




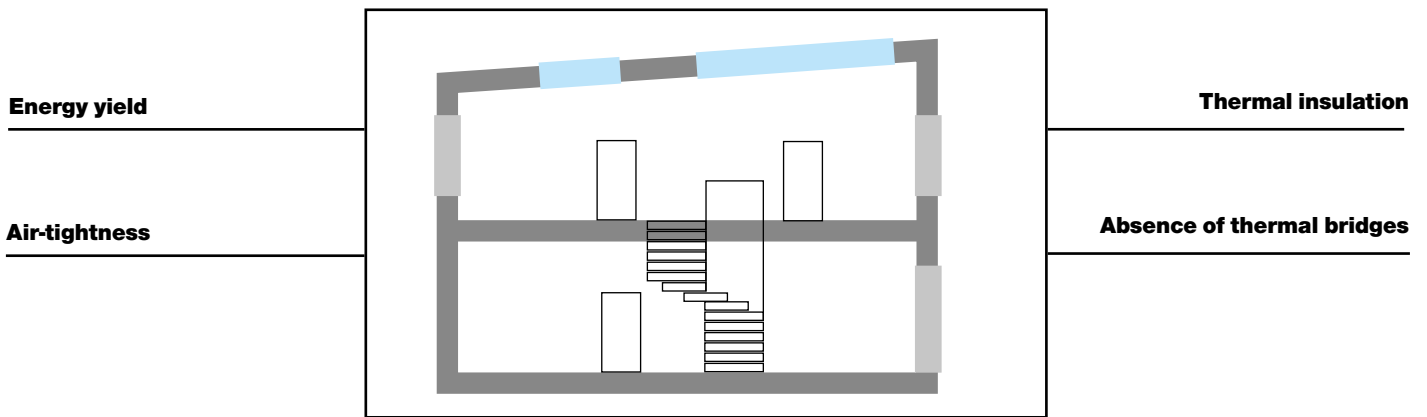
# LAMILUX PASSIVE HOUSE DAYLIGHT SYSTEMS

MAXIMUM EFFICIENCY FOR ACTIVE ENERGY MANAGEMENT 

# MAXIMUM EFFICIENCY FOR PASSIVE HOUSES

LAMILUX is the first manufacturer worldwide to develop three skylight systems for Passive Houses – one large-scale sloped glazing system and two flat roof windows. They are **phA advanced components**, meaning that they all achieve the highest efficiency ratings.

LAMILUX daylight systems have all the key features of Passive Houses:



- **excellent thermal insulation** with extremely low U-values
- **very good, verified air-tightness** achieving Class 4 of the EN12207 standard
- **effective energy yield** thanks to extensive daylight incidence and solar heat input
- **no thermal bridges** thanks to **thermally isolated systems throughout**



## 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 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

## DAYLIGHT SYSTEMS AS ACTIVE ENERGY MANAGERS

**The trend is continuing: 'Passive Houses' are on the rise around the world as the highest standard in energy efficiency. This standard of energy excellence has long been established far beyond the private housing sector and is manifesting itself in a number of successful and groundbreaking projects: swimming pools, schools, nurseries, sports and events facilities, conference and office buildings are all becoming 'Passive Houses'.**



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CI System glazed architecture PR 60energysave



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CI System glazed element FEnergysave



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CI System glazed element FEnergysave

## PASSIVE HOUSES – REQUIREMENTS AND PRODUCTS

**Ever more architects and planners around the world are getting on board with the Passive House concept. It has proven itself thousands of times in practice and represents energy efficiency, comfort, economy and environmental friendliness. As the Passivhaus-Institut Darmstadt points out, a Passive House is far more than 'just' an energy-saving house:**

- **It needs 75 per cent less heat than conventional new builds.**
- **Its heating energy consumption is way below that of a 'low-energy house'.**
- **A Passive House is fitted with special windows and has highly effective thermal insulation overall.**
- **It uses its inherent energy sources, especially incident solar heat.**

Dr Benjamin Krick from the Passivhaus-Institut Darmstadt, which certified the LAMILUX daylight systems, says: 'The high quality of our construction concept is built around high-grade components that fit seamlessly into the sophisticated overarching energy context.'



