

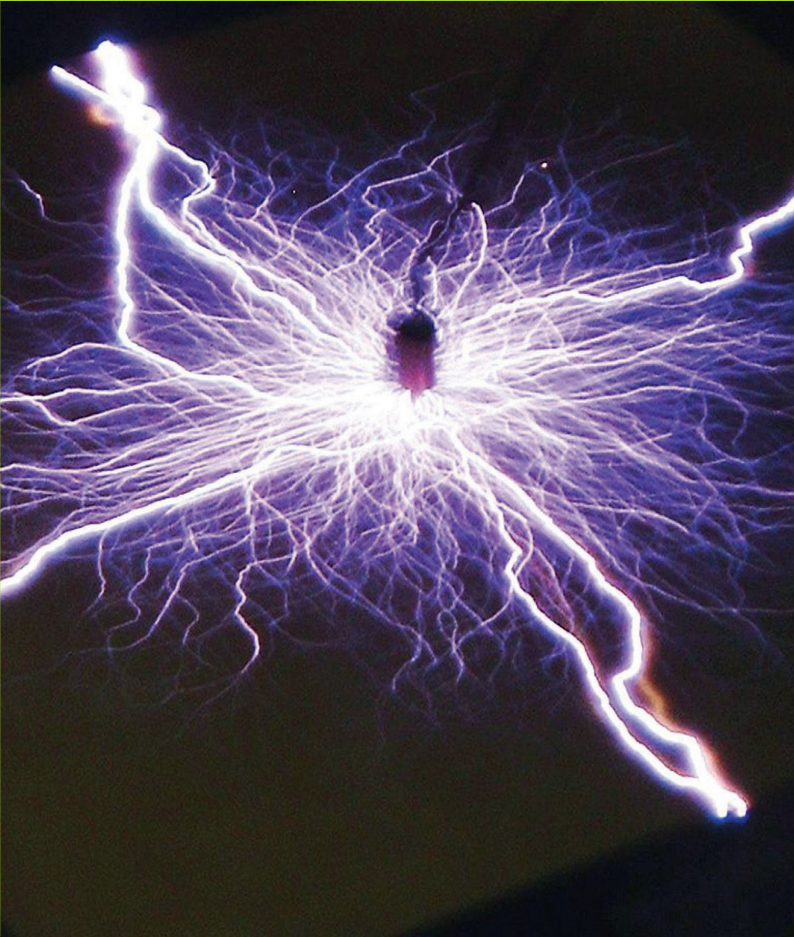


**Fraunhofer**

**IKTS**

FRAUNHOFER INSTITUTE FOR  
CERAMIC TECHNOLOGIES AND SYSTEMS IKTS

**QUALITY ASSURANCE  
LABORATORY**



**“OF COURSE, QUALITY IS EXPENSIVE.  
BUT LACK OF QUALITY IS EVEN MORE  
COSTLY.”**

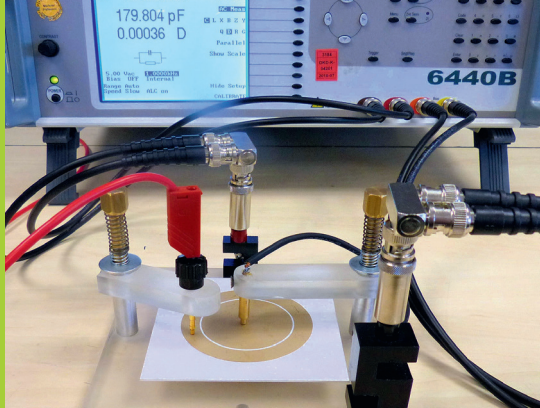
*Prof. Dr. Hans-Jürgen Quadbeck-Seeger, German chemist*

## **QUALITY ASSURANCE LABORATORY**

The use of materials and components in industry and households requires a comprehensive characterization of their properties and their application behavior. In the Quality Assurance Laboratory audited and accredited by VDE, TÜV Nord and DAkkS, Fraunhofer IKTS in Hermsdorf offers a broad portfolio of standard-compliant and individual, customer-specific tests. In addition to a laboratory for electrical and mechanical testing, the technical infrastructure also includes a laboratory for environmental and safety testing, and a calibration laboratory.

In addition to these services, Fraunhofer IKTS has numerous other methods at its disposal with which the material characteristics of material samples or components can be determined under mechanical, thermal or chemical stress and the microstructure quality, application behavior and manufacturing processes can then be evaluated. An overview can be found at: [www.ikts.fraunhofer.de/en/qal](http://www.ikts.fraunhofer.de/en/qal)





## ELECTRIC AND DIELECTRIC TESTING

Specific electrical material properties are essential to better understand and assess the degradation behavior and the degradation mechanisms that occur during use. At Fraunhofer IKTS, tests are carried out in accordance with national and international standards as well as customer-specific requirements. For some procedures, the Quality Assurance Laboratory has been granted flexible accreditation by the German National Accreditation Body (Deutsche Akkreditierungsstelle, DAkkS).

