SANDVIK
Coromant

Turbo charger exhaust housing

Machining challenges

The material in the turbo exhaust housing must withstand temperatures ranging from 850°C to over 1300°C (1562°F–2372°F). Therefore, stainless steel and cast iron are commonly used.

Machining of abrasive material is often characterized by extremely short and irregular insert tool life as well as uneven wear. Due to these common challenges, meeting workpiece tolerance demands can be difficult and bring exceedingly high demands on the cutting tool performance.

Sandvik Coromant offers component solutions for machining of turbo exhaust housings, including both standard tools and engineered solutions as well as application knowledge for your specific needs. Two important aspects to help you on your way to successful machining are turning with high pressure coolant and the use of our new dedicated milling cutter.

Turning – the power of coolant

Increasing the coolant pressure has a positive effect on both chip breaking and tool life. CoroTurn® HP is designed with fixed nozzles to enable high precision of the coolant supply at the cutting edge of the insert – a direct route to excellent chip breaking, process security and high productivity.

Tool life comparison, finishing operation

Material: Austenitic stainless steel

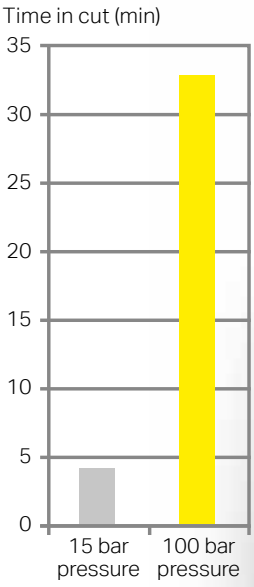
(CMC 20.11, M2.0.C.AQ)

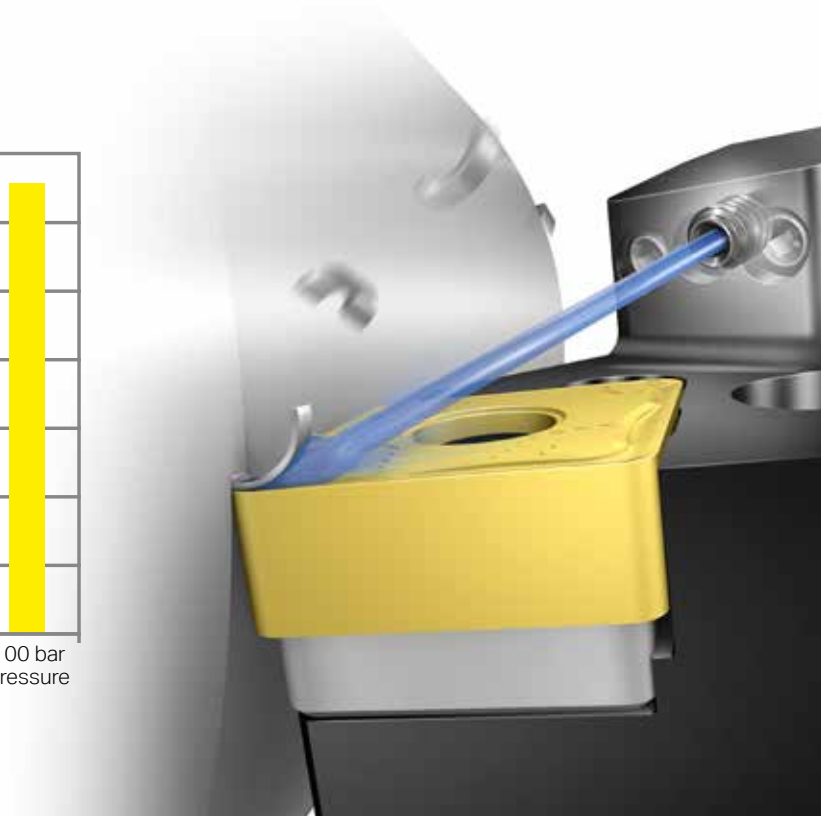
Insert: CNMG 120418

Grade: GC1010 SF

	15 bar	100 bar
Time in cut (min)	4.54	33
Wear (VB)	0.62	0.3

By applying a coolant pressure of 100 bar, tool life increased by seven times in the finishing operation.



