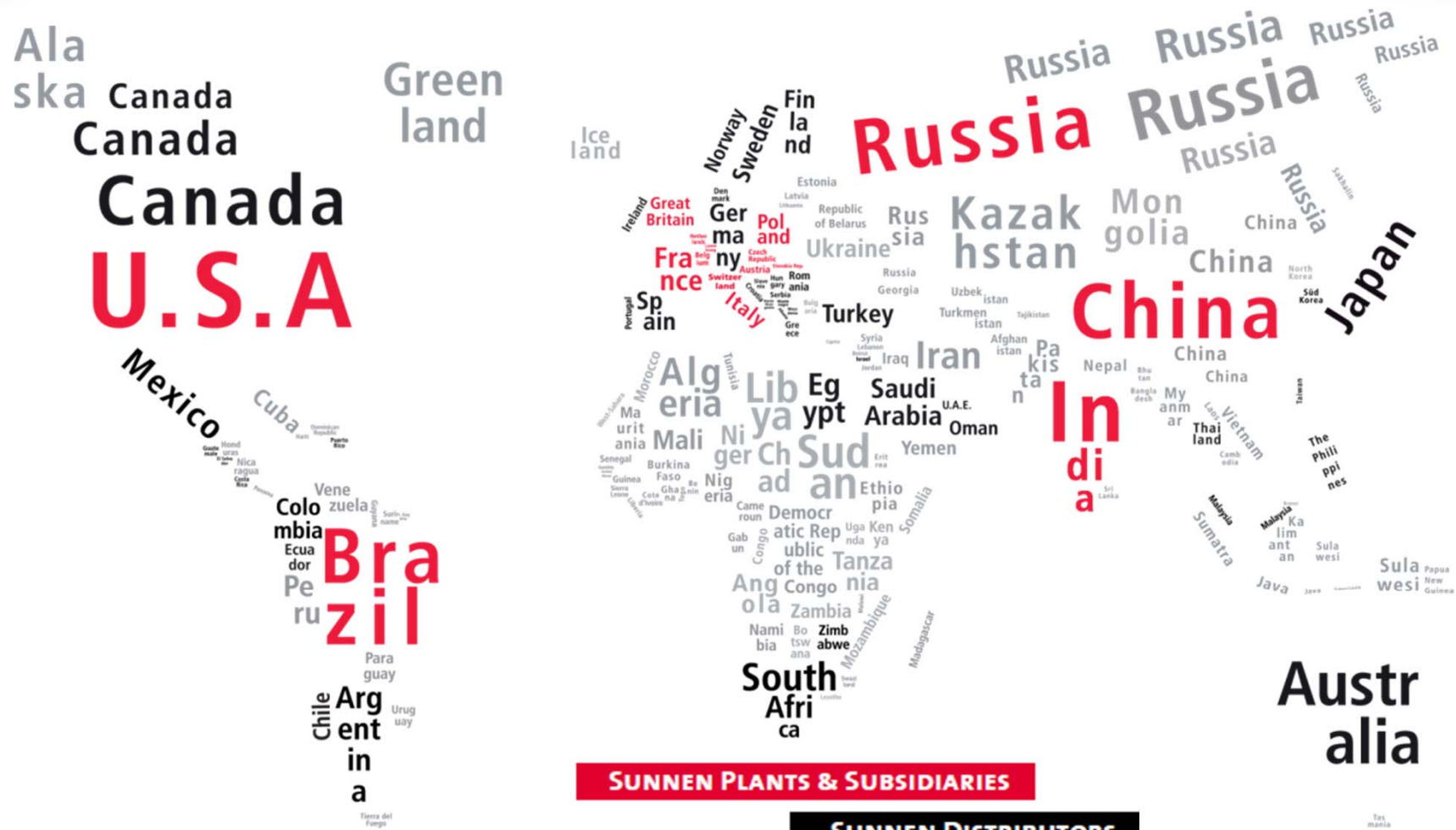




ABOVE AND BEYOND HONING



XTREME HONE



Local sales & Service organization in more than 50 countries all over the world!

