

Raise3D Rigid 3K Grey V1 Resin Technical Data Sheet¹

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Material with high strength, rigidity and heat-resistance

Rigid 3K Resin is designed for stiff and strong parts where high strength, high rigidity and heat resistance are required. This material delivers excellent results in part accuracy as well as mechanical and thermal properties.

Features

- 3263 MPa Young's modulus
- 78 MPa tensile strength
- 97°C HDT @ 0.45 MPa
- 30 J/m Izod notched impact

Benefits

- High rigidity
- Excellent part strength
- Heat resistance
- Rigidity similar to glass fiber reinforced thermoplastic materials

Applications

- Robust prototypes
- Thin-wall parts
- Connectors
- Mounts and brackets

¹ The cover shows jigs.



Physical Properties

Property	Testing Method	Typical Value	
		Metric	Imperial
Appearance	/	Liquid, Grey	
Density (liquid resin)	ASTM D4052	1.148 g/cm ³	9.58 lb/gal
Density	ASTM D792	1.26 g/cm ³	10.52 lb/gal
Liquid Viscosity	ASTM D7867	515 cps@25°C	515 cps@77°F
Shore D Hardness	ASTM D2240	/	/

Mechanical Properties*

Property	Testing Method	Green		Post-Cured	
		Metric	Imperial	Metric	Imperial
Young's Modulus	ASTM D638	1766 MPa	256.13 ksi	3263 MPa	473.24 ksi
Tensile Strength	ASTM D638	38 MPa	5.51 ksi	78 MPa	11.31 ksi
Elongation at Break	ASTM D638	30%	30%	14%	14%
Flexural Modulus	ASTM D790	1278 MPa	185.35 ksi	3252 MPa	471.65 ksi
Flexural Strength	ASTM D790	52 MPa	7.54 ksi	139 MPa	20.166 ksi
Notched Izod	ASTM D256	24 J/m	0.45 ft-lbf/in	30 J/m	0.56 ft-lbf/in

***Note:**

All test specimens were printed with Raise3D DF2 printer (100µm thickness, 5.5s).

All post-cured test specimens were cured with DF Cure for 30 minutes per side at room temperature.

All specimens were conditioned in ambient lab conditions at 20-25 °C / 40-60% RH for 16 to 24 hours.

Test performance differs depending on part geometry, print placement orientation, print settings and temperature.

Thermal Properties*

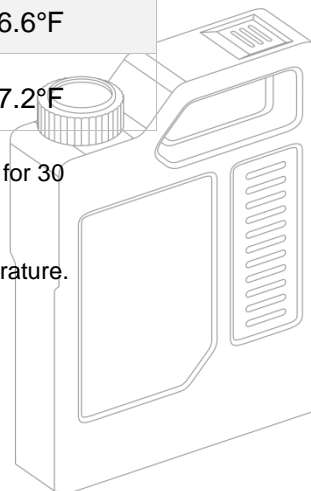
Property	Testing Method	Post-Cured	
		Metric	Imperial
Heat Deflection Temp. @0.45 MPa/66 psi	ASTM D648	97°C	206.6°F
Heat Deflection Temp. @1.82 MPa/264 psi	ASTM D648	64°C	147.2°F

***Note:**

All test specimens were printed with Raise3D DF2 printer (100µm thickness, 5.5s) and cured with DF Cure for 30 minutes per side at room temperature.

All specimens were conditioned in ambient lab conditions at 20-25 °C / 40-60% RH for 16 to 24 hours.

Test performance differs depending on part geometry, print placement orientation, print settings and temperature.



Workflow

Printer settings

Recommended to use the default printing profiles in ideaMaker.

Recommended printing parameters with Raise3D DF2 printer:

- ◆ Shake the resin bottle before usage
- ◆ Environmental conditions: 20-25 °C, 40-60% RH
- ◆ Power: 2 mW/cm² at 405 nm
- ◆ Layer thickness: 50 μm
- ◆ Normal layer curing time: 2.8s

Cleaning

Rigid 3K Grey V1 Resin requires cleaning to achieve ideal properties of printed part.

Support structures should be removed from the printed part, and the part should then be washed before post-curing.

Blow dry the part with compressed air/nitrogen to remove residual solvent from the surface. Or leave the part for a short time at room temperature to dry.

