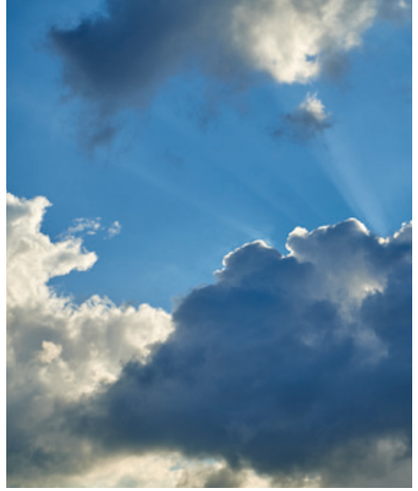
DAYLIGHT SOLUTIONS FOR SUSTAINABLE BUILDINGS

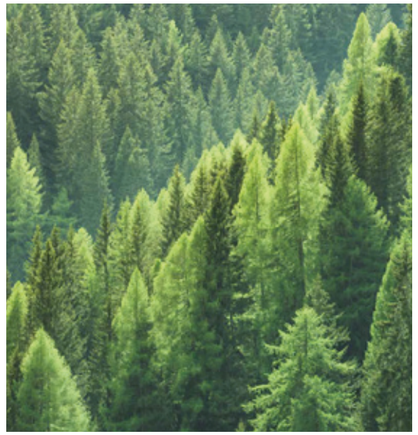
When great design enhances
a good indoor climate in commercial buildings

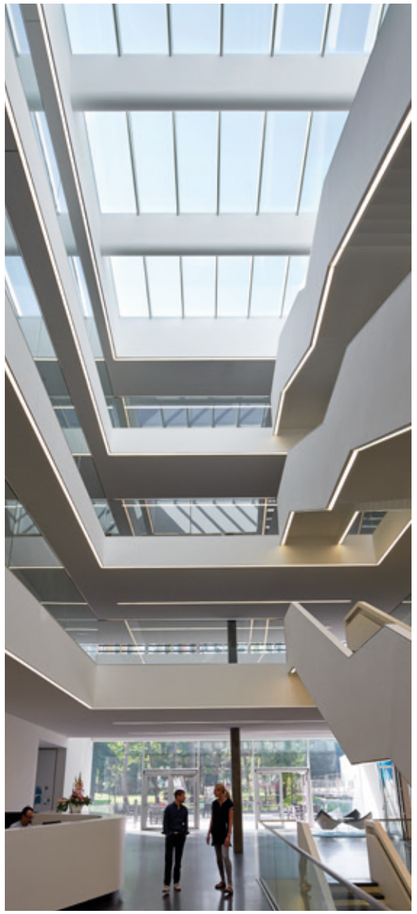
VELUX®
Modular Skylights

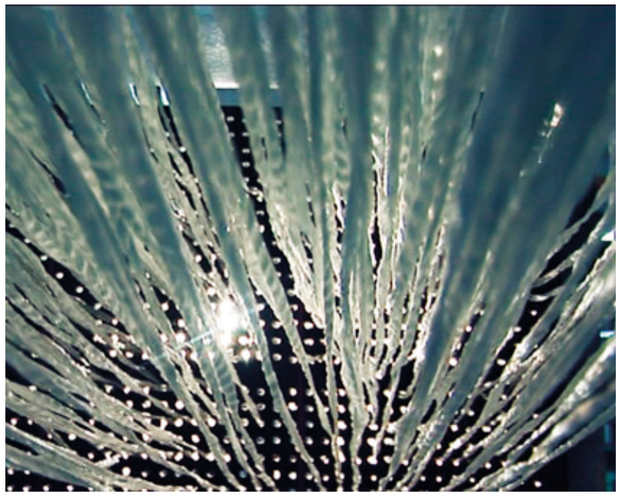
VELUX MODULAR SKYLIGHTS

Improving people's quality of life with daylight and fresh air through the roof.









