

THE WORLD LEADER IN HIGH-PRECISION HONING TECHNOLOGY



ABOVE AND BEYOND **HONING**



Precision Machines, Quality Accessories,
& Unparalleled Service and Support:

That's The Sunnen Solution.



WHEN IT COMES TO HIGH-PRECISION HONING

MORE MACHINES | MORE TOOLING | MORE ABRASIVES | MORE HONING FLUIDS | MORE GAGING

SUNNEN PRODUCTS COMPANY is the leader in precision bore sizing systems worldwide. When you choose the “Sunnen Solution,” you get the industry’s best honing machines, precision bore gages, tooling, fixturing, abrasives, honing oils, coolants, and accessories – all working together to satisfy your specific production needs.

With over 80 years of technological leadership, Sunnen provides innovative, precision honing solutions for an incredibly wide range of industries

and applications. We produce the industry’s largest selection of honing machines – horizontal or vertical, single or multi-spindle, automated or manual, standard or customized – and our systems are designed with a focus on reliability, flexibility and ease of use.

As the world’s largest integrated honing systems supplier, we maintain Advanced Technology Centers around the globe, dedicated to finding

specialized solutions to our customers’ specific application challenges. Within those centers are climate-controlled metrology laboratories, outfitted with state-of-the-art bore measurement equipment, allowing Sunnen to continually push the envelope in honing tolerances and surface finish geometry.

No matter what your bore sizing challenge may be, anywhere in the world, we have the “Sunnen Solution” for you!



FUEL INJECTORS

Delivering high pressure injectors, lower emissions and better fuel economy.



HYDRAULICS

For higher-pressure, longer lasting hydraulic valves and components.



GEARS

Greater precision and advanced surface finishes for smoother running gears.

Sunnen's wide range of standard products and

SOLUTIONS, **SUNNEN** DELIVERS.

MORE FIXTURING | MORE AUTOMATION | MORE PRECISION | MORE CHOICES

SUNNEN's MISSION:

To deliver solutions that improve the performance of our customers. Better products make a better world.

TECHNOLOGY. QUALITY. PARTNERSHIP.



CYLINDER LINERS

Consistent crosshatch for lower emissions, better fuel economy, and reduced oil consumption.



SMALL ENGINES

Superior accuracy and advanced surface finishes deliver lower emissions and greater fuel efficiency.



OIL & GAS

The technological leader for high precision honing of all types of down-hole oil field instruments and tubes.

custom solutions all have one thing in common: THEY EXCEED OUR CUSTOMERS' EXPECTATIONS.





SV-1000 SERIES

VERTICAL HONING MACHINES

The SV-1000 Series is capable of holding the industry's tightest production environment tolerances – as fine as 0.00025 mm (0.000010 inch) – tolerances far superior to I.D. grinding.

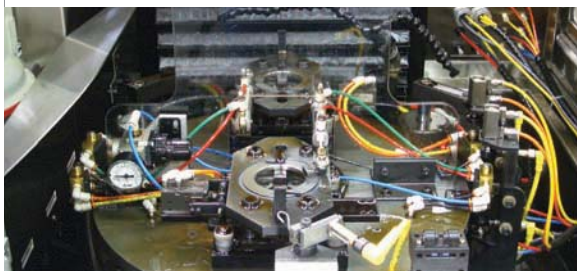
Built on a proven, modular platform, the SV-1000 Series can be easily customized and automated to suit your exact specifications – whatever your needs demand, from multiple spindles to air gaging. Plus, this flexible system supports both single-pass and conventional reciprocating honing. Brushing stations can also be added.

A Windows®-based PC control features easy-to-use dropdown menus and the ability to save job set-ups for later use.

Perfect for mid- to high-production manufacturers, the SV-1000 Series delivers the lowest cost per honed part with the tight bore tolerances you expect from Sunnen.

BORE DIAMETER RANGE (I.D.):*

3 mm – 65 mm
(.118 inch – 2.56 inch)



SV-410

VERTICAL HONING MACHINE

This versatile system combines power, precision, durability, and technology to make vertical honing more economical and productive than ever before.

The SV-410 incorporates a patent-pending 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. A Windows®-based PC control simplifies the honing process.

