ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A2*

Owner of the Declaration	VELUX Group
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-VEL-20250347-CBI1-EN
Issue date	11/07/2025
Valid to	10/07/2030

VELUX polyurethane roof windows GGU (triple glazing configuration)

VELUX Group

Institut Bauen und Umwelt e.V.

www.ibu-epd.com | https://epd-online.com

ECO PLATFORM EPD VERIFIED



General Information

VELUX Group

Programme holder

IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

Declaration number

EPD-VEL-20250347-CBI1-EN

This declaration is based on the product category rules:

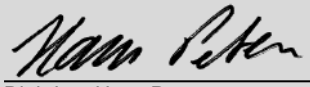
Windows and doors , 01/08/2021
(PCR checked and approved by the SVR)

Issue date

11/07/2025

Valid to

10/07/2030



Dipl.-Ing. Hans Peters
(Chairman of Institut Bauen und Umwelt e.V.)



Florian Pronold
(Managing Director Institut Bauen und Umwelt e.V.)

VELUX polyurethane roof windows GGU (triple glazing configuration)

Owner of the declaration

VELUX Group
Ådalsvej 99
2970 Hørsholm
Denmark

Declared product / declared unit

The declared unit is a polyurethane roof window of 1 m^2 with triple glazing configuration (3-layer). The declared unit is based on the size 1.14 m x 1.60 m (SK10), which is the closest available size to the standard size 1.23 m x 1.48 m (DS/EN 17213:2020).

Scope:

The EPD is a representative EPD covering part of VELUX polyurethane roof windows as specified in detail in the product description. The products are manufactured by the VELUX Group at different production sites in Europe for sale throughout Europe. The windows' production take place in Germany, Denmark, Poland and Slovakia.
The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804*.

Verification

The standard EN 15804 serves as the core PCR
Independent verification of the declaration and data according to ISO 14025:2011
☐ internally ☒ externally



Dr.-Ing. Nikolay Minkov,
(Independent verifier)

Product

Product description/Product definition

The VELUX polyurethane roof windows are skylight window products for sale in the European market. EPD covers a range of GPU variants as specified in the table below. All windows have a polyurethane and wooden frame/sash. Some windows can be opened (venting), while others cannot be opened (fixed). In addition, the windows consist of 4 different hinge-functionalities (pivot-hung, top-hung, side-hung, bottom-hung). The handles and handlebars are made of aluminium, while the hinges are made of steel (galvanised, stainless). GPU window can be used in conjunction with electric or solar window operators for automatic opening and closing. The calculations are based on the window type named GPU. In the LCA, the GPU was assessed to be a conservative choice for a representative window type.

The glass panes are with double glazing (3-layer glazing), and different glass configurations are covered by the EPD. The EPD is based on an average of the following glazing unit configurations: 15, 61, 62, 64, 66 (86), 67, 68, 69.

Only the window modules are included, and any applied window operators, installation products, accessories, etc., are not part of the EPD. These are available as separate EPDs, that can be used in combination with this EPD.

Window type			Glazing options	Description
GGU		GGU -K-- 20--	--62, --66, --66Pro, --67, --67Pro, --68, --68Pro, --69, --84, --86	White lacquered pivot-hinged window with manual top operation and ventilation flap with integrated handlebar along the top sash. More simple and light than GPU, which also contain top-hinge.
GGU Electric		GGU -K-- 20--21	--62, --66, --67, --68, --69, --86	White lacquered GGU window with remote operation - mains motor. Similar to GGU, but with an electrical window opener.
GGU Solar		GGU -K-- 20--30	--66, --67, --68, --69, --86	White lacquered GGU window with remote operation - mains motor. Similar to GGU, but with an electrical window opener.

For the placing on the market of the product in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) *Regulation (EU) No. 305/2011 (CPR)* applies. The product needs a declaration of performance taking into consideration *EN 14351-1:2006+A2:2016*, Windows and doors - Product standard, performance characteristics - Part 1: Windows and external pedestrian doorsets. For the application and use, the respective national provisions apply.

Application

VELUX polyurethane roof windows are used in renovation and new builds. Either installed as a single window or in a combination of multiple windows.

