Produktion von Lithium-Ionen-Batterien –
Vom Aktivmaterial zum Batteriesystem und zurück

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Structure of interdisciplinary center

Data and facts

- Battery research since 2008
- 7 institutes of TU BS and PTB
- 900 m² pilot plant (+ 500 m² labs)
- 160 m² primary dry room
- Approx. 50 researchers and technicians

Executive Board

Prof. Arno Kwade  
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Prof. Christoph Herrmann  
Prof. Klaus Dilger  
Prof. Michael Kurrat  
Dr. Steffen Seitz  
Prof. Thomas Vietor
Main research areas

- Recycling der Batteriesysteme
- Life Cycle Bewertung / Modellierung / Metrologie
- Modul- und Batteriesystemfertigung
- Fahrzeugintegration
- Material-/Komponentenherstellung
- Elektrodenfertigung
- Zelfertigung
Educts:
- Active material
- Binder
- Conductive additive
- Solvent

Products:
- Slurry
Electrode – coating and drying

**Educts:**
- Slurry
- Aluminum or copper foil

**Products:**
- Electrode coils
Educts:
- Electrode coils with low density

Products:
- Electrode coils with higher density
Electrode cutting

Educts:
- Electrode coils

Products:
- Electrode sheets
Assembly and Electrolyte Filling

**Educts:**
- Elektrode sheets, separator coils, pouch foil
- Electrolyte

**Products:**
- Battery cells
Educts:
- Battery cells

Products:
- Formatted battery cells
Process Chain

Electrode production

- Material
- Material Conditioning
- Coating and Drying
- Calandering

Cell production

- Cutting
- Packaging
- Contacting
- Cell Assembly

Cell conditioning

- Electrolyte Filling
- Formation and Aging
- Electrochemical QS
- Battery Cells
Process Chain

Discharge
Disassembly
Crushing
Drying
Separation
Sieving
Disassembly

- Disassembly to modules
- Protection of disassembler
- Manual or partly automatic
- Recovery of system periphery

![Diagram showing material distribution in a battery system periphery.]

Electrolyte Extraction

- Removal of carbonates
  - Thermal/ Vacuum
  - Solid-Liquid-Extraction
- Decomposition of the conducting salt
- No inert atmosphere for following process steps necessary
Products

Discharge → Disassembly → Crushing → Drying → Separation → Sieving

Steel: 88.1 %
Electronics: 3.9 %
Al: 1.5 %
Plastics: 0.6 %
Cables: 5.9 %

Al: 74.3 %
Steel: 13.8 %
Plastics: 4.0 %
Copper: 5.0 %
Inclusions: 2.9 %

Al-Foil: 16.6 %
Cu-Foil: 29.8 %
Separator: 2.9 %
Plastics: 5.9 %
Black Mass: 12.3 %

Separator: 97.8 %
Black Mass: 97.6 %
Al-Foil: 1.6 %
Cu: 1.8 %
Al: 0.6 %
Fe: 0.1 %
Acknowledgements

Federal Ministry of Economics and Technology

Federal Ministry of Education and Research

Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety

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