



## **PRESS RELEASE**

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### **White record OLEDs of Dresden University and Novaled surpass efficiency of fluorescent tubes**

**The Technical University of Dresden and Novaled AG have reached 90 lm/W at a brightness of 1.000 cd/m<sup>2</sup> for a real lighting device and even 124 lm/W when using a 3D light extraction system.**

White organic light-emitting diodes (OLEDs) are a promising new technology to become the next generation light source. They have the potential of much higher efficiencies than classical lighting sources. Due to their unique features and attractive appearance white OLEDs will have a striking impact on the lighting industry. These ultra-thin large-area-emitting devices can be flexible, transparent, color-tunable and scaled to virtually any size or shape enabling completely new ways for lighting designers. In terms of power efficiency, fluorescent tubes are a benchmark for emerging technologies with some 50-70 lm/W (considering losses in reflectors). With the latest OLED record values of the Dresden University of Technology and Novaled AG closely cooperating in this project, this benchmark was clearly surpassed.

“In our approach, we combine a novel, very energy efficient emission layer design with improved light outcoupling concepts, leading to this breakthrough” says project leader Sebastian Reineke, Physicist at Institute of Applied Photophysics (IAPP, TU Dresden). “The power efficiencies of the record devices reach 90 lm/W even if only flat, scalable outcoupling techniques are used. With special 3D outcoupling measures, even 124 lm/W have been achieved.” Both values were determined in an integrating sphere with blocked substrate edges, only taking the light into account that is emitted to the forward hemisphere, CIE color coordinates are (0.41/0.49). An in depth article is published in today’s highly esteemed research journal ‘nature’.

“The potential of the devices is obvious when one considers that even at the very high brightness of 5,000 cd/m<sup>2</sup> a power efficiency of 74 lm/W is obtained,” comments Prof. Karl Leo, Director of IAPP. “Thus high-intensity illuminations at very high efficiencies are possible as well”.

“These results are at R&D level and further developments need to be made, e.g. for reaching commercially acceptable lifetime”, says Gildas Sorin, CEO of Novaled AG. “However, the values clearly indicate a major breakthrough and qualify OLEDs for mainstream lighting applications. The Novaled PIN OLED<sup>®</sup> technology is crucial, especially for combining high efficiencies with high-brightness data. White OLEDs soon will help to reduce our carbon footprint and the Novaled doping technology will play a key role in this development”, adds Sorin.



#### **about OLEDs**

OLEDs (organic light-emitting diode) are semiconductors made of thin organic material layers of only a few nanometers thickness. They emit light in a diffuse way to form an area light source. In a fast growing display market OLEDs are key part of a revolution: the dream of paper-thin, highly efficient displays with brilliant colors and great flexibility in design. OLEDs represent the future of a vast array of completely new lighting applications. By combining color with shape, organic LEDs will create a new way of decorating and personalizing personal surroundings with light. At the same time OLEDs offer the potential to become even more efficient than energy-saving bulbs.

#### **about IAPP**

The Institute of Applied Photophysics of the Dresden University of Technology is a leading research institute working on basic and applied research on organic semiconductors. In the past years, the institute has realized a number of innovations in organic devices. Furthermore, the institute has spun out a number of companies, including Novaled AG, Heliatek GmbH, Creaphys GmbH, and sim4tec GmbH.

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#### **about Novaled**

Novaled AG is a world leading company in the OLED field specialized in high efficiency long lifetime OLED structures and an expert in synthetic and analytical chemistry. The company offers complete solutions to the organic electronic markets, commercializing its Novaled PIN OLED® technology along with its proprietary OLED materials. Novaled has developed long term partnerships with major OLED players worldwide. Based on more than 400 patents granted or pending, Novaled has a strong IP position in OLED technology, and was named No. 1 on a list of coming world market leaders by the German newspapers Handelsblatt and Wirtschaftswoche. Main investors are eCAPITAL, Crédit Agricole Private Equity, TechnoStart, TechFund and CDC Innovation. For details please visit [www.novaled.com](http://www.novaled.com) or the currently released Asian pages [www.novaled.com/jp](http://www.novaled.com/jp) and [www.novaled.com/kr](http://www.novaled.com/kr).

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