

Thermoplastic Bonded Buildups for Mass Transit Interior Applications

The evolution of railway interiors

Many of the railcars that are in service today were designed decades ago. Their purpose was mostly utilitarian and functional, often with little regard for aesthetics. We can see this in their lack of tight fit and finish on interior components, exposed fasteners, and bland colors. The choice of materials was typically limited to fiberglass and painted sheet metal which often show signs of chipping, cracking and denting, especially in high traffic areas. These materials are also heavy, require costly manufacturing, finishing and assembly steps.

Today's transit authorities are recognizing the need to update these outdated cars, and develop modern rail fleets that reflect the needs of today's commuters and the desire to increase ridership. Railcar designers are incorporating aesthetic design elements, softer geometries, texture and colors that make the interiors friendlier to riders, reflecting the image of the city or region in which they operate.

An economical choice

Thermoplastics offer an alternative solution to traditional materials typically found in railcar interiors. These materials have been providing benefits to manufacturers in many industries for years because they are robust, wear-resistant and will not chip, crack, dent or ding.

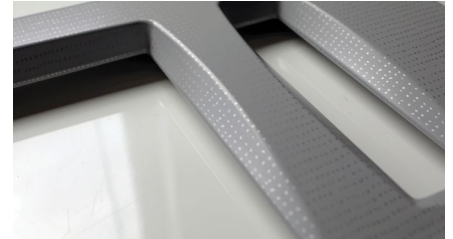
New railcars incorporating thermoplastics into designs benefit through:

- Lighter weight
- Allow for a more detailed and refined design, including virtually unlimited color options
- More cost-efficient to fabricate

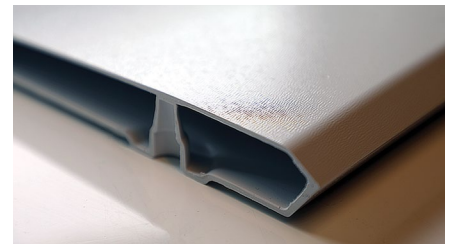
These benefits result in reduced manufacturing, finishing, and assembly time. Parts made from thermoplastics retain the materials' mechanical properties and durability, which decreases replacement and out-of-service costs.

Enhanced flexibility from thermoplastics with bonded buildups

Advanced thermoplastics processing is opening new applications that require increased strength and rigidity. Bonded buildups, including twin sheet forming, fiber glass and recycled carbon fiber reinforcement, increases the strength of the part without significantly increasing weight. These processes allow thermoplastics to be used in high-strength applications typically reserved for full fiberglass or metal components. By utilizing these processes, thermoplastics provide durability, improved aesthetics with added strength and rigidity.



Twin Sheet Forming



Twin Sheet Forming (Cross Section)



Fiberglass Reinforced (Finished)



Fiberglass Reinforced (Back)

continued >

Thermoplastics are pressure or vacuum formed over a mold to produce the finished part. The formed part can be produced with complex geometries, undercuts, and tight tolerances. Fasteners and hardware can be formed into the part during forming, or attached using epoxy, depending on the specific design. Integrating hardware in the finished part can eliminate on site secondary operations which reduces assembly time while still benefiting from the lighter weight and design freedom that thermoplastics offers.

- Superior aesthetics with a greater choice of colors, textures and finishes
- Ability to form complex geometries
- Integration of functions into one piece
- No finishing or painting
- VOC free and recyclable

When to consider thermoplastics

Thermoplastics can help you reimagine designs, replace heavier materials, and improve the overall aesthetic of the railcar interior. Thermoplastic materials are impact resistant, and provide excellent resistance to graffiti, chemicals, and staining. Thermoplastics exceed regulatory compliance and safety standards, making them ideal for the following railcar interior applications:

- Wall, ceiling, and kick panels
- Window masks and shrouds
- Windscreens and bulkhead partitions
- HVAC, lighting, and signage enclosures
- Operator consoles

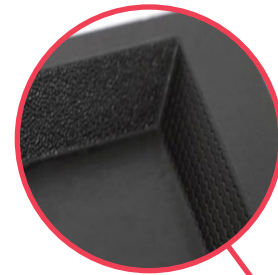
Thermoplastics and harsh environments

Thermoplastics hold up to even the harshest environments. Thermoplastics are chemical and stain resistant, and can be cleaned without worry of discoloration. Thermoplastics are durable, and impact resistant, making them ideal for high traffic areas. Since the color of the material is consistent throughout its thickness, scratches and marks go virtually unnoticed.

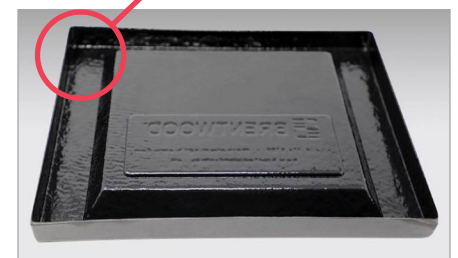
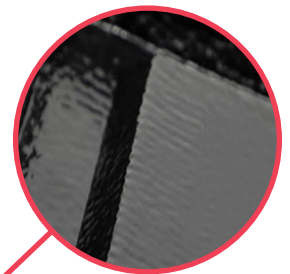
SEKISUI SPI

SEKISUI SPI supports transit system operators, designers and railcar manufacturers by offering a range of thermoplastic materials. Thermoplastic sheets can be manufactured in nearly any color to match your design and application. Our designLab™ and FSTLab™ are available to help you enhance your designs, ensuring they meet regulatory compliance and safety standards.

To learn more about SEKISUI SPI and our line of KYDEX® and ALLEN® Thermoplastics, contact your local representative or visit us at www.sekisui-spi.com.



Recycled Carbon Fiber Reinforced (Front)



Recycled Carbon Fiber Reinforced (Back)