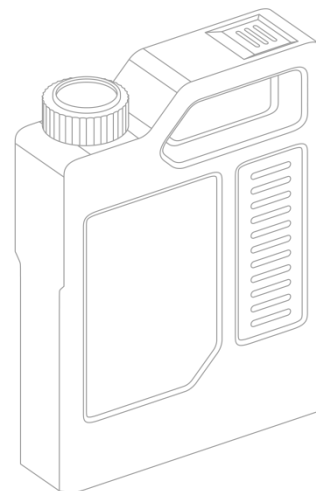
Post curing

After cleaning, Rigid 3K Grey V1 parts requires post curing to achieve optimal properties.

Recommended print parameters with Raise3D DF Cure:

- ◆ Intensity: 25 mW/cm² at 405 nm
- ◆ UV cure time: 30 min per side
- ◆ Cure temperature: Room temperature.

More printing information please read *Raise3D DF2 3D Printer User Manual*.



Testing Geometries

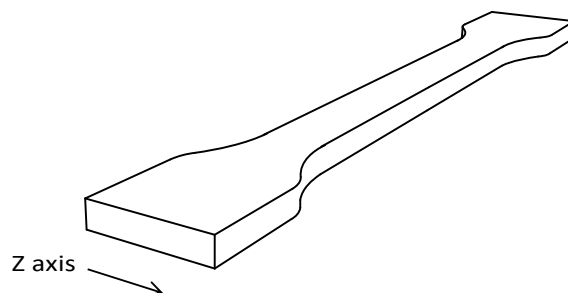
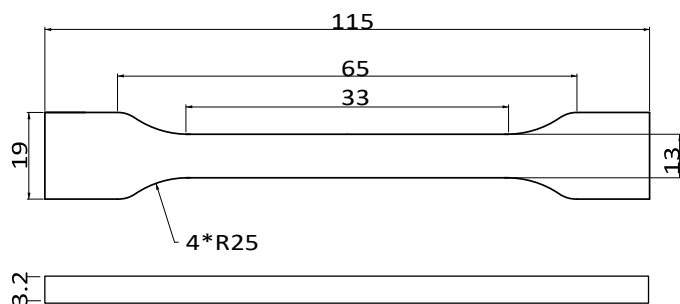


Fig 1. Tensile testing specimen

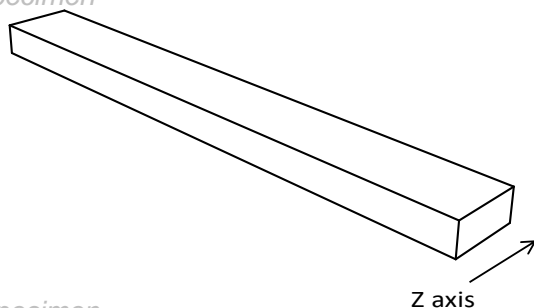
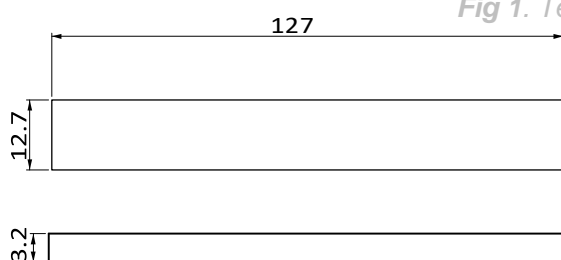


Fig 2. Flexural testing specimen

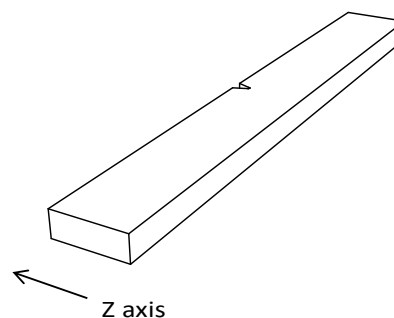
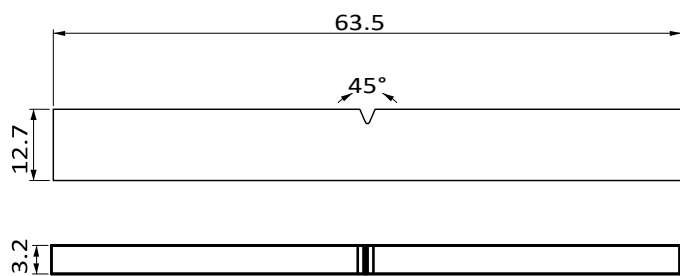


Fig 3. Impact testing specimen

Disclaimer

The typical values presented in this data sheet are intended for reference and comparison purposes only. They should not be used for design specifications or quality control purposes. Actual values may vary significantly with printing conditions. End-use performance of printed parts depends not only on materials, but also on part design, environmental conditions, printing conditions, etc. Product specifications are subject to change without notice.

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