Radel® R-5000
polyphenylsulfone

Radel® R-5000 is a general-purpose medium flow grade of polyphenylsulfone (PPSU), which offers exceptional hydrolytic stability, and toughness superior to other commercially available, high-temperature engineering resins. This resin also offers high deflection temperatures and outstanding resistance to environmental stress cracking. Radel PPSU polymers are inherently flame retardant, provide excellent thermal stability and possess good electrical properties

Transparent Grades:

- Smoke: Radel® R-5000 CL 301
- Natural Amber: Radel® R-5000 NT
- Blue: Radel® R-5000 TR BU391

General

Material Status	• Commercial: Active	
Availability	• Asia Pacific • Europe	• Latin America • North America
Features	• Acid Resistant • Autoclave Sterilizable • Base Resistant • Biocompatible • Chemical Resistant • Detergent Resistant • E-beam Sterilizable • Ethylene Oxide Sterilizable • Flame Retardant • General Purpose • Good Dimensional Stability • Good Electrical Properties • 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 • Thermal Aging Resistant • Ultra High Toughness
Uses	• Automotive Applications • Dental Applications • Food Service Applications • Hospital Goods	• Medical Devices • Medical/Healthcare Applications • Membranes • Surgical Instruments
Agency Ratings	• FAA FAR 25.853a • ISO 10993	• NSF STD-51 [1] • NSF STD-61 [2]
RoHS Compliance	• RoHS Compliant	
Automotive Specifications	• ASTM D6394 SP0312	
Appearance	• Clear/Transparent	
Forms	• Pellets	
Processing Method	• Blow Molding • Extrusion • Film Extrusion • Injection Molding	• Machining • Profile Extrusion • Sheet Extrusion • Thermoforming

Physical	Typical Value	Unit	Test method
Density / Specific Gravity	1.29		ASTM D792
Melt Mass-Flow Rate (MFR) (365°C/5.0 kg)	17	g/10 min	ASTM D1238
Molding Shrinkage - Flow (3.18 mm)	0.70	%	ASTM D955
Water Absorption			ASTM D570
24 hr	0.37	%	
Equilibrium	1.1	%	

Mechanical	Typical Value	Unit	Test method
Tensile Modulus (3.18 mm)	2340	MPa	ASTM D638
Tensile Strength (Yield, 3.18 mm)	69.6	MPa	ASTM D638
Tensile Elongation			ASTM D638
Yield, 3.18 mm	7.2	%	
Break, 3.18 mm	60 to 120	%	
Flexural Modulus (3.18 mm)	2410	MPa	ASTM D790
Flexural Strength (5.0% Strain, 3.18 mm)	91.0	MPa	ASTM D790

Impact	Typical Value	Unit	Test method
Notched Izod Impact (3.18 mm)	690	J/m	ASTM D256
Tensile Impact Strength (3.18 mm)	399	kJ/m²	ASTM D1822

Thermal	Typical Value	Unit	Test method
Deflection Temperature Under Load			ASTM D648
1.8 MPa, Unannealed, 3.18 mm	207	°C	
Glass Transition Temperature	220	°C	ASTM E1356
CLTE - Flow (3.18 mm)	5.6E-5	cm/cm/°C	ASTM D696

Electrical	Typical Value	Unit	Test method
Volume Resistivity	9.0E+15	ohms·cm	ASTM D257
Dielectric Strength			ASTM D149
0.0254 mm	> 200	kV/mm	
3.18 mm	15	kV/mm	
Dielectric Constant (3.18 mm, 60 Hz)	3.44		ASTM D150

Flammability	Typical Value	Unit	Test method
Flame Rating [3] (0.76 mm)	V-0		UL 94