LAMILUX CI System

Glazed Architecture PR60<sub>energysave</sub>

**LAMILUX CI System Glazed Architecture PR60energysave for large glass roofs**

## CERTIFIED GLASS ROOF SYSTEM SOLUTION IN THE BEST EFFICIENCY CLASS

The **LAMILUX CI System Glazed Architecture PR60energysave** glass roof is the world's first sloped glazing in the highest Passive House efficiency class of pHA advanced component and can be designed to suit almost any configuration. Its high solar yield is excellent thanks to the generous incident daylight and the optimised isotherm profiles (no thermal bridges) in the robust support structure.

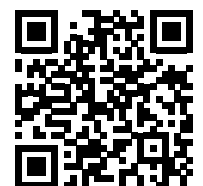


- 1** special core insulation block
- 2** energy-efficient triple glazing with 'warm edge' in SuperSpacer design
- 3** high air and rain impermeability thanks to continuous outer EPDM seals
- 4** solar yield thanks to narrow support profiles

**LAMILUX CI System glazed architecture PR60energysave** is becoming an integral part of challenging architectural concepts for energy-efficient Passive House building skins.

Freely designable, the sloped glazing achieves the ideal balance between **high daylight incidence** and **excellent thermal insulation** and **air-tightness**.

The **optimised isotherm profiles** prevent water condensation and mould formation.



[www.LAMILUX.de/passivhaus](http://www.LAMILUX.de/passivhaus)

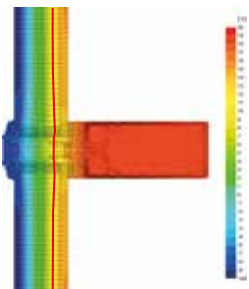




## THE HIGHEST PASSIVE HOUSE STANDARD WITH FREEDOM OF DESIGN

**LAMILUX CI System Glazed Architecture PR 60energysave** sets energy standards for glass roofs and embodies LAMILUX's promise of high energy efficiency.

- first sloped glazing certified in line with the Passive House standard
- highest Passive House energy efficiency class – phA advanced component
- **heat transfer coefficient ( $U_{CWi}$ ) is up to  $0.81 \text{ W}/(\text{m}^2\text{K})$  / temperature factor  $f_{Rsi} = 0.79$**
- high solar yield thanks to narrow profiles and large glass surfaces



### PASSIVE HOUSE CERTIFICATION

in the highest class, phA

*'For the first time, this gives energy- and cost-conscious architects and designers a sloped glazing system solution that is not only suitable for Passive Houses, but also meets the highest Passive House efficiency class, phA.'*

(Dr-Ing. Benjamim Krick, Passivhaus-Institut Darmstadt)



Premises: SHOPPING MALL

## ENERGY EFFICIENCY

Thermally isolated and thermally insulated profile system – optionally with the highest Passive House efficiency class

Building-specific, energetically optimised glazing with a 'Warm Edge'

Integration of highly airtight lift systems for natural aeration and ventilation

Integration of pane-integrated PV systems

## COMFORT

Integration of controllable and permanent sun protection systems

Integration of programmed controllers and sensor-dependent automation for the ventilation lifts and sunshade control

