

## SILFILM - Ultra Thin Silicone Film For High Precision Solutions

### Product Description

SILFILM ultra thin silicone film is a high-precision material that is manufactured from crosslinked silicone rubber. It is available in a variety of thicknesses ranging from 20  $\mu\text{m}$  to > 400  $\mu\text{m}$ . The film is produced under clean room conditions, entirely without solvents. The unique manufacturing process produces immaculate, high-precision silicone film with a consistent defined thickness that is impossible to achieve through other manufacturing processes. The film features a maximum thickness variation across the film width of plus and minus 5%. This manufacturing precision coupled with the high quality performance of silicone opens up applications that were certainly not conceivable until now.

SILFILM ultra thin silicone film is especially popular due to its combination of durability with outstanding dielectric properties and wide operating temperature range. SILFILM is also chemically inert and suitable for use in food contact applications. Like many silicone elastomers, our ultra thin silicone film is characterised by selective permeability for gases and water vapor.

### Key Features

- Selective gas-permeable
- Permanently elastic
- Good dielectric properties
- High stretch recovery
- Heat-resistant and flexible at low temperatures
- High-precision ( $\pm 5\%$ )

### Potential Applications

SILFILM ultra thin silicone film is especially suited for use in as a dielectric medium in applications that employ electroactive polymers (EAPs). Common uses include:

- Actuator technology ("artificial muscle")
- Generator technology (energy harvesting)
- Sensor technology ("smart sensing")

Properties	Values
Starting Material	Addition-curing silicone rubber
Layer Thickness	20 $\mu\text{m}$ – 400 $\mu\text{m}$
Hardness (Shore A) (DIN 53505)	30°
Elongation at Break (ISO 527-3)	450%
Tear Strength (ASTM D624 B)	10 N/mm
Glass Transition Temperature (Tg)	-126°C
Operating Temperature Range	-45 °C to +200°C
Gas Permeability (Selectivity)	CO <sub>2</sub> /N <sub>2</sub> 10:1
Water Vapor Permeability (JIS 1099 A1)	3000 g/m <sup>2</sup> /24h at 20 $\mu\text{m}$
Compression Set (22hrs @100°C) (ISO 815-B)	5%
Permittivity	2.8 $\epsilon$
Dielectric Strength (VDE 0303)	10 <sup>14</sup> $\Omega\cdot\text{cm}$
Volume Resistivity (IEC 60093)	80 - 100 V/ $\mu\text{m}$