A way of life
For more than 75 years, VELUX has been dedicated to improving people's quality of life with daylight and fresh air through the roof.

VELUX Modular Skylight embodies this strong passion for daylight, unrelenting product quality and care for people and planet.

Health and comfort
The modular, prefabricated VELUX skylights are designed to take full advantage of daylight and fresh air through the roof to create healthy, comfortable and productive indoor spaces.

The skylights come with several unique design features for good indoor climate. The modules offer integrated blinds and awnings for daylight control. And special venting modules with built-in motor provides easy control of temperature and air quality.

Energy efficient
Very low thermal conductivity of the profiles and a range of low-energy glazing options make the total modular solution highly energy efficient.

Solar panel modules are also available for easy integration of renewables.

Resource efficient
VELUX Modular Skylight is a durable solution with an estimated service life of 40 years on profiles and 20 years on panes.

The prefabricated skylights are designed, manufactured and delivered to minimise the resource footprint from cradle to grave.

Ready for certification
The skylights come with the required environmental assessments and declarations for building certification according to all common certification schemes.

Responsible production
All skylights are produced at our specialised skylight factory, which is committed to quality, environment and safety.

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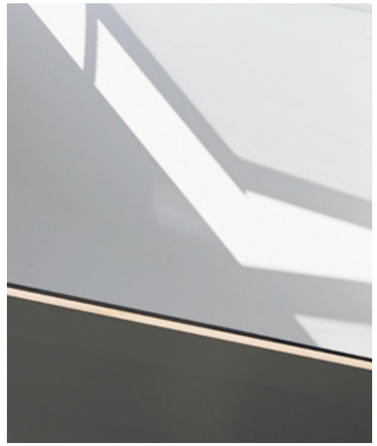
INDOOR
COMFORT



GREAT DAYLIGHT
DESIGN

SUPERIOR
PERFORMANCE

CERTIFIED
BUILDINGS

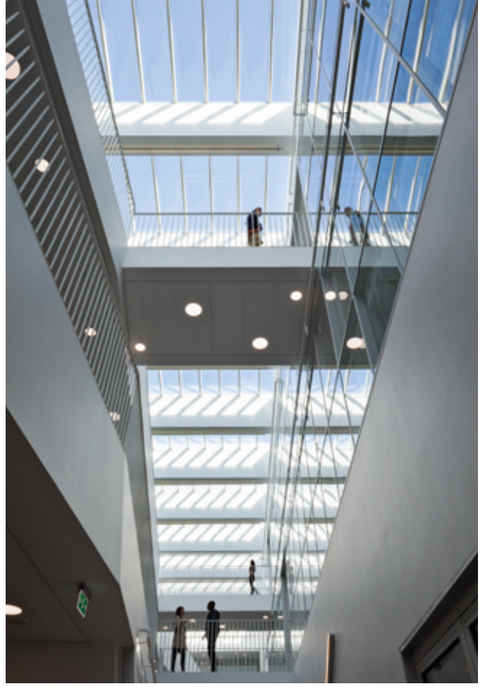
SUSTAINABLE
SOURCING

RESPONSIBLE
PRODUCTION

INDOOR COMFORT

Boost comfort and productivity with daylight and fresh air through the roof.

CREATING HEALTHY AND COMFORTABLE SPACES WITH MODULAR SKYLIGHTS



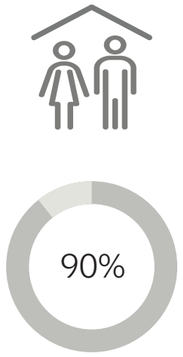
Healthy indoor climate
Understanding how the indoor climate impacts health and comfort is vital in new building design as well as in building renovation projects.

VELUX Modular Skylight enables design of buildings that improve health and reduce the risk of allergies. At the same time, right levels of daylight and fresh air help improve the ability to learn and perform inside buildings. The modular skylights create buildings that take full advantage of daylight and fresh air through the roof.

