



LAMILUX COMPOSITES

HIGH-TECH MATERIALS FOR THE MARKETS OF THE FUTURE



# LAMILUX COMPOSITES – HIGH-TECH MATERIALS FOR THE MARKETS OF THE FUTURE

**LAMILUX Composites is Europe's leading developer and manufacturer of fibre-reinforced plastics.**

With knowledge and experience from over 60 year in plastics manufacturing, we produce panels and sheeting from highstrength and sturdy, yet very light fi bre-reinforced materials on several production lines.

These high-performance and individually adaptable high-tech materials are used in industrial areas including the transport, logistics, automotive and construction sectors.

The high quality and the ideal adaptation of material properties to the fields of application have secured LAMILUX Composites a leading position in the international composites market for many years.



## The LAMILUX CI Philosophy

Customer value is the reason for our existence and is the focus of our activities. This requires harmony, identity and a balance between customer value and company strategy.

These guiding ideas for our company's actions and our day-to-day relationship with our customers are described in LAMILUX's company philosophy:

### Customized intelligence – serving the customer is our mission

**This requires outstanding performance and leadership in all areas relevant to customers, particularly in the role of:**

- Quality leader - optimum benefit for customers
- Leader in innovation - at the cutting edge of technology
- A leader in service - fast, uncomplicated, reliable and friendly
- A leader in expertise - optimum sales and technical consultation
- Leader in solving problems - individual, tailor made solutions

## Numerous material properties – numerous material benefits

LAMILUX Composites are ground-breaking construction materials in expanding industries like energy-efficient mobility, safe haulage of foodstuffs, hygienic foodstuff preparation and aesthetic-functional construction. Whether it involves a low weight with high resistance, non-porous and easy-to-clean surfaces or good thermal insulation values and low thermal expansion – LAMILUX Composites combine numerous beneficial material properties into individually tailored glass or carbon fibre reinforced plastics.

## Unique production process – unique quality

Several flat sheet production lines of over one hundred metres each produce the LAMILUX Composites in a continuous production process. Due to the high level of automation, which guarantees reproducible manufacturing of the different material variants at all times, the plants are the most advanced of their type in Europe. The high production standards are assured through consistent quality management throughout the entire production process. In addition to the monitoring which accompanies the process, this also includes intensive laboratory-based incoming raw material and output material inspections.



## TÜV SÜD certified quality

LAMILUX is the world's first manufacturer of fibre-reinforced composites to have voluntarily submitted a major portion of its laboratory and testing facilities to testing by TÜV Süd Deutschland and to have successfully obtained certification. With this, LAMILUX has submitted itself to the very highest quality requirements.

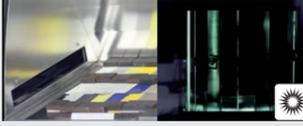
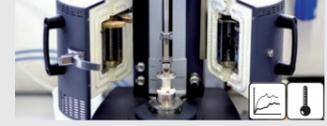
# LAMILUX QUALITÄT: TESTS AND TÜV-CERTIFIED INSPECTIONS

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extensive input throughout all stages of LAMILUX Composites materials' development, production and life cycle. Extensive substance tests and analyses form the basis in reliably examining the properties of our composites and in securing their durability and service life - to provide you with constant 100% quality at all times. For this purpose, we make use of our state-of-the-art laboratory technology and simulation environments.

## ALL TESTS CERTIFIED IN COMPLIANCE WITH TÜV SÜD QUALITY



 Sun-/Xenotest	 Infrared/halogen radiation	 Outdoor weathering	 Thermography test
 Noise prevention acc. to PIEK	 Abrasion/slip resistance	 Adhesion/delamination test	 Gas chromatography
 Impact test	 DMA measurement	 Temperature change test	 Condensation water test
 Tensile/bending strength	 Torsion test	 Barcol hardness	 Impact resistance acc. to Charpy



# LAMILUX COMPOSITES IN THE CARAVAN INDUSTRY – LONG-LASTING – LIGHT – STURDY – ELEGANT

LAMILUX Composites are mature materials proven in practical use for caravan and mobile home construction. These long-lasting, sturdy materials are found in all areas of application.



