

Automotive solutions for ISO K

When machining in ISO K materials, you need tough tools that can withstand high abrasive wear and chattering, and deliver secure and precise machining again and again. This is a particularly great challenge in the automotive industry, with its large production volumes and high degree of optimization and automation.

Sandvik Coromant automotive solutions for ISO K have been developed not only to do the job, but to do it with high productivity and security to deliver lower costs per component.

CoroMill® 745

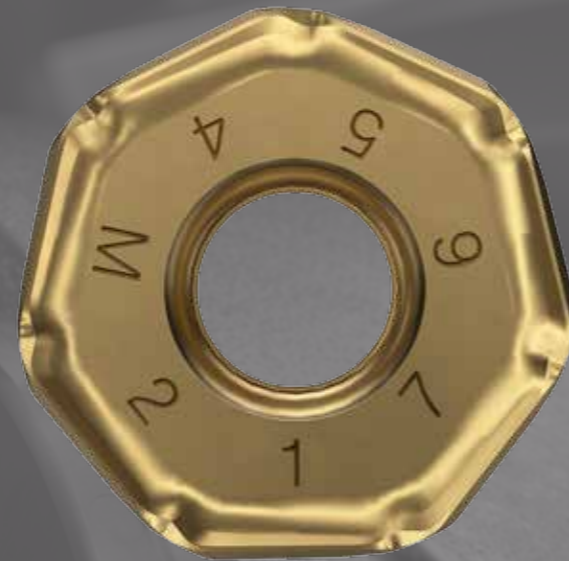
Innovative design for best production economy

People in the metal cutting industry are often intrigued when they see CoroMill® 745 for the first time. With its unconventional insert angles, it does not really look like any other milling cutter, with its unconventional insert angles.

Thanks to the innovative design, the CoroMill® 745 can achieve the same performance as a positive, single-sided cutter, but in a negative, double-sided tool with 14 edges.

Secure insert mounting

The heptagonal insert design and the position in the tip seat keep the inserts in the pocket when mounting them.



The large insert screws also prevents problems assembling or disassembling the inserts.

Low vibration and light-cutting action

Low vibration means low noise levels and high security.

The light-cutting action makes CoroMill® 745 very suitable for mass production, since it minimizes machine maintenance and provide low power consumption.

This will lead to substantial savings in time and money.



Application

- Operations with a maximum depth of cut of 5.2 mm (0.205 inch) using only one edge, meaning that all 14 edges can really be fully used
- Face milling in steel and cast iron
- Roughing to semi-finishing
- Multi-edge concept suitable for large batch productions, flexible transfer lines and when maximum tool utilization is important

Benefits

- High productivity – full usability of 14 edges
- Low vibrations
- Excellent chip formation
- Easy insert handling
- Low cost per component



The differential MD pitch provides great problem-solving abilities when machining vibration-sensitive components and in weak set-ups. This will lead to substantial savings in time and money.

Customer case

Targeted tool life is 110 pieces per edge. With the first cutting edge, CoroMill 745 achieved 113 pieces. The reference cutter from a competitor brand has an inconstant tool life with an average of 90 pieces per edge.

Apart from tool life, the lower power consumption and the smooth sound were also positive aspects in favour of CoroMill 745.

Operation	Rough face milling, dry machining	
Component	Engine block	
Workpiece material	GCI GG26 Cr, CMC 08.2 (K2.1.C.UT) 240 HB	
Tool	745-160Q40-21H	
Insert	745R-2109E-M50 K20D	
Tool	CoroMill® 745	Competitor tool
Z_n	17	20
v_c m/min (ft/min)	267 (500)	267 (500)
v_f mm/min (in/min)	3200 (126)	3200 (126)
f_z mm/z (in/z)	0.38 (0.015)	0.32 (0.013)
a_d mm (inch)	5 (0.197)	5 (0.197)
f_e mm (inch)	120 (4.72) max	120 (4.72) max
Result		
Tool life (pcs/edge)	113	90
Tool life (min)	171	136
Worn out	Yes	Yes
Tool life increase	25%	

+25%
Increased tool life

CoroDrill® 400, 430 and 460

New grades in customized solutions

The new straight-flute CoroDrill® 400 and 3-flute CoroDrill® 430 support complex, multi-step applications and can be designed to your precise component requirements. Optimized features, high productivity and long tool life provide you a low cost per hole. Combined with Sandvik Coromant's existing 2-flute CoroDrill® 460, they make a strong and diverse product range for short hole drilling in ISO-K materials.

