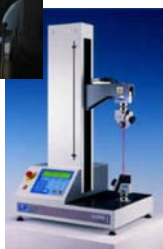


BioMater Centre - Services of the Material Testing Laboratory

The material testing laboratory is responsible for services including mechanical testing of materials for companies and research institutions. Tests are categorized as non-destructive and destructive material testing. The facilities include the following equipment and services, and for some of them a detailed description is followed.

- Instron 8874 material testing device; *for diverse materials testing*
- Fine mechanical testing device; *for testing of small specimens*
- Impedance testing; *for non-destructive structural studies*
- Ultrasonic testing; *for non-destructive structural studies*
- Hip joint simulator; *for studying of medical endoprostheses*
- The use of infrared camera; *for imaging of temperatures*
- Roughness measurements; *for determining surface roughness*



Material testing devices

Standardized tests for material strength by compressive, tensile, torsion and bending tests are available for several types of materials in standardized environment.

1. Instron 8874 bi-axial testing device

- In addition to static tests, cyclic fatigue testing (up to 30 Hz) can be carried out and loading curve congruent with the real use can be simulated.
 - tension and compression 0.001 - 25 kN
 - torsion 0.001 - 100 Nm

2. Lloyd LFPlus 1 kN

- tension and compression 0.005 - 1000 N
- speed range 0.05 - 1270 mm/min

Impedance analyzers

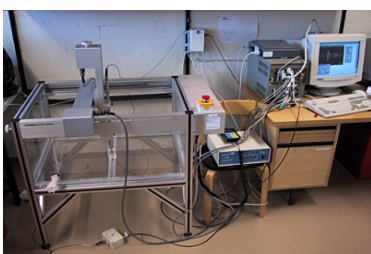
Two electrical impedance analyzers covering frequency range 10 μ Hz - 3 GHz are suitable for example for biomaterials, pharmaceutical materials and wood.

1. Solartron 1260 impedance analyzer

- frequency range: 10 μ Hz – 32 MHz
- impedance range: 1m Ω - 100 M Ω
- accuracy 0.1%

2. Agilent E4991A RF impedance/material analyzer

- frequency range: 1 MHz – 3 GHz
- impedance range 130 m Ω - 20 k Ω
- accuracy \pm 10 ppm



Ultrasonic testing

The ultrasound device in our use is capable of non-destructive structural studies with high resolution. The system includes a tank and scanning drives which enable also imaging. The equipment enables measurements in pulse-echo and thru-transmission geometry with a frequency range of 0.2 - 100 MHz. The set-up enables measurements in A-, B- or C-mode.



Hip joint simulator

The hip joint simulator has six rotational stations for anatomical simulation (i.e. ball joints such as a hip joint) and six static stations as controls. Specific tests can last even for years. The loading curve for cyclic testing can be programmed and the loading can set within the range of 0 - 5000 N.

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