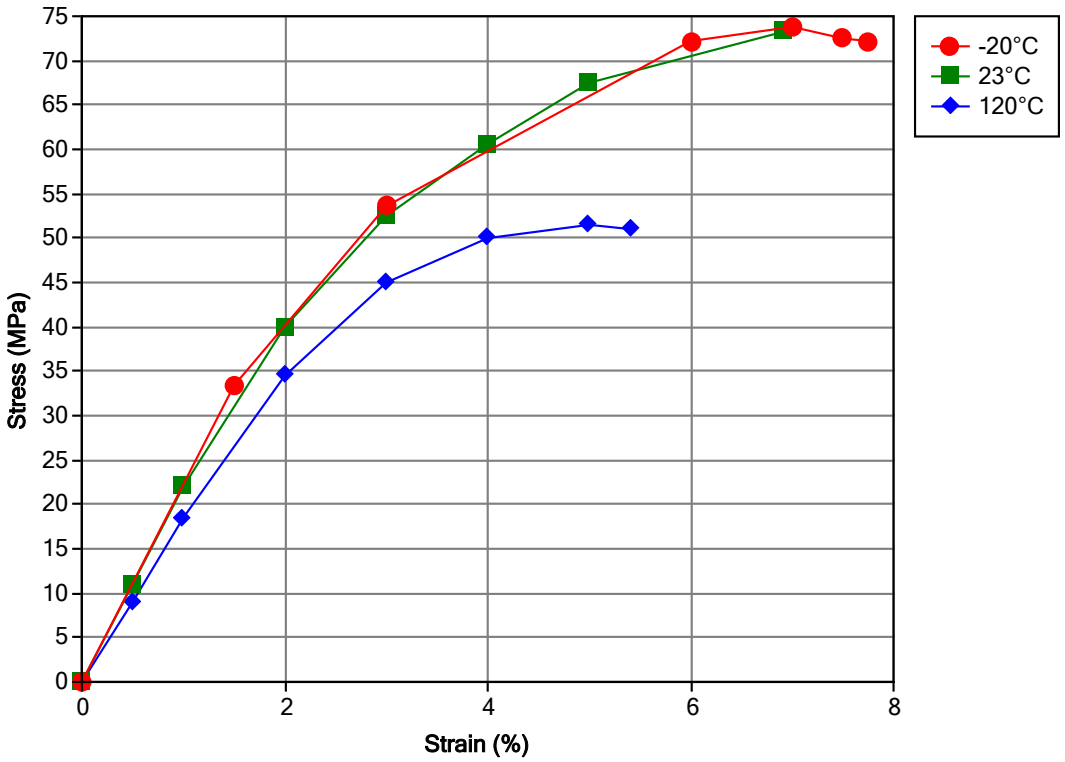
Optical	Typical Value	Unit	Test method
Refractive Index	1.672		ASTM D542

Additional Information	Typical Value	Unit
Steam Sterilization - w/ Morpholine [4]	> 1000	Cycles

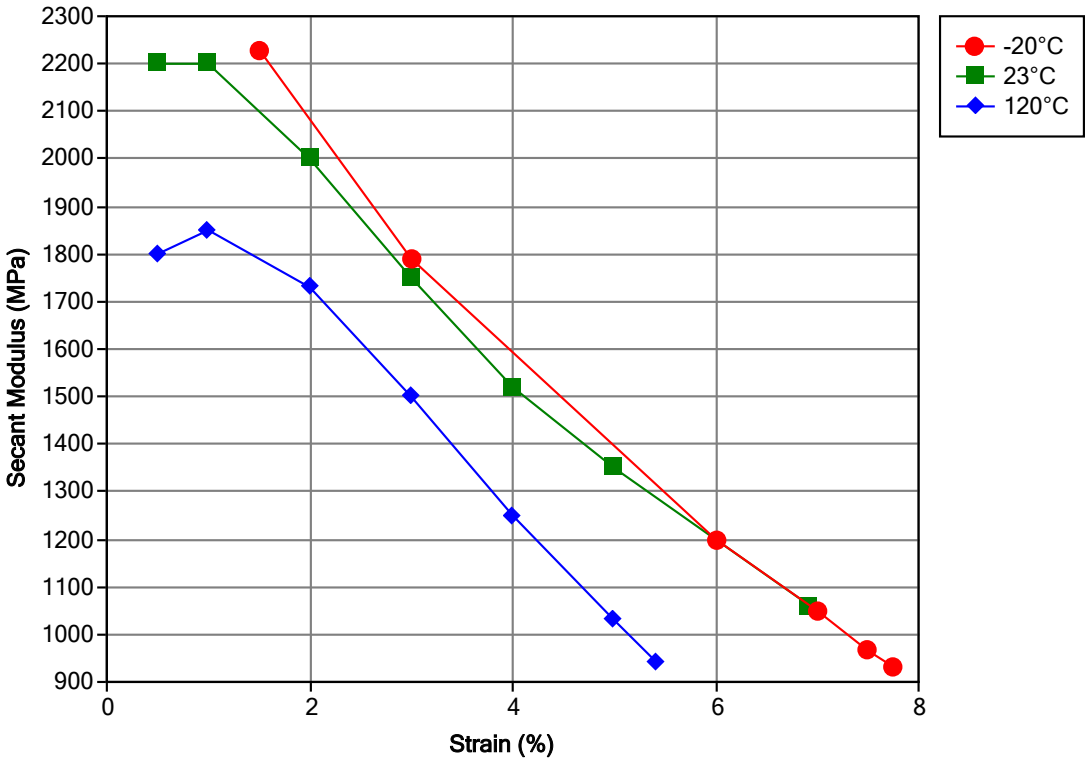
Injection	Typical Value	Unit
Drying Temperature - Desiccant Dryer	135 to 175	°C
Drying Time - Desiccant Dryer	2.0 to 4.0	hr
Suggested Max Moisture	< 0.050	%
Processing (Melt) Temp	365 to 393	°C
Mold Temperature	150 to 163	°C
Injection Rate	Slow-Moderate	
Back Pressure	1.00 to 3.50	MPa
Screw Compression Ratio	1.8:1.0 to 2.6:1.0	

