MATERIAL DATA SHEET

# Durable

## Durable Resin for Low Friction and Wear

With low modulus, high elongation, and high impact strength, Durable Resin produces parts with a smooth, glossy finish and high resistance to deformation. Use this material for applications requiring minimal friction.

- Consumer packaging
- Bushings and bearings
- Snap fits and flexures
- Living hinges

**FLDUCL02**

formlabs

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# Material Properties Data

| | METRIC[1] | | IMPERIAL[1] | | METHOD |
|---|---|---|---|---|---|
| | Green[2] | Post-Cured[3] | Green[2] | Post-Cured[3] | |
| **Tensile Properties** | | | | | |
| Ultimate Tensile Strength | 18.6 MPa | 31.8 MPa | 2.7 ksi | 4.61 ksi | ASTM D 638-10 |
| Tensile Modulus | 0.45 GPa | 1.26 GPa | 65.7 ksi | 183 ksi | ASTM D 638-10 |
| Elongation | 67 % | 49 % | 67 % | 49 % | ASTM D 638-10 |
| **Flexural Properties** | | | | | |
| Flexural Stress at 5% Strain | 4.06 MPa | 27.2 MPa | 0.59 ksi | 3.95 ksi | ASTM D 790-10, Procedure A |
| Flexural Modulus | 0.16 GPa | 0.82 GPa | 23.4 ksi | 119 ksi | ASTM D 790-10, Procedure A |
| **Impact Properties** | | | | | |
| Notched IZOD | 130.8 J/m | 109 J/m | 2.46 ft-lbf/in | 2.05 ft-lbf/in | ASTM D 256-10, Test Method A |
| **Temperature Properties** | | | | | |
| Heat Deflection Temp. @ 0.45 MPa | < 30 °C | 43.3 °C | < 86 °F | 110 °F | ASTM D 648-07, Method B |
| Thermal Expansion (23 to 50° C) | 117.0 µm/m/°C | 145.1 µm/m/°C | 65.0 µin/in/°F | 80.6 µin/in/°F | ASTM E831-14 |

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

[2] Data was obtained from green parts, printed using Form 2, 100 µm, Durable settings, without additional treatments.

[3] Data was obtained from parts printed using Form 2, 100 µm, Durable settings and post-cured with 2.5 mW/cm$^2$ of 405 nm LED light for 120 minutes at 60°C.

## 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 (%) | Mechanical Properties | 24 hr weight gain (%) |
|---|---|---|---|
| Acetic Acid, 5 % | 1.3 | Hydrogen Peroxide (3 %) | 1 |
| Acetone | sample cracked | Isooctane | < 1 |
| Isopropyl Alcohol | 5.1 | Mineral Oil, light | < 1 |
| Bleach, ~5 % NaOCl | < 1 | Mineral Oil, heavy | < 1 |
| Butyl Acetate | 7.9 | Salt Water (3.5 % NaCl) | < 1 |
| Diesel | < 1 | Sodium hydroxide (0.025 %, pH = 10) | < 1 |
| Diethyl glycol monomethyl ether | 7.8 | Water | < 1 |
| Hydrolic Oil | < 1 | Xylene | 6.5 |
| Skydrol 5 | 1.3 | Strong Acid (HCl Conc) | distorted |