

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, Radel® R-5000 XC, & Radel® R-5000 LC
- Blue: Radel® R-5000 TR BU391

Radel® R-5000

polyphenylsulfone

General

Material Status	• Commercial: Active	
Availability	• Asia Pacific • Europe	• Latin America • North America
Features	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Automotive Applications • Dental Applications • Food Service Applications • Hospital Goods 	<ul style="list-style-type: none"> • Medical Devices • Medical/Healthcare Applications • Membranes • Surgical Instruments
Agency Ratings	<ul style="list-style-type: none"> • FAA FAR 25.853a • ISO 10993 	<ul style="list-style-type: none"> • NSF STD-51 ¹ • NSF STD-61 ²
RoHS Compliance	• RoHS Compliant	
Automotive Specifications	• ASTM D6394 SP0312	
Appearance	• Clear/Transparent	
Forms	• Pellets	
Processing Method	<ul style="list-style-type: none"> • Blow Molding • Extrusion • Film Extrusion • Injection Molding 	<ul style="list-style-type: none"> • Machining • Profile Extrusion • Sheet Extrusion • Thermoforming

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

Radel® R-5000

polyphenylsulfone

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/m ²	ASTM D1822
Thermal	Typical Value	Unit	Test method
Deflection Temperature Under Load 1.8 MPa, Unannealed, 3.18 mm	207	°C	ASTM D648
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	
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	

