epd-norge
Global program operatør

Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

AluWood®

WOODUPP

The Norwegian EPD Foundation

Owner of the declaration:
PVH Outdoor A/S (part of WoodUpp Group A/S)

Product:
AluWood®

Declared unit:
1 m2

This declaration is based on Product Category Rules:
CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 010:2022 Part B for building boards

Program operator:
The Norwegian EPD Foundation

Declaration number:

NEPD-8599-8261-EN

Registration number:

NEPD-8599-8261-EN

Issue date: 20.12.2024

Valid to: 20.12.2029

EPD software:
LCAno EPD generator ID: 728298

General information

Product

AluWood®

Owner of the declaration:

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Program operator:

The Norwegian EPD Foundation
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Manufacturer:

PVH Outdoor A/S (part of WoodUpp Group A/S)

Declaration number:

NEPD-8599-8261-EN

Place of production:

PVH Outdoor A/S (part of WoodUpp Group A/S)
Industrivej 13
6780 Skaerbaek, Denmark

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 010:2022 Part B for building boards

Management system:

Statement of liability:

The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Organisation no:

44604221

Declared unit:

1 m2 AluWood®

Issue date:

20.12.2024

Declared unit with option:

A1-A3,A4,C1,C2,C3,C4,D

Valid to:

20.12.2029

Year of study:

2024

Functional unit:

Not defined.

Comparability:

EPD of construction products may not be comparable if they not comply with EN 15804 and seen in a building context.

General information on verification of EPD from EPD tools:

Independent verification of data, other environmental information and the declaration according to ISO 14025:2010, § 8.1.3 and § 8.1.4. Verification of each EPD is made according to EPD-Norway's guidelines for verification and approval requiring that tools are i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPD-Norway, and iii) the process is reviewed annually by an independent third party verifier. See Appendix G of EPD-Norway's General Programme Instructions for further information on EPD tools

Development and verification of EPD:

The declaration is created using EPD tool lca.tools ver EPD2022.03, developed by LCA.no. The EPD tool is integrated in the company's management system, and has been approved by EPD Norway.

Developer of EPD: Emil Pedersen - Nordic LCA

Reviewer of company-specific input data and EPD: Børge Heggen Johansen, Energiråd AS

Verification of EPD tool:

Independent third party verification of the EPD tool, background data and test-EPD in accordance with EPDNorway's procedures and guidelines for verification and approval of EPD tools.

Third party verifier:

Elisabet Amat, GREENIZE projects

(no signature required)

Approved:

Håkon Hauan
Managing Director of EPD-Norway

Product

Product description:

AluWood is a solution for facade cladding, designed specifically for outdoor applications. It combines thermally modified Nordic Spruce (Picea) certified as PCAB EU (N) Termo D by the International ThermoWood Association, with an coated aluminum plate for enhanced durability and weather resistance.
The system is installