



A news service about the electronic display industry from the analysts at:



IM HOME PAGE

ABOUT US

MONTHLY REPORTS

YEARLY REPORTS

CONFERENCES

CONSULTING

WEBINARS



INDEX | ARCHIVE | NEWS BY SUBJECT

Search

Display Products | Display Components | Competitive Intelligence | Content Delivery

Slot-coated OLED Displays Could Hit Market in 2010, says NexTechFAS

Get FREE e-mail delivery of Display Daily

June 19th, 2008

As you may have grown tired of reading in this space, the development of material deposition processes that scale to larger substrates are one of the keys to reducing the cost of AMOLED displays. The point-source vacuum thermal evaporation (VTE) process used for most current OLED displays is limited to small substrates.



Ken Werner
Senior Analyst and Editor

Although Kodak has developed an evaporative process for larger substrates that uses a linear instead of a point source, and this process is likely to be used by Samsung and perhaps other companies for a new generation of OLED displays, a lot of conversation has been devoted to solution processing. That is, put the OLED materials into a solution and then do one of the things that people do with solutions, such as ink-jet them, spray them, or print them.

Although ink-jet (Sumitomo Chemical, Sumation, CDT, etc.), continuous spray (DuPont, Dainippon Screen), roll printing (LG Display, demonstrated for TFT backplanes), and roll-to-roll printing (GE) have gotten most of the attention, there is another, time-tested solution process: slot-coating or extrusion coating, which has been used to apply photoresist, among other things, for decades.

A phone conversation yesterday with Greg Gibson, CTO of NexTech FAS (Austin, Texas; www.nextechfas.com) indicated that the commercial use of slot coating to apply some of the functional coatings used in OLED displays is closer than I would have thought. (NexTech FAS is the operating company for the process equipment companies NexTech Solutions and FAS Holdings Group, which are in the process of merging.)



NexTech FAS Advantage slot coaters are available for substrate sizes through 6m & and feature 95% material utilization.

Slot coaters put down an unpatterned layer of material, so their most obvious application is for OLED lighting and for the unpatterned layers in an OLED display, such as the hole injection layer (HIL) and the electronic transport layer (ETL). Although patterning of multiple organic layers, such as would be required for an RGB display, is difficult, development work is continuing, Gibson said. And patterning of a single layer, as would be required for a color-by-white or monochrome display, is relatively straightforward.



Learn from the experts.



Displays incorporating HIL, ETL, and/or emitting layers applied with slot coaters are likely to appear on the market in 2010, Gibson said. Which layers exactly? Products will incorporate at least two of the three, Gibson answered.

HILs and ETLs are usually apply by thin-film deposition and are very thin. Can slot coaters apply layers that thin? "Our development is to slot-coat very thin layers, and it has taken a combination of equipment and material advancements," Gibson said. "There is a low solids concentration in the wet film, which is fairly thin itself, and then it dries to a thickness of 100 to 200 nm. Although it's hard to make a direct comparison, that's in the general range of thin-film deposition. The materials are somewhat different than ink-jet materials because they need to be formulated specifically for slot-coating solution processing."

NexTech FAS is looking at both polymer materials and small-molecule materials in solution form. Products with both kinds of materials are under development by NexTech FAS customers, Gibson, said.

Does the fact that people are looking at slot-coating imply the problems of the ink-jet process are not being solved quickly? "Ink-jet has lots of challenges in manufacturing devices, including resolution, repeatability, and smoothness of layers. So people have been evaluating alternative deposition methods," Gibson answered. "For patterned layers, people are still looking at ink-jet. They are most interested in slot-coating for the unpatterned layers or for large areas."

Will it be slot-coated lighting or display products that are first to market? "Display products will probably be the first products to market made with this equipment. We are also involved with lighting and PhotoVoltaic products."

And will these first display products be small? "That's a good assumption."

The fact that panel makers are looking at a wide variety of processing techniques bodes well for the mid- and long-term future of OLED displays. The problems of cost-reduction and moving to larger panel sizes remain formidable, but solutions are being developed and applied as you read this.

[Reply to the author](#)

Posted in [Small Displays](#), [Optical](#), [Supply Chain](#) |

[« Previous Entries](#)