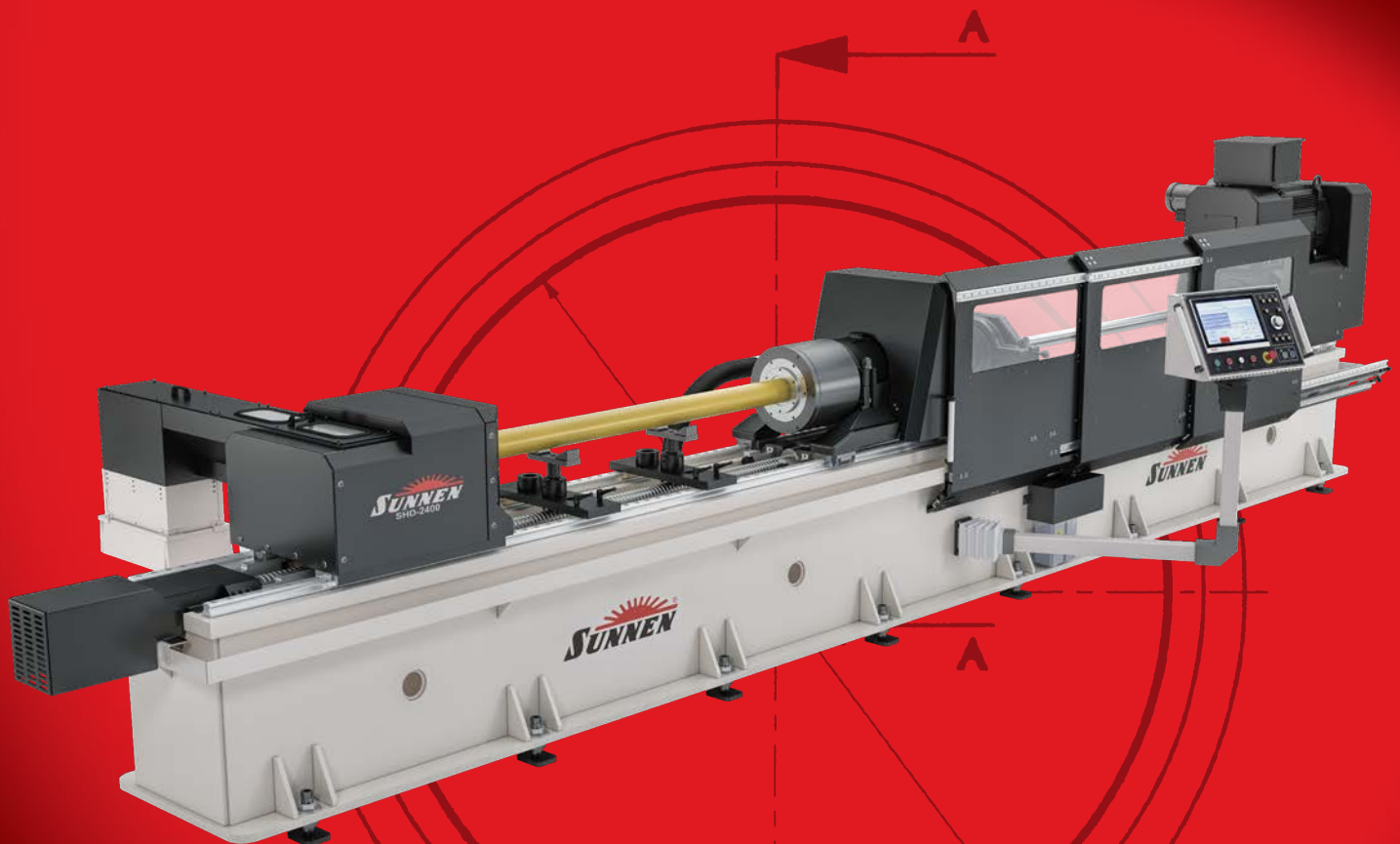




ABOVE AND BEYOND HONING

SHDS SERIES

SKIVING AND ROLLER BURNISHING SYSTEMS



$\varnothing 137.185 \pm 0.025$

| | | |
|--|-----------|------|
| | 0.18 | A-B |
| | 0.025 | LG H |
| | 0.013/20° | LG H |

SUNNEN'S SHDS SERIES SKIVING/ROLLER BURNISHING



Sunnen Products Company, the global leader in honing technology since 1924, now offers a cost effective bore sizing solution for hydraulic cylinders and other high production applications. The new SHDS series skiving and roller burnishing systems are up to 70 percent faster than traditional honing and are engineered to deliver precise tolerances and quality surface finishes.

