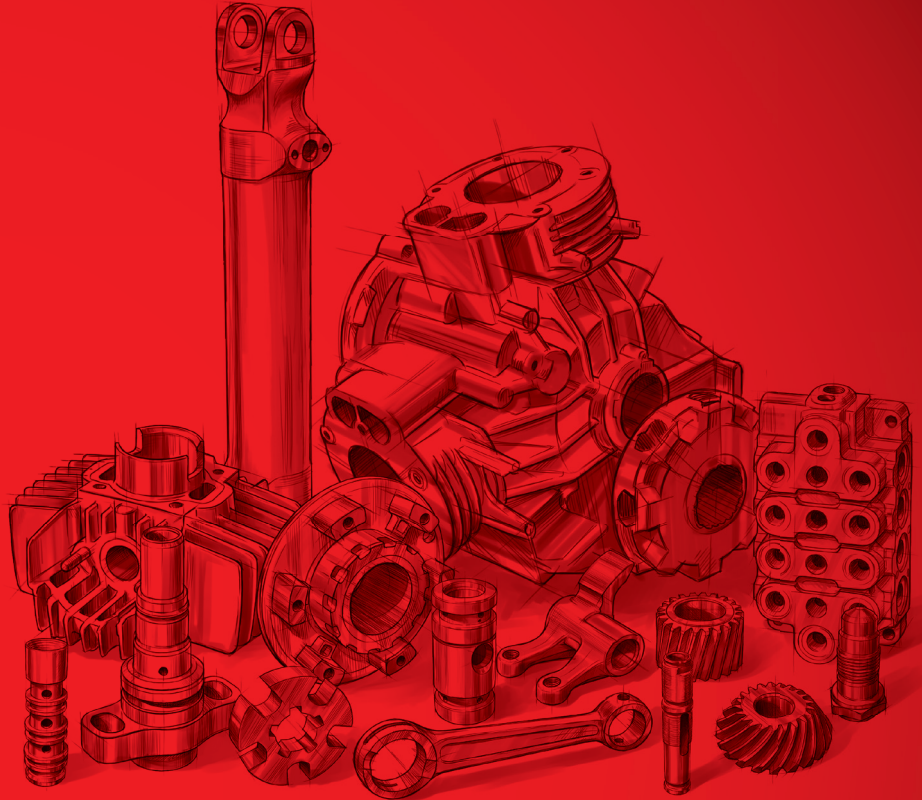




ABOVE AND BEYOND **HONING**



YOUR PARTNER IN
PRECISION BORE SIZING

SUNNEN GLOBAL NETWORK

**CLOSE TO YOUR COMPANY
AND YOUR PRODUCTION**

Sunnen is the leader in precision bore sizing systems worldwide. When you choose the “Sunnen Solution”, you get the honing machines together with best cutting abrasives, high performance honing oils, coolants, toolings and precision bore gages. Either as manual stand-alone machine or fully automated, the Sunnen solution fits best into high demanding production processes – working to satisfy your specific production needs.

With over 90 years of experience, Sunnen provides precision bore honing solutions for an incredibly wide range of industries and applications. Our global network and the industry's largest selection of honing machines – horizontal or vertical, single or multi-spindle, standard or customized – allows us to be close to you and provide the appropriate solution in every country worldwide.

As the largest integrated honing systems supplier, we maintain Advanced Technology Centers around the globe with a workforce of over 650. Our outstanding support is provided through our 3 production plants and 10 subsidiaries and our sales and service network in more than 50 countries around the globe.

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





ALL-INCLUSIVE SUPPLIER



CONSULTING



MACHINE SOLUTIONS



INSTALLATION & TRAINING



TOOLINGS & ABRASIVES

SUNNEN COMPLETE SOLUTIONS

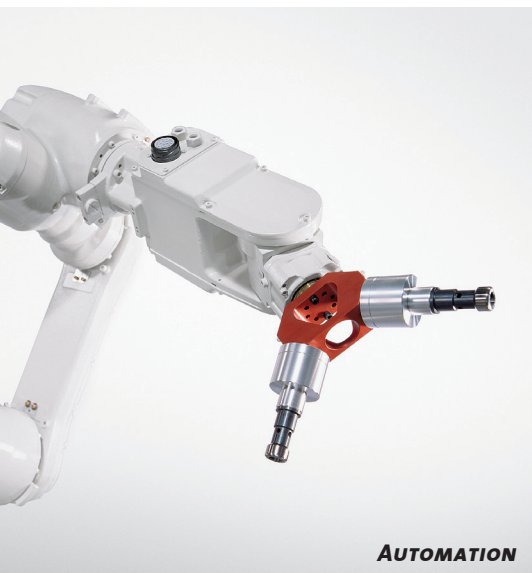
YOUR PARTNER FOR TURN-KEY SYSTEMS

Harmonized combination between machine, tool, abrasive, coolant and gaging is crucial for cost effective honing and optimal bore quality.

Process analyses and cost calculations are the basis for supplying the complete Sunnen solution.

All basic bore sizing parameters and quality requirements are developed in our customer technology centers in the U.S. and Switzerland.

As experts, Sunnen takes full responsibility for your entire honing process.



AUTOMATION



HONING-OILS & COOLANTS

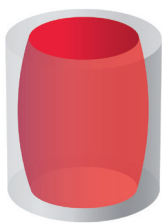


PRECISION GAGES



SERVICE & SUPPORT

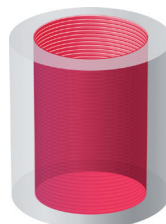
GEOMETRY CORRECTION THROUGH HONING



Barrel



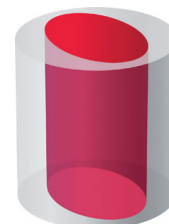
Bell Mouth



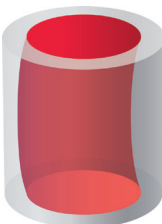
Boring Marks



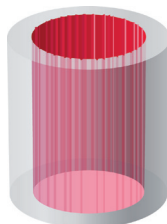
Tandem



Out-of-round



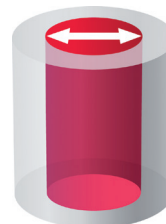
Rainbow



Reamer Marks



Taper



Undersize



Waviness

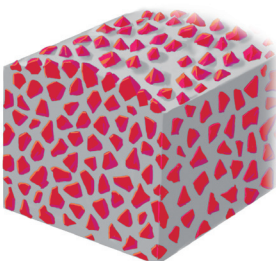


FIGURE 1:
The abrasive coating consists of several grain layers used one after the other.

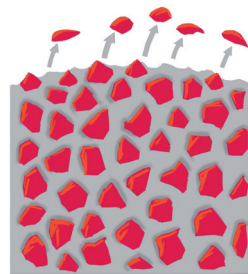


FIGURE 2:
Each grain breaks out of its bond precisely when the grain point is blunt.

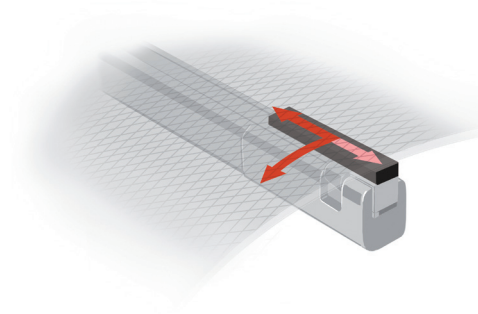


FIGURE 3:
A surface structure with crosswise serration is produced by a combination of rotary and linear movement.

UNIQUE BORE SIZING

THROUGH HONING

An abrasive stone is generally used for stock removal. The abrasive stone consists of several layers of bound abrasive grains (FIG. 1). Each of the many abrasive points act as a cutting tool and break off as soon as it is blunt (FIG. 2). This exposes a new, sharper grain.

The honing process produces optimal bores within a very short time. This is a cost effective and strong alternative to:

