

# 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	<ul style="list-style-type: none"> <li>• Acid Resistant</li> <li>• Autoclave Sterilizable</li> <li>• Base Resistant</li> <li>• Biocompatible</li> <li>• Chemical Resistant</li> <li>• E-beam Sterilizable</li> <li>• Ethylene Oxide Sterilizable</li> <li>• Flame Retardant</li> <li>• General Purpose</li> <li>• Good Sterilizability</li> <li>• Good Thermal Stability</li> </ul>	<ul style="list-style-type: none"> <li>• Heat Sterilizable</li> <li>• High ESCR (Stress Crack Resist.)</li> <li>• High Heat Resistance</li> <li>• Hydrolytically Stable</li> <li>• Radiation (Gamma) Resistant</li> <li>• Radiation Sterilizable</li> <li>• Radiotranslucent</li> <li>• Steam Resistant</li> <li>• Steam Sterilizable</li> <li>• Ultra High Toughness</li> </ul>
Uses	<ul style="list-style-type: none"> <li>• Aerospace Applications</li> <li>• Aircraft Applications</li> <li>• Connectors</li> <li>• Dental Applications</li> <li>• Food Service Applications</li> </ul>	<ul style="list-style-type: none"> <li>• Hospital Goods</li> <li>• Medical Devices</li> <li>• Medical/Healthcare Applications</li> <li>• Plumbing Parts</li> <li>• Surgical Instruments</li> </ul>
Agency Ratings	<ul style="list-style-type: none"> <li>• FAA FAR 25.853a</li> <li>• ISO 10993<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>• NSF STD-51<sup>2</sup></li> <li>• NSF STD-61<sup>3</sup></li> </ul>
RoHS Compliance	• RoHS Compliant	
Automotive Specifications	• ASTM D6394 SP0312	
Appearance	<ul style="list-style-type: none"> <li>• Black</li> <li>• Colors Available</li> </ul>	<ul style="list-style-type: none"> <li>• Light Beige</li> <li>• Opaque</li> </ul>
Forms	• Pellets	
Processing Method	<ul style="list-style-type: none"> <li>• Blow Molding</li> <li>• Extrusion</li> <li>• Film Extrusion</li> <li>• Injection Molding</li> </ul>	<ul style="list-style-type: none"> <li>• Machining</li> <li>• Profile Extrusion</li> <li>• Sheet Extrusion</li> <li>• Thermoforming</li> </ul>