High level of sound insulation

## DESIGN

Individual freedom of design

Adaptable system for large-scale structures

Premium and filigree appearance

## SAFETY

Actuation of the lift systems as a SHEVS system

Permanent fall-through proofing

Impervious to driving rain (Class E, 1200 EN 12208) and high air-tightness





LAMILUX CI System

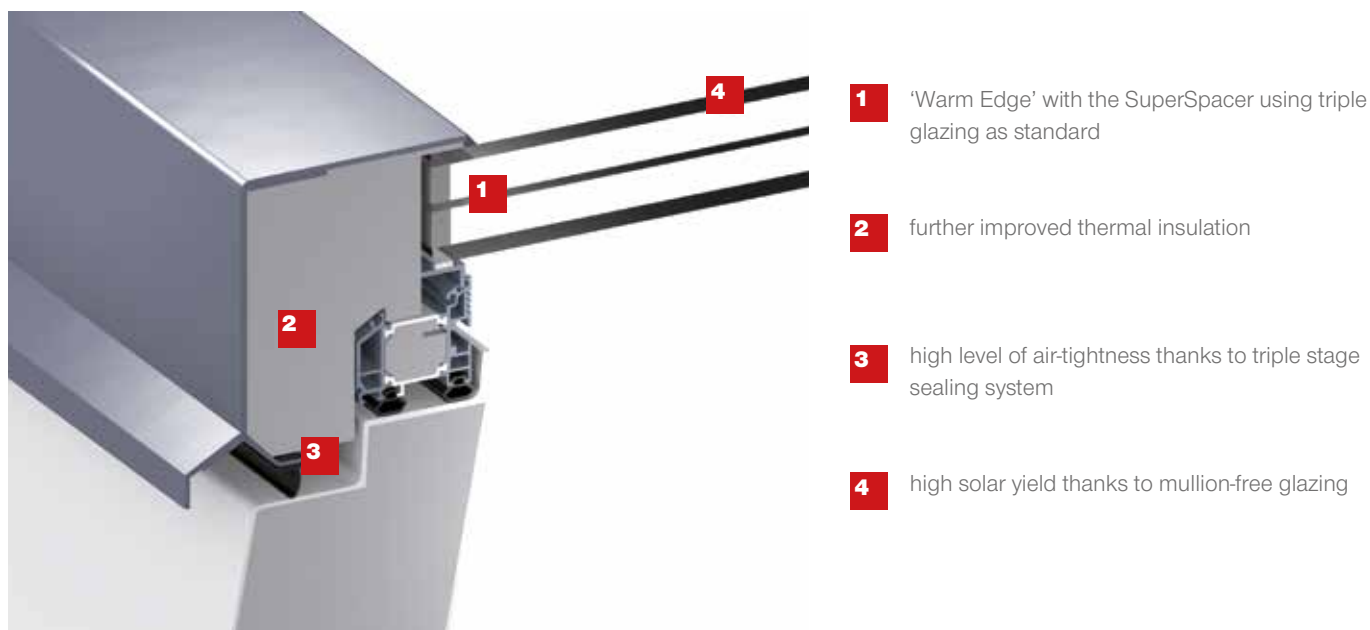
Glass Elements FE<sub>energysave</sub>



**LAMILUX CI System glazed element FEnergysave – flat roof windows for Passive Houses**

## EXCELLENT THERMAL INSULATION AND AIR-TIGHTNESS

The ideal skylight for new builds and energy-related renovations are now available to architects and Passive House planners – **the LAMILUX CI System Glazed Element FEnergysave**. Based on the standards DIN EN ISO 10077-1 and 10077-2, the Passivhaus-Institut Darmstadt determined a thermal insulation value (U<sub>SL</sub>) of 0.84 W/(m<sup>2</sup>K).



The **LAMILUX CI System Glazed Element FEnergysave** combines **outstanding thermal insulation and air-tightness** with a generous amount of natural incident light. It achieved the **highest classification** as a phA advanced component in the certification.

**Triple glazing** with argon filling is used in the compact system in accordance with Passive House requirements. The spacer forms the 'warm edge' with SuperSpacers.



[www.LAMILUX.de/passivhaus](http://www.LAMILUX.de/passivhaus)



Premises: HOUSE



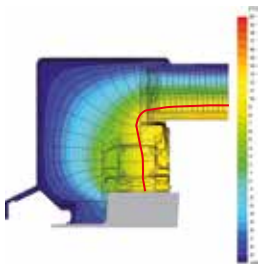
## THE BEST ENERGY PERFORMANCE FOR SUSTAINABLE AND MODERN BUILDING

- highest Passive House energy efficiency class – phA advanced component
- **heat transfer coefficient  $U_{sL}$  0.84 W/(m<sup>2</sup>K)**
- minimised risk of condensation thanks to the stable  $f_{RSI}$ -value of 0.73
- low heat loss and high solar heat yield

### Available sizes

Upper edge of roof size

80/80	100/100	120/120
90/90	100/150	150/150
90/120	100/200	180/180



### PASSIVE HOUSE CERTIFICATION

in the highest class, phA

*The compact daylight element for flat roofs has achieved the highest efficiency rating following its classification as a phA advanced component. 'The energy performance of this skylight is excellent.'*

(quote Passivhaus-Institut, Darmstadt, Germany)



