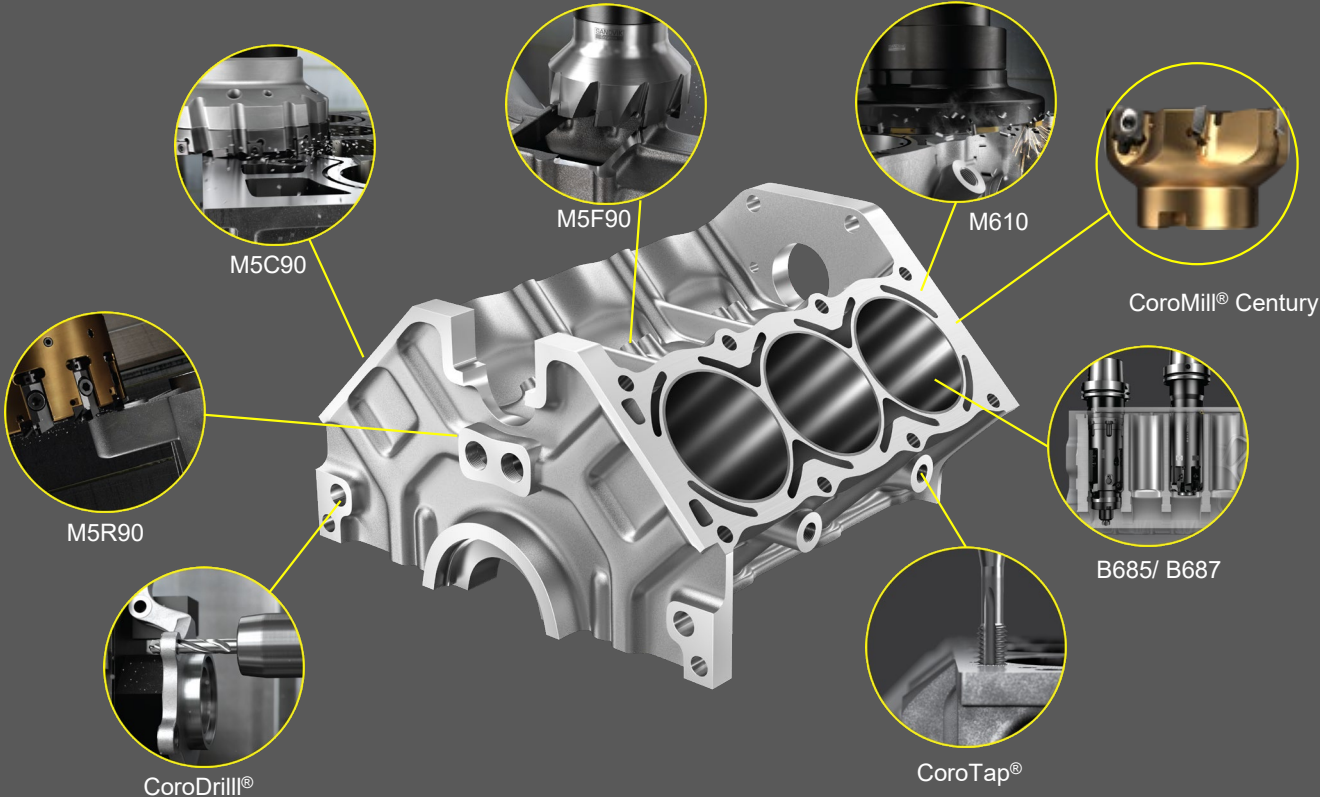
A range of thermal and mechanical properties makes milling bi-metal materials challenging.

Current bi-metal milling cutters are complex and require adjusting, resulting in low feed rates. In addition, these cutters often cause chipping on the grey cast iron (GCI) parts of products.

