



LAMILUX
GASYSYSTEME

LAMILUX Façade Panel

Aesthetics and design
Efficiency and function



BACKLIGHTING WITH RGB LED

Building: ADMINISTRATION BUILDING IN REHAU

LAMILUX FAÇADE PANEL – Artistic leeway for individualised building exteriors

With panels made of fibre-reinforced plastic, ventilated project façades become an overall concept for modern, aesthetic construction – and the architecture is enriched by a variety of creative perspectives. They range from transparent, back-lit effects to the creation of high-contrast plays of colour to succinct, monochromatic and homogeneous façade surfaces.

LAMILUX Composites produces façade panels which are 5.0 millimetres thick and at the same time very light, varying from translucent to complete colour saturation. In the process, all colours of the RAL and NCS scales as well as custom colours are possible. The balanced colour effect and durability of the composite façade panels is the result of a technologically sophisticated, quality-oriented continuous production line. With 60 years of market and production experience, LAMILUX Composites is Europe's leading manufacturer of fibre-reinforced plastics.



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 benefit 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 advisory services
- A leader in solving problems - individual, tailored solutions

A play of LIGHT AND COLOUR

Attractive colour-light effects can be achieved with the backlighting of translucent LAMILUX façade panels using light emitting diode systems (LED) or similar systems. The particular visual appeal:

With the glass fibres and their arrangement structure in the façade panels, the result is a soft and harmonic light, as opposed to a cooler, more localised light.

- With a white light, the façade impressively radiates in its colour scheme.
- With coloured light, the base colours of the façade panels recede into the background, so that the façade shines in the colours of the LEDs.
- Using LEDs with variable colours, the entire colour impression of a building can be altered within a matter of seconds.

The building pictured appears in the colours ivory, wine red and translucent white during the day. At night the backlighting of the LAMILUX façade panels creates light effects in the colours of the variable RGB LEDs (miniature images).

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LAMILUX façade panels made of fibre-reinforced composite:
Artistic leeway for individualised building exteriors

Ventilated project façade made of fibre-reinforced plastic panels are setting a new trend in contemporary architecture: They bestow a great deal of visual appeal upon functional buildings and turn them into attractive, prestigious buildings.

Based on aesthetic ideas and object-specific building characteristics, architects and developers can design unique building exteriors with the fibre-reinforced plastic panels.

LAMILUX produces the façade panels according to customer wishes in a wide variety of versions: The numerous possibilities for colouring and panel dimensions offer creative leeway for ideally adapting the effect of façade appearances to the building characteristics.

AESTHETICS AND DESIGN

Extensive range of colouring options from translucent to complete colour saturation

Realisation of attractive backlighting effects, high-contrast colour play or calm, monochromatic façades

Changeable façade appearance with variable LED colour compositions

Elegant, brilliant outer surface structure

Creative design leeway through various element dimensions (up to 2.5 m x 4.0 m) and low panel weight

Variety of colours in standardised and custom tones



Product: FAÇADE PANEL IN SPECIAL GOLD COLOUR

From the functional building to PRESTIGIOUS ARCHITECTURE

In the course of steadily increasing demands on building efficiency, LAMILUX façade panels make a major contribution to optimal heat insulation in the realisation of ventilated project façades.

The outstanding quality of LAMILUX façade panels is especially evident in the physical and chemical material properties: The GRP specially developed for the external area is highly resistant to UV, weathering and frost. As a result, long-lasting colour fastness and durability of life are guaranteed. In addition, the robust panels offer good protection against driving rain, as well as fire protection classification B2.

EFFICIENCY AND FUNCTION

Fast implementation of ventilated project façades on filigree framing construction

Energy efficiency due to low thermal conductivity

Robust and highly resistant to frontal force and hail

Long-lasting resistance to UV rays and weathering with gelcoat surface sealing

DIBt approval Z-33.2-1173 in fire protection classification B2

Simple material preparation

Easy to clean and polish

LAMILUX FAÇADE PANEL – THE COMBINED benefits of aluminium, glass and fibre cement



