

Radel® R-5100

polyphenylsulfone

Radel® R-5100 is an opaque, general purpose polyphenylsulfone (PPSU) for injection molding, that offers exceptional hydrolytic stability, and toughness superior to other commercially-available, high-temperature engineering resins. This resin also offers a high deflection temperature and outstanding resistance to environmental stress cracking. Radel® polymers are inherently flame retardant, provide excellent thermal stability and possess good electrical properties.

- Black: Radel® R-5100 BK937
- Bone: Radel® R-5100 NT15
- Grey: Radel® R-5100 GY1137
- Grey: Radel® R-5100 GY1037
- Grey: Radel® R-5100 GY874
- Red: Radel® R-5100 RD1018
- Orange: Radel® R-5100 OR1145
- Yellow: Radel® R-5100 YL1337
- Green: Radel® R-5100 GN1007
- Blue: Radel® R-5100 BU1027
- Violet: Radel® R-5100 VT2582
- Brown: Radel® R-5100 BN1164

General

| | | |
|---------------------------|---|--|
| Material Status | • Commercial: Active | |
| Availability | • Asia Pacific • Europe | • Latin America • North America |
| Filler / Reinforcement | • Filler | |
| Features | • Acid Resistant • Autoclave Sterilizable • Base Resistant • Biocompatible • Chemical Resistant • E-beam Sterilizable • Ethylene Oxide Sterilizable • Flame Retardant • General Purpose • Good Sterilizability • Good Thermal Stability | • Heat Sterilizable • High ESCR (Stress Crack Resist.) • High Heat Resistance • Hydrolytically Stable • Radiation (Gamma) Resistant • Radiation Sterilizable • Radiotranslucent • Steam Resistant • Steam Sterilizable • Ultra High Toughness |
| Uses | • Aerospace Applications • Aircraft Applications • Connectors • Dental Applications • Food Service Applications | • Hospital Goods • Medical Devices • Medical/Healthcare Applications • Plumbing Parts • Surgical Instruments |
| Agency Ratings | • FAA FAR 25.853a • ISO 10993 ¹ | • NSF STD-51 ² • NSF STD-61 ³ |
| RoHS Compliance | • RoHS Compliant | |
| Automotive Specifications | • ASTM D6394 SP0312 | |
| Appearance | • Black • Colors Available | • Light Beige • Opaque |
| Forms | • Pellets | |
| Processing Method | • Blow Molding • Extrusion • Film Extrusion • Injection Molding | • Machining • Profile Extrusion • Sheet Extrusion • Thermoforming |

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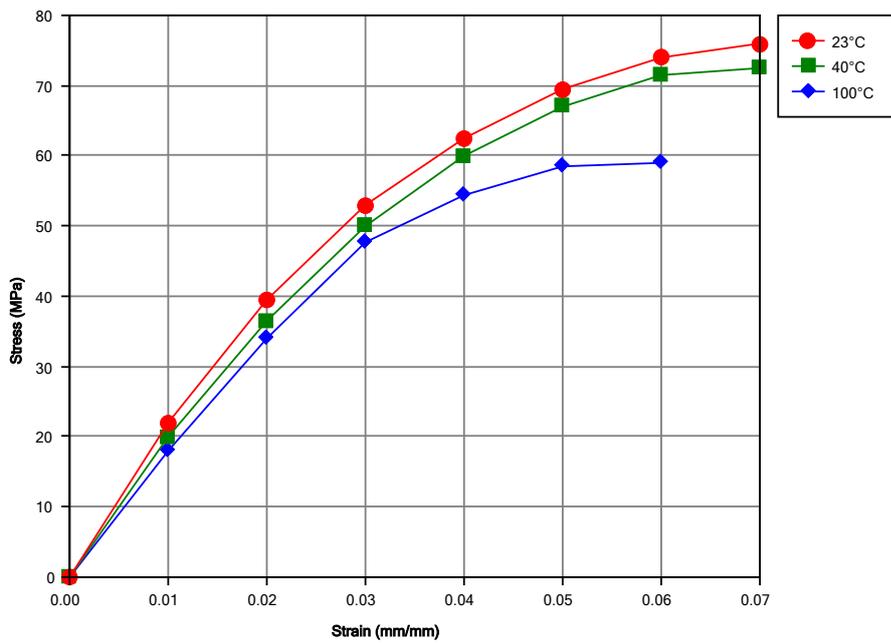
polyphenylsulfone

