SENTINEL HOLDING
INSTITUT

SHI-PRODUKTPASS

Produkte finden - Gebäude zertifizieren

SHI-Produktpass-Nr.:

15305-10-1002

VELUX Schwingfenster aus Kunststoff

Warengruppe: Kunststofffenster - Fenster

VELUX®

VELUX A/S
Aadalsvej 99
2970 Hørsholm

Produktqualitäten:

- SHI-Produkt bewertung 2024 ✓
- QNG Qualitätssiegel Nachhaltiges Gebäude ✓
- DGNB NEUBAU 2023 ✓
- DGNB NEUBAU 2018 ✓
- BNB-BN NEUBAU V2015 ✓
- BREEAM DE NEUBAU 2018 ✓

GEPRÜFT NACHHALTIGES PRODUKT
SHI PRODUKT PASS
SENTINEL HOLDING INSTITUT
www.sentinel-holding.eu

Köttner

Helmut Köttner
Wissenschaftlicher Leiter
Freiburg, den 27.08.2025

SENTINEL HOLDING
INSTITUT

Produkt:
VELUX Schwingfenster aus Kunststoff

SHI Produktpass-Nr.:
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Inhalt

Wir sind stolz darauf, dass die SHI-Datenbank, die erste und einzige Datenbank für Bauprodukte ist, die ihre umfassenden Prozesse sowie die Aktualität regelmäßig von dem unabhängigen Prüfunternehmen SGS-TÜV Saar überprüfen lässt.

SGS

SGS TÜV SAAR

SENTINEL HOLDING
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SHI-Produktbewertung 2024

Seit 2008 etabliert die Sentinel Holding Institut GmbH (SHI) einen einzigartigen Standard für schadstoffgeprüfte Produkte. Experten führen unabhängige Produktprüfungen nach klaren und transparenten Kriterien durch. Zusätzlich überprüft das unabhängige Prüfunternehmen SGS regelmäßig die Prozesse und Aktualität.

Kriterium	Produktkategorie	Schadstoffgrenzwert	Bewertung
SHI-Produktbewertung	sonstige Produkte	TVOC ≤ 300 µg/m³ Formaldehyd ≤ 24 µg/m³	Schadstoffgeprüft
Gültig bis: 20.04.2027			

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Qualitätssiegel Nachhaltiges Gebäude

Das Qualitätssiegel Nachhaltiges Gebäude, entwickelt durch das Bundesministerium für Wohnen, Stadtentwicklung und Bauwesen (BMWSB), legt Anforderungen an die ökologische, soziokulturelle und ökonomische Qualität von Gebäuden fest. Das Sentinel Holding Institut prüft Bauprodukte gemäß den QNG-Anforderungen für eine Zertifizierung und vergibt das QNG-ready Siegel. Das Einhalten des QNG-Standards ist Voraussetzung für den KfW-Förderkredit. Für bestimmte Produktgruppen hat das QNG derzeit keine spezifischen Anforderungen definiert. Diese Produkte sind als nicht bewertungsrelevant eingestuft, können jedoch in QNG-Projekten genutzt werden.

Allgemeine Bewertung

Kriterium	Pos. / Bauproduktgruppe	Betrachtete Stoffe	QNG Freigabe
3.1.3 Schadstoffvermeidung in Baumaterialien	nicht zutreffend	nicht zutreffend	QNG-ready nicht bewertungsrelevant
Nachweis: Produkt besteht aus PU, nicht PVC			

Holzanteil

Kriterium	Pos. / Bauproduktgruppe	Betrachtete Stoffe	QNG Freigabe
3.1.3 Schadstoffvermeidung in Baumaterialien	nicht zutreffend	nicht zutreffend	QNG-ready nicht bewertungsrelevant

Kriterium	Bewertung
ANF2-WG1 Nachhaltige Materialgewinnung	Kann Gesamtbewertung positiv beeinflussen
Nachweis: PEFC zertifiziert	

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DGNB Neubau 2023

Das DGNB-System (Deutsche Gesellschaft für Nachhaltiges Bauen) bewertet die Nachhaltigkeit von Gebäuden verschiedener Art. Das System ist sowohl anwendbar für private und gewerbliche Großprojekte als auch für kleinere Wohngebäude. Die Version 2023 setzt hohe Standards für ökologische, ökonomische, soziokulturelle und funktionale Aspekte während des gesamten Lebenszyklus eines Gebäudes.

Allgemeine Bewertung

Kriterium	Bewertung
ECO 1.1 Gebäudebezogene Kosten im Lebenszyklus (*)	Kann Gesamtbewertung positiv beeinflussen
Nachweis: 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.	

Kriterium	Bewertung
ECO 2.6 Klimaresilienz (*)	Kann Gesamtbewertung positiv beeinflussen
Nachweis: 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.	

Kriterium	Bewertung
ENV 1.1 Klimaschutz und Energie (*)	Kann Gesamtbewertung positiv beeinflussen
Nachweis: Some of the products include PV cells. This generates PV panels on both the roof and in the product./Connected to ECO 1.1 as well as an implementation of the automation of the windows and Velux Active./ The product is charaterised for its high durability (see life time test attached), but is not characterised for its recyclability. We do not have any external test of durability, but have internal test protocols that must be fulfilled in product developement and rutine testing. What could be a suited docementation?	

Kriterium	Bewertung
SOC 1.1 Thermischer Komfort (*)	Kann Gesamtbewertung positiv beeinflussen
Nachweis: The opening of the windows introduce fresh air into the building	

Kriterium	Bewertung
SOC 1.3 Schallschutz und akustischer Komfort (*)	Kann Gesamtbewertung positiv beeinflussen
Nachweis: We offer some products with high sound properties as well as external accessories	

Kriterium	Bewertung
SOC 1.4 Visueller Komfort (*)	Kann Gesamtbewertung positiv beeinflussen
Nachweis: Connected to ECO 1.1	

Kriterium	Bewertung
TEC 1.3 Qualität der Gebäudehülle (*)	Kann Gesamtbewertung positiv beeinflussen
Nachweis: We offer some products with higher insulation properties with various glazings and an addition of various accessories	

Kriterium	Bewertung
TEC 1.4 Einsatz und Integration von Gebäudetechnik (*)	Kann Gesamtbewertung positiv beeinflussen
Nachweis: we offer products which can integrate automation systems.	

Kriterium	Pos. / Relevante Bauteile / Bau-Materialien / Flächen	Betrachtete Stoffe / Aspekte	Qualitätsstufe
ENV 1.2 Risiken für die lokale Umwelt, 03.05.2024 (3. Auflage)	32 Sämtliche Aluminium und Edelstahlbauteile	Chrom-VI	Qualitätsstufe: 4
Nachweis: Herstellererklärung vom 04.08.2025			

Kriterium	Bewertung
SOC 1.2 Innenraumluftqualität (*)	Kann Gesamtbewertung positiv beeinflussen
Nachweis: SHI Schadstoffgeprüft	

Kriterium	Pos. / Relevante Bauteile / Bau-Materialien / Flächen	Betrachtete Stoffe / Aspekte	Qualitätsstufe
ENV 1.2 Risiken für die lokale Umwelt, 29.05.2025 (4. Auflage)	32 Sämtliche Aluminium und Edelstahlbauteile	Chrom-VI	Qualitätsstufe: 4
Nachweis: Herstellererklärung vom 04.08.2025			

Holzanteil

Kriterium	Pos. / Relevante Bauteile / Bau-Materialien / Flächen	Betrachtete Stoffe / Aspekte	Qualitätsstufe
ENV 1.2 Risiken für die lokale Umwelt, 03.05.2024 (3. Auflage)	30a Masshaltige Holzbauteile: Außentüren und Außenfenster	Holzschutzmittel (Produktart 8 nach 528/2012/EG)	Qualitätsstufe: 3
Nachweis: Herstellererklärung vom Februar 2025 zum Einsatz von Bioziden.			

Kriterium	Qualitätsstufe
ENV 1.3 Verantwortungsbewusste Ressourcengewinnung	Kann Gesamtbewertung positiv beeinflussen
Nachweis: PEFC zertifiziert	

Kriterium	Pos. / Relevante Bauteile / Bau-Materialien / Flächen	Betrachtete Stoffe / Aspekte	Qualitätsstufe
ENV 1.2 Risiken für die lokale Umwelt, 29.05.2025 (4. Auflage)	30a Masshaltige Holzbauteile: Außentüren und Außenfenster	Holzschutzmittel (Produktart 8 nach 528/2012/EG)	Qualitätsstufe: 4
Nachweis: Herstellererklärung vom Februar 2025 zum Einsatz von Bioziden.			

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DGNB Neubau 2018

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Allgemeine Bewertung

Kriterium	Pos. / Relevante Bauteile / Bau-Materialien / Flächen	Betrachtete Stoffe / Aspekte	Qualitätsstufe
ENV 1.2 Risiken für die lokale Umwelt	32 Sämtliche Aluminium- und Edelstahlbauteile der Hülle. Nicht betrachtet werden Sonnenschutzlamellen, Rolladenkästen sowie Edelstahlgeländer	Chrom-VI	Qualitätsstufe: 4
Nachweis: Herstellererklärung vom 04.08.2025			

Holzanteil

Kriterium	Pos. / Relevante Bauteile / Bau-Materialien / Flächen	Betrachtete Stoffe / Aspekte	Qualitätsstufe
ENV 1.2 Risiken für die lokale Umwelt	30a Masshaltige Holzbauteile: Außentüren und Außenfenster		Qualitätsstufe: 3
Nachweis: Herstellererklärung vom Februar 2025 zum Einsatz von Bioziden.			

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BNB-BN Neubau V2015

Das Bewertungssystem Nachhaltiges Bauen ist ein Instrument zur Bewertung von Büro- und Verwaltungsgebäuden, Unterrichtsgebäuden, Laborgebäuden sowie Außenanlagen in Deutschland. Das BNB wurde vom damaligen Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (BMUB) entwickelt und unterliegt heute dem Bundesministerium für Wohnen, Stadtentwicklung und Bauwesen.

Allgemeine Bewertung

Kriterium	Pos. / Bauprodukttyp	Betrachtete Schadstoffgruppe	Qualitätsniveau
1.1.6 Risiken für die lokale Umwelt	27 eloxierte Aluminium- und passivierte Edelstahloberflächen	Schwermetalle (Chrom-VI)	Qualitätsniveau 5
Nachweis: Herstellererklärung vom 04.08.2025			

Holzanteil

Kriterium	Pos. / Bauprodukttyp	Betrachtete Schadstoffgruppe	Qualitätsniveau
1.1.6 Risiken für die lokale Umwelt	26 Chemische Imprägnierung nichttragender Bauteile	Biozide	Qualitätsniveau 3
Nachweis: Herstellererklärungen vom 01.02.2025 und Februar 2025 zum Einsatz von Bioziden.			

Kriterium	Bewertung
1.1.7 Nachhaltige Materialgewinnung	Kann Gesamtbewertung positiv beeinflussen
Nachweis: PEFC zertifiziert	

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BREEAM DE Neubau 2018

BREEAM (Building Research Establishment Environmental Assessment Methodology) ist ein britisches Gebäudebewertungssystem, welches die Nachhaltigkeit von Neubauten, Sanierungsprojekten und Umbauten einstuft. Das Bewertungssystem wurde vom Building Research Establishment (BRE) entwickelt und zielt darauf ab, ökologische, ökonomische und soziale Auswirkungen von Gebäuden zu bewerten und zu verbessern.

Kriterium	Produktkategorie	Betrachtete Stoffe	Qualitätsstufe
Hea 02 Qualität der Innenraumluft			nicht bewertungsrelevant

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Produktsiegel

In der Baubranche spielt die Auswahl qualitativ hochwertiger Materialien eine zentrale Rolle für die Gesundheit in Gebäuden und deren Nachhaltigkeit. Produktlabels und Zertifikate bieten Orientierung, um diesen Anforderungen gerecht zu werden. Allerdings besitzt jedes Zertifikat und Label eigene Prüfkriterien, die genau betrachtet werden sollten, um sicherzustellen, dass sie den spezifischen Bedürfnissen eines Bauvorhabens entsprechen.

Dieses Produkt ist schadstoffgeprüft und wird vom Sentinel Holding Institut empfohlen. Gesundes Bauen, Modernisieren und Betreiben von Immobilien erfolgt dank des Sentinel Holding Konzepts nach transparenten und nachvollziehbaren Kriterien.

Produkte mit dem QNG-ready Siegel des Sentinel Holding Instituts eignen sich für Projekte, für welche das Qualitätssiegel Nachhaltiges Gebäude (QNG) angestrebt wird. QNG-ready Produkte erfüllen die Anforderungen des QNG Anhangdokument 3.1.3 "Schadstoffvermeidung in Baumaterialien". Das KfW-Kreditprogramm Klimafreundlicher Neubau mit QNG kann eine höhere Fördersumme ermöglichen.

Auch hier werden Hölzer und Holzprodukte aus nachhaltiger Forstwirtschaft ausgezeichnet. Laut Umweltverbänden sind die Anforderungen nicht ganz so hoch wie beim FSC. Auch hier spielen gesundheitliche Kriterien keine Rolle.

Das IBU ist eine Initiative von Bauprodukt- und Baukomponentenherstellern, die sich dem Leitbild der Nachhaltigkeit im Bauwesen verpflichten. IBU ist Programmbetreiber für Umwelt-Produktdeklarationen (Environmental Product Declaration, kurz: EPD) nach der Norm EN 15804. Das IBU-EPD-Programm steht für umfassende Ökobilanzen und Umweltwirkungen von Bauprodukten und eine unabhängige Überprüfung durch Dritte.

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Rechtliche Hinweise

(*) Die Kriterien dieses Steckbriefs beziehen sich auf das gesamte Bauobjekt. Die Bewertung erfolgt auf der Ebene des Gebäudes. Im Rahmen einer sachgemäßen Planung und fachgerechten Installation können einzelne Produkte einen positiven Beitrag zum Gesamtergebnis der Bewertung leisten. Das Sentinel Holding Institut stützt sich einzig auf die Angaben des Herstellers.

Alle Kriterien finden Sie unter:
https://www.sentinel-holding.eu/de/Themenwelten/Pr%C3%BCfkriterien%20f%C3%BCr%20Produkte

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SGS TÜV SAAR

Herausgeber

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79111 Freiburg im Breisgau
Tel.: +49 761 59048170
info@sentinel-holding.eu
www.sentinel-holding.eu

VELUX roof window GGU

Glazing 66SG

The VELUX top-operated, centre-pivot roof window GGU is perfect for those looking for a maintenance-free window that allows for easy access over e.g. a sofa, countertop or bathtub. The durable, moisture-resistant finish looks great in any room and is ideal for humid rooms like kitchens.

- Open the top control bar to the ventilation position for fresh air through a closed window.
- Refresh your home by slightly opening the window and fixing it in the top bushing.
- Top operation allows for a low installation height that lets you enjoy the view while seated.
- 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.
- Upgrade to a remote-controlled mains- or solar-powered motor for extra convenience.

CE

Creation date 26-02-2025 00:16:30 VRW Roof windows en-WW - Approved

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.

Available sizes and daylight area

	550 mm	660 mm	780 mm	942 mm	1140 mm	1340 mm
778 mm	GGU CK02 (0.22) [0.26]					
978 mm	GGU CK04 (0.29) [0.34]	GGU FK04 (0.38) [0.43]	GGU MK04 (0.47) [0.53]			GGU UK04 (0.91) [0.98]
1178 mm	GGU CK06 (0.37) [0.43]	GGU FK06 (0.47) [0.54]	GGU MK06 (0.59) [0.66]	GGU PK06 (0.75) [0.83]	GGU SK06 (0.95) [1.03]	
1398 mm		GGU FK08 (0.58) [0.66]	GGU MK08 (0.72) [0.81]	GGU PK08 (0.92) [1.01]	GGU SK08 (1.16) [1.25]	GGU UK08 (1.40) [1.54]
1600			GGU MK10 (0.85) [0.94]	GGU PK10 (1.07) [1.17]	GGU SK10 (1.35) [1.46]	GGU UK10 (1.63) [1.80]

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

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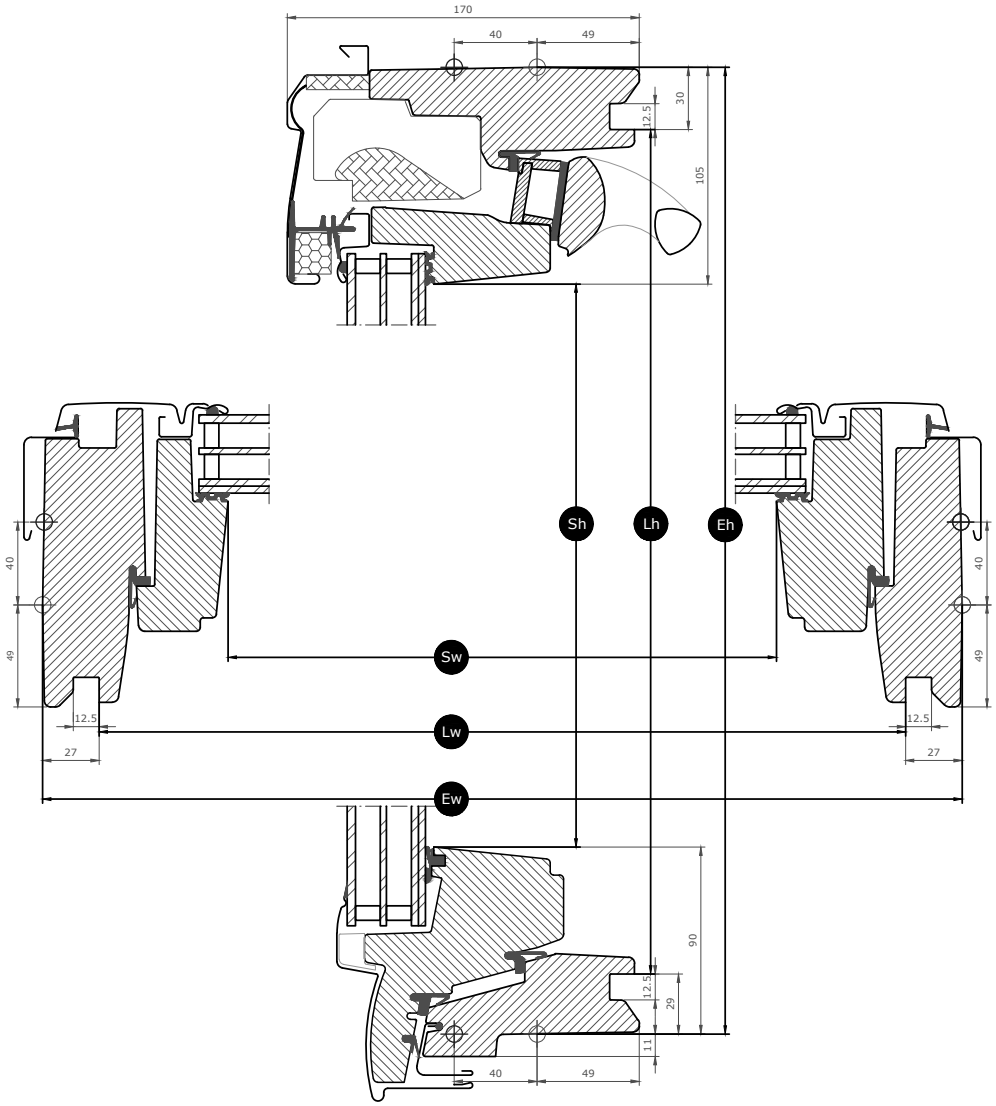
Cross section dimensions

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



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

Height		--02	--04	--06	--08	--10
Sh	Sash aperture height	584	784	984	1204	1406
Lh	Distance between lining grooves, height	719	919	1119	1339	1541
Eh	Exterior frame height	778	978	1178	1398	1600

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

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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 (PK10: 3)
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]	D-s3,d2
Resistance to snow load	See glazing composition
Resistance to wind load [class]	C3 (>SK08: NPD)
Water tightness [class]	E900

NPD: No Performance Determined

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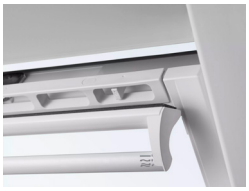
Visible features

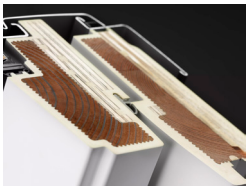
Control bar
The ergonomic aluminum control bar allows effortless opening and closing of the window. It can also lock the ventilation flap in the ventilation position.

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.

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.



Excellent insulation
High performance insulation materials in the window construction and thermally modified timber core incease the energy efficiency of the window.

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.

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Interior finish

Material Description	White maintenance-free Finished with polyurethane lacquer.
Colour code NCS, inner surface	S 0500-N
Colour code nearest RAL, inner surface	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 and secure in cleaning position with barrel bolts.

VELUX repair and maintenance kits are available.

Guarantee period

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 26-02-2025 00:16:30

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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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-20250346-CBI1-EN
Issue date	11/07/2025
Valid to	10/07/2030

VELUX polyurethane roof windows GGU (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-20250346-CBI1-EN

This declaration is based on the product category rules:

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

Issue date

11/07/2025

Valid to

10/07/2030

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

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

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

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

Verification

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

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

Product

Product description/Product definition

The VELUX polyurethane roof windows are skylight window products for sale in the European market. EPD covers a range of GGU variants as specified in the table below. All windows have a polyurethane and wooden frame/sash. All windows are the classic pivo-hinged VELUX GGU. The handles and handlebars are made of aluminium, while the hinges are made of steel (galvanised, stainless). GGU window can be used in conjunction with electric or solar window operators for automatic opening and closing. The calculations are based on the window type named GGU. In the LCA, the GGU was assessed to be a conservative choice for a representative window type.

The glass panes are with double (2-layer) and triple (3-layer) glazing, and different glass configurations are covered by the EPD. The EPD is based on the following 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.