Technical data for LAMILUX Façade panels

Technical and mechanical properties	Test method	
Material thickness	In-house	5.0 mm
Weight	In-house	approx. 7,250 g/m ²
Glass content	In-house	25-28 %
Flexural strength	DIN EN ISO 14125	About 145 N/mm ²
Flexural modulus of elasticity	DIN EN ISO 14125/WKII	approx. 5,600 N/mm ²
Tensile strength	DIN EN ISO 527-4/2/2	approx. 90 N/mm ²
Tensile modulus	DIN EN ISO 527-4/2/2	approx. 7,800 N/mm ²

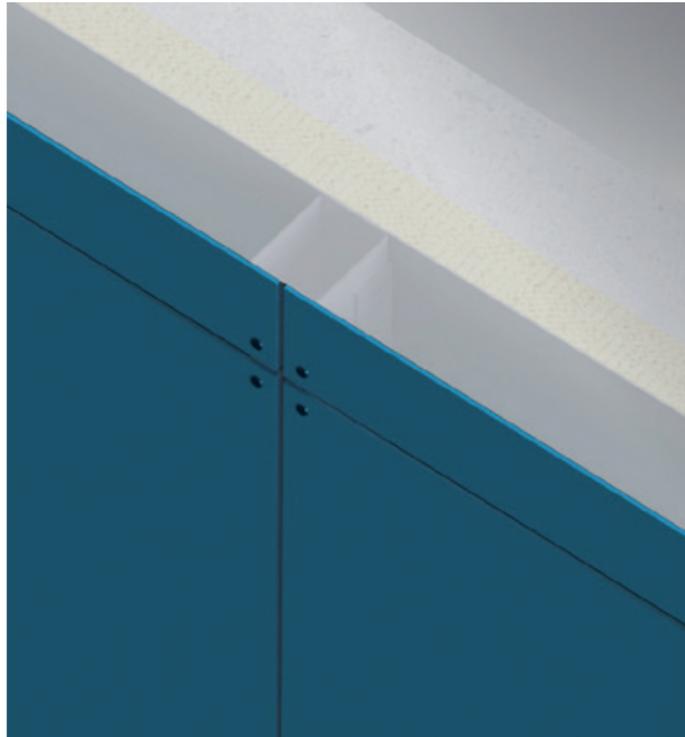
Palette of STANDARD COLOURS

Building: WOHLN GYMNASIUM



Colours may vary.

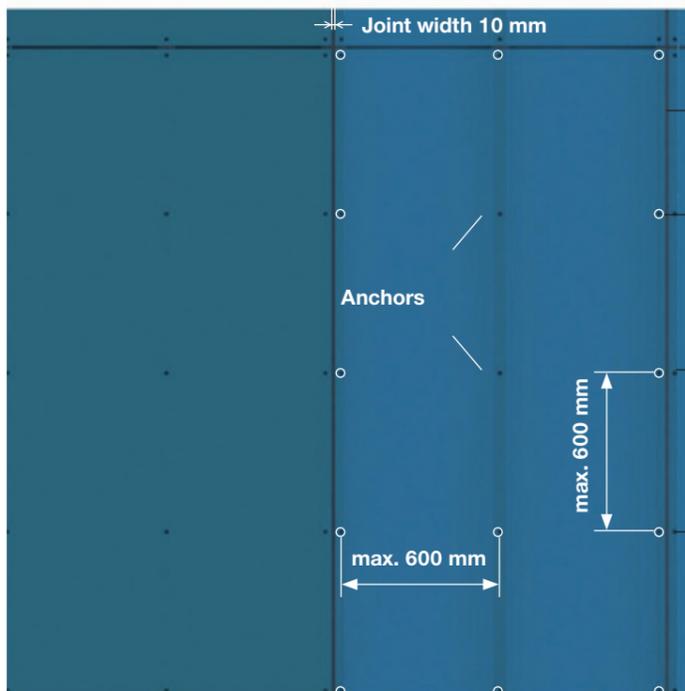
MOUNTING TECHNOLOGY



When mounting the panels on a suitable framing construction, it must be assured that the panels are not under tension and can work freely. The following figures are example representations; for more detailed information about the mounting possibilities and mounting materials, please refer to the building supervisory approval Z-33.2.-1173.

