

# Residential skylights

2008 edition







Bringing light to life.









Daylight is the essential element that transforms conventional rooms into the splendid spaces that add value and quality to your home and your life. And nothing brings in daylight like a VELUX skylight. Whether it's in the privacy of a master bath or in a social area like the kitchen, VELUX skylights bring the best of the outdoors inside with you.

In this residential product catalog, you will find detailed information on:

- Why VELUX skylights are the best choice
- · How to choose your ideal VELUX products
- Our full line of skylights and accessories.

#### Additional resources

In addition to our residential product catalog, you may find the following resources to be helpful. These and other resources are available on our web site, www.veluxusa.com, or call customer service at 1-800-888-3589 for help.



Find a local dealer to purchase VELUX products.





Find an installer near you.

www.veluxusa.com/installer



Download product information from our literature library.

www.veluxusa.com/literature

#### Commercial skylights

VELUX does have a full line of commercial skylights. For more in-depth information on our full line of commercial skylights.

Commercial skylights catalog XUS 20023





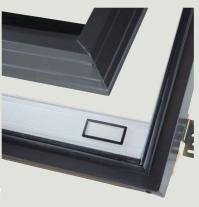




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Rain sensors automatically close the skylight when it rains to provide complete protection from the elements.



A VELUX® venting skylight does more than add visual drama to a room. It helps remove gases, moisture, odors and other trapped volatile gasses (VOCs) via the chimney effect it creates. Making a home greener, healthier and more liveable.







An infrared remote control can operate multiple skylights and sunscreening blinds. It can also be programmed to close skylights after a set time period.



While conventional incandescent bulbs create an unnatural yellow glow, VELUX SUN TUNNEL™ skylights bring bright, white, healthy daylight into small spaces and rooms where traditional skylights are not an option.





### **VELUX®**

Technological developments have revolutionized the window and skylight industry. Since 1941, VELUX has lead the skylight industry throughout the world and is now the world's largest manufacturer of skylights. Today, with offices in more than 40 countries, we manufacture and sell energy efficient, durable skylights on all five continents from the United States to China and from Norway to Australia!

#### Quality

After more then 65 years, VELUX continues to be a leader in the roof window and skylight industry.

- VELUX is the preferred brand for American contractors according to every national survey of building industry professionals.
- VELUX holds more than 300 patents in roof window and skylight design.

#### Leakproof

VELUX has been engineering and manufacturing skylights to withstand the harshest of elements. Each product is subjected to rigorous air, water, and pressure testing before ever being brought to market. Each skylight is then combined with a custom tailored flashing system. That's why VELUX is the world leader and the prefered skylight brand worldwide.



#### **Energy efficiency**

VELUX is leading the industry by being the first manufacturer with all standard glass skylights meeting ENERGY STAR® approval guidelines for all climatic regions of the US. Promote energy efficiency and save money on utility bills – all while making your project brighter and more comfortable. VELUX insulated low-E tempered and insulated low-E laminated glazings:



- Offer three times more protection against solar heat gain.
- Resist condensation twice as long as clear glass.
- Protect interiors by reflecting most of the sun's fade-causing rays.

#### The complete system

VELUX offers a complete system for bringing daylight into virtually every space in your home. Take advantage of our 65+ years of experience and the solutions we offer for controlling natural light and fresh air.



Exterior heat control – Best protection against heat gain. Details on page 15.



Weathertight flashings – Leak proof flashings are a must for every skylight. Details on pages 22 and 26.



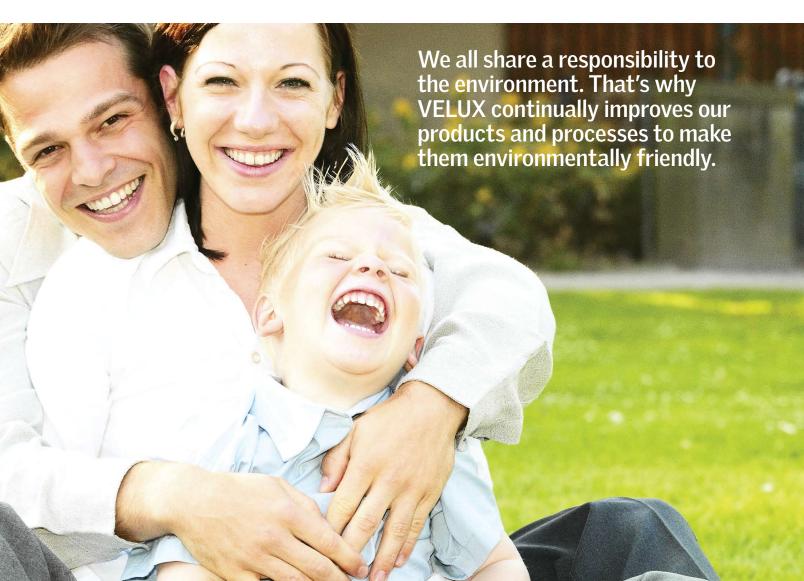
Skylights and roof windows – VELUX offers a range of skylights and roof windows with features for any need. Details on pages 17-32.



Blinds and shades – Provide varying degrees of interior light control while saving you money on your energy bill. Details on page 15.



Convenient controls – Handles, rods and electronic control systems provide easy operation of skylights and blinds. Details on page 16.



### Technology leader

At VELUX, innovation is the name of the game. We are constantly exploring new technologies and finding ways to apply them to better meet the needs of our customers. Here are a few of the latest examples of technologies that we have been working with.



#### Solar battery shades

This unique shade (currently available exclusively for skylight models FS and QFS) uses the sun to recharge itself, so that you can enjoy the convenience of an electric blind without any wiring to install.



The solar battery lightblock shade operates by remote control and charges automatically using only the sun. A single charge operates the shade over 500 times. The solar battery lightblock shade should not be installed with clear glass.

Details about all blinds on page 15.

#### **Electric skylights**

Our premium electric skylights are packed with features that make them the most convenient skylight option.



A single 14 gauge hard-wire connects directly into a standard junction box to provide power.

With no additional wiring, an electric interior blind, exterior awning or SageGlass® can be added.

An infrared remote control can operate multiple skylights and sunscreening blinds. It can also be programmed to close skylights after a set time period.



Rain sensors automatically close the skylight when it rains to provide complete protection from the elements.

#### The following electric skylights are available from VELUX:



**Deck mounted** model VSE Details on page 19.



Curb mounted model VCE Details on page 24.



Self-flashed model QVE Details on page 28.

### Exclusive technology

#### Electronically tintable SageGlass®

The revolutionary new technology called electrochromic glass in VELUX electronically tintable skylights allows control of the amount of light and heat that enters a room.

The benefits of solar control through electrochromic glass include:

- Light control at the touch of a button without losing a view to the sky...even in the darkened state
- Energy savings and elimination of uncomfortable heat gain, even on the brightest and hottest days.
- Great protection from fading of furniture or artwork.
- An automatic timer mode can be set to darken the glass at a specified time each day.

#### Code compliance

VELUX skylights\* meet the general requirements of the:

- IBC (International Building Code)
- IRC (International Residential Code)
- IECC (International Energy Conservation Code)
- Uniform Building Code.





In addition, all VELUX electrical components are UL listed. VELUX skylights\* also meet or exceed the general requirements of Powersmart and the North American Fenestration Standard 101/I.S. 2/NAFS-02 and AAMA/WDMA/CSA 101/I.S. 2/A440-05 Standard/Specification for windows, doors and unit skylights.



In addition, VELUX skylights\* are ENERGY STAR® qualified in every region of the country.