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

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

Application

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

Technical Data

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

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

Constructional data

Name	Value	Unit
Reaction to fire	D-s3,d2	class
Air permeability acc. EN 12207	4	class
Resistance to wind load, (for window width >1140 mm or height > 1398 mm no performance is determined)	C3	class
Resistance to snow loads	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 heigh<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 polyurethane roof window are the glazing unit (made of mainly laminated and tempered glass), frames/sashes (made of polyurethane and wood), hinges (made of steel) and handles/handlebars (made of aluminium). The packaging of the products consists mostly of cardboard with paper inserts and galvanised steel.

Name	Value	Unit
Glazing unit (2-layer)	63	%
Wooden frame/sash	14	%
Polyurethane frame/sash	7	%
Steel components (galvanised and stainless)	5	%
Aluminium components	3	%
Other components (including packaging)	2	%
Packaging	6	%

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

VELUX assembly sites in Poland, Denmark, Slovakia and Germany where they are assembled into the final window product.

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

Reference service life

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

LCA: Calculation rules

Declared Unit

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

Declared unit and mass reference

Name	Value	Unit
Declared unit	1	m^2
Grammage	47.12	kg/m^2

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

System boundary

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

Product stage:

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

End of life stage:

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

Benefits and loads beyond the system boundaries:

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

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

Geographic Representativeness

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

Comparability

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

LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

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

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

Information on describing the biogenic carbon content at factory gate

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

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

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

Scenario information for packaging generated in module A5

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

End of life (C1-C4)

Name	Value	Unit
Collected as mixed construction waste	47.12	kg
Recycling	13.46	kg
Energy recovery	10.66	kg
Landfilling	22.9	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 polyurethane window

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	8.89E+01	5.15E+00	2.24E+01	1.34E-03	1.59E+00	2.09E+01	1.56E+00	-2.7E+01
GWP-fossil	kg CO_2 eq	1.15E+02	5.06E+00	6.44E+00	1.33E-03	1.56E+00	1.13E+01	3.66E-01	-2.69E+01
GWP-biogenic	kg CO_2 eq	-2.63E+01	1.21E-02	1.6E+01	1.19E-05	3.72E-03	9.53E+00	1.2E+00	-5.47E-02
GWP-luluc	kg CO_2 eq	7.66E-02	8.5E-02	3.64E-02	2.02E-07	2.62E-02	7.37E-04	2.07E-03	-6.5E-03
ODP	kg CFC11 eq	1.19E-06	7.45E-13	2.18E-09	3.01E-14	2.3E-13	-9.08E-09	9.71E-13	-7.31E-11
AP	mol H^+ eq	5.4E-01	6.88E-03	2.27E-02	2.57E-06	9.05E-03	7.97E-03	2.56E-03	-1.04E-01
EP-freshwater	kg P eq	4.78E-03	2.16E-05	8.5E-05	5.51E-09	6.66E-06	-2.08E-05	6.3E-06	-1.94E-05
EP-marine	kg N eq	1.19E-01	2.49E-03	1.06E-02	6.41E-07	4.41E-03	3.56E-03	6.83E-04	-2.64E-02
EP-terrestrial	mol N eq	1.35E+00	2.96E-02	1.09E-01	6.71E-06	4.9E-02	4.26E-02	7.4E-03	-2.94E-01
POCP	kg NMVOC eq	3.2E-01	6.85E-03	2.48E-02	1.69E-06	8.51E-03	9.21E-03	2.27E-03	-6.58E-02
ADPE	kg Sb eq	3.69E-04	4.4E-07	5.03E-06	2.49E-10	1.36E-07	-1.75E-07	2.31E-08	-6.37E-06
ADPF	MJ	1.7E+03	6.66E+01	9.08E+01	2.79E-02	2.05E+01	5.46E+00	4.88E+00	-3.63E+02
WDP	m^3 world eq deprived	1.39E+01	7.83E-02	3.36E-01	3.67E-04	2.41E-02	2.28E+00	4.2E-02	-4.48E+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 polyurethane window

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PERE	MJ	2.95E+02	5.74E+00	2.42E+02	2.01E-02	1.77E+00	1.06E+02	8.23E-01	-9.97E+01
PERM	MJ	2.6E+02	0	4.48E+01	0	0	-1.04E+02	0	0
PERT	MJ	5.56E+02	5.74E+00	2.86E+02	2.01E-02	1.77E+00	1.42E+00	8.23E-01	-9.97E+01
PENRE	MJ	1.54E+03	6.66E+01	9.11E+01	2.79E-02	2.05E+01	1.53E+02	4.88E+00	-3.63E+02
PENRM	MJ	1.55E+02	0	-3.13E-01	0	0	-1.48E+02	0	0
PENRT	MJ	1.7E+03	6.66E+01	9.08E+01	2.79E-02	2.05E+01	5.46E+00	4.88E+00	-3.63E+02
SM	kg	3.71E+00	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0
FW	m^3	5.53E-01	6.39E-03	2.86E-02	1.54E-05	1.97E-03	5.37E-02	1.27E-03	-1.68E-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 polyurethane window

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
HWD	kg	2.32E-03	2.55E-09	1.9E-06	4.03E-11	7.86E-10	3.07E-09	1.19E-09	-1.06E-07
NHWD	kg	1.18E+01	1.09E-02	2.27E-01	2.3E-05	3.35E-03	5.51E-01	2.28E+01	-5.09E+00
RWD	kg	3.13E-02	1.21E-04	1.63E-03	4.45E-06	3.74E-05	2.64E-04	5.23E-05	-1.58E-02
CRU	kg	0	0	0	0	0	0	0	0
MFR	kg	1.74E-02	0	1.32E+01	0	0	1.37E+01	0	0
MER	kg	0	0	0	0	0	0	0	0
EEE	MJ	3.45E-02	0	0	0	0	3.59E+01	0	0
EET	MJ	5.03E-02	0	0	0	0	6.51E+01	0	0

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

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

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PM	Disease incidence	8.9E-06	6.95E-08	2.57E-07	2.15E-11	4.98E-08	3.16E-08	3.16E-08	-1.28E-06
IR	kBq U235 eq	5.78E+00	1.76E-02	2.7E-01	7.34E-04	5.43E-03	2.99E-02	6.23E-03	-2.36E+00
ETP-fw	CTUe	2.28E+03	4.94E+01	2.66E+01	8.08E-03	1.52E+01	2.58E+00	2.98E+00	-1.49E+02
HTP-c	CTUh	7.53E-07	9.98E-10	8.59E-09	4.54E-13	3.08E-10	1.71E-10	7.04E-11	-2.01E-08
HTP-nc	CTUh	8.34E-07	4.48E-08	8.15E-08	6.95E-12	1.38E-08	8.39E-09	3.35E-09	-1.44E-07
SQP	SQP	4.89E+03	3.28E+01	2.12E+02	1.17E-02	1.01E+01	4.53E-01	1.27E+00	-3.28E+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 the energy consumption. All main components in the windows contribute significantly to some of the environmental indicators. The glass in the glazing units has the highest contribution in most impact categories among all material types. The galvanised steel components contribute significantly to the results due to their high weight contribution to the product. The aluminium components are also significant for the WDP indicator, although the weight of the aluminium components is notably lower in comparison with the galvanised steel components. This is most likely due to the relatively high energy and water consumption in the production of aluminium.

References

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

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

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

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

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

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

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

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

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

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

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

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

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

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

LCA for Experts (GaBi) LCA software, Managed LCA

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

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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-20250348-CBI1-EN
Issue date	11/07/2025
Valid to	10/07/2030

VELUX polyurethane roof windows GGU (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

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Programme holder

IBU – Institut Bauen und Umwelt e.V.
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Germany

Declaration number

EPD-VEL-20250348-CBI1-EN

This declaration is based on the product category rules:

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

Issue date

11/07/2025

Valid to

10/07/2030

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

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

VELUX polyurethane roof windows GGU (double glazing configuration)

Owner of the declaration

VELUX Group
Ådalsvej 99
2970 Hørsholm
Denmark

Declared product / declared unit

The declared unit is a polyurethane roof window of 1 m^2 with 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 polyurethane roof windows as specified in detail in the product description. The products are manufactured by the VELUX Group at different production sites in Europe for sale throughout Europe. The windows' production take place in Germany, Denmark, Poland and Slovakia.
The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

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

Verification

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

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

Product

Product description/Product definition

The VELUX polyurethane roof windows are skylight window products for sale in the European market. The product family covers a range of product varieties as specified in the table below. All windows have a polyurethane and wooden frame/sash. Some windows can be opened (venting), while others cannot be opened (fixed). In addition, the windows consist of 4 different hinge-functionalities (pivot-hung, top-hung, side-hung, bottom-hung). The handles and handlebars are made of aluminium, while the hinges are made of steel (galvanised, stainless). 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 GGU. In the LCA, the GGU 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.

Window type			Glazing options	Description
GGU		GGU -K-- 20--	--70, --70Q, --76,	White lacquered pivot-hinged window with manual top operation and ventilation flap with integrated handlebar along the top sash. More simple and light than GPU, which also contain top-hinge.
GGU Electric		GGU -K-- 20--21	--70, --76	White lacquered GGU window with remote operation - mains motor. Similar to GGU, but with an electrical window opener.
GGU Solar		GGU -K-- 20--30	--70	White lacquered GGU window with remote operation - mains motor. Similar to GGU, but with an electrical window opener.

[1] 2-layer glazing options: 70, 70 Q, 76.

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

Application

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

Technical Data

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

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

Constructional data

Name	Value	Unit
Reaction to fire	D-s3,d2	class
Air permeability acc. EN 12207	4	class
Resistance to wind load, (for window width >1140 mm or height > 1398 mm no performance is determined)	C3	class
Resistance to snow loads	4 (toughened) - 16 - 6,8 (laminated float)	mm
Water tightness acc. EN 12208 unprotected / protected	E900	class
Impact resistance (for window width<550mm or heigh<778mm no performance is determined)	3	class
Acoustic performance	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 polyurethane roof window are the glazing unit (made of mainly laminated and tempered glass), frames/sashes (made of polyurethane and wood), hinges (made of steel) and handles/handlebars (made of aluminium). The packaging of the products consists mostly of cardboard with paper inserts and galvanised steel.

