

# Automotive transmission

Metal cutting solutions



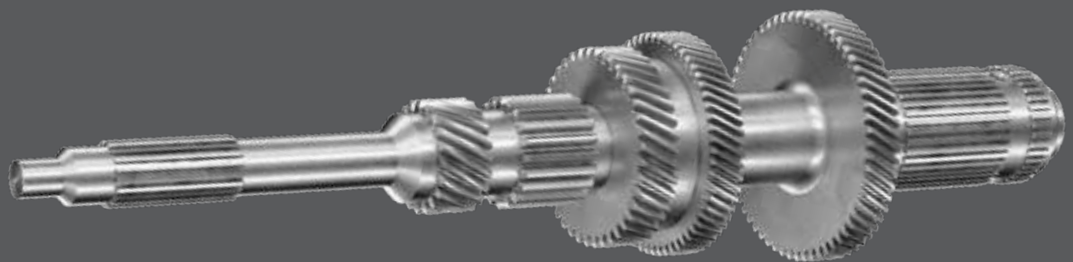
# The future of automotive transmission

The energy and climate challenge call for lighter and more energy efficient engines with lower material consumption, less scrap and a minimum of carbon dioxide emissions.

While electric cars, especially hybrids, are continuously increasing in number, all kinds of vehicles will however contain gear boxes for an indefinite future. They will just be more ingenious, all the way from design and production planning, to manufacturing and performance.

With 75 years of close partnership with automotive manufacturers around the world, Sandvik Coromant has developed solutions together with the industry. We know the challenges and work closely with machine tool builders, manufacturers and universities around the world to provide tools and in-depth application know-how for most components in all sizes of automotive vehicles - from motorcycles to heavy trucks.

## Turning



### CoroTurn® Prime and PrimeTurning™ - the biggest innovation in turning, since turning

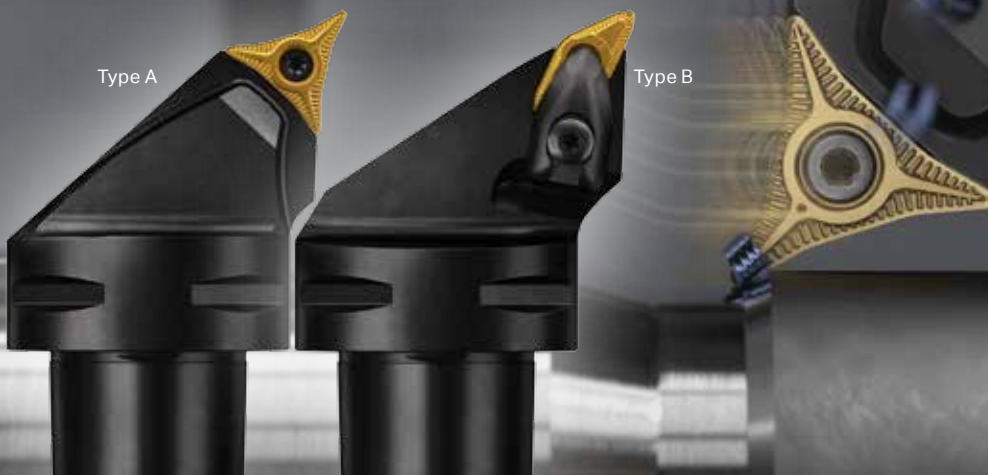
What if you could turn backwards... with a small lead angle between the cutting edge and the feed direction, allowing for massively increased feed rates and yield. Now, you can.

CoroTurn® Prime promises productivity improvements of more than 50 percent, better machine utilization and substantially longer tool life.

- **PrimeTurning™** new methodology enabling turning in all directions in much more efficient and productive way compared to conventional turning
- **CoroTurn® Prime** consists of two innovative turning tools for PrimeTurning™ to get highest metal removal rates and extraordinary productivity
- **PrimeTurning™** code generator supplies programming codes and techniques to set up the proper parameters and variables

Type A

Type B



# Outstanding surface finish

## Eight-edged smartness

CoroTurn® 300 offers effective and high-quality turning for medium to finishing operations in turning centres and multi-task machines.

Eight effective edges with excellent heat transfer provides predictable performance and wear.



