RTP Co.
Imagineering Plastics®

SPECIALTY THERMOPLASTIC COMPOUNDS FOR AIRCRAFT INTERIORS

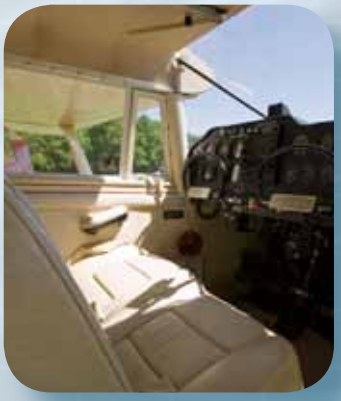
Performance and Regulatory Compliance with Innovative Materials Technology

RTP Company has extensive experience developing materials for aircraft interior applications and our engineers understand the demanding environment these materials will have to perform in. Whether it is an existing RTP Company product or a new cutting-edge formulation specifically tailored to meet your application needs, RTP Company can support your specialty compound needs.

Engineered thermoplastics from RTP Company can be an integral part of a lighter-weight interior package that still meets the stringent FAA Flammability, Smoke Density, Toxic Gas Emission (FST) and OSU Heat Release (OSU) requirements. Engineered thermoplastic materials generally offer better corrosion resistance, more design freedom, opportunities for parts consolidation, and lower manufacturing costs when compared to many metals and advanced composites.

Traditional materials such as aluminum, titanium, and advanced composites, while versatile, typically come with a weight penalty. More than ever, reducing weight to improve fuel efficiency and increase load carrying capability is critical to the bottom line of any aircraft operator. Additionally, raw materials can be expensive, parts costly to produce, and some designs just aren't possible with standard manufacturing methods. Injection molding of engineered thermoplastics can help to overcome many of these issues allowing for designs that are lighter weight, more comfortable, and more aesthetically pleasing interior packages.

Our broad product portfolio includes compounds of many of the standard thermoplastics that are currently in use in aircraft interiors such as PEEK, PEKK, PEI, PC, and PPSU. We also offer a number of new and exciting compounds that meet the FAA requirements in resins such as PP, PA66, PA12, PPS, and PPA. Most grades can either be unfilled or filled/reinforced and can be customized to your specific application needs such as increased strength or wear resistance. Additionally, we can custom color these materials offering you a one-pellet solution to your aircraft interiors needs.



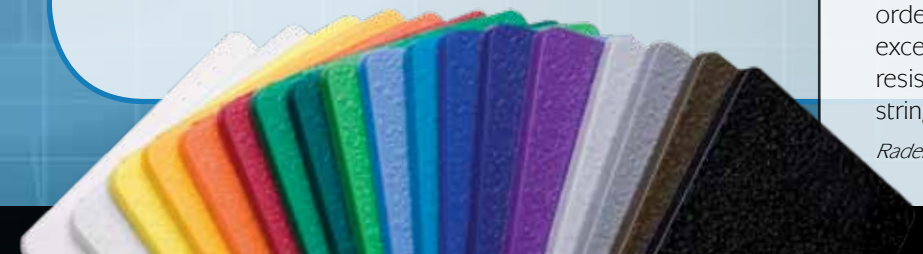
Aerospace Markets:

- **Commercial**
- **Business**
- **General**
- **Transparent**
- **Military**
- **Space**
- **Unmanned Systems**

Now Offering Radel® R-7000 series PPSU

Under a licensing agreement with Solvay Specialty Polymers, RTP Company now produces and sells RADEL® R-7000 polyphenylsulfone (PPSU) compounds on a global basis, supporting faster lead times and lower minimum order quantities. RADEL® R-7000 series PPSU delivers excellent aesthetics, superior impact strength and chemical resistance, and complies with the aircraft industry's most stringent regulations for flammability.

Radel® 7000 is a registered trademark of Solvay S.A.



