

# VELUX Modular Skylights

Daylight solutions for public and commercial buildings





Front cover: Logistics Company, Laakdal, Belgium. One Step Longlight 117 modules

## Advanced, innovative and proven

When VELUX Modular Skylights were first introduced in 2011, they were the first prefabricated rooflights, incorporating high energy performance, thermal stability and great strength in a slim and fully integrated design. Since then, our Modular Skylight systems have established themselves as the most innovative on the market and are now the proven choice in public and commercial buildings throughout Europe.

Designed to provide daylight and fresh air through the roof, our Modular Skylights help create healthy, comfortable and productive indoor spaces. We offer a complete pre-engineered modular design system with optional blinds. It is easy to specify, predictable and fast to install and time efficient through the entire building project.



Above: Atrium Longlight in DSV Headquarters, Hedehusene, Denmark

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## Serving your daylighting needs every step of the way

VELUX Commercial offers daylighting and ventilation solutions for industrial, commercial and public buildings. Our domes, rooflights and glazing systems provide plenty of daylight and fresh air, transforming the indoor spaces into inspiring and productive places.

With us as your partner, you have installation and technical expertise close at hand. Together, we can develop longlasting and high-quality results for your building.

We are here to support you throughout the building project, from specification and design to installation and maintenance. We will carefully listen to your specific needs and help you select the best possible solution.

As part of the VELUX Group, we draw on 80 years of expertise in daylighting solutions. Today, we are a team of 1,100 people working within manufacturing, sales and global support functions in 15 countries.

## **VELUX Commercial offers solutions** in following categories:

### **Domes and flat roof windows**

Our complete range of prefabricated, ready-to-install domes and flat roof windows provide single sources of daylight and fresh air as well as smoke and heat exhaust ventilation.

### **Vario Continuous Rooflights**

Our economic continuous rooflight systems provide large areas of natural, diffused light as well as comfort and certified smoke and heat exhaust ventilation options in a lightweight construction.

### **GRILLODUR®**

This lightweight, fiberglass solution provides glare-free and shadow-free illumination, along with fall-through safety and options for comfort and smoke and heat exhaust ventilation.

### **Glass systems**

Our reliable glass systems with design flexibility enable you to produce a building with optimal daylight and fresh air as well as smoke and heat exhaust ventilation to support occupant wellbeing.

### Smoke exhaust and comfort ventilation

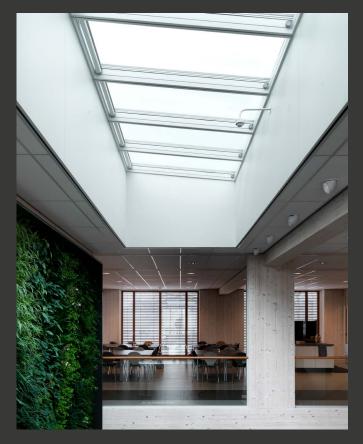
Our solutions for smoke and heat exhaust ventilation, comfort ventilation and daylight and heat control ensure safety and occupant wellbeing.

### Support

We offer a wide range of support in the design, specification and installation phases, as well as, service and maintenance. For easy specification, download our detailed 2D illustrations and technical drawings or our detailed 3D CAD/BIM objects.



## Designing with daylight and natural ventilation







### Improving well-being and comfort

With people spending up to 90% of their time indoors, designing with daylight becomes increasingly important to enhance well-being. Innovative daylight design connects the inside of buildings to the world outside. Natural light helps stimulate the mind and creates comfortable environments for work, study, and leisure. When thermal control is combined with natural light and fresh air, comfort and well-being are maximised.

### Daylight and ventilation with additional comfort features

VELUX Commercial offers several unique features to help create grand daylight designs. The availability of sun protection and opening modules for ventilation help reduce heat and glare exposure, providing climate control.

### Daylight and artificial light

A key difference between daylight and artificial light is daylight's evolving light levels, color, and direction throughout the day. The direction in which light falls is also dependent on the location of windows and lighting fixtures. Daylight penetrating through façade windows and rooflights provide an evolving light direction, while electric lights in the ceiling provide vertical illumination. Try our Daylight Visualizer tool for a precise and visual daylight analysis of any given rooflight installation.

### **Smoke ventilation**

Skylights play a major role in keeping the building and its occupants safe by removing toxic smoke in the event of a fire. To make sure people are safe, our innovative rooflight solutions can be complemented with accessories that provide several benefits. Smoke ventilation systems channel the smoke and heat through the roof and are designed to facilitate the safe escape of people. The type of fire ventilation that VELUX Commercial provides is natural fire ventilation.