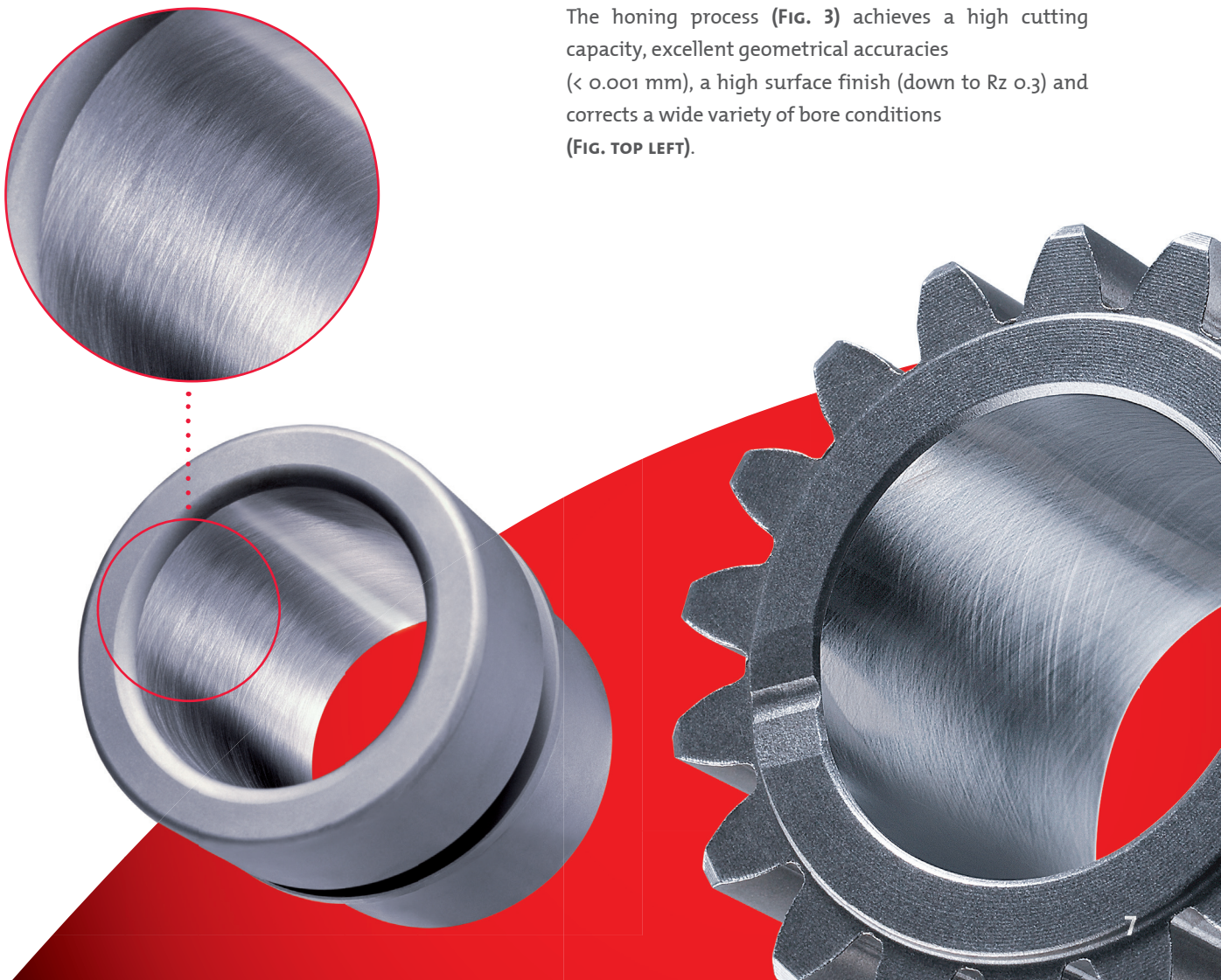
- INTERNAL GRINDING
- PRECISION AND HARD TURNING
- REAMING
- ROLLER BURNISHING

WHY TO USE HONING

Cost savings and low amortization time due to:

- Easier and faster part holding concepts; part doesn't need to be centered (especially compared to ID grinding)
- High stock removal (short cycle time) due to cutting action of hundreds of abrasive points (turning only 1 point cutting action ...)
- High force / expansion of tooling (short cycle time) due to centric force balance (especially at long bores, tooling is bending during ID grinding)
- Long life time of abrasive / tooling (not often the time consuming sharpening process)
- Low investment cost compared to other processes with similar precision
- Highest surface quality; $< Rz\ 1$ without changing of surface structure due to little heat production

The honing process (FIG. 3) achieves a high cutting capacity, excellent geometrical accuracies ($< 0.001\text{ mm}$), a high surface finish (down to $Rz\ 0.3$) and corrects a wide variety of bore conditions (FIG. TOP LEFT).





HYDRAULICS

TYPICAL HYDRAULIC APPLICATIONS

Axial Piston Pumps, Hydraulic Blocks,
Valves and Hydraulic Cylinders

TYPICAL REQUIREMENTS

Blocks and Valves: Tol. ± 0.001 mm, 0.0005 ,
 $\sqrt{R} 0.001$ mm - 0.003 mm, surface Ra $0.2 - 0.4$
Hydraulic Cylinders: H7 / H8 Tolerances

ADVANTAGES OF HONING

Piston Pumps: Improve life time, safe airplanes

Blocks and Valves: Higher pressure operation /
efficiency due to high precision, no leakage

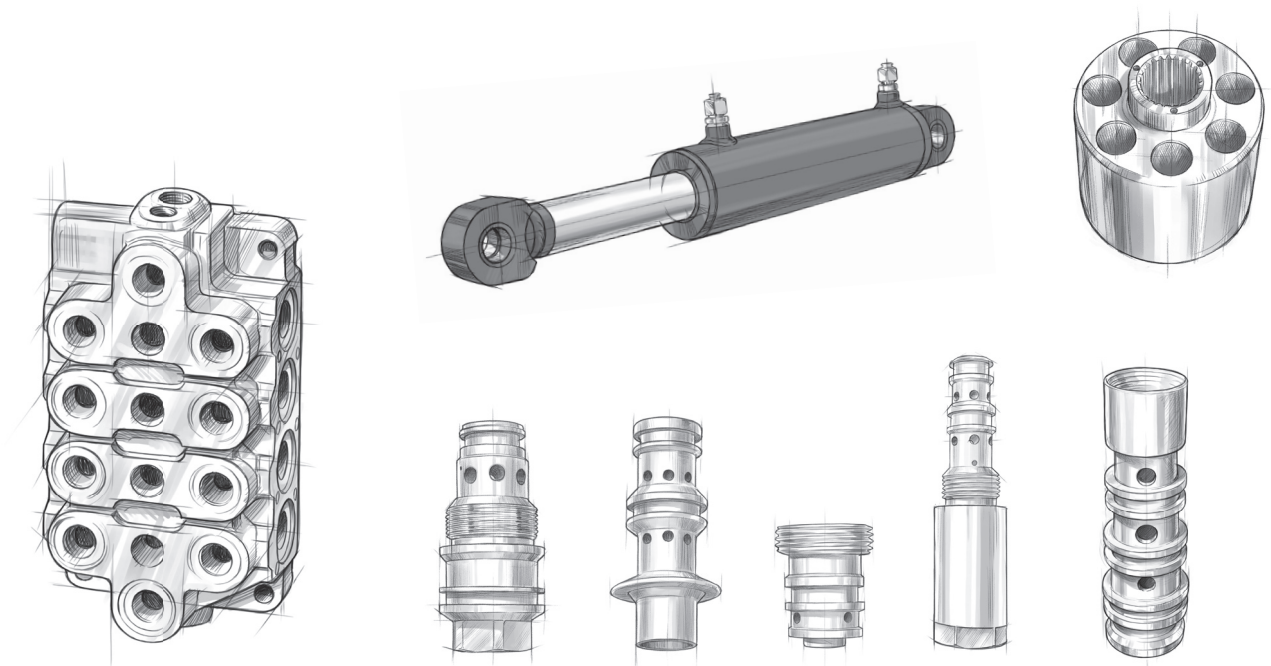
Hydraulic Cylinders: High precision, long seal life

SUNNEN SOLUTION

Blocks: VSS2 Series, SV20xx Series

Valves: SH Series, VSS2 Series, SV2010/5

Hydraulic Cylinders: HT Series





ENERGY PRODUCTION

TYPICAL ENERGY PRODUCTION APPLICATIONS

Oil & Gas Components, Wind Mills, Turbines

TYPICAL REQUIREMENTS

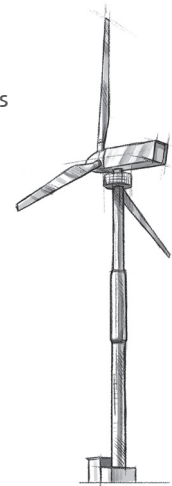
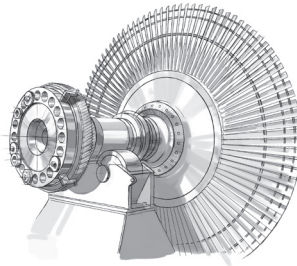
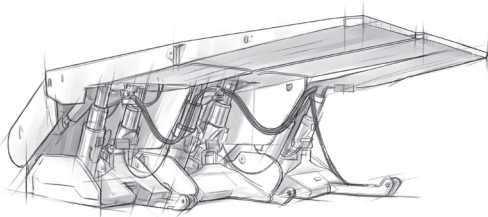
H7 / H8 Tolerances, surface Ra 0.2 - 0.4,
directly honing of rough cold drawn,
plasma and powder coated tubes

ADVANTAGES OF HONING

Improves life time, provides higher pressure operation /
efficiency due to high precision, no vibration due to tem-
perature changes, flexible due to low number of tools for
large diameter range

SUNNEN SOLUTION

HT Series, SV24xx Series, SV25xx Series



AVIATION

TYPICAL AVIATION APPLICATIONS

Landing Gears, Turbines, Pressure Reservoirs, Shaft for
Jet Fans, Helicopter-Blade Control Shafts

TYPICAL REQUIREMENTS

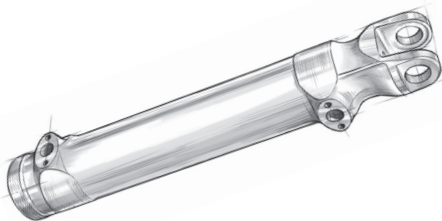
H7 / H8 Tolerances, blind-bores

ADVANTAGES OF HONING

Crosshatch pattern characteristic, outstanding bore
quality leads tribology values, no influencing of heat to
material structure of the surface, no white layer

SUNNEN SOLUTION

HT Series, SV24xx Series, SV25xx Series





CAR & ENGINE COMPONENTS

TYPICAL CAR & ENGINE COMPONENTS

Motor Blocks, Small Engines, Injectors,
Turbo Charger Housings, Common Rail Parts,
Servo Steering Components, Brake Drums,
Liners, Gears, Rocker Arms, Connecting Rods

TYPICAL REQUIREMENTS

Liners: Constant crosshatch angle

Small Engines: Nikasil & Chromium plated, blind-bore

Injectors: Tolerances < 0.001 mm, $R_z < 1$

Brake Drums: Constant surface texture,
 $0 < 0.015$ mm, blind-bore

Gears: $\lambda < 0.003 - 0.004$ mm,
surface $R_a 0.2 - 0.3$, perpendicularity

Connecting Rods: Bore parallelism, roundness,
surface texture

ADVANTAGES OF HONING

Improved life time, better operation, replacing of lap-
ping, improves energy efficiency, lower emission rate,
excellent tribology values

