

PRESS RELEASE

Number 25

International Trade Fair for Plastics and Rubber K2019:

WACKER Presents Ready-to-Use Electroactive Silicone Laminates

Munich, July 16, 2019 – At this year's K 2019 International Trade Fair for Plastics and Rubber, WACKER will showcase a novel silicone laminate with electroactive properties called NEXIPAL® for the very first time. It consists of several ultrathin precision films made of silicone rubber. The films are coated with an electrically conductive material prior to lamination. The result is an actuator that creates movement, as soon as electrical voltage is applied. In addition, NEXIPAL® can also be used as a sensor by measuring deformations electrically. The silicone laminate is wear-free, compact and energy saving and ideal for use in innovative applications. Tablet displays equipped with NEXIPAL® create vibrations and haptic feedback which simulate the shape of keys or control panels that can be operated blindly by touch. Such a feature can be especially useful in automotive applications. K2019 will take place from October 16 to 23 in Duesseldorf, Germany.

The new laminate technology is based on ELASTOSIL® Film. WACKER produces the extremely thin silicone film in thicknesses between 20 and 400 µm. The silicone rubber is a key component whose dielectric properties are an important prerequisite for the

desired electroactive effects of the laminate. For the film to execute and/or measure deformations, however, it must be coated with an electrically conductive layer, and subsequently laminated to form a multilayer stack.

In the future, WACKER will produce such prefabricated laminates itself under the trade name NEXIPAL®. At the K 2019 Trade Fair for Plastics and Rubber, the group will be presenting the first applications of such multilayer films, e.g. a haptic touch screen, which was developed in collaboration with the Intelligent Material Systems Lab at the University of Saarland, Germany. This and other typical applications will give visitors to K2019 insights into the fascinating potential of electroactive polymers.

NEXIPAL® laminates are made of several ultrathin precision films coated with conductive material which acts as a flexible electrode. When voltage is applied, the positive and negative charge carriers of the electrodes attract one another, forcing the silicone film in-between to change its shape. As a result, the film flattens and at the same time elongates horizontally. The elongation of the surface is proportionate to the compression force. When discharged, the resilience of the highly elastic silicone film allows the laminate to return to its original shape. This process can be repeated indefinitely.

One of the most outstanding advantages of electroactive silicone laminates compared to existing solenoid technology is the fact that electric power is only applied during the short period of switching between ON and OFF status, not for holding it. This results in a significantly reduced consumption of energy as well as in sustainable

and cost saving processes. Moreover, silicone laminates do not produce any heat when in use. This avoids investments into expensive thermal management systems.

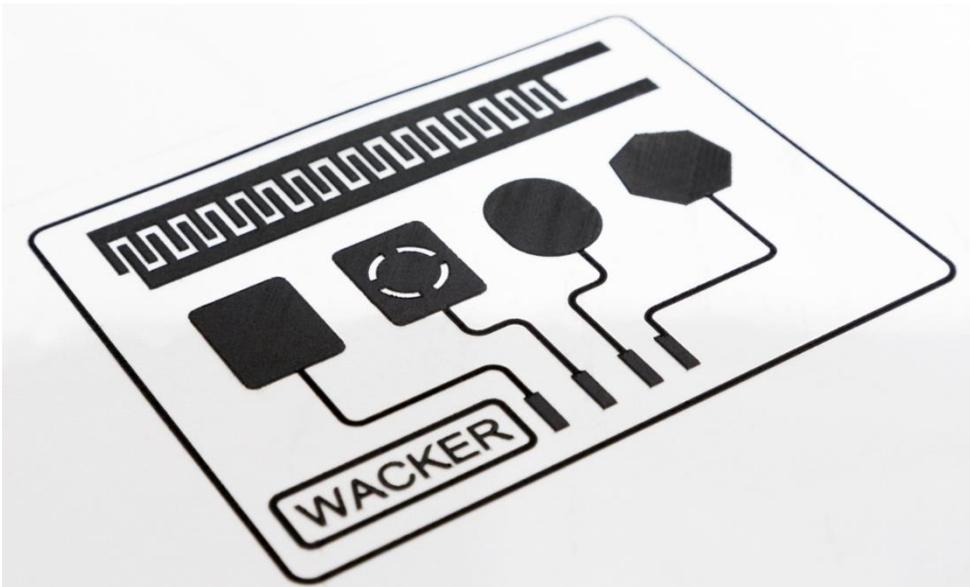
The electroactive component also acts like a sensor, since any movement or deformation alters the charge on the electrodes. This dual function makes NEXIPAL® a genuine all-rounder and suitable for applications in medical technology, sensors and robotics. For example, the material is able to control the orientation of headlamps or mirrors in cars. Moreover, since fluid movements are possible with NEXIPAL®, the laminate can also be used as an artificial muscle.