## Recommended Composites in the Caravan industry

### Roof – LAMILUX High Strength X-treme

- Lightweight surface weight with high stability
- Very high lightweight-potential
- Very good UV and weathering resistance as well as resistance to hail
- Ideal material for bending applications in small radii

### Exterior side wall – LAMILUX HG 4000

- LAMILUX premium quality: combines the benefits of fibre glass reinforced plastic with the look of aluminium
- Smooth, high gloss surface for exacting optical requirements
- Surface sealing with gelcoat layer: excellent resistance to UV rays and weathering
- Shiny metallic surfaces possible

### Interior side wall – LAMILUX Graph

- High-quality graphics on the visible side for a custom interior design
- Highly resistant to frontal impact
- Corrosion-free and no mould formation
- Easy to clean and food safe

### Floor – Composite Floor

- Very stabilizing and resilient construction material
- Attractive and abrasion-resistant PVC coating in different versions

### Floor – LAMILUX Anti Slip

- Glass fiber reinforced laminate with anti-slip coating
- Wear-resistant grit through very good distribution and attachment

#### Roof:

exterior layer – extremely resistant to UV radiation, weathering and hail, no corrosion

#### Side wall sandwich element:

exterior cover layer – light, stabilising construction material with elegant appearance

interior cover layer – customer interior design with numerous options

#### Floor:

Living room - innovative lightweight material with decorative PVC-surface

Luggage space and ramps - very durable anti-slip coating

# LAMILUX COMPOSITES IN THE COMMERCIAL VEHICLE INDUSTRY – WITH FIBRE-REINFORCED PLASTICS FOR ENVIRONMENTALLY FRIENDLY MOBILITY

LAMILUX Composites open up new possibilities for lightweight construction of truck bodies and trailers. Due to the low weight, yet high level of stability, the use of fibre-reinforced plastics is prevalent in all surface-covering zones of the roof, wall and floor areas.

## Recommended Composites in the Commercial Vehicle Industry

### Roof – LAMILUX Woven Fabric Gelcoat

- Glass-fibre polyester laminate with fabric reinforcement
- Very high tensile and flexural strength
- Outstanding for large-surface roof applications due to the low coefficient of longitudinal extension
- Long-lasting resistance to UV rays and weathering

### Exterior side wall – LAMILUX Super Plus Gelcoat

- Lightweight surface weight with high stability
- Easy-to-clean, smooth and glossy surface
- Very good UV and weathering resistance as well as resistance to hail
- Ideal material for very light and thermally insulating composite systems

### Interior side wall – LAMILUX High Impact

- Very high impact resistance and strength
- Low thermal conductivity and low thermal expansion
- High UV, weathering and corrosion resistance of duroplastics
- Easy to clean and classy surface structure

### Floor – LAMILUX Anti Slip

- Glass-fibre reinforced laminate with anti-slip coating (anti-slip class R13)
- Abrasive-resistant grit with very good distribution and adhesion and incorporation into the material
- Very stabilising and resistant material for various floor constructions

#### Roof:

outside layer – very robust and long-lasting-  
cover layer with low thermal expansion

#### Side wall sandwich element:

cover coat outside and inside –  
extremely resistant to impact and stress  
from frontal impact