SUNNEN SOLUTION

Liners / Blocks: SV24xx Series, SV25xx Series

Small Engines / Gears: SV24xx Series, SH Series, SV2010/5

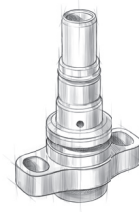
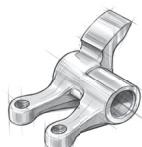
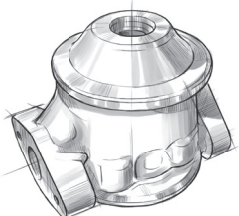
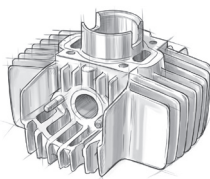
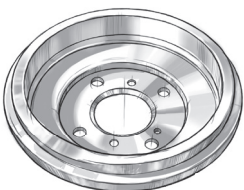
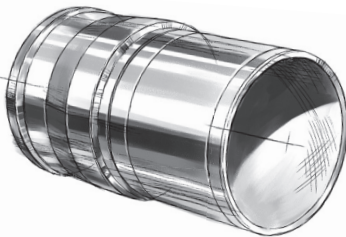
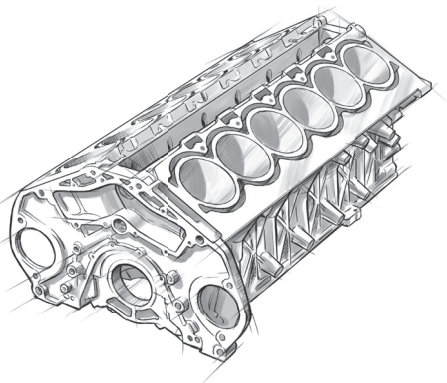
Turbo Charger Housings: SV2010/5, VSS2 Series, SH Series

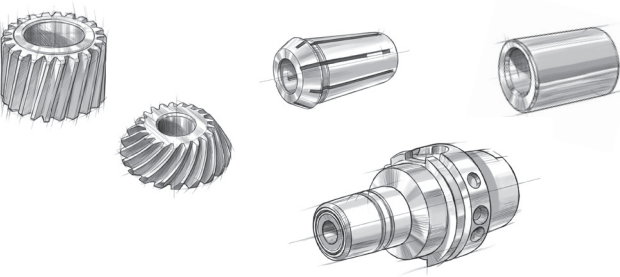
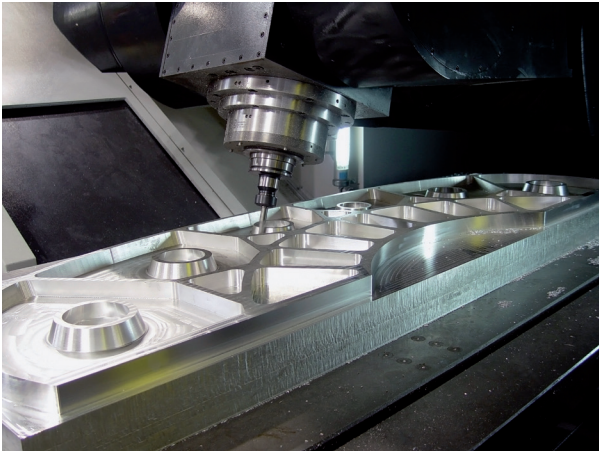
Housings: SV2010/5

Fuel Injectors: SV2015 Multispindle

Common Rail Parts: SV2010/5, SH Series

Brake Drums: SV25xx Series





MACHINERY & COMPONENTS

TYPICAL MACHINERY & COMPONENT APPLICATIONS

Gears, Machine Tool Components, Tool Holding Devices, Bearings, Collets, Carbide Bushings, Ceramics / Compound Material Parts, Measuring Equipments, Compressor Comp.

TYPICAL REQUIREMENTS

Gears: Perpendicularity, special shape
(e.g. must not be concave)

Tool Holding Devices: $\lambda < 0.002$ mm, surface $R_z < 1$
crosshatch angle

Turbo Chargers: $\lambda < 0.004$ mm, surface $R_a 0.2$

ADVANTAGES OF HONING

Improved life time, higher holding torque (tool holding devices), quiet running of gear boxes, quality improvement

SUNNEN SOLUTION

SV25xx Series, SV2010/5, VSS2 Series, SH Series

Large gears: SV24xx Series, SV25xx Series, SV2010/5

INJECTION MOLD & DIE PRODUCTION

TYPICAL INJECTION MOLDING SYSTEMS APPLICATIONS

Extruder (twin- and single screw), Cavities for PET-Bottle Production, Manifolds, Punching Dies, Carbide Dies for Screw Manufacturing

TYPICAL REQUIREMENTS

Cavity: Conical shape, high surface finish (polished)

ADVANTAGES OF HONING

Improved life time, brilliant surface finish $< R_a 0.03 \rightarrow$
replacing of lapping, cost reduction due to quality improvement, most economical manufacturing of carbide bushings

SUNNEN SOLUTION

SV2010/5, HT Series, SH Series



Single Spindle Design



Multi Spindle Design
with rotary table

SUNNEN SV20xx & SV21xx SERIES are holding the industry's tightest tolerances – as fine as $0.25 \mu\text{m}$ – tolerances far superior to any other production processes. A Windows®-based PC control features easy-to-use dropdown menus and the ability to save job set-ups for later use.

SV20xx SERIES built on a proven, modular platform, the SV20xx Series can be easily customized and automated to suit your exact specifications – whatever your needs demand, from multiple spindles to air gaging. Plus, the flexible system supports both single pass and honing with expandable tools (multistroke honing). The perfect solution for mid- to high-production manufacturers with tightest tolerances.

SV21xx SERIES this agile small bore system is suited for an impressive range of applications and it can be easily customized and automated to suit your exact specifications – whatever your needs demand. Perfect for mid- to high-production manufacturers with small bore applications with tightest tolerances.

SPECIFICATIONS

SV20xx spindle motor: 7.5 kW / 10.2 HP

Diameter range [ID]: 3 - 65 mm

SV2010 / SV2015 max. workpiece length: 250 mm (no X-axis)

SV2020 max. workpiece length: 250 mm

X-axis carriage travel: 1'143 mm

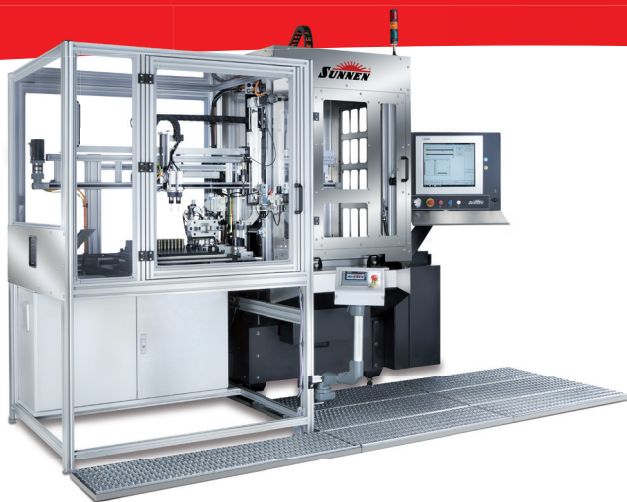
SV2052 max. workpiece length: 1'200 mm (no X-axis)

SV21xx spindle motor: 1.5 kW / 2 HP

Diameter range [ID]: 1 - 20 mm

ADVANTAGES / CUSTOMER BENEFITS

- Automatic bore geometry correction
- Automatic start diameter detection
- Short stroke or dwell in any part of the bore
- Easy operation thanks to industrial touch screen
- Windows®-based, operator-friendly monitoring system
- Unlimited storage capacity
- Superior tooling choices



SUNNEN SV2015 with loading / unloading unit, gantry type part handling system, external air measuring system, unique part holding system.



SUNNEN SV2015 with large robot, part feeding conveyor-belt, 1 roughing- / 1 finishing- / 1 deburring-spindle inside machine, index table, external part spinning (cleaning) station.



SUNNEN SV2010 with external air measuring system and process feedback.



SUNNEN SV2015 with loading chute and linear loading / unloading unit.



SUNNEN SV2015 with linear loading / unloading unit, bowl feeder, index table inside the machine for multiple operation such as bore size air gaging with 100% feedback, honing, brushing and measuring.



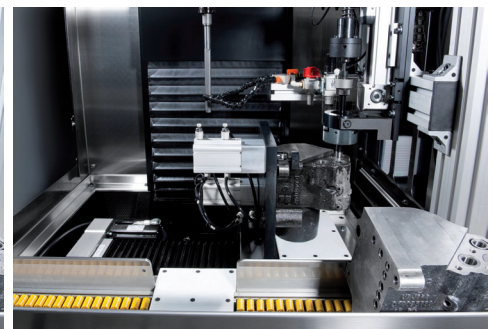
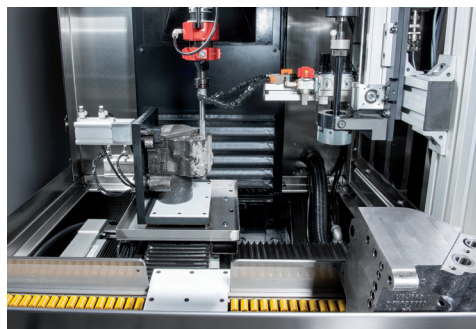
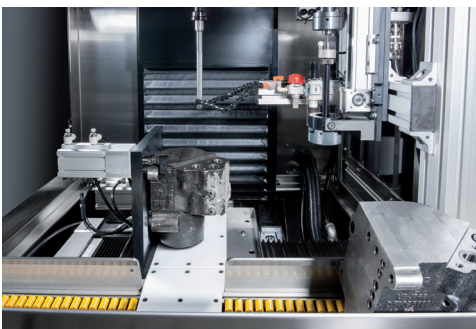
SUNNEN SV2015 with robot, pallet changing system for 13-26 pallets, measuring station with feedback and index table for multiple operations, miscellaneous numbers of hydraulic valves.



TWO FULLY AUTOMATED SUNNEN SV2015

machines for roughing and finishing, connected with smart part handling system, visual part orientation unit, post-process measuring with 100% feedback.

TWO INDEPENDENT SUNNEN SV2010 machines for roughing and finishing, connected with manual conveyor, automated clamping, processing of programmed hole pattern, post-process measuring with feedback.





SUNNEN VSS2xx SERIES The VSS2xx is a single pass multiple spindle system (4 or 6 spindles) that delivers high precision bore geometries. It is very easy to set up and operate – just some few steps and the machine is ready for a new part.

