



## 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
- Blue: Radel® R-5100 BU1027

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### 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 <sup>1</sup>	• NSF STD-51 <sup>2</sup> • NSF STD-61 <sup>3</sup>	
RoHS Compliance	• RoHS Compliant		
Automotive Specifications	• ASTM D6394 SP0312 <sup>4</sup>		
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	Dry	Conditioned	Unit	Test method
Density / Specific Gravity	1.30	--		ASTM D792
Melt Mass-Flow Rate (MFR)	17	--	g/10 min	ASTM D1238
Molding Shrinkage				
Flow	0.70	--	%	ASTM D955
Across Flow	0.74	--	%	ISO 294-4
Flow	0.58	--	%	ISO 294-4
Water Absorption				
24 hr	0.37	--	%	ASTM D570
24 hr, 23°C	0.57	--	%	ISO 62
Saturation, 23°C	1.2	--	%	Internal Method
Equilibrium, 23°C, 50% RH	0.080	--	%	Internal Method

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Mechanical	Dry	Conditioned	Unit	Test method
Tensile Modulus				
--	2340	--	MPa	ASTM D638
--	2370	2370	MPa	ISO 527-2
Tensile Strength				
Yield	69.6	--	MPa	ASTM D638
Break	69.6	--	MPa	ASTM D638
--	76.4	74.1	MPa	ISO 527-2
Tensile Elongation				
Yield	7.2	--	%	ASTM D638
Break	60	--	%	ASTM D638
Break	7.4	7.6	%	ISO 527-2
Flexural Modulus				
--	2410	--	MPa	ASTM D790
--	2340	--	MPa	ISO 178
Flexural Stress				
--	75.0	--	MPa	ISO 178
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	Dry	Conditioned	Unit	Test method
Charpy Notched Impact Strength	56	53	kJ/m <sup>2</sup>	ISO 179
Charpy Unnotched Impact Strength	No Break	No Break		ISO 179
Notched Izod Impact	690	--	J/m	ASTM D256
Unnotched Izod Impact	No Break	--		ASTM D4812
Tensile Impact Strength	399	--	kJ/m <sup>2</sup>	ASTM D1822
Thermal	Dry	Conditioned	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	Dry	Conditioned	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	--		
Comparative Tracking Index	--	160	V	IEC 60112

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Flammability	Dry	Conditioned	Unit	Test method
Flame Rating				UL 94
0.75 mm, ALL colors, UL file E36098 <sup>5</sup>	V-0	--		
0.8 mm	V-0	--		
Oxygen Index	38	--	%	ASTM D2863

Optical	Dry	Conditioned	Unit	Test method
Refractive Index	1.672	--		ASTM D542

Injection	Dry	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

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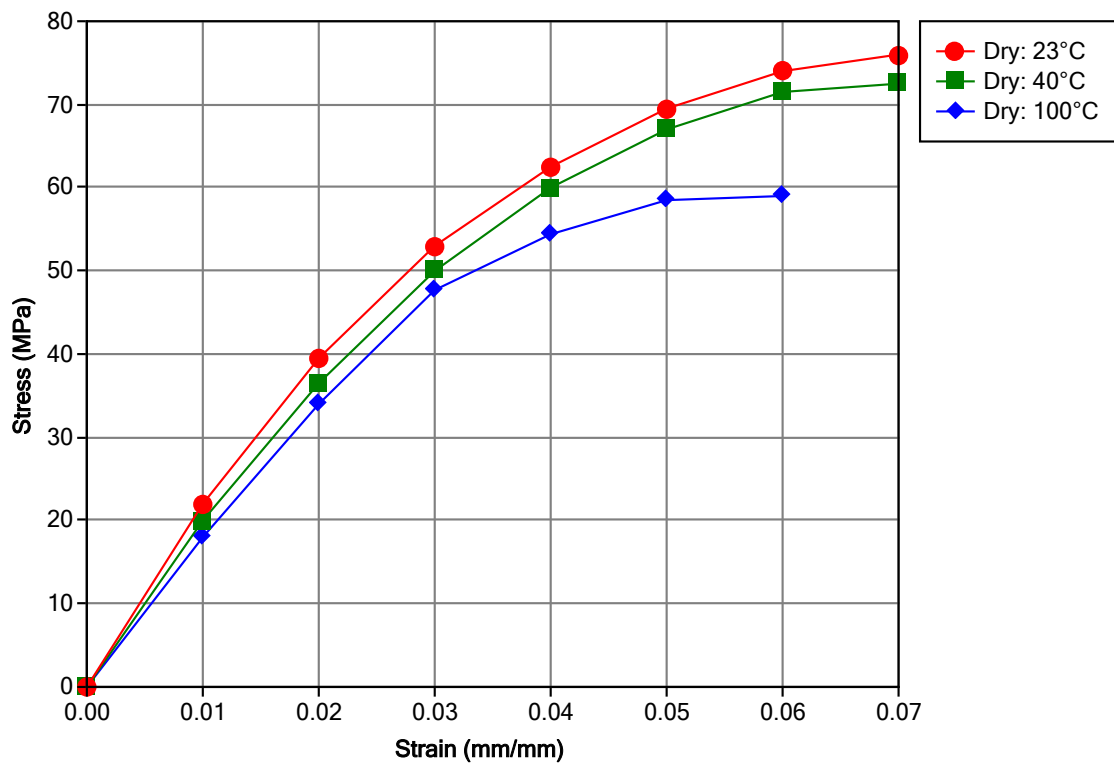
Injection

