



# CI System Glass Element F

One system, many perspectives

## Energy efficiency, comfort, design, safety



»» As a resource, daylight is irreplaceable! Whether at home within your own four walls, at your desk in the office, in the sports hall or in the factory: natural daylight illumination increases our sense of well-being, improves our mood, increases motivation and provides the most energy-efficient solution for lighting rooms in an agreeable way. For this reason, daylight systems form an integral part of the shell of industrial, commercial and residential buildings – particularly where the intelligent and sustainable use of energy resources is of prime importance.

With our flat glass, pyramid-shaped and hipped roof daylight systems from the **LAMILUX CI System Glass Element F** range, we offer elegantly designed individual elements for flat-roof installation that allow you to apply all the aspects of modern, energy-efficient and design-oriented construction and to incorporate all your sophisticated architectural design ideas.



**Joachim Hessemer,**  
Technical Director  
LAMILUX daylight elements



### 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:

**'Customised intelligence – Serving customers is our first priority.'**

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

- **Leader in quality – for the highest customer benefit**
- **Leader in innovation – for always being ahead in technology**
- **Leader in service – for fast, straightforward, reliable and friendly communication**
- **Leader in expertise – for the best technical and commercial advice on the market**
- **Leader in problem solving – for custom made solutions**

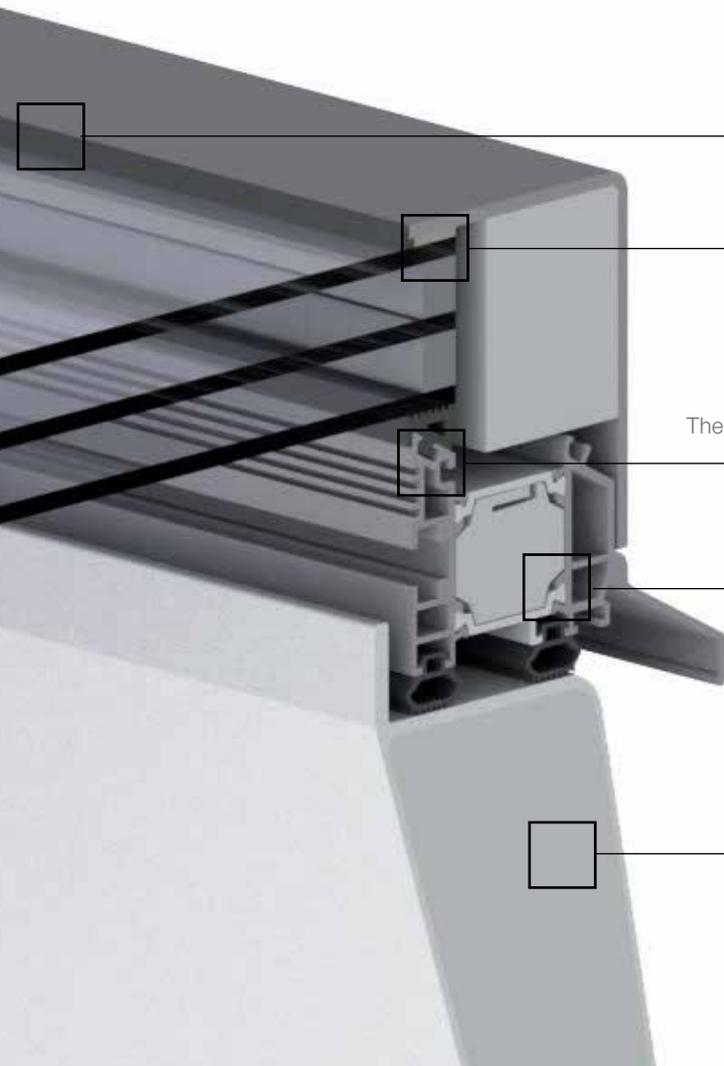
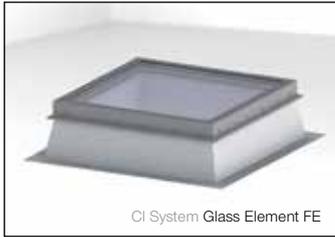


Building: DETACHED HOUSE, NUREMBERG (GERMANY) | CI SYSTEM GLASS ELEMENT FE

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# LAMILUX CI System Glass Element F



**NEW: Wide range of glazing options:**

The option of using triple glazing is available for the flat glass elements, pyramids and hipped roof models.

