

Production Tube Hone

HTS Series

Market driven Solution

Tube Hone System HTS



Swiss Innovation



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.

Two power versions

HTS-074-xxx

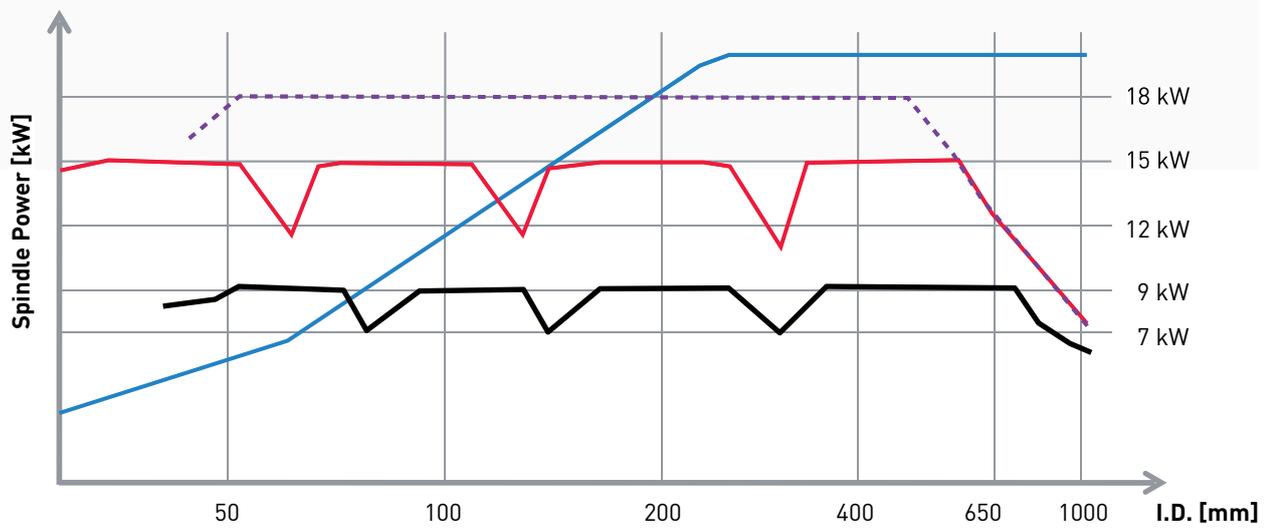
1'100 cm³/h (67.1 in³/h)
7.0 - 9.0 kW / 9.5 - 12.2 HP

HTS-124-xxx

1'600 cm³/h (97.6 in³/h)
11.0 - 15.0 kW / 16.5 - 20.3 HP
(Optional: 18 kW / 24.5 HP)



Power Diagram



— HTS-124-xxx
 — HTS-074-xxx
 — Max. GH / 2C-Tool load (1'600 cm³/h at $\phi > 200$ mm)
 - - - Optional

Customer Benefits

Tube Hone System HTS





Your Benefits with the New HTS Generation

The new HTS-Series is proceeding the success of the wellknown HT (Tube Hone) family of Sunnen. Over 500 systems sold world-wide of its type, the new market driven HTS-Series is now featuring all inputs of our customers around the globe. With a state-of-the-art design, the rigid HTS-Series is completely covered to the floor and built as unique modular concept. Anywhere at anytime the system therefore is extendable by either 4 m or 6 m honing length. The rack and pinion stroker system in combination with 7 kW or 12 kW and the harmonized gear box ensures optimal and constant power over the whole range. No matter what diameter and tube length you might have, the system will do it. With Sunnen's new AutoShift gear box system, the spindle speed will be adjusted automatically, which maximizes the operator's comfort and safety. In addition the HTS works with a belt driven tool drive which guarantees smooth working condition and shock protection for the gear box.

Meeting customers demand

A special improvement has been made at the part holding device. Standard for the 12 kW version and optional for the 7 kW version, the unique system holds all parts in the range of 50 - 800 mm (2.0 - 31.5 in) and can be set-up and adjusted easily. The adjustable V-block unit can be slid on rails to the right position. Even the highly valued touch screen control got re-designed. Now featuring Sunnen Icons, the system can be set-up and operated even more simple.

Unique Touch Screen Control

Automatic bore geometry correction: The system indicates high and low spots and corrects the geometry with appropriate short strokes without operator intervention.

