Radel® R-5100
polyphenylsulfone

Radel® R-5100 is a 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. Transparent and opaque colors are available.

Transparent Grades:
- Natural: Radel® R-5100 NT

Opaque Grades:
- Black: Radel® R-5100 BK 937
- Black: Radel® R-5100 BK 937 LF
- Bone: Radel® R-5100 NT 15
- Grey: Radel® R-5100 GY N7
- Grey: Radel® R-5100 GY 874
- Grey: Radel® R-5100 GY 1037
- Grey: Radel® R-5100 GY 1037 LF
- Grey: Radel® R-5100 GY 1137
- Grey: Radel® R-5100 GY 7016
- Blue: Radel® R-5100 BU 1027
- Blue: Radel® R-5100 BU 1197

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 [4]	
Appearance	• Black • Colors Available	• Light Beige • Opaque
Forms	• Pellets	

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General

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)	16	--	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

Mechanical	Dry	Conditioned	Unit	Test method
Tensile Modulus				
--	2340	--	MPa	ASTM D638
--	2370	2370	MPa	ISO 527-1
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

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Impact	Dry	Conditioned	Unit	Test method
Charpy Notched Impact Strength	56	53	kJ/m²	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/m²	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

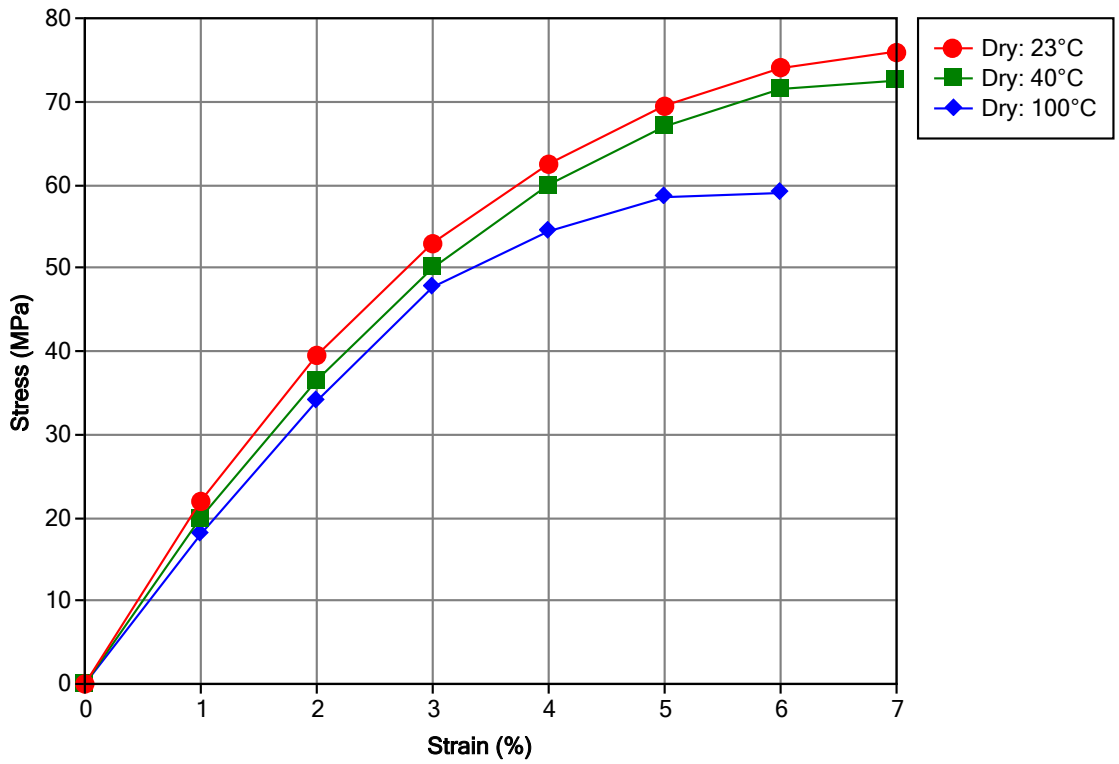
Electrical	Dry	Conditioned	Unit	Test method
Volume Resistivity	9.0E+15	--	ohms·cm	ASTM D257
Dielectric Strength	14	--	kV/mm	ASTM D149
Dielectric Constant				ASTM D150
60 Hz	3.44	--		
1 kHz	3.40	--		
Comparative Tracking Index	--	160	V	IEC 60112

Flammability	Dry	Conditioned	Unit	Test method
Flame Rating				UL 94
0.75 mm, ALL colors, UL file E36098 [5]	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
Screw Compression Ratio	2.2:1.0	

Isothermal Stress vs. Strain (ISO 11403)



