Radel® R-5800
polyphenylsulfone

Radel® R-5800 is a general-purpose medium-high 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:
- Natural Amber: Radel® R-5800 NT
- Blue: Radel R-5800® TR BU301

Opaque grades:
- Black: Radel® R-5800 BK937
- Bone: Radel® R-5800 NT15
- Blue: Radel® R-5800 BU1037

General		
Material Status	• Commercial: Active	
Availability	• Asia Pacific • Europe	• Latin America • North America
Features	• Acid Resistant • Autoclave Sterilizable • Base Resistant • Biocompatible • Chemical Resistant • E-beam Sterilizable • Ethylene Oxide Sterilizable • Flame Retardant • 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 • Automotive Applications • Dental Applications • Food Service Applications	• Hospital Goods • Medical Devices • Medical/Healthcare Applications • Surgical Instruments
Agency Ratings	• ISO 10993	
RoHS Compliance	• RoHS Compliant	
Automotive Specifications	• ASTM D6394 SP0313	
Appearance	• Clear Amber	• Colors Available
Forms	• Pellets	
Processing Method	• Extrusion • Injection Molding	• Sheet Extrusion • Thermoforming

Physical	Typical Value	Unit	Test method
Density / Specific Gravity [1]	1.29		ASTM D792
Melt Mass-Flow Rate (MFR) (365°C/5.0 kg)	24	g/10 min	ASTM D1238

Physical	Typical Value	Unit	Test method
Molding Shrinkage			
Flow : 3.18 mm	0.70	%	ASTM D955
Across Flow	0.95	%	ISO 294-4
Flow	0.86	%	ISO 294-4
Water Absorption			
24 hr	0.37	%	ASTM D570
24 hr, 23°C	0.54	%	ISO 62
Saturation, 23°C	1.1	%	Internal Method
Equilibrium	1.1	%	ASTM D570
Equilibrium, 23°C, 50% RH	0.10	%	Internal Method

Mechanical	Typical Value	Unit	Test method
Tensile Modulus			
3.18 mm	2340	MPa	ASTM D638
--	2380	MPa	ISO 527-1
Tensile Strength			
Yield, 3.18 mm	69.6	MPa	ASTM D638
Yield	69.6	MPa	ISO 527-2
Tensile Elongation			
Yield, 3.18 mm	7.2	%	ASTM D638
Yield	7.5	%	ISO 527-2
Break, 3.18 mm	60 to 120	%	ASTM D638
Flexural Modulus			
3.18 mm	2410	MPa	ASTM D790
--	2410	MPa	ISO 178
Flexural Strength			
5.0% Strain, 3.18 mm	91.0	MPa	ASTM D790
--	78.3	MPa	ISO 178

Impact	Typical Value	Unit	Test method
Charpy Notched Impact Strength	64	kJ/m²	ISO 179
Charpy Unnotched Impact Strength	No Break		ISO 179
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 [2]	220	°C	DSC
CLTE - Flow (3.18 mm)	5.6E-5	cm/cm/°C	ASTM D696

Electrical	Typical Value	Unit	Test method
Volume Resistivity (3.18 mm)	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

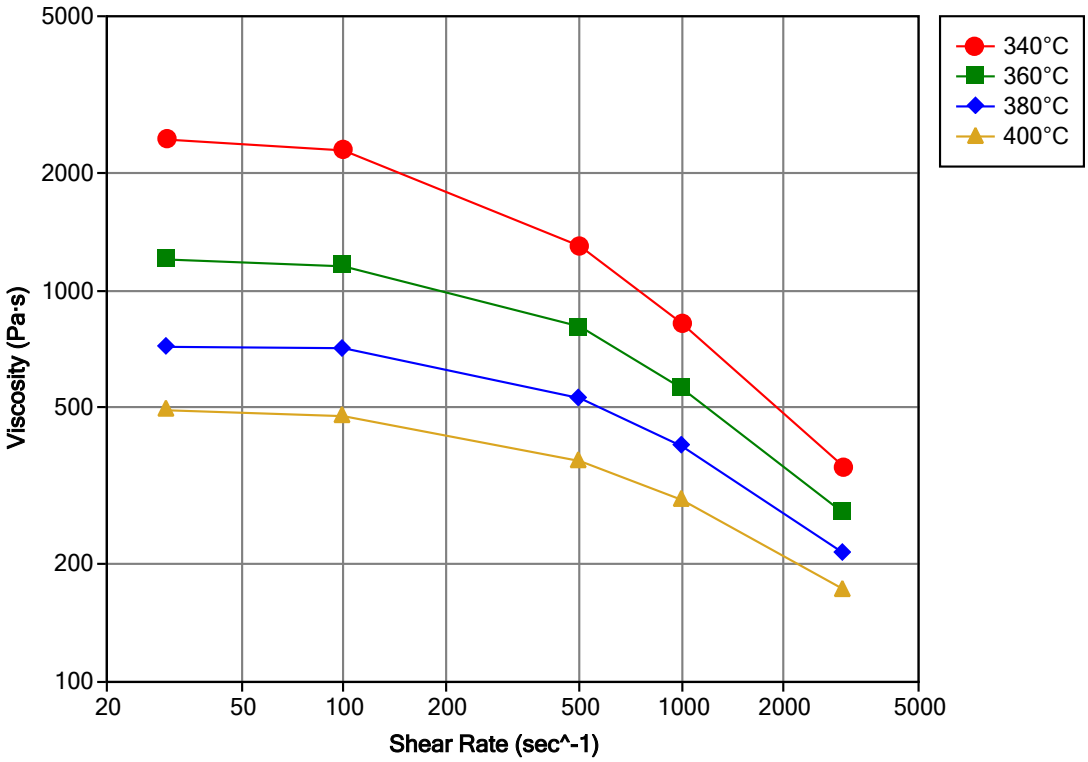
Optical	Typical Value	Unit	Test method
Refractive Index	1.672		ASTM D542

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	138 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

Viscosity vs. Shear Rate (ISO 11403)



Notes

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

[1] Base resin and transparent colors; Opaque colors can be up to 1.35

[2] Heating rate of 36°F (20°C) per minute.

[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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