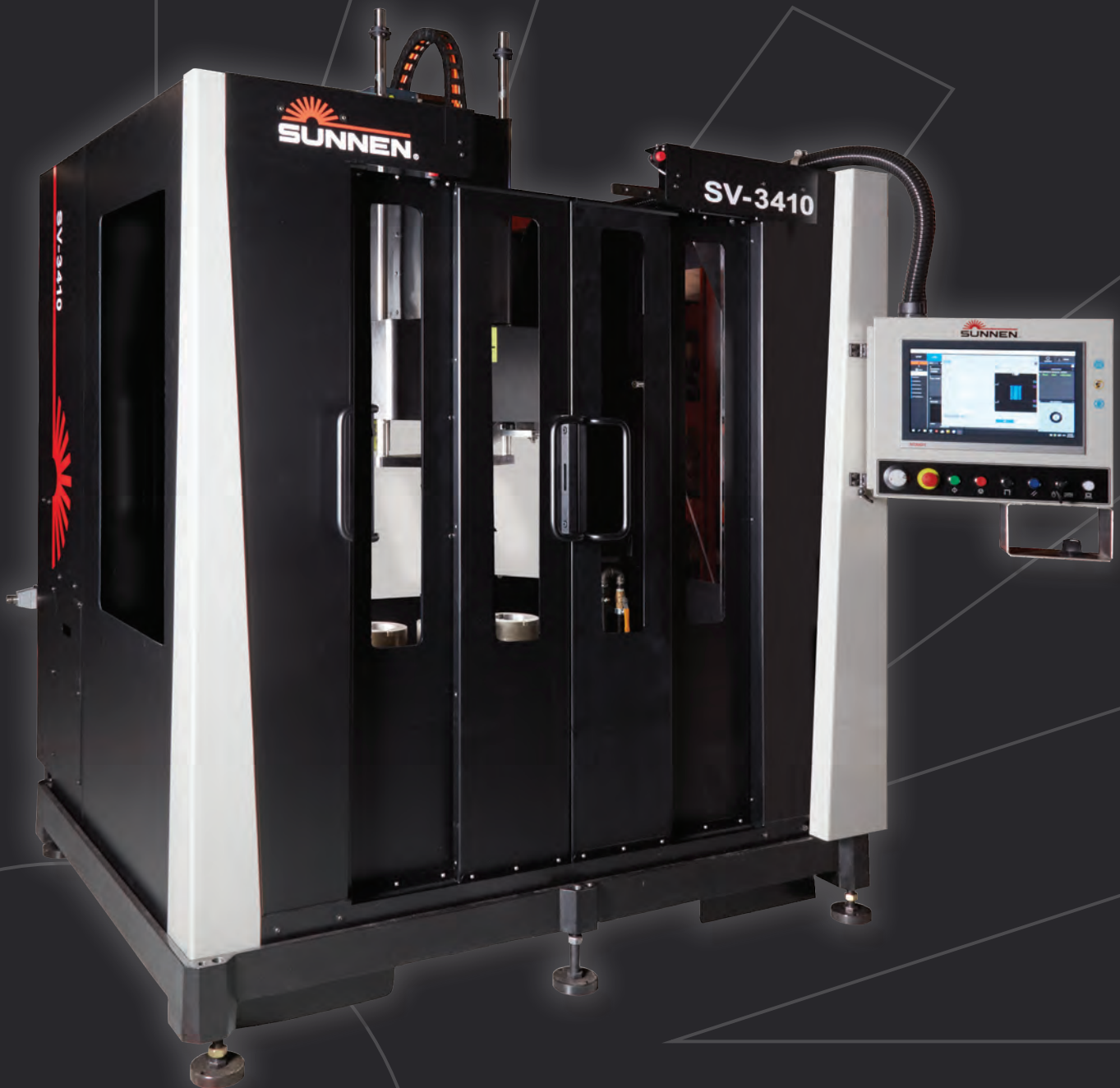
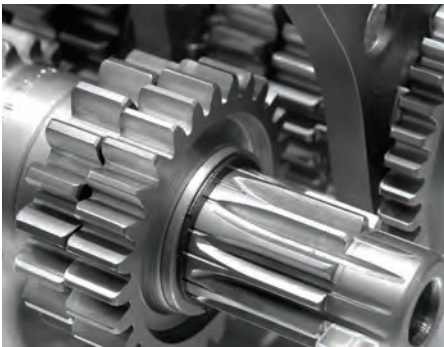




