
Automotive

Transmission machining solutions

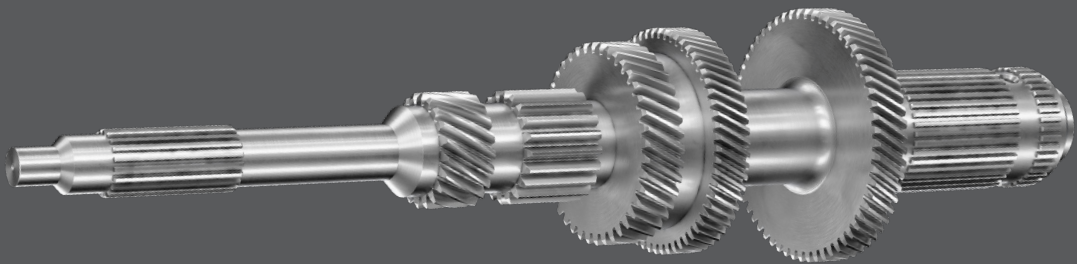


The future of automotive transmission

The challenges posed by energy and climate concerns 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, vehicles of all kinds will contain gear boxes for the indefinite future. They will simply become more innovative, in aspects ranging 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 automotive vehicles of all sizes – from motorcycles to heavy trucks.



Turning

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

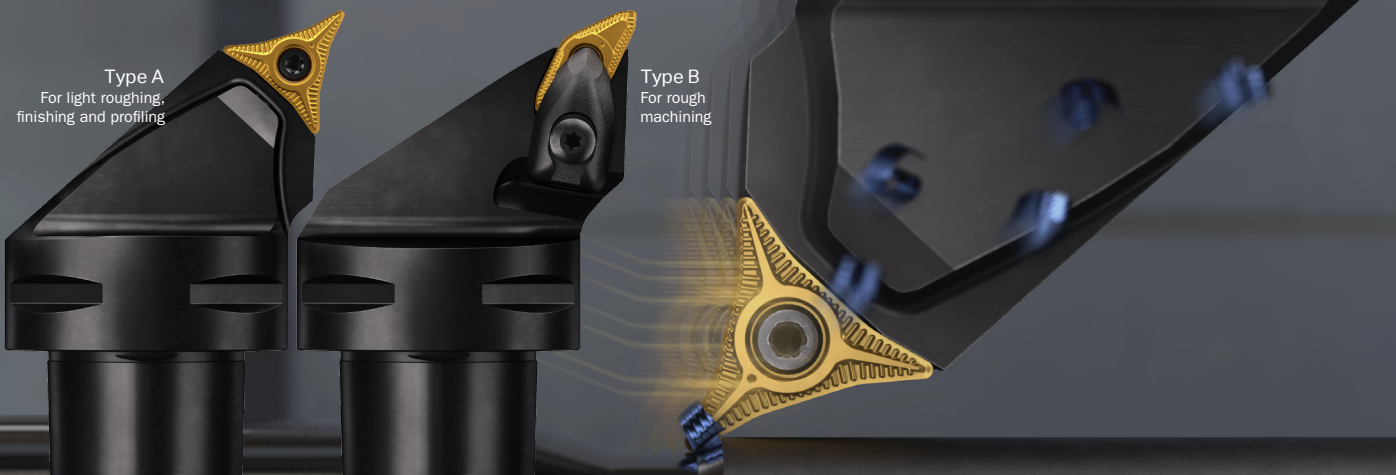
What if you could turn backwards – with a small lead angle between the cutting edge and the feed direction – allowing for massively increased feed rates and yield? Now, you can.

