STEREOLITHOGRAPHY

High Temperature Resin

Formlabs' Most Heat-Resistant Resin for Hot Air, Fluids and Tooling

High Temperature Resin reaches a 238 °C heat deflection temperature at 0.45 MPa after thermal post-cure and is the most heat-resistant Formlabs resin. Engineered for applications requiring exceptional thermal stability, this advanced photopolymer enables precise, detailed parts that hold their shape in hot air, gas and fluid flow.

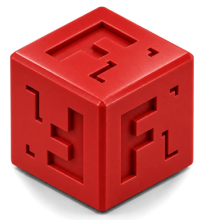


SURFACE FINISHES



Standard Finish Natural

Parts are washed, post-cured and have their supports removed, leaving the smooth, finely detailed surface SLA is known for. Sharp edges, small text and fine features hold their shape, and the surface is ready for fit checks, assembly, presentation or paint.



Performance Paint Premium Finish

A highly durable, automotive-grade coating, hand-finished for smooth surfaces and applied with professional-grade equipment for exceptional adhesion. It comes in matte to semi-gloss, with custom colour matching for parts that need specific branding or visual impact.

BUILD VOLUME	LEAD TIME	LAYER HEIGHT	TOLERANCE
353 × 196 × 350 mm	2-4 business days	0.05-0.1 mm	±0.25% (min ±0.25 mm); ±0.4% (min ±0.5 mm) over 10 in

MECHANICAL PROPERTIES

Tensile and flexural modulus show how stiff the resin is, and elongation shows how far it stretches before it breaks. High stiffness with low elongation marks a resin that holds precise geometry rather than one that flexes or absorbs impact.

Every part receives the Formlabs oven thermal cure; the post-cured rows show Formlabs' UV-only values for comparison. The thermal cure lowers tensile strength and elongation and raises flexural stiffness slightly in exchange for its heat resistance. Low elongation and notched impact call for generous radii, and the resin is not suited to snap-fits, living hinges or parts under sustained load.

PROPERTY	VALUE	TEST STANDARD
Ultimate Tensile Strength (Post-Cured)	**58 MPa**	ASTM D638-14
Ultimate Tensile Strength (Post-Cured + Thermal Cure)	**49 MPa**	ASTM D638-14
Tensile Modulus (Post-Cured)	**2800 MPa**	ASTM D638-14
Tensile Modulus (Post-Cured + Thermal Cure)	**2800 MPa**	ASTM D638-14
Elongation at Break (Post-Cured)	**3.3 %**	ASTM D638-14
Elongation at Break (Post-Cured + Thermal Cure)	**2.3 %**	ASTM D638-14
Flexural Strength at Break (Post-Cured)	**95 MPa**	ASTM D790-15
Flexural Strength at Break (Post-Cured + Thermal Cure)	**97 MPa**	ASTM D790-15
Flexural Modulus (Post-Cured)	**2600 MPa**	ASTM D790-15
Flexural Modulus (Post-Cured + Thermal Cure)	**2800 MPa**	ASTM D790-15
Notched Izod Impact (Post-Cured)	**18 J/m**	ASTM D256-10
Notched Izod Impact (Post-Cured + Thermal Cure)	**17 J/m**	ASTM D256-10

THERMAL PROPERTIES

Heat deflection is listed at two loads. The oven thermal cure lifts heat deflection at the lower load to the headline figure; at the higher load the gain is smaller, so size each part to the load it carries at its operating temperature.

Thermal expansion is typical of a rigid photopolymer. Allow for it where a part mates with metal across a wide temperature swing.

PROPERTY	VALUE	TEST STANDARD
HDT @ 0.45 MPa (Post-Cured)	**120 °C**	ASTM D648-16
HDT @ 0.45 MPa (Post-Cured + Thermal Cure)	**238 °C**	ASTM D648-16
HDT @ 1.8 MPa (Post-Cured)	**78 °C**	ASTM D648-16
HDT @ 1.8 MPa (Post-Cured + Thermal Cure)	**101 °C**	ASTM D648-16
Thermal Expansion (Post-Cured)	**80 $\times 10^{-6}$/K**	ASTM E831-13
Thermal Expansion (Post-Cured + Thermal Cure)	**75 $\times 10^{-6}$/K**	ASTM E831-13

PHYSICAL PROPERTIES

Density and viscosity describe the liquid resin in the vat, not the finished part; Formlabs publishes no cured-part density. A controlled wash and post-cure give every part a smooth, uniform surface, so critical features stay in tolerance and downstream finishing stays predictable.

PROPERTY	VALUE	TEST STANDARD
Resin Density (liquid)	**1.14 g/cm³**	Formlabs SDS
Resin Viscosity (liquid, 35 °C)	**1015 cP**	Formlabs SDS

CHEMICAL PROPERTIES

Formlabs immersed printed, post-cured cubes in 19 fluids for 24 hours and measured size and weight gain. Fuels, mineral and hydraulic oils, salt water, alcohol and dilute acids and bases leave almost no change, while acetone causes the largest weight gain and concentrated hydrochloric acid a small size change.

Formlabs does not state an elevated test temperature, so treat the ratings as screening guidance and confirm hot-fluid exposure with application-specific testing before production release.

CHEMICAL	24 H SIZE GAIN	24 H WEIGHT GAIN
Acetic acid 5%	**< 1%**	**< 1%**
Acetone	**< 1%**	**2%**
Bleach (~5% NaOCl)	**< 1%**	**< 1%**
Butyl acetate	**< 1%**	**< 1%**
Diesel fuel	**< 1%**	**< 1%**
Diethylene glycol monomethyl ether	**< 1%**	**1%**
Hydraulic oil	**< 1%**	**< 1%**
Hydrogen peroxide 3%	**< 1%**	**< 1%**
Isooctane (gasoline)	**< 1%**	**< 1%**
Isopropyl alcohol	**< 1%**	**< 1%**
Mineral oil (light)	**< 1%**	**< 1%**
Mineral oil (heavy)	**< 1%**	**< 1%**
Salt water (3.5% NaCl)	**< 1%**	**< 1%**
Skydrol 5	**< 1%**	**1.1%**
Sodium hydroxide 0.025% (pH 10)	**< 1%**	**< 1%**
Strong acid (HCl, concentrated)	**1.2%**	**< 1%**
Tripropylene glycol monomethyl ether	**< 1%**	**< 1%**
Water	**< 1%**	**< 1%**
Xylene	**< 1%**	**< 1%**

COMPLIANCE

Formlabs' June 2024 statement covering all its resins, including High Temp, declares RoHS compliance and no substances from the ECHA candidate list as of June 2024. Formlabs also states that every substance in High Temp Resin is on the US TSCA Active Inventory.

Formlabs publishes no biocompatibility, food-contact or flammability rating for this resin, so it is not used for food contact or where a flame-retardant material is required. For parts that must meet UL 94 V-0, Formlabs Flame Retardant Resin is the flame-retardant SLA choice.

STANDARD	STATUS
RoHS Directives 2011/65/EU and (EU) 2015/863 Restricted substances not contained or intentionally added above the threshold limits (statement covers all Formlabs resins)	Formlabs declaration
REACH SVHC (EC 1907/2006) No substances on the ECHA candidate list (June 2024 statement; all Formlabs resins except Clear Resin)	Formlabs declaration
TSCA Active Inventory All substances used in High Temp Resin are on the US TSCA Active Inventory	Formlabs statement

SUPPORTING DOCUMENTS

RoHS declaration