



# A home that grows with its residents

Transforming an old house into a family home for the future



# One-family suburban house

## From dark and damp to light and spacious

This Danish home was installed with VELUX roof windows, modular skylights and sun tunnels as part of a rebuilding project with roof replacement.

The yellow brick house in a suburb north of Copenhagen was built in 1928. The original house consists of a total of 158 m<sup>2</sup>, with 99.5 m<sup>2</sup> on the ground floor and loft and 58.5 m<sup>2</sup> in the basement. In 2017 an extension of approximately 50 m<sup>2</sup> was added to the original house.

When the Dreyer-Søndergaard family bought their house in 2010, the yellow brick building looked like the perfect home for a family of four. But the house had shortcomings. The bedrooms on the first floor were dark, the bathroom felt damp and small, the entrance area was worn out and the entire roof needed replacement.

The family decided to work on all the problems at once and embarked on a major renovation.

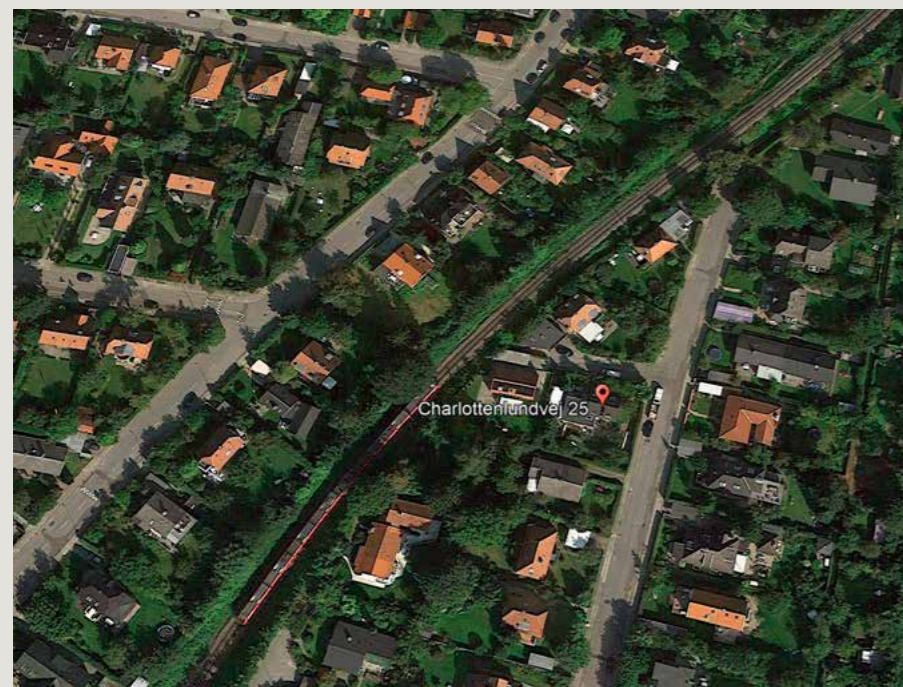
They turned to the VELUX Group for inspiration. Here, the architects saw the roof replacement as an opportunity to add new qualities to the house.

By installing 12 roof windows in the loft, and two sun tunnels in the entrance area, daylight and natural ventilation could transform the old building into a comfortable and healthy home.

The rebuilding was completed in 2012 and immediately improved the family's daily life: "To have all this light and air from the roof window is pure luxury," husband Anders says.

While the house now offered everything the family could wish for in terms of comfort, it lacked one thing: space.

"From the moment we saw the house for the first time, we knew that we wanted an extension," Anders remembers. "We wanted the opportunity to gather the entire family on the same floor and still have enough room."





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Not enough room? Look how this family transformed their old house into a bright and spacious home.

The solution turned out to be an extension, which was far from a simple enlargement.

"From the beginning, I knew that the extension should embrace the house," Anders explains.

Such an extension could not be built with a pitched roof. After consulting architects, the family found an answer.

The extension should come in the shape of a big, black box. Planked with wood and equipped with a flat roof, the building would be a powerful contrast as well as a suitable supplement to the existing building: "It matched the main entrance, which looks like a black box too," wife Malene explains.

The cube-like structure was completed in 2017 and came with a bright and flexible interior. It was divided into two areas: a large sitting room equipped with VELUX Modular Skylights and sliding glass doors on both sides, and a smaller, elevated room, nicknamed the "TV cave". Here, a dome-shaped VELUX roof window provides daylight for relaxing activities such as reading, playing and, of course, TV-watching.

"The dome suits the flat roof very well. It is not visible from the street," Malene says.

The TV cave is a favourite of hers: "It feels like a room of its own. We didn't want the sitting room to turn into a place where the couches were arranged in front of the

television, as if it was some sort of altar," she recalls.