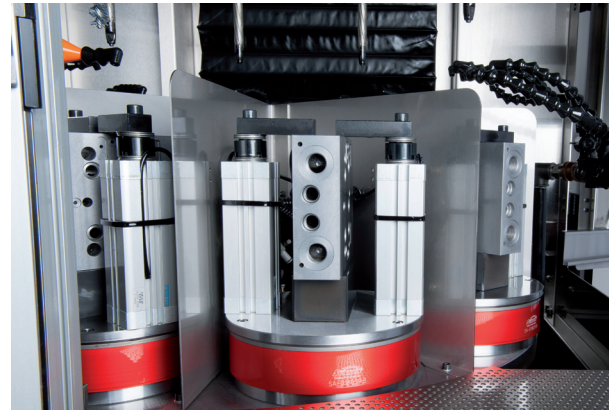
SPECIFICATIONS

Spindle motor: 7.5 kW / 10.2 HP
Diameter range [ID]: 3 - 50 mm
Stroke speed: 250 - 6'350 mm/min
Max. workpiece length: 155 mm

ADVANTAGES / CUSTOMER BENEFITS

- Short cycle time (Single stroke®)
- Short setup time
- Excellent precision
(especially for hydraulic blocks)
- Choice of 4 and 6 spindles





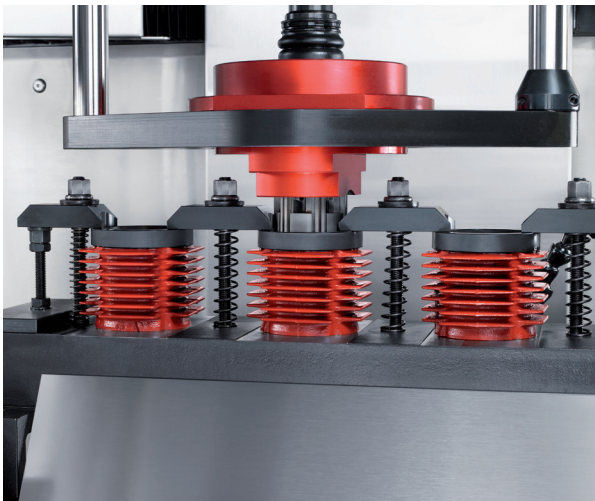
SUNNEN VSS286 with customized machine housing, independent infinitely variable brushing station, flexible clamping system for short setup changes.

SUNNEN VSS286 with linear-gantry, part separation unit, loading / unloading of two parts, double indexing of the rotary table inside the machine, high production solution integrated in transfer line.





SUNNEN SV24xx SERIES The SV24xx incorporates a patent-pending stroking system that produces a true vertical stroke and can short stroke or dwell in any part of the bore, end-to-end, producing the straightest, roundest bore possible. A Windows®-based PC control simplifies the honing process. The SV2410 features an additional travel axis with the ability to hone beaded parts in a line. The machine is also provided for twin table machining.



SPECIFICATIONS

Spindle motor: 7.5 kW / 10.2 HP

Diameter range: 19 - 200 mm

Working area: 1'016 x 1'178 mm

SV2410 max. workpiece length: 600 mm

X-axis carriage travel: 1'143 mm

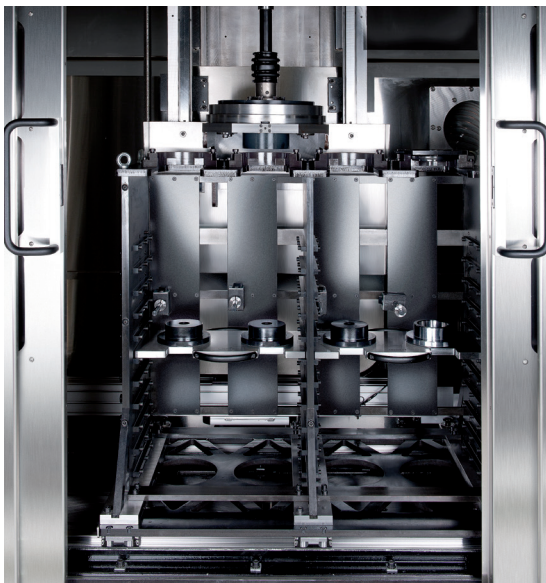
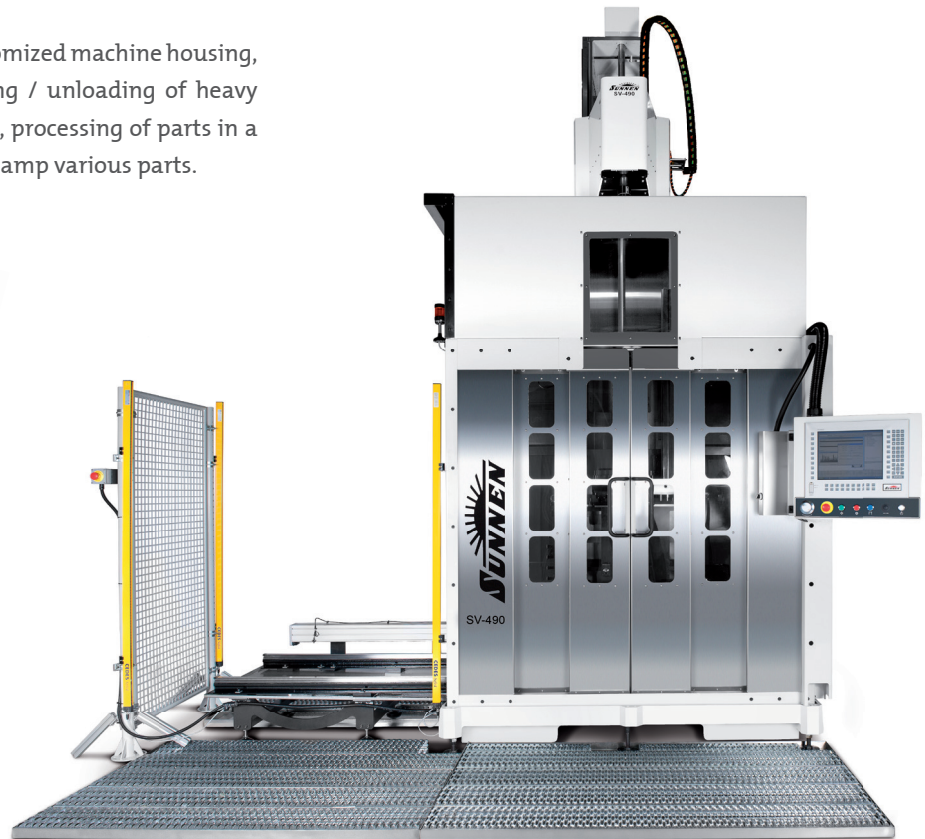
SV2460 max. workpiece length: 1'300 mm
(no X-axis)

SV2490 max. workpiece length: 2'100 mm
(no X-axis)

ADVANTAGES / CUSTOMER BENEFITS

- Constant cross-hatch
- Automatic bore geometry correction
- Short stroke or dwell in any part of the bore
- Programmable horizontal spindle axis;
Spindle moves automatically to the next bore
- Easy operation with industrial touch screen
- Operator-friendly Windows®-based monitoring system

SUNNEN SV2490 with customized machine housing, integrated oil mist filter, loading / unloading of heavy parts on automated linear table, processing of parts in a row in cycle, fixture capable to clamp various parts.





SUNNEN SV25xx SERIES This skillful system combines power, precision and durability. The all-new, patent pending stroking system, produces a true vertical stroke that can selectively removing stock in any part of the bore – delivering a true constant crosshatch pattern throughout the entire bore length with no rollover at the ends. Built on a proven, flexible platform, these versatile systems can be customized to satisfy any application requirements, including full automation.

SPECIFICATIONS

Spindle motor: 7.5 kW / 10.2 HP

Diameter range: 19 - 300 mm

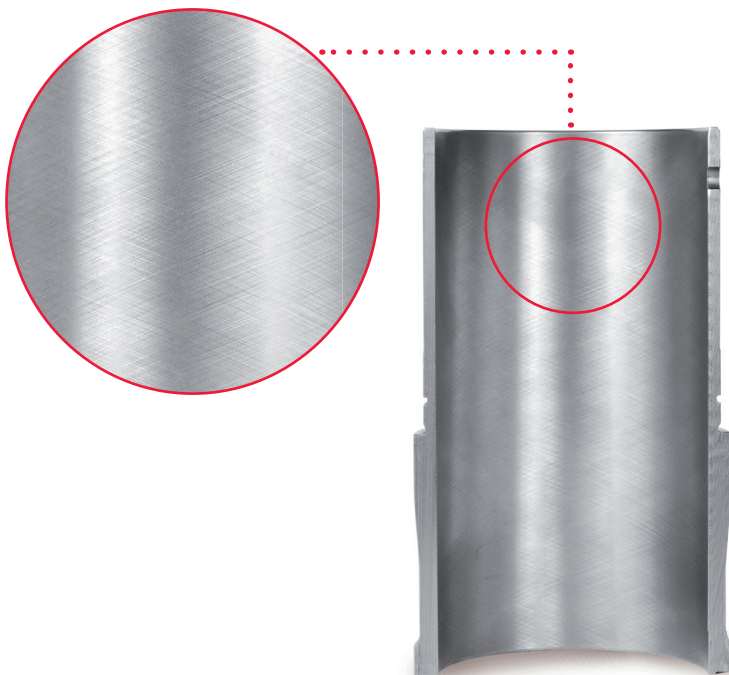
SV2510 max. workpiece length: 600 mm

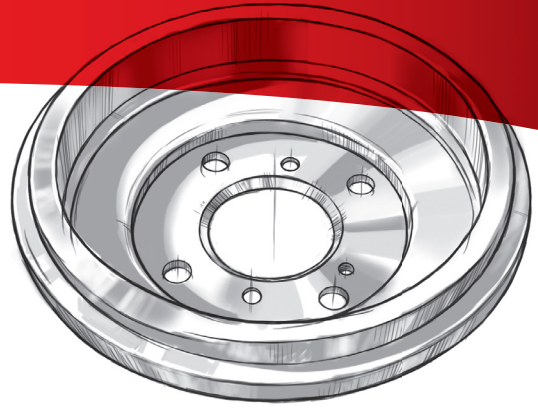
X-axis carriage travel: 1'143 mm

SV2560 max. workpiece length: 1'300 mm
(no X-axis)

