Next Generation Evaporation Technology for Future AMOLEDs

Changhun Hwang, Sung Su Kim, Sung Min Jo, and Byung Doo Chin (Dankook Univ., Korea)

The conventional linear source evaporation technology known for manufacturing tool of the large size AMOLED panels has a critical limitation for very fine patterns to be overlapped. It is known as “shadow distance effect” being caused by the low n-cosine distribution of the organic gas emission from the linear source. The shadow distance is known to be as of 3 to 8um. In plane source evaporation as new method for the next generation, the plane source evaporation beam has known to be very high n-cosine (n=25) distribution as a nearly vertical collimated emission and it could suppress the shadow angle to 80 degrees. Recently, we have been developing the prototype of plane source set up to measure the sub-micron shadow distances as of 0.5 to 0.9um. In this paper, the very small numbers of shadow data will be reported to wider discuss with many of OLED experts in order to achieve the breakthrough evaporation technology for the super-ultra-high-definition AMOLED industry.

Monolithic Integration for Robust and Foldable AMOLED Displays

Jan-Laurens P.J. van der Steen, Hylke B. Akkerman, Joris de Riet (Holst Centre/TNO, Netherlands), Soeren Steudel (IMEC, Belgium), Auke J. Kronemeijer, and Gerwin H. Gelinck (Holst Centre/TNO, Netherlands)

Although curved displays are slowly entering the market, the advent of truly flexible displays will open up a whole range of new applications. Their flexible or even foldable form factor allows unprecedented design freedom and seamless integration into everyday objects. However, with flexibility comes the need for robustness. From a technological point of view, we are facing an interesting challenge: to be truly foldable, the display needs to be extremely thin. The thickness of an OLED display is essentially determined by the substrate and moisture barrier layers. Hence, our technological efforts towards foldable displays focus on these key aspects. In this work, we present our latest results on flexible thin-film encapsulation for foldable displays. Furthermore, we will show a route to achieve improved mechanical stability and robustness.
OLED Manufacturing

Date: Aug. 30, 2017 (Wednesday)
Time: 09:00~10:30
Session Chair: Prof. Toshihide Kamata (AIST, Japan)

G23-3 09:50~10:15

Proprietary Process Technologies for Cost-Efficient OLED Manufacturing

Jae H. Jung, Soeren Hartmann, Boerge Wessling, Juergen Kreis, and Markus Gersdorff (AIXTRON SE, Germany)

Taking the basic principle, AIXTRON has added its proprietary Close Coupled Showerhead® (CCS) technology as well as novel source technologies specifically developed for efficient evaporation of organic materials. These core technologies enable the precise deposition of organic thin films with excellent thickness uniformity and high material utilization efficiency at high throughput. The approach realizes cost advantages through economies of scale, thus leading to significantly lower manufacturing costs.

G23-4 10:15~10:30

Fine Metal Mask Laser Solution for 1k-ppi OLED Display

Jong Kab Park, Jungyu Hur, Boram Kim, Doh Hoon Kim, Chi Woo Kim, and Kiro Jung (AP Systems Corp., Korea)

Laser processes are widely used in display industry such as annealing, cutting, repairing and etching, etc. There have been lots of effort for fabricating Fine Metal Mask by laser process since conventional wet-chemical processing has a technical limitation and yield issue to go super high resolution such as Ultra High Definition and beyond regime. There is no doubt that laser processing would only be the way to overcome issues for high density metal mask, however, most of laser approaches face harmful thermal effect when exposing energetic laser pulses onto the reactive thin invar material as conventional laser ablation process is made in such a way that continuous accumulation of laser pulses is done until the ablation is completed without giving sufficient cooling time. By circumventing such issue, we have developed thermal effect free laser processing strategy and successfully demonstrated deformation free fine metal mask with 1000 ppi grade resolution.