

# Edge formation in slot die coating of lithium-ion battery electrodes

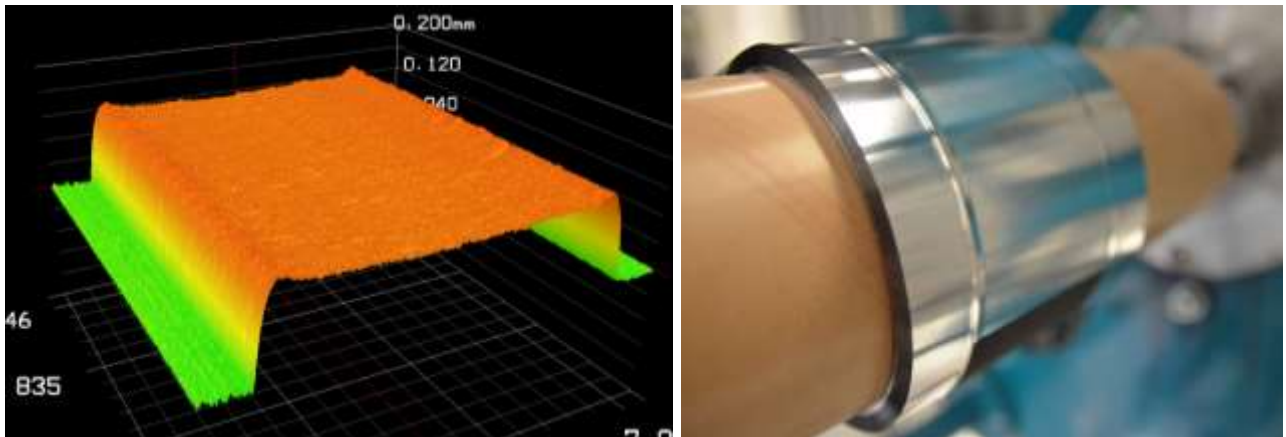
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**Keywords:** slot die coating, edge effects, film uniformity, lithium-ion batteries

In the manufacturing process of Li-Ion batteries the slot die coating of the electrodes is a crucial step, which is not fully understood yet. Especially the mechanisms creating super-elevations at the coating edges, which cause trouble in the downstream process steps, are not fully understood yet. Until now literature only delivers a model for super-elevations in hot melt extrusion coatings [1], which for some reasons is hardly comparable.



*Fig. 1. Super-elevated film-edges of a wet LIB coating, measured online (left). The superposition of several “heavy edges” leads to deformations in the mm-scale during the up-winding process, which provoke a stiffening embossing in the metal foil and a delamination of the electrodes (right).*

Further and more recent literature only described and discussed the observed heavy edges [2,3]. Therefore we applied flow and deformation balances and invented a semi-empirical expression describing the height of super-elevated edges. This expression is based on the liquid acceleration between the gap and the full established downstream film-flow.

It was compared to the latest experimental results which could be explained quite well. The comparison shows a significant increasing height of the so called of heavy edges for an increasing coating gap to film height ratio.

## REFERENCES

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