The following must be taken into account for the appropriateness of the framing construction:

- Wind loads
- Maximum mounting distances for the panels
- Use as ventilated façade conforming to DIN 18516-1
- Zero-stress mounting
- Panel dimensions in accordance with the building supervisory approval and installation guidelines
- Thickness of a potential insulation layer
- Anchoring possibilities in the (wall) construction
- For concrete data, please refer to the general building supervisory approval no. Z-33.2.-1173



Colour: blue (opaque)

Colour: blue (translucent)

ALUMINIUM SUPPORT PROFILES OF THE FRAMING CONSTRUCTION

According to the building supervisory approval, the support profiles of the framing construction must be vertically running, symmetrical aluminium profiles with a thickness ≥ 2 mm. With a moment of inertia of at least $I = 15.93 \text{ cm}^4$ in the panel field (and/or at least $I = 16.73 \text{ cm}^4$ in the area of the vertical joints), the maximum supporting width of the supporting profiles may be $l = 2.4$ m for single-field supports and $l = 1.20$ m for multiple-field supports. With a low moment of inertia $I_{\text{Red}} < 16 \text{ cm}^4$, the maximum supporting width of l to I_{Red} must be reduced according to the following correlation: $l_{\text{Red}}/16 = (I_{\text{Red}}/16)^{0.5}$. A minimum value of $I_{\text{Red}} = 6 \text{ cm}^4$ may not be undercut.

FASTENERS

The blind rivets ($\varnothing 5$ mm) in accordance with the general building supervisory approval no. Z-33.2.-1173 with a head diameter of 16 mm are to be used as fasteners.

At mounting points to be designed as anchors, the blind rivets must be installed in aluminium anchor bushings (alloy EN AW 2007).

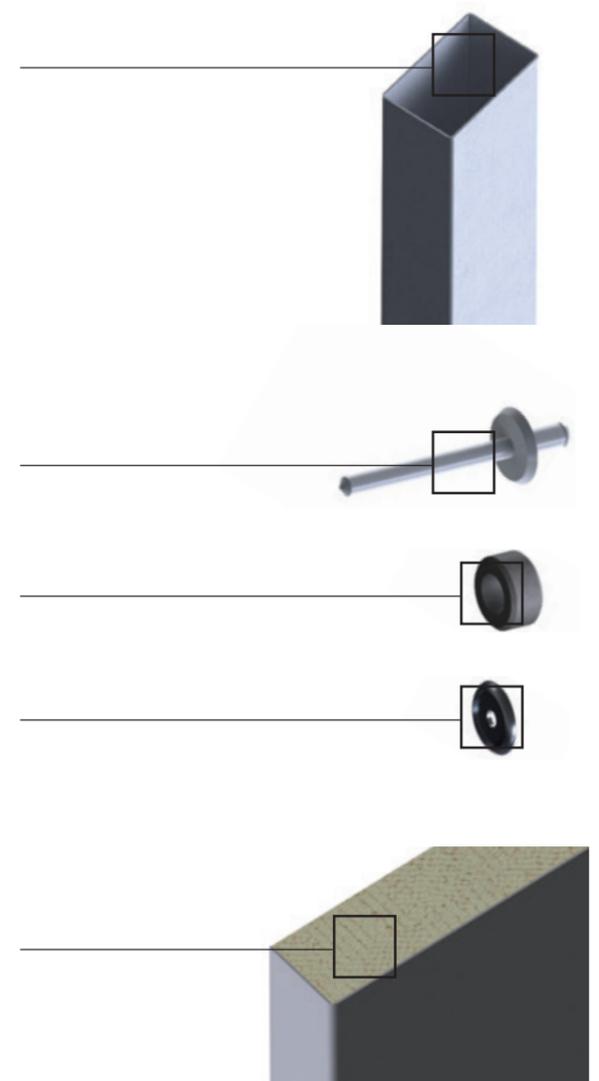
At mounting points with panel holes ($\varnothing 12.5$ mm), the blind rivets must be installed with aluminium washers (Cuvette) (alloy EN AW 2007).

THERMAL PROTECTION

With the proof of thermal protection, the rated value of thermal conductivity use for the insulation in accordance with DIN V 4108-41:2006-06, Table 2, Category I is to be applied.

GENERAL BUILDING SUPERVISORY APPROVAL

The recommendations provided on this page and the following pages are non-binding. For concrete instructions for application, please refer to approval no. Z-33.2.-1173, which you can request from us free of charge.