Name	Value	Unit
Glazing unit (2-layer)	51	%
Wooden frame/sash	18	%
Polyurethane frame/sash	9	%
Steel components (galvanised and stainless)	7	%
Aluminium components	4	%
Other components (including packaging)	3	%
Packaging	8	%

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

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

Reference service life

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

LCA: Calculation rules

Declared Unit

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

Declared unit and mass reference

Name	Value	Unit
Declared unit	1	m^2
Grammage	34.95	kg/m^2

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

System boundary

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

Product stage:

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

End of life stage:

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

Benefits and loads beyond the system boundaries:

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

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

Geographic Representativeness

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

Comparability

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

LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

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

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

Information on describing the biogenic carbon content at factory gate

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

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

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

Scenario information for packaging generated in module A5

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

End of life (C1-C4)

Name	Value	Unit
Collected as mixed construction waste	34.95	kg
Recycling	9.81	kg
Energy recovery	10.66	kg
Landfilling	14.48	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	5.87E+01	3.31E+00	2.24E+01	1.34E-03	1.13E+00	2.01E+01	1.43E+00	-2.36E+01
GWP-fossil	kg CO_2 eq	8.49E+01	3.25E+00	6.41E+00	1.33E-03	1.1E+00	1.06E+01	2.28E-01	-2.35E+01
GWP-biogenic	kg CO_2 eq	-2.65E+01	7.75E-03	1.6E+01	1.19E-05	2.64E-03	9.53E+00	1.2E+00	-4.84E-02
GWP-luluc	kg CO_2 eq	5.46E-02	5.46E-02	3.59E-02	2.02E-07	1.86E-02	7.44E-04	1.25E-03	-5.68E-03
ODP	kg CFC11 eq	5.31E-07	4.78E-13	2.18E-09	3.01E-14	1.63E-13	-5.34E-09	6.01E-13	-6.25E-11
AP	mol H^+ eq	3.14E-01	4.42E-03	2.26E-02	2.57E-06	6.42E-03	7.55E-03	1.59E-03	-8.48E-02
EP-freshwater	kg P eq	2.61E-04	1.39E-05	8.48E-05	5.51E-09	4.72E-06	-1.19E-05	5.69E-06	-1.69E-05
EP-marine	kg N eq	7.05E-02	1.6E-03	1.05E-02	6.41E-07	3.13E-03	3.33E-03	4.32E-04	-2.06E-02
EP-terrestrial	mol N eq	8.01E-01	1.9E-02	1.08E-01	6.71E-06	3.48E-02	3.99E-02	4.64E-03	-2.29E-01
POCP	kg NMVOC eq	2.12E-01	4.4E-03	2.47E-02	1.69E-06	6.04E-03	8.65E-03	1.5E-03	-5.41E-02
ADPE	kg Sb eq	3.25E-04	2.83E-07	5.03E-06	2.49E-10	9.64E-08	-7.5E-08	1.42E-08	-4.77E-06
ADPF	MJ	1.26E+03	4.28E+01	9.04E+01	2.79E-02	1.46E+01	5.63E+00	3.07E+00	-3.12E+02
WDP	m^3 world eq deprived	9.38E+00	5.03E-02	3.35E-01	3.67E-04	1.71E-02	2.21E+00	2.63E-02	-4.22E+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	2.51E+02	3.68E+00	2.42E+02	2.01E-02	1.26E+00	1.06E+02	5.07E-01	-9.24E+01
PERM	MJ	2.6E+02	0	4.48E+01	0	0	-1.04E+02	0	0
PERT	MJ	5.11E+02	3.68E+00	2.86E+02	2.01E-02	1.26E+00	1.4E+00	5.07E-01	-9.24E+01
PENRE	MJ	1.12E+03	4.28E+01	9.07E+01	2.79E-02	1.46E+01	1.4E+02	3.07E+00	-3.12E+02
PENRM	MJ	1.4E+02	0	-2.86E-01	0	0	-1.35E+02	0	0
PENRT	MJ	1.26E+03	4.28E+01	9.04E+01	2.79E-02	1.46E+01	5.63E+00	3.07E+00	-3.12E+02
SM	kg	3.61E+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	4.27E-01	4.1E-03	2.86E-02	1.54E-05	1.4E-03	5.19E-02	7.93E-04	-1.59E-01

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

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

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
HWD	kg	2.32E-03	1.64E-09	1.9E-06	4.03E-11	5.58E-10	2.96E-09	7.38E-10	-9.11E-08
NHWD	kg	9.56E+00	6.98E-03	2.23E-01	2.3E-05	2.38E-03	5.24E-01	1.36E+01	-4.4E+00
RWD	kg	2.62E-02	7.79E-05	1.63E-03	4.45E-06	2.65E-05	2.56E-04	3.32E-05	-1.42E-02
CRU	kg	0	0	0	0	0	0	0	0
MFR	kg	1.74E-02	0	1.19E+01	0	0	9.67E+00	0	0
MER	kg	0	0	0	0	0	0	0	0
EEE	MJ	3.45E-02	0	0	0	0	3.39E+01	0	0
EET	MJ	5.03E-02	0	0	0	0	6.13E+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	7.4E-06	4.46E-08	2.56E-07	2.15E-11	3.53E-08	3.15E-08	1.94E-08	-1.15E-06
IR	kBq U235 eq	3.59E+00	1.13E-02	2.7E-01	7.34E-04	3.85E-03	3.34E-02	4.02E-03	-2.11E+00
ETP-fw	CTUe	1.51E+03	3.17E+01	2.64E+01	8.08E-03	1.08E+01	2.56E+00	1.92E+00	-1.07E+02
HTP-c	CTUh	5.44E-07	6.41E-10	8.58E-09	4.54E-13	2.18E-10	1.8E-10	4.55E-11	-1.96E-08
HTP-nc	CTUh	6.42E-07	2.88E-08	8.12E-08	6.95E-12	9.81E-09	8.13E-09	2.4E-09	-1.21E-07
SQP	SQP	4.85E+03	2.1E+01	2.12E+02	1.17E-02	7.17E+00	9.47E-01	7.69E-01	-2.83E+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 the energy consumption. All main components in the windows contribute significantly to some of the environmental indicators. The glass in the glazing units has the highest contribution in most impact categories among all material types. The galvanised steel components contribute significantly to the results due to their high weight contribution to the product. The aluminium components are also significant for the WDP indicator, although the weight of the aluminium components is notably lower in comparison with the galvanised steel components. This is most likely due to the relatively high energy and water consumption in the production of aluminium.

References

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

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

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

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

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

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

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

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

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

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

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

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

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

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

LCA for Experts (GaBi) LCA software, Managed LCA

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

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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-20250347-CBI1-EN
Issue date	11/07/2025
Valid to	10/07/2030

VELUX polyurethane roof windows GGU (triple glazing configuration)

VELUX Group

Institut Bauen und Umwelt e.V.

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

ECO PLATFORM EPD VERIFIED

General Information

VELUX Group

Programme holder

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

Declaration number

EPD-VEL-20250347-CBI1-EN

This declaration is based on the product category rules:

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

Issue date

11/07/2025

Valid to

10/07/2030

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

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

VELUX polyurethane roof windows GGU (triple glazing configuration)

Owner of the declaration

VELUX Group
Ådalsvej 99
2970 Hørsholm
Denmark

Declared product / declared unit

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

Scope:

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

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

Verification

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

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

Product

Product description/Product definition

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

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

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

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

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

Application

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

Technical Data

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

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

Constructional data

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

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

Base materials/Ancillary materials

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

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

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

Germany where they are assembled into the final window product.

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

Reference service life

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

LCA: Calculation rules

Declared Unit

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

Declared unit and mass reference

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

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

System boundary

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

Product stage:

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

End of life stage:

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

Benefits and loads beyond the system boundaries:

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

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

Geographic Representativeness

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

Comparability

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

LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

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

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

Information on describing the biogenic carbon content at factory gate

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

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

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

Scenario information for packaging generated in module A5

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

End of life (C1-C4)

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

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

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

LCA: Results

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

References

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

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

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

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

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

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

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

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

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

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

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

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

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

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

LCA for Experts (GaBi) LCA software, Managed LCA

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

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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-20250344-CBI1-EN
Issue date	11/07/2025
Valid to	10/07/2030

VELUX polyurethane roof windows GPU, GTU, GXU, GLU, VIU, GIU (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-20250344-CBI1-EN

This declaration is based on the product category rules:

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

Issue date

11/07/2025

Valid to

10/07/2030

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

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

VELUX polyurethane roof windows GPU, GTU, GXU, GLU, VIU, GIU (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 polyurethane 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 polyurethane roof windows as specified in detail in the product description. The products are manufactured by the VELUX Group at different production sites in Europe for sale throughout Europe. The windows' production take place in Germany, Denmark 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 polyurethane 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 polyurethane and wooden frame/sash. Some windows can be opened (venting), while others cannot be opened (fixed). In addition, the windows consist of 3 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 GPU. In the LCA, the GPU was assessed to be a conservative choice for a representative window type.

The glass panes are with double glazing (2-layer), and different glass configurations are covered by the EPD. The EPD is based on the following glazing unit configuration: 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.

Window type			Glazing options	Description
GPU		GPU -K-- 20--	--70, --70Pro, --76	White lacquered top-hung window with manual bottom operation, ventilation flap and integrated handlebar along the top sash and pivot-hinge for cleaning. Due to the additional pivot-hinge it is heavier than GGU.
GTU		GTU -K—20--	--70	White lacquered top-hung window for rescue opening with manual bottom operation, Like GPU, but with gas springs in order to enable extra opening hight and additional handles on the side sash.
GPU Electric		GPU -K-- 20--21	--70, --76,	White lacquered GPU window with remote operation - mains motor. Like GPU, but with an electrical window opener.
GPU Solar		GPU -K-- 20--30	--70	White lacquered GPU window with remote operation - mains motor. Like GPU, but with a solar window opener.
GXU		GXU -K-- 20--	--70	White lacquered manual side-opening window with ventilation flap along top sash and handle bar in the side.
GLU		GLU -K-- 20--	--51	White lacquered top-hung window with manual bottom operation, ventilation flap and integrated handlebar along the top sash and pivot-hinge for cleaning. Similar to GGU, but with simplified ventilation flap/handlebar.
GLU-B		GLU -K-- 20--B	--51	White lacquered manual bottom operation window, with ventilation slats and handle on bottom sash. Similar to GGU, but ventilation flap/handlebar is replaced by ventilation slats and a handle on the bottom sash.
VIU		VIU -K-- 20--	--70	White lacquered vertical extension fixed window. Fixed without opening mechanism or ventilation flap.
GIU		GIU -K-- 20--	--70	White lacquered sloped extension fixed window. Fixed 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 polyurethane roof windows are used in renovation and new builds. Either installed as a single window or in a combination of multiple windows.

Technical Data

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

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

Constructional data

Name	Value	Unit
Reaction to fire	D-s2,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 mm toughened - 16 mm - 6.8 mm laminated float	mm
Water tightness acc. EN 12208 unprotected / protected	E900	class
Impact resistance (for window width<550mm or heigh<778mm no performance is determined)	3	class
Acoustic performance	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 polyurethane roof window are the glazing unit (made of mainly laminated and tempered glass), frames/sashes (made of polyurethane and wood), hinges (made of steel) and handles/handlebars (made of iron). The packaging of the products consists mostly of cardboard with paper inserts and galvanised steel.

