SANDVIK
Coromant

Silent Tools™

Productivity with slender tools

SilentTools®

Reducing vibration in focus

Vibration-prone operations pose a constant threat to productive and secure machining, especially when dealing with long overhangs or deep cavities. Reducing process parameters such as depth of cut, speed or feed is one aspect to consider, but it will most likely have a negative impact on productivity.

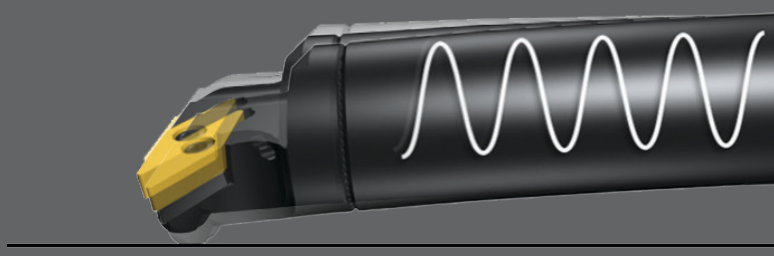
A more productive solution is to use Silent Tools™. Silent Tools is a unique range of long-reach cutting tools and adaptors for turning, milling and boring, designed with a damping system inside the tool body to minimize vibration.

For components requiring slender tool assemblies, Silent Tools can be your one and only choice for productive machining. However, Silent Tools is not only a problem-solver, it can also be used as a powerful productivity booster when working with shorter overhangs.

Enjoy the silence!

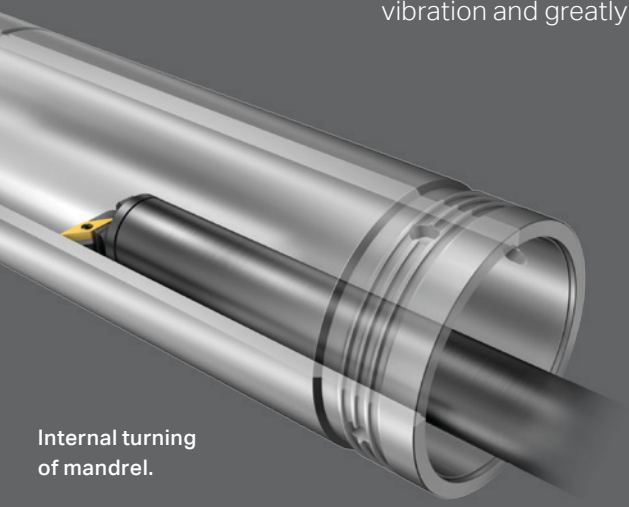
Silent Tools™ benefits

- Improved process security
- Improved surface finish
- Productivity gains
- Reduced cost per component



Difference in vibration between undamped and damped tool.

Inside the tool is a pre-tuned damping system that consists of a heavy mass, supported by rubber spring elements. If vibration arise, the kinetic energy will be absorbed by the damping system. This leads to minimized vibration and greatly improved productivity.



Internal turning of mandrel.

CoroTurn® SL with Silent Tools turning adaptor.

Maximum reach with Silent Tools elliptical adaptors.

Shoulder milling with CoroMill® 490.

Titanium milling of aerospace landing gear beam with CoroMill® 390.

