formlabs

Flexible

Photopolymer Resin for Form 1+ and Form 2

FLFLGR02 MATERIAL PROPERTIES

Prepared: 04/19/2016

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[1]		IMPERIAL[1]		METHOD
	Green	**Postcured[2]**	**Green**	**Postcured[2]**	
Mechanical Properties					
Ultimate Tensile Strength[3]	3.3 – 3.4 MPa	7.7 – 8.5 MPa	483 – 494 psi	1110 – 1230 psi	ASTM D412-06 (A)
Elongation at Failure[3]	60%	75 – 85%	60%	75 – 85%	ASTM D412-06 (A)
Compression Set[4]	0.40%	0.40%	0.40%	0.40%	ASTM D395-03 (B)
Tear Strength[5]	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
Thermal Properties					
Vicat Softening Point[6]	231 °C	230 °C	448 °F	446 °F	ASTM D1525-09

NOTES:

[1]Material properties can vary with part geometry, print orientation, print settings and temperature.

[2]Data was obtained from parts printed using Form 2, 100 µm, Flexible settings and post-cured with 80.5 mW/cm^2 of 365 nm fluorescent light for 60 minutes.

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

[4]Compression testing was performed at 23 °C after aging at 23 °C for 22 hours.

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

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

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:

Mechanical Properties	24 HR WEIGHT GAIN (%)
Acetic Acid, 5 %	1.3
Acetone	33
Isopropyl Alcohol	9.8
Bleach, ~5 % NaOCl	1.1
Butyl Acetate	16
Diethyl glycol monomethyl ether	30
Hydrogen Peroxide (3 %)	1.3
Isooctane	< 1
Salt Water (3.5 % NaCl)	< 1
Sodium hydroxide (0.025 %, pH = 10)	1
Xylene	29