

SIL 30

SIL 30 is a soft, biocompatible, and tear-resistant silicone urethane elastomer that is ideal for skin-contact applications.

Tensile Properties ASTM D412, Die C, 500 mm/min	Metric	US
Tensile Modulus	3 MPa	440 psi
Elongation at Break	350%	350%
Stress at 50% Elongation	0.4 MPa	60 psi
Stress at 100% Elongation	0.7 MPa	100 psi
Stress at 200% Elongation	1.5 MPa	220 psi
Ultimate Tensile Strength	3.5 MPa	500 psi

Other Mechanical Properties	Metric	US
Tear Strength, Die C (die cut), ASTM D624	10 kN/m	57 lbf/in
Compression Set, 23 °C, 72 h, ASTM D395-B	10%	10%
Bayshore Rebound Resilience, ASTM D2632	20%	20%

Thermal Properties	Metric	US
T _g (DMA, tan(d)), ASTM D4065	10 °C	50 °F

Dielectric/Electric Properties		
Dielectric Constant, ASTM D150	7.6	
Dissipation Factor, ASTM D150	0.15	

General Properties		
Hardness, ASTM D2240	35 (Instant), 31 (5 sec), Shore A	
Density, ASTM D792	1.07 g/cm ³	
Density (liquid)	1.05 g/cm ³	

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Parts were processed using an M series printer and a Smart Part Washer with VF 1 as the solvent.