Our products can be configured to automatically open and close according to changes within the building environment. VELUX Commercial offers a wide range of natural comfort ventilation and natural smoke and heat exhaust ventilation rooflights. Changes to the environment such as building temperature or smoke detection can trigger your building management system to adjust hinges, opening rooflight panels in order to help to control indoor comfort or ventilate smoke in the event of a fire.

### Safety on the roof

To ensure safety during installation, maintenance and inspection, VELUX rooflights can be offered with a range of metal fall-through protection systems that can be either pre-installed or installed on-site. Whether a warehouse, factory, or an office building – VELUX Commercial can help you select the safest solution.



# VELUX Modular Skylights

## VELUX Modular Skylights



Siemens Head Office, Ballerup, Denmark

VELUX Modular Skylights are sash-frame constructed single roof windows with a high-insulating glazing unit. The modules are available as both fixed and venting skylights. All individual skylights are delivered as prefabricated modules with dedicated factory finished flashings to ensure watertightness in of every solution. This versatile skylight system allows you to create a range of different designs for a variety of commercial and public buildings.

### Modularity in every single product

All modules are produced offsite at our factory, meaning every single component is rigorously tested and integrated in a controlled environment. Each component is also of the highest premium

quality and is built to stand the test of time. The easy installation process allows you to seal the roof within days - regardless of the weather - letting you get to work inside the building with speed and efficiency.

All prefabricated modules are CE-marked in accordance with EN 14351-1, and delivered with customised flashings and integrated insulation.

VELUX Modular Skylights has a reference service life of 30 years in accordance with EN 17213.

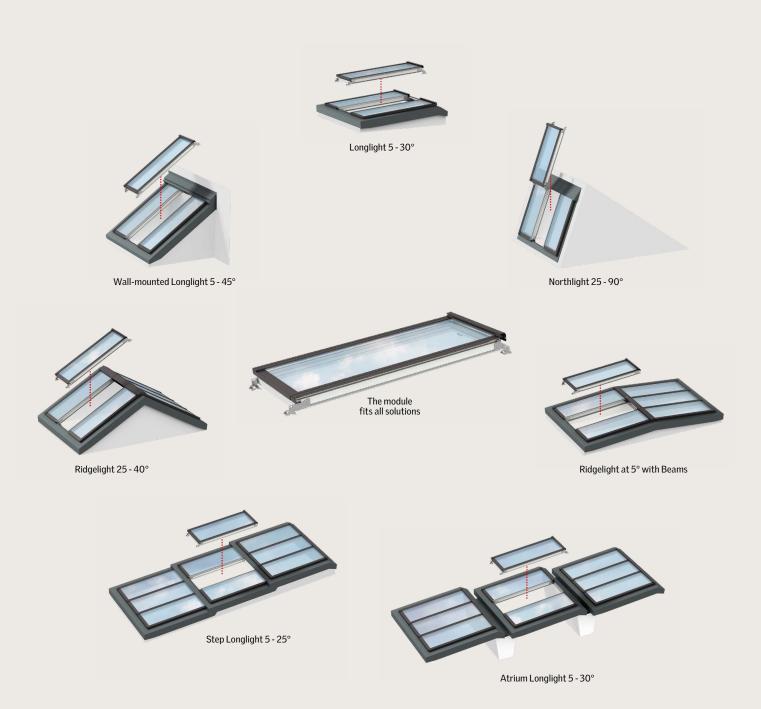
## The advantages of a truly prefabricated modular system - One fits all

### Prefabrication

- Off-site production ensuring consistent, high quality and durable modules that gives predictable installation in all weather conditions for at fast closure of the building envelope
- Known performance, classifications and behaviour, easing the specification phase
- Predictable time frame and estimation of manpower in the installation phase

### Modularity

- Unique bracket system that makes every single module fit all solutions, it is truly one fits all
- The modules fit perfectly together and create a seamless, watertight system
- Enables re-use of modules in other buildings
- A versatile skylight system with the possibility of creating a large range of different designs for a variety of commercial buildings



