CI System Glass Element F

One system, many perspectives
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:

**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**
- **Leader in solving problems - individual, tailor-made solutions**
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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 – Thermo active design: 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
Edge guard profile for stepped profile pane

Thermal insulation glazing with stepped profile FLOAT or 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.

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).
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.

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

<table>
<thead>
<tr>
<th>Glazing Type</th>
<th>Characteristics</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat insulation glazing Ug = 1.1 W/(m²K) Float</td>
<td>Light permeability approx. 77%, total energy permeability approx. 55%, Ug value approx. 1.1W/(m²K) weighted sound reduction index R₆₅₅ approx. 35 dB</td>
<td>W104</td>
</tr>
<tr>
<td>Heat insulation glazing Ug = 1.1 W/(m²K) Float MHF</td>
<td>Light permeability approx. 53%, total energy permeability approx. 57%, Ug value approx. 1.1W/(m²K) weighted sound reduction index R₆₅₅ approx. 35 dB</td>
<td>W105</td>
</tr>
<tr>
<td>Heat insulation glazing Ug = 1.1 W/(m²K) toughened glass</td>
<td>Light permeability approx. 77%, total energy permeability approx. 58%, Ug value approx. 1.1W/(m²K) weighted sound reduction index R₆₅₅ approx. 35 dB</td>
<td>W102</td>
</tr>
<tr>
<td>Heat insulation glazing Ug = 1.1 W/(m²K) toughened glass MHF</td>
<td>Light permeability approx. 53%, total energy permeability approx. 57%, Ug value approx. 1.1W/(m²K) weighted sound reduction index R₆₅₅ approx. 35 dB, exterior pane made of toughened glass</td>
<td>W103</td>
</tr>
<tr>
<td>Bioclean</td>
<td>Light permeability approx. 77%, total energy permeability approx. 55%, Ug value approx. 1.1W/(m²K) weighted sound reduction index R₆₅₅ approx. 35 dB</td>
<td>W100</td>
</tr>
<tr>
<td>Climatop</td>
<td>Light permeability approx. 69%, total energy permeability approx. 47%, Ug value approx. 0.6W/(m²K) weighted sound reduction index R₆₅₅ approx. 38 dB</td>
<td>W101</td>
</tr>
<tr>
<td>Solar protection glazing 60/30 Neutral 1.1 Float</td>
<td>Light permeability approx. 60%, total energy permeability approx. 32%, Ug value approx. 1.1W/(m²K) weighted sound reduction index R₆₅₅ approx. 35 dB</td>
<td>S111</td>
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<tr>
<td>Iso Roll</td>
<td>Light permeability approx. 2 - 77%, total energy permeability approx. 12 - 50%, Ug value approx. 1.3 - 1.6W/(m²K) weighted sound reduction index R₆₅₅ approx. 35 dB</td>
<td>S100</td>
</tr>
</tbody>
</table>

