„From the Raw Material to a Lithium-ion Battery“
Cell Manufacturing with the Research Production Line

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Research Platform for the Industrial Production of Lithium-ion Batteries

Mission:

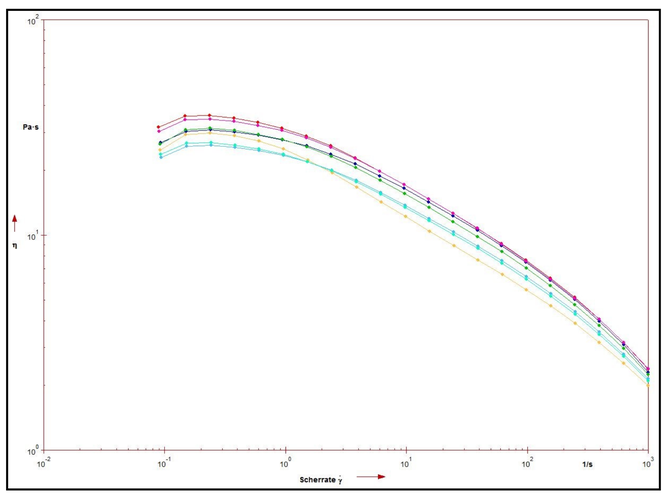
- Enable materials manufacturers to demonstrate advanced active materials and chemistries in standard cells
- Provide a practically industrial environment to assess new materials and components
- Furnish a reliable modular platform for testing and improving new manufacturing processes and system components
- Develop and improve process parameters and quality assurance methods that determine manufacturing quality and yield under real-world manufacturing conditions

Official opening ceremony 2014

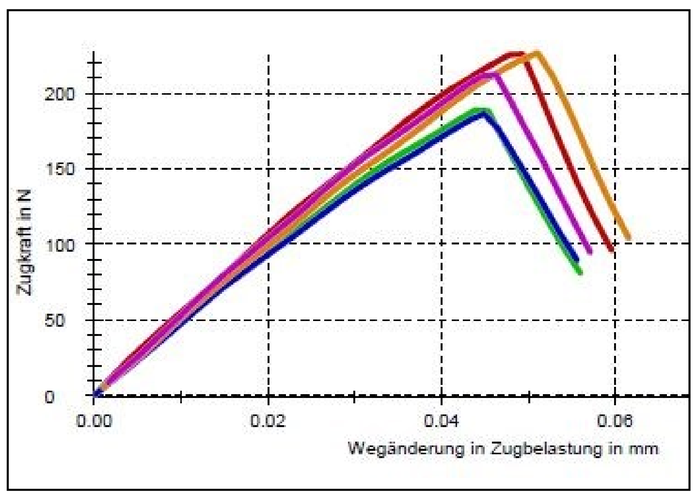
Slurry preparation

Slurry preparation & mixing station

- Automated materials weighing and loading
- Automatic materials feeding for dry chemicals and for solvents
- Temperature controlled mixing stations for preparing slurries in 60-liter batches



Different batches show the same viscosity
→ High process reproducibility

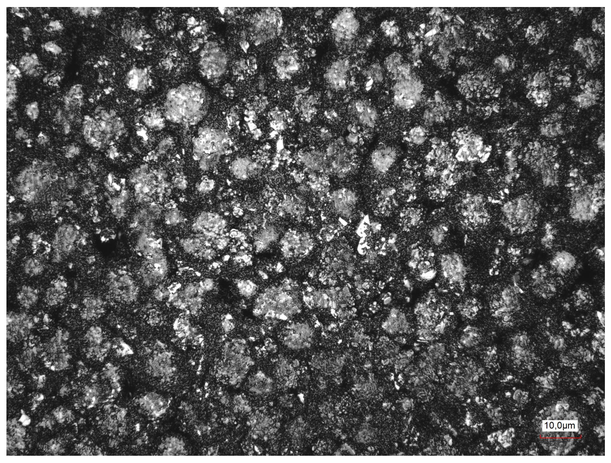


Different samples of one single coating have identical adhesion values → Reliable processing

Electrode manufacturing

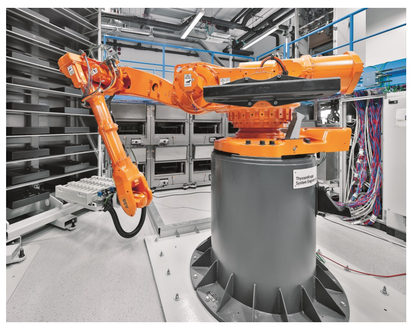
Coating line & calender

- Electrode coating up to 500 mm width, on both sides, at 30 m/min. belt speed, and various application systems
- Calendering machine with 600 mm width drums
- Slitter winder with velocity up to 30 mtr./min, exchangeable slitting cartridges, 4 knives, and brush roller for slitted electrodes



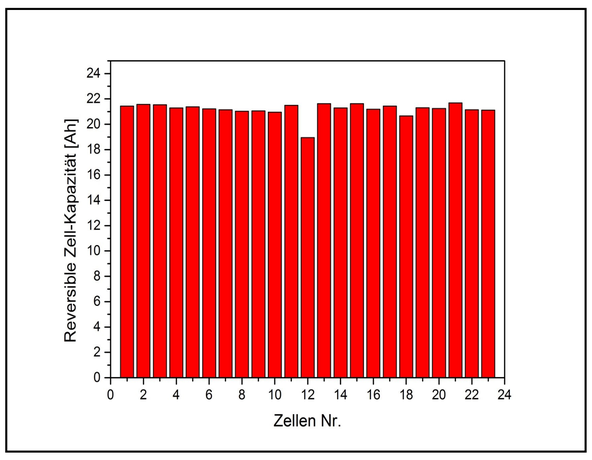
Fast and non destructive analysis of coatings and electrodes via Laser-Microscopy
According to material distribution/homogeny (right) and comparison of the layer thickness for double-side coated electrodes (left)

Cell assembly & formation

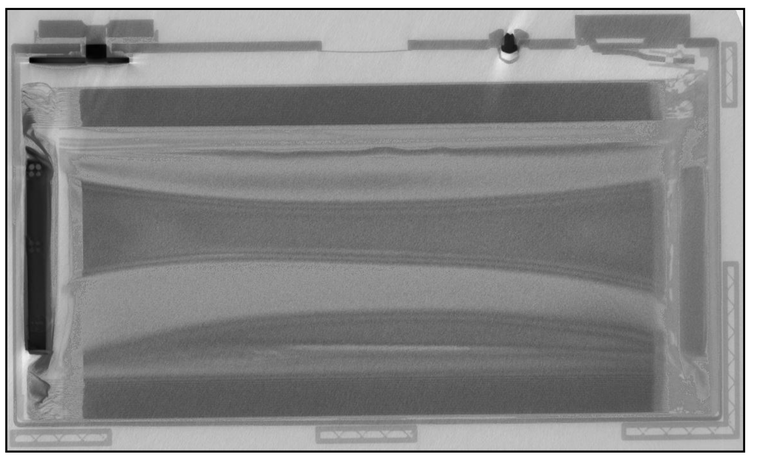


200 m² dry room & formation

- Fully automated systems for winding, assembling, and filling of prismatic cells with a cycle time of 1 cell/min.
- 200 m² dry room with -60°C dew point
- Fully automated formation with 240 temperature controlled cycle stations and 2.140 storage stations



Reproduceable cell-fabrication with a high level of automatization in the area of assembling and cycling → Identical cell parameters with a low scrap rate



Fast and non destructive failure analysis via high resolution 3D Computer-Tomography → Determined process optimization