SENTINEL HOLDING
INSTITUT

SHI PRODUCT PASSPORT

Find products. Certify buildings.

SHI Product Passport No.:

15305-10-1001

VELUX Schwingfenster aus Holz

Product group: Wood aluminum window

VELUX®

VELUX A/S
Aadalsvej 99
2970 Hørsholm

Product qualities:

- **SHI** Product Assessment 2024
- **QNG** Qualitätssiegel Nachhaltiges Gebäude
- **DGNB** NEW CONSTRUCTION 2023
- **DGNB** NEW CONSTRUCTION 2018
- **BNB-BN** NEUBAU V2015
- **BREEAM** DE NEUBAU 2018

CERTIFIED SUSTAINABLE PRODUCT
SHI PRODUCT PASSPORT
SENTINEL HOLDING INSTITUT
www.sentinel-holding.eu

Köttner

Helmut Köttner
Scientific Director
Freiburg, 28 November 2025

SENTINEL HOLDING
INSTITUT

Product:
VELUX Schwingfenster aus Holz

SHI Product Passport no.:
15305-10-1001

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The SHI Database is the first and only database for construction products whose comprehensive processes and data accuracy are regularly verified by the independent auditing company SGS-TÜV Saar

SGS TÜV SAAR

SENTINEL HOLDING
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Product:
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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 ≤ 300 µg/m^3 Formaldehyd ≤ 24 µg/m^3	Indoor Air Quality Certified
Valid untill: 20 March 2027			

Product:
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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	not applicable	not applicable	QNG ready - Not relevant for assessment

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

Aluminium-Vorsatzschale

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

Product:
VELUX Schwingfenster aus Holz

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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
Verification: 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
Verification: 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
Verification: 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 automised product package. /The product is charaterised 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
Verification: PEFC zertifiziert	

Criteria	Assessment
SOC1.1 Thermal comfort (*)	May positively contribute to the overall building score
Verification: 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
Verification: 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
Verification: Connected to ECO 1.1	

Criteria	Assessment
TEC1.3 Quality of the building envelope (*)	May positively contribute to the overall building score
Verification: 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
Verification: we offer products which can integrate automation systems.	

Criteria	Assessment
SOC1.2 Indoor air quality (*)	May positively contribute to the overall building score
Verification: 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
Verification: 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
Verification: 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
Verification: 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
Verification: Herstellererklärung vom 04.08.2025			

Product:
VELUX Schwingfenster aus Holz

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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
Verification: 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
Verification: Herstellererklärung vom 04.08.2025			

Product:
VELUX Schwingfenster aus Holz

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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			

Product:
VELUX Schwingfenster aus Holz

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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

Product:
VELUX Schwingfenster aus Holz

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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.

Find our criteria here: https://www.sentinel-holding.eu/de/Themenwelten/Pr%C3%BCfkriterien%20of%C3%BCr%20Produkte

The SHI Database is the first and only database for construction products whose comprehensive processes and data accuracy are regularly verified by the independent auditing company SGS-TÜV Saar

SGS TÜV SAAR

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VELUX roof window GGL

Glazing 66SG

15°-90°

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.

CE

VRW Roof windows en-WW - Approved
Creation date 25-02-2025 21:47:48

Application guidance

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.

Creation date 25-02-2025 21:47:48

Available sizes and daylight area

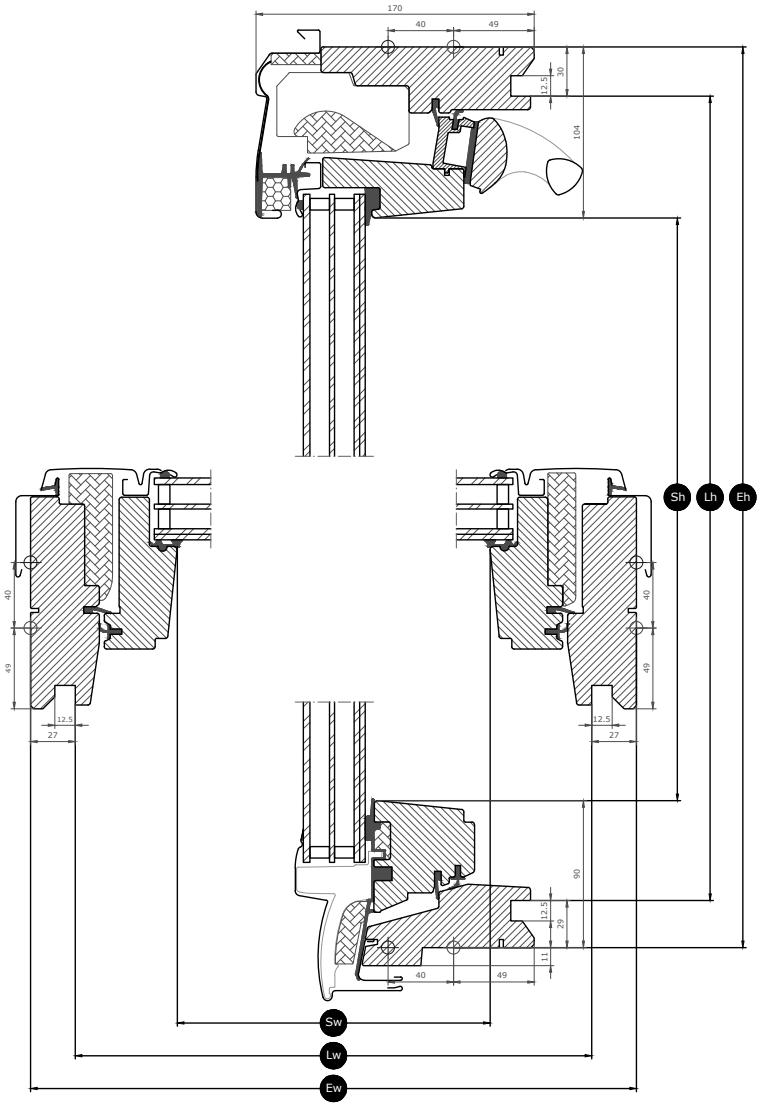
	472 mm	550 mm	660 mm	780 mm	942 mm	1140 mm	1340 mm
550 mm					GGL PK25 (0.27) [0.31]		
624 mm				GGL MK27 (0.26) [0.30]			
698 mm		GGL CK01 (0.19) [0.23]				GGL SK01 (0.48) [0.54]	
778 mm		GGL CK02 (0.22) [0.26]					
978 mm	GGL BK04 (0.23) [0.28]	GGL CK04 (0.29) [0.34]	GGL FK04 (0.38) [0.43]	GGL MK04 (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				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				GGL MK12 (0.97) [1.07]			

