

Rigid 10K

HIGH-STIFFNESS GLASS-FILLED RESIN FOR INDUSTRIAL PARTS

Rigid 10K is a highly glass-filled engineering resin for precise industrial components that must resist significant load with minimal bending. Published data show high stiffness, elevated heat-deflection performance, broad short-term solvent resistance, and a smooth matte finish. Final performance should be verified for the intended geometry, post-processing condition, and service environment.

Design Advantages

- Post-cured tensile modulus up to 11 GPa, depending on finishing condition
- Heat deflection temperature up to 238 C at 0.45 MPa
- Low 24-hour weight gain across the published solvent panel
- Useful for short-run molds, inserts, fixtures, fluid-exposed parts, and aerodynamic models

Material Specifications

ITEM	PUBLISHED VALUE
Material family	Glass-filled engineering photopolymer
Tensile modulus	10 GPa, standard post-cure
Flexural strength	126 MPa, standard post-cure
HDT at 0.45 MPa	163 C, standard post-cure
Thermal expansion	47 um/m/C, standard post-cure
Flammability	UL 94 HB at 3 mm

Application Fit

- Short-run injection molds, inserts, and forming tools
- Heat-resistant and fluid-exposed jigs, fixtures, and components
- Rigid prototypes simulating glass- or fiber-filled thermoplastics
- Aerodynamic test models and dimensionally stable industrial parts

Mechanical and Thermal Properties

PROPERTY	GREEN	70 C CURE	70 C + 90 C	MEDIA BLASTED
Ultimate tensile strength	55 MPa	65 MPa	53 MPa	88 MPa
Tensile modulus	7.5 GPa	10 GPa	10 GPa	11 GPa
Elongation at break	2.0%	1.0%	1.0%	1.7%
Flexural strength	84 MPa	126 MPa	103 MPa	158 MPa
Flexural modulus	6.0 GPa	9.0 GPa	10 GPa	9.9 GPa
Notched Izod	16 J/m	16 J/m	18 J/m	20 J/m
Unnotched Izod	41 J/m	47 J/m	41 J/m	130 J/m
HDT at 0.45 MPa	65 C	163 C	218 C	238 C
HDT at 1.8 MPa	56 C	82 C	110 C	92 C
Thermal expansion, 0-150 C	48 um/m/C	47 um/m/C	46 um/m/C	41 um/m/C

Tensile values use ASTM D638-14; flexural values use ASTM D790-15; impact values use ASTM D256-10 and ASTM D4812-11; heat deflection uses ASTM D648-16; thermal expansion uses ASTM E831-13.

Electrical Characterization

PROPERTY	PUBLISHED VALUE
Dielectric constant	3.4 at 1 GHz; 3.3 at 10 GHz
Loss tangent	0.036 at 1 GHz; 0.0074 at 10 GHz
Volume resistivity	1.1 x 10 ¹⁵ ohm-cm
Surface resistivity	6.9 x 10 ¹³ ohm
Dielectric strength	458 V/mil

Fire Smoke and Toxicity

TEST	PUBLISHED RESULT
Flammability	UL 94 HB at 3 mm
Smoke density, flaming	2 at 90 s; 95 at 4 min; maximum 132
Smoke density, non-flaming	0 at 90 s; 1 at 4 min; maximum 63
Toxic gas generation	Published BSS 7239 values below listed limits

Published gas results: HCN 1 ppm flaming and 0.5 ppm non-flaming; CO 50 and 10 ppm; NOx <2 ppm; SO2 <1 ppm; HF <1.5 ppm; HCl 1 ppm flaming and <1 ppm non-flaming.

Solvent Compatibility

FLUID	24 H WEIGHT GAIN
Acetic acid, 5%	<0.1%
Acetone	<0.1%
Isopropyl alcohol	<0.1%
Bleach, about 5% NaOCl	0.1%
Butyl acetate	0.1%
Diesel fuel	0.1%
Diethylene glycol monomethyl ether	0.4%
Hydraulic oil	0.2%
Skydrol 5	0.6%
Hydrogen peroxide, 3%	<0.1%
Isooctane, gasoline analogue	0%
Mineral oil, light	0.2%
Mineral oil, heavy	<0.1%
Salt water, 3.5% NaCl	0.1%
Sodium hydroxide, 0.025% pH 10	0.1%
Water	<0.1%
Xylene	<0.1%
Concentrated hydrochloric acid	0.2%
Tripropylene glycol monomethyl ether	0.4%

Post Processing Basis

The standard post-cure condition is 60 minutes at 70 C. The extended thermal condition adds 125 minutes at 90 C. Media-blasted values were measured after the standard 70 C cure. These conditions describe the published specimens and should not be treated as universal performance guarantees.

Design and Qualification Notes

Rigid 10K is designed for stiffness and dimensional stability rather than high elongation or impact toughness. Account for stress concentrations, brittle failure modes, fastener loads, thermal cycling, surface treatment, and fluid exposure. Solvent results report short-term mass change only and do not establish long-term retention of mechanical properties.

Published Data and Qualification

The values in this sheet are based on published specimen data and are provided for design reference and material comparison. Lucent Additive has not independently generated every published value. Properties can vary with geometry, orientation, process settings, post-curing, finishing, temperature, and exposure history. Validate final-part performance using the intended production process and service environment.

Start an Application Review

Send Lucent Additive your CAD model, quantity, load conditions, operating temperature, fluid exposure, surface-finish needs, inspection requirements, and target schedule. Our team can review material fit, production strategy, and validation needs before quoting.

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