Easy set-up: All parameters are stored and the system recommends the required tool, sets the spindle speed and all necessary cycle parameters. A new set-up can be made within 2 minutes, step-by-step.

Tool overload protection: The 100% control of the process ensures optimal stock removal and protection of the tool.

Customer Application

HYDRAULICS





HYDRAULICS

Typical Applications

- Hydraulic Cylinders for:
- Construction Machinery
 - Moving Dredging Unit
 - Lifting of Bridges
 - Moving of Stage Equipment
 - Mining Equipment (e.g. roof support)

Typical Requirements

H7 / H8 Tolerances

Advantages of Honing

High precision, long seal life

Sunnen Solution

HT-Series (HTA, HTB, HTH, HTS, HTG, HTD)

Customer Application

OIL & GAS / ENERGY





ENERGY PRODUCTION

Typical 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, higher pressure operation / efficiency due to high precision, no vibration due to temperature changes, flexible due to low number of tools for large diameter range, honing of exotic materials (Inconel...)

Sunnen Solution

HT-Series (HTA, HTB, HTH, HTS, HTG, HTD)

Customer Application

AVIATION





AVIATION

Typical Applications

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

Typical Requirements

H6 / H7 / H8 Tolerances, blind-bores

Advantages of Honing

Crosshatch pattern characteristic, outstanding bore quality leads tribology values, no influence of heat to material structure of the surface, no white layer, honing of exotic materials (Titanium, Inconel...)

Sunnen Solution

HT-Series (HTA, HTB, HTH, HTS, HTG, HTD)

