Radel® R-5500
polyphenylsulfone

Radel® R-5500 is a general purpose extrusion grade of polyphenylsulfone (PPSU), offering exceptional hydrolytic stability and better toughness than most commercially available high-temperature polymers. This resin has a high heat deflection temperature, excellent thermal stability, outstanding resistance to environmental stress cracking, good electrical properties and inherent flame retardant properties. Transparent and opaque colors are available.

Transparent Grades:
- Natural: Radel® R-5500 NT

Opaque Grades:
- 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 RD1018
- Orange: Radel® R-5500 OR1145
- Yellow: Radel® R-5500 YL1337
- Green: Radel® R-5500 GN1007
- Blue: Radel® R-5500 BU1027
- Blue: Radel® R-5500 BU391
- Violet: Radel® R-5500 VT2582
- Brown: Radel® R-5500 BN1164

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 • Dental Applications • Food Service Applications • Hospital Goods	• Medical Devices • 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

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Physical	Typical Value	Unit	Test method
Density / 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
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 [1] (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 [2]	> 1000	Cycles

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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

Notes

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

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

[2] 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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