Radel® R-5000
polyphenylsulfone

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

- Smoke: Radel® R-5000 CL 301
- 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

Radel® R-5000
polyphenylsulfone

Physical	Typical Value	Unit	Test method
Density / Specific Gravity	1.29		ASTM D792
Melt Mass-Flow Rate (MFR) (365°C/5.0 kg)	14 to 20	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 (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

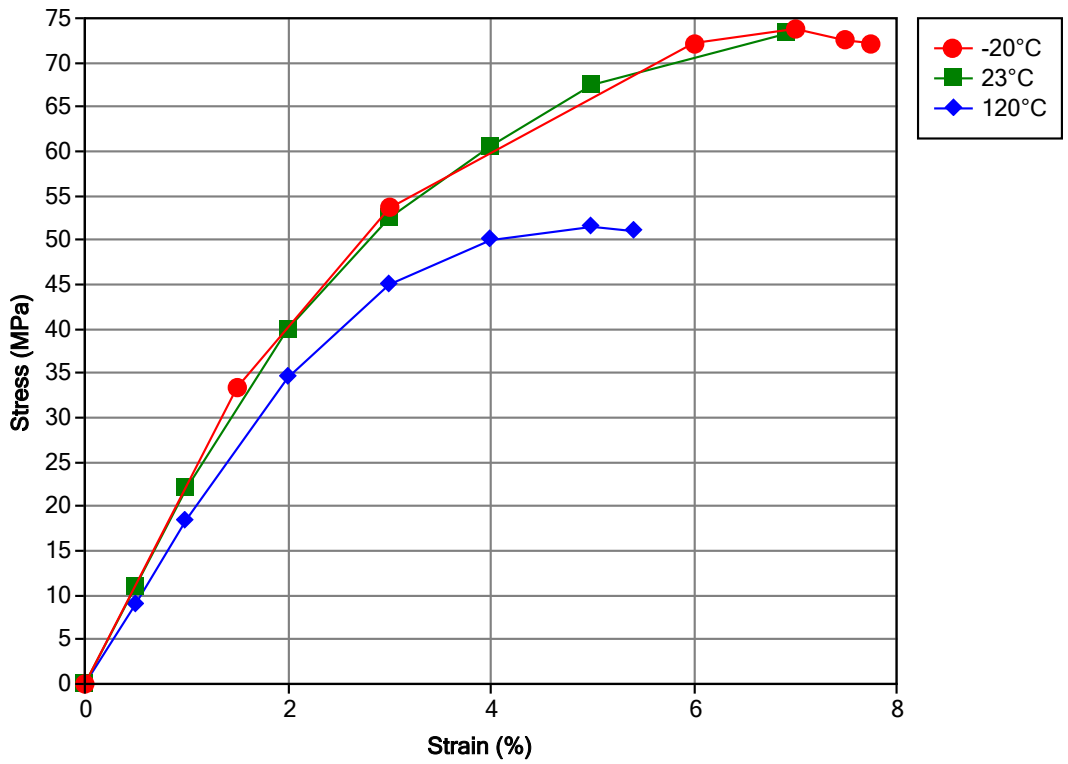
Additional Information	Typical Value	Unit
Steam Sterilization - w/ Morpholine [4]	> 1000	Cycles

Radel® R-5000
polyphenylsulfone

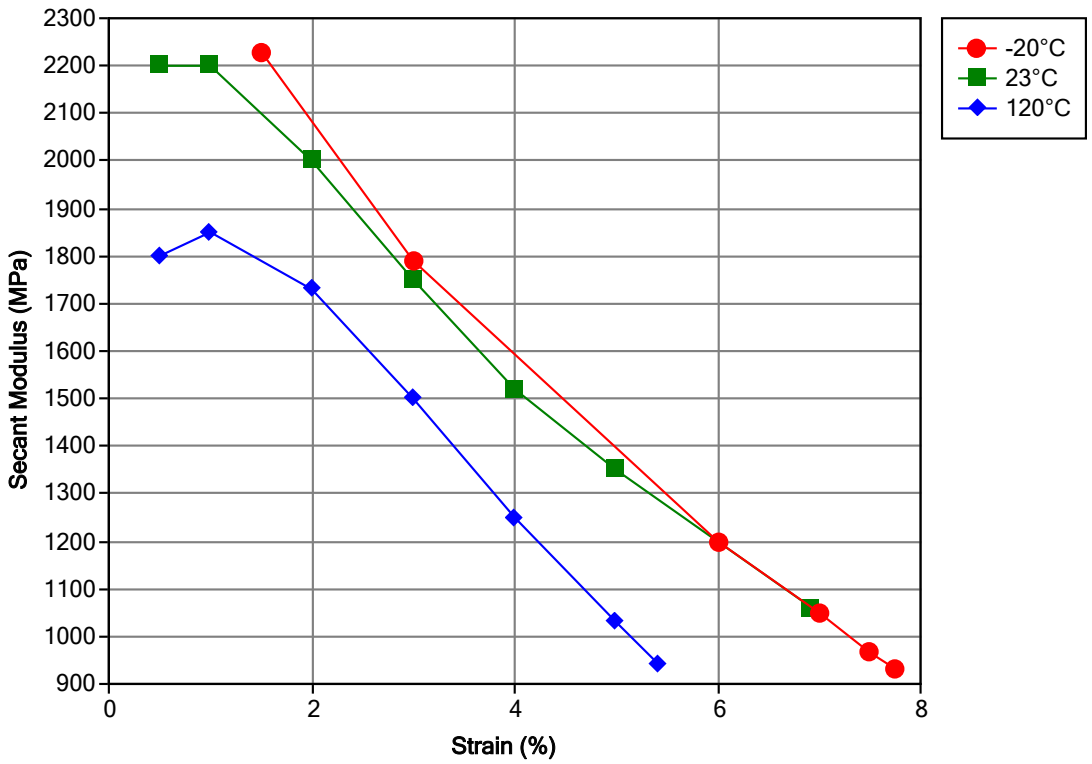
Injection	Typical Value	Unit
Drying Temperature	149	°C
Drying Time	2.5	hr
Processing (Melt) Temp	360 to 391	°C
Mold Temperature	138 to 163	°C
Screw Compression Ratio	2.2:1.0	