Name	Value	Unit
Glazing unit (2-layer)	41	%
Wooden frame/sash	15	%
Polyurethane frame/sash	10	
Steel components (galvanised and stainless)	18	%
Aluminium components	4	%
Other components (including packaging)	5	%
Packaging	7	%

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

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

Reference service life

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

LCA: Calculation rules

Declared Unit

Multiple product dimensions are represented by this EPD (see product description). The declared unit is 1 m^2 polyurethane roof window and calculated based on the size 1.14 m x 1.60 m (SK10), which is the closest available size to the reference window size (1.23 m x 1.48 m based on EN 14351-1). The GPU variant has the largest weight per m^2 in the product group. Since the frame/sash construction is alike across all variants in the product group, the parts that set the variants apart are primarily the window-operation components, such as hinges, handles and ventilation flaps. These components are to a high degree metal-based, and the worst-case product can thus be identified by the weight of products with a similar size and glazing unit. The heavier the product, the larger the content of metal. Therefore, the GPU 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	44.08	kg/m^2

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

System boundary

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

Product stage:

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

End of life stage:

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

Benefits and loads beyond the system boundaries:

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

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

Geographic Representativeness

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

Comparability

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

LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

6.92 kg of wood is used in window frames/sashes and 0.05 kg of paper inlet is used per declared unit. For the packaging, 3.10

kg of cardboard and 0.008 kg of paper insert are used per declared unit.

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

Information on describing the biogenic carbon content at factory gate

Name	Value	Unit
Biogenic carbon content in product	3.18	kg C
Biogenic carbon content in accompanying packaging	2.48	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	3.10	kg
Paper packaging for waste treatment	0.008	kg
Steel packaging for waste treatment (galvanised)	0.005	kg
EPS packaging for waste treatment	0.29	kg
LD PE film packaging for waste treatment	0.011	kg

End of life (C1-C4)

Name	Value	Unit
Collected as mixed construction waste	44.08	kg
Recycling	16.44	kg
Energy recovery	12.7	kg
Landfilling	14.93	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 polyurethane roof window

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	1.04E+02	4.21E+00	2.46E+01	1.34E-03	1.35E+00	2.47E+01	1.45E+00	-3.96E+01
GWP-fossil	kg CO_2 eq	1.31E+02	4.13E+00	8.37E+00	1.33E-03	1.33E+00	1.5E+01	2.33E-01	-3.95E+01
GWP-biogenic	kg CO_2 eq	-2.68E+01	9.85E-03	1.62E+01	1.19E-05	3.17E-03	9.68E+00	1.22E+00	-4.47E-02
GWP-luluc	kg CO_2 eq	7.22E-02	6.93E-02	3.73E-02	2.02E-07	2.23E-02	1.15E-03	1.26E-03	-1.23E-02
ODP	kg CFC11 eq	5.57E-07	6.08E-13	1.25E-09	3.01E-14	1.96E-13	-5.34E-09	6.15E-13	-4.69E-11
AP	mol H^+ eq	4.45E-01	5.62E-03	2.69E-02	2.57E-06	7.72E-03	1.03E-02	1.62E-03	-1.29E-01
EP-freshwater	kg P eq	3.44E-04	1.76E-05	9.64E-05	5.51E-09	5.68E-06	-1.17E-05	7.44E-06	-2.21E-05
EP-marine	kg N eq	9.93E-02	2.03E-03	1.2E-02	6.41E-07	3.76E-03	4.64E-03	4.39E-04	-3.06E-02
EP-terrestrial	mol N eq	1.11E+00	2.42E-02	1.23E-01	6.71E-06	4.18E-02	5.51E-02	4.71E-03	-3.37E-01
POCP	kg NMVOC eq	3.06E-01	5.59E-03	3.69E-02	1.69E-06	7.25E-03	1.2E-02	1.52E-03	-8.57E-02
ADPE	kg Sb eq	1.02E-03	3.59E-07	6.3E-06	2.49E-10	1.16E-07	-4.27E-08	1.45E-08	-1.32E-05
ADPF	MJ	1.85E+03	5.43E+01	1.32E+02	2.79E-02	1.75E+01	7.49E+00	3.14E+00	-4.66E+02
WDP	m^3 world eq deprived	1.38E+01	6.39E-02	5.26E-01	3.67E-04	2.06E-02	2.68E+00	2.69E-02	-5.85E+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 polyurethane roof window

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PERE	MJ	3.85E+02	4.68E+00	3.23E+02	2.01E-02	1.51E+00	1.08E+02	5.18E-01	-1.09E+02
PERM	MJ	2.64E+02	0	4.19E+01	0	0	-1.06E+02	0	0
PERT	MJ	6.5E+02	4.68E+00	3.65E+02	2.01E-02	1.51E+00	1.76E+00	5.18E-01	-1.09E+02
PENRE	MJ	1.66E+03	5.43E+01	1.17E+02	2.79E-02	1.75E+01	2E+02	3.14E+00	-4.66E+02
PENRM	MJ	1.93E+02	0	1.48E+01	0	0	-1.92E+02	0	0
PENRT	MJ	1.85E+03	5.43E+01	1.32E+02	2.79E-02	1.75E+01	7.49E+00	3.14E+00	-4.66E+02
SM	kg	4.6E+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	6.31E-01	5.22E-03	3.54E-02	1.54E-05	1.68E-03	6.32E-02	8.1E-04	-2.24E-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 polyurethane roof window

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
HWD	kg	2.32E-03	2.08E-09	2.35E-06	4.03E-11	6.7E-10	3.69E-09	7.56E-10	-7.99E-08
NHWD	kg	1.38E+01	8.87E-03	2.89E-01	2.3E-05	2.86E-03	9.62E-01	1.38E+01	-5.67E+00
RWD	kg	4E-02	9.9E-05	1.76E-03	4.45E-06	3.19E-05	3.13E-04	3.42E-05	-1.7E-02
CRU	kg	0	0	0	0	0	0	0	0
MFR	kg	1.74E-02	0	1.57E+01	0	0	1.63E+01	0	0
MER	kg	0	0	0	0	0	0	0	0
EEE	MJ	3.45E-02	0	0	0	0	4.28E+01	0	0
EET	MJ	5.03E-02	0	0	0	0	7.74E+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 polyurethane roof window

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PM	Disease incidence	9.37E-06	5.67E-08	2.88E-07	2.15E-11	4.24E-08	4.28E-08	1.97E-08	-1.85E-06
IR	kBq U235 eq	5.13E+00	1.44E-02	2.87E-01	7.34E-04	4.63E-03	4.2E-02	4.16E-03	-2.52E+00
ETP-fw	CTUe	1.68E+03	4.03E+01	4.39E+01	8.08E-03	1.3E+01	3.47E+00	2.05E+00	-1.36E+02
HTP-c	CTUh	1.77E-06	8.15E-10	1.17E-08	4.54E-13	2.62E-10	2.23E-10	4.75E-11	-4.15E-08
HTP-nc	CTUh	9.71E-07	3.66E-08	1.05E-07	6.95E-12	1.18E-08	9.88E-09	2.46E-09	-1.42E-07
SQP	SQP	4.99E+03	2.67E+01	2.68E+02	1.17E-02	8.61E+00	1.42E+00	7.82E-01	-2.86E+01

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

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

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

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

References

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

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

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

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

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

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

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

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

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

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

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

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

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

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

LCA for Experts (GaBi) LCA software, Managed LCA

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

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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-20250343-CBI1-EN
Issue date	11/07/2025
Valid to	10/07/2030

VELUX polyurethane roof windows GPU, GTU, VKU, GXU, GLU, VU, VIU, GIU (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

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10117 Berlin
Germany

Declaration number

EPD-VEL-20250343-CBI1-EN

This declaration is based on the product category rules:

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

Issue date

11/07/2025

Valid to

10/07/2030

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

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

VELUX polyurethane roof windows GPU, GTU, VKU, GXU, GLU, VU, VIU, GIU (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 polyurethane roof window with triple glazing configuration (3-layer). The declared unit is based on the size 1.14 m x 1.60 m (SK10), which is the closest available size to the standard size 1.23 m x 1.48 m (DS/EN 17213:2020).

Scope:

The EPD is a representative EPD covering part of VELUX polyurethane roof windows as specified in detail in the product description. The products are manufactured by the VELUX Group at different production sites in Europe for sale throughout Europe. The windows' production take place in Germany, Denmark 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 polyurethane 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 polyurethane and wooden frame/sash. Some windows can be opened (venting), while others cannot be opened (fixed). In addition, the windows consist of 3 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 GPU. In the LCA, the GPU was assessed to be a conservative choice for a representative window type.

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

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

Window type			Glazing options	Description
GPU		GPU -K-- 20--	--62, --66, --66Pro, --67, --68, --68Q, --69, --86	White lacquered top-hung window with manual bottom operation, ventilation flap and integrated handlebar along the top sash and pivot-hinge for cleaning. Due to the additional pivot-hinge it is heavier than GGU.
GTU		GTU -K—20--	--66	White lacquered top-hung window for rescue opening with manual bottom operation, Like GPU, but with gas springs in order to enable extra opening hight and additional handles on the side sash.
GPU Electric		GPU -K-- 20--21	--66, --66Pro, --67, --68, --69, --84	White lacquered GPU window with remote operation - mains motor. Like GPU, but with an electrical window opener.
GPU Solar		GPU -K-- 20--30	--61, --66, --84	White lacquered GPU window with remote operation - mains motor. Like GPU, but with an solar window opener.
VKU		VKU Y-- 20--	--81	White lacquered top-hung window with manual bottom operation, ventilation flap and integrated handlebar along the top sash and pivot-hinge for cleaning. Similar to GPU, but with older generation ventilation flap/handle bar
GXU		GXU -K-- 20--	--66,	White lacquered manual side-opening window with ventilation flap along top sash and handle bar in the side.
GLU		GLU -K-- 20--	--61, --64	White lacquered top-hung window with manual bottom operation, ventilation flap and integrated handlebar along the top sash and pivot-hinge for cleaning. Similar to GGU, but with simplified ventilation flap/handlebar.
GLU Electric		GLU -K-- 20--21	--61	White lacquered top-hung window with manual bottom operation, ventilation flap and integrated handlebar along the top sash and pivot-hinge for cleaning. Similar to GGU, but with simplified ventilation flap/handlebar.
GLU Solar		GLU -K-- 20--30	--61	White lacquered top-hung window with manual bottom operation, ventilation flap and integrated handlebar along the top sash and pivot-hinge for cleaning. Similar to GGU, but with simplified ventilation flap/handlebar.
GLU-B		GLU -K-- 20--B	--61, --64	White lacquered manual bottom operation window, with ventilation slats and handle on bottom sash. Similar to GGU, but ventilation flap/handlebar is replaced by ventilation slats and a handle on the bottom sash.
VU		VU Y-- 20--	--81	White lacquered pivot-hinged window with manual top operation and ventilation flap with integrated handlebar along the top sash. Similar to GGU, but with older generation ventilation flap/handle bar.
VIU		VIU -K-- 20--	--66, --68, --62	White lacquered vertical extension fixed window. Fixed without opening mechanism or ventilation flap.
GIU		GIU -K-- 20--	--62, --66, --68	White lacquered sloped extension fixed window. Fixed 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 polyurethane roof windows are used in renovation and new builds. Either installed as a single window or in a combination of multiple windows.