For ease of setup, the SV-410 features a 3-axis hand wheel for fine-tuning the vertical stroke, honing tool position, and column position. Multiple positions can be programmed for in-line bore honing. And, because it's built on a proven, modular platform, this system can be automated or otherwise customized to meet your exact requirements, including in-process air gaging.

BORE DIAMETER RANGE (I.D.):*

19 mm – 200 mm
(.75 inch – 8 inch)



* OTHER SIZES
AVAILABLE
UPON REVIEW.



SV-500 SERIES

VERTICAL HONING MACHINE

The SV-500 Series features the latest in honing technology. Using a linear feed system that allows the most precise and fastest feed control on the market, this system delivers mid- to high-volume manufacturers the lowest costs per honed part.

The all-new, patent pending stroking system produces a true vertical stroke that can dwell in any part of the bore – selectively removing stock – delivering a true constant crosshatch pattern throughout the entire length of the bore with no rollover. And the Auto-Dwell feature corrects bore straightness automatically – great for blind bores.

A Windows®-based PC control simplifies the honing process while a 3-axis hand wheel allows fine-tuning of the vertical stroke, honing tool position and column position for ease of set-up.

Built on a proven, flexible platform, this versatile system can be automated or otherwise customized to satisfy most any application requirements, including in-process air gaging.

BORE DIAMETER RANGE (I.D.):*

19 mm – 300 mm
(.75 inch – 12 inch)



VSS® SERIES 2

SINGLE STROKE® HONING SYSTEM

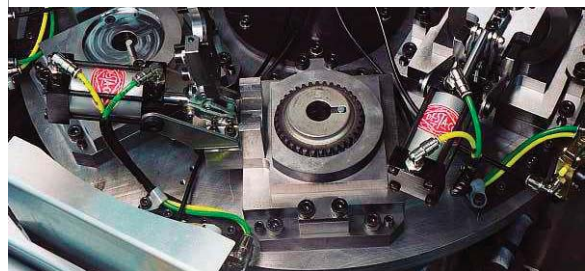
The VSS-2 is a value-priced single-pass honing machine that delivers precise bore size, geometry and surface finish. It is very easy to set up and operate and is the most productive machine in its class.

An advanced spindle design and multiple spindle configurations (up to six) make the VSS-2 a versatile solution for virtually any production environment. The system's PLC control with Sunnen software makes set-up and operation easy. Column feed and spindle speed are easily varied throughout the cycle for process optimization.

The system is the perfect solution for mid- to high-production applications that are suited to single-pass bore sizing.

BORE DIAMETER RANGE (I.D.):*

4 mm – 65 mm
(.156 inch to 2.56 inch)



* OTHER SIZES
AVAILABLE
UPON REVIEW.



SV-10

VERTICAL HONING MACHINE

The SV-10 is designed with power, precision, durability, and advanced technology to deliver state-of-the-art performance, and is perfect for honing large, heavy, and odd-shaped work pieces.

The SV-10 is power packed with two motors – one for the spindle and one for the stroker. This combination provides the muscle to run our DH-Series Diamond Hone Heads with multi-point cutting action, in addition to Sunnen's full array of industrial tooling.

The easy-to-use, yet highly advanced touch screen control projects Sunnen's patented full-bore profile display. This real time graphical display of the cross section allows the operator to dwell in the exact position where the bore is visually smaller – eliminating guesswork.

BORE DIAMETER RANGE (I.D.):*

19 mm – 200 mm
(.75 inch – 8 inch)



ML-2000/4000/5000

AUTOMATIC HONING MACHINES

The Sunnen ML-Series of horizontal power stroked honing machine is up to six times faster than I.D. grinding and can be set up in half the time. The fast stock removal rates also allow the elimination of preliminary reaming, boring or grinding on many jobs.

The top-of-the-line ML-5000 offers programmable stroke control which virtually eliminates taper by allowing the honing tool to dwell or short stroke at either end of the bore. Cycle time control delivers increased productivity and consistency by automatically adjusting feed pressure to optimize abrasive performance.

The ML-Series machines deliver optimum bore geometry and produce a desirable oil-bearing crosshatch finish, and can be automated for mid- to high-production applications.

BORE DIAMETER RANGE (I.D.):*

1,5 mm - 165,1 mm
(.060 inch - 6.500 inch)



* OTHER SIZES
AVAILABLE
UPON REVIEW.

