

Core Competences

- Complex microstructure diagnostics
- Modelling and numerical simulation
- Process assessment and complex failure analysis
- Design for reliability and robustness evaluation of cutting edge technologies, prototypes and demonstrators
- Support for yield improvement and process metrology
- Development of reliability tests and analytical equipment
- Standardization of analysis and testing methods



We support the development of innovative electronic technologies, devices and systems by securing their product quality, manufacturing yield and reliability to enable new applications and accelerate their market introduction.«

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Quality Management at Fraunhofer IMWS is ISO 9001 certified.



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We are Failure Analysis Experts

Electronic Materials and Components

Portfolio

We analyse and test electronic components, systems and materials in order to understand the relationship between technological manufacturing processes, operating conditions, microstructure and material properties and the functional properties that depend on them. We thus support our industry partners to increase and secure quality, reliability and safety of electronic components and systems.

Microstructure and material diagnostics

- Process evaluation (development, qualification, output)
- Prototyping (FIB layout modification)
- Reverse engineering
- Physical failure analysis
- Mechanical characterisation and functional tests
- Complex analysis for a deeper understanding of degradation mechanisms
- Target preparation techniques for physical defect analysis
- Mechanical characterisation techniques
- Electrochemical test methods

Theoretical modelling and simulation

- Mechanical, thermomechanical application behaviour (service life)
- Thermal, acoustic signal behaviour for development of diagnostic methods

Methods developments

- Electrical, thermal, acoustic and magnetic defect localisation techniques
- Target preparation techniques for physical defect analysis
- Mechanical characterisation techniques
- Electrochemical test methods

In our research projects we investigate electronic components along the entire production chain from wafer to the assembled component in application:

- Semiconductor wafers and chips (IC, sensors, power electronics, optoelectronics) of Si technologies, GaN & SiC
- Materials and components of packaging and interconnection technologies, power electronics modules
- Electronic assemblies and systems, e.g. in automobiles

WE ARE FAILURE ANALYSIS EXPERTS

We support our partners in...

- **improving their time to market** by accelerating the development of innovative material solutions and technologies
- **increasing quality and process reliability** by qualifying new manufacturing processes for industrial use
- **securing production yield** by ensuring optimum output in batch production
- **ensuring reliability** through achieving a long service life of products in use
- introducing improved methods of material diagnostics to the market by **providing a suitable infrastructure for quality assurance.**