interior cover layer – customer interior  
design with numerous options

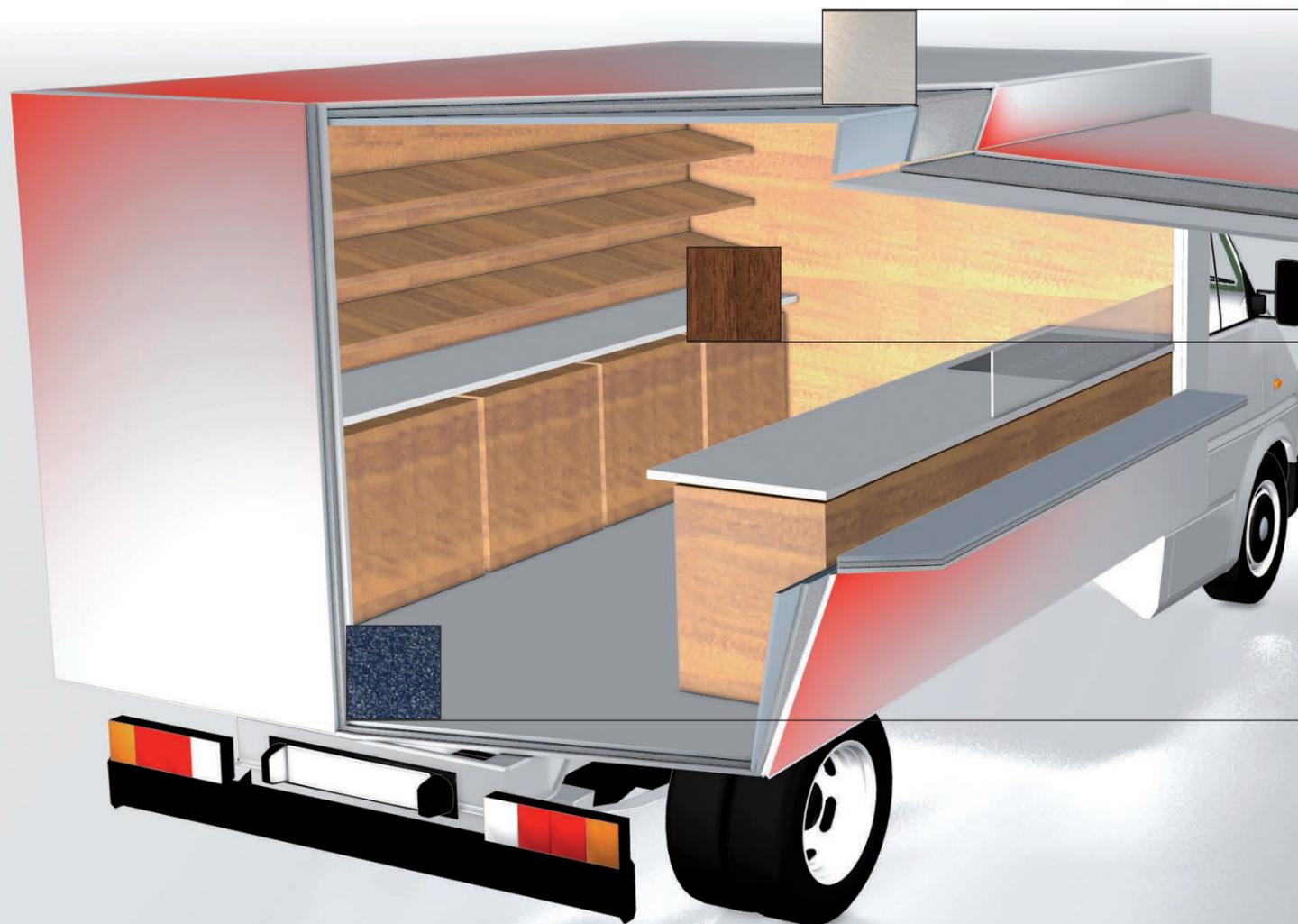
#### Floor construction:

fibre-reinforced plastic with anti-slip surface as a cover  
layer and extremely stabilising GRP as a bottom layer with  
wood or foam inserts in between



# LAMILUX COMPOSITES IN SALES AND DELIVERY VEHICLES – FUNCTIONAL AND TRANSLUCENT LIGHTWEIGHT MATERIAL

LAMILUX composites are primarily designed for the heavy mechanical influences in commercial vehicles. Their stability and long life under daily stress make them the ideal materials for bodies on sales and delivery vehicles, where they are used in the roof, the side walls and the floor.



## Roof:

Hail-proof, extremely robust materials in optional translucent version for natural light incidence in the vehicle interior

## Side wall sandwich element:

exterior cover layer – impact-resistant, weather-proof and stability-providing materials

interior cover layer – surface-tempered, food-safe and easy-to-clean materials with decorative design

## Floor construction:

very stabilising, abrasion resistant and easy-care floor surface with anti-slip effect

## Recommended Composites in Sales and Delivery Vehicles

### Roof – LAMILUX Woven Fabric Gelcoat

- High-strength glass fibre reinforced plastic for heavy mechanical stress
- Stabilising material in roof constructions
- Extremely resistant to UV radiation, weathering, hail and corrosion
- Low coefficient of thermal expansion due to high glass content
- Daylight intake possible with translucent material design

### Exterior side wall – LAMILUX Super Gelcoat

- Stabilising material for sandwich construction of side walls
- Available in all shades (RAL and NCS scale) and custom colours also available
- Construction material for very light bodies
- Easy to repair if damaged
- UV-resistant and weatherproof for a long time