Other types of glazing available on request.
### Dimensions and sizes

<table>
<thead>
<tr>
<th>Dimensions at roof surface in cm</th>
<th>Glass Element FP / FW</th>
<th>Glass Element FE / FE 3°</th>
</tr>
</thead>
<tbody>
<tr>
<td>60/60</td>
<td>19</td>
<td>50S</td>
</tr>
<tr>
<td>45°</td>
<td>21</td>
<td>50S</td>
</tr>
<tr>
<td>60/90</td>
<td>30°</td>
<td>50S</td>
</tr>
<tr>
<td>39</td>
<td>50S</td>
<td>65S</td>
</tr>
<tr>
<td>45°</td>
<td>45°</td>
<td>65S</td>
</tr>
<tr>
<td>37</td>
<td>50S</td>
<td>65S</td>
</tr>
<tr>
<td>45°</td>
<td>45°</td>
<td>65S</td>
</tr>
<tr>
<td>80/80</td>
<td>45°</td>
<td>50S</td>
</tr>
<tr>
<td>36</td>
<td>50S</td>
<td>100S</td>
</tr>
<tr>
<td>45°</td>
<td>45°</td>
<td>65S</td>
</tr>
<tr>
<td>37</td>
<td>50S</td>
<td>100S</td>
</tr>
<tr>
<td>45°</td>
<td>45°</td>
<td>65S</td>
</tr>
<tr>
<td>100/100</td>
<td>30°</td>
<td>48</td>
</tr>
<tr>
<td>45°</td>
<td>50S</td>
<td>100S</td>
</tr>
<tr>
<td>45°</td>
<td>50S</td>
<td>100S</td>
</tr>
<tr>
<td>100/150</td>
<td>30°</td>
<td>77</td>
</tr>
<tr>
<td>45°</td>
<td>80S</td>
<td>100S</td>
</tr>
<tr>
<td>45°</td>
<td>80S</td>
<td>100S</td>
</tr>
<tr>
<td>100/200</td>
<td>30°</td>
<td>91</td>
</tr>
<tr>
<td>45°</td>
<td>106</td>
<td>100T</td>
</tr>
<tr>
<td>45°</td>
<td>106</td>
<td>100T</td>
</tr>
<tr>
<td>120/120</td>
<td>30°</td>
<td>67</td>
</tr>
<tr>
<td>45°</td>
<td>50S</td>
<td>100S</td>
</tr>
<tr>
<td>120/150</td>
<td>30°</td>
<td>82</td>
</tr>
<tr>
<td>45°</td>
<td>95</td>
<td>100S</td>
</tr>
<tr>
<td>120/180</td>
<td>30°</td>
<td>99</td>
</tr>
<tr>
<td>45°</td>
<td>119</td>
<td>100T</td>
</tr>
<tr>
<td>125/125</td>
<td>30°</td>
<td>72</td>
</tr>
<tr>
<td>45°</td>
<td>84</td>
<td>100S</td>
</tr>
<tr>
<td>150/150</td>
<td>30°</td>
<td>102</td>
</tr>
<tr>
<td>45°</td>
<td>119</td>
<td>100T</td>
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<td>141</td>
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<tr>
<td>150/200</td>
<td>30°</td>
<td>133</td>
</tr>
<tr>
<td>45°</td>
<td>156</td>
<td>100T</td>
</tr>
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Motorised opener:

50 – lifting force 500 N | S = Solo ( T = Tandem)
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

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.
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.
Convenience and safety – Further options for you

**Manual spindle**
- Stroke length: 28.5 cm
- 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
Safety on flat roofs

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.
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

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.
New technology for the future of energy-efficient building

The climate targets within the European Union are clearly specified: by the year 2020, energy consumption and greenhouse gas emissions must be reduced by 20 percent and the proportion of renewable energy sources must be increased by 20 percent (the 20-20-20 rule).

Since buildings represent the lion’s share, with 40 percent of the total energy consumption, most countries apply stringent regulations to this sector. The central component of the energy concept for buildings in Germany, for example, is the German Energy Saving Ordinance (EnEV).

With the amendments that are due to come into effect in 2012, the European guideline for energy efficient buildings and the energy concept of the German federal government will be implemented:

- From 2021 onwards, only passive buildings or zero-energy buildings may be constructed. For public buildings, this will apply from as early as 2019.
- A practically “climate neutral building stock” is to be achieved by 2050.

Intelligent energy management with daylight systems...

**CONTROLLING ENERGY**
Intelligent control technology and building automation systems reduce energy consumption by up to 30%.

**GENERATING ENERGY**
Use solar energy, solar heat intake and daylight intake intelligently.

**SAVE ENERGY**
Innovative system components and constructions for optimum heat insulation values.

... to convert roofs into highly effective, productive areas that are energy efficient!
Intelligent energy management with daylight systems…
…to convert roofs into highly effective, productive areas that are energy efficient!
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.

Texts for public tenders are available from: http://www.lamilux.de/Ausschreibungstexte