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

- **PrimeTurning™** methodology enabling all-directional turning
- **CoroTurn® Prime** innovative turning tools for PrimeTurning™
- **PrimeTurning™** tool path software generating optimized CNC code

Type A
For light roughing,
finishing and profiling

Type B
For rough
machining



Outstanding surface finish



Eight-edged smartness

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

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



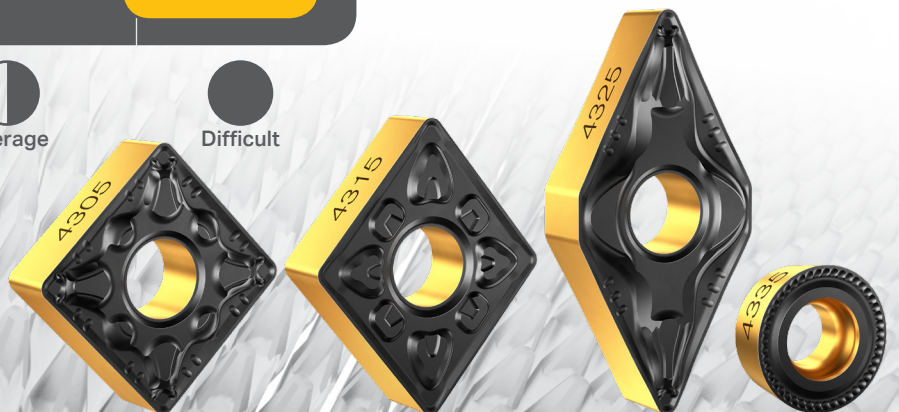
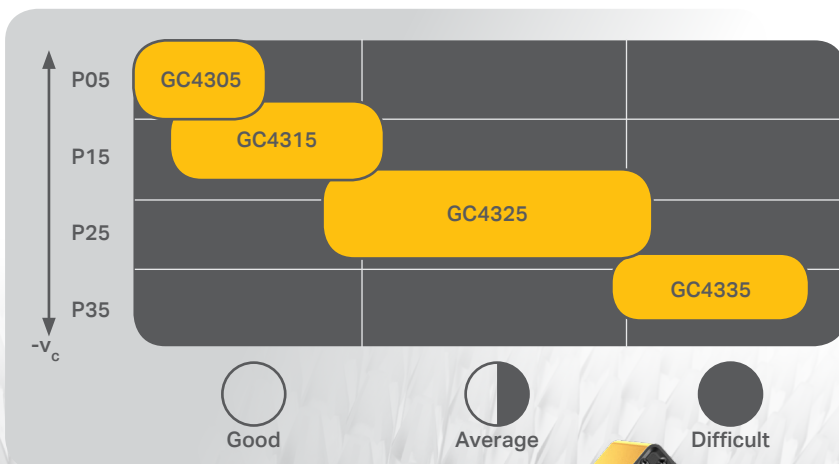
Inveio™

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 centers, multi-task machines and turning centers, making it possible to machine complete components in one set-up.