### Exterior side wall – LAMILUX Graph

- Easy to clean and non-porous surface with a high quality decor
- Lends great stability to the sandwich construction
- Incorporation of custom designs possible
- Food safe

### Floor – LAMILUX Anti Slip

- Very durable and highly resistant floor covering
- Abrasion-resistant anti-slip grit

# LAMILUX COMPOSITES IN THE BUS INDUSTRY – ATTRACTIVE DESIGN AVAILABLE IN CUSTOM TYPES

LAMILUX Composites are used in both the interior and exterior areas of buses. Sheets of fibre-reinforced plastic form the outside layers of the roofs and side walls. Additional product variants also offer the possibility to cover the interior walls and floors to coat or to construct.

## Recommended Composites in the Bus Industry

### Roof – LAMILUX Woven Fabric Gelcoat 48 % SH

- Stabilising material with high tensile strength
- Low coefficient of thermal expansion in the longitudinal direction of the roof
- Extremely resistant to UV radiation, weathering, hail and corrosion
- Roof production in one piece

### Exterior side wall – LAMILUX High Strength X-treme

- Very elegant and glossy, non-porous surface
- All shades (RAL and NCS scale) as well as custom colours and metallic effects
- Outstanding UV and weathering resistance thanks to a gelcoat surface sealing
- Very robust behaviour against frontal impact forces
- Quick and easy to repair in case of damages like cracks and scratches

### Interior side wall – LAMILUX Graph

- Custom design for interior space design
- No penetration of condensate water into the material structure
- Problem-free cleaning thanks to non-porous surface
- Pressure and impact resistant

### Floor – LAMILUX Anti Slip

- Anti-slip floor coating
- Very long-lasting and abrasion-resistant
- Colouring to match the interior design

#### Roof:

large-surface, hail-proof cover layer  
with very low longitudinal expansion

#### Side wall sandwich element:

exterior cover layer – elegant and glossy  
surface with high stability and low weight

interior cover layer – decorative, colour-coor-  
dinated materials for an attractive  
interior design

#### Floor construction:

extremely long-lasting and durable floor  
covering available in a variety of colours with  
anti-slip effect





## LAMILUX FAÇADE PANELS MADE OF FIBRE-REINFORCED PLASTIC – CREATIVE LEEWAY FOR CUSTOM TAILORED EXTERNAL SKINS OF BUILDINGS

**Ventilated project façades made of fibre-reinforced plastic sheets are setting a new trend in contemporary architecture: They lend visual flair to functional buildings, turning them into attractive, prestigious buildings.**

Architects and builders can individually tailor façade skins with fibre-reinforced plastic sheets on the basis of aesthetic ideas and object-specific building characteristics.

LAMILUX produces the facing sheets in a wide variety of versions according to requirements:

The numerous possibilities with respect to colouring and sheet dimensions provide for creative leeway in order to ideally adapt the façade's appearance to the building characteristics.

In the course of continuously increasing demands on the energy efficiency of buildings, LAMILUX façade panels make a major contribution to thermal insulation with the realisation of ventilated project façades.

The outstanding quality of the LAMILUX façade panels is exemplified first and foremost by the physical and chemical material properties.

The GRP specially developed for outdoor areas is highly resistant to UV, weathering and frost. This also guarantees that the colour is non-fading and extremely durable. In addition, the sturdy sheets with fire protection classification B2 provide excellent protection against driving rain.

### APPEARANCE AND DESIGN

- Wide variety of colouring options ranging from translucent to complete colour saturation
- Realisation of striking backlighting effects, high-contrast plays of colours or muted, consistent colouring of façade surfaces
- Variable façade appearance with changing LED colour compositions
- Elegant, brilliant outer surface structure
- Creative leeway with various element dimensions and low sheet weight
- Variety of colours in standard and custom shades

### EFFICIENCY AND FUNCTION

- Rapid implementation of ventilated project façades on a filigree joint framing construction
- Energy efficiency through low thermal conductivity
- Solid and extremely resistant to frontal force effects and hail
- Long-lasting UV and weathering resistance thanks to a gelcoat surface sealing
- DIBt approval in fire protection class B2
- Simple material preparation
- Easy to clean and polish



## FIBRE-REINFORCED PLASTICS IN REFRIGERATED WAREHOUSES, COLD STORES AND SANITARY FACILITIES – IDEAL PROTECTION IN A HYGIENIC ENVIRONMENT

**The food industry has an enormous responsibility: Absolutely flawless protection of our foodstuffs must be guaranteed in production and storage. Particular care is required when handling fresh and frozen goods in refrigerated warehouses and cold stores.**

LAMILUX fibre-reinforced composites are leading the way in food safety.

