

To whom it may concern,

VELUX flashings are primarily available in three variants: 0000, 1000, and 2000.

The 0000 variant is created for flashings alone, whereas the 1000 and 2000 variants are intended for flashings sold in conjunction with the underfelt collar BFX and insulation collar BDX, as follows:

- 0000: Single flashing
- 1000: Flashing + BFX
- 2000: Flashing + BFX + BDX

This documentation has been created to facilitate the consolidation of two or three Environmental Product Declarations (EPDs) to accommodate the 1000 and 2000 variants, respectively.

The provided kg  $CO_2$  eq. /  $m^2$  values represent the cumulative values derived from the relevant EPDs outlined in subsequent sections.

Ugne Krikstanaite

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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-20220114-CBB3-EN

Issue date 24.05.2022 Valid to 23.05.2027

# Flashing EDN Velux



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# **General Information**

Velux	Flashing EDN
Programme holder	Owner of the declaration
IBU – Institut Bauen und Umwelt e.V. Hegelplatz 1 10117 Berlin Germany	VELUX Group Adalsvej 99 2970 Hørsholm Denmark
Declaration number	Declared product / declared unit
EPD-VEL-20220114-CBB3-EN	1m² flashing for flat roofing material EDN
	The declared unit is based on the configuration of a standard size window measuring $0.78 \text{m} \times 1.178 \text{m}$ .
This declaration is based on the product category rules:	Scope:
Windows and doors , 01.08.2021 (PCR checked and approved by the SVR)	Productline EDN - Flashing; manufactured by VELUX in France, Hungary, Poland, Denmark and China for sale in Europe.
	Declaration according to ISO 14025 and EN 15804 describing specific
Issue date	environmental performances of the construction product.  The owner of the declaration shall be liable for the underlying information
24.05.2022	and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.
Valid to	The EPD was created according to the specifications of EN 15804+A2. In
23.05.2027	the following, the standard will be simplified as <i>EN 15804</i> .
	Verification
	The standard EN 15804 serves as the core PCR
	Independent verification of the declaration and data according to ISO 14025:2011
	internally 🗓 externally
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DiplIng. Hans Peters (Chairman of Institut Bauen und Umwelt e.V.)	_
* Paul	fralet
Florian Pronold (Managing Director Institut Bauen und Umwelt e.V.)	Prof. Dr. Birgit Grahl, (Independent verifier)



# **Product**

# Product description/Product definition

The VELUX flashings for flat roofing material are products for sale in the European market. This group of flashings cover a large range of different flashing types for profiled roofing material.

The different flashing types fit for installation with either a single window configuration or configurations of multiple windows installed adjacent to each other. All the flashings consist mainly of aluminium.

The calculations are based on the representative flashing for flat roofing material named EDN. In the LCA, the EDN was assessed to be a conservative choice for a representative flashing for profiled roofing material type. For the use and application of the product the respective national provisions at the place of use apply, in Germany for example the building codes of the federal states and the corresponding national specifications.

#### **Application**

VELUX flashings for flat roofing material are used in renovation and new build. Either installed as a single window or in a combination of multiple windows.

#### **Technical Data**

#### **Constructional data**

Name	Value	Unit
Reaction to fire EN 13501-1	Е	class

Performance data of the product with respect to its characteristics in accordance with the relevant technical provision (no CE-marking).

# Base materials/Ancillary materials

#### % Galvanized steel 1 Stainless steel 0.4 % Polybutadiene 1 % Polyethylene LD 1 % REACH

Value

96

Unit

%

Name

Aluminium

This product/article/at least one partial article contains substances listed in the candidate list (date: 17.01.2022) exceeding 0.1 percentage by mass: no.

#### Recycled content

Name	Value	Unit
Aluminum	30	%
Steel	10	%
Others	0	%

The values stated in the table relate to the recycled material streams in VELUX production.

#### Reference service life

A calculation of the reference service life according to ISO 15686 is not possible.

The Bundesinstitut für Bau, Stadt und Raumforschung/Federal office for building and regional planning (BBSR) table declares for the complete roof window a service life dependent on the applied window frame material between 25 and ≥ 50 years. This includes collars and flashings as declared with this EPD.

# LCA: Calculation rules

# **Declared Unit**

The declared unit is one m<sup>2</sup> related to a reference window, that the flashing is installed in connection with.

The declared unit is based on the representative product measuring 0.78m x 1.178m.

# **Declared unit**

Name	Value	Unit
Declared unit	1	m <sup>2</sup>
Weight per area	3.30	kg/representative product
Weight per area	3.59	kg/declared unit

### System boundary

Type of EPD: Cradle to gate - with options. The following life cycle stages were considered:

### Production stage A1-A3:

Consideration of the production of raw materials and their processing; transport of major material to the manufacturing site; assembly of semi-finished products to the final product; packaging material (including waste paper input for paper and cardboard).

End-of-Life stage C1, C2, C3:

C1: a manual demolition is assumed, resulting in indicator value

C2: For the transport to EoL by truck a distance of 50 km is assumed

C3: A scenario for the incineration of plastics in a waste incineration plant (WIP) is assumed.

The EoL-Scenario does not assume waste to be disposed of on a landfill site. Module C4 is declared as "0".

Benefits for the next product system D:

Resulting electrical and thermal energy from the WIP, avoiding the generation of electricity and heat via fossil fuels, is considered.

The amount of metals after the reduction due to the net-flow calculations is sent to a recycling process. The effort for recycling, as well as the benefit for the regained metals are declared in module D.

Contribution of waste flows is considered in the modules where they occur.

# 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. The *software GaBi* is used accompanied by the *GaBi background data base* (version 2021.2, 2021).

# LCA: Scenarios and additional technical information

# Characteristic product properties of biogenic carbon

The following declared values refer to the declared unit of 1m<sup>2</sup>.

# Information on describing the biogenic Carbon Content at factory gate

The declared biogenic content comprises the paper manual and the packaging material consisting of cardboard, paper and wood. As module A5 is not declared, the information on packaging supports further EoL calculations.

Name	Value	Unit
Biogenic carbon content in product	-	В
Biogenic carbon content in accompanying packaging	0.735	kg C

The value refers to the following packaging material (per 1m²): Paper (manual): 0.020kg, Cardboard packaging: 1.684kg, Paper insert: 0.007kg, PE-LD: 0.013kg

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

# Reference service life

Name	Value	Unit
Life Span (according to BBSR) depending on	25 -	
window frame material	50	а

# End of life (C1-C4)

Name	Value	Unit
Collected separately waste type waste type	3.59	kg
Recycling	3.5	kg
Energy recovery	0.07	kg

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

Name	Value	Unit
Aluminium (net-flow calculation)	2.31	kg/1m² product
Steel (net-flow calculation)	0.04	kg/1m² product
Stainless steel (net-flow calculation)	8.18E-03	kg/1m <sup>2</sup> product



# LCA: Results

Description	LCA:	Resu	1115																		
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RESULTS OF THE LGA - ENVIRONMENTAL IMPACT according to EN 15804+A2:1 m* EDN										_	_										
Parameter														Х	X	X	X				
Godal Warming Potential Iotal (GWP-Iotal)			THE LO	CA - EN	VIRONI	/ENTAI	_ IMPA														
Schoal Warming Petential blogenic (GWP-blogenic)   kg CO <sub>2</sub> eq 2.57E+01   0   1.08E+02   7.29E+01   0   4.72E+01   0   4.72E+01   0   4.72E+01   0   4.72E+01   0   4.72E+01   0   4.72E+02   0   8.88E+05   2.6E+05   0   4.23E+02   0   0   4.72E+01   0   4.72E+									-												
Sichal Warming Potential biogenic (GWP-biogenic)   Rg CO <sub>2</sub> eq   2.89E+00   0   -1.29E-05   4.45E-05   0   -4.32E-02   Sichal Warming Potential blue (GWP-blue)   Rg CO <sub>2</sub> eq   1.75E-02   0   8.85E-05   2.6E-05   0   -6.23E-03   Depletion potential of the stratespheric ozone layer (COP)   Rg CCFC1 eq   2.7E-11   0   2.14E-18   2.11E-16   0   -1.9E-14   Additication potential of the stratespheric water (EP-restwater)   Rg Peq   7.7E-05   0   3.22E-08   3.26E-08   0   -8.46E-02   Eutrophication potential aquatic marine (EP-mainte)   Rg Peq   7.7E-05   0   3.22E-08   3.26E-08   0   -8.46E-02   Eutrophication potential aquatic marine (EP-mainte)   Rg Peq   7.7E-05   0   3.22E-08   3.26E-08   0   -8.46E-02   Eutrophication potential aquatic marine (EP-mainte)   Rg Peq   7.7E-05   0   3.22E-08   3.26E-08   0   -8.46E-02   Eutrophication potential of tropospheric ozone photochemical oxidants   Rg MM/OC   Rg Cop   0   1.9E-01   Formation potential of tropospheric ozone photochemical oxidants   Rg MM/OC   Rg Cop   0   1.9E-05   7.12E-05   0   3.42E-02   Abicide depletion potential for non fossil resources (ADPE)   Rg Sb eq   3.56E-02   0   1.9E-05   7.12E-05   0   3.42E-02   Abicide depletion potential for fossil resources (ADPE)   Rg Sb eq   3.56E-02   0   1.01E-04   7.49E-02   0   2.28E+00    RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1m² EDN    Renewable primary energy as energy carrier (PERE)   MJ   1.27E+02   0   8.3E-03   5.84E-02   0   -1.01E+02   Renewable primary energy as marging term (PENRE)   MJ   1.27E+02   0   8.3E-03   5.84E-02   0   -1.01E+02   Renewable primary energy resources (PERT)   MJ   1.55E+02   0   8.3E-03   5.84E-02   0   -1.01E+02   Renewable primary energy resources (PERT)   MJ   3.56E-02   0   1.45E-01   3.8SE-00   0   -2.2E-02   Resource of non renewable primary energy resources (PERT)   MJ   3.56E-02   0   1.45E-01   3.8SE-00   0   -2.2E-02   Resource of non renewable primary energy resources (PERT)   MJ   3.56E-02   0   1.45E-01   3.8SE-02   0   -1	Global W	arming Po	otential to	tal (GWP-	total)			kg CO <sub>2</sub>	eq	2.3E+01	0	1	1.09E-02	7.29	9E-01	0	-1.72E	Ξ+01			
Sobal Warming Potential Iuliu (GWP-luluc)   Rig CO <sub>2</sub> eq 1,75E-02   0   8.85E-05   2.8E-05   0   -6.23E-03	Global W	arming Po	otential fo	ssil fuels (	GWP-foss	sil)				2.57E+01	0	1	1.08E-02	7.29	9E-01	0	-1.72E	Ξ+01			
Depetion potential of the stratespheric corone layer (ODP)   kg CFCT1 eq   2.7E-11   0   2.14E-15   0   1.19E-16   0   1.19E-14   Acidification potential of land and water (AP)   mol H* eq   1.14E-01   0   2.14E-05   9.15E-05   0   4.8.6E-02   Eutrophication potential acquatic Treshwater (EP/freshwater)   kg P eq   7.7E-05   0   3.2E-03   3.2E-03   0   4.8.6E-06   Eutrophication potential acquatic Teshwater (EP/freshwater)   kg P eq   7.7E-05   0   3.2E-03   3.2E-05   0   4.8.6E-06   Eutrophication potential acquatic Teshwater (EP/freshwater)   kg N eq   1.86E-02   0   8.86E-06   2.46E-05   0   1.1E-02   Eutrophication potential acquatic Teshwater (EP/freshwater)   kg N eq   1.86E-02   0   8.86E-06   2.46E-05   0   1.1E-02   1.1E-01   0   (POCP)   Eutrophication potential for from potential control acquation   EV/freshwater   EV/fre	Global W	arming Po	tential bi	ogenic (G\	WP-bioge	nic)				-2.69E+00	0	)	-1.29E-05	4.45	5E-05	0	-4.32E	E-02			
Apadification potential all and and water (AP)	Global W	arming Po	otential lul	luc (GWP-	luluc)					1.75E-02	0	١	8.85E-05	2.6	E-05	0	-6.23E	E-03			
Eutrophication potential aquatic freshwater (EP-freshwater)		•				yer (ODP)		kg CFC1	1 eq												
Eutrophication potential aquate marine (EP-narine)					· ,									_							
Eutrophication potential terrestrial (EP-terrestrial)	<u> </u>				•		r)				_										
Formation potential of tropospheric ozone photochemical oxidants   kg NM/OC eq   0.55E-02   0.191E-05   7.12E-05   0.342E-02   0.434E-02   0.42E-02   0.434E-03								_						_							
Abbitc depletion potential for non fossil resources (ADPE)   Mg Sb eq 5.94E-08 0 0 9.6E-10 3.07E-09 0 -1.88E-08   Abbitc depletion potential for fossil resources (ADPF)   MJ 3.56E+02 0 1.44E-01 2.7E-01 0 -2.19E+02   Water use (WDP)   m³ world eq deprived   3.6E+00 0 0 1.01E-04 7.49E-02 0 -2.82E+00	<u> </u>					,	oxidants				_										
Abbiblic depletion potential for fossil resources (ADPF)   MJ   3.56E+02   0   1.44E-01   2.7E-01   0   -2.19E+02   Water use (WDP)   m³ world eq deprived   3.6E+00   0   1.01E-04   7.49E-02   0   -2.82E+00		· potoritio	. с. а. орос	Sp.10110 02						5.5E-02 0		1.91E-05	7.12E-05		0	-3.42E	Ξ-02				
Water use (WDP)							)	_	eq					_							
RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2; 1 m² EDN		Abiotic depletion potential for fossil resources (ADPF)			m3 world on					1.44E-01	2.7	=-01 0		-2.19E	<u>-</u> +02						
Parameter	Water use	e (WDP)								3.6E+00	0	'	1.01E-04	7.49	9E-02	0	-2.82E	Ē+00			
Parameter	RESUL	TS OF	THE LO	CA - IND	ICATO	RS TO I	DESCR	IBE RE	SOU	RCE USE	accord	ding to	o EN 1580	04+A2:	1 m <sup>2</sup> E	DN					
Renewable primary energy resources as material utilization (PERM)   NJ   2.73E+01   0   0   0   0   0   0   0   0   0	Parame	eter						Unit	t	A1-A3	С	1	C2	(	23	C4	D	,			
(PERM)	Renewab	le primary	, energy a	as energy	carrier (Pl	ERE)		MJ		1.27E+02	0		8.3E-03	5.84	1E-02	0	-1.01E	Ē+02			
Total use of renewable primary energy resources (PERT)   MJ   1.55E+02   0   8.3E+03   5.84E+02   0   -1.01E+02		le primary	energy r	esources	as materia	al utilizatio	n	MJ		2.73E+01	0	,	0		0	0	0	,			
Non renewable primary energy as energy carrier (PENRE)   MJ   3.53E+02   0   1.45E-01   3.83E+00   0   -2.2E+02     Non renewable primary energy as material utilization (PENRM)   MJ   3.56E+00   0   0   0   -3.56E+00   0   0     Total use of non renewable primary energy resources (PENRT)   MJ   3.57E+02   0   1.45E-01   2.7E-01   0   -2.2E+02     Use of secondary material (SM)   kg   2.88E+00   0   0   0   0   0   0   2.22E+00     Use of renewable secondary fuels (RSF)   MJ   0   0   0   0   0   0   0   0     Use of non renewable secondary fuels (RRSF)   MJ   0   0   0   0   0   0   0   0     Use of non renewable secondary fuels (RRSF)   MJ   0   0   0   0   0   0   0   0   0     Use of nor tenewable secondary fuels (RRSF)   MJ   0   0   0   0   0   0   0   0   0		of renewa	able prima	arv energy	resource	s (PERT)		MJ	-	1.55E+02	0	,	8.3E-03	5.84	1E-02	0	-1.01E	E+02			
Total use of non renewable primary energy resources (PENRT)   MJ   3.57E+02   0   1.45E-01   2.7E-01   0   -2.2E+02     Use of secondary material (SM)   kg   2.88E+00   0   0   0   0   0   2.22E+00     Use of renewable secondary fuels (RSF)   MJ   0   0   0   0   0   0   0     Use of not renewable secondary fuels (NRSF)   MJ   0   0   0   0   0   0   0     Use of not fresh water (FW)   m³   3.31E-01   0   9.51E-06   1.78E-03   0   -2.61E-01     RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2:    1 m² EDN     Parameter   Unit   A1-A3   C1   C2   C3   C4   D     Hazardous waste disposed (HWD)   kg   6.03E-07   0   7.63E-12   4.83E-11   0   -4.88E-06     Non hazardous waste disposed (NHWD)   kg   5.97E+00   0   2.27E-05   6.54E-02   0   -5.14E+00     Radioactive waste disposed (RWD)   kg   2.37E-02   0   2.63E-07   1.06E-05   0   -1.32E-02     Components for re-use (CRU)   kg   0   0   0   0   0   0     Materials for energy recovery (MER)   kg   0   0   0   0   0   0     Materials for energy (EEE)   MJ   0   0   0   0   0   0     Exported electrical energy (EEE)   MJ   0   0   0   0   0   0     RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional:    1 m² EDN   Parameter   Unit   A1-A3   C1   C2   C3   C4   D     Incidence of disease due to PM emissions (PM)   Disease incidence incidence incidence incidence incidence incidence findidence incidence findidence incidence inc							)														
Use of secondary material (SM)	Non rene	wable prir	mary ener	rgy as mat	erial utiliz	ation (PEN	NRM)	MJ		3.56E+00	0	١	0	-3.56	6E+00	0	0				
Use of renewable secondary fuels (RSF)					ergy reso	urces (PE	NRT)	MJ		3.57E+02	0	1	1.45E-01	2.7	E-01	0					
Use of non renewable secondary fuels (NRSF)					\ <b>r</b> \									_							
Use of net fresh water (FW)   m³   3.31E-01   0   9.51E-06   1.78E-03   0   -2.61E-01																					
RESULTS OF THE LCA - WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2:   1 m² EDN				iuai y iuels	(INNOF)				+												
Parameter				`^ _ \//	STE C	ATEGO	DIEC V	<u> </u>	TDI IT						,2 00			_ 0 .			
Parameter				)A – VV	NOTE O	AILGO	IXILO A	IND OU	1701	I LOWS	accord	illig to	LIN 1500	4 · AL.							
Hazardous waste disposed (HWD)								Unit	t	A1-A3	С	1	C2		23	C4	D	)			
Non hazardous waste disposed (NHWD)   kg   5.97E+00   0   2.27E-05   6.54E-02   0   -5.14E+00   Radioactive waste disposed (RWD)   kg   2.37E-02   0   2.63E-07   1.06E-05   0   -1.32E-02   Components for re-use (CRU)   kg   0   0   0   0   0   0   0   0   0			lisposed (	(HWD)																	
Components for re-use (CRU)														0	·	2.27E-05			0		
Materials for recycling (MFR)         kg         0         0         0         3.3E+00         0         0           Materials for energy recovery (MER)         kg         0	_	, ,																			
Materials for energy recovery (MER)         kg         0         0         0         0         0           Exported electrical energy (EEE)         MJ         0         0         0         1.6E+00         0         0           Exported thermal energy (EET)         MJ         0         0         0         2.88E+00         0         0           RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional:           1 m² EDN           Parameter         Unit         A1-A3         C1         C2         C3         C4         D           Incidence of disease due to PM emissions (PM)         Disease incidence incidence incidence         1.2E-06         0         1.3E-10         1.25E-09         0         -9.09E-07           Human exposure efficiency relative to U235 (IR)         kBq U235 eq 4.59E+00         0         3.84E-05         1.4E-03         0         -2.76E+00           Comparative toxic unit for ecosystems (ETP-fw)         CTUe         1.25E+02         0         1.07E-01         1.91E-01         0         -7.94E+01	<u> </u>																				
Exported electrical energy (EEE)							-					_									
Exported thermal energy (EET)							+														
RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional:           1 m² EDN         Unit         A1-A3         C1         C2         C3         C4         D           Incidence of disease due to PM emissions (PM)         Disease incidence incidence         1.2E-06         0         1.3E-10         1.25E-09         0         -9.09E-07           Human exposure efficiency relative to U235 (IR)         kBq U235 eq         4.59E+00         0         3.84E-05         1.4E-03         0         -2.76E+00           Comparative toxic unit for ecosystems (ETP-fw)         CTUe         1.25E+02         0         1.07E-01         1.91E-01         0         -7.94E+01	<u> </u>					$\overline{}$					_										
Parameter         Unit         A1-A3         C1         C2         C3         C4         D           Incidence of disease due to PM emissions (PM)         Disease incidence of disease due to PM emissions (PM)         1.2E-06         0         1.3E-10         1.25E-09         0         -9.09E-07           Human exposure efficiency relative to U235 (IR)         kBq U235 eq         4.59E+00         0         3.84E-05         1.4E-03         0         -2.76E+00           Comparative toxic unit for ecosystems (ETP-fw)         CTUe         1.25E+02         0         1.07E-01         1.91E-01         0         -7.94E+01	RESUL	TS OF			ditional	impact	categ	ories ac	cord	ing to EN	15804	+A2-0	ptional:								
Incidence of disease due to PM emissions (PM)								Unit	t	A1-A3	С	1	C2		23	C4	D	)			
Human exposure efficiency relative to U235 (IR) kBq U235 eq 4.59E+00 0 3.84E-05 1.4E-03 0 -2.76E+00  Comparative toxic unit for ecosystems (ETP-fw) CTUe 1.25E+02 0 1.07E-01 1.91E-01 0 -7.94E+01			se due to	PM emiss	ions (PM)			Diseas	se												
Comparative toxic unit for ecosystems (ETP-fw) CTUe 1.25E+02 0 1.07E-01 1.91E-01 0 -7.94E+01									_												
		-						_			_			_							
	Compara	tive toxic	unit for hu	ımans (ca	rcinogenio	) (HTP-c)		CTU	n	4.06E-08	0	)	2.17E-12	1.06	3E-11	0	-1.08E	E-08			



