



# SHI PRODUCT PASSPORT

Find products. Certify buildings.

SHI Product Passport No.:

**15305-10-1001**

## VELUX Schwingfenster aus Holz

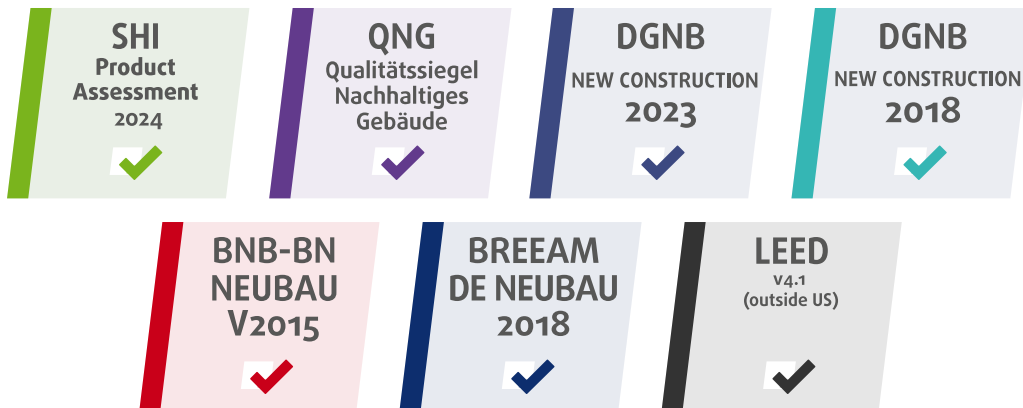
Product group: Wood-aluminum windows - Skylights - Assembly parts



VELUX A/S  
Aadalsvej 99  
2970 Hørsholm



### Product qualities:










*Köttner*

Helmut Köttner  
Scientific Director  
Freiburg, 08 April 2026



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**VELUX®**

## SHI Product Assessment 2024

Since 2008, Sentinel Holding Institut GmbH (SHI) has been establishing a unique standard for products that support healthy indoor air. Experts carry out independent product assessments based on clear and transparent criteria. In addition, the independent testing company SGS regularly audits the processes and data accuracy.

Criteria	Product category	Harmful substance limit	Assessment
SHI Product Assessment	Other products	TVOC $\leq 300 \mu\text{g}/\text{m}^3$ Formaldehyd $\leq 24 \mu\text{g}/\text{m}^3$	Indoor Air Quality Certified
Valid untill: 20 March 2027			



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# QNG - Qualitätssiegel Nachhaltiges Gebäude

The Qualitätssiegel Nachhaltiges Gebäude (Quality Seal for Sustainable Buildings), developed by the German Federal Ministry for Housing, Urban Development and Building (BMWSB), defines requirements for the ecological, socio-cultural, and economic quality of buildings. The Sentinel Holding Institut evaluates construction products in accordance with QNG requirements for certification and awards the QNG ready label. Compliance with the QNG standard is a prerequisite for eligibility for the KfW funding programme. For certain product groups, the QNG currently has no specific requirements defined. Although classified as not assessment-relevant, these products remain suitable for QNG-certified projects.

## Holzrahmen

Criteria	Pos. / product group	Considered substances	QNG assessment
3.1.3 Schadstoffvermeidung in Baumaterialien			QNG ready - Not relevant for assessment

Criteria	Assessment
ANF2-WG1 Nachhaltige Materialgewinnung	May positively contribute to the overall building score
<b>Verification:</b> PEFC zertifiziert	

## Aluminium-Vorsatzschale

Criteria	Pos. / product group	Considered substances	QNG assessment
3.1.3 Schadstoffvermeidung in Baumaterialien			QNG ready - Not relevant for assessment



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## DGNB New Construction 2023

The DGNB System (German Sustainable Building Council) assesses the sustainability of various types of buildings. It can be applied to both large-scale private and commercial projects as well as smaller residential buildings. The 2023 version sets high standards for ecological, economic, socio-cultural, and functional aspects throughout the entire life cycle of a building.

### Holzrahmen

Criteria	Assessment
ECO1.1 Life cycle cost (*)	May positively contribute to the overall building score
<b>Verification:</b> An improved u-value can contribute to more energy efficient building components. Sloped roof windows, flat roof windows and other Velux windows can result in less frequent use of electric light. Use of window's opening can also increase ventilation. Further detailing can be completed with more case-to-case information.	

Criteria	Assessment
ECO2.6 Climate resilience (*)	May positively contribute to the overall building score
<b>Verification:</b> Velux Products provide natural cooling and ventilation, see documentation of windows application. Materials providing heat protection are the individual window's glazing and implementation of various accessories.	

Criteria	Assessment
ENV1.1 Climate action and energy (*)	May positively contribute to the overall building score
<b>Verification:</b> Some of the products include PV cells. This generates PV panels on both the roof and in the product./ We offer products which operated through electric/solar powered sources, which results in an automatised product package. /The product is characterised for its high durability (see life time test attached), but is not characterised for its recyclability.	

Criteria	Quality level
ENV1.3 Responsible resource extraction	May positively contribute to the overall building score
<b>Verification:</b> PEFC zertifiziert	



Criteria	Assessment
SOC1.1 Thermal comfort (*)	May positively contribute to the overall building score
<b>Verification:</b> The opening of the windows introduce fresh air into the building + offering of various shading and glazing materials resulting in a solar protection	

Criteria	Assessment
SOC1.3 Sound insulation and acoustic comfort (*)	May positively contribute to the overall building score
<b>Verification:</b> We offer some products with high sound properties as well as external accessories	

Criteria	Assessment
SOC1.4 Visual comfort (*)	May positively contribute to the overall building score
<b>Verification:</b> Connected to ECO 1.1	

Criteria	Assessment
TEC1.3 Quality of the building envelope (*)	May positively contribute to the overall building score
<b>Verification:</b> We offer some products with higher insulation properties with various glazings and an addition of various accessories	

Criteria	Assessment
TEC1.4 Use and integration of building technology (*)	May positively contribute to the overall building score
<b>Verification:</b> we offer products which can integrate automation systems.	

Criteria	Assessment
SOC1.2 Indoor air quality (*)	May positively contribute to the overall building score
<b>Verification:</b> SHI Schadstoffgeprüft	

Criteria	No. / Relevant building components / construction materials / surfaces	Considered substances / aspects	Quality level
ENV 1.2 Local environmental impact, 03.05.2024 (3rd edition)	30a Dimensionally stable wooden building components	Wood preservative (product type 8 according to 528/2012/EC)	Quality level 3
<b>Verification:</b> Herstellererklärung vom Februar 2025 zum Einsatz von Bioziden.			



Criteria	No. / Relevant building components / construction materials / surfaces	Considered substances / aspects	Quality level
ENV 1.2 Local environmental impact, 29.05.2025 (4th edition)	30a Dimensionally stable wooden building components: external doors and windows	Wood preservative (product type 8 according to 528/2012/EC)	Quality level 4
<b>Verification:</b> Herstellererklärung vom Februar 2025 zum Einsatz von Bioziden.			

### Aluminium-Vorsatzschale

Criteria	No. / Relevant building components / construction materials / surfaces	Considered substances / aspects	Quality level
ENV 1.2 Local environmental impact, 03.05.2024 (3rd edition)	32 All of the shell's aluminium and stainless steel building components.	Chromium VI	Quality level 4
<b>Verification:</b> Herstellererklärung vom 04.08.2025			

Criteria	No. / Relevant building components / construction materials / surfaces	Considered substances / aspects	Quality level
ENV 1.2 Local environmental impact, 29.05.2025 (4th edition)	32 All of the shell's aluminium and stainless steel building components	Chromium VI	Quality level 4
<b>Verification:</b> Herstellererklärung vom 04.08.2025			



Product:

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## **DGNB New Construction 2018**

The DGNB System (German Sustainable Building Council) assesses the sustainability of various types of buildings. It can be applied to both large-scale private and commercial projects as well as smaller residential buildings.

### **Holzrahmen**

Criteria	No. / Relevant building components / construction materials / surfaces	Considered substances / aspects	Quality level
ENV 1.2 Local environmental impact	30a Dimensionally Stable Timber Components		Quality level 3
<b>Verification:</b> Herstellererklärung vom Februar 2025 zum Einsatz von Bioziden.			

### **Aluminium-Vorsatzschale**

Criteria	No. / Relevant building components / construction materials / surfaces	Considered substances / aspects	Quality level
ENV 1.2 Local environmental impact	32 All aluminium and stainless steel components in the building envelope	Chromium VI	Quality level 4
<b>Verification:</b> Herstellererklärung vom 04.08.2025			



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## **BNB-BN Neubau V2015**

The Bewertungssystem Nachhaltiges Bauen (Assessment System for Sustainable Building) is a tool for evaluating public office and administrative buildings, educational facilities, laboratory buildings, and outdoor areas in Germany. The BNB was developed by the former Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) and is now overseen by the Federal Ministry for Housing, Urban Development and Building (BMWSB).

### **Holzrahmen**

Criteria	Pos. / product type	Considered substance group	Quality level
1.1.6 Risiken für die lokale Umwelt	26 Chemical impregnation of non-load-bearing components	Biocides	Quality level 3

**Verification:** Herstellererklärung vom Februar 2025 zum Einsatz von Bioziden.

Criteria	Assessment
1.1.7 Nachhaltige Materialgewinnung	May positively contribute to the overall building score

**Verification:** PEFC zertifiziert

### **Aluminium-Vorsatzschale**

Criteria	Pos. / product type	Considered substance group	Quality level
1.1.6 Risiken für die lokale Umwelt	27 Anodized aluminum and passivated stainless steel surfaces	Heavy metals (chromium VI)	Quality level 5

**Verification:** Herstellererklärung vom 04.08.2025



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## **BREEAM DE Neubau 2018**

BREEAM (Building Research Establishment Environmental Assessment Methodology) is a UK-based building assessment system that evaluates the sustainability of new constructions, refurbishments, and conversions. Developed by the Building Research Establishment (BRE), the system aims to assess and improve the environmental, economic, and social performance of buildings.

Criteria	Product category	Considered substances	Quality level
Hea 02 Indoor Air Quality			Not relevant for assessment



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## LEED v4.1

LEED (Leadership in Energy and Environmental Design) is an internationally recognised building certification system developed by the U.S. Green Building Council. It is one of the most widely used sustainability standards for buildings worldwide and is particularly applied in internationally oriented projects. LEED assesses buildings holistically across categories such as energy efficiency, resource conservation, material selection, indoor environmental quality and site sustainability. Depending on the number of points achieved, projects are awarded one of the certification levels: LEED Certified, Silver, Gold or Platinum.

Criteria	Product category	Assessment
EQ Credit: Low-Emitting Materials		Not relevant for assessment



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## Product labels

In the construction industry, high-quality materials are crucial for a building's indoor air quality and sustainability. Product labels and certificates offer guidance to meet these requirements. However, the evaluation criteria of these labels vary, and it is important to carefully assess them to ensure products align with the specific needs of a construction project.



The PEFC label certifies wood and wood products from sustainably managed forests and requires, among other things, legal origin, protection of forest ecosystems, and social minimum standards in forestry. Environmental organisations consider PEFC's criteria to be less strict than those of FSC, particularly regarding the protection of sensitive forest areas. Health-related aspects of the final product are not part of the PEFC assessment.



This product is SHI Indoor Air Quality certified and recommended by Sentinel Holding Institut. Indoor-air-focused construction, renovation, and operation of buildings is made possible by transparent and verifiable criteria thanks to the Sentinel Holding concept.



Products bearing the Sentinel Holding Institute QNG-ready seal are suitable for projects aiming to achieve the "Qualitätssiegel Nachhaltiges Gebäude" (Quality Seal for Sustainable Buildings). QNG-ready products meet the requirements of QNG Appendix Document 3.1.3, "Avoidance of Harmful Substances in Building Materials." The KfW loan program Climate-Friendly New Construction with QNG may allow for additional funding.



The IBU ("Institut Bauen und Umwelt e.V.") is an initiative of building product manufacturers committed to sustainability in construction. It serves as the programme operator for Environmental Product Declarations (EPDs) in accordance with the EN 15804 standard. The IBU EPD programme provides comprehensive life cycle assessments and environmental impact data for construction products, supported by independent third-party verification.



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## Legal notices

(\* ) These criteria apply to the construction project as a whole. While individual products can positively contribute to the overall building score through proper planning, the evaluation is always conducted at the building level. The information was provided entirely by the manufacturer.

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**Find our criteria here: <https://www.sentinel-holding.eu/de/Themenwelten/Pr%C3%BCfverfahren/C3%BCr%20Produkte>**

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# VELUX roof window GGL

Glazing 66SG

**VELUX®**



The original VELUX top-operated, centre-pivot roof window GGL is easy to operate and gives you the freedom to place furniture underneath. The innovative top control bar allows you to install the window at a lower position to get an excellent view while standing and even when seated.

