RAILWAY INTERIOR INNOVATIONS

LIGHTWEIGHT, COMPLIANT, DURABLE & AESTHETIC LEXAN™ SHEET SOLUTIONS



LEXAN™ SHEET

POLYVANTIS

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INTRODUCTION
ABOUT POLYVANTIS

POLYVANTIS is a global, multi-material player with some of the most coveted and iconic brands in the industry – such as PLEXIGLAS® and ACRYLITE® for polymethylmethacrylate semi-finished products and LEXAN™ for polycarbonate sheets and films. With 15 production sites across the United States, Europe, Asia and Africa, we offer innovative products and solutions.

Our LEXAN™ Sheet portfolio offers transparent and opaque sheets that combine formability with excellent flame-retardant properties. Transparent products meet the flammability requirements of the global building and construction market. Opaque sheets can be used for rail applications, like seat cladding, wall panels, ceilings and other interior parts.

We are dedicated to serve our customers' changing needs at any time, that is why our LEXAN™ polycarbonate sheet portfolio is backed by innovative technology, technical support, and application development services worldwide.

Global Company with Local Services & Supply





VALUE PROPOSITION OF LEXAN™ SHEET

LEXAN™ polycarbonate (PC) sheets can play a significant role in train interiors due to their versatility, durability and design possibilities.

Incorporating lightweight LEXAN™ polycarbonate sheet materials can contribute to a more efficient, attractive and passenger-friendly environment while addressing important considerations such as compliancy, increased energy efficiency, and cleanability. This brochure is a comprehensive resource, providing essential information for your consideration of integrating LEXAN™ sheets into your vehicles.

LEXAN™ thermoplastic sheet products enable modern, lightweight train interiors that improve passenger comfort and reduce costs.

SUPPLIER

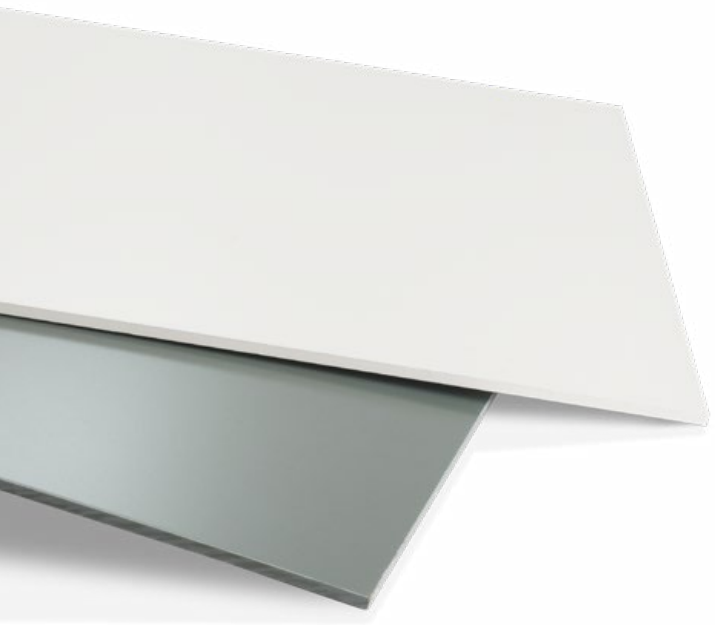
- Cost reduction from process simplicity and improved productivity
- Reduction of secondary operations (e.g. painting)
- Better EHS for workers

OEM

- **~25% weight reduction vs. FRP**
- Design flexibility and integration potential
- Easy to install; lighter weight and less likely to crack or chip

TRAIN OPERATOR

- Better passenger experience through modern design
- Lower ownership costs
- Reduced wear on rail infrastructure



Lightweight materials play a critical role when weight reduction is a priority for the customer. This is especially valuable for OEMs facing weight challenges in the later stages of design, where efficient solutions are needed to meet weight targets.

IMPORTANT MATERIAL PROPERTIES

LIGHTWEIGHT

LEXAN™ polycarbonate sheets are used in the railway industry for their exceptional durability, fire resistance, and lightweight properties. Our opaque LEXAN™ sheets are particularly well-suited for interior applications where structural integrity, aesthetics, and safety are paramount. Complementing our lightweight opaque interiors portfolio, we also offer transparent and translucent LEXAN™ sheet glazing solutions for light diffusers and small application spaces. These advanced materials are engineered to reduce weight while maintaining high standards of durability and safety, offering the following key benefits:

BENEFITS



LOWER ENERGY CONSUMPTION/ENERGY EFFICIENCY
Lightweight, energy-efficient trains lower emissions, supporting sustainability and carbon regulations.



SAFE & IMPACT RESISTANT
Virtually unbreakable, durable & cost-effective solution.



REDUCED OPERATING AND MAINTENANCE COSTS
Lighter trains reduce strain on tracks and components, cutting wear, extending lifespan, and lowering maintenance costs.



WEIGHT REDUCTION
LEXAN™ can reduce weight up to ~50% vs. glass, which can eliminate substantial weight from a single passenger car and complete trainset.



ENVIRONMENTAL IMPACT
Lightweight, energy-efficient trains lower emissions, supporting sustainability and carbon regulations.



AESTHETIC DESIGN
Lightweight glazing can allow for larger windows (NFPA-130) or more innovative window shapes, enhancing the overall aesthetic appeal of the train's interior and exterior.

EASE OF MAINTENANCE

LEXAN™ sheet materials are designed for demanding rail interiors, offering a smooth surface that is easy to clean and resistant to chemicals. Their exceptional impact strength makes them an effective solution against vandalism, including graffiti and physical damage.

Built for durability and safety, LEXAN™ sheets help minimize maintenance, reduce downtime, and keep interiors looking clean and professional.

BENEFITS



CLEANABILITY

LEXAN™ sheets, which are used in train interiors, are known for their durability and ease of cleaning. They are typically easy to clean with common cleaning agents such as mild soap with water or mild disinfectants.



GRAFFITI RESISTANCE

Anti-vandalism LEXAN™ sheets can feature films or other treatments that support graffiti removal without causing permanent damage to the surface. See page 16 for more information on film options.



IMPACT RESISTANCE

Virtually unbreakable, with outstanding impact resistance again tools, rocks and projectiles.



CHEMICAL RESISTANCE

The chemical resistance of LEXAN™ sheets can be increased by applying a film or coating which will support less permanent damage to the surface

It's important to note that the specific chemical resistance of LEXAN™ Sheet can vary depending on factors such as the used grade and the concentration and temperature of the involved chemical.





SUSTAINABILITY

SUSTAINABLE SOLUTIONS FOR MODERN RAIL INTERIORS

LEXAN™ polycarbonate sheets support a more sustainable approach to railway interior design—delivering safety, durability, and environmental responsibility in one material.

Manufactured with a lower carbon footprint compared to traditional materials like FRP, metal or glass, LEXAN™ sheets are lightweight, which contributes to overall vehicle weight reduction and improved fuel / energy efficiency. This directly contributes to achieving emissions reduction targets in public transportation.

Additionally, LEXAN™ sheets are highly durable and resistant to impact, reducing the need for frequent replacements and minimizing material waste over time. Many grades are also recyclable at end-of-life, further contributing to circular economy principles.

ENHANCING SUSTAINABILITY THROUGH RECYCLABILITY

LEXAN™ sheets are 100% recyclable, enabling end-of-life recovery and repurposing of materials, which significantly reduces environmental impact. This makes them an ideal choice for rail operators and manufacturers aiming to meet growing sustainability targets and regulatory requirements.

BY CHOOSING LEXAN™ POLYCARBONATE, THE RAILWAY INDUSTRY BENEFITS FROM:

- Reduced landfill waste through efficient recycling processes
- Support for circular economy goals by reintegrating materials into new applications
- Sustainable material sourcing with options that contain recycled content
- Compliance with green building and transport standards

Beyond recyclability, LEXAN™ sheets offer exceptional performance, including high impact resistance, lightweight design, and flame retardancy—making them a smart, future-ready material for sustainable rail interiors.

