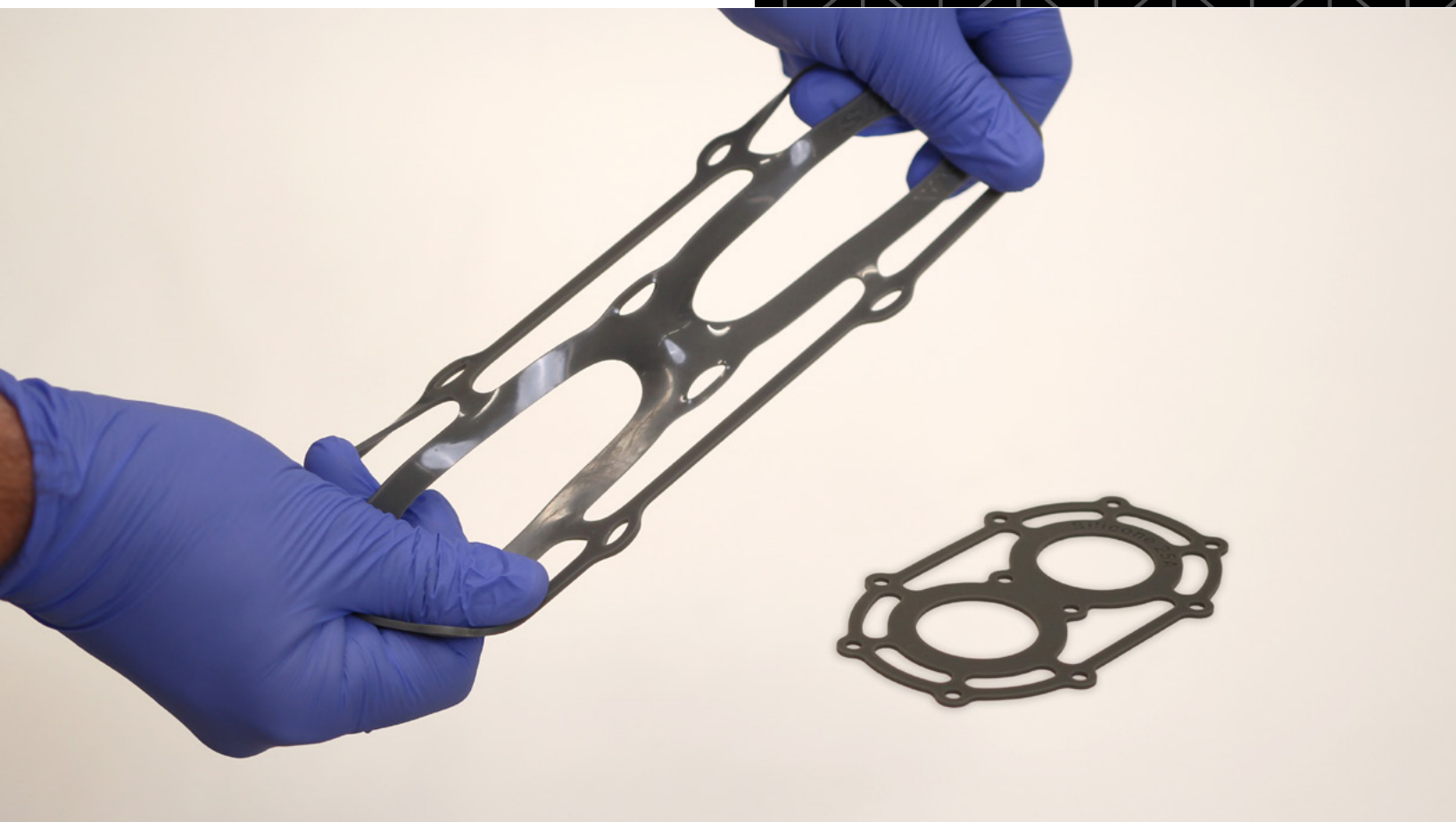
stratasys | alphacam SOLUTIONS FOR A 3D WORLD®

MATERIAL DATA SHEET
P3™ DLP

P3™ Silicone 25A
by Shin-Etsu

P3™ Silicone 25A is a pure silicone material with the lasting mechanical and chemical properties and stability that silicones are known for.