- Open the top control bar to the ventilation position for fresh air through a closed window.
- The glazing comes standard with premium features like safety lamination, toughened glass, UV filter, easy to clean, anti-dew and our unique rain noise reduction.
- Refresh your home by slightly opening the window and fixing it in the top bushing.
- Easily rotate the window 180° for safe cleaning of the outer glass from the inside.
- Removable and cleanable ventilation filter protects your home from dust and insects while ventilating.
- Maintenance-free exterior covers increase peace of mind throughout the lifetime of the roof window.
- The exclusive top control bar complements the window for a modern, elegant look.



## Application guidance

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The window can be installed in roof pitches between 15° and 90° to the horizontal.



Manually top-operated, centre-pivot roof windows make it possible to place furniture directly below the window without obstructing the window's operation. We recommend an installation height that allows for a clear sight line to the outside from both a standing and seated position. Please note that the optimum window height depends on the roof pitch.

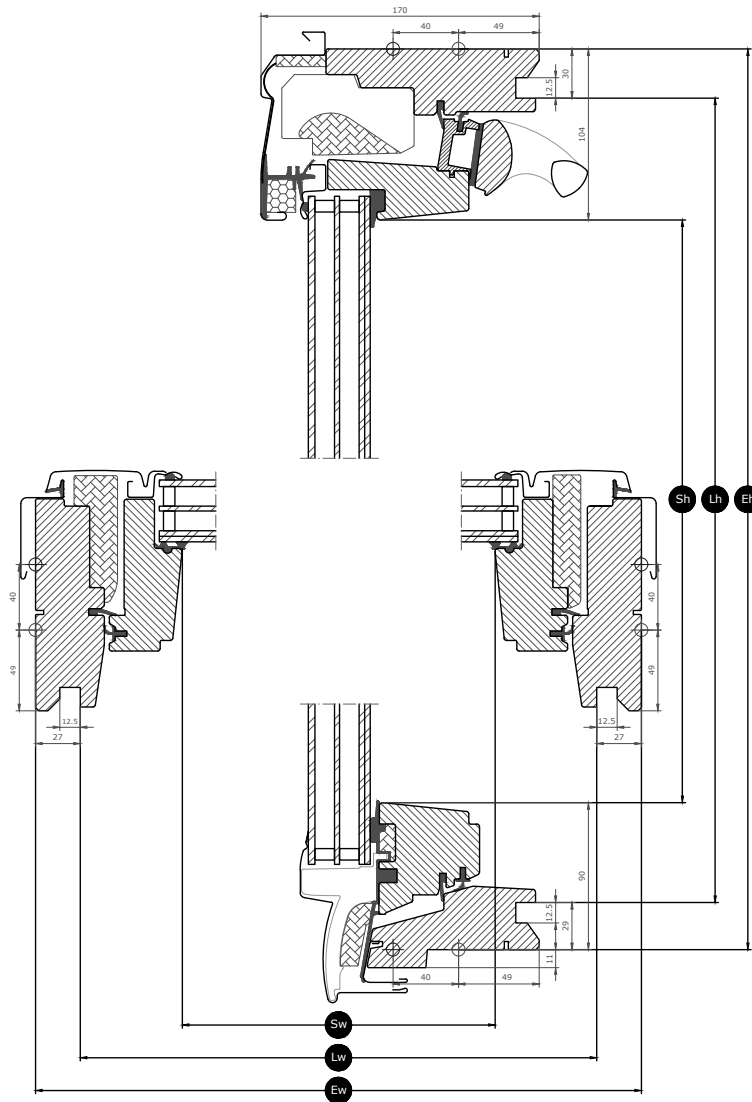
## Available sizes and daylight area

	472 mm	550 mm	660 mm	780 mm	942 mm	1140 mm	1340 mm
550 mm					GGL PK25  (0.27) [0.31]		
624 mm				GGL MK27  (0.26) [0.30]			
698 mm		GGL CK01  (0.19) [0.23]				GGL SK01  (0.48) [0.54]	
778 mm		GGL CK02  (0.22) [0.26]					
978 mm	GGL BK04  (0.23) [0.28]	GGL CK04  (0.29) [0.34]	GGL FK04  (0.38) [0.43]	GGL MK04  (0.47) [0.53]	GGL PK04  (0.60) [0.66]		GGL UK04  (0.91) [0.98]
1178 mm		GGL CK06  (0.37) [0.43]	GGL FK06  (0.47) [0.54]	GGL MK06  (0.59) [0.66]	GGL PK06  (0.75) [0.83]	GGL SK06  (0.95) [1.03]	
1398 mm			GGL FK08  (0.58) [0.66]	GGL MK08  (0.72) [0.81]	GGL PK08  (0.92) [1.01]	GGL SK08  (1.16) [1.25]	GGL UK08  (1.40) [1.54]
1600 mm				GGL MK10  (0.85) [0.94]	GGL PK10  (1.07) [1.17]	GGL SK10  (1.35) [1.46]	GGL UK10  (1.63) [1.80]
1800 mm				GGL MK12  (0.97) [1.07]			

All measurements are in mm. ( ) = Effective daylight area, m<sup>2</sup> [ ] = Geometric free area, m<sup>2</sup>

# Cross section dimensions










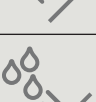
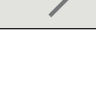
Please note that the view of the cross section is from bottom to top



Width		BK--	CK--	FK--	MK--	PK--	SK--	UK--
Sw	Sash aperture width	293	371	481	601	763	961	1161
Lw	Distance between lining grooves, width	417	495	605	725	887	1085	1285
Ew	Exterior frame width	472	550	660	780	942	1140	1340

Height		--01	--02	--04	--06	--08	--10	--12	--25	--27
Sh	Sash aperture height	504	584	784	984	1204	1406	1606	356	430
Lh	Distance between lining grooves, height	639	719	919	1119	1339	1541	1741	491	565
Eh	Exterior frame height	698	778	978	1178	1398	1600	1800	550	624

## Glazing features

Glazing 66SG		
	<b>Heat insulation</b> The low energy glazing unit reduces heat loss through the window and enhanced indoor comfort.	$U_g = 0.6$
	<b>Solar gain</b> In colder climates and in rooms with large window areas, solar gain provides a better indoor climate during winter periods.	<b>0.44</b>
	<b>Solar protection</b> In warm climates and in rooms with large window areas, a sun protective glazing unit provides a better indoor climate during summer periods.	★★★★☆
	<b>Security</b> Thicker laminated inner glass increases resistance to manual attack (burglary).	★★★★☆
	<b>Safety lamination</b> Prevents glass from falling into the room in case of accidental breakage.	✓
	<b>Toughened glass</b> Adds strength to the outer glass surface to protect from wayward balls and extreme weather such as heavy storms and hail.	✓
	<b>UV filter</b> Protects your interior furnishings from fading due to the sun's harmful UV rays.	✓
	<b>Rain noise reduction</b> Rain noise reduction creates a barrier between the window and the weather outside for undisturbed moments during rainy days – or nights.	✓
	<b>Easy-to-clean</b> Dirt-repellent coating lets you spend less time cleaning and more time enjoying the view.	✓
	<b>Anti-dew</b> The anti-dew coating significantly reduces the days with dew on the outer glass and thus gives you a clear view.	✓

### Glazing structure

Glazing unit	Composition (from inside to outside)
Triple-glazed	6.8 mm laminated float glass - 13 mm Argon - 3 mm heat strengthened glass - 13 mm Argon - 4 mm toughened glass

## Technical values for the window

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Overview of technical values for the product, covering among other, CE marking in accordance with EN 14351-1.

Window characteristics	Performance
Thermal transmittance (U-value)	1.0 W/(m <sup>2</sup> K)
Light transmittance (τ <sub>v</sub> )	0.62
Total solar energy transmittance (g-value)	0.44
Sound insulation (R <sub>w</sub> )	37(-2;-4)
Air permeability, [class]	4
External fire performance - British [class]	AC
External fire performance - European [class]	npd
Impact resistance [class]	3
Load-bearing capacity of safety devices	√
Reaction to fire [class]	C-s1,d2
Resistance to snow load	See glazing composition
Resistance to wind load [class]	C3 (>SK08: NPD)
Water tightness [class]	E900

NPD: No Performance Determined

## Visible features

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### Control bar

The ergonomic aluminum control bar allows effortless opening and closing of the window. It can also lock the ventilation flap in the ventilation position.



### Blind bracket, manual

Easily install blinds on the window without the need for extra tools. Simply click on the blind in the pre-fitted brackets.



### Ventilation flap

The full-width ventilation flap can be used for ventilation even with a closed window. The ventilation flap is connected to the top sash with the lock casing.



### Frame hinge, centre-pivot, side

Durable hinge design allows for reliable operation and enables the sash to be rotated for easy cleaning of the outer glass.



### Interior insulation, frame top sides

Innovative ThermoTechnology™ insulation is integrated into the top frame sides of the window to increase energy-efficiency.



### Barrel bolt

The barrel bolt can be placed into the integrated barrel bolt bushing to secure the window for cleaning of outer glass surface or for safe ventilation.



### Headlock

When closed, the window is locked firmly into place by the headlock.



### Data plate

Every VELUX roof window has a unique data plate with information that can be used to look up CE marking documentation, when purchasing accessories or in case of service or replacement.

## Interior finish

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Material Description	Clear lacquer Finished with triple coat, clear lacquered.	White-painted Finished with triple coat, white painted.
Colour code NCS, inner surface	No colour code	S 0500-N
Colour code nearest RAL, inner surface	No colour code	9003

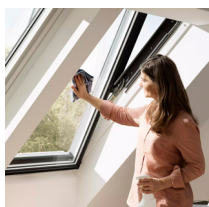
## Exterior covers

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Material Description	Aluminium, dark grey Dark grey	Titanium zinc	Untreated copper
Colour code NCS, outer surface	S 7500-N	No colour code	
Colour code nearest RAL, outer surface	7043	No colour code	

## Cleaning and maintenance

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To clean the outer glass surface from the inside, rotate sash manually and secure in cleaning position with barrel bolts.



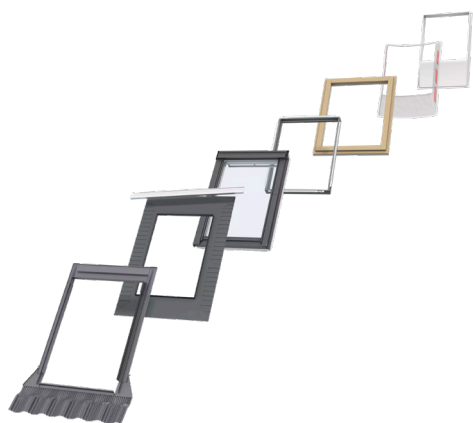
VELUX repair and maintenance kits are available.

## Guarantee period

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## Flashings and installation products

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### **Flashings**

Install the VELUX roof window in virtually any roofing material by using genuine VELUX flashing solutions. Our flashings are designed specifically for the exact size and shape of the roof windows to create perfect, watertight fit. Flashings can also be used to combine multiple roof windows.

### **Installation products**

Ensure a proper installation and an air- and watertight connection between the window and roof with VELUX installation products. All installation products are designed to perfectly fit the roof window for a reliable and durable result.

## Blinds, awnings and shutters

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Complete the VELUX roof window installation with roller shutters and awning blinds for heat protection and interior blinds for light dimming, blackout and insect protection. Choose from a wide range of manually operated or remote-controlled products that are made to fit the particular window type and size. Please contact your local VELUX sales company for more details about compatibility.

## Further information

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We reserve the right to make technical changes.

For more information on our products, please visit <https://velux.com>.

To whom it may concern



VELUX A/S  
Ådalsvej 99  
DK-2970 Hørsholm  
Denmark  
Telephone +45 45 16 40 00  
www.velux.com

Date: 04 August 2025

## Sentinel Haus criteria

### VOC content

We can confirm that the plants performing the factory coating of our products are operated in accordance with or (for smaller companies) in accordance with the 31st Ordinance of the Federal Emission Control Act or by the Europe-wide regulation Regulation 2010/75/EU - Industrial Emissions Directive (IED), (formerly Regulation 1999/13/EU).

We are working with our supplier base to investigate means of reducing the VOC content of the applied coating materials.

We are continuously working on reducing our negative social and environmental impact. Information on this work can be found in our Sustainability Report 2023 ([link](#)).

### Chemical content

We hereby declare that all products comply with the following criteria.