| Physical | Typical Value | Unit | Test method |
|-------------------------------------|---------------|-------------------|-------------|
| Density / Specific Gravity | 1.30 | | ASTM D792 |
| Melt Mass-Flow Rate (MFR) | 14 to 20 | g/10 min | ASTM D1238 |
| Molding Shrinkage - Flow | 0.70 | % | ASTM D955 |
| Water Absorption (24 hr) | 0.37 | % | ASTM D570 |
| Mechanical | Typical Value | Unit | Test method |
| Tensile Modulus | 2340 | MPa | ASTM D638 |
| Tensile Strength | | | ASTM D638 |
| Yield | 69.6 | MPa | |
| Break | 69.6 | MPa | |
| Tensile Elongation | | | ASTM D638 |
| Yield | 7.2 | % | |
| Break | 60 | % | |
| Flexural Modulus | 2410 | MPa | ASTM D790 |
| Flexural Strength (Yield) | 91.0 | MPa | ASTM D790 |
| Compressive Modulus | 1730 | MPa | ASTM D695 |
| Compressive Strength | 98.9 | MPa | ASTM D695 |
| Shear Strength | 62.7 | MPa | ASTM D732 |
| Poisson's Ratio | 0.42 | | ASTM E132 |
| Impact | Typical Value | Unit | Test method |
| Notched Izod Impact | 690 | J/m | ASTM D256 |
| Unnotched Izod Impact | No Break | | ASTM D256 |
| Tensile Impact Strength | 399 | kJ/m ² | ASTM D1822 |
| Thermal | Typical Value | Unit | Test method |
| Deflection Temperature Under Load | | | ASTM D648 |
| 0.45 MPa, Unannealed | 214 | °C | |
| 1.8 MPa, Unannealed | 207 | °C | |
| Glass Transition Temperature | 220 | °C | ASTM E1356 |
| CLTE - Flow | 5.6E-5 | cm/cm/°C | ASTM D696 |
| Thermal Conductivity | 0.35 | W/m/K | ASTM C177 |
| Electrical | Typical Value | Unit | Test method |
| Volume Resistivity | 9.0E+15 | ohms·cm | ASTM D257 |
| Dielectric Strength | 14 | kV/mm | ASTM D149 |
| Dielectric Constant | | | ASTM D150 |
| 60 Hz | 3.44 | | |
| 1 kHz | 3.40 | | |
| Flammability | Typical Value | Unit | Test method |
| Flame Rating ⁴ | | | UL 94 |
| 0.75 mm, ALL colors, UL file E36098 | V-0 | | |
| Oxygen Index | 38 | % | ASTM D2863 |
| Optical | Typical Value | Unit | Test method |
| Refractive Index | 1.672 | | ASTM D542 |