Technical Specification

HTS-Series

Specification Number

HTS-XXX-XXX-XX

Spindle Power

07 = 7 kW
12 = 12 kW

Gear Box

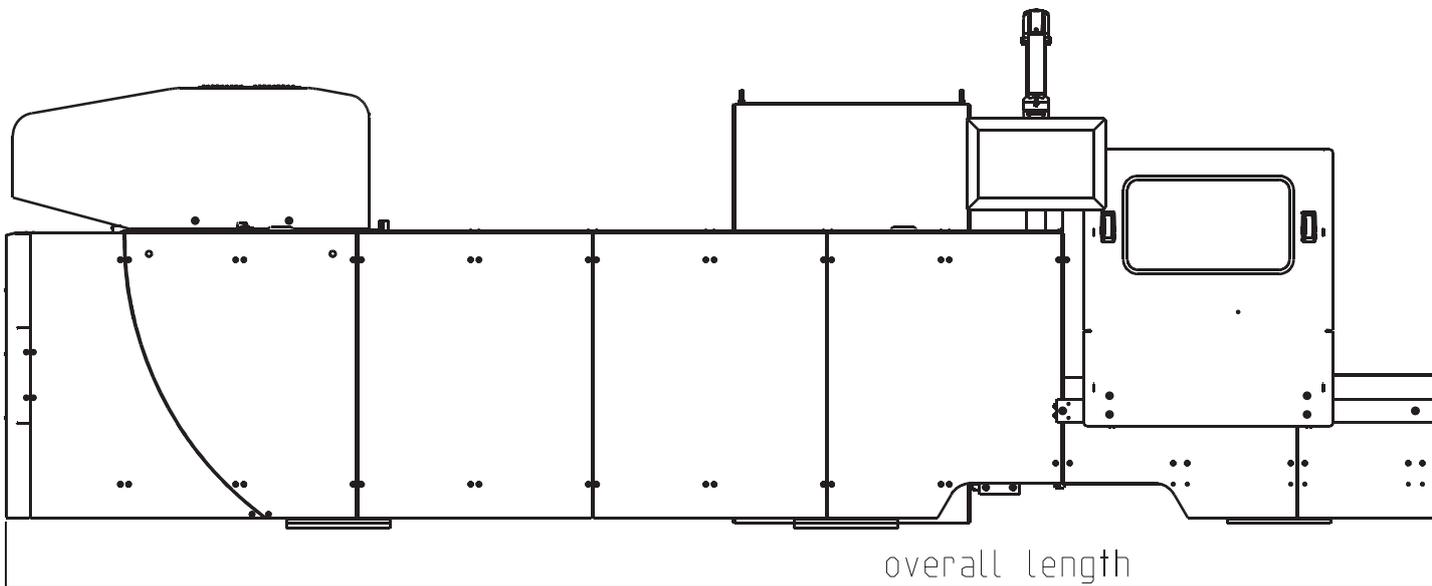
4 = 4 steps

Max. Bore Length

020 = 2'000 mm (2.0 m), 6.56 ft
040 = 4'000 mm (4.0 m), 13.12 ft
055 = 5'500 mm (5.5 m), 18.04 ft
075 = 7'500 mm (7.5 m), 24.61 ft
095 = 9'500 mm (9.5 m), 31.17 ft
115 = 11'500 mm (11.5 m), 37.73 ft
130 = 13'000 mm (13.0 m), 42.65 ft

Options

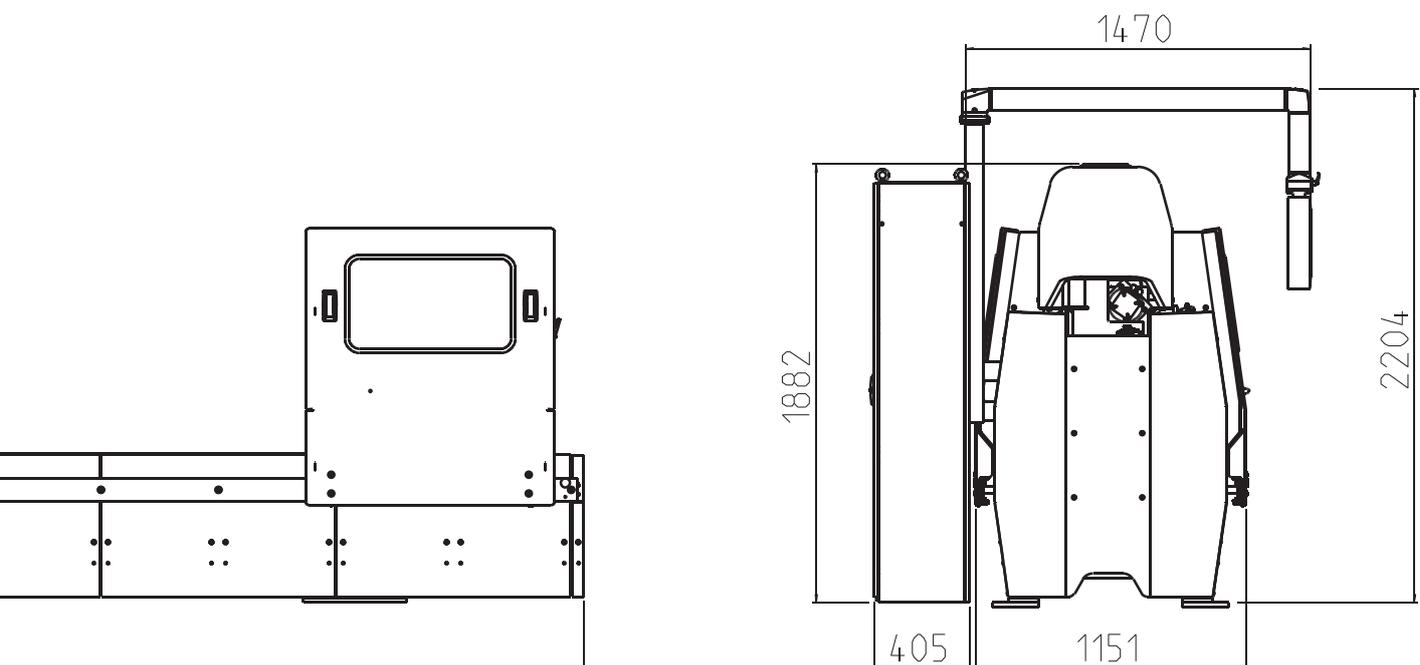
01 = w/o working table
02 = Low working table



