

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.

Additional Radel grades include a transparent injection molding grade (R-5000) and a transparent extrusion grade (R-5500).

- Black: Radel R-5100 BK 937
- White: Radel R-5100 NT 15
- Various Opaque Colors

General

Material Status	• Commercial: Active		
Availability	• Asia Pacific • Europe	• North America • South America	
Filler / Reinforcement	• Unspecified Filler\Reinfor.		
Features	• Acid Resistant • Autoclave Sterilizable • Base Resistant • Biocompatible • E-beam Sterilizable • Ethylene Oxide Sterilizable • Flame Retardant	• General Purpose • Good Chemical Resistance • 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 Appliances • Medical/Healthcare Applications	• Plumbing Parts • Surgical Instruments
Agency Ratings	• FAA FAR 25.853a • ISO 10993 ¹	• ISO 10993-Part 1 • NSF 51 ²	• NSF 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

Physical

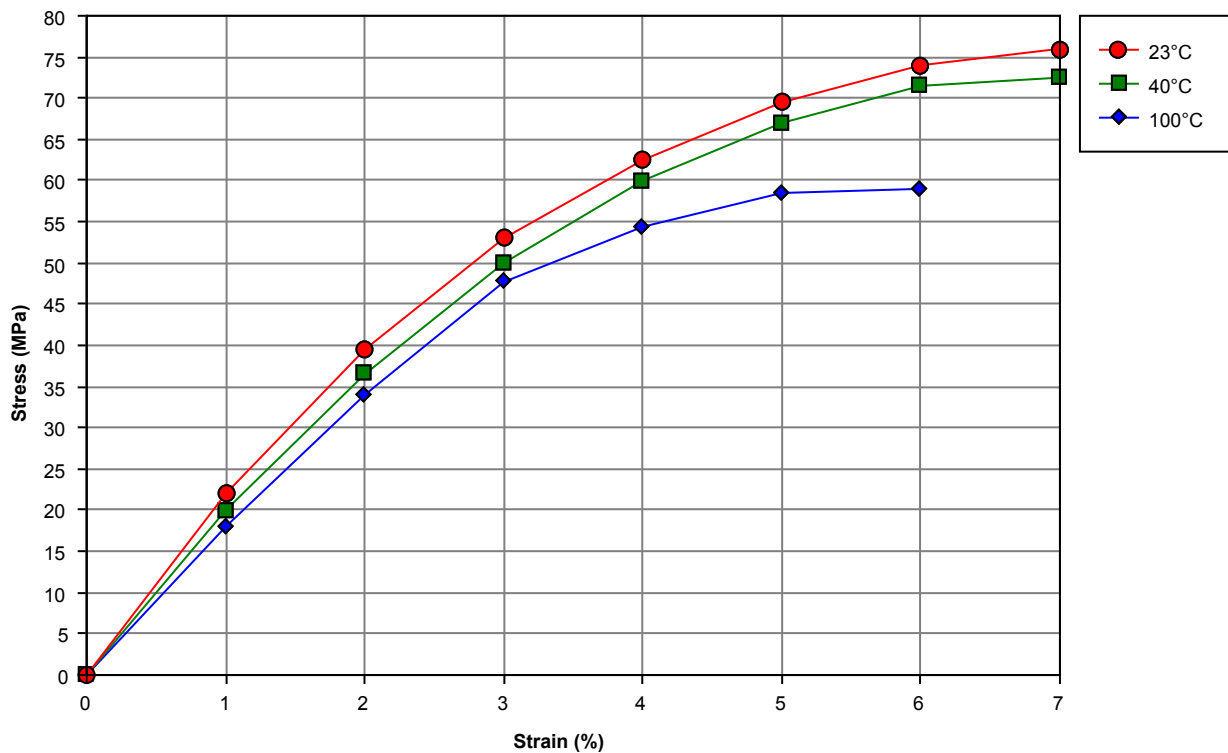
	Typical Value Unit	Test Method
Specific Gravity	1.30 g/cm ³	ASTM D792
Melt Mass-Flow Rate (MFR)	14 to 20 g/10 min	ASTM D1238
Molding Shrinkage - Flow	0.70 %	ASTM D955
Water Absorption (24 hr)	0.37 %	ASTM D570

