

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

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 **Fraunhofer**
IZFP

Sensor and Data Systems for Safety,
Sustainability and Efficiency



Intelligent Inspection Monitoring and Documentation by Optical Tracking System for Ultrasound and Eddy Current Inspection

3D SmartInspect



Robot-moved 3D SmartInspect sensor at a specimen with curved shape



3D SmartInspect – a Fraunhofer IZFP tool for the digital NDT world: Augmented Reality System as a support for the manual inspection of components or large surfaces

3D SmartInspect – Intelligent Inspection Monitoring and Documentation

In the case of the widely used manual inspection, the quality of the inspection depends strongly on the personnel and the environmental conditions; this fact concerns the inspection of small components in production as well as the maintenance inspections of large industrial structures. The adequate interpretation of the measured values and the thorough coverage of the inspection area require a high degree of personal expertise.

In addition, companies face considerable challenges with regard to documentation. Often, inspection reports are drawn up by hand and any peculiar observations are marked on the components themselves. A digital link between the specimen and the documentation is not established. If

inspections take several hours or days, errors and incomplete documentation can occur, leading to negative consequences for subsequent processes.

To solve this topic, Fraunhofer IZFP has developed the optical tracking system “3D SmartInspect”, an assistance system for manual inspections based on cognitive signal evaluation. The system allows:

- Digital recording of the manual inspection process by cameras
- Tracking of the probe position
- Automated evaluation of the measured signals
- Automated compilation of a digital inspection protocol

Thus, this assistance system clearly relieves the processing, analysis, and control of the manual inspection: First, before the inspection the camera system is placed in a position with a good overview of the inspection area. Afterwards, the inspection personnel can start the inspection. The tracking module detects and tracks the movement of the probe and logs inspection positions and measured signals. The signals are automatically evaluated and merged with spatial coordinates for the live image. The inspected areas as well as the recorded defect indications are displayed on a control screen (notebook, tablet). Optionally, an Augmented Reality (AR) Software enables the visualization with a HoloLens. Finally, the result can be digitally transferred to a server or a data center.

Benefits

- Interactive support of the inspection personnel in the manual inspection process

- Complete scanning of the test area
- Automatic documentation of test results as proof of correct inspection performance in accordance with quality assurance requirements, transmission, and storage of evaluated material data
- Combination with collaborative robotics
- Adaptation to customer-specific requirements through the option of integrating additional sensors on the basis of further inspection principles

3D SmartInspect provides unique options for objectifying and quantifying the inspection of large and/or safety-relevant industrial structures (“NDT 4.0”) with regard to the continuous digitization of industrial working environments (“Industry 4.0”).

The 3D SmartInspect assistance system is suited for all fields of applications of manual inspection, a.o. aerospace, energy plants, large-scale equipment construction, etc.