

Upscaling New Battery Technologies from Lab to Fab

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The lecture “Upscaling New Battery Technologies from Lab to Fab” describes the development of a Lab2Fab concept for Lithium-Ion batteries for the new generation of hybrid automotives.

In the first part of the talk an overview on the different battery technologies is given. The operating principle of a Li-Ion battery is described and the different types of battery designs like rolled ones or folded ones.

The second part of the presentation describes the parameters which influence the coating of the anode and cathode. Those parameters are e.g. chemistry, processes, curing, substrate, process control, pre-treatment and environment condition/control.

Then an overview of existing coating technologies is given and explained in detail. Based on this overview, the presenter gives a detailed explanation of the most common coating technologies which are being used like knife coating, commabar system, reverse commabar, case knife, engraved roller system, micro roller, rotary screen and a detailed explanation of slot die coating processes.

In the next part we find a detailed explication of the different drying and curing technologies used for Li-ion technologies. Further the use of a flotation dryer either in pilot or production lines is described.

In the following the upscale process from Lab2Fab is described. It starts with an overview of the different lab coaters being used, starting with a sample machine for letter size samples up to roll to roll laboratory coaters on small scale in different layouts to vertical double side pilot coaters which can also be used for semi production output.

¹ Unpublished. ISCST shall not be responsible for statements or opinions contained in papers or printed in its publications.

The next step is a semi production system like the Linecoater on 500 mm working width with longer dryers and interchangeable coating heads. Then a bigger scale of equipment with flotation dryers on 800 mm working width is shown then.

A new approach in equipment for product development is described in the next chapter. This is the so called Click&Coat system, which gives a wide variety of process combinations in semi production process layouts.

The final description gives a complete overview on a battery fab design developed with M+W Zander FE GmbH on a complete battery fab for Lithium-Ion batteries newest generation for hybrid cars.

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