Mechanical

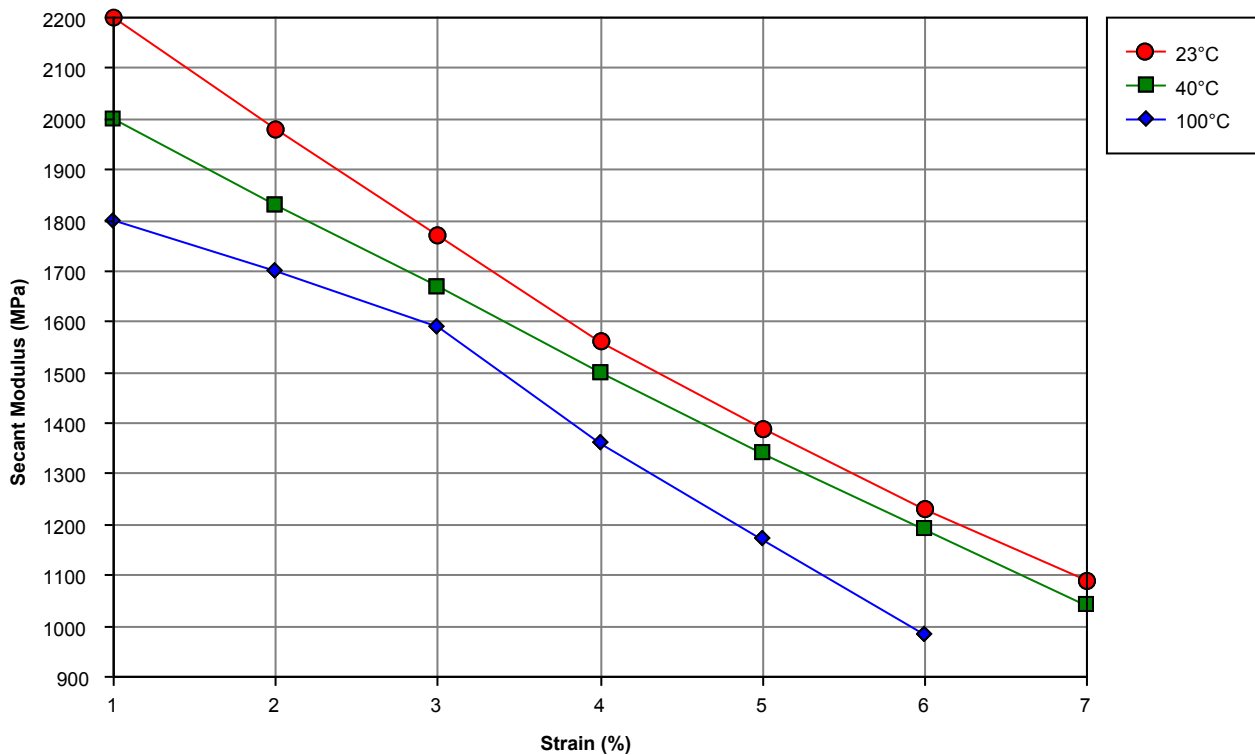
	Typical Value Unit	Test Method
Tensile Modulus	2340 MPa	ASTM D638

Mechanical	Typical Value	Unit	Test Method
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	0.000056	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	ohm·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 - UL ⁴ (1.57 mm)	V-0		UL 94
Oxygen Index	38	%	ASTM D2863
Optical	Typical Value	Unit	Test Method
Refractive Index	1.672		ASTM D542
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		