Premises: SHOPPING MALL

## ENERGY EFFICIENCY

Optimum thermal insulation with smooth isothermal profiles thanks to an overall system that avoids thermal bridges

Airtight as per EN 12207 Class 4

Controllable energy load with intelligent control systems for natural ventilation, sun protection, and shading blinds

## COMFORT

Pleasant indoor atmosphere thanks to natural ventilation and regulation of solar heat load

High level of protection against condensation on the insides of the glazing and the frame and mullion profiles

Excellent sound insulation of glazing options (EN ISO 140-3) up to 45 dB

Roof exit variant both single- and double-leaf in large dimensions for the CI System Glazed Element FE

## DESIGN

Filigree appearance inside and out with elegant and narrow mullion profiles

Variety of colours can be chosen individually as per RAL card

## SAFETY

Permanent fall-through protection (GSBAU 18) for all elements up to upper edge of roof surface 150/180

Resistance class 2 verified according to DIN V ENV 1627 'opportunistic offender' (optional)

Driving rain protection as per EN 12208 Class E1500



# PASSIVE HOUSE CERTIFICATIONS IN LINE WITH CLIMATE ZONES

Extending in east to west direction, the earth is divided into seven climate zones – from 'very hot' (7) to 'Arctic cold' (1). Category 2 is the 'cold' zone and category 3 the 'cool-moderate' zone.







In the 'cold' climate zone, the **LAMILUX CI System Glazed Element FE<sub>energysave+</sub>** is the first skylight worldwide to achieve Passive House certification in the highest efficiency class. As an example, it is suitable for Passive Houses in the cities of Reykjavik, Oslo, Stockholm, Warsaw, Kiev, Moscow, Yekaterinburg, Winnipeg, Quebec, Halifax and Calgary.



The two skylights **LAMILUX CI System Glazed Architecture PR60<sub>energysave</sub>** and **CI System Glazed Element FE<sub>energysave</sub>** are certified for the 'cool-moderate' climate zone. Cities such as London, Paris, Berlin, Vienna, Zagreb, Budapest, Sofia, Washington, New York, Montreal, Kansas City, Shanghai, Beijing, Seoul and Tokyo are all in this zone.

## Climate zones

-  Arctic
-  cold
-  cool-moderate
-  warm-moderate



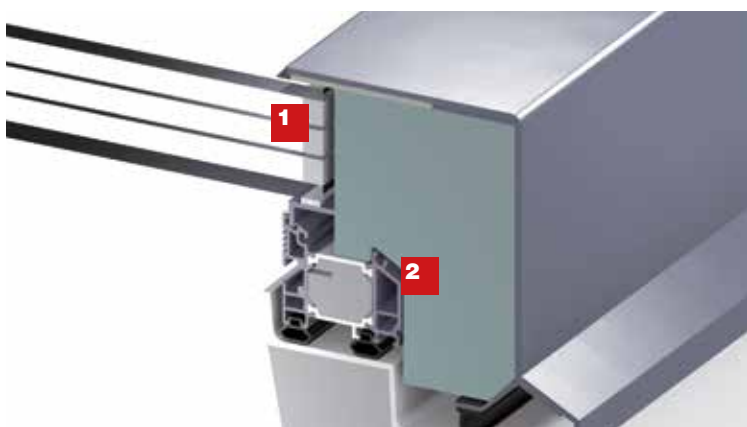
Premises: SCHOOL

**LAMILUX CI System Glazed Element FE<sub>energysave+</sub>**



**THE FIRST CERTIFIED DAYLIGHT ELEMENT FOR THE 'COLD' CLIMATE ZONE**

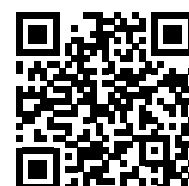
The **LAMILUX CI System Glazed Element FE<sub>energysave+</sub>** is the world's first verified and certified flat roof window for the 'cold' climate region. For example, it fulfils the very demanding Passive House criteria for the Alpine region and Scandinavia.



- 1** 'Warm Edge' with the SuperSpacer using quadruple glazing as standard
- 2** optimum insulating core material

$U_{SL} = 0.68 \text{ W}/(\text{m}^2\text{K})$   
 $f_{RSi} = 0.76$

The good U-value of the **LAMILUX CI System Glazed Element FE<sub>energysave+</sub>** is the result of insulation made from a special foam in the casement, upstand and the installation area, as well as from the use of quadruple glazing filled with inert gas.