Comparative toxic unit for humans (noncarcinogenic) (HTP-nc)	CTUh	2.99E-07	0	1.18E-10	1.11E-09	0	-2.12E-07
Soil quality index (SQP)	SQP	1.74E+02	0	4.96E-02	6.59E-02	0	-7.21E+00

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 or as there is limited experience with the indicator.

Disclaimer 3 – for 'potential soil quality index'. Due to a data lack in the foreground data of VELUX, the result has a very high uncertainty and refers only to the background data, which contain respective information.

# References

#### **BBSR**

BBSR, 24.02.2017, Nutzungsdauer von Bauteilen nach BNB

#### **DIN FN 13501**

DIN EN 13501-1:2019-05: Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests

#### **DIN EN ISO 10077**

DIN EN ISO 10077-1:2020-10: Thermal performance of windows, doors and shutters - Calculation of thermal transmittance

#### EN 15804

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

#### GaBi

GaBi Software and GaBi Database by Sphera Solution GmbH, version: 2021.2, 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.ibuepd.com

# ISO 14025

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

# ISO 15686

ISO 15686:2011-05: Buildings and constructed assets - Service life planning - Part 1: General principles and framework

# PCR part A

Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report according to EN 15804+A2:2019, version 1.2, Berlin: Institut Bauen und Umwelt e.V., 2021

#### PCR part B

Requirements on the EPDS for Windows and doors, version 01-2021, Berlin: Institut Bauen und Umwelt e.V.