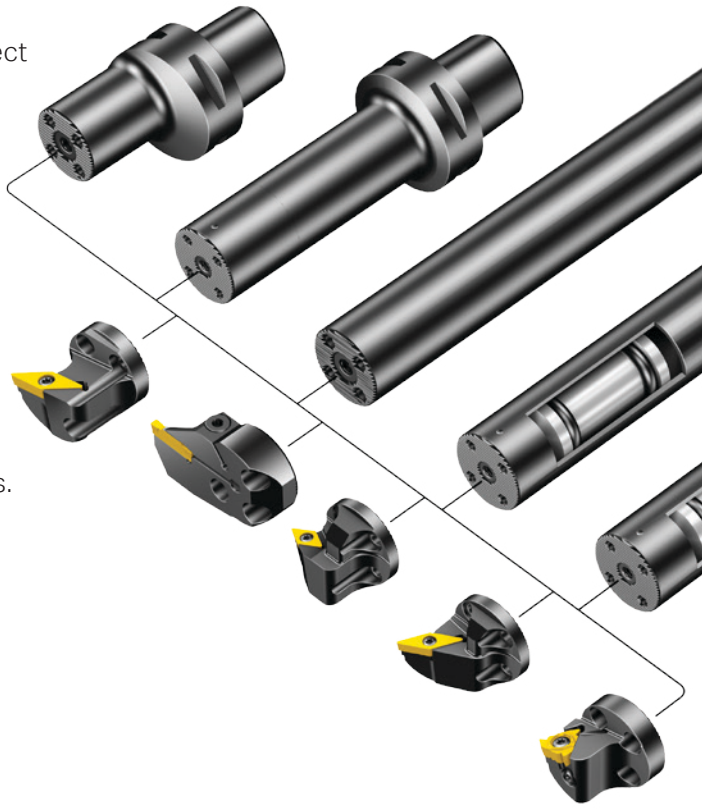
Silent Tools™ for turning

Secure and productive turning

Silent Tools turning adaptors

Internal turning is very sensitive to vibration. It is essential to select the largest possible tool size and to minimize the overhang in order to obtain the best stability and accuracy. Choosing the right turning adaptor has a big impact on production economy. The Silent Tools turning adaptors are ideal for successful turning operations at overhangs reaching from 4 up to 14 times bar diameter, and are available from diameter 16–250 mm (0.630–9.84 inch) as standard solutions.

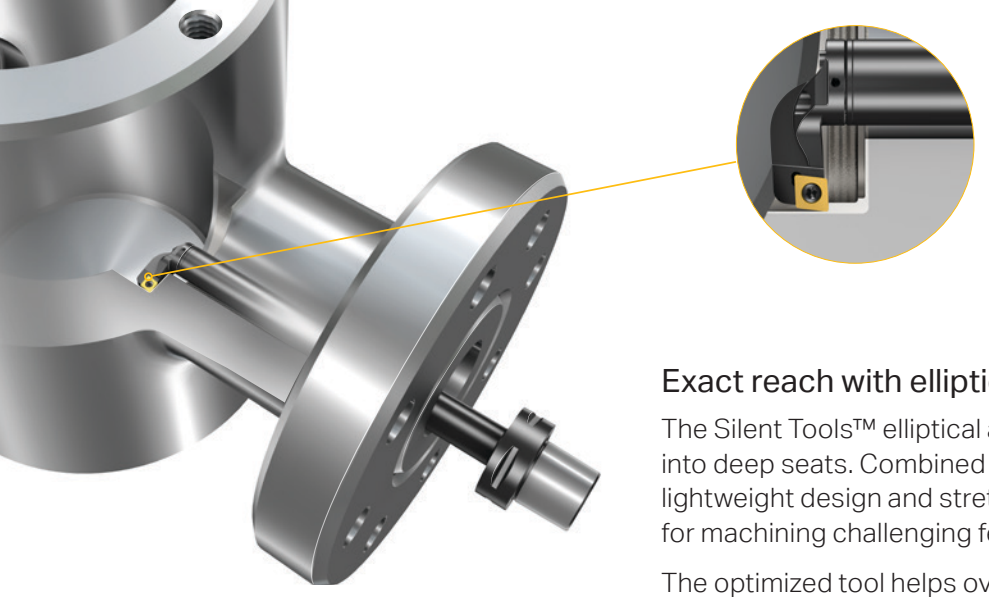
The easily replaceable cutting head and the stable, robust interface make the CoroTurn® SL modular system a standardized interface for all Silent Tools damped bar adaptors. The combination offers great flexibility with a large number of cutting heads suitable for a wide range of applications.