Technical Data

The Declaration of Performance, including relevant technical specifications and test methods/test standards, can be downloaded from the website www.velux.com/ce.

The performance values are specific for each polyurethane roof window variant covered by the EPD. The declared values in the table relate to the reference product variant GGU with triple-glazed configuration 66 (GGU --66).

Constructional data

Name	Value	Unit
Reaction to fire	D-s3,d2	class
Air permeability acc. EN 12207	4	class
Resistance to wind load, (for window width >1140 mm or height > 1398 mm no performance is determined)	C3	class
Resistance to snow loads	4 (toughened) - 13 – 3 (heat strengthened) - 13 - 6,8 (laminated float)	mm
Water tightness acc. EN 12208 unprotected / protected	E900	class
Impact resistance (for window width<550mm or heigh<778mm no performance is determined)	3	class
Acoustic performance	37(-2;-4)	-
Load-bearing capacity of safety devices	passed	-
Thermal transmittance, 90 degree installation acc. to EN 10077-1/2	1	W/(m^{2}K)
Solar factor	0.44	-
Light transmittance	0.62	-

Product performance data in accordance with *DS/EN 14351-1:2006+A2:2016*, Windows and doors - Product standard, performance characteristics - Part 1: Windows and external pedestrian doorsets.

Base materials/Ancillary materials

The main components of the polyurethane roof window are the glazing unit (made of mainly laminated and tempered glass), frames/sashes (made of polyurethane and wood), hinges (made of steel) and handles/handlebars (made of aluminium). The packaging of the products consists mostly of cardboard with paper inserts and galvanised steel.

Name	Value	Unit
Glazing unit (2-layer)	58	%
Wooden frame/sash	16	%
Polyurethane frame/sash	8	%
Steel components (galvanised and stainless)	6	%
Aluminium components	3	%
Other components (including packaging)	3	%
Packaging	7	%

The polyurethane components are produced internally in VELUX facilities, located in Poland, Denmark, Slovakia and Germany. The wooden components (sashes, frames) are produced internally in VELUX facilities, located in Hungary, Poland, and Denmark. VELUX receives sawn pine wood (dried) and processes it (sawing, cutting, etc.) into lamellas of different quality. The lamellas are then glued together (lamination) and processed into profiles (cutting them into the correct size, cladding, drilling, etc.). VELUX produces the glazing units in sites located in Hungary, Denmark, France, and Germany. After their production, the glazing units join the window assembly process. Finally, the frames/sashes, glazing unit and the rest of the components (delivered by suppliers) are transported to VELUX assembly sites in Poland, Denmark, Slovakia and

Germany where they are assembled into the final window product.

This product/article/at least one partial article contains substances listed in *the candidate list* (date: 23.08.2023) exceeding 0.1 percentage by mass: **NO**.

Reference service life

No reference service life (RSL) is defined for the roof windows because the use stage modules are not included in the EPD.

LCA: Calculation rules

Declared Unit

Multiple product dimensions are represented by this EPD (see product description). The declared unit is 1 m^2 polyurethane roof window and calculated based on the size 1.14 m x 1.60 m (SK10), which is the closest available size to the reference window size (1.23 m x 1.48 m based on EN 14351-1). The GGU variant has the largest weight per m^2 in the product group. Since the frame/sash construction is alike across all variants in the product group, the parts that set the variants apart are primarily the window-operation components, such as hinges, handles and ventilation flaps. These components are to a high degree metal-based, and the worst-case product can thus be identified by the weight of products with a similar size and glazing unit. The heavier the product, the larger the content of metal. Therefore, the GGU variant can be considered more representative as a worst-case scenario for the windows group.

Declared unit and mass reference

Name	Value	Unit
Declared unit	1	m^2
Grammage	40.71	kg/m^2

Data quality and a sensitivity analysis show that the results are robust with regard to data quality and appropriateness. There is low variability of production processes and product variations have a limited influence on the results.