- Complex multi-step form drills with a diameter range of 3–25 mm, up to 8×Ø
- Minimum quantity lubrication (MQL) supported
- Optimized features, including edge preparation and flute polishing



Application

Short hole drilling operations in cast iron cylinder block and cylinder head components.

Benefits

- High reliability and process security
- Exceptional and consistent tool life
- Outstanding productivity, low cost per hole
- Flexible tool solutions
- Reconditioning
- Fast quotations
- Fast and secure delivery

CoroDrill® 400, CoroDrill® 430 and CoroDrill® 460 are customized solutions, available as Tailor Made.

Advanced Engineered Solutions available on request.

CoroTap® 100-KM

For productive and trouble-free threading in all ISO K materials

Dedicated straight-flute tap for all ISO K materials, designed for maximized productivity. By increasing the number of flutes to five, the force on each cutting edge is reduced. The flute shape helps to produce thin and small chips to minimize problems.

The new grade D210 reduces friction and gives excellent wear resistance in dry and wet machining, including minimum quantity lubrication (MQL).

Improved geometry and cutting edge technology

A back chamfer has been added to let the tap thread deeper, and use of a new grade offering improved hardness makes the tap more wear-resistant. Finally, thread and chamfer relief is optimized to reduce the contact between the tap and the workpiece material.

Application

- Threading in GCI, NCI, CGI, and ADI
- Threading in cast Al-Si alloys and soft steel 150–190 HB as chip solver in blind holes with axial coolant
- Threading in both blind holes and through holes
- M3–M24, 1/4–7/8
- Great performance with emulsion, MQL, and also in dry machining
- Suitable for all automotive components where tapping in cast iron is needed

Benefits

- Provides reliable and predictable tool life
- Enables high cutting speed for increased productivity
- Offers secure and cost-efficient production of threads in all cast iron materials
- Suitable for horizontal and vertical applications

Customer case

When tested against a competitor product, CoroTap® 100-KM showed outstanding machining results, a secure process and 91% longer tool life.

91%
Increase in tool life

Workpiece material	Compact graphite iron, K4.1.C.UT	
Coolant	External, emulsion, 8%	
Holder	CoroChuck® 970	
Tool	CoroTap® 100 M6	Competitor M6
Drill dimension, mm (inch)	5.1 (0.200)	
Drill depth, mm (inch)	40 (1.574)	
Thread depth, mm (inch)	18 (0.708)	
Cutting data		
v_c m/min (ft/min)	15 (49)	
Result		
Tool life/No of holes	13780	7200



CoroMill® 425

Quick and easy setup

CoroMill® 425 is a face milling cutter specifically designed for mass production finishing of cast iron in the automotive industry. The new, patented wiper insert adjustment system makes it possible to easily adjust and optimize according to specific needs. It can be adjusted up and down without loosening the cassette clamping screw.

- The working inserts have eight cutting edges: four horizontal, and four vertical. Wiper inserts have four cutting edges
- The same insert can be used as working or wiper insert
- A 25° entering angle and different optimized chamfers reduce frittering and burr formation



Application

- Face milling in cast iron
- Finishing operations
- Surface finish within the range Ra<1 micrometer and Ra<10 micrometer, WT<10 micrometer (at recommended cutting data), and Rmax <15 micrometer
- Materials: GCI, NCI, CGI
- Main components:
 - Engine blocks
 - Cylinder heads
 - Casings and housings