All measurements are in mm. ( ) = Effective daylight area, m^2 [ ] = Geometric free area, m^2

Creation date 25-02-2025 21:47:48

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

Creation date 25-02-2025 21:47:48

Technical values for the window

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/(m²K)
Light transmittance (τ,v)	0.62
Total solar energy transmittance (g-value)	0.44
Sound insulation (Rw)	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

Creation date 25-02-2025 21:47:48

Visible features

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.

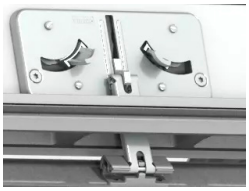
Blind bracket, manual
Easily install blinds on the window without the need for extra tools. Simply click on the blind in the pre-fitted brackets.

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

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

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

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

Creation date 25-02-2025 21:47:48

Flashings and installation products

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

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

We reserve the right to make technical changes.

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

Creation date 25-02-2025 21:47:48

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

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DK-2970 Hørsholm
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+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.

Birthe Kjeldsen

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

To Whom it May Concern

Ådalsvej 99
DK-2970 Hørsholm
Denmark
+45 45 16 40 00 Telephone
+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[1] 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
Senior manager
Technical Values
Standardisation & Technical Performance
VELUX A/S
Ådalsvej 99, DK 2970 Hørsholm

[1] 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.

Place and date:
Espoo, 19 September 2022

PEFC
PEFC/02-44-32
www.pefc.fi

FINAS
Finnish Accreditation Service
S018 (EN ISO/IEC 17065)

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

Kimmo Haarala
Management Representative

Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.

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

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

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

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 Felelösségü 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 (Feuquiéres-en-Vimeu)	ul. Krakowiaków 34, PL-02-255 Warszawa, Poland	Sales of wooden roof windows
VKR France (Feuquières-en-Vimeu)	Zone Industrielle, 80210, Feuquiéres-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

Product category:	08031 (Windows)
Material category:	PEFC certified
Applied chain of custody method:	Percentage
Tree species:	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

Institut Bauen und Umwelt e.V.

ECO PLATFORM EPD VERIFIED

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-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^2 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-hinged 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-hinged 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-hinged similar to GGL and equipped with solar powered window operator.
GZL		GZL -K-- -0--	--51	Clear lacquered pivot-hinged window with ventilation flap and integrated handlebar along the top sash.
GZL-B		GZL -K-- -0--B	--51	Clear lacquered pivot-hinged window with ventilation slats at top sash and handle on bottom sash.
VFA		VFA -K-- -0--	--70	White painted or clear lacquered side-hinged 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-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.

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^{2}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^2 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^2 in the product group. Since the frame/sash construction is alike across all variants in the product group, the parts that set the variants apart are primarily the window-operation components, such as hinges, handles and ventilation flaps. These components are to a high degree metal-based, and the worst-case product can thus be identified by the weight of products with 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^2
Grammage	33.95	kg/m^2

System boundary

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

Product stage:

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

End of life stage:

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

Benefits and loads beyond the system boundaries:

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

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

Geographic Representativeness

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

Comparability

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

LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

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_2.

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

Scenario information for packaging generated in module A5

Name	Value	Unit
Cardboard packaging for waste treatment	3.05	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_2 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_2 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_2 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_2 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^+ 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^3 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^3	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.

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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

Institut Bauen und Umwelt e.V.

ECO PLATFORM EPD VERIFIED

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-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^2 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.