[www.LAMILUX.de/passivhaus](http://www.LAMILUX.de/passivhaus)





## BINDER, Tuttlingen

### Project:

Binder GmbH is an international market leader in the development and manufacture of environmental simulation chambers. The company put their trust in the Passive House standard when building the new offices at their headquarters in Tuttlingen.

### Systems:

- 2 gabled roofs **LAMILUX CI System Glazed Architecture PR60energysave** with a surface incline of 8° (4.5 x 8.8 metres). Laminated safety glass with sunscreen three-layer glazing ( $U_g$ -value 0.7 W/(m<sup>2</sup>K)) each split into 16 glass areas. Edge composite thermally optimised with 'warm edge'.
- 3 sawtooth roofs **LAMILUX CI System Glazed Architecture PR60energysave** (2.1 x 4.3 metres) with glazing as described above.
- 66 valve systems **LAMILUX CI System fan blades M** (0.5 x 0.8 metres)
- 66 chain drives 24V

## KITA, Frankfurt

### Project:

The City of Frankfurt is embracing the trend for sustainable and energy efficient buildings: municipal buildings are being built to Passive House standards. This includes a modern, bright and friendly nursery.

### Systems:

- 1 gabled roof **LAMILUX CI System Glazed Architecture PR60energysave** with a surface incline of 5° (7.5 x 7.5 metres). Laminated safety glass with heat protective three-layer glazing ( $U_g$ -value 0.6 W/(m<sup>2</sup>K)) split into 36 glass areas. Edge composite thermally optimised with 'warm edge' with SuperSpacer.
- 12 SHEVS leaves for vertical installation
- Flyscreen for SHEVS lifts





## INSELPARK, Wilhelmsburg

### Project:

The Inselpark swimming pool in the Hamburg district of Wilhelmsburg has been designed to meet the highest efficiency criteria and is being built as a Passive House. In addition to the Passive House daylight systems, LAMILUX is also providing the control technology for the ventilation and SHEVS function.

### Systems:

- 9 Passive House flat roof windows **LAMILUX CI System Glazed Element FE<sub>energysave</sub>**. Laminated safety glass with three-layer glazing ( $U_g$ -value  $0.7 \text{ W}/(\text{m}^2\text{K})$ ). Verified as fall-through-proof skylights.
- 7 LAMILUX Passive House sloped glazing **LAMILUX CI System Glazed Architecture PR60<sub>energysave</sub>**
- 1 flat roof window **LAMILUX CI System Glazed Element FE** in  $3^\circ$ -inclined design as a roof exit hatch
- 1 ventilation control centre, 18 pneumatic drives, 4  $\text{CO}_2$  alarm stations

## KITA, Baienfurt

### Project:

The City of Baienfurt is expanding its care facilities to include two further toddler groups, one kindergarten group and one full-day care facility by building the new St. Joseph kindergarten. Its energy requirements are based on the Passive House standard.

### Systems:

- 3 Passive House flat roof windows **LAMILUX CI System Glazed Element FE<sub>energysave</sub>** with the dimensions of  $1.5 \times 1.5$  metres. Laminated safety glass with three-layer glazing ( $U_g$ -value  $0.6 \text{ W}/(\text{m}^2\text{K})$ ). Mounted on a composite upstand.
- 1 LAMILUX control set for SHEVS and ventilation
- 2 chain drives
- 1 servomotor opener in tandem design
- LAMILUX electrically controllable external blinds



Scan this to discover more about  
LAMILUX daylight systems!



ROOFLIGHT DOME F100



ROOFLIGHT DOME F100 ROUND VERSION  
GLASS ELEMENT F100 ROUND VERSION



CONTINUOUS ROOFLIGHT B



GLASS ARCHITECTURE PR60



SMOKE AND HEAT EXHAUST  
VENTILATION SYSTEMS



BUILDING CONTROL SYSTEMS



GLASS ELEMENT F



CONTINUOUS ROOFLIGHT W|R



CONTINUOUS ROOFLIGHT S



RENOVATION



SMOKE LIFT TWIN



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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