New Zealand



Sunnen AG *European technology center*

Technical Support for Europe, RSA & India

Specialized in Customized Automated Solutions & Tube Hones (worldwide)





Sunnen Organization *Headquarter St. Louis*

Portrait:

- ✓ Foundation 1924
- ✓ 700 employees – USA, Europe, Asia





Sunnen Company *Complete honing solutions*

Tooling and Abrasives



Cross- grinding oil
and coolant



Measuring
Instruments



Installation & Training



Cross- grinding Systems



Production accompany
Support & Service

Your Request *Piston rods / hydraulic cylinders*



Specifications

Material:	Steel, Stainless Steel, MOC plating's
Stock removal:	0.3 – 0.7 mm (0.03 – 0.05 mm for hard chrome plated)
Surface finish:	Ra 0.2 μ m (Ra 0.05 μ m after hard chrome plating)

Your Solution *Sunnen Xtreme Hone – external honing machine*

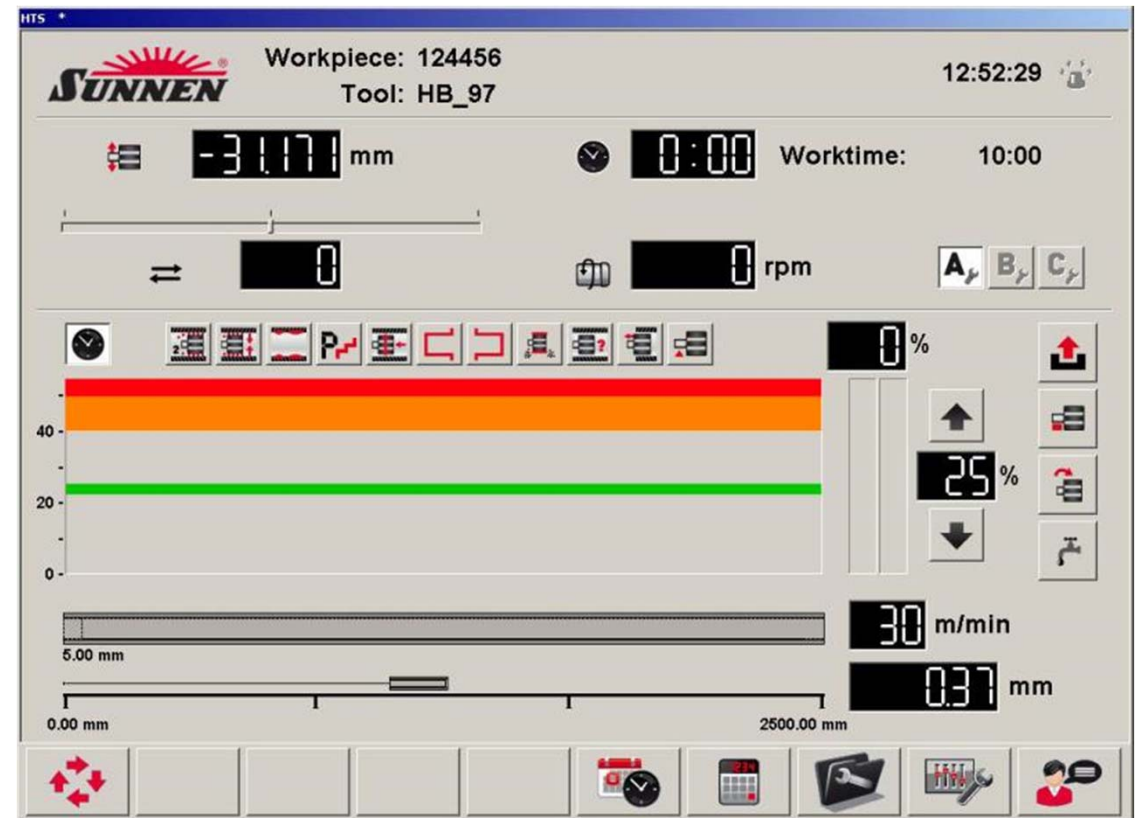


Technical Specifications

- Outside Ø range: 50 - 450 mm
- Max. part length: Up to 12'000 mm
- Spindle power: 30 kW
- Stroke drive power: 14 kW
- Stock Removal rate: Up to **2'500 cm³/h**
- Very thin layers can be honed e.g. laser coating (not possible with grinding)