\*FS, VSE, VS, QFS, QVE, QVM, VCE, VCM, FCM skylights, and SUN TUNNEL™ skylights



### How to choose

With VELUX, you have several choices, no matter how the house and roof are constructed. Before getting started and to help you make the best possible choice for your application, read the following steps:

#### 1. Check your roof pitch to verify that it works with your intended products.

Installation method	Models	Roof pitch	
Deck mounted skylights*	VSE, VS, FS	15° - 85°	
Roof windows	GDL, GPL	Varies, details on page 21.	
Curb mounted skylights	VCE**, VCM, FCM	0° - 60°	
Self-flashed skylights	QVE, QVM, QFS	15° - 60°	
SUN TUNNEL™ skylights	TGF, TGR, TMF, TMR	15° - 60°	

<sup>\*</sup> Installer built curbs can raise the pitch from 0° to the required minimum. VELUX Model ECB Biepack Flashing Kit is designed to flash deck mounted skylights to the installer built curbs.

#### 2. Choose the ideal product category.

Product category	Application
Electric venting skylights	Overhead installations that need natural ventilation, especially kitchens and baths.
Manual venting skylights	In-reach or overhead installations, not requiring escape and rescue, where natural ventilation and manual operation is desired.
Roof windows	In-reach installations requiring emergency escape and rescue capabilities such as above-garage bonus rooms and finished attics.
Fixed skylights	Installations where ventilation is not desired, but where a view to the outside would still be beneficial.
SUN TUNNEL™ skylights	Small spaces where natural daylight is the only requirement or where a traditional skylight shaft length would be more than 4 feet.



Download architectural specs for VELUX products.

www.veluxusa.com/specifications

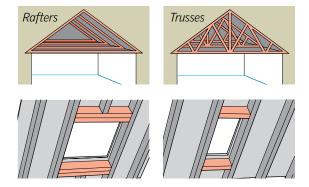
<sup>\*\*</sup>VCE size 4646 with laminated glazings should not be installed on a roof pitch less than 10°.

#### 3. Select the optimal size and configuration

In deciding the right size for your skylights it is usually best to factor in whether the roof was built with rafters or trusses.

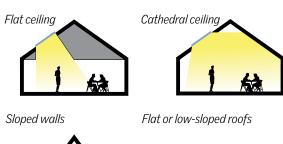
VELUX has several sizes that fit perfectly between trusses. Since trusses typically can not be cut, the effect of a wider skylight can be acheived by combining two smaller skylights together using VELUX combi-flashing.

See products and sizes on pages 33 - 35.



#### 4. Identify your ceiling style

Your ceiling style determines how your skylight shaft can be constructed. The skylight shaft can have a major impact on the way daylight is delivered and on the architectural drama of your room.







### Need an Installer?

- Use our installer locator at veluxusa.com/installer.
- Check with your local VELUX dealer.
- Contact VELUX Solutions at 866-878-3589.

VELUX offers a Skylight Specialist program for local independent installers. A VELUX Skylight Specialist is:

- · Carefully screened by VELUX.
- Required to complete an extensive training program.
- Provides the best solutions for your daylighting needs.



VELUX Skylight Specialists offer guaranteed installation. Visit the installer locator on veluxusa.com/installer for more information. Not available in all areas.

### How to choose

#### 5. Select your glazing type (traditional skylights and roof windows only).

Most VELUX glass skylights and roof windows are available in a variety of glazing options, each designed to meet the needs of specific building situations. All VELUX glazings are built using energy efficient, low-E<sup>2</sup>, Argon gas injected dual glass panes.

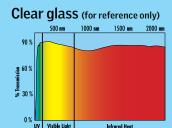
NOTICE: ALL GLASS MAY BE SUBJECT TO UNEXPECTED AND SPONTANEOUS BREAKAGE in rare circumstances due to imperfections in the glass that are undetectable during the manufacturing and inspection process by the manufacturer of the glass and VELUX.

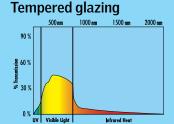
VELUX offers the choice of laminated or tempered glass skylights. SageGlass, Miami-Dade glass, impact glass and comfortplus glass are all types of laminated glass. Comfort glass is a type of tempered glass. Laminated glass is a combination of two or more glass sheets with one or more interlayers of plastic (PVB) or resin. In case of breakage, the interlayer is designed to hold the fragments together. Tempered glass does not contain an interlayer to hold the fragments together. Instead, tempered glass is designed to break into small, pebble-like pieces. When tempered glass breaks, pieces of glass come loose and may strike an individual.

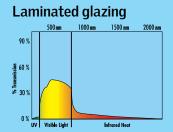
CONSULT LOCAL REGULATIONS AND/ OR BUILDING MATERIAL CONSULTANTS TO DETERMINE WHICH TYPE OF GLASS IS RIGHT FOR YOU OR IF LAMINATED GLASS IS REOUIRED IN YOUR APPLICATION.

VELUX glaz	ing type	Features	Compatible models
	Tempered (variant code **75)	Energy efficient tempered glass	VS, FS, VCM, FCM, QVM, QFS
	Laminated (variant code **74)	Energy efficient, tempered, laminated safety glass	VSE, VS, FS, GPL, GDL, VCE, VCM, FCM, QVE, QVM, QFS
	Impact (variant code **06)	Designed for hurricane prone areas	VSE, VS, FS, VCE, VCM, FCM, QVE, QVM, QFS
	Miami-Dade (variant code **07)	Designed for high velocity hurricane areas	FCM
	SageGlass® variant code **09)	Revolutionary new electronically tinting glass	VSE, FS, VCE, FCM
	White laminated (variant code **08)	White specialty glass that provides diffuse lighting	VSE, VS, FS, VCE, VCM, FCM, QVE, QVM, QFS
	Snowload (variant code **10)	Designed for heavy snow areas	VSE, VS, FS, VCE, VCM, FSM

### Benefits of VELUX<sup>®</sup> glazings







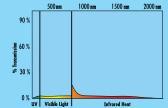
Unlike clear glass, energy efficient VELUX glazings provide substantial protection against unwanted infrared and UV rays.

#### 6. Select your sunscreening accessories

Depending on the skylight model you select, a variety of VELUX blinds and controls are available.

VELUX Sunso	creening accessory	Features	Compatible models
Marilla and	SageGlass®	Maximum control of heat and light while maintaining a view	VSE, FS, VCE, FCM
	Venetian blind	Controls the light	VSE, VS, FS, GPL, GDL, QVE, QVM, QFS
E	Cellular shade	Diffuses the light	VSE, VS, FS, FCM, QVE, QVM, QFS
	Solar battery lightblock shade	Blocks the light using solar energy	FS, QFS
	Lightblock shade	Blocks the light	VSE, FS, GPL, QVE, QFS
	Roller shade	Economical choice for light control	FS, GPL, GDL, QFS
	Heatblock exterior awning	Blocks the heat	VSE, VS, FS, GPL, FCM, QVE

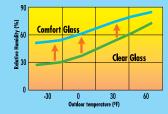
#### Laminated glazing + blinds



Add VELUX blinds and shades for even greater protection.

Note: Chart shows results with lightblock shade and heatblock awning.

#### **Condensation resistance**



With VELUX glazings, a home can contain up to 50% more humidity before condensation occurs.

#### **Fading reduction**



VELUX glazings protect interiors by controlling up to 83% of the sun's fade causing rays.

# How to choose

### 7. Select your controls.

VELUX offers a variety of electric and manual controls to operate our venting skylights and blinds.