**“Warm edge”** (spacers between the panes, made of materials with low thermal conductivity), as a **standard feature**

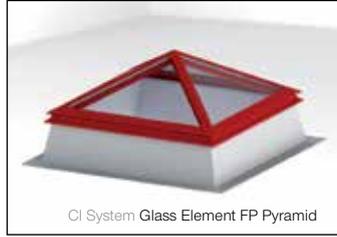
**NEW: TAD – ThermoActiveDesign:** A patented component fitted beneath the glazing support has an increased surface area due to its ribbed structure.

This allows it to extract more thermal energy from the air in the room and thus increases the temperature on the inside of the aluminium frame. The effect: the isothermal lines run smoothly through the profile system with no kinks.

**NEW: Optimised insulation core:** improved thermal insulation in the aluminium profiles

**Heat-insulated upstand made of fibre-reinforced composite:**

manufactured without joints and with a continuous insulation core made of PU foam, 60 mm thick



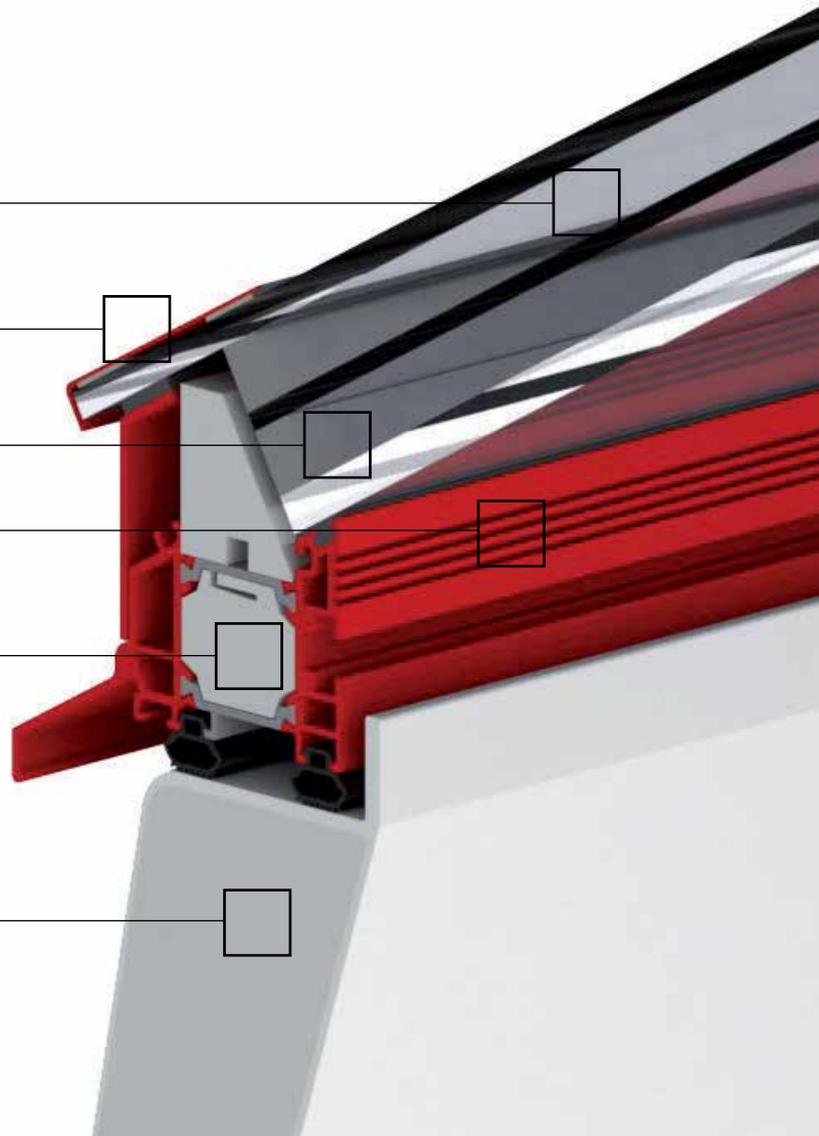
CI System Glass Element FP Pyramid



CI System Glass Element FW Hipped Roof

Edge guard profile for stepped profile pane

Thermal insulation glazing with stepped profile FLOAT or TSG (toughened safety glass)

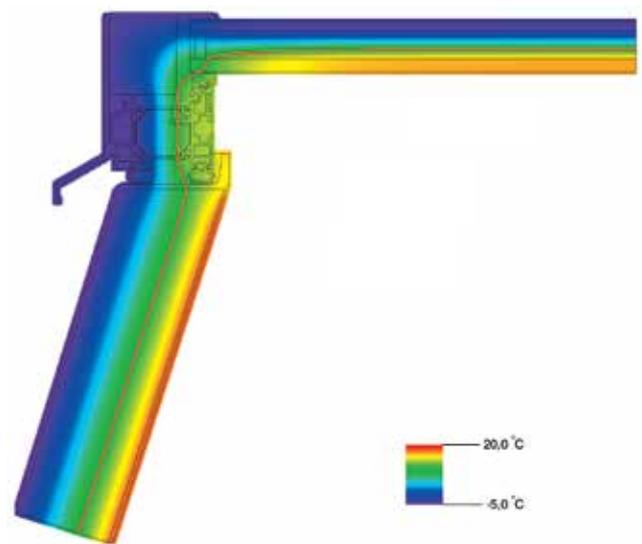




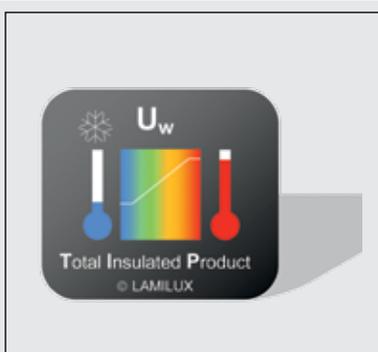
## Energy-efficient construction – We offer more!

The **verified, kink-free isothermal lines** produce above average energy efficiency characteristics. This **considerably reduces the danger of condensation build-up** on the inside of the skylight when temperatures are low outside. It also ensures an integrated, airtight system, which retains a great deal of heat energy inside the building.

**Isothermal lines** are a series of points featuring the same temperature (red line in the diagram), which reveal a tangible customer benefit. The 10°C isothermal line is a measured variable used in building physics, for example. If this line wanders outside the confines of a structure, condensate or even hoar frost will form precisely at this point. An **optimally aligned 10°C isothermal line**, on the other hand, leads to a noticeable reduction in the risk of condensation on the interior of the overall structure when temperatures are low outside.



CI System Glass Element FE



### TIP: Total Insulated Product

Optimised thermal characteristics, for consistent heat insulation zones without any weak spots, provide superior thermal insulation in all sections throughout the structure: evidence of optimum energy efficiency. LAMILUX calls this **thermal bridge-free** product concept TIP, or Total Insulated Product, (in accordance with DIN EN ISO 14021).



**Building: PRIMARY SCHOOL IN ZAPFENDORF (GERMANY)**

An attractive design, generous daylight intake, perfected thermal insulation and easy-to-use functionality: all three of the LAMILUX CI System Glass Element F models (flat glass element, pyramid and

hipped roof) unite the exacting requirements of modern and sustainable construction with regard to the aesthetics, energy efficiency and convenience of daylight systems.