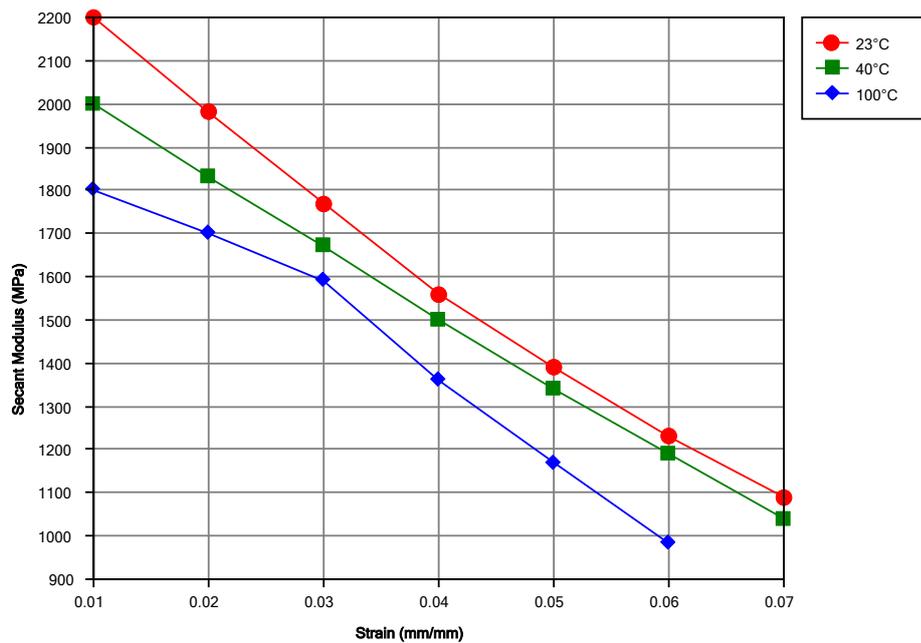
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| Injection | Typical Value | Unit |
|-------------------------|----------------|------|
| Drying Temperature | 149 | °C |
| Drying Time | 2.5 | hr |
| Suggested Max Moisture | 0.050 | % |
| Rear Temperature | 321 | °C |
| Middle Temperature | 349 | °C |
| Front Temperature | 349 | °C |
| Processing (Melt) Temp | 343 to 388 | °C |
| Mold Temperature | 138 to 163 | °C |
| Back Pressure | 0.345 to 0.689 | MPa |
| Screw Compression Ratio | 2.2:1.0 | |



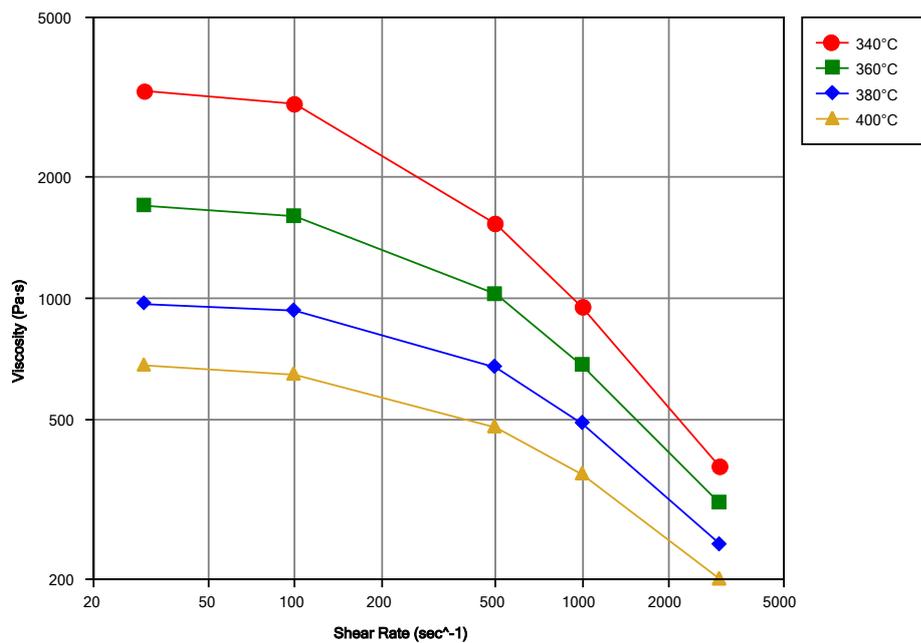
Secant Modulus vs. Strain (ISO 11403-1)



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Viscosity vs. Shear Rate (ISO 11403-2)



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Notes

Typical properties: these are not to be construed as specifications.

¹ For limited exposure (less than 24 hours).

² NSF STD-51 compliant for NT15 only.

³ NSF STD-61 compliant for BK937, NT15 and GY1037 only. Tested at 82 °C (180 °F) (Commercial Hot).

⁴ These flammability ratings are not intended to reflect hazards presented by these or any other materials under actual fire conditions.



Safety Data Sheets (SDS) are available by emailing us or contacting your sales representative. Always consult the appropriate SDS before using any of our products.

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