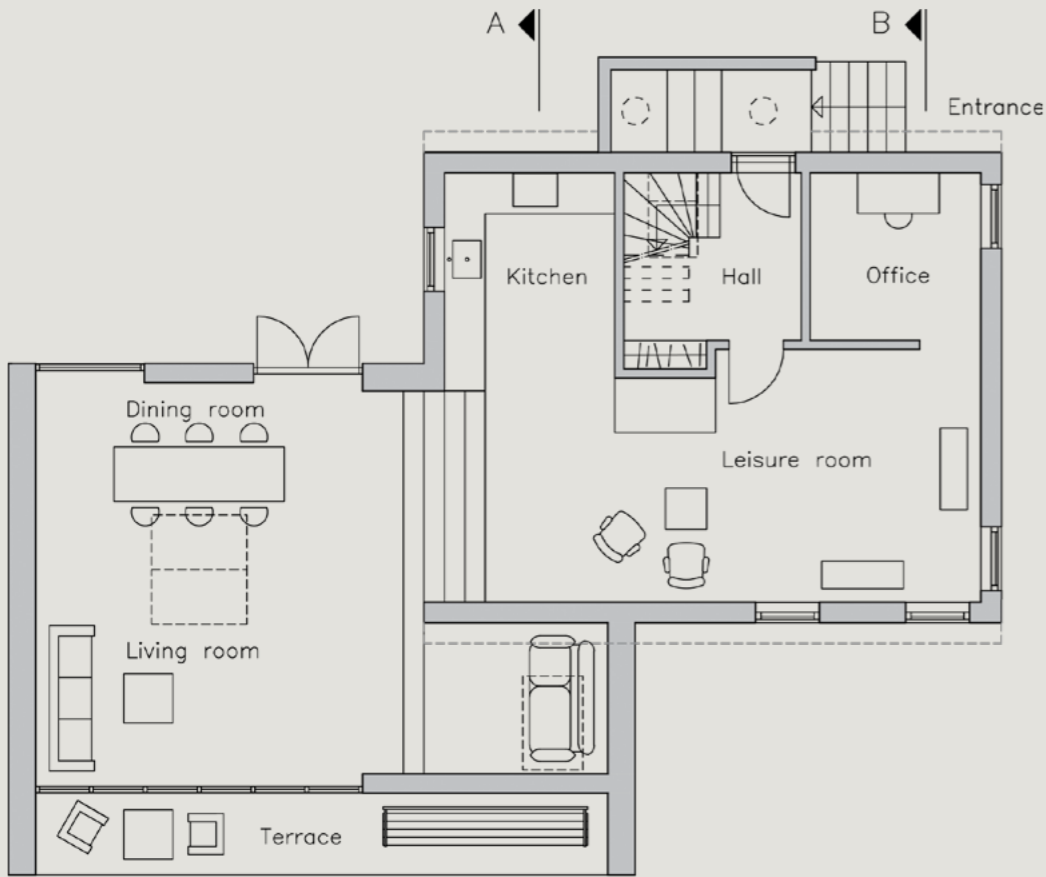
Now, the small, cave-like room allows the residents to watch their screens without being excluded from the airy atmosphere of the sitting room.

"Apart from light, the roof windows also enlarge the floor-to-ceiling height in the extension, and I love that," Malene states.

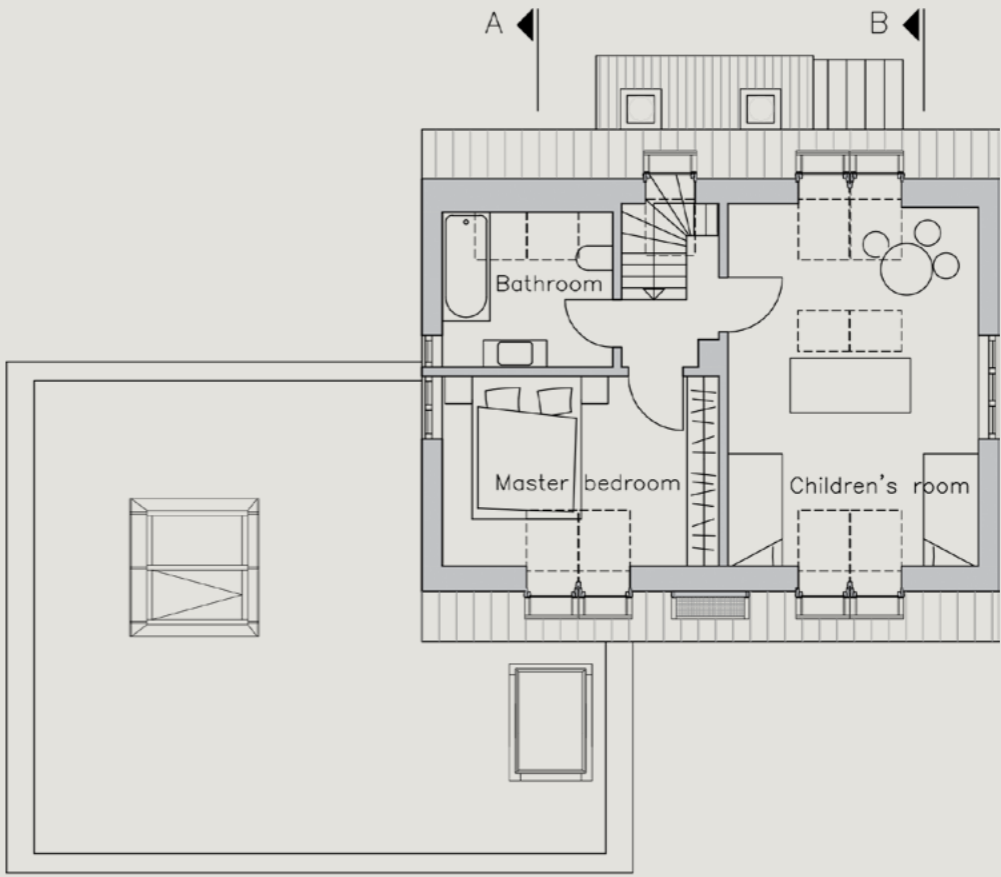
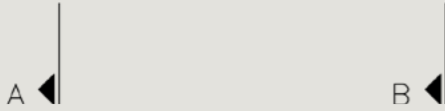
Anders appreciates how the extension, though it appears square from the outside, feels vibrant and varied on the inside: "What I find especially valuable are the lights and shadows created by the windows. I like the sense of edges and lines in the room."



