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Press Release

LOPEC 2020 in Munich

Printed electronics in 3D: Ready for the mass market

- 3D structural electronics as the key to smart products
- Digital printing technologies enable individualized mass production
- LOPEC focusing on functional materials and equipment

Printed electronics in 3D, also known as 3D structural electronics, equip all kinds of objects with additional electronic functions. LOPEC, the International Exhibition and Conference for the Printed Electronics Industry taking place in Munich, Germany, from March 24 to 26, 2020, will provide information about production processes, applications and the potential of the technology.

It is integrated in sneakers and T-shirts, in vehicles, household appliances and many other everyday objects: Printed electronics is revolutionizing many industries because it is so lightweight, thin, flexible and robust that it can be discreetly integrated into virtually any object of any shape. "Printed electronics makes it possible to meet the growing demand for smart products with sophisticated additional electronic features—with a great deal of design freedom," emphasizes Dr. Klaus Hecker, Managing Director of the industry association and LOPEC co-organizer OE-A (Organic and Printed Electronics Association).

For some years now, Hecker has also observed an increasing interest by various user industries in customizable manufacturing processes: "The goal is to produce customized smart products at competitive costs." This year's LOPEC picks up on this trend as printed electronics plays a key role in this area. "If the digital manufacturing technologies inkjet printing and laser processing are cleverly integrated into mass production environments, products can be individualized in-line," explains Professor Reinhard Baumann of the Fraunhofer

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Institute for Electronic Nano Systems ENAS: “As a result, unique items can be manufactured using mass production methods.” In his plenary lecture at the LOPEC Conference (March 26, 10:15 a.m.), Baumann will illustrate this approach as well as the Fraunhofer project “Go Beyond 4.0”, which he coordinates. Researchers from six Fraunhofer Institutes are involved in this project, developing, for example, printed heating structures embedded in glass or carbon fiber reinforced plastics for aircraft construction as well as a smart car door with conductor paths, sensors, switches and light-emitting diodes, some of which are printed directly onto the car’s body parts. With this project, Fraunhofer will be taking part in the OE-A Competition and will also show first prototypes at the association's booth.

Fraunhofer ENAS has been exhibiting at LOPEC since 2010 and describes it as the leading trade fair and most important conference for printed electronics and its applications. At this year's LOPEC, the Fraunhofer-Gesellschaft will be represented by a total of 13 institutions. Its wide range of new developments includes printed solar cells as well as a roll-to-roll pilot line for the production of flexible hybrid electronics and new functional materials.

Focus on materials and processes

Printing inks and pastes with electronic properties and flexible carrier materials that build a stable bond are the foundation of 3D structural electronics. Dr. Hongye Sun of the Karlsruhe Institute of Technology will be presenting extremely stretchable silver-based inks at the LOPEC Conference. The concept is based on the so-called capillary suspension: A substance that does not mix with the main component of the printing ink builds bridges between the silver particles. In her presentation “3D printable and stretchable inks and their applications” which will be part of the session “Materials III—Metal Inks” (March 25, 4:00 p.m. to 4:20 p.m.), Sun will illustrate the strategy.

About 35 material manufacturers—including Heraeus and Elantas from Germany, ACI Materials from the USA, GenesInk from France, DuPont from Great Britain and Panasonic from Japan—will present their new products in Munich. Another focus of LOPEC is on manufacturing processes. An alternative

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to direct printing of 3D parts is the thermoforming of 2D components printed on plastic. LOPEC exhibitor Adenso has developed a roll-to-roll printing technology with integrated forming process for the mass production of 3D electronics. In the Conference session “Upscaling and manufacturing processes” (March 26, 2:00 p.m. to 2:20 p.m.), Adenso Managing Director Uwe Beier will take a closer look at the forming of printed electronics. Exhibitor watttron, in turn, will show a special heating system for thermoforming: It is based on many small heating pixels arranged in a matrix the temperature of which can be individually programmed and controlled. Markus Stein, CEO of the company, will discuss this during the session “3D Structural Electronics” (March 25, 2:20 p.m. to 2:40 p.m.).

In addition to thermoforming, injection molding is particularly suitable for the production of 3D structural electronics. In the LOPEC Short Course “IMSE technology for smart molded structures” (March 24, 9:30 a.m. to 11:50 a.m.), Dr. Pálvi Apilo and Dr. Outi Rusanen from the Finnish company TactoTek will speak about the potential of the injection molding technology IMSE (Injection Molded Structural Electronics). This technology enables the integration of printed circuits and other electronic components in 3D parts. The LOPEC Short Courses serve to introduce special fields of printed electronics and are traditionally held on the first day of the Conference. This year, they will focus on topics including printed biosensors, Perovskite solar cells and textile electronics.

“The materials and techniques best suited for the production of 3D structural electronics are dependent on the respective application,” emphasizes Hecker. “As LOPEC covers the entire value chain of printed electronics and various user industries, we offer interested visitors from all industries comprehensive support for their decision-making.” Moreover, LOPEC likes to be considered as a bridge between science and application. Being a combination of international exhibition and conference, LOPEC makes it easy for all players to get in touch with each other and to further advance printed electronics.

Further information about 3D structural electronics is available from our free [White Paper](#).

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Service

Further information and background data can be found at www.lopec.com. Image material is available from the [media database](#). All contributions from LOPEC TV can be found on our [webpage](#) as well as in the [media library](#).

LOPEC

LOPEC (Large-area, Organic & Printed Electronics Convention) is the leading international event for printed electronics. The combination of an exhibition and a conference is the perfect way to depict the complex and dynamic nature of this young industry. More than 2,700 participants from 44 countries attended the event in 2019. There were 163 exhibitors from 19 countries, and more than 200 conference presentations from 25 countries. LOPEC is organized jointly by the OE-A (Organic and Printed Electronics Association) and Messe München GmbH. The next event takes place from March 24 to 26, 2020 at the ICM – Internationales Congress Center München in Munich, Germany. www.lopec.com

Messe München

Messe München is one of the leading exhibition organizers worldwide with more than 50 of its own trade shows for capital goods, consumer goods and new technologies. Every year, a total of over 50,000 exhibitors and around three million visitors take part in more than 200 events at the exhibition center in Munich, at the ICM – Internationales Congress Center München and the MOC Veranstaltungszentrum München as well as abroad. Together with its subsidiary companies, Messe München organizes trade shows in China, India, Brazil, Russia, Turkey, South Africa, Nigeria, Vietnam and Iran. With a network of associated companies in Europe, Asia, Africa and South America as well as around 70 representations abroad for over 100 countries, Messe München has a global presence.

OE-A

The OE-A (Organic and Printed Electronics Association) was founded in December 2004 and is the leading international industry association for organic and printed electronics. The OE-A represents the entire value chain of this industry. The members are world-class global companies and institutions, ranging from R&D institutes, mechanical engineering companies and material suppliers to producers and end-users. Well over 200 companies from Europe, Asia, North America, South America, Africa and Oceania are working together to promote the establishment of a competitive production infrastructure for organic and printed electronics. The OE-A is building a bridge between science, technology and application. The OE-A is a working group within VDMA. www.oe-a.org.