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Munich, January 23, 2018

## Press Release

### LOPEC 2018 in Munich, Germany

## Printed electronics: New sensors for the medical field

From March 13 to 15, 2018, LOPEC, the international exhibition and conference for the printed electronics industry, will provide information on state-of-the-art technologies, trends and new markets for printed electronics. In addition to sectors such as the packaging industry, the consumer electronics industry and the mobility sector, the healthcare market is becoming increasingly important. In an interview, Teemu Alajoki, senior scientist at the Technical Research Centre of Finland VTT and speaker at the LOPEC conference, illustrates the potential of printed sensors in the medical field.

*Mr. Alajoki, you develop sensors for medical applications. What do these sensors measure?*

Sensors can be used to monitor a wide variety of physiological parameters. Applications range from monitoring body temperature and respiratory rate to use in electrocardiography (ECG), electroencephalography (EEG) or pulse oximetry, a method for measuring the oxygen saturation in arterial blood.

*How do you manufacture the sensors?*

We print with silver inks and other mostly inorganic inks on flexible and stretchable plastic films. We have developed multiple methods and use, for example, reel-to-reel printing processes. Printed sensors can for example be integrated into skin adhesives as well as bandages or band-aids.

We have not yet integrated them into textiles, but that could be the next step in some application areas.

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*Why do you use printed electronics?*

The biggest advantage of the printed sensors is that they are not as bulky and voluminous as conventional sensors. They ensure much higher comfort for patients as they wear the sensors close to their bodies. The flexibility and conformability of printed electronics is a key factor for wearing comfort but also for the functionality of sensors worn close to the body. In pulse oximetry, for example, which is, among other things, used for monitoring during anesthesia, an optical sensor is placed around the patient's fingertip. The low production costs of printed electronics also play a decisive role, because the trend is for medical sensors to be used just once and only for one patient. Printing processes reduce costs significantly. However, there is still a need for further development in this area, especially with regard to the automation of the mass production of printed electronics components.

*Sensors and other components for medical applications need to be particularly reliable. Does printed electronics meet this requirement?*

Yes, absolutely. Actually, for instance in pulse oximetry, disposable sensors utilizing printed electronics are already commercially available. This shows that the reliability of the printed electronics can indeed be at an adequate level for medical sensors. The main challenge is to ensure a high level of wearing comfort and at the same time reliable stability – despite the mechanical stress in certain applications or in case of patient movements. Here, we have made significant progress. Long-term reliability, in turn, plays a minor role, at least for disposable sensors, which are only used for a short period of time.

*What are the advantages of these disposable sensors?*

The main reason for using disposable sensors is to prevent the transmission of pathogens and thus obtain better infection control in healthcare facilities. In pulse oximetry, for instance, one reason for the use of disposable sensors is because disinfection is expensive and despite careful cleaning, there is always a residual risk that germs will survive and spread. Multi-resistant bacteria pose an ever-increasing threat to patients in many countries. Disposable sensors can minimize this problem.

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*Apart from sensors for monitoring body functions, what other medical applications will benefit from printed electronics?*

Printed electronics can be used not only for monitoring or diagnostics, but also in therapy. In pain treatment, for example, there is a method called electrostimulation. It is based on electrodes that sit directly on the skin and release pain-relieving electrical impulses. Similar to the sensors we are developing, printed electronics can improve wearing comfort and functionality.

*The Technical Research Centre Finland VTT is one of LOPEC's regular exhibitors. What will you and your colleagues present this year in Munich?*

In my presentation at the LOPEC Conference, I will give an overview of our work in the field of medical sensor technology, from the production of prototypes using mass patterning techniques to the various test procedures with which we characterize and test the sensors under realistic conditions. Over the past two years, the VTT has further enhanced its reel-to-reel printing systems, so that several steps previously carried out manually are now automated. My colleague Tuomas Happonen will talk about this in his poster presentation. The VTT will also demonstrate many other new developments at our booth.

*To what extent does LOPEC drive the development of printed electronics for medical purposes?*

It is most important that key players from industry and science meet regularly to build networks. As an annual event, LOPEC offers the ideal setting for this purpose and the VTT is always represented by five to ten researchers in Munich. I am already looking forward to many exciting conversations with members from the printed electronics industry at LOPEC 2018. Many people think that printed electronics is not yet ready to be used in the medical field – they will be surprised by the advances and the many new developments that are about to be commercialized.

**More information about LOPEC is available at: [www.lopec.com](http://www.lopec.com)**

[Photos & logos](#) in print quality and [film material](#) are available free of charge.

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### **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. 2,585 participants from 50 countries attended the event in 2017. There were 154 exhibitors from 17 countries, and 182 conference presentations from 22 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 13 to 15, 2018 at the ICM – Internationales Congress Center München in Munich, Germany.

[www.lopec.com](http://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](http://www.oe-a.org)