



Screen Printing Forever

27th October 2021

Valencia - Spain



BIO

Pushing the Boundaries of Screen Printing - From Modeling to new Applications

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Sebastian Tepner studied electrical engineering and information technology at the University of Bremen in Germany. In 2016 he joined the Fraunhofer Institute for Solar Energy Systems. His research focuses on the process development for printing technologies such as screen-printing and dispensing. In 2021, he became the head of the team "Printing Process Modeling & Rheology". His team develops solutions to accelerate the transition of printing technologies into the digital age. [***sebastian.tepner@ise.fraunhofer.de***](mailto:sebastian.tepner@ise.fraunhofer.de)

Linda Ney received her diploma in the field of renewable energy systems from the technical university of Dresden. Since 2017 she works at Fraunhofer ISE, focusing on the optimization of screens for solar cell manufacturing. In 2019 she started her Ph.D. about the development of industry-related production processes for PEM-fuel cells, as well as stability studies of catalyst inks and pastes. [***linda.ney@ise.fraunhofer.de***](mailto:linda.ney@ise.fraunhofer.de)

Abstract:

Fraunhofer ISE is working towards a full digitalization of screen printing, including a digital twin of screen architectures which automatically finds optimal screen specifications for selected printing pastes. These optimized screens are then automatically evaluated in computational fluid dynamics simulations by determining the paste flow through the screen opening. In this talk, we showcase how an optimization of the screen-printing process sequence can be achieved only by performing virtual experiments.

Furthermore, we present how screen printing can be used to overcome challenges in upscaling and optimization of fabrication processes for fuel cell catalyst production, which includes an increase of throughput rates while maintaining quality demands. At Fraunhofer ISE, we apply flatbed screen printing to enable sufficiently high layer thicknesses and the possibility of in-plane structuring of the catalyst layer, compared to e.g. slot die coating.