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

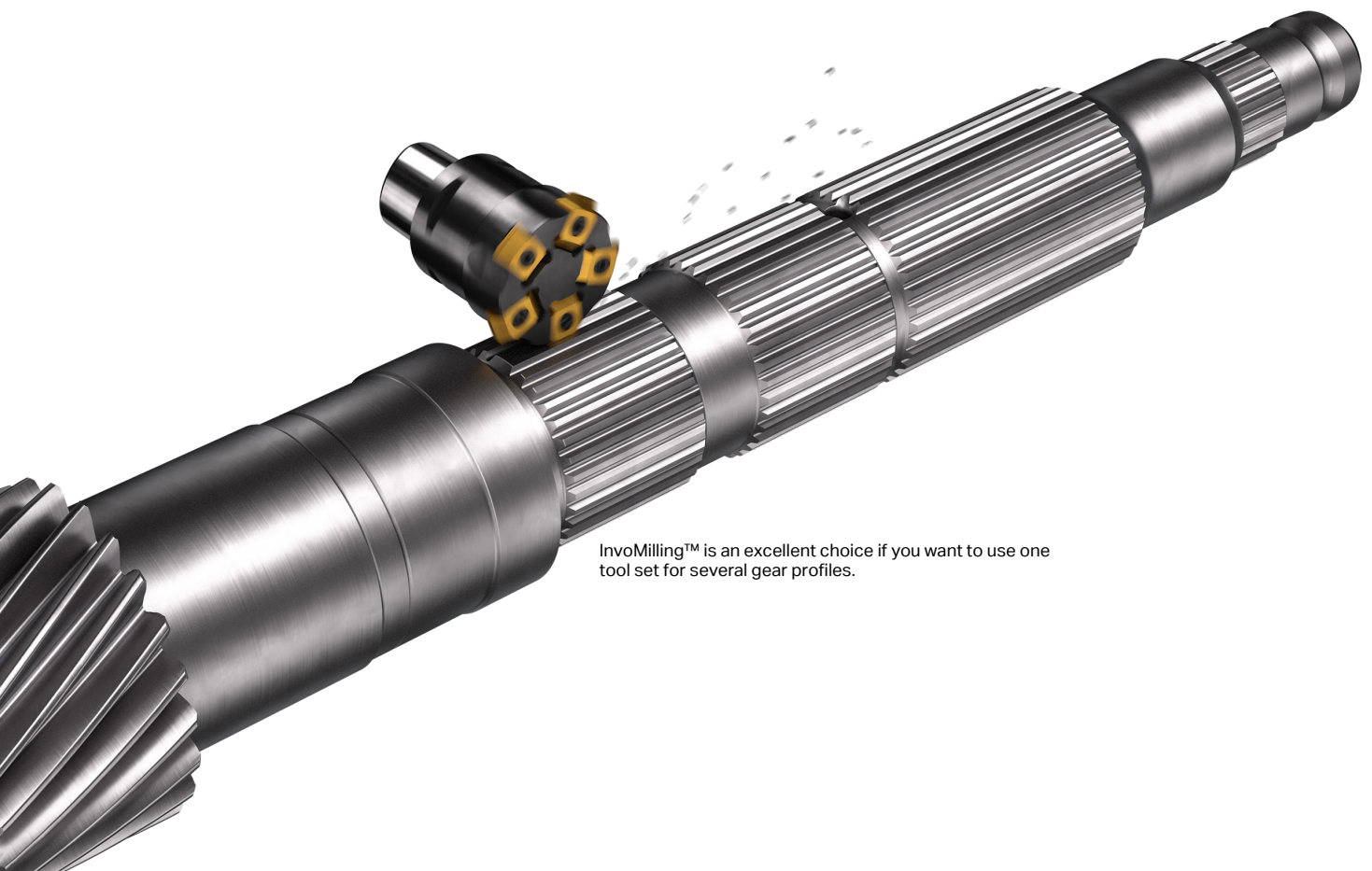
- Use CoroMill® 171.4 for module range 0.8–4
- Use CoroMill® 172 for module range 3–10

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 set-up, 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 enables greater freedom in designing components.

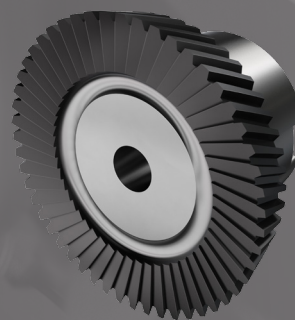
Power skiving is used for the productive mass-production of gear teeth and splines. With power skiving, the complete component can be machined in universal 5-axis machines in one single set-up.

Power skiving benefits

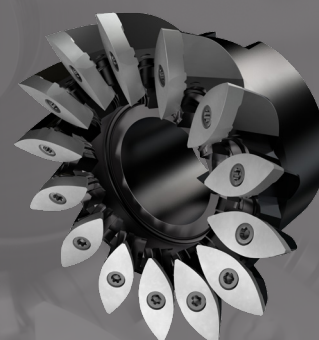
- High productivity and flexibility
- Considerably reduced cycle time compared to conventional machining methods, such as broaching, shaping and hobbing
- Machine the complete component in a universal 5-axis machine in one set-up
- Predictable machining process
- Also efficient in dry conditions