REGULATORY

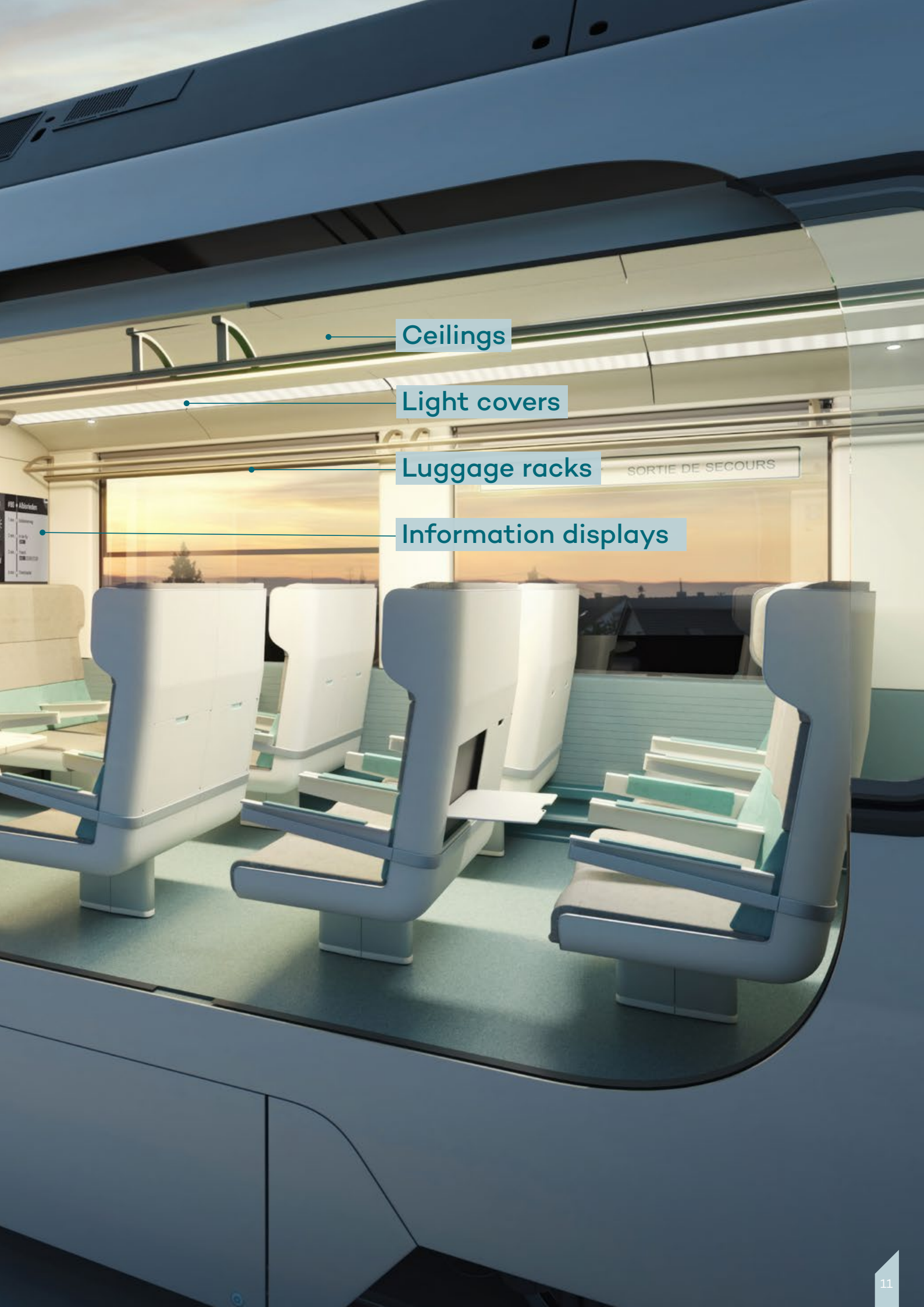


EN 45545-2 AND NFPA-130

In the dynamic landscape of the railway industry, the importance of stringent fire regulations cannot be overstated. These regulations serve as a cornerstone for ensuring the safety and integrity of railway operations, passengers, and infrastructure.

Our LEXAN™ sheet portfolio provides lightweight, durability, aesthetics and is compliant to all major Fire Safety Standards EN45545-2, NFPA130, and TBT3237.

For detailed information in product compliance and our product portfolio, kindly navigate to page 18 of this brochure. There, you will find a comprehensive list detailing their alignment of each product with the respective railway application standards.


Ceilings
Light covers
Luggage racks
Information displays
SORTIE DE SECOURS

GLOBAL OVERVIEW



- TB/T 3237
- NFPA 130
- EN 45545-2
- GOST
- Regulatory Standards Japanese Railways

INNOVATING RAILWAY INTERIORS

We're driving innovation in railway interiors with the launch of LEXAN™ H6600 and H6900 sheets - our latest high-performance materials engineered for modern railway interiors. These glass-filled polycarbonate sheets significantly enhance stiffness, making them ideal for seating components and other structural interior parts. With these new LEXAN™ sheet solutions, we reaffirm our position as a pioneer in advanced polymer technologies, supporting safer and more sustainable railway interiors.