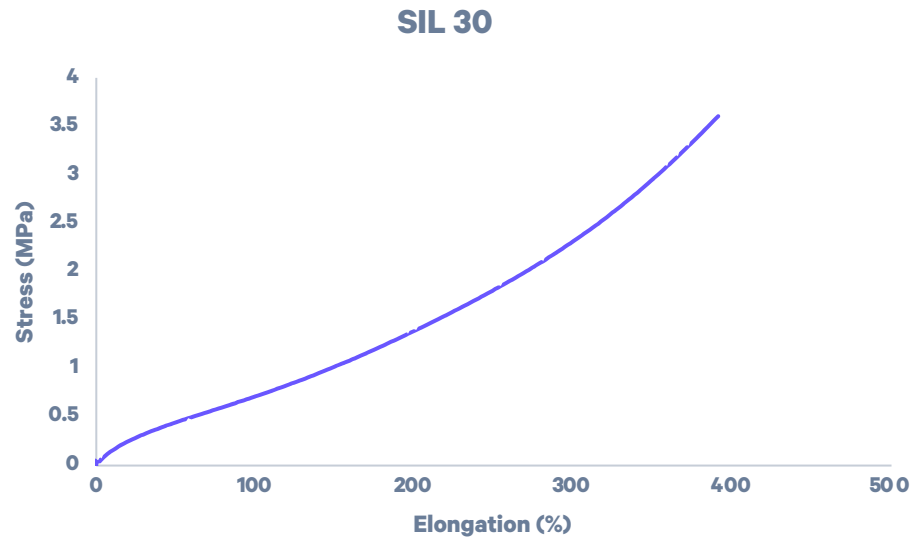
SIL 30

Extended TDS

SIL 30 Mechanical Properties

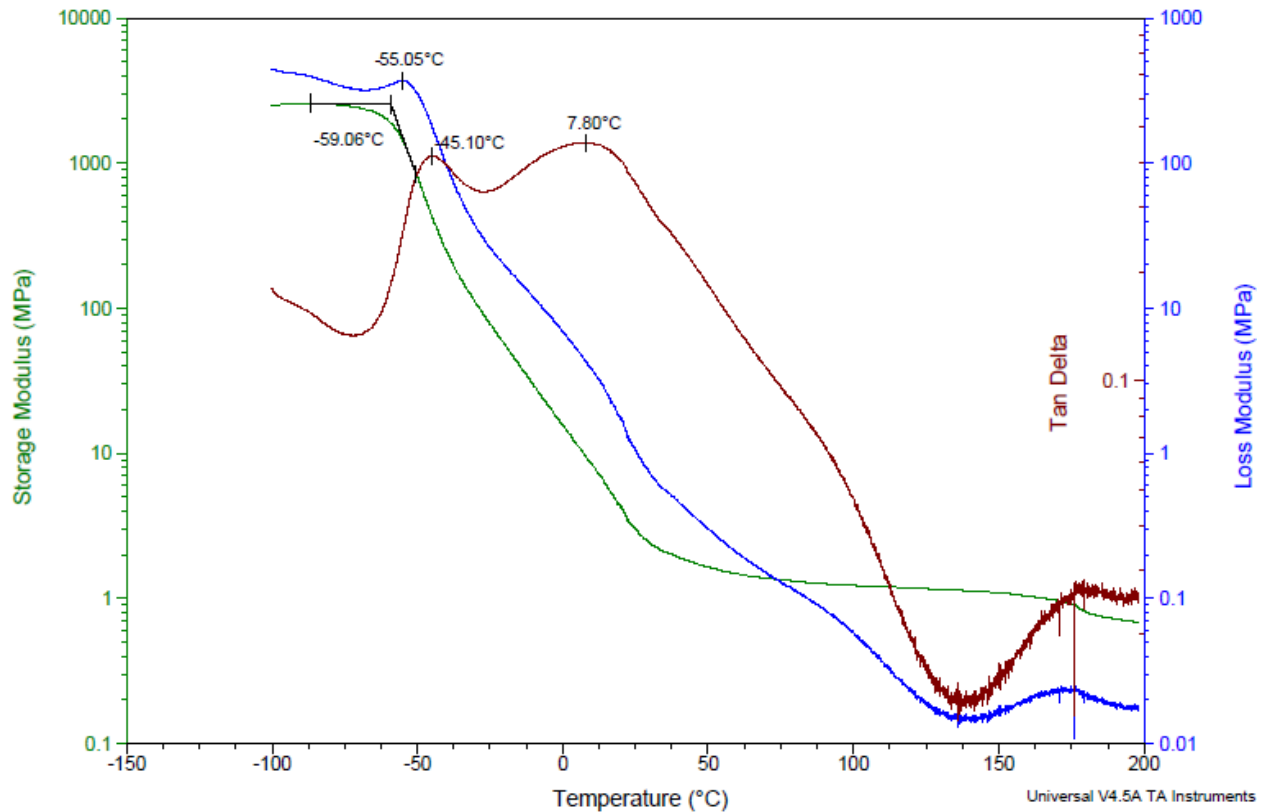
Representative Tensile Curve

ASTM D412, Die C, 500 mm/min



SIL 30 Dynamic Mechanical Analysis (DMA)

Dynamic mechanical analysis provides insight into a material's viscoelastic properties across a range of temperatures. The figure below shows a temperature ramp of SIL 30. The peak in the tan(δ) curve indicates that the glass transition temperature for this material is approximately 10 °C. A rubbery plateau is observed in the storage modulus from 20 – 150 °C reflecting the elastic nature of this material within this temperature window.



Standard: ASTM D4065

Instrument: TA DMA Q800

DMA Mode: Tension

Sample Dimensions: L=20 mm, W=10 mm, t=1 mm (rectangular block)

Strain Amplitude: 0.1% (linear regime of viscoelasticity)

Oscillation frequency: 1 Hz

Temperature Range: -100 °C to 200 °C

Ramp Rate: 1.5 °C/min

Print Conditions: All DMA samples were printed using software v1.9. Samples were hand-wiped and not washed with solvent. The thermal cure for all materials complies with the Carbon user manual.