SV-3400 SERIES

PRECISION VERTICAL HONING SYSTEM





SUNNEN'S SV-3400 SERIES

Fast, Economical Large Bore Precision Honing

The SV-3400 is the next step in the continuing evolution of the Sunnen SV Series. A new look combined with the new, easy-to-use Sunnen2 controls. The SV-3400 Series medium duty honing machines combine power, precision, durability and technology to make vertical honing more economical and productive than ever before.

This innovative machine incorporates a patented stroking system that produces a true vertical stroke and can dwell in any part of the hole, end-to-end, producing the straightest, roundest bore possible with a consistent crosshatch pattern.

With its 6.3 kW (8.5 HP) servo spindle motor and powerful 8.0 kW (10.8 HP) stroking motor, the SV-3400 Series can handle almost any job. It is perfect for mid- to high-volume production in large bores 14 mm to 203 mm (.50 in. to 8.0 in.) and is well suited for a wide range of applications, including:

- Air compressors
- Diesel liners up to 150 mm (6.0 in.)
- All types of engine blocks
- Gear hobs
- Refrigeration compressors
- Landing gear components
- Large connecting rods
- Construction machinery and military tank hydraulic blocks
- Bearing sleeves

For ease of setup, the SV-3400 Series features a multi-axis hand wheel for fine-tuning the vertical stroke, honing tool position, column position (SV-3410 only) and optional cradle position. And, because it's built on a proven, modular platform, this system can be automated or otherwise customized to meet your exact requirements.

THE SUNNEN SERVICE TEAM

Your Sunnen Technical Specialist will work with you to determine the best solution for your needs – it's all part of the added value you get with Sunnen. Plus, our worldwide sales and service team provides comprehensive support for the installation and operation of every system we make. Whatever your need, we have the expertise and product range to create the right solution for you and the dedication to support you for the long run.

