



DIGITALIZATION IN ENERGY STORAGE SYSTEMS PRODUCTION

The transformation process in the automotive and energy sectors requires networked, digitally supported production and quality assurance of battery cells and modules. The comprehensive digitalization of industrial production is key to optimizing the entire production chain and thus increasing the competitiveness of companies.

At our Arnstadt site - the Battery Innovation and Technology Center BITC - we are therefore testing innovative data-driven approaches to process monitoring, control and quality assurance on industry-scale pilot lines. They make it possible to identify error patterns, optimize production flows and establish holistic production data management. This opens up new possibilities for quality criteria and standards in battery production.

In addition to specific battery development issues, we are working on basic routines for scalable production of complex energy storage devices and converters. In the near future, we will also transfer the experience gained from battery research to digitally supported production technologies for electrolyzers in the hydrogen economy.

FRAUNHOFER IKTS

The Fraunhofer Institute for Ceramic Technologies and Systems IKTS conducts applied research on high-performance ceramics and is Europe's largest R&D institute dedicated to ceramics. As a research and technology service provider, the Fraunhofer IKTS develops advanced high-performance ceramic materials, industrial manufacturing processes as well as prototype components and systems in complete production lines up to the pilot-plant scale. In addition, we have decades of experience in the non-destructive testing of components and plants. With the latest in measurement technologies, automation concepts and approaches to interpreting complex data sets, we offer solutions for quality control and condition monitoring.

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BATTERY INNOVATION AND TECHNOLOGY CENTER BITC



OFFERS FOR INNOVATION AND DEVELOPMENT

NEXT-LEVEL RESEARCH

Research at BITC focuses on the technological advancement of cell production through the use of fully integrated inline monitoring systems and digital, automated processes. The resource-efficient use of raw materials plays an important role here. In the context of production research for energy storage, modular data management and computing concepts are developed at BITC and transferred into hardware components for efficient as well as scalable instrumentation and networking of process steps.

Research focus

- Data management
- Technical evaluation of production data
- Computing concepts
- Workflow management
- Instrumentation and networking of process steps
- Evaluation of digitally supported production
- Hardware concepts and solutions

PARTNERS IN THE REGION

BITC considers itself a platform for networking companies and research institutions in order to develop innovative technologies and products for the automotive and energy industries of tomorrow. This know-how is jointly developed and transferred into qualification measures for (supra)regional specialists.

TECHNICAL INFRASTRUCTURE

At BITC, the best conditions are available for tests on networked pilot plants. Data-driven production and quality assurance processes can be designed and tested here. It is important to collect and process the necessary data in a high-quality manner. The more than 5000 m² of technical space include extensive plant technology for life cycle testing of energy storage systems under various operating conditions.

Specialized equipment

- Multifunction cyler and climate chambers for energy storage tests
- Plant for industrial semi-automated energy storage analysis
- Fragmented pilot lines

EDUCATION AND TRAINING

BITC develops demand-oriented education and training measures in the field of energy storage, digitalized production, especially e-mobility, new inline monitoring systems as well as digital material technologies.

Qualification measures

- Student research projects and PhD topics
- Further education and training for professionals
- Technology-specific workshops
- Lectures and trainings