Motivation & Goal

- Digitalization of battery cell production offers enormous potential for optimization to meet the high quality demands while keeping production as cost-effective as possible.
- Data-driven processes can make production more sustainable and optimize quality, by controlling processes to minimize waste.
- In the project InQuBator, we (Fraunhofer FFB, Fraunhofer IPT, and BST GmbH) demonstrate an approach for position-accurate allocation of quality characteristics and process parameters using the example of a coating and drying machine. This can serve as a basis for aggregating the data required for effective battery cell production and enables traceability.

Approach

Exemplary data of detected quality issues on coated foil

- Quality of sheet is assigned to a DMC Code
- Quality of the electrode paste defines its formation
- Homogenization of the compounds
- Avoiding entrapment of air
- Complex process & high requirements
- Quality of sheet is assigned to a DMC Code
- Fig. 6 Inline camera for defect detection and EoL-Testing

Outlook on further work in collaborative project

- Further adaption, testing, and validation of the DMC code and its readability:
  - Size and design
  - Frequency on electrode band
  - Quality
  - Conception of code for use in production lines with line speed up to 80m/min
- Integration of further measurement technology and process data for position-accurate data allocation

Contact

Thomas Ackermann
Research Associate
Tel. +49 241 8904-544
thomas.ackermann@ffb.fraunhofer.de
Fraunhofer FFB
Bergiusstr. 8
48165 Münster
Fraunhofer-Einrichtung Forschungsfertigung Batteriezelle FFB

Fraunhofer-Forschungsinstitut für Batteriezellen FFB

Projektpartner (Fußnoten zu Titelseite):

1 Fraunhofer Research Institute for Battery Cell Production FFB, Bergiusstraße 8, Münster 48165, Germany
2 BST GmbH, Remusweg 1, Bielefeld 33729, Germany
3 Fraunhofer Institute for Production Technology IPT, Steinbachstr. 17, Aachen 52074, Germany

Insights into collaborative project and outlook on further work

- Fig. 1 Importance of understanding cause-effect relationships based on the work developed in the InQuBator project
- Fig. 2 Big Picture of position-accurate data documentation with exemplary data of a coating process
- Fig. 3 DMC Laser marking
- Fig. 4 Laser and laser enclosure
- Fig. 5 Laser enclosure
- Fig. 6 Laser camera for defect detection and scanner for reading DMC codes
- Fig. 7 Microscopic view on DMC code (lines a)