Stable threading for every need

Ultra-rigid CoroThread® 266 covers just about all types of internal and external thread turning applications possible. It is designed with an iLock™ interface to handle the extreme forces placed upon the insert in threading operations. The tool ensures exceptional insert stability for ultimate accuracy, surface finish and product consistency.

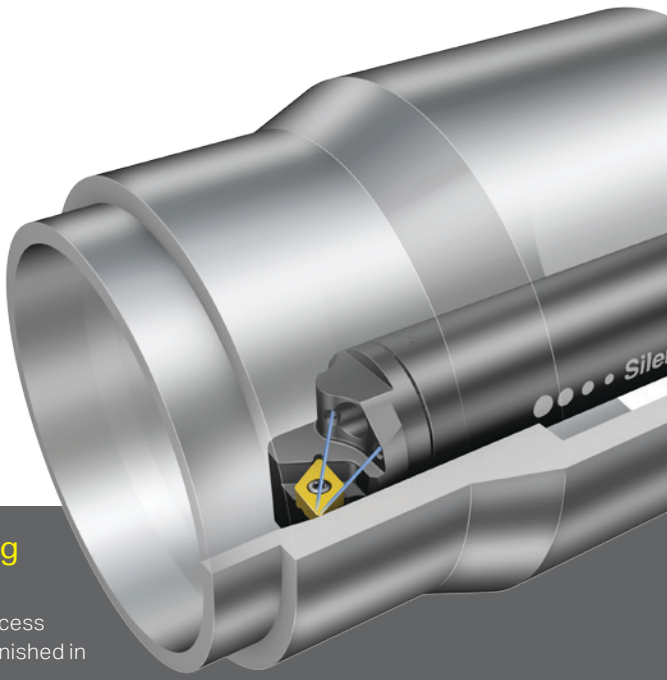
CoroThread 266 provides great stability in long overhangs. Damped Silent Tools boring adaptors dedicated for threading can withstand the increased radial cutting forces of internal machining and maintain precision even in the most difficult machining conditions.



Exact reach with elliptical bars

The Silent Tools™ elliptical adaptors are designed for maximum reach into deep seats. Combined with CoroTurn® SL cutting heads with a lightweight design and stretched radial length, you have a tool tailored for machining challenging features such as the valve seat pocket.

The optimized tool helps overcome challenges like narrow entries and long overhangs in order to achieve a highly stable machining process.



Customer case

Performance: Machining a flanged bearing

The customer was struggling with vibration and productivity loss when machining a flanged bearing case. The existing process featured a steel bar, and the remainder of the bore had to be finished in a secondary operation.

When changing to Silent Tools, the outcome showed a huge increase in productivity. Vibration was diminished and surface finish improved, while saving valuable time when completing roughing and finishing in one operation. In addition, it saved a lot of ear plugs.

Operation: Rough and finish deep boring

Workpiece material: CMC 02.1, MC P2.2.Z.AN – Alloy steel forging

Tool: A570-3C D32-27 40

Insert: TNMG 332-QM, grade GC4215

+160%
Finishing productivity

	Sandvik Coromant	Competitor
v_c m/min (ft/min)	Roughing: 99 (325), finishing: 152 (500)	Roughing: 67 (220)
f_n mm/rev (in/rev)	Roughing: 0.406 (0.016), finishing: 0.559 (0.022)	Roughing: 0.356 (0.014)
a_p mm (inch)	3.18 (0.125)	3.18 (0.125)
Results		
Time saved	15 min per part	
Productivity increase, roughing	132%	
Productivity increase, finishing	160%	