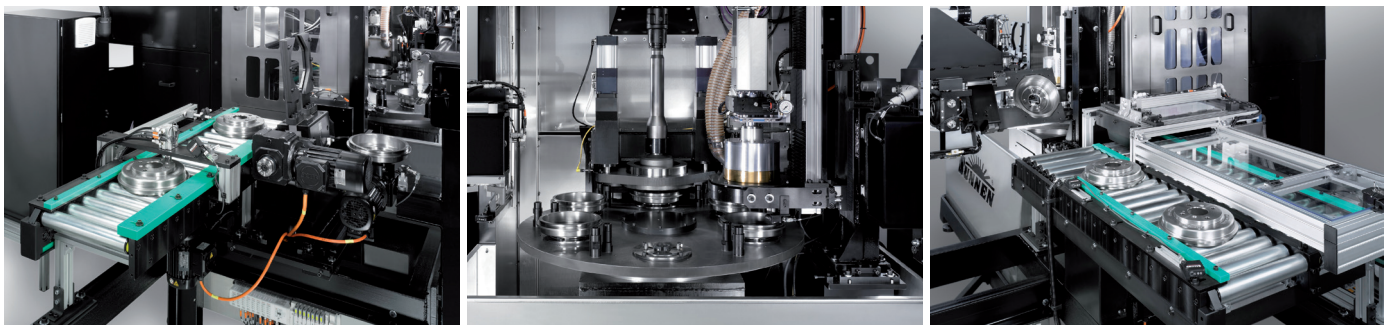
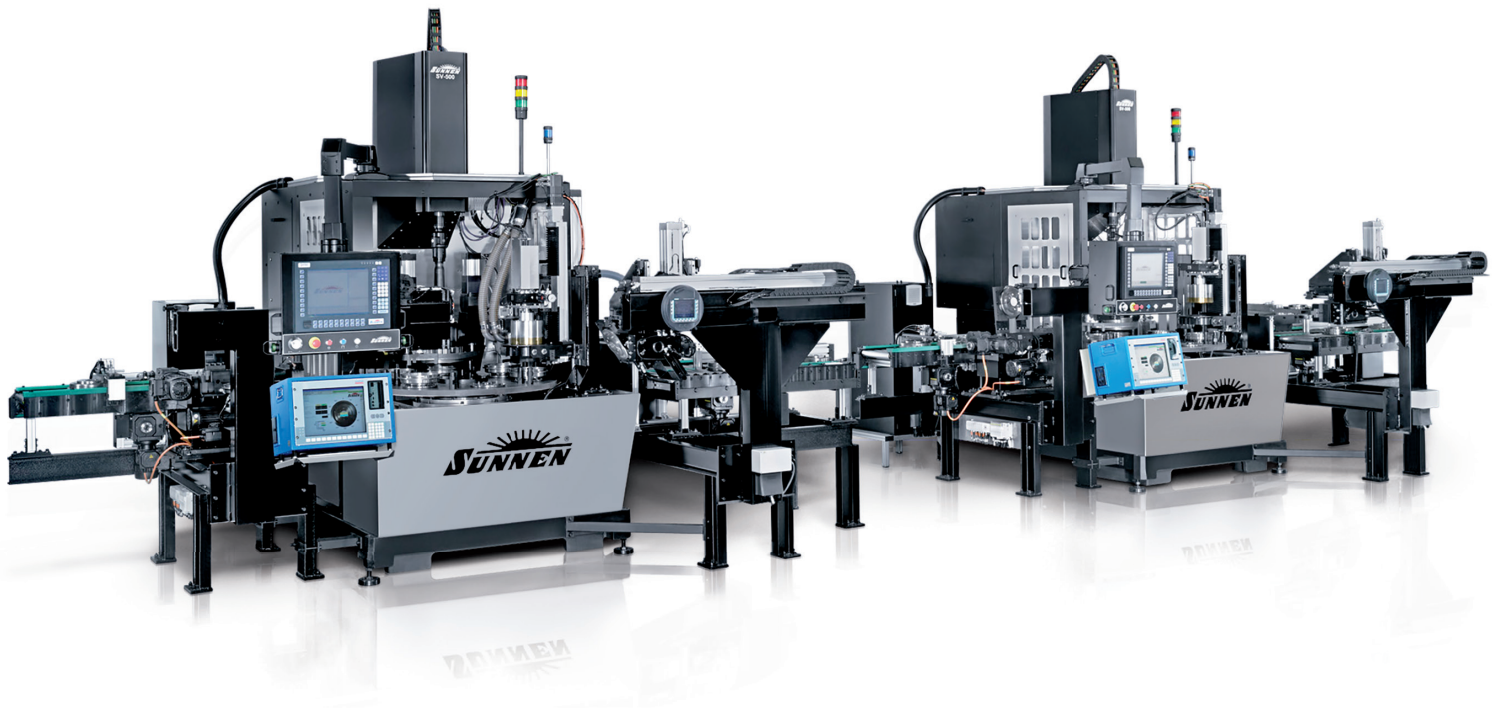
ADVANTAGES / CUSTOMER BENEFITS

- Constant cross-hatch angle
- Automatic bore geometry compensation
- Short stroke or dwell in any part of the bore
- Easy operation with industrial touch screen
- Operator-friendly Windows[®]-based monitoring system
- High stock removal up to 700 cm³/h
- Runs air gage integrated and dual stage tooling
- Rotary index table ensures short changing time of application





SYSTEM SOLUTION FOR BRAKE DRUMS SV2500 with linear loading / unloading unit, part-orientation, index table inside machine for multiple operations such as loading / unloading, honing and measuring. Complete integration in the production line.





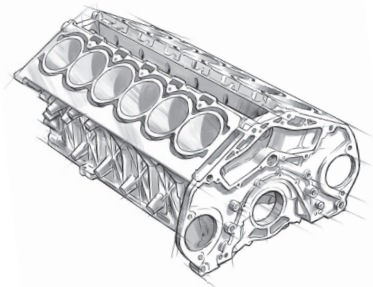
SUNNEN SV15 The SV15 is the very universal machine with a straightforward way to set up and control the process. The easy-to-use, yet highly advanced touch screen control projects Sunnen's patented full-bore profile display. This real time graphical display of the cross section allows the operator to dwell in the exact position where the bore is visually smaller – eliminating guesswork.

SPECIFICATIONS

Spindle motor: 2.25 kW / 3 HP
 Diameter range [ID]: 19 - 200 mm
 Workpiece weight: 680 kg
 Stroke length: 225 mm
 Working area: 558 x 1'168 mm

ADVANTAGES / CUSTOMER BENEFITS

- Short setup times
- Universal machine
- Bore geometry monitoring



SUNNEN SV30 SERIES The SV30 Series is designed for flexible low- to mid-volume production. The easy to use Sunnen patented touch screen PC control ensures short setup times. With a proven ball screw servo stroking system, the SV30 produces a true, straight stroker movement. The servo rotary tool feed system provides enough force for high stock removal rates with diamond or borazon superabrasives. Even roughing and finishing can be done with a two stage honing tool. Standard programmable auto dwell corrects the tightest section in the bore without operator intervention.

SPECIFICATIONS

Spindle motor: 4.1 kW / 5.5 HP
 Diameter range [ID]: 19 - 200 mm
 Workpiece weight: 600 kg
 Stroke length: 705 mm
 X-axis carriage travel: 813 mm

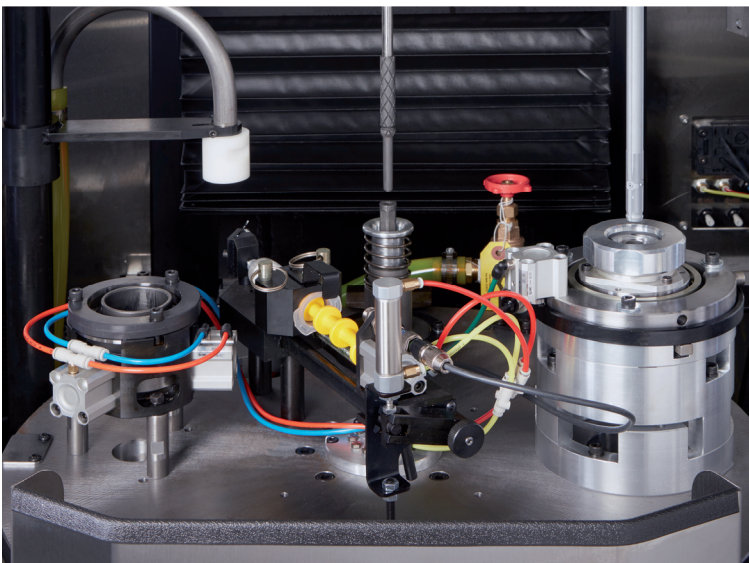
ADVANTAGES / CUSTOMER BENEFITS

- Short setup times
- Tool protection
- Intelligent PC control
- Auto dwell
- Size lock
- Full bore profile display

MAXIMUM LAPPING PRECISION



SUNNEN SVL2115 The new Sunnen SVL2115 is developed for extremely tight tolerances. The worldwide first automated bore lapping machine achieves increased productivity and part consistency to what has been a manual process. An interface allows a seamless automation integration, such as robot interface for loading and unloading or pneumatic interface for easy fixture integration.



SPECIFICATIONS

Spindle motor: 1.2 kW / 2 HP
Diameter range [ID]: 7.9 - 44.5 mm
Stroke length: 630 mm
Max. workpiece length: 200 mm

ADVANTAGES / CUSTOMER BENEFITS

- Fully automated and controlled lapping process
- Burr-free cross-holes
- Short cycle time
- Easy operation with industrial touch screen
- Operator-friendly Windows®-based monitoring system

SUNNEN SH SERIES The SH series builds on the heritage of the successful ML series. This next generation of power stroked horizontal machines are taking honing to the next level. Low invest and high profit through proven simple mechanics and electronics. Also available as automated performance package.



SUNNEN SH5000 is designed for mid- to high-volume jobs. Short setup time and easy to operate. All necessary process parameters are controlled through the large touch screen display (HMI). Prestored, tool specific parameters and teaching of positions eliminates time-consuming programming. Increased 400 mm maximum stroke travel allows for longer parts. A patented linear hybrid expansion system provides phenomenal diameter repeatability - over constant pressure or constant feed.

SUNNEN SH6000 features a standard run out adjustable spindle with direct CGT tooling connection. The machine comes with a new servo linear tool feed system with 30 percent more force for improved performance.