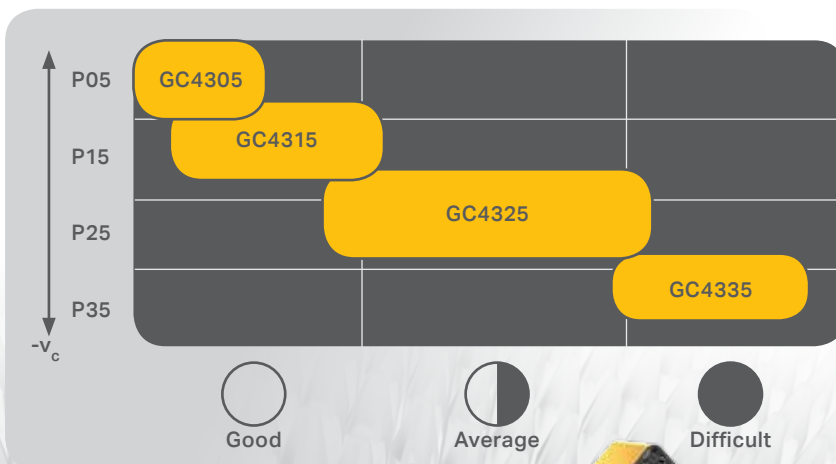
**Inveio™**

Uni-directional crystal orientation

Inveio™ is a true technical breakthrough providing turning predictability and long tool life, along with high strength and excellent wear resistance. With GC4335 in place, there is now a complete grade chain available, off the shelf, for productive transmission manufacturing.



CoroTurn 300 features precision coolant from above for chip breaking and surface quality, and under-coolant for temperature control and long, predictable tool life.



# Milling of gears and splines

## Quick and easy milling of splines

The CoroMill® 171.4 cutter for small modules is easily applied in machining centres, multi-task machines and turning centres, making it possible to machine complete components in one set-up.

CoroMill® 172 is another productive disc cutter that allows for machining the whole component in flexible non-dedicated machines, such as multi-task machines and machining centres, as well as in hobbing machines.

- Use CoroMill® 171.4 for module range 0.8–4
- ...and CoroMill® 172 for module range 3–10

## InvoMilling™ for productive small batch machining

InvoMilling™ is ideal when machining small batches and when short lead time is the priority. The concept includes both cutting tools and a CNC program generator based on InvoMilling algorithms.

### Benefits:

- User friendly combination of tool and software
- Flexible gear machining in one setup from the blank to the finished gear
- Gear cutting with standard tools – fast delivery
- Reduced lead times



InvoMilling is an excellent choice if you want to use one tool set for several gear profiles.



## Power skiving for flexible productivity

Power skiving is a continuous cutting process, much faster than shaping and more flexible than broaching and hobbing. This method allows for machining close to shoulders, which provides greater freedom to design the components.

Power skiving is used for productive mass-production of gear teeth and splines. With power skiving, the complete component can be machined in universal 5-axis machines in one single set-up.

## Power skiving benefits

- High productivity and flexibility
- Considerably reduced cycle time compared to conventional machining methods, such as broaching, shaping and hobbing
- Machine the complete component in a universal 5-axis machine in one set-up
- Predictable machining process
- Efficient also in dry conditions



CoroMill® 178



CoroMill® 178



CoroMill® 179



CoroMill® 180

# Hard part turning

## Productivity by feed with new geometries for CoroCut® 1-2 inserts

At last, the demand for high dimensional accuracy and surface quality is now compatible with high feed rates.

- Low entering-angle approach with optimized wiper for high-feed hard part turning and long tool life
- Operates at higher feed rates than normal wiper geometries and still achieves closer surface finish tolerances
- Economical and flexible – can be used in traditional lathes with standard tool holders

New CoroCut® 1-2 insert –XB geometry allows for very high feed rates of both longitudinal turning and facing without compromising on surface- and dimensional tolerance requirements.



## Productivity by speed with new CBN insert grades

Insert grades CB7105 and CB7115 are designed for high cutting speeds in case- and induction hardened materials. Select a one or two cut strategy depending on surface finish requirements. The grades are TiN-coated for better wear detection and surface quality and provide long and stable tool life.

- CB7105 for continuous cuts
- CB7115 for slightly interruptive cuts



## Geometry selection for best productivity

The constant struggle for increased productivity, balanced with a stable and predictable performance continuously drives the Sandvik Coromant R&D team to challenge status quo.