#### REACH

Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

# Regulation (EU) No. 305/2011 (CPR)

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





#### **Publisher**

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# Programme holder

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# Owner of the Declaration

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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)

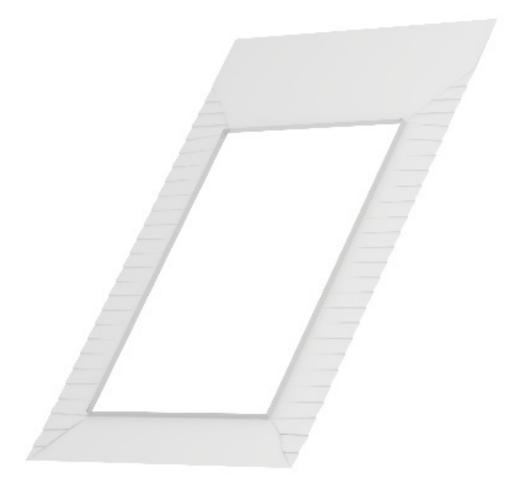
Declaration number EPD-VEL-20220111-CBB3-EN

Issue date 24.05.2022 Valid to 23.05.2027

# Collar BFX **Velux**



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







# **General Information**

Velux	Collar BFX					
Programme holder	Owner of the declaration					
IBU – Institut Bauen und Umwelt e.V. Hegelplatz 1 10117 Berlin Germany	VELUX Group Ådalsvej 99 2970 Hørsholm Denmark					
Declaration number	Declared product / declared unit					
EPD-VEL-20220111-CBB3-EN	1m² underfelt collar BFX					
	The declared unit is based on the configuration of a standard size window measuring $0.78 \text{m} \times 1.178 \text{m}$ .					
This declaration is based on the product category rules:	Scope:					
Windows and doors , 01.08.2021 (PCR checked and approved by the SVR)	Productline BFX - Collar/installation product; manufactured by VELUX in France for sale in Europe.					
	Declaration according to ISO 14025 and EN 15804 describing specific					
Issue date	environmental performances of the construction product.  The owner of the declaration shall be liable for the underlying information					
24.05.2022	and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.					
Valid to	The EDD was greated asserting to the appointment of EN 15004+A2. In					
23.05.2027	The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as <i>EN 15804</i> .					
	Verification					
	The standard EN 15804 serves as the core PCR					
	Independent verification of the declaration and data according to ISO 14025:2011					
	internally 🗵 externally					
Nam Roben						
DiplIng. Hans Peters (Chairman of Institut Bauen und Umwelt e.V.)	<u> </u>					
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* Panil	1,400-1					
Florian Pronold (Managing Director Institut Bauen und Umwelt e.V.)	Prof. Dr. Birgit Grahl, (Independent verifier)					



# **Product**

### Product description/Product definition

The VELUX BFX underfelt collar is a product for sale in the European market.

The underfelt collar consists of mainly steel and plastics.

The calculations are based on the BFX underfelt collar. 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 DIN EN 13859-1:2014 - Flexible sheets for waterproofing - Definitions and characteristics of underlays - Part 1: Underlays for discontinuous roofing. For the application and use the respective national provisions apply.

#### **Application**

VELUX BFX underfelt collar is used in renovation and new build.

#### **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-marking.

The performance values are specific for the BFX underfelt collar

The declared values in the table relate to the reference product. For other covered product variants, specific values can be selected at the bottom of the above-mentioned download page.

#### Constructional data

Name	Value	Unit
Fire resistance class DIN EN 1634-1	Е	class
Resistance to water penetration before artificial ageing	class W1	
Resistance to water penetration after artificial ageing	class W1	
Tensile strength in longitudinal direction before artificial ageing	200	N/50mm
Tensile strength in longitudinal direction after artificial ageing	120	N/50mm
Tensile strength in transverse direction before artificial ageing	200	N/50mm
Tensile strength in transverse direction after artificial ageing	120	N/50mm

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to *DIN EN 13859-1:2014* - Flexible sheets for waterproofing – Definitions and characteristics of underlays – Part 1:

Underlays for discontinuous roofing.

#### Base materials/Ancillary materials

Name	Value	Unit
Galvanized steel	67	%
Polypropylene	16	%
Polybutadiene	16	%
Hot-melt adhesive	0.3	%

#### REACH

This product/article/at least one partial article contains substances listed in the candidate list (date: 17.01.2022) exceeding 0.1 percentage by mass: no.

#### Recycled content

Name	Value	Unit
Steel	10	%
Others	0	%

The values stated in the table relate to the recycled material streams in VELUX production.

#### Reference service life

A calculation of the reference service life according to *ISO* 15686 is not possible.

The Bundesinstitut für Bau, Stadt und Raumforschung/Federal office for building and regional planning (*BBSR*) table declares for the complete roof window a service life dependent on the applied window frame material between 25 and ≥ 50 years. This includes collars and flashings as declared with this EPD.

# LCA: Calculation rules

# **Declared Unit**

The declared unit is one m² related to a reference window, that the collar is installed in connection with.

The declared unit is based on the representative product measuring 0.78m x 1.178m.

### **Declared unit**

Name	Value	Unit
Declared unit	1	m <sup>2</sup>
Weight per area	r area 1.77 kg/representative prod	
Weight per area	1.92	kg/declared unit

# System boundary

Type of EPD: Cradle to gate - with options. The following life cycle stages were considered:

# Production stage A1-A3:

Consideration of the production of raw materials and their processing; transport of major material to the manufacturing site; assembly of semi-finished products to the final product; packaging material (including waste paper input for paper and cardboard).

End-of-Life stage C1, C2, C3:



C1: a manual demolition is assumed, resulting in indicator value "0"

C2: For the transport to EoL by truck a distance of 50 km is assumed.

C3: A scenario for the incineration of plastics in a waste incineration plant (WIP) is assumed.

The EoL-Scenario does not assume waste to be disposed of on a landfill site. Module C4 is declared as "0".

Benefits for the next product system D:

Resulting electrical and thermal energy from the WIP, avoiding the generation of electricity and heat via fossil fuels, is considered.

The amount of metals after the reduction due to the net-flow calculations is sent to a recycling process. The effort for recycling, as well as the benefit for the regained metals are

declared in module D.

Contribution of waste flows is considered in the modules where they occur.

#### **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. The *software GaBi* is used accompanied by the *GaBi background data base* (version 2021.2, 2021).

# LCA: Scenarios and additional technical information

# Characteristic product properties of biogenic carbon

The following declared values refer to the declared unit of 1m<sup>2</sup>.

# Information on describing the biogenic Carbon Content at factory gate

The declared biogenic content comprises the paper manual and the packaging material consisting of cardboard, paper and wood. As module A5 is not declared, the information on packaging supports further EoL calculations.

Name	Value	Unit
Biogenic carbon content in product	-	В
Biogenic carbon content in accompanying packaging	0.147	kg C

The value refers to the following packaging material (per 1m²): Paper (manual): 0.009kg, Cardboard packaging: 0.329kg, Paper insert: 0.003kg, PE-LD: 0.009kg

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of  ${\rm CO_2}$ .