SPECIFICATIONS

SH5000 spindle motor: 4.1 kW / 5.5 HP

SH5000 stroke length: 6 - 400 mm

SH6000 spindle motor: 3.8 kW / 5 HP

SH6000 stroke length: 6 - 392 mm

Diameter range [ID]: 1.5 - 165 mm

Stroke speed: 10 - 550 SPM

ADVANTAGES / CUSTOMER BENEFITS

- Universal machine
- Short setup time
- Patented linear hybrid expansion system
- Unlimited setup storage
- In-process short stroke function
- Intuitive NC-control

SUNNEN SH2000 is equipped with a PLC touch screen you can control functions like slow extra strokes, ignore oversize workpiece, stroke count honing without opening the control panel and adjusting switches. The digital honing indicator can be easily configured at the touch of the screen.



SPECIFICATIONS

Spindle motor: 2.25 kW / 3 HP

Diameter range [ID]:

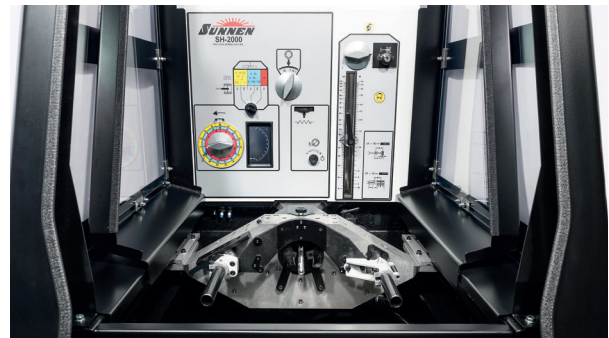
- Manual stroke: 1.5 - 165 mm

- Automatic stroke: 1.5 - 101 mm

Stroke length: 6 - 170 mm

ADVANTAGES / CUSTOMER BENEFITS

- Universal machine
- Short setup time
- High repeat accuracy
- In-process diameter monitoring system for maximum accuracy



SUNNEN MBB1660 For Job-shop applications in the general machine tool, automobile and aviation industries.

SPECIFICATIONS

Spindle motor: 0.375 kW / 0.5 HP

Diameter range [ID]: 1.5 - 165 mm

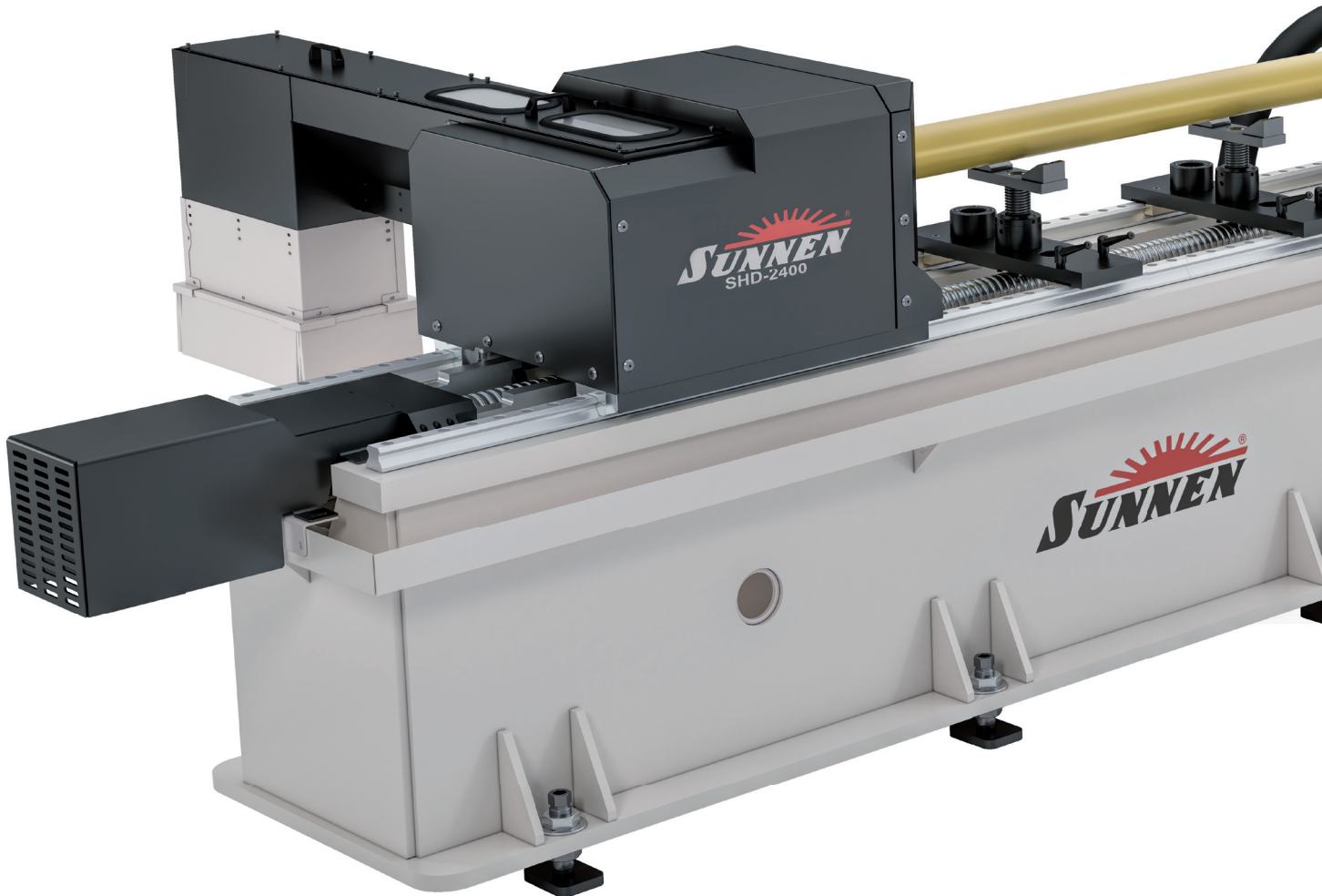
Honing length: 3 - 400 mm

ADVANTAGES / CUSTOMER BENEFITS

- Universal machine
- Short setup time



US INNOVATION



SUNNEN SHD SERIES The first Sunnen skiving/roller burnishing machine

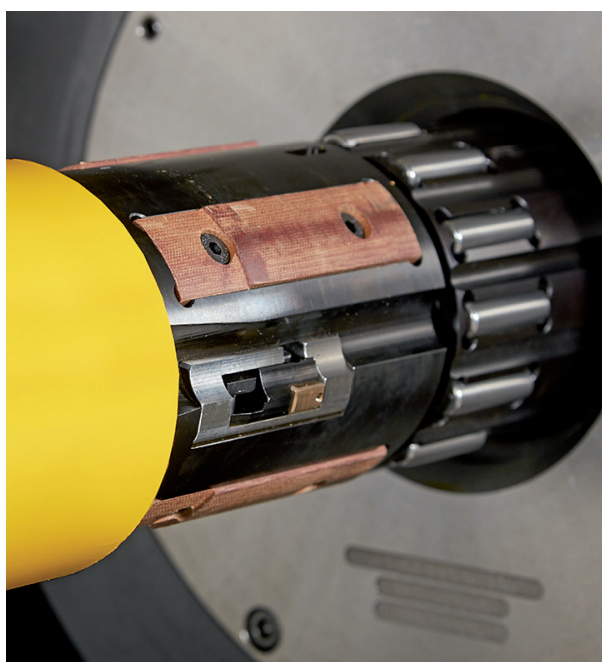
Sunnen has acquired the premiere skiving/roller burnishing & deep hole drilling tools and systems manufacturer BTA Heller. With this partnership we combine years of expertise in both skiving/roller burnishing and honing.

The new developed Sunnen SHD systems are easy to setup and use and provide a consistent finish and fast part cycle time. They come as a complete solution with tools, chip management, coolant systems and cutting fluids.

The SHD is available in two models: the SHD-2400 (featuring a 2-meter stroke), and the SHD-4400 (featuring a 4-meter stroke).



HYDRAFINISH SKIVING/ROLLER BURNISHING TOOLS



SUNNEN SHD

SPECIFICATIONS

Spindle motor: 57 kW / 76 HP

Diameter range [ID]: 50.8 - 177.8 mm

Min. part length: 155 mm

Stroke length: up to 4'000 mm

ADVANTAGES / CUSTOMER BENEFITS

- Easy operation with industrial touch screen
- Surface finish up to Ra 0.1 - 0.15
- Increased surface hardness
- Enhanced corrosion resistance
- Lower costs compare to other ID finishing processes
- Programmable dimension monitoring



SWISS INNOVATION

SUNNEN XTREME HONE The first External Honing Machine

Sunnen's first generation of external honing machines has been developed to meet the continuously increasing demands of the industry. Workpieces in the offshore, energy production and aviation sectors are exposed to extreme environments. Therefore electroplated hardchrome or plasma-spray coated surfaces are in operation. The new Xtreme Hone Machine cuts nearly all advanced materials without trouble, next to mild steel. Sunnen built an outstanding control with maximum comfort and safety as a result of over 30 years of experience.

Sunnen provides the major advantages for your future production.



SUNNEN XTREME HONE up to 1'600 cm³/h

SPECIFICATIONS

Spindle motor: 16 kW / 22 HP

Diameter range (OD): 50 - 450 mm

Stroke length: up to 12'000 mm

ADVANTAGES / CUSTOMER BENEFITS

- Large diameter range
- Automatic correction of roundness and parallelity
- Operator-friendly, Windows[®]-based monitoring system
- Tool overload protection
- Easy operation with industrial touch screen
- Programmable dimension monitoring

SUNNEN HTD-W The heavy-duty extension of the most successful tube hone system is called HTD-W Series. For highest demands, this series provides a unique stock removal of up to 3'000 cm³/h. Two systems in two power versions are available, the HTD-X300W and the HTD-X400W. The combination of the HTD system with Sunnen tooling, abrasive and coolant oil, guarantees optimum performance and perfect results.