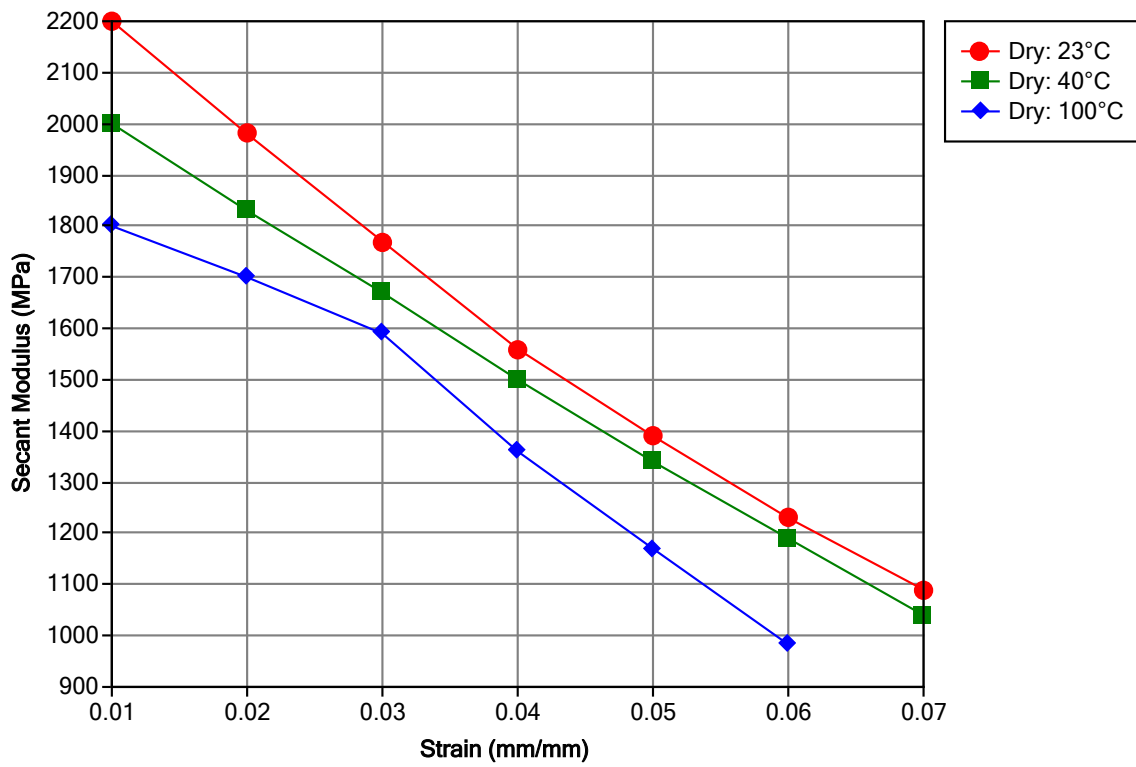
Dry Unit

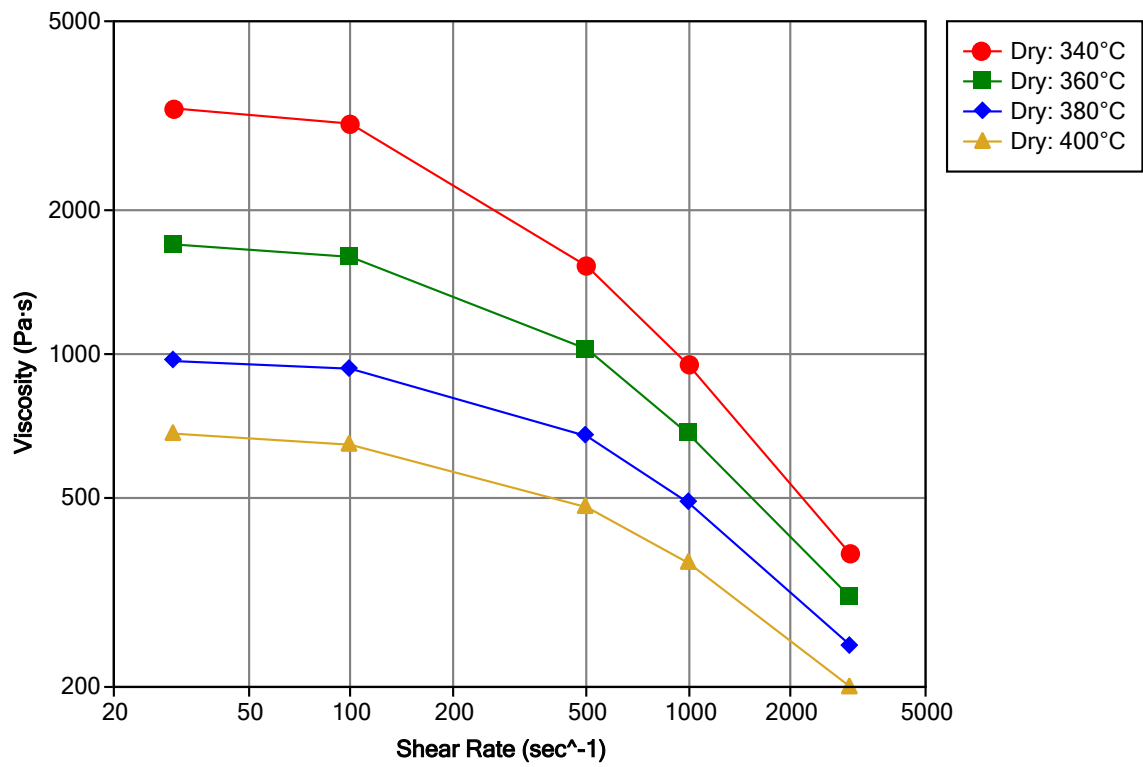
Screw Compression Ratio

2.2:1.0

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## Notes

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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> Latest version of the standard applies.

<sup>5</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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