<b>Energy efficiency</b>	<b>Comfort</b>	<b>Design</b>	<b>Safety</b>
<p><b>TIP technology</b> “Total Insulated Product” where the entire system is free of thermal bridges</p>	<p><b>Pleasant indoor climate</b> due to natural ventilation and the regulation of the solar heat input</p>	<p><b>Fine and delicate appearance</b> from both inside and outside with slim and elegant cross-bar profiles (CI System FP/FW)</p>	<p><b>Sealed against driving rain</b></p>
<p><b>Thermally optimum connection to the building</b> with thermally-insulated upstands made of glass-fibre reinforced composite</p>	<p><b>Minimised condensation</b> on the inside of the glazing and on the frame and cross-bar profiles thanks to the thermally decoupled construction</p>	<p><b>Many different dimensions and shapes available</b></p>	<p><b>Storm safety</b></p>
<p><b>High intake of daylight</b> with a large selection of glazing systems with real glass</p>	<p><b>Glazing with excellent sound insulation</b> (EN ISO 140-3 up to 45 dB)</p>	<p><b>Sleek, uncluttered front view</b> with no visible screw connections (CI System FP/FW)</p>	<p><b>Permanent fall-through protection</b> (GSBAU 18) for all elements up to a roof edge size of 150/180</p>
<p><b>Optimal thermal insulation</b> with kink-free isothermal lines, core insulation between the bearing profiles and cover strips, and glazing types with “warm edges”</p>	<p><b>Roof exit hatch model available</b> with single or double flap and large dimensions for the CI System Glass Element FE</p>	<p><b>A variety of colours</b> for individual selection from the RAL colour range</p>	<p><b>Protection against forced entry</b> Resistance class 2, tested in accordance with DIN V ENV 1627 “opportunistic entry” (optional with CI System Glass Element FE)</p>
<p><b>Controllable energy input</b> with intelligent controls for natural ventilation and for shading and solar-protection roller blinds</p>	<p><b>Easy remote control</b> for opening and closing the element and the sun-protection roller blind</p>		



# The energy balance – daylight intake, controllable solar heat intake and solar protection

How much daylight is required for natural, energy-saving lighting? At what level does the solar heat intake need to be restricted? And what is the best way to prevent glare? – These factors are determined by the glazing and sun protection systems, which are specially tailored to the type of building use and the specific comfort requirements.