FACTS ABOUT INDOOR CLIMATE

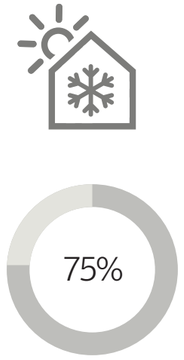
- People spend about 90% of the time indoors.

(Healthy Home Barometer 2016)



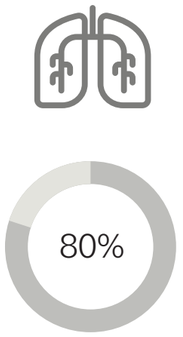
- 75% of all buildings are too hot in summer, too cold in winter.

(Healthy Home Barometer 2017)



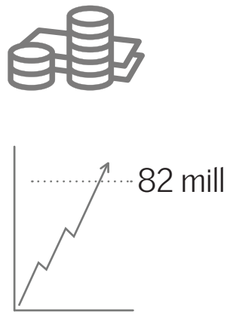
- 80 mill. Europeans live in unhealthy buildings.

(Healthy Home Barometer 2017)



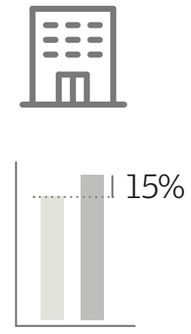
- In Europe alone, 82 mill euro go to treatment of asthma every year.

(Healthy Home Barometer 2017)



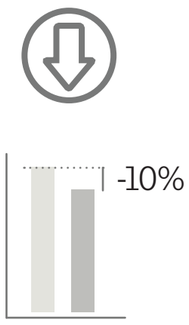
- Good indoor climate can improve office productivity by 15%.

(Healthy Home Barometer 2017)



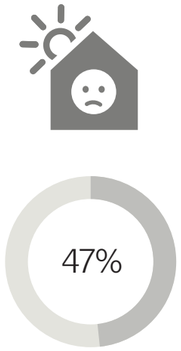
- Too high or too low temperature can decrease employee performance by up to 10%.

(Healthy Home Barometer 2018)



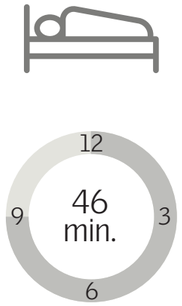
- 47% of office workers have no natural light in their working environment.

(Healthy Home Barometer 2018)



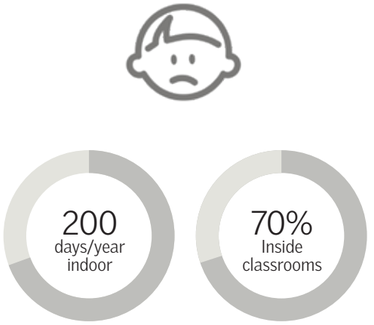
- When working in offices with windows, people get 46 minutes more sleep per night on average.

(Healthy Home Barometer 2018)



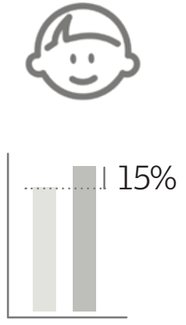
- Every year, students spend 200 days at school - 70% of the time indoors.

(SINPHONIE final report)



- Learning abilities of children rise by up to 15% in good indoor climate.

(Fraunhofer – Schools in Europe 2015)



GREAT DAYLIGHT DESIGN

Bring architectural ideas to life and design with maximum daylight.

The essence of comfort
When people tend to spend 90% of their time indoors, designing with daylight becomes an obligation. Great daylight design brings the qualities of the outdoors into the building. Daylight brightens the mind and invigorates the body. It carries warmth, provides clarity, and creates spaces for meeting, talking, relaxing and playing.

Pleasant temperatures combined with fresh air and daylight is the essence of comfort and well-being.

Built-in comfort
VELUX Modular Skylight offers several unique features for great daylight design. The integrated blinds and awnings ensure pleasant temperatures and prevent glare.