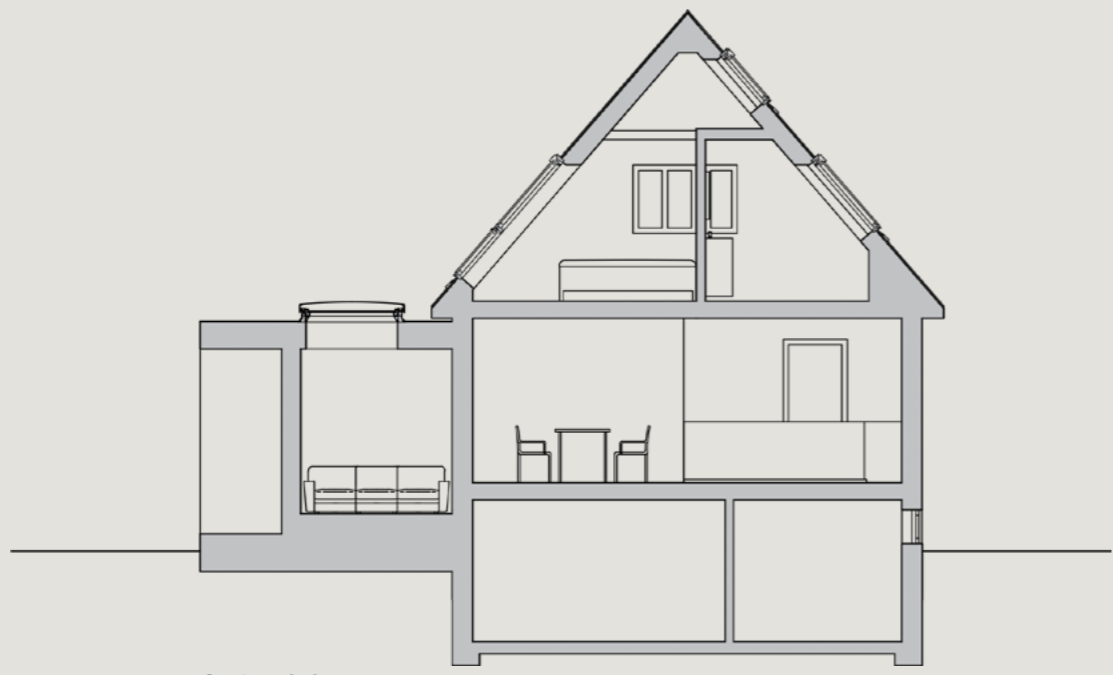
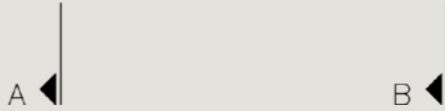
# Plans and sections