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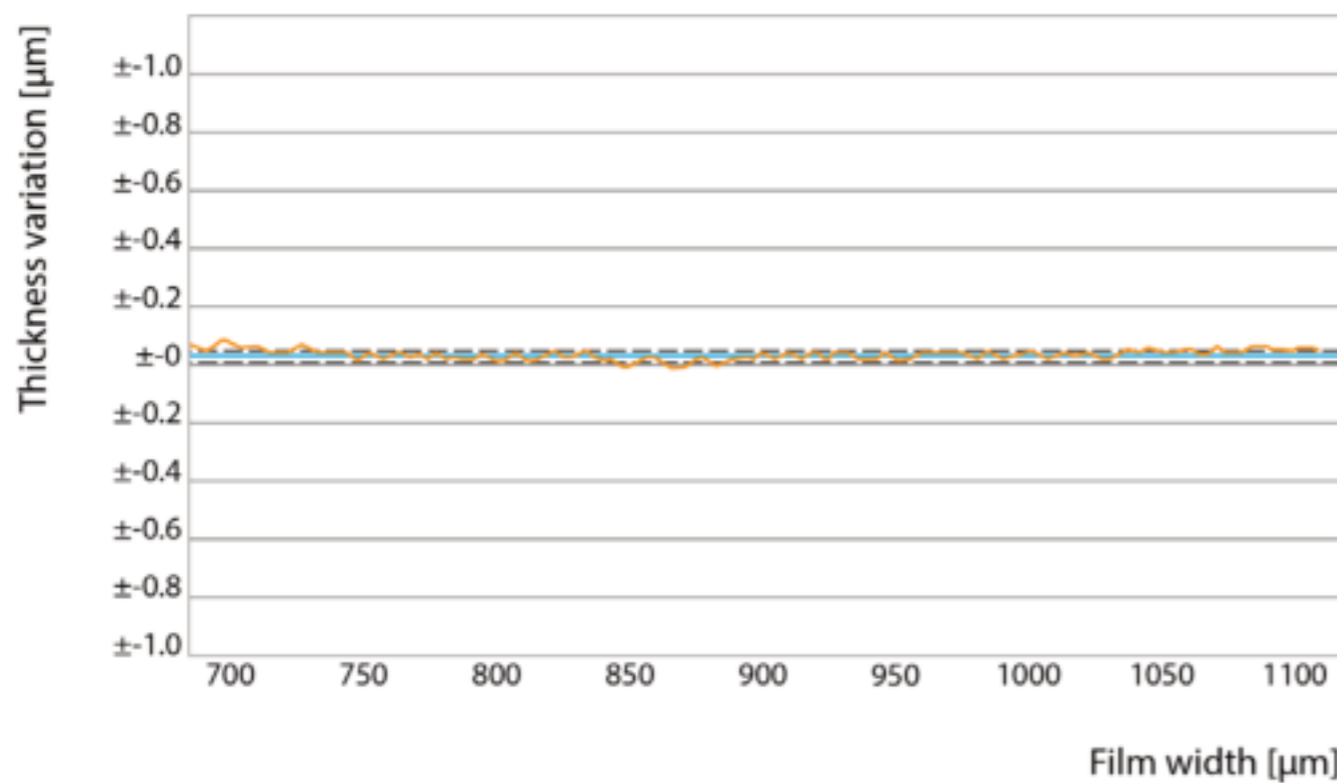


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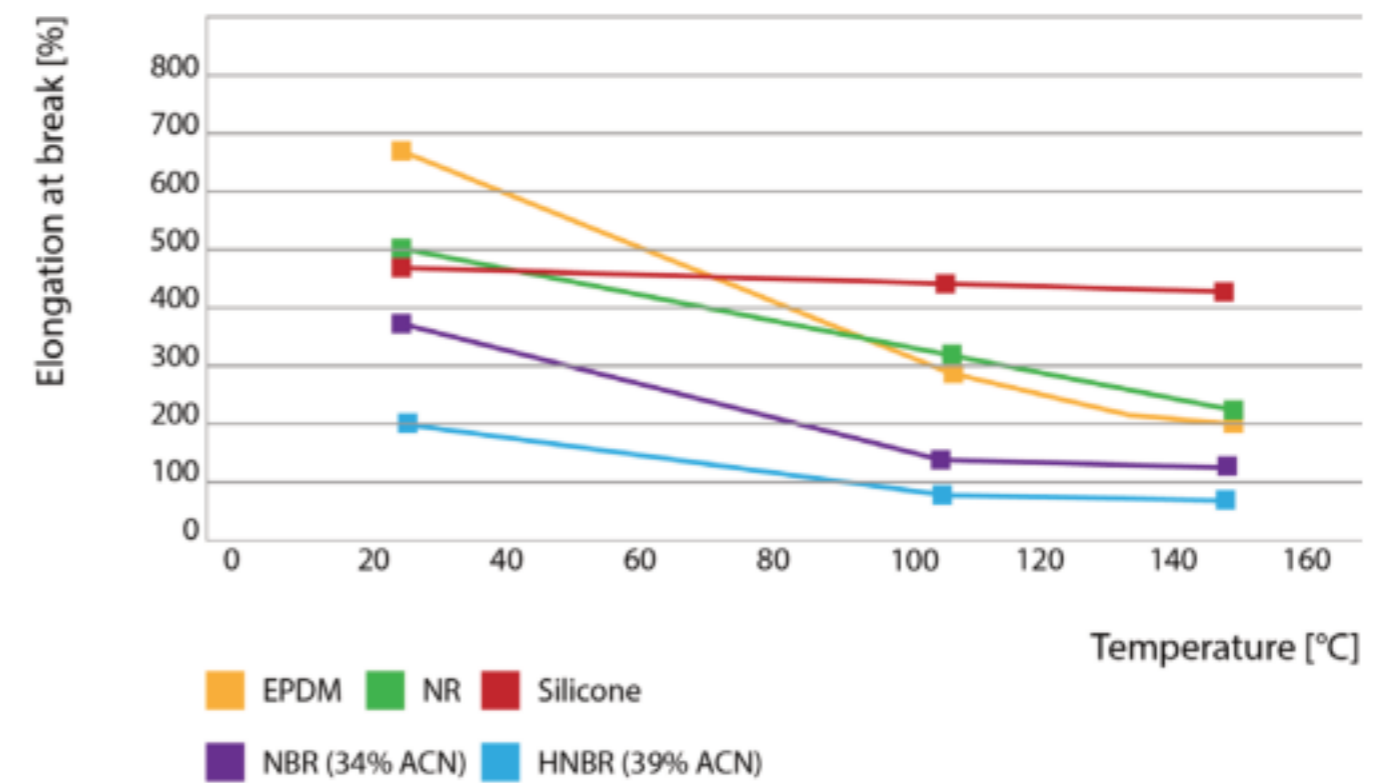
## Thickness Precision

