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## Flexible OLEDs with adjustable colors – new design options for lighting designers

**The Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP, one of the leading R&D partners for surface technologies and organic electronics, specializes in the development and fabrication of OLED modules with unconventional properties for specific client designs. The Institute will debut flexible adjustable-color organic light-emitting diodes (OLEDs) at ISAL 2017 in Darmstadt, Germany from September 25-27, 2017 at its booth (No. 31).**

With their unique characteristics like bendability, segmentation, transparency, and their nearly unlimited range of shapes, organic light-emitting diodes (OLEDs) facilitate diverse new design opportunities by virtue of their being efficient areal lighting sources fabricated on flexible substrates.

In 2015, scientists of the Fraunhofer FEP were successful for the first time in processing adjustable-color OLEDs on rigid substrates. This facilitated the extension of the application spectrum of OLEDs, such as for integration into vehicle interiors where the lighting levels should be controllable as a function of the time of day. Imagine employment as ambient or accent illumination, such as for lighting in museums and exhibitions, where the adjustability of color from just a single lighting component can present the works exhibited in different colors of light.

Just two years later, the next big development goal has now been reached: the Fraunhofer FEP now offers OLED emission systems featuring an adjustable color range integrated on flexible substrates. These types of OLED modules are able to switch the emitted color between two different color temperatures. In this way, a yellow-blue bi-color emission system can not only be switched between the pure emission colors of yellow and blue, but white light can also be generated through simultaneous activation of both colors.

The integration of adjustable-color OLEDs on flexible substrates brings their employment on curved surfaces in vehicle interiors such as roofs and curved fixtures into the realm of the tangible. In the meanwhile, the range of choice for substrates has also been broadened. Flexible OLEDs can be fabricated on metal and plastic films just as they can be on ultra-thin glass. The scientists will debut the new flexible variable-color OLED modules at the International Symposium on Automotive Lighting (ISAL). The symposium takes place directly after the International Motor Show Germany (IAA Pkw 2017) and addresses lighting applications in automobiles. The wide range of possibilities for OLED technology



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on flexible substrates for applications upon and in automobiles will be on display at the Fraunhofer FEP booth (No. 31) at ISAL.

Claudia Keibler, head of the Sheet-to-Sheet Organic Technology department at Fraunhofer FEP welcomes you: "I am looking forward to being able to personally discuss with conference visitors the astonishing opportunities of flexible OLEDs right on site. Our technological know-how and the features of our fab facility allow us not only to discuss the wishes of interested visitors, but also produce OLED samples afterwards."

#### **Fraunhofer FEP at ISAL:**

##### Presentation:

September 26, 2017 at 1:40 pm

„Enhanced Light Out-Coupling for Flexible OLEDs in Automotive Rear Lights“,  
Claudia Keibler, Fraunhofer FEP

In addition, we would like to direct your attention to the contribution of our project partner AUDI AG entitled "Investigation of the Optimum Brightness of Dynamic Tail Lights" to be held by Philipp Rabenau the same day at 1:30 pm.

Exhibition: Booth No. 31

#### **"Hands-on" Flexible OLED Lighting Workshop @ ISAL:**

The "Hands-on" Flexible OLED Lighting Workshop is intended for designers and product developers from not only the automotive industry but also many other different application areas including architecture, aerospace, fashion and consumer electronics. The workshop will offer a deep level of understanding of the possibilities and technical challenges of integrating OLEDs into existing and future products, and explain how the PI-SCALE pilot line can help with this. Discussions with OLED experts from industry and R&D will offer the attendees the opportunity to work through design concepts and have their questions about the technology answered.

Three sessions of workshop will be available over the two days at the ISAL conference, and space for this workshop is limited to 40 places per session so please register your interest via the instructions as soon as possible:

<http://pi-scale.eu/hands-on-flexible-oled-lighting-workshop-at-isal-2017-conference/>

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**PI-SCALE FLEXIBLE OLED DESIGN Competition 2017**

Fraunhofer FEP is a key partner of the public funded project PI-SCALE (FKZ 688093) with the aim to install a European Open-Access-pilotline for the production of OLED. Within the project now the PI-SCALE FLEXIBLE OLED DESIGN COMPETITION 2017 is launched. The Competition invites designer proposals for organic light-emitting diode (OLED) lighting and signage applications. Submission is possible until September 17, 2017. The competition is open to individuals, groups and organizations from every country in the world. There is no limit on the number of entries per person. Participation is free. Further interaction with Grant Winner occurs after award of prize, as there is opportunity to fabricate the OLED design prototype with the help of technical experts.

More information: <http://pi-scale.eu/923-2/>.



**Adjustable-color OLED on flexible substrates**

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The **Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP** works on innovative solutions in the fields of vacuum coating, surface treatment as well as organic semiconductors. The core competences electron beam technology, sputtering and plasma-activated deposition, high-rate PECVD as well as technologies for the organic electronics and IC/system design provide a basis for these activities. Thus, Fraunhofer FEP offers a wide range of possibilities for research, development and pilot production, especially for the processing, sterilization, structuring and refining of surfaces as well as OLED microdisplays, organic and inorganic sensors, optical filters and flexible OLED lighting. Our aim is to seize the innovation potential of the electron beam, plasma technology and organic electronics for new production processes and devices and to make it available for our customers.