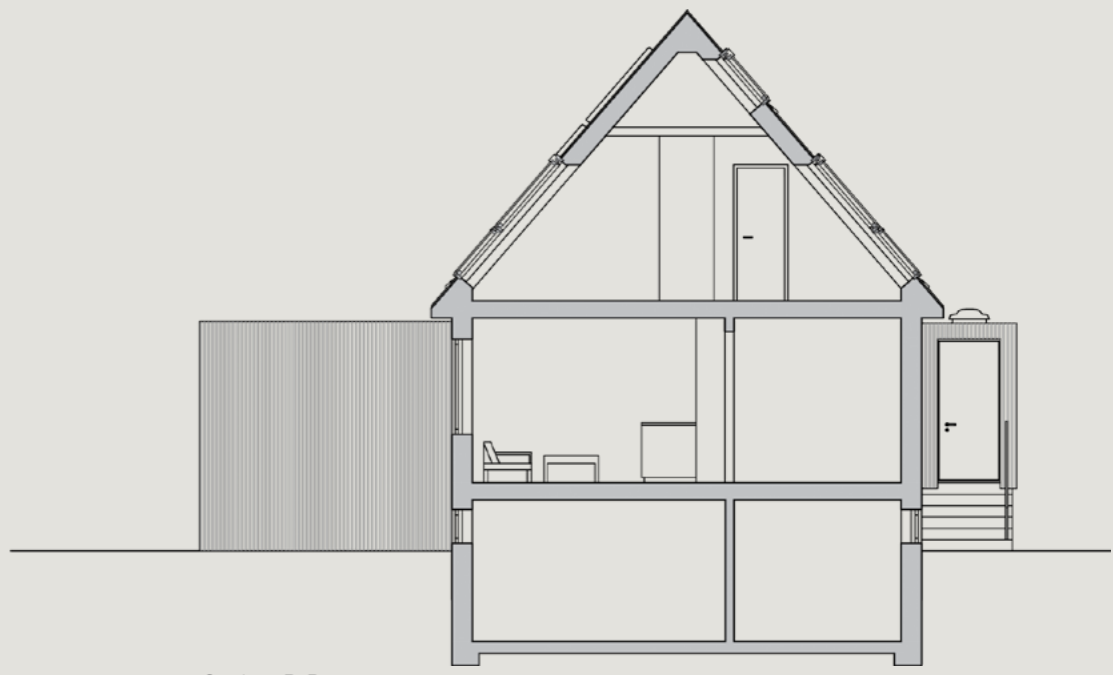
Ground floor



First floor



Section A-A



Section B-B



# Indoor climate

Air quality, temperature and daylight are essential components of a good indoor climate. The rebuilding has ensured that the Dreyer-Søndergaard family can enjoy a healthy and comfortable home all year round.

Nowadays, we spend most of our time indoors, so a good indoor climate is of great importance. Active use of daylight and fresh air not only ensures a comfortable home, it also has a number of positive effects on our senses, concentration and health. High levels of daylight exposure and a well-ventilated environment boost our immune system and make it harder for bacteria to survive.

In addition, access to daylight energises and enables us to sense the change of day, seasons and weather.

In the Dreyer-Søndergaard home, roof windows provide the building with generous amounts of daylight and fresh air. A good example is the improved air quality in the bathroom.

“Before we had roof windows installed, the air in the bathroom stayed humid for a long time after someone had a shower,” explains Malene Dreyer. “Now, moist air is quickly and easily expelled through the roof windows.”



# Daylight factor

The daylighting performance of the house has been specified using the daylight factor (DF) as indicator.

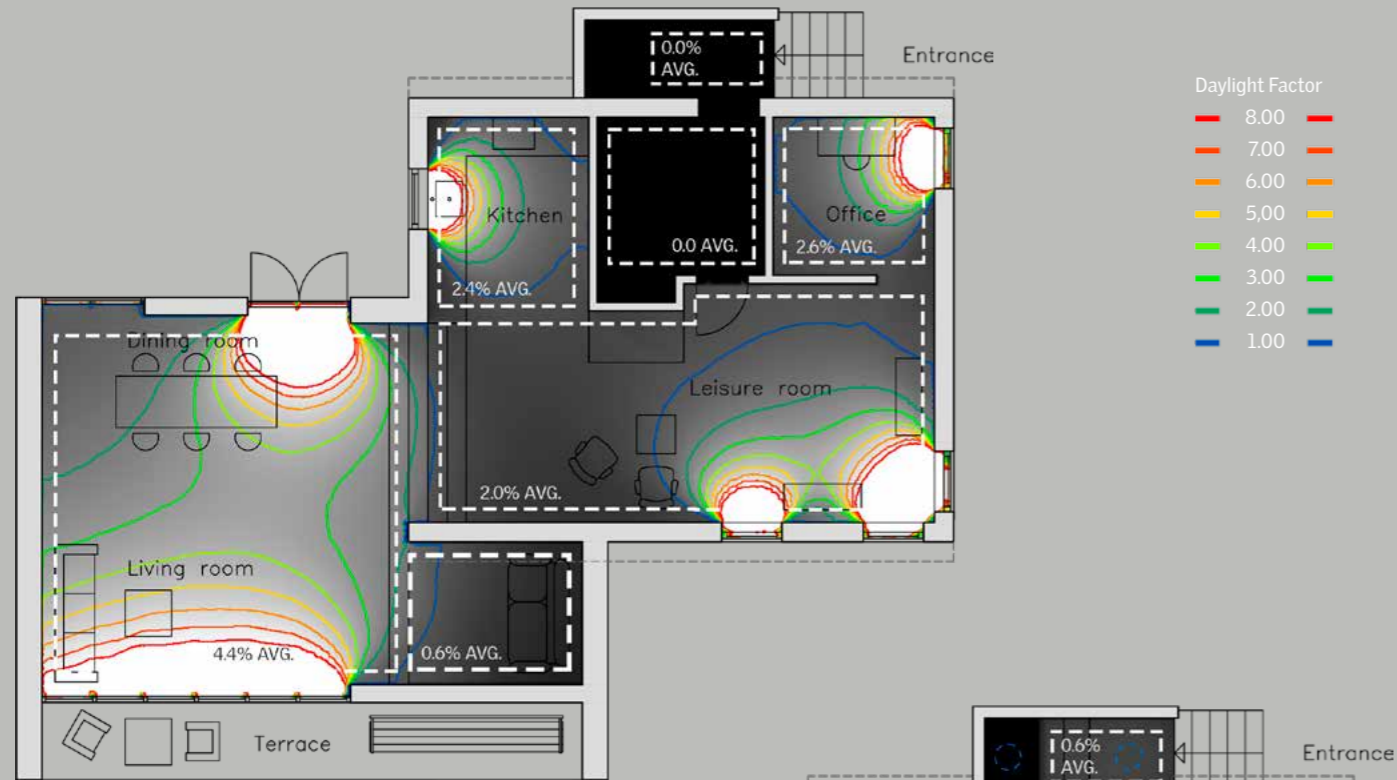
The daylight factor is a common and easy-to-use measure for the available amount of daylight in a room. It expresses the percentage of daylight available inside, on a work