#### Reference service life

Name	Value	Unit
Life Span (according to BBSR) depending on	25 -	
window frame material	50	а

# End of life (C1-C4)

Name	Value	Unit
Collected separately waste type waste type	1.92	kg
Recycling	1.29	kg
Energy recovery	0.62	kg

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

Name	Value	Unit
Steel (net-flow calculation)	1.63	kg/1m² product



# LCA: Results

Description OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA, MND = MODULE OR INDIGATOR NOT DECLARED, MNR   MND   MND   MNR	LCA:	Resu	1115																
Product stage	DESCR	IPTION	OF TH	IF SYST	TEM BO	ΠΝΟΔΙ	RY (X =	INCLU	DED	IN I CA:	MND =	MODI	II F OR I	NDICAT	COR NO	OT DEC	ΙΔR	FD: MNR	
Product stage						ONDA	X1 (X =	INCLO		iit LOA,		IIIOD(	JEE OIL	IIDIOA		or bec		LD, MINI	
Products stage																	Ber	nefits and	
Part	Dro	dust stage Construction							laa at					First of life at a ma				loads beyond	
At   A2   A3   A4   A5   B1   B2   B3   B4   B5   B6   B7   C1   C2   C3   C4   D	Pio	duct Sta	age	proces	s stage			U	ise si	.age			End of life stage				the system		
Fig. 1																	bo	undaries	
Fig. 1				he						t t	rgy	ter	L		ng				
Fig. 1	rial	t	rin S	m t site	<u>&gt;</u>		ခင		eut	l en	l sue	N N	ig c	t	SSi			- b=	
A1	ate ply	ods	l de	the	d d	eg.	nar	Dair	e E	shn		la e	it it	ods	8	OSS	Se	ver Slin ntia	
A1	v m	ans	nta	to co	sse	š	nte	Rep	lac	Ē	le si	iੂ si	one of	ans	l d	gsi	  }	ecy ote	
A1	Rav	=	lan l	nnsp ate	Ϋ́		Maj		Rep	-  seft	erat	era	99	=	  sste		"	<u>ж</u> ж о	
X			_	Tra						"	ð	Q			×				
Name	A1	A2	А3	A4	A5	B1	B2	В3	В4	B5	В6	B7	C1	C2	C3	C4		D	
Parameter	Х	Х	Х	MND	MND	MND	MND	MNR	MN	R MNR	MND	MNE	) X	Х	Х	Х		Χ	
Parameter	RESUL	TS OF	THE LO	CA - EN	VIRONI	/ENTAI	IMPA	СТ ассо	ordin	a to EN 1	5804+	\2: 1 r	n² BFX						
Space   Spac															C3	C4		D	
Gobal Warming Potential Incised (GWP-Hossi)   kg CO <sub>2</sub> eq	Global W	arming Po	otential to	tal (GWP-	total)			kg CO <sub>2</sub>	eq		_		5.84E-03			0		-3.41E+00	
Sichal Warming Potential biogenic (GWP-biogenic)   Rg CO <sub>2</sub> eq   5.15E-01   0   6.9E-06   1.26E-04   0   7.717E-03						sil)		kg CO <sub>2</sub>	eq			)		_		0			
Sobal Warming Potential Iulius (GWP-Iulius)   Rg CO <sub>2</sub> eq   3.39E.93   0				•										_					
Depletion potential of the stratespheric corone layer (ODP)   kg CFCT1 eq   5.3E-12   0   1.14E-18   5.47E-18   0   -1.88E-14   Additional potential and water (AP)   mol H* eq   1.8E-02   0   1.14E-05   2.79E-04   0   -5.5E-03   Collectrophication potential aquatic freshwater (EP/freshwater)   kg P eq   3.8E-02   0   1.72E-08   8.34E-08   0   -2.03E-08   Eutrophication potential aquatic marine (EP-marine)   kg N eq   4.36E-03   0   4.74E-06   7.19E-05   0   -1.2E-03   Eutrophication potential aquatic marine (EP-marine)   kg N eq   4.36E-03   0   4.74E-06   7.19E-05   0   -1.2E-05   Eutrophication potential of tropospheric cozone photochemical oxidants   kg NMVOC   1.91E-02   0   1.02E-05   1.28E-03   0   -1.2E-03				• •										_					
Acidification potential of and and water (AP)						ver (ODP)											-		
Eutrophication potential aqualite frashwater (EP-trestwater)	<u> </u>					yor (ODI )	'							_					
Eutrophication potential aquatic marine (EP-marine)		<u> </u>			· ,	freshwate	r)							_					
Formation potential of tropospheric ozone photochemical oxidants   kg NM/OC eq   1.91E-02   0   1.02E-05   2.08E-04   0   -4.66E-03   (POCP)   (POCP)   (POCP)   kg Sb eq   2.38E-05   0   5.13E-10   7.96E-09   0   -5.72E-06   Abiotic depletion potential for non fossil resources (ADPE)   MJ   1.24E-02   0   7.72E-02   7.15E-01   0   -4.22E-01   Mater use (WDP)   m³ world eq deprived   3.41E+00   0   5.38E-05   2.35E-01   0   -6.16E+00   Mater use (WDP)   m³ world eq deprived   3.41E+00   0   5.38E-05   2.35E-01   0   -6.16E+00   Mater use (WDP)   m³ world eq deprived   3.41E+00   0   5.38E-05   2.35E-01   0   -6.16E+00   Mater use (WDP)   Mater use (WDP)   M\$ was a seneral variety of the deprived   3.41E+00   0   4.44E-03   1.53E-01   0   -3.27E-00   M\$ was a seneral variety of the deprived   M\$ was a seneral variety of the depriv		<u> </u>			•		,							_		0			
A   A   A   A   A   A   A   A   A   A	Eutrophic	ation pote	ential terre	estrial (EP	-terrestria	l)		mol N	eq	4.58E-02	(	)	5.37E-05	1.28	3E-03	0		-1.24E-02	
Abiotic depletion potential for non fossil resources (ADPE)   Alg Sb eq   2.38E.05   0   5.13E-10   7.96E-09   0   -5.72E-06   Abiotic depletion potential for fossil resources (ADPF)   MJ   1.24E+02   0   7.72E-02   7.15E-01   0   -4.22E+01   Mill   Mater use (WDP)   m³ world eq   deprived   3.41E+00   0   5.38E-05   2.35E-01   0   -6.16E+00   RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 m² BFX   Parameter   Unit   A1-A3   C1   C2   C3   C4   D   C4.44E-03   C4.44E-03   C5.44E-00   C6.44E-03   C6.44		n potentia	l of tropos	spheric oz	one photo	chemical	oxidants		oc	1.91E-02		)	1.02E-05	2.08	3E-04	0		-4.65E-03	
Abiotic depletion potential for fossil resources (ADPF)   MJ   1.24E+02   0   7.72E-02   7.15E-01   0   4.22E+01   Water use (WDP)   m³ world eq deprived   3.41E+00   0   5.38E-05   2.35E-01   0   -6.16E+00   RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 m² BFX	,	anletion n	otontial fo	r non foss	il resource	oc (ADDE)			00			,				0			
Water use (WDP)	-						<u>'</u>							_			+		
RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2; 1 m² BFX			otorniai ro	1 100011 100	, 000 in	.D. 1 )			d ea										
Parameter	vvater use	e (WDP)								3.41E+00		,	5.38E-05	2.3	DE-01	U		-0.10E+00	
Renewable primary energy as energy carrier (PERE)   MJ	RESUL	TS OF	THE LO	CA - IND	ICATO	RS TO I	DESCR	IBE RE	SOU	RCE USE	accor	ding to	o EN 158	04+A2:	1 m <sup>2</sup> E	BFX			
Renewable primary energy resources as material utilization (PERM)	Parame	eter						Unit	t	A1-A3	С	1	C2		C3	C4		D	
Total use of renewable primary energy resources (PERT)   MJ   9.548±00   0   0   0   0   0   0   0   0   0	Renewab	le primary	/ energy a	as energy	carrier (Pl	ERE)		MJ		4.11E+00	(	)	4.44E-03	1.53	3E-01	0		-3.27E+00	
Total use of renewable primary energy resources (PERT)   MJ   9.54E+00   0   4.44E-03   1.53E-01   0   -3.27E+00		le primary	energy r	esources	as materia	al utilizatio	n	MJ		5.43E+00		)	0		0	0		0	
Non renewable primary energy as energy carrier (PENRE)   MJ   9.66E+01   0   7.74E-02   2.84E+01   0   -4.22E+01   Non renewable primary energy as material utilization (PENRM)   MJ   2.77E+01   0   0   0   -2.77E+01   0   0   0   0   1.74E-02   0   0   0   0   0   0   0   0   0		of renewa	able prima	arv energy	resource	s (PFRT)		M.J		9 54F+00	- (	)	4 44F-03	1.53	3F-01	0	-	-3 27F+00	
Non renewable primary energy as material utilization (PENRM)   MJ   2.77E+01   0   0   -2.77E+01   0   0   0   Total use of non renewable primary energy resources (PENRT)   MJ   1.24E+02   0   7.74E-02   7.15E-01   0   -4.22E+01   Use of secondary material (SM)   kg   3.98E-01   0   0   0   0   0   Use of renewable secondary fuels (RSF)   MJ   0   0   0   0   0   0   Use of non renewable secondary fuels (RSF)   MJ   0   0   0   0   0   0   Use of non renewable secondary fuels (NRSF)   MJ   0   0   0   0   0   0   0   Use of non renewable secondary fuels (NRSF)   MJ   0   0   0   0   0   0   0   Use of non renewable secondary fuels (NRSF)   MJ   0   0   0   0   0   0   0   Use of not frenewable secondary fuels (NRSF)   MJ   0   0   0   0   0   0   0   Use of not frenewable secondary fuels (NRSF)   MJ   0   0   0   0   0   0   0   Use of not frenewable secondary fuels (NRSF)   MJ   0   0   0   0   0   0   0   Use of not frenewable secondary fuels (NRSF)   MJ   0   0   0   0   0   0   0   Use of not frenewable secondary fuels (NRSF)   MJ   0   0   5.09E-06   5.55E-03   0   -1.46E-01    Was of not frenewable secondary fuels (NRSF)   MJ   0   0   4.08E-12   1.28E-10   0   1.46E-01    Parameter							)												