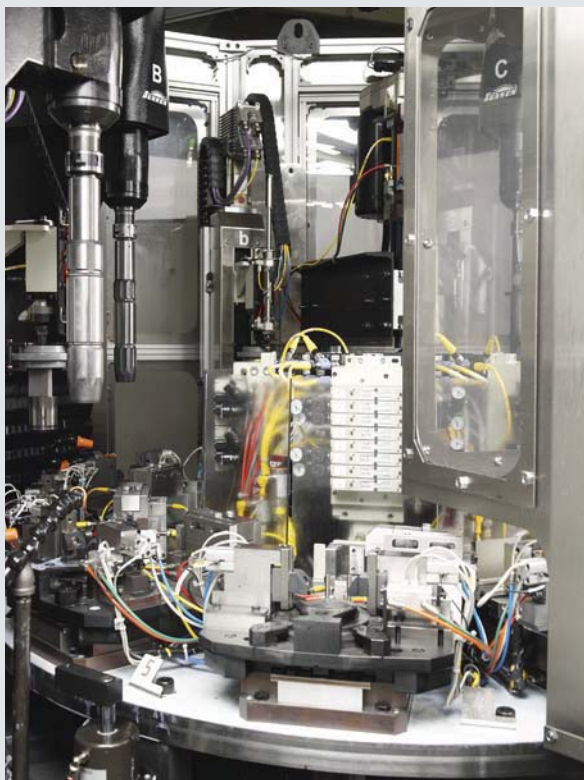
MAKE YOUR SUNNEN SOLUTION WORK EVEN HARDER WITH INNOVATIVE TECHNOLOGY AND AUTOMATION OPTIONS.

MULTI-FEED TECHNOLOGY

A FIRST IN HONING

Sunnen's patented multi-feed technology gives users a revolutionary choice of tool-feed modes to achieve the shortest cycle times, lowest part cost, and longest abrasive life.

Multi-feed combines Sunnen's controlled-force tool-feed with its controlled-rate feed system. The two different tool-feed modes allow the user to select the better option to suit the workpiece geometry, material and tool type/size. Multi-feed technology is available as an option on new machines in Sunnen's SV-1000 and SV-500 Series, as well as a retrofit for existing machines in these series.



Our fixturing, automation and other customization options are designed to increase the operational efficiency of your precision honing system while significantly reducing labor costs. From integrated air gaging to robotic work-piece handling, Sunnen solutions can be customized to satisfy the requirements of even the most specialized applications.

INTEGRATED AIR GAGING

At the beginning, middle, or end of the honing process, Sunnen's integrated air sizing systems are designed to ensure precise bore size and straightness, part after part.

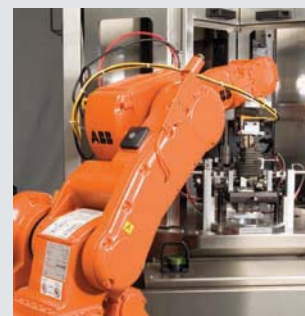


INTEGRATED AIR SIZING SYSTEMS CONTROL THE ACCURACY OF BOTH ROUGHING AND FINISHING PROCESSES.

** AVAILABLE ON SV-1000, SV-310 AND SV-500 SERIES MACHINES.*

AUTOMATION OPTIONS

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



MULTI-AXIS SERVO ROBOT SHOWN INTEGRATED INTO A SUNNEN MODULAR HONING SYSTEM.

SUNNEN PRECISION TUBE HONING SYSTEMS

HT SERIES PRECISION HORIZONTAL TUBE HONING SYSTEMS

Sunnen's HT Series tube honing systems are designed for a wide range of industries and processes, from small-diameter precision parts to large-diameter oil field instruments and tubes.

With spindle power ranges from 1.5 kW to 30 kW (2 to more than 40 horsepower), these versatile systems boast features such as: A unique tool expansion and feed system that maintains close size and finish specifications; touch screens for easy programming; PC or PLC controlled stroke position, motion, stone feed and cutting; automatic bore geometry correction; and servo rack or chain drive.

Whatever your application – from aircraft components to gun barrels to very large hydraulic cylinders – Sunnen has a high performance tube honing system for you.