plane, compared to the amount of daylight available outside the building under known overcast sky conditions. The higher the DF, the more daylight is available in the room.

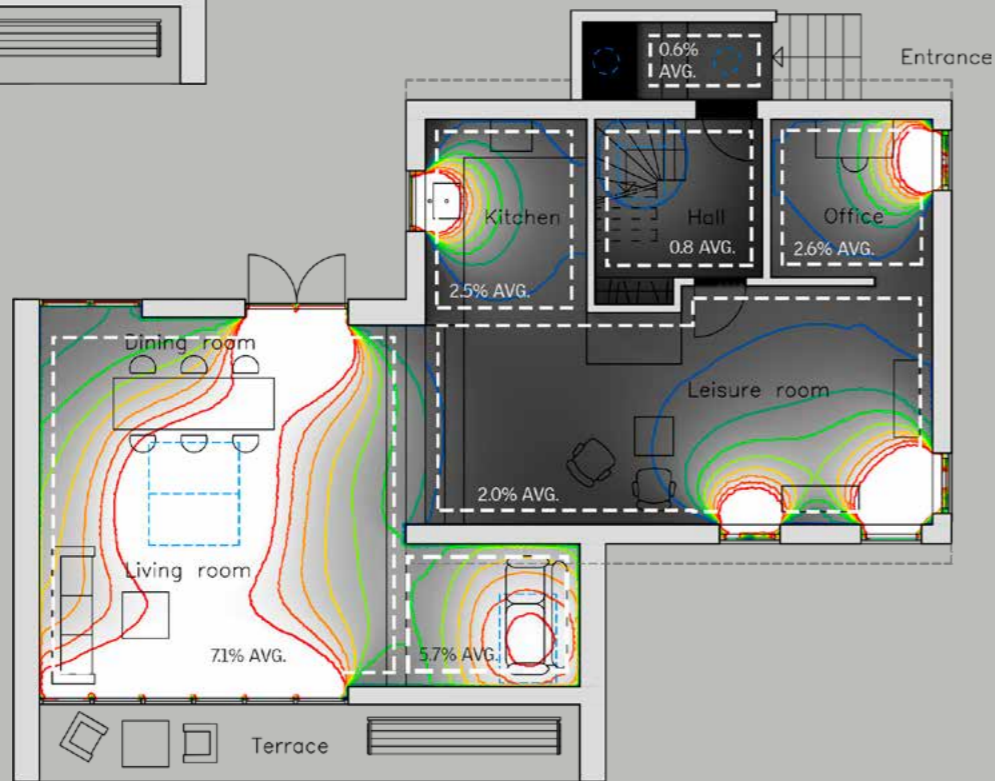
Rooms with an average DF of 2% or more are considered daylit. A room will appear strongly daylit when the average DF is above 5%.

