

Press release

Hanau, April 5, 2016

Heraeus innovations accelerate the development of rollable and foldable displays and touchscreens

LOPEC Trade Fair: Heraeus exhibits research projects and new material and system solutions for printed electronics

Read the latest news while relaxing at home, in a café, at the beach, in the mountains or in a self-driving car on a highly flexible, rollable and foldable touchscreen. This may sound like a pipe dream, but could be a reality in the next five years. Then these flexible, three-dimensional or foldable displays will be an essential part of our everyday lives. Electronic materials play a key role for this form of printed electronics. Through innovative material and system solutions, Heraeus is accelerating the development of flexible touchscreens. Current materials are not suitable for this application because they are not mechanically flexible enough. Heraeus offers an ideal solution especially for this interface: Clevios, a conductive polymer that can be used in touch panels. At the LOPEC trade fair for printed electronics being held in Munich on April 5-7, Heraeus presents a groundbreaking improvement in touchscreen production – a flexible, fully functional 7 inch (17.8 cm) touch panel on a polyimide film substrate only 12 micrometers thick that serves as a curved sensor that controls an LCD display.

“Our prototype is a fully functional, flexible touch panel that can be produced on an industrial scale. In comprehensive testing, the multi-touchscreen withstood 10,000 bending cycles at a 5 and a 3 millimeter bending radius without any issues,” states Dr. Armin Sautter, director of Technical Service Displays at Heraeus New Businesses. Heraeus developed the improvement for mass production of Clevios™-coated films in a collaborative research project with the Industrial Technology Research Institute (ITRI, Taiwan). With this conductive coating, manufacturers can produce touchscreens with improved functionality on an industrial scale – for flexible, curved, three-dimensional touchscreens as well as wearable functional apparel, for example. The 7-inch touch panels can also carry out multi-touch functions with five contact points.

Consumer electronics are driving development

The LOPEC trade fair shows the lightning-fast development in printing processes and materials for the electronics industry and highlights the potential of printed electronics, which are already found in countless everyday items like displays or printed antennas. “The main driver of consumer electronics is ongoing customer demand for improved devices with higher performance,” says Dr. Armin Sautter. “From a customer perspective, foldable and rollable displays are extremely important, because customers want larger and larger screens but, at the same time, they want a compact, transportable device. That’s actually a contradiction,

but one that can be solved in the future with flexible, foldable displays that can be folded and rolled like a newspaper.”

Printed electronics dry 2000 times faster

Heraeus offers a large portfolio of materials and technologies for printed electronics. These include conductive polymers and printing pastes as well as process technologies such as specialty light sources. With printed electronics for displays produced by the meter, in addition to using suitable materials, fast drying surfaces are important, along with good conductivity of the applied silver pastes. An infrared module newly developed by Heraeus achieves this in a fraction of a second (0.32 s.), making it almost 2000 times faster than traditional drying processes with conventional heating plates or hot air. Metallic nanoparticles for printed electronics are frequently applied to flexible, temperature-sensitive polymer materials in an inkjet printing process, then dried and sintered. However, using a roll-to-roll process is necessary for mass production. The optimal process should dry and sinter quickly and efficiently while not damaging the often temperature-sensitive polymer substrates. Heraeus developed a custom infrared module for this purpose that requires 0.32 seconds for drying and sintering. By contrast, this process takes around 10 minutes with a heating plate. Thanks to the custom infrared system the printed electronics on the film roll can be dried and sintered lightning-fast in a single step.

Heraeus, the technology group headquartered in Hanau, Germany, is a leading international family-owned company formed in 1851. With expertise, a focus on innovations, operational excellence and an entrepreneurial leadership, we strive to continuously improve our business performance. We create high-quality solutions for our clients and strengthen their competitiveness in the long term by combining material expertise with technological know-how. Our ideas are focused on themes such as the environment, energy, health, mobility and industrial applications. Our portfolio ranges from components to coordinated material systems which are used in a wide variety of industries, including the steel, electronics, chemical, automotive and telecommunications industries. In the 2014 financial year, Heraeus generated product revenues of €3.4 bn and precious metal revenues of €12.2bn euros. With around 12,600 employees worldwide in more than 100 subsidiaries in 38 countries, Heraeus holds a leading position in its global markets.

For additional information, please contact:

Dr. Jörg Wetterau
Communications & Marketing
Head of Technology Communications & Trade Press
Heraeus Holding GmbH
Heraeusstraße 12-14
63450 Hanau
Phone +49 (0) 6181.35-5706
E-mail: joerg.wetterau@heraeus.com
www.heraeus.com

1_Heraeus_ITRI_Demonstrator

Prototype: Heraeus presents a groundbreaking improvement in touchscreen production – a flexible, fully functional 7 inch (17.8 cm) touch panel on a polyimide film substrate only 12 micrometers thick that serves as a curved sensor that controls an LCD display.

2_Laborproduktion_Printed Electronic

Heraeus developed the improvement for mass production of Clevios™-coated films in a collaborative research project with the Industrial Technology Research Institute (ITRI, Taiwan).

3_Heraeus_Leitfaehiges Polymer Clevios

Through innovative material and system solutions, Heraeus is accelerating the development of flexible touchscreens, e.g. with Clevios, a conductive polymer that can be used in touch panels.

4_Printed Electronic_Infrarotstrahler_1

With printed electronics for displays fast drying surfaces are important, along with good conductivity of the applied silver pastes. An infrared module newly developed by Heraeus achieves this in a fraction of a second (0.32 s.), making it almost 2000 times faster than traditional drying processes with conventional heating plates or hot air.