## Standard glazing types

Heat insulation glazing $U_g = 1.1 \text{ W}/(\text{m}^2\text{K})$ Float	<b>Heat insulation glazing</b> Light permeability approx. 77%, total energy permeability approx. 55%, $U_g$ value approx. $1.1\text{W}/(\text{m}^2\text{K})$ weighted sound reduction index $R_{w,p}$ approx. 35 dB	<b>W104</b>
Heat insulation glazing $U_g = 1.1 \text{ W}/(\text{m}^2\text{K})$ Float MHF	<b>Heat insulation glazing – with opal-coloured (matt, light-coloured) film</b> Light permeability approx. 53%, total energy permeability approx. 57%, $U_g$ value approx. $1.1\text{W}/(\text{m}^2\text{K})$ weighted sound reduction index $R_{w,p}$ approx. 35 dB	<b>W105</b>
Heat insulation glazing $U_g = 1.1 \text{ W}/(\text{m}^2\text{K})$ TSG	<b>Heat insulation glazing</b> Light permeability approx. 77%, total energy permeability approx. 58%, $U_g$ value approx. $1.1\text{W}/(\text{m}^2\text{K})$ weighted sound reduction index $R_{w,p}$ approx. 35 dB, exterior pane made of toughened glass	<b>W102</b>
Heat insulation glazing $U_g = 1.1 \text{ W}/(\text{m}^2\text{K})$ TSG MHF	<b>Heat insulation glazing – with opal-coloured (matt, light-coloured) film</b> Light permeability approx. 53%, total energy permeability approx. 57%, $U_g$ value approx. $1.1\text{W}/(\text{m}^2\text{K})$ weighted sound reduction index $R_{w,p}$ approx. 35 dB, exterior pane made of toughened glass	<b>W103</b>
Bioclean $U_g = 1.1 \text{ W}/(\text{m}^2\text{K})$ Float	<b>Heat insulation glazing with self-cleaning effect</b> Light permeability approx. 77%, total energy permeability approx. 55%, $U_g$ value approx. $1.1\text{W}/(\text{m}^2\text{K})$ weighted sound reduction index $R_{w,p}$ approx. 35 dB	<b>W100</b>
Climatop $U_g = 0.6 \text{ W}/(\text{m}^2\text{K})$	<b>Heat insulation glazing, triple glazing design</b> Light permeability approx. 69%, total energy permeability approx. 47%, $U_g$ value approx. $0.6\text{W}/(\text{m}^2\text{K})$ weighted sound reduction index $R_{w,p}$ approx. 38 dB	<b>W101</b>
Solar protection glazing 60/30 Neutral 1.1 Float	<b>Solar protection insulating glazing, 60/30 neutral</b> Light permeability approx. 60%, total energy permeability approx. 32%, $U_g$ value approx. $1.1\text{W}/(\text{m}^2\text{K})$ weighted sound reduction index $R_{w,p}$ approx. 35 dB	<b>S111</b>
Iso Roll	<b>Heat insulation glass with motorised film blind integrated into the air space</b> Light permeability approx. 2 - 77%, total energy permeability approx. 12 - 50%, $U_g$ value approx. 1.3 - $1.6\text{W}/(\text{m}^2\text{K})$ weighted sound reduction index $R_{w,p}$ approx. 35 dB	<b>S100</b>

Other types of glazing available on request.

# Dimensions and sizes

Dimensions roof edge size in cm	Glass Element FE / FE 3° with upstand			Glass Element FP / FW with upstand				
	Standard position Electric motor 230V	Standard position Electric motor 24V	Standard position Chain drive	Standard position Electric motor 230V	Standard position Electric motor 24V	Standard position Chain drive		
50/100	0°	■	■	■	30°	■	■	■
	3°	■	■	■	45°	■	■	■
50/150	0°	■	■	■	30°	■	■	■
	3°	■	■	■	45°	■	■	■
60/60	0°	■		■	30°	■		■
	3°	■		■	45°	■		■
60/90	0°	■	■	■	30°	■	■	■
	3°	■	■	■	45°	■	■	■
60/120	0°	■	■	■	30°	■	■	■
	3°	■	■	■	45°	■	■	■
70/135	0°	■	■	■	30°	■	■	■
	3°	■	■	■	45°	■	■	■
80/80	0°	■		■	30°	■		■
	3°	■		■	45°	■		■
80/150	0°	■	■	■	30°	■	■	■
	3°	■	■	■	45°	■	■	■
90/90	0°	■	■	■	30°	■	■	■
	3°	■	■	■	45°	■	■	■
90/120	0°	■	■	■	30°	■	■	■
	3°	■	■	■	45°	■	■	■
90/145	0°	■	■	■	30°	■	■	■
	3°	■	■	■	45°	■	■	■
100/100	0°	■	■	■	30°	■	■	■
	3°	■	■	■	45°	■	■	■
100/150	0°	■	■	■	30°	■	■	■
	3°	■	■	■	45°	■	■	■
100/200	0°	■	■	■	30°	■	■	■
	3°	■	■	■	45°	■	■	■
100/240	0°	■	■	■	30°	■	■	■
	3°	■	■	■	45°	■	■	■
100/250	0°	■	■	■	30°	■	■	■
	3°	■	■	■	45°	■	■	■
100/300	0°	■	■	■	30°	■	■	■
	3°	■	■	■	45°	■	■	■
120/120	0°	■	■	■	30°	■	■	■
	3°	■	■	■	45°	■	■	■
120/150	0°	■	■	■	30°	■	■	■
	3°	■	■	■	45°	■	■	■
120/180	0°	■	■	■	30°	■	■	■
	3°	■	■	■	45°	■	■	■
120/240	0°	■	■	■	30°	■	■	■
	3°	■	■	■	45°	■	■	■
120/250	0°	■	■	■	30°	■	■	■
	3°	■	■	■	45°	■	■	■
120/270	0°	■	■	■	30°	■	■	■
	3°	■	■	■	45°	■	■	■
125/125	0°	■	■	■	30°	■	■	■
	3°	■	■	■	45°	■	■	■
125/250	0°	■	■	■	30°	■	■	■
	3°	■	■	■	45°	■	■	■
150/150	0°	■	■	■	30°	■	■	■
	3°	■	■	■	45°	■	■	■
150/180	0°	■	■	■	30°	■	■	■
	3°	■	■	■	45°	■	■	■
150/200	0°	■	■	■	30°	■	■	■
	3°	■	■	■	45°	■	■	■
150/210	0°	■	■	■	30°	■	■	■
	3°	■	■	■	45°	■	■	■
150/240	0°	■	■	■	30°	■	■	■
	3°	■	■	■	45°	■	■	■
150/250	0°	■	■	■	30°	■	■	■
	3°	■	■	■	45°	■	■	■
180/180	0°	■	■	■	30°	■	■	■
	3°	■	■	■	45°	■	■	■