Controls			Models
	Convert manual to electric skylights	WCM 140 52	VS, QVM
	For wall-mounted operation	WLI 160	VSE, VS, FS, VCE, QVE, QVM, QFS
	To power three electric blinds	WLC 160	VS, FS, QVM, QFS
	To operate electric blinds and skylights	WLR 160	VSE, VS, FS, VCE, QVE, QVM, QFS
	Sensor interface for automation systems	WLF 111	VSE, VCE
E	To power one electric blind	KES 160	VS, FS, FCM, QVM, QFS
	6' - 10' rod for operation of manual skylights and blinds	ZCT 300	VS, FS, VCM, FCM, QVM, QFS
	6' - 10' motorized rod for operation of manual skylights and blinds	ZMT 300	VS, FS, VCM, QVM, QFS
	3' extension for ZCT 300 and ZMT 300	ZCT 100	VS, FS, VCM, QVM, QFS
	2' rod for operation of manual skylights and blinds	ZOZ 032	VS, FS, QVM, QFS
6)2	Replacement hook for manual skylights	ZZZ 179W	VS, VCM, QVM
	Crank handle for manual skylights	ZZZ 169W or 180W	VS, VCM, QVM
7	Cord pulley for roller shades	ZAZ 090	FS, QFS

### Skylight installation methods



#### **Deck mounted installation**

Skylight with insulated glass lens, built-in wood frame combined with protective cladding mounts directly to the roof deck.

Engineered flashings integrate with roofing material to provide the most weathertight installation available (sold separately).

Details on pages 18-22.

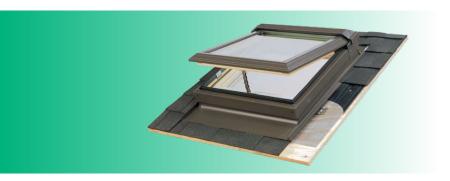


#### **Curb** mounted installation

Skylight with insulated glass lens, combined with a durable metal frame, mounts directly to a site-built curb.

Engineered flashing system designed for shingle roofing material available (sold separately) or use installer provided flashing.

Details on pages 23-26.



#### **Self-flashed installation**

Skylight with insulated glass lens, wood frame, protective cladding combined with factory installed flashing system that mounts directly to the roof deck.

Asphalt shingles are installed over the flashing for a weathertight installation.

Details on pages 27-29.



#### **Tunnel installation**

VELUX SUN TUNNEL™ skylight with UV resistant acrylic dome and diffuser, reflective tunnel, and one-piece flashing system mounts to the roof deck.

Roofing material is installed over the flashing for a weathertight installation.

Details on pages 30-32.



#### Broadest range of installation options

- Engineered flashing systems available for most roofing materials on most roof pitches.
- Flashings and claddings available in heavy-duty aluminum or copper.
- Widest range of blinds, shades and accessories available.
- Combi-flashing for grouping skylights in dramatic patterns.
- Roof windows satisfy egress requirements for emergency escape.









#### Roof pitch/slope



#### Glazing options available.

Details on page 14.

# Flashing systems available. (sold separately)

Details on page 22.

#### Blinds and controls available.

(sold separately)

Details on pages 15 and 16.

### Venting skylight models

All VELUX deck mounted venting skylights come standard with a select wood frame and sash, insect screen and aluminum or copper cladding.

Each model includes pre-installed mounting brackets for an easier, more secure installation, and a stainless steel chain operator for smoother quieter operation.

Sizes and product info on pages 33 - 35.

#### Electric venting skylight - model VSE



The perfect daylighting solution for overhead applications. It brings in abundant natural light and opens to let in fresh air with the touch of a button. And it closes automatically in case of rain.



- Concealed motor, control system and two rain sensors.
- Pre-wired for two sunscreening blinds.
- Single hard wire connects into a standard junction box.
- Wall mounted keypad (WLI 160) and interface to home automation systems (WLF 111) are optional.

Glazing note: The VSE is intended for out of reach applications and is only available with laminated low-E Argon filled glazing. This glazing eliminates the need to install a structural screen below the skylight as required by most building codes when non-laminated glass is used high overhead.

#### Manual venting skylight - model VS



An economical solution for bringing abundant natural light and fresh air into the home, the VS manual venting skylight also contributes to a home's proper moisture balance and comfort level by allowing stale, humid air to be released.

- Opened and closed manually with VELUX control rods when out of reach.
- Smooth-turning handle for when the skylight is installed within reach.
- Manual to electric conversion kit available (WCM 140).





### Fixed skylight models

All VELUX deck mounted fixed skylights come standard with a select wood frame, gasketing to drain condensation to the exterior and aluminum or copper cladding.

Each model also includes pre-installed mounting brackets for an easier, more secure installation.

Sizes and product info on pages 33 - 35.

#### Fixed skylight - model FS



An economical choice for visually expanding areas such as hallways, stairwells, and other closed-in, dark spaces that can be transformed with daylight and sky views.

- Features a select wood frame and protective aluminum or copper cladding.
- Integrated gaskets drain condensation to the outside.
- Streamlined exterior profile does not obstruct your roofline.

## Working with trusses?



We have several sizes available that are designed specifically to work with 24" on center truss roofs. See the size charts at the end of this brochure for more information.

 Temporary positioning blocks make mounting the skylights over the roof opening fast and simple.

Paint shield included (model FS only).

New! •

 Prepainted white frames and sashes are now standard, eliminating the need to paint them on-site.



### Roof window models

VELUX roof windows are designed for in-reach applications that require egress emergency escape capabilities. Examples include above-garage bonus rooms, lofts, and finished attic spaces.

Each model features a select wood frame and sash coated with a clear finish and exterior aluminum or copper cladding.

Roof windows also feature a ventilation flap that allows air circulation when the window is closed.

Sizes and product info on pages 33 - 35.

Note: Roof windows are not designed to be used in combination with skylights.



Roof pitch/slope

### Balcony roof window - model GDL CABRIO™



- Dual-sash operation: Top opens for ventilation and bottom opens outward to create a roof balcony.
- Top sash rotates inward for easy glass cleaning from inside.



Roof pitch/slope

#### Top hinged roof window - model GPL



- •Opens to a 45° angle to satisfy egress requirements for emergency escape.
- •Sash rotates inward for easy glass cleaning from inside.
- •Optional insect screen available.



### Flashing systems



#### Shingles/shakes - Type EDL

- Step flashing pieces interweave with roofing material for proper water drainage.
- Additional step pieces (ZZZ 165) are required for shakes and other thick roofing materials.



#### Tile roofing – Type EDW

- Patented sill flashing features pliable pleats that form to most types of tile.
- Side and head flashing pieces form a gutter to direct water away from the skylight.



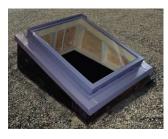
#### Metal roofing - Type EDM

- Flashing pieces interlock with roofing material for a fast, weathertight installation.
- Sill apron features pliable pleats that form to the roof.



#### Copper cladding and flashing

- Available for select deck mounted VELUX roof windows and skylights.
- Copper products are special order items and require varying lead-times.
   Call for more information.



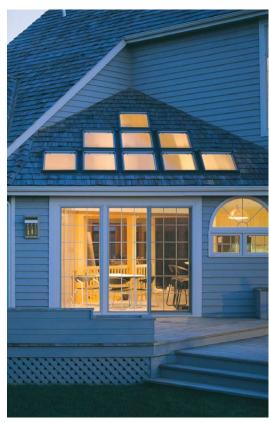
#### Biepack flashing - Type ECB

- Used with site-built curb on low-sloped roofs.
- No bending of flashing required.
- Applied to 2x4 lumber and plywood.
- Download curb construction guidelines at: www.veluxusa.com.



#### Roofing underlayment - ZOZ 121

An alternative to roofing felt that wraps the skylight to provide added protection from extreme weather conditions such as ice and snow.



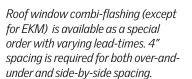
#### For combi applications

Type EKL works with groupings on low-profile roofing materials such as shingles and shakes.

Type EKW works with groupings on highprofile roofing materials such as Spanish tile or corrugated metal roofing.

Type EKM works with groupings on standing seam metal roofs and many profiled metal panels.

Note: Skylight applications require 4" over-and-under spacing and 2.5" - 12' side-by-side spacing.





