Radel® R-5000

Polyphenylsulfone

Syensqo

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Technical Data

Product Description

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		
Literature [1]	• Technical Datasheet		
UL Yellow Card [2]	• E36098-628748		
Search for UL Yellow Card	• Syensqo • Radel®		
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 [3] • NSF STD-61 [4]	
RoHS Compliance	• RoHS Compliant		
Appearance	• Clear/Transparent		
Forms	• Pellets		
Processing Method	• Blow Molding • Extrusion • Film Extrusion	• Injection Molding • Machining • Profile Extrusion	• Sheet Extrusion • Thermoforming
Multi-Point Data	• Isothermal Stress vs. Strain (ISO 11403)	• Secant Modulus vs. Strain (ISO 11403)	• Viscosity vs. Shear Rate (ISO 11403)

Physical	Nominal Value	Unit	Test Method
Density / Specific Gravity	1.29	g/cm³	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	%	

Document Created: Tuesday, January 30, 2024
Added to Prospector: November 2000
Last Updated: 9/29/2023

Mechanical	Nominal 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	**Nominal 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	**Nominal 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	**Nominal 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	**Nominal Value**	**Unit**	**Test Method**
Flame Rating [6] (0.76 mm)	V-0		UL 94
Optical	**Nominal Value**	**Unit**	**Test Method**
Refractive Index	1.672		ASTM D542
Additional Information	**Nominal Value**	**Unit**	
Steam Sterilization - w/ Morpholine [7]	> 1000	Cycles	

Injection	Nominal 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	**Nominal 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

Form No. TDS-1445-en

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Notes

[1] These links provide you with access to supplier literature. We work hard to keep them up to date; however you may find the most current literature from the supplier.

[2] A UL Yellow Card contains UL-verified flammability and electrical characteristics. UL Prospector continually works to link Yellow Cards to individual plastic materials in Prospector, however this list may not include all of the appropriate links. It is important that you verify the association between these Yellow Cards and the plastic material found in Prospector. For a complete listing of Yellow Cards, visit the UL Yellow Card Search.

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

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

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

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

[7] 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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