HTA SERIES

SPINDLE POWER: 2.24 kW (3 Hp)

STROKE LENGTH: Models available for 2 and 4 meters (6.56 and 13.12 ft)

BORE DIAMETER RANGE (I.D.):

64 – 533 mm

(2.5 inch – 21 inch)



HTB SERIES

SPINDLE POWER: 3 kW (4 Hp)

STROKE LENGTH: Models available from 2 to 10 meters (6.56 to 32.8 ft)

BORE DIAMETER RANGE (I.D.):

25 – 350 mm

(.984 inch – 13.78 inch)

HTS SERIES

SPINDLE POWER: 7 kW (9.5 Hp)/12 kW (16.5 Hp)

STROKE LENGTH: Up to 13750 mm (45 ft.)

BORE DIAMETER RANGE (I.D.):

20 – 1000 mm

(.8 inch – 39.37 inch)

HTC SERIES

SPINDLE POWER: 1.5, 2.2, 7, and 9 kW models available (2, 2.95, 9.4 and 12 Hp)

STROKE LENGTH: Models available from 0.5 to 12 meters (1.64 to 39.37 ft)

BORE DIAMETER RANGE (I.D.):

3 – 1000 mm

(.118 inch – 39.37 inch)

HTD SERIES

SPINDLE POWER: 22 and 30 kW

models available (29.5 and 40.23 Hp)

STROKE LENGTH: Models available from 4-16 meters (13.12 to 52.5 ft)

BORE DIAMETER RANGE (I.D.):

50 – 700 mm

(1.96 inch – 27.56 inch)



HTG HEAVY DUTY TUBE HONE

For decades, Sunnen's GH-210 has been the industry standard for high precision honing of all types of down-hole oil field instruments and tubes. Sunnen once again leads the way with the new HTG Series tube honing system. With all the reliability of the GH-210, the HTG Series machines are faster, more precise and are even more powerful with many new features.

The Sunnen HTG tube hone, with GH tooling and abrasives, is the solution for the heavy-duty yet precise demands of the oil industry... and any industry that requires precise honing of long parts.

SPINDLE POWER: 29.83 kW (40 Hp)

STROKE LENGTH: Models available from 4 meter (13.12 ft) - 14 meter (45.93 ft)

BORE DIAMETER RANGE (I.D.):

50.8 - 609.6 mm (2-24 inches)



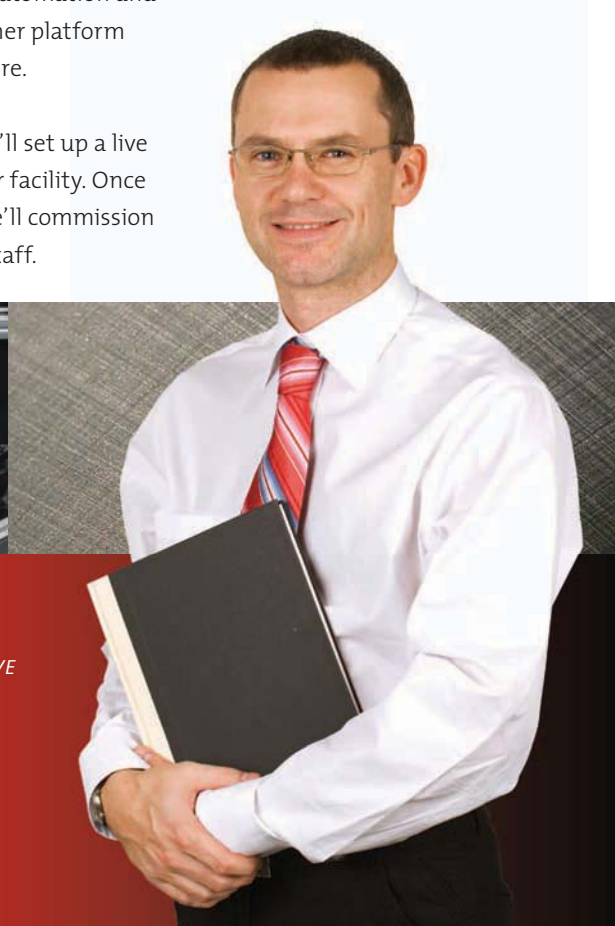
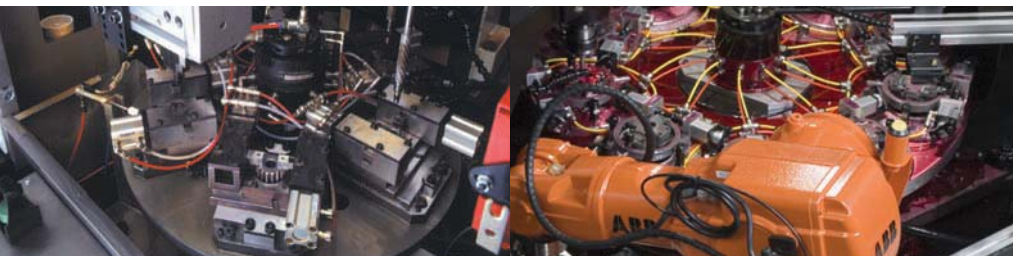
CUSTOM, HIGH-PRODUCTION SYSTEMS