The SHDS systems were designed with input from the hydraulic cylinder industry up front. Every feature was scrutinized to improve the productivity and

reliability of the machine. The prototype was tested on the punishing environment of the factory floor of a high production hydraulic cylinder manufacturer to further refine the design. This design and testing effort coupled with the use of heavy duty name brand components ensures years of trouble free operation. Change over and run times are minimized ensuring process profitability. Sunnen also offers the complete solution with not only machines but tooling, coolants, and coolant systems. Backed by a 3-year machine warranty and a global service and support network.



System shown with coolant system, safety guarding and chip removal system.



SYSTEMS FOR IMPROVED PRODUCTION RATES



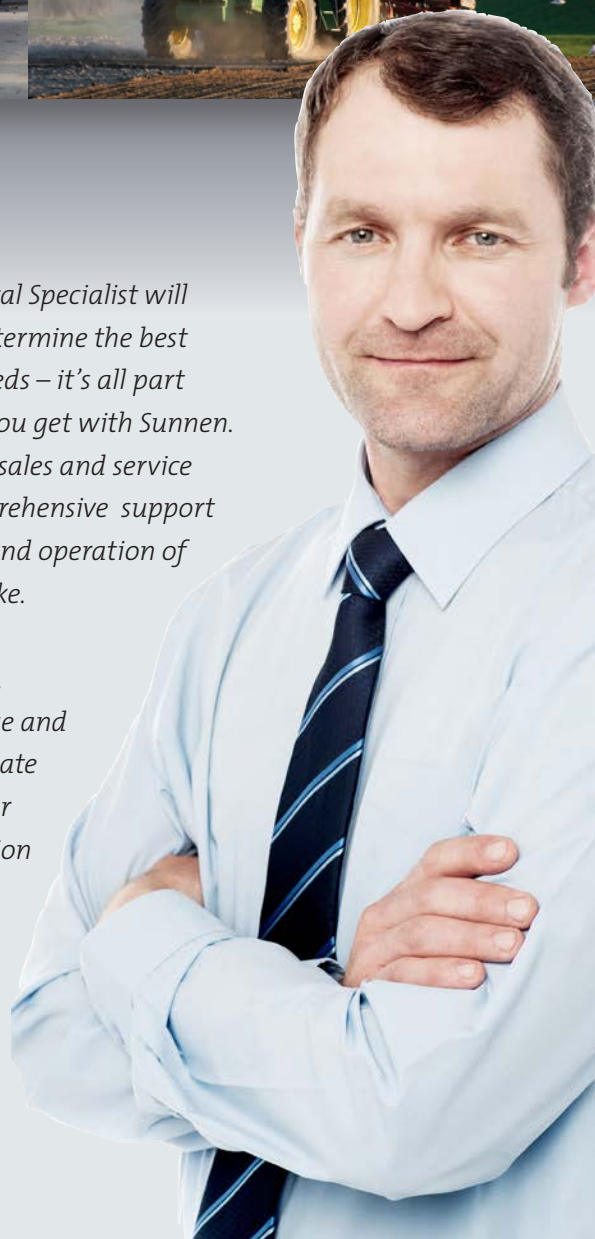
Only Sunnen offers both honing and skiving/roller burnishing so the most cost effective bore finishing process may be selected for your specific application.

The advantages of the Sunnen Skiving/Roller Burnishing systems include:

- Improved surface finish — as fine as .10 to .15 microns (4 to 6 micro inch) (Ra) on average.
- Improved size control — tolerances within 0.0254 mm (.001 inch) on average and much finer for special applications.
- Increased surface hardness.
- Improved fatigue life.
- Enhanced corrosion resistance.
- Elimination of tool marks and minor surface imperfections.
- Faster production of hydraulic cylinders at a lower cost compared to other ID finishing processes.

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.



