



Fraunhofer R&D Center for Electromobility Bavaria

Your Partner for the Development, Testing, and Optimization
of Materials, Components, and Processes for Batteries.

The Fraunhofer R&D Center for Electromobility Bavaria is your partner for the development, testing, and optimization of materials, components, and processes for batteries.

We offer R&D services for lithium-ion (LIB), sodium-ion (SIB) and solid-state battery (SSB) technologies, battery recycling, modern lead-acid batteries, as well as electrochromic systems. With a track record of more than 20 years and an interdisciplinary team of more than 35 experts we are one of the largest battery research groups in Germany.

We provide the right solutions for customers from various industries, e. g. battery cell manufacturers, cell users as well as chemical and materials companies:

- Development of materials and components for customer-specific battery systems
- Customized process development
- Development of electrochromic materials and devices
- Analytical, testing and characterization services
- Battery manufacturing for cell prototypes and small batches
- Consulting services
- Feasibility studies
- National/International R&D collaborations

Battery Materials and Components

At the Fraunhofer R&D Center for Electromobility, we are committed to driving the future of sustainable energy. As your strategic partner, we specialize in the development, testing, and precise optimization of advanced battery materials and components. Our comprehensive R&D services cater to a diverse range of industries, including battery material suppliers, electrode and battery manufacturers, and battery recyclers.

By collaborating with us, you gain access to state-of-the-art facilities and a team of experts dedicated to pioneering solutions that meet the evolving demands of the battery sector.

Processing of Batteries

The Center is specialized on the development and upscaling of electrode and cell manufacturing processes.

With our comprehensive knowledge and understanding of materials and expertise on the processing of electrode materials as well as electrolyte coating and lamination we offer customized process development (from lab to pilot scale) for various types of batteries and electrochromic cells. Our research focuses on the manufacturing of single and multi-layer stacks in small scale for investigating and evaluating novel electrode materials and cell types, such as lithium-ion (LIB), sodium-ion (SIB), solid-state battery (SSB), and electrochromic cells.

We provide electrode and cell manufacturing services for customers from various industries, e.g., electrode and battery cell manufacturers, chemical and materials companies.



Direct Battery Recycling and Design for Circularity

Working on direct battery recycling and design for circularity since 2016, the Fraunhofer R&D Center for Electromobility has developed a wide range of sustainable, highly efficient technologies and low-energy processes.

Direct battery recycling is an emerging approach that is in particular – but not exclusively – interesting for low-cost battery chemistries. It has the decisive advantage that the materials are not "downcycled" into precursors (e.g. in form of metal salts), but will be conserved in their original structure, which can allow the direct re-use of these materials in the fabrication of new batteries.

The Center is involved in numerous national and international projects and is one of the key players in Europe in the field of direct battery recycling. We provide direct battery recycling solutions for customers from various industries, e. g. battery recyclers, electrode and battery manufacturers, cell users as well as chemical and materials companies.

Direct Battery Recycling – Range of Services

RECOVERY

- Efficient recovery of functional battery materials including low-cost materials via direct recycling processes (production scrap and EoL cells)
- Tailored processes for e.g., cell disassembly, electrode detachment, binder extraction, black mass classification

PRE-TREATMENT / PURIFICATION

- Removal of impurities from black mass and pre-treatment of black mass for further processing (e.g., centrifuge process, heavy liquid approach)
- Treatment of process water and recovery of valuable metal ions

REGENERATION

- Relithiation of recycled active materials (e.g., NMC, LFP) from EoL cells
- Repairing of the structure of recycled active materials via thermal treatment
- Upgrading of recycled active materials

EVALUATION

- Evaluation of customers' devices/processes with regards to their suitability for direct battery recycling
- Evaluation and qualification of recycled battery materials

PROCESS DEVELOPMENT

- Design for circularity solutions
- Development of tailored processes for the direct recycling of LIB and SIB
- Automatization and digitalization of battery recycling processes
- Water-based and PFAS-free electrode production



Testing and Characterization of Battery Cells and Modules

The range of electrochemical energy systems is big and so is the chemistry within the cells. Depending on the battery application, the battery cells have to be tested for their functionality and applicability with respect to their operational life.

Fraunhofer ISC offers testing capabilities for high performance and large scale cells with their new high current battery laboratory.

We offer high current battery channels for cells from the automotive sector, stationary energy storage and other high performance or large scale cell applications. With advanced sensors and measurement equipment for electrochemical impedance spectroscopy, multiple temperature measurements per cell and a variety of data logger channels for additional sensors, we can provide cell tests tailored specifically to your needs and requirements.



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