HTS Dimensions

	HTS -xxx-020	HTS -xxx-040	HTS -xxx-055	HTS -xxx-075	HTS -xxx-095	HTS -xxx-115	HTS -xxx-130
Max. Bore Length	2'000 mm 6.56f t	4'000 mm 13.12 ft	5'500 mm 18.04 ft	7'500 mm 24.61 ft	9'500 mm 31.17 ft	11'500 mm 37.73 ft	13'000 mm 42.65 ft
Max. Stroke Length	2'500 mm 8.2 ft	4'500 mm 14.76 ft	6'250 mm 20.5 ft	8'000 mm 26.24 ft	10'000 mm 32.81 ft	12'000 mm 39.37 ft	14'000 mm 45.93 ft
No. of Fix Steady Rests	1	1	1	1	1	1	1
No. of Moving Steady Rests	0	0	1	2	3	3	3
Overall Length	8'500 mm 27.90 ft	12'500 mm 41.00 ft	16'500 mm 54.12 ft	20'500 mm 67.24 ft	24'500 mm 80.36 ft	28'500 mm 93.50 ft	32'500 mm 106.60 ft
Spindle Center Height	1'200 mm 3.93 ft	1'200 mm 3.93 ft	1'200 mm 3.93 ft	1'200 mm 3.93 ft	1'200 mm 3.93 ft	1'200 mm 3.93 ft	1'200 mm 3.93 ft
Machine weights (basis machine)	~5.5 T	~7.5 T	~9.5 T	~10.5 T	~12.0 T	~13.5 T	~15.0 T

Remark: Other lengths on request.



Technical Specification

HTS-074-XXX / 7 kW

Capacity	<ul style="list-style-type: none"> • Stock Removal Power • I.D. Capacity <p>Part Holding Fixtures</p> <ul style="list-style-type: none"> • O.D. Capacity No. 1: V-Blocks 6'000 kg • O.D. Capacity No. 2: V-Blocks 8'000 kg • O.D. Capacity No. 3: Chain type 16'000 kg 	upt o1'100c m ³ /h (67.1 in ³ /h) 20 - 900* mm (0.8 - 35.4* in) 40 - 600 mm (1.6 - 22.6 in) 50 - 810 mm (2 - 31.8 in) 70 - 1'000 mm (2.7 - 39.4 in)
Spindle Drive System	<ul style="list-style-type: none"> • AC-Motor • Spindle Speeds-Ininitely Variable Spindle reducer 1: SUNNEN 4 Step Shifting Gear Spindle reducer 2: Timing - Belt 	7.0 kW (Rated Output 7.0 - 9.0 kW) 10 - 450 RPM
Stroke System	<ul style="list-style-type: none"> • Servo Motor • Speed Control • Stroking Speeds-Ininitely Variable • The spindle carriage run's by linear ball bearing on two hardened and ground linear way bars on the gear table (left side) • Rack and pinion system guarantees evenly carriage and tool movements 	10.2 kW Electronic – Variable 0.1 - 48 m/min
Tool Feed System	<ul style="list-style-type: none"> • Servo Motor • The rotary tool feed is generated through servo motor and overlap gear system. 	1.0 kW
Computer Control	<ul style="list-style-type: none"> • SUNNEN IPC Control (Industrial PC Control), based on Windows EMBEDDED • Remote Maintenance • The 3-Axis function control manage stroke positions, motion control, stone feed, spindle speed and cutting pressure guarantee the most favorable accuracy and bore geometry • The Touch Screen Panel for the dialog programming has all the necessary functions to control the process 100% 	
Machine Base	<ul style="list-style-type: none"> • Heavy duty reinforced welded steel construction artificially aged, fully covered • Modular Construction, easy to extend stroke length (modules of 4 and 6 meters) 	
Supply Requirements	<ul style="list-style-type: none"> • Electrical Machine • Electrical Turbo Separator Filter unit • Pneumatics 	3 PNE 400-460 V / 50/60 Hz, 50 A 3 PNE 400-460 V / 50/60 Hz, 22 A 6 bar, 30 l/min - 1/2" I.D. thread
Lubrication System	<ul style="list-style-type: none"> • Way Bearings • Rack and Pinion • Spindle Bearings, Gear Reducers 	Manual lubricated Auto forced grease Oil Bath

* I.D. Capacity depending on Part Holding Fixture, Optional up to 1'200 mm, with special workbase.

