



LAMILUX FACADE PANELS
AESTHETICS AND DESIGN

LAMILUX FACADE PANEL – CREATIVE FREEDOM FOR INDIVIDUAL BUILDING SHELLS

With panels made of fibre-reinforced plastic, rear-ventilated curtain wall facades become the model of modern, aesthetic construction - and the architecture is made richer by many creative perspectives. They range from transparent, backlit effects and the creation of contrasting colour combinations to distinctive, colour-coordinated and uniform facade areas.

LAMILUX Composites manufactures 5.0 millimetre thick yet extremely light facade panels from translucent to completely opaque. All RAL and NCS scale colours as well as custom colours are available. The balanced colour effect and durability of the fibre composite panels is the result of a technologically sophisticated, quality-oriented flat sheet production process. LAMILUX Composites is Europe's leading manufacturer of fibre-reinforced plastics with 70 years of market and production experience.



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

Customised intelligence – serving the customer is our mission:

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

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

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INTERPLAY BETWEEN LIGHT AND COLOUR

Attractive colour light effects can be achieved by backlighting translucent LAMILUX facade panels, for example with LED systems. The special visual appeal: The glass fibres and their structured layout in the facade panels do not create a cool, localised light, but a soft and harmoniously scattered light.

- With white light, the facade gleams impressively in its colour.
- With coloured light, the base colours of the facade panels recede into the background, so that the facade shines in the light colour of the LEDs.
- With colour-changing LEDs, the whole colour impression of a building can be altered with just the flick of a switch.

During the day, the pictured building appears in ivory, wine red and translucent white colours. At night, the backlighting of the LAMILUX facade panels creates light effects in the colours of the switchable RGB LEDs (thumbnail pictures).



AESTHETICS AND DESIGN

Rear-ventilated curtain wall facades made of fibre-reinforced plastic panels set a new trend in contemporary architecture: They give functional buildings a great visual appeal and transform them into attractive showpiece buildings.

Based on the aesthetic expectations and the project-specific building characteristics, architects and builders can custom design facade claddings with the fibre-reinforced plastic panels.

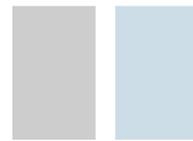
LAMILUX manufactures the facade panels in a wide range of different types as required: The range of options in terms of colour and panel dimensions provide the creative freedom to perfectly adapt the appearance of the facade in its effect to the building characteristics.



A wide range of colours from translucent to completely opaque



Implementation of attractive backlighting effects, contrasting colour interplay or calm, colour-coordinated facade areas