LEXAN™ H6600 SHEET

An opaque, solid, glass filled PC sheet for all applications, providing light weight, high stiffness, durability and aesthetics.

COMPLIANT TO
- EN45545-2 (R1 HL2 & HL3*)
- TB/T 3237
- NFPA-130

POTENTIAL APPLICATIONS
- Wall and seat claddings
- Kickboards
- Window frames
- Partition walls
- Lavatory modules
- Ceilings

LEXAN™ H6900 SHEET

An opaque, solid, glass filled PC sheet specifically for railway seating, providing light weighting, high stiffness, durability and aesthetics.

COMPLIANT TO
- EN45545-2 (R6 HL3)
- TB/T3237
- NFPA-130

KEY APPLICATION
- Railway seating





On a life-cycle basis, the new LEXAN™ sheet portfolio has a smaller CO_2 footprint than FRP or aluminum. It reduces the water and energy consumption from cradle-to-gate and mitigates fossil fuel depletion. These features, along with ease of processing and durability, may also result in lower ownership costs.

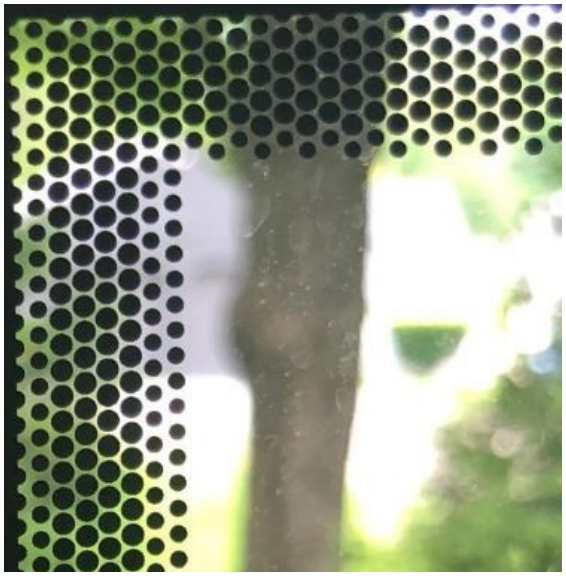
*Color and design dependent

FEATURES

FRIT/PRINT

Frit refers to a pattern that is fused onto surfaces, typically applied along the edges of architectural, automotive, and decorative glazing solutions for various functional and aesthetic purposes.

Our LEXAN™ sheet materials (both coated and uncoated) can be printed on to achieve the visual and functional equivalent of frit on glass.

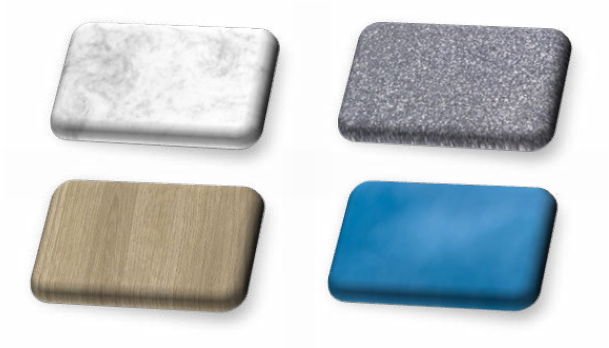




FILM LAMINATION

LEXAN™ polycarbonate sheets can be in-line laminated with decorative or transparent films, offering a high-performance solution that combines aesthetics and / or improved UV and graffiti resistance with long-term functionality for railway interiors.

This advanced lamination process allows for the integration of custom colors, patterns, and branding elements directly on to the sheet—while also enhancing surface durability. The laminated surface provides superior resistance to abrasion, chemicals, and frequent cleaning, making it ideal for high-traffic public transport environments.



KEY BENEFITS

FIRE SAFETY & COMPLIANCE

Laminated LEXAN™ sheets meets major rail industry fire, smoke, and toxicity (FST) standards as EN 45545-2 and NFPA-130.

SURFACE PROTECTION & DURABILITY

- The film is laminated inline and does not need secondary operations.
- The scratch-resistant and anti-graffiti properties of the film help maintain appearance during the lifetime of the interior.
- UV-resistant films prevent yellowing and degradation, extending service life.