System boundary

The type of the EPD is "cradle to gate - with options" including the modules C1-C4 and D. The following life cycle phases were considered:

Product stage:

- A1 - Raw material supply: extraction and processing, production of the pre-products (e.g. laminated glass, sawn pine wood, metal/plastic components, sealants etc.) and sales packaging components (e.g., cardboard).
- A2 - Transport: Transport of pre-products and packaging components to the processing or assembly sites, as well as internal transportation of components between sites.
- A3 - Manufacturing: The wooden frames/sashes and glazing units are produced internally at VELUX production sites. Subsequently, the final production and assembly of the windows takes place, which involves activities such as shortening of profiles, drilling of holes, clamping and glueing, mounting of gaskets, brackets, panes etc.

End of life stage:

- C1 - De-construction/demolition: deconstruction of the window with the use of an electric screwdriver and manual work.
- C2 - Transport: transport of window materials to Material Recovery Facilities (MRF) and then to incineration, landfill or recycling facilities.
- C3 - Waste processing: sorting of waste, recycling (metal and glass waste), incineration (plastic and wood waste) and landfill (metal, glass, wood and plastic waste).
- C4 - Disposal: disposal of all materials

Benefits and loads beyond the system boundaries:

- D - Reuse, recovery and recycling potential: benefits from plastic and wood waste incineration processes and material recycling of metal and glass.

For the environmental impact, the use of green electricity was calculated. The proportion of the electricity demand covered by green electricity in the total electricity demand is 100 %. The source of electricity is wind energy and the emission factor used is 0.014 kg CO_2 eq. / kWh.

Geographic Representativeness

Land or region, in which the declared product system is manufactured, used or handled at the end of the product´s lifespan: Europe

Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account. Average secondary datasets were retrieved from the Managed LCA Content (v2024.2) and Ecoinvent (v3.10) databases.

LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

6.82 kg of wood is used in window frames/sashes and 0.04 kg of paper inlet is used per declared unit. For the packaging, 3.20 kg of cardboard and 0.014 kg of paper insert are used per declared unit.

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO_2.

Information on describing the biogenic carbon content at factory gate

Name	Value	Unit
Biogenic carbon content in product	3.13	kg C
Biogenic carbon content in accompanying packaging	2.57	kg C

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO_2.

The construction process stage and the use stage modules are not declared. However, the quantity of packaging generated in module A5 is declared as scenario information.

Scenario information for packaging generated in module A5

Name	Value	Unit
Cardboard packaging for waste treatment	3.20	kg
Paper packaging for waste treatment	0.014	kg
Steel packaging for waste treatment (galvanised)	0.003	kg

End of life (C1-C4)

Name	Value	Unit
Collected as mixed construction waste	40.71	kg
Recycling	11.54	kg
Energy recovery	10.66	kg
Landfilling	18.51	kg

Reuse, recovery and/or recycling potentials (D), relevant scenario information

Name	Value	Unit
Wood incinerated	95	%
Plastic incinerated	95	%
Paper incinerated	95	%
Metal recycled	95	%
Glass recycled	30	%

LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

Product stage			Construction process stage		Use stage							End of life stage				Benefits and loads beyond the system boundaries
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MNR	MNR	MNR	MND	MND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m2 VELUX standard wooden roof window