Roof pitch/slope



## Skylight trim kit - ZZZ 189

The new VELUX skylight trim kit provides a clean interior finish with no trim work required when replacing older style roof windows and skylights.

## Why use curb mounted skylights?





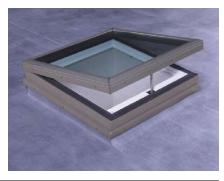
**Bubble replacement** 

Curb mounted skylights provide a quick and easy solution for replacing plastic bubbles with quality glass VELUX skylights.

Roof pitch/slope\*







#### Flat roof applications

In addition to sloped roof applications, curb mounted skylights can be installed on completely flat or low sloped roof applications all the way up to a  $60^\circ$  roof pitch.

\* VCE size 4646 with laminated glazings should not be installed on a roof pitch less then 10°.

#### Glazing options available.

Details on page 14.

# Flashing systems available. (sold separately)

Details on page 22.

### Blinds and controls available.

(sold separately)

Details on page 15 and 16.

### Venting skylight models

All VELUX curb mounted venting skylights are designed for simple and weathertight installation on a site-built curb. Each unit features a pre-finished white interior wood frame that insulates and strengthens the unit.

Each model includes a stainless steel chain operator for smoother quieter operation.

Sizes and product info on pages 33 - 35.

#### **Electric venting skylight - model VCE**

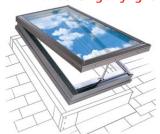


Brings in abundant natural light and opens with the touch of a button to let in fresh air. And it closes automatically in case of rain.

- Slimline remote control included.
- Concealed motor, control system and two rain sensors.
- Pre-wired for two sunscreening blinds.
- Single hard wire connects into a standard junction box.
- Wall mounted keypad (WLI 160) and interface to home automation systems (WLF 111) are optional.

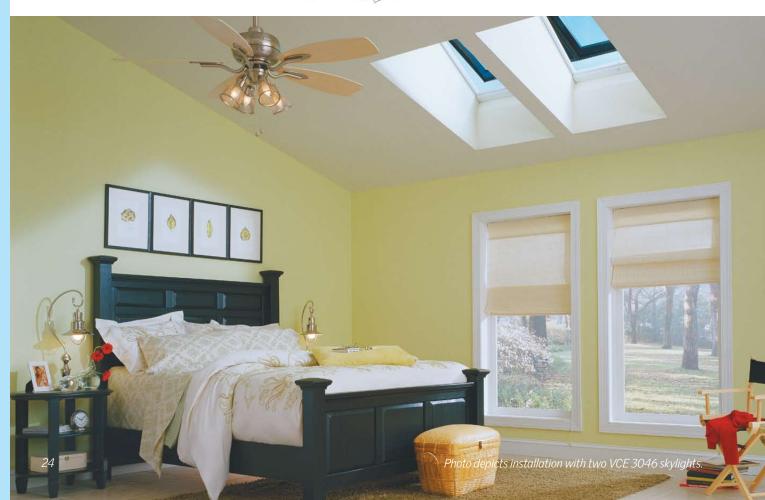
Glazing note: The VCE is intended for out of reach applications and is only available with laminated low-E Argon filled glazing. This glazing eliminates the need to install a structural screen below the skylight as required by most building codes when non-laminated glass is used high overhead.

#### Manual venting skylight - model VCM



An economical solution for bringing natural light and fresh air into the home.

- Opened and closed manually with VELUX control rods when out of reach.
- Smooth-turning handle for when the skylight is installed within reach.



### Fixed skylight models

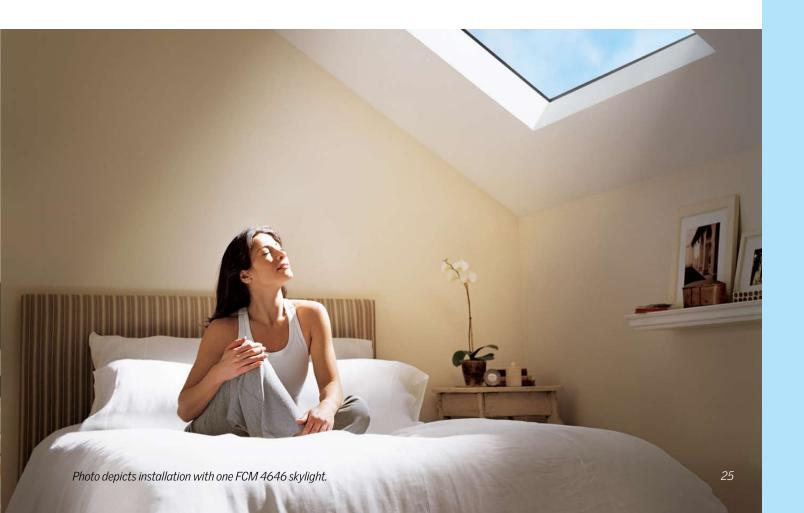
#### Fixed skylight - model FCM



Sizes and product info on pages 33 - 35.

The FCM curb mounted fixed skylight is sized to work with all types of site-built curbs, whether they're slightly out-of-square, pre-existing, or surrounded by unusually thick flashing and roofing material. Heavy-duty materials ensure the FCM skylight is built to withstand the installation process, as well as anything Mother Nature throws its way.

- No designated top, bottom or sides so you can install it in whatever direction you want.
- Maintenance free exterior.
- Integrated gasket provides a thermal break for energy efficiency and seals out water, wind and hassles for years.
- Choice of tempered or laminated low-E insulated glass.
- Impact glass and Miami-Dade glass available for hurricane prone areas.
- Electronically tintable glass available in sizes 2222 and 2246. Call for more information.
- White laminated glass available for applications where diffused lighting is required.
- Wide range of custom sizes available.



# Flashing systems

VELUX has created an engineered step flashing system for curb mounted installations on low profile roofing materials such as shingles and shakes.







# Shingle/low profile step flashing - type ECL

- For curb mounted skylights such as the VCE, VCM and FCM.
- Works with 2x6 or 2x4 site-built curbs made to standard dimensions.
- Designed for shingles or other low-profile roofing materials.





For installations on other roofing materials, a third party flashing system can be used.

In many plastic bubble replacements, curb mounted skylights can be used with existing flashings and curbs.

### Why use self-flashed skylights?



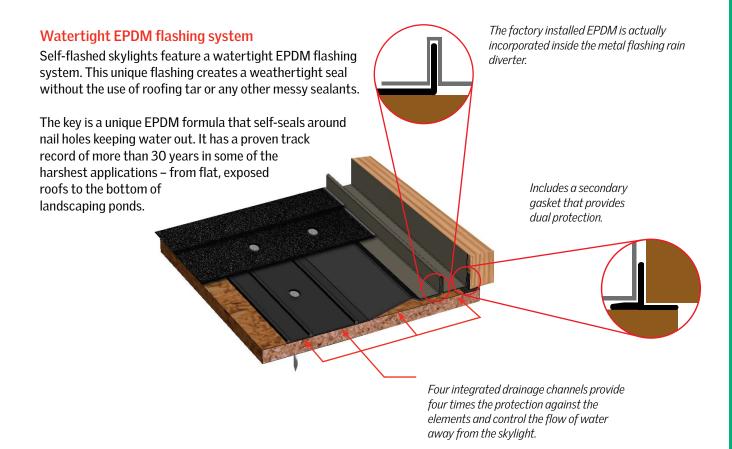




#### Quickest and easiest installation

Designed for asphalt shingle roofs with roof pitches at  $15^{\circ}$ - $60^{\circ}$ , self-flashed skylights are the quickest and easiest to install.





Glazing options available.

Details on page 14.

Blinds and controls available (sold separately)

Details on pages 15 and 16.