+132%
Roughing productivity

Silent Tools™ for milling

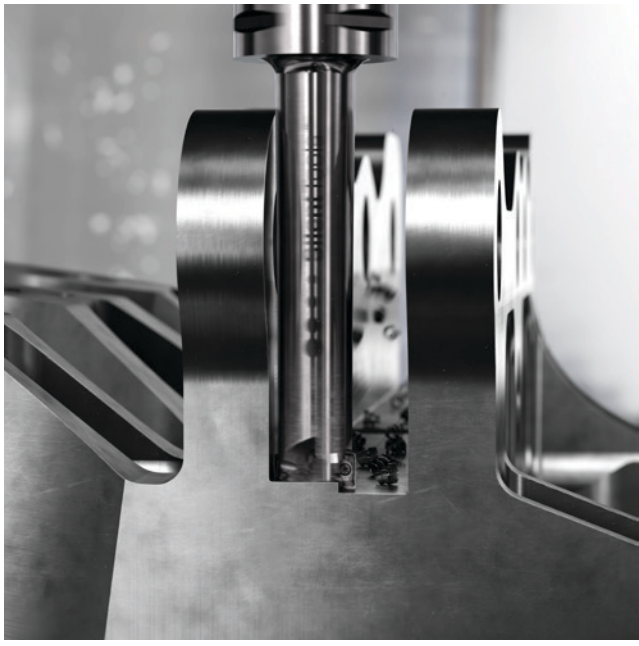
Maximize your milling cutter productivity

Working with rotating tools differ from turning, where you have a boring bar in a rigid tool post. Most considerations for successful operations are however the same, such as workpiece set-up and machine stability. Make the most out of your milling operation with Silent Tools.

CoroMill® 390 with integrated damping

By integrating Silent Tools technology into the extra-long, extremely versatile CoroMill 390 end mills, you can easily stabilize your machining process while maintaining required surface finish and high-quality components.

The combination offers unrivalled productivity with small-diameter milling cutters on slender, undersized shanks. Available for insert sizes 07 and 11 for minimized vibration and increased output.



CoroMill 390 covers many applications, including shoulder milling and pocketing. The cutters are ideal for ramping and helical interpolation.

Vibration-free groove milling

CoroMill® QD with Silent Tools provide you the required reach and vibration can be kept at bay up to six times bar diameter. Add a cutter with light-cutting insert geometries for an ideal solution for reducing vibration when milling grooves with long overhangs.

Apply CoroMill QD with Silent Tools for long-reach, internal or external groove milling or for slitting of tubes, casings and sleeves.

Silent Tools™ arbor milling adaptors

The Silent Tools arbor milling adaptors are available for a large number of cutting concepts and for a wide range of applications, including long reach face milling, deep shoulder and side milling, cavity milling, slot milling and profiling.

Undersized adaptors with nominal diameter cutters are first choice for greatest productivity in deep cavities, while nominal diameter adaptors are available for maximum stiffness and capacity for oversized diameter cutters.

Productivity gains:

At least 50% for the shortest adaptor lengths and up to 300% for longer adaptors, compared to same length without Silent Tools

Tool assembly lengths:
4 to 8×body diameter

High reliability in large machining centres with Coromant EH

Silent Tools adaptors are suitable for cavity and profile milling in deep molds, Pelton wheels, Francis blades and impellers. Choose betweeen CoroMill® 216 and CoroMill® 316 ball nose, CoroMill® 300 with round inserts or CoroMill® 415 high feed cutters with Coromant EH machine side interface.

Silent Tools™ for boring

Flexible boring at long overhangs

Internal boring of large-diameter holes and deep holes is a particularly vibration-prone operation, especially when machining with long overhangs. To avoid vibration-related issues such as bad surface texture, insufficient accuracy and increased insert and machine tool wear, a stable tooling solution is a necessity.

Sandvik Coromant offers Silent Tools for rough and finish boring. The tools are designed with a strong dedicated interface between bridge and damped adaptor, and the same adaptors and bridges can be used for both rough and fine boring. This gives you unique flexibility and modularity to build desired tool assemblies.

