



# WHEN IT COMES TO HONING HYDRAULIC VALVES, SUNNEN DELIVERS.

MORE MACHINES | MORE TOOLING | MORE ABRASIVES | MORE HONING FLUIDS | MORE GAGING | MORE FIXTURING | MORE AUTOMATION | MORE PRECISION | MORE CHOICES



With over 80 years of technological leadership, Sunnen has *the* solution for the precision honing of all types of hydraulic valves and components. Our advanced, precision bore machining technology:

- Delivers improved bore accuracy for higher pressure operation and efficiency
- Reduces the clearance between the bore and the spool, reducing valve leakage
- Creates surface finishes that wear at a slower rate leading to longer valve life
- Provides improved process control and greater accuracy, reducing valve rejection rate

We can provide a system for virtually any hydraulic valve application, including:

- Bore diameters from 1,5 mm – 165 mm (.118 inch – 6.5 inch)\*
- Multi-land bores or simple bores, with and without cross bores
- Open or blind bores
- A wide range of materials and surface finishes

Only Sunnen offers all three types of honing technologies – conventional, single-pass or KROSSGRINDING®. We also offer the industry's largest choice of machines – horizontal or vertical, single or multi-spindle, automated or manual, standard or customized – so no matter what you require, we have the Sunnen solution.

\* OTHER SIZES AVAILABLE UPON REVIEW.

## SUNNEN PROVIDES GLOBAL SUPPORT

*Sunnen's worldwide sales and service team provides comprehensive support for the installation and operation of every system we make. To find the Sunnen representative nearest you, visit our website:*  
[www.sunnen.com](http://www.sunnen.com)

**SUNNEN**<sup>®</sup>





**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 (0.00010 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.

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)\*



**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 just about any production environment. And the system's PLC control with Sunnen software makes operation easier and provides more feed, speed and special cycle options to satisfy a wider range of applications.

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)\*



**KGM™ -5000**  
*KROSSGRINDING® SYSTEM*

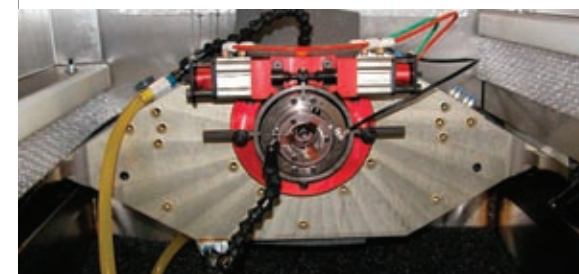
Sunnen's KGM-5000 KROSSGRINDING System sets the industry standard for precision size control and bore geometry in a horizontal spindle system.

No other mid- to high-production horizontal spindle honing system on the market can match the precision roundness, straightness, bore size, and finish capabilities of the KGM-5000. The system is able to hold production environment tolerances as fine as 0,00025 mm (0.00010 inch).

The menu-driven Windows® operating system makes set up and operation easy – even for unskilled operators. Separate set-ups can be entered and saved for future production runs, saving time and money in the process.

High precision combined with ease of use. The KGM-5000 KROSSGRINDING System is a field-proven, profit-producing fit for virtually any shop.

**BORE DIAMETER RANGES (I.D.):**  
 3 mm – 65 mm  
 (.118 inch – 2.56 inch)\*



**ML-5000**  
*AUTOMATIC HONING MACHINE*

The Sunnen ML-5000 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 of the ML-5000 also allow the elimination of preliminary reaming, boring or grinding on many jobs.

Programmable stroke control 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-5000 delivers optimum bore geometry and produces a desirable oil-bearing crosshatch finish, and can be automated for mid- to high-production applications.

**BORE DIAMETER RANGES (I.D.):**  
 1,5 mm - 165,1 mm  
 (.060 inch - 6.500 inch)\*



\* OTHER SIZES AVAILABLE UPON REVIEW.



## CUSTOM, HIGH-PRODUCTION VERTICAL HONING SYSTEMS

Since 1924, Sunnen has defined the state of the art in the industry, and our current generation of high precision honing systems represents 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 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.



*"BECAUSE OF THEIR VERSATILE DESIGN, WE CAN CUSTOMIZE AND AUTOMATE MANY OF OUR SYSTEMS TO MEET YOUR SPECIALIZED HYDRAULIC COMPONENT HONING REQUIREMENTS. JUST CONTACT YOUR SUNNEN REPRESENTATIVE FOR A FREE NEEDS ANALYSIS TO GET THE DESIGN PROCESS STARTED."*



## TOOLING

Sunnen offers an extensive line of tooling that delivers precise, accurate and consistent bore sizing of hydraulic valve components. Tooling choices include diamond or CBN multi-stone tools and vitrified abrasive tools.



### CGT TOOLS

**KROSSGRINDING® Plated Diamond Tools**  
High-precision, plated diamond tools deliver extreme accuracy, excellent stock removal capability and long life (tool wear is next to zero per cycle). These tools hold tolerances to within 0,00025 mm (0.000010 in), even in a production environment.

### BORE DIAMETER RANGE:

3 mm - 32 mm  
(.118 inch - 1.20 inch)\*

### MMT MULTI-STONE MANDRELS

These mandrels offer faster cycle times, superior accuracy, longer time between stone changeovers, and maintain superior bore geometry.  
*ABRASIVE SELECTION: METAL BOND CBN OR DIAMOND ABRASIVES*

*CUSTOM-DESIGNED FOR YOUR SPECIFIC APPLICATION*

### SINGLE STROKE® HONING TOOLS

Sunnen's line of Single Stroke® Honing tools provide fast stock removal and consistent bore geometry. With our new generation of HPH (High Production Helix) plated diamond single-pass honing tools, you can size thousands of bores with the same tool, reducing your production costs.

### BORE DIAMETER RANGE:

4 mm - 52,2 mm  
(.156 inch - 2.055 inch)\*

### STANDARD MANDRELS

For bores under 150 mm (6 inch) in diameter, the industry-standard Sunnen mandrels provide straightness and roundness with minimum stock removal. Standard mandrels can be supplied for blind hole honing, with multiple stones for honing long bores.

### BORE DIAMETER RANGE:

1,5 mm - 165 mm  
(.06 inch - 6.5 inch)\*

## SUNNEN-MADE 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 offers the right honing oil or waterbase coolant for virtually any honing application. The use of Sunnen's premium line of lubricants will help produce the lowest overall honing cost per part.

\* OTHER SIZES AVAILABLE UPON REVIEW.



A LEGACY OF EXCELLENCE SINCE 1924.

## WORLDWIDE

Our global manufacturing, distribution, and sales and service network allows us to deliver quality Sunnen solutions worldwide.

And our state-of-the-art Technical Services Centers 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 world.

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