Benefits

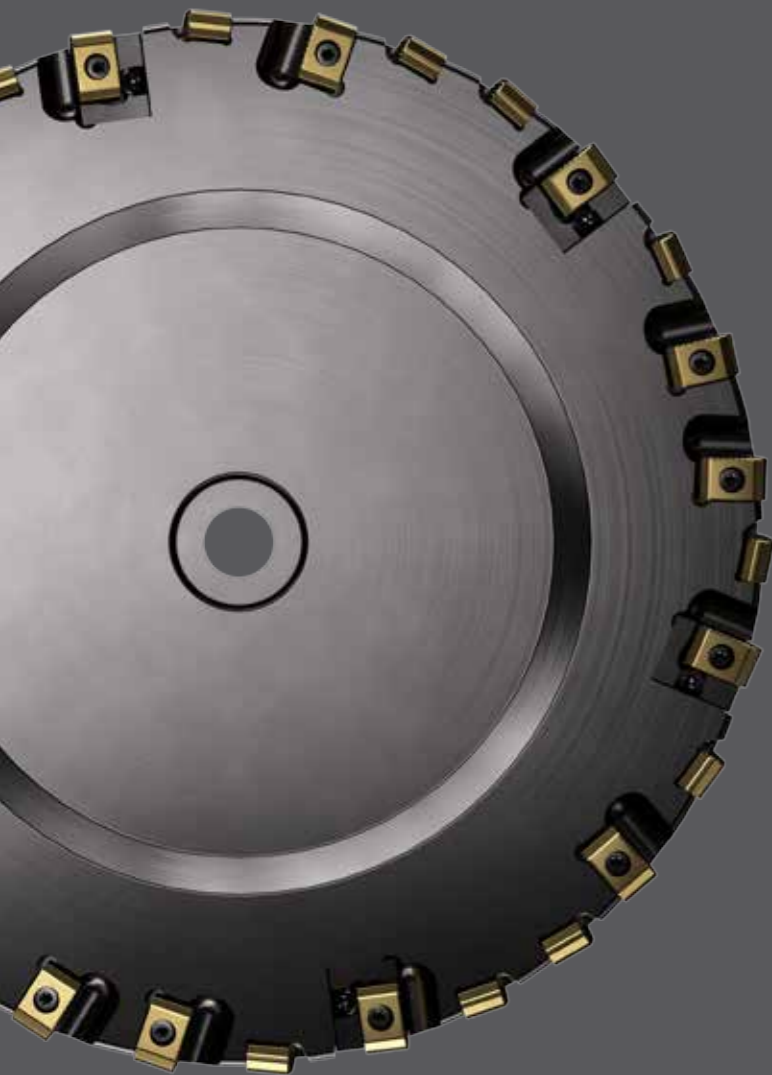
- Outstanding surface quality
- Minimized set-up time
- Extensive and accurate adjustment possibilities – easiest-to-use system on the market
- The same insert type can be used as working insert or wiper – reduces number of items in stock
- Reduced cost per part

Coupling

Arbor or CAP. Coromant Capto® and HSK are available as Tailor Made.

Grades

GC1010 (dry) and K20W (wet) for better tool life in CGI.