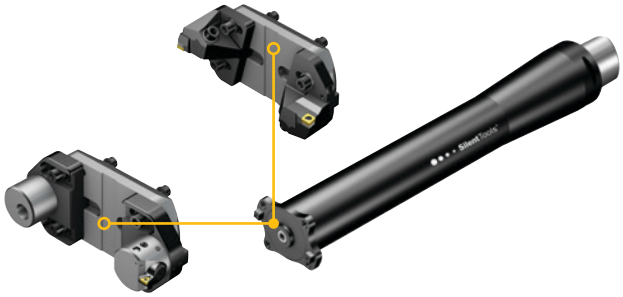
Vibration-free rough and finish boring

Silent Tools finish and rough boring tools give increased productivity and close tolerances from lengths of 3–10 × body diameter. When using Silent Tools, you have the opportunity to double the depth of cut, while maintaining productive boring at long overhangs.

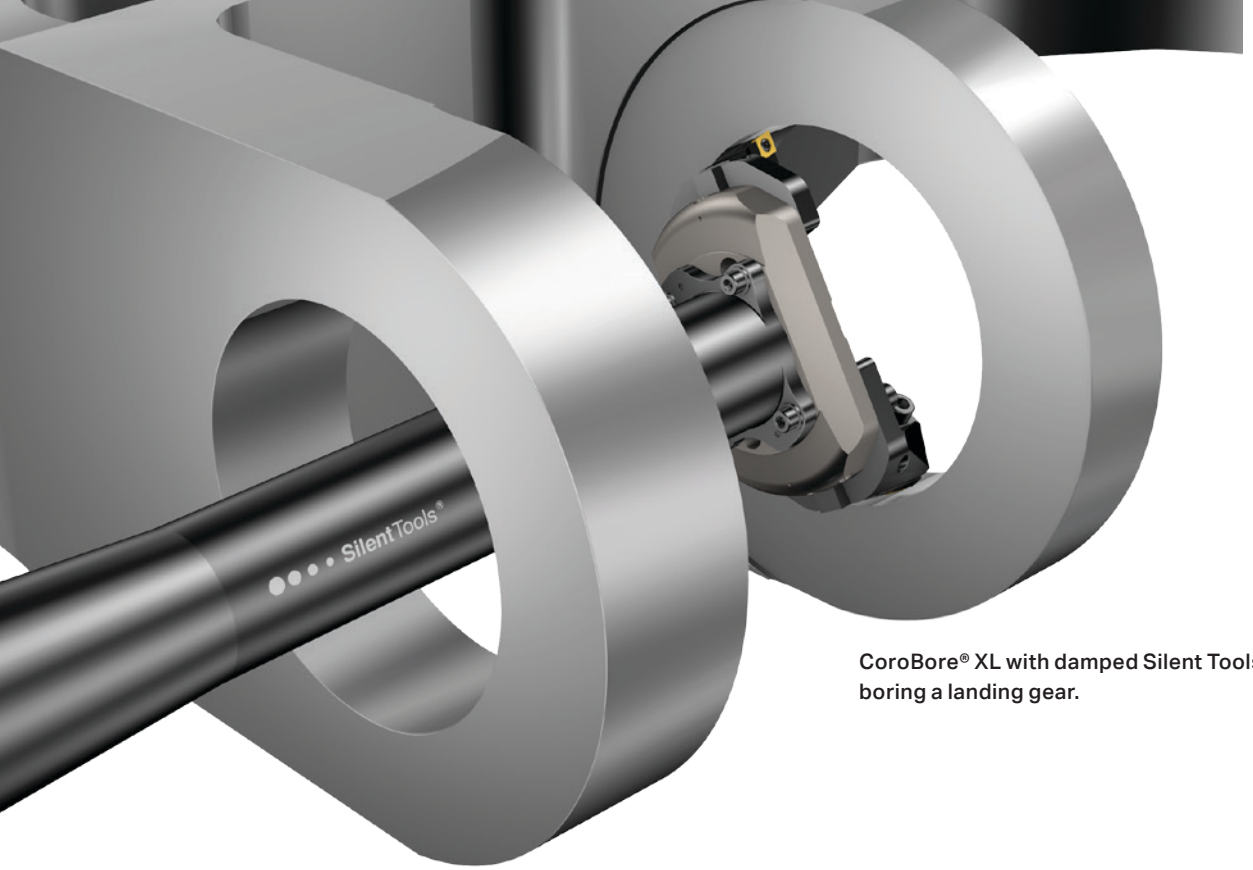
CoroBore® BR20 with Silent Tools™ technology is part of the new generation rough boring tools. This flexible solution holds features such as differential pitch, coolant nozzles with high precision capability and step boring functionality, and is to be combined with dedicated, four-edged CoroBore® 111 inserts. Together with CoroBore® 825 and CoroBore® 826 for finishing, these are ideal solutions for close hole tolerances and excellent surface finish in small diameters.

