From planning to implementation

Integrated process planning – everything from a single source.

Production Planning
- Process and cycle time analysis
- Technology
- Machine configuration

Production Logistics
- Automation design
- Material flow analysis
- 3D-system layout planning
- Material flow simulation

Start-up
- Human resources planning, training
- R & M analysis
- Process visualization
- Virtual commissioning

Globally Connected – Locally Specialized

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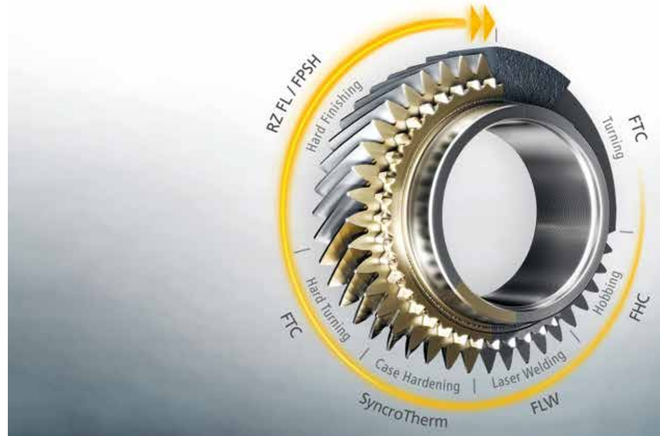
FELSOMAT

Gear Production

State of the Art Manufacturing Technology



Flexline – One Piece Flow

FTC 180
Felsomat Turning Center
- Chip-to-chip time < 1 sec
- Loading / unloading parallel to the processing
- Eco-friendly dry machining
- Green machining of precise chucked components in two operations
- Precision hard turning – dry cutting and high accuracy

FTC 160
Felsomat Turning Center
- Chip to chip time < 4 sec
- Configurable as single spindle, pendulum machine, or double spindle
- Green machining of precise chucked components
- Precision hard turning – dry cutting and high accuracy

FHC 180
Felsomat Hobbing Center
- Chip-to-chip time < 1 sec
- Shorter machining time due to higher material removal rate
- Finish machinig in final quality IT4 to IT5 with the single cut or a dressing cut process
- Chamfering / deburring parallel to main processing time
- Dressing cut process roughing / chamfering / finishing

FHC 80
Felsomat Hobbing Center
- Same features as FHC 180
- Especially developed for high speed cutting for small gears and short shafts (e-gears) for automotive transmissions

FHC 150 S
Felsomat Hobbing Center
- Rapid work piece change < 4 sec
- Processing of shafts up to 600 mm length possible
- Hobbing, chamfering, and deburring of 2 different gear profiles in one clamping

FLW 400
Felsomat Laser Welding Cell
- Large workspace 400 x 400
- Welding optics with wire feeder
- Low pressure welding
- Loading / unloading parallel to the processing
- NC pivoting optics

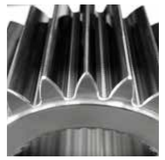
FLW 180
Felsomat Laser Welding Cell
- Implementation of rotary indexing table for cycle times < 10 sec
- Radial and axial welding
- Joining station with integrated force/stroke monitoring
- Pre heating with induction or UMH technology
- Flatness and concentricity testing
- Optical or ultrasonic weld seam inspection

FSC / FRC
Felsomat Stacking Cell / Felsomat Robot Cell
- Scalable in width and length
- Enables highest productivity with small foot print
- Gantry or robot loading
- No downtimes during basket or stack changes
- Module runs > 40 min autonomously without operator

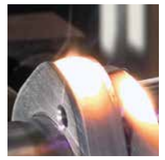
FPSH
Felsomat Power Speed Honing
- Part production time advantage at a 30% higher cutting speed and material removal rate
- Reduction of idle times with fast pick up spindle concept
- Minimum change over time through excellent access, quick change gripper and only one single hydraulic expansion tension bolt for a fast change of the honing wheel
- Machining of gears without lead out area

Integration of all gear manufacturing technologies in one seamless, continuous-flow production process.
Flexline – state of the art manufacturing for gears.

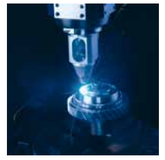
Lead Free Turning
Achieving Lead Free Turning through Extreme Rigidity
The Felsomat modified grooving process, which achieves an absolute lead free surface by an incremental Z axis feed, gives the highest accuracy and cost effectiveness to the customer. With the axial feed and the different insert tip radius, it is possible to create almost any surface finish requirements specified.



Chamfer Skiving
Hobbing & Chamfer Cutting with One Machine
The precise chamfer profile is machined by a form of skiving. The quality of the generated chamfer defines a new standard – with freely controllable bevel angle parallel with maintaing high repeatability. It also enables chamfering of components with interfering contours at the part or clamping device.



Laser Hardening
FLH – Felsomat Laser Hardening
The combination of reliable automation technologies and sophisticated welding technology enables a scalable construction kit for components such as sliding cam units, pistons, or crankshafts. In the process, workpieces can be hardened on parts on specific areas only. Due to less heat input into the part, less deformations occur. This eliminates operation costs and investment in many finishing operations.



Laser Welding
Optimum Welding Results at Maximum Speed
In modern automotive transmission manufacturing, the welding technology with a laser beam is gaining in importance. Low pressure welding technology is setting a new standard as regards welding quality / weld spatters and energy input and can be integrated in FLW 180 as well as in FLW 400.

Hard Turning – Grinding
Hard Turning and Grinding in One Set Up without Cutting Fluids
Grinding spindles integrated into the turret convert the turning machine to an universal dry machining hard turning and grinding center. Costs are reduced significantly with dry machining, even for the grinding process. ID, OD, or cone grinding are easily achieved with these high precision turning and grinding machines.

Turning – Milling – Drilling
FTC 180 F – Turning Center with Integrated Milling Unit
The performance of this proven machine platform FTC 180 for serial production far exceeds the normal turning process. Instead of a turret or driven tools the system can be configurated with robust drilling and milling heads. This configuration is primarily deployed in the production of cams or cam units for milling cam contours or shifting gates.