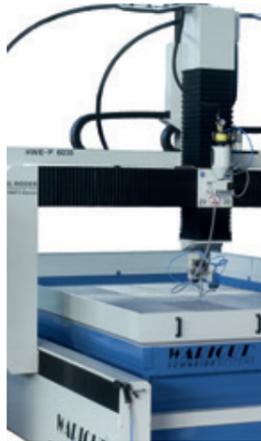
PREPARATION AND HANDLING



DRILLING CONNECTING HOLES

Simple carbide drills with a conventional cutting edge geometry and very small cutting edge radius are suitable for drilling small numbers of holes. If a larger number of holes are being drilled, it is recommendable to use a diamond-tipped or PCD-tipped drill. However, such drills can only be used for manual drilling to a limited extent.

- 9.5 mm hole diameter for panel lengths < 3 m
- 12.5 mm hole diameter for panel lengths > 3 m



WATER JET CUTTING

Water jet cutting is an environmentally friendly, high-precision, cold-cut process which uses a high-pressure jet of water to cut almost all types of materials and different thicknesses without heating or deforming the material. The high-pressure water jet cutting process thus offers an alternative to thermal cutting methods with the advantage that no gases or vapours are released during the machining process. This type of process offers a number of further advantages:

- There are no cutting tools involved, so there is no direct wear on tools
- Cutting geometry almost point-shaped; all types of two-dimensional contours can be cut (corners, edges, extremely narrow radii, etc.)
- Clean, almost burr-free cut edges
- No micro-cracks



SAWING

A circular saw with an integrated extraction system will suffice for smaller quantities of material. If you need to cut larger quantities, it is recommended that you use a diamond-tipped saw blade. Work on a stable support surface to ensure the material does not fragment along the cutting edge. Cutting speeds usually lie within the range of 1.0 – 3.6 m/min. Carbide, polycrystalline diamond (PCD) or diamond-tipped saw blades are used, depending on tool life requirements.

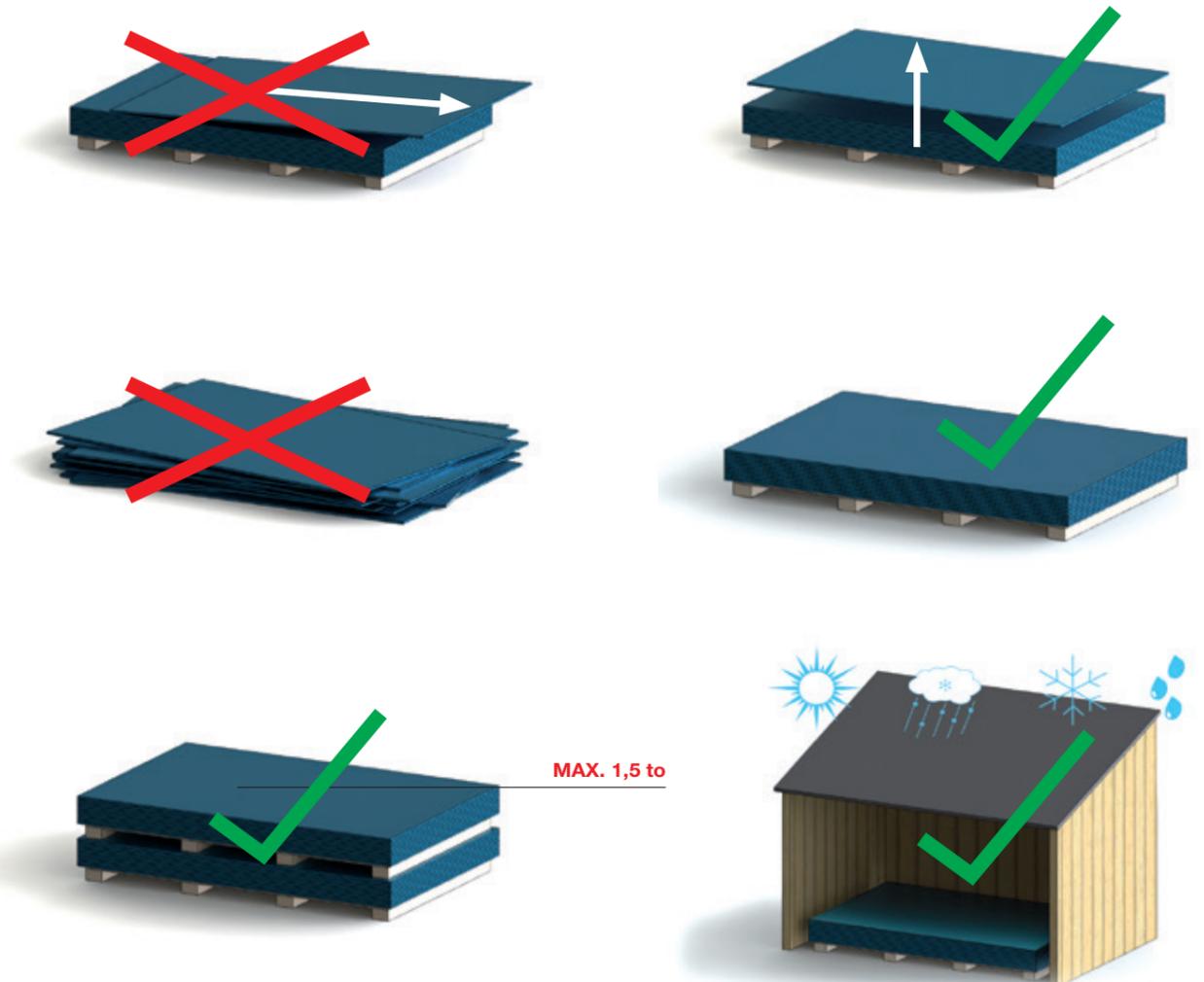
For these processes we recommend sealing the cut edges with a conventional UV-resistant paint.