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

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

Constructional data

Name	Value	Unit
Reaction to fire	D-s2,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 mm toughened - 13 mm - 3 mm heat strengthened - 13 mm - 6.8 mm laminated float	mm
Water tightness acc. EN 12208 unprotected / protected	E900	class
Impact resistance (for window width<550mm or heigh<778mm no performance is determined)	3	class
Acoustic performance	37 (-2; -4)	-
Load-bearing capacity of safety devices	passed	-
Thermal transmittance, 90 degree installation acc. to EN 10077-1/2	1	W/(m^{2}K)
Solar factor	0.44	-
Light transmittance	0.62	-

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

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

Name	Value	Unit
Glazing unit (2-layer)	48	%
Wooden frame/sash	13	%
Polyurethane frame/sash	9	
Steel components (galvanised and stainless)	16	%
Aluminium components	4	%
Other components (including packaging)	5	%
Packaging	6	%

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

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

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

LCA: Calculation rules

Declared Unit
Multiple product dimensions are represented by this EPD (see product description). The declared unit is 1 m^2 polyurethane roof window and calculated based on the size 1.14 m x 1.60 m (SK10), which is the closest available size to the reference window size (1.23 m x 1.48 m based on EN 14351-1). The GPU variant has the largest weight per m^2 in the product group. Since the frame/sash construction is alike across all variants in the product group, the parts that set the variants apart are primarily the window-operation components, such as hinges, handles and ventilation flaps. These components are to a high degree metal-based, and the worst-case product can thus be identified by the weight of products with a similar size and glazing unit. The heavier the product, the larger the content of metal. Therefore, the GPU 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	49.84	kg/m^2

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

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

Product stage:

- A1 - Raw material supply: extraction and processing, production of the pre-products (e.g. laminated glass, sawn pine wood, metal/plastic components, sealants etc.) and sales packaging components (e.g., cardboard).

- A2 - Transport: Transport of pre-products and packaging components to the processing or assembly sites, as well as internal transportation of components between sites.
- A3 - Manufacturing: The wooden frames/sashes and glazing units are produced internally at VELUX production sites. Subsequently, the final production and assembly of the windows takes place, which involves activities such as shortening of profiles, drilling of holes, clamping and glueing, mounting of gaskets, brackets, panes etc.

End of life stage:

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

Benefits and loads beyond the system boundaries:

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

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

Geographic Representativeness

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

Comparability

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

LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

6.92 kg of wood is used in window frames/sashes and 0.05 kg of paper inlet is used per declared unit. For the packaging, 3.10 kg of cardboard and 0.008 kg of paper insert are used per declared unit.

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

Information on describing the biogenic carbon content at factory gate

Name	Value	Unit
Biogenic carbon content in product	3.18	kg C
Biogenic carbon content in accompanying packaging	2.48	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	3.10	kg
Paper packaging for waste treatment	0.008	kg
Steel packaging for waste treatment (galvanised)	0.005	kg
EPS packaging for waste treatment	0.29	kg
LD PE film packaging for waste treatment	0.011	kg

End of life (C1-C4)

Name	Value	Unit
Collected as mixed construction waste	49.84	kg
Recycling	18.17	kg
Energy recovery	12.7	kg
Landfilling	18.96	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 polyurethane roof window

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	1.23E+02	5.22E+00	2.46E+01	1.34E-03	1.54E+00	2.54E+01	1.51E+00	-4.12E+01
GWP-fossil	kg CO_2 eq	1.49E+02	5.12E+00	8.38E+00	1.33E-03	1.51E+00	1.57E+01	2.88E-01	-4.12E+01
GWP-biogenic	kg CO_2 eq	-2.67E+01	1.22E-02	1.62E+01	1.19E-05	3.62E-03	9.68E+00	1.22E+00	-4.8E-02
GWP-luluc	kg CO_2 eq	9.07E-02	8.61E-02	3.74E-02	2.02E-07	2.55E-02	1.15E-03	1.59E-03	-1.27E-02
ODP	kg CFC11 eq	1.02E-06	7.55E-13	1.25E-09	3.01E-14	2.24E-13	-6.83E-09	7.64E-13	-5.35E-11
AP	mol H^+ eq	5.66E-01	6.97E-03	2.69E-02	2.57E-06	8.81E-03	1.08E-02	2.01E-03	-1.37E-01
EP-freshwater	kg P eq	4.73E-03	2.19E-05	9.66E-05	5.51E-09	6.48E-06	-1.52E-05	7.87E-06	-2.36E-05
EP-marine	kg N eq	1.24E-01	2.52E-03	1.21E-02	6.41E-07	4.29E-03	4.9E-03	5.4E-04	-3.3E-02
EP-terrestrial	mol N eq	1.39E+00	3E-02	1.24E-01	6.71E-06	4.77E-02	5.8E-02	5.82E-03	-3.64E-01
POCP	kg NMVOC eq	3.65E-01	6.94E-03	3.7E-02	1.69E-06	8.29E-03	1.27E-02	1.83E-03	-9.07E-02
ADPE	kg Sb eq	1.06E-03	4.46E-07	6.3E-06	2.49E-10	1.32E-07	-8.18E-08	1.81E-08	-1.48E-05
ADPF	MJ	2.14E+03	6.75E+01	1.32E+02	2.79E-02	2E+01	7.56E+00	3.87E+00	-4.91E+02
WDP	m^3 world eq deprived	1.75E+01	7.93E-02	5.27E-01	3.67E-04	2.35E-02	2.77E+00	3.32E-02	-5.99E+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 polyurethane roof window

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PERE	MJ	4.18E+02	5.81E+00	3.23E+02	2.01E-02	1.72E+00	1.08E+02	6.45E-01	-1.14E+02
PERM	MJ	2.64E+02	0	4.19E+01	0	0	-1.06E+02	0	0
PERT	MJ	6.83E+02	5.81E+00	3.65E+02	2.01E-02	1.72E+00	1.8E+00	6.45E-01	-1.14E+02
PENRE	MJ	1.93E+03	6.75E+01	1.17E+02	2.79E-02	2E+01	2.13E+02	3.87E+00	-4.91E+02
PENRM	MJ	2.08E+02	0	1.48E+01	0	0	-2.06E+02	0	0
PENRT	MJ	2.14E+03	6.75E+01	1.32E+02	2.79E-02	2E+01	7.56E+00	3.87E+00	-4.91E+02
SM	kg	4.71E+00	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0
FW	m^3	7.34E-01	6.47E-03	3.54E-02	1.54E-05	1.92E-03	6.52E-02	1E-03	-2.29E-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 polyurethane roof window

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
HWD	kg	2.32E-03	2.58E-09	2.35E-06	4.03E-11	7.66E-10	3.8E-09	9.37E-10	-8.88E-08
NHWD	kg	1.48E+01	1.1E-02	2.93E-01	2.3E-05	3.27E-03	9.89E-01	1.75E+01	-5.96E+00
RWD	kg	4.28E-02	1.23E-04	1.76E-03	4.45E-06	3.64E-05	3.21E-04	4.19E-05	-1.8E-02
CRU	kg	0	0	0	0	0	0	0	0
MFR	kg	1.74E-02	0	1.63E+01	0	0	1.79E+01	0	0
MER	kg	0	0	0	0	0	0	0	0
EEE	MJ	3.45E-02	0	0	0	0	4.48E+01	0	0
EET	MJ	5.03E-02	0	0	0	0	8.11E+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 polyurethane roof window

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PM	Disease incidence	1.02E-05	7.04E-08	2.89E-07	2.15E-11	4.85E-08	4.41E-08	2.46E-08	-1.91E-06
IR	kBq U235 eq	6.88E+00	1.78E-02	2.87E-01	7.34E-04	5.28E-03	4.14E-02	5.05E-03	-2.68E+00
ETP-fw	CTUe	2.24E+03	5.01E+01	4.41E+01	8.08E-03	1.48E+01	3.54E+00	2.48E+00	-1.54E+02
HTP-c	CTUh	1.98E-06	1.01E-09	1.17E-08	4.54E-13	3E-10	2.23E-10	5.76E-11	-4.19E-08
HTP-nc	CTUh	1.11E-06	4.54E-08	1.05E-07	6.95E-12	1.35E-08	1.02E-08	2.84E-09	-1.52E-07
SQP	SQP	5.03E+03	3.32E+01	2.68E+02	1.17E-02	9.84E+00	1.25E+00	9.83E-01	-3.14E+01

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

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

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

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

References

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

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

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

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

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

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

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

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

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

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

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

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

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

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

LCA for Experts (GaBi) LCA software, Managed LCA

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

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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-20250345-CBI1-EN
Issue date	11/07/2025
Valid to	10/07/2030

VELUX polyurethane roof windows GPU, VIU, GIU (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.
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10117 Berlin
Germany

Declaration number

EPD-VEL-20250345-CBI1-EN

This declaration is based on the product category rules:

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

Issue date

11/07/2025

Valid to

10/07/2030

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

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

VELUX polyurethane roof windows GPU, VIU, GIU (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 polyurethane 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 polyurethane roof windows as specified in detail in the product description. The products are manufactured by the VELUX Group at different production sites in Europe for sale throughout Europe. The windows' production take place in Germany, Denmark 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 polyurethane 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 polyurethane and wooden frame/sash. Some windows can be opened (venting), while others cannot be opened (fixed). The handles and handlebars are made of aluminium, while the hinges are made of steel (galvanised, stainless). The calculations are based on the representative window type named GPU. In the LCA, the GPU was assessed to be a conservative choice for a representative window type.

The EPD is based on the triple glazing 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.

Window type			Glazing options	Description
GPU		GPU -K-- 20--	--62	White lacquered top-hung window with manual bottom operation, ventilation flap and integrated handlebar along the top sash and pivot-hinge for cleaning. Due to the additional pivot-hinge it is heavier than GGU.
VIU		VIU -K-- 20--	--62	White lacquered vertical extension fixed window. Fixed without opening mechanism or ventilation flap.
GIU		GIU -K-- 20--	--62	White lacquered sloped extension fixed window. Fixed 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 polyurethane roof windows are used in renovation and new builds. Either installed as a single window or in a combination of multiple windows.

Technical Data

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

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

Constructional data

Name	Value	Unit
Reaction to fire	D-s2,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 mm toughened - 11 mm - 3 mm heat strengthened - 11 mm - 6.8 mm laminated float	mm
Water tightness acc. EN 12208 unprotected / protected	E900	class
Impact resistance (for window width<550mm or heigh<778mm no performance is determined)	3	class
Acoustic performance	42 (-2;-5)	-
Load-bearing capacity of safety devices	passed	-
Thermal transmittance, 90 degree installation acc. to EN 10077-1/2	0.96	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 polyurethane roof window are the glazing unit (made of mainly laminated and tempered glass), frames/sashes (made of polyurethane and wood), hinges (made of steel) and handles/handlebars (made of iron). The packaging of the products consists mostly of cardboard with paper inserts and galvanized steel.

Name	Value	Unit
Glazing unit (2-layer)	54	%
Wooden frame/sash	11	%
Polyurethane frame/sash	8	
Steel components (galvanised and stainless)	14	%
Aluminium components	3	%
Other components (including packaging)	4	%
Packaging	6	%

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

where they are assembled into the final window product.