SUNNEN AND THE SUNNEN LOGO ARE
REGISTERED TRADEMARKS OF
SUNNEN PRODUCTS COMPANY

EASY-TO-USE, EFFICIENT, HEAVY-DUTY UP TO 70 PERCENT FASTER THAN HONING



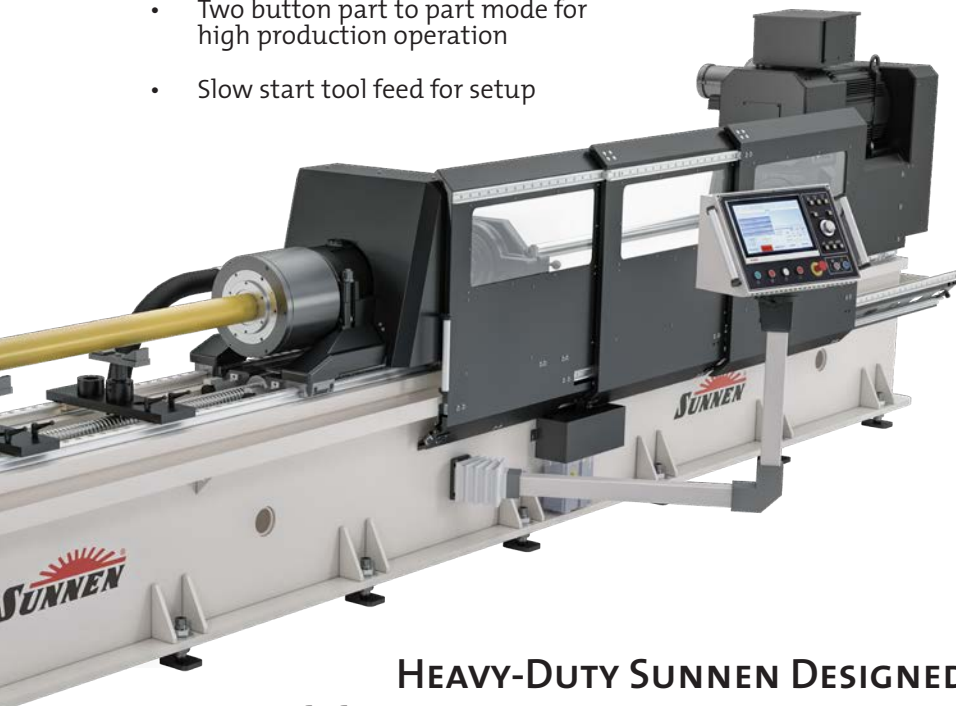
- **Available in three standard models**
2-meter maximum part length (SHD-2500S)
4-meter maximum part length (SHD-4500S)
6-meter maximum part length (SHD-6500S)
- Large 394 mm (15.5 in) color HMI with intuitive controls for ease of use.
- Heavy-duty Bosch-Rexroth 55 mm (2.16 in) linear rails for maximum durability.
- Standard safety system with a combination of multiple E-stops, light curtains, interlocked guarding and fencing.
- Manufactured to finish the inside diameter of a hydraulic cylinder in a single pass within a minimum amount of time. Maximum feed rate of 125 mm/sec (4.9 in/sec).
- Beckhoff servo driven heavy-duty ball screws for tool feed and part clamping.
- Electrical enclosure air conditioning unit standard to protect critical electronics in high temperature environments.
- Heavy-duty welded base.
- Automatic lubrication system for ball screws and linear rails standard.
- Heavy-duty servo rack and pinion driven pressure head.
- Spindle carriage control station for ease of driveshaft installation.
- Sunnen is the complete system supplier ... machines, tools, chip management, cooling systems and cutting fluids.



SUNNEN DESIGNED AND DEVELOPED INTUITIVE CONTROL SYSTEM

Features include:

- Beckhoff PLC with 394 mm (15.5 in) color touchscreen
- All machine functions controlled from the operator station
- Real time graphical display of tool position, tool feed load, spindle load and coolant pressure
- One button part clamping
- Two button part to part mode for high production operation
- Slow start tool feed for setup
- Tool protection function
- USB port for ease of backup
- Metric/inch units screen selectable
- Up to 100 part setups can be saved and retrieved
- Machine diagnostics
- Multiple languages screen selectable