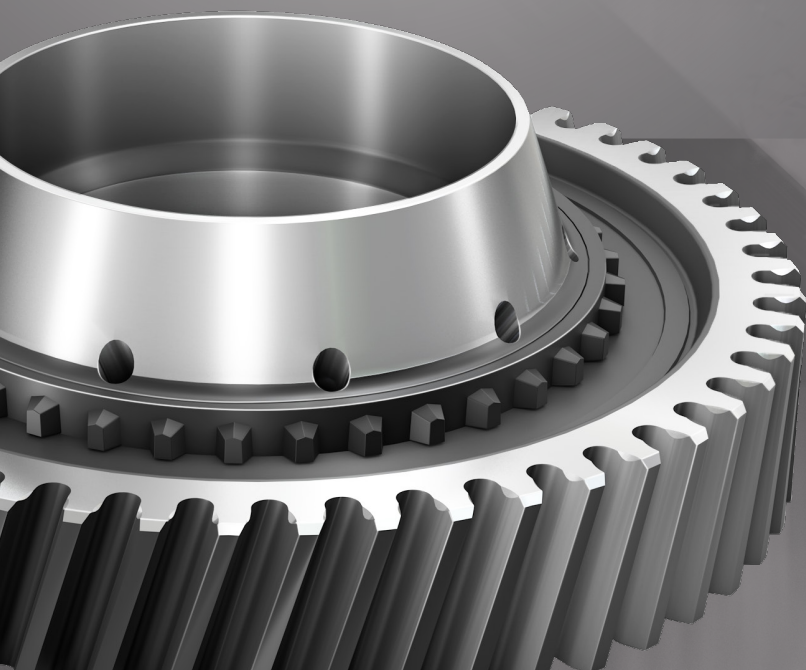
CoroMill® 178



CoroMill® 178



CoroMill® 180



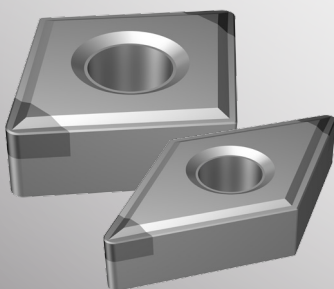
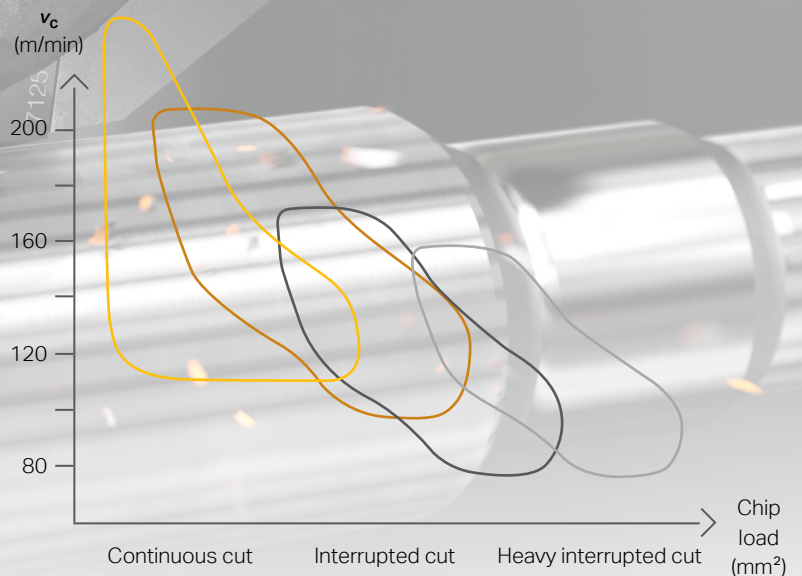
Hard part turning

Hard part turning with new-generation CBN grades

For anyone working in transmission and hard part turning, there are good reasons to choose our new-generation Cubic Boron Nitride (CBN) grades. The grades' speed capabilities, more secure edge line and consistent tool life add value and result in lower cost per component. Designed to meet the demands of hard part turning, the grades achieve efficient and secure machining with excellent surface finish.

Application area

- CB7105**
Continuous cut, smaller depth of cut and smaller chip loads at high speed.
- CB7115**
Continuous to light interrupted cut or larger chip loads at medium to high speed.
- CB7125**
Medium interrupted cut, chamfered component edges.
- CB7135**
Heavy interrupted cut, unchamfered component features.