## Solutions

## Areas of application







Sports facilities



Public buildings







## Mono pitched solutions

Longlight 5-30°



Wall-mounted Longlight 5-45°



Northlight 25-90°

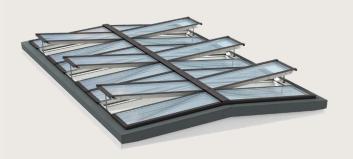


## **Dual pitched solutions**

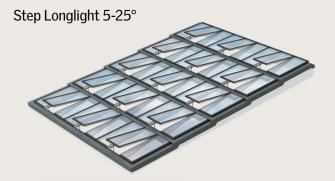
Ridgelight 25-40°



Ridgelight at 5° with Beams







Step Ridgelight 25°



Step Ridgelight 5-25° on Girder



Step Wall-mounted Longlight 5-25°



Atrium Longlight 5-30°



Atrium Ridgelight 25-40°



Atrium Ridgelight at 5° with Beams



### **Functions and sizes**

Modular Skylights are available as fixed and venting modules. These are visually identical in the closed position due to a hidden chain actuator. Venting modules are top-hung and exist in comfort and smoke ventilation versions. It is not possible to install two venting modules next to each other.



### Fixed skylight module

Code: HFC

### Fire resistant module

Code: HFS



### Motorized comfort venting skylight module

Code: HVC-C Actuator chain stroke up to 260 mm.

Motorised smoke venting skylight module Code: HVC-A Actuator chain stroke up to 700 mm.

### **Smoke and Heat Exhaust Ventilation (SHEV)**

Smoke venting skylight modules provide smoke ventilation in accordance with EN 12101-2. VELUX Modular Skylights offer smoke venting modules that come with optional wind deflectors. The modules and deflectors are designed to reduce smoke accumulation inside the building in case of a fire.

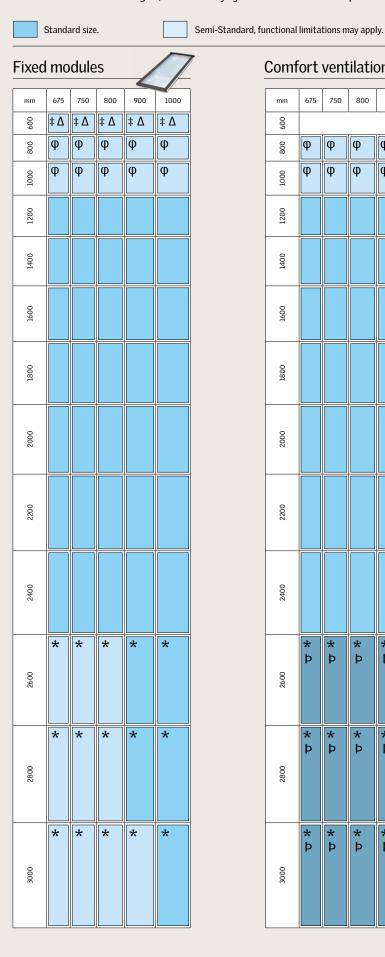
Our smoke venting skylight module has an actuator chain stroke length up to 700 mm, which opens in less than 60 seconds. Smoke venting modules are only available with an Open System actuator. If you are interested in roller blinds for your smoke venting modules, please refer to the local fire authorities for permission.





## Size grid

Besides the standard size grid, Modular Skylights are available in bespoke sizes.



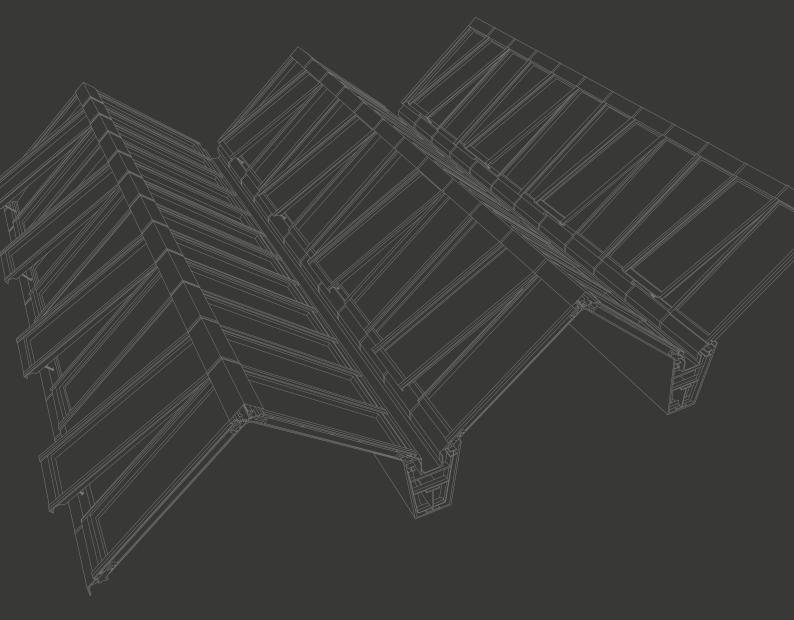
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1400	0	0	0	0	0	
1600	0	0	0	0	0	
1800	0	0	0	0	0	
2000	0	0	0	0	0	
2200	0	0	0	0	0	
2400	0	0	О	0	0	
2600	* 0 Þ	* 0 Þ	*	Module height above 2400 mm is delivered with an extra strong glazing unit only. No roller blinds available.		
2800	* 0 Þ			Only operactuator Not avai Ridgelig Not poss modules Roller bl	en system r available lable for ht. sible as sta	art/

If roller blinds are requested for smoke venting modules or fire resistant modules, please refer to local fire authorities for permission.