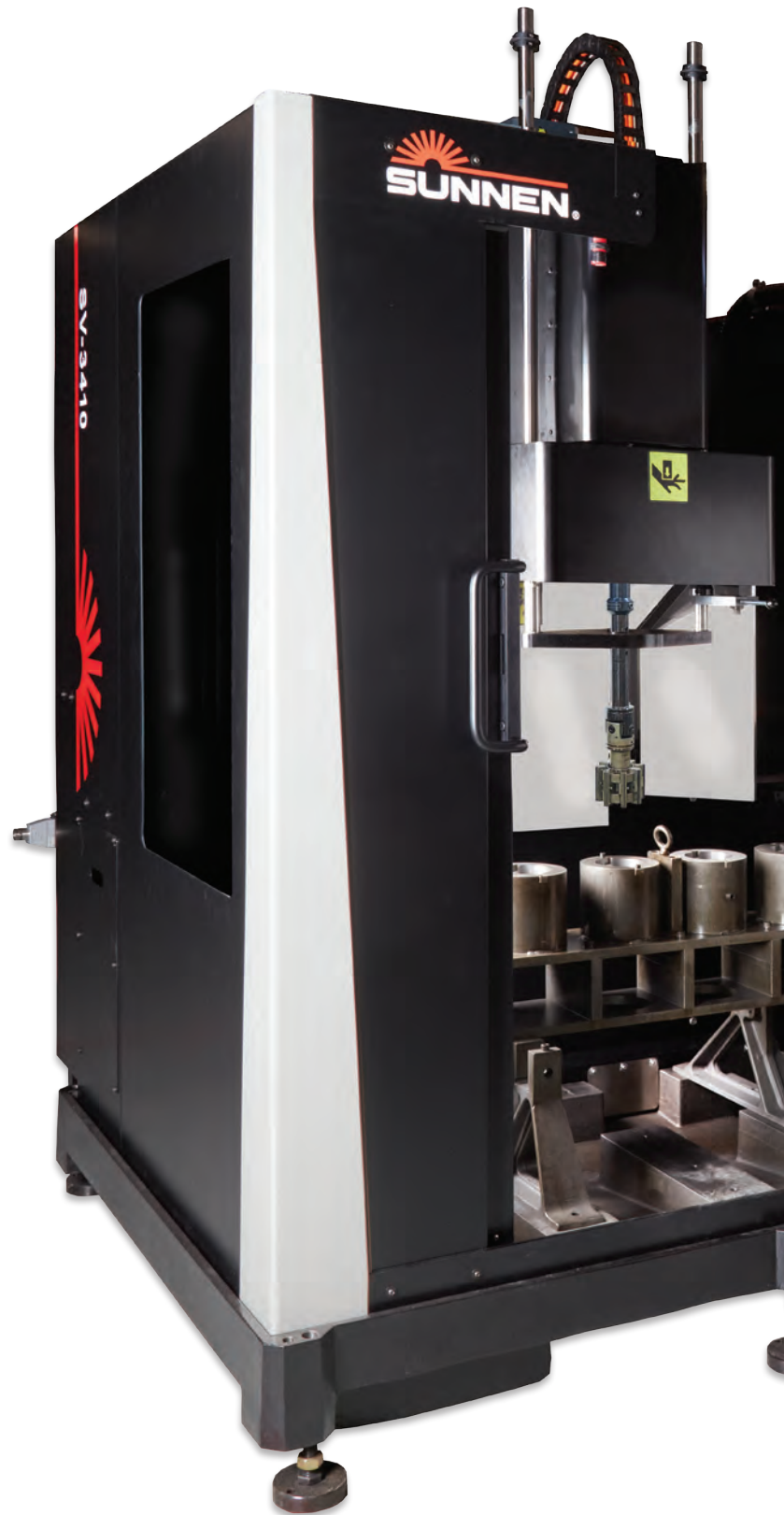
To find the Sunnen representative nearest you, visit our website at www.sunnen.com



Superior features put the SV-3400 in a class by itself.

STANDARD & OPTIONAL FEATURES

- New look with a focus on ergonomics and ease of use combined with the new Sunnen2 controls and proven Beckhoff electronics.
- Precision 8.0 kW (10.8 HP) servo ball screw stroking system assures accurate tool positioning and stroking control.
- Powerful 6.3 kW (8.5 HP) servo spindle.
- Servo rotary feed system and superior tooling choices (GHSS; GHTS; PH; CV/CK; P20/P28; MPS) deliver extremely precise bores for a variety of applications.
- T-Slot table and optional elevated fixture frame allow optimal fixturing versatility. T-slot table standard on SV-3460/SV-3490 and optional on SV-3410.
- Heavy duty vertical slide and horizontal slide stroke guide ways ensure superior performance and long, trouble-free life. Auto lubrication system is standard for critical components.
- The wide-open door design allows full access to the work area for either manual or fully automated robotic parts loading [SV-3410/3460/3490].
- Synchronized servo stroke and spindle maintain constant crosshatch finishing throughout the bore from end to end for the most demanding surface finish requirements.
- Add an optional Sunnen-built SVF coolant system or connect the system to a central coolant system.
- Optional tool guide pot assembly aligns tool with bore as tool is indexed (SV-3410 only).
- Hone longer bores with the SV-3400 series featuring a vertical stroke travel of: 762 mm (30 in.) [SV-3410]; 528 mm (20.75 in.) [SV-3415]; 1475 mm (58 in.) [SV-3460]; or 2285 mm (90 in.) [SV-3490].
- Heavy-duty cast iron base [SV-3410/3460/3490].
- Optional servo rollover cradle (for v-block application, SV-3410 only).
- SV-3415 includes standard servo index table (3 position) with bi-directional .001° repeatability.
- Standard LED work area lighting.
- Latest in safety technology including safety PLC, Safe Drive System, and secondary brake on column stroking system, European Machinery Directive (CE) compliant – all standard.