Extrusion	Typical Value	Unit
Drying Temperature	171	°C
Drying Time	4.0	hr
Cylinder Zone 1 Temp.	338 to 388	°C
Cylinder Zone 2 Temp.	338 to 388	°C
Cylinder Zone 3 Temp.	338 to 388	°C
Cylinder Zone 4 Temp.	338 to 388	°C
Cylinder Zone 5 Temp.	338 to 388	°C
Adapter Temperature	327 to 371	°C
Melt Temperature	343 to 399	°C
Die Temperature	327 to 371	°C

Isothermal Stress vs. Strain (ISO 11403)

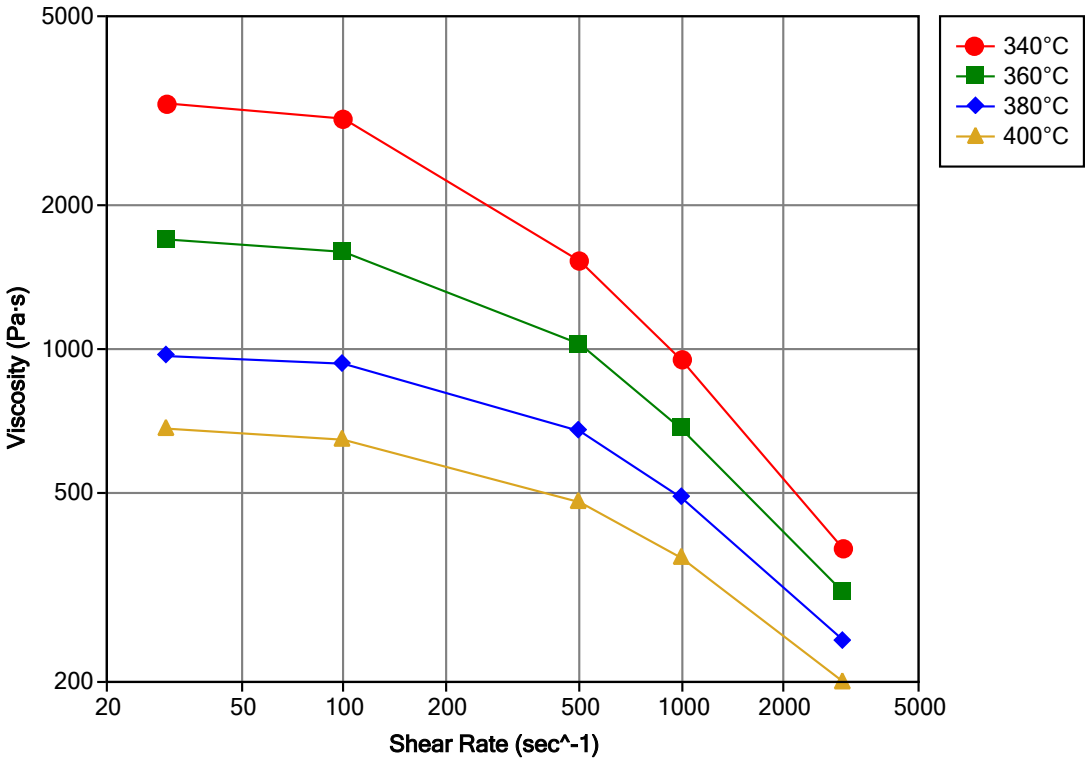


Secant Modulus vs. Strain (ISO 11403)



Radel® R-5000
polyphenylsulfone

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