NB: Roller blinds for smoke venting modules or fire resistant modules cannot be pre-mounted.

Wind deflector KCD 0080 is not available for sizes above 2400 mm.



# Case studies





 $Hal\ C, Multi\ Sports\ Arena,\ Copenhagen,\ Denmark.\ Three\ Longlights,\ 60\ modules.$ 





ASSA ABLOY office, Apeldoorn, The Netherlands. One Longlight, 12 modules.



Dreamhill Kindergarten, Aarup, Denmark. Eleven Longlights, 49 modules.





Green-Building KITA, Kindergarten, Köln, Germany, Three Longlights, 9 modules.

Villebon 2 Shopping Centre, Villebon-sur-Yvette, France. Seven rows of Longlight & ten rows of Ridgelight, 194 modules.

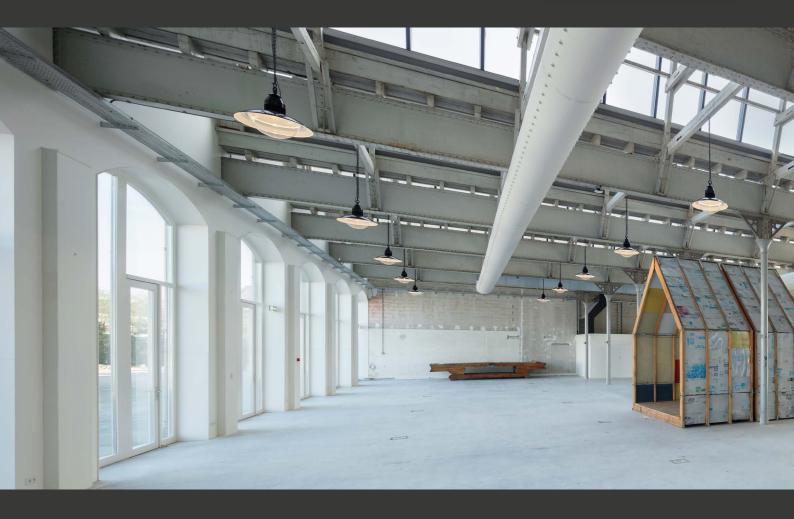






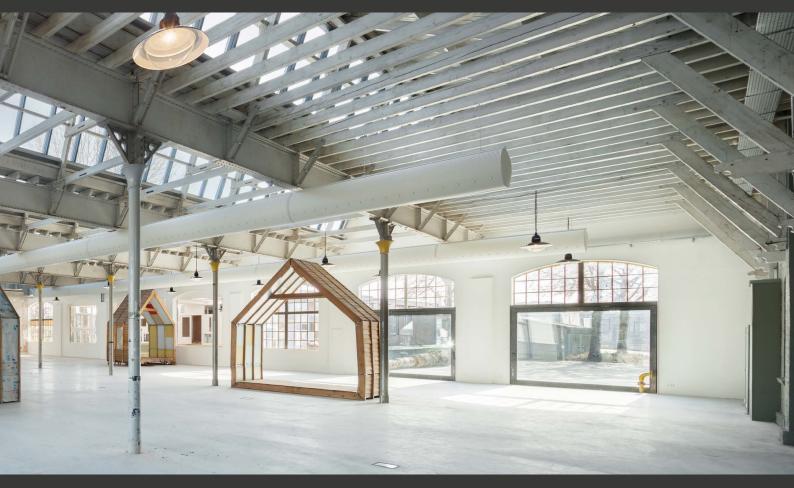
 $Church, Erkelenz, Germany.\ Wall-mounted\ Longlight,\ 30\ modules.$ 