**With fibre-reinforced composites as face sheets on walls in refrigerated warehouses, cold stores and sanitary rooms, you can:**

- Create smooth and easy-to-clean surfaces.
- Provide extremely hygienic, food-safe walls.
- Benefit from exceptional performance in heat-insulating, corrosion-free sandwich composite systems which offer optimum insulation and resistance to damp and chemical attacks.

### ADVANTAGES

- Lightweight, yet highly resistant and sturdy
- Low tendency to deform and no dents in the event of mechanical impact
- No corrosion
- Personalised colours from the full RAL and NCS ranges or in customer-specific shades
- Easy to repair if damaged or scratched
- Also available and easy to process in large widths up to 3.20 metres

## REFRIGERATED AND FREEZER DISPLAY CASES – GUARANTEED FOOD SAFETY

Cleanliness and hygiene directly at the PoS: The pore-free surface of LAMILUX Composites is an outstanding feature in refrigerated and freezer display cases that is directly visible to the consumers. The benefits of fibre-reinforced composites used in the refrigeration of food products in sales rooms: easy and residue-free cleaning, the clean appearance and the insulation properties in sandwich design.

The food safety of materials that come into contact with food is a very important aspect in refrigerated and freezer display cases. The food safety of several material qualities has been tested. This means that even in direct contact with food, these materials do not emit any chemical substances.

### ADVANTAGES

- Easy cleaning without any residues
- Antibacterial
- Available in food-safe material variants
- Highly resistant against moisture and no corrosion
- Very durable and resistant against pressure loads
- No formation of mould



## FIBRE-REINFORCED PLASTICS IN ANIMAL HOUSING – UPSCALE HYGIENE STANDARDS IN THE LIVESTOCK BRANCHE

**Periodical cleaning to ensure cleanliness and sterility is a decisive means against bacteria in stalls. Only this way can businesses involved in animal husbandry comply with the increasing requirements pertaining to disease control.**

Fibre-reinforced composites by LAMILUX with their pore-free and therefore easy-to-clean and residue free surfaces greatly contribute in providing sustainably improved hygiene.

### ADVANTAGES

- Easy to clean
- No corrosion
- Resistance against mould formation
- Easy to handle in daily production
- Good chemical resistance against a number of cleaning agents
- Low tendency to deform and no dents in the event of impact

## FIBRE-REINFORCED PLASTICS IN MOBILE UNITS AND SECONDARY HOUSES – VARIOUS AND COMFORTABLE ROOM SOLUTIONS

**Whether it involves temporary room solutions for conflict area, construction sites, offices and sanitary containers, flexible housing units or individual modular buildings for daycare centres and schools: Projectbased room mobility can only be realised with materials which have versatile physical and chemical properties. Fibre-reinforced plastics produced in sheets are construction materials in high demand for mobile units, modular housing and agricultural buildings.**

Available in several product variants, LAMILUX is the ideal material available for wall elements which set up quickly both indoors and outdoors or for mobile room units.

- Since the entire spectrum of colours is available in all RAL, NCS and customer-specific shades, very unique spaces can be designed, which can be harmonically adapted to existing architecture in the surroundings – e.g. as modular systems.
- The smooth and easy-to-clean wall surfaces in the indoor area are setting new standards for cleanliness and hygiene.
- The cover layers of the sandwich construction made of fibre-reinforced plastics have an extremely stabilising effect and ensure a very sturdy construction even for temporary room solutions.

### Further applications in the building industry



Clarification plants



Wall cladding



Door panels



Agricultural buildings



## FIBRE-REINFORCED PLASTICS FOR THE SPORTS INDUSTRY – LAMISPORT X-TREME

**Along with the customer and application-based development and production of its composites, LAMILUX is opening up entirely new application possibilities.**

From the initial idea to the final product, LAMILUX pursues the objective of creating and offering very innovative, personalised industry solutions with a wide range of advantages over the materials employed up until now.