For large-diameter roughing and finishing, up to 1275 mm (50.197 inch) in standard assortment, the versatile CoroBore® XL system provides the optimal solution, giving great stability and vibration-free boring.

CoroBore BR20 with Silent Tools technology and CoroBore 825 for small diameters up to 167 mm (6.57 inch).



CoroBore XL for large diameters, including dedicated lightweight bridges that fit together with existing slides and cartridges for both rough and fine boring.



CoroBore® XL with damped Silent Tools adaptor boring a landing gear.

Customer case

Performance: Finishing of a chamber

The customer produces 200–250 components per year, but had problems obtaining the desired surface finish without encountering vibration. Prior to the finishing operation, two roughing operations were performed which gave a concentricity error of 0.02.

By changing to Silent Tools, the customer benefited from time savings of up to 12.3 minutes per machined part. No vibration, a good finishing surface and no conical dimension of the hole were all welcomed results. The radius 0.8 mm gave better results than previous 0.4 mm due to the possibility to increase feed and further the stability.

Component: Chamber with interrupted cut

Workpiece material: 6082 aluminium, CMC 30.21

Operation: Finishing

Machine: Biglia Smart Turn B1200 L, HSK 63

Coolant: Emulsion

+400%
Time savings per part

	Sandvik Coromant	Competitor
Machine interface adaptor	C6-390.419-63 100	
Tool	C6-R825C-FAG 307A, R825-AF23STUC1103	Modular assembly HSK 63
Diameter, mm	100	103
Tool length, mm	440	440
Insert	TCGX 110308-AL H10	
v_c m/min (ft/min)	323–388 (1060–1273)	100 (328)
n, rpm	1000–1200	240
f_n mm/rev (in/rev)	0.15 (0.006)	0.15 (0.006)
a_p mm (inch)	0.15 (0.006)	0.15 (0.006)
Results		
Minutes per part	3–2.73	15
Time saved	Approx. 12 minutes per part	