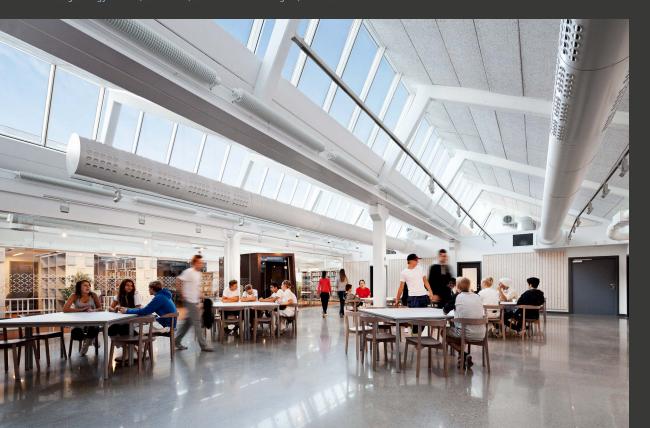
 $\label{thm:linear_problem} At elier\ Zimmer list rasse,\ Z\"{u}rich,\ Switzerland.\ Five\ Northlights,\ 100\ modules.$ 

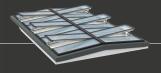




De Utrecht Community, UCo, Utrecht, The Netherlands. Seven Northlights, 210 modules.

Sågbäcksgymnasiet. Stockholm, Sweden, Four Northlights, 104 modules.







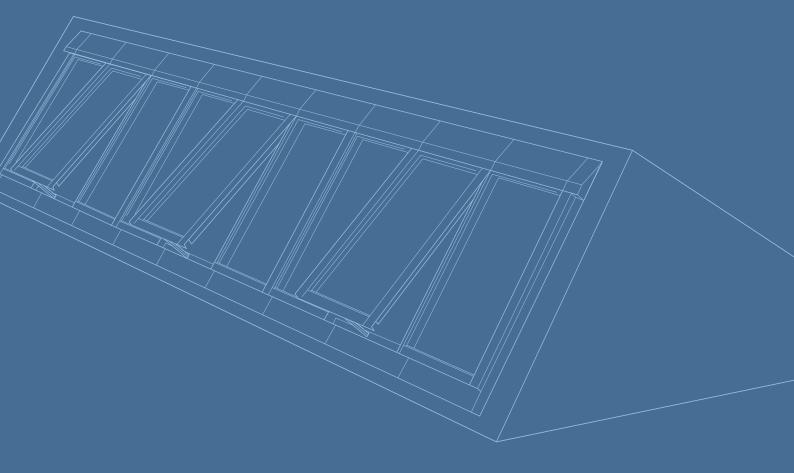
PS.Speicher, Museum, Einbeck, Germany. Ridgelight at  $5^\circ$  with Beams, 50 modules.



Roskilde Cathedral School, Roskilde, Denmark, Two Ridgelight at 5° with Beams, 50 modules



ATP, Vordingborg, Denmark. Ridgelight at  $5^{\circ}$  with Beams, 26 modules.



# Materials & technical details

## Material/colours

### Interior colour

### Standard colours



Frame and Sash White

Material: Pultruded composite (approx. 80% fibreglass and 20% polyurethane) Surface: Waterbased white coating Colour: RAL 9010, gloss 30

### Semi-standard colours (Available at additional cost)



Frame and Sash **Light grey** 

Material: Pultruded composite (approx. 80% fibreglass and 20% polyurethane) Surface: Waterbased light grey coating Colour: RAL 7037, gloss 30



Frame and Sash **Dark grey** 

Material: Pultruded composite (approx. 80% fibreglass and 20% polyurethane) Surface: Waterbased dark grey coating Colour: RAL 7021, gloss 30



Frame and Sash **Black** 

Material: Pultruded composite (approx. 80% fibreglass and 20% polyurethane) Surface: Waterbased black coating Colour: RAL 9005, gloss 30

### **Special colours**



### **Special colours**

All other colours can be ordered at additional price, though with exception of mother-of-pearl, effect and metallic colours, neon colours, and colours with other substances than pigment.

Contact our sales team for more details.

### **Exterior colour**

### **Standard colours**



Cladding Dark grey

Material: Aluminium (1.5 mm) Surface: Scratch resistant powder lacquer Colour: Noir 2100 Sable (Granite 60)



Flashing Grey

Material: Aluminium (1 mm) Surface: PVdf lacquer

Colour: NCS standard colour: S 7500-N (RAL 7043), gloss 30

### Semi-standard colours (Available at additional cost)



Cladding White

Material: Aluminium (1.5 mm) Surface: Scratch resistant powder lacquer Colour: AA10F Sable (Granite 01)



Flashing White

Material: Aluminium (1 mm) Surface: PVdf lacquer Colour: RAL 9010, gloss 30



Cladding Light grey

Material: Aluminium (1.5 mm) Surface: Scratch resistant powder lacquer Colour: Gris 400 Sable (Granite 20)