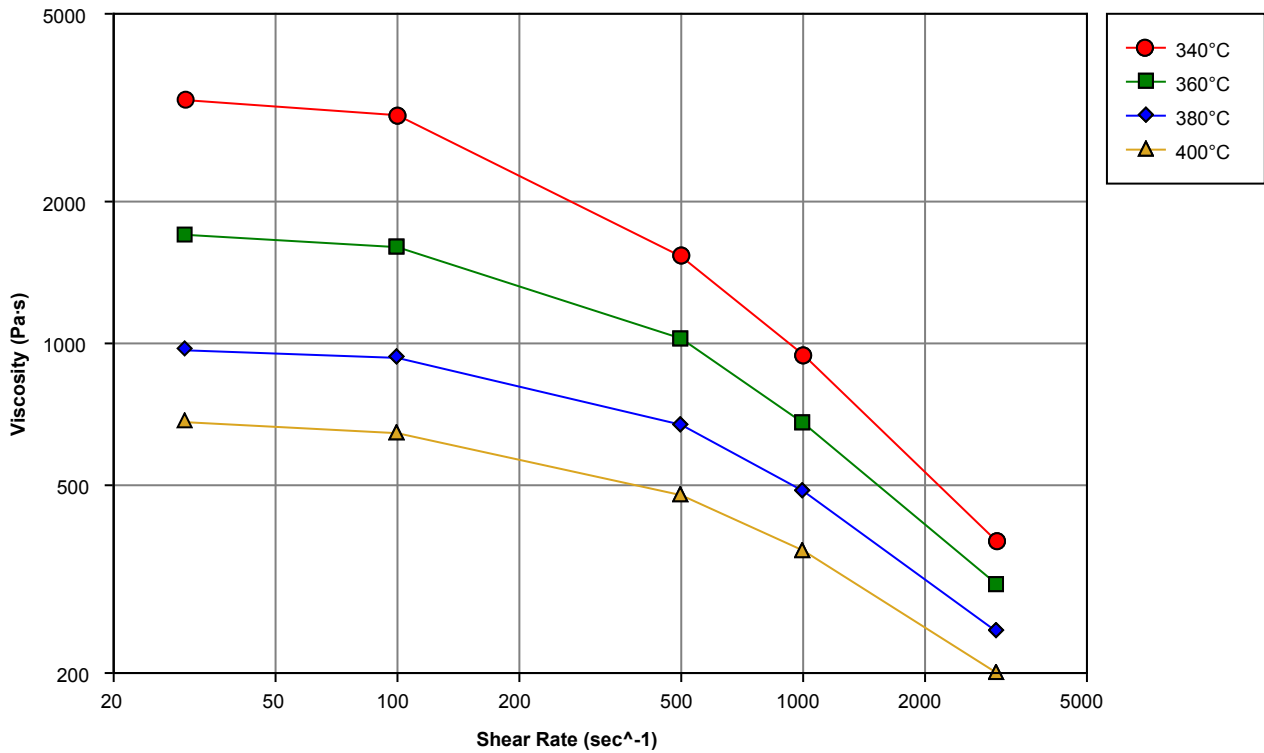
Isothermal Stress vs. Strain (ISO 11403-1)



Secant Modulus vs. Strain (ISO 11403-1)



Viscosity vs. Shear Rate (ISO 11403-2)



Notes

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

¹ For limited exposure (less than 24 hours).

² Maximum Temperature of Use: 190°C (375°F)

³ 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.

www.SolvaySpecialtyPolymers.com

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For assistance with an emergency involving this product, such as spill, leak, fire or explosion, call day or night:

Emergency Health Information

USA +1.800.621.4590

International +1.770.772.8577

Emergency Spill Information

USA +1.800.424.9300

+1.703.527.3887 (CHEMTREC)

Europe +44.208.762.8322 (CARECHEM)

China +86.10.5100.3039

All other Asian countries +65.633.44.177

For additional product information, technical assistance and Material Safety Data Sheets (MSDS), call:

USA + 1.800.621.4557 / +1.770.772.8760

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Japan +81.3.5425.4300

China & Southeast Asia +86.21.5080.5080

Material Safety Data Sheets (MSDS) for products of Solvay Specialty Polymers are available upon request from your sales representative or by emailing us at specialtypolymers@solvay.com. Always consult the appropriate MSDS before using any of our products.

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