

Services

- **Static tests** from 0,1 kN up to 8 MN
- **Fatigue tests** uni axial or multi axial from 0,1 kN up to 2 MN
- **Determination of characteristic material properties**
including values for fracture mechanics
- **Extraction of samples from structures** and determination of characteristic material properties with small-sized specimen
- **Measurement of force, length and acceleration** on site and in the lab
- **Non-contact 3D deformation and strain measurement** in the field of $1 \cdot 10^2$ to $5 \cdot 10^6$ mm²
- **Measurements of wind in situ** measurement of meteorologic data
- **Dynamic Measurements** of resonance frequency and damping of constructions (tower, mast, portal frames, slabs etc.)
- **Determination of damage to steel structures**
- **Testing of cables** and cable clamps up to 8MN
- **Pendulum and loading tests** on glass constructions
- **Approved inspection body** for space structures, beam clamps, tanks, tension member systems, cables
- **Approved inspection body** for accident proof glazing
- **Wind tunnel tests**, pressure measurements, force measurements, dynamic tests

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Institute for Steel Structures

Main Research Equipment Services

Main Research

- **Monitoring:** Measurements of strain, displacement, temperature, acceleration of (building) structures
- **Maintenance of structures:** Anamnesis of structures, determination of remaining life, calculation of fatigue
- **Fatigue:** Investigation of deterioration (HCF- and LCF-Fatigue) and crack propagation (fracture mechanics)
- **Wind engineering:** Measurement and calculation of wind forces on structures
- **Dynamics:** Design of structures with wind loading, dynamic excitation, earthquake or explosion
- **Stability:** Investigations of thin-walled components (e.g. sandwich-panels, plates etc.)
- **Material behaviour / plasticity:** Investigation on the elastic-plastic behaviour of steel
- **Lightweight constructions:** Development of lightweight girders (trapezoidally corrugated girder, girder with composite web)
- **Constructions:** High strength tensile members, cables and anchoring, glazing



Equipment

- **Strong floor 9 x 25 m** with portal frame for full scale testing with loading up to 4 MN static and 2 MN dynamic
- **Hydraulic test rigs** for compression and tension from 1 kN up to 1 MN (static and dynamic)
- **Frame structure** for compression tests up to 8 MN
- **Cable test rig** for 8 MN tension
- **Resonance pulsator (imbalance)** up to ± 1 MN, test frequency up to 60 Hz
- **Hydraulic high speed testing machine** ± 50 kN, velocity up to 25 m/s
- **Pendulum test** equipment for glass and wall constructions
- **Welding roboter** with MIG/MAG welding machine
- **Boundary layer wind tunnel**, type Eiffel, wind speed up to 25 m/s with force balance



- **High resolution thermography camera**
 - **Video microscope**
 - **Metallography** with microsection and microscope
 - **Portable spectrometer**
 - **Temperature chamber** from -160 to +600°C
 - **CNC milling machine** for parts up to 1000 x 600 mm and CNC lathe plus metalworking machines
 - **Measuring system** with digital image correlation for non-contact 3D deformation and strain measurement
 - **Measuring system** with electronic speckle pattern interferometry for non-contact high-precision 3D deformation and strain measurement
 - **Video extensometer**
- Forthcoming:**
- **Hydraulic high speed test rig** ± 300 kN with velocity up to 10 m/s
 - **Close circuit wind tunnel**, type Göttingen, wind speed up to 65 m/s