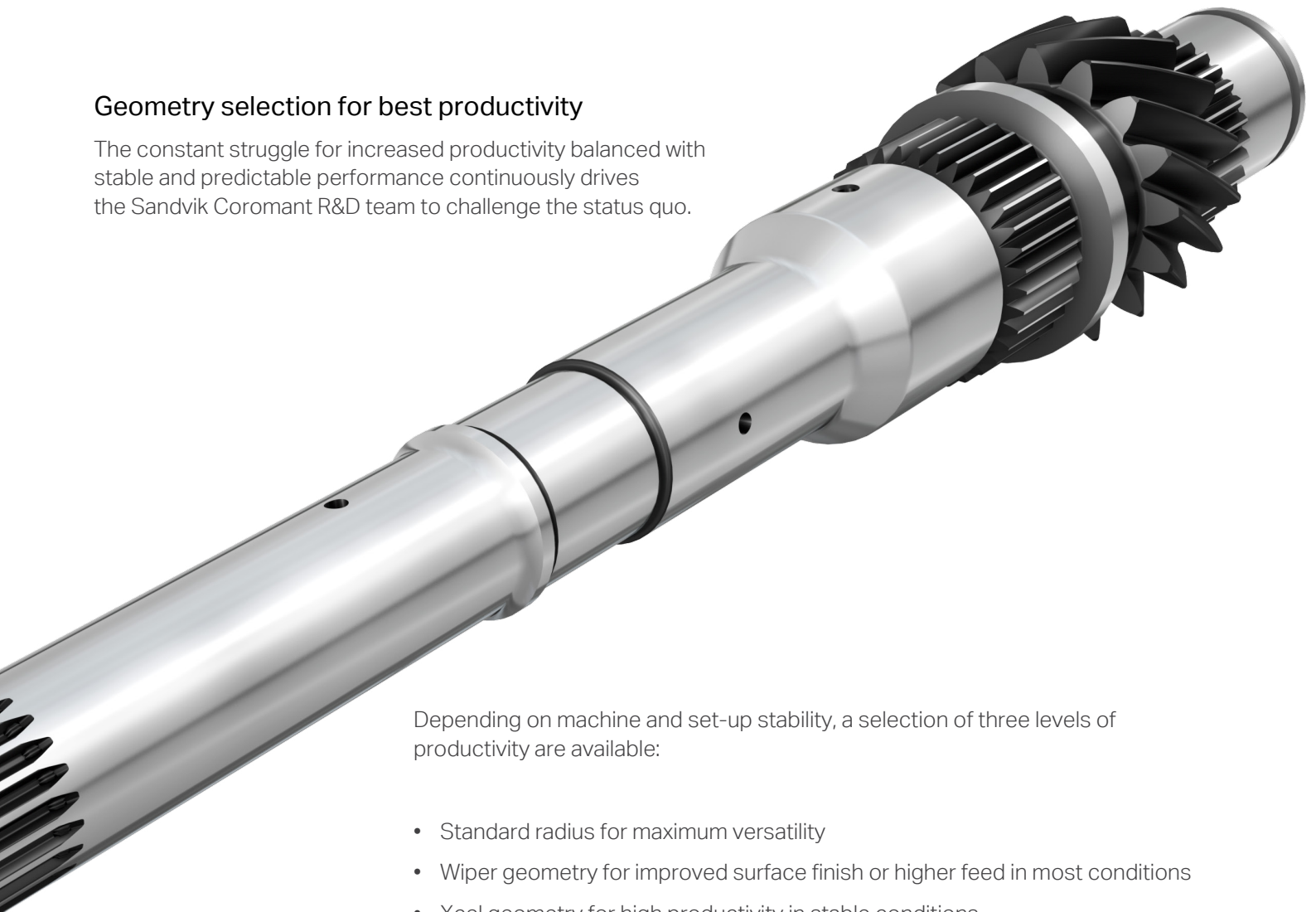


CBN insert with integral chip breaker

Utilize a one-cut strategy for hard-to-soft rough machining of automotive components such as gears, crown wheels, shafts and case-hardened components.

Geometry selection for best productivity

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

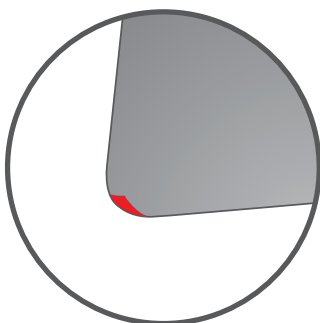


Depending on machine and set-up stability, a selection of three levels of productivity are available:

