

Battery Production at Highest Speed

World Record at the Laboratory Is Basis of New Industry-scale Coating Machines for Lithium-ion Batteries



KIT President Professor Eberhard Umbach and Dr. Tarik Vardag, Managing Director of KROENERT GmbH&Co KG, signed the cooperation agreement. (Photo: KIT)

The speed at which components for lithium-ion batteries are produced decides on the costs of the battery. The team of Professor Wilhelm Schabel and Dr. Philip Scharfer of Karlsruhe Institute of Technology (KIT) has now succeeded in doubling the coating speed of electrodes, the main component of lithium-ion batteries, to more than 100 meters per minute. To transfer these and other innovations to the next generation of coating and drying machines, KIT has concluded a strategic alliance agreement with the renowned manufacturer of coating machines KROENERT, Hamburg.

Professor Eberhard Umbach, President of Karlsruhe Institute of Technology, and Dr. Tarik Vardag, Managing Director of KROENERT GmbH & Co KG, signed an agreement on future cooperation. For the manufacture of lithium-ion batteries so far, both sides of a metal foil have been coated successively with a storage material paste that has to be dried afterwards. The partners now plan to accelerate this time- and energy-consuming process, to enhance its energy efficiency, and to reduce the costs of manufacture

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of lithium-ion batteries. Experiments conducted by the team of the KIT scientists Schabel and Scharfer have demonstrated that this is a realistic project. A paste of a commercial storage material was used for these experiments that were carried out under the “Competence E” project funded by the Federal Ministry of Economics. Among others, geometries, process settings, and flow rates in the coating unit were optimized such that the researchers obtained excellent coating results even at band speeds of more than 100 m/minute. Presently, the band speed reached in industry is 50 m/minute.

“We are facing great challenges in the area of new drying concepts. Cooperation with a leading manufacturer of coating machines allows for the direct transfer of our development results to innovative machines and facilities for electrode production and their worldwide commercialization,” says Wilhelm Schabel, professor of the Institute of Thermal Process Engineering of KIT. “We want to optimize industrial processes with respect to costs.”

“Development cooperation with KIT gives KROENERT the opportunity to implement superior technical electrode coating concepts and machines for high-quality, high-energy cells in cooperation with application-oriented engineers and scientists,” emphasizes Dr. Tarik Vardag, Managing Director of KROENERT. “We will contribute our vast experience in the planning and implementation of customer-specific coating machines in order to establish an efficient and innovative manufacture of batteries meeting highest quality requirements in Germany.”

The strategic alliance between KROENERT and KIT will be extended step by step: After signing the agreement, the partners will start to develop a novel coating and drying machine that is planned to be built as a prototype in 2013.

About the Competence E Project

The “Competence E” project bundles all KIT activities relating to the storage of electric energy for mobile and stationary applications. With a so far unique focus on the entire system, Competence E develops industrially applicable low-cost solutions for battery systems and electric drive trains of the next generations. Parallel to development and prototype construction of novel cells and batteries, new fabrication processes for cost-efficient production of these bat-

teries are designed. This work is funded by the Federal Ministry of Economics based on a decision of the German parliament.

KROENERT GmbH & Co KG, Hamburg, is an internationally active manufacturer of coating and laminating machines for all web-like materials, such as paper, cardboard, plastic films, and metal foils. It possesses vast experience obtained during more than 100 years of business. Machines for manufacturing electrode foils and separator membranes are planned to become a major element of the future business of the company.

Karlsruhe Institute of Technology (KIT) is a public corporation according to the legislation of the state of Baden-Württemberg. It fulfills the mission of a university and the mission of a national research center of the Helmholtz Association. KIT focuses on a knowledge triangle that links the tasks of research, teaching, and innovation.

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