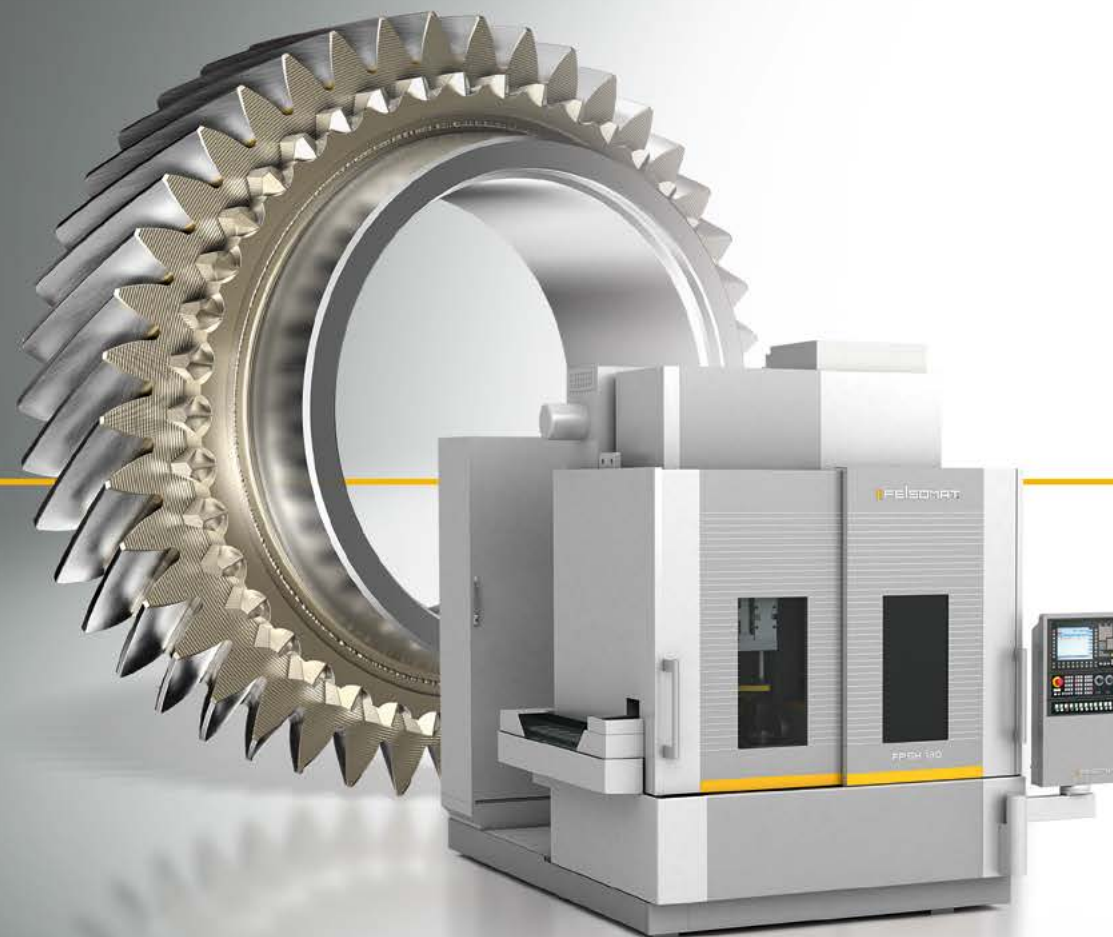


A NEW MACHINE GENERATION

FPSH – Felsomat Power Speed Honing

POWER+
speed



FELSOMAT



POWER+
speed

FPSH – Felsomat Power Speed Honing

The perfected honing machine with ideal process parameters and optimal tool efficiency achieved within a completely synchronized system

- ▶ An inherently rigid and precise machine with excellent damping properties
- ▶ Highly dynamic direct drives with very high spindle speeds, and high torque of the work piece and tool spindle for precise and rigid gear honing
- ▶ A Linear motor enables high feed rates and powerful processing forces for high quality and fast work piece changeover
- ▶ Stiff ceramic honing tool with high material removal rate capability
- ▶ The high cutting speed, vibration dampening and optimal cleaning of the honing tool significantly improves the quality, process times and costs per workpiece
- ▶ High accuracy of Reishauer positive or negative diamond-coated dressing wheel

