

We are Well Versed in:

Application-Oriented Evaluation of Machine Tools and their Components

Simulation-based and experimental determination of properties and optimisation (static, dynamic and thermal) with the aim of higher productivity and quality

Machine Components and Tools

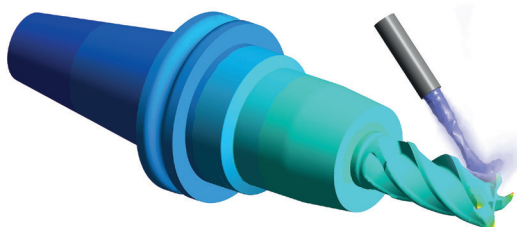
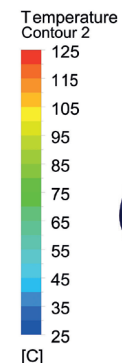
Basic research for innovative, sensor- and actuator-based working principles as well as advancement of frame assemblies, main spindles, guiding systems and tool geometries

Machine Safety

Evaluation of workpiece clamping systems and derivation of measures to improve instructive safety

Technology Development

Analysis of cutting processes for tool and process design in the machining of hard-to-cut materials using geometrically defined cutting edge and waterjet technologies.



CFD simulation of a tool cooling system



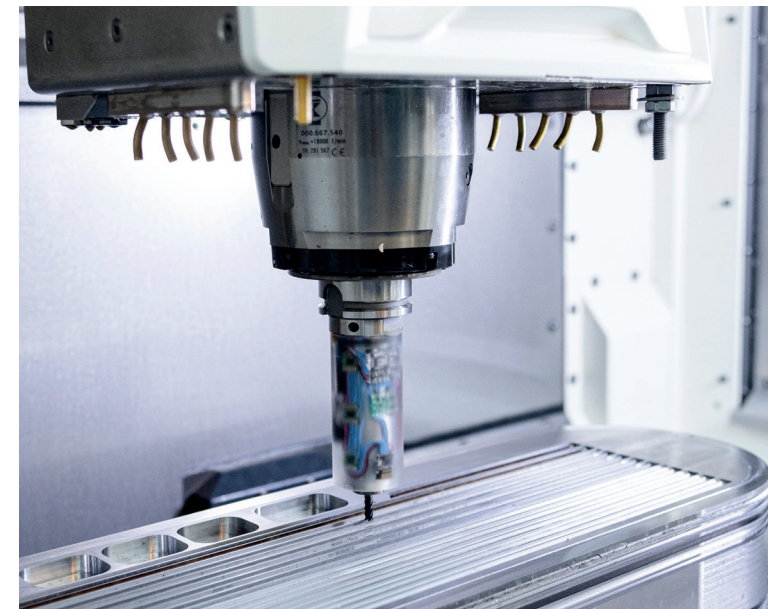
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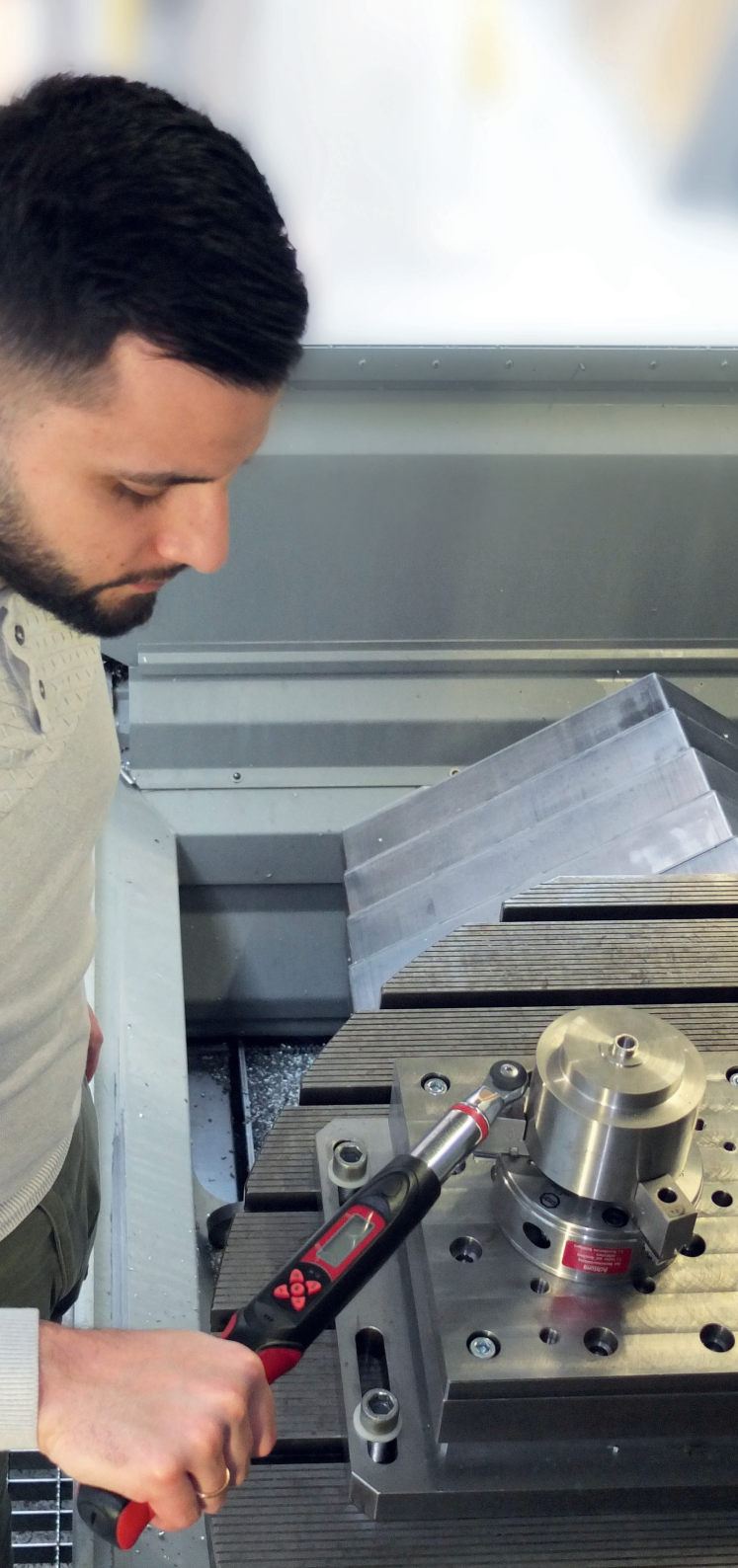
Division

