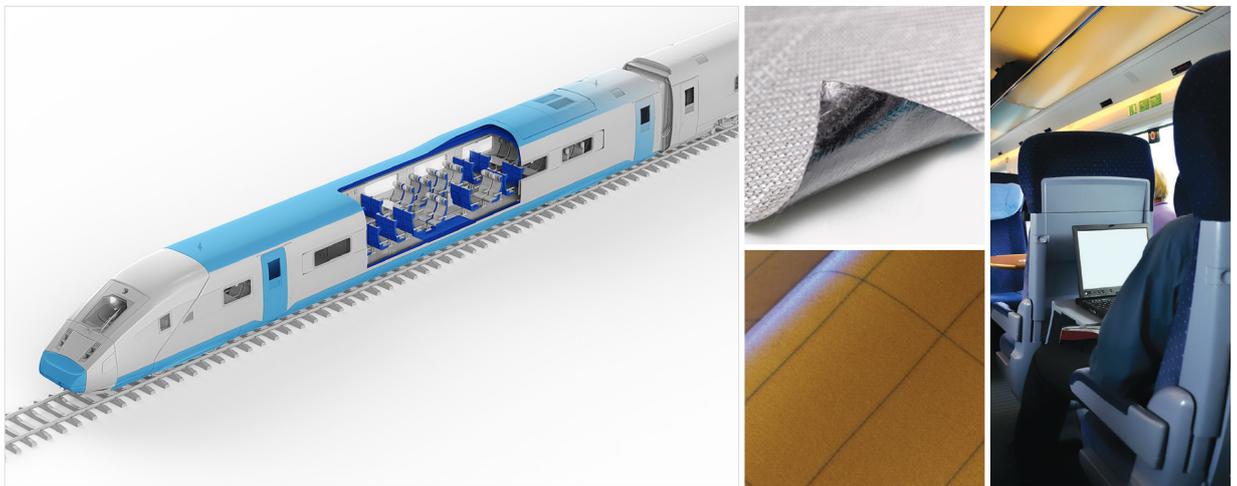


## Materials for the Railway industry



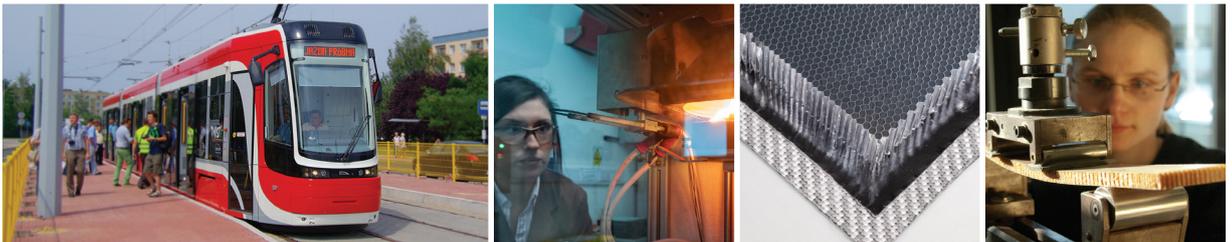
Modern mass transportation needs to be fast, efficient, comfortable and safe. Velocity, energy efficiency and passenger comfort and safety have a lot to do with the design concept, smart components and the materials employed: the lighter train carriages are, the faster a train can accelerate, move and brake. A lighter train also uses less energy per passenger distance covered. Stronger, more durable and easy to clean materials translate into lower maintenance cost over the whole life span of a train. Passenger comfort also requires lightweight, compact and durable materials, so designers can design train car interiors, or seat structures that offer passengers amongst other features the maximum individual space and leg room, a friendly and clean environment and excellent noise and pressure protection during high-speed motion. The key parameters of passenger safety are the fire, smoke and toxicity performance of the materials chosen. All these aspects can be optimised by using state-of-the-art composite materials and solutions from Gurit.

With over 30 years of experience as a prime composite materials supplier and engineering partner to a broad array of industrial markets including high-end applications such as today's most advanced passenger aircraft, award-winning high-performance boats, prestigious cars or weight and performance optimised composite wind turbine blades, Gurit also understands the most pressing needs of the rail market.



**As a trusted supplier of composite materials for interior and structural aerospace applications, Gurit has developed a broad range of tried, tested and qualified performance prepreg systems and structural core materials that are ideally suited to manufacture weight-optimised laminate structures, sandwich or crushed-core components that exceed the customers' performance criteria and the most stringent safety requirements of the global rail market.**

Gurit prepregs are used in a growing range of rail projects from High-Speed to Subway trains across the globe. From concept to product development and into production, Gurit's experience and understanding ensure products are delivered on time and to specification.



### Maximum passenger comfort

Sandwich constructions are an ideal way to achieve optimal results and meet passenger requirements. In a sandwich panel, two outer material layers provide a stable and smooth surface, while a lightweight core section adds stiffness and insulation, both ideal for rail applications. Modern rail tracks are designed for speed – the straighter the tracks, the smoother and faster the ride. The topography or cityscape between two destinations is a given and the availability of land is often scarce. Therefore, fast, high-speed, urban train lines feature ever-longer tunnels and bridges, consequently travellers and train crew must be even better protected to get a maximum chance of safely escaping during the unlikely event of an emergency. This is a true call for phenolic prepregs!

### Meeting the most stringent safety standards

Favourable mechanical profiles are important, but chemical features of the material are equally vital, especially in terms of passenger safety requirements. The fire, smoke and toxicity performance (FST) is a top priority when selecting new materials. Gurit's experience in

the development of tailored, long-term solutions for the complex aerospace industry has allowed the development and market introduction of Gurit's range of Phenolic and Epoxy prepregs to the rail market. The outstanding behaviours of Gurit's prepregs include short burn lengths, lowest smoke densities and smoke toxicities and very low heat release values. Such materials fulfil the highest demands in fire protection, strength, and lightweight properties for rail structures, exceed, for example, the new European Standard EN 45545, and are thus ideal for the construction of lightweight rail interior and exterior components.

### Exterior & interior rail solutions

High FST, lightweight structural monolithic and sandwich constructions:

- **PH 840** - Established Phenolic Prepreg for rail applications
- **130FR** Range of High Performance Epoxy Products, curable from 85°C, including:
  - **SE 130FR** - EN45545 tested epoxy prepreg
  - **ST 130FR** - SPRINT™ version for thick sections
  - **SA 130FR** - epoxy resin film for core bonding
  - **SF 130FR** - fire retardant epoxy surfacing film
- **Gurit® Kerdyn™ Green FR, Gurit® Balsaflex™**  
- Structural Core Materials