The venting modules allow easy control of the indoor climate by opening and closing the windows to provide fresh air and pleasant temperatures at all times.

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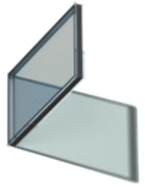
5 TIPS FOR DESIGNING BUILDINGS WITH DAYLIGHT AND FRESH AIR

1. Ensure optimum daylight by:
   - Maximising the glazing in the roof light.
   - Taking into account the size and shape of the roof light.
   - Considering the angle of the roof and the orientation of the building.
2. Install venting modules to create comfort ventilation. Install fixed units when mechanical ventilation is available.
3. Create an invisible solution by means of a slim and discreet profile.
4. Use sun screening – blinds and/or awnings – to block glare and heat from the sun.
5. Choose fritted or opal glazing to divert the sunrays, bounce the heat and let in lots of daylight.

THIS IS HOW DAYLIGHT DESIGN WORKS IN PRACTICE

Light distribution, colour reproduction, heat transmittance and heat control



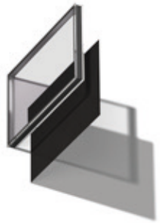
GLAZING WITH ADVANCED SUN PROTECTION COATING
Coating efficiently blocks the sun and prevents overheating.

Note: The human eye can easily compensate for the darker luminance, but colour reproduction will desaturate significantly.

Glazing with low emissivity coating (LowE)

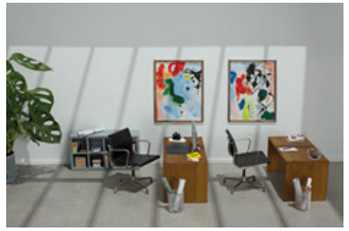
Glazing with light sun protection coating (Sun1)

Glazing with advanced sun protection coating (Sun2)

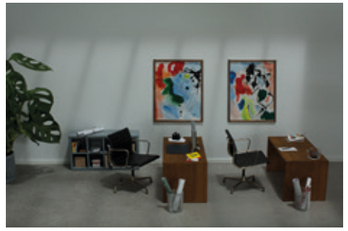


GLAZING WITH LOW EMISSIVITY COATING AND ROLLER BLIND
Efficiently blocks light and heat and is easy to regulate.

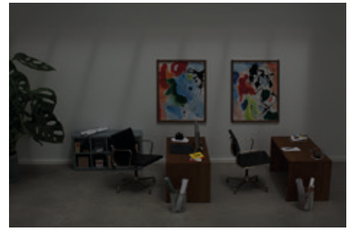
Note: A white roller blind creates diffuse light with low contrast and high luminance, which is great for studying, computer work and typical office tasks.



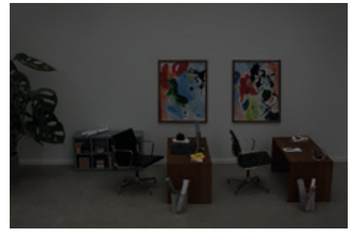
Glazing with low emissivity coating (LowE) – No sunscreening



Glazing with low emissivity coating and Roller Blind RMM 8806, White



Glazing with low emissivity coating and Roller Blind RMM 8805, Grey



Glazing with low emissivity coating and Roller Blind RMM 8807, Black

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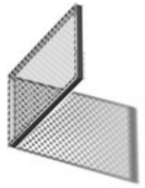


FRITTED OR OPAL GLAZING
Lowers the contrast for a plesant work environment, reduces the heat intake and preserves the luminance.

Note: Opal glazing preserves colour and luminance, while removing contrasts, which creates a perfect lighting for schools and offices.

Glazing with low emissivity coating (LowE)

Fritted glazing

Opal glazing

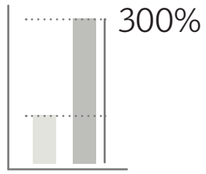
FACTS ABOUT DAYLIGHT

- Panes used in VELUX Modular Skylights provide light transmission up to 79% depending on coating and variant.