P3™ Silicone 25A is a soft, flexible, and durable elastomer that features unique properties versus traditional polymers thanks to its distinct silicon-oxygen backbone. The material, an Origin exclusive by Shin-Etsu, is designed for applications requiring excellent tear resistance, elongation, chemical resistance, and consistent mechanical performance. With a Shore A hardness of 25, this material offers a balance of softness and strength, making it ideal for directly 3D printing seals, gaskets, selected applications in medical, wearables, and consumer goods. Tests prove the high resilience and stability over time across a wide temperature range, ensuring reliable performance in industrial, automotive, aerospace, healthcare, and consumer applications. P3 Silicone 25A requires proper handling and post-processing to achieve optimal properties and surface finish.

Key Features

- Soft material with high tear resistance
- Excellent strength and rebound
- Superior thermal stability, also after at min 1000 hours
- Biocompatible (certification in progress)
- Flame retardant - UL-94 V0 certified
- Results in fine features with excellent surface finish
- Single-component UV resin; no mixing required
- Low curing shrinkage (<1%)
- Odorless

Industries & Applications

- Aerospace
- Automotive - Flexible seals and housings
- Industrial - Air and dust gaskets, cushioning pads
- Consumer electronics & goods
- Healthcare

Liquid Properties

Property	Value
Appearance	Glossy Gray
Viscosity (23 °C)	17,000 mPa-s
Density	1.3 g/cm³

Mechanical Properties

Property	Unit	Method	Post Processed
Tensile Stress at Break	MPa	ASTM D638	5.4 ± 0.4[1]
Young's Modulus	MPa	ASTM D638	1.45 ± 0.07[1]
Elongation at Break	%	ASTM D638	672 ± 18[1]
Tear Strength	kN/m	ASTM D624	16 ± 3[1]
Shore Hardness	A	ASTM D2240	25-30
Bayshore rebound resilience		ASTM D2632	50± 1
Compression set	%	ASTM D 395-03 (B) 23 °C for 22 hours	6

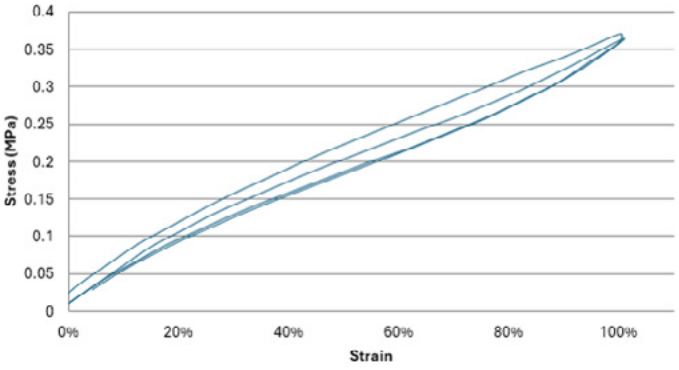
[1] Cleaned with acetone & postcured on ECE5000 (20 min. X 2)

Chemical Properties

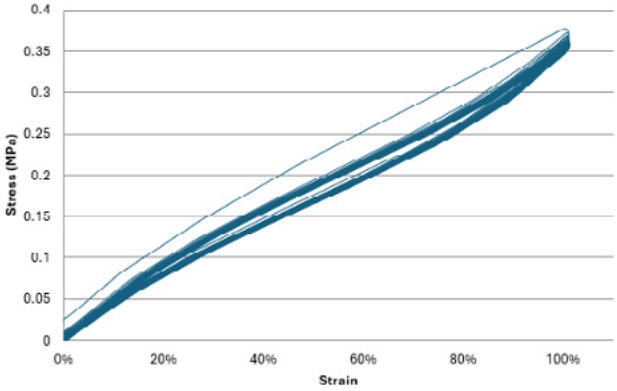
Property	Unit	Method	Value
Flammability, Vertical	V Rating	UL94V 3mm & 6MM	V-0
Solid Density (Cured)	g/cm³	ASTM D792	1.3
Water Absorption (24hr)	%	ASTM D570	1.5%
Cytotoxicity		ISO 10993-5	Comply*

*Cleaning with Acetone after post-curing in oven.