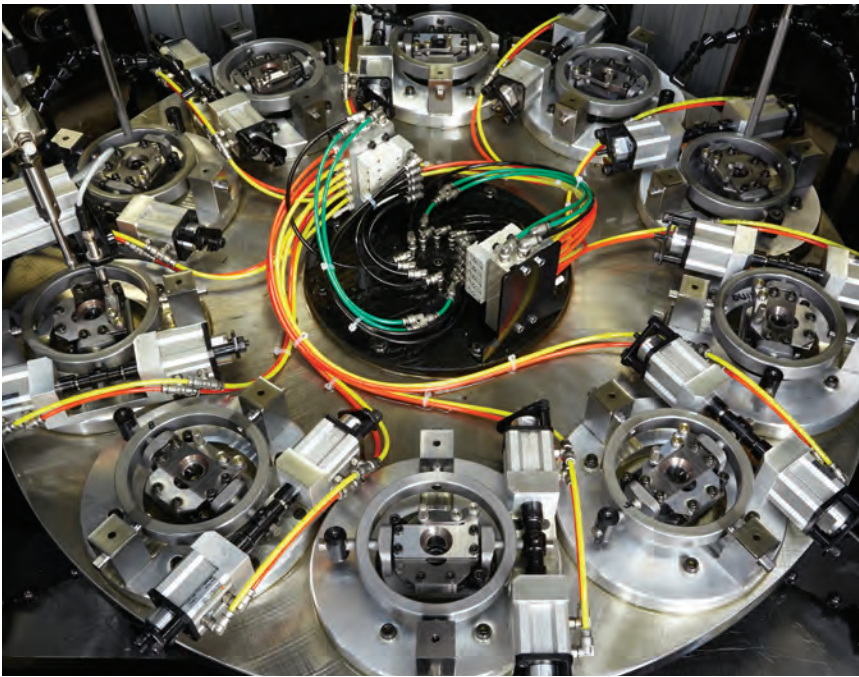




NEW

Sunnen2 Control System

- Windows®-based PC touch screen control system coupled with servo tool feed provides optimum process control with ease of set-up.
- Intuitive touch screen ensures new machine operators are quickly trained. Setup time is minimized.
- Infinite adjustability of honing parameters allows processing of complex bore configurations such as blind bores, thin wall parts, etc.
- State of the art Beckhoff electronics.
- Bore profile display shows bore straightness during the cycle.
- Large 470 mm (18.5 in.) color touch screen.
- Servo Control X-axis (left-right 1143 mm (45 in.) travel) allows programming positions for multiple in-line bore honing. Available on SV-3410 only.
- Configurable, multi-level permissions allow varying levels of access depending on user role.
- Optional post-process gaging system with industry leading SPC software allows data collection and machine process control to sub-micron tolerances.
- Optional OPC-UA interface allows access for remote monitoring.
- Fast, simple setup using hand wheel control for tool feed, vertical, servo left-to-right position [SV-3410 only] and optional servo cradle.
- Advanced servo stroke control delivers a consistent crosshatch pattern and allows the machine to short stroke or dwell in any part of the bore, end-to-end for incredibly precise honing.
- Patented load-sensing feed can operate in either constant spindle load or constant rate mode.
- Auto-Dwell feature corrects bore straightness automatically (great for blind holes).
- Optional automation interface.
- Includes EtherCAT industrial communications protocol to minimize machine response time and increase level of control.
- Multiple languages available.



Customize the SV-3400 To Your Exact Requirements

Sunnen's high-precision SV honing systems represent the very finest solutions available anywhere in the world. With over 600 systems delivered globally, they are reliable, durable, and flexible systems designed to deliver the production quality and precision our customers have grown to expect.