### Venting skylight models

All VELUX self-flashed venting skylights come standard with a select wood frame, sash, insect screen and aluminum cladding.

Each model is sized perfectly to fit on truss roofs and includes pre-installed mounting brackets for an easier, more secure installation, and a stainless steel chain operator for smoother quieter operation.

Sizes and product info on pages 33 - 35.



# Electric venting skylight – model QVE

The perfect daylighting solution for overhead applications. It brings in abundant natural light and opens to let in fresh air with the touch of a button. And it closes automatically in case of rain.

- Slimline remote control included.
- Concealed motor, control system and two rain sensors.
- Pre-wired for two sunscreening blinds.
- Single hard wire connects into a standard junction box.
- Wall mounted keypad (WLI 160) and interface to home automation systems (WLF 111) are optional.

Glazing note: The QVE is intended for out of reach applications and is only available with laminated low-E Argon filled glazing. This glazing eliminates the need to install a structural screen below the skylight as required by most building codes when non-laminated glass is used high overhead.



# Manual venting skylight – model QVM

An economical solution for bringing abundant natural light and fresh air into the home, the QVM manual venting skylight also contributes to a home's proper moisture balance and comfort level by allowing stale, humid air to be released.

- Opened and closed manually with VELUX control rods when out of reach.
- Smooth-turning handle for when the skylight is installed within reach.
- Manual to electric conversion kit available (WCM 140).

# Fixed skylight models

#### Fixed skylight - model QFS



An economical choice for visually expanding areas such as hallways, stairwells, and other closed-in, dark spaces that can be transformed with daylight and sky views.

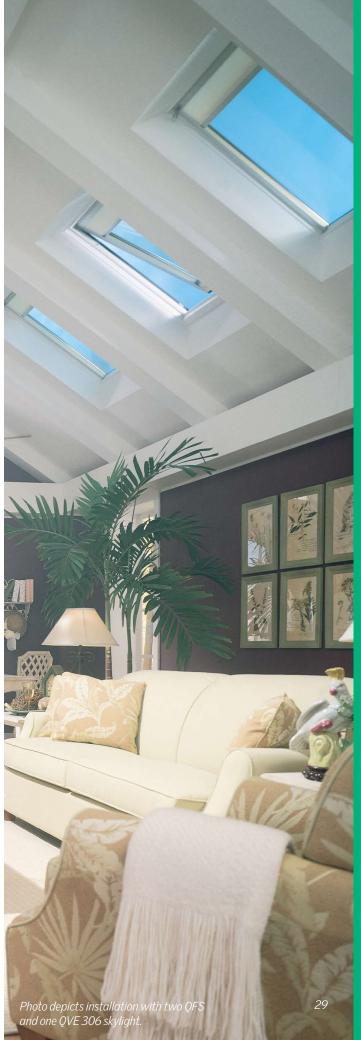
Select sizes are sized perfectly to fit on truss roofs and includes pre-installed mounting brackets for an easier, more secure installation.

- Select wood frame, gasketing to drain condensation outside and aluminum cladding.
- Flexible EPDM side flashing eliminates the need for sealants
- The quickest, simplest installing self-flashed skylight on the market.

Sizes and product info on pages 33 - 35.



Studies show that students learn better, adults suffer less Seasonal Affective Disorder (SAD), and older adults have less trouble reading and getting around when rooms are filled with daylight.



### Why use SUN TUNNEL™ skylights?

#### Superior weatherability

An innovative seamless one-piece metal flashing keeps out leaks from even the harshest weather conditions. VELUX SUN TUNNEL skylights have a corrosion resistant exterior that will withstand the forces of nature.

#### Easy and fast installation

With features like an adjustable pitch adapter, flexible tunnel options, and a pre-assembled ceiling ring, installation is a snap.

#### Bright white daylight

While conventional incandescent bulbs create an unnatural yellow glow, VELUX SUN TUNNEL skylights bring bright, white, healthy daylight into small spaces and rooms where traditional skylights are not an option.

Roof pitch/slope



Light kit - model ZTL allows you to use the SUN TUNNEL™ skylight as an extra light source even at night.





# Rigid SUN TUNNEL™ skylight models

Rigid SUN TUNNEL skylights feature a highly reflective rigid tunnel that provides bright, white daylight. These products are excellent for spaces that require a longer tunnel run or for areas with less sunlight.

Sizes and product info on pages 33 - 35.

#### Pitched - model TMR



The model TMR features a one piece pitched metal flashing that angles the tunnel to receive light from all directions.

- Great for roofs facing any direction.
- Provides straighter tunnel runs through many roof pitches.
- Tile flashing available.
- Impact models available for hurricane prone areas.

#### Low profile - model TGR



The model TGR features a low profile exterior that parallels the roof line for a sleek appearance.

- Great for South facing applications.
- Impact models available for hurricane prone areas.





# Flexible SUN TUNNEL skylight models

Flexible SUN TUNNEL skylights are quick and easy to install. The flexible tunnel easily bends around attic obstructions. These products are excellent for spaces that don't require a long tunnel run or for sunny areas.

Sizes and product info on pages 33 - 35.

#### Pitched - model TMF



The model TMF features a one piece pitched metal flashing that angles the tunnel to receive light from all directions.

- Great for roofs facing any direction.
- Provides straighter tunnel runs through many roof pitches.
- Tile flashing available.
- Impact models available for hurricane prone areas.

#### Low profile - model TGF



The model TGF features a low profile exterior that parallels the roof line for a sleek appearance.

- Great for South facing applications.
- Tile flashing available for 21" units only.
- Impact models available for hurricane prone areas.

### **Product Sizes**

To assist you in your planning, these charts provide the data useful in specifying and installing your VELUX skylights. Each model is shown with the available size measurements and other necessary information.