AESTHETIC & FUNCTIONAL CUSTOMIZATION

- Decorative (printed) films can be supplied with textured, colored, or patterned finishes to match CI or improve interior designs.
- An anti-reflective or matte finish can improve passenger comfort by reducing glare.

IMPACT RESISTANCE & WEIGHT REDUCTION

- Flexibility and high impact resistance can reduce damages and improve safety in high-traffic areas.
- LEXAN™ sheets are significantly lighter than FRP or metal, reducing overall train weight for fuel efficiency, reduce ware and extend range for EV's.

HYGIENE & EASY MAINTENANCE

The films have stain-resistant properties, allow for easy cleaning, and graffiti removal, and help reduce maintenance time.

COLOR PORTFOLIO

LEXAN™ H6600, H6900 SHEET

80098

8003

WH1158
(RAL 9001)

50032

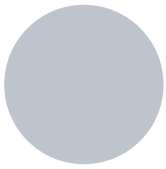
501735
(PMS 7527 C)

GY9G059
(S 1500-N)

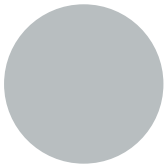
705008
(PMS cool gray 2 C)

70350
(RAL 9018)

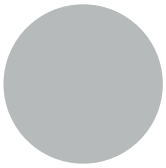
BR7E166
(PMS 7534 C)



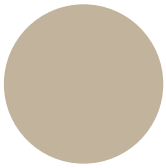
GY8E477
(S 2005-R90B)



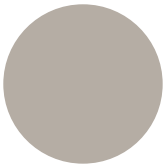
705035
(S 2002-B)



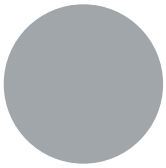
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(S 2502-B)



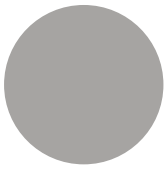
50652



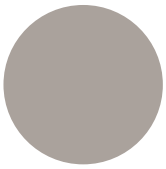
GY6E638
(PMS Warm Gray 4 C)



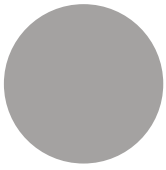
GY6E293
(RAL 7040)



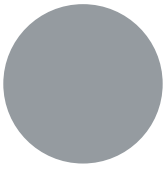
GY6B008
(RAL 9006)



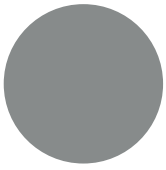
701778
(PMS Warm Gray 5 U)



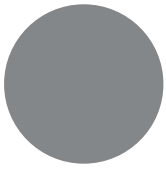
GY5722
(S 3500-N)



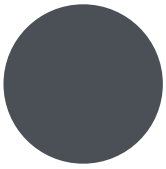
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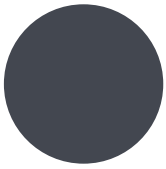
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(PMS 424 U)



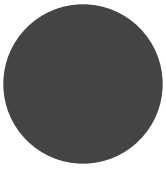
705505
(PMS Cool Gray 8 C)



20904
(PMS 7540 C)



BL1896
(RAL 260 30 05)



701
(RAL 9004)

COMPARISON OVERVIEW

Incumbent solutions comparison frp, aluminum & metal

	LEXAN™ SHEET	FRP/THERMOSET	METAL
Material	**Polycarbonate**	**Fiber Reinforced Plastics**	**Aluminum**
Fire Safety	Meets major standards, options for different application groups	Meets all major standards	Meets all standards
Impact	High ductility / crash worthiness	Brittle (low crash worthiness)	Very robust - non flexible
Repairs	Easy installation/ replacement of part as result of lower weight (-30%)	Repairable (labor and time consuming)	Repairable (labor and time consuming)
Weight/Density	1.3 g/cm³	1.75 g/cm³	2.7 g/cm³
Quality	Consistent quality/ parts	Risk if more inconsistency (part & finish) due to manual labor	Consistent quality/ parts
Aesthetics	Full colored / translucent / transparent	Surface finish necessary (paint / gelcoat)	Surface finish necessary (paint / gelcoat)
Design	Complex part shape and geometry capability with one tool	Parts with complex geometry typically require multiple piece molds	Limited freedom, deep draws not possible. Multiple tools might be needed
Anti-graffiti/ Chemical Resistance	Additional measures necessary (i.e.POLYVANTIS inline decorative/ transparent film lamination)	High scratch and chemical resistance. Also supported by the applied finish	Highly (depending on surface finish)
Weight/Stiffness Ratio	Excellent weight/ stiffness ratio	Lower performance for low cost FRP in rail.	
Environmental Impact	Recyclable, and most raw thermoplastic materials are VOC free	Non-recyclable, Intense environmental control requirements i.e. respiratory controls (fumes and dust), highly flammable materials and “dirty” mfg. process.	Almost always recyclable (secondary steps necessary depending on finish)
Automation	Process largely automated	Manual intensive process/ hand lay-up	
Output	Fast part processing times (large series)	Labor and time intensive process (~ LEXAN™ x6)	Slow due to heavy machinery and secondary labor
Quality	Tight tolerances and consistent part dimensions	Maintaining controlled wall thickness in open mold process very time consuming and challenging	Variable, easy to damage (incl. surface)
EHSS	Environmentally safe	EHSS measures necessary	Improving
System Cost	High at small series	Low at small series	High due time and equipment cost