Use of secondary material (SM)	Non rene	wable prir	mary ener	rgy as mat	erial utiliz	ation (PEN	NRM)	MJ		2.77E+01	(	)	0	-2.7	7E+01	0		0	
Use of renewable secondary fuels (RSF)					ergy reso	urces (PE	NRT)	MJ		1.24E+02	(	)	7.74E-02	7.15	5E-01	0		-4.22E+01	
Use of non renewable secondary fuels (NRSF)														_					
Use of net fresh water (FW)   m³   9.2E-02   0   5.09E-06   5.55E-03   0   -1.46E-01	-													_					
RESULTS OF THE LCA - WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2:   1 m² BFX				idary fuels	(NKSF)				-+								+		
Parameter			. ,	<b>.</b>	OTE O	ATE 0.0			TOUT						DE-03	U		-1.40⊑-01	
Parameter			THE LC	SA – VVA	ISTE C	AIEGO	RIES A	חס מעי	IPU	FLOWS	accord	ling to	EN 1580	J4+A2:					
Hazardous waste disposed (HWD)   kg   1.42E-07   0   4.08E-12   1.28E-10   0   1.66E-10     Non hazardous waste disposed (NHWD)   kg   2.13E-01   0   1.21E-05   1.57E-01   0   2.68E-01     Radioactive waste disposed (RWD)   kg   4.71E-03   0   1.4E-07   2.95E-05   0   -1.49E-03     Components for re-use (CRU)   kg   0   0   0   0   0   0     Materials for recycling (MFR)   kg   0   0   0   0   0   0     Materials for energy recovery (MER)   kg   0   0   0   0   0   0     Exported electrical energy (EEE)   MJ   0   0   0   0   0   0     Exported thermal energy (EET)   MJ   0   0   0   0   0   0     RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional:  1 m² BFX    Parameter   Unit   A1-A3   C1   C2   C3   C4   D     Incidence of disease due to PM emissions (PM)   Disease incidence   1.98E-07   0   6.94E-11   3.32E-09   0   -8.86E-08     Human exposure efficiency relative to U235 (IR)   KBq U235 eq   1.18E+00   0   2.05E-05   4.02E-03   0   -2.04E-01     Comparative toxic unit for ecosystems (ETP-fw)   CTUe   7.62E+01   0   5.73E-02   4.86E-01   0   -5.7E+00								Unit		Λ1_Λ3		4	C2		2	C4			
Non hazardous waste disposed (NHWD)   kg   2.13E-01   0   1.21E-05   1.57E-01   0   2.68E-01     Radioactive waste disposed (RWD)   kg   4.71E-03   0   1.4E-07   2.95E-05   0   -1.49E-03     Components for re-use (CRU)   kg   0   0   0   0   0   0     Materials for recycling (MFR)   kg   0   0   0   0   0   0     Materials for energy recovery (MER)   kg   0   0   0   0   0   0     Exported electrical energy (EEE)   MJ   0   0   0   5.09E+00   0   0     Exported thermal energy (EET)   MJ   0   0   0   9.14E+00   0   0      RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional:  1 m² BFX    Parameter   Unit   A1-A3   C1   C2   C3   C4   D     Incidence of disease due to PM emissions (PM)   Disease incidence   1.98E-07   0   6.94E-11   3.32E-09   0   -8.86E-08     Human exposure efficiency relative to U235 (IR)   K8q U235 eq   1.18E+00   0   2.05E-05   4.02E-03   0   -2.04E-01     Comparative toxic unit for ecosystems (ETP-fw)   CTUe   7.62E+01   0   5.73E-02   4.86E-01   0   -5.7E+00			lisposed (	(HWD)															
Radioactive waste disposed (RWD)   kg   4.71E-03   0   1.4E-07   2.95E-05   0   -1.49E-03				,	'D)				_		_			_			-+		
Components for re-use (CRU)																			
Materials for energy recovery (MER)         kg         0         0         0         0         0           Exported electrical energy (EEE)         MJ         0         0         0         5.09E+00         0         0           Exported thermal energy (EET)         MJ         0         0         0         9.14E+00         0         0           RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional:           1 m² BFX           Parameter         Unit         A1-A3         C1         C2         C3         C4         D           Incidence of disease due to PM emissions (PM)         Disease incidence incidence incidence         1.98E-07         0         6.94E-11         3.32E-09         0         -8.86E-08           Human exposure efficiency relative to U235 (IR)         kBq U235 eq         1.18E+00         0         2.05E-05         4.02E-03         0         -2.04E-01           Comparative toxic unit for ecosystems (ETP-fw)         CTUe         7.62E+01         0         5.73E-02         4.86E-01         0         -5.7E+00	Compone	ents for re-use (CRU)			kg		0	(	)	0		0	0		0				
Exported electrical energy (EEE)					kg		0	(	)	0	1.04	IE+00	0		0				
Exported thermal energy (EET)										_									
RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional:           1 m² BFX         Unit         A1-A3         C1         C2         C3         C4         D           Incidence of disease due to PM emissions (PM)         Disease incidence incidence incidence         1.98E-07         0         6.94E-11         3.32E-09         0         -8.86E-08           Human exposure efficiency relative to U235 (IR)         kBq U235 eq         1.18E+00         0         2.05E-05         4.02E-03         0         -2.04E-01           Comparative toxic unit for ecosystems (ETP-fw)         CTUe         7.62E+01         0         5.73E-02         4.86E-01         0         -5.7E+00	<u> </u>					-+								+					
1 m² BFX           Parameter         Unit         A1-A3         C1         C2         C3         C4         D           Incidence of disease due to PM emissions (PM)         Disease incidence incidence incidence         1.98E-07         0         6.94E-11         3.32E-09         0         -8.86E-08           Human exposure efficiency relative to U235 (IR)         kBq U235 eq         1.18E+00         0         2.05E-05         4.02E-03         0         -2.04E-01           Comparative toxic unit for ecosystems (ETP-fw)         CTUe         7.62E+01         0         5.73E-02         4.86E-01         0         -5.7E+00								l						9.14	+ <b>=</b> +UU	U		U	
Parameter         Unit         A1-A3         C1         C2         C3         C4         D           Incidence of disease due to PM emissions (PM)         Disease incidence of disease direction of the disease direction of the disease direction of the disease direction of the disease due to PM emissions (PM)         1.98E-07         0         6.94E-11         3.32E-09         0         -8.86E-08           Human exposure efficiency relative to U235 (IR)         kBq U235 eq         1.18E+00         0         2.05E-05         4.02E-03         0         -2.04E-01           Comparative toxic unit for ecosystems (ETP-fw)         CTUe         7.62E+01         0         5.73E-02         4.86E-01         0         -5.7E+00			THE LO	A – ado	ditional	impact	categ	ories ac	cord	iing to El	15804	+A2-c	ptional:						
Incidence of disease due to PM emissions (PM)   Incidence   1.98E-07   0   6.94E-11   3.32E-09   0   -8.86E-08								Unit	t	A1-A3	С	1	C2		С3	C4		D	
Human exposure efficiency relative to U235 (IR)         kBq U235 eq         1.18E+00         0         2.05E-05         4.02E-03         0         -2.04E-01           Comparative toxic unit for ecosystems (ETP-fw)         CTUe         7.62E+01         0         5.73E-02         4.86E-01         0         -5.7E+00			se due to	PM emiss	ions (PM)			Diseas	se										
Comparative toxic unit for ecosystems (ETP-fw)									-		(	)				0	+		
Comparative toxic unit for humans (carcinogenic) (HTP-c) CTUh 2.9E-09 0 1.16E-12 2.89E-11 0 -1.4E-09								_			_								
	Compara	tive toxic	unit for hu	ımans (ca	rcinogenio	(HTP-c)		CTU	n	2.9E-09	(	)	1.16E-12	2.89	9E-11	0		-1.4E-09	



