

## News Release

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November 26, 2015

## Gray Modules: New Dimension in Organic Photovoltaics for Buildings

- **The new isicon formulation of Merck KGaA, Darmstadt, Germany, enables greater power generation of more than 50 W/m<sup>2</sup> in semi-transparent Belectric OPV modules**
- **Availability of gray modules is creating broad possibilities for architects and designers**

Darmstadt and Nuremberg, Germany, November 26, 2015 – Merck KGaA, Darmstadt, Germany, a leading science and technology company, announced that semi-transparent gray-colored organic photovoltaic (OPV) modules are now available on the market. The new materials, which were successfully developed together with Belectric OPV, were recently presented to the public at the Adaptive Architectures and Smart Materials Conference in Chicago. The showpiece, using gray freeform modules, comprises several laminated glass panes mounted with steel ropes to create a lightweight, curtain-wall-type façade. This offers unlimited design options for modern architectural accents while maintaining transparency and shape.

The modules include the new isicon formulation of Merck KGaA, Darmstadt, Germany, which achieves superior performance by enabling greater than 50 W/m<sup>2</sup> power generation in the Belectric OPV modules while remaining semi-transparent. They were optimized and produced in a large-scale production set-up and are ready for commercialization. Merck KGaA, Darmstadt, Germany, and Belectric OPV have previously presented the lively blue-colored OPV, which was already used in the installations at the EXPO 2015 at the German Pavilion in Milan, Italy and in the headquarters building of the African Union Security and Peace Council in Addis Ababa, Ethiopia.



## News Release

There are many important advantages of OPV technology, especially with respect to building-integrated photovoltaics (BIPV). OPV modules do not show the performance drop usually observed with traditional inorganic photovoltaics in diffuse lighting conditions and under elevated temperatures – typical conditions found in façades. In addition, semi-transparency and tunable colors as well as freedom of design in shape and form are attractive and often even essential features for BIPV applications.

Brian Daniels, Head of the Advanced Technologies business unit at Merck KGaA, Darmstadt, Germany, says, “From many architects we have learned that a gray color will significantly increase the usage of OPV in building integration. Following the installations at the Expo in Milan, we set an aggressive target to develop such a solution. Achieving the intended color with our partner Belectric OPV in such a short time while also achieving superior performance clearly demonstrates the momentum we are gaining within the OPV industry.” Ralph Pätzold, CEO of Belectric OPV added, “The new gray is a key for the wider adoption of OPV. We are very proud that – in the joint effort with Merck KGaA, Darmstadt, Germany – we could bring the new material to a manufacturing quality in very short time. Now all our partners in the construction material segments can benefit instantly from the new color tone.”

Buildings account for 40% of energy consumption and 36% of CO<sub>2</sub> emissions in the EU. As a consequence, the EU has set a target for all new buildings to be nearly zero-energy (NZEB) as of 2021. The achievement of the legally binding NZEB objectives will require active building envelopes since passive materials are reaching their own limits. Gray OPV-based active building elements are an important step forward to combine energy generation and the aesthetic needs of architects.

### **About BELECTRIC OPV:**

BELECTRIC OPV GmbH, with offices in Nuremberg and Kitzingen, is the market leader in the area of organic photovoltaics. BELECTRIC OPV produces bespoke organic solar cells and systems, tailored to customers' specific requirements. Furthermore, BELECTRIC OPV is active in the area of research and development, in order to continuously provide their customers with creative and innovative solutions. Additionally, BELECTRIC OPV employs a unique manufacturing process, based on a combination of printing, lamination and laser structuring processes. These give a distinct advantage due to their high scalability and, moreover, allow the implementation of custom designs. BELECTRIC OPV supports its customers with the integration of OPV in existing as well as new products and delivers the accompanying system solutions. BELECTRIC OPV currently has two product lines: SOLARTE for architects and designers and POWER PLASTIC for large scale industrial applications. Products from BELECTRIC OPV stand for innovation, quality, and design.

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## News Release

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### **About Merck KGaA, Darmstadt, Germany**

Merck KGaA, Darmstadt, Germany, is a leading science and technology company in healthcare, life science and performance materials. Around 40,000 employees work to further develop technologies that improve and enhance life – from biopharmaceutical therapies to treat cancer or multiple sclerosis, cutting-edge systems for scientific research and production, to liquid crystals for smartphones and LCD televisions. In 2014, Merck KGaA, Darmstadt, Germany, generated sales of € 11.3 billion in 66 countries. Founded in 1668, Merck KGaA, Darmstadt, Germany, is the world's oldest pharmaceutical and chemical company. The founding family remains the majority owner of the publicly listed corporate group. Merck KGaA, Darmstadt, Germany, holds the global rights to the Merck KGaA, Darmstadt, Germany, name and brand. The only exceptions are the United States and Canada, where the company operates as EMD Serono, EMD Millipore and EMD Performance Materials.