- No use of halogenated blowing agents
- No use of brominated flame retardants (HBCD)
- No use of reproduction toxic boron compounds in quantities of more than 0.1% (w/w)
- No use of chrome VI oxide surface treatment (passivation)
- No use of lead, tin and cadmium compounds in quantities of more than 0,1% in our windows, except for MSL awning blind and KFX smoke ventilation control unit, both contains lead ((CAS no 743-92-1) in quantities of more than 0,1%.
- No use of chrome VI compounds
- None of our products contain any substances (incl. reproductive-toxic phthalates) of very high concern or substances from the candidate list in quantities of more than 0.1 % (w/w)
- No use of cadmium in PVC components in quantities of more than 0.01%

Yours sincerely,

Birthe Uldahl Kjeldsen

Senior manager,

Product Specification and Documentation

Product Regulatory Affairs

To Whom it May Concern

The logo for VELUX, featuring the word "VELUX" in white, bold, sans-serif capital letters on a red rectangular background. A registered trademark symbol (®) is located to the upper right of the text.

Ådalsvej 99  
DK-2970 Hørsholm  
Denmark  
+45 45 16 40 00 Telephone  
+45 45 16 40 01 Telefax

February 2025  
Renewal date: February 2027

VELUX A/S is aware of the Biocidal Product Regulation (528/2012/EU) (BPR) and Biocidal Product Regulation, implementing regulation (2023/2596 (EU)) and acknowledge the obligations which derive from the regulations.

VELUX wooden windows and wooden upstands for flat roof windows (VMR) are considered treated articles containing wood preservatives. All biocidal products used in our products are covered by the obligation to register in accordance with BPR.

We can confirm that all biocidal products used in our VELUX products are registered in accordance with BPR.

We can also confirm that we are in contact with our suppliers to ensure that they are aware of BPR.

One of the active substances (propiconazole) used in the wood preservation of VELUX wooden roof windows (PT8) triggers a labelling requirement, which entails that all VELUX roof wooden windows from 1 July 2024 has a label on with the text: "This product contains wood treated with propiconazole" in English. Furthermore the following information is available online through the QR code from the product data plate:

VELUX sloped roof windows:

This product contains wood treated with propiconazole. It must not be used for furniture and play structures such as playgrounds.

#### **Use and Maintenance**

VELUX wooden windows are treated with propiconazole and a topcoat to protect the product. In the case of sanding during repair on topcoat, dust must be collected and disposed of appropriately and respiration equipment must be worn. After grinding we recommend that a new topcoat is applied over the sanded area.

#### **Disposal of product**

It's important to note that the product is not suitable for use as furniture or play structures, as per Biocidal Product Regulation, implementing regulation 2023/2596 (EU). Treated or painted wood must be disposed of according to local regulations.

A handwritten signature in black ink that reads "Birthe Kjeldsen".

Birthe Kjeldsen  
Manager, Technical Values  
Ådalsvej 99, DK 2970 Hørsholm

To Whom it May Concern

The logo for VELUX, featuring the word "VELUX" in white, bold, uppercase letters on a red rectangular background.

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+45 45 16 40 01 Telefax

Valid: 22 January 2025 – 21 January 2026

VELUX A/S is aware of REACH regulation and acknowledge the obligations which derive from the regulation.

We can confirm that none of the VELUX products, packaging etc. are covered by the obligation to register in accordance to REACH.

Furthermore, we can confirm that none<sup>1</sup> of our products contain any Substances of Very High Concern or substances at the Candidate list in quantities of more than 0,1% (w/w).

We can also confirm that we are in contact with our suppliers to ensure that they are aware of REACH.

Birthe Uldahl Kjeldsen

A handwritten signature in black ink that reads "Birthe Kjeldsen".

Senior manager

Technical Values

Standardisation & Technical Performance

VELUX A/S

Ådalsvej 99, DK 2970 Hørsholm

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<sup>1</sup> Apart from backup batteries for smoke ventilation products (KFX) and small PV modules used in VELUX MSL awning blinds, please see separate certificate.

# CHAIN OF CUSTODY CERTIFICATE

Certificate no.:  
DNVFI-PEFC-COC-000075

Initial certification date:  
25 August 2008

Valid:  
19 September 2022 – 09 January 2027

This is to certify that

## VELUX A/S

Platinvej 14, 6000 Kolding, Denmark

and the sites as mentioned in the appendix accompanying this certificate

meets the requirements of following international PEFC standards:

**PEFC ST 2002:2020, PEFC ST 2001:2020**

This certificate is valid for the following product or service ranges:

**Manufacturing, sales and distribution of wooden roof windows.**

The validity of this certificate shall be verified on [www.pefc.org](http://www.pefc.org).

Place and date:  
Espoo, 19 September 2022



For the issuing office:  
DNV - Business Assurance  
Keilaranta 1, 02150 Espoo, Finland



Kimmo Haarala  
Management Representative

## Appendix to Certificate

### VELUX A/S

Locations included in the certification are as follows:

Site Name	Site Address	Site Scope
JTJ Sonneborn Industrie GmbH	Am Arzbach 13, DE-99869 Sonneborn, Germany	Manufacturing of wooden roof windows and windows components
NB Polska Sp. z o.o.	Ul. Sloneczna 29, PL-62-200 Gniezno, Poland	Manufacturing of roof windows and components for windows
NM Polska Sp. z o.o.	Ul. Olesnicka 12, PL-46-100 Namyslow, Poland	Manufacturing, sales and distribution of wooden roof windows
Østbirk Bygningsindustri A/S	Ryvej 21, 8752 Østbirk, Denmark	Manufacturing of wooden roof windows and windows components
Partizánske Building Components-SK s.r.o	Malobielicka 1/215, 95804 Partizanske, Slovak Republic	Manufacturing of wooden roof windows and windows components
Thyregod Bygningsindustri A/S	Nordre Ringvej 9, 7323 Give, Denmark	Manufacturing of wooden roof windows and windows components
VELUX A/S	Platinvej 14, 6000 Kolding, Denmark	Logistics HQ
VELUX A/S - DC Portugal	Travessa do Areeiro 272, PT-2440-05, Batalha, Portugal	Distribution and warehousing of wooden roof windows
VELUX A/S - European Central Warehouse CEE	H-9431 Fertod, Malom Köz 1, Hungary	Distribution and warehousing of wooden roof windows
VELUX A/S - Feuquières	Zone Industrielle, F-80210, Feuquières en Vimeu, France	Manufacturing of wooden roof windows and windows components
VELUX A/S - JTJ-D Sonneborn	Am Arzbach 13, DE-99869 Sonneborn, Germany	Distribution and warehousing of wooden roof windows
VELUX A/S - Kolding	Jupitervej 4, 6000 Kolding, Denmark	Central Purchasing
VELUX A/S - LOG-V	Platinvej 14, 6000 Kolding, Denmark	Manufacturing, sales and distribution of wooden roof windows.
VELUX A/S - NB PL Gniezno	Ul. Sloneczna 29, PL-62-200 Gniezno, Poland	Distribution and warehousing of wooden roof windows
VELUX A/S - NM PL Namyslow	Ul. Olesnicka 12, PL-46-100 Namyslow, Poland	Distribution and warehousing of wooden roof windows
VELUX A/S - Nordic DC FWH	Platinvej 14, 6000 Kolding, Denmark	Distribution and warehousing of wooden roof windows
VELUX A/S - PBC SK	Malobielická 1/225, SK-958 04 Partizánske, Slovak Republic	Distribution and warehousing of wooden roof windows
VELUX A/S V-LOG	Platinvej 14, 6000 Kolding, Denmark	Sales of wooden roof windows
VELUX Belgium	Boulevard de l'Europe 121, B-1300 Wavre, Belgium	Sales of wooden roof windows
VELUX Company Ltd.	Woodside Way, Glenrothes East, GB-KY7 4ND, United Kingdom	Sales of wooden roof windows
VELUX Danmark A/S	Breeltevej 20, 2970 Hørsholm, Denmark	Sales of wooden roof windows
VELUX Deutschland GmbH	Gazellenkamp 168, DE-22527 Hamburg, Germany	Sales of wooden roof windows

Site Name	Site Address	Site Scope
VELUX France SAS	1, rue Paul Cézanne, F-91421, Morangis Cédex, France	Sales of wooden roof windows
VELUX Italia S.p.a.	Via Strà 152 - I-37030 Colognola ai Colli (VR) - Italy	Sales of wooden roof windows
VELUX Magyarország LKR Korlátolt Felelősségű TársaságS	H-9431 Fertod, Malom köz 1, Hungary	Manufacturing of wooden roof windows and windows components
VELUX Nederland B.V	Molensteijn 2, NL-3454 ZJ De Meern, Netherlands	Sales of wooden roof windows
VELUX Norway AS	Gjerdrumsvej 10 D, NO-0484 Oslo, Norway	Sales of wooden roof windows
VELUX Romania SRL	Coresi Business Park, 5 Turnului Street, RO-500152, Brasov, Romania	Sales of wooden roof windows
VELUX Schweiz AG	Industristrasse 7, CH-4632 Trimbach, Switzerland	Sales of wooden roof windows
VELUX Spain, S. A.	Ctra. de La Coruña 18, 150, E-28231, Las Rozas de Madrid, Spain	Sales of wooden roof windows
VELUX Svenska AB	Karbingatan 22, SE-254 67, Helsingborg, Sweden	Sales of wooden roof windows
VKR France (Feuquières-en-Vimeu)	ul. Krakowiaków 34, PL-02-255 Warszawa, Poland	Sales of wooden roof windows
VKR France (Feuquières-en-Vimeu)	Zone Industrielle, 80210, Feuquières-en-Vimeu, France	Distribution and warehousing of wooden roof windows

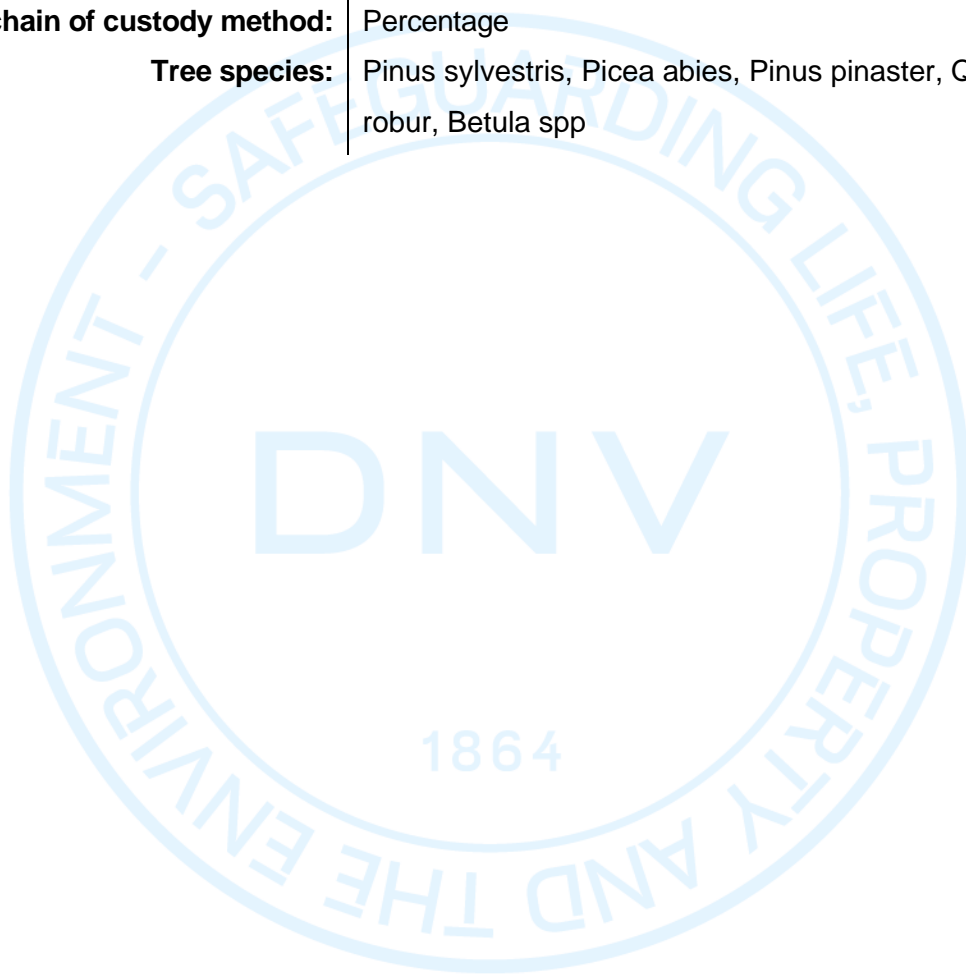


Certificate no.: DNVFI-PEFC-COC-000075  
Place and date: Espoo, 19 September 2022

## Appendix to Certificate

### Multi-site certificate

<b>Product category:</b>	08031 (Windows)
<b>Material category:</b>	PEFC certified
<b>Applied chain of custody method:</b>	Percentage
<b>Tree species:</b>	Pinus sylvestris, Picea abies, Pinus pinaster, Quercus robur, Betula spp



# 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-20250259-CBI1-EN
Issue date	28.05.2025
Valid to	27.05.2030

**VELUX wooden roof windows GGL, GGLS, GZL, VFA, VFB, VFE  
(double glazing configuration)  
VELUX Group**

[www.ibu-epd.com](http://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-20250259-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**

28.05.2025

**Valid to**

27.05.2030



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



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

**VELUX wooden roof windows GGL, GGLS, GZL, VFA, VFB, VFE (double glazing configuration)****Owner of the declaration**

VELUX Group  
Ådalsvej 99  
2970 Hørsholm  
Denmark

**Declared product / declared unit**

The declared unit is 1 m<sup>2</sup> of a wooden roof window with double glazing configuration (2-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 wooden 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 takes place in Germany, France, Denmark, Hungary and Poland. 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.

