

Success Stories - Service Users

Challenge: Suitable tool for quality control and efficient development of electrodes

Organisation Profile

At Easyl, we develop powder active materials and additives, based on 20 years of research on ceramic powders for Zinc rechargeable batteries (Zinc-Air and Nickel-Zinc and Zinc-Manganese oxide). EASYL is also developing electrodes for battery manufacturers to help them improve their performances according to electrochemical characteristics.

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Problem to be solved

Easyl produces Zn-based electrodes for Zn/Ni batteries. Different parameters and formulations can be tested in order to find the best compromise to reach the best performance of batteries. Easyl contacted TEESMAT to find a tool to probe the electrical conductivity of the produced electrodes. This tool would be used later to control the produced electrodes' quality.

Solution provided by TEESMAT

SEMILAB Eddy current sheet resistance measurement is a non-contact alternative to the widely used four-point-probe measurement. It provides fast, accurate, repeatable and high-resolution maps of the sheet resistance distribution on electrodes, even on samples with insulating surface. The Eddy current measurement probe enabled the measurement of all samples with different compositions showing heterogeneities on the surface of the samples and then distinguishing the areas with different conductivity.

The set up of the Eddy current measurement is easy and fast, as well as the duration of the measurement, which allows to test many materials and samples and to be able to optimize the electrical properties and the qualities of the electrodes. This offline characterization system can also be installed in line with the production metrology toolset.

Impact

The first trials show a variation of resistance and resistivity that is related to the design of Easyl's electrodes, meaning that Eddy measurement could be further explored to have a better control in the electrode manufacturing but also for research and development purposes.

Easyl plans to send more samples to TEESMAT with varied formulation or geometry and then perform electrochemical tests followed by post-test analysis in order to check and confirm if the morphological structure of the aged electrodes can be predicted thanks to Eddy measurements.