Flashing Light grey

Material: Aluminium (1 mm) Surface: PVdf lacquer Colour: RAL 7037, gloss 30



Cladding Dark grey

Not a semi-standard colour Same as our standard colour cladding



Cladding **Black** 

Material: Aluminium (1.5 mm) Surface: Scratch resistant powder lacquer Colour: Noire 900 Sable (Granite 80)



Flashing Dark grey

Material: Aluminium (1 mm) Surface: PVdf lacquer Colour: RAL 7021, gloss 30



Flashing **Black** 

Material: Aluminium (1 mm) Surface: PVdf lacquer Colour: RAL 9005, gloss 30

### Special colours



### **Special colours**

All other colours can be ordered at additional price, though with exception of mother-of-pearl, effect and metallic colours, neon colours, and colours with other substances than pigment. Contact our sales team for more details.

## Glazing

## **Glazing and U-values**

Modular skylights come with low energy double or triple glazing with foil-laminated inner glazing for added safety, and three different coating options.

The coatings are optimised to meet the desired levels of solar heat gain, sun protection, light transmittance and colour rendering.



• Thermal transmittance in accordance with EN 14351-1:

Modules with double-glazing:  $U_w = 1.3-1.5 \text{ W/(m}^2\text{K)}$ 



• Thermal transmittance in accordance with EN 14351-1:

Modules with triple glazing (down to):  $U_w = 0.86-1.1 \text{ W/(m}^2\text{K)}$ 

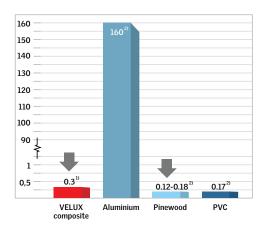


## Technical details

### Thermal conductivity (W/mK)

### - A low score means high insulating performance

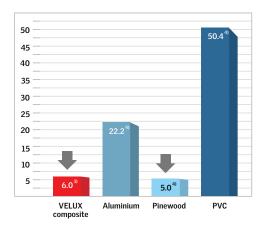
Profiles used for VELUX Modular Skylights consist of pultruded fibreglass and polyurethane composite, resulting in a high insulating performance.



## Linear expansion coefficient (10<sup>-6</sup> m/mK)

### - A low score means high thermal stability

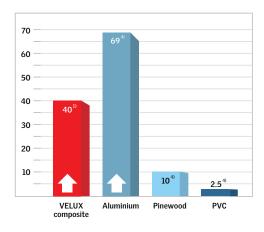
Whereas traditional skylight materials are bound to fluctuations in form due to thermal changes, the composite of VELUX Modular Skylights will maintain its dimensional properties, ensuring tightness of joints and prolonging the expected lifetime of the application.



## Flexural modulus (E-Modulus)

### - A high score means low deflection

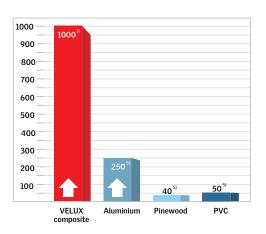
The high rigidity of the pultruded composite material results in a very stiff frame and sash, ensuring reliable performance with very little deflection of the profiles and better aesthetics of the skylight.



## Flexural strength (N/mm²)

### - A high score means high strength

The very high strength of the pultruded composite material allows for design and production of longer and slimmer frame and sash profiles than traditional skylight materials allow. This enables design of large skylights with slim profiles resulting in better aesthetic performance.



## Classifications

Because our products are prefabricated, we're able to test them extensively against all conceivable hazards and stressful events. Tests are carried out for all obligatory, mandated properties listed in harmonised product standards for windows and doors and as well for Natural Heat and Smoke Exhaust ventilators in a controlled

environment. Furthermore, we can test products for other commonly-used parameters our customers may require. All products are manufactured, assembled and delivered from the same heavily-controlled production line, leading to components with identical properties.



### Watertightness

**Classification: EN 12208** 

### **VELUX Modular Skylights: E1200**

No water penetration up to 1200 Pa. 1200 Pa equals 155 Km/h (43 m/s). (Hurricane = 32 m/s).



### Resistance to wind load

**Classification: EN 12210** 

### VELUX Modular Skylights: Class C5 1)

Frontal deflection measured at 2000 Pa is less than L/300. (L = span length).
Safety test at 3000 Pa is passed.



