



Composite Reinforced Panels for Vehicle Interiors

Adding stiffness and strength to interior components

PRODUCT & PROCESS DESCRIPTION

Continuous fiber reinforced thermoplastic materials from PolyOne Advanced Composites include polyolefin composites with 60–80% fiber by weight, providing a range of material properties to meet diverse application needs. These versatile materials can be processed and configured in a number of ways:

- Structural panels in standard and custom configurations
- Compression molded as a backing or sandwich panel material with core materials including non-wovens
- Lamination as reinforcement for traditional panel materials such as honeycomb, foam, plywood, and aluminum

KEY CHARACTERISTICS

Benefits include:

- Added stiffness and structure
- Dimensional stability (creep resistance)
- Low coefficient of thermal expansion
- Material reduction and part consolidation
- Elimination of secondary operations
- Superior strength-to-weight ratio vs. wood or aluminum

- High impact and puncture resistance vs. thermoset laminates
- Moisture resistance: will not rot, mold, or delaminate
- Excellent processability with fast cycle times vs. thermoset or adhesive lamination
- Thermal insulation
- Vibration damping and acoustic insulation (depending upon construction)
- UV, chemical, and corrosion resistance

USES & APPLICATIONS

Panels made with Polystrand™ CF RTP materials are well suited for vehicle interior applications including:

- Walls and side panels
- Load floors
- Headliners
- Shelving and storage areas
- Trim pieces
- Seat backs and seat pans
- Luggage racks
- Door panels
- Bunk reinforcement

MATERIAL PROPERTIES

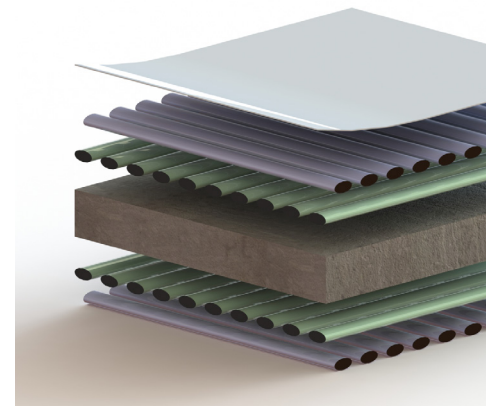
Property comparison – non-woven representative samples with and without Polystrand reinforcement

Description	Test Orientation	Thickness (Inches)	Peak Flexural Stress (psi)	Flexural Stress Percent Increase	Modulus of Elasticity (MOE) (Ksi)	MOE Percent Increase
Continuous filament polyester substrate - 300 GSM						
Substrate alone	n/a	0.06	*	n/a	*	n/a
Polystrand IE 6537 Tri-ply	0°	0.10	32126	*	2482.1	*
Polystrand IE 6537 Tri-ply	90°	0.10	18792	*	1050.3	*
Lightweight reinforced thermoplastic substrate - 600 GSM						
Substrate alone	n/a	0.13	923	n/a	73.3	n/a
Polystrand IE 6537 Tri-ply	0°	0.15	20993	2174%	2066.3	2719%
Polystrand IE 6537 Tri-ply	90°	0.15	19053	1964%	1163.0	1487%
Lightweight reinforced thermoplastic substrate - 1,200 GSM						
Substrate alone	n/a	0.14	1480	n/a	192.5	n/a
Polystrand IE 6537 Tri-ply	0°	0.18	14374	871%	1529.3	694%
Polystrand IE 6537 Tri-ply	90°	0.18	12625	753%	1057.8	450%
Design-engineered composite substrate - 700 GSM						
Substrate alone	n/a	0.15	1003	n/a	91.3	n/a
Polystrand IE 6537 Tri-ply	0°	0.17	11805	1077%	916.2	904%
Polystrand IE 6537 Tri-ply	90°	0.17	7436	641%	585.5	541%

* properties of the sample were not conducive to testing without additional reinforcement

EXAMPLE OF A PANEL CONFIGURATION

Substrate material laminated with Polystrand X-Ply™ CFRTP



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