Radel® R-5000

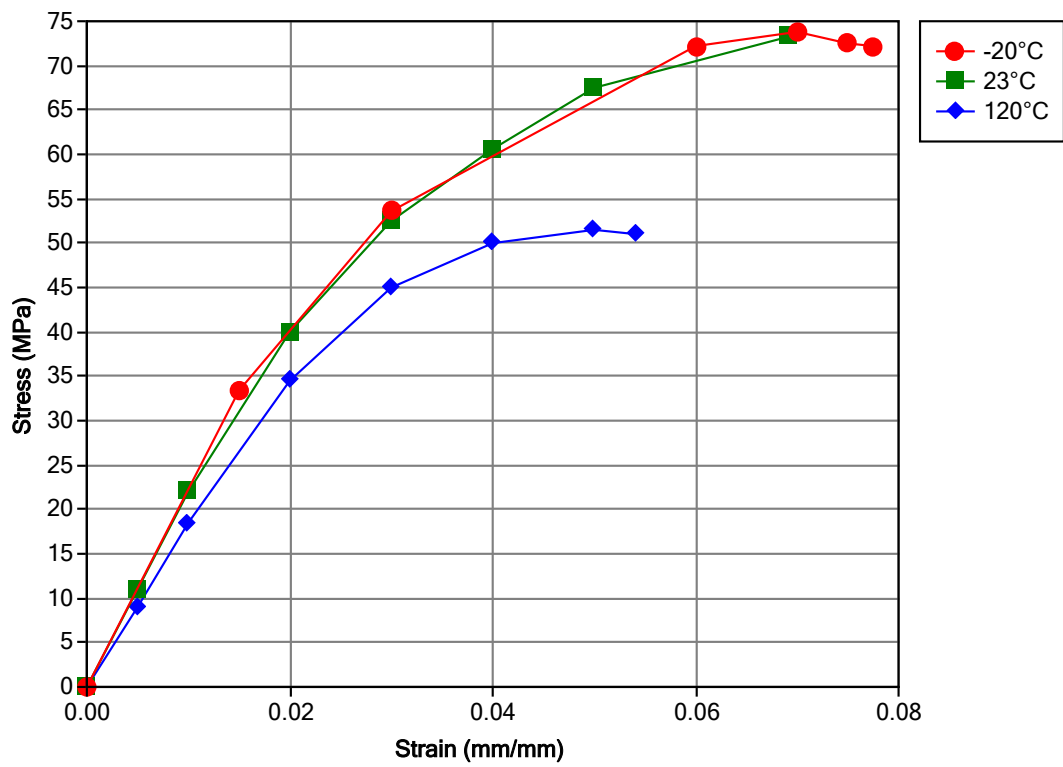
polyphenylsulfone

Extrusion

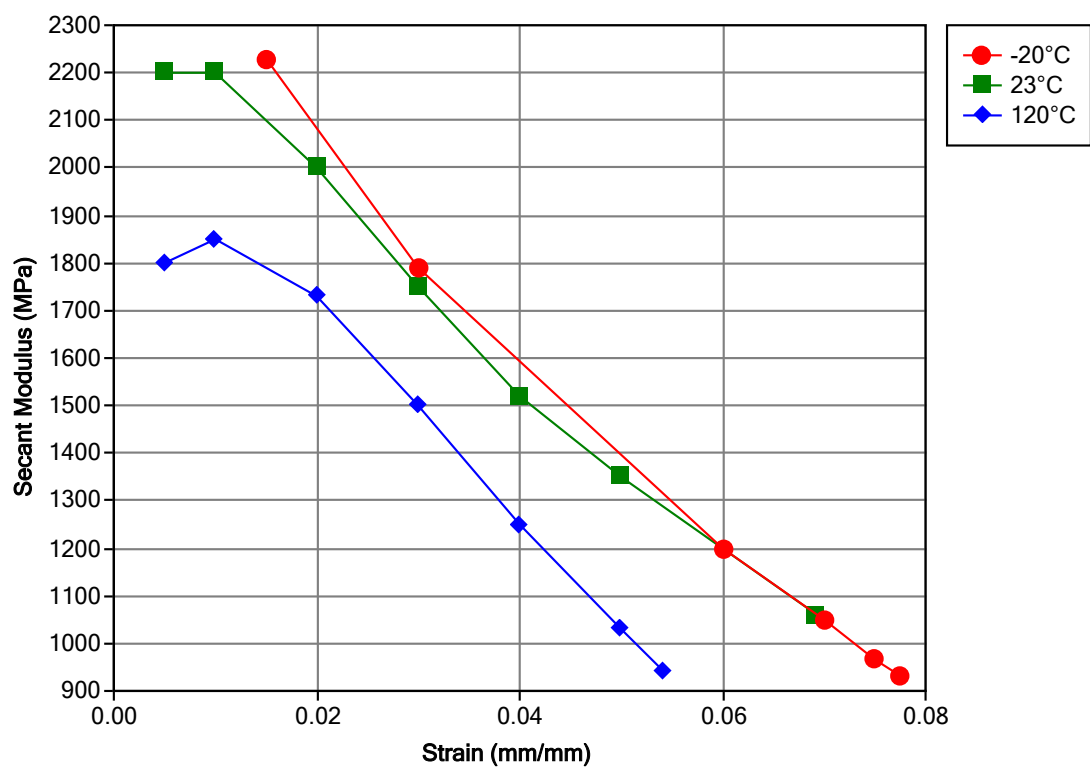
Typical Value Unit

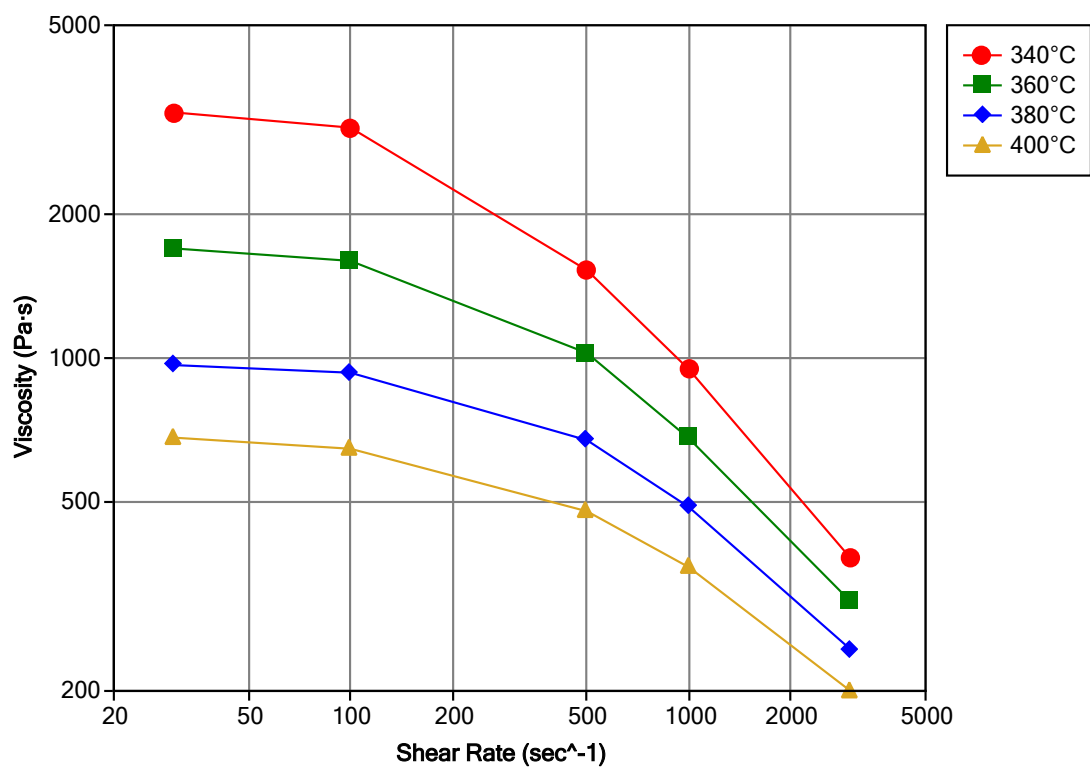
Die Temperature

327 to 371 °C



Secant Modulus vs. Strain (ISO 11403-1)





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

www.solvay.com

SpecialtyPolymers.EMEA@solvay.com | Europe, Middle East and Africa

SpecialtyPolymers.Americas@solvay.com | Americas

SpecialtyPolymers.Asia@solvay.com | Asia and Australia

Safety Data Sheets (SDS) are available by emailing us or contacting your sales representative. Always consult the appropriate SDS before using any of our products.

Neither Solvay Specialty Polymers nor any of its affiliates makes any warranty, express or implied, including merchantability or fitness for use, or accepts any liability in connection with this product, related information or its use. Some applications of which Solvay's products may be proposed to be used are regulated or restricted by applicable laws and regulations or by national or international standards and in some cases by Solvay's recommendation, including applications of food/feed, water treatment, medical, pharmaceuticals, and personal care. Only products designated as part of the Solviva® family of biomaterials may be considered as candidates for use in implantable medical devices. The user alone must finally determine suitability of any information or products for any contemplated use in compliance with applicable law, the manner of use and whether any patents are infringed. The information and the products are for use by technically skilled persons at their own discretion and risk and does not relate to the use of this product in combination with any other substance or any other process. This is not a license under any patent or other proprietary right.

All trademarks and registered trademarks are property of the companies that comprise the Solvay Group or their respective owners.

© 2020 Solvay Specialty Polymers. All rights reserved.