

RR355-100-SPC

Manufactured by Spectra photopolymers



Self-extinguishing halogen free material with favourable flame, smoke and toxicity ratings

- Custom jigs, fixtures, and replacement parts for industrial environments with high temperatures or ignition sources
- Interior parts in airplanes, automobiles, and railways with excellent surface finish
- Protective and internal consumer or medical electronics components



Effortlessly and rapidly produce robust, creep-resistant plastic components designed for long-term performance in indoor and industrial settings. RR355-100-SPC Resin is self-extinguishing and free of halogens, offering favourable flame, smoke, and toxicity (FST) ratings.

MATERIAL PROPERTIES DATA

RR355-100-SPC Resin

| Flammability 1, 2 | Result | | | Method |
|--|--------------|-------------|------------|--------|
| UL 94 | V-0 (3mm) | V-1 (2.5mm) | HB (1.5mm) | |
| FAR 25.853 Appendix F, Part I (a) (1) (ii)12 seconds Vertical Burn | Pass (2.5mm) | | | |

| Smoke Toxicity ^{3,4} | Result | | Method |
|---|--------------|------------|-----------|
| | Ds @ 1.5 min | Ds @ 4 min | |
| Smoke Generation: Flaming at 3mm thickness | 19.5 | 285 | ASTM E662 |
| Smoke Generation: Flaming at 5mm thickness | 5 | 114 | ASTM E662 |

| Gas Toxicity ^{3,4} | Result | | | | Method |
|-------------------------------|--------|--|--------------------------------|--|----------|
| Gas Toxicity at 3mm thickness | Pass | CO: 56 PPM HCN: 7 PPM SO2: <1 PPM (NO + NO2) NOx: <1 PPM | HCN: 7 PPM HF: <1 PPM | SO2: <1 PPM (NO + NO2) NOx: <1 PPM | BSS 7239 |

| METRIC ^{3, 5} | | IMPERIAL ^{3, 5} | | | METHOD | |
|------------------------|-------------------------|--------------------------|-------|-------------------------|--------------------------|--|
| | Post-Cured 70 °C 60m | Post-Cured 80 °C 120m | Green | Post-Cured 70 °C 60m | Post-Cured 80 °C 120m | |

Mechanical Properties 5, 6

| | | | | | | | |
|---------------------------|---------|---------|--------|---------|----------|----------|--------------|
| Ultimate Tensile Strength | 24 MPa | 38 MPa | 41 MPa | 3560 | 5590 psi | 5990 psi | ASTM D638-14 |
| Tensile Modulus | 1.8 GPa | 2.9 GPa | 3.1 | psi 263 | 430 ksi | 446 ksi | ASTM D638- |
| Elongation at Break | 20% | 9.4% | GPa | ksi | 9.40% | 7.10% | 14 ASTM |

| Flexural Properties | 7.1% | | 20% | | D638-14 | | |
|---------------------|---------|--------|--------|----------|-----------|-----------|------------|
| Flexural Strength | 36 MPa | 72 MPa | 75 MPa | 5280 psi | 10500 psi | 10900 psi | ASTM D790- |
| Flexural Modulus | 1.3 GPa | 2.7 | 2.7 | 188 ksi | 392 ksi | 401 ksi | 15 ASTM |

| Impact Properties | GPa | | GPa | | D790-15 | | |
|-------------------|-----|---------|---------|-------------|-------------|-------------|--------------|
| Notched Izod19 | J/m | 22 J/m | 22 J/m | 0.36 ft- | 0.41 ft- | 0.42 ft- | ASTM D256-10 |
| Unnotched Izod227 | J/m | 241 J/m | 257 J/m | lbs/in 4.26 | lbs/in 4.51 | lbs/in 4.82 | ASTM D4812- |

| Fracture Properties | ft-lbs/in | | ft-lbs/in | | ft-lbs/in | | 11 |
|--|-----------------------------|-----------------------------|-----------|-----------------------------|------------------------------|--|----------------------------------|
| Maximum Stress Intensity Factor (Kmax) | 1.05 MPa · m ^{1/2} | 1.11 MPa · m ^{1/2} | | 956 psi · in ^{3/2} | 1009 psi · in ^{3/2} | | ISO 20795-1:2013(E), Section 8.6 |
| Work of Fracture (Wf) | 311 J/m ² | 277 J/m ² | | 21 ft-lbs/ft ² | 19 ft-lbs/ft ² | | ISO 20795-1:2013(E), Section 8.6 |