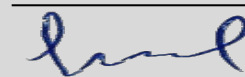
The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804*.

**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 wooden roof windows are skylight window products for sale in the European market. The product family covers a range of product varieties as specified in the table below. All windows have a 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). Some of the window varieties can be used in conjunction with electric or solar window operators for automatic opening and closing, while other windows are opened and closed manually. The calculations are based on the representative window type named GGL. In the LCA, the GGL was assessed to be a conservative choice for a representative window type.

The glass panes are with double glazing (2-layer glazing) and different glass configurations are covered by the EPD. The EPD is based on an average of the following glazing unit configurations: 50/51, 70, 70 Q, 76.

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.

Variant	Window type	Glazing options	Description
GGL	 GGL -K-- 0--	--70	White painted or clear lacquered pivot-hung window with ventilation flap and integrated handlebar along the top sash.
GGL Electric	 GGL -K-- 0--21	--70	White painted or clear lacquered GGL window with an electrical window opener, main operated.
GGL Solar	 GGL -K-- 0--30	--70	White painted or clear lacquered GGL window with an electrical window opener, solar powered.
GGLS 2-in-1 or 3-in-1	  GGLS ---K--- 0--	--70	White painted window, consisting of 2 or 3 window elements in one frame. One element is fixed, and the other element(s) are pivot-hung similar to GGL.
GGLS 2-in-1 solar	  GGLS ---K--- 0--	--70	White painted window, consisting of 2 or 3 window elements in one frame. One element is fixed, and the other element(s) are pivot-hung similar to GGL and equipped with solar powered window operator.
GZL	 GZL -K-- 0--	--51	Clear lacquered pivot-hung window with ventilation flap and integrated handlebar along the top sash.
GZL-B	 GZL -K-- 0--B	--51	Clear lacquered pivot-hung window with ventilation slats at top sash and handle on bottom sash.
VFA	 VFA -K-- 0--	--70	White painted or clear lacquered side-hung window for vertical extension with handle on the side sash
VFB	 VFB -K-- 0--	--70	Similar to VFA, just with opening to the opposite side.
VFE	 VFE -K-- 0--	--70	White painted or clear lacquered bottom-hung window for vertical extension with handle on top sash

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 wooden roof windows are used in renovation and new build. 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](http://www.velux.com/ce).

The performance values are specific for each standard wooden roof window variant covered by the EPD. The declared values in the table relate to the reference product variant GGL with double-glazed configuration 70 (GGL --70).

### Constructional data

Name	Value	Unit
Reaction to fire	C-s1,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) - 16 - 6,8 (laminated float)	mm
Water tightness acc. EN 12208 unprotected / protected	E900	class
Impact resistance (for window width<550mm or height<778mm no performance is determined)	3	class
Acoustic performance	35 (-1; -3)	-
Load-bearing capacity of safety devices	passed	-
Thermal transmittance, 90 degree installation acc. to EN 10077-1/2	1.3	W/(m <sup>2</sup> K)
Solar factor	0.46	-
Light transmittance	0.68	-

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

Name	Value	Unit
Glazing unit (2-layer)	53	%
Wooden frame/sash	26	%
Steel components (galvanised and stainless)	4	%
Aluminium components	4	%
Other components (including packaging)	5	%
Packaging	8	%

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 Germany, Denmark, France, Hungary and Poland, where they are assembled into the final window product. The aluminium, steel and glass used in the product have 43, 10 and 12 % recycled content, respectively.

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<sup>2</sup> wooden roof window 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) with double-glazed window panes. The GGL variant has the largest weight per m<sup>2</sup> 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 similar sizes and glazing units. The heavier the product, the larger the content of metal. Therefore, the GGL 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 <sup>2</sup>
Grammage	33.95	kg/m <sup>2</sup>

**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<sub>2</sub> 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**

9.56 kg of wood is used in window frames/sashes and 0.04 kg of paper inlet is used per declared unit. For the packaging, 3.05 kg of cardboard and 0.01 kg of paper insert are used per declared unit.

**Information on describing the biogenic carbon content at factory gate**

Name	Value	Unit
Biogenic carbon content in product	4.37	kg C
Biogenic carbon content in accompanying packaging	2.44	kg C

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO<sub>2</sub>.

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	3.05	kg
Paper packaging for waste treatment	0.01	kg
Steel packaging for waste treatment (galvanised)	0.003	kg

**End of life (C1-C4)**

Name	Value	Unit
Collected as mixed construction waste	33.95	kg
Recycling	8.73	kg
Energy recovery	10.79	kg
Landfilling	14.08	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 <sub>2</sub> eq	3.38E+01	4.47E+00	2.79E+01	1.34E-03	1.1E+00	1.79E+01	1.91E+00	-2.03E+01
GWP-fossil	kg CO <sub>2</sub> eq	7.08E+01	4.39E+00	5.57E+00	1.33E-03	1.08E+00	4.62E+00	2.34E-01	-2.02E+01
GWP-biogenic	kg CO <sub>2</sub> eq	-3.72E+01	1.05E-02	2.23E+01	1.19E-05	2.59E-03	1.33E+01	1.67E+00	-4.66E-02
GWP-luluc	kg CO <sub>2</sub> eq	6.16E-02	7.35E-02	3.49E-02	2.02E-07	1.83E-02	8.44E-04	1.25E-03	-4.54E-03
ODP	kg CFC11 eq	5.19E-07	6.45E-13	1.25E-09	3.01E-14	1.6E-13	-5.34E-09	6.05E-13	-5.95E-11
AP	mol H <sup>+</sup> eq	2.93E-01	6.27E-03	2.26E-02	2.57E-06	6.31E-03	4.32E-03	1.62E-03	-7.77E-02
EP-freshwater	kg P eq	2.32E-04	1.87E-05	6.96E-05	5.51E-09	4.64E-06	-1.18E-05	3.54E-06	-1.5E-05
EP-marine	kg N eq	6.52E-02	2.26E-03	1.08E-02	6.41E-07	3.07E-03	1.59E-03	4.52E-04	-1.89E-02
EP-terrestrial	mol N eq	7.46E-01	2.69E-02	1.13E-01	6.71E-06	3.42E-02	2.07E-02	4.81E-03	-2.1E-01
POCP	kg NMVOC eq	1.92E-01	6.24E-03	2.56E-02	1.69E-06	5.93E-03	4.24E-03	1.63E-03	-4.87E-02
ADPE	kg Sb eq	2.03E-04	3.81E-07	4.26E-06	2.49E-10	9.46E-08	-7.59E-08	1.43E-08	-4.28E-06
ADPF	MJ	9.98E+02	5.78E+01	7.87E+01	2.79E-02	1.43E+01	5.41E+00	3.14E+00	-2.76E+02
WDP	m <sup>3</sup> world eq deprived	9.53E+00	6.77E-02	2.35E-01	3.67E-04	1.68E-02	2.1E+00	2.69E-02	-3.97E+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	2.23E+02	4.96E+00	2.03E+02	2.01E-02	1.23E+00	1.47E+02	5.1E-01	-8.7E+01
PERM	MJ	3.65E+02	0	2.98E+01	0	0	-1.46E+02	0	0
PERT	MJ	5.88E+02	4.96E+00	2.32E+02	2.01E-02	1.23E+00	1.5E+00	5.1E-01	-8.7E+01
PENRE	MJ	8.98E+02	5.78E+01	7.88E+01	2.79E-02	1.43E+01	7.66E+01	3.14E+00	-2.76E+02
PENRM	MJ	9.95E+01	0	-1.38E-01	0	0	-7.12E+01	0	0
PENRT	MJ	9.98E+02	5.78E+01	7.87E+01	2.79E-02	1.43E+01	5.41E+00	3.14E+00	-2.76E+02
SM	kg	3.55E+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 <sup>3</sup>	3.58E-01	5.53E-03	2.48E-02	1.54E-05	1.37E-03	4.95E-02	8.08E-04	-1.49E-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	2.62E-03	2.21E-09	1.59E-06	4.03E-11	5.48E-10	3.19E-09	7.45E-10	-8.51E-08
NHWD	kg	1.01E+01	9.42E-03	1.64E-01	2.3E-05	2.34E-03	6.59E-01	1.36E+01	-4.28E+00
RWD	kg	2.41E-02	1.05E-04	1.52E-03	4.45E-06	2.61E-05	2.61E-04	3.39E-05	-1.3E-02
CRU	kg	0	0	0	0	0	0	0	0
MFR	kg	1.74E-02	0	1.41E+01	0	0	8.59E+00	0	0
MER	kg	0	0	0	0	0	0	0	0
EEE	MJ	3.45E-02	0	0	0	0	2.9E+01	0	0
EET	MJ	5.03E-02	0	0	0	0	5.3E+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	8.49E-06	6.74E-08	2.68E-07	2.15E-11	3.47E-08	2.82E-08	1.97E-08	-1.04E-06
IR	kBq U235 eq	3.58E+00	1.52E-02	2.52E-01	7.34E-04	3.78E-03	3.36E-02	4.14E-03	-1.89E+00
ETP-fw	CTUe	1.4E+03	4.29E+01	2.38E+01	8.08E-03	1.06E+01	2.8E+00	1.82E+00	-1.01E+02
HTP-c	CTUh	4.82E-07	8.66E-10	6.95E-09	4.54E-13	2.15E-10	1.91E-10	4.57E-11	-1.58E-08
HTP-nc	CTUh	4.93E-07	3.88E-08	7.04E-08	6.95E-12	9.63E-09	1.07E-08	2.73E-09	-1.17E-07
SQP	SQP	6.7E+03	2.83E+01	1.65E+02	1.17E-02	7.04E+00	1.07E+00	7.71E-01	-2.6E+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 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 galvanized 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 galvanized steel components. This is most likely due to the relatively high energy and water consumption in the production of aluminium.

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.

## 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](http://www.gabisoftware.com/support/gabi).



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# 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-20250261-CBI1-EN
Issue date	28.05.2025
Valid to	27.05.2030

**VELUX wooden roof windows GGL, GGLS, VFA, VFB, VFE (triple glazing configuration)**  
**VELUX Group**

[www.ibu-epd.com](http://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.  
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10117 Berlin  
Germany

**Declaration number**

EPD-VEL-20250261-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**

28.05.2025

**Valid to**

27.05.2030



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



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

**VELUX wooden roof windows GGL, GGLS, VFA, VFB, VFE (triple glazing configuration)****Owner of the declaration**

VELUX Group  
Ådalsvej 99  
2970 Hørsholm  
Denmark

**Declared product / declared unit**

The declared unit is 1 m<sup>2</sup> of a wooden roof window with double glazing configuration (2-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 wooden 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 takes place in Germany, France, Denmark, Hungary and Poland.

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.

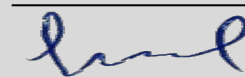
The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804*.

**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 wooden roof windows are skylight window products for sale in the European market. The product family covers a range of product varieties as specified in the table below. All windows have a 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). Some of the window varieties can be used in conjunction with electric or solar window operators for automatic opening and closing, while other windows are opened and closed manually. The calculations are based on the representative window type named GGL. In the LCA, the GGL was assessed to be a conservative choice for a representative window type.

The glass panes are with triple 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.

Variant	Window type	Glazing options	Description
GGL	 GGL -K-- -0--	--66 --67 --68 --69 --86	White painted or clear lacquered pivot-hinged window with ventilation flap and integrated handlebar along the top sash.
GGL Electric	 GGL -K-- -0--21	--66 --67 --68 --69 --86	White painted or clear lacquered GGL window with an electrical window opener, main operated.
GGL Solar	 GGL -K-- -0--30	--66 --67 --68 --69 --86	White painted or clear lacquered GGL window with an electrical window opener, solar powered.
GGLS 2-in-1 or 3-in-1	 GGLS ---K--- -0--	--66	White painted window, consisting of 2 or 3 window elements in one frame. One element is fixed, and the other element(s) are pivot-hinged similar to GGL.
GGLS 2-in-1 solar	 GGLS ---K--- -0--	--66	White painted window, consisting of 2 or 3 window elements in one frame. One element is fixed, and the other element(s) are pivot-hinged similar to GGL and equipped with solar powered window operator.
VFA	 VFA -K-- -0--	--66 --67 --68	White painted or clear lacquered side-hinged window for vertical extension with handle on the side sash.
VFB	 VFB -K-- -0--	--66 --67 --68	Similar to VFA, just with opening to the opposite side.
VFE	 VFE -K-- -0--	--66 --68	White painted or clear lacquered bottom-hinged window for vertical extension with handle on top sash.

