

# Radel® R-5500

## polyphenylsulfone

Radel® R-5500 is a transparent general purpose polyphenylsulfone (PPSU) for extrusion, 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.

- Natural Transparent: Radel® R-5500 NT
- Clear Transparent: Radel® R-5500 CL301
- Blue Transparent: Radel® R-5500 TR BU501
- Black: Radel® R-5500 BK937
- Bone: Radel® R-5500 NT15
- Grey: Radel® R-5500 GY1137
- Grey: Radel® R-5500 GY1037
- Grey: Radel® R-5500 GY874
- Red: Radel® R-5500 RD 1018
- Orange: Radel® R-5500 OR1145
- Yellow: Radel® R-5500 YL1337
- Green: Radel® R-5500 GN1007
- Blue: Radel® R-5500 BU1027
- Violet: Radel® R-5500 VT2582
- Brown: Radel® R-5500 BN1164

### General

Material Status	• Commercial: Active		
Availability	• Asia Pacific • Europe	• North America • South America	
Features	• Acid Resistant • Autoclave Sterilizable • Base Resistant • Biocompatible • E-beam Sterilizable • Ethylene Oxide Sterilizable • Flame Retardant	• Good Chemical Resistance • 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 • Dental Applications	• Food Service Applications • Hospital Goods • Medical Appliances	• Medical/Healthcare Applications • Membranes • Surgical Instruments
Agency Ratings	• ISO 10993		
RoHS Compliance	• RoHS Compliant		
Automotive Specifications	• ASTM D6394 SP0311		
Appearance	• Black	• Clear/Transparent	• Colors Available
Forms	• Pellets		
Processing Method	• Blow Molding • Extrusion • Film Extrusion	• Injection Molding • Machining • Profile Extrusion	• Sheet Extrusion • Thermoforming

### Physical

	Typical Value	Unit	Test method
Specific Gravity	1.29		ASTM D792
Melt Mass-Flow Rate (MFR) (365°C/5.0 kg)	12 to 17	g/10 min	ASTM D1238
Molding Shrinkage - Flow (3.18 mm)	0.70	%	ASTM D955

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<b>Physical</b>	<b>Typical Value</b>	<b>Unit</b>	<b>Test method</b>
Water Absorption			ASTM D570
24 hr	0.37	%	
Equilibrium	1.1	%	
<b>Mechanical</b>	<b>Typical Value</b>	<b>Unit</b>	<b>Test method</b>
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
<b>Impact</b>	<b>Typical Value</b>	<b>Unit</b>	<b>Test method</b>
Notched Izod Impact (3.18 mm)	690	J/m	ASTM D256
Tensile Impact Strength (3.18 mm)	399	kJ/m <sup>2</sup>	ASTM D1822
<b>Thermal</b>	<b>Typical Value</b>	<b>Unit</b>	<b>Test method</b>
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)	0.000056	cm/cm/°C	ASTM D696
<b>Electrical</b>	<b>Typical Value</b>	<b>Unit</b>	<b>Test method</b>
Volume Resistivity	9.0E+15	ohm·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
<b>Flammability</b>	<b>Typical Value</b>	<b>Unit</b>	<b>Test method</b>
Flame Rating <sup>1</sup> (0.762 mm)	V-0		UL 94
<b>Optical</b>	<b>Typical Value</b>	<b>Unit</b>	<b>Test method</b>
Refractive Index	1.672		ASTM D542
<b>Additional Information</b>	<b>Typical Value</b>	<b>Unit</b>	<b>Test method</b>
Steam Sterilization - w/ Morpholine <sup>2</sup>	> 1000	Cycles	No Standard
<b>Injection</b>	<b>Typical Value</b>	<b>Unit</b>	
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		
<b>Extrusion</b>	<b>Typical Value</b>	<b>Unit</b>	
Drying Temperature	171	°C	
Drying Time	4.0	hr	
Cylinder Zone 1 Temp.	338 to 388	°C	

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Extrusion	Typical Value	Unit
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

## Notes

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

<sup>1</sup> These flammability ratings are not intended to reflect hazards presented by these or any other materials under actual fire conditions.

<sup>2</sup> 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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