Felsomat Power Speed Honing FPSH 180 stands for the highest performance and process stability

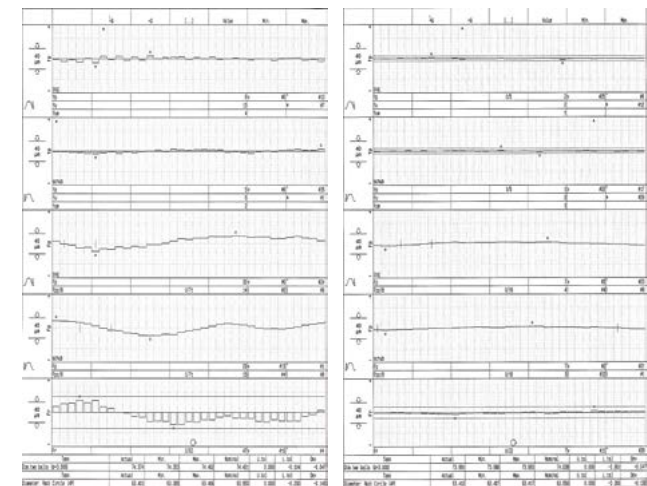
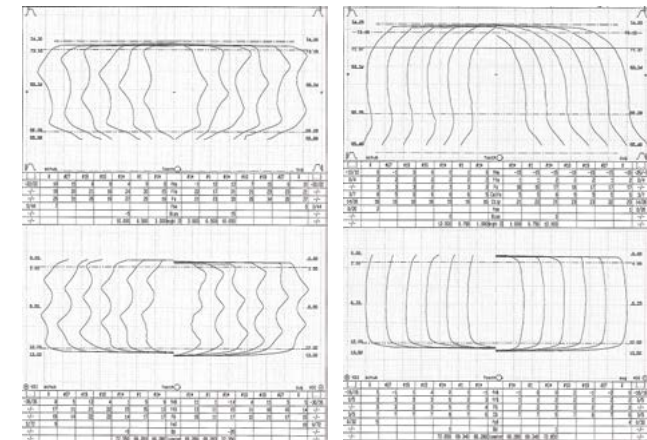
The FPSH 180 starts with the ideal conditions resulting from the Felsomat 2-cut hobbing and adds low distortion vacuum heat treatment, to achieve the advantages of gear noise reduction and compressive residual stress. As compared to shaving of unhardened gears or grinding of hardened gears, the superior performance of the FPSH 180 is evident.

POWER 
speed



Before Honing

After Honing





Hard finish gear cutting is efficient and economical with the Felsomat FPSH 180

The ground-breaking machine concept FPSH 180, sets new standards!
Win Now 3-fold

1. Cycle time advantage

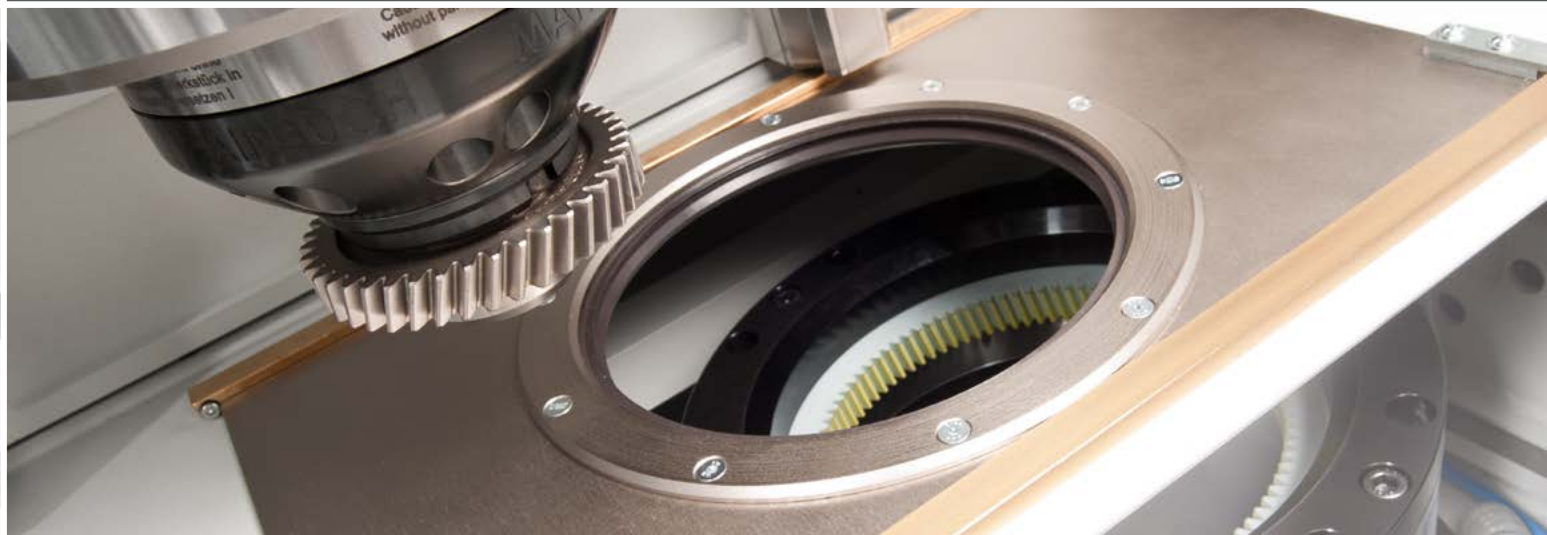
- ▶ 50% higher cutting speed and removal rate
- ▶ Reduced idle time by the quick pick-up concept
- ▶ Minimal set-up by easy access, quick change gripper and a hydraulic quick change clamping of the honing ring actuated by only one central screw
- ▶ Automatic changing of dressing gear and rolls

