

SEKISUI KYDEX

Rapid Prototyping KYDEX® Thermoplastics Seatback for Rail Interiors

KYDEX® Thermoplastics offer ample design flexibility while meeting the most stringent fire, smoke, heat release and toxicity requirements.

As a lightweight and durable alternative to FRP, KYDEX® Thermoplastics are not only graffiti resistant, but offer unlimited design possibilities for shape, colour and embossed features, including texture.

As a globally recognised leader in high-performance speciality polymers for mass transit interiors, KYDEX® Thermoplastics provide long-term durability and weight savings over FRP, aluminium or steel, making them the sustainable choice for customers who expect rail cars to last 20 years or more. With the rolling stock industry growing worldwide, the rail industry is in a position to become more sustainable through its material selection process. As a replacement to

FRP, thermoplastics can transform rail car interiors to improve the passenger experience.

The SEKISUI KYDEX mass transit interiors team set out to showcase how thermoplastics can provide better aesthetics, enhanced durability and improved sustainability for rolling stock interiors.

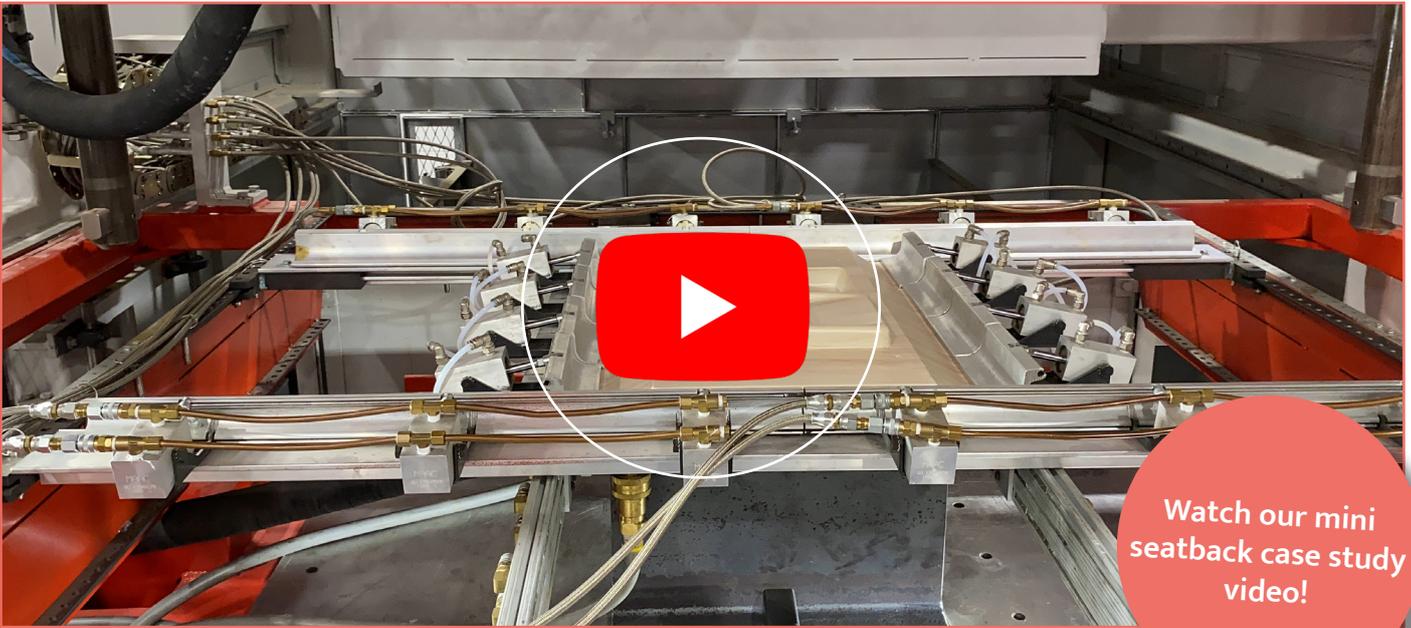
To do this, the designLab™, appLab™, business development teams and SEKISUI KYDEX summer interns from the Pennsylvania College of Technology's plastics and polymer programme collaborated to create a pressure-formed sample using PVDF capped KYDEX® 2200LT rail material with Infused Imaging™ technology. The mass transit prototype project offered an opportunity to educate the interns on the rapid prototyping process while creating an educational tool for customers to illustrate different thermoforming processes within one part.

“Our internships give students the opportunity to work on real projects as part of the learning process. This project is an excellent way for our interns to get hands-on experience in the field they are interested in, while also providing us with an educational tool for use with customers. The final part provided a physical sample of how KYDEX® Thermoplastics perform in different thermoforming processes,” said Shawn Gum, Business Development Engineer. To kick off the project, a competition was held among the interns to design and present mass transit-inspired parts for consideration, with Elijah Peltz's design for a mini seatback with the KYDEX® Thermoplastics logo being ultimately chosen.

During his experienceship, Peltz learned to programme design for both RenShape® and aluminium tools. Ideally, the final tool would be made from aluminium because



KYDEX® Thermoplastics with Infused Imaging™ Olive Ash woodgrain design



Thermoforming process inside appLab™ Innovation Center

the moulds are temperature-controlled and provide better consistency from part to part. They are also more durable and can be used for thousands of parts. RenShape® is an inexpensive polyurethane modelling and styling board that can be quickly and easily CNC-routed into specific shapes but is not temperature-controlled. Although the temperature of the mould can fluctuate over time and the part dimensions can vary from part to part, it is ideal for rapid prototyping.

The initial parts pulled from the round were excellent talking pieces for the InnoTrans summit. *“Several seat manufacturers I visited at InnoTrans were impressed with the design capabilities of the thermoformed mini seatback. They were particularly interested in the patterned samples as great alternatives to laminates. They also provided us with some pattern direction which we were able to implement in our next round of samples,”* said Ruben Bake, Mass Transit Business Manager.

While the appLab™ team was working on tool design, the designLab® team was developing patterns and selecting colours for the final parts. Their goal was to showcase the benefits of integral colour and Infused Imaging™ technology utilising PVDF-capped materials, compared to metal or fibreglass that is traditionally painted. *“One of the greatest benefits of using Infused Imaging™ on capped KYDEX® Thermoplastics is that customers can create custom panels with orders as low as one sheet!”* said Karyn McAlphin, Creative Design Lead.

Infused Imaging™ technology embeds the pattern into the sheet rather than on it, allowing custom quantities and increased quality. Importantly, it won't chip, fade or delaminate like other materials, and because the design permeates the capped material, it retains the anti-graffiti and cleanability properties of the PVDF film. The team then pressure-formed a full set of positive and negative parts using the textured tool in time for the RedCabin Railway Interior Innovation Summit.

Utilising rapid prototyping and industry-leading design, the teams delivered on their mission to create a versatile and educational part for the mass transit industry. As collaborative partners, SEKISUI KYDEX puts innovation at the forefront of its business by guiding customers through the project from beginning to end. The experts inside the Innovation Centers, designLab® and appLab™, are available to our partners to help identify the best solutions for their applications.

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