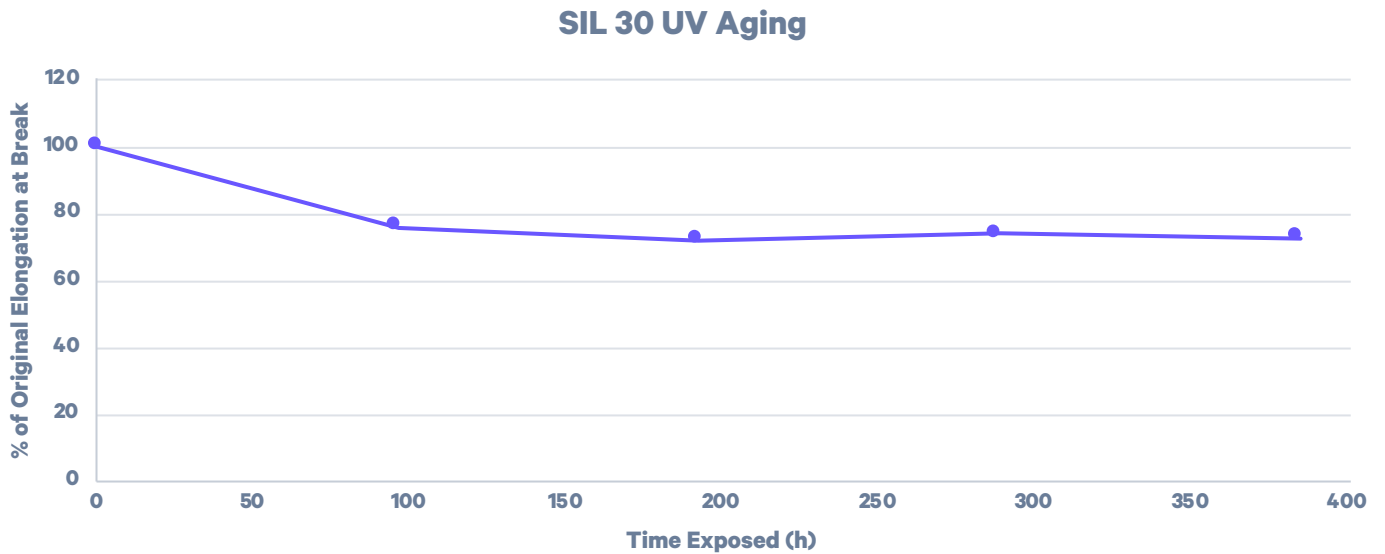
SIL 30 Chemical Compatibility

	Mass Gain* (%)
Household Chemicals	
Bleach (NaClO, 5%)	< 5%
Sanitizer (NH ₄ Cl, 10%)	5 – 15%
Distilled Water	5 – 15%
Sunscreen (Banana Boat, SPF 50)	5 – 15%
Detergent (Tide, Original)	5 – 15%
Windex Powerized Formula	5 – 15%
Hydrogen Peroxide (30%)	15 – 30%
Ethanol (95%)	> 30%
Industrial Fluids	
Engine Oil (Havoline SAE 5W-30)	< 5%
Brake Fluid (Castrol DOT-4)	> 30%
Airplane Deicing Fluid (Type I Ethylene Glycol)	< 5%
Airplane Deicing Fluid (Type I Propylene Glycol)	5 – 15%
Airplane Deicing Fluid (Type IV Ethylene Glycol)	< 5%
Airplane Deicing Fluid (Type IV Propylene Glycol)	5 – 15%
Transmission Fluid (Havoline Synthetic ATF)	< 5%
Engine Coolant (Havoline XLC, 50%/50% premixed)	< 5%
Diesel (Chevron #2)	15 – 30%
Gasoline (Chevron #91)	> 30%
Skydrol 500B-4	> 30%
Strong Acid/Base	
Sulfuric Acid (30%)	> 30%
Sodium Hydroxide (10%)	< 5%

***Percent weight gained after 1 week submersion following ASTM D543. Values do not represent changes in dimension or mechanical properties.**