Sunnen's new generation of high precision honing systems represent the very finest solutions available anywhere in the world. Sunnen systems are reliable, durable, and flexible and are designed to deliver the precision our customers have grown to expect.


From design to delivery, you have the Sunnen commitment to service and quality. Our technical experts will work with you to create

a complete "turnkey" solution to fit your exact requirements, including the machine model, number of spindles, style of tooling, fixture design, abrasives selection, automation and gaging packages, and any other platform customization you may require.

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.



"We can customize and automate many of our systems to meet your specialized honing requirements. Just contact your Sunnen Representative for a FREE needs analysis or to get the design process started."



THE SUNNEN SOLUTION: HIGH-PERFORMANCE TOOLING, ABRASIVES, OILS, COOLANTS, AND ACCESSORIES

TOOLING

As the world's foremost authority on honing, we have more than 80 years of experience in the development and production of honing tools. Our tooling line includes standard mandrels, retractable stone mandrels, plated-diamond Single Stroke® and KROSSGRINDING® tools, the MPS Modular Tool System, General Hone® brand heavy duty hone heads, MMT™ Mandrels, the new KRQ Quick Change mandrels, and a wide variety of two-stage and multi-stone tools.

ABRASIVES

Sunnen offers the industry's most comprehensive line of honing stones, including diamond and CBN superabrasives. The line includes both mounted abrasives and unmounted stick abrasives compatible with non-Sunnen machines. Sunnen honing stones are manufactured in our own dedicated facility to meet our own exacting quality standards. With Sunnen abrasives, our honing operation can achieve the optimum in precision, quality, and consistency.



PREMIUM HONING OILS & COOLANTS

Sunnen offers the right honing oil, including an all vegetable environmentally friendly oil, or water base coolant for virtually any honing application. Our premium line of honing oils and coolants, developed by Sunnen specifically for honing applications, will help deliver superior cutting rates and produce the lowest overall honing cost per part.

Typically, honing lubricant cost per part is less than one-tenth of one percent of the total. Yet, a slight decrease in cycle time or a decrease in abrasive consumption resulting from a better lubricant repays the cost of premium honing oil many times over.

Your investment in top-quality Sunnen honing oils, saturated with surface active agents, provides the extreme lubricity that allows you to use higher honing pressure and harder abrasives for faster, more profitable cutting rates.

Some honing applications produce better results using one of Sunnen's water base coolants. You can rely on your Sunnen Field Engineer or our Sunnen Technical Centers to advise you whether Sunnen honing oil or water base coolant is best for your specific application.



BORE GAGES

Shops around the world know the best way to check the accuracy of honed parts is with Sunnen bore gages. We offer two styles and dozens of models to meet your specific bore sizes and applications, all robustly designed for continuous use on the floor shop.



The **SUNNEN "PG" BORE GAGING SYSTEM** is a unique mechanical system (gage and setting fixture) that makes I.D. gaging simple, reliable and economical. No need to buy and maintain costly master rings and air gage probes. Both gage and setting fixture are built tough for everyday use, making them ideal for bore inspection during production.



SUNNEN'S DIAL BORE GAGES offer foolproof setup with Sunnen Setting Fixtures – eliminating the need for ring gages, micrometers or jo blocks. These gages are easy to use, fast, durable, and accurate.

WORLDWIDE



Our global manufacturing, sales, and service network allows us to deliver quality Sunnen solutions worldwide. And our network of more than 50 authorized Sunnen international distributors is second to none.

Sunnen's state-of-the-art Advanced Technology Centers – located in the US, Switzerland, and China – allow our technical experts to develop innovative solutions to customer application challenges. The Centers also provide answers for customer questions and training for Sunnen representatives around the globe.

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