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^{2}K)
Solar factor	0.44	-
Light transmittance	0.62	-

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

Base materials/Ancillary materials

The main components of the 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^2 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^2 in the product group. Since the frame/sash construction is alike across all variants in the product group, the parts that set the variants apart are primarily the window-operation components, such as hinges, handles and ventilation flaps. These components are to a high degree metal-based, and the worst-case product can thus be identified by the weight of products with 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^2
Grammage	39.71	kg/m^2

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_2 eq. / kWh.

Geographic Representativeness

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

Comparability

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

LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

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_2.

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

Scenario information for packaging generated in module A5

Name	Value	Unit
Cardboard packaging for waste treatment	3.05	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_2 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_2 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_2 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_2 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^+ 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^3 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^3	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 m2 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

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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.

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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

Institut Bauen und Umwelt e.V.

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

ECO PLATFORM EPD VERIFIED

General Information

VELUX Group

Programme holder

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

Declaration number

EPD-VEL-20250260-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, 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^2 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.

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^{2}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^2 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^2 in the product group. Since the frame/sash construction is alike across all variants in the product group, the parts that set the variants apart are primarily the window-operation components, such as hinges, handles and ventilation flaps. These components are to a high degree metal-based, and the worst-case product can thus be identified by the weight of products with 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^2
Grammage	46.12	kg/m^2

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_2 eq. / kWh.

Geographic Representativeness

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

Comparability

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

LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

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_2.

The construction process stage and the use stage modules are not declared. However, the quantity of packaging generated in

module A5 is declared as scenario information.

Scenario information for packaging generated in module A5

Name	Value	Unit
Cardboard packaging for waste treatment	3.05	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_2 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_2 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_2 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_2 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^+ 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^3 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^3	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 m2 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
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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.

Publisher

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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

Institut Bauen und Umwelt e.V.

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

ECO PLATFORM EPD VERIFIED

General Information

VELUX Group

Programme holder

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

Declaration number

EPD-VEL-20250262-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 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^2 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.

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^{2}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^2 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^2 in the product group. Since the frame/sash construction is alike across all variants in the product group, the parts that set the variants apart are primarily the window-operation components, such as hinges, handles and ventilation flaps. These components are to a high degree metal-based, and the worst-case product can thus be identified by the weight of products with 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^2
Grammage	52.39	kg/m^2
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 CO2 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_2.

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

Scenario information for packaging generated in module A5

Name	Value	Unit
Cardboard packaging for waste treatment	3.09	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	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

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

LCA: Results

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

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

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

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	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_2 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_2 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_2 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^+ 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^3 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^3	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

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	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

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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

Institut Bauen und Umwelt e.V.

ECO PLATFORM EPD VERIFIED

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

General Information

VELUX Group

Programme holder

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

Declaration number

EPD-VEL-20250263-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, GBL, GIL, GLL, GXL (triple glazing configuration)

Owner of the declaration

VELUX Group
Ådalsvej 99
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Declared product / declared unit

The declared unit is 1 m^2 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 hight 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-hinged window with ventilation flap and integrated handlebar along the top sash.
GLL-B		GLL -K-- -0—B	--61 --64	Clear lacquered pivot-hinged window with ventilation slats at top sash and handle on bottom sash.
GXL		GXL -K-- -0--	--66	White painted or clear lacquered side-hinged 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.

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^{2}K)
Solar factor	0.44	-
Light transmittance	0.62	-

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

Base materials/Ancillary materials

The main components of the 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^2 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 m2 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^2
Grammage	44.54	kg/m^2

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_2 eq / kWh.

Geographic Representativeness

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

Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account. Average secondary datasets were retrieved from the *Managed LCA Content (v2024.2) 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_2.

The construction process stage and the use stage modules are not declared. However, the quantity of packaging generated in

module A5 is declared as scenario information.

Scenario information for packaging generated in module A5

Name	Value	Unit
Cardboard packaging for waste treatment	3.09	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_2 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_2 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_2 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_2 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^+ 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^3 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^3	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
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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: 91.060.50Doors 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 andrepealing 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.

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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

Institut Bauen und Umwelt e.V.

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

ECO PLATFORM EPD VERIFIED

General Information

VELUX Group

Programme holder

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

Declaration number

EPD-VEL-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.)

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Owner of the declaration

VELUX Group
Ådalsvej 99
2970 Hørsholm
Denmark

Declared product / declared unit

The declared unit is 1 m^2 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 hight 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-hinged window with ventilation flap and integrated handlebar along the top sash.
GZL-B		GZL -K-- -0--B	--51	Clear lacquered pivot-hinged window with ventilation slats at top sash and handle on bottom sash.
GXL		GXL -K-- -0--	--70	White painted or clear lacquered side-hinged 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.

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^{2}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^2 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^2 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^2
Grammage	38.78	kg/m^2

System boundary

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

Product stage:

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

End of life stage:

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

Benefits and loads beyond the system boundaries:

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

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

Geographic Representativeness

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

Comparability

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

LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

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_2.

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

Scenario information for packaging generated in module A5

Name	Value	Unit
Cardboard packaging for waste treatment	3.09	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_2 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_2 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_2 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_2 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^+ 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^3 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^3	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 m2 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
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.

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