HT Control *Generation*

- Easy operation with Windows touch screen
- Easy step by step programming
- **Automatic geometry correction**
- Automatic size control
- More than 200 programs can be stored
- Stone wear compensation
- Self process control (machine can run without operator)
- 100% control of process (NO SCRAP AND STONE BREAKS)



Xtreme Hone *Part handling*



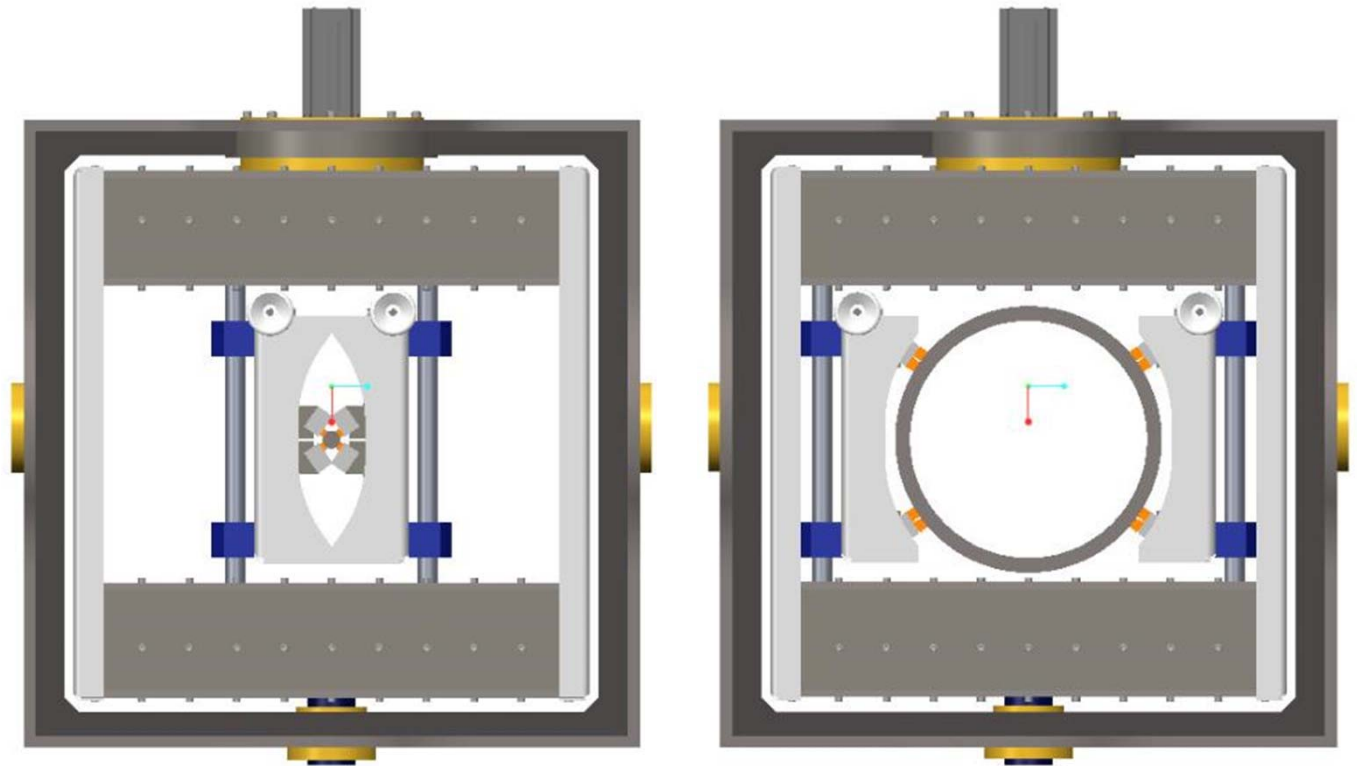
Easy part loading / unloading from the top side of the machine