(Source: EN 14351-1)

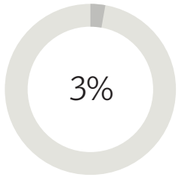
- Skylights provide up to three times more daylight than facade windows depending on building orientation and roof pitch.

(Source: CIE Standard General Sky)



- Illuminance requirements for an office building is 300 lux. This is only 3% of the illuminance provided by daylight. A skylight provides up to 10,000 lux – corresponding to the levels of daylight when outside.

(Source: CIE Standard General Sky)



SUPERIOR PERFORMANCE

Verified documentation of the skylight's performance – from energy efficiency to water tightness.

THE PREFABRICATED VELUX MODULAR SKYLIGHTS FULFIL ALL REQUIREMENTS OF EU AND NATIONAL BUILDING STANDARDS AND NORMS

Energy efficiency
The modules are highly energy efficient. The airtight modules fit perfectly together to provide a tight roof glazing with good energy performance. The modules can be delivered with integrated blinds, awnings and vented modules that ensure thermal stability no matter the weather conditions.

Insulating profiles
The composite material used for the profiles combines great strength and high insulating performance.

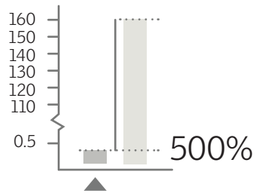
Favourable U-value
The panes are supplied with low-energy double or triple glazing to achieve a favourable U-value. The integrated flashings ensure water tightness between module and roof.

Integrated solar panels
The modules are available with integrated solar panels allowing integration of renewables into the roof structure.

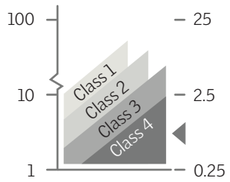
Environmental Product Declaration
VELUX Modular Skylight comes with Environmental Product Declarations (EPD) for several markets.

FACTS ABOUT PERFORMANCE

- The profiles are made of a composite material (80% glass fiber and 20% PUR) with very low thermal conductivity. This gives a 500% lower (better) insulation rate than aluminium.



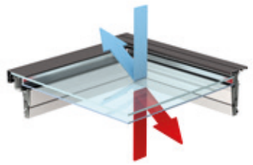
- The modules have obtained the air permeability classification, Class 4, lowest heat loss.



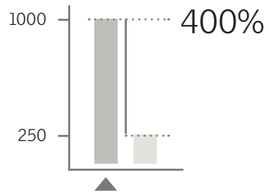
- Thermal transmittance per sqm module:

  Modules with double-glazing: U_w = 1.3-1.5 W/(m²K)

  Modules with triple glazing: down to U_w = 0.86-1.1 W/(m²K)

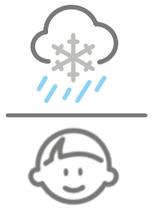


- The composite material has high flexural strength and is four times stronger than aluminium. The profiles are slim and allow more daylight into the building.



- The prefabricated modules are tested through-and-through before leaving the factory. This means that all EN and DIN classifications are in place for easy specification.

- Low-energy glazing in combination with low-conductive profiles create an effective shield against all kinds of cold weather.



- Per August 2018, Environmental Product Declarations (EPD) are available for the following markets:
  - UK (and DK) is ready.
  - EPDs for France and Netherlands are on the way.

- The EPDs offer full declaration of factors like Global Warming Potential (GWP), Ozone Depletion Potential (ODP), acidification and eutrophication.