### Services offered

- Specific transition resistance (DIN EN 60093)
- Specific surface resistance (DIN EN 60093)
- Dielectric strength (DIN EN 60243-1)
- Dielectric characteristics (DIN VDE 0303-4 [IEC 250])
- Isolation resistance (DIN IEC 60167)

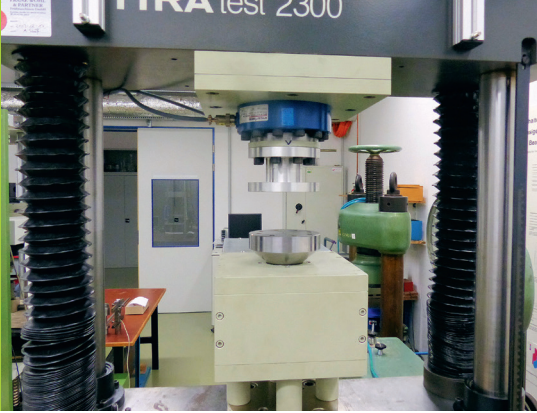


## HIGH-VOLTAGE TESTING

For electrical components and assemblies, it is important to guarantee the insulation of the live parts and to correctly dimension the clearance and creep distances. Fraunhofer IKTS uses high-voltage testing to ensure the insulation strength and dielectric strength of a wide variety of materials and components.

### Services offered

- Up to 100 kV AC or 130 kV DC, max. 40 mA
- Ramp function, recording of breakdown voltages and voltage curve
- Calculation and determination of dielectric strength
- Electrostatics (DIN EN 61304-2-3 und DIN EN 61304-4-1)
- Arc resisting tests (VDE 0303-5 und VDE 0303-71)
- Glow-wire testing (DIN EN 60695-2-10)
- Tracking resistance PTI and CTI (DIN EN 60112)
- Resistance to tracking and erosion (DIN IEC 60587)



## MECHANICAL TESTING

Mechanical material properties are decisive for component design and further development of modern materials. Fraunhofer IKTS uses a number of standardized test methods as well as specialized test methods. A fast realization of tests under customer-specific load situations is also possible. Furthermore, mechanical tests can be carried out in combination with various climate and environmental inspections. The portfolio also includes the conducting of simulation studies on the load behavior of components and the development of customer-specific test apparatuses.

### Services offered

- Bending, compression, tensile and torsion testing
- Combined torsions-tensile-pressure testing
- Continuous oscillation and static long-term tests
- Customer-specific inspections including development and construction of test apparatuses
- FEM simulation studies on load behavior
- Determination of hardness, fracture toughness, and elastic properties at room temperature and higher temperatures (up to 1500 °C)
- Ball pressure testing (DIN EN 60695-10-2)



## VIBRATION TESTING

Materials change their properties during continuous use. Damage, such as fatigue fractures or hairline cracks, often only becomes apparent after intensive use. With the help of vibration testing, Fraunhofer IKTS examines the mechanical strength in order to evaluate the function of technical systems under vibration stress. During testing, shock and vibration loads are measured according to general standardized procedures (e.g. DIN EN 60721-3-2 transport testing), special product standards (e.g. DIN EN 61373 equipment for railway vehicles) or individual customer requirements.

### Services offered

- Sinus and noise up to 100 G (max. amplitude of 63.5 mm)
- Maximum weight 610 kg (test setup and test object)
- Shock up to 200 G (max. amplitude of 76.2 mm)
- Frequency response from 5 Hz to 2000 Hz
- Testing of up to 50 kg under climate possible



## ENVIRONMENTAL TESTING

Each newly developed or further developed product should be tested under consideration of environmentally relevant influencing factors in order to be able to represent its real stress. Fraunhofer IKTS can regulate the parameters of the climatic environment as well as transition periods according to test specifications (e.g. DIN 60068 or MIL standards) or according to individual customer specifications. This is a fast-track procedure to revealing the component's weak points.

### Services offered

- Temperature storage (-70 °C to +1000 °C)
- Climate testing (-70 °C to +190 °C, 0% rF to 98% rF) at a maximum temperature change of 15K/min
- Climate shock testing in two-chamber temperature shock cabinet (-80 °C to +220 °C)
- Corrosion testing according to DIN EN ISO 9227





## CALIBRATION LABORATORY

The calibration of measuring instruments is an important element in quality assurance. It not only provides the user with confidence in the handling of his measurement results, but also contributes to process improvements and cost savings. Fraunhofer IKTS offers factory calibrations that are performed according to the principles of DIN EN IEC 17025. The calibration laboratory is equipped with state-of-the-art calibration technology to perform the most precise calibrations in the field of electrical engineering.

### Services offered

- Electrical measurands (DC and AC voltage, DC and AC current, DC resistance, inductance, capacitance)
- Thermodynamic measurands (resistance thermometers, thermocouples)
- Thermodynamic quantities (humidity sensors and loggers)
- Further calibration values on request





## SAFETY TESTING

Manufacturers of electrical equipment must guarantee the safe operation of their equipment. To ensure this, it is necessary to subject devices to various tests according to current standards. Fraunhofer IKTS tests components and products for load capacity and safety using standardized test procedures and systems. These tests can be used as the basis for CE marking, TÜV type marking or VDE marking.

### Services offered

- Testing of lights, household appliances, conductors, sockets, switches, controllers, transformers, and connection terminals according to current standards
- Life-span testing of components and products
- Tests during development according to customer specifications
- Reliability and usage tests

# FRAUNHOFER IKTS

The Fraunhofer Institute for Ceramic Technologies and Systems IKTS conducts applied research on high-performance ceramics. The institute's three sites in Dresden (Saxony) and Hermsdorf (Thuringia) represent Europe's largest R&D institution dedicated to ceramics.

As a research and technology service provider, Fraunhofer IKTS develops modern ceramic high-performance materials, customized industrial manufacturing processes and creates prototype components and systems in complete production lines from laboratory to pilot-plant scale. Furthermore, the institute has expertise in diagnostics and testing of materials and processes.

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