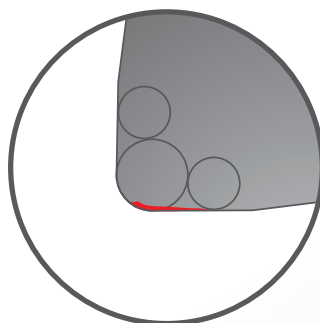
- Standard radius for maximum versatility
- Wiper geometry for improved surface finish or higher feed in most conditions
- Xcel geometry for high productivity in stable conditions
- CoroCut® 1-2 insert with -XB geometry for tightest surface finish tolerances and highest productivity in stable conditions

Select the geometry that suits your operation

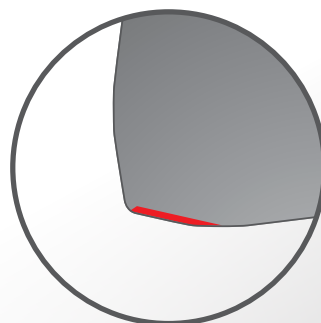
Hard part turning concepts from Sandvik Coromant are available in different versions. Select the best alternative depending on your specific situation.



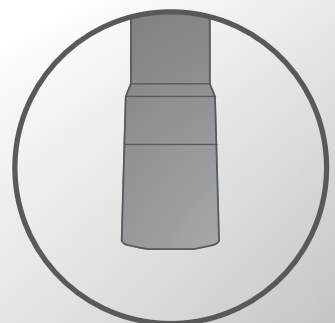
Standard radius
for maximum versatility.



Wiper
for improved surface finish or
higher feed in most conditions.



Xcel
for high productivity in stable
conditions.



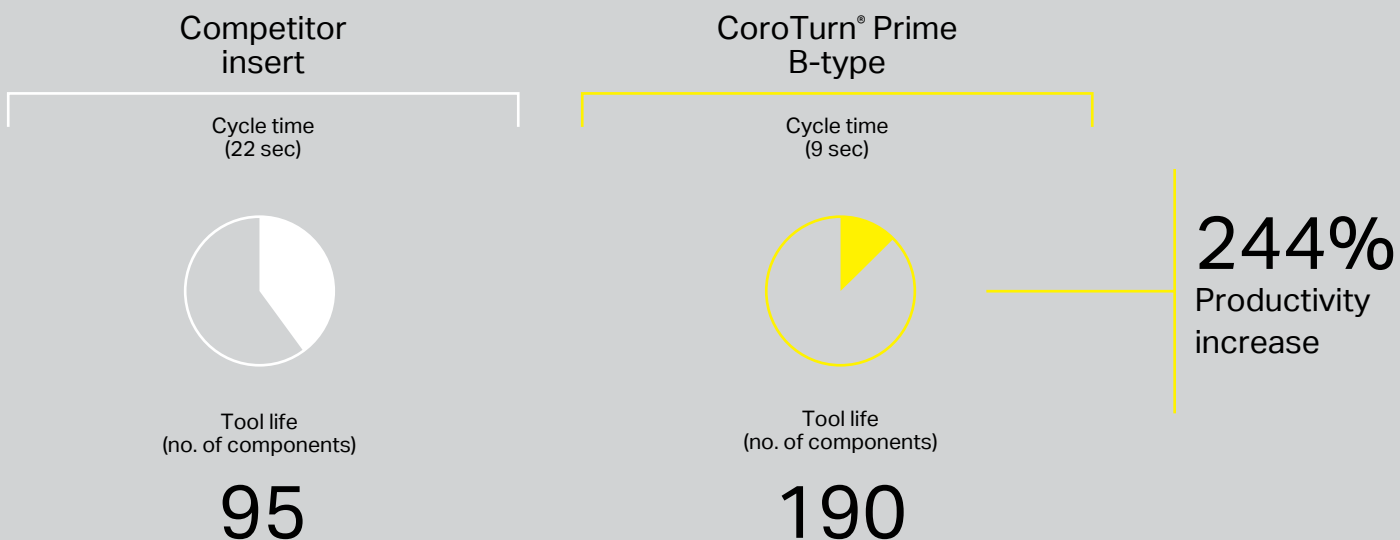
CoroCut® 1-2 insert
with -XB geometry
for maximum feed.

Productivity booster

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

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

The reduced cycle time resulted in a productivity increase of 244% for the customer. 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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