CREATING TOMORROW’S SOLUTIONS

NEW HORIZONS THROUGH INNOVATIVE APPLICATIONS WITH ELASTOSIL® FILM
ULTRATHIN SILICONE FILM
FOR HIGH-PRECISION SOLUTIONS

A New Product Form for Silicone Elastomers
ELASTOSIL® Film from WACKER is an ultrathin, high-precision film of crosslinked silicone rubber that is available in various layer thicknesses from 20 µm to > 400 µm and is manufactured under clean-room conditions entirely without solvents. The unique patent-registered manufacturing process produces immaculate, high-precision silicone film with a defined thickness that is impossible by other production processes. The maximum thickness variation across the film width is ±5%. This precision, combined with the proven properties of silicone rubber opens up potential applications that were hardly conceivable until now, and could certainly not be realized on an industrial scale.

ELASTOSIL® Film is especially impressive for its durability. Its outstanding dielectric properties, Young’s modulus and rebound resilience remain constant over a wide range of temperatures and frequencies, as well as over millions of load cycles. Moreover, ELASTOSIL® Film is chemically inert and suitable for food contact. Like all silicone elastomers, ELASTOSIL® Film is characterized by selective permeability for gases and water vapor.

Diverse Applications
ELASTOSIL® Film is ideal for use as a dielectric precision layer in innovative, future-oriented electronics applications: so-called EAPs (electroactive polymers), especially in:
• Actuator technology (“artificial muscles”)
• Electricity generation (“energy harvesting”)
• Smart sensors

With its typical silicone properties, ELASTOSIL® Film can also be used in food packaging, technical textiles and an extremely wide variety of industrial applications.

For applications in the medical sector and for wound dressing, ask about our biocompatible SILPURAN® Film.

Form of Delivery and Processing
ELASTOSIL® Film
• Produced under cleanroom conditions, currently on a pilot scale, at a width of 250 mm
• Available as sheet or roll stock on a support film, from which it can be easily stripped off for further processing
• Can be processed by conventional die-cutting or laser techniques
• Can be permanently and reliably bonded using silicone adhesive. Different grades are available for different applications. Ask us, and we will recommend one that is optimum for your application.

Properties of ELASTOSIL® Film
- Selective gas-permeable
- High-precision (±5%)
- Heat-resistant and flexible at low temperatures
- Permanently elastic
- Good dielectric properties
- High stretch recovery

ELASTOSIL® Film 2030 Product Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting material</td>
<td>Addition-curing silicone rubber</td>
</tr>
<tr>
<td>Layer thickness</td>
<td>20 µm – 400 µm</td>
</tr>
<tr>
<td>Shore A (DIN ISO 7619-1)</td>
<td>27</td>
</tr>
<tr>
<td>Elongation at break (ISO 527-3)</td>
<td>450%</td>
</tr>
<tr>
<td>Tear strength (ASTM D624 B)</td>
<td>10 N/mm</td>
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<tr>
<td>Glass transition temperature (Tg)</td>
<td>-126 °C</td>
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<tr>
<td>Operating range</td>
<td>-45 °C to 200 °C</td>
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<tr>
<td>Gas permeability (selectivity)</td>
<td>CO₂/N₂ 10:1</td>
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<tr>
<td>Water vapor permeability (JIS 1099 A1)</td>
<td>3,000 g/m²/24 h at 20 µm</td>
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<tr>
<td></td>
<td>1,200 g/m²/24 h at 50 µm</td>
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<tr>
<td></td>
<td>800 g/m²/24 h at 100 µm</td>
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<tr>
<td>Compression set, 22 h, 100 °C (ISO 815-B)</td>
<td>5%</td>
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<tr>
<td>Permittivity ε</td>
<td>2.8</td>
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<tr>
<td>Dielectric strength (VDE 0303)</td>
<td>80 – 100 V/µm</td>
</tr>
<tr>
<td>Volume resistivity (IEC 60090)</td>
<td>10¹⁴ Ω·cm</td>
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<tr>
<td>Suitable for food contact (BfR/FDA)</td>
<td>Yes</td>
</tr>
</tbody>
</table>

1 BfR recommendation: “XV. Silicones” / FDA CFR 21 § 177.2600
   “Rubber articles intended f. repeated use”

These figures are only intended as a guide and should not be used in preparing specifications.
Water-Vapor Permeability
The water-vapor permeability of ELASTOSIL® film depends on the layer thickness.

Gas Permeability and Selectivity
ELASTOSIL® Film is water repellent but selectively permeable to gases. This permeability is significantly higher than that of other polymers.

Elongation at Break
Silicones high elongation at break remains practically constant over a wide temperature range.

Elasticity and Resilience
ELASTOSIL® Film is highly elastic – permanently.

Stretch Recovery
Compared to other materials, silicone, and therefore ELASTOSIL® Film, has excellent elastic recovery.

Thickness Precision
The ELASTOSIL® Film process produces films that are a fraction of the thickness of a human hair with state-of-art film thickness uniformity.

Stress-Strain Curve of ELASTOSIL® Film
20 μm, 3 Samples, 1.0 Hz, 10 Cycles

Heat Resistance of Various Elastomers

Gas Permeability (ELASTOSIL® Film 20 μm) ISO 15105-1

Water-Vapor Permeability of ELASTOSIL® Film

The water-vapor permeability of ELASTOSIL® film depends on the layer thickness.
The data presented in this medium are in accordance with the present state of our knowledge but do not absolve the user from carefully checking all supplies immediately on receipt. We reserve the right to alter product constants within the scope of technical progress or new developments. The recommendations made in this medium should be checked by preliminary trials because of conditions during processing over which we have no control, especially where other companies' raw materials are also being used. The information provided by us does not absolve the user from the obligation of investigating the possibility of infringement of third parties' rights and, if necessary, clarifying the position. Recommendations for use do not constitute a warranty, either express or implied, of the fitness or suitability of the product for a particular purpose.