

R-7000 TR

RADEL R-7000 TR is a new low-color, transparent grade of polyphenylsulfone (PPSU), which was developed specifically for aircraft interior applications. The resin offers low heat release, low smoke generation, and low toxic gas emissions, thereby complying with the FAA/JAA regulation 14CFR Part 25.853 Appendix F. These resins offer reliable toughness and good resistance to most fluids found in the aviation industry.

In general, RADEL R polyphenylsulfone is a tough, rigid, high-strength, high-heat thermoplastic with properties that are retained at temperatures from -150°F to 360°F (-101°C to 182°C). The heat deflection temperature at 264 psi (1.82 MPa) is 405°F (207°C). It features superior toughness, elongation, and impact resistance characteristics comparable to those of polycarbonate. Other key

properties include resistance to hydrolysis by hot water and resistance to acids and bases. In addition, the resin is resistant to a wide range of cleaners and disinfectants.

RADEL R-7000 TR can be fabricated using conventional thermoforming or injection molding equipment. RADEL R-7000 TR thermoplastic sheet is formable into large complex geometries with relative ease on conventional thermoforming equipment. When injection molded, the resin has excellent flow characteristics, readily filling complex parts with thin walls or long flow lengths.

RADEL R-7000 TR thermoplastic sheet or resin is available in a variety of colors. Custom color matching can also be provided.

Typical Properties of RADEL R-7000 TR Polyphenylsulfone Resin

Property	ASTM Test Method	Typical Values ⁽¹⁾			
		U.S. Customary Units		SI Units	
		Value	Units	Value	Units
Mechanical					
Tensile Strength		10.5	kpsi	72	MPa
Tensile Modulus		340	kpsi	2.34	GPa
Tensile Elongation at Yield		7.5	%	7.5	%
Tensile Elongation At Break	D 638	60-120	%	60-120	%
Flexural Strength		15.0	kpsi	103	MPa
Flexural Modulus	D 790	350	kpsi	2.41	GPa
Izod Impact - Notched	D 256	13	ft-lb/in	690	J/m
Thermal					
Glass Transition Temperature	E 1356	428	°F	220	°C
Heat Deflection Temperature ⁽²⁾ at 264 psi (1.8 MPa)	D 648	405	°F	207	°C
General					
Specific Gravity	D 792	1.29		1.29	
Water Absorption, 24 hours	D 570	0.4	%	0.4	%
Water Absorption, Equilibrium	D 570	1.1	%	1.1	%
Melt Flow at 365°C, 5.00 kg	D 1238	17	g/10 min	17	g/10 min
Optical					
Light Transmittance at 0.10 in. (2.5 mm)	D 1003	50-60	%	50-60	%
Haze at 0.10 in. (2.5 mm)		<5	%	<5	%

⁽¹⁾ Actual properties of individual batches will vary within specification limits.

⁽²⁾ Test specimens - annealed 0.125 in. (3.2 mm)

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Flammability

The Federal Aviation Administration (FAA) has issued stringent regulations covering materials for use in commercial aircraft interiors. As shown in the following tables, RADEL R-7000 sheet complies with these regulations.

Heat Release Test RADEL R-7000 TR Ohio State University

Heat Release					
	FAA ⁽¹⁾ Rqmnt	<0.080" (<2.0 mm)	0.080-0.140" (2.0-3.5 mm)	>0.140" (>3.5 mm)	Units
2 min.	65	<35	<20	<20	kw-min/m ²
Std Dev		<5	<5	<5	
Peak Rate	65	50	59	35	kw/m ²
Std Dev		<5	9	9	

⁽¹⁾ Per 14CFR PART 25.853 Appendix F

60 Second Vertical Burn

Measurement	U.S. Units		SI Units	
	Value	Units	Value	units
Burning Time	0	s	0	s
Burning Length	<3	in.	<7.6	cm

Smoke Density Test for Aerospace Applications

ASTM F-814 - Flaming Mode

Measurement	RADEL R-7000	FAA/Industry Requirements
D _s @ 1.5 minutes	1	
D _m @ 4.0 minutes	<5	200

D_s - specific optical density
D_m - maximum specific optical density

In addition, several airframe manufacturers have an additional requirement that, when these materials burn, any smoke generated contain no more than defined levels of specific toxic gases. RADEL R-7000 polyphenylsulfone sheet typically exhibits levels of these gases that are much lower than the maximum levels allowed.

Toxic Gas Emissions, ppm at 4 minutes, flaming

Toxic gas	Specification Limits		RADEL R-7000
	BMS	ATS 1000.001	
Carbon Monoxide	500	3,500	<100
Hydrogen Cyanide	60	150	<1
Nitrous Gases	60	100	<1
Sulfur Oxides	30	100	<1
Hydrogen Chloride	60	500	<1
Hydrogen Fluoride	60	50	<1

Precautionary Labeling

On the basis of the toxicological, physical, and chemical properties of RADEL R-7000 polyphenylsulfone sheet, labeling used on containers is as follows:

Caution! Handling and/or processing of this material may generate a dust which can cause respiratory irritation.

Product Safety and Emergency Service

For product safety information or a Material Safety Data Sheet on a product of Solvay Advanced Polymers

1 (800) 621-4557

1 (770) 772-8880 outside of U.S.

For information or help in an emergency such as a spill, leak, fire or explosion, call day or night:

Emergency Health Information

1 (800) 621-4590

1 (770) 772-5177 outside of U.S.

Emergency Spill Information

CHEMTREC 1 (800) 424-9300

1 (703) 527-3887 outside of U.S.

collect calls accepted

For Additional Information

Technical Service

1 (800) 621-4557

Customer Service

1 (800) 848-9744

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