Coolant System	<ul style="list-style-type: none"> • Sump Pump 	100 l/min
Coolant and Filter Systems	<ul style="list-style-type: none"> • Coolant Tank with 300 or 600 liter capacity, Magnetic Separator, Supply Pump 50 l/min • Centrifugal filter unit 700 liter capacity, Magnetic Separator, Oil Chiller, Supply Pump 50 l/min • Customer Solution 	<ul style="list-style-type: none"> - Paper Filter Unit (optional) - Chiller unit (optional)
Safety Features	<ul style="list-style-type: none"> • CE Version: <ul style="list-style-type: none"> - 1 Light Curtain in front of spindle table - 1 Fence on right and left end side to the backside wall 	
Paint	<ul style="list-style-type: none"> • Silver Grey RAL 9006 / Anthracite 6482 / Red RAL 3001 	
Standard Features	<ul style="list-style-type: none"> • The 3-axis function control manages stroke positions, motion control, stone feed, spindle speed and the cutting pressure guarantees the most favorable accuracy and bore geometry • Repeat position of stroke within 0.1 mm during operation, independent of different stroke speeds • Stroke speed variable (stroke rate adjustable in 0.1 m/min increments through operator interface adjustable during cycle) • Size lock system with stone wear compensation • Dwell and oscillation feature • Spark out function • All axes are electrical driven • Storage facility for over 900 programmed set-up • Spindle jog, short stroke • Digital stroke position indicator • Digital stroke speed indicator • Digital spindle RPM readout 	
Optional Features	<ul style="list-style-type: none"> • In-process gauging system for I.D. 25 - 230 mm • Moving steady rests for 2 and 4 Meter Machines • Double stage tools option (roughing / finishing operation) • Taper bore option • Part rotary device • Other Spindle Motors with single speed Spindle Gear Box for special applications (3 up to 9 kW) 	

Remark: The mentioned max. stock removal power are measured on a test bench with a tube I.D. 250 mm / O.D. 450 mm, St-52. Diametrical Stock Removal 0.5 mm, bore length 2'000 mm.

Technical Specification

HTS-124-XXX / 12 kW

Capacity	<ul style="list-style-type: none"> • Stock Removal Power • I.D. Capacity <p>Part Holding Fixtures</p> <ul style="list-style-type: none"> • O.D. Capacity No. 1: V-Blocks 6'000 kg • O.D. Capacity No. 2: V-Blocks 8'000 kg • O.D. Capacity No. 3: Chain type 16'000 kg 	<p>up to 1'600 cm³/h (97.6 in³/h)</p> <p>20 - 900* mm (0.8 - 35.4* in)</p> <p>40 - 600 mm (1.6 - 23.6 in)</p> <p>50 - 810 mm (2- 31.8 in)</p> <p>70 - 1'000 mm (2.7 - 39.4 in)</p>
Spindle Drive System	<ul style="list-style-type: none"> • AC-Motor • Spindle Speeds-Ininitely Variable Spindle reducer 1: SUNNEN 4 Step Shifting Gear Spindle reducer 2: Timing - Belt 	<p>12.0 kW (Rated Output 11.0 - 15.0 kW)</p> <p>10 - 470 RPM</p>
Stroke System	<ul style="list-style-type: none"> • Servo Motor • Speed Control • Stroking Speeds-Ininitely Variable • The spindle carriage run's by linear ball bearing on two hardened and ground linear way bars on the gear table (left side) • Rack and pinion system guarantees evenly carriage and tool movements 	<p>10.2 kW</p> <p>Electronic – Variable</p> <p>0.1 - 48 m/min</p>
Tool Feed System	<ul style="list-style-type: none"> • Servo Motor • The rotary tool feed is generated through servo motor and overlap gear system. 	<p>1.0 kW</p>
Computer Control	<ul style="list-style-type: none"> • SUNNEN IPC Control (Industrial PC Control), based on Windows EMBEDDED • Remote Maintenance • The 3-Axis function control manage stroke positions, motion control, stone feed, spindle speed and cutting pressure guarantee the most favorable accuracy and bore geometry • The Touch Screen Panel for the dialog programming has all the necessary functions to control the process 100% 	
Machine Base	<ul style="list-style-type: none"> • Heavy duty reinforced welded steel construction artificially aged, fully covered • Modular Construction, easy to extend stroke length (modules of 4 and 6 meters) 	
Supply Requirements	<ul style="list-style-type: none"> • Electrical Machine • Electrical Turbo Separator Filter unit • Pneumatics 	<p>3 PNE 400-460 V / 50/60 Hz, 80 A</p> <p>3 PNE 400-460 V / 50/60 Hz, 22 A</p> <p>6 bar, 30 l/min - 1/2" I.D. thread</p>
Lubrication System	<ul style="list-style-type: none"> • Way Bearings • Rack and Pinion • Spindle Bearings, Gear Reducers 	<p>Manual lubricated</p> <p>Auto forced grease</p> <p>Oil Bath</p>

* I.D. Capacity depending on Part Holding Fixture, Optional up to 1'200 mm, with special workbase.