The daylight factor analysis has been performed using computer simulations made by the VELUX Daylight Visualizer 2, a software tool dedicated to daylighting design and analysis. For more details and down-

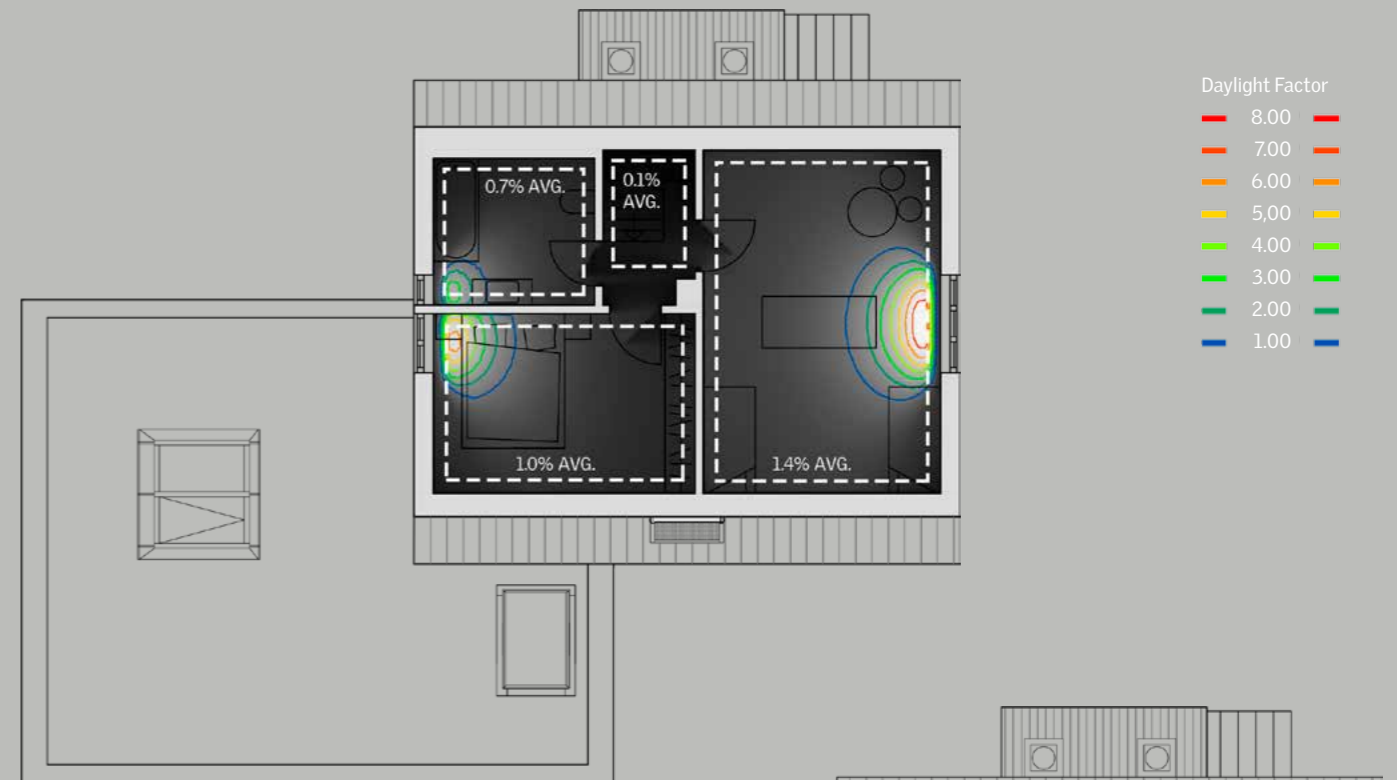
load, visit <http://viz.velux.com>. The figures below are showing the daylight factor levels before and after installation of VELUX roof windows and the impact of the installed roof windows.



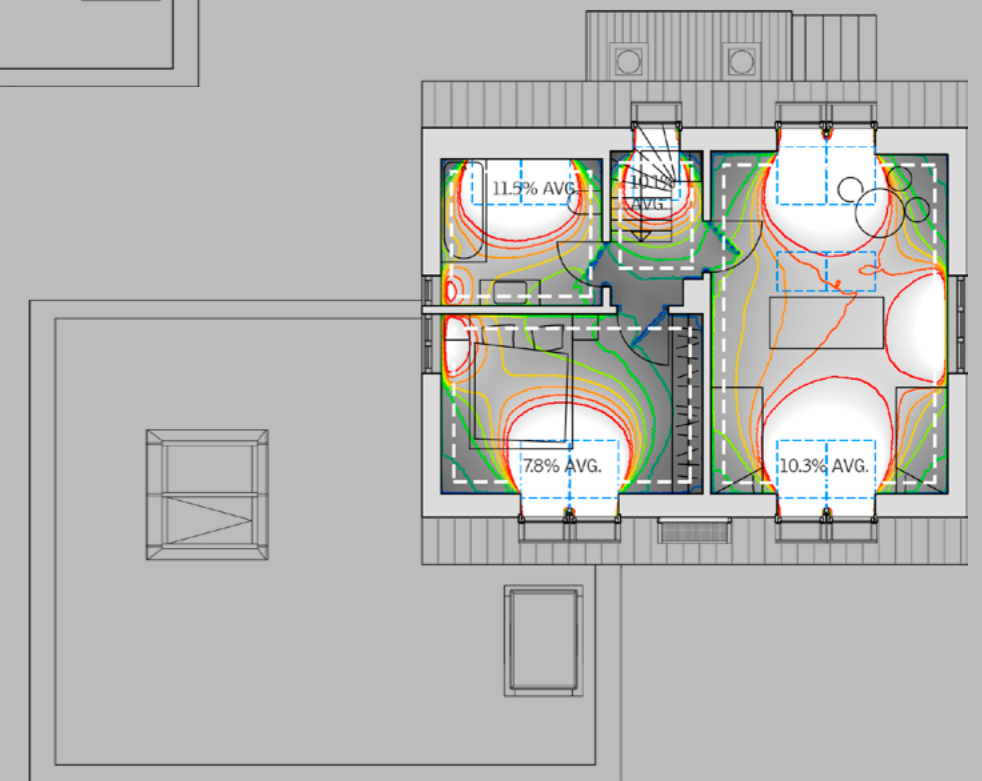
Before installation of VELUX roof windows  
Ground floor