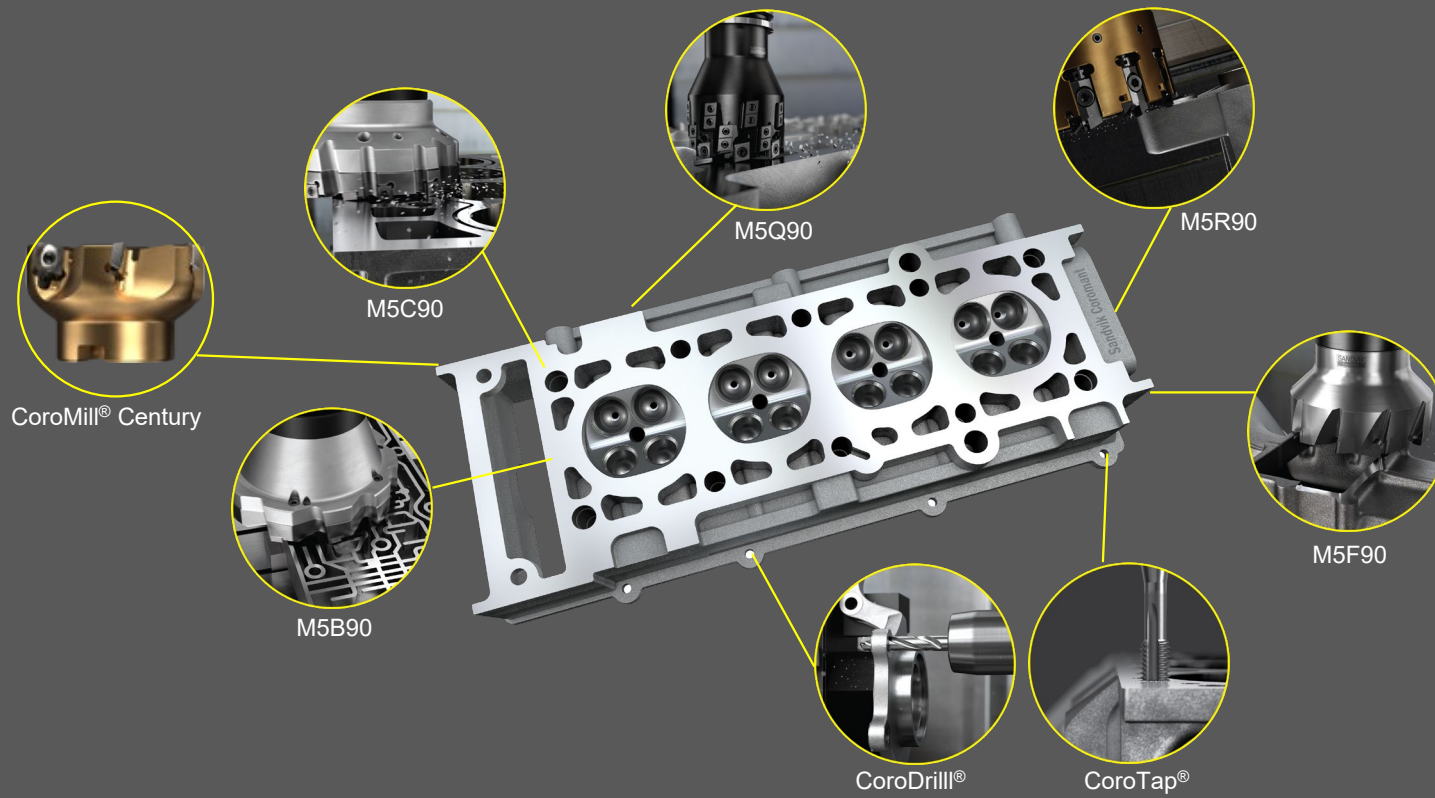
M610 is a stand-alone milling cutter for finishing milling of bi-metal materials such as aluminium and GCI. It requires no set-up and no adjustment, and results in high feed rates with no chipping, burring or scratching on the parts.




Component solution for aluminium cylinder blocks



Component solution for aluminium cylinder heads



A grayscale photograph of two men in an industrial setting. Both are wearing white hard hats and safety glasses. The man on the left is wearing a dark vest over a light-colored sweater. The man on the right is wearing a light-colored lab coat. They are both looking down at a circular metal component that the man on the left is holding. The man on the right is holding a small electronic device, possibly a handheld scanner or data logger. The background shows industrial machinery and structures.

A fast track
to bi-metal face milling

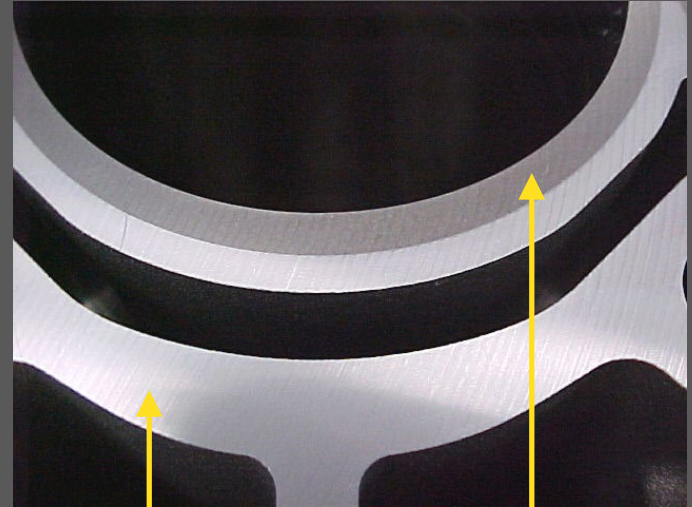
CoroMill® Century

Bi-metal machining process

Many modern engines use cylinder blocks that consist of grey cast iron liners casted together with aluminum.

This makes machining engine-block deck-faces a considerable challenge.

Sandvik Coromant has developed a process in which bi-metal cylinder blocks can be machined without burring, chipping or scratching using CoroMill® Century.



Scratches on the deck face



Flaking on the liner

CoroMill® Century

Bi-metal machining process



Highly flexible machining method for aluminium blocks and cast-iron liners in standard machining centres.

- Reliability and surface quality according to component specifications
- Depending on the application and the part specifications, the process can be done in one or two machining steps
- Smallest cutter diameter always in correlation with the cylinder liner outer and inner diameter
- MQL application is required



CoroMill® Century