Coolant System	<ul style="list-style-type: none"> • Sump Pump 	100 l/min
Coolant and Filter Systems	<ul style="list-style-type: none"> • Coolant Tank with 300 or 600 liter capacity, Magnetic Separator, Supply Pump 50 l/min • Centrifugal filter unit 700 liter capacity, Magnetic Separator, Oil Chiller, Supply Pump 50 l/min • Customer Solution 	<ul style="list-style-type: none"> - Paper Filter Unit (optional) - Chiller unit (optional)
Safety Features	<ul style="list-style-type: none"> • CE Version: <ul style="list-style-type: none"> - 1 Light Curtain in front of spindle table - 1 Fence on right and left end side to the backside wall 	
Paint	<ul style="list-style-type: none"> • Silver Grey RAL 9006 / Anthracite 6482 / Red RAL 3001 	
Standard Features	<ul style="list-style-type: none"> • The 3-axis function control manages stroke positions, motion control, stone feed, spindle speed and the cutting pressure guarantees the most favorable accuracy and bore geometry • Repeat position of stroke within 0.1 mm during operation, independent of different stroke speeds • Stroke speed variable (stroke rate adjustable in 0.1 m/min increments through operator interface adjustable during cycle) • Size lock system with stone wear compensation • Dwell and oscillation feature • Spark out function • All axes are electrical driven • Storage facility for over 900 programmed set-up • Spindle jog, short stroke • Digital stroke position indicator • Digital stroke speed indicator • Digital spindle RPM readout 	
Optional Features	<ul style="list-style-type: none"> • In-process gauging system for I.D. 25 - 230 mm • Moving steady rests for 2 and 4 Meter Machines (Stroke length minus 300 mm) • Double stage tools option (roughing / finishing operation) • Taper bore option • Part rotary device • Other Spindle Motors with single speed Spindle Gear Box for special applications (3 up to 18 kW) • Special applications can be addressed as required 	

Remark: The mentioned max. stock removal power are measured on a test bench with a tube I.D. 380 mm / O.D. 600 mm, St-52. Diametrical Stock Removal 0.5 mm, bore length 2'000 mm.

All-Inclusive Supplier

Sunnen Essentials

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 a 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.

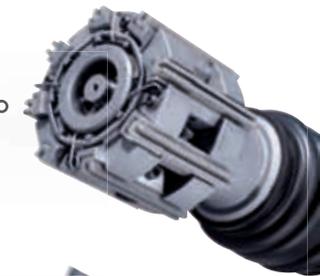


Shell Tool 2C

Range of Use \varnothing 100- 810 mm
(up to 1'600 cm³/h; up to 97.6 in³/h)*

Multi-Stone GHSS Tool

Range of Use \varnothing 37 - 195 mm
(50 - 350 cm³/h; 3 - 21.3 in³/h)*
High Precision



Four-Stone MPS Tool

Range of Use \varnothing 50 - 177 mm
(70 - 300 cm³/h; 4.3 - 18.3 in³/h)*



Multi-Stone GH Tool

Range of Use \varnothing 20 - 350 mm
(50 - 1'600 cm³/h; 3 - 97.6 in³/h)*



Eight-Stone HB Tool

Range of Use \varnothing 76 - 1'200 mm
(400 - 900 cm³/h; 24.4 - 54.9 in³/h)*



Four-Stone HB-SL Tool

Range of Use \varnothing 97 - 670 mm
(100 - 500 cm³/h; 6.1 - 30.5 in³/h)*



* Stock removal values are for soft steel St-52.

All common honing tools are adaptable.



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
- MAN-852 Honing Oil
- MAN-863 Honing Oil
- MB-30 Honing Oil
- MB-40 Honing Oil
- SCC Honing Coolant
- SHO-500 Vegetable Honing Oil
- SHO-965 Honing Oil



Measuring Instruments

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

Range \varnothing 20 - 300 mm (0.8 - 11.8 in)



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