

# Rigid 4000

Resin for Stiff, Strong, Engineering-Grade Prototypes

Glass-filled Rigid 4000 Resin prints with a smooth, polished finish and is ideal for stiff and strong parts that can withstand minimal deflection. Consider Rigid 4000 Resin for general load-bearing applications.

**Mounts and brackets**

**Jigs and fixtures**

**Thin-walled parts**

**Simulates stiffness of PEEK**



**FLRGWH01**

\* May not be available in all regions

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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 4000 Resin

	METRIC <sup>1</sup>		IMPERIAL <sup>1</sup>		METHOD
	Green <sup>2</sup>	Post-Cured <sup>3</sup>	Green <sup>2</sup>	Post-Cured <sup>3</sup>	
<b>Tensile Properties</b>					
Ultimate Tensile Strength	33 MPa	69 MPa	4786 psi	10007 psi	ASTM D638-14
Tensile Modulus	2.1 GPa	4.1 GPa	305 ksi	595 ksi	ASTM D638-14
Elongation at Break	23%	5.3%	23%	5.3%	ASTM D638-14
<b>Flexural Properties</b>					
Flexural Stress at 5% Strain	43 MPa	105 MPa	6236 psi	15229 psi	ASTM D 790-15
Flexural Modulus	1.4 GPa	3.4 GPa	203 ksi	493 ksi	ASTM D 790-15
<b>Impact Properties</b>					
Notched Izod	16 J/m	23 J/m	0.3 ft-lbf/in	0.43 ft-lbf/in	ASTM D256-10
<b>Thermal Properties</b>					
Heat Deflection Temp. @ 1.8 MPa	41 °C	60 °C	105 °F	140 °F	ASTM D 648-16
Heat Deflection Temp. @ 0.45 MPa	48 °C	77 °C	118 °F	170 °F	ASTM D 648-16
Thermal Expansion (0-150 °C)	64 µm/m/°C	63 µm/m/°C	36 µin/in/°F	35 µin/in/°F	ASTM E 831-13

<sup>1</sup> Material properties can vary with part geometry, print orientation, print settings, and temperature.

<sup>2</sup> Data was obtained from green parts, printed using Form 3, 100 µm, Rigid settings, without additional treatments.

<sup>3</sup> Data was obtained from parts printed using Form 3, 100 µm, Rigid settings and post-cured with a Form Cure for 15 minutes at 80 °C.

## 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%	0.8	Isooctane (aka gasoline)	< 0.1
Acetone	3.3	Mineral oil (light)	0.2
Isopropyl Alcohol	0.4	Mineral oil (Heavy)	0.2
Bleach ~5% NaOCl	0.7	Salt Water (3.5% NaCl)	0.7
Butyl Acetate	< 0.1	Sodium Hydroxide solution (0.025% PH 10)	0.7
Diesel Fuel	< 0.1	Water	0.7
Diethyl glycol Monomethyl Ether	1.4	Xylene	< 0.1
Hydraulic Oil	0.2	Strong Acid (HCl conc)	5.3
Skydrol 5	1.1		
Hydrogen peroxide (3%)	0.9		