P3 Silicone 25A, 100% extension, 100 mm/min, 2 cycles

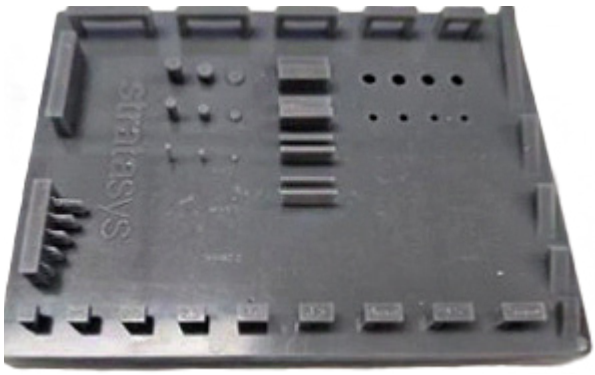


P3 Silicone 25A, 100% extension, 100 mm/min, 50 cycles

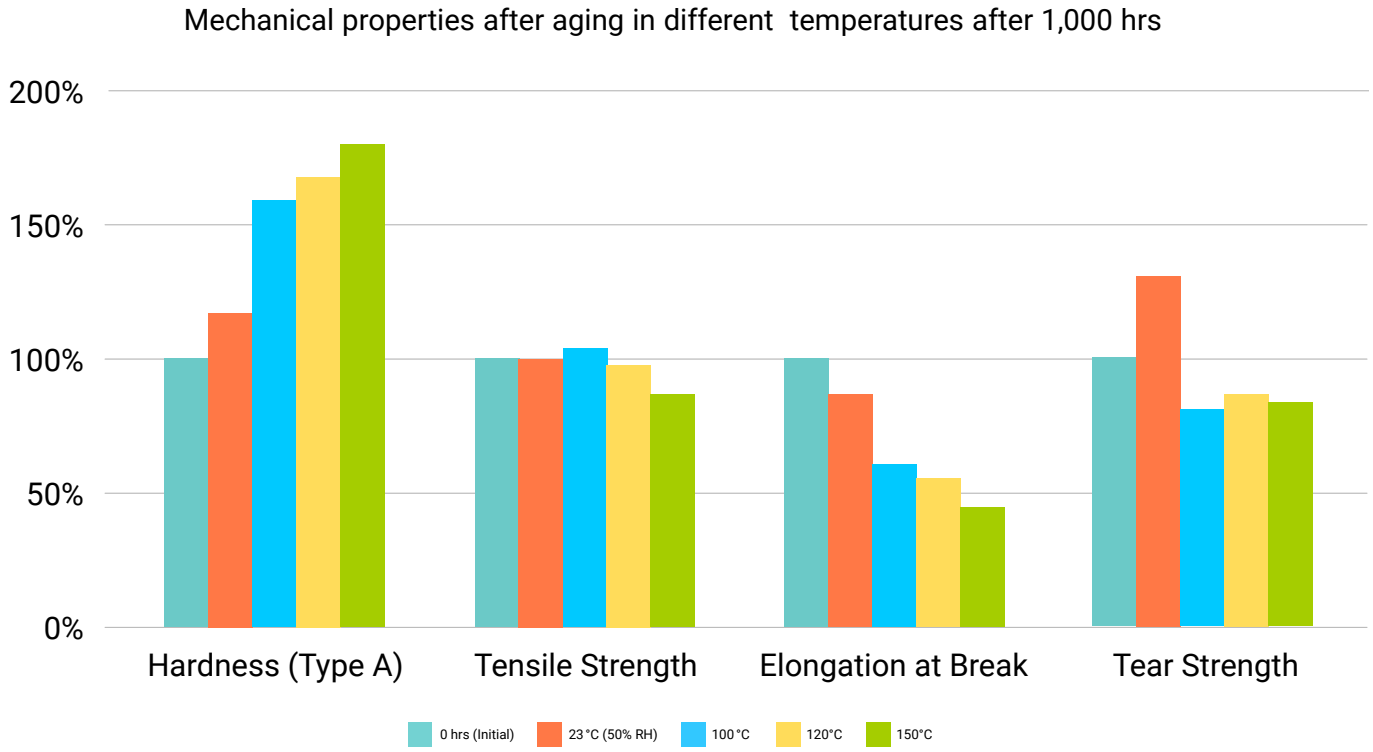


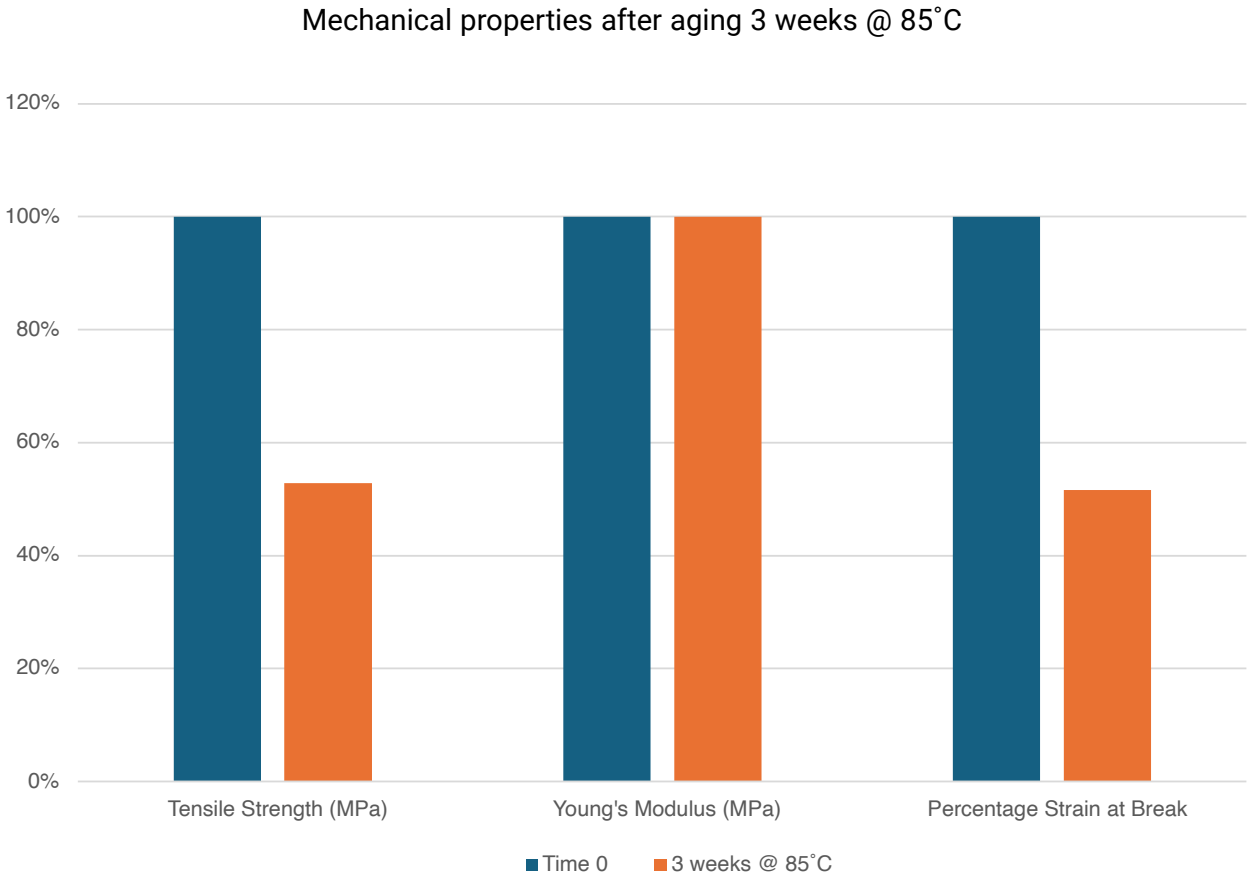
Feature Capabilities

Evaluated Feature	mm
Largest overhang no droop	**3**
Largest bridge no droop	**7**
Largest overhang no delamination	**4.5**
Largest bridge no delamination	**13**
Shallowest overhang no droop (deg)	**15**
Thinnest positive cylinder (1 mm height)	**0.5**
Thinnest positive cylinder (3 mm height)	**1**
Thinnest positive cylinder (5 mm height)	**1**
Thinnest positive wall (5 mm height)	**0.5**
Thinnest positive wall (10 mm height) (mm)	**0.5**
Smallest successful Z through hole (mm)	**2**