Variable facade appearance thanks to switchable LED colour combinations



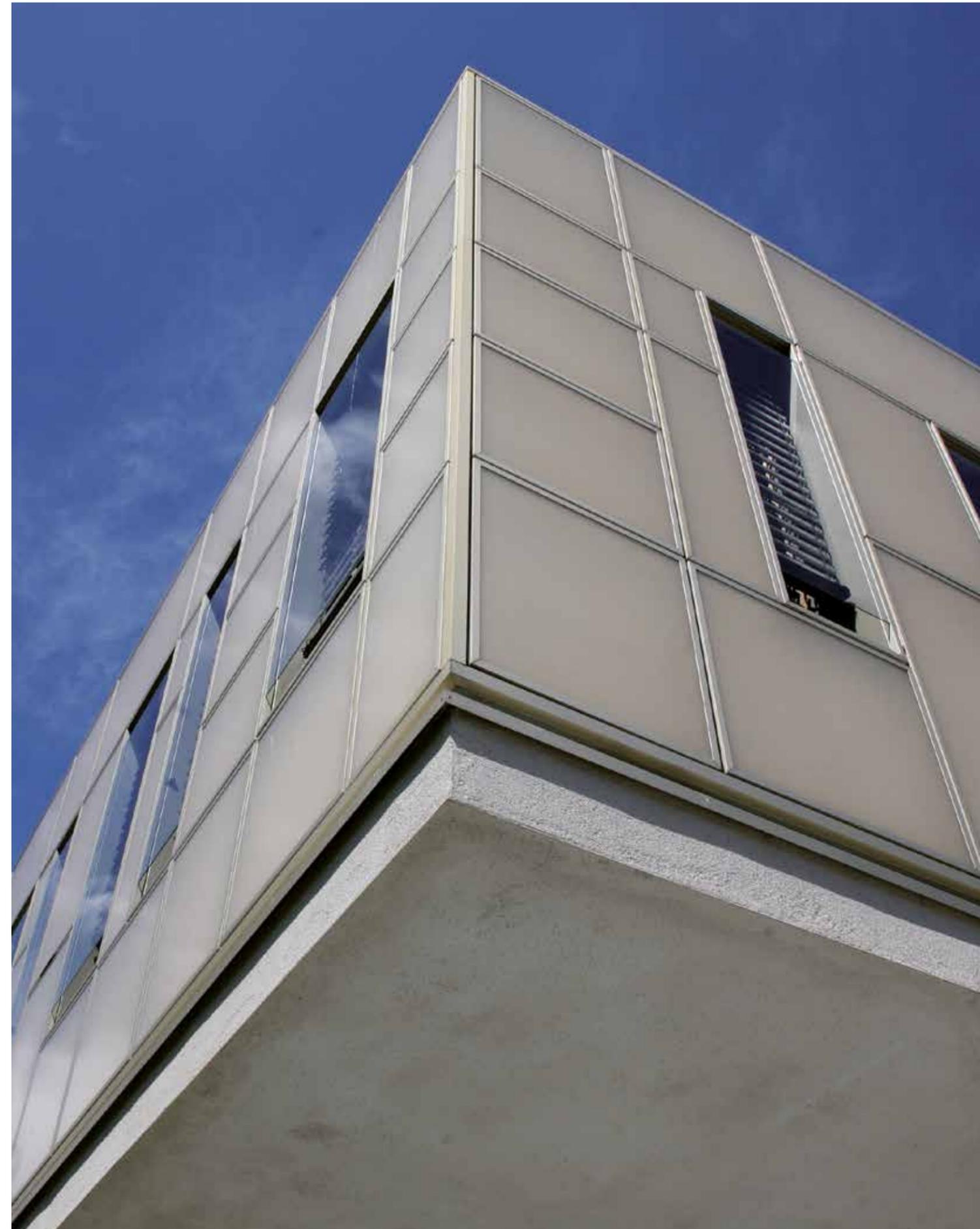
Elegant, high-gloss surface structure



Creative design freedom thanks to different element dimensions (up to 2.5 m x 4.0 m) and low panel weight



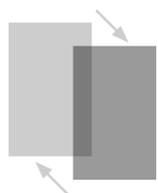
Wide range of standard and custom colours



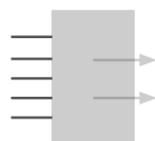
EFFICIENCY AND FUNCTION

LAMILUX facade panels make a significant contribution to optimum heat insulation in the implementation of rear-ventilated curtain wall facades in the wake of ever-increasing building energy efficiency requirements.

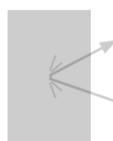
The outstanding quality of LAMILUX facade panels is primarily reflected in their physical and chemical material properties: The GRP has been specially developed for outdoor use and is highly resistant to UV rays, weathering and frost. This guarantees long colour fastness and a long durability of life. The robust panels also offer good protection against driving rain.



Rapid implementation of rear-ventilated curtain wall facades on filigree framing construction



Energy efficiency due to low thermal conductivity



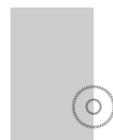
Robust and highly resistant to frontal force and hail storms



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



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



Simple material processing



Easy to clean and polish



CHURCH, STAUFEN

Project

- Country: Switzerland
- Architects: Hegi Koch Kolb Architekten, Wohlen

Product

- Facade panel custom colour special gold
- Facade panel grey
- Aluminium substructure
- Fixing Blind rivets



SCHOOL, MANNHEIM

Project

- Country: Germany
- Architects: Motorlab Architekten, Mannheim

Product

- Facade panel, translucent green, medium and light
- Facade panel natural
- Aluminium substructure
- Fixing Blind rivets



