

# Rigid 10K

## Rigid 10K Resin for Rigid, Strong, Industrial-Grade Prototypes

This highly glass-filled resin is the stiffest material in our engineering portfolio. Choose Rigid 10K Resin for precise industrial parts that need to withstand significant load without bending. Rigid 10K Resin has a smooth matte finish and is highly resistant to heat and chemicals.

**Short-run injection molds and inserts**

**Heat resistant and fluid exposed components, jigs, and fixtures**

**Aerodynamic test models**

**Simulates stiffness of glass and fiber-filled thermoplastics**



V1

**FLRG1001**

\* May not be available in all regions

**formlabs** 

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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 DATA

# Rigid 10K Resin

	METRIC			IMPERIAL			METHOD
	Green	UV Post-cured <sup>1</sup>	UV + Thermal <sup>2</sup>	Green	UV Post-cured <sup>1</sup>	UV + Thermal <sup>2</sup>	
<b>Tensile Properties</b>							
Ultimate Tensile Strength	55 MPa	65 MPa	53 MPa	7980 psi	9460 psi	7710 psi	ASTM D638-14
Tensile Modulus	7.5 GPa	10 GPa	10 GPa	1090 ksi	1480 ksi	1460 ksi	ASTM D638-14
Elongation at Break	2%	1%	1%	2%	1%	1%	ASTM D638-14
Flexural Strength	84 MPa	126 MPa	103 MPa	12200	18200	15000	ASTM D 790-15
<b>Flexural Properties</b>							
Flexural Modulus	6 GPa	9 GPa	10 GPa	905	1360	1500	ASTM D 790-15
<b>Impact Properties</b>							
Notched IZOD	16 J/m	16 J/m	18 J/m	0.3 ft-lbf/in	0.3 ft-lbf/in	0.3 ft-lbf/in	ASTM D256-10
<b>Temperature Properties</b>							
Heat Deflection Temp. @ 1.8 MPa	56 °C	82 °C	110 °C	133 °F	180 °F	230 °F	ASTM D 648-16
Heat Deflection Temp. @ 0.45 MPa	65 °C	163 °C	218 °C	149 °F	325 °F	424 °F	ASTM D 648-16
Thermal Expansion, 0-150 °C	48 µm/m/°C	47 µm/m/°C	46 µm/m/°C	27 µin/in/°F	26 µin/in/°F	26 µin/in/°F	ASTM E 831-13

Material properties can vary with part geometry, print orientation, print settings, and temperature. All testing was done on Form 3.

<sup>1</sup>Data was obtained from parts printed using Form 3, 100 µm and post-cured with a Formcure for 60 minutes at 70 °C.

<sup>2</sup>Data was obtained from parts printed using Form 3, 100 µm and post-cured with a Formcure for 60 minutes at 60 °C and an additional thermal cure at 90 °C for 125 minutes.

## 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:

Solvent	24 hr weight gain, %	Solvent	24 hr weight gain, %
Acetic Acid 5%	< 0.1	Mineral oil (Light)	0.2
Acetone	< 0.1	Mineral oil (Heavy)	< 0.1
Bleach ~5% NaOCl	0.1	Salt Water (3.5% NaCl)	0.1
Butyl Acetate	0.1	Skydrol 5	0.6
Diesel Fuel	0.1	Sodium Hydroxide solution (0.025% PH 10)	0.1
Diethyl glycol Monomethyl Ether	0.4	Strong Acid (HCl conc)	0.2
Hydraulic Oil	0.2	Tripropylene glycol monomethyl ether	0.4
Hydrogen peroxide (3%)	< 0.1	Water	< 0.1
Isooctane (aka gasoline)	0.0	Xylene	< 0.1
Isopropyl Alcohol	< 0.1		