



Technische  
Universität  
Braunschweig

## Interdisciplinary Consortium

- **Institute for Particle Technology (iPAT)**  
Electrode process engineering (LiB, ASSB, LiS); dry and wet extrusion coating, calendering, electrode and cell characterization; cell and process design; safety tests, recycling
- **Institute of Joining and Welding (ifs)**  
Laser cutting and structuring, contacting, cell sealing and binder development
- **Institute of Machine Tools and Production Technology (IWF)**  
Automatic cell assembly, electrolyte filling, cell housing, cyber-physical production systems, production simulation, LCA/LCC
- **Institute for High Voltage Technology and Electric Power Systems (elenia)**  
Formation and aging, cell characterization based on electrical and electrochemical measuring methods, classification
- **Institute of Engineering Design (IK)**  
Design methods, production planning and development
- **Institute of Energy and Process Systems Engineering (InES)**  
Simulation and model-assisted cell design, electrochemical analysis and diagnostics
- **Institute of Environmental and Sustainable Chemistry (IÖNC)**  
Electrochemical, chemical diagnostic; adv. impedance methods (NLEIS, DRT) and sustainable battery components
- **Institute of Automotive Management and Industrial Production (AIP)**  
Operations management, economic and sustainability assessment
- **Physikalisch-Technische Bundesanstalt Braunschweig (PTB)**  
Metrology, standardization, traceability and measurement uncertainty
- **Institute of Chemical and Electrochemical Process Engineering (ICVT), Technische Universität Clausthal**  
Alkaline water electrolysis, bio-electrical fuel cells, gas-diffusion electrodes, redox-flow batteries
- **Institute for Electric Power Systems (IfES) - Chair for Electric Energy Storage Systems, Leibniz Universität Hannover**  
Technology selection and dimensioning methodologies, techno-economic evaluation of business models

## Visitor Address

Battery LabFactory | Langer Kamp 19 | 38106 Braunschweig

### Scientific Director

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### Further Information:

[www.tu-braunschweig.de/forschung/zentren/blb](http://www.tu-braunschweig.de/forschung/zentren/blb)



## Battery LabFactory Braunschweig

Knowledge-driven battery production



Source: Ulrich Pucknat/Pucknat Pictures



Source: Marisol Glasserman/TU Braunschweig

## Core Competences

- Excellence in process engineering along entire value chain
- Development of advanced production processes for electrode and cell manufacturing (LiB - C/Si, LiS, ASSB)
- Customized and application-specific electrode and cell development
- In-deep diagnostics for processes, intermediates and cells; metrology, especially impedance measurements
- Model-assisted processing and cell design
- Physical and electrochemical modelling as well as simulation from molecular to factory scale (CFD, FEM, DEM, Newman)
- Sustainable and energy-efficient battery production and supply chains
- Cyber-Physical Battery Production 4.0
- Recycling and recuperation of electrode production rejects (with > 90% material recovery)

## Unique Characteristics

- R&D platform for production, diagnostic and simulation for today's and future battery technologies
- Unique cooperation of transdisciplinary consortium in a Joint Lab (13 institutes; 1,000 m<sup>2</sup> with 200 m<sup>2</sup> dry room)
- Joint Lab covers electrode and cell production processes up to pilot scale (TRL 1-5, < 40 Ah)
- Freedom of design - large variety of production equipment
- Glovebox environment for R&D on scalable processes and production for ASSB electrodes and batteries
- Quality inspection of products and processes
- Automated production data acquisition through SCADA/MES for faster data-driven engineering
- Safety test environment with in-line FTIR gas analysis

## Aims

- Establishment of knowledge-driven battery production via process-/material-property functions to enhance transfer of new materials to industrial applications
- Evaluation of impacts of production processes on battery quality and performance, costs and energy demand
- Realization of reproducible and stable production
- Development of advanced processes, process equipment and measurement techniques
- Increase of energy density, power density and safety
- Simulation of whole battery production chain (processes, process chain, factory scale and cell properties)
- Establishment of Circular Battery Economy

## Circular Battery Production