Xtreme Hone *Retractable steady rests*



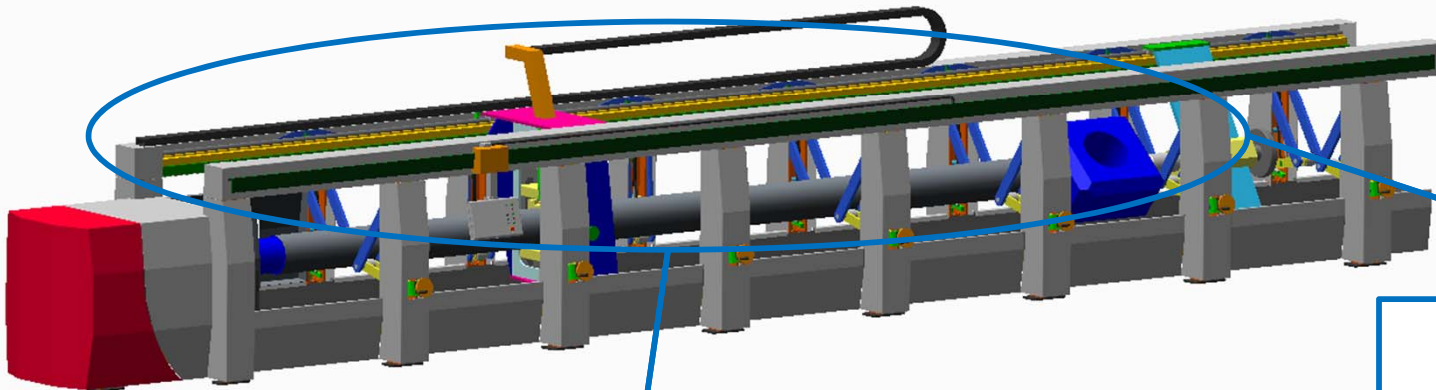
Steady rests will be retracted automatically if the honing tool passes by

Xtreme Hone *Special tooling design for a big Ø range*

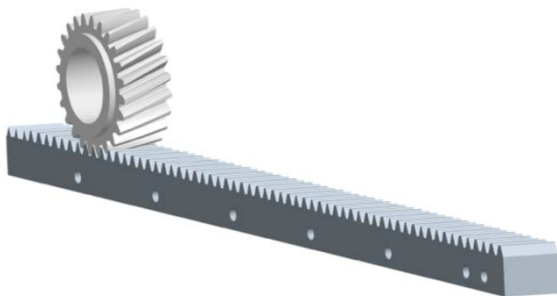


Outside part diameter range 50 – 450 mm

Xtreme Hone *Technical Feature – Rack & Pinion / Linear Guide Rails*



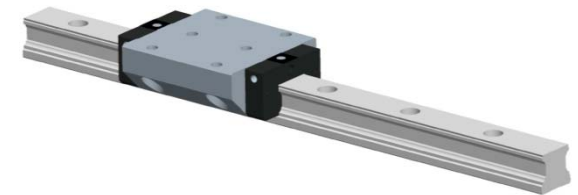
Rack and Pinion



Advantages:

- High positioning accuracy
- Rigid design reduces swinging / bouncing
- Direct drive
- Silent movement
- Low maintenance

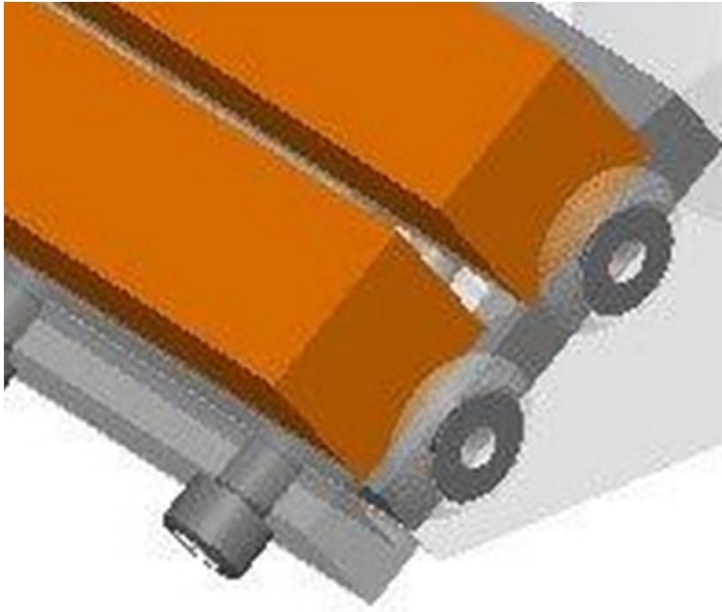
Linear Guide Rails



Advantages:

- stronger guiding of carriage
- Longer life-time

HED Xtreme Hone *Easy stone changing with stone holder shells*



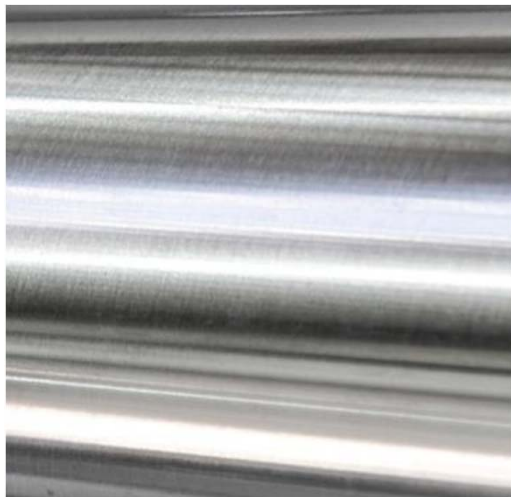
Feature

- Stone holder shells can be changed as a assembly including abrasives.

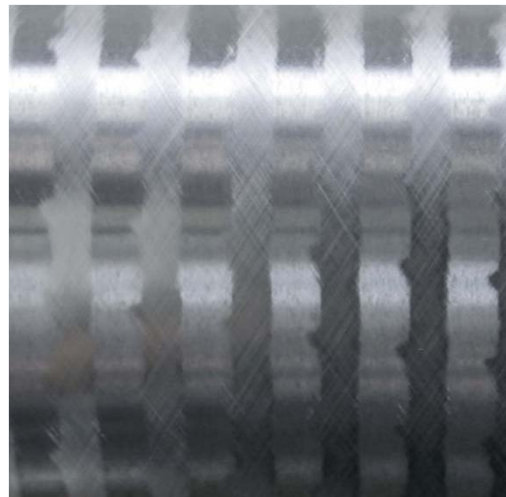
Benefit

- Short change-over time (from roughing to finishing operation)

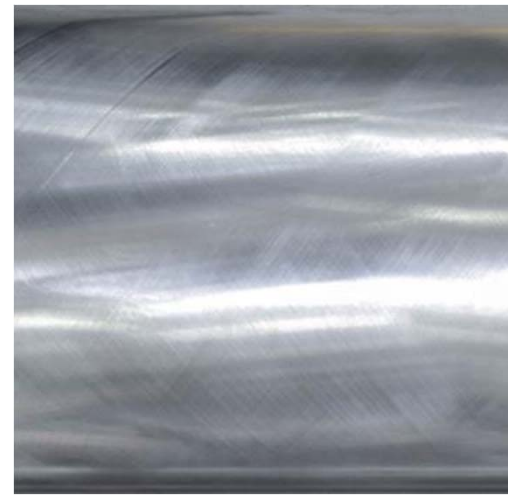
HED Xtreme Hone *Automatic geometry correction*