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 wooden roof windows are used in renovation and new build. 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](http://www.velux.com/ce).

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

### Constructional data

Name	Value	Unit
Reaction to fire	C-s1,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 height <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 <sup>2</sup> 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 standard wooden roof window are the glazing unit (made of mainly laminated and tempered glass), wooden frames/sashes (made of wood), hinges (made of steel) and handles/handlebars (made of aluminium). The packaging of the products consists of mostly cardboard with paper inserts and galvanised steel.

Name	Value	Unit
Glazing unit (2-layer)	59	%
Wooden frame/sash	22	%
Steel components (galvanised and stainless)	4	%
Aluminium components	3	%
Other components (including packaging)	4	%
Packaging	7	%

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 Germany, Denmark, France, Hungary and Poland. 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, France and Germany, where they are assembled into the final window product. The aluminium, steel and glass used in the product have 43, 10 and 12 % recycled content, respectively.

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<sup>2</sup> wooden roof window 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) with double-glazed window panes. The GGL variant has the largest weight per m<sup>2</sup> 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 similar sizes and glazing units. The heavier the product, the larger the content of metal. Therefore, the GGL variant can be considered more representative as a worst-case scenario for the whole roof windows group.

**Declared unit and mass reference**

Name	Value	Unit
Declared unit	1	m <sup>2</sup>
Grammage	39.71	kg/m <sup>2</sup>

Other declared units are allowed if the conversion is shown transparently.

For IBU core EPDs (where clause 3.6 is part of the EPD): for average EPDs, an estimate of the robustness of the LCA values must be made, e.g. concerning the variability of the production process, geographical representativeness and the influence of background data and preliminary products compared to the environmental impacts caused by the actual production.

**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<sub>2</sub> 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**

9.56 kg of wood is used in window frames/sashes and 0.04 kg of paper inlet is used per declared unit. For the packaging, 3.05 kg of cardboard and 0.01 kg of paper insert are used per declared unit.

**Information on describing the biogenic carbon content at factory gate**

Name	Value	Unit
Biogenic carbon content in product	4.37	kg C
Biogenic carbon content in accompanying packaging	2.44	kg C

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO<sub>2</sub>.

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	3.05	kg
Paper packaging for waste treatment	0.01	kg
Steel packaging for waste treatment (galvanised)	0.003	kg

**End of life (C1-C4)**

Name	Value	Unit
Collected as mixed construction waste	39.71	kg
Recycling	10.46	kg
Energy recovery	10.79	kg
Landfilling	18.46	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 <sub>2</sub> eq	5.28E+01	5.49E+00	2.8E+01	1.34E-03	1.3E+00	1.87E+01	1.96E+00	-2.19E+01
GWP-fossil	kg CO <sub>2</sub> eq	8.97E+01	5.38E+00	5.58E+00	1.33E-03	1.27E+00	5.33E+00	2.89E-01	-2.19E+01
GWP-biogenic	kg CO <sub>2</sub> eq	-3.71E+01	1.28E-02	2.23E+01	1.19E-05	3.04E-03	1.33E+01	1.67E+00	-5E-02
GWP-luluc	kg CO <sub>2</sub> eq	8.01E-02	9.02E-02	3.51E-02	2.02E-07	2.14E-02	8.48E-04	1.58E-03	-4.95E-03
ODP	kg CFC11 eq	9.84E-07	7.92E-13	1.25E-09	3.01E-14	1.88E-13	-6.84E-09	7.54E-13	-6.6E-11
AP	mol H <sup>+</sup> eq	4.14E-01	7.62E-03	2.27E-02	2.57E-06	7.4E-03	4.81E-03	2.01E-03	-8.59E-02
EP-freshwater	kg P eq	4.62E-03	2.29E-05	6.97E-05	5.51E-09	5.44E-06	-1.53E-05	3.96E-06	-1.64E-05
EP-marine	kg N eq	9.03E-02	2.75E-03	1.08E-02	6.41E-07	3.61E-03	1.85E-03	5.53E-04	-2.13E-02
EP-terrestrial	mol N eq	1.02E+00	3.27E-02	1.13E-01	6.71E-06	4.01E-02	2.36E-02	5.92E-03	-2.38E-01
POCP	kg NMVOC eq	2.51E-01	7.59E-03	2.56E-02	1.69E-06	6.96E-03	4.88E-03	1.94E-03	-5.37E-02
ADPE	kg Sb eq	2.38E-04	4.68E-07	4.26E-06	2.49E-10	1.11E-07	-1.15E-07	1.79E-08	-5.82E-06
ADPF	MJ	1.29E+03	7.09E+01	7.88E+01	2.79E-02	1.68E+01	5.48E+00	3.87E+00	-3.01E+02
WDP	m <sup>3</sup> world eq deprived	1.32E+01	8.32E-02	2.35E-01	3.67E-04	1.97E-02	2.19E+00	3.32E-02	-4.11E+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	2.56E+02	6.09E+00	2.03E+02	2.01E-02	1.45E+00	1.47E+02	6.38E-01	-9.16E+01
PERM	MJ	3.65E+02	0	2.98E+01	0	0	-1.46E+02	0	0
PERT	MJ	6.21E+02	6.09E+00	2.32E+02	2.01E-02	1.45E+00	1.55E+00	6.38E-01	-9.16E+01
PENRE	MJ	1.18E+03	7.09E+01	7.9E+01	2.79E-02	1.68E+01	9.01E+01	3.87E+00	-3.01E+02
PENRM	MJ	1.14E+02	0	-1.65E-01	0	0	-8.46E+01	0	0
PENRT	MJ	1.29E+03	7.09E+01	7.88E+01	2.79E-02	1.68E+01	5.48E+00	3.87E+00	-3.01E+02
SM	kg	3.66E+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 <sup>3</sup>	4.61E-01	6.79E-03	2.48E-02	1.54E-05	1.61E-03	5.16E-02	1E-03	-1.54E-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	2.62E-03	2.71E-09	1.59E-06	4.03E-11	6.43E-10	3.3E-09	9.26E-10	-9.41E-08
NHWD	kg	1.11E+01	1.16E-02	1.67E-01	2.3E-05	2.74E-03	6.86E-01	1.72E+01	-4.57E+00
RWD	kg	2.68E-02	1.29E-04	1.52E-03	4.45E-06	3.06E-05	2.69E-04	4.16E-05	-1.39E-02
CRU	kg	0	0	0	0	0	0	0	0
MFR	kg	1.74E-02	0	1.47E+01	0	0	1.02E+01	0	0
MER	kg	0	0	0	0	0	0	0	0
EEE	MJ	3.45E-02	0	0	0	0	3.1E+01	0	0
EET	MJ	5.03E-02	0	0	0	0	5.67E+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 m<sup>2</sup> VELUX standard wooden roof window

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PM	Disease incidence	9.33E-06	8.11E-08	2.68E-07	2.15E-11	4.07E-08	2.94E-08	2.46E-08	-1.1E-06
IR	kBq U235 eq	5.33E+00	1.87E-02	2.52E-01	7.34E-04	4.44E-03	3.29E-02	5.03E-03	-2.05E+00
ETP-fw	CTUe	1.96E+03	5.26E+01	2.4E+01	8.08E-03	1.25E+01	2.87E+00	2.26E+00	-1.19E+02
HTP-c	CTUh	6.9E-07	1.06E-09	6.95E-09	4.54E-13	2.52E-10	1.91E-10	5.58E-11	-1.62E-08
HTP-nc	CTUh	6.33E-07	4.77E-08	7.05E-08	6.95E-12	1.13E-08	1.11E-08	3.12E-09	-1.27E-07
SQP	SQP	6.74E+03	3.48E+01	1.65E+02	1.17E-02	8.26E+00	9.03E-01	9.71E-01	-2.88E+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 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 galvanized 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 galvanized steel components. This is most likely due to the relatively high energy and water consumption in the production of aluminium.

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.

## 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](http://www.gabisoftware.com/support/gabi).



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# 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-20250260-CBI1-EN
Issue date	28.05.2025
Valid to	27.05.2030

**VELUX wooden roof windows GGL, VFE (62 triple glazing configuration)**  
**VELUX Group**

[www.ibu-epd.com](http://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-20250260-CB11-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

28.05.2025

#### Valid to

27.05.2030



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



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

### VELUX wooden roof windows GGL, VFE (62 triple glazing configuration)

#### Owner of the declaration

VELUX Group  
Ådalsvej 99  
2970 Hørsholm  
Denmark

#### Declared product / declared unit

The declared unit is 1 m<sup>2</sup> of a wooden roof window with triple glazing configuration 62. 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 wooden 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 takes place in Germany, France, Denmark, Hungary and Poland.

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.

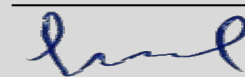
The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804*.

#### 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 wooden roof windows are skylight window products for sale in the European market. The product family covers a range of product varieties as specified in the table below. All windows have a wooden frame/sash. 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). Some of the window varieties can be used in conjunction with electric or solar window operators for automatic opening and closing, while other windows are opened and closed manually. The calculations are based on the representative window type named GGL. In the LCA, the GGL was assessed to be a conservative choice for a representative window type.

The EPD is based on the glazing unit configuration 62.

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.

Variant	Window type	Glazing options	Description
GGL	 GGL -K-- -0--	--62	White painted or clear lacquered pivot-hinged window with ventilation flap and integrated handlebar along the top sash.
GGL Electric	 GGL -K-- -0--21	--62 --62D	White painted or clear lacquered GGL window with an electrical window opener, main operated.
GGL Solar	 GGL -K-- -0--30	--62	White painted or clear lacquered GGL window with an electrical window opener, solar powered.
VFE	 VFE -K-- -0--	--62	White painted or clear lacquered bottom-hinged window for vertical extension with handle on top sash

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 wooden roof windows are used in renovation and new build. 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](http://www.velux.com/ce).

The performance values are specific for each standard wooden roof window variant covered by the EPD. The declared values in the table relate to the reference product variant GGL with triple-glazed configuration 62 (GGL --62).

### Constructional data

Name	Value	Unit
Reaction to fire	C-s1,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	8 (toughened) - 11 - 3 (heat strengthened) - 11 - 6,8 (33.2) (laminated float heat strengthened)	mm
Water tightness acc. EN 12208 unprotected / protected	E900	class
Impact resistance (for window width <550mm or height <778mm no performance is determined)	3	class
Acoustic performance	42(-2;-5)	-
Load-bearing capacity of safety devices	passed	-
Thermal transmittance, 90 degree installation acc. to EN 10077-1/2	0.92	W/(m <sup>2</sup> K)
Solar factor	0.47	-
Light transmittance	0.68	-

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

Name	Value	Unit
Glazing unit (2-layer)	65	%
Wooden frame/sash	19	%
Steel components (galvanised and stainless)	3	%
Aluminium components	3	%
Other components (including packaging)	4	%
Packaging	6	%

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 Germany, Denmark, France, Hungary and Poland where they are assembled into the final window product. The aluminium, steel and glass used in the product

have 43, 10 and 12 % recycled content, respectively.

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<sup>2</sup> wooden roof window 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 GGL variant has the largest weight per m<sup>2</sup> 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 similar sizes and glazing units. The heavier the product, the larger the content of metal. Therefore, the GGL variant can be considered more representative as a worst-case scenario for the whole roof windows group.

### Declared unit and mass reference

Name	Value	Unit
Declared unit	1	m <sup>2</sup>
Grammage	46.12	kg/m <sup>2</sup>

Other declared units are allowed if the conversion is shown transparently.

For IBU core EPDs (where clause 3.6 is part of the EPD): for average EPDs, an estimate of the robustness of the LCA values must be made, e.g. concerning the variability of the production process, geographical representativeness and the influence of background data and preliminary products compared to the environmental impacts caused by the actual production.

### 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<sub>2</sub> 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

9.56 kg of wood is used in window frames/sashes and 0.04 kg of paper inlet is used per declared unit. For the packaging, 3.05 kg of cardboard and 0.01 kg of paper insert are used per declared unit.

### Information on describing the biogenic carbon content at factory gate

Name	Value	Unit
Biogenic carbon content in product	4.37	kg C
Biogenic carbon content in accompanying packaging	2.44	kg C

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO<sub>2</sub>.