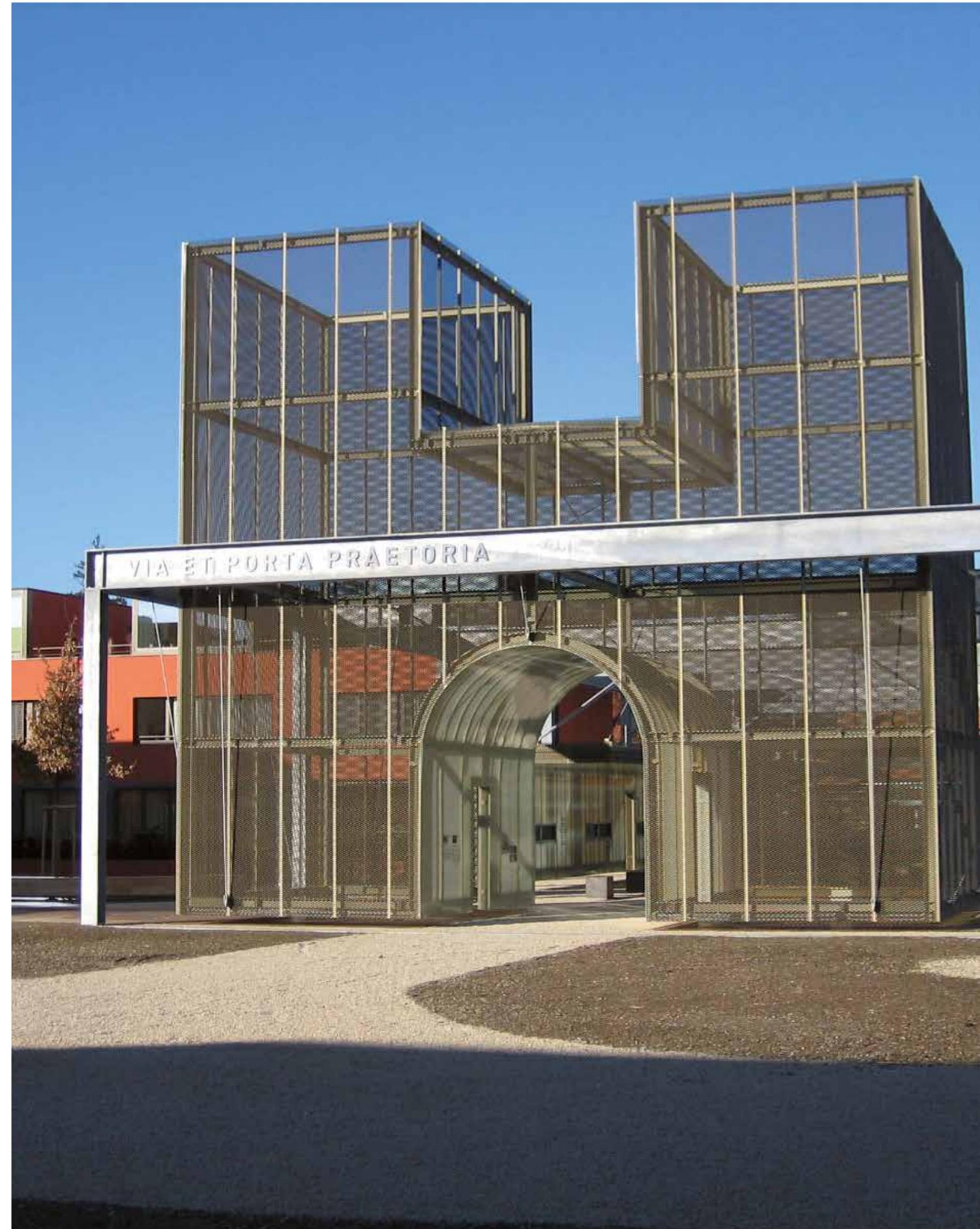
VIA PRAETORIA, WINDISCH

Project

- Country: Switzerland
- Architects: Walker Architekten, Bruggn

Product:

- Facade panel natural
- Steel substructure
- Fixing Blind rivets
- Special: Printing on panels, curved version in arched entrance