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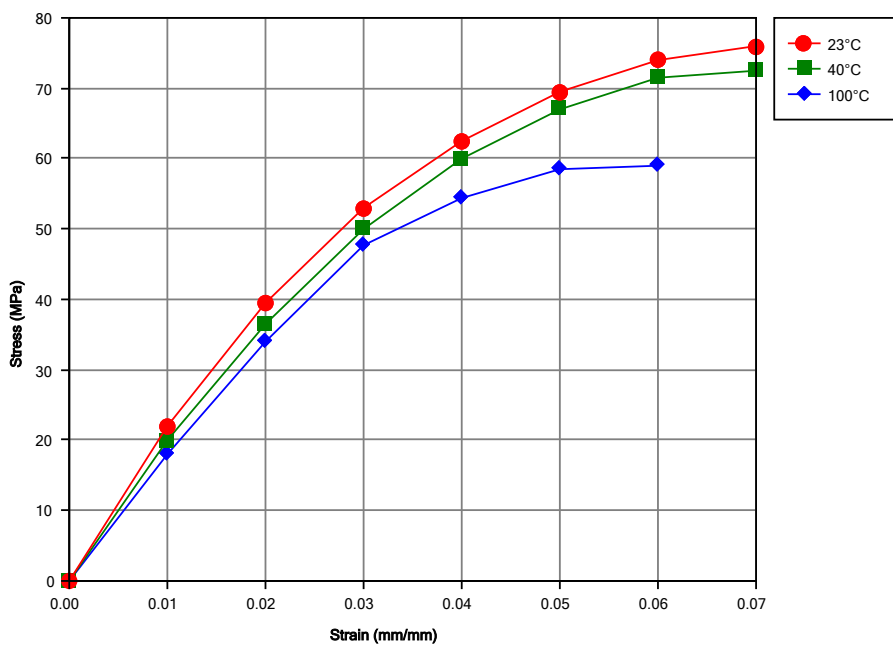
Physical	Typical Value	Unit	Test method
Density / Specific Gravity	1.30		ASTM D792
Melt Mass-Flow Rate (MFR)	14 to 20	g/10 min	ASTM D1238
Molding Shrinkage - Flow	0.70	%	ASTM D955
Water Absorption (24 hr)	0.37	%	ASTM D570
Mechanical	Typical Value	Unit	Test method
Tensile Modulus	2340	MPa	ASTM D638
Tensile 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 <sup>2</sup>	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 <sup>4</sup>			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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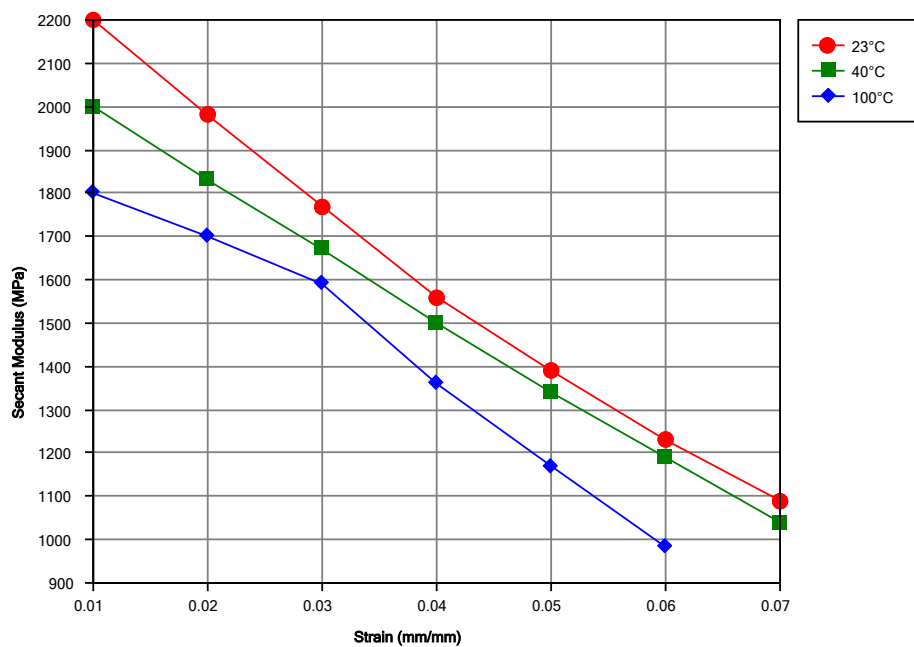
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Injection	Typical Value	Unit
Drying Temperature	149	°C
Drying Time	2.5	hr
Suggested Max Moisture	0.050	%
Rear Temperature	321	°C
Middle Temperature	349	°C
Front Temperature	349	°C
Processing (Melt) Temp	343 to 388	°C
Mold Temperature	138 to 163	°C
Back Pressure	0.345 to 0.689	MPa
Screw Compression Ratio	2.2:1.0	



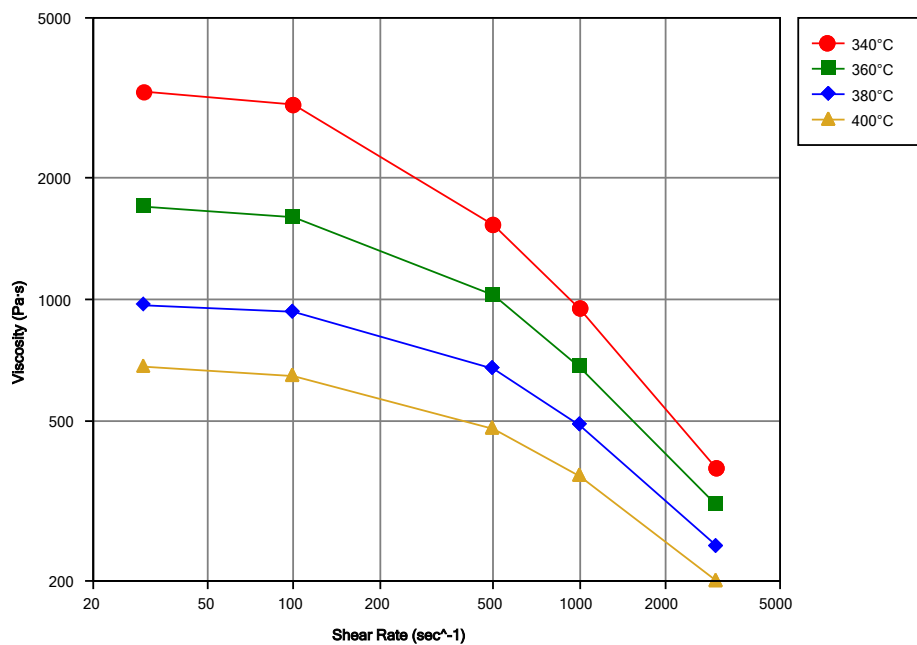
Secant Modulus vs. Strain (ISO 11403-1)



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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.

<sup>1</sup> For limited exposure (less than 24 hours).

<sup>2</sup> NSF STD-51 compliant for NT15 only.

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

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

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