

EMP/ASDD-01-1-I-M

Roll-to-roll processes for OLED lighting devices

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Organic light-emitting diodes (OLEDs) were fabricated by a series of roll-to-roll processes for the lighting applications. Starting with a PET roll, a moisture-barrier layer was deposited by a roll-to-roll atomic layer deposition process in order to protect the OLED devices from ambient moisture. A silver-nanowire network transparent electrode was then coated on the barrier surface and planarized by embedding silver nanowires into a polymer resin and utilized directly as the anode for the OLEDs. All the processes were carried out in roll-to-roll. An OLED device was deposited in a vacuum roll-to-roll chamber on the silver nanowire anode. Finally, after the lamination of the roll OLED devices with our moisture-barrier film, flexible OLED lighting devices were fabricated by full roll-to-roll processes. In the presentation, the full roll-to-roll processes for the fabrication of OLED lighting devices will be explained in detail, along with the performance of the devices.