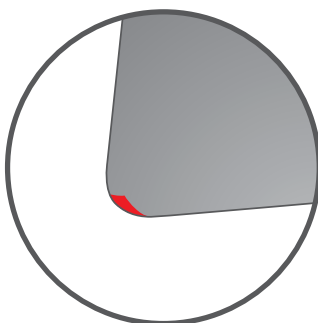


Depending on machine and set-up stability, a selection of three levels of productivity are available:

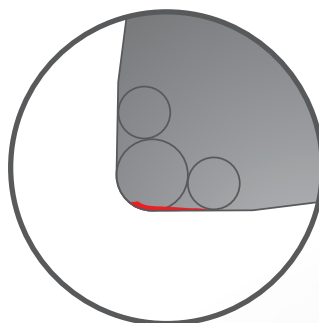
- Standard radius for maximum versatility
- Wiper geometry for improved surface finish or higher feed in most conditions
- Xcel geometry for high productivity at stable conditions
- CoroCut® 1-2 insert –XB for tightest surface finish tolerances and highest productivity at stable conditions

## Select the geometry that suits your operation

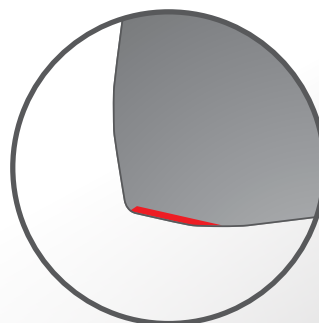
The hard part turning concepts from Sandvik Coromant are available in different versions. Select the best alternative depending on your specific situation.



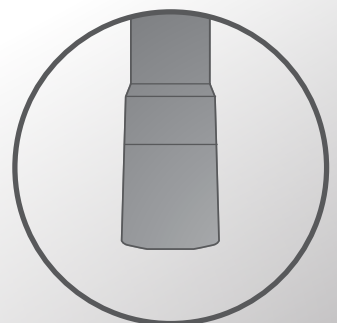
Standard radius  
for maximum versatility.



Wiper  
for improved surface finish or  
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Xcel  
for high productivity at  
stable conditions.



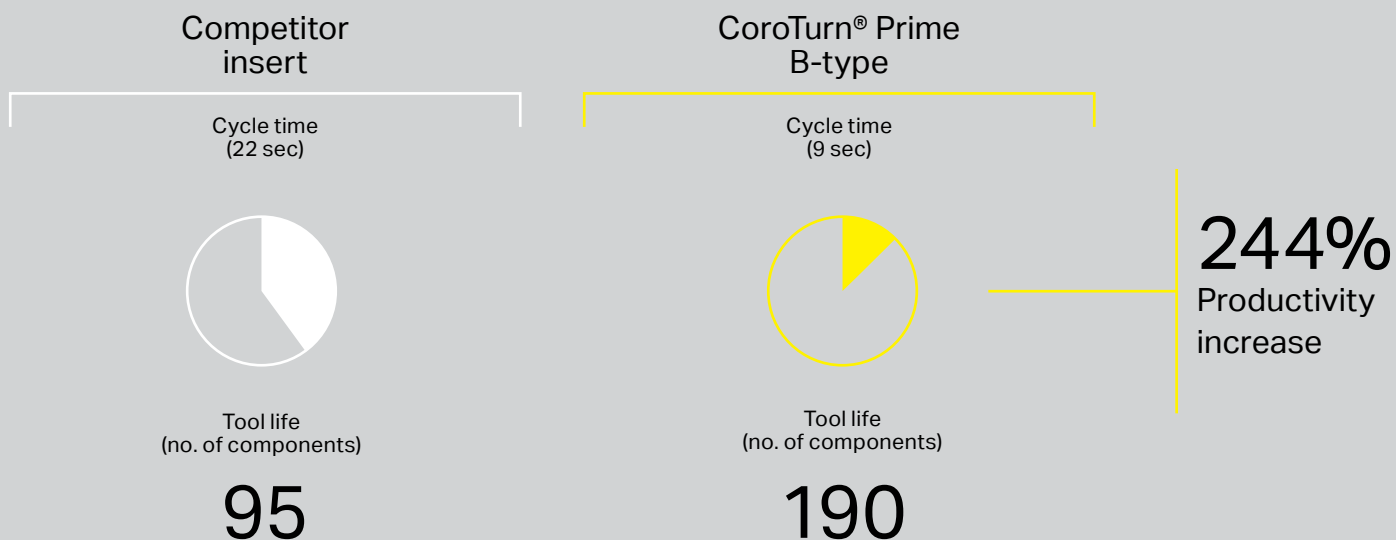
CoroCut® 1-2 insert  
with -XB geometry  
for maximum feed.

## Productivity booster

An automotive customer initially had a cycle time of 22 seconds and a tool life of 95 components.

By implementing a PrimeTurning™ both speed and feed could be increased substantially, making the cycle time only nine seconds.

The reduced cycle time provided the customer with a productivity increase of 244%. In addition, tool life was doubled, from the initial 95 components to 190.



For more information please contact your local Sandvik Coromant representative.

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