

# Non-Destructive Techniques and Systems for Process and Quality Control in the Automotive and Supplier Industry

Eckhardt Schneider and Christian Boller

**Abstract** The objective of the applied research and development at Fraunhofer IZFP is the improvement of product quality—together with the reduction of quality cost—and proof of technical safety of devices, machines, and plants.

**Keywords** Damage tolerant design · Material properties · Defect detection, sizing · Metallic components · Civil infrastructure

The contribution gives an overview of the Fraunhofer IZFP-developments of nondestructive techniques and systems to:

- characterize the mechanical properties of steel and Al-sheets for the automotive body,
- evaluate the hardness and hardening depth of gear parts and engine components,
- evaluate stress states in sheets and plates as well as in and around welds,
- evaluate the clamp load during fastening processes,
- evaluate the thickness of the clinched joint,
- detect and describe defects in body parts on the surface as well as in the volume of components of the engine and the power train.

Ultrasonic, eddy current, micromagnetic, magnetic flux, thermography, and X-ray methods are optimized to meet the particular requests of the client. Manual and automated systems are developed and introduced into the daily application in manufacturing lines as well as in quality assurance laboratories.

---

E. Schneider (✉) · C. Boller  
Fraunhofer IZFP Saarbrücken, Saarbrücken, Germany  
e-mail: Eckhardt.Schneider@izfp.fraunhofer.de