Silent Tools™
Productivity with slender tools
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 can have a negative impact on productivity.

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

For components that require slender tool assemblies, Silent Tools is the choice for productive machining. However, Silent Tools is more than a problem-solver; it is also a powerful productivity booster when working with shorter overhangs.

Enjoy the silence!
Inside the tool is a pre-tuned damping system, consisting of a heavy mass supported by rubber spring elements. If vibration occurs, the kinetic energy is absorbed by the damping system. This leads to minimized vibration and improved productivity.

**Silent Tools™ benefits**
- Improved process security
- Improved surface finish
- Increased productivity
- Reduced cost per component

Maximum reach with Silent Tools elliptical adapters.
CoroTurn® SL with Silent Tools turning adapter.
Difference in vibration between undamped and damped tool.
Internal turning of mandrel.

Shoulder milling with CoroMill® 490.
Titanium milling of aerospace landing gear beam with CoroMill® 390.
Secure and productive turning

Silent Tools™ for turning

Silent Tools turning adapters

Internal turning is extremely sensitive to vibration. It is important to select the largest possible tool size and minimize the overhang in order to obtain the best stability and accuracy. Choosing the right turning adapter has a considerable impact on production economy. The Silent Tools turning adapters are ideal for successful turning operations at overhangs from 4 to 14 times bar diameter and available for diameters of 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 adapters. 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 supports nearly all internal and external thread turning applications. 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 adapters 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 adapters are designed for maximum reach into deep seats. Combined with CoroTurn® SL cutting heads with a lightweight design and stretched radial length, the elliptical adapters create a tool tailored for machining challenging features such as the valve seat pocket.

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

Performance: Machining a flanged bearing

A 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.

Moving to a Silent Tools solution resulted in a huge increase in productivity. Vibration was diminished, and surface finish improved, while saving valuable time when completing roughing and finishing in one operation. And, the Silent Tools solution saved a lot of ear plugs.

<table>
<thead>
<tr>
<th>parameter</th>
<th>Sandvik Coromant</th>
<th>Competitor</th>
</tr>
</thead>
<tbody>
<tr>
<td>$v_c$ m/min (ft/min)</td>
<td>Roughing: 99 (325), finishing: 152 (500)</td>
<td>Roughing: 67 (220)</td>
</tr>
<tr>
<td>$f_v$ mm/rev (in/rev)</td>
<td>Roughing: 0.406 (0.016), finishing: 0.559 (0.022)</td>
<td>Roughing: 0.356 (0.014)</td>
</tr>
<tr>
<td>$a_p$ mm (inch)</td>
<td>3.18 (0.125)</td>
<td>3.18 (0.125)</td>
</tr>
</tbody>
</table>

Results

- Time saved: 15 min per part
- Productivity increase, roughing: +132%
- Productivity increase, finishing: +160%
Maximize your milling cutter productivity

Working with rotating tools differs from turning, which uses a boring bar in a rigid tool post. However, most considerations for successful operations are the same, including workpiece set-up and machine stability. Make the most out of your milling operation with Silent Tools.

CoroMill® 390 with integrated damping
Integrate Silent Tools technology into the extra-long, extremely versatile CoroMill 390 end mills to stabilize the machining process while maintaining required surface finish and high-quality components.

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

Vibration-free groove milling
CoroMill® QD with Silent Tools provides the required reach and can keep vibration at bay up to six times bar diameter. Add a cutter with light-cutting insert geometries for an ideal solution to reduce 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 adapters

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

Undersized adapters with nominal diameter cutters are First Choice for greatest productivity in deep cavities, while nominal diameter adapters are available for maximum stiffness and capacity for oversized diameter cutters.

Productivity gains:
At least 50% for the shortest adapter lengths and up to 300% for longer adapters, compared to the same length without Silent Tools

Tool assembly lengths:
4 to 8 times body diameter

High reliability in large machining centers with Coromant EH

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

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

Vibration-free rough and finish boring

Silent Tools finish and rough boring tools provide increased productivity and close tolerances for lengths of 3 to 10 times body diameter. With Silent Tools, you can double the depth of cut, while maintaining productive boring at long overhangs.

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

For large-diameter roughing and finishing, up to 1275 mm (50.197 inches) in standard assortment, the versatile CoroBore® XL system provides the optimal solution, giving great stability and vibration-free boring.
A customer producing 200–250 components per year had problems obtaining the desired surface finish without encountering vibration. Prior to the finishing operation, two roughing operations were performed, resulting in a concentricity error of 0.02.

By changing to Silent Tools, the customer benefited from a 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 welcome results. The radius 0.8 mm offered better results than the previous 0.4 mm due to the ability to increase feed and further the stability.

Performance: Finishing of a chamber

Component: Chamber with interrupted cut
Workpiece material: 6082 aluminum, CMC 30.21
Operation: Finishing
Machine: Biglia Smart Turn B1200 L, HSK 63
Coolant: Emulsion

<table>
<thead>
<tr>
<th>Performance: Finishing of a chamber</th>
<th>Sandvik Coromant</th>
<th>Competitor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine interface adapter</td>
<td>C6-390:419-63 100</td>
<td>Modular assembly HSK 63</td>
</tr>
<tr>
<td>Tool</td>
<td>C6-R825C-FAG 307A, R825-AF23STUC1103</td>
<td></td>
</tr>
<tr>
<td>Diameter, mm</td>
<td>100</td>
<td>103</td>
</tr>
<tr>
<td>Tool length, mm</td>
<td>440</td>
<td>440</td>
</tr>
<tr>
<td>Insert</td>
<td>TCGX 110308-AL H10</td>
<td></td>
</tr>
<tr>
<td>$v_c$, m/min (ft/min)</td>
<td>323–388 (1060–1273)</td>
<td>100 (328)</td>
</tr>
<tr>
<td>$n$, rpm</td>
<td>1000–1200</td>
<td>240</td>
</tr>
<tr>
<td>$f_n$, mm/rev (in/rev)</td>
<td>0.15 (0.006)</td>
<td>0.15 (0.006)</td>
</tr>
<tr>
<td>$a_p$, mm (inch)</td>
<td>0.15 (0.006)</td>
<td>0.15 (0.006)</td>
</tr>
<tr>
<td>Results</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minutes per part</td>
<td>3–2.73</td>
<td>15</td>
</tr>
<tr>
<td>Time saved</td>
<td>Approx. 12 minutes per part</td>
<td></td>
</tr>
</tbody>
</table>
Engineered tools for specialized machining

The standard off-the-shelf Silent Tools™ offer provides a good platform for optimized solutions and high productivity, but for a more tailored tool, our engineered solutions are the answer. Together, we 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 times bar diameter (BD) are available.

Ask your Yellow Coat representative to help with your engineered solution.

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 adapter and Bluetooth data distribution capacity, and designed to increase process control and security in internal turning with long overhang.
Machine-adapted, advanced Silent Tools™ boring bars

Sandvik Coromant offers machine-adapted boring bars with bar diameter ranging from 100–300 mm, suitable for overhangs up to 14 times BD. The bars are equipped with ATC in the front to fit many tool configurations and 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 toward maximum return on 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.

An investment in Silent Tools™ can offer a quick return on investment, thanks to increased productivity and less scrap, and using the dedicated Silent Tools calculators allows you to determine the return on investment (ROI) quickly and easily. Enter just a little information to calculate the outcome and payback time for a Silent Tool investment compared to undamped tools.

Enter the measurements and start on your way to calculated success!

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