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## Convenience – LAMILUX CI System Glass Element FE as roof exit hatch

Roof exit hatches provide access onto the roof from building interiors. They are often required even in office and residential buildings, for chimney sweep or roof maintenance access, for example. Roof exit hatches can also be used to provide additional comfort and convenience: Glazed hatches direct daylight into rooms. And where there is a roof terrace, they provide the option of reaching the outdoor space comfortably via a flight of stairs.

The influence of all the LAMILUX Daylight System advantages is also evident in the roof exit hatches. These advantages include the optimal guiding of daylight into the building interior and excellent heat insulation and airtightness.



Roof exit hatch with gas pressure springs

For double glazing  
up to a size of 120 / 120

For triple glazing  
up to a size of 100 / 100



Building: APARTMENT BUILDING, BERLIN (GERMANY)



**Roof exit hatch with electric drive**

For double glazing  
up to a size of 120 / 120

For triple glazing  
up to a size of 100 / 100



**Luxurious roof exit hatch with horizontally sliding elements**

Particularly high-quality and innovative product solutions are in increasing demand for use in exclusive residential building projects. One such product is the LAMILUX CI System Glass Element FE model used as a linear roof exit hatch: In this case, the glass element slides horizontally, driven by a rack drive.



**Roof exit hatch deluxe model**

A special model of the linear roof exit hatch is available from LAMILUX as a roof hatch with two leaves. This opens a two-section glass element, measuring 120 x 300 cm, towards the longitudinal sides. This two-leaf roof hatch can also be fitted with functional glazing and can be used without limitation as a ventilation system. The element has no unsightly edges or visible drive units on the inside and ensures very good heat insulation.



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## Shading – Glare Control – Screening

Daylight systems are integral components of the building shell in energy-efficient construction. No matter how desirable daylight intake may be – it is important to regulate the solar heat and light intake in order to prevent glare and overheating of rooms.



### Controllable exterior solar protection

The exterior solar protection, which can be integrated independently of the roof inclination and can be opened and closed whatever the current position of the glazing elements, ensures pleasant shading that reduces the level of brightness in the room and prevents glare and sunlight reflection. At the same time, the system allows effective regulation of the solar heat intake and prevents rooms from overheating.



