

ArmaFORM[®] PET foam cores the **green PET** for the railway industry

Today's train operators and manufacturers are challenged by the need for even lighter, more energy-efficient and environmentally friendly trains without compromising safety and durability. With ArmaFORM[®] PET we offer the railway industry a polyethylene terephthalate (PET)-based structural foam core combining high strength to low weight, excellent fatigue and durability, superior temperature stability and excellent compatibility with all common resins and manufacturing methods.



Beyond the mechanical properties of sandwich structures used in railway applications, the fire smoke and toxicity (FST) performance is a top priority in public transport, even more when trains operate in underground or in tunnels. With the introduction of the new European standard EN 45545-2, the requirements for FST performance in core material have become even more demanding.

One of the big advantages of ArmaFORM[®] PET core is the **very low smoke and toxicity level** achieved when subjected to fire. Armacell offers two grades, the non-self-extinguishing standard grade PET GR and the fire-retarded, self-extinguishable PET FR grade. Experience in the industry has shown that fire-retarded core material grades are not necessarily needed for trains classified under EN 45545-2. The core material contributes mostly to the smoke and toxicity levels, slightly to heat release but almost not at all to flame spread, while the skins handle the flame response. Official testing has shown that ArmaFORM[®] PET cored sandwich structures,

in combination with appropriate laminates, achieve the highest **classification, HL3** - which qualifies the material for use in all types of trains including metro, sleeper and couchette cars. More detailed information is provided in our technical bulletin „Development of durable train floor compliant with EN 45545-2“.

Today, designing and manufacturing eco-friendly trains also implies consideration of how the processed materials are manufactured. The use of ArmaFORM[®] PET GR, 100% made from post-consumer PET, enables Armacell and its customers to present a real green alternative to standard PET foams and other foam core materials currently used in railway applications. A comprehensive LCA study has shown that ArmaFORM[®] PET GR outperforms any other foam core currently available on the composite market in terms of its environmental benefits. For further details please see our technical bulletin „Life Cycle Assessment ArmaFORM[®] PET“.

Savings of CO₂ emission during the foaming process of ArmaFORM® PET GR



(source: Armacell, Life Cycle Assessment ArmaFORM® PET, 2015)

The ideal combination of superior FST properties, mechanical properties, cost-effectiveness and environmental sensitivity make ArmaFORM® PET the material of choice for railway sandwich applications such as component floor panels, nose cones, interior ceiling and partition walls, doors and much more.

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Benefits

Light weight for

- > Improved energy efficiency in operation
- > increased freight & passenger revenues

Safety and comfort through

- > Superior FST properties
- > Excellent insulation properties for efficient heating / cooling systems

Overall cost reduction through

- > Reduced operational costs over its life span
- > Reduced installation costs and time

Sustainability trough

- > Less CO₂ emissions in operation
- > Less energy / fuel consumption in operation
- > Full recyclability at the end of train's life cycle

Applications

Compartment / partition walls

- > Good screw retention and adhesive bonding
- > Ease of assembly and maintenance

Interior ceiling / side wall panels

- > Superior FST properties
- > Excellent thermal insulation

Component floor panels

- > High impact and point load resistance
- > Weight savings

Nose cone / train body

- > Optimized strength-to-weight ratio
- > Outstanding resistance to fatigue and corrosion
- > Thermoforming for complex 3D geometries

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