After installation of VELUX roof windows  
Ground floor



Before installation of VELUX roof windows  
First floor



After installation of VELUX roof windows  
First floor



## Climate control made easy

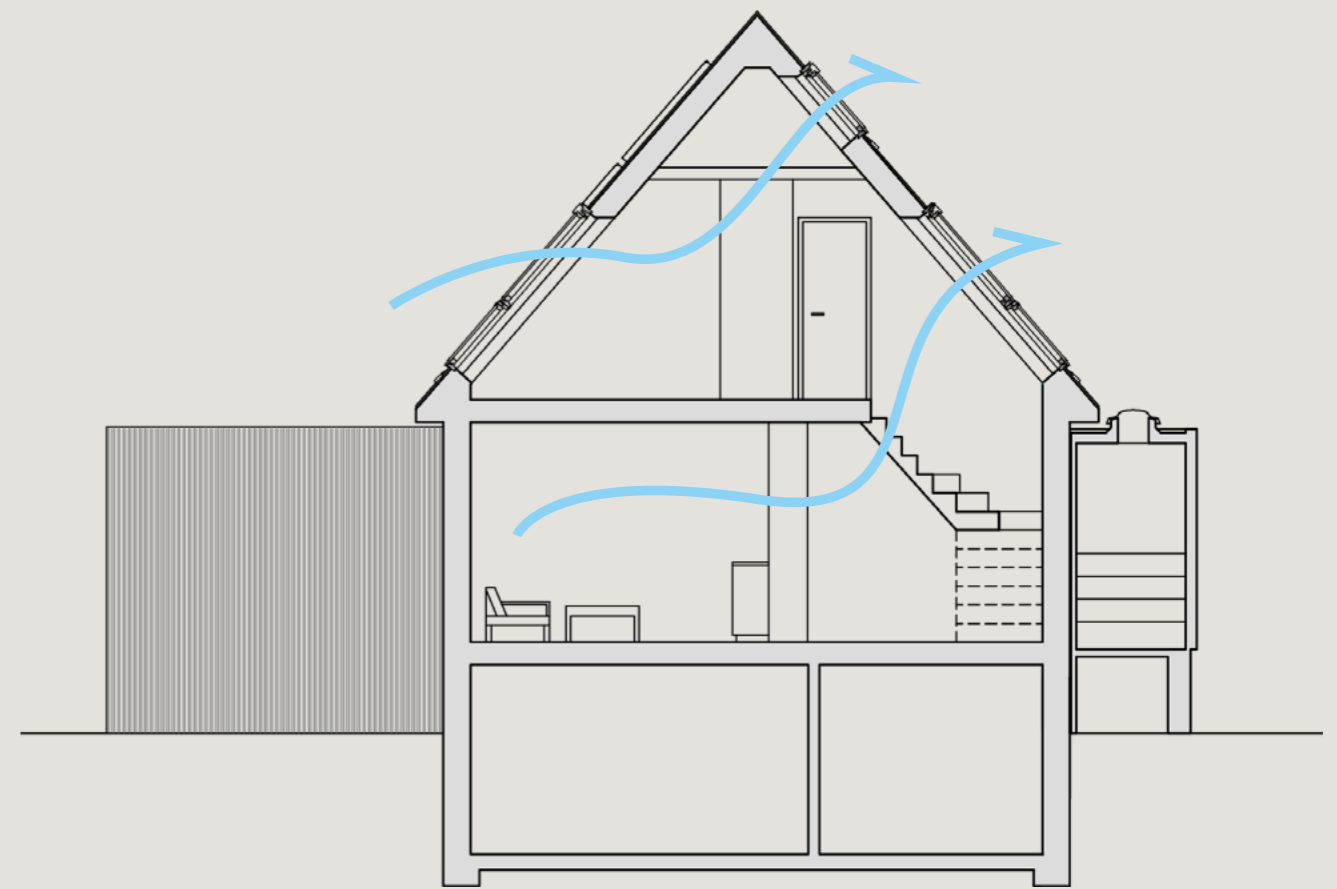
Solutions that provide a good indoor climate must not only be efficient but also simple to operate

As part of the rebuilding of the Dreyer-Søndergaard family home, roof windows with remote control were installed, allowing the family to open all the windows at the same time. Sensors ensure the windows close automatically in the event of rain.