### Controllable interior solar protection

A further elegant shading solution – also available ex factory for retrofitting – is available in the form of a film blind fitted on the inside. The movement of the film is controlled via two safety bands. The particularly attractive film is white on the interior side creating a perfect match with the upstand.



Building: SPORTS HALL, HERSBRUCK (GERMANY)

## Convenience and safety – Further options for you



**Manual spindle**  
 Length 150 cm  
 Length 200 cm  
 Extendible 175 cm - 300 cm  
 Extendible 250 cm - 400 cm

**230V electric motor**  
 Type EM  
 Voltage: 230 V (24V on request)  
 Stroke length 30 cm  
 Suitable for individual  
 and group control



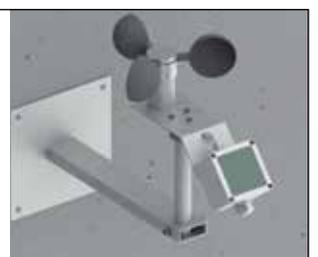
**Chain drive motor 250 mm - 400 mm**  
 Type KSA  
 Voltage: 230 V (24V on request)  
 Stroke length up to 40 cm  
 Suitable for individual and group control

**Chain drive motor concealed incl. concealed cable duct**  
 Type EM  
 Voltage: 230 V (24V on request)  
 Stroke length 30 cm  
 Suitable for individual  
 and group control



**Small space ventilator for LAMILUX upstands with installation heights of 30, 40 and 50 cm**

**Wind and rain sensors**  
 For automatic closing in wind and rain, and subsequent automatic opening.  
 Operated as a group or individually



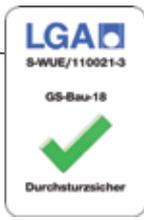
The **LAMILUX CI System Glass Element FE** is the perfect daylight system wherever round shapes bring out the optical visual impression of a building in even better way

**LAMILUX reflective**  
 Increase the light transmittance of the daylight element by up to 50% thanks to the patented principle of lining with highly reflective aluminium reflector material





## Safety on flat roofs



Our daylight elements are tested in accordance with the GS Bau 18 standard – permanent fall-through protection

### Permanent fall-through protection

There are many reasons why someone may need to walk on a flat roof – whether it be the house owner or maintenance personnel: for cleaning and repair work, the removal of heavy snow loads, etc. Falling onto daylight systems or taking one false step could prove fatal – if not all of the daylight elements in our LAMILUX CI System Glass Element F were permanently fall-through proof. (This does not apply to the CI System Glass Element FE as a linear roof hatch with window leaves.)

### Protection against forced entry – with tested resistance class (optional with CI System Glass Element FE)

Once they have gained access to the flat roof, burglars often try to enter the building by levering open skylights or breaking their glazing. Comprehensive tests have shown that: this method is significantly hampered by the LAMILUX CI System Glass Element F. The daylight elements belong to resistance class 2. The resistance classes are tested and regulated by European standard DIN V ENV 1627 for burglar resistant windows and doors.

### Secure alarm signalling – Additional hurdles that protect against forced entry and damage



#### Alarm glazing

The outer pane made of toughened glass incorporates an alarm loop. This is an electrical conductor loop which is interrupted if the glass is broken. When interrupted, it triggers a burglar alarm, if connected to an alarm system.



Building: SHOPPING CENTRE, SCHWABACH (GERMANY)

#### Reed contact

The magnet switch is fitted in the frame profile. It sends a signal via a non-contact switching process to indicate whether the daylight system is open or closed. This status is transmitted to the control device and can be read out from there. It can also be connected to the alarm system.