SIL 30 UV Aging

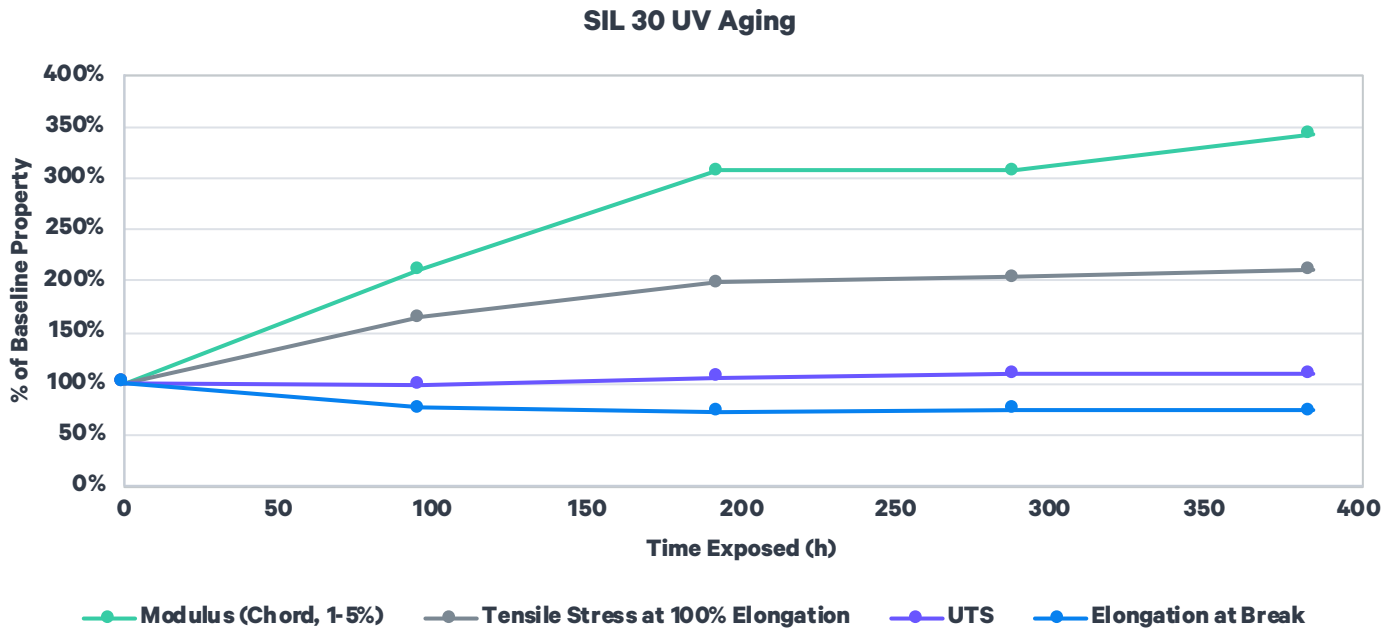
Natural polymer aging can occur in the presence of light, sun, and heat. Carbon evaluated the UV aging performance of SIL 30 using ASTM D4459, which is intended to simulate indoor exposure of solar radiation through glass.



ASTM D4459: Q-Sun XE-1, 0.8 W/m² at 420 nm, 55 °C
ASTM D412: Die C, 500 mm/min, average values represented

SIL 30 UV Aging

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ASTM D412: Die C, 500 mm/min, average values represented

SIL 30 Biocompatibility

Biocompatibility Testing

Printed parts were provided to NAMSA for evaluation in accordance with ISO 10993-5, *Biological evaluation of medical devices - Part 5: Tests for in vitro cytotoxicity*, and ISO 10993-10, *Biological evaluation of medical devices - Part 10: Tests for irritation and skin sensitization (GPMT)*. Parts were processed using an M series printer and a Smart Part Washer with VF 1 as the solvent. The results for all tests indicated that SIL 30 passed the requirements for biocompatibility according to the above tests. **Carbon makes no representation and is not responsible for the results of any biocompatibility tests other than those specified above.**

Disclaimer

Biocompatibility results may vary based on printing and/or post-processing procedures.

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