Research and development center for transparent ceramics

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Expansion of development of transparent ceramics

By integrating the transparent ceramics division of the CeramTec-ETEC GmbH (PERLUCOR®), Fraunhofer IKTS will significantly expand its existing competences in the development of transparent ceramics. The new technical infrastructure enables the establishment of a research and development center for transparent ceramics at the IKTS site in Hermsdorf.

With the financial support of the Free State of Thuringia, a complete ceramic technology chain consisting of equipment for conditioning high- purity powders, shaping, heat treatment, laser processing and ultra-precision finishing will be installed in Hermsdorf, providing a link between laboratory scale and industrial production.

Ceramic technology in Hermsdorf will thus achieve a performance leap in terms of component size, degree of purity and innovative manufacturing.

The funding is an important foundation for future projects. It represents a real milestone in the development of Thuringia, especially the industrial region Hermsdorf, towards Europe's leading center for advanced ceramics.

Transparent ceramics are characterized by excellent material properties and are superior in comparison to glass, sapphire or gorilla glass in many applications:

- Spectral transmission 0.2–6 µm
- Refractive index 1.72
- Hardness 13.8 GPa
- Bending strength 350 MPa
- Dielectric constant 8–9
- Melting point ~2000 °C

Unique characteristics and subsequent applications of transparent ceramics

- Extreme robustness, hardness and resistance to scratches for longer-lasting visibility and functionality of scanners and displays
- Protective windows in armored vehicles with reduced weight
- Efficient utilization under extreme conditions in industry for a more secure monitoring of processes: e.g., in production, in high-temperature areas, in furnace windows, inspection glasses and spin windows
- Long-lasting protection for optics and sensor systems in harsh environments, such as desert regions, subsea or space, e.g., optical lenses and optical camera elements for night-vision devices, lidar sensors or surveillance systems
- Biocompatibility and biostability of optics for medical devices, endoscopes and point-of-care diagnostics

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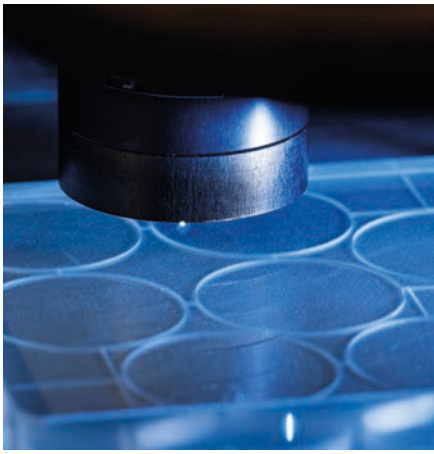
Thüringer Aufbaubank



Laser-perforated transparent ceramics for sensor and opto-electronic applications.

Electronic device with spinel cover.

Optical lense made of spinel ceramics.