

# Test engineering equipment

## Mechanical tests

### Universal testing machine

- Force sensor 20 N, 100 N, 500 N, 20 kN
- Temperature chamber -40 °C to +250 °C
- videoXtens for non-contact deformation measurement
- Tensile, compression, shear, peel and bending tests on standard test samples/use-oriented test samples/components

## Fatigue tests

### Servo-electric testing machine

- Force sensor 2 kN
- Frequency up to 80 Hz
- Tensile, compression, shear, peel, bending and dynamic tests
- Dynamic loading test on dental implants according to ISO 14801

## Dynamic mechanical analysis

### Dynamic mechanical analysis (DMA)

- Determination of characteristic values of polymer materials e.g. glass transition temperatures, modulus values
- Determination of thermal expansion of materials in TMA mode
- Determination of material-specific properties in creep, relaxation or stress/strain-sweep mode

## Thermal analysis

### Differential scanning calorimetry (DSC)

- Determination of characteristic values of polymer materials e.g. glass transition and melting temperature, degree of crystallization
- Determination of the cross-linking kinetics of adhesives (e.g. curing time and curing degree)
- Analysis of exothermic and endothermic reactions

## Surface analysis

### Contact angle measurement

- Digital drop shape detection
- Measurement of the surface free energy using several test liquids

### Further analysis

- SEM-FIB with EDX
- XPS

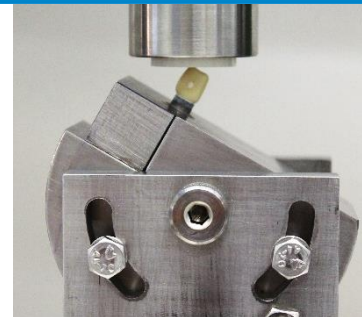
## Spectroscopic analysis

### FTIR

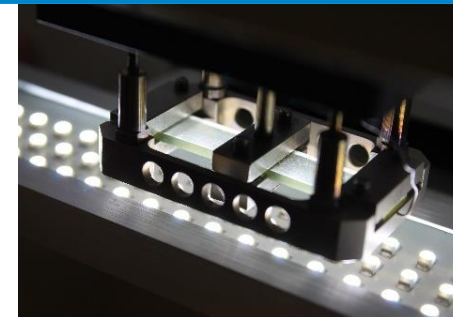
- Material identification e.g. type of plastic and fillers
- Detection of aging and degradation processes
- Damage analysis



Bending test on PP-GF according to DIN EN ISO 178



Dynamic loading test on dental implants according to DIN EN ISO 14081



Dynamic mechanical analysis (DMA) of epoxy resin adhesive according to DIN EN ISO 6721