



# Flexible

Photopolymer Resin for Form 1+ and Form 2

## **FLFLGR02 MATERIAL PROPERTIES**

Prepared: 04/19/2016

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.

Formlabs Flexible resin has elastomeric properties allowing you to print parts on the Form 1+ and Form 2 3D printers that are bendable and compressible. Parts are pliable when thin and resilient when thick. Flexible has compression characteristics that make it great for creating parts like custom grips, stamps, keypads, gaskets and wearable prototypes. It does not shatter upon failure making it ideal for high impact applications.

	METRIC <sup>1</sup>		IMPERIAL <sup>1</sup>		METHOD
	Green	Postcured <sup>2</sup>	Green	Postcured <sup>2</sup>	
<b>Mechanical Properties</b>					
Tensile Strength <sup>3</sup>	3.3 – 3.4 MPa	7.7 – 8.5 MPa	483 – 494 psi	1110 – 1230 psi	ASTM D412-06 (A)
Elongation at Failure <sup>3</sup>	60%	75 – 85%	60%	75 – 85%	ASTM D412-06 (A)
Compression Set <sup>4</sup>	0.40%	0.40%	0.40%	0.40%	ASTM D395-03 (B)
Tear Strength <sup>5</sup>	9.5 – 9.6 kN/m	13.3 – 14.1 kN/m	54 – 55 lbf/in	76 – 80 lbf/in	ASTM D624-00
Shore Hardness	70 – 75 A	80 – 85 A	70 – 75 A	80 – 85 A	ASTM 2240
<b>Thermal Properties</b>					
Vicat Softening Point <sup>6</sup>	231 °C	230 °C	448 °F	446 °F	ASTM D1525-09

**NOTES:**

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

<sup>2</sup>Data was obtained from parts printed using Form 2, 100 um, Flexible settings and post-cured with 290 J/cm<sup>2</sup> of fluorescent bulb UV light, centered at 365 nm.

<sup>3</sup>Tensile testing was performed after 3+ hours at 23 °C, using a Die C dumbbell and 20 in/min cross head speed.

<sup>4</sup>Compression testing was performed at 23 °C after aging at 23 °C for 22 hours.

<sup>5</sup>Tear testing was performed after 3+ hours at 23 °C, using a Die C tear specimen and a 20 in/min cross head speed.

<sup>6</sup>Thermal testing was performed after 40+ hours with a 10 N loading at 50 °C/hour. Cracks formed in samples during testing.

## SOLVENT COMPATIBILITY

### **G = Good resistance.**

Parts exposed to this solvent should not experience a decrease in mechanical properties.  
( $\leq$  1% weight gain,  $\leq$  1% width increase over 24 hours for a 1 x 1 x 1 cm cube)

### **A = Acceptable resistance.**

Parts exposed to this solvent may experience a small decrease in mechanical properties.  
(1 – 2% weight gain, 1 – 2% width increase over 24 hours for a 1 x 1 x 1 cm cube)

### **X = Unacceptable resistance.**

Parts exposed to this solvent will experience a significant decrease in mechanical properties as well as visible degradation. (> 2% weight gain, > 2% width increase over 24 hours for a 1 x 1 x 1 cm cube)

	FLEXIBLE RESIN FLFLGR02	
	GREEN	POST CURED
Acetic Acid, 5%	A	A
Acetone	X	X
Bleach (~5% NaOCl)	G	A
Butyl Acetate	X	X
Diethyl glycol monomethyl ether	X	X
Hydrogen Peroxide (3%)	A	A
Isooctane	G	G
Isopropyl alcohol	X	X
Sodium hydroxide (0.025%, pH = ~10)	A	G
Salt Water (3.5% NaCl)	G	G
Water	G	G
Xylene	X	X