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

Reference service life

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

LCA: Calculation rules

Declared Unit

Multiple product dimensions are represented by this EPD (see product description). The declared unit is 1 m^2 polyurethane roof window and calculated based on the size 1.14 m x 1.60 m (SK10), which is the closest available size to the reference window size (1.23 m x 1.48 m based on EN 14351-1). The GPU variant has the largest weight per m^2 in the product group. Since the frame/sash construction is alike across all variants in the product group, the parts that set the variants apart are primarily the window-operation components, such as hinges, handles and ventilation flaps. These components are to a high degree metal-based, and the worst-case product can thus be identified by the weight of products with a similar size and glazing unit. The heavier the product, the larger the content of metal. Therefore, the GPU 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	57.7	kg/m^2

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

System boundary

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

Product stage:

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

End of life stage:

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

Benefits and loads beyond the system boundaries:

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

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

Geographic Representativeness

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

Comparability

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

LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

6.92 kg of wood is used in window frames/sashes and 0.05 kg of paper inlet is used per declared unit. For the packaging, 3.10 kg of cardboard and 0.008 kg of paper insert are used per declared unit.

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

Information on describing the biogenic carbon content at factory gate

Name	Value	Unit
Biogenic carbon content in product	3.18	kg C
Biogenic carbon content in accompanying packaging	2.48	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	3.10	kg
Paper packaging for waste treatment	0.008	kg
Steel packaging for waste treatment (galvanised)	0.005	kg
EPS packaging for waste treatment	0.29	kg
LD PE film packaging for waste treatment	0.011	kg

End of life (C1-C4)

Name	Value	Unit
Collected as mixed construction waste	56.25	kg
Recycling	20.09	kg
Energy recovery	12.7	kg
Landfilling	23.45	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 polyurethane roof window

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	1.34E+02	6.05E+00	2.46E+01	1.34E-03	1.81E+00	2.54E+01	1.59E+00	-4.3E+01
GWP-fossil	kg CO_2 eq	1.61E+02	5.94E+00	8.37E+00	1.33E-03	1.78E+00	1.57E+01	3.7E-01	-4.29E+01
GWP-biogenic	kg CO_2 eq	-2.66E+01	1.42E-02	1.62E+01	1.19E-05	4.25E-03	9.68E+00	1.22E+00	-5.09E-02
GWP-luluc	kg CO_2 eq	9.42E-02	9.97E-02	3.73E-02	2.02E-07	2.99E-02	1.14E-03	2.09E-03	-1.31E-02
ODP	kg CFC11 eq	1.21E-06	8.74E-13	1.25E-09	3.01E-14	2.62E-13	-9.08E-09	9.86E-13	-5.75E-11
AP	mol H^+ eq	6.7E-01	8.08E-03	2.7E-02	2.57E-06	1.03E-02	1.07E-02	2.59E-03	-1.49E-01
EP-freshwater	kg P eq	4.87E-03	2.53E-05	9.66E-05	5.51E-09	7.61E-06	-2.06E-05	8.06E-06	-2.46E-05
EP-marine	kg N eq	1.48E-01	2.92E-03	1.21E-02	6.41E-07	5.04E-03	4.87E-03	6.9E-04	-3.63E-02
EP-terrestrial	mol N eq	1.66E+00	3.48E-02	1.24E-01	6.71E-06	5.6E-02	5.77E-02	7.47E-03	-4.02E-01
POCP	kg NMVOC eq	4.14E-01	8.04E-03	3.71E-02	1.69E-06	9.72E-03	1.26E-02	2.29E-03	-9.74E-02
ADPE	kg Sb eq	1.07E-03	5.17E-07	6.3E-06	2.49E-10	1.55E-07	-1.42E-07	2.34E-08	-1.48E-05
ADPF	MJ	2.28E+03	7.82E+01	1.32E+02	2.79E-02	2.35E+01	7.32E+00	4.96E+00	-5.17E+02
WDP	m^3 world eq deprived	1.83E+01	9.19E-02	5.27E-01	3.67E-04	2.76E-02	2.76E+00	4.26E-02	-6.11E+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 polyurethane roof window

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PERE	MJ	4.3E+02	6.73E+00	3.23E+02	2.01E-02	2.02E+00	1.08E+02	8.34E-01	-1.17E+02
PERM	MJ	2.64E+02	0	4.19E+01	0	0	-1.06E+02	0	0
PERT	MJ	6.95E+02	6.73E+00	3.65E+02	2.01E-02	2.02E+00	1.78E+00	8.34E-01	-1.17E+02
PENRE	MJ	2.07E+03	7.82E+01	1.17E+02	2.79E-02	2.35E+01	2.13E+02	4.96E+00	-5.17E+02
PENRM	MJ	2.08E+02	0	1.48E+01	0	0	-2.06E+02	0	0
PENRT	MJ	2.28E+03	7.82E+01	1.32E+02	2.79E-02	2.35E+01	7.32E+00	4.96E+00	-5.17E+02
SM	kg	4.71E+00	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0
FW	m^3	7.57E-01	7.5E-03	3.54E-02	1.54E-05	2.25E-03	6.5E-02	1.29E-03	-2.32E-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 polyurethane roof window

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
HWD	kg	2.32E-03	2.99E-09	2.35E-06	4.03E-11	8.99E-10	3.8E-09	1.21E-09	-9.46E-08
NHWD	kg	1.61E+01	1.28E-02	2.93E-01	2.3E-05	3.83E-03	9.89E-01	2.3E+01	-6.37E+00
RWD	kg	4.51E-02	1.42E-04	1.76E-03	4.45E-06	4.28E-05	3.21E-04	5.33E-05	-1.86E-02
CRU	kg	0	0	0	0	0	0	0	0
MFR	kg	1.74E-02	0	1.71E+01	0	0	2.03E+01	0	0
MER	kg	0	0	0	0	0	0	0	0
EEE	MJ	3.45E-02	0	0	0	0	4.48E+01	0	0
EET	MJ	5.03E-02	0	0	0	0	8.11E+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 polyurethane roof window

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PM	Disease incidence	1.09E-05	8.15E-08	2.89E-07	2.15E-11	5.69E-08	4.29E-08	3.19E-08	-1.99E-06
IR	kBq U235 eq	7.32E+00	2.07E-02	2.88E-01	7.34E-04	6.2E-03	3.86E-02	6.37E-03	-2.78E+00
ETP-fw	CTUe	2.45E+03	5.8E+01	4.42E+01	8.08E-03	1.74E+01	3.48E+00	3.11E+00	-1.78E+02
HTP-c	CTUh	1.98E-06	1.17E-09	1.17E-08	4.54E-13	3.52E-10	2.15E-10	7.24E-11	-4.2E-08
HTP-nc	CTUh	1.16E-06	5.26E-08	1.05E-07	6.95E-12	1.58E-08	1.01E-08	3.41E-09	-1.64E-07
SQP	SQP	5.04E+03	3.85E+01	2.68E+02	1.17E-02	1.15E+01	9.23E-01	1.28E+00	-3.31E+01

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

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

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

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

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EN 17213
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Candidate list
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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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VELUX Schwingfenster GGU

10 Jahre Garantie

15°-90°

Das VELUX Schwingfenster GGU mit Obenbedienung ist perfekt für alle, die ein wartungsfreies Dachfenster suchen, das einen einfachen Zugang über z. B. einem Sofa, Schreibtisch oder einer Badewanne bietet. Die robuste, feuchtigkeitsbeständige Oberfläche ist vor allem geeignet in feuchten Umgebungen, wie beispielsweise in Küchen, macht sich aber auch in jedem anderen Zimmer gut.

- Öffnen Sie die obere Griffleiste in die Lüftungsposition, um Frischluft durch das geschlossene Dachfenster zu erhalten.
- Lüften Sie Ihre Wohnräume, indem Sie das Dachfenster leicht öffnen und in der oberen Buchse fixieren.
- Die Obenbedienung erlaubt eine niedrige Installationshöhe, sodass Sie sogar im Sitzen oder vom Bett aus die Aussicht genießen können.
- Einfaches Drehen des Fensters um 180° für die sichere Reinigung der Außenscheibe von innen.
- Wartungsfreie Außenabdeckungen erhöhen das sicherere Gefühl über die gesamte Betriebslebensdauer des Dachfensters.
- Aufrüstbar mit einem fernbedienbaren, per Strom oder solarbetriebenen Motor für noch bequemere Bedienung.
- Bringen Sie schnell und einfach Rollos an, indem Sie sie in die vormontierten Zubehörträger klicken.

CE

PEFC
PEFC/09-31-020

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Anleitung zur Bedienung

Das Fenster kann in Dachneigungen zwischen 15° und 90° eingebaut werden.

Manuelle Schwingfenster mit Obenbedienung bieten die Möglichkeit, Möbel direkt unter dem Fenster zu platzieren, ohne die Bedienung des Fensters zu beeinträchtigen. Wir empfehlen eine Einbauhöhe, die sowohl in stehender als auch in sitzender Position eine klare Sicht nach außen ermöglicht. Bitte beachten Sie, dass die optimale Fensterhöhe von der Dachneigung abhängt.

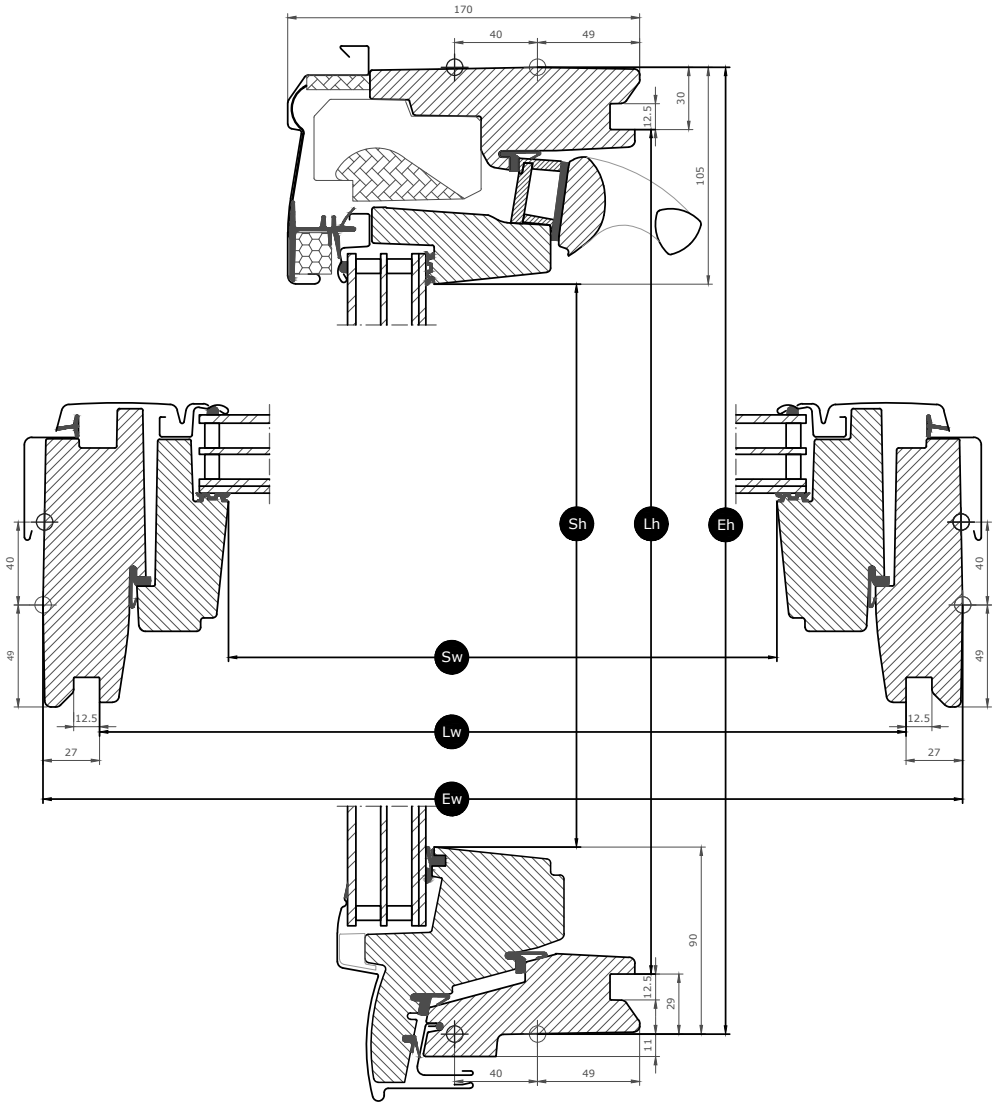
Größenübersicht

Die Größenübersicht zeigt die Verfügbarkeit der verschiedenen Größen für die verschiedenen Verglasungen.

