

# Silicone 40A Resin

100% Silicone Material for Soft, Pliable, and Durable Parts

Enabled by Formlabs' Pure Silicone Technology™, Silicone 40A Resin produces 100% silicone parts with excellent elasticity, chemical resistance, and thermal stability.

**Seals, gaskets, and connectors for industrial and automotive applications requiring high thermal and chemical resistance**

**Wearables, grippers, and consumer goods prototypes requiring excellent tear strength and rebound resilience**

**Medical device components, patient-matched prosthesis, and audiology applications**

**Soft and Flexible fixtures and casting molds for repeated use**



**FLS14001**

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To the best of our knowledge the information contained herein is accurate. However, Formlabs, Inc. makes no warranty, expressed or implied, regarding the accuracy of these results to be obtained from the use thereof.

Material Properties	METRIC	IMPERIAL	METHOD
	Post-Cured <sup>1, 2, 3</sup>	Post-Cured <sup>1, 2, 3</sup>	
Mechanical Properties	METRIC	IMPERIAL	METHOD
Ultimate Tensile Strength	5 MPa	725 psi	ASTM D412-06 Type C, 500 mm/min
Elongation at Break	230%	230%	ASTM D412-06 Type C, 500 mm/min
Tear Strength	12 kN/m	68 lb/in	ASTM D624-00, Type C
Stress at 50% elongation	0.4 MPa	58 psi	ASTM D412-06 Type C, 500 mm/min
Stress at 100% elongation	1 MPa	145 psi	ASTM D412-06 Type C, 500 mm/min
Stress at 150% elongation	2.1 MPa	305 psi	ASTM D412-06 Type C, 500 mm/min
Compression Set 23 °C for 22 hours		20%	ASTM D395-03 (B)
Bayshore Resilience		34%	ASTM D2632
Ross Flexing Fatigue at 23 °C		> 500,000 cycles	ASTM D1052, (notched), 60° bending, 100 cycles/minute
Ross Flexing Fatigue at -10 °C		> 500,000 cycles	ASTM D1052, (notched), 60° bending, 100 cycles/minute
General Properties	METRIC	IMPERIAL	METHOD
Shore Hardness		40A	ASTM 2240
Color		Dark grey	
Viscosity (@ 35 °C)		7800 cP	
Thermal Properties	METRIC	IMPERIAL	METHOD
Glass Transition Temperature	-107 °C	-161 °F	ASTM D4065

## BIOCOMPATIBILITY

Silicone 40A Resin has been evaluated as a skin contacting device in accordance with ISO 10993-1, and passed the requirements for the following biocompatibility endpoints:

ISO Standard	Description <sup>4,5</sup>
ISO 10993-5:2009	Not cytotoxic
ISO 10993-23:2021	Not an irritant
ISO 10993-10:2021	Not a sensitizer

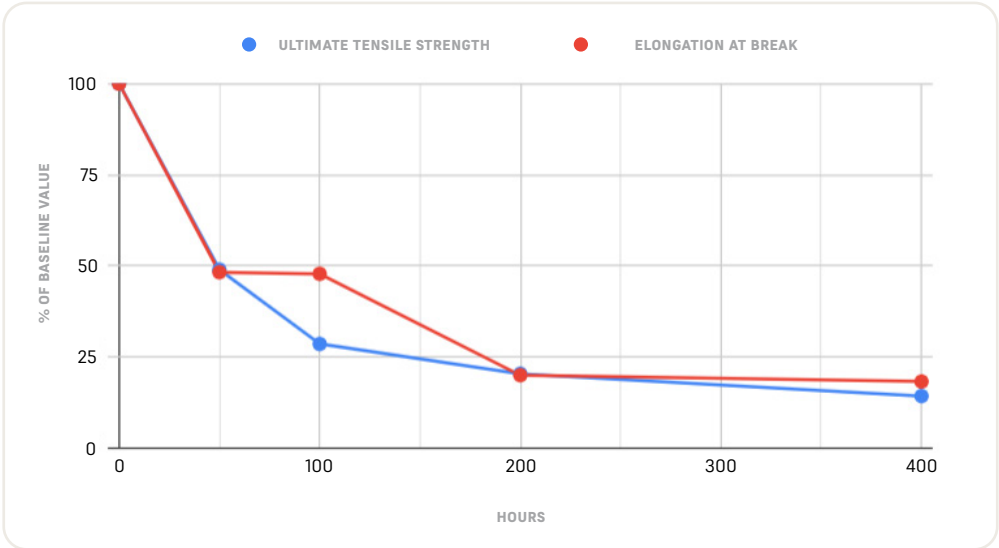
<sup>1</sup> The measured properties have been determined through internal testing and will be updated with results from an external lab.

<sup>2</sup> Material properties may vary based on part geometry, print orientation, print settings, temperature, and disinfection or sterilization methods used.

