



Composite Panels for Railcar Applications

Reduce railcar weight and accelerate production with ready-to-install engineered composites.

Lowering energy usage and associated emissions in railroad rolling stock often requires new weight-out strategies. Replacing heavy panel materials—wood, steel and aluminum—with advanced composite panels can significantly cut weight while establishing strength and stiffness, and delivering other important benefits.

In performance comparisons, these next-generation panels surpass older materials in terms of weatherability, corrosion resistance, impact resistance, and many other attributes.

From a production standpoint, ready-to-install, custom composite panels sharply accelerate throughput. Although it is still common practice to fabricate railcar panels in house, the process requires extensive time and labor, and involves multiple parts and SKUs, which complicate the supply chain. In contrast, advanced composite panels simplify procurement, streamline manufacturing and achieve part-to-part uniformity.

PolyOne has an industry-leading portfolio of engineered composite panels that meet

these challenges. Our high fiber volume, glass-reinforced thermoplastic panels and continuous resin transfer molding (CRTM) thermoset sandwich panels can eliminate assembly steps such as welding, drilling, bolting and riveting. Because the manufacturing process is continuous, it also provides significant cost savings over hand-laid composite panel manufacturing techniques.

PolyOne engineered composite panels can be tailored to your design and performance specifications. Advantages include:

- Superior strength-to-weight ratio vs. wood and metal
- Resistance to ultraviolet (UV) light and chemicals
- Impact strength
- Vibration damping and acoustic insulation
- Thermal insulation
- Uniform high quality
- Nearly unlimited lengths, widths up to 10 feet, and thicknesses customized to the application

These versatile panels can be used in many passenger and freight car applications—interior walls, floors, ceilings and doors, as well as exteriors that do not require a Class A finish.

Our extensive experience in composite panel technology and rapid, customized product development capabilities can help you meet your specific needs. Working together, we can help optimize your railcar manufacturing system to raise productivity, increase efficiency and ensure repeatable quality.

Our composite panels are custom engineered by varying core thicknesses to increase or decrease stiffness; by varying core materials (including end-grain balsa, foam or engineered woods) to increase or decrease weight; by varying fiber to modify the stiffness-to-weight ratio; and by varying resin material to increase or decrease strength.

TYPICAL SANDWICH PANEL PROPERTIES

SPECIMEN	TYPICAL SKIN THICKNESS (in)	TYPICAL WEIGHT (lb/ft ²)	TYPICAL PANEL THICKNESS (in)	TYPICAL FLEXURAL FAILURE LOAD* (lbf)
Glass/Thermoplastic Skinned, PET Foam Core	0.05	0.75–0.85	1.0-1.5	135-195
Glass/Thermoset Skinned, PET Foam Core	0.05	1.0-1.2	0.5	120-150
Glass/Thermoset Skinned, PET Foam Core	0.06	1.6-1.7	1.0-1.5	340-395
Glass/Thermoset Skinned, Balsa Core	0.12	1.2-1.4	0.50-0.75	850-1500
Glass/Thermoset Skinned, Balsa Core	0.09	3.0	2.25	3000

* 4 point flex., 44 in. span, ASTM 7249

Note: Additional core materials available. Properties shown are based on a representative sample and may vary based on actual material selection.



1.866.POLYONE
www.polyone.com



Copyright © 2016, PolyOne Corporation. PolyOne makes no representations, guarantees, or warranties of any kind with respect to the information contained in this document about its accuracy, suitability for particular applications, or the results obtained or obtainable using the information. Some of the information arises from laboratory work with small-scale equipment which may not provide a reliable indication of performance or properties obtained or obtainable on larger-scale equipment. Values reported as "typical" or stated without a range do not state minimum or maximum properties; consult your sales representative for property ranges and min/max specifications. Processing conditions can cause material properties to shift from the values stated in the information. PolyOne makes no warranties or guarantees respecting suitability of either PolyOne's products or the information for your process or end-use application. You have the responsibility to conduct full-scale end-product performance testing to determine suitability in your application, and you assume all risk and liability arising from your use of the information and/or use or handling of any product. POLYONE MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, either with respect to the information or products reflected by the information. This literature shall NOT operate as permission, recommendation, or inducement to practice any patented invention without permission of the patent owner.