formlabs

GENERAL PURPOSE RESIN

# **Black** Resin V5

## An optimally-balanced Black Resin for versatile applications

Black Resin V5 is an exceptionally rich, deep black General Purpose Resin, offering an optimal balance of fast print speed, high accuracy, presentation-ready appearance, strong mechanical properties, and an easy, reliable workflow.

Create parts that are stiff and strong with a surface finish that rivals injection molding. Black Resin V5 has a rich, matte color that captures fine features accurately.

Black Resin V5 is a new material formulation that leverages the Form 4 ecosystem to print three times faster than the previous version.

**Form and fit prototyping**

**Presentation-ready models with fine features and intricate details**

**Enclosures and housings**

**Jigs and fixtures**

V5 **FLGPBK05**

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| Material Properties | METRIC [1] | | | IMPERIAL [1] | | | METHOD |
|---|---|---|---|---|---|---|---|
| | Green | Post-Cured for 5 min at ambient temperature [2] | Post-Cured for 15 min at 60 °C [3] | Green | Post-Cured for 5 min at ambient temperature [2] | Post-Cured for 15 min at 140 °F [3] | |
| **Tensile Properties** | METRIC [1] | | | IMPERIAL [1] | | | METHOD |
| Ultimate Tensile Strength | 48 MPa | 57 MPa | 61 MPa | 6962 psi | 8267 psi | 8847 psi | ASTM D638-14 |
| Tensile Modulus | 2200 MPa | 2450 MPa | 2700 MPa | 319 ksi | 363 ksi | 388 ksi | ASTM D638-14 |
| Elongation at Break | 19% | 14% | 10% | 19% | 14% | 10% | ASTM D638-14 |
| **Flexural Properties** | METRIC [1] | | | IMPERIAL [1] | | | METHOD |
| Flexural Strength | 82 MPa | 91 MPa | 103 MPa | 11893 psi | 13198 psi | 14938 psi | ASTM D790-15 |
| Flexural Modulus | 2000 MPa | 2450 MPa | 2750 MPa | 290 ksi | 355 ksi | 399 ksi | ASTM D790-15 |
| **Impact Properties** | METRIC [1] | | | IMPERIAL [1] | | | METHOD |
| Notched Izod | 31 J/m | 29 J/m | | 0.580 ft-lb/in | 0.542 ft-lb/in | | ASTM D4812-11 |
| **Thermal Properties** | METRIC [1] | | | IMPERIAL [1] | | | METHOD |
| Heat Deflection Temp. @ 1.8 MPa | 54 °C | | 57 °C | 129 °F | | 135 °F | ASTM D648-16 |
| Heat Deflection Temp. @ 0.45 MPa | 61 °C | | 69 °C | 142 °F | | 156 °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% | 0.9 | Mineral oil (Heavy) | 0.2 |
| Acetone | 4.9 | Mineral oil (Light) | 0.2 |
| Bleach ~5% NaOCl | 0.7 | Salt Water (3.5% NaCl) | 0.8 |
| Butyl Acetate | 0.3 | Skydrol 5 | 0.5 |
| Diesel Fuel | 0.1 | Sodium Hydroxide solution (0.025% PH 10) | 0.8 |
| Diethyl glycol Monomethyl Ether | 1.0 | Strong Acid (HCl conc) | 0.5 |
| Hydraulic Oil | 0.2 | Tripropylene glycol monomethyl ether | 0.3 |
| Hydrogen peroxide (3%) | 0.9 | Water | 0.8 |
| Isooctane (aka gasoline) | < 0.1 | Xylene | < 0.1 |
| Isopropyl Alcohol | 0.3 | | |

[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 parts printed on a Form 4 printer with 100 µm Black Resin V5 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.

[3] Data was obtained from parts printed on a Form 4 printer with 100 µm Black Resin V5 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.