The SILFILM manufacturing process produces films that are a fraction of the thickness of a human hair with unrivaled uniformity.



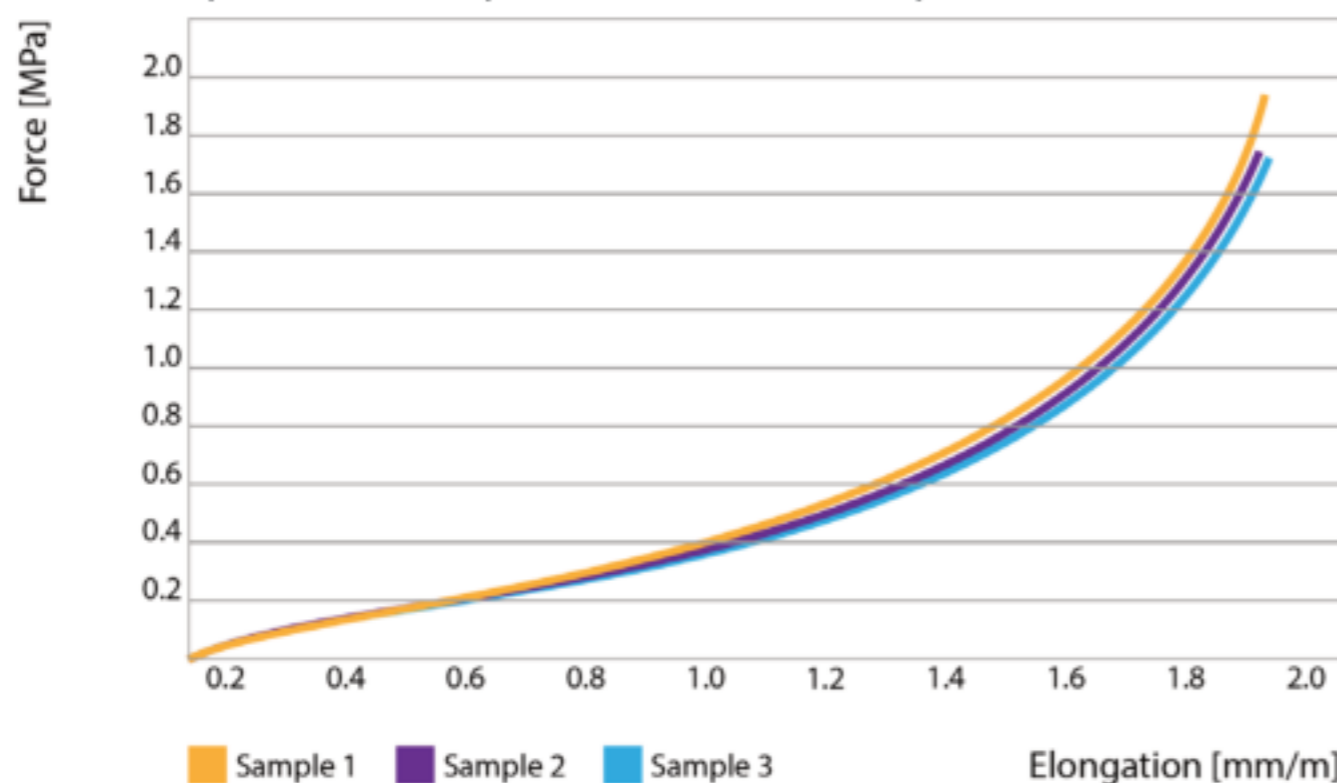
## Elongation at Break

Silicone compounds feature a high elongation at break point, which remains constant over a wide temperature range.