#### **Models VSE and VS**

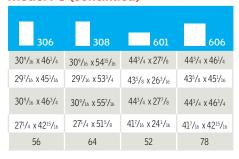
Size code		101	104	106	108	156	304	306	308	601	606
Outside frame	in.	21½ x 27³/8	21½ x 38¾	21½ x 46¼	21½ x 54½/16	23 <sup>5</sup> / <sub>16</sub> x 46 <sup>3</sup> / <sub>8</sub>	30 <sup>9</sup> / <sub>16</sub> x 38 <sup>3</sup> / <sub>8</sub>	30 <sup>9</sup> / <sub>16</sub> x 46 <sup>1</sup> / <sub>4</sub>	30 <sup>9</sup> / <sub>16</sub> x 54 <sup>15</sup> / <sub>16</sub>	44 <sup>3</sup> / <sub>4</sub> x 27 <sup>3</sup> / <sub>8</sub>	44 <sup>3</sup> / <sub>4</sub> x 46 <sup>1</sup> / <sub>4</sub>
Finished framing	in.	20 <sup>3</sup> / <sub>8</sub> x 26 <sup>3</sup> / <sub>16</sub>	20 <sup>3</sup> / <sub>8</sub> x 37 <sup>3</sup> / <sub>16</sub>	20 <sup>3</sup> / <sub>8</sub> x 45 <sup>1</sup> / <sub>16</sub>	20 <sup>3</sup> / <sub>8</sub> x 53 <sup>3</sup> / <sub>4</sub>	22½ x 455/16	29 <sup>7</sup> / <sub>16</sub> x 37 <sup>3</sup> / <sub>16</sub>	29 <sup>7</sup> / <sub>16</sub> x 45 <sup>1</sup> / <sub>16</sub>	29 <sup>7</sup> / <sub>16</sub> x 53 <sup>3</sup> / <sub>4</sub>	43 <sup>5</sup> / <sub>8</sub> x 26 <sup>3</sup> / <sub>16</sub>	43 <sup>5</sup> / <sub>8</sub> x 45 <sup>1</sup> / <sub>16</sub>
Rough opening*	in.	21½ x 27 <sup>7</sup> /8	21½ x38 <sup>7</sup> / <sub>8</sub>	21½ x 46¾	21½ x 55 <sup>7</sup> /16	22 <sup>1</sup> / <sub>2</sub> x 45 <sup>5</sup> / <sub>16</sub>	30 <sup>9</sup> / <sub>16</sub> x 38 <sup>7</sup> / <sub>8</sub>	30 <sup>9</sup> / <sub>16</sub> x 46 <sup>3</sup> / <sub>4</sub>	30 <sup>9</sup> / <sub>16</sub> x 55 <sup>7</sup> / <sub>16</sub>	44 <sup>3</sup> / <sub>4</sub> x 27 <sup>7</sup> / <sub>8</sub>	44 <sup>3</sup> / <sub>4</sub> x 46 <sup>3</sup> / <sub>4</sub>
Daylight area (glass)	in.	16 <sup>3</sup> / <sub>4</sub> x 20 <sup>13</sup> / <sub>16</sub>	16 <sup>3</sup> / <sub>4</sub> x 31 <sup>7</sup> / <sub>8</sub>	16 <sup>3</sup> / <sub>4</sub> x 39 <sup>3</sup> / <sub>4</sub>	16 <sup>3</sup> / <sub>4</sub> x 48 <sup>3</sup> / <sub>8</sub>	18 <sup>1</sup> / <sub>2</sub> x 39 <sup>3</sup> / <sub>4</sub>	25 <sup>7</sup> / <sub>8</sub> x 31 <sup>7</sup> / <sub>8</sub>	25 <sup>7</sup> / <sub>8</sub> x 39 <sup>3</sup> / <sub>4</sub>	25 <sup>7</sup> / <sub>8</sub> x 48 <sup>3</sup> / <sub>8</sub>	40 x 20 <sup>13</sup> / <sub>16</sub>	40 x 39 <sup>3</sup> / <sub>4</sub>
Ventilation area	sq. ft.	1.37	3.63	4.16	4.77	4.27	4.27	4.80	5.41	2.18	5.82
Net wt (Lam. glass) V	SE/VS lbs.	41/38	50/47	59/55	65/64	62/58	64/57	73/71	82/80	65/65	96/93

<sup>\*</sup> Rough opening for type EDL, EDM, EDW flashings.

#### **Model FS**

Size code		056	101	104	106	108	112	150	156	302	304
Outside frame	in.	15½ x 46½	21½ x 27³/8	21½ x 38¾	21½ x 46¼	21½ x 54½/16	21½ x 70¾	23 <sup>5</sup> / <sub>16</sub> x 23 <sup>9</sup> / <sub>16</sub>	23 <sup>5</sup> / <sub>16</sub> x 46 <sup>3</sup> / <sub>8</sub>	$30^9/_{16} \times 30^1/_2$	30 <sup>9</sup> / <sub>16</sub> x 38 <sup>3</sup> / <sub>8</sub>
Finished framing	in.	14 <sup>3</sup> / <sub>8</sub> x 45 <sup>1</sup> / <sub>16</sub>	20 <sup>3</sup> / <sub>8</sub> x 26 <sup>3</sup> / <sub>16</sub>	20 <sup>3</sup> / <sub>8</sub> x 37 <sup>3</sup> / <sub>16</sub>	20 <sup>3</sup> / <sub>8</sub> x 45 <sup>1</sup> / <sub>16</sub>	20 <sup>3</sup> / <sub>8</sub> x 53 <sup>3</sup> / <sub>4</sub>	20 <sup>3</sup> / <sub>8</sub> x 69 <sup>3</sup> / <sub>4</sub>	22 <sup>1</sup> / <sub>2</sub> x 22 <sup>1</sup> / <sub>2</sub>	22 <sup>1</sup> / <sub>2</sub> x 45 <sup>5</sup> / <sub>16</sub>	29 <sup>7</sup> / <sub>16</sub> x 29 <sup>5</sup> / <sub>16</sub>	29 <sup>7</sup> / <sub>16</sub> x 37 <sup>3</sup> / <sub>16</sub>
Rough opening	in.	14 <sup>3</sup> / <sub>8</sub> x 46 <sup>3</sup> / <sub>4</sub>	21½ x 27 <sup>7</sup> /8	21½ x 38½	21½ x 46¾	21½ x 55 <sup>7</sup> /16	21½ x71½	22 <sup>1</sup> / <sub>2</sub> x 22 <sup>1</sup> / <sub>2</sub>	22 <sup>1</sup> / <sub>2</sub> x 45 <sup>5</sup> / <sub>16</sub>	30 <sup>9</sup> / <sub>16</sub> x 31	30 <sup>9</sup> / <sub>16</sub> x 38 <sup>7</sup> / <sub>8</sub>
Daylight area (glass)	in.	12 x 42 <sup>15</sup> / <sub>16</sub>	18 <sup>3</sup> / <sub>16</sub> x 24 <sup>1</sup> / <sub>16</sub>	18 <sup>3</sup> / <sub>16</sub> x 35 <sup>1</sup> / <sub>16</sub>	18 <sup>3</sup> / <sub>16</sub> x 42 <sup>15</sup> / <sub>16</sub>	18 <sup>3</sup> / <sub>16</sub> x 51 <sup>5</sup> / <sub>8</sub>	18 <sup>3</sup> / <sub>16</sub> x 67 <sup>7</sup> / <sub>16</sub>	19 <sup>15</sup> / <sub>16</sub> x 20 <sup>1</sup> / <sub>8</sub>	19 <sup>15</sup> / <sub>16</sub> x 42 <sup>15</sup> / <sub>16</sub>	27 <sup>1</sup> / <sub>4</sub> x 27 <sup>3</sup> / <sub>16</sub>	27 <sup>1</sup> / <sub>4</sub> x 35 <sup>1</sup> / <sub>16</sub>
Net wt (w/ temp. glass)	lbs.	33	28	37	43	49	63	26	46	41	48

#### Model FS (continued)



# Model VSE, VS and FS sizes that fit perfectly between roof trusses. (see page 20 for additional information)

#### **Model GPL**

Size code		M08	S06
Outside frame	in.	30⁵/8 x 55	44 <sup>3</sup> / <sub>4</sub> x 46 <sup>3</sup> / <sub>8</sub>
Rough opening	in.	31 <sup>1</sup> / <sub>4</sub> x 55 <sup>1</sup> / <sub>2</sub>	45 <sup>1</sup> / <sub>4</sub> x 46 <sup>7</sup> / <sub>8</sub>
Daylight area (glass)	in.	23 <sup>3</sup> / <sub>4</sub> x 45 <sup>1</sup> / <sub>4</sub>	37 <sup>15</sup> / <sub>16</sub> x 36 <sup>5</sup> / <sub>8</sub>
Ventilation area (opening)	sq. ft.	11.34	11.64
Ventilation area (flap)	sq. in.	30.00	47.81
Net wt (w/ Lam. glass)	lbs.	111	123

#### **Model GDL**

Size code		P19
Outside frame	in.	37 <sup>1</sup> / <sub>16</sub> x 99 <sup>1</sup> / <sub>4</sub>
Rough opening	in.	39³/8 x 101
Daylight area (upper section)	in.	30 x 53 <sup>1</sup> / <sub>4</sub>
Daylight area (lower section)	in.	30 x 28 <sup>3</sup> / <sub>4</sub>
Ventilation area (upper section)	sq. ft.	22.5
Ventilation area (flap)	sq. in.	36.7
Net wt (w/ Lam. glass)	lbs.	160