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	3.05	kg
Paper packaging for waste treatment	0.01	kg
Steel packaging for waste treatment (galvanised)	0.003	kg

**End of life (C1-C4)**

Name	Value	Unit
Collected as mixed construction waste	46.12	kg
Recycling	12.38	kg
Energy recovery	10.79	kg
Landfilling	22.94	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 <sub>2</sub> eq	6.4E+01	6.32E+00	2.8E+01	1.34E-03	1.56E+00	1.87E+01	2.05E+00	-2.37E+01
GWP-fossil	kg CO <sub>2</sub> eq	1.01E+02	6.2E+00	5.6E+00	1.33E-03	1.54E+00	5.32E+00	3.71E-01	-2.36E+01
GWP-biogenic	kg CO <sub>2</sub> eq	-3.71E+01	1.48E-02	2.23E+01	1.19E-05	3.67E-03	1.33E+01	1.67E+00	-5.29E-02
GWP-luluc	kg CO <sub>2</sub> eq	8.36E-02	1.04E-01	3.54E-02	2.02E-07	2.59E-02	8.37E-04	2.07E-03	-5.35E-03
ODP	kg CFC11 eq	1.18E-06	9.12E-13	1.25E-09	3.01E-14	2.27E-13	-9.08E-09	9.76E-13	-7.01E-11
AP	mol H <sup>+</sup> eq	5.18E-01	8.73E-03	2.28E-02	2.57E-06	8.93E-03	4.73E-03	2.6E-03	-9.72E-02
EP-freshwater	kg P eq	4.76E-03	2.64E-05	6.98E-05	5.51E-09	6.57E-06	-2.07E-05	4.15E-06	-1.74E-05
EP-marine	kg N eq	1.14E-01	3.15E-03	1.09E-02	6.41E-07	4.35E-03	1.82E-03	7.03E-04	-2.47E-02
EP-terrestrial	mol N eq	1.29E+00	3.75E-02	1.14E-01	6.71E-06	4.84E-02	2.34E-02	7.57E-03	-2.76E-01
POCP	kg NMVOC eq	3E-01	8.69E-03	2.57E-02	1.69E-06	8.4E-03	4.8E-03	2.4E-03	-6.04E-02
ADPE	kg Sb eq	2.47E-04	5.39E-07	4.26E-06	2.49E-10	1.34E-07	-1.75E-07	2.32E-08	-5.89E-06
ADPF	MJ	1.43E+03	8.16E+01	7.9E+01	2.79E-02	2.03E+01	5.24E+00	4.95E+00	-3.27E+02
WDP	m <sup>3</sup> world eq deprived	1.41E+01	9.58E-02	2.35E-01	3.67E-04	2.38E-02	2.18E+00	4.26E-02	-4.23E+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	2.68E+02	7.01E+00	2.03E+02	2.01E-02	1.75E+00	1.47E+02	8.27E-01	-9.44E+01
PERM	MJ	3.65E+02	0	2.98E+01	0	0	-1.46E+02	0	0
PERT	MJ	6.33E+02	7.01E+00	2.32E+02	2.01E-02	1.75E+00	1.53E+00	8.27E-01	-9.44E+01
PENRE	MJ	1.32E+03	8.16E+01	7.92E+01	2.79E-02	2.03E+01	8.98E+01	4.95E+00	-3.27E+02
PENRM	MJ	1.14E+02	0	-1.65E-01	0	0	-8.46E+01	0	0
PENRT	MJ	1.43E+03	8.16E+01	7.9E+01	2.79E-02	2.03E+01	5.24E+00	4.95E+00	-3.27E+02
SM	kg	3.66E+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 <sup>3</sup>	4.84E-01	7.82E-03	2.49E-02	1.54E-05	1.94E-03	5.14E-02	1.29E-03	-1.58E-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	2.62E-03	3.12E-09	1.59E-06	4.03E-11	7.76E-10	3.3E-09	1.2E-09	-9.98E-08
NHWD	kg	1.24E+01	1.33E-02	1.67E-01	2.3E-05	3.31E-03	6.86E-01	2.27E+01	-4.98E+00
RWD	kg	2.91E-02	1.49E-04	1.52E-03	4.45E-06	3.69E-05	2.69E-04	5.3E-05	-1.45E-02
CRU	kg	0	0	0	0	0	0	0	0
MFR	kg	1.74E-02	0	1.55E+01	0	0	1.26E+01	0	0
MER	kg	0	0	0	0	0	0	0	0
EEE	MJ	3.45E-02	0	0	0	0	3.1E+01	0	0
EET	MJ	5.03E-02	0	0	0	0	5.67E+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 m<sup>2</sup> VELUX standard wooden roof window

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PM	Disease incidence	9.99E-06	9.23E-08	2.69E-07	2.15E-11	4.91E-08	2.83E-08	3.19E-08	-1.18E-06
IR	kBq U235 eq	5.77E+00	2.15E-02	2.52E-01	7.34E-04	5.36E-03	3.01E-02	6.34E-03	-2.15E+00
ETP-fw	CTUe	2.16E+03	6.06E+01	2.41E+01	8.08E-03	1.5E+01	2.81E+00	2.88E+00	-1.43E+02
HTP-c	CTUh	6.91E-07	1.22E-09	6.95E-09	4.54E-13	3.04E-10	1.83E-10	7.05E-11	-1.63E-08
HTP-nc	CTUh	6.86E-07	5.49E-08	7.06E-08	6.95E-12	1.36E-08	1.1E-08	3.69E-09	-1.39E-07
SQP	SQP	6.75E+03	4.01E+01	1.65E+02	1.17E-02	9.97E+00	5.74E-01	1.27E+00	-3.05E+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 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 galvanized 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 galvanized steel components. This is most likely due to the relatively high energy and water consumption in the production of aluminium.

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.

## 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](http://www.gabisoftware.com/support/gabi).



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# 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-20250263-CBI1-EN
Issue date	28.05.2025
Valid to	27.05.2030

**VELUX wooden roof windows GPL, GTL, GPLS, GBL, GIL, GLL,  
GXL (triple glazing configuration)  
VELUX Group**

[www.ibu-epd.com](http://www.ibu-epd.com) | <https://epd-online.com>



**General Information****VELUX Group****Programme holder**

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

**Declaration number**

EPD-VEL-20250263-CB11-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**

28.05.2025

**Valid to**

27.05.2030



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



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

**VELUX wooden roof windows GPL, GTL, GPLS, GBL, GIL, GLL, GXL (triple glazing configuration)****Owner of the declaration**

VELUX Group  
Ådalsvej 99  
2970 Hørsholm  
Denmark

**Declared product / declared unit**

The declared unit is 1 m<sup>2</sup> of a wooden roof window with triple glazing configuration (3-layer). The declared unit is based on the size 1.34 m x 1.40 m (UK08), 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 VELUX wooden roof windows as specified in more detail in the product description. The products are manufactured by the VELUX Group at production sites in different locations in Europe for sale throughout Europe. The windows' production takes place in Poland, Denmark, France and Germany. 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 wooden roof windows are skylight window products for sale in the European market. The product family covers a range of product varieties as specified in the table below. All windows have a 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). Some of the window varieties can be used in conjunction with electric or solar window operators for automatic opening and closing, while other windows are opened and closed manually. The calculations are based on the representative window type named GPL. In the LCA, the GPL was assessed to be a conservative choice for a representative window type.

The glass panes are with triple glazing (3-layer glazing unit) and different glass configurations are covered by the EPD. The EPD is based on an average of the glazing unit configurations: 15, 61, 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.

Variant	Window type	Glazing options	Description
GPL		GPL -K-- -0-- --66 --67 --68 --69	White painted or clear lacquered top-hung window with manual bottom operation, ventilation flap and integrated handlebar along the top sash and pivot-hinge for cleaning.
GPL Electric		GPL -K-- -0--21 --66	White painted or clear lacquered GPL window, with grid-connected electrical window opener.
GTL		GTL -K-- -0-- --66	White painted or clear lacquered top-hung window for rescue opening with manual bottom operation. Like GPU, but with gas springs to enable extra opening height and additional handles on the side sash.
GPLS 2-in-1 or 3-in-1		GPLS -K-- -0-- --66	White painted window, consisting of 2 or 3 window elements in one frame. One element is fixed, and the other element(s) are top-hung similar to GPL.
GBL		GBL -K-- -0-- --15	Like GGL, but for lower inclinations
GIL		GIL -K-- -0-- --66 --68	White painted or clear lacquered fixed window without opening mechanism or ventilation flap.
GLL		GLL -K-- -0-- --61 --64	Clear lacquered pivot-hung window with ventilation flap and integrated handlebar along the top sash.
GLL-B		GLL -K-- -0--B --61 --64	Clear lacquered pivot-hung window with ventilation slats at top sash and handle on bottom sash.
GXL		GXL -K-- -0-- --66	White painted or clear lacquered side-hung window for craftsman exit, with ventilation flap and integrated handle along top sash and handlebar in the side.

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 wooden roof windows are used in renovation and new build. 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](http://www.velux.com/ce).

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

### Constructional data

Name	Value	Unit
Reaction to fire	C-s1,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 <550 mm or height <778 mm 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	1.0	W/(m <sup>2</sup> 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 standard wooden roof window are the glazing unit (made of mainly laminated and tempered glass), wooden frames/sashes (made of wood), hinges (made of steel) and handles/handlebars (made of aluminium). The packaging of the products consists of mostly cardboard along with paper inserts and galvanised steel.

Name	Value	Unit
Glazing unit (3-layer)	53	%
Wooden frame/sash	17	%
Steel components (galvanised and stainless)	15	%
Aluminium components	4	%
Other components (including packaging)	4	%
Packaging	7	%

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.). For the glazing units, VELUX receives the glazing units components from suppliers and produces the final glazing unit 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, France and Germany, where they are assembled into the final

window product. The aluminium, steel and glass used in the product have 43, 10 and 12 % recycled content, respectively.

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<sup>2</sup> wooden roof window calculated based on the size 1.34 m x 1.40 m (UK08), which is the closest available size to the reference window size (1.23 m x 1.48 m based on *EN 14351-1*) with triple glazed window panes. The GGL variant has the largest weight per m<sup>2</sup> 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 similar sizes and glazing units. The heavier the product, the larger the content of metal. Therefore, the GPL variant can be considered more representative as a worst-case scenario for the whole roof windows group.

### Declared unit and mass reference

Name	Value	Unit
Declared unit	1	m <sup>2</sup>
Grammage	44.54	kg/m <sup>2</sup>

### 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 taking into account the residual electricity mix for the remaining electricity. 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<sub>2</sub> 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) database*.

## LCA: Scenarios and additional technical information

### Characteristic product properties of biogenic carbon

8.02 kg of wood is used in window frames/sashes and 0.03 kg of paper inlet is used per declared unit. For the packaging, 3.09 kg of cardboard and 0.01 kg of paper insert are used per declared unit.

### Information on describing the biogenic carbon content at factory gate

Name	Value	Unit
Biogenic carbon content in product	3.66	kg C
Biogenic carbon content in accompanying packaging	2.47	kg C

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO<sub>2</sub>.

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	3.09	kg
Paper packaging for waste treatment	0.01	kg
Steel packaging for waste treatment (galvanised)	0.0032	kg

**End of life (C1-C4)**

Name	Value	Unit
Collected as mixed construction waste	44.54	kg
Recycling	16	kg
Energy recovery	10.73	kg
Landfilling	17.76	kg
Omitted to atmosphere (Krypton gas in glazing unit)	0.055	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 <sub>2</sub> eq	9.12E+01	5.8E+00	2.53E+01	1.34E-03	1.39E+00	1.72E+01	1.69E+00	-3.42E+01
GWP-fossil	kg CO <sub>2</sub> eq	1.22E+02	5.69E+00	6.5E+00	1.33E-03	1.36E+00	6E+00	2.84E-01	-3.42E+01
GWP-biogenic	kg CO <sub>2</sub> eq	-3.1E+01	1.36E-02	1.88E+01	1.19E-05	3.26E-03	1.12E+01	1.4E+00	-3.63E-02
GWP-luluc	kg CO <sub>2</sub> eq	8.54E-02	9.54E-02	3.63E-02	2.02E-07	2.3E-02	1E-03	1.57E-03	-1.05E-02
ODP	kg CFC11 eq	9.72E-07	8.37E-13	1.41E-09	3.01E-14	2.01E-13	-6.84E-09	7.46E-13	-3.11E-11
AP	mol H <sup>+</sup> eq	4.95E-01	8.01E-03	2.35E-02	2.57E-06	7.93E-03	5.26E-03	1.98E-03	-1.19E-01
EP-freshwater	kg P eq	4.67E-03	2.42E-05	7.71E-05	5.51E-09	5.83E-06	-1.54E-05	4.05E-06	-1.75E-05
EP-marine	kg N eq	1.09E-01	2.89E-03	1.1E-02	6.41E-07	3.86E-03	2.16E-03	5.4E-04	-2.9E-02
EP-terrestrial	mol N eq	1.23E+00	3.44E-02	1.14E-01	6.71E-06	4.3E-02	2.67E-02	5.8E-03	-3.21E-01
POCP	kg NMVOC eq	3.09E-01	7.97E-03	2.6E-02	1.69E-06	7.46E-03	5.65E-03	1.86E-03	-7.86E-02
ADPE	kg Sb eq	8.11E-04	4.95E-07	5.14E-06	2.49E-10	1.19E-07	-1.03E-07	1.77E-08	-5.63E-06
ADPF	MJ	1.64E+03	7.49E+01	9.21E+01	2.79E-02	1.8E+01	5.39E+00	3.8E+00	-3.99E+02
WDP	m <sup>3</sup> world eq deprived	1.54E+01	8.79E-02	3.05E-01	3.67E-04	2.12E-02	2.02E+00	3.26E-02	-4.89E+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	3.34E+02	6.44E+00	2.55E+02	2.01E-02	1.55E+00	1.24E+02	6.31E-01	-8.74E+01
PERM	MJ	3.06E+02	0	3.71E+01	0	0	-1.22E+02	0	0
PERT	MJ	6.4E+02	6.44E+00	2.92E+02	2.01E-02	1.55E+00	1.45E+00	6.31E-01	-8.74E+01
PENRE	MJ	1.51E+03	7.49E+01	9.23E+01	2.79E-02	1.8E+01	1.03E+02	3.8E+00	-3.99E+02
PENRM	MJ	1.28E+02	0	-1.96E-01	0	0	-9.73E+01	0	0
PENRT	MJ	1.64E+03	7.49E+01	9.21E+01	2.79E-02	1.8E+01	5.39E+00	3.8E+00	-3.99E+02
SM	kg	3.77E+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 <sup>3</sup>	5.67E-01	7.18E-03	2.72E-02	1.54E-05	1.73E-03	4.76E-02	9.86E-04	-1.86E-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	2.53E-03	2.87E-09	1.97E-06	4.03E-11	6.89E-10	3.08E-09	9.15E-10	-5.68E-08
NHWD	kg	1.32E+01	1.22E-02	1.95E-01	2.3E-05	2.94E-03	9.43E-01	1.72E+01	-5.23E+00
RWD	kg	3.52E-02	1.36E-04	1.59E-03	4.45E-06	3.28E-05	2.49E-04	4.08E-05	-1.33E-02
CRU	kg	0	0	0	0	0	0	0	0
MFR	kg	1.74E-02	0	1.63E+01	0	0	1.6E+01	0	0
MER	kg	0	0	0	0	0	0	0	0
EEE	MJ	3.45E-02	0	0	0	0	3.01E+01	0	0
EET	MJ	5.03E-02	0	0	0	0	5.5E+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	9.74E-06	8.46E-08	2.67E-07	2.15E-11	4.36E-08	3.04E-08	2.43E-08	-1.63E-06
IR	kBq U235 eq	6.15E+00	1.98E-02	2.63E-01	7.34E-04	4.75E-03	2.97E-02	4.91E-03	-1.95E+00
ETP-fw	CTUe	2.03E+03	5.56E+01	2.72E+01	8.08E-03	1.34E+01	2.89E+00	2.25E+00	-1.36E+02
HTP-c	CTUh	6.67E-07	1.12E-09	9.04E-09	4.54E-13	2.7E-10	1.75E-10	5.47E-11	-3.53E-08
HTP-nc	CTUh	8.33E-07	5.04E-08	7.85E-08	6.95E-12	1.21E-08	1.04E-08	2.91E-09	-1.26E-07
SQP	SQP	5.72E+03	3.68E+01	1.92E+02	1.17E-02	8.85E+00	8.33E-01	9.66E-01	-2.1E+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 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 galvanized 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 galvanized steel components. This is most likely due to the relatively high energy and water consumption in the production of aluminium.

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.

## 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](http://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 database**

The LCA modelling software is LCA for Experts program version 10.7.1 with corresponding databases from Sphera Solutions GmbH (Managed LCA Content). Documentation hyperlink [www.gabisoftware.com/support/gabi](http://www.gabisoftware.com/support/gabi).



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# 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-20250262-CBI1-EN
Issue date	28.05.2025
Valid to	27.05.2030

**VELUX wooden roof windows GIL (62 triple glazing configuration)**  
**VELUX Group**

[www.ibu-epd.com](http://www.ibu-epd.com) | <https://epd-online.com>



**General Information****VELUX Group****Programme holder**

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

**Declaration number**

EPD-VEL-20250262-CB11-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**

28.05.2025

**Valid to**

27.05.2030



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



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

**VELUX wooden roof windows GIL (62 triple glazing configuration)****Owner of the declaration**

VELUX Group  
Ådalsvej 99  
2970 Hørsholm  
Denmark

**Declared product / declared unit**

The declared unit is 1 m<sup>2</sup> of a wooden roof window with triple glazing configuration 62. The declared unit is based on the size 1.34 m x 1.40 m (UK08), 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 VELUX wooden roof windows as specified in more detail in the product description. The products are manufactured by the VELUX Group at production sites in different locations in Europe for sale throughout Europe. The windows' production takes place in Poland, Denmark, France and Germany. 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.

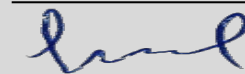
The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804*.

**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 wooden roof windows are skylight window products for sale in the European market. The covered product variant is specified in the table below. The windows has a wooden frame/sash and it cannot be opened (fixed). The calculations are based on the representative window type named GPL. In the LCA, the GPL was assessed to be a conservative choice for a representative window type.

The glass pane is triple glazing (3-layer glazing unit) and is based on the glazing unit configuration 62.

Only the window modules are included and 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.

Variant	Window type	Glazing options	Description
GIL		GIL -K- -0-	--62 White painted or clear lacquered fixed window without opening mechanism or ventilation flap.

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 wooden roof windows are used in renovation and new build. 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](http://www.velux.com/ce).

The performance values are specific for each standard wooden roof window variant covered by the EPD. The declared values in the table relate to the reference product including the variant GGL with triple-glazed configuration 62 (GGL --62).

### Constructional data

Name	Value	Unit
Reaction to fire	C-s1,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	8 (toughened) - 11 - 3 (heat strengthened) - 11 - 6,8 (33.2) (laminated float heat strengthened)	mm
Water tightness acc. EN 12208 unprotected / protected	E900	class
Impact resistance (for window width <550 mm or height <778 mm no performance is determined)	3	class
Acoustic performance	42 (-2; -5)	-
Load-bearing capacity of safety devices	passed	-
Thermal transmittance, 90 degree installation acc. to EN 10077-1/2	0.92	W/(m <sup>2</sup> K)
Solar factor	0.47	-
Light transmittance	0.68	-

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

Name	Value	Unit
Glazing unit (3-layer)	60	%
Wooden frame/sash	14	%
Steel components (galvanised and stainless)	13	%
Aluminium components	3	%
Other components (including packaging)	4	%
Packaging	7	

The wooden components (sashes, frames) are produced internally in VELUX facilities, located in Hungary, Poland, and France. 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.). For the glazing units, VELUX receives the glazing unit components from suppliers and produces the final 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, France and Germany, where they are assembled into the final

window product. The aluminium, steel and glass used in the product have 43, 10 and 12 % recycled content, respectively.

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<sup>2</sup> wooden roof window calculated based on the size 1.34 m x 1.40 m (UK08), which is the closest available size to the reference window size (1.23 m x 1.48 m based on EN 14351-1) with triple glazed window panes (configuration 62). The GPL variant has the largest weight per m<sup>2</sup> 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 similar sizes and glazing units. The heavier the product, the larger the content of metal. Therefore, the GPL variant can be considered more representative as a worst-case scenario for the whole roof windows group.

**Declared unit and mass reference**

Name	Value	Unit
Declared unit	1	m <sup>2</sup>
Grammage	52.39	kg/m <sup>2</sup>
Layer thickness (glazing unit)	0.0377	m

**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 taking into account the residual electricity mix for the remaining electricity. 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<sub>2</sub> 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)* database.

**LCA: Scenarios and additional technical information**

**Characteristic product properties of biogenic carbon**

8.02 kg of wood is used in window frames/sashes and 0.03 kg of paper inlet is used per declared unit. For the packaging, 3.09 kg of cardboard and 0.01 kg of paper insert are used per declared unit.

**Information on describing the biogenic carbon content at factory gate**

Name	Value	Unit
Biogenic carbon content in product	3.66	kg C
Biogenic carbon content in accompanying packaging	2.47	kg C

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO<sub>2</sub>.

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	3.09	kg
Paper packaging for waste treatment	0.01	kg
Steel packaging for waste treatment (galvanised)	0.0032	kg



**End of life (C1-C4)**

<b>Name</b>	<b>Value</b>	<b>Unit</b>
Collected as mixed construction waste	52.39	kg
Recycling	18.35	kg
Energy recovery	10.73	kg
Landfilling	23.26	kg
Omitted to atmosphere (Krypton gas in glazing unit)	0.055	kg

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

<b>Name</b>	<b>Value</b>	<b>Unit</b>
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 <sub>2</sub> eq	1.02E+02	6.63E+00	2.53E+01	1.34E-03	1.66E+00	1.72E+01	1.77E+00	-3.6E+01
GWP-fossil	kg CO <sub>2</sub> eq	1.33E+02	6.5E+00	6.52E+00	1.33E-03	1.63E+00	5.98E+00	3.67E-01	-3.59E+01
GWP-biogenic	kg CO <sub>2</sub> eq	-3.1E+01	1.55E-02	1.88E+01	1.19E-05	3.89E-03	1.12E+01	1.4E+00	-3.92E-02
GWP-luluc	kg CO <sub>2</sub> eq	8.89E-02	1.09E-01	3.66E-02	2.02E-07	2.74E-02	9.92E-04	2.06E-03	-1.09E-02
ODP	kg CFC11 eq	1.16E-06	9.57E-13	1.41E-09	3.01E-14	2.4E-13	-9.08E-09	9.68E-13	-3.51E-11
AP	mol H <sup>+</sup> eq	5.99E-01	9.12E-03	2.36E-02	2.57E-06	9.46E-03	5.18E-03	2.57E-03	-1.31E-01
EP-freshwater	kg P eq	4.81E-03	2.77E-05	7.72E-05	5.51E-09	6.96E-06	-2.07E-05	4.24E-06	-1.86E-05
EP-marine	kg N eq	1.33E-01	3.29E-03	1.11E-02	6.41E-07	4.61E-03	2.13E-03	6.9E-04	-3.24E-02
EP-terrestrial	mol N eq	1.5E+00	3.92E-02	1.15E-01	6.71E-06	5.13E-02	2.64E-02	7.46E-03	-3.59E-01
POCP	kg NMVOC eq	3.58E-01	9.07E-03	2.61E-02	1.69E-06	8.89E-03	5.58E-03	2.32E-03	-8.53E-02
ADPE	kg Sb eq	8.2E-04	5.66E-07	5.14E-06	2.49E-10	1.42E-07	-1.63E-07	2.31E-08	-5.69E-06
ADPF	MJ	1.78E+03	8.56E+01	9.23E+01	2.79E-02	2.15E+01	5.15E+00	4.88E+00	-4.25E+02
WDP	m <sup>3</sup> world eq deprived	1.62E+01	1.01E-01	3.05E-01	3.67E-04	2.52E-02	2.01E+00	4.21E-02	-5.01E+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	3.45E+02	7.36E+00	2.55E+02	2.01E-02	1.85E+00	1.24E+02	8.21E-01	-9.02E+01
PERM	MJ	3.06E+02	0	3.71E+01	0	0	-1.22E+02	0	0
PERT	MJ	6.51E+02	7.36E+00	2.92E+02	2.01E-02	1.85E+00	1.43E+00	8.21E-01	-9.02E+01
PENRE	MJ	1.65E+03	8.56E+01	9.25E+01	2.79E-02	2.15E+01	1.02E+02	4.88E+00	-4.25E+02
PENRM	MJ	1.28E+02	0	-1.96E-01	0	0	-9.73E+01	0	0
PENRT	MJ	1.78E+03	8.56E+01	9.23E+01	2.79E-02	2.15E+01	5.15E+00	4.88E+00	-4.25E+02
SM	kg	3.77E+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 <sup>3</sup>	5.9E-01	8.2E-03	2.72E-02	1.54E-05	2.06E-03	4.75E-02	1.27E-03	-1.9E-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	2.53E-03	3.28E-09	1.97E-06	4.03E-11	8.22E-10	3.08E-09	1.19E-09	-6.25E-08
NHWD	kg	1.45E+01	1.4E-02	1.95E-01	2.3E-05	3.51E-03	9.43E-01	2.27E+01	-5.64E+00
RWD	kg	3.75E-02	1.56E-04	1.59E-03	4.45E-06	3.91E-05	2.49E-04	5.22E-05	-1.39E-02
CRU	kg	0	0	0	0	0	0	0	0
MFR	kg	1.74E-02	0	1.71E+01	0	0	1.84E+01	0	0
MER	kg	0	0	0	0	0	0	0	0
EEE	MJ	3.45E-02	0	0	0	0	3.01E+01	0	0
EET	MJ	5.03E-02	0	0	0	0	5.5E+01	0	0

**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	1.04E-05	9.57E-08	2.67E-07	2.15E-11	5.2E-08	2.92E-08	3.17E-08	-1.71E-06
IR	kBq U235 eq	6.59E+00	2.26E-02	2.63E-01	7.34E-04	5.67E-03	2.69E-02	6.22E-03	-2.05E+00
ETP-fw	CTUe	2.24E+03	6.36E+01	2.73E+01	8.08E-03	1.59E+01	2.83E+00	2.87E+00	-1.61E+02
HTP-c	CTUh	6.69E-07	1.28E-09	9.04E-09	4.54E-13	3.22E-10	1.66E-10	6.95E-11	-3.55E-08
HTP-nc	CTUh	8.86E-07	5.76E-08	7.86E-08	6.95E-12	1.44E-08	1.03E-08	3.48E-09	-1.38E-07
SQP	SQP	5.74E+03	4.2E+01	1.92E+02	1.17E-02	1.06E+01	5.04E-01	1.26E+00	-2.28E+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 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 galvanized 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 galvanized steel components. This is most likely due to the relatively high energy and water consumption in the production of aluminium.

