

ENGINEERING RESIN

# 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 exhibits a smooth matte finish and is highly resistant to heat and chemicals.

Short-run injection mold masters and inserts

Heat resistant and fluid exposed components, jigs, and fixtures

Aerodynamic test models

Simulates stiffness of glass and fiber-filled thermoplastics



FLRG1001

formlabs 

Prepared 06 . 09 . 2020  
Rev 01 06 . 09 . 2020

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.

## RIGID 10K MATERIAL PROPERTIES DATA

Mechanical Properties	METRIC			IMPERIAL			METHOD
	Green	UV <sup>1</sup>	UV+Thermal <sup>2</sup>	Green	UV <sup>1</sup>	UV+Thermal <sup>2</sup>	
Ultimate Tensile Strength	55 MPa	65 MPa	53 MPa	7980 psi	9460 psi	7710 psi	ASTM D 638-14
Tensile Modulus	7.5 GPa	10 GPa	10 GPa	1090 ksi	1480 ksi	1460 ksi	ASTM D 638-14
Elongation at Break	2%	1%	1%	2%	1%	1%	ASTM D 638-14
Flexural Strength	84 MPa	126 MPa	103 MPa	12200	18200	15000	ASTM D 790-15
Flexural Modulus	6 GPa	9 GPa	10 GPa	905	1360	1500	ASTM D 790-15
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
Unnotched IZOD	41 J/m	41 J/m	41 J/m	0.8 ft-lbf/in	0.9 ft-lbf/in	0.7 ft-lbf/in	ASTM D4812-11
<b>Thermal Properties</b>							
HDT @ 0.45 MPa	65 °C	163 °C	218 °C	149 °F	325 °F	424 °F	ASTM D 648-16
HDT @ 1.8 MPa	56 °C	82 °C	110 °C	133 °F	180 °F	230 °F	ASTM D 648-16
CTE, 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

All testing specimens were printed using Form 3

<sup>1</sup> Data was obtained from parts printed using Form 3, 100 µm and post-cured with a Form Cure 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 Form Cure for 60 minutes at 60°C and an additional thermal cure at 125°C for 90 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	Isooctane (aka gasoline)	0
Acetone	<0.1	Mineral oil (light)	0.2
Isopropyl Alcohol	<0.1	Mineral oil (Heavy)	<0.1
Bleach ~5% NaOCl	0.1	Salt Water (3.5% NaCl)	0.1
Butyl Acetate	0.1	Sodium Hydroxide solution (0.025% PH 10)	0.1
Diesel Fuel	0.1	Water	<0.1
Diethyl glycol Monomethyl Ether	0.4	Xylene	<0.1
Hydraulic Oil	0.2	Strong Acid (HCl conc)	0.2
Skydrol 5	0.6	Tripropylene glycol monomethyl ether	0.4
Hydrogen peroxide (3%)	<0.1		