Screen Printing Forever

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BIO

Manufacturing of Printed Batteries – Screen Printing of Thick Layers

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Since 1999 Prof. Hübner teaches at the University of Applied Science, Stuttgart Media University "Hochschule der Medien" (HdM) in Stuttgart, Germany.

From 2004 until 2014 he was the leader of the HdM study program "Print and Media Technology". Besides the entire printing technologies and printing processes his specialties in teaching are digital, screen and functional printing.
In 2006 the Institute for Applied Research (Institut für angewandte Forschung – IAF) was founded at the HdM. He took over the leadership of the IAF, which is an umbrella organization over meanwhile, about 30 research groups within the HdM.

His own research group is called "Institute for Innovative Applications of the Printing Technologies" (IAD) and mainly deals with functional and specialty printing. Recent successful developments are printed antennae for automotive applications, screen- printing of rechargeable batteries and resistive or capacitive sensors.

Before joining the HdM he worked for about 11 years with the companies AGFA Gevaert AG and DuPont de Nemours as a research and process engineer.

Abstract:

For printing batteries, the electrochemically active materials must be brought into a printable, paste like form. Battery materials comprise relatively coarse particles in the range from a few to about 20 to 30µm. Therefore, relatively coarse meshes are necessary that the particles can pass the mesh openings. Furthermore, the quantity of electrochemically active materials determines the capacity of the battery. Therefore, the layers of the active materials should be as thick as possible/necessary to guarantee a well-functioning system with sufficient capacity. When printing the electrochemical system zinc manganese dioxide (MnO_2). The MnO_2 layer must be at least 1.5 times thicker than the zinc to keep the electrochemical balance. Up to now PET meshes were used for this purpose. Thanks to Asada Mesh a comparison between PET and stainless steel (Asada mesh 3D) with much higher theoretical ink volume could be accomplished. We are also very thankful for the support by Berbertec company (stretching) and Hurtz (frames).

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