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.

## 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](http://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 database**

The LCA modelling software is LCA for Experts program version 10.7.1 with corresponding databases from Sphera Solutions GmbH (Managed LCA Content). Documentation hyperlink [www.gabisoftware.com/support/gabi](http://www.gabisoftware.com/support/gabi).

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# 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-20250264-CBI1-EN
Issue date	28.05.2025
Valid to	27.05.2030

**VELUX wooden roof windows GPL, GTL, GPLS, GIL, GXL (double glazing configuration)**

**VELUX Group**

[www.ibu-epd.com](http://www.ibu-epd.com) | <https://epd-online.com>



ECO PLATFORM  
**EPD**  
VERIFIED

**General Information****VELUX Group****Programme holder**

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10117 Berlin  
Germany

**Declaration number**

EPD-VEL-20250264-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**

28.05.2025

**Valid to**

27.05.2030



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



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

**VELUX wooden roof windows GPL, GTL, GPLS, GIL, GXL (double glazing configuration)****Owner of the declaration**

VELUX Group  
Ådalsvej 99  
2970 Hørsholm  
Denmark

**Declared product / declared unit**

The declared unit is 1 m<sup>2</sup> of a wooden roof window with double glazing configuration (2-layer). The declared unit is based on the size 1.34 m x 1.40 m (UK08), 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 wooden 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 takes place in Poland, Denmark, France and Germany.

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 wooden roof windows are skylight window products for sale in the European market. The product family covers a range of product varieties as specified in the table below. All windows have a 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). Some of the window varieties can be used in conjunction with electric or solar window operators for automatic opening and closing, while other windows are opened and closed manually. The calculations are based on the representative window type named GPL. In the LCA, the GPL was assessed to be a conservative choice for a representative window type.

The glass panes are with double glazing (2-layer glazing) and different glass configurations are covered by the EPD. The EPD is based on an average of the following glazing unit configurations: 50/51, 70, 70 Q, 76.

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.

Variant	Window type	Glazing options	Description
GPL		GPL -K-- 0-- --70	White painted or clear lacquered top-hung window with manual bottom operation, ventilation flap and integrated handlebar along the top sash and pivot-hinge for cleaning.
GPL Electric		GPL -K-- 0--21 --70	White painted or clear lacquered GPL window, with grid-connected electrical window opener.
GTL		GTL -K-- 0-- --70	White painted or clear lacquered top-hung window for rescue opening with manual bottom operation. Like GPU, but with gas springs to enable extra opening height and additional handles on the side sash.
GPLS 2-in-1 or 3-in-1		GPLS -K-- 0-- --70	White painted window, consisting of 2 or 3 window elements in one frame. One element is fixed, and the other element(s) are top-hung similar to GPL.
GIL		GIL -K-- 0-- --70	White painted or clear lacquered fixed window without opening mechanism or ventilation flap.
GZL		GZL -K-- 0-- --51	Clear lacquered pivot-hung window with ventilation flap and integrated handlebar along the top sash.
GZL-B		GZL -K-- 0--B --51	Clear lacquered pivot-hung window with ventilation slats at top sash and handle on bottom sash.
GXL		GXL -K-- 0-- --70	White painted or clear lacquered side-hung window for craftsman exit, with ventilation flap and integrated handle along top sash and handlebar in the side.

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 wooden roof windows are used in renovation and new build. 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](http://www.velux.com/ce).

The performance values are specific for each standard wooden roof window variant covered by the EPD. The declared values in the table relate to the reference product including the variant GPL with double-glazed configuration 70 (GPL --70).

### Constructional data

Name	Value	Unit
Reaction to fire	C-s1,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) - 16 - 6,8 (laminated float)	mm
Water tightness acc. EN 12208 unprotected / protected	E900	class
Impact resistance (for window width<550mm or height<778mm no performance is determined)	3	class
Acoustic performance	35 (-1; -3)	-
Load-bearing capacity of safety devices	passed	-
Thermal transmittance, 90 degree installation acc. to EN 10077-1/2	1.3	W/(m <sup>2</sup> K)
Solar factor	0.46	-
Light transmittance	0.68	-

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

Name	Value	Unit
Glazing unit (2-layer)	47	%
Wooden frame/sash	19	%
Steel components (galvanised and stainless)	17	%
Aluminium components	4	%
Other components (including packaging)	5	%
Packaging	7	%

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.). For the glazing units, VELUX receives the glazing unit components from suppliers and produces the final 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, France and Germany, where they are assembled into the final window product. The aluminium, steel and glass used in the product have 43, 10 and 12 % recycled content, respectively.

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<sup>2</sup> wooden roof window calculated based on the size 1.34 m x 1.40 m (UK08), which is the closest available size to the reference window size (1.23 m x 1.48 m based on EN 14351-1) with double-glazed window panes. The GPL variant has the largest weight per m<sup>2</sup> in the 2-layer glazing 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 similar sizes and glazing units. The heavier the product, the larger the content of metal. Therefore, the GPL variant can be considered more representative as a worst-case scenario for the whole roof windows group.

### Declared unit and mass reference

Name	Value	Unit
Declared unit	1	m <sup>2</sup>
Grammage	38.78	kg/m <sup>2</sup>

### 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<sub>2</sub> 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

8.02 kg of wood is used in window frames/sashes and 0.03 kg of paper inlet is used per declared unit. For the packaging, 3.09 kg of cardboard and 0.01 kg of paper insert are used per declared unit.

### Information on describing the biogenic carbon content at factory gate

Name	Value	Unit
Biogenic carbon content in product	3.66	kg C
Biogenic carbon content in accompanying packaging	2.47	kg C

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO<sub>2</sub>.

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	3.09	kg
Paper packaging for waste treatment	0.01	kg
Steel packaging for waste treatment (galvanised)	0.0032	kg

**End of life (C1-C4)**

Name	Value	Unit
Collected as mixed construction waste	38.76	kg
Recycling	14.35	kg
Energy recovery	10.33	kg
Landfilling	14.08	kg
Omitted to atmosphere (Argon gas in glazing unit)	0.022	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 <sub>2</sub> eq	7.22E+01	4.78E+00	2.53E+01	1.34E-03	1.2E+00	1.65E+01	1.63E+00	-3.26E+01
GWP-fossil	kg CO <sub>2</sub> eq	1.03E+02	4.69E+00	6.49E+00	1.33E-03	1.17E+00	5.28E+00	2.29E-01	-3.25E+01
GWP-biogenic	kg CO <sub>2</sub> eq	-3.11E+01	1.12E-02	1.88E+01	1.19E-05	2.81E-03	1.12E+01	1.4E+00	-3.3E-02
GWP-luluc	kg CO <sub>2</sub> eq	6.69E-02	7.87E-02	3.61E-02	2.02E-07	1.98E-02	9.99E-04	1.24E-03	-1.01E-02
ODP	kg CFC11 eq	5.07E-07	6.9E-13	1.41E-09	3.01E-14	1.73E-13	-5.34E-09	5.97E-13	-2.45E-11
AP	mol H <sup>+</sup> eq	3.74E-01	6.65E-03	2.34E-02	2.57E-06	6.84E-03	4.76E-03	1.59E-03	-1.11E-01
EP-freshwater	kg P eq	2.82E-04	2E-05	7.7E-05	5.51E-09	5.03E-06	-1.18E-05	3.63E-06	-1.61E-05
EP-marine	kg N eq	8.43E-02	2.4E-03	1.1E-02	6.41E-07	3.33E-03	1.9E-03	4.39E-04	-2.66E-02
EP-terrestrial	mol N eq	9.51E-01	2.85E-02	1.14E-01	6.71E-06	3.7E-02	2.38E-02	4.69E-03	-2.94E-01
POCP	kg NMVOC eq	2.5E-01	6.62E-03	2.59E-02	1.69E-06	6.43E-03	5.01E-03	1.55E-03	-7.36E-02
ADPE	kg Sb eq	7.76E-04	4.08E-07	5.14E-06	2.49E-10	1.03E-07	-6.39E-08	1.41E-08	-4.09E-06
ADPF	MJ	1.35E+03	6.18E+01	9.19E+01	2.79E-02	1.55E+01	5.32E+00	3.07E+00	-3.74E+02
WDP	m <sup>3</sup> world eq deprived	1.17E+01	7.25E-02	3.05E-01	3.67E-04	1.82E-02	1.93E+00	2.63E-02	-4.74E+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	3.01E+02	5.31E+00	2.55E+02	2.01E-02	1.34E+00	1.24E+02	5.04E-01	-8.29E+01
PERM	MJ	3.06E+02	0	3.71E+01	0	0	-1.22E+02	0	0
PERT	MJ	6.07E+02	5.31E+00	2.92E+02	2.01E-02	1.34E+00	1.4E+00	5.04E-01	-8.29E+01
PENRE	MJ	1.23E+03	6.18E+01	9.21E+01	2.79E-02	1.55E+01	8.93E+01	3.07E+00	-3.74E+02
PENRM	MJ	1.13E+02	0	-1.69E-01	0	0	-8.4E+01	0	0
PENRT	MJ	1.35E+03	6.18E+01	9.19E+01	2.79E-02	1.55E+01	5.32E+00	3.07E+00	-3.74E+02
SM	kg	3.67E+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 <sup>3</sup>	4.64E-01	5.92E-03	2.72E-02	1.54E-05	1.49E-03	4.56E-02	7.93E-04	-1.81E-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	2.52E-03	2.37E-09	1.97E-06	4.03E-11	5.94E-10	2.96E-09	7.34E-10	-4.78E-08
NHWD	kg	1.23E+01	1.01E-02	1.91E-01	2.3E-05	2.53E-03	9.16E-01	1.35E+01	-4.95E+00
RWD	kg	3.24E-02	1.12E-04	1.58E-03	4.45E-06	2.82E-05	2.41E-04	3.31E-05	-1.23E-02
CRU	kg	0	0	0	0	0	0	0	0
MFR	kg	1.74E-02	0	1.57E+01	0	0	1.43E+01	0	0
MER	kg	0	0	0	0	0	0	0	0
EEE	MJ	3.45E-02	0	0	0	0	2.81E+01	0	0
EET	MJ	5.03E-02	0	0	0	0	5.12E+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 m<sup>2</sup> VELUX standard wooden roof window

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PM	Disease incidence	8.89E-06	7.09E-08	2.66E-07	2.15E-11	3.76E-08	2.91E-08	1.94E-08	-1.57E-06
IR	kBq U235 eq	4.4E+00	1.63E-02	2.63E-01	7.34E-04	4.1E-03	3.04E-02	4.02E-03	-1.79E+00
ETP-fw	CTUe	1.47E+03	4.59E+01	2.7E+01	8.08E-03	1.15E+01	2.82E+00	1.81E+00	-1.19E+02
HTP-c	CTUh	4.59E-07	9.26E-10	9.04E-09	4.54E-13	2.32E-10	1.75E-10	4.46E-11	-3.5E-08
HTP-nc	CTUh	6.93E-07	4.15E-08	7.84E-08	6.95E-12	1.04E-08	1E-08	2.52E-09	-1.16E-07
SQP	SQP	5.69E+03	3.03E+01	1.92E+02	1.17E-02	7.63E+00	9.98E-01	7.66E-01	-1.83E+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 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 galvanized 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 galvanized steel components. This is most likely due to the relatively high energy and water consumption in the production of aluminium.

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.

## 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

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### IBU 2021

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### 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](http://www.gabisoftware.com/support/gabi).



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