Customer case

Increased metal removal rate by doubling the feed and the tool life

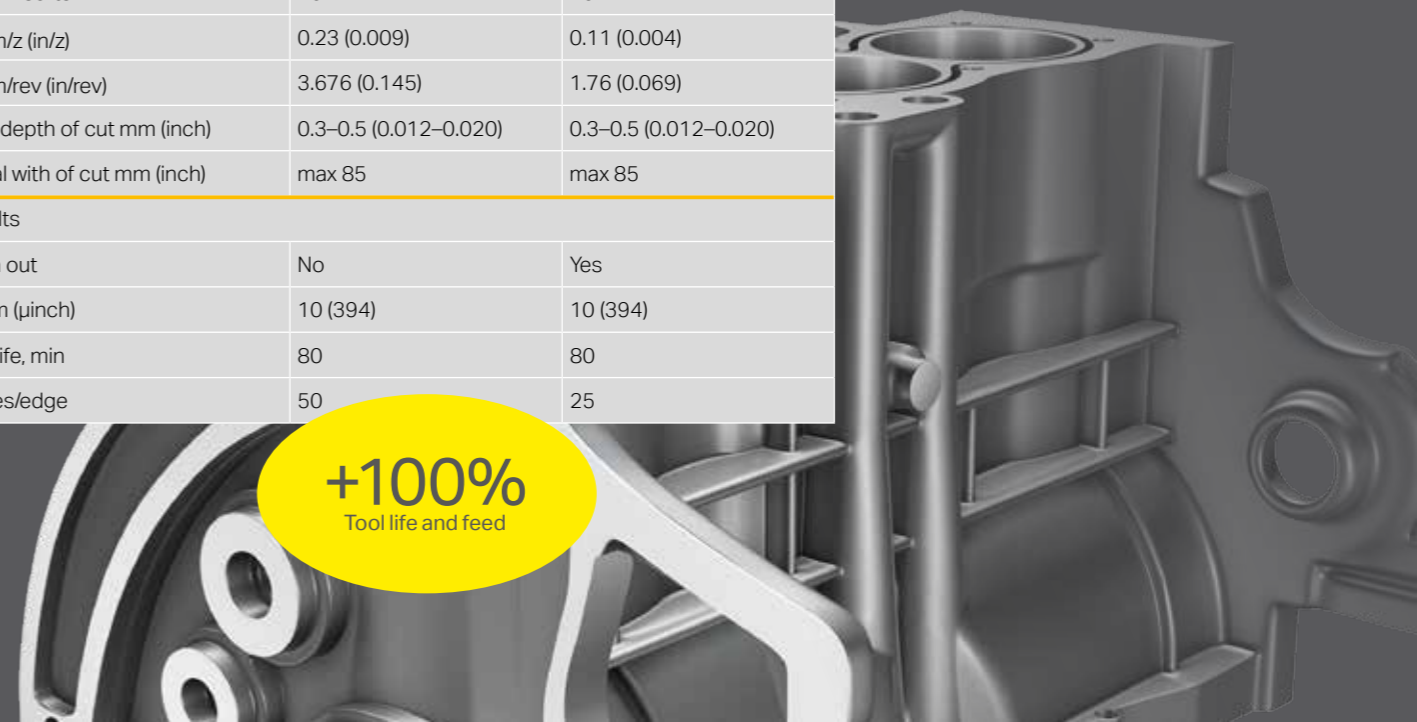
A customer in Germany producing axle housings machined dry with a competitor face milling cutter. The material was EN-GJS-600-3, GGG-60 (250 HB). We replaced the existing solution with a CoroMill® 425 and doubled the feed.

Result:

The surface finish was exactly the same for the two solutions, but with CoroMill® 425, we could double the tool feed and increase the tool life by 100%.

	CoroMill®425	Competitor
Cutting data		
v_c m/min (ft/min)	200 (656)	200 (656)
n rpm	510	500
v_f mm/min (in/min)	1875 (78.819)	900 (35.433)
No of inserts	16	16
f_z mm/z (in/z)	0.23 (0.009)	0.11 (0.004)
f_n mm/rev (in/rev)	3.676 (0.145)	1.76 (0.069)
Axial depth of cut mm (inch)	0.3–0.5 (0.012–0.020)	0.3–0.5 (0.012–0.020)
Radial width of cut mm (inch)	max 85	max 85
Results		
Worn out	No	Yes
Rz μ m (μ inch)	10 (394)	10 (394)
Tool life, min	80	80
Pieces/edge	50	25

+100%
Tool life and feed



Dedicated competences centres for the automotive industry, global support and development

In order to help our customers quickly and accurately, we have a global network of dedicated colleagues around the world. To further support your needs, we have a large number of engineering competence centres worldwide, for training, engineered customer solutions and customer support.

For specific customer demands, we can offer comprehensive process, design, product, and application engineering solutions.

- Component feature solutions
- Engineered solutions
- Best practice machining strategies
- R&D application support
- Time studies
- Part processing
- CAM program simulation
- Tool data information
- Customer project/MI support
- Industry specific technical expertise
- Component materials knowledge
- Training support

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