

## PRESS RELEASE

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### **Novaled demonstrates long lifetime and high efficiency white top emitting OLEDs**

**Novaled**, a leading company in OLEDs for display and lighting applications, demonstrates white top-emitting devices with a lifetime exceeding 50,000 h and a power efficiency of 30 lm/W at an initial luminance of 1,000 cd/m<sup>2</sup>.

The white top emitting OLED structure offers the realisation of OLED lighting products made on metal substrates. Metal substrates bring advantages such as good heat dissipation, mechanical stability, bended designs and open the roadmap towards low cost roll-to-roll production.

Novaled has developed a high performance white top emitting OLED using the Novaled PIN OLED<sup>®</sup> technology with its proprietary doping and host materials in association with a blue fluorescent emitting material from SFC Korea. In addition the device has an ITO-free top contact and incorporates a Novaled-specific light extraction material layer to enhance the efficiency. At the same time this outcoupling material reduces the color shift over a wide viewing angle so that it can hardly be detected by the naked eye.

The device achieves a lifetime above 50,000 h (t<sub>50</sub>) at an initial brightness of 1,000 cd/m<sup>2</sup>. This long lifetime translates into continuous device operation for more than 5 years. By using Novaled's proprietary doping technology, the device reaches a high power efficiency of 30 lm/W measured in an integrating sphere. Broad emission spectrum and good CIE color coordinates (0.46/0.42) were achieved in the devices, which is close to illuminant A and inside the US Department of Energy (DOE) quadrangles.

“With this achievement Novaled demonstrates once again the robustness and potential of its PIN technology”, says Gildas Sorin, Novaled CEO. “Configurations like top or bottom, inverted or non-inverted organic structures with various emitting materials and metal electrodes bring the proper high performance for each specific market request in the display and lighting domain.”

#### **about OLEDs**

OLEDs (organic light-emitting diode) are semiconductors that are made of thin organic material layers that measure just a few nanometers in thickness. They emit light in a diffuse way to form an area light source. This disruptive technology represents an entirely new approach for architects, designers, system integrators, planners and luminaire makers when working with light. OLED lighting has a dual nature, which means it can function both as a lamp and a luminaire. OLEDs herald the future of a vast array of completely new lighting applications and by combining color with shape, OLEDs will create a new way of decorating and personalizing surroundings with light. Furthermore, organic LEDs will make a significant contribution to sustainability due to their energy efficiency, environmentally friendly materials and reduced packaging requirements.

#### **about Novaled**

Novaled AG is a world leader in the OLED field and specializes in high efficiency long lifetime OLED structures and is an expert in organic electronics. The company is known for its Novaled PIN OLED<sup>®</sup> technology, its proprietary OLED materials and the customized OLED products and services. Novaled has developed long term partnerships with major OLED producers throughout the world. Based on more than 400 patents granted or pending, Novaled has a strong IP position in the field of OLED technology, and was named No. 1 in a list of 'up and coming' world market leaders by the German newspapers Handelsblatt and Wirtschaftswoche. Its main investors include eCAPITAL, Crédit Agricole Private Equity, TechnoStart, TechFund and CDC Innovation. For further details please visit [www.novaled.com](http://www.novaled.com).

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