The surface can be printed with the protective film already applied. Sublimation printing allows colour particles diffusing directly into the surface. The process-outlasting protective film can remain applied during all production stages that follow. LAMILUX supplies the material in white and many other colours, as well as in a translucent version for use in combination with high-quality wooden cores. The carbon-fibre reinforced material has an aesthetically pleasing appearance with the woven structure visible on the boards or skis surface.

### ADVANTAGES

- Up to 15 percent less weight
- Extreme strength and stiffness for sports equipment
- High UV resistance
- Directly printable surface
- No need for additional layers thanks to the integrated topcoat, enabling a more efficient production process

## FIBRE-REINFORCED PLASTICS FOR TRANSPORTATION APPLICATIONS – FOR A SAFE TRANSPORTATION UNDER DIFFICULT CONDITIONS

**Refrigerated containers are subjected to very high mechanical stress during loading and transport. In addition, they must maintain low temperatures using as little energy as possible over very long periods of time. LAMILUX Composites ensure the safe and energy-efficient transport of food in refrigerated containers.**

Cooling container interiors are equipped with wall paneling made of highly impact resistant fibre-reinforced composites, their stiffening effect lending high stability to the entire container construction. Further outstanding features are their thermal insulation properties and the low heat expansion of the material due to its high fibre content.

### ADVANTAGES

- High impact resistance and robustness
- High loads thanks to the lightweight design
- Easy to clean and no corrosion
- Very durable and resistant against sunlight and weather
- Avoidance of thermal bridges with reinforced materials



## WITH LAMILUX YOU GAIN SAFETY – MADE IN GERMANY

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- An excellently trained maintenance and repair team ensures the smooth and error-free operation of our several production lines.
- Our decades of logistical expertise enable cost-efficient, worldwide shipment of materials.
- Our continuous manufacturing processes monitored by highly qualified experts ensure that you get constant and highest quality, at all times.
- We create your unique selling points Our engineers and technicians work in close collaboration with you to produce customised and industry-specific product solutions.
- As Europe's market leader, we have extensive production capacities which guarantee supply reliability.
- Prior to each composite production, we conduct comprehensive controls of the delivered raw materials. Our supplier selection is performed on the basis of the very highest quality criteria.
- During and after production, we subject your material to extensive controls and laboratory inspections.
- We examine the mechanical, chemical and physical properties of the completed composite in real application environments and tests its behaviour in combination with other materials.
- We continue to develop your individual materials and optimize material properties for the respective areas of applications.

## WITH LAMILUX YOU SAVE TIME AND MONEY

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- With our international local offices we are available to you in the respective time zones.
- Our warehouses in several countries and regions ensure the quick delivery of your materials around the world.
- We transfer our knowledge and offer you on-site engineering support for further processing of composites and on any application-specific questions you may have.
- With our flexible manufacturing technology, we can start the production of your individual material following short machine changeover times.
- Our highly automated, continuous manufacturing processes always create reproducible material variants in the very highest, unvarying quality.

## WORLDWIDE SERVICE AND FAST DISTRIBUTION

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### Smooth cycle for the satisfaction of our customers

With local contact partners always available and its fast international distribution, LAMILUX is an industry leader in delivery reliability. This is partly thanks to our long-time experience in worldwide shipping and the logistical know-how of our customer-oriented sales team. In addition, the large production capacities of the five flat sheet production lines assure short-term material production.

- With strategic, intelligently distributed dependencies in numerous countries around the world, we are always available for our customers in the respective time zones.
- The long-sheet final format of the fibre-reinforced plastics developed predominantly on rollers enables optimal utilisation of the container volume.
- With warehouses in international locations stocked with the most common material qualities, fast regional delivery is guaranteed worldwide.
- Our decades-long logistical experience enables cost-efficient material delivery.
- The continuous, highly-automated and very flexible manufacturing process can be converted at any time to accommodate the production of custom material variants - and usually with short change-over times.

## INTENSIVE TECHNICAL SUPPORT

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The service of LAMILUX is also intensified through a thorough exchange of engineering know-how on site.

- Support in the further processing of fibre-reinforced plastics
- Collaborative development of new material solutions
- Consultation with all application-specific questions
- Effective strengthening of the time-to-market competence



The specifications in this brochure are based on our current knowledge and experience. They are not a guarantee of technical characteristic features in the scope of specifications. The suitability of the product for the respective application must be checked by the user due to the variety of application parameters. Changes and errors excepted.



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