"If I need to open all the windows simultaneously, in order to air out our home, the remote control is very practical," explains Anders.

In addition, the windows can independently help regulate temperature and light. The VELUX ACTIVE climate control products ensure the house is never overheated in the warm season, and that energy consumption is kept to a minimum in the heating season. VELUX ACTIVE consists of a range of exterior awning blinds and interior sun screening products. Apart from contributing to a good indoor climate, they also improve the atmosphere in the house:

"I like it in the afternoon. When the awning blinds are down there is a soft light in the bedrooms. It feels very pleasant," says Malene.



**Building section.**  
Natural ventilation through the vertical windows, the staircase and the roof windows.







# Environment

## A house enjoyable from both inside and outside

Careful design and placement of roof windows have ensured that the surroundings appreciate the new house just as much as the family does.

Transforming an old building into a modern home always poses the threat of destroying architectural values and creating disharmony between the house and its surroundings. In case of the Dreyer-Søndergaard home, such side effects were avoided by choosing a look and colour of the roof very similar to the original construction. Because as much as the family was looking forward to the way the new roof and windows would improve their home on the inside, they were also concerned about the house's appearance from the outside.

"I appreciate that our roof has long, straight lines. It creates visual harmony," says Malene.

The house's attractive additions have already caught the neighbours' attention. "The family in the house across the street has decided to install roof windows rather than dormer windows," says Anders.

But the new windows have not just improved the family's interaction with the surroundings from the outside. On the inside, they can now enjoy their neighbourhood in a new way. "I like the view very much," says Malene. "We can see over all the roofs and gardens in the neighbourhood."



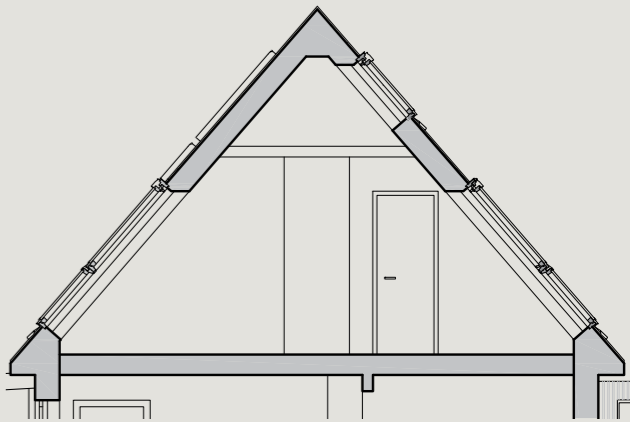


# VELUX Products

For more than 75 years, the VELUX Group has created better living environments by bringing daylight and fresh air into people's homes all over the world. Our products help create bright, healthy, energy-efficient places in which to live, work, learn and play.

The VELUX Group has manufacturing and sales operations in more than 40 countries, with an extensive distribution network. Our products include roof windows and modular skylights, as well as a range of decorative elements, blinds, roller shutters, installation solutions and remote controls.

For more details, please visit [www.velux.com](http://www.velux.com)



Section B-B

## Windows

VELUX roof windows. Pivot-hung versions. Model GGU INTEGRA®. Electrically-operated roof window including remote control and rain sensor for automatic closing in case of rain.



VELUX roof windows. Model GIU. It is a fixed roof window, which cannot be operated in any way. The window is always installed in combination with a roof window that opens and can be used for ventilation.



VELUX roof windows. Model GPU. Top-hung. Opening to any position up to 45°, they are ideal at creating extra headroom, a feeling of increased space and panoramic views.



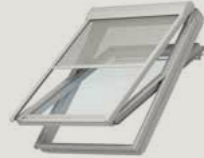
## Sun tunnel

The VELUX TCF sun tunnels for flat roof are designed to provide natural light into areas of the house such as corridors, stairwells, bathrooms, cupboards, etc. where installation of a VELUX roof window is not possible.



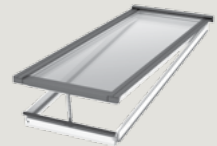
## Sunscreening products

Exterior suncreening. Electrically operated awning blinds. Model MML and MMG.



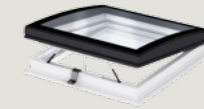
## VELUX Modular Skylights

Introducing VELUX Modular Skylights, the perfect way to open up large rooms in your home to create a light, bright and spacious environment. This solution can be opened automatically for ventilation and the addition of electrically operated roller blinds offers greater light and energy control.



## VELUX flat roof windows

The VELUX curved glass rooflight is our newest flat roof window, designed specifically to accommodate house roofs with pitches that go all the way down to 0°.



The VELUX curved glass rooflight has a unique curved glass surface that lets in more daylight and stands out externally as a modern addition to roof surfaces – ideal for design-conscious homeowners.

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**VELUX®**