WACKER is currently setting up a production line for developing and manufacturing silicone laminates. The facility is scheduled to produce the first prefabricated laminates in the second half of 2020. The size and design of the laminates can be modified upon the customer's request.

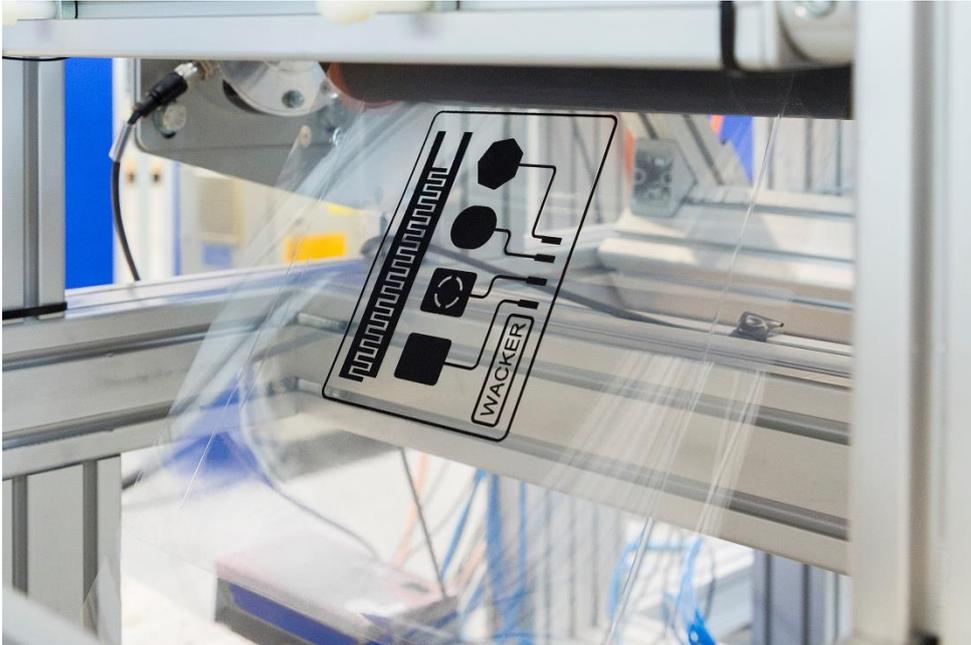
“We have closely studied the needs of the sector and the technical requirements for creating our own production system. Based on our experience so far, we decided to produce high-quality electroactive laminates on an industrial scale in addition to silicone films,” says Christian Gimber, head of the Engineering Silicones business unit within the WACKER SILICONES business division: “In establishing our own production, we are the first chemical company to close a gap in the supply chain for this innovative technology. As a leading silicone manufacturer, we will soon be capable of meeting the growing need for electroactive solutions with our own high-quality silicone laminates.”

Want to know more about NEXIPAL®? Visit us at www.wacker.com/NEXIPAL.

Visit WACKER at K 2019 in Düsseldorf. You'll find us in Hall 6, Booth A10.



A world first at this year's K 2019 Trade Fair for Plastics and Rubber: WACKER will present NEXIPAL® silicone laminates. The product consists of ultrathin precision films coated with electrodes. The multi-layer laminate can be used as an actuator to create movements or as a sensor to measure mechanical deformations. (Photo: WACKER)



WACKER, the Munich based chemical group, will be presenting NEXIPAL[®] for the first time at this year's K 2019 trade fair for plastics and rubber. The product consists of silicone films coated with electrically conductive material laminated in several layers. WACKER intends to manufacture such ready-to-use electroactive laminates in an industrial scale. (Photo: WACKER)

Note:

These photos are available for download at:
<http://www.wacker.com/pressreleases>

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The Company in Brief:

WACKER is a globally-active chemical company
WACKER is a globally-active chemical company with some 14,500 employees and annual sales of around € 4.98 billion (2018).
WACKER has a global network of 24 production sites, 22 technical competence centers and 50 sales offices.

WACKER SILICONES

Silicone fluids, emulsions, rubber grades and resins; silanes; pyrogenic silicas; thermoplastic silicone elastomers

WACKER POLYMERS

Polyvinyl acetates and vinyl acetate copolymers and terpolymers in the form of dispersible polymer powders, dispersions, solid resins and solutions

WACKER BIOSOLUTIONS

Biotech products such as cyclodextrins, cysteine and biologics, as well as fine chemicals and PVAc solid resins

WACKER POLYSILICON

Polysilicon for the semiconductor and photovoltaic industries