Metallic Materials

Process improvement
- Development of advanced manufacturing processes: welding, brazing, coating, heat treatment
  - tailored mechanical properties
- Surface treatment (e.g. sandblasting, shot peening)
- Evaluation of mechanical properties after process improvement

Mechanical testing of materials
- Steel, aluminium-, copper-, nickelbase- and titanium alloys, metallic and ceramic coatings
- Cyclic deformation behaviour of metallic materials
- LCF, HCF, specialized mechanical testing methods up to 1100 °C
- Experimental validation of design analysis tools
- Wear and friction testing up to 900 °C
- Acoustic emission analysis

Analysis and assessment of failure mechanisms
- Base materials and coatings, components
- Fractography: light microscopy and scanningelectron microscopy (VP-SEM)
- Microstructure and chemical composition: energy dispersive X-ray analysis (EDX)
- 3D surface topography analysis (confocal and interferometry technique)

Laser weld: element distribution
Low-cycle fatigue (LCF) test
Friction and wear test at 650 °C