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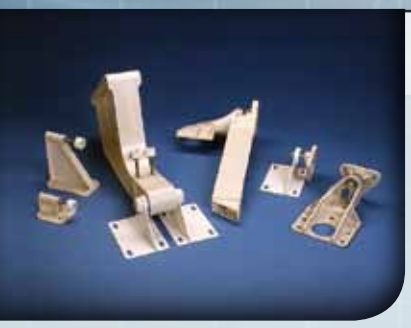
Understanding FAR 25.853

FAR 25.853 is the Federal Aviation Regulation (FAR) that governs the flammability of aircraft cabin interiors. Appendix F to Part 25 is the document that governs the test methods used to comply with FAA FST/OSU requirements called out in FAR 25.853. The most common methods for thermoplastics are shown in the table.

	FAR	BSS*	ABD/AITM**
Horizontal Bunsen Burner Test Measures Burn Rate • 15-Second Flame Application	25.853 (a) 25.855 (d) Appendix F Part I (a)(1)(iv) and (v)	7230 F3/F4	0031/2.0003
Vertical Bunsen Burner Test Measures Ignition & Fire Propagation Tendency • 12-Second or 60-Second Flame Application	25.853 (a) 25.855 (d) Appendix F Part I (a)(1)(i) and (ii)	7230 F1/F2	0031/2.0002 A/B
NBS Smoke Density Measures the Amount of Smoke Emission • Specific Optical Density Measured at 4 minutes	25.853 (d) Appendix F Part V	7238	0031/2.0007
Smoke Toxicity Measures Toxic Gases in the Smoke Emissions • Requirements Vary by Manufacturer	-	7239	0031/3.0005
OSU Heat Release Measures Fire Propagation Tendency • Uses OSU Heat Release Apparatus	25.853 (d) Appendix F Part IV	7322	0031/2.0006

For additional information on the FAR and Appendix F visit: http://www.rtpcompany.com/markets/aerospace/links htm.
*Boeing Specification Support Standard ** Airbus Directive/Airbus Industries Test Method



Case Study - Stow Bin Brackets

When Boeing started looking for ways to reduce weight in their 767 aircraft, they started with what may seem like a small step. The hinge bracket assemblies on the overhead bins in the main cabin of the aircraft were being made from aluminum. Though a good material, it was heavy and required additional machining which also added to the final cost of the components.

RTP Company custom engineered a glass fiber-reinforced PEEK™ compound which not only met the stringent FAA standards for OSU smoke and toxicity, it also had the toughness and strength to withstand the abuse that overhead stow bins receive. The final requirement was a custom color match to white. PEEK™ is naturally a dark brown color and RTP Company was the only material supplier to achieve a specified white critical color match.

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Material Options

Our complete understanding of industry regulations and our broad material portfolio enables us to help you find a solution that maintains regulatory compliance while remaining cost competitive. Designing the best interior package requires looking at each individual piece to accurately assess the regulatory standards alongside the mechanical requirements and total system cost. In many cases, this analysis allows not only a weight reduction but also a cost reduction while still meeting the critical performance parameters of the application and the Federal Aviation Regulations. Our Defense & Aerospace application development engineers can review your application requirements with you and help to select a material that meets the needs of your application.

The table below lists some of the base resin systems that RTP Company can formulate with and the associated FST / OSU requirements they can meet. These resin systems are available with many filler/reinforcement combinations and can be precolored to meet your needs.