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	7.76E+01	4.32E+00	2.24E+01	1.34E-03	1.32E+00	2.09E+01	1.48E+00	-2.52E+01
GWP-fossil	kg CO_2 eq	1.04E+02	4.24E+00	6.42E+00	1.33E-03	1.29E+00	1.13E+01	2.84E-01	-2.52E+01
GWP-biogenic	kg CO_2 eq	-2.63E+01	1.01E-02	1.59E+01	1.19E-05	3.09E-03	9.53E+00	1.2E+00	-5.18E-02
GWP-luluc	kg CO_2 eq	7.31E-02	7.13E-02	3.61E-02	2.02E-07	2.18E-02	7.48E-04	1.58E-03	-6.09E-03
ODP	kg CFC11 eq	9.97E-07	6.25E-13	2.18E-09	3.01E-14	1.91E-13	-6.84E-09	7.5E-13	-6.91E-11
AP	mol H^+ eq	4.35E-01	5.78E-03	2.27E-02	2.57E-06	7.52E-03	8.05E-03	1.98E-03	-9.31E-02
EP-freshwater	kg P eq	4.64E-03	1.81E-05	8.49E-05	5.51E-09	5.53E-06	-1.55E-05	6.11E-06	-1.84E-05
EP-marine	kg N eq	9.56E-02	2.09E-03	1.06E-02	6.41E-07	3.66E-03	3.58E-03	5.33E-04	-2.3E-02
EP-terrestrial	mol N eq	1.08E+00	2.49E-02	1.08E-01	6.71E-06	4.07E-02	4.28E-02	5.75E-03	-2.56E-01
POCP	kg NMVOC eq	2.72E-01	5.75E-03	2.47E-02	1.69E-06	7.07E-03	9.29E-03	1.81E-03	-5.91E-02
ADPE	kg Sb eq	3.59E-04	3.7E-07	5.03E-06	2.49E-10	1.13E-07	-1.14E-07	1.78E-08	-6.31E-06
ADPF	MJ	1.55E+03	5.59E+01	9.05E+01	2.79E-02	1.71E+01	5.7E+00	3.8E+00	-3.37E+02
WDP	m^3 world eq deprived	1.31E+01	6.57E-02	3.36E-01	3.67E-04	2.01E-02	2.29E+00	3.26E-02	-4.36E+00

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential)

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 m2 VELUX standard wooden roof window

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PERE	MJ	2.84E+02	4.81E+00	2.42E+02	2.01E-02	1.47E+00	1.06E+02	6.34E-01	-9.69E+01
PERM	MJ	2.6E+02	0	4.48E+01	0	0	-1.04E+02	0	0
PERT	MJ	5.44E+02	4.81E+00	2.86E+02	2.01E-02	1.47E+00	1.44E+00	6.34E-01	-9.69E+01
PENRE	MJ	1.4E+03	5.59E+01	9.08E+01	2.79E-02	1.71E+01	1.54E+02	3.8E+00	-3.37E+02
PENRM	MJ	1.55E+02	0	-3.13E-01	0	0	-1.48E+02	0	0
PENRT	MJ	1.55E+03	5.59E+01	9.05E+01	2.79E-02	1.71E+01	5.7E+00	3.8E+00	-3.37E+02
SM	kg	3.71E+00	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0
FW	m^3	5.3E-01	5.36E-03	2.86E-02	1.54E-05	1.64E-03	5.39E-02	9.86E-04	-1.64E-01

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 m2 VELUX standard wooden roof window

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
HWD	kg	2.32E-03	2.14E-09	1.9E-06	4.03E-11	6.53E-10	3.07E-09	9.19E-10	-1E-07
NHWD	kg	1.05E+01	9.13E-03	2.27E-01	2.3E-05	2.79E-03	5.51E-01	1.73E+01	-4.68E+00
RWD	kg	2.9E-02	1.02E-04	1.63E-03	4.45E-06	3.11E-05	2.64E-04	4.09E-05	-1.52E-02
CRU	kg	0	0	0	0	0	0	0	0
MFR	kg	1.74E-02	0	1.24E+01	0	0	1.13E+01	0	0
MER	kg	0	0	0	0	0	0	0	0
EEE	MJ	3.45E-02	0	0	0	0	3.59E+01	0	0
EET	MJ	5.03E-02	0	0	0	0	6.51E+01	0	0

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 m2 VELUX standard wooden roof window

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PM	Disease incidence	8.24E-06	5.83E-08	2.56E-07	2.15E-11	4.13E-08	3.27E-08	2.43E-08	-1.21E-06
IR	kBq U235 eq	5.34E+00	1.48E-02	2.7E-01	7.34E-04	4.51E-03	3.27E-02	4.92E-03	-2.26E+00
ETP-fw	CTUe	2.07E+03	4.15E+01	2.65E+01	8.08E-03	1.27E+01	2.63E+00	2.36E+00	-1.25E+02
HTP-c	CTUh	7.52E-07	8.38E-10	8.58E-09	4.54E-13	2.56E-10	1.8E-10	5.56E-11	-1.99E-08
HTP-nc	CTUh	7.81E-07	3.76E-08	8.13E-08	6.95E-12	1.15E-08	8.48E-09	2.78E-09	-1.31E-07
SQP	SQP	4.88E+03	2.75E+01	2.12E+02	1.17E-02	8.39E+00	7.82E-01	9.69E-01	-3.11E+01

PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index

Disclaimer 1 – for the indicator 'Potential Human exposure efficiency relative to U235'. This impact category deals mainly with the eventual impact of low-dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators 'abiotic depletion potential for non-fossil resources', 'abiotic depletion potential for fossil resources', 'water (user) deprivation potential, deprivation-weighted water consumption', 'potential comparative toxic unit for ecosystems', 'potential comparative toxic unit for humans – cancerogenic', 'Potential comparative toxic unit for humans - not cancerogenic', 'potential soil quality index'. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high as there is limited experience with the indicator.

The results show that module A1 has the highest impact across all environmental impact indicators (except GWP – biogenic). Module A3 has the second highest impact in most impact indicators due to the energy consumption. All main components in the windows contribute significantly to some of the environmental indicators. The glass in the glazing units has the highest contribution in most impact categories among all material types. The galvanised steel components contribute significantly to the results due to their high weight contribution to the product. The aluminium components are also significant for the WDP indicator, although the weight of the aluminium components is notably lower in comparison with the galvanised steel components. This is most likely due to the relatively high energy and water consumption in the production of aluminium.

References

IBU PCR Part A
IBU PCR Part A: Institut Bauen und Umwelt e.V., Product Category Rules for Building-Related Products and Services. Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report according to EN 15804+A2:2019, version 1.4.

IBU PCR Part B
IBU PCR Part B: Institut Bauen und Umwelt e.V., Requirements on the EPD for Windows and doors, version 10: 2024.

IBU 2021
IBU 2021 Institut Bauen und Umwelt e.V.: General Instructions for the EPD programme of Institut Bauen und Umwelt e.V. Version 2.0, Berlin: Institut Bauen und Umwelt e.V., 2021.www.ibu-epd.com.

EN 12207
EN 12207:2016 Windows and doors - Air permeability - Classification

EN 12208
EN 12208:2000 Windows and doors. Watertightness. Classification is classified in these ICS categories: 91.060.50 Doors and windows

EN 13501-1
EN 13501-1 EN13501-1, 2018: Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests.

ISO 14025
DIN EN ISO 14025:2011-10, Environmental labels and declarations - Type III environmental declarations - Principles and procedures.

EN 14351-1
EN 14351-1:2006+A2:2016, Windows and doors - Product standard, performance characteristics - Part 1: Windows and external pedestrian doorsets.

EN 15804
EN 15804:2012+A2:2019+AC:2021, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products.

EN 17213
EN 17213:2020, Windows and doors – Environmental Product Declarations – Product category rules for windows and pedestrian doorsets.

Regulation (EU) No 305/2011
Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC

Candidate list
ECHA Candidate list of substances of very high concern, status 23.08.2023

ISO 10077-1
ISO 10077-1:2017, Thermal performance of windows, doors and shutters - Calculation of thermal transmittance - Part 1: General.

ISO 10077-2
ISO 10077-2:2017, Thermal performance of windows, doors and shutters - Calculation of thermal transmittance - Part 2: Numerical method for frames.

LCA for Experts (GaBi) LCA software, Managed LCA

Content and Ecoinvent databases
The LCA modelling software is LCA for Experts with corresponding databases from Sphera Solutions GmbH (Managed LCA Content) and Ecoinvent. Documentation hyperlink www.gabisoftware. com/support/gabi.

Publisher

Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

+49 (0)30 3087748- 0
info@ibu-epd.com
www.ibu-epd.com

Programme holder

Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

+49 (0)30 3087748- 0
info@ibu-epd.com
www.ibu-epd.com

Author of the Life Cycle Assessment

FORCE Technology
Park Alle 345
2605 Brøndby
Denmark

+4543250856
chme@forcetechnology.com
www.forcetechnology.com

Owner of the Declaration

VELUX Group
Ådalsvej 99
2970 Hørsholm
Denmark

+4545164871
birthe.kjeldsen@velux.com
www.velux.com