

NEXIPAL® | ELECTROACTIVE POLYMERS

NEXIPAL® SILICONE LAMINATES: POWERFUL PERFORMANCE – LAYER ON LAYER

Medical technology, robotics, automotive engineering, artificial muscle: in all of these fields, electroactive silicone laminates open up fascinating opportunities for innovative applications in actuator and sensor technology. WACKER's NEXIPAL® laminates are the first ready-to-use silicone laminates with electroactive properties and will be available on the market from 2021 onwards.

The basis for the new laminate technology is ELASTOSIL® Film, an ultrathin silicone film with dielectric properties, which WACKER produces as roll stock in thicknesses between 20 and 400 µm. WACKER then uses this silicone film to produce electroactive polymers (EAPs), which are distributed under the brand name NEXIPAL®. NEXIPAL® is a multi-layer laminate made of alternating layers of ELASTOSIL® Film coated with special electrodes. The resulting material can be used as an actuator to produce movement or as a sensor to measure mechanical deformation.



NEXIPAL® Act – Strength for Actuators

In actuator applications, laminates made with NEXIPAL® Act convert electrical energy into mechanical work. Each layer of the film is embedded between two flexible electrodes. When voltage is applied, every other electrode is charged positively and every other electrode is charged negatively. The positive and negative charge

carriers of the electrodes attract each other. This causes the silicone film between them to change its shape, becoming not only thinner, but also longer and wider, and causing the surface to expand in proportion to the compressive force. When uncharged, the high elastic recovery of these films ensures that the laminate will return to its original shape – a process that can be repeated indefinitely.



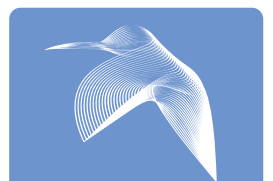
NEXIPAL® Sense – Feeling for Intelligent Sensors

Intelligent sensors showcase the potential of NEXIPAL® Sense laminates. Every mechanical influence changes the electrical capacity of the laminate, making it possible to record expansion and compression movements. Touchscreens equipped with NEXIPAL® can use vibrations and haptic signals, for instance, to simulate keys that can be recognized and operated by touch alone and without eye contact.

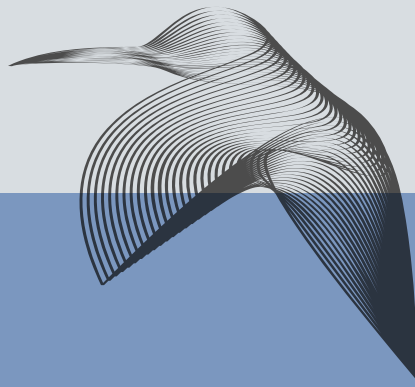


A Jack-of-All-Trades for Innovative Applications

- **NEXIPAL® Act:**
Valves, pumps, relays, switches, artificial muscles, grippers and sound systems
- **NEXIPAL® Sense:**
Touch displays, smart textiles, recording the movements of the body for medical, athletic and lifestyle applications



More information on:
www.wacker.com/nexipal

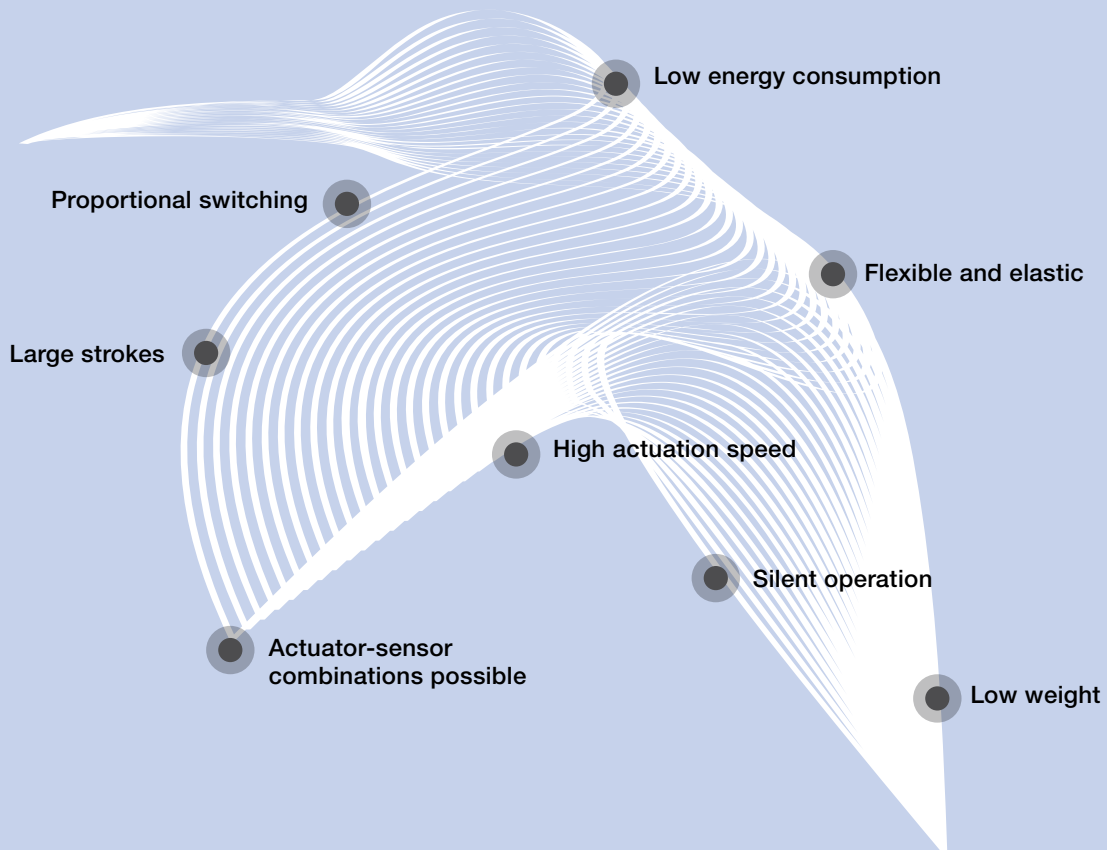


Major Advantages for Many Challenges

Unlike existing solenoid technology, one of the advantages of actuators made from electroactive silicone laminates is that they only consume electrical energy during the switching process. As a result, their operation is more sustainable and significantly more economical over their

entire service life. Silicone laminates also produce less heat than solenoids, for example. In addition, EAPs can be either flat and wide or long and thin, which provides more leeway when designing the components and the space where they will be installed.

The Advantages of NEXIPAL®

**NEXIPAL®**

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