After outside grinding



Waviness correction



After roughing

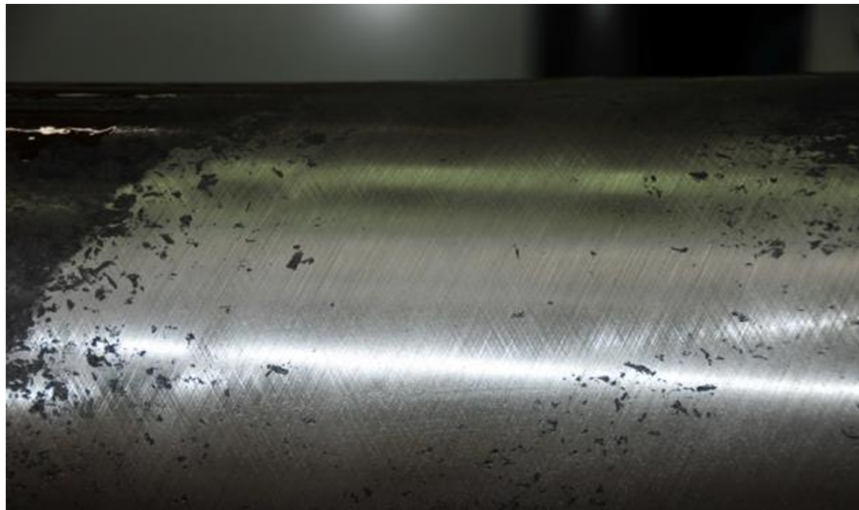


2nd operation finishing

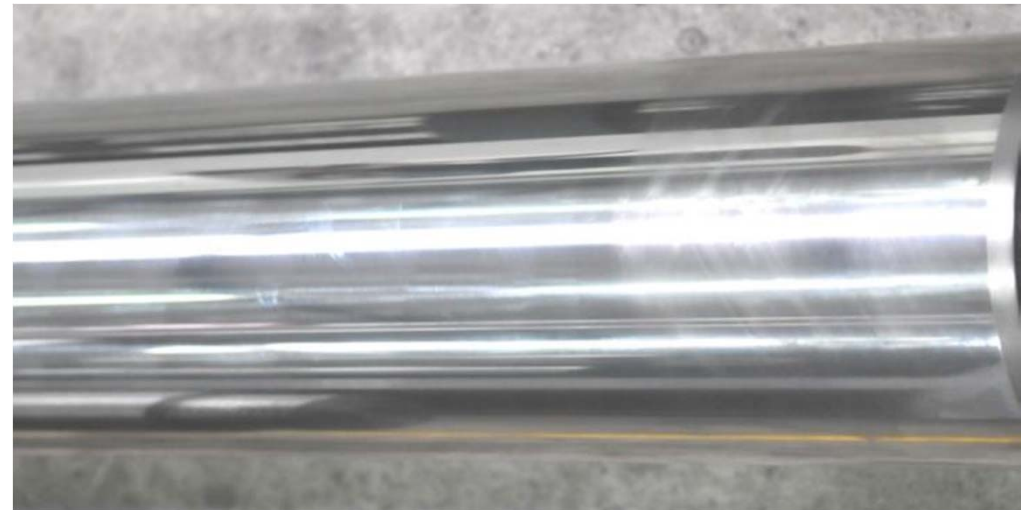
- Automatic correction of waviness
- Reachable surface quality by cross grinding $Ra < 0.05 \mu m$

Reference *Soft steel bar*

BEFORE



AFTER



Specifications:

Shaft OD:	200.00 mm
Shaft length:	4000 mm
Ø tolerance:	0 /+ 0.03 mm
Roundness:	0.015 mm
Cylindricity:	0.03 mm
Surface:	Ra 0.1 µm

Production data:

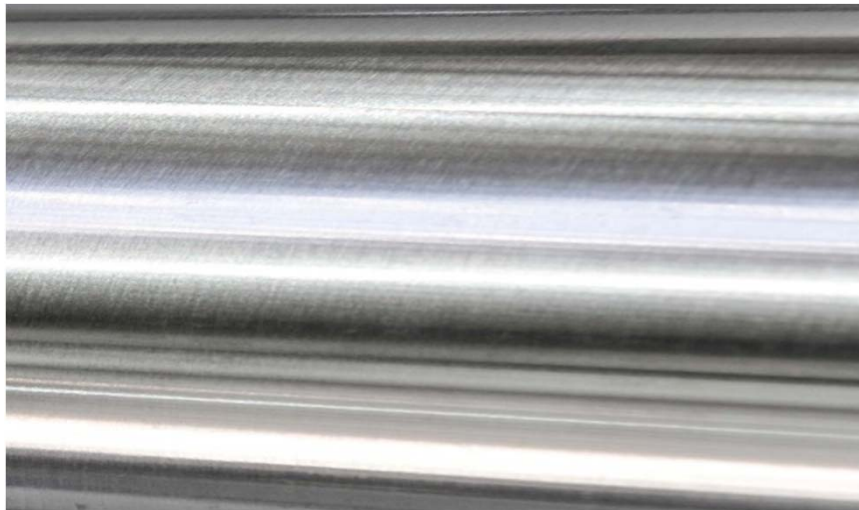
Total stock removal:	1.1 mm
Total Cycle time:	40 min. / part

Steps:

1. Roughing with NM57, Stock removal: ~ 1.00 mm
2. Semi Finishing with A400, Stock removal: ~ 0.04 mm
3. Finishing with C500, Stock removal: ~ 0.03 mm
4. Polishing with Diamond, Stock removal: ~ 0.02 mm