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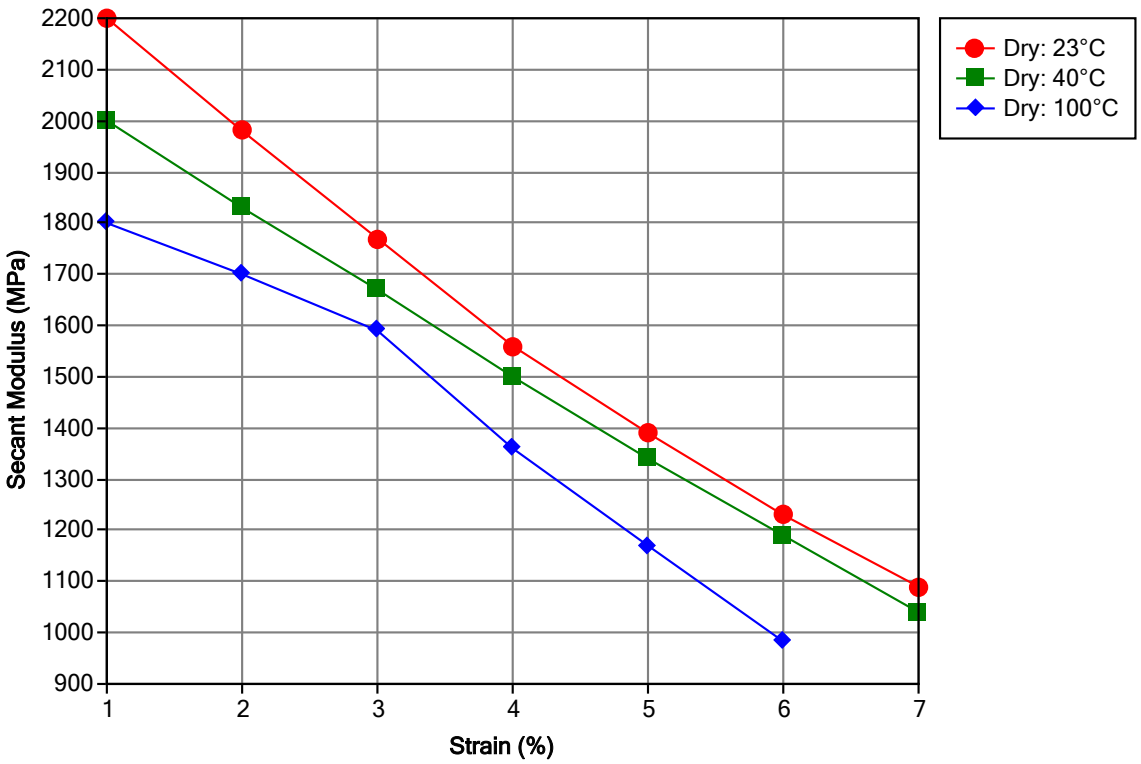
Secant Modulus vs. Strain (ISO 11403)



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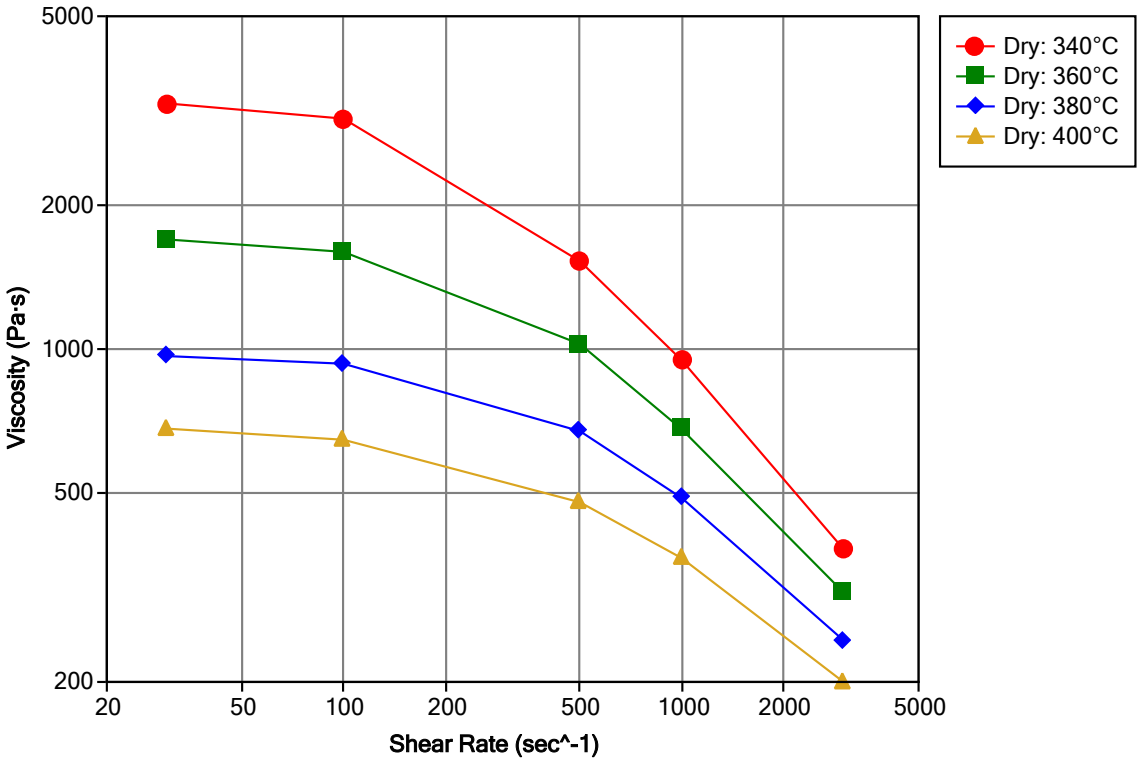
Viscosity vs. Shear Rate (ISO 11403)



Notes

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

[1] For limited exposure (less than 24 hours). ISO 10993 not compliant for GY 1037 LF or BK 937 LF.

[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] Latest version of the standard applies. Note that this ASTM call is also listed under ASTM F1960 for compliance of unreinforced sulfone plastic materials for use to that end use standard.

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