Comparative toxic unit for humans (noncarcinogenic) (HTP-nc)	CTUh	9.62E-08	0	6.29E-11	2.75E-09	0	-3.45E-08
Soil quality index (SQP)	SQP	2.4E+01	0	2.65E-02	1.77E-01	0	-2.85E+00

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 or as there is limited experience with the indicator.

Disclaimer 3 – for 'potential soil quality index'. Due to a data lack in the foreground data of VELUX, the result has a very high uncertainty and refers only to the background data, which contain respective information.

# References

#### **BBSR**

BBSR, 24.02.2017, Nutzungsdauer von Bauteilen nach BNB

#### **DIN EN 1634-1**

DIN EN 1634-1:2018-04: Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware - Part 1: Fire resistance test for door and shutter assemblies and openable windows

#### **DIN EN 13859-1**

DIN EN 13859-1:2014-07: Flexible sheets for waterproofing - Definitions and characteristics of underlays - Part 1: Underlays for discontinuous roofing

#### EN 15804

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

### GaBi

GaBi Software and GaBi Database by Sphera Solution GmbH, version: 2021.2, 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.ibuepd.com

# ISO 14025

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

# ISO 15686

ISO 15686:2011-05: Buildings and constructed assets - Service life planning - Part 1: General principles and framework

# PCR part A

Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report according to EN 15804+A2:2019, version 1.2, Berlin: Institut Bauen und Umwelt e.V., 2021

#### PCR part B

Requirements on the EPDS for Windows and doors, version 01-2021, Berlin: Institut Bauen und Umwelt e.V.

#### REACH

Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

# Regulation (EU) No. 305/2011 (CPR)

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





#### **Publisher**

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# Programme holder

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# Owner of the Declaration

VELUX Group Ådalsvej 99 2970 Hørsholm Denmark +4545164726 jakob.roerbech@velux.com www.velux.com



# **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-20220112-CBB3-EN

Issue date 24.05.2022 Valid to 23.05.2027

# Collar BDX **Velux**



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







# **General Information**

Velux	Collar BDX					
Programme holder	Owner of the declaration					
IBU – Institut Bauen und Umwelt e.V. Hegelplatz 1 10117 Berlin Germany	VELUX Group Ådalsvej 99 2970 Hørsholm Denmark					
Declaration number	Declared product / declared unit					
EPD-VEL-20220112-CBB3-EN	1m² insulation collar BDX					
	The declared unit is based on the configuration of a standard size window measuring $0.78m \times 1.178m$ .					
This declaration is based on the product category rules:	Scope:					
Windows and doors , 01.08.2021 (PCR checked and approved by the SVR)	Productline BDX - Collar/installation product; manufactured by VELUX in France and Poland for sale in Europe.					
Issue date	Declaration according to ISO 14025 and EN 15804 describing specific					
24.05.2022	environmental performances of the construction product.  The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer					
Valid to	— information, life cycle assessment data and evidences.					
23.05.2027	The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as <i>EN 15804</i> .					
	Verification					
	The standard EN 15804 serves as the core PCR					
	Independent verification of the declaration and data according to ISO 14025:2011					
Nam Peter	internally 🗵 externally					
DiplIng. Hans Peters (Chairman of Institut Bauen und Umwelt e.V.)	<u> </u>					
F Paus Ol	- fraelet					
Florian Pronold (Managing Director Institut Bauen und Umwelt e.V.)	Prof. Dr. Birgit Grahl, (Independent verifier)					



# **Product**

# Product description/Product definition

The VELUX BDX insulation collar is a product for sale in the European market.

The Insulation collar is for insulation and closure of gaps between the window and roof.

The insulation collars consist of mainly steel and plastics. The calculations are based on the BDX insulation collar. 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 *DIN EN 16069:2012+A1:2015* Thermal insulation products for buildings – Factory made products of polyethylene foam (PEF) – Specification. For the application and use, the respective national provisions apply.

# **Application**

VELUX BDX insulation collaris used in renovation and new build. Either installed as a single window or in a combination of multiple windows.

#### **Technical Data**

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

The performance values are specific for the BDX insulation collar.

The declared values in the table relate to the reference product. For other covered product variants, specific values can be selected at the bottom of the above-mentioned download page.

# **Constructional data**

Name	Value	Unit
Fire resistance class DIN EN 1634-1	Е	class
Thermal resistance λD	0.039	W/(mK)

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to *DIN EN 16069:2012+A1:2015* Thermal insulation products for buildings – Factory made products of polyethylene foam (PEF) – Specification.

# Base materials/Ancillary materials

Name	Value	Unit
Galvanized steel	65	%
Polyethylene LD	18	%
Polypropylene	8	%
Polybutadiene	7	%
PA 6.6 with glass fibre	1	%
Hot-melt adhesive	1	%

#### **REACH**

This product/article/at least one partial article contains substances listed in the candidate list (date: 17.01.2022) exceeding 0.1 percentage by mass: no.

#### Recycled content

Name	Value	Unit
Steel	10	%
Others	0	%

The values stated in the table relate to the recycled material streams in VELUX production.

# Reference service life

A calculation of the reference service life according to *ISO* 15686 is not possible.

The Bundesinstitut für Bau, Stadt und Raumforschung/Federal office for building and regional planning (BBSR) table declares for the complete roof window a service life dependent on the applied window frame material between 25 and  $\geq$  50 years. This includes collars and flashings as declared with this EPD.

# LCA: Calculation rules

# **Declared Unit**

The declared unit is one m² related to a reference window, that the collar is installed in connection with.

The declared unit is based on the representative product measuring 0.78m x 1.178m.

# **Declared unit**

Name	Value	Unit						
Declared unit	1	m <sup>2</sup>						
Weight per area	3.81	kg/representative product						
Weight per area	4.14	kg/declared unit						

# System boundary

Type of EPD: Cradle to gate - with options. The following life cycle stages were considered:

Production stage A1-A3:

Consideration of the production of raw materials and their processing; transport of major material to the manufacturing

site; assembly of semi-finished products to the final product; packaging material (including waste paper input for paper and cardboard).

End-of-Life stage C1, C2, C3:

C1: a manual demolition is assumed, resulting in indicator value "0".

C2: For the transport to EoL by truck a distance of 50 km is assumed.

C3: A scenario for the incineration of plastics in a waste incineration plant (WIP) is assumed.

The EoL-Scenario does not assume waste to be disposed on a landfill site. Module C4 is declared as "0".

Benefits for the next product system D:

Resulting electrical and thermal energy from the WIP, avoiding the generation of electricity and heat via fossil fuels, is considered

The amount of metals after the reduction due to the net-flow calculations is sent to a recycling process. The effort for



recycling, as well as the benefit for the regained metals are declared in module D.