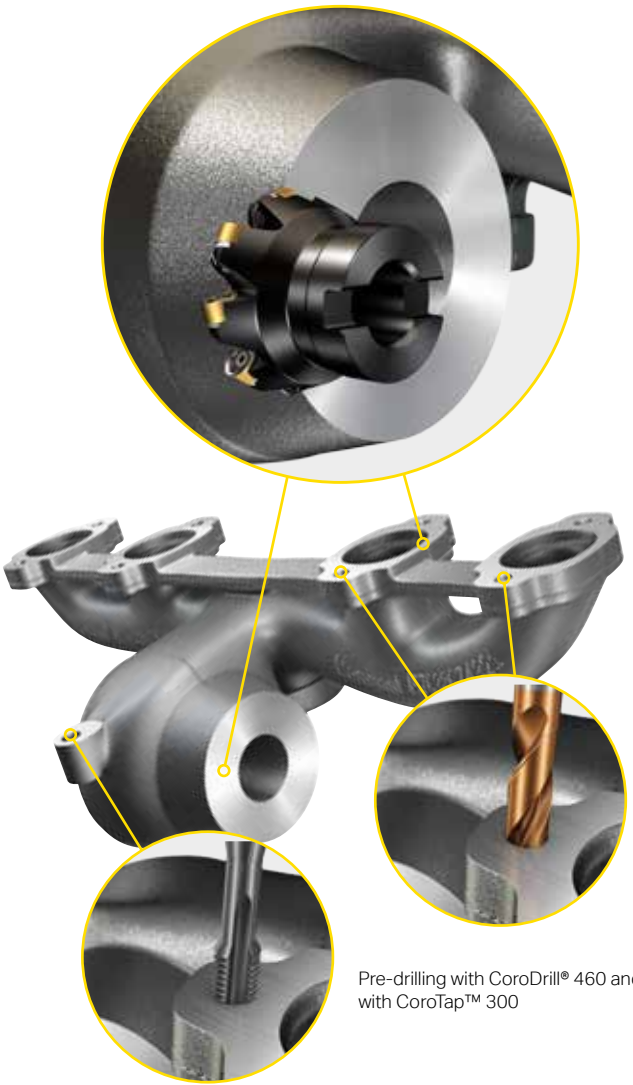


Developed for exhaust housings

The patented shim design prevents tip seat deformations due to tough cutting processes. This leads to high repeatability, high productivity and prolonged tool life.

The main challenge in roughing operations of the turbo exhaust housing is the extreme temperatures. Add to that the complex shape of the thin-walled component and the intricate clamping, making it a very vibration-prone operation.

The M612 face milling cutter is developed exclusively for machining of turbo exhaust housings in stainless steel. The positive geometry and the edge line quality ensure a reliable performance and an increased number of components per insert.



Pre-drilling with CoroDrill® 460 and tapping with CoroTap™ 300

Short facts M612 face milling cutter:

- Insert with 12 cutting edges
- Better stability and easier to index insert with new shim design
- Reduced wear on tip seat
- High metal removal rate
- Smooth cutting action lowers power consumption and eliminates vibration
- Coolant access through the cutter body
- Easy to clamp (screw clamping)
- Rotating prevention system
- Reduced cost per part
- High accuracy and repeatability

CoroMill 490 is one of our standard versatile solutions that works excellent for finishing applications.

Find out more

The M612 face milling cutter is one of our engineered products developed exclusively for turbo exhaust housings in stainless steel. Do not hesitate to contact us to further help develop your customized solution, or to know more about our wide range of standard options available.

For more information about automotive machining visit: www.sandvik.coromant.com/automotive

Customer case

Machining of turbo exhaust housing with M612 face milling cutter

27%
Reduced machining time

Component feature:	Turbo exhaust housing	
Material:	Stainless steel (CMC 20.11, M2.0.C.AQ)	
Operation	Rough face milling	
Grade:	GC4240	
Cutting data	**Sandvik Coromant**	**Competitor**
n rev/min	273	212
v_c m/min (ft/min)	90 (295)	70 (230)
f_z mm (inch)	0.18 (0.007)	0.13 (0.005)
a_p mm (inch)	2.5 (0.098)	2.5 (0.098)
Tool life (number of components)	22	18
Tool life, m (ft)	7.13 (23.4)	5.83 (19.1)
Machining time per component (sec)	40.8	55.8
Result:	By using the M612 face milling cutter, machining time per component was reduced with **27%**. Tool life, m (ft) increased by as much as **22%**.	

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