	550	660	780	942	1140	1340
778	GGU CK02 (0.22) [0.26]					
978	GGU CK04 (0.29) [0.34]	GGU FK04 (0.38) [0.43]	GGU MK04 (0.47) [0.53]			GGU UK04 (0.91) [0.98]
1178	GGU CK06 (0.37) [0.43]	GGU FK06 (0.47) [0.54]	GGU MK06 (0.59) [0.66]	GGU PK06 (0.75) [0.83]	GGU SK06 (0.95) [1.03]	
1398		GGU FK08 (0.58) [0.66]	GGU MK08 (0.72) [0.81]	GGU PK08 (0.92) [1.01]	GGU SK08 (1.16) [1.25]	GGU UK08 (1.40) [1.54]
1600			GGU MK10 (0.85) [0.94]	GGU PK10 (1.07) [1.17]	GGU SK10 (1.35) [1.46]	GGU UK10 (1.63) [1.80]

Alle Abmessungen in mm. ( ) = Effektive Lichtfläche, m^2 [ ] = Belüftungsbereich, m^2

Fenstermaße



Breite		CK--	FK--	MK--	PK--	SK--	UK--
Sw	Breite, Scheiben-Lichtmaß	371	481	601	763	961	1161
Lw	Breite, Innenfutter-Nutmaß	495	605	725	887	1085	1285
Ew	Breite, Blendrahmen-Außenmaß	550	660	780	942	1140	1340

Höhe		--02	--04	--06	--08	--10
Sh	Länge, Scheiben-Lichtmaß	584	784	984	1204	1406
Lh	Länge, Innenfutter-Nutmaß	719	919	1119	1339	1541
Eh	Länge, Blendrahmen-Außenmaß	778	978	1178	1398	1600

Verglasungseigenschaften

	THERMO -70	Verglasung 84	ENERGIE PLUS --66	ENERGIE SCHALLSCHUTZ --62	ENERGIE WÄRMEDÄMMUNG --67	ENERGIE HITZESCHUTZ --69	Einbruchschutz -70Q
Hitzeschutz	★★☆☆	★★★☆	★★☆☆	★★☆☆	★★☆☆	★★★★	★★☆☆
Schutz	★★☆☆	★★☆☆	★★★☆	★★☆☆	★★☆☆	★★☆☆	★★★★
Verbundsicherheitsglas	√	√	√	√	√	√	√
Einscheiben-Sicherheitsglas (ESG)	√	√	√	√	√	√	√
UV-Filter	√	√	√	√	√	√	√
Anti-Regengeräusch-Effekt	√	√	√	√	√	√	
Natürlicher Reinigungseffekt			√		√		
Anti-Tau-Effekt			√	√	√		

Scheibenaufbau

Verglasungen	Verglasungsart	Zusammensetzung (von innen nach außen)
THERMO -70	Doppelt verglast	2x3 mm Verbundsicherheitsglas (VSG) – 16 mm Argon – 4 mm Einscheibensicherheitsglas (ESG)
Verglasung 84	Dreifach verglast	2x3 mm Verbundsicherheitsglas (VSG) – 13 mm Argon – 3 mm teilvorgespanntes Glas (TVG) – 13 mm Argon – 4 mm Einscheibensicherheitsglas (ESG)
ENERGIE PLUS --66	Dreifach verglast	2x3mm Verbundsicherheitsglas (VSG) – 13 mm Argon – 3 mm teilvorgespanntes Glas (TVG) – 13 mm Argon – 4 mm Einscheibensicherheitsglas (ESG)
ENERGIE SCHALLSCHUTZ --62	Dreifach verglast	2x3 mm Verbundsicherheitsglas (VSG) – 11 mm Krypton – 3 mm teilvorgespanntes Glas (TVG) – 11 mm Krypton – 8 mm Einscheibensicherheitsglas (ESG)
ENERGIE WÄRMEDÄMMUNG --67	Dreifach verglast	2x3 mm Verbundsicherheitsglas (VSG) – 12 mm Krypton – 3 mm teilvorgespanntes Glas (TVG) – 12 mm Krypton – 4 mm Einscheibensicherheitsglas (ESG)
ENERGIE HITZESCHUTZ --69	Dreifach verglast	2x3 mm Verbundsicherheitsglas (VSG) – 13 mm Argon – 3 mm teilvorgespanntes Glas (TVG) – 13 mm Argon – 4 mm Einscheibensicherheitsglas (ESG)
Einbruchschutz -70Q	Doppelt verglast	2x3 mm Verbundsicherheitsglas (VSG) – 16 mm Argon – 4 mm Einscheibensicherheitsglas (ESG)

Technische Werte

Übersicht der technischen Werte des Produktes, darunter unter anderem die CE-Kennzeichnung gemäß EN 14351-1.

	THERMO -70	Verglasung 84	ENERGIE PLUS --66	ENERGIE SCHALLSCHUTZ --62	ENERGIE WÄRMEDÄMMUNG --67	ENERGIE HITZESCHUTZ --69	Einbruchschutz -70Q
Fenstermerkmale	**Leistung**						
Wärmedurchgangskoeffizient	1.3 W/(m²K)	1.0 W/(m²K)	1.0 W/(m²K)	0.92 W/(m²K)	0.83 W/(m²K)	1.1 W/(m²K)	1.3 W/(m²K)
Lichttransmissionsgrad (τ,v)	0.68	0.63	0.62	0.68	0.62	0.57	0.68
Gesamtsolarenergiedurchlassgrad	0,46	0,46	0,44	0,47	0,44	0,27	0,45
Schalldämmung (Rw)	35(-1;-3)	35(-1;-3)	37(-2;-4)	42(-2;-5)	38(-2;-5)	35(-1;-3)	35(-1;-3)
Luftdurchlässigkeit [Klasse]	4 (PK10: 3)	4 (PK10: 3)	4 (PK10: 3)	4 (PK10: 3)	4 (PK10: 3)	4 (PK10: 3)	4 (PK10: 3)
Externes Brandverhalten - Britisch [Klasse]	AC	AC	AC	AC	AC	AC	AC
Externes Brandverhalten - Europa [Klasse]	npd	npd	npd	npd	npd	npd	npd
Schlagfestigkeit [Klasse]	3	3	3	3	3	3	3
Tragfähigkeit der Sicherheitsvorrichtungen	√	√	√	√	√	√	√
Brandverhalten [Klasse]	D-s3,d2	D-s3,d2	D-s3,d2	D-s3,d2	D-s3,d2	D-s3,d2	D-s3,d2
Widerstand gegen Schneelast	**	**	**	**	**	**	**
Widerstand gegen Windlast [Klasse]	C3 (>SK08: NPD)	C3 (>SK08: NPD)	C3 (>SK08: NPD)	C3 (>SK08: NPD)	C3 (>SK08: NPD)	C3 (>SK08: NPD)	C3 (>SK08: NPD)
Wasserdichtigkeit [Klasse]	E900	E900	E900	E900	E900	E900	E900

Widerstand gegen Schneelast = ** Siehe Scheibenaufbau

NPD: No Performance Determined - Keine Leistung bestimmt

Rahmenmaterialien

Material Beschreibung	Weißer, wartungsfreier Lack Oberfläche mit Polyurethanlack.
Farbcode NCS, Oberfläche innen	S 0500-N
Farbcode am ähnlichsten zu RAL, Oberfläche innen	9003

Außenabdeckungen

Material Beschreibung	Aluminium, dunkelgrau Dunkelgrau	Aluminium, schwarz Uni Schwarz	Kupfer	Titanzink
Farbcode NCS	S 7500-N	S 9000-N	Kein Farbcode	
Farbcode am ähnlichsten zu RAL	7043	9005	Kein Farbcode	

Reinigung und Wartung

Um die Außenscheibe von innen zu reinigen, drehe den Flügel und sichere ihn mit dem Putzriegel in der Reinigungsposition.

VELUX Reparatur- und Wartungssets sind erhältlich.

Garantie

VELUX übernimmt 10 Jahre Garantie für Dachfenster inkl. Isolierverglasung. Eine besondere Garantie von 15 Jahren übernimmt VELUX bei Bruch von Metallbeschlägen sowie Bruch von Kunststoff-Rahmen. Die ausführlichen VELUX Garantiebedingungen finden Sie auf unserer Website www.velux.de.

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Eindeckrahmen und Anschlussprodukte

Eindeckrahmen
Das VELUX Dachfenster lässt sich mit original VELUX Eindeckrahmen-Lösungen in praktisch jede Dacheindeckung einbauen. Unsere Eindeckrahmen sind passend auf die genaue Größe und Form der Dachfenster abgestimmt, um eine perfekte, wasserdichte Passform zu gewährleisten. Eindeckrahmen lassen sich auch zur Kombination mehrerer Dachfenster verwenden.

Anschlussprodukte
Stellen Sie mit VELUX Anschlussprodukten den fachgerechten Einbau und die luft- und wasserdichte Verbindung zwischen Fenster und Dach sicher. Alle Anschlussprodukte gewährleisten dank ihrer perfekten Abstimmung auf das Dachfenster ein zuverlässiges und langlebiges Ergebnis.

Rollos, Markisen und Rollläden

Vervollständigen Sie den VELUX Dachfenster-Einbau mit Rollläden und Markisen für Hitzeschutz und Innenrollos für Lichtregulierung, Verdunkelung oder zum Schutz vor Insekten. Sie finden eine große Auswahl von manuell oder fernbedienbaren Produkten passgenau für jeden Fenstertyp und jede Größe.

Weitere Informationen

Technische Änderungen vorbehalten.

Weitere Informationen über unsere Produkte finden Sie auf http://www.velux.de

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