Are you already familiar with our industry-standard services?

- Accredited testing laboratory in accordance with DIN EN ISO/IEC 17025 for various NDT methods
- Certificate of competence of the accredited laboratory to qualify and validate (new) nondestructive testing methods for industrial testing practice in the field of ultrasonic testing
- Rapid transfer to market readiness for qualified, standard-compliant use in industrial applications, both for new developments (in-house developments) or for adaptations
- Our associated quality management system is certified in accordance with DIN EN ISO 9001

Contact

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Sensor and Data Systems for Safety, Sustainability and Efficiency



Ultrasound technologies at Fraunhofer IZFP



Left: Ultrasound sensor for sampling small radii using a contact method ; middle: Setup for manipulator-controlled ultrasound testing using a contact method

Available Ultrasound Technologies

Ultrasound testing with its versatile methods is one of the crucial procedures used in nondestructive testing and as such an essential part of many quality assurance measures. It provides established methods – in particular for the realm of production processes – whose manifold applications allow to ensure the safety of the components manufactured.

Novel, anisotropic, or heterogeneous materials such as fiber-reinforced plastics, high-strength steels or lightweight metals increase the requirements for ultrasound testing, especially since this method is also more and more used for hybrid components. Besides the characteristics of the materials, there are additional requirements – such as the needs of progressively more complex component geometries, high-resolution defect inspection, or the implementation of higher testing speed – that can be addressed by the technologies used at Fraunhofer IZFP. We focus primarily on the areas of materials inspection, process control, inspection of parts and components, as well as on condition monitoring.

For meeting client-specific needs, Fraunhofer IZFP can deploy a broad range of operational technologies, competences, and expertise for

 building customized ultrasonic transducers,

- inspection systems, including hard- and software development, and
- performing qualifying manual and robot-supported ultrasound inspections.

Moreover, the Institute counsels and supports its customers with regard to generating individualized inspection instructions, as well as performing and analyzing inspections.

Availabe ultrasound technologies

- Piezoelectrically excited ultrasound
- Electromagnetically excited ultrasound
- Air-coupled ultrasound
- Phased array / total focusing method
- Ultrasound microscopy

Applications

In addition to their classic applications – such as testing weld seams, purity grade, and wall thickness – the various ultrasound methods are increasingly used in defect inspection focusing on corrosion, inclusions, pores, and cracks in:

- Heavy cast and forged parts
- Fiber-reinforced plastics (carbon / glass fiber)
- Hybrid materials / composite materials
- Concrete testing in the construction industry

In addition to traditional defect inspection, materials inspection is of special significance for

- characterizing discontinuities,
- determining existing internal and load strains,
- characterizing microstructures,
- examining microstructural fatigue processes,
- monitoring cracks induced by operating processes, and
- monitoring crack propagation.