

## Low-cost, large-area production of flexible OLEDs a step closer



**AGFA MATERIALS AND HOLST CENTRE DEMONSTRATE WORLD'S FIRST ITO\*- AND LITHO-FREE OLEDs ON FOIL**

**MORTSEL (B) AND EINDHOVEN (NL) – APRIL 7, 2009** - *Agfa Materials, part of the Belgian Agfa-Gevaert Group, Philips Research, and Holst Centre, an open-innovation initiative by IMEC (Belgium) and TNO (The Netherlands) demonstrate the world's first large-area flexible OLED tile that does not require ITO as transparent electrode and has printed shunting lines. The result, partly funded by the EU FP7 Fast2Light project, eliminates costly material and lithography process steps. It is therefore a significant improvement towards low-cost, high volume and large-area manufacturing of flexible OLED lighting.*

For OLED lighting to become producible at low cost, simple system design and compatibility with roll-to-roll processing are a must. To achieve low cost, elimination of transparent conductive oxides as the high-conductive and transparent anode layer is the preferred way to go. Up till now, ITO was needed as supporting layer for the PEDOT/PSS\* anode layer with lower conductivity. Thanks to Agfa's high-conductive transparent polymer Orgacon™, a PEDOT/PSS-based solution with six orders better conductivity than its predecessor, the use of ITO can now be avoided. Proof is the latest OLED lighting demonstrator of Holst Centre's shared programs: a homogeneous white OLED tile of 12x12cm<sup>2</sup> without the use of ITO.

However, to obtain homogeneous light distribution over large surfaces like this, some kind of additional current distribution is still needed. Even in the presence of ITO, a grid of metallic shunting lines is needed. In conventional designs, ITO, shunting lines, and insulation lines covering the shunting lines are patterned using photolithography steps. Holst Centre and its partners have succeeded in direct patterned deposition of these shunting lines by inkjet printing, and combining it with PEDOT/PSS without the need for any photolithography steps. To our knowledge, this is the first time that ITO-free flexible OLEDs are demonstrated in combination with printed shunting lines, which is an important step towards low-cost manufacturing. According to recent reporting, OLED lighting is expected to hit the market already in the course of 2011.

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The demonstrator is displayed at the Printed Electronics Conference in Dresden (April 7-8) and the technical details will be presented during the SPIE Optics and Photonics Conference in San Diego (August 2009). The results were obtained thanks to the combined expertise in the Holst Centre program on Flexible Organic Lighting and Signage and in the EU FP7 Fast2Light project. In these programs, Holst Centre researchers collaborate in mixed teams with academics and resident researchers from industrial partners, like Agfa and Philips Research.

\* ITO= IndiumTinOxide / PEDOT(/PSS)= Poly(3,4-ethylenedioxythiophene) (/poly(styrenesulfonate))

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## **Picture**

High-resolution version can be found on [www.holstcentre.com/NewsPress](http://www.holstcentre.com/NewsPress)



*"OLED lighting foil with printed shunting lines and Agfa's transparent conductive polymer Orgacon™, avoiding the need for photolithography and ITO."*

## **More information**

### **About the Agfa-Gevaert Group**

The Agfa-Gevaert Group is one of the world's leading imaging and information technology companies. The Agfa-Gevaert Group develops, manufactures and markets analogue and digital systems for the printing industry (Agfa Graphics), the healthcare sector (Agfa HealthCare) and film related products and specific industrial applications (Agfa Materials). The Agfa-Gevaert Group has its headquarters in Mortsel, Belgium. The company is present in 40 countries and has agents in another 100 countries throughout the world. The Agfa-Gevaert Group achieved a turnover of 3,032 million Euro in 2008.

For more information on Agfa, visit [www.agfa.com](http://www.agfa.com).

### **About Agfa Materials**

Agfa Materials has a leading position as a low cost producer of film and related products and serves not only Agfa Graphics and Agfa HealthCare, but also third

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parties in the printing and medical sector. It plays a prominent role in industrial markets outside printing and healthcare, such as the printed circuit board industry, aerial photography, motion picture film and e-consumables (e.g. conductive polymers, identity & security systems). At the same time, Agfa Materials will continue to invest in and develop new applications, such as functional foils.

## About Holst Centre

Holst Centre is an independent open-innovation R&D centre that develops generic technologies for Wireless Autonomous Transducer Solutions and for Systems-in-Foil. A key feature of Holst Centre is its partnership model with industry and academia around shared roadmaps and programs. It is this kind of cross-fertilization that enables Holst Centre to tune its scientific strategy to industrial needs.

Holst Centre was set up in 2005 by IMEC (Flanders, Belgium) and TNO (The Netherlands) with support from the Dutch Ministry of Economic Affairs and the Government of Flanders. It is named after Gilles Holst, a Dutch pioneer in Research and Development and first director of Philips Research.

Located on High Tech Campus Eindhoven, Holst Centre benefits from the state-of-the-art on-site facilities. Holst Centre has over 145 employees from 25 nationalities and a commitment from close to 20 industrial partners.

Visit us at [www.holstcentre.com](http://www.holstcentre.com)

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