2. Quality Advantage

- ▶ Improving the quality of teeth by 4-6 DIN levels after heat treatment
- ▶ Twist-free process
- ▶ Noise reduction through unsystematic, accurate surface structures with a high surface finish of $Ra < 0.2$ micron
- ▶ Wear-resistant surfaces of the tooth flanks induced by high residual compressive stresses enable a high load on the gears

3. Process Benefits

- ▶ Maximum process safety through the integrated double flank gear test to check for gear deviations and damages prior to honing
- ▶ Clean oil-tight machine concept with a loading space separate from the enclosed machining area to prevent oil leakage and oil mist
- ▶ A pick-up concept in combination with the double flank gear test, is performed in parallel with the machining time. This allows the work-piece spindle to load/unload and dress the honing tool without requiring an additional axis and provides the shortest possible chip-to-chip-time
- ▶ Minimal tools / workpiece costs due to longer life of the dressing and honing rings
- ▶ High energy efficiency due to:
 - Controlled power recovery module
 - Automatic spray nozzle shutdown
 - Automatic standby mode
 - Short exhaust tubes



Better ergonomics through precision engineering, operations, and maintenance concepts.

The controls – user friendly in every situation

The Siemens Sinumerik 840 DSL controller, with "smart" functions has been integrated by Felsomat for efficient, high-speed honing applications.

The operator is provided with an integrated MMI that is fast, simple and accurate, with "smart" functions.

- ▶ Structured controls layout
- ▶ Input of workpiece data via a centralized, logical standard template with user-friendly data entry
- ▶ Automatic generation of part programs
- ▶ Convenient control cycles support recurring tasks, and complex editing functions. Plain text messages through pop-up windows inform the user comprehensively and make it easier to correct malfunctions

Technical data FPSH 180

Workpiece dia.	160 mm
Max. tooth width	50 mm
Module	0.5 - 4.0 mm
Max. workpiece length	80 mm
Outside honing ring dia.	270 mm
Honing ring width	50 mm
Cutting tool material	ceramic
Max. workpiece spindle RPM	13000
Max. tool spindle RPM	5000
Machine weight	15000 kg



Flexline: highest efficiency, cost-effectiveness and quality

The Future of Gear Manufacturing

Machines, tooling and automation, including intergrated quality assurance for every individual process: REISHAUER and FELSOMAT are redefining the integration of gear manufacturing technologies.

The task

Combining all process technologies into one complete system. Every process step is integrated into the seamless, continuous-flow production process, thereby streamlining the production line and drastically reducing throughput time and work in process.

The result

A highly efficient integrated production system, consisting of interchangeable technology modules and automation components. This results in lowest cost per part and maximum return on investment, without compromising process reliability or quality.

FELSOMAT®



REISHAUER
GROUP

REISHAUER

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