Extrusion	Typical Value	Unit
Drying Temperature	135 to 175	°C
Drying Time	4.0 to 8.0	hr
Suggested Max Moisture	< 0.010	%
Melt Temperature	343 to 400	°C

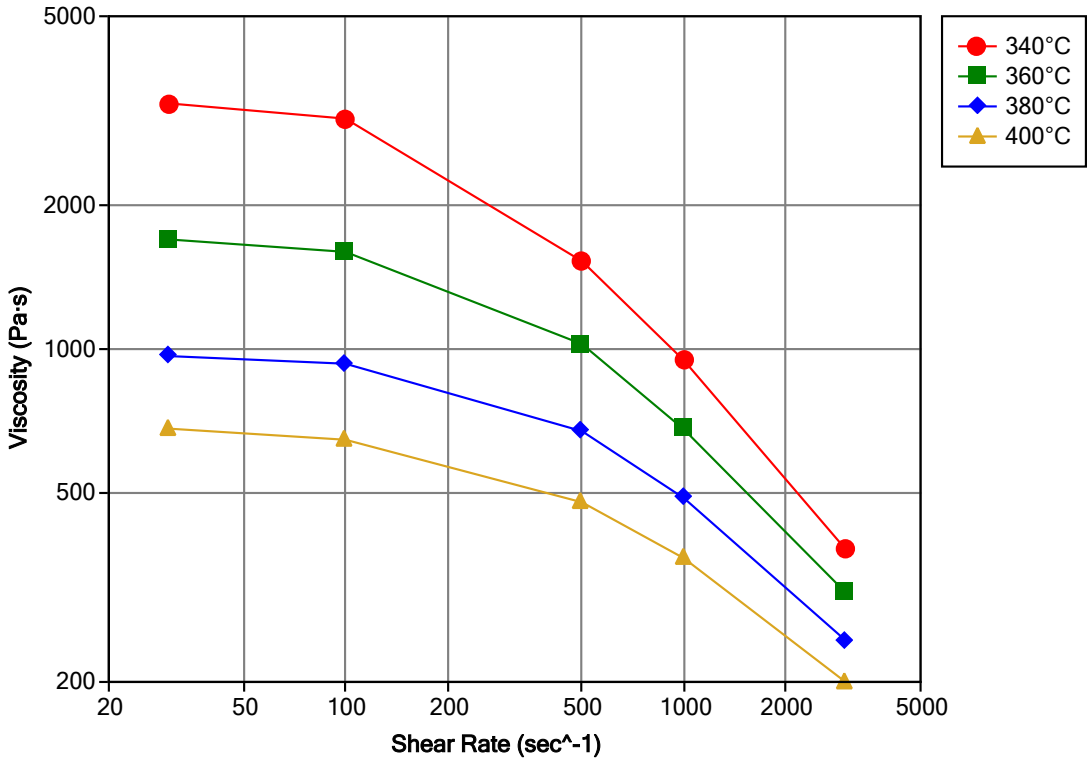
Isothermal Stress vs. Strain (ISO 11403)



Secant Modulus vs. Strain (ISO 11403)



Viscosity vs. Shear Rate (ISO 11403)



Notes

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

[1] NSF STD-51 compliant for NT only.

[2] Tested at 82 °C (180 °F) (Commercial Hot)

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

[4] Cycles passed without cracking, crazing, or rupture.

Steam Autoclave Conditions:
- Temperature: 270°F (132°C)
- Time: 30 minutes/cycle
- Steam Pressure: 27 psig (0.19 MPa)
- Stress Level: 1000 psi (7.0 MPa) in flexure
- Additive: Morpholine at 50 ppm

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