CERTIFIED BUILDINGS

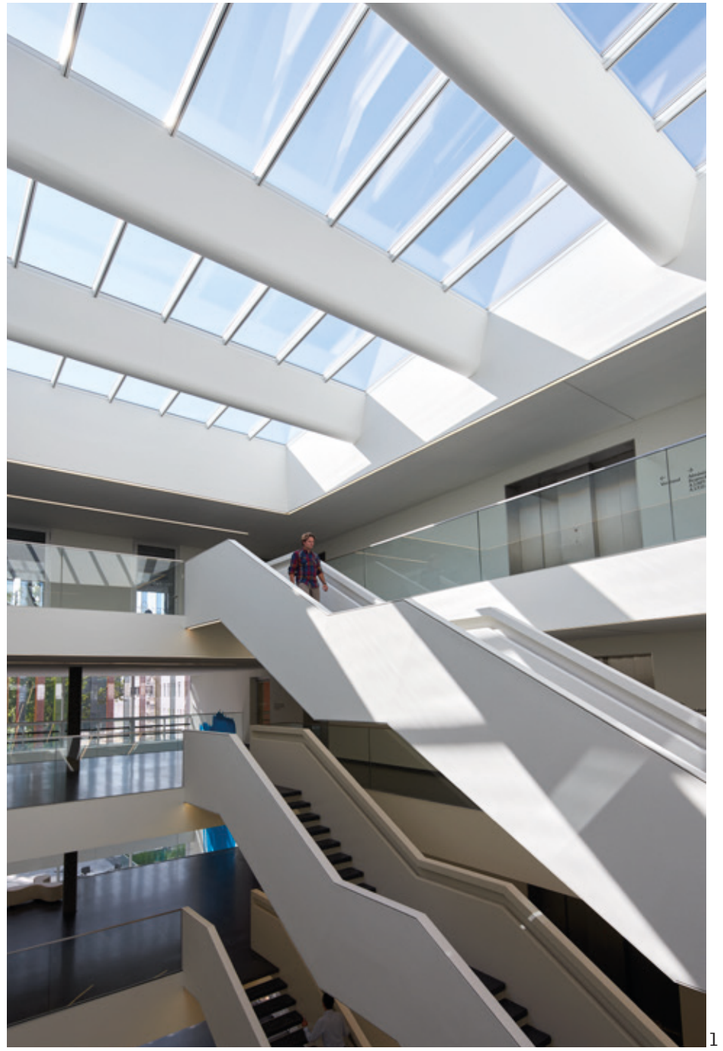
Meet the need to build sustainably with VELUX Modular Skylight.

Holistic approach to sustainability
The EPD of VELUX Modular Skylights eases the evaluation of the product in connection with environmental building rating schemes such as BREEAM, LEED, DGNB, Active House, AktivPlus, Living Building Challenge and Well Building Standard.

The different rating schemes vary widely in terms of overall scope, performance metrics and priorities during the building's life cycle, yet they all share the ambition to create healthy and sustainable buildings.

VELUX Modular Skylight pursues the same holistic strategy that seeks to optimize energy efficiency, minimize environmental impact and ensure a healthy indoor climate.

We follow the development and content of the rating schemes closely and provide guidance as well as all relevant information that can help you achieve certification.



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Examples of buildings with VELUX Modular Skylights

1. German Center for Neurodegenerative Diseases, DZNE, Germany
2. Siemens Head Office, Denmark
3. Hafner, Office Building, Germany
4. KITA, Kindergarten, Germany

5 6

5. Hal 3, Multihal, Sports Facility, Denmark
6. Green Solution House, Hotel, Denmark
(Modules with Photovoltaic glazing)

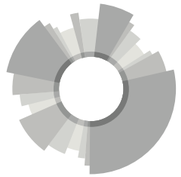
7 8

7. Experimentarium, Science Center, Denmark
8. The Houtloods, Auditorium, Bar and Restaurant, Netherlands

FACTS ABOUT CERTIFICATION

- Worldwide, more than 600 sustainability certification schemes for building components and building design are being used. A new guide "Guide to sustainable building certifications 2018" provides an in-depth investigation of the ten most widely used standards.