SUNNEN HTD-X300W up to 2'500 cm³/h

SPECIFICATIONS

Spindle motor: 22 kW / 30 HP
Diameter range [ID]: 50 - 1'200 mm
Stroke length: up to 16'000 mm

ADVANTAGES / CUSTOMER BENEFITS

- Large diameter range
- Automatic bore geometry correction
- Operator-friendly Windows®-based monitoring system
- Tool overload protection
- Easy operation with industrial touch screen
- Programmable dimension monitoring
- High stock removal up to 2'500 cm³/h

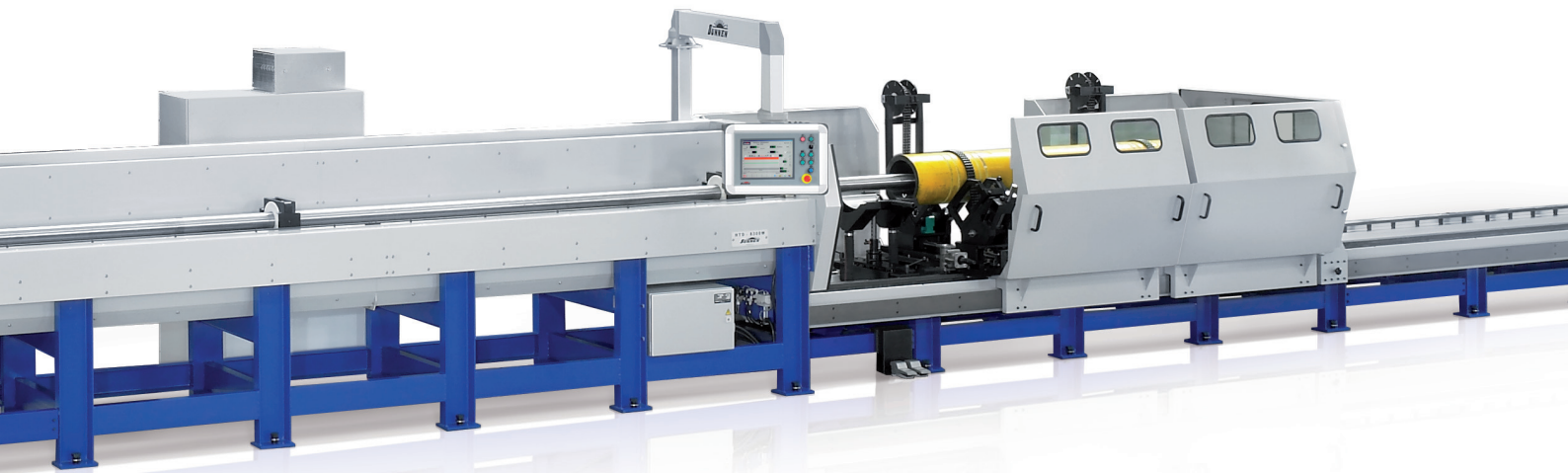
SUNNEN HTD-X400W up to 3'000 cm³/h

SPECIFICATIONS

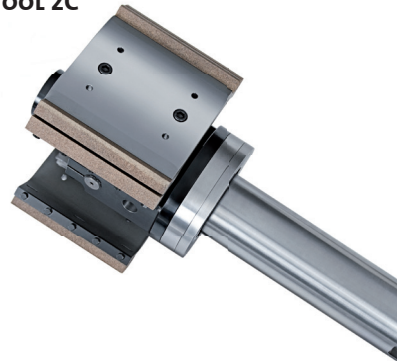
Spindle motor: 30 kW / 40 HP
Diameter range [ID]: 50 - 1'200 mm
Stroke length: up to 16'000 mm

ADVANTAGES / CUSTOMER BENEFITS

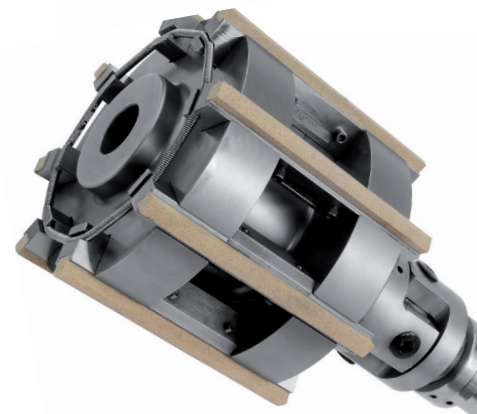
- Large diameter range
- Automatic bore geometry correction
- Operator-friendly Windows®-based monitoring system
- Tool overload protection
- Easy operation with industrial touch screen
- Programmable dimension monitoring
- High stock removal up to 3'000 cm³/h



SHELL TOOL 2C



MULTI-STONE GH TOOL





SWISS INNOVATION

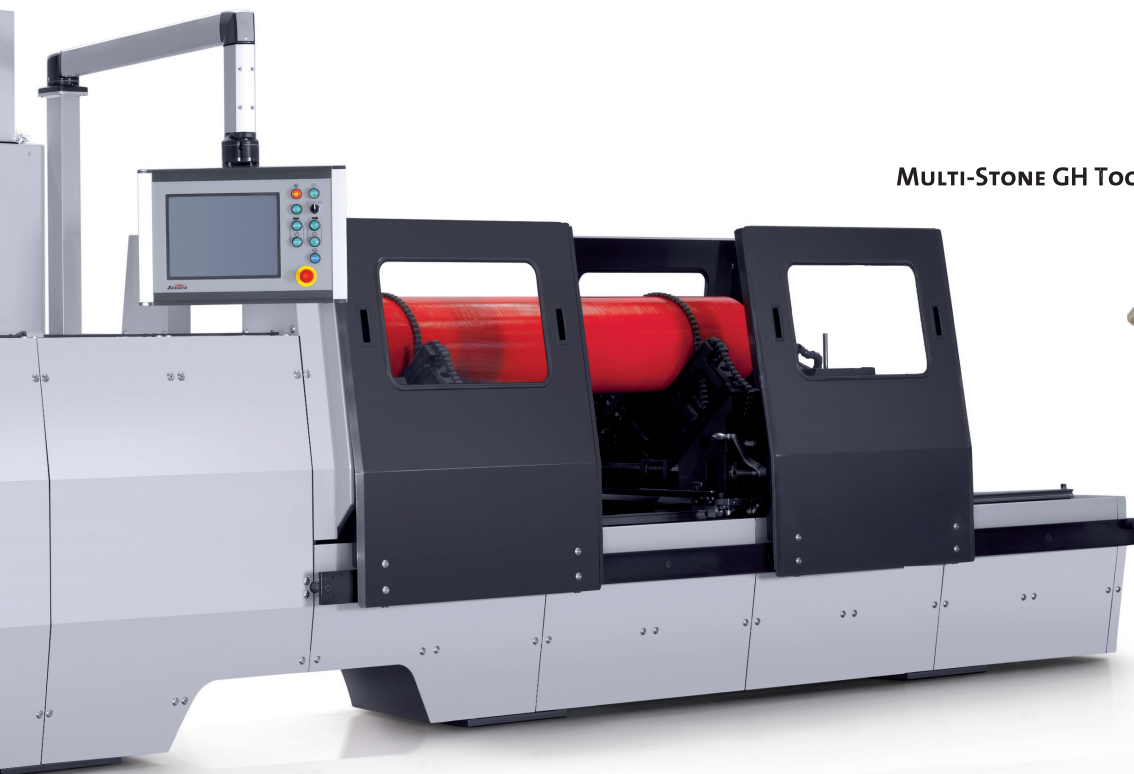


SUNNEN HTS The latest Tube Hone Generation

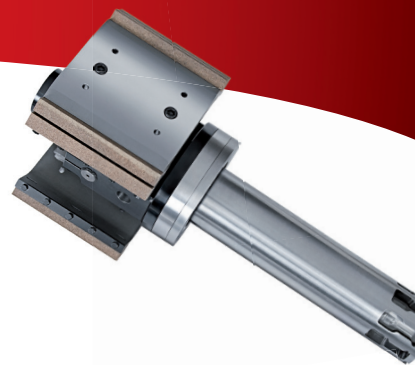
Let yourself be inspired by the Swiss HTS-Series from Sunnen. This new system represents 30 years of experience combined with state-of-the-art technology, built to exceed highest demands for production.

Available in two power versions, the Swiss HTS-Series reaches either up to 1'100 cm³/h or enormous 1'600 cm³/h.

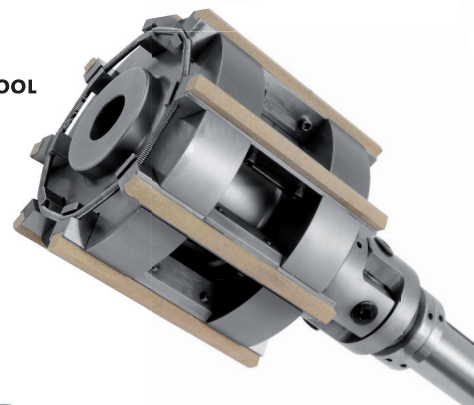
With Sunnen's new AutoShift gear box system, the spindle speed will be adjusted automatically guaranteeing maximum possible comfort and safety for the operator. The largest manufacturer of Tube Honing Technology delivers to you major advantages for the future.



SHELL TOOL 2C



MULTI-STONE GH TOOL



SUNNEN HTS-074-xxx up to 1'100 cm³/h

SPECIFICATIONS

Spindle motor: 7 - 9 kW / 9.5 - 12.2 HP
 Diameter range [ID]: 20 - 900 mm
 (Diameter range depends on machine type)
 Stroke length: up to 13'750 mm

ADVANTAGES / CUSTOMER BENEFITS

- Large diameter range
- Automatic bore geometry correction
- Operator-friendly Windows®-based monitoring system
- Tool overload protection
- Easy operation with industrial touch screen
- Programmable dimension monitoring

SUNNEN HTS-124-xxx up to 1'600 cm³/h

SPECIFICATIONS

Spindle motor: 11 - 15 kW / 16.5 - 20.3 HP
 Diameter range [ID]: 40 - 900 mm
 (Diameter range depends on machine type)
 Stroke length: up to 13'750 mm

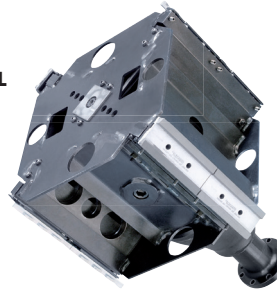
ADVANTAGES / CUSTOMER BENEFITS

- Large diameter range
- Automatic bore geometry correction
- Operator-friendly Windows®-based monitoring system
- Tool overload protection
- Easy operation with industrial touch screen
- Programmable dimension monitoring

MULTI-STONE GH TOOL



EIGHT-STONE HB TOOL



SUNNEN HTC-W SERIES The HTC-W is the result of 30 years experience in tube hone design and manufacturing, combined with inputs from our customers around the globe. Most of the systems are custombuilt and have enough power and sensibility to work from diameter 25 mm up to 1'000 mm. The stock removal rate is given through a 9 kW servo drive and a 4-step gearbox.