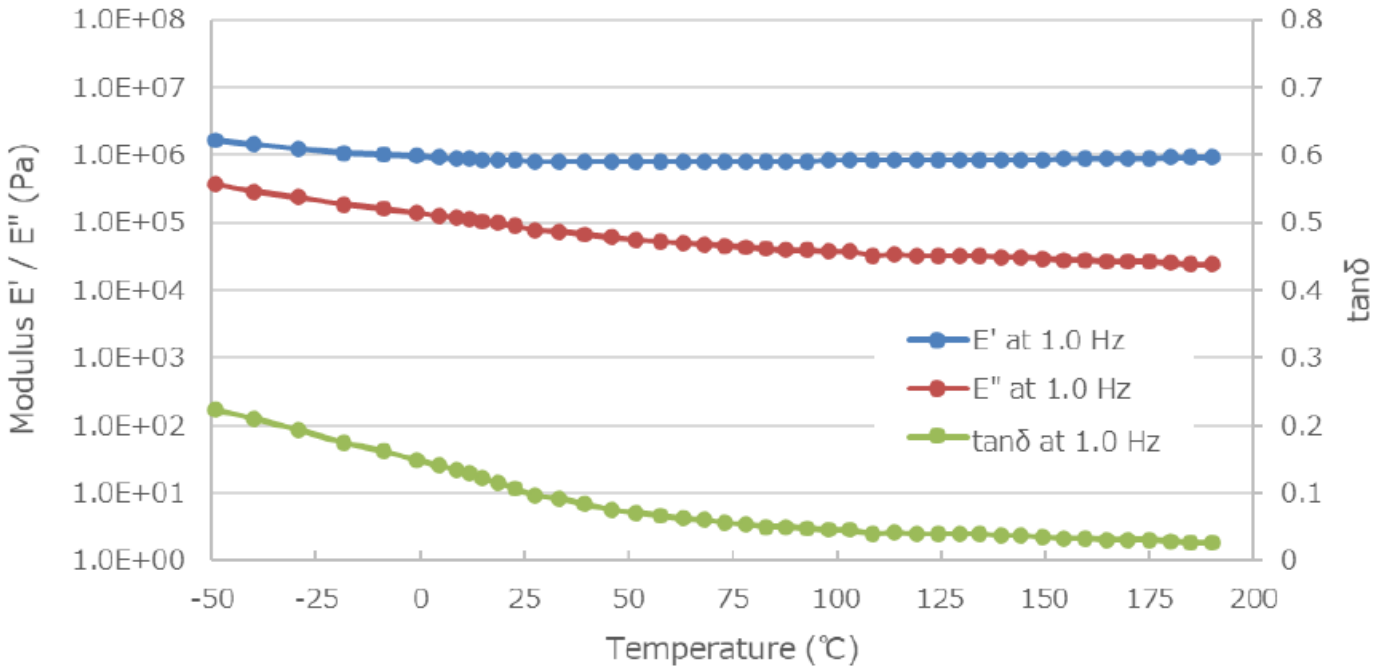
Thermal Properties





Dynamic Mechanical Analysis

The below graph shows how the mechanical properties of the material change with temperature at a frequency of 1.0 Hz. It tracks the storage modulus (E'), loss modulus (E"), and damping factor (tanδ), indicating the material's stiffness, energy dissipation, and damping behavior, respectively. The data demonstrate that the material maintains relatively stable mechanical performance across a wide temperature range, with gradual softening and reduced damping as temperature increases.



Temperature	-49	-29	-1	28	52	73	98	124	149	175	190
Modulus E' @ 1.0 Hz (MPa)	1.66	1.20	0.95	0.81	0.79	0.79	0.81	0.83	0.85	0.89	0.93
Modulus E" @ 1.0 Hz (MPa)	0.37	0.23	0.14	0.08	0.05	0.04	0.03	0.03	0.03	0.03	0.02
Tan δ @ 10 Hz	0.22	0.19	0.15	0.10	0.07	0.06	0.05	0.04	0.03	0.03	0.03