### Air permeability

**Classification: EN 12207** 

### **VELUX Modular Skylights: Class 4**

Highest air permeability classification
Draught measured to less than 2.6 m³/hm through joints at peak pressure of 600 Pa.



### Sustainability

### **Environmental product declarations for our modules**

VOC rating A+ for our modules Oeko-tex standard 100 certified roller blinds ISO 9001 quality management ISO 14001 environmental management ISO 50001 energy management system

<sup>1)</sup> For sizes up to 2400 mm height, except HVC 090220, HVC 090240, HVC 100220 and HVC 100240 with glazing variants 10L and 11L, which have Class C4. For skylight height > 2400 mm: NPD.



## **External fire performance**

Classification: EN 13501-5 + A1

### **VELUX Modular Skylights**

B<sub>ROOF</sub> (t1): No penetration or burning droplets.

 $B_{ROOF}$  (t4): No penetration of roof system within one hour.



### Reaction to fire

Classification: EN 13501-1 + A1

VELUX Modular Skylights: Class B, s1-d0 or d2 depending on the choice of glazing unit

Slow development of fire and moderate heat and smoke release.



### Resistance to fire

Classification: EN 13501-2 + A1

Fixed fire resistant module (HFS): REI30

Ability to contain the fire in the compartment for minimum 30 minutes or more.



### **Electromagnetic compatibility (EMC)**

All electrical components are rigorously tested and comply with relevant EMC standards.



## Safety at work

### Fall-through protection

- Falling Through Safety Certificate in accordance with DIN 18008-6
- · NARM ACR fragile roofing assembly Class A
- CWCT TN 66/67 Class 2

## Sustainability

## Our contribution to excellent indoor climate

Sustainable building certifications are tools we can use to measure and document sustainability, as well as, support integrated design and interdisciplinary collaboration. Certifications help shift the industry and drive innovation by formalising design and performance criteria so that what was once innovative becomes the norm.

The process of evolving certification tools forces stakeholders to raise green building standards in response to new factors such as the Paris Agreement. Certification systems have been extremely successful in raising awareness of sustainability in the building industry. Our next focus should be on real building behaviour and the impact on global warming.

The following is a wide range of certified buildings in which VELUX Modular Skylights contributed to the excellent indoor climate, helping them achieve outstanding ratings and classifications.

# BREEAM° ★★★★☆

EXCELLENT



Energy Transition Company, The Netherlands, BREEAM Excellent





Siemens Head Office, Denmark, LEED Gold







Green Solution House, Denmark, DGNB and Active House



Genmab, Research Facility of Biotechnology, Utrecht, The Netherlands, BREEAM Excellent



Trumpington College, United Kingdom, BREEAM Excellent



Utopia Library, Aalst, Belgium, BREEAM Excellent



Geelen Counterflow, The Netherlands, BREEAM Outstanding

## **Additional Products**

### Sun screening - roller blinds

The integrated roller blinds fit perfectly into the window opening, creating a seamless connection between sash and cloth. To support fast and safe installation of the blinds, it is possible to order roller blinds pre-mounted from the factory.





### Photovoltaic glazing



Modular Skylights are available with built-in photovoltaic cells as a special product. Photovoltaic modules are designed to generate free electricity for the building and its users, creating a valuable supplement to the consumption of conventional power. Modular Skylights with integrated monocrystalline photovoltaics come in a double or triple glazing options. Both photovoltaic options maintain the same low U-value as modules with standard glazing variants. The photovoltaic cells are black squares approx. 15 x 15 cm evenly distributed over the glazed area of the module. The coverage is project specific, ranging from half to fully covered modules depending on size and customer requirements.



### Sun screening - electrochrome glass



Glazing with electrochrome glass in clear state. Visible light transmission 57%



Glazing with electrochrome glass in intermediate state. Visible light transmission 15%



Glazing with electrochrome glass in fully tinted state. Visible light transmission 1%

VELUX Modular Skylights are available with electrochromic panes. The electrochromic pane is an insulated glazing unit with electronic, tintable coating. The coating can be darkened on demand by applying a low voltage of electricity. The dynamic changing in tint provides exceptional control of daylight, glare and energy use without blinds or shades.