Engineered tools for specialized machining

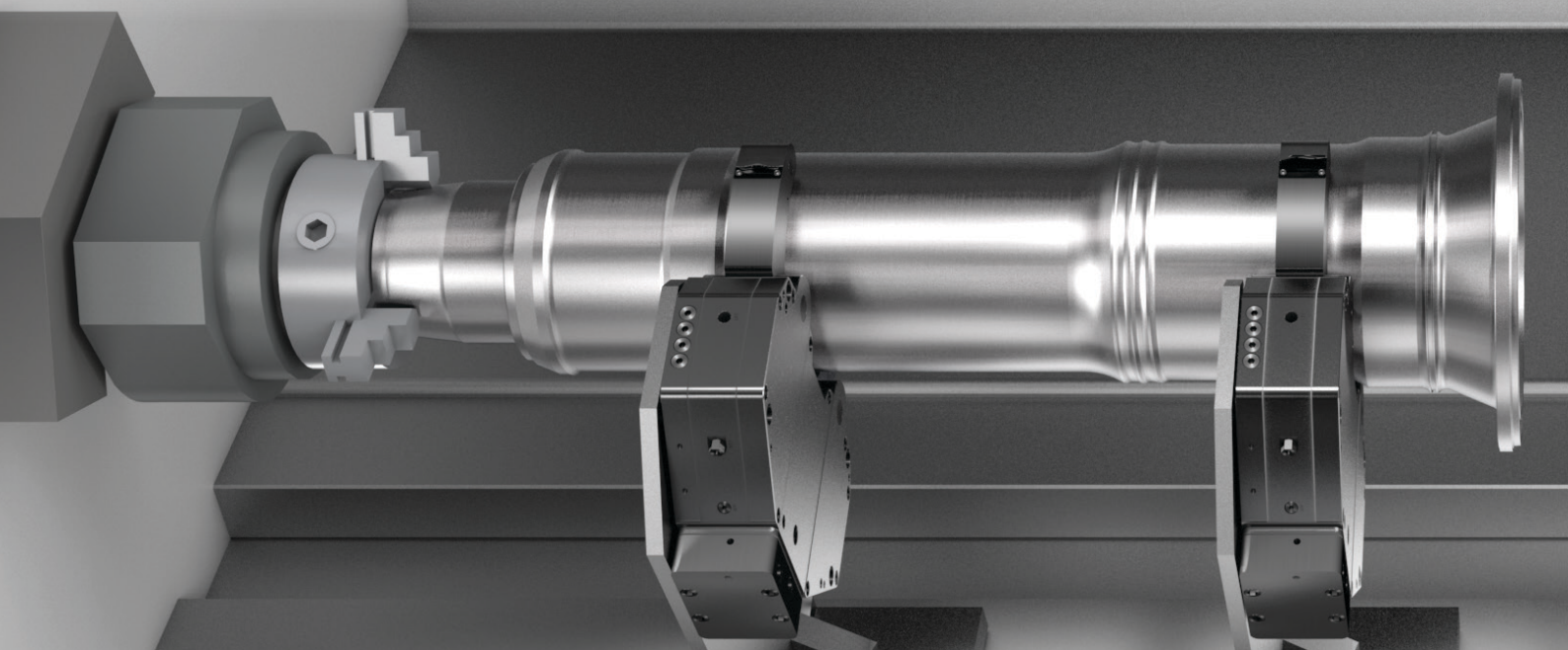
The standard off-the-shelf Silent Tools™ offer represents a good platform for optimized solutions and high productivity, but if you need a tailored tool our engineered solutions are the answer. Together, we can carefully examine your application and develop the best solution for your process. The engineered damped boring bars are often tapered, elliptical and/or curved, with the mounting adapted to the machine. Bars with overhangs of up to 14 x bar diameter (BD) are available.

Ask your yellow coat representative to help you order your engineered solution.

Engineered tool with Silent Tools technology optimized for internal turning.

Silent Tools™ + sensor-based anti-vibration technology

Connected Silent Tools + cutting tools allow you to remotely monitor the tool and machining in order to optimize your metal cutting process. The tools are equipped with sensors embedded in the adaptor and Bluetooth data distribution capacity, and are designed to increase process control and security in internal turning with long overhang.



Machine-adapted advanced Silent Tools™ boring bars

Sandvik Coromant offer machine-adapted boring bars with bar diameter ranging from 100–300 mm, suitable for overhangs up to 14×BD. The bars are equipped with ATC in the front to fit many tool configurations and to minimize downtime. They have through coolant capability with pressure up to 350 bar (5076 psi).

Machining of jet engine shaft with an engineered Silent Tools + 120 mm BD boring bar, working with a 16×BD overhang.

Calculated success

Sandvik Coromant offers several helpful applications to guide you towards maximum return of your investment. Use CoroPlus® ToolGuide to receive quick and accurate tool recommendations and apply the productivity calculators to monitor your savings and maximize your earnings.

A Silent Tools™ investment almost always has a short pay-back time, thanks to increased productivity and less scrap. Use the dedicated Silent Tools calculators to help you calculate return of investment (ROI) of your Silent Tools. With limited input, you will instantly see the outcome and payback time for a Silent Tools investment, compared to undamped tools.

Enter your measurements and you are on your way to calculated success!

Find the calculators and other useful info such as a comprehensive application guide at www.sandvik.coromant.com/silenttools

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