



BATTERY FOIL WITH A CARBON CONTACT LAYER

Renewable energies, new concepts of energy production or electric mobility are up-to-date topics of high relevance. Regarding this, there is a virulent need for more efficient energy storage systems. Within the project “Battery Foil with a Carbon Contact Layer” the improvement of lithium-ion batteries is envisioned at Fraunhofer Application Center for Plasma and Photonics – a department of the Fraunhofer IST.

New energy storage systems for electric mobility

Current German policy target at an enhanced usage of renewable energy sources. Goal is a decentralization of energy production by means of e.g. solar cells and local energy storage. Here, lithium-ion batteries (LIB) is the preferred system. In the area of electric mobility, LIB is currently penetrating the market. Up to now, German producers of storage cells for hybrid cars only play a minor role on the market, even though a “Leading Market for Electric Mobility” is planned to be realized by the year 2020.

Plasma coated current collectors for improved lithium-ion batteries

Project focus at Fraunhofer Application Center is laser structuring and the design of ultrathin carbon and copper films on aluminum foils. Furthermore, the characterization of the modified foil's electrical properties is intended. Here, an important aspect is the development of a novel method that guarantees a reliable and non-invasive measurement of the foil's electrical contact resistances. The novel battery foil will be implemented as current collector in LIB. The functionalization minimizes overall bulk resistances in electrodes and, as a consequence, a higher LIB quality and performance enhancements will be achieved.

Outlook

Until the end of the project the suitability of different laser and plasma processes for an industrial coating process is to be demonstrated.

The project

In the cooperation project of the Fraunhofer IST Application Center for Plasma and Photonics and the Fraunhofer Institute for Silicium Technology ISIT, a plasma generated carbon contact layer on aluminum electrode foils for lithium-ion batteries is to be developed. The Project "Battery Foil with a Carbon Contact Layer" is funded by the German Federation of Industrial Research Associations (Aif) with € 215,750.00 (€75,500 in 2014) for the Application Center.

1 *Carbon coated battery foil.*

2 *Surface morphology of aluminum battery foil (atomic force microscope).*

CONTACT

Prof. Dr. Wolfgang Viöl
Phone +49 551 3705-218
wolfgang.vioel@ist.fraunhofer.de

Nils Mainusch
Phone +49 551 3705-333
nils.mainusch@ist.fraunhofer.de