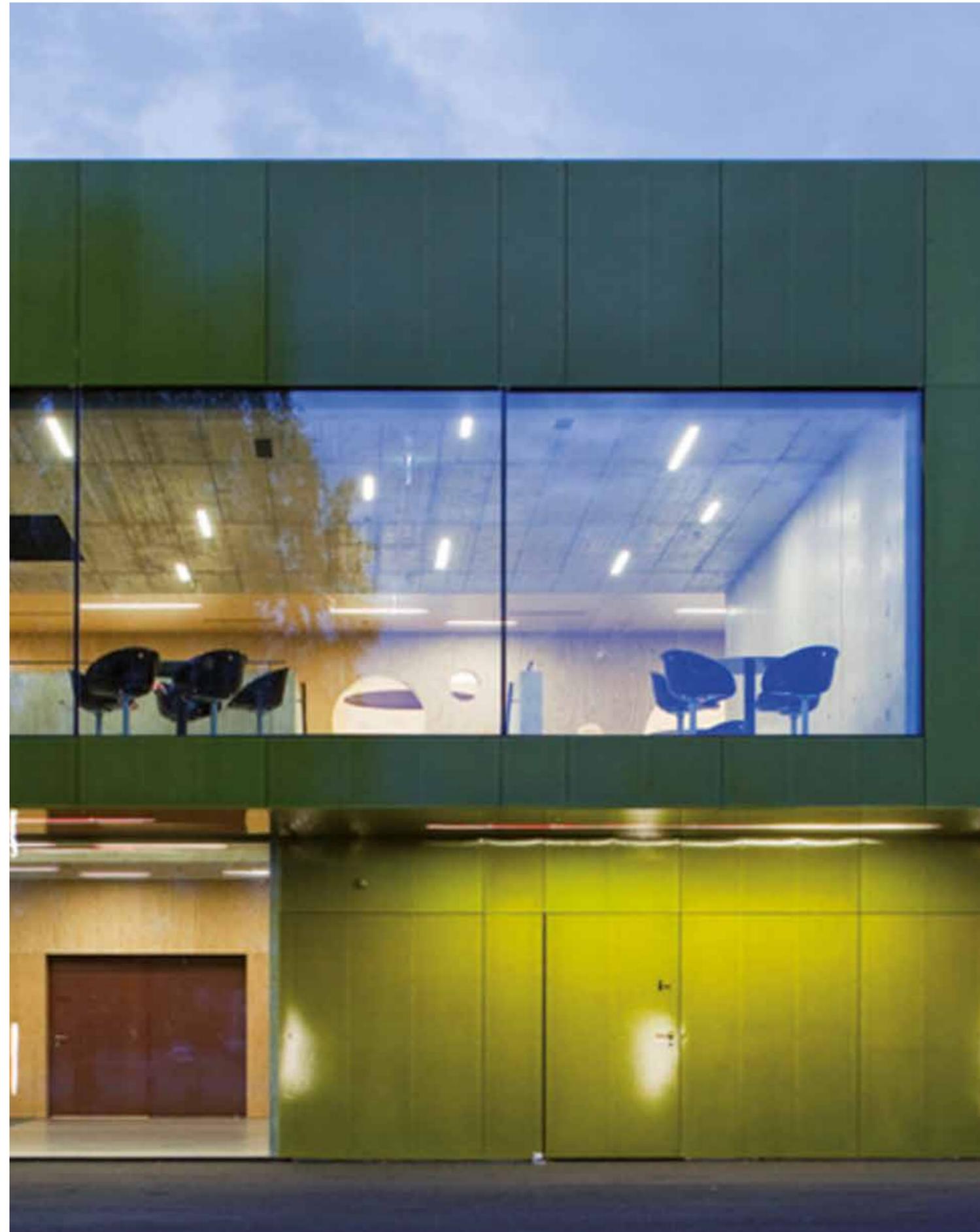
GYMNASIUM, NIEDERGLATT

Project

- Country: Switzerland
- Architects: L3P Architekten, Regensberg

Product:

- Facade panel yellow
- Aluminium substructure
- Fixing Blind rivets



CHARACTERISTICS AND COLOURS

LAMILUX facade panels combine the advantages of aluminium, glass, and fibre cement:

- Low weight and high strength like **aluminium**
- High resistance to hail and vandalism as well as translucency like **glass**
- Good insulating properties and organic surface effect like **fibre cement**

Technical and mechanical properties	Testing methods	
Material thickness	internal	5.0 mm
Weight	internal	approx. 7,250 g/m ²
Glass content	internal	25-28%
Thermal expansion	internal	2.5 10 ⁻⁵ 1/K
Flexural strength	DIN EN ISO 14125	approx. 145 N/mm ²
Flexural modulus of elasticity	DIN EN ISO 14125	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

Standard colour palette*



Other colours on request.