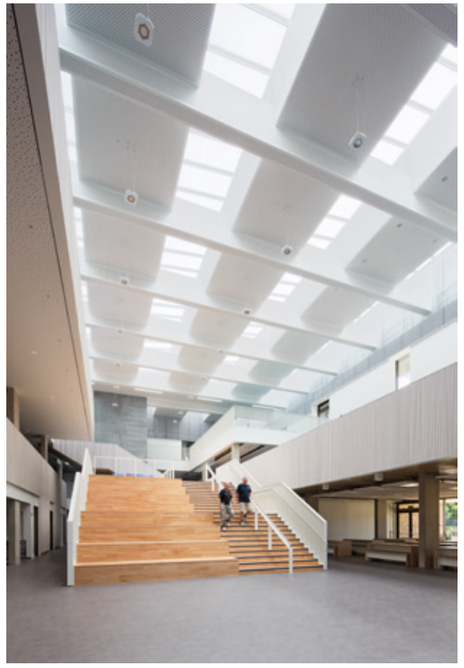
(Guide to Sustainable Building Certifications 2018)



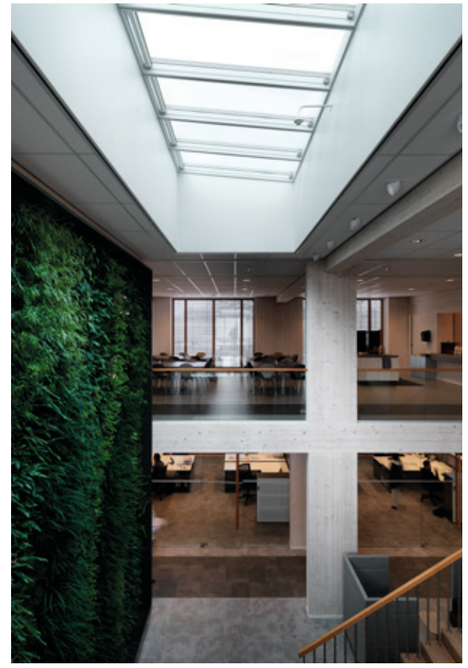
- As regards chemical emissions, VELUX Modular Skylight has been tested A+ in VOC (Volatile Organic Compounds) according to the French regulation on VOC emissions from construction products.

Siemens Head Office, Denmark, LEED Gold

Green Solution House, Denmark, DGNB and Active House



Trumpington College, United Kingdom, BREEAM Excellent



Geelen Counterflow, Netherlands, BREEAM Outstanding

SUSTAINABLE SOURCING

Maximise the use of sustainable materials throughout the entire life cycle of the building.

Sustainable resource use
The main materials used in VELUX Modular Skylight with double-glazing are glass (57%), composite (19%), wood (7%, used for packaging), aluminium (7%) and other minor material fractions.

Profiles
The structural profiles of VELUX Modular Skylights are made of low-conductive, pultruded composite, containing approximately 80% fiberglass and 20% polyurethane resin. The composite material provides high flexural strength, good insulation performance and long service life.

As primary producer of Composite, the VELUX Group carries out research and development in recycling of the composite material. Currently, experiments are carried out to re-cycle the material in different window components, noise screens, glass wool insulation and other products.

Glass
The VELUX Modular Skylight panes are made from virgin glass sourced from leading European glass manufacturers.

Wood and aluminium
The wood used for packaging pallets for VELUX Modular Skylight is sourced from certified, sustainable forests. The aluminium used in the skylight modules contains 50% recycled aluminium.

Re-use and replacement
Prefabrication enables re-use of modules in other buildings. The modular design of the skylights allows easy replacement of panes, motors and blinds.

FACTS ABOUT MATERIALS

- The service life of the profiles is estimated to be 40 years; for panes 20 years.
- The composite holds ECRT certificate (European Composite Recycling Technology) to certify that composite waste is treated and recovered into new raw material for insertion in and production of composite products.

ECRT
European Composite Recycling Technology

- Buildings account for one third of humanity's resource consumption.
- 3 billion tons of raw materials go into the building sector every year.
- 40% of solid waste comes from the construction or demolition of buildings.

