EPU 40

EPU 40 is a high-performance polyurethane elastomer that is a good choice for applications where high elasticity and tear resistance are needed.

Tensile Properties ASTM D412, Die C, 500 mm/min	**Metric**	**US**
Tensile Modulus	8 MPa	1200 psi
Elongation at Break	300%	300%
Stress at 50% Elongation	2 MPa	290 psi
Stress at 100% Elongation	3 MPa	440 psi
Stress at 200% Elongation	6 MPa	870 psi
Ultimate Tensile Strength	9 MPa	1300 psi

Other Mechanical Properties	**Metric**	**US**
Tear Strength, Die C (die cut), ASTM D624	20 kN/m	110 lbf/in
Compression Set, 23 °C, 72 h, ASTM D395-B	20%	20%
Bayshore Rebound Resilience, ASTM D2632	30%	30%

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

Dielectric/Electric Properties	
Dielectric Constant, ASTM D150	4
Dissipation Factor, ASTM D150	0.03

General Properties	
Hardness, ASTM D2240	68 (Instant), 64 (5 sec), Shore A
Density, ASTM D792	1.03 g/cm^3
Density (liquid resin)	1.00 g/cm^3
Relative Abrasion Volume Loss, ISO-4649 A	170 mm^3

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

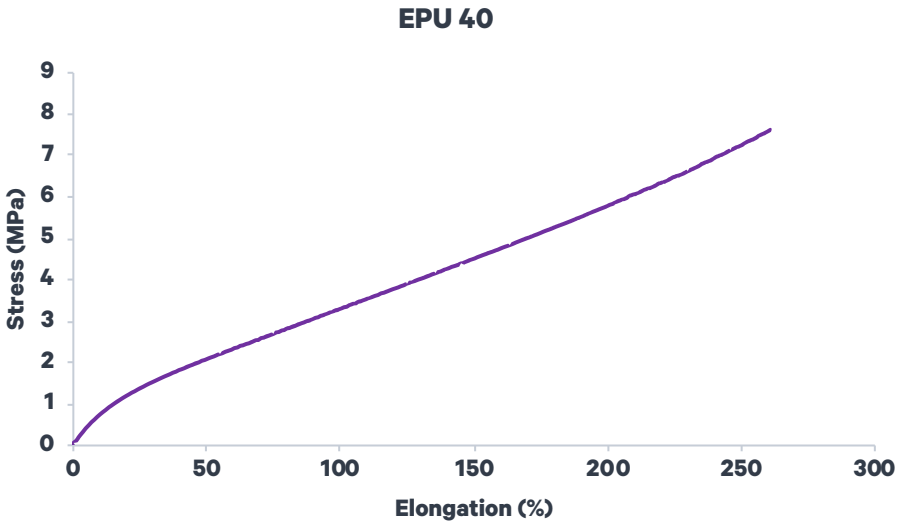
EPU 40

Extended TDS

EPU 40 Mechanical Properties

Representative Tensile Curve

ASTM D412, Die C, 500 mm/min



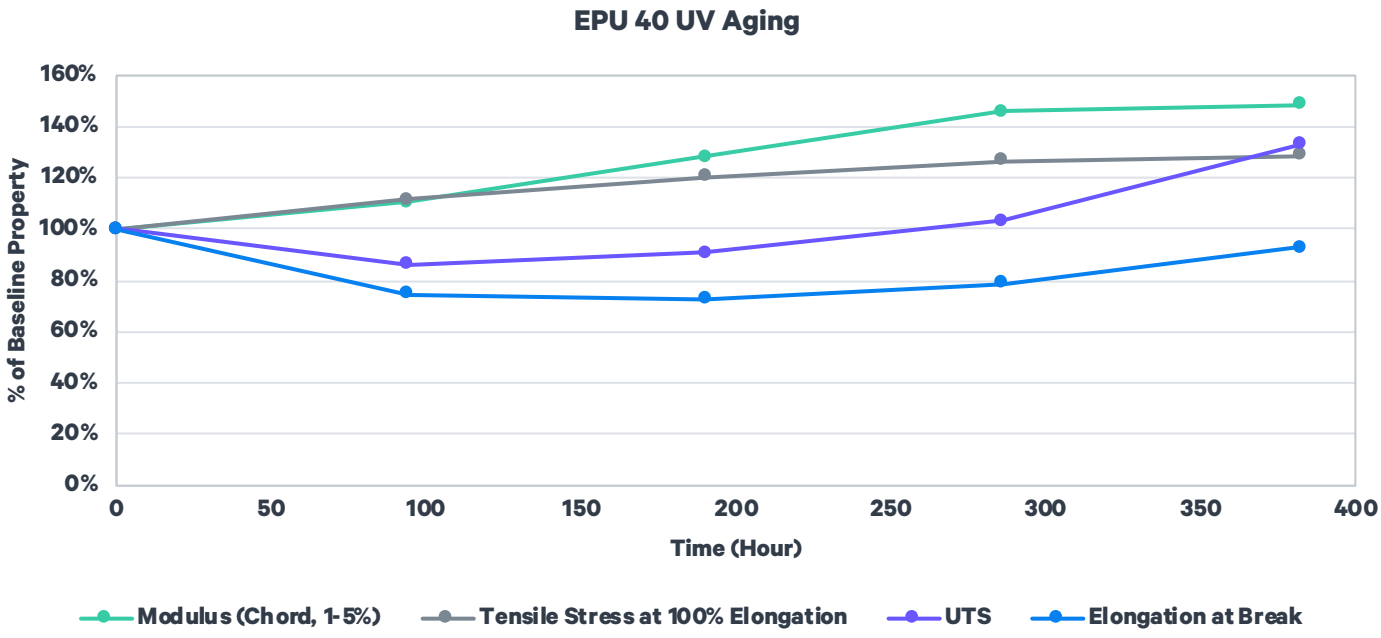
EPU 40 Chemical Compatibility

	Mass Gain (%)
Household Chemicals	
Bleach (NaClO, 5%)	< 5%
Sanitizer (NH_4Cl, 10%)	< 5%
Distilled Water	< 5%
Sunscreen (Banana Boat, SPF 50)	5 – 15%
Detergent (Tide, Original)	< 5%
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)	15 – 30%
