formlabs

GENERAL PURPOSE RESIN

Fast Model Resin

Formlabs' fastest resin, capable of printing at speeds up to 100mm/hr

Fast Model Resin is capable of printing dental models in less than 10 minutes or large prototypes in less than 2 hours. This highly accurate resin leverages the Form 4 ecosystem to print three times faster than previous formulations of Draft Resin. Use 200 micron settings for fastest print speeds, or use 100 micron settings for more detailed models.

Initial prototypes

Rapid design iterations

Dental models for thermoforming aligners

V1 **FLFMGR01**

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Material Properties	METRIC [1]			IMPERIAL [1]			METHOD
	Green	Post-Cured for 5 min at ambient temperature [3]	Post-Cured for 15 min at 60 °C [4]	Green	Post-Cured for 5 min at ambient temperature [3]	Post-Cured for 15 min at 140 °F [4]	
Tensile Properties	METRIC [1]			IMPERIAL [1]			METHOD
Ultimate Tensile Strength	46 MPa	55 MPa	62 MPa	6670 psi	7980 psi	8990 psi	ASTM D638-14
Tensile Modulus	2.18 GPa	2.48 GPa	2.67 GPa	320 ksi	360 ksi	390 ksi	ASTM D638-14
Elongation at Break	22%	15%	11%	22%	15%	11%	ASTM D638-14
Flexural Properties	METRIC [1]			IMPERIAL [1]			METHOD
Flexural Strength	74 MPa	98 MPa	106 MPa	10700 psi	14200 psi	15400 psi	ASTM D790-15
Flexural Modulus	1.96 GPa	2.60 GPa	2.74 GPa	280 ksi	380 ksi	400 ksi	ASTM D790-15
Impact Properties	METRIC [1]			IMPERIAL [1]			METHOD
Notched Izod	34 J/m	30 J/m	37 J/m	0.64 ft-lb/in	0.56 ft-lb/in	0.69 ft-lb/in	ASTM D4812-11
Thermal Properties	METRIC [1]			IMPERIAL [1]			METHOD
Heat Deflection Temp. @ 1.8 MPa	47 °C	49 °C	61 °C	117 °F	120 °F	142 °F	ASTM D648-16
Heat Deflection Temp. @ 0.45 MPa	55 °C	58 °C	76 °C	131 °F	136 °F	167 °F	ASTM D648-16

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%	0.6	Mineral oil (Heavy)	0.2
Acetone	8.9	Mineral oil (Light)	0.1
Bleach ~5% NaOCl	0.7	Salt Water (3.5% NaCl)	0.8
Butyl Acetate	0.5	Skydrol 5	1.0
Diesel Fuel	< 0.1	Sodium Hydroxide solution (0.025% PH 10)	0.8
Diethyl glycol Monomethyl Ether	3.1	Strong Acid (HCl conc)	0.5
Hydraulic Oil	0.2	Tripropylene glycol monomethyl ether	0.7
Hydrogen peroxide (3%)	0.9	Water	0.8
Isooctane (aka gasoline)	< 0.1	Xylene	0.2
Isopropyl Alcohol	0.8		

[1] Material properties may vary based on part geometry, print orientation, print settings, temperature, and disinfection or sterilization methods used.

[2] Data was obtained from green parts printed on a Form 4 printer with 100 µm Fast Model Resin settings, washed in a Form Wash for 5 minutes in ≥99% Isopropyl Alcohol, and air dried without post-cure.

[3] Data was obtained from parts printed on a Form 4 printer with 100 µm Fast Model Resin settings, washed in a Form Wash for 5 minutes in ≥99% Isopropyl Alcohol, and post-cured at room temperature for 5 minutes in a Form Cure.

[4] Data was obtained from parts printed on a Form 4 printer with 100 µm Fast Model Resin settings, washed in a Form Wash for 5 minutes in ≥99% Isopropyl Alcohol, and post-cured at 60°C for 15 minutes in a Form Cure.

[5] Fast Model Resin was tested at NAMSA World Headquarters, OH, USA.