Contribution of waste flows is considered in the modules where they occur.

#### **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. The *software GaBi* is used accompanied by the *GaBi background data base* (version 2021.2, 2021).

# LCA: Scenarios and additional technical information

# Characteristic product properties of biogenic carbon

The following declared values refer to the declared unit of 1m<sup>2</sup>.

# Information on describing the biogenic Carbon Content at factory gate

The declared biogenic content comprises the paper manual and the packaging material consisting of cardboard, paper and wood. As module A5 is not declared, the information on packaging supports further EoL calculations.

Name	Value	Unit
Biogenic carbon content in product	-	В
Biogenic carbon content in accompanying packaging	0.267	kg C

The value refers to the following packaging material (per 1m²): Paper (manual): 0.015kg, Cardboard packaging: 0.603kg, Paper insert: 0.003kg, PE-LD: 0.009kg

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

#### Reference service life

Name	Value	Unit
Life Span (according to BBSR) depending on	25 -	
window frame material	50	а

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

Name	Value	Unit
Collected separately waste type waste type	4.14	kg
Recycling	2.7	kg
Energy recovery	1.43	kg

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

Name	Value	Unit
Steel (net-flow calculation)	3.41	kg/1m <sup>2</sup> product



# LCA: Results

LCA: Results											
DESCRIPTION OF THE SYSTEM BOUNI = MODULE NOT RELEVANT)	OARY (X =	: INCLUI	DED	IN LCA; I	MND = I	MODU	ILE OR II	NDICAT	FOR NO	OT DEC	
Product stage Construction process stage	Use stage					E	End of li	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 B		B3	B4	_	B6	B7	C1	C2	C3	C4	D
X X X MND MND MN		MNR	MN		MND	MND		Х	X	X	X
RESULTS OF THE LCA - ENVIRONMENT	TAL IMPA	1	$\overline{}$						20	0.4	
Parameter Global Warming Potential total (GWP-total)		Unit kg CO <sub>2</sub>		<b>A1-A3</b>	C 0		C2		C3	<b>C4</b>	7.24F+00
Global Warming Potential total (GWP-total)  Global Warming Potential fossil fuels (GWP-fossil)		kg CO <sub>2</sub>		1.51E+01 1.6E+01	0		1.26E-02 1.25E-02	_	E+00 E+00	0	-7.24E+00 -7.23E+00
Global Warming Potential lossifidets (GWP-lossif)  Global Warming Potential biogenic (GWP-biogenic)		kg CO <sub>2</sub>		-9.36E-01	0		-1.49E-05	_	E-04	0	-1.56E-02
Global Warming Potential Iuluc (GWP-Iuluc)		kg CO <sub>2</sub>		8.06E-03	0		1.02E-04	_	E-04	0	-1.89E-03
Depletion potential of the stratospheric ozone layer (C	DP)	kg CFC1		9.36E-12	0		2.47E-18	_	9E-15	0	-4.07E-14
Acidification potential of land and water (AP)		mol H <sup>+</sup>	eq	3.92E-02	0	1	2.47E-05	6.3	E-04	0	-1.16E-02
Eutrophication potential aquatic freshwater (EP-freshv	ater)	kg P e	-	5.48E-05	0		3.71E-08		1E-07	0	-4.4E-06
Eutrophication potential aquatic marine (EP-marine) Eutrophication potential terrestrial (EP-terrestrial)		kg N eq		9.62E-03 1.01E-01	0		1.02E-05 1.16E-04		7E-04 3E-03	0	-2.55E-03 -2.64E-02
Formation potential of tropospheric ozone photochem	cal oxidants	mol N eq								0	
(POCP)		eq		3.7E-02	0		2.2E-05		1E-04		-9.82E-03
Abiotic depletion potential for non fossil resources (ADAbiotic depletion potential for fossil resources (ADPF)	PE)	kg Sb eq MJ		4.98E-05 2.7E+02	0		1.11E-09 1.66E-01	_	2E-08 9E+00	0	-1.19E-05 -9.03E+01
Water use (WDP)		m <sup>3</sup> world eq deprived		6.3E+00	0		1.16E-04		1E-01	0	-1.28E+01
RESULTS OF THE LCA - INDICATORS T	O DESCR	IBE RE	sou	RCE USE	accord	ding to	EN 1580	)4+A2:	1 m² E	BDX	
Parameter		Unit		A1-A3	С	1	C2	(	23	C4	D
Renewable primary energy as energy carrier (PERE)		MJ		1.88E+01	0	)	9.58E-03	3.86	6E-01	0	-7.33E+00
Renewable primary energy resources as material utiliz (PERM)	ation	MJ		9.9E+00	0	)	0		0	0	0
Total use of renewable primary energy resources (PEI	es (PERT)			2.87E+01	0	)	9.58E-03	3.86	6E-01	0	-7.33E+00
Non renewable primary energy as energy carrier (PEN	` '			2.08E+02	0		1.67E-01		E+01	0	-9.03E+01
Non renewable primary energy as material utilization ( Total use of non renewable primary energy resources				6.23E+01 2.7E+02	0		0 1.67E-01		3E+01 9E+00	0	-9.03E+01
Use of secondary material (SM)	(FLINIXI)	MJ kg		7.5E-01	0		0	_	0	0	2.73E+00
Use of renewable secondary fuels (RSF)		MJ		0	0	1	0		0	0	0
Use of non renewable secondary fuels (NRSF)		MJ		0	0		0	_	0	0	0
Use of net fresh water (FW)		m <sup>3</sup>		1.73E-01	0		1.1E-05		3E-02	0	-3.05E-01
RESULTS OF THE LCA – WASTE CATE( 1 m² BDX	OKIES A	וטט טאי	IPU	I FLOWS	accord	ing to	EN 1580	4+A2:			
Parameter		Unit		A1-A3	С	1	C2		23	C4	D
Hazardous waste disposed (HWD)		kg		2.97E-07	0		8.8E-12	_	E-10	0	-1.75E-10
Non hazardous waste disposed (NHWD)		kg kg	_	4.52E-01	0		2.62E-05		2E-01	0	5.57E-01
Components for re-use (CRU)	Radioactive waste disposed (RWD)			8.89E-03 0	0		3.03E-07 0	_	3E-05 0	0	-3.27E-03 0
Materials for recycling (MFR)				0	0		0		E+00	0	0
Materials for energy recovery (MER)		kg		0	0		0		0	0	0
Exported thermal energy (EEE)		MJ MJ		0	0		0		E+01 E+01	0	0
Exported thermal energy (EET)  RESULTS OF THE LCA – additional imp	act categ		cord					2.01	01	U U	
1 m² BDX Parameter		Unit		A1-A3	С	1	C2		23	C4	D
Incidence of disease due to PM emissions (PM)		Diseas	e	4.18E-07	0		1.5E-10		E-09	0	-1.86E-07
Human exposure efficiency relative to U235 (IR)		kBq U235	_	2.13E+00	0	,	4.43E-05	9.5	E-03	0	-4.52E-01
Comparative toxic unit for ecosystems (ETP-fw)		CTUe	;	1.31E+02	0	1	1.24E-01	_	E+00	0	-1.24E+01
Comparative toxic unit for humans (carcinogenic) (HTP-c)		CTUh	1 I	6.48E-09	0	1	2.5E-12	7.06	3E-11	0	-2.94E-09



Comparative toxic unit for humans (noncarcinogenic) (HTP-nc)	CTUh	2.22E-07	0	1.36E-10	7.24E-09	0	-7.28E-08
Soil quality index (SQP)	SQP	8.74E+01	0	5.72E-02	4.38E-01	0	-6.29E+00

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 or as there is limited experience with the indicator.

Disclaimer 3 – for 'potential soil quality index'. Due to a data lack in the foreground data of VELUX, the result has a very high uncertainty and refers only to the background data, which contain respective information.

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### **REACH**

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





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