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Why You Should Work With Us

The System on Flex research group brings over 25 years of experience in electronic textiles, with a strong foundation in microelectronics packaging and access to state-of-the-art laboratories.

The interdisciplinary team combines expertise in microsystems engineering, clothing technology, mechanical engineering, materials science, electronics, physics, and fashion design. Our broad technology portfolio covers substrates, integration and interconnection technologies, as well as system testing and failure analysis. In addition, we develop hardware and software solutions for wearable electronics and sensors.

As your research partner—either directly or in collaboration with our network of partners from industry and academia—we support your R&D at every stage, from individual solutions to fully integrated systems ready for production.

System on Flex
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www.electronics-in-textiles.com

texlab
SOFT HARD SMART

Contact

Fraunhofer Institute for Reliability and Microintegration IZM

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As an ambassador of the Smart Textile Alliance, Fraunhofer IZM is actively working on the standardization of an e-textile connector.

https://smarttextilealliance.com

Smart Textile Alliance

Fraunhofer IZM

Fraunhofer Institute for Reliability and Microintegration IZM

Substrates, integration and interconnection

Electronic Textiles

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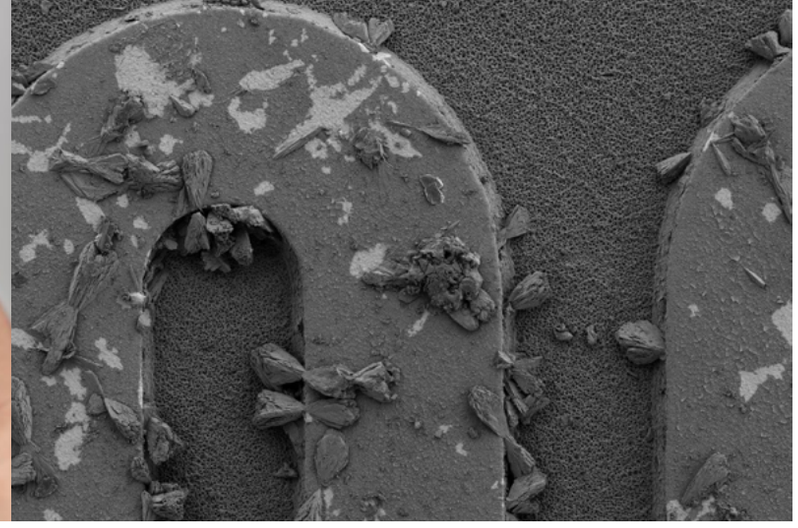

High-End Technology Solutions

Fraunhofer IZM provides access to a vast pool of proven materials, technologies, and systems for e-textiles.

We work with flexible, durable, and conductive materials such as metal-hybrid yarns, liquid metals, and metallized fabrics, selected according to application requirements. These are processed into textile-based circuits using advanced techniques including embroidery, dispensing, and galvanic or laser-based methods. Alternatively, stretchable circuit boards based on thermoplastic elastomers can be laminated onto various fabrics.
Our electronics expertise focuses on highly miniaturized, energy-efficient wearable systems with strong emphasis on reliability, safety, and electromagnetic compatibility. For interconnection and long-term stability, we apply specialized textile integration and advanced encapsulation technologies.

Testing and Analysis

All materials and systems can be tested and analysed in-house to ensure compliance with textile and electronics standards. We support quality control, failure analysis, material characterization, process optimization, and reliability assessment across the entire development cycle. Our capabilities include non-destructive inspection using optical, X-ray, and scanning electron microscopy, as well as 3D investigations via micro-X-ray computed tomography. High-resolution analysis is enabled through cross-sectioning and advanced techniques such as focused ion beam preparation and energy-dispersive X-ray spectroscopy.
A particular focus lies on the washability of e-textiles. We investigate influencing factors, analyse damage mechanisms, and develop strategies to improve durability. In addition, we offer consulting, customized washing protocols, and evaluation of washing tests.
Through active participation in standardization bodies, we contribute to global standards for e-textiles, including IPC-8981, defining durability tests under real-world conditions such as washing and perspiration.

Applications and Services

Following applications are only a selection of our recent R&D activities:

- Multi-sensor smart vest for continuous, non-invasive monitoring of up to 110 cardiovascular parameters simultaneously and AI-based interpretation
- Textile-based padded dry electrodes with a micro-fastener film for ExG and BioZ short and long-term measurements
- Elastic and highly durable textile cables
- Universal smart textile connector
- Liquid metal dispersions for stretchable conductors and sensors, such as for breathing or touch-interfaces

Our clients can choose the mode of cooperation that suits them: From direct project assignments to a full cooperation on technical or scientific research projects supported by EU, federal, or state funding. Our services include:

- Developing and constructing textile integrated sensors and electronic systems
- Interconnection solutions for textile microsystems
- Textile-ready design of hardware and software
- Qualification and reliability tests and failure analytics
- Fast prototyping up to small series production
- Licensing and technology transfer
- Technical service, consulting, training, and studies
- Fundamental research

We support your R&D from idea to application.

Get in touch with us!