HEAVY-DUTY SUNNEN DESIGNED AND BUILT COOLANT SYSTEM

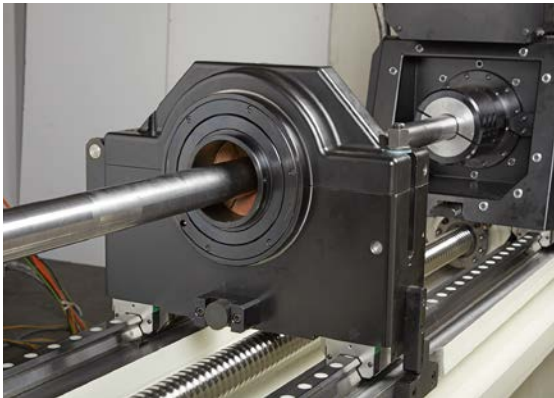
Features Include:

- Modular clean and dirty tanks with 6245 liter (1650 gallon) maximum capacity and 3765 liter (1000 gallon) operating capacity
- Heavy-duty welded construction using 4.75 mm (.187 in) plate with a double wall option available
- High flow 10 micron four bag filtration system
- Heavy-duty screw type pump with 757 lpm (200 gpm) max flow
- 70 micron inlet filter
- Optional chiller for hot environments
- Designed for maintainability with multiple level gages, clean out ports and instrumentation
- Heavy-duty Chip Conveyor
- Active coolant level monitoring

THE SHDS SERIES UP CLOSE



Precision long life
Sunnen skiving/roller
burnishing tool.



Heavy-duty tool
drive shaft vibration
damper.



Automatic chip
removal system.



Self contained hydraulic
power unit activates
rollers and skives for
one pass operation and
provides adjustable part
clamping force.

SPECIFICATIONS:

BORE DIAMETER RANGE (ID):

50.8- 177.8 mm
(2.0- 7.0 in)

OUTSIDE DIAMETER RANGE (OD):

50 - 300 mm
(1.97 - 11.8 in)

MAXIMUM PART LENGTH:

SHD-2500S (2-METER): 2000 MM (78.7 in)
SHD-4500S (4-METER): 4000 MM (157.5 in)
SHD-6500S (6-METER): 6000 MM (236 in)

SPINDLE SPEED:

1650 RPM maximum

CARRIAGE SPEED:

Maximum feed rate: 125 mm/sec
(4.9 in/sec)

TOOL FEED SYSTEM:

Hydraulic actuation
45 kN (10,000 lbf) maximum thrust

MAXIMUM COOLANT FLOW:

750 liters per minute
(200 gpm)

MAXIMUM COOLANT PRESSURE

1.9 MPa
(275 PSIG)

VOLTAGES AVAILABLE:

Electrical System:
400 VAC 50 Hz 3 phase
460 VAC 60 Hz 3 Phase



Heavy-duty Sunnen designed and built coolant system
includes separate clean and dirty tanks.

SKIVING/ROLLER BURNISHING TOOLS

Sunnen is your complete supplier of specialty skiving/roller burnishing tools designed to work with Sunnen machines and cutting fluids.

BORE DIAMETER RANGE:
50.4 MM TO 177.8 MM (2 IN TO 7 IN)
FOR CYLINDERS UP TO 6 METERS (19.7 FEET) LONG

Sunnen skiving tools produce a geometrically true round bore, a prerequisite for successful roller burnishing. This process has proven to be the fastest method of ID finishing of seamless or DOM tubing, with rates of metal removal of 2540 mm up to 3180 mm per minute (100in - 150 in/minute). In cases where depth of cut exceeds the capacity of the skiving knives, a counter-bore cutter can be added to the skiving/roller burnishing tool assembly. The resulting tool assembly is capable of removing up to as much as 6.35 mm (.250 in) total stock removal in one operation.

Sunnen offers a full range of individual or combined skiving/roller burnishing tool assemblies. These tool assemblies are available for use on non-Sunnen machines with ranges dependent on the machine and application of 12 - 500 mm (.5 - 20 in).



Skiving/Roller Burnishing Tools

SCO-885 CUTTING OIL

Sunnen cutting oil is designed to provide optimal lubricity and chip flushing for long tool life and superior surface finish.



Buy with confidence

Sunnen backs the quality of its machines with a 3-year standard machine warranty.

This warranty is the best in the business, and no competitors currently offer such a warranty.



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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