Reference *Hard chrome (pre-honing after chrome plating)*

BEFORE



AFTER



Specifications:

Shaft OD:	90.00 mm
Shaft length:	7100 mm
Ø tolerance:	0 /+ 0.02 mm
Roundness:	0.01 mm
Cylindricity:	0.02 mm
Surface:	Ra 0.05 µm

Production data:

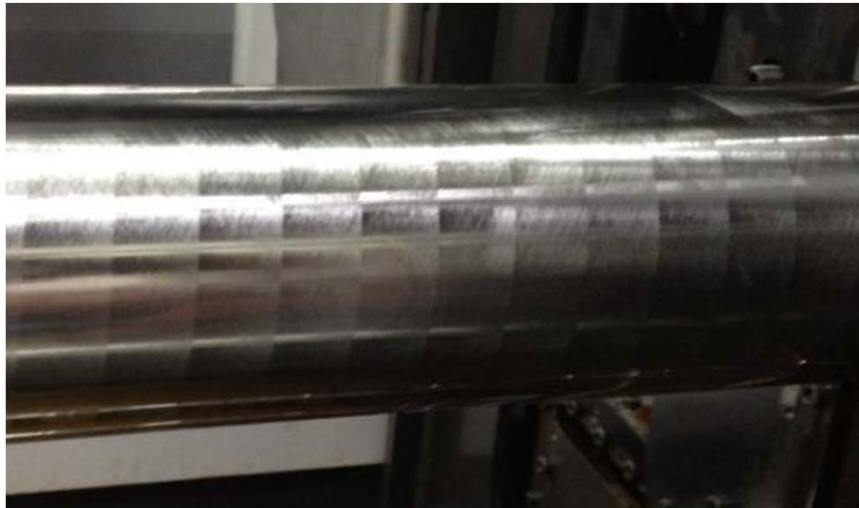
Total stock removal:	0.03 mm
Total Cycle time:	15 min. / part

Steps:

1. Finishing with RMG05, Stock removal: ~ 0.02 mm
2. Finishing2 with Diamond, Stock removal: ~ 0.01 mm

Reference *Wolfram carbide bar (Hardness > 70 HRC)*

BEFORE



AFTER



Specifications:

Shaft OD:	180.00 mm
Shaft length:	7000 mm
Ø tolerance:	0 /+ 0.01 mm
Roundness:	0.01 mm
Cylindricity:	0.02 mm
Surface:	Ra 0.035 µm

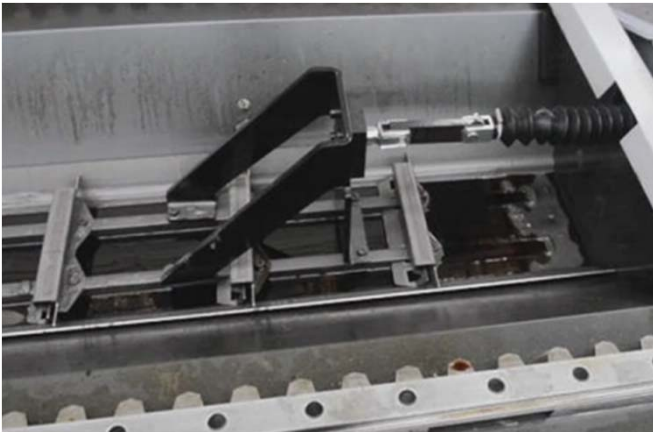
Production data:

Total stock removal:	0.08 mm
Total Cycle time:	35 min. / part

Steps:

1. Roughing with DMG57, Stock removal: ~ 0.05 mm
2. Finishing with RMG05, Stock removal: ~ 0.02 mm
3. Polishing with Diamond, Stock removal: ~ 0.01 mm

HED Xtreme Hone *Sludge scrapper*



Benefits:

- No stipulation of grinding sludge
- Continuous sludge eduction
- Less cleaning effort

Tank and Filtration *Centrifugal filter system with fine filter option*



Specifications:

- 1000 L coolant tank capacity
- Magnetic filter unit
- Oil centrifuge with 65 L/min. cleaning performance
- Optional fine filter (paper filter)



Partnership _____ and Sunnen

... ready for take off - you are driving the market ... !



A Strong Partnership!





Thank you!