TRANSPORT AND STORAGE

The façade panels are to be placed on stackable one-way pallets. The size of the pallets must be adapted to the panel dimensions so that they are approx. 1 cm larger than the panels on each side. A panel may never protrude over a pallet edge. The panels must lie flat so that they do not incur any damage when the pallets are stacked. Only one panel size should be packed per pallet. However, if multiple panel sizes are stacked on a pallet in exceptional cases, a GRP protective panel and a plywood panel must be used as intermediate layers.

A pallet may not be loaded with a weight in excess of 1.5 t. The panels may not be stacked directly on the panel; a GRP panel must be placed beneath them for protection. As an additional means of protection, each pallet stack must be covered with a chipboard panel. A layer of protective film must be placed between the panels. Each pallet must be covered with waterproof and lightproof film secured against slipping after the load is completed. When packing the pallets it is mandatory that an edge guard is placed below any contact points for straps or bands.

With vertical storage, the panels must be stored on a special shelf system for panels in which they stand upright at their full height.





REFERENCES



Fraunhofer-Institut Ilmenau

Building

Country: Germany

Year of construction: 2008

Architects: Staab Architekten, Berlin

Product

Special colourless façade panel

Fire protection classification DIN 4102 B2

Framing construction
made of aluminium

Fastening
not visible due to framing in aluminium cassettes

Special
concealed doors and maintenance openings
integrated in the cladding