RESPONSIBLE PRODUCTION

Focus on quality, environment and safety from manufacturing to final products.

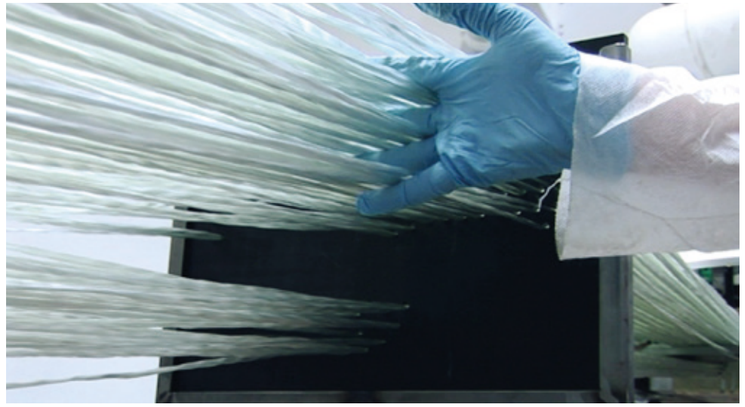
Peace of mind
VELUX Modular Skylights are produced at our specialised factory in Denmark. The factory is ISO 9001 certified and in the process of being certified according to ISO 14001 and OHSAS 18001 to ensure continuous focus on quality, environment and safety in operations and products.

Minimise footprint
We seek to minimise our footprint in the way we source, manufacture and transport our products.

We strive towards zero-waste production and constantly seek to optimize our resource efficiency.

Work safety
We pursue a safety vision of zero work-related injuries at our manufacturing sites. New factory equipment and new working procedures are always subjected to thorough safety assessments before purchase/implementation.

Our proactive approach to safety has brought down the work-related accident frequency to a level four times lower than the comparable industry benchmark.



FACTS ABOUT PRODUCTION

- The target for the carbon footprint of our manufacturing processes is a 50% reduction of CO_2 emissions compared to the 2007 baseline.
- The VELUX Modular Skylight factory is certified according to ISO 50001, Energy Management.
- We carry out research and experiments to investigate reuse of the composite material. More specifically, we have material specifications ready for innovative products, where new or recycled composite can be used. In the longer term, this insight will be used to fulfil EU regulation on end-of-life return of products.
- The work-related accident frequency at the VELUX factories is four times lower than the comparable industry benchmark.

ISO 9001
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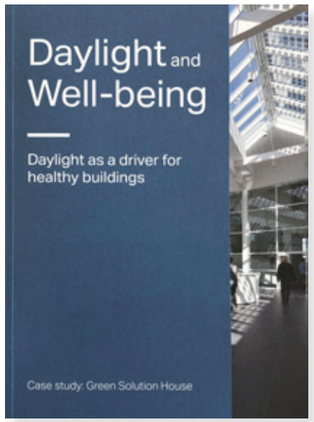

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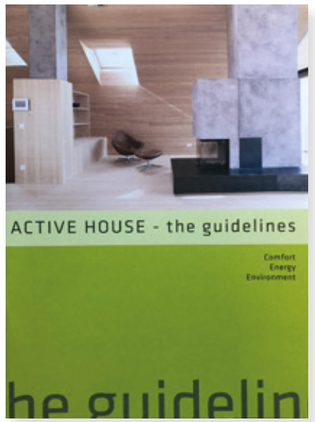

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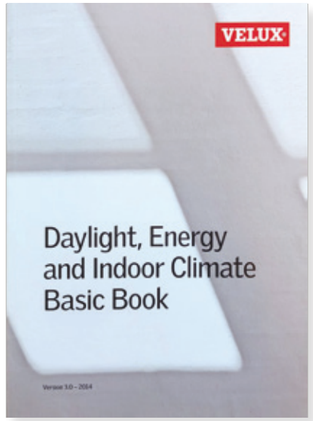

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