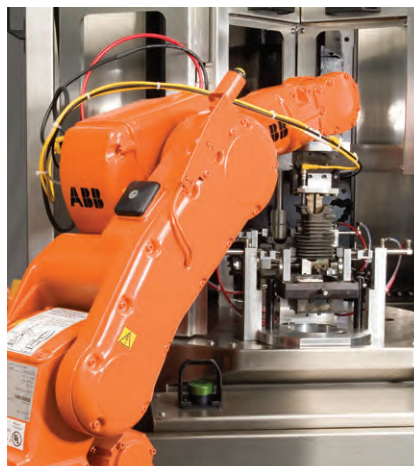
From design to delivery, you have the Sunnen commitment to service and quality assurance. Our technical experts will work with you to determine the number of spindles, style of tooling, fixturing, abrasives, in-process and/or post-process gaging, and method of parts loading and unloading (including robotics) you require. Then we'll provide you a written proposal.

After your system is built, we'll set up a live run-off demonstration at our facility. Once it meets all specifications, we'll commission your system and train your staff.

SV-3400 Series Automation Options

Our automation options are designed to increase the operational efficiency of your precision honing system. They shorten cycle times, increase tool life, and – most importantly – radically reduce labor costs. Sunnen automation solutions can keep your system running 24 hours a day, seven days a week.

A two-axis or multi-axis servo robot can be integrated into a Sunnen modular honing system.



Specifications

DIAMETER RANGE

19 mm – 203 mm (.75 in. – 8 in.)

WORKPIECE WEIGHT

900 kg (2,000 lbs.)

WORK AREA ENVELOPE (TABLE)

1016 mm x 1778 mm (40 in. x 70 in.)

CARRIAGE TRAVEL

SV-3410: Up to 762 mm (30 in.)

SV-3415: Up to 528 mm (20.75 in.)

SV-3460: Up to 1475 mm (58 in.)

SV-3490: Up to 2285 mm (90 in.)

RECIPROICATION RATE (STROKE)

SV-3410/SV-3415: Up to 186 strokes per minute

SV-3460: Up to 186 strokes per minute

SV-3490: Up to 130 strokes per minute

STROKER MOTOR

8.0 kW (10.8 HP)

SPINDLE SPEEDS

SV-3410/SV-3415/SV-3460: 10 to 600 rpm

SV-3490: 5 to 500 rpm

SPINDLE MOTOR

6.3 kW (8.5 HP)

TOOL FEED

Rotary Servo Control

X-AXIS (SV-3410 ONLY)

Travel: 1143 mm (45 in.)

Speed: .001 to .095 mps

COOLANT SUMP PUMP

Centrifugal Pump

0.5 kW (0.67 HP) / 257 lpm (68 gpm)

FLOOR SPACE *(Coolant Tank Not Included)*

SV-3410: 2600 mm W x 3507 mm D x 2900 mm H (98 in. W x 138 in. D x 114 in. H)

SV-3415: 3000 mm W x 4268 mm D x 2764 mm H (118 in. W x 168 in. D x 109 in. H)

SV-3460: 2600 mm W x 3947 mm D x 4600 mm H (102 in. W x 155.5 in. D x 181 in. H)

SV-3490: 2600 mm W x 3947 mm D x 5885 mm H (102 in. W x 155.5 in. D x 232 in. H)

FLOOR WEIGHT *(Dry)*

SV-3410: 3216 kg (7,090 lbs.)

SV-3415: 2615 kg (5,880 lbs.)

SV-3460: 5500 kg (12,125 lbs.)

SV-3490: 6294 kg (14,000 lbs.)

PNEUMATIC REQUIREMENTS

5.5 to 6.9 Bar (80 to 100 psi) (not required for SV-3410, SV-3460, SV-3490 machines except for certain options). Required for SV-3415 machine.

ELECTRICAL REQUIREMENTS

460V, 60Hz, 3Ph

400V, 50Hz, 3Ph

NOISE EMISSION

Less than 72 db(a) continuous load (max. noise) condition in a factory environment.

