Are you familiar with our industrial-grade accredited inspection services?

- Accredited laboratory in line with DIN EN ISO / IEC 17025, to qualify and validate new non-destructive testing (NDT) processes for industrial applications
- Accelerated time-to-market and opportunity for qualified, norm-compliant deployment in industrial applications as well as for complete new in-house developments or custom adaptation of innovative NDT technologies, even in fields where norms have not been established
- Certification of the corresponding quality management system in accordance with DIN EN ISO 9001

Contact

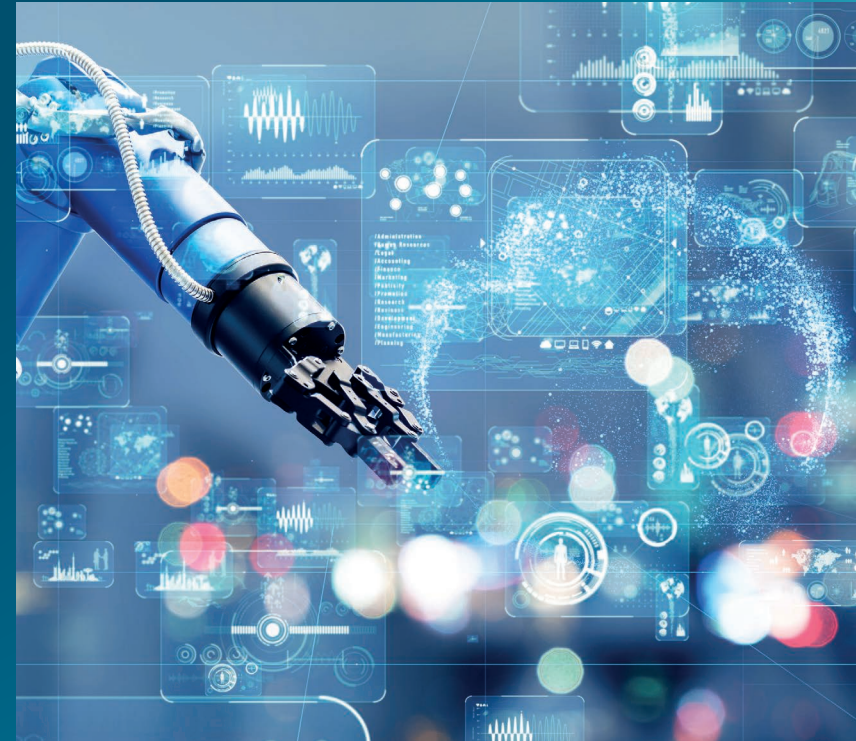Fraunhofer Institute for Nondestructive
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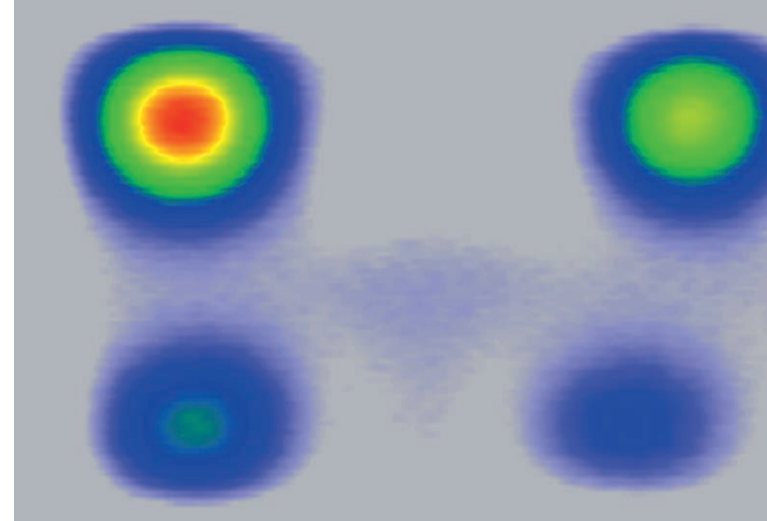info@izfp.fraunhofer.de
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Fraunhofer

IZFP

**Sensor and Data Systems
for Safety, Sustainability and Efficiency**

NDT 4.0

Digital Transformation of NDT in Industry 4.0

3D SmartInspect leads the way into the digital NDT world: AR system for manual component testing with automated documentation in DICONDE

middle: OPC UA-capable eddy current system (inspECT-PRO); right: eddy current results image

NDT 4.0 – Digital Transformation of NDT in Industry 4.0

Many manufacturers and suppliers prefer using their own data formats and interfaces for their soft- and hardware solutions. Thus, compatibility between different systems cannot be presupposed; it exists only rarely. In addition, once they are stored, the systematic, long-term linking between test data and results derived from the former is not guaranteed over the years. They are often still manually documented in hardcopy. There is no single standard that dominates the interfaces. Interfaces and their use differ between application levels. Integrating new interfaces in existing systems requires expert-level knowledge.

In this context, Fraunhofer IZFP offers two process-neutral technologies:

- OPC UA allows uniform linking to Industry 4.0 networks for (automated) use of nondestructive monitoring,
- DICONDE offers a data exchange and storage format for holistic digital documentation of signal, measurement and inspection data as well as inspection results.

Using these technologies and our existing expertise in testing technology opens up novel options (for combining) with regard to digitalizing, optimizing, as well as modernizing existing inspection tasks. In This approach supports the development and application of hybrid inspection technologies, achieving the best possible

results by applying multiple NDT processes.

OPC UA (Open Platform Communication Unified Architecture)

OPC UA is a platform-neutral service-oriented structure for data exchange. It allows implementing a communication interface that allows making independent links between machine-to-machine interactions.

Benefits

- Easy-to-implement real time-capable sensor control
- Uniform communication with actuators, sensors, and MES/ERP systems
- A basis for developing cognitive and IIoT-capable sensor systems

DICONDE (Digital Imaging and Communications for Non-Destructive Evaluation)

DICONDE is an extension of the DICOM medical exchange and documentation format for nondestructive material testing.

This format allows storing information (e.g. image or volume data) as well as additional information (surface definitions, metadata). DICONDE standardizes both the format for storing the data as well as the communication protocol for exchanging them.

Benefits

- Linking of inspection results independently from the inspection procedure
- Simple access to measurement data even after they have been stored for several years
- A basis for a database containing inspection technology knowledge for Big Data approaches

Fields of Application

Applications can be found wherever existing infrastructure is expanded, modernized, or designed from scratch. OPC UA and DICONDE ensure essential prerequisites for quality assurance in any type of production facility. In the context of integration into Industry 4.0, both of them provide an optimum basis for intelligent, networked production.