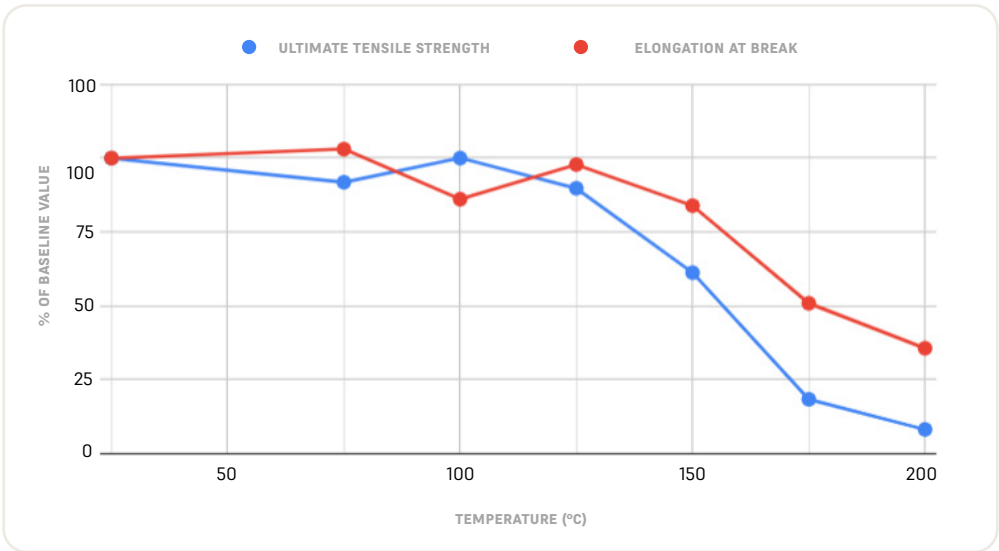
<sup>3</sup> Data for post-cured samples were measured on Type C tensile bars printed on a Form 3 printer with 100 µm Silicone 40A Resin settings, washed in a Form Wash for 20 minutes in 80% Isopropyl Alcohol / 20% Butyl Acetate, and post-cured at 60°C for 30 minutes submerged in water in a Form Cure.

<sup>4</sup> Silicone 40A Resin was tested at NAMSA World Headquarters, OH, USA.

**MECHANICAL PROPERTIES AFTER UV AGING**



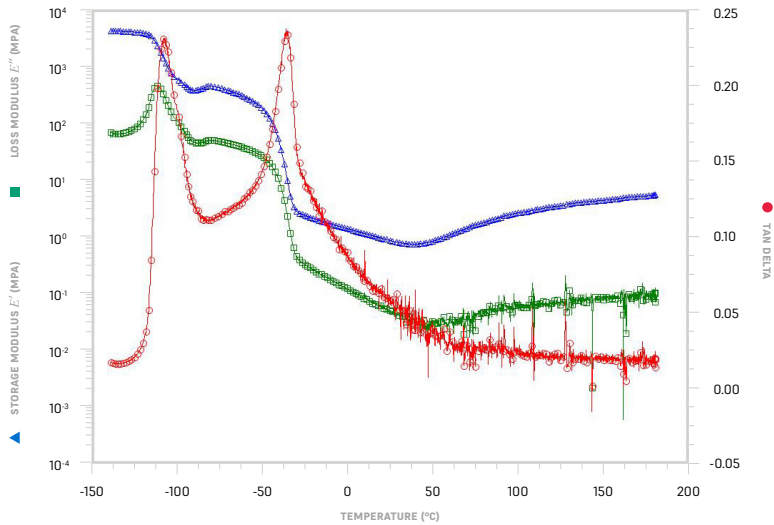
**MECHANICAL PROPERTIES AFTER 24 HOURS THERMAL AGING**



**Aerospace Specific Testing**

Outgassing	"Total Mass Loss (TML): 1.34% Collected Volatile Condensable Material (CVCM): 0.61% Water Vapor Recovered (WVR): 0.2%"	ASTM E595-15
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## SILICONE 40A RESIN DYNAMIC MECHANICAL ANALYSIS (DMA)



A DMA curve from -150 °C to 180 °C at 3 °C/min is shown. A glass transition is observed at -107 °C, and a crystalline melting transition is observed at -37 °C followed by a rubbery plateau to the conclusion of the test at 180 °C.

## SOLVENT COMPATIBILITY

Percent weight gain over 24 hours for a printed and post-cured 1 x 1 x 1 cm cube immersed in respective solvent:

Cleaning Chemicals	24 hr weight gain, %	Industrial Fluids	24 hr weight gain, %
Acetone	11.5	Gasoline (ISO 1817, liquid C)	69.8
Bleach ~5% NaOCl	< 0.1	Diesel (Chevron #2)	32.9
Distilled Water	< 0.1	Skydrol 5	23.2
<b>Strong Acid/Base/Alcohol</b>	<b>24 hr weight gain, %</b>	Hydraulic Oil	10
Acetic Acid (5%)	< 0.1	Diethyl glycol monomethyl ether	2.5
Hydrochloric Acid (10%)	0.4	Mineral oil (Heavy)	1.6
Sodium hydroxide solution (0.025% pH = 10)	< 0.1	Mineral oil (Light)	2
Salt Water (3.5% NaCl)	< 0.1		-3.0
Isopropyl Alcohol	5.9		0.3
Hydrogen peroxide (3%)	< 0.1		2.0
Butyl Acetate	92.3		