

Roll-to-Roll Nanofabrication Processes for Flexible

Electronics and Biomedical Applications

EIPBN 2017

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The ability to pattern materials at the nanoscale can enable a variety of applications in areas such as nanoelectronics, optical metamaterials, and emerging applications in nanomedicine. This presentation will discuss recent progress in cost-effective roll-to-roll (R2R) nanoscale patterning based on imprint lithography. The presentation will also discuss the complementary R2R technologies such as nanoscale thin film coatings using slot die coating techniques, R2R sputtering and e-beam evaporation, and R2R reactive ion etching. The speaker will discuss ongoing efforts at the NASCENT Center at the University of Texas at Austin to bring silicon IC grade nanofabrication to the world of R2R processing, including contamination control, nanoscale metrology and yield management strategies.

If a reliable and cost-effective R2R nanofabrication capability can be established, there are major potential applications in areas such as photonic devices for displays, and size and shape controlled nanocarriers for targeted drug delivery. This presentation will discuss the performance and cost metrics associated with display photonics and nanocarrier drug delivery applications, our current state-of-the-art in R2R nanofabrication, and technology gap analysis relative to these applications.