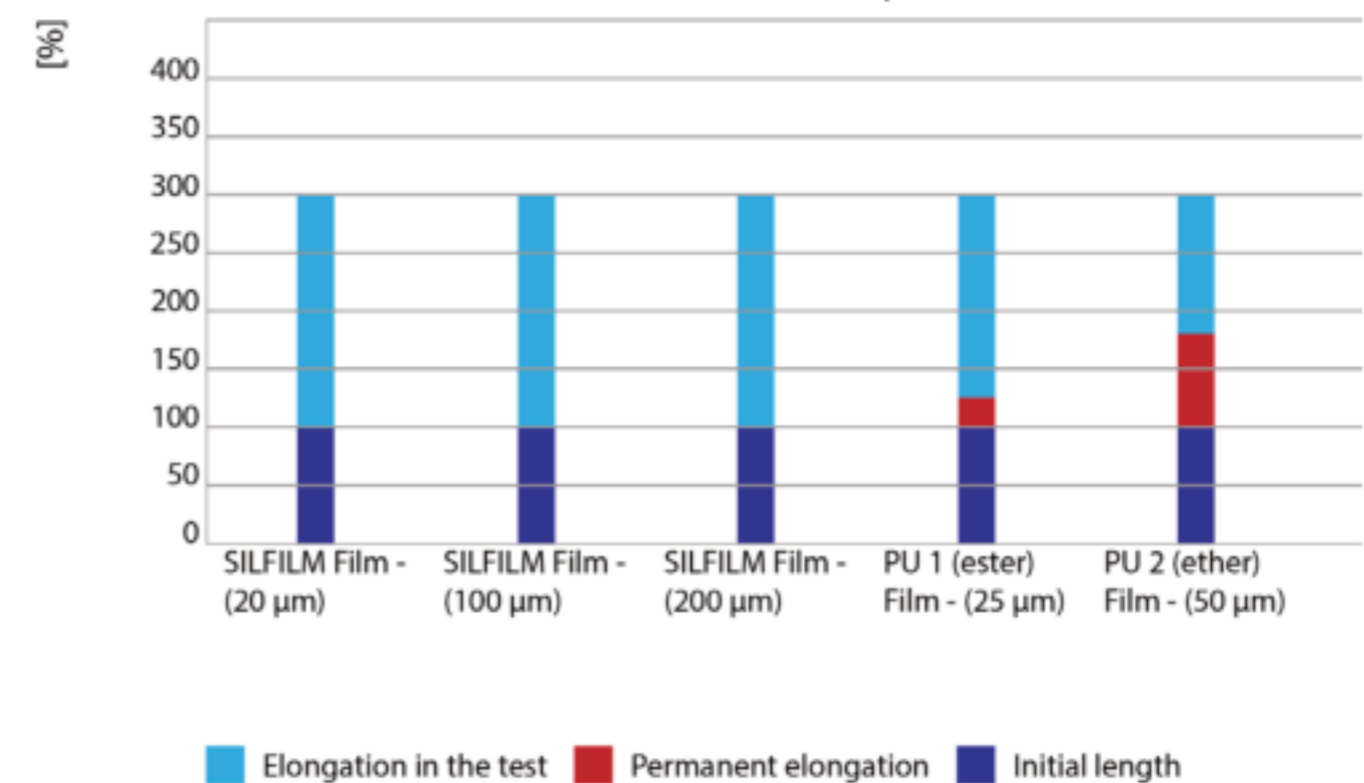
## Elasticity & Resilience

SILFILM permanently holds its elasticity



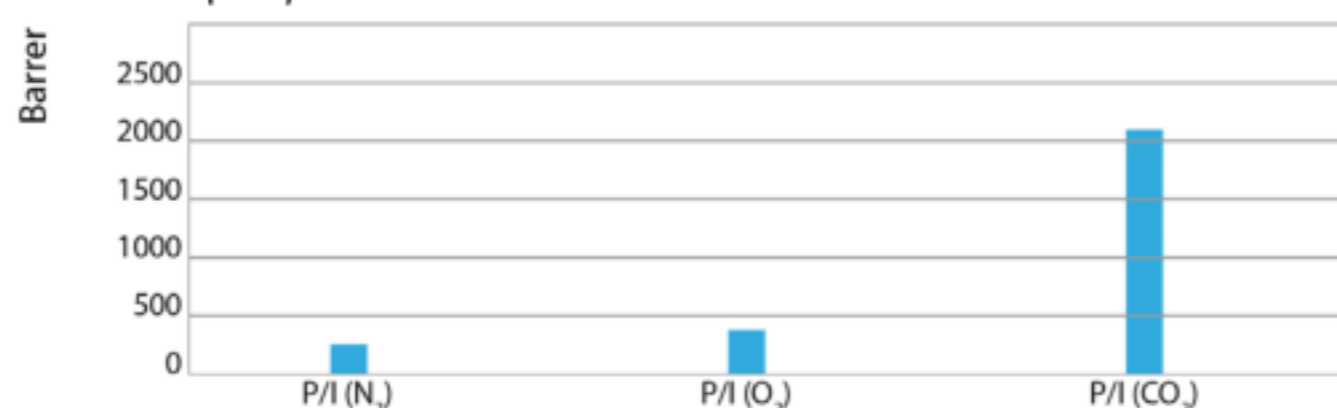
## Stretch Recovery

SILFILM has excellent elastic recovery



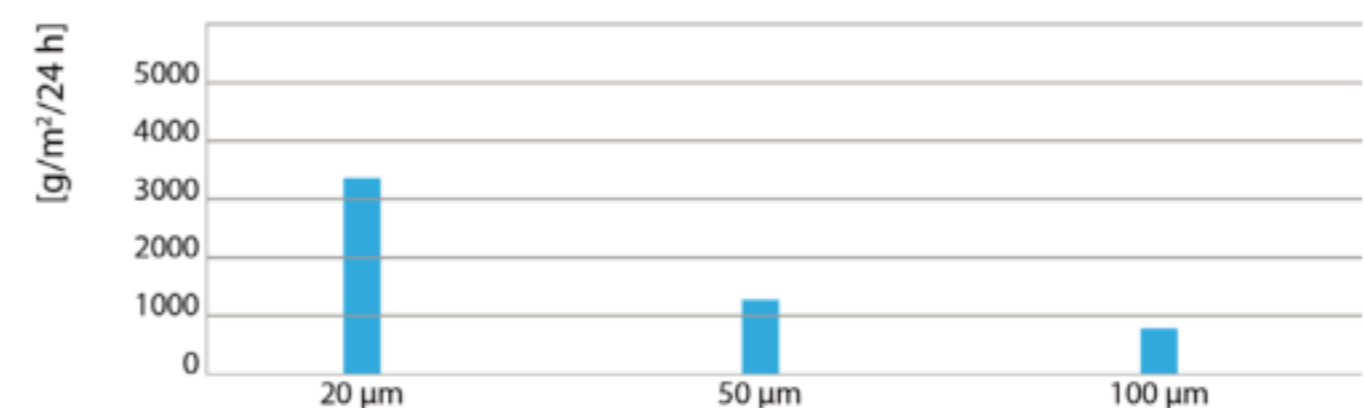
## Gas Permeability & Selectivity

SILFILM is water repellent but selectively permeable to gases. This permeability is significantly higher than that of other polymers.



## Water-Vapor Permeability

The water-vapor permeability of SILFILM depends on the layer thickness.



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