Tooling, Abrasives and Lubricants

The SV-3400 series features the latest technology in vertical honing for bores 19 mm to 203 mm (.75 in. to 8.0 in.).* Tooling choices include diamond or Borazon multi-stone tools and vitrified abrasives tools.

PH PRECISION MULTI-STONE HONING TOOLS

New features on this line of multi-stone honing tools optimize bore geometry and efficiency in mid- and high-volume production applications. Tools can be built to meet any need, and are available in single-stage and two-stage models. PH tools can hold 12 or more stones to produce optimum straightness and roundness. Available with integral plug sizing or in-process air gaging.

Bore Diameter Range:

50 mm – 203 mm (2.00 in. – 8.0 in.)+



CV/CK CYLINDER HONING TOOLS

Two abrasives and two die cast zinc guides provide an effective way to finish a large range of bore diameters. These tools use conventional abrasives and can be fitted with metal bond super abrasives, plus they're well suited for short production runs, engine rebuilding, and other precision honing operations.

Bore Diameter Range:

CK-2000: 51 mm – 76 mm (2.0 in. – 3.0 in.)+

CK-2600: 66 mm – 89 mm (2.60 in. – 3.50 in.)+

CK-3000: 76 mm – 127 mm (3.0 in. – 5.0 in.)+

CK-4000: 102 mm – 203 mm (4.0 in. – 8.0 in.)+



GHSS SINGLE-STAGE MULTI-STONE TOOLS

These tools use precision graded Sunnen metal bond CBN and diamond abrasives to provide fast cycle-time, consistent geometry and surface finish accuracy, and utilize multiple abrasive stones to lower costs.

Bore Diameter Range:

37.59 mm – 140.71 mm (1.480 in. – 5.540 in.)+



GHTS TWO-STAGE MULTI-STONE TOOLS

These versatile tools perform both rough and fine honing operations (stone or brush) within the same honing tool – without changing stones – to reduce your bore sizing costs.

Bore Diameter Range:

62 mm – 140.71 mm (2.440 in. – 5.540 in.)+

P20/P28 MANDRELS

These mandrels incorporate multiple stones aligned end-to-end to allow for long bore honing, with the P28 accommodating blind bore honing as well. Both P20 and P28 mandrels have replaceable abrasives and guide shoes.

Bore Diameter Range:

P20: 19 mm – 25.40 mm (.75 in. – 1.000 in.)+

P28: 25.15 mm – 152.40 mm (0.990 in. – 6.000 in.)+



MPS MODULAR TOOLING

These are the first building block tooling system for honing large pieces. With MPS tooling you can convert any “big work” honing machine into a new bore finishing system and you can tailor tooling to fit your jobs. All components are standard and interchangeable and most are available from stock for immediate delivery.

Bore Diameter Range:

62 mm – 140.71 mm (2.440 in. – 5.540 in.)+



* Diameter range, length range and workpiece weight are contingent on workpiece and application.

+ For diameter sizes below or above the standard range, or for specially designed high production tools, contact your Sunnen Field Engineer.

Sunnen Abrasives & Lubricants

From aluminum oxide to silicon carbide to diamond and CBN, Sunnen offers the industry's largest variety of mounted or un-mounted stick abrasives, bond types, grain sizes and stone configurations.

Before any stone is shipped, it is graded and qualified, maintaining the most exacting quality control standards in the industry to assure you of the most precise honing performance available.



Sunnen's premium honing oils and coolants provide extreme lubricity for higher honing pressure and harder abrasives, delivering faster, lower cost-per-part and ultimately more profitable cutting rates.

A LEGACY OF EXCELLENCE SINCE 1924

Sunnen Worldwide

With world headquarters in St. Louis, Missouri, Sunnen is the largest fully integrated company in the world specializing in precision bore creation, sizing and finishing equipment. A Sunnen solution might include honing, lapping, skiving/roller burnishing or deep hole machining...or a combination of those processes.

Our 13 international affiliates and over 40 authorized distributors allow us to deliver top quality Sunnen machines, tools, service and training wherever they are needed around the globe.

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