Thermal Properties

| | | | | | | | |
|---|--------|-------------|-------------|--------|---------------|---------------|--|
| Heat Deflection Temp. @ 1.8 MPa | 45 °C | 71 °C | 83 °C | 113 °F | 160 °F | 181 °F | ASTM D648-16 |
| Heat Deflection Temp. @ 0.45 MPa | 55 °C | 94 °C | 111 °C | 131 °F | 201 °F | 232 °F | ASTM D648-16 |
| Coefficient of Thermal Expansion, 20°- 80°C | | 98.6 μm/m°C | 68.1 μm/m°C | | 54.8 μin/in°F | 37.8 μin/in°F | ASTM E813-13 |
| Glass Transition Temperature (Tg) | 101 °C | 130 °C | 144 °C | 214 °F | 266 °F | 291 °F | Peak of tan delta, Heating Rate: 3°Cpm |

MATERIAL PROPERTIES DATA

RR355-100-SPC Resin

| General Properties | Result | Method |
|--------------------|-------------------------------|--------------|
| Hardness | Green: 74D Post Cured: 80D | ASTM D2240 |
| Bulk Density | 1.25 g/cm ³ | ASTM D792-20 |
| Viscosity (25 °C) | 4500 - 5000 cP | |
| Color | Light grey | |

| Electrical Properties ² | Result | Method |
|------------------------------------|-------------------------------|--------------------|
| Dielectric Strength | 15.1 kV/mm | ASTM D149 |
| Dielectric Constant | 3.83 | ASTM D150, 0.5 MHz |
| Dielectric Constant | 3.82 | ASTM D150, 1.0 MHz |
| Dissipation Factor | 0.024 | ASTM D150, 0.5 MHz |
| Dissipation Factor | 0.025 | ASTM D150, 1 MHz |
| Volume Resistivity | 2.1 x 10 ¹⁵ ohm-cm | ASTM D257 |

| Outgassing ^{3,5} | Result | Method |
|--|---|-----------|
| Total Mass Loss and Collected Volatile Condensable Materials from Outgassing in a Vacuum Environment | Pass Total Mass Loss (TML): 0.87% Collected Volatile Condensable Material (CVCM): <0.01% Water Vapor Recovered (WVR): 0.2% | ASTM E595 |

SOLVENT COMPATIBILITY 3

RR355-100-SPC Resin

Percent weight gain over 24 hours for a printed and post-cured 1 x 1 x 1 cm cube immersed in respective solvent:

| Cleaning Chemicals | 24 hr weight gain, % |
|---------------------------|-----------------------------|
| Acetone | 2.1 |
| Bleach ~5% NaOCl | 0.3 |
| Windex Powerized Formula | 0.3 |
| Hydrogen Peroxide (30%) | 1 |
| Soapy water | 0.2 |
| TPM | 0.1 |
| Distilled Water | 0.2 |

Strong Acid/Base/Alcohol

| | |
|---|---------------|
| Hydrochloric Acid (10%) | < 0.1 |
| Sodium Hypochlorite Solution | < 0.1 |
| Sodium hydroxide solution (0.025% pH = 10) Salt | 0.3 |
| Water (3.5% NaCl) | 0.2 |
| Isopropyl Alcohol | 0.2 |
| Hydrogen peroxide (3%) | 0.2 |
| Butyl Acetate | 0.4 |
| Sulfuric Acid (30%) | Disintegrated |

Industrial Fluids

| | |
|---|-------|
| Gasoline ISO 1817, liquid C | < 0.1 |
| Transmission Fluid (Havoline Synthetic ATF) | < 0.1 |
| Engine Oil (Havoline SAE 5W-30) | < 0.1 |
| Brake Fluid (Castrol DOT-4) | < 0.1 |
| Diesel (Chevron #2) | < 0.1 |
| Power Steering Fluid | < 0.1 |
| Skydrol 5 | < 0.1 |
| Hydraulic Oil | < 0.1 |
| Diethyl glycol monomethyl ether | 0.3 |
| Mineral oil, heavy | < 0.1 |
| Mineral oil, light | < 0.1 |