

SA-3

## Electrostatic Spray Deposition Technique for Thin Film Fabrication

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Electrospray deposition (ESD) technique is fast finding its applicability in the field of thin film device manufacturing processes and the ease and cost efficiency attached to ESD process with possible integration with batch manufacturing technologies is the potential future of thin film device manufacturing. As the name suggests, the deposition phenomenon should solely be a spray achieved through electrostatic forces. In fact it is an imbalance between the surface forces arising because of the surface tension of the liquid to be sprayed and Maxwell stresses which are induced because of the electric field, that pull the liquid downwards from the capillary into a stable jet which further disintegrates into smaller droplets because of coulomb forces and hence a cloud of charged, mono-dispersed and extremely diminutive (sometimes up to femtolitres) droplets is achieved. The present talk is going to be exclusively about the electrospray process concepts, generation and possible applications.

**Keywords:** Electrospray, Thin film

SA-4

## Roll-to-Roll Printing Techniques and Materials for Large-Area Electronics

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In this talk, the general concept of roll-to-roll printing technologies will be introduced with basic fundamentals of ink formulations for printing electronic devices as the first part of the talk. As the second part, based on the R2R printing process, key factors for printing TFTs, IC, PV and display would be presented using the information from the case study of R2R gravure and offset.

**Keywords:** Roll-to-Roll, Printing

SA-5

## Development of Transparent Conductive Patterned Film with Hybrid Ag Ink

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With increased interest in printed devices, various metal nano inks have been investigated as candidates materials for printed electrodes and wiring as well as conductive film substituting photo-lithography process. Recent advances in organic conductive polymer allow us to fabricate high performance printed device. Meanwhile, there was several attempts to fabricate conductive films by mixing conductive polymer with metal nano-particle or nano-wires. The presence of Ag nanowires in conductive polymer mixture have shown good potential in organic photovoltaic devices.

**Keywords:** Printing, OPV, TCF, Nano-wire