



MATERIALS AND PROCESS ANALYSIS

ELECTRICAL AND MECHANICAL CHARACTERIZATION OF MATERIALS

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Use of materials and components in industrial and household applications requires extensive characterization of their properties and application behavior. The accredited quality and reliability laboratory at Fraunhofer IKTS is specialized in testing electrical and mechanical properties of tools and components. Diverse unique test setups, which can be customized for specialized measurement tasks, are available.

Characteristics, such as dielectric strength, permittivity, and specific volume and surface resistance are determined in the lab using accredited procedures for materials including those developed at Fraunhofer IKTS. The information thus yielded can be applied toward making well-founded estimates of material or component suitability, following the degradation process during use, and understanding degradation mechanisms. Safety tests can aptly support declarations of conformity for the issuance of VDE and TÜV marks.

Accredited measurement methods for calibration of various electrical properties are currently under development. Tensile strength, compressive strength, uniaxial flexural strength, biaxial flexural strength, impact strength, fracture energy, fracture toughness, shear strength, torsional strength, and adhesion are well-known terms of mechanical strength of materials that are determined in the lab using the appropriate methods. Structure and component testing is also possible with the extensive test equipment available in the lab.

Special methods can be employed, e.g., to simulate aging of components and systems. The lab is equipped with a vibration test stand with vibration loading of up to 100 g and impact

loading of up to 200 g for component, structure, and real simulated mechanical load testing and failure prediction.

Environmental effects can also be determined in accordance with DIN 60068, MIL, or other standards. Typical tests include thermal cycling from -80 °C to 200 °C and classic thermal shock for ceramics, as well as aging in hydrothermal conditions or in salt spray tests.

Services offered

- Simulation of environmental influences according to relevant standards
- Safety testing
- Informational testing according to customer’s specifications
- Determination of electrical and mechanical material properties
- Mechanical load testing
- Calibration of various parameters

- 1 *High-voltage equipment for dielectric strength testing (100 kV AC, 130 kV DC).*
- 2 *Environmental test chamber.*
- 3 *Shaker.*