# xESD - Nano-engineered ESD resin for Isotropic Static Dissipative Performance

xESD is a black, rigid, static-dissipative photopolymer resin using a urethane dimethacrylate base that includes a stable dispersion of discrete functionalized carbon nanotubes to achieve consistent static dissipative properties. This dispersion does not settle in xESD resin, resulting in consistent ESD-capable parts. The discrete nature of xESD also produces parts that leave no carbon trails and improves key mechanical properties such as tensile strength, modulus, and impact resistance. xESD is designed for use with LSPc®Technology and allows for high resolution part fabrication with isotropic static dissipative and mechanical properties.

## Part Properties

| | Metric | Imperial | Method |
|---|---|---|---|
| **Mechanical Properties** | | | |
| **Tensile Strength** | 68.1 MPa | 9880 psi | ASTM D 638-14 |
| **Tensile Modulus** | 2.6 GPa | 380 ksi | ASTM D 638-14 |
| **Yield Strength** | 40.6 MPa | 5880 psi | ASTM D 638-14 |
| **Elongation at Break** | 3.8 % | 3.8 % | ASTM D 638-14 |
| **Flexural Properties** | | | |
| **Flexural Strength** | 97.4 MPa | 14,100 psi | ASTM D 790-15* |
| **Flexural Modulus** | 1.8 GPa | 260 ksi | ASTM D 790-15* |
| **Impact Properties** | | | |
| **Notched IZOD** | 24 J/m | 0.45 ft-lbf/in | ASTM D 256-10 |
| **Hardness** | | | |
| **Shore "D"** | 87 | 87 | ASTM D 2240-15 |
| **Thermal Properties** | | | |
| **Heat Deflection @1.8MPa** | 91.4 °C | 196.5 °F | ASTM D 648-16 |
| **Heat Deflection @0.45MPa** | 91.3 °C | 196.3 °F | ASTM D 648-16 |
| **Electrical Properties** | | | |
| **Surface Resistance** | $10^7$ Ω | $10^7$ Ω | ASTM D 257 |

*Specimens did not yield or break within the 5% strain limit when tested by Procedure A, the increased strain was applied (Procedure B) to induce yield and/or break within the required 5% strain limit

## Resin Properties

| | Value | | |
|---|---|---|---|
| **Other Properties** | **Metric** | **Imperial** | **Condition** |
| **Water Absorption** | 0.9% | 0.9% | ASTM D 570-98 |
| **Density** | 1.1 g/cm$^3$ | 0.04 lbs/in$^3$ | 25°C |
| **Viscosity** | 878.1 cps | 878.1 cps | 25°C |

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