

Press release, 11 February 2025:

Battery technology, lithium-ion technology, R&D, energy transition, sustainability

Efficient cell production: research team scales sustainable direct coating of LFP electrodes

Nordhausen / transregional. In the 'SkaleD' project, five research partners from industry and research are further developing a process that directly coats electrodes in industrial battery cell production. This will reduce the costs and resources used in the mass production of lithium iron phosphate cells, replace solvent-intensive processes, and create the conditions for a sustainable energy transition as well as for European competitiveness in relation to Asian markets.

Manugy, Matthews International, the Fraunhofer-Institut für Keramische Technologien und Systeme IKTS, the Fraunhofer-Einrichtung Forschungsfertigung Batteriezelle FFb and EAS Batteries are optimising a direct extrusion process and the associated plant concept from pilot to industrial scale and complementing it with efficiency-enhancing innovations – right up to a technology for simultaneous direct coating of both sides of the electrodes.

The research project 'SkaleD – Scaling of extrusion-based direct coating' is supported with around 2.1 million euros from the 'Sondervermögen Klima- und Transformationsfonds' of the 'Bundesministerium für Bildung und Forschung (BMBF)' (funding code O3XP0631A-D). The total volume is 2.8 million euros. EAS Batteries coordinates the research project.

Scaled technology – environmentally friendly, optimised and inline-capable

Novel solvent-reduced coating processes are the key to making the production of electrodes sustainable, efficient and healthy. The 'SkaleD' research project is based on the direct extrusion process developed in the previous 'OptiEx' project to make the innovative technology suitable for mass production. The process represents a resource-saving alternative to the previously established process and overcomes the technological bottleneck of this crucial manufacturing step in the production of batteries. The research alliance will adapt and improve the entire process chain. This applies in particular to the coating width and process speed, as well as to the accompanying optimisations of the plant technology and formulations. The focus is also on inline capability, so that plant technology and processes can be linked to upstream and downstream processes. In addition, this project aims to realise – initially in the form of a feasibility study – simultaneous double-sided coating for the first time, which can significantly increase process speed.

Funded battery research – competitive and pioneering

In order to remain competitive in Germany and Europe, particularly vis-à-vis Asian markets, the price per kilowatt hour of cells produced in Europe must decrease. This can be achieved by establishing innovative manufacturing processes. 'We are pleased that the federal government has recognised the importance of efficient mass production of battery cells and is funding our research work,' says EAS Managing Director Michael Deutmeyer. 'In times of budget cuts, this is not a matter of course and once again highlights the relevance of our development effort. At the same time, this is an urgent appeal to support the entire location of Germany in implementing the energy transition with a new, significantly higher

budget for cell and battery research in a future-oriented way and to consistently continue in this direction with the bridge financing that has now been adopted.'

Germany as an industrial location – sustainable, innovative and cost-efficient

Awareness of sustainability and the requirements for cost-efficient battery systems are continuously growing worldwide. The knowledge gained in the 'Skale D' research project meets these needs and ensures the long-term further development of battery cell production. The new skills will thus strengthen Germany as an industrial location as well as the European Economic Area. The developed systems and processes open new sales markets – up to and including scaling the concept from an industry-like environment to a gigafactory scale. The project results thus create a wide range of exploitation opportunities and international competitiveness. The research project has a duration of three years and ends on 31 December 2027.

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About EAS Batteries

Large-format round cells, LFP as a safe cell chemistry, energy-saving extrusion and an efficient contacting method are among the powerful ideas of a quarter of a century of EAS history. As a highly specialised niche supplier, EAS has been developing innovative cell and battery solutions at its Nordhausen production site for 25 years - including extremely robust and high-performance cells for applications in the aero-space, aviation, automotive, NRMM (Non-Road Mobile Machinery) and maritime industries. The EAS brand emerged from GAIA Akkumulatorenwerke GmbH, founded in Nordhausen in 1996. Since June 2017, EAS Batteries GmbH has been part of the Monbat Group.

About Manugy

MANUGY is a machine and plant manufacturer for modular, small to medium-scale, highly automated production lines for energy storage systems with a particular focus on battery technology. MANUGY combines product, process, machine and plant knowledge to enable customers to manufacture high-quality next-gen battery cells. As a spin-off of the Fraunhofer IPT, it builds on developments in flexible, modular and adaptable machine architecture. In recent years, this machine architecture has been optimised in particular for continuous roll-to-roll (R2R) and discrete assembly lines.

About Matthews International

SAUERESSIG, a division of Matthews International GmbH, is a leading and innovative full-service provider of calendaring, embossing and rotary processing systems in standard and special designs. The product portfolio includes both complete production lines and individual machines for embossing, finishing, smoothing, perforating and calibrating web materials. In addition to individual solutions for the converting industry, Matthews Engineering develops and manufactures advanced systems for the production of battery components, covering the entire process chain from development and production to installation and commissioning of the production lines. Comprehensive testing options and versatile laboratory equipment form the interface between the laboratory and large-scale production.

About Fraunhofer-Institut für Keramische Technologien und Systeme IKTS

The Fraunhofer IKTS develops high-performance ceramic materials, industry-relevant manufacturing processes, and prototype components and systems in complete production lines up to the pilot scale. A broad spectrum of technologies for materials diagnostics and testing contributes significantly to the quality assurance of our customers' products and plants. The focus is on sustainable and economical solutions for resource conservation, energy system transformation and digitalisation.

About Fraunhofer-Einrichtung Forschungsfertigung Batteriezelle FFB

The Fraunhofer Research Facility for Battery Cells is a branch of the Fraunhofer-Gesellschaft in Münster. Its concept involves a combination of laboratory and production research for different battery cell formats – round cells, prismatic cells and pouch cells. The employees of the Fraunhofer FFB research individual process steps or the entire production chain as required. An infrastructure is being created at the Münster site that will enable small, medium and large companies, as well as research institutions, to test, implement and optimise the near-series production of new batteries. As part of the 'FoFeBat' project, the Federal Ministry of Education and Research and the state of North Rhine-Westphalia are providing a total of around 820 million euros in funding for the construction of the Fraunhofer FFB. The federal government is providing up to 500 million euros for research facilities and projects, while the state of North Rhine-Westphalia is investing around 320 million euros in land and new buildings.

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