REFERENCES



CHURCH Staufen

Building

Country: Switzerland

Year of construction: 2009

Architects: Hegi Koch Kolb Architekten, Wohlen

Product

Special gold façade panel
Grey façade panel

Framing construction
made of aluminium

Fastening
Blind rivets



Via Praetoria Windisch

Building

Country: Switzerland

Year of construction: 2007

Architects: Walker Architekten, Brugg

Product

colourless façade panel
Fire protection classification BKZ 4.2

Framing construction
made of steel

Fastening
Blind rivets

Special
printing on the sheets,
curved design in the
archway

Gymnasium Niederglatt

Building

Country: Switzerland

Year of construction: 2008

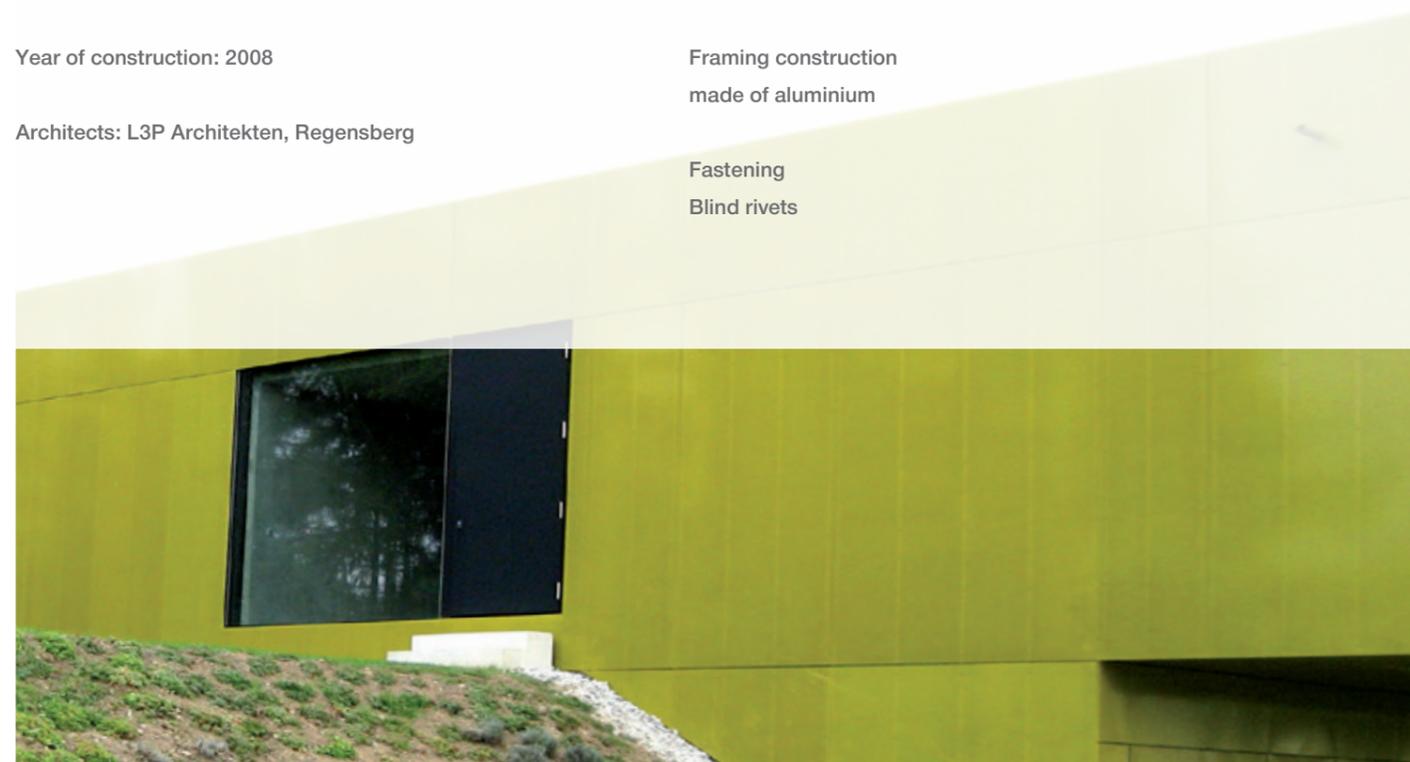
Architects: L3P Architekten, Regensberg

Product

Yellow façade panel

Framing construction
made of aluminium

Fastening
Blind rivets



LAMILUX CI-SYSTEME



ROOFLIGHT DOME F100



CONTINUOUS ROOFLIGHT B



LIGHT WALL



GLASS ARCHITECTURE KWS 60



CONTROL SYSTEMS



FRESH AIR SUPPLY DEVICES



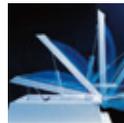
GLASS ELEMENT F



CONTINUOUS ROOFLIGHT S



BUILDING UPGRADES



SMOKE AND HEAT EXHAUST
VENTILATION SYSTEMS



PHOTOVOLTAIC SYSTEMS



FIBRE-REINFORCED
COMPOSITES

The information submitted in this brochure is based on our current knowledge and experience. Technical values do not represent any assurance of characteristics within the scope of a specification. Users have to check the product's suitability for the respective application owing to the wide range of available application parameters. We reserve the right to make mistakes or modifications.



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