
# formlabs ESD Resin Static Electronics Manufacturing Workflows User Guide



Contents



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**formlabs ESD Resin Static Electronics Manufacturing Workflows**

## Product Specifications

| Mechanical Properties | Metric | Imperial |
|---|---|---|
| Ultimate Tensile Strength | 44.2 MPa | 6410 psi |
| Tensile Modulus | 1.937 GPa | 280.9 ksi |
| Elongation at Break | 12% | |
| Flexural Strength | 61 MPa | 8860 psi |
| Flexural Modulus | 1.841 GPa | 267 ksi |
| Notched Izod | 26 J/m | 0.489 ft-lb/in |
| Unnotched Izod | 277 J/m | 5.19 ft-lb/in |
| Heat Deflection Temp. @ 1.8 MPa | | |
| Heat Deflection Temp. @ 0.45 MPa | | |
| **Thermal Expansion** | **Metric** | **Imperial** |

## Product Usage Instructions

**1. Applications:**

- Anti-static prototypes and end-use parts.
- Housings for sensitive electronics.
- Tooling, jigs, and fixtures for electronics manufacturing.

**Benefits:**

- IESD Resin is a rugged ESD-safe material that improves electronics manufacturing workflows by reducing the risk of static discharge and increasing manufacturing yield.

**Usage Recommendations:**

- Use ESD Resin to 3D print custom tools, jigs, and fixtures to protect critical electronics components from static discharge.
- Ensure proper post-curing for optimal material properties.

## Product Information

Reduce risk and increase manufacturing yield by 3D printing custom tools, jigs, and fixtures with ESD Resin that protect your critical electronics components from static discharge. ESD Resin is a cost-effective solution for producing static-dissipative parts designed to endure use on the factory floor. Anti-static prototypes and end-use parts Housings for sensitive electronics Tooling, jigs, and fixtures for electronics manufacturing.

## Material Properties

| **Material Properties** | **METRIC 1,2** | **IMPERIAL 1,2** | **METHOD** |
|---|---|---|---|
| | **Post-Cured** | **Post-Cured** | |
| **Mechanical Properties** | **METRIC 1,2** | **IMPERIAL 1,2** | **METHOD** |
| Ultimate Tensile Strength | 44.2 MPa | 6410 psi | ASTM D638-14 |
| Tensile Modulus | 1.937 GPa | 280.9 ksi | ASTM D638-14 |
| Elongation at Break | 12% | | ASTM D638-14 |
| **Flexural Properties** | **METRIC 1,2** | **IMPERIAL 1,2** | **METHOD** |
| Flexural Strength | 61 MPa | 8860 psi | ASTM D790-17 |
| Flexural Modulus | 1.841 GPa | 267 ksi | ASTM D790-17 |
| **Impact Properties** | **METRIC 1,2** | **IMPERIAL 1,2** | **METHOD** |
| Notched Izod | 26 J/m | 0.489 ft-lb/in | ASTM D256-10 |
| Unnotched Izod | 277 J/m | 5.19 ft-lb/in | ASTM D4812-11 |
| **Thermal Properties** | **METRIC 1,2** | **IMPERIAL 1,2** | **METHOD** |
| Heat Deflection Temp. @ 1.8 MPa | 54.2 °C | 129.6 °F | ASTM D648-18 |
| Heat Deflection Temp. @ 0.45 MP a | 62.2 °C | 143.9 °F | ASTM D648-18 |
| Thermal Expansion | 123.7 µm/m/°C | 68.7 µin/in/°F | ASTM E813-13 |
| **Electrical Properties** | **METRIC 1,2** | **IMPERIAL 1,2** | **METHOD** |
| Surface Resistivity | 105 – 108 Ω/sq | | ANSI/ESD 11.11 3 |
| Volume Resistivity | 105 – 107 Ω-cm | | ANSI/ESD 11.11 3 |
| **Physical Properties** | **METRIC 1,2** | **IMPERIAL 1,2** | **METHOD** |
| Density | 1.116 g/cm3 | 69.67 lb/ft3 | ASTM D792 |
| Hardness | 90 Shore D | | ASTM D2240 |

## 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% | 0.5 | Mineral oil, heavy | 0.1 |
| Acetone | 13.1 | Mineral oil, light | 0.1 |
| Bleach ~5% NaOCl | 0.5 | Salt Water (3.5% NaCl) | 0.6 |
| Butyl Acetate | 3.8 | Skydrol 5 | 0.5 |
| Diesel Fuel | 0.2 | Sodium hydroxide solution (0.025% p H = 10) | 0.7 |
| Diethyl glycol monomethyl ether | 3.6 | Strong Acid (HCl Conc) | 1.4 |
| Hydraulic Oil | 0.2 | TPM | 0.6 |
| Hydrogen peroxide (3%) | 0.6 | Water | 0.7 |
| Isooctane | < 0.1 | Xylene | 1.60 |
| Isopropyl Alcohol | 2.6 | | |

**More Information**

1. Material properties may vary based on part geometry, print orientation, print settings, temperature, and disinfection or sterilization methods used.
2. Data for post-cured samples were measured on Type IV tensile bars printed on a Form 3 printer with 100 µm ESD Resin settings, washed in a Form Wash for 20 minutes in ≥99% Isopropyl Alcohol, and post-cured at 70°C for X 60 minutes in a Form Cure.
3. ESD Resin was tested at ETS 700 West Park Avenue, Perkasie, PA 18944.

To the best of our knowledge the information contained herein is accurate. However, Formlabs, Inc. makes no warranty, expressed or implied, regarding the accuracy of these results to be obtained from the use thereof.

## FAQs

**Q: What applications is ESD Resin suitable for?**

- **A:** ESD Resin is suitable for anti-static prototypes, end-use parts, housings for sensitive electronics, and tooling, jigs, and fixtures for electronics manufacturing.

**Q: How can I ensure the best results when using ESD Resin?**

- **A:** To achieve optimal results, follow the recommended usage instructions provided in the user manual, ensure proper post-curing, and consider factors like part geometry, print orientation, print settings, temperature, and disinfection or sterilization methods used.

## Documents / Resources

| | |
|---|---|
|  | formlabs ESD Resin Static Electronics Manufacturing Workflows [pdf] User Guide<br>V1 FLESDS01, ESD Resin Static Electronics Manufacturing Workflows, ESD Resin, Static Electronics Manufacturing Workflows, Manufacturing Workflows, Workflows |

## References

- User Manual