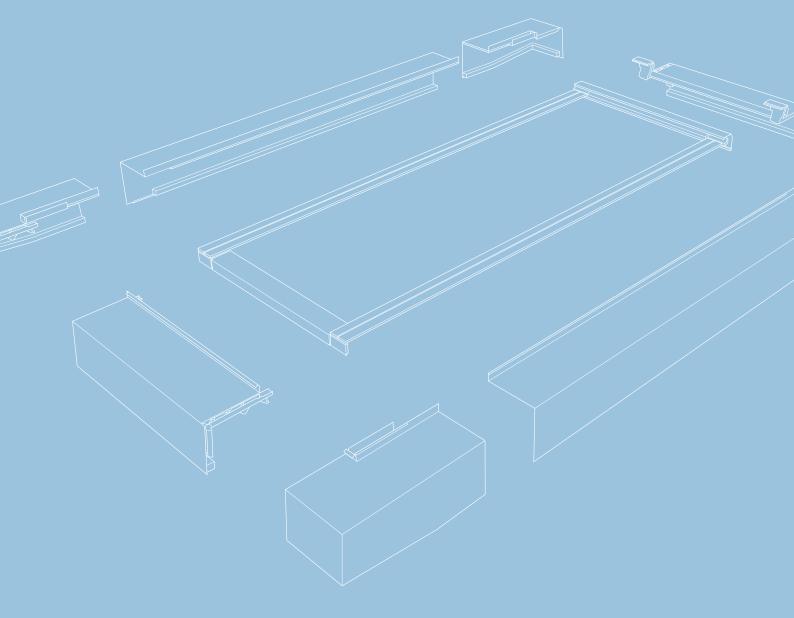
An easy-to-use control system allows anyone to operate the electrochromic panes with wall switches, a mobile app or with a building management system. A combination of the three is also possible.

## **Controlling Modular Skylights**

For venting Modular Skylights and roller blinds, we offer two controlling solutions: VELUX io-homecontrol® and an Open System solution. VELUX io-homecontrol® uses VELUX supplied operation devices to operate venting modules and roller blinds to any desired position.

Alternatively, the Modular Skylight system can be controlled with an Open System solution, connected to ± 24 V DC. Options include io-homecontrol® compatible systems and common building automation fieldbus systems.

Power supply and control unit	Rain sensor	Rain and wind sensor set	Control pad	Wall switch	Switch interface (external wall switch)	Interface (external controls)
			VELUX:	For ventilation  For roller blinds		
KLC 410	KLA 200	KLA S105	KLR 200/ KLR 300	KLI 311/KLI 312	KLF 050	KLF 150



# Installation

### **Sub-construction**



Modular Skylights require an accurate fixed-dimension substructure to support an easy installation process. Likewise, the strength of the sub-construction needs to be calculated from project to project, based on the building design and application size.

Download our guide on sub-construction.

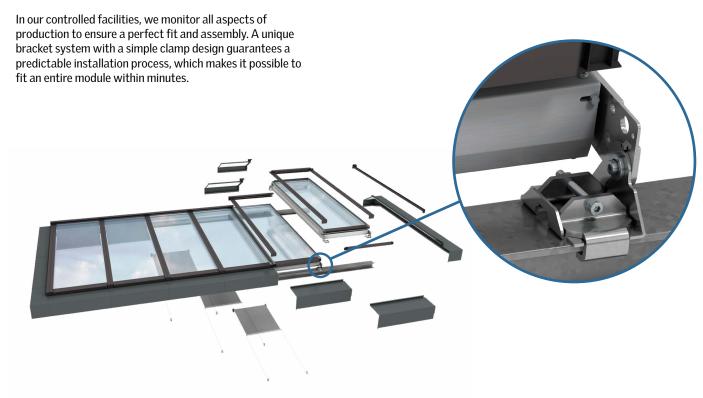
Download at veluxcommercial.com

>



Read all about sub-constructions in the guides at:  $\underline{\text{veluxcommercial.com}}$ 

## Designed for easy installation



### Faster and smoother installation saves time and resources

Save time and money with our 100% prefabricated skylight modules that allows you to close the roof within days, regardless of the weather, and lets you to get on with the indoor work with speed and efficiency.





### Delivery

We offer a variety of logistic services to suit your delivery needs.



### **Craning and packaging**

The modules are delivered on pallets, prepared for crane lift and clearly marked with letters, signifying the components' order in the installation process.



### On-site handling

Clear instructions on the packaging and letters marking the installation sequence help plan the installation so that each component is available at the right time in the right place.



### **Placement**

Place the modules in the correct spot, adjust later if necessary.



### Fixing

Fix the module fast and easily by means of brackets with clamps.



### Click-on

Click on the prefabricated cladding and flashings.

### Year-round installation in all kinds of weather



Modular Skylights can be installed in all kinds of weather. The guick installation process quickly seals the hole in the roof and creates a more comfortable indoor working environment.

Prefabrication eliminates the need for silicone jointing, which saves time and enables year-round installation.

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