### **Product sizes**

#### Models VCE and VCM

Size code		2222	2234	2246	3030	3046	3434	4646
Inside curb	in.	22 <sup>1</sup> / <sub>2</sub> x 22 <sup>1</sup> / <sub>2</sub>	22 <sup>1</sup> / <sub>2</sub> x 34 <sup>1</sup> / <sub>2</sub>	22 <sup>1</sup> / <sub>2</sub> x 46 <sup>1</sup> / <sub>2</sub>	30 <sup>1</sup> / <sub>2</sub> x 30 <sup>1</sup> / <sub>2</sub>	30½ x 46½	34 <sup>1</sup> / <sub>2</sub> x 34 <sup>1</sup> / <sub>2</sub>	46 <sup>1</sup> / <sub>2</sub> x 46 <sup>1</sup> / <sub>2</sub>
Outside curb	in.	25½ x 25½	25½ x 37½	25½ x 49½	33 <sup>1</sup> / <sub>2</sub> x 33 <sup>1</sup> / <sub>2</sub>	33 <sup>1</sup> / <sub>2</sub> x 49 <sup>1</sup> / <sub>2</sub>	37½ x 37½	49 <sup>1</sup> / <sub>2</sub> x 49 <sup>1</sup> / <sub>2</sub>
Max. skylight clearance	in.	26 <sup>1</sup> / <sub>4</sub> x 26 <sup>1</sup> / <sub>4</sub>	26 <sup>1</sup> / <sub>4</sub> x 38 <sup>1</sup> / <sub>4</sub>	26 <sup>1</sup> / <sub>4</sub> x 50 <sup>1</sup> / <sub>4</sub>	34 <sup>1</sup> / <sub>4</sub> x 34 <sup>1</sup> / <sub>4</sub>	34 <sup>1</sup> / <sub>4</sub> x 50 <sup>1</sup> / <sub>4</sub>	38½ x 38½	50 <sup>1</sup> / <sub>4</sub> x 50 <sup>1</sup> / <sub>4</sub>
Daylight area (glass)	in.	20.62 x 18.62	20.62 x 30.709	20.62 x 42.72	28.62 x 26.69	28.62 x 42.72	32.62 x 30.709	44.62 x 42.72
Ventilation area	sq. ft.	1.46	3.84	4.73	4.06	5.13	4.65	6.50
Net weight (Lam. glass) lbs.	VCE/VCM	62/54	83/77	93/85	85/80	113/112	99/98	133/144

#### **Model FCM**

Size code		1430	1446	2222	2230	2234	2246	2270	3030	3046	3434	4646
Inside curb	in.	14½ x 30½	14½ x 46½	22 <sup>1</sup> / <sub>2</sub> x 22 <sup>1</sup> / <sub>2</sub>	22½ x 30½	22 <sup>1</sup> / <sub>2</sub> x 34 <sup>1</sup> / <sub>2</sub>	22 <sup>1</sup> / <sub>2</sub> x 46 <sup>1</sup> / <sub>2</sub>	22½ x 70½	30 <sup>1</sup> / <sub>2</sub> x 30 <sup>1</sup> / <sub>2</sub>	30½ x 46½	34 <sup>1</sup> / <sub>2</sub> x 34 <sup>1</sup> / <sub>2</sub>	46 <sup>1</sup> / <sub>2</sub> x 46 <sup>1</sup> / <sub>2</sub>
Outside curb	in.	17½ x 33½	17 <sup>1</sup> / <sub>2</sub> x 49 <sup>1</sup> / <sub>2</sub>	25½ x 25½	25½ x 33½	25½ x 37½	25½ x 49½	25½ x 73½	33½ x 33½	33½ x 49½	37 <sup>1</sup> / <sub>2</sub> x 37 <sup>1</sup> / <sub>2</sub>	49 <sup>1</sup> / <sub>2</sub> x 49 <sup>1</sup> / <sub>2</sub>
Max. skylight clearance	in.	18½ x 34½	18½ x 50½	26½ x 26½	26 <sup>1</sup> / <sub>4</sub> x34 <sup>1</sup> / <sub>4</sub>	26 <sup>1</sup> / <sub>4</sub> x 38 <sup>1</sup> / <sub>4</sub>	26½ x 50½	26 <sup>1</sup> / <sub>4</sub> x 74 <sup>1</sup> / <sub>4</sub>	34 <sup>1</sup> / <sub>4</sub> x 34 <sup>1</sup> / <sub>4</sub>	34 <sup>1</sup> / <sub>4</sub> x 50 <sup>1</sup> / <sub>4</sub>	38½ x 38½	50 <sup>1</sup> / <sub>4</sub> x 50 <sup>1</sup> / <sub>4</sub>
Daylight area (glass)	in.	14½ x 30½	14½ x 46½	22 <sup>1</sup> / <sub>2</sub> x 22 <sup>1</sup> / <sub>2</sub>	22½ x 30½	22 <sup>1</sup> / <sub>2</sub> x 34 <sup>1</sup> / <sub>2</sub>	22 <sup>1</sup> / <sub>2</sub> x 46 <sup>1</sup> / <sub>2</sub>	22½ x 70½	30½ x 30½	30½ x 46½	34 <sup>1</sup> / <sub>2</sub> x 34 <sup>1</sup> / <sub>2</sub>	46 <sup>1</sup> / <sub>2</sub> x 46 <sup>1</sup> / <sub>2</sub>
Net weight (w/ temp. glass) I	lbs.	35	46	23	42	32	40	65	37	51	52	86

#### Models QVE and QVM

Size code		150	152	156	302	306	656
Outside frame	in.	23½ x 23 <sup>7</sup> /16	23 <sup>1</sup> / <sub>4</sub> x 30 <sup>1</sup> / <sub>2</sub>	23 <sup>1</sup> / <sub>4</sub> x 46 <sup>1</sup> / <sub>4</sub>	$30^9/_{16} \times 30^1/_2$	30 <sup>9</sup> / <sub>16</sub> x 46 <sup>1</sup> / <sub>4</sub>	47 <sup>1</sup> / <sub>4</sub> x 46 <sup>1</sup> / <sub>4</sub>
Rough opening/ Finished framing	in.	22 <sup>7</sup> / <sub>16</sub> x 22 <sup>1</sup> / <sub>2</sub>	22 <sup>7</sup> / <sub>16</sub> x 29 <sup>9</sup> / <sub>16</sub>	22 <sup>7</sup> / <sub>16</sub> x 45 <sup>5</sup> / <sub>16</sub>	29 <sup>11</sup> / <sub>16</sub> x 29 <sup>9</sup> / <sub>16</sub>	29 <sup>11</sup> / <sub>16</sub> x 45 <sup>5</sup> / <sub>16</sub>	46 <sup>7</sup> / <sub>16</sub> x 45 <sup>5</sup> / <sub>16</sub>
Daylight area (glass)	in.	18 <sup>1</sup> / <sub>2</sub> x 16 <sup>7</sup> / <sub>8</sub>	18 <sup>1</sup> / <sub>2</sub> x 24	18 <sup>1</sup> / <sub>2</sub> x 39 <sup>3</sup> / <sub>4</sub>	25 <sup>7</sup> /8 x 24	25 <sup>7</sup> / <sub>8</sub> x 39 <sup>3</sup> / <sub>4</sub>	$42^{1}/_{2} \times 39^{3}/_{4}$
Ventilation area (openin	g) sq. ft.	1.28	2.88	4.27	3.67	4.80	5.70
Net wt (Lam glass)	QVE/QVM lbs.	55/54	64/63	83/84	72/69	93/85	127/123

