

R-7300, R-7400

Radel R-7300 and R-7400 polyphenylsulfone resins were developed specifically for aircraft interior applications, and through the use of a proprietary flame retardant package, offer low heat release, low smoke generation, and low toxic gas emissions, therefore complying with the FAA regulation 14CFR Part 25.853 Appendix F. In addition, they have excellent impact resistance and ESCR when exposed to fluids typically used by the aerospace industry, reducing the need for annealing or protective films.

These resins offer exceptional hydrolytic stability, similar to that of UDEL® polysulfone, with improved toughness, higher heat deflection temperature, and better resistance to environmental stress cracking.

Radel R-7300 and R-7400 resins can be fabricated using conventional injection molding equipment. These materials have excellent flow characteristics, readily filling complex parts with thin walls or long flow lengths.

While the two resins exhibit nearly identical performance characteristics, Radel R-7300 is formulated for applications requiring light colors and R-7400 is preferred for applications specifying darker colors.

Chemical Resistance

One of the outstanding characteristics of both Radel R-7300 and R-7400 resins is resistance to many commonly used aviation fluids. Three test methods, unstressed immersion, stressed with a 5-inch radius curve, and stressed with a variable radius curve fixture, were employed to evaluate resistance of Radel resins to Skydrol® LD-4; 1,1,1-trichloroethane; Jet fuel A; methyl ethyl ketone; toluene; isopropanol; and Skydrol 500B.

In all cases, Radel R-7000A resin exceeded industry requirements and was clearly superior to the competitive materials. Radel R-7300 and R-7400 resins, while providing improved processing and physical properties, have the same base resin composition as R-7000A resin and will yield similar chemical resistance results.

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Typical Properties of Radel R-7300 and R-7400 Resins

Property	Test Method	Typical Values ⁽¹⁾			
		U.S. Customary Units		SI Units	
		Value	Units	Value	Units
Mechanical					
Tensile Strength	D 638	11.0	kpsi	76	MPa
Tensile Modulus	D 638	405	kpsi	2.8	GPa
Tensile Elongation at break	D 638	40	%	40	%
Flexural Strength	D 790	16.0	kpsi	110	MPa
Flexural Modulus	D 790	400	kpsi	2.8	GPa
Izod Impact, Notched	D 256	1.5	ft-lb/in	80	J/m
Thermal					
Deflection Temperature at 264 psi (1.82 MPa)	D 648	360	°F	182	°C
OSU, 2 minute Total Heat Release ⁽²⁾	FAR25.853(d)	<20	kW-min/m ²	<20	kW-min/m ²
OSU, Peak Rate of Heat Release ⁽²⁾	FAR25.853(d)	<55	kW/m ²	<55	kW/m ²
General					
Specific Gravity	D 792	1.36		1.36	
Water Absorption at 24 hours	D 570	0.3	%	0.3	%
Melt Flow, 380°C, 2.16 kg		16	g/10 min.	16	g/10 min.

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

⁽²⁾ The flammability ratings are not intended to reflect hazards presented by these or any material under actual fire conditions.

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Flammability

Materials intended for aircraft interior parts must meet stringent flammability requirements. Radel R-7300 and R-7400 resins meet or exceed all commercial and regulatory requirements for flammability, smoke density, heat release, and toxic gas emissions.

Smoke Density Test for Aerospace Applications		
ASTM F-814		
Measurement	Radel R-7300/7400	Industry Requirement
Ds @ 1.5 min.	1	
Dm @ 4.0 min.	<5	50-100

Drying

Radel R-7300 and R-7400 resins must be dried completely prior to melt processing. Incomplete drying will result in defects in the formed part ranging from surface streaks to severe bubbling. Pellets can be dried on trays in a circulating air oven or in desiccating hopper dryer. Drying conditions recommended are 4 hours at 300°F (149°C).

Injection Molding

Radel R-7300 and R-7400 resins can be readily injection molded in most screw injection machines. A general purpose screw with a 2-3:1 compression ratio is recommended, as is minimum back pressure. Injection speeds should be as fast as possible, consistent with part appearance requirements. Mold temperatures in the range of 225°F to 325°F (107°C to 163°C) are suggested. Melt temperature should generally range from 690°F to 730°F (366°C to 388°C). Recommended barrel temperature settings are shown in the following table.

Caution: Exceeding 780°F (415°C) during processing may cause degradation.

Zone heater settings		
Zone	Recommended Barrel Temperatures	
	°F	°C
Rear (Feed)	670 - 700	354 - 371
Middle	680 - 710	360 - 377
Front	690 - 720	366 - 382
Nozzle	680 - 710	360 - 377

Standard Packaging and Labeling

Radel resins are packaged in multiwall paper bags containing 25 kg (55.115 pounds) of material. Special packaging can be supplied upon request. Individual packages will be plainly marked with the product number, the color, the blend number, and the net weight.

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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