Machine Tools and Machining Technologies



... more than steel and iron

We are working on the development of innovative methods for the analysis and optimization of machine tools and the machining of hard-to-cut materials.



Deformation analysis of workpiece clamping systems

What We Offer:

Simulation of Machines and Processes

- Dynamic behaviour
 - Setup of mechanical models (FEM, MKS)
 - Structural mechanics simulation and weak point analysis
- Thermo-elastic behaviour
 - Setup of thermo-elastic models (FEM)
 - Imaging of process heat on machine
- Fluid flow behaviour
 - Setup of Fluid Dynamic Models (CFD)
 - Calculation of the cooling effect of coolant and the floating behavior of sliding guideways
- Multi-criteria optimisation

Measuring Investigations

- Characterisation of basic machine properties (geometric and kinematic accuracy, static, dynamic, thermal behaviour)
 - Machine analysis to fix quality problems
 - Parameter identification (Model Updating)
 - Investigations with own measuring equipment on-site or at professorship laboratory
- Mobile energy consumption measurement and evaluation according to VDMA 34179
- Process and clamping forces
- Determination of friction coefficients for different tribological pairings up to 100 m/min

Technology Consulting and Training

- Process planning
 - Development of CAM machining strategies
 - Concepts and strategies for energy and resource efficient production
- Process development
 - Machining of hard-to-cut materials
 - High-pressure water jet machining (injector / suspension jet technologies)
 - Additive manufacturing
 - Process design and optimisation (tools, cooling lubrication strategies and hybrid processes)

We are Equipped with:

Machines and Test Benches

- 3-/5-axes-milling centres in different sizes
- High-precision turning milling centre
- 2D-/3D-waterjet precision cutting systems (injector and suspension technology)
- Mobile parallel kinematics
- Test benches (motor spindle, sliding guide, clamping systems, belts, mineral casting bed, Fast-Tool-Servo, cryogenic machining)

Measuring Devices for Property Analysis

- Laser-interferometer (measuring of positions, tilt angle, straightness, rectangularity and rotary axes)
- Ball-Bar-System (Circular path accuracy test)
- Clamping force measuring device, load sensing platform and dynamometers (cutting forces and torque)
- FFT-frequency-analyser (vibration analysis)
- Climate chamber (thermal analysis of machines)
- Thermo-graphic cameras (high-speed, wide-angle lens)
- Energetic measurement (multi channel, high-resolution or long-term measuring)
- Roughness tester
- Measuring microscopes (surface characteristics)
- Sensors (acceleration, temperature, displacement, force, pressure)



Cutting edge preparation with high pressure water jet