This configuration ensures optimum power in the whole diameter range and a stock removal rate up to 1'000 cm³/h. Together with the Sunnen tools, abrasives and coolant oils, all the HTC-W Systems are working at their top performance and will meet everybody's production demands.



SUNNEN HTC-W up to 1'000 cm³/h

SPECIFICATIONS

Spindle motor: 9 kW / 12.2 HP
Diameter range [ID]: 25 - 1'000 mm
Stroke length: up to 10'000 mm

ADVANTAGES / CUSTOMER BENEFITS

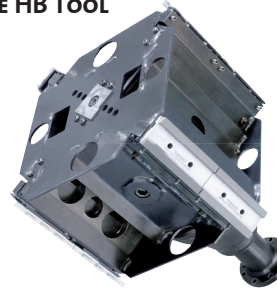
- Large diameter range
- Automatic bore geometry correction
- Operator-friendly Windows®-based monitoring system
- Fast setup
- Excellent for production



MULTI-STONE GH TOOL



EIGHT-STONE HB TOOL



SUNNEN HTH-S up to 800 cm³/h

SUNNEN HTH-S SERIES The HTH-S Series is working with a 7.5 kW spindle drive system. Together with the 4-step gearbox the HTH-S ensures maximum power over the whole diameter range (up to 800 cm³/h). It is the first system of its kind which offers highest flexibility on a production level.

SPECIFICATIONS

Spindle motor: 7.5 kW / 10.2 HP
Diameter range [ID]: 25 - 800 mm
Stroke length: up to 10'000 mm

ADVANTAGES / CUSTOMER BENEFITS

- Automatic bore geometry correction
- Fast setup
- Simple operation
- Excellent for production



FOUR-STONE MPS TOOL



SUNNEN HTB-S up to 400 cm³/h

SUNNEN HTB-S SERIES is the ideal system when flexibility for repair work and small production is required. The job shop system with the 3.5 kW spindle drive ensures maximum power up to diameter (ID) 350 mm with 400 cm³/h stock removal.

SPECIFICATIONS

Spindle motor: 3.5 kW / 4.8 HP
Diameter range [ID]: 25 - 350 mm
Stroke length: up to 10'000 mm

ADVANTAGES / CUSTOMER BENEFITS

- Automatic bore geometry correction
- Fast setup
- Simple operation
- Excellent for repair & job-shop production

MULTI-STONE MMT TOOL



SUNNEN HTE-W The HTE-W has been developed to hone small diameters, especially for job shops and repair facilities. The flexible honing system achieves enough power to drive a wide range of push-tools by using our large assortment of borazon or diamond metal-bond superabrasives. The smart control system feels tight sections in the bore and corrects them automatically. Even excessive torque incidents are handled safely.

SUNNEN HTE-W up to 150 cm³/h



SPECIFICATIONS

Spindle motor: 0.75 kW / 1 HP
Diameter range [ID]: 4 - 19 mm
Stroke length: 1'600 mm

ADVANTAGES / CUSTOMER BENEFITS

- Fast setup
- Automatic bore geometry correction
- Programmable dimension monitoring
- Tool overload protection
- Operator-friendly Windows®-based monitoring system



US INNOVATIONS

LARGE PART – TUBE HONE PRODUCTION

SUNNEN HTG-S SERIES The HTG-S is the solution for the heavy-duty demands of the oil and gas industry. A new proportional load control hydraulic system enables maximum utilization of hydraulic power. The power of the hydraulic system is controlled with precision, enabling better accuracy and productivity when honing rough bores.



SUNNEN HTG-S up to 3'000 cm³/h

SPECIFICATIONS

Spindle motor: 30 kW / 40 HP

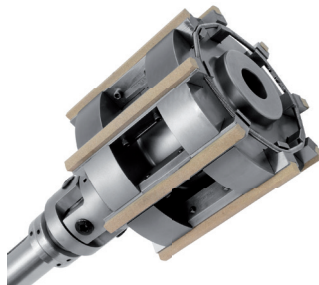
Diameter range [ID]: 50 - 610 mm

Stroke length: up to 13'750 mm

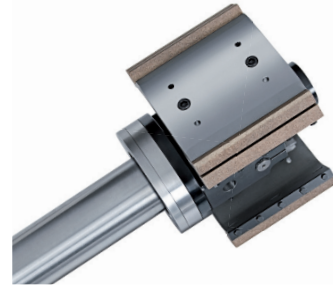
ADVANTAGES / CUSTOMER BENEFITS

- Large diameter range
- Feed pressure control
- Easy to use large PLC touch screen control
- Programmable dimension monitoring
- High stock removal up to 3'000 cm³/h

MULTI-STONE GH TOOL



SHELL TOOL 2C



SUNNEN HTA-S The HTA-S is specially designed for job shops and repair facilities. This system is suited for hydraulic services, repair of actuators and other low stock removal applications such as flow tube/meter run cleanup or extruder tube rebuilding.

The HTA is available in two models: the HTA-2100 (featuring a 2-meter stroke), and the HTA-4100 (featuring a 4-meter stroke).

SUNNEN HTA-S up to 130 cm³/h

SPECIFICATIONS

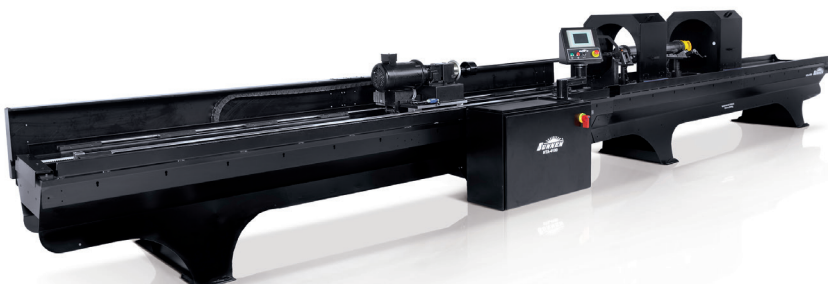
Spindle motor: 2.24 kW / 3 HP

Diameter range [ID]: 64 - 533 mm

Stroke length: up to 4'000 mm

ADVANTAGES / CUSTOMER BENEFITS

- Fast setup
- Simple operation
- For repair jobs



HEAVY-DUTY ANR TOOL



○..... **SHELL TOOL 2C**

Range of use ϕ 100 - 810 mm
Large cutting volume
up to 3'000 cm³/h (up to 183.1 in³/h)

○..... **STANDARD SINGLE-STONE TOOLS**

ϕ 1.5 - 152 mm
Application: Workpieces with through-bores, blind bores and tandem bores

○..... **STANDARD Y TOOLS**

ϕ 6.2 - 98 mm
Application: Bores with splines or other interruptions

○..... **MULTI-STONE MMT TOOLS**

ϕ 3.8 - 110 mm
Maximum precision
(geometrical tolerance and surface)

○..... **TUBE-TYPE CGT TOOL**

ϕ 3 - 32 mm
Maximum precision
(geometrical tolerance and surface)

○..... **SINGLE STROKE[®] TOOLS**

ϕ 3 - 50 mm
Maximum precision
(geometrical tolerance and surface)
Ideal for short-chip materials

○..... **MULTI-STONE SRT TOOL**

ϕ 39 - 78 mm
Large cutting volume up to 300 cm³/h (up to 18.3 in³/h)
6 - 8 abrasive stones in use

○..... **FOUR-STONE GL TOOL**

ϕ 12.7 - 65 mm
Large cutting volume
4 abrasive stones in use

SUNNEN TOOLING Sunnen offers the most complete line of tooling in the industry. This variety is crucial for the flexibility of the honing process and its economical advantages. Besides lubricants and coolants for an optimum cutting action, Sunnen manufactures the largest selection of abrasive materials, bond types, grain sizes and stone configurations. The range goes from customized solutions for large series and μ -applications to standard and portable hand-honing tools.

MULTI-STONE GHSS TOOL○

ϕ 37 - 195 mm
Large cutting volume
up to 350 cm³/h (up to 21.3 in³/h)
6 - 8 abrasive stones in use

FOUR-STONE MPS TOOL○

ϕ 50 - 650 mm
Broad diameter range
Easy handling

MULTI-STONE GH TOOL○

ϕ 12.7 - 450 mm
Large cutting volume
up to 3'000 cm³/h (up to 183.1 in³/h)
3 - 10 abrasive stones in use

EIGHT-STONE HB TOOL○

ϕ 76 - 1'500 mm
Large diameter range
Large cutting volume
up to 900 cm³/h (up to 54.9 in³/h)

FOUR-STONE HB-SL TOOL○

ϕ 97 - 670 mm
Large cutting volume
up to 500 cm³/h (up to 30.5 in³/h)
Easy handling





HONING OILS AND COOLANTS

Sunnen's specially formulated and tested honing oils and coolants optimize the bore sizing performance of both plated and abrasive stone tools. These fluids cool the workpiece and flush chips from the work zone. Filters are designed to remove contamination from the coolants in various micron levels to ensure consistent bore sizing performance.

- KG3X HONING OIL
- LT9X HONING OIL CONCENTRATE
- MAN852 HONING OIL
- MAN863 HONING OIL
- MB30 HONING OIL
- MB40 HONING OIL
- SCC HONING COOLANT
- SH0500 VEGETABLE HONING OIL
- SH0965 VEGETABLE HONING OIL

MEASURING INSTRUMENTS

Sunnen measuring instrument systems are mechanically stable, reliable and comply with the required measuring accuracy.

Range \varnothing 1.37 - 305 mm (0.05 - 12 in)



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