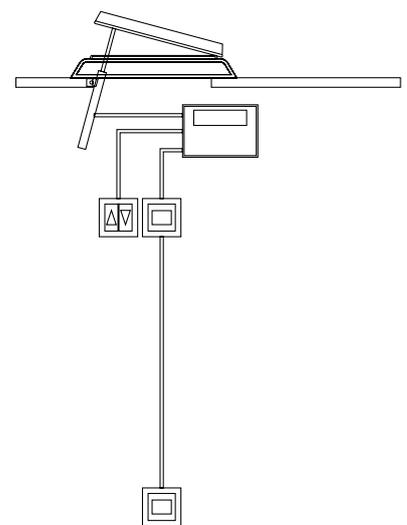


#### Safety in stairwells – thanks to effective smoke removal in the event of fire

LAMILUX offers an effective system for removing poisonous flue gases from stairwells. In line with current regulations, the electrically controlled system operates independently from the mains power supply in the building – ensuring a high degree of safety in the event of fire. In addition, the smoke removal system for stairwells can also be used to provide natural ventilation.

System and advantages:

- Supplied in kit form with all required motors as well as wiring diagrams and installation instructions
- Easily installed by an electrician
- SHEV controls suitable for both roof and façade

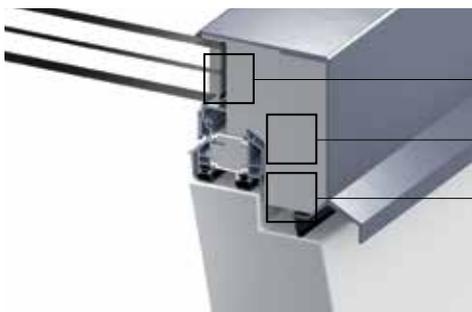




## LAMILUX CI System Glass Element FE<sub>energysave</sub>

The energetic qualities of construction products are the measure of all things in the modern building. Passive houses require the highest standards – and the LAMILUX CI System Glass Element FE<sub>energysave</sub> has been certified as the world’s first skylight to achieve this level of energy efficiency by the Passivhaus Institut in Darmstadt, Germany.

- Highest passive house efficiency class  
phA advanced component
- Heat-transmission coefficient  $U_{SL} 0.84 \text{ W}/(\text{m}^2\text{K})$
- Minimised risk of condensate thanks to a stable  $f_{RSI}$  value of 0.73
- Low heat losses and high solar heat gains  
( $\psi_{opaque} \leq 0.110 \text{ W}/(\text{mK})$ )



**NEW:** „Warm edge“ with superspacer in triple glazing as standard

**NEW:** Optimised insulation core

**NEW:** Three-stage sealing system



The LAMILUX CI System Glass Element FE<sub>energysave+</sub> has even better energetic qualities and the highest passive house certification class phA. The daylight system meets the criteria for

the „cold“ climate region and is therefore the first skylight that is suitable for passive houses in Scandinavia as well as in many regions of Switzerland, Austria and Eastern Europe.

Building: RETIREMENT HOME, WERDAU (GERMANY) | CI SYSTEM GLASS ELEMENT FP

# LAMILUX CI-SYSTEME



ROOFLIGHT DOME F100



CONTINUOUS ROOFLIGHT B



LIGHT WALL



GLASS ARCHITECTURE PR60



BUILDING CONTROL SYSTEMS



FRESH AIR SUPPLY DEVICES



GLASS ELEMENT F



CONTINUOUS ROOFLIGHT S



BUILDING UPGRADES



SMOKE AND HEAT  
EXHAUST SYSTEMS



PHOTOVOLTAIC SYSTEMS



FIBRE-REINFORCED  
COMPOSITES

The technical data printed in this brochure was accurate when this brochure went to press and is subject to change without notice. Our technical specifications are based on calculations and supplier specifications, or have been determined by independent testing authorities within the scope of applicable standards.

Thermal transmission coefficients for our composite glazing were calculated using the finite element method with reference values in accordance with DIN EN 673 for insulated glass. Based on empirical values and specific characteristics of the plastics, a temperature vector of 15 K was defined as the vector between the outer surfaces of the material. Functional values refer to test specimens and the dimensions used in testing only. We cannot provide any further guarantees of technical values. This particularly applies to changes in installation locations, or if dimensions are re-measured on site.



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