



Mechanical Engineering

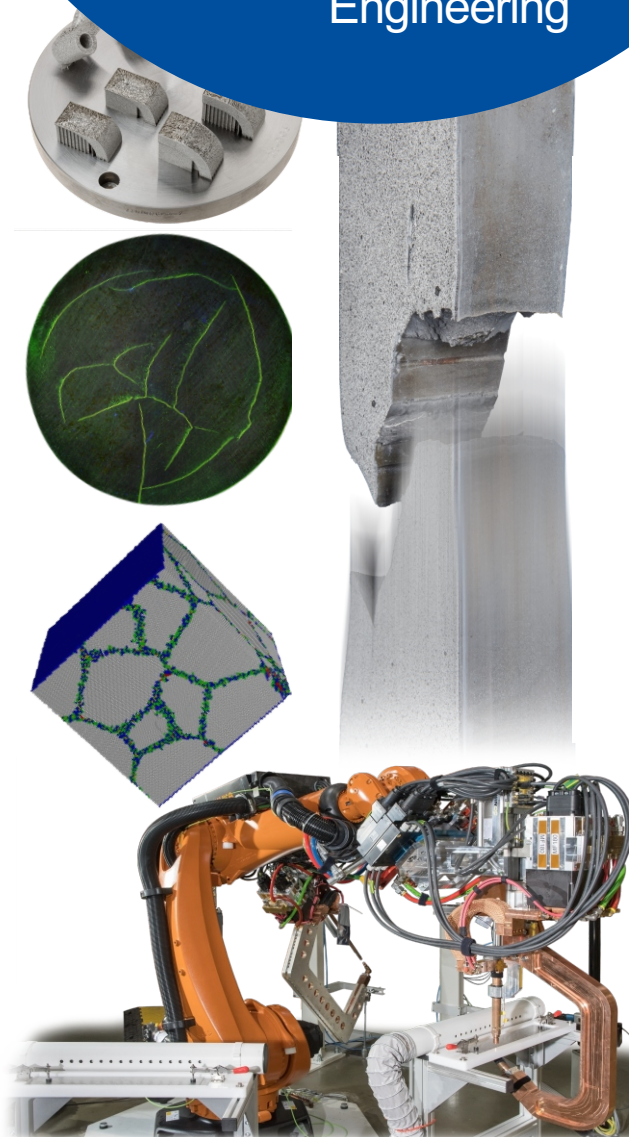


The Materials Testing Institute University of Stuttgart is a central facility of the university of Stuttgart. The institute operates successfully in materials testing and research in almost all areas of mechanical and plant engineering as well as civil engineering.

Contact

Prof. Dr.-Ing. Stefan Weihe
Phone: +49 711 685 62604

e-mail: stefan.weihe@mpa.uni-stuttgart.de
Internet: <http://www.mpa.uni-stuttgart.de>



Materials Behavior and Materials Modelling

- High Temperature Materials Testing and High Pressure Testing
- Materials Modelling
- High Speed Loading
- Influence of Hydrogen

High-temperature materials testing means to represent a material's behaviour at high temperatures via appropriate experiments. In general, time-dependent inelastic deformation plays a key role in the high temperature field. The main task of the Material Law and Microstructure Calculation Unit is to describe the processes and mechanisms during loading and to analyse them on different scales.

The Unit of High-Speed Loading applies loading rates up to 20m/s as well as impact loads on simple specimens and on components and structures. The analysis of the material and component behaviour at those loading rates is essential for safety analysis and also the simulation of manufacturing processes.

Contact

Maximilian Friedrich M.Sc.
Phone: +49 711 685 62592
e-mail: maximilian.friedrich@mpa.uni-stuttgart.de

Non-Destructive Testing and Materials Characterization

- Non-Destructive Testing
- Electron Microscopy and Metallography
- Research Network AMICA
- Quality Surveillance and Damage Analysis

The behavior of components under service loading and the lifetime of components as well as plants are determined by material's properties and often by the type and size of possible defects.

The visualization and characterization of microstructure at different length scales and the non-destructive material testing are important tools when studying the material behavior under realistic loading as well as for the analysis of damage and failure mechanisms in technical materials. For this purpose, equipment which allows studying and characterizing materials up to nanoscale range is available at the department.

Contact

Dr. Sophia Ungermann
Phone: +49 711 685 60714
e-mail: zfp@mpa.uni-stuttgart.de

Component Assessment and Reliability

- Integrity Assessment and Structural Durability
- Reliability and Probabilistic Assessment
- Fatigue Testing

The department is mainly concerned with computational stress and fatigue analyzes as well as safety analyzes and aging management. The application covers components, structures and systems of power plants, general mechanical engineering, transport technology and aerospace.

The available calculation methods and models are capable to evaluate the whole life cycle of a component, structure or system, starting with the manufacturing process, including the evolution of damages and the various stages of failure. In addition, calculations and certificates are provided on the basis of relevant codes and standards.

Contact

Dr. Sc. Stephan Frank
Phone : +49 711 685 62554
e-mail: stephan.frank@mpa.uni-stuttgart.de

Joining Technology, Additive Manufacturing

- Additive Manufacturing
- Joining Technology
- Stress Analysis and Residual Stress
- Transformation Hub CyberJoin

The department Joining Technology and Additive Manufacturing consisting of both joining technologies and additive manufacturing as a system of process technology, material condition and the resulting strength properties. The influence of process parameters on emerging microstructure, formation of geometry and finally the mechanical properties is investigated in experimental studies and numerical process simulations. A well-equipped laboratory is available for experimental studies of manufacturing and processing problems. Besides experimental investigations of process limits and determination of stable parameters for existing joining processes, we develop new and derived processes; especially for joining of different materials.

Contact

Dr.-Ing. Martin Werz
Phone: +49 711 685 62597
e-mail: martin.werz@mpa.uni-stuttgart.de

Calibration, Bearing, Passive Safety

- Calibration
- Bearings and Expansion Joints in Structural Engineering
- Passive Safety

MPA is equipped with an excellent calibration laboratory which is accredited by the Deutschen Akkreditierungsstelle GmbH (DAkkS). With more than 45,000 calibration certificates under the accreditation the MPA has a lot of experience.

The unit Bearings and Expansion Joints in Structural Engineering is an officially approved as well as notified inspection and certification body with testing, third party surveillance and certification (PÜZ) of bridge bearings, expansions joints and anti-seismic devices. The unit Passive Safety is designated as technical service category A and D by the Kraftfahrt-Bundesamt (KBA) and as a technical service for the Vehicle Safety Certification Center (VSCC) in Taiwan for Safety-belts / restraint systems.

Contact

Dipl.-Ing. Siegfried Gerber
Phone: +49 711 685 62557
e-mail: siegfried.gerber@mpa.uni-stuttgart.de

Central Workshops Division Mechanical Engineering

- Mechanical Workshop
- Makerspace

A mechanical workshop with modern CNC manufacturing is available to the departments and other institutes for the production of samples and test rigs. With the CAM connection, modern methods are used here. With decades of experience in fixture construction and sample production, high-quality solutions are found here in a timely manner. The machine park includes state-of-the-art machines such as 3-axis or 5-axis milling machines, lathes for sample diameters up to 400 mm and lengths up to 2000 mm, wire EDM machines, etc.

Makerspace offers students and doctoral researchers the opportunity to realize their creative research ideas.

Contact

Dipl.-Ing. Siegfried Gerber
Tel: +49 711 685 62557
e-mail: siegfried.gerber@mpa.uni-stuttgart.de