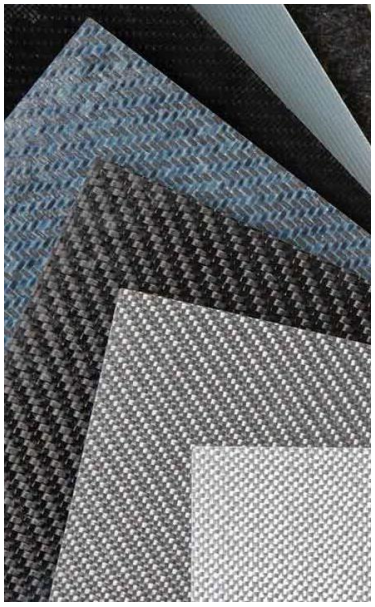
BASF
We create chemistry

Ultrason® Reinforced Thermoplastic Laminate (RTL)



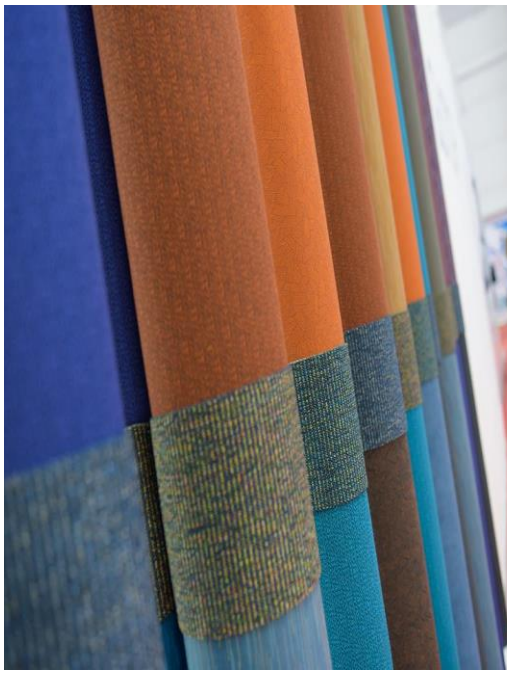
Ultrason RTL utilizes Ultrason E (polyethersulfone) resin to achieve a consistent resin to glass ratio ensuring FAA, Airbus, and Boeing FST requirements are met. The RTL is offered in 1 and 2 ply configurations with the core and resin layers composed of 7781 E glass fabric and Ultrason E2010, respectively. Each product is manufactured in role form (2' x 100'), which minimizes scrap and reduces processing time compared to thermosets. This manufacturing process also results in a high surface quality RTL that reduces the need for sweep and sand processing when used as a facing material in composite panels.

Features and Benefits

- Exceeds FST and OSU requirements
- Smooth surface quality and finish
- Chemical, fuel, and oil resistance at high temperatures
- Wear and impact resistant
- Recyclable
- Faster cycle times (curing and forming)
- Elimination of freezer storage
- No VOCs
- Labor and time savings

Aerospace Applications

Ultrason RTL's compliance with FST and OSU requirements, exceptional physical properties, range of 1 and 2 ply configurations with 2 or 4 ft. widths, and economic benefits make it the idea choice for a range of aerospace applications. Typical uses include interior wall panels (privacy, bathroom, sidewalls), luggage bins, decorative and galley panels, air ducting, cargo liners, cabin flooring, seat trays, and seat shells.



Flame Retardance and Regulatory Compliance

The 1 and 2 ply RTLs passed all flame, smoke, toxicity, and heat release testing with outstanding results. The 1 ply peak and total at 2 minutes OSU heat release resulted in average values of 32.6 kW/m2 and 22.8 kW min/m2, respectively. The 2 ply peak and total at 2 minutes OSU heat release resulted in average values of 11.1 kW/m2 and 6.8 kW min/m2 respectively.

Airbus FST Test Results 1 & 2 Ply

TEST	METHOD	RESULT
12s Vertical Burn	AITM 2.0002A	PASS
60s Vertical Burn	AITM 2.0002B	
Horizontal Burn	AITM 2.0003	
Heat Release (OSU)	AITM 2.0006	
Smoke Density	AITM 2.0007B	
Smoke Toxicity	AITM 3.0005	

Boeing FST Test Results 1 & 2 Ply

TEST	METHOD	RESULT
12s Vertical Burn	BSS 7230 F2&7	PASS
60s Vertical Burn	BSS 7230 F1	
Horizontal Burn	BSS 7230 F4	
Heat Release (OSU)	BSS 7322	
Smoke Density	BSS 7238	
Smoke Toxicity	BSS 7239	

FAA FST Test Results 1 & 2 Ply

TEST	METHOD	RESULT
12s Vertical Burn	FAA Part I (a) (1) (ii)	PASS
60s Vertical Burn	FAA Part I (a) (1) (i)	
Horizontal Burn	FAA Part I (a) (1) (v)	
Heat Release (OSU)	FAA Part IV	
Smoke Density (Flaming Only)	FAA Part V	

Technical Specifications

Ultrason E2010 - Neat Resin Properties

PROPERTY	METHOD	RESULT
Specific Gravity (g/cm^3)	ISO 1183	1.37
Glass Transition Temperature (°C)	DMA	225 / 437
Dielectric Constant	ASTM D150	3.7
Moisture Absorption	ISO 62	0.80%
Flammability	UL94	V-0
Tensile Strength (Mpa / psi)	ISO R527	85 / 13,100
Tensile Modulus (Mpa / psi)	ISO R527	2,650 / 384
Elongation at Yield	ISO R527	6.90%
Poisson's Ratio	ISO 572	0.41
Compression Strength (Mpa / psi)	ASTM D695	413 / 59,900
Compression Modulus (Mpa / psi)	ASTM D695	2,806 / 407,000
Izod Notched (J/m)	ASTM D256	80
CLTE	ASTM E228 (dilatometer)	55 x 10-6/K
Thermal Conductivity (W/m-K)	ASTM C518	0.20

Ultrason 1 Ply RTL Physical Properties

PROPERTY	RESULT
Mass of Fabric (g/m^2)	300
Mass of Fabric + Resin (g/m^2)	450
Resin Content by Volume	32%
Resin Content by Weight	33%
Moisture Pick Up (ISO 62-4)	0.24%
Ply Thickness (mm)	0.33
Specific Gravity (g/cm^3)	1.36
Tg (DSC)(amorphous)(°C / °F)	225 / 437
Tm (°C / °F)	N/A

BASF
We create chemistry

For more information on BASF Aerospace Materials
aerospace.materials@basf.com
www.aerospace.basf.com