Airplane Deicing Fluid (Type I Ethylene Glycol)	< 5%
Airplane Deicing Fluid (Type I Propylene Glycol)	< 5%
Airplane Deicing Fluid (Type IV Ethylene Glycol)	< 5%
Airplane Deicing Fluid (Type IV Propylene Glycol)	< 5%
Transmission Fluid (Havoline Synthetic ATF)	< 5%
Engine Coolant (Havoline XLC, 50%/50% premixed)	< 5%
Diesel (Chevron #2)	> 30%
Gasoline (Chevron #91)	> 30%
Skydrol 500B-4	> 30%
Strong Acid/Base	
Sulfuric Acid (30%)	> 30%
Sodium Hydroxide (10%)	< 5%

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

EPU 40 UV Aging

Natural polymer aging can occur in the presence of light, sun, and heat. Carbon evaluated the UV aging performance of EPU 40 using ASTM D4459, which is intended to simulate indoor exposure of solar radiation through glass.



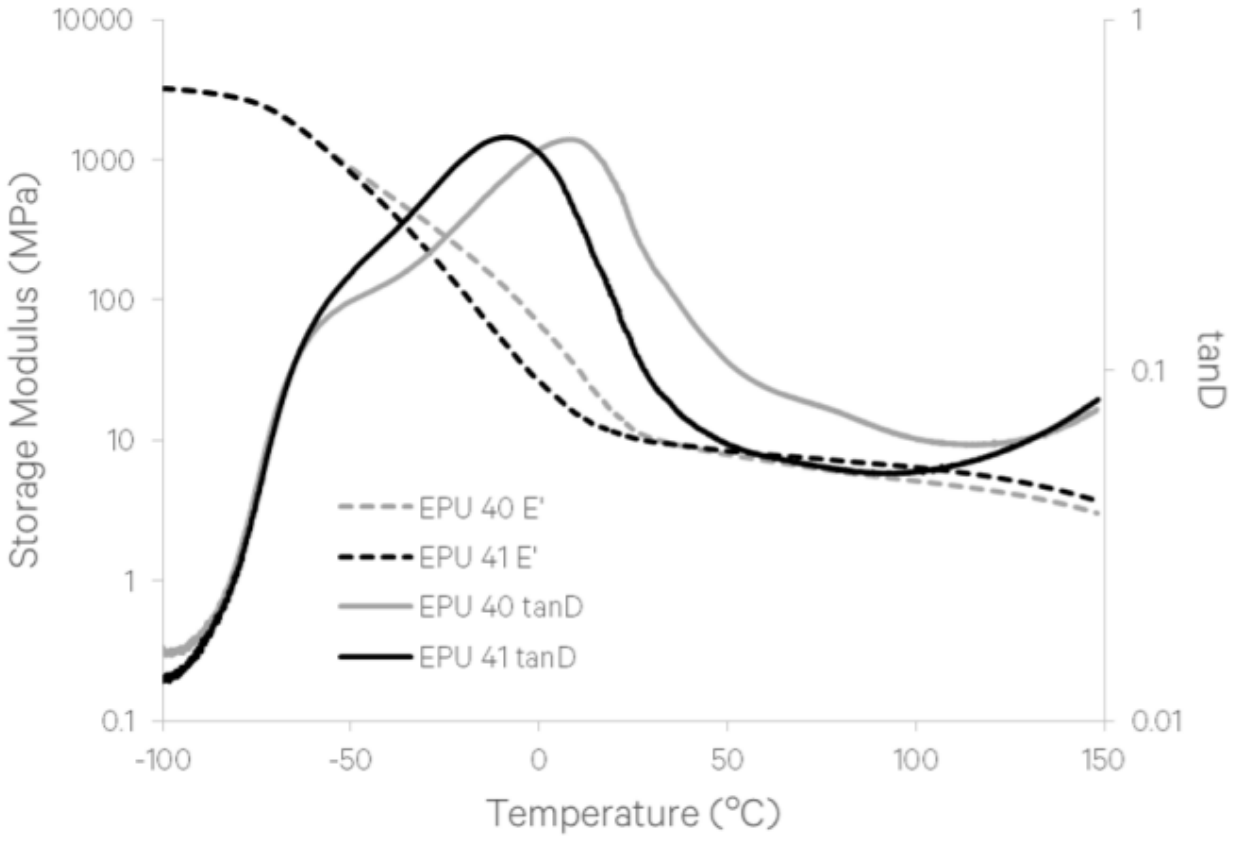
ASTM D4459: Q-Sun XE-1, 0.8 W/m^2 at 420 nm, 55 °C
ASTM D412: Die C, 500 mm/min, average values represented

EPU 40 Dynamic Mechanical Analysis (DMA)

In impact and shock performance, damping properties are important. EPU 40 has a higher T_g compared to EPU 41 (tanD peak) and overall higher damping coefficient (tanD), indicating better damping performance at a broader temperature window.

EPU 41 T_g(tanD) = -10 °C

EPU 40 T_g(tanD) = 10 °C



EPU 40 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* (specifically the Closed Patch Sensitization Study). 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 EPU 40 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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