Highlights from our business divisions

In interview
page 22–27

Circular economy, sustainable energy supply and industrial transformation are current challenges for society as a whole. Fraunhofer IKTS works across disciplines and locations to develop needs-based and sustainable solutions. Through unique facilities and test fields, we quickly transfer research and development results into application – for the benefit of society, the economy and the environment.

In two interviews, we shed light on technological approaches to circular value creation and increasing resource efficiency in a post-fossil, sustainable economy.

Materials and Processes
page 28–33

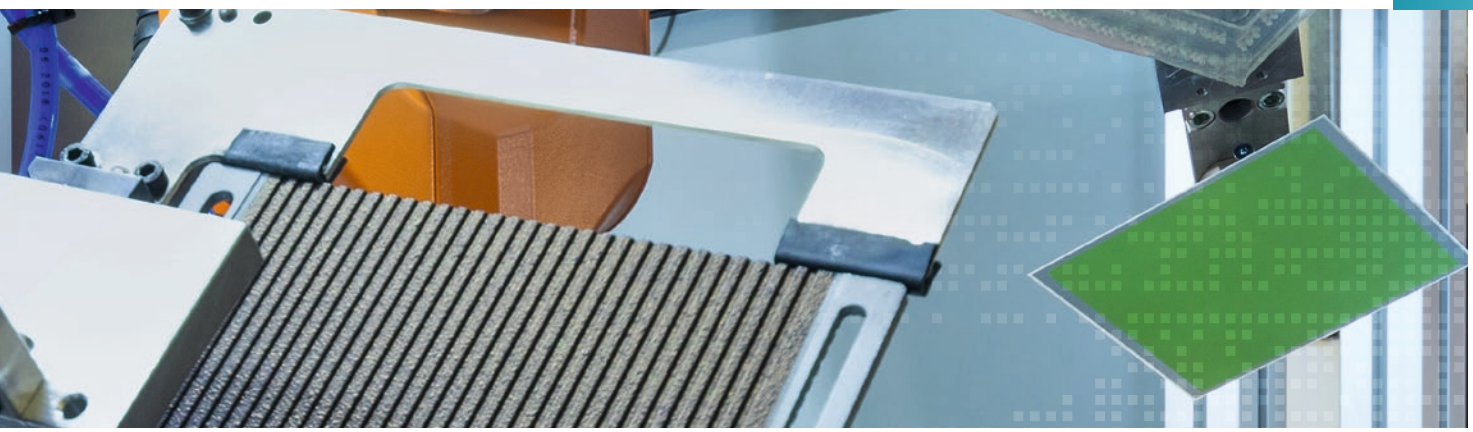
This business division is a port of call for all questions concerning the development, production and qualification of high-performance ceramics for a wide range of applications. At its center is the long years of experience with all relevant ceramic materials and technologies for which functionally adequate solutions are developed based on the specific requirements. The business division works to solve issues along the complete process chain. It also functions as a central hub for all other business divisions.

Energy
page 34–40

For improved and groundbreaking new applications in the field of energy technology, IKTS tests components, modules and complete systems. These help to convert energy more efficiently, integrate regenerative energies and enable energy storage solutions to meet future needs. Ceramic solid-state ion conductors are a focal point of the work done within the business division. Applications include batteries and fuel cells, solar cells and thermal energy systems, even solutions for bioenergetic and chemical energy sources.

Water
page 41–44

Efficient use and purification of water is of the highest importance. Fraunhofer IKTS provides solutions for the treatment of wastewaters – from multifunctional components to compact overall systems. The combination of various methods, such as filtration, adsorption or sono-electrochemical oxidation, has significant advantages over traditional approaches. Furthermore, specific sensor systems are integrated to increase process efficiency, reduce process costs and enable balancing.



Environmental and Process Engineering
page 45–51

Work in this business division is focused on processes in the field of conventional energy and bioenergy, strategies and methods for water and air purification and for recovering valuable raw materials from residual waste. Many of these approaches aim for closed material cycles. Fraunhofer IKTS uses ceramic membranes, filters, adsorbents and catalysts to implement complex process engineering systems for energy-efficient separation processes, chemical conversion and the recovery of valuable materials.

Electronics and Microsystems
page 52–54

The business division gives manufacturers and users unique access to cost-efficient and reliable materials and manufacturing solutions for robust and high-performing electronic components. In addition to sensors and sensor systems, components for power electronics as well as smart multifunctional systems are another focal point. Using innovative test methods and systems, IKTS provides support throughout the complete value chain – from the material through to the integration of complex electronic systems.

Non-Destructive Testing and Monitoring
page 55–56

Quality, cost and time are key if products and services are to succeed in the marketplace. Non-destructive testing can contribute significantly to their continuous improvement. Fraunhofer IKTS combines its decades of experience in the testing and monitoring of components and plants with novel measuring technologies, automation concepts and approaches for the interpretation of complex volumes of data. The portfolio of our competencies thus far exceeds that of a typical NDT technology provider.

Mechanical and Automotive Engineering
page 57–60

High performance ceramics are key components for plant engineering and construction as well as automotive engineering. Because of their outstanding properties, they often constitute the only viable solution. The business division provides wear parts and tools as well as components from high performance ceramics, cemented carbides, cermets and hybridized composites with very specific load profiles. Testing systems for the monitoring of components and production plants based on optical, elastodynamic and magnetic effects are another focal point.

Bio- and Medical Technology
page 61–63

Fraunhofer IKTS makes use of the outstanding properties offered by ceramic materials with regard to the development of dental and endoprosthetic implants as well as surgical instruments. In our certified labs, we use the very best equipment to examine the interactions between biological and artificial materials, leading to improved developments in materials, analytics and diagnostics. To achieve this, we use some of the most unique optical, acoustic and bioelectric methods.

Materials and Process Analysis
page 64–67

Fraunhofer IKTS offers a comprehensive portfolio in testing, characterization and analysis methods to control material features and production processes. As a service provider accredited and audited multiple times, IKTS supports the analysis of materials fundamentals, application-related questions and developments in measuring technology. Characteristic values are not just determined but interpreted within the context of their specific application in order to reveal the potential for optimization.