*Colour variations possible

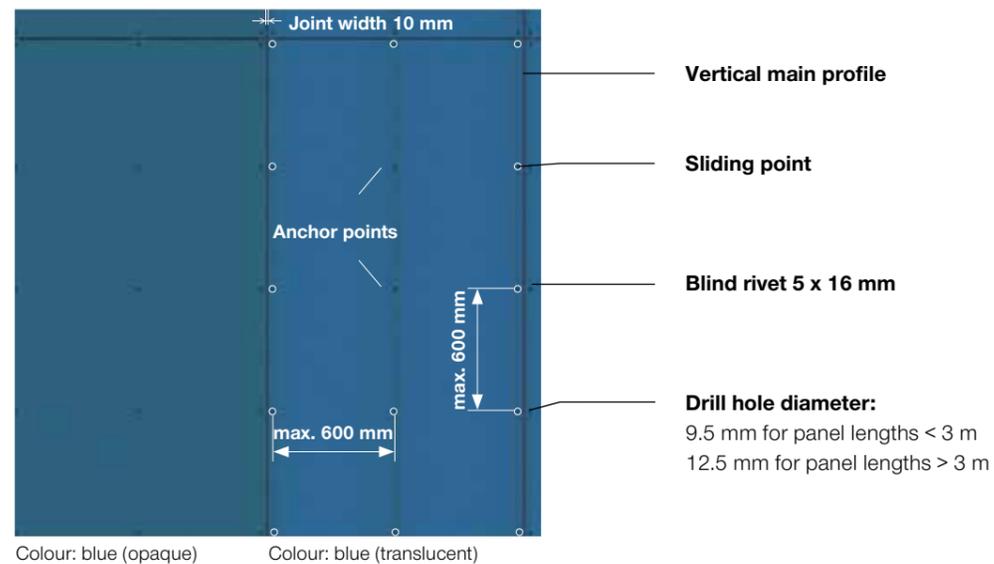


FIXING INSTRUCTIONS

LAMILUX facade panels are mounted on a suitable substructure construction without tension, so that the panels can work freely. Example illustrations are shown here, detailed information on fixing options and fixing materials can be found in the building authority approval Z-33.2.-1173.

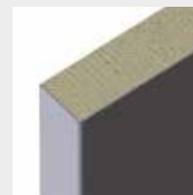
The following aspects, among others, shall be taken into account when designing the framing construction:

- Wind loads
- Maximum fixing distances for the panels
- Standard-compliant application as rear-ventilated facade in accordance with DIN 18516-1
- Tension-free installation
- Panel dimensions in accordance with building authority approval and installation guidelines
- Thickness of any insulation layer
- Anchoring options in the (wall) construction
- Specific data can be found in the general building authority approval no. Z-33.2-1173, available on request



Aluminium supporting profiles of the framing construction

According to building authority approval, the supporting profiles of the substructure shall be vertically aligned 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 (or at least $I = 16.73 \text{ cm}^4$ in the area of vertical panel joints), the maximum supporting width of the support profiles shall be $l = 2.4$ m for single-span beams or $l = 1.20$ m maximum for multi-span beams. At a lower moment of inertia $I_{\text{Red}} < 16 \text{ cm}^4$, the maximum supporting width from l to l_{Red} shall be reduced according to the following relationship: $l_{\text{Red}}/16 = (I_{\text{Red}}/I)^3$. A minimum value of $I_{\text{Red}} = 6 \text{ cm}^4$ shall be complied with.



Thermal protection

In the case of the thermal protection certification, the rated thermal conductivity value in accordance with DIN V 4108-41:2007-06, Table 2, Category I, shall be used for the insulation material used.

Fixing materials



Blind rivet

The blind rivets ($\varnothing 5$ mm) with a head diameter of 16 mm shall be used as fixing means in accordance with the general building authority approval no. Z-33.2-1173.



Fixed point sleeves

The blind rivets shall be placed in fixed point sleeves made of aluminium (alloy EN AW 2007) at fixing points which are to be designed as fixed points.



Cuvettes

The blind rivets with washers (cuvettes) made of aluminium (alloy EN AW 2007) shall be installed at fixing points with panel drill holes ($\varnothing 12.5$ mm).

PROCESSING AND HANDLING



Drilling connecting holes

Simple carbide drills with a conventional cutting-edge geometry and very small cut-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.

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



Waterjet cutting

Waterjet 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 waterjet cutting process thus offers an alternative to thermal cutting methods with the advantage that no gases or vapours are released during the machining process. The process offers a range of additional advantages:

- 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
- No tool wear



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. Usual cutting speeds range from 1.0 to 3.6 m/min. For blades, carbide, PKD (polycrystalline diamond) or diamond-studded saw blades are used, depending on the requirements for tool service life.

In this process, we recommend sealing the cut-edges with commercially available, UV-resistant paints.

TRANSPORT AND STORAGE

The facade panels shall be placed on stackable one-way pallets. The size of the pallets shall be adapted to the panel dimensions so that they are approx. 1 cm larger on each side than the panels. Panels shall not protrude from the pallet edges. The panels shall lie flat in such a way that no damage occurs to the panels when stacking the pallets. Only one panel size shall be packed per pallet. If, in exceptional cases, several panel sizes can be packed on a pallet, a GRP protective panel and a plywood panel shall be inserted as intermediate layers.

A pallet shall not be loaded with a weight of more than approx. 1.5t. The panels shall not be stacked directly on the pallet, but a fibre-

glass panel shall be placed underneath for protection. For additional protection, each stack of panels shall be covered with a chipboard panel. A layer of foam film shall be placed between the panels. When loading is complete, each pallet shall be covered with a waterproof and opaque film that is secured against slipping. When packaging pallets, edge protection shall be provided at the points where straps are attached.

In case of vertical storage, the panels shall be placed in a special panel rack in which they are supported vertically over their full height.