ENGINEERED COMPOUNDS	15 Second Horizontal Burn	12 Second Vertical Burn	60 Second Vertical Burn	Smoke Density	Toxic Gas Emission	OSU Heat Release (Reinforced)	OSU Heat Release (Unreinforced)
RTP100-Series Compounds (Polypropylene)	Pass	Pass	-	Pass	Pass	-	-
RTP 200-Series Compounds (Polyamide 6/6)	Pass	Pass	Pass	Pass	Pass	-	-
RTP 200 D-Series Compounds (Polyamide 6/12)	Pass	Pass	Pass	Pass	Pass	-	-
RTP 200 F-Series Compounds (Polyamide 12)	Pass	Pass	Pass	Pass	Pass	-	-
RTP 300-Series Compounds (Polycarbonate)	Pass	Pass	Pass	Pass	Pass	-	-
RTP 1300-Series Compounds (Polphenylene Sulfide)	Pass	Pass	Pass	Pass	Pass	Pass	-
RTP 1400-Series Compounds (Polyethersulfone / Polyphenylsulfone)	Pass	Pass	Pass	Pass	Pass	Pass	-
RTP 2100-Series Compounds (Polyetherimide)	Pass	Pass	Pass	Pass	Pass	Pass	-
RTP 2200-Series Compounds (Polyetheretherketone)	Pass	Pass	Pass	Pass	Pass	Pass	-
RTP 2200 A-Series Compounds (Polyetherketoneketone)	Pass	Pass	Pass	Pass	Pass	Pass	-
RTP 4000-Series Compounds (Polyphthalamide)	Pass	Pass	Pass	Pass	Pass	-	-
RTP Radel® R-7000 Series Compounds (Polyphenylsulfone)	Pass	Pass	Pass	Pass	Pass	N/A	Pass

RTP Company works with a wide array of resin systems and not all are listed here. The resins listed are those most commonly used in aircraft interior applications. We can often customize materials to meet additional needs such as strength, wear resistance, custom color, and conductivity with minimal (if any) impact on the FST properties.

Applications: • Seating • Rub/ Trim Strips • Armrest • Lighting • Tray Tables • Galley • Lavatory • Cockpit Controls • Avionics • Stow Bins

Features: • High Strength • High Stiffness • High Impact Resistance • Molded-In Color • Wear Resistance • FAA/FST/OSU Compliance • FAR 25.853 Compliance

Benefits: • Lightweight • Corrosion Resistant • Greater Design Freedom • Material Customized to Application Needs

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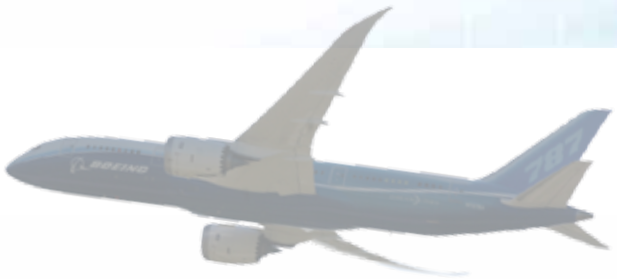

Our Team of Aerospace Experts Working With Your Team of Experts

RTP Company is ready to work with your internal design, engineering, and flammability teams to ensure that we apply the key engineering criteria and appropriate aerospace regulatory specifications pertinent to your application. By working side-by-side with your team, we help minimize over-specification and are able to provide you with the best custom engineered thermoplastic compound for your application.

Your Global Compounder of Custom Engineered Thermoplastics

At RTP Company, we use our 60+ years of independence and technology in thermosets and engineering thermoplastics to act as a materials leader in the defense and aerospace industries. We have accomplished this by forming strategic relationships with defense and aerospace OEM's, processors, and engineering materials suppliers worldwide. We address these industries' long (and short) term initiatives using RTP Company's engineering resources and advanced materials technologies.

By combining our in-depth knowledge of plastic technologies with imagination, RTP Company imagineers material solutions ideally matched to end-use requirements. We are dedicated to providing the OEM and molding communities with specialty compounds, concentrates, and custom sheet products.

Our independence

Our independence permits us to be unbiased as we choose from over 60 engineering resins and hundreds of reinforcements and additives to tailor a specialty compound matched to your design requirements. With RTP Company, you won't have to change your expectations to fit an off-the-shelf material.

RTP Company R&D Capabilities

- 40+ development engineers located around the world
- Wide range of technical backgrounds
- Prompt and efficient assistance
- Global R&D facilities allow for seamless transfer of formulations

RTP Company CAE Capabilities

- Extensive CAE capabilities including Moldflow® Plastics Insight & NEiNASTRAN®
- Over 50 years of combined technical experience
- Extensive understanding of how fiber orientation affects molding and mechanical performance
- Ability to provide data to customers for Moldflow or Structural analysis

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ISO 9001 REGISTERED FACILITIES

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