PRODUCT PORTFOLIO & REGULATORY

			OPAQUE SHEET	
			LEXAN™ H6600 Sheet	**LEXAN™ H6900 Sheet**
INTERIORS (R1)	**Wall cladding**		•	
	Ceilings		•	
	Luggage racks		•	
	Berths		•	
	Kick boards		•	
	Window frames		•	
SEATING (R6)	**Seat cladding**		•	•
DIMENSIONS	**Gauge (mm)**		3-5	3-5
	Width (mm)		Up to 2050	Up to 2050
	Length (mm)		Up to 3050	Up to 3050
COMPLIANCY	**EUR**	EN 45545-2 Interior Surfaces (R1)	R1-HL2 @3-5mm	
	EUR	EN 45545-2 Passenger seat Shells (R6)	R6-HL2 @3-5mm	R6-HL2 @2-3mm
	NPAC	TB/T 3237		
	AMR	NFPA 130, ASTM E162	Pass@2-5mm	Pass@2-3mm
	AMR	NFPA 130, ASTM E662	Pass@2-5mm	Pass@2-3mm
	INT	UL94 V0	Pass@2-5mm	Pass@2-3mm

		TRANSPARANT GLAZING SHEET								
		F2000 Sheet	MR5FR Sheet	MR5E OB FR Sheet	F2500 Sheet	FR65 film	FR25AC /FR460 sheet	MR10/ MRT sheet	DLCW sheet	SPLUX24 sheet
GLASS REPLACEMENT (NFPA-130)	Draft screens		•	•			•			
	Partitions		•	•			•			
	Doors		•	•			•			
	Windows						•	•		
	Luggage racks	•	•	•			•			
	Insulators (enclosure elec. equipment)				•	•	•			
	Transparent wind screens						•			
LIGHTING & SIGNAGE (R4)	Light diffusers	•						•	•	•
	Lighting covering	•		•						
DIMENSIONS	Gauge (mm)	1.5 - 8	3 - 9.5	3 - 8	2 - 5	0.25 – 0.5	0.25 – 0.75	1.5 – 12.7	1 – 3.2	1.5 – 2
	Width (mm)	Up to 2000	2000	2000	1250	Up to 1220	Up to 1220	1219	1219	1220
	Length (mm)	Up to 3000	Up to 3000	Up to 3000	2050	Up to 587 (mtr)	Up to 587 (mtr)	Up to 2438	Up to 3048	2440
SPECIFI-CATIONS	Hard-Coating both sides		•	•						
COMPLIANCY	EN 45545-2	8mm R22 HL3 3-4mm R22, R23 HL3 2-4mm R4 HL3	3-9.5mm R4- HL3 3-9.5mm R1-HL1	8mm R4-HL1						
	TB/T 3237	Pass								
	NFPA 130						Pass*	Pass*	Pass*	
	49 CFR Part 223 Type I and Type II						Pass			
	49 CFR Part 238						Pass	Pass	Pass	
	UL 94 V0	Pass @3-6mm	6mm 5VB		Pass 2-5mm	Pass @0.23-3mm				Pass V-2: 1.5-2.2 mm

* A fire hazard analysis per section 8.4.2 of NFPA 130-2023 may be required for compliance of transparent or translucent LEXAN™ sheet products used for rail glazing.

POLYVANTIS

www.polyvantis.com

LEXAN™ POLYCARBONATE FILM & SHEET | Tough, Virtually Unbreakable

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