#### **Models QFS**

Size code		150	152	156	302	306	656
Outside frame	in.	23½ x 23½	23 <sup>1</sup> / <sub>4</sub> x 30 <sup>1</sup> / <sub>2</sub>	23 <sup>1</sup> / <sub>4</sub> x 46 <sup>1</sup> / <sub>4</sub>	30 <sup>9</sup> / <sub>16</sub> x 30 <sup>1</sup> / <sub>2</sub>	30 <sup>9</sup> / <sub>16</sub> x 46 <sup>1</sup> / <sub>4</sub>	47 <sup>1</sup> / <sub>4</sub> x 46 <sup>1</sup> / <sub>4</sub>
Finished framing Rough opening	in.	22 <sup>7</sup> / <sub>16</sub> x 22 <sup>1</sup> / <sub>2</sub>	22 <sup>7</sup> / <sub>16</sub> x 29 <sup>9</sup> / <sub>16</sub>	22 <sup>7</sup> / <sub>16</sub> x 45 <sup>5</sup> / <sub>16</sub>	29 <sup>11</sup> / <sub>16</sub> x 29 <sup>9</sup> / <sub>16</sub>	29 <sup>11</sup> / <sub>16</sub> x 45 <sup>5</sup> / <sub>16</sub>	46 <sup>7</sup> / <sub>16</sub> x 45 <sup>5</sup> / <sub>16</sub>
Daylight area (glass)	in.	19 <sup>15</sup> / <sub>16</sub> x 20 <sup>1</sup> / <sub>8</sub>	19 <sup>15</sup> / <sub>16</sub> x 27 <sup>3</sup> / <sub>16</sub>	19 <sup>15</sup> / <sub>16</sub> x 42 <sup>15</sup> / <sub>16</sub>	27 <sup>1</sup> / <sub>4</sub> x 27 <sup>3</sup> / <sub>16</sub>	27 <sup>1</sup> / <sub>4</sub> x 42 <sup>15</sup> / <sub>16</sub>	43 <sup>15</sup> / <sub>16</sub> x 42 <sup>15</sup> / <sub>16</sub>
Ventilation area (opening)	sq. ft.	2.78	3.76	5.94	5.15	8.12	13.10
Net wt (w/ temp. glass)	lbs.	40	37	64	54	78	102

#### **Testing data notes**

a) Largest size units tested in accordance with one or more of: AAMA/WDMA 101/I. S.2/NAFS-02, AAMA/WDMA/CSA 101/ I.S.2/A440-05, or ICC-ES Acceptance Criteria AC16 and AC17.

b) Performance data are determined for complete units at 20 degree slope, and verified in accordance with NFRC procedures (where applicable) by accredited entities.

VELUX products are listed in the NFRC Certified Products Directory, and carry appropriate labels in accordance with NFRC's certification program. NFRC ID: VEL-N-xxx

c) Most variants have achieved WDMA Hallmark certification under No. 426-H, ICC-ES recognition under Legacy Report NER-216, and/or ATI recognition under report CCRR-0104.

In addition, Florida and TDI have listed most variants in their product evaluation systems, and the FCM has achieved Miami-Dade approval. Additional approvals are pending.

# **Product sizes**

		Model TMR		Model TGR		Model TMF Model TGF		:
Size code		• 010	014	● 010	014	014	014	021
Outside flashing	in.	27 x 27	29 <sup>3</sup> / <sub>4</sub> x 30 <sup>5</sup> / <sub>8</sub>	25 <sup>1</sup> / <sub>2</sub> x 25 <sup>1</sup> / <sub>2</sub>	29 x 29	29 <sup>3</sup> / <sub>4</sub> x 30 <sup>5</sup> / <sub>8</sub>	29 x 29	37 x 37
Rough opening (ceiling)	in.	101/2	141/2	101/2	141/2	141/2	141/2	221/2
Rough opening (roof deck)	in.	14 <sup>1</sup> / <sub>2</sub> x 16	14 <sup>1</sup> / <sub>2</sub> x 20	14 <sup>1</sup> / <sub>2</sub> x 14 <sup>1</sup> / <sub>2</sub>	14 <sup>1</sup> / <sub>2</sub> x 18	14 <sup>1</sup> / <sub>2</sub> x 20	14 <sup>1</sup> / <sub>2</sub> x 18	22 <sup>1</sup> / <sub>2</sub> x 26
Daylight area	sq. in.	65.29	137.82	65.29	137.82	137.82	137.82	314.00
Net wt (w/ acrylic)	lbs.	20	29	19	28	26	24	36
Standard tubing kit length	in.	48*	48*	48*	48*	96	96	72
Maximum recommended install length	ft.	20	20	20	20	8	8	12

 $<sup>\</sup>hbox{``Subtract approximately 6'' for flashing}$ 

# Testing data

For more detailed product information and for data updates visit our website at www.veluxusa.com. (User is advised to verify critical values have not changed since publication.)

Glazing option	VSE VS	FS	VCE VCM	FCM	QVE QVM	QFS		
Air infiltration, l/s/m2 (cfm/ft2) at 75 Pa (1.57 lbf/ft2) air pressure								
All glazings	0.10 (0.02)	0.71 (0.14)	0.41 (0.08)	0.30 (0.06)	0.36 (0.07)	0.25 (0.05)		
Water penetration "No entry" pressure, Pa (lbf/ft2) at 3.4 l/m/min (5 US gal/ft/hr) water flow								
All glazings	466.5 (9.75)	466.5 (9.75)	360 (7.5)	720 (15)	580 (12)	580 (12)		
	U-factor, (Btu/hr/ft2/°F)							
Laminated (74)	0.50	0.47	0.60	0.50	0.49	0.45		
Tempered (75)	0.50 *	0.48	0.60 **	0.50	0.50 ***	0.47		
		Solar hea	at gain, SHGC	, %				
Laminated (74)	0.29	0.33	0.29	0.32	0.29	0.33		
Tempered (75)	0.29 *	0.33	0.29 **	0.32	0.29 ***	0.33		
		Visible tra	nsmittance, \	/t, %				
Laminated (74)	0.48	0.54	0.48	0.53	0.48	0.54		
Tempered (75)	0.49 *	0.55	0.49 **	0.53	0.49 ***	0.55		
	Classical UV protection, %							
Laminated (74)	99.9	99.9	99.9	99.9	99.9	99.9		
Tempered (75)	87*	87	87 **	87	87***	87		
	Total fading protection, %							
Laminated (74)	83	83	83	83	83	83		
Tempered (75)	75*	75	75 **	75	75 ***	75		
Downward load, lbf/ft2								
Laminated (74)	65 to 135	65 to 188	50	175	145	165		
Tempered (75)	NA	NA	50 **	200	NA ***	NA		
Uplift load, lbf/ft2								
Laminated (74)	50 to 63	60 to 80	70	120	50	50		
Tempered (75)	NA	NA	60 **	70	NA ***	NA		

Glazing option	TGR	TGF	TMR	TMF					
Air infiltration, I/s/m2 (cfm/ft2) at 75 Pa (1.57 lbf/ft2) air pressure									
All glazings	<0.05 (<0.01)	<0.05 (<0.01)	<0.05 (<0.01)	<0.05 (<0.01)					
Water penetration "No entry" pressure, Pa (lbf/ft2) at 3.4 l/m/min (5 US gal/ft/hr) water flow									
All glazings	720 (15)	720 (15)	720 (15)	720 (15)					
U-factor, (Btu/hr/ft2/°F)									
Acrylic	0.42	0.43	0.42	0.43					
Polycarbonate	0.42	0.43	0.42	0.43					
Solar heat gain, SHGC, %									
Acrylic	0.40	0.35	0.40	0.35					
Polycarbonate	0.40	0.35	0.40	0.35					
Visible transmittance, Vt, %									
Acrylic	NA	NA	NA	NA					
Polycarbonate	NA	NA	NA	NA					
Downward load, lbf/ft2									
Acrylic	200	200	220	220					
Polycarbonate	210	210	210	210					
Uplift load, lbf/ft2									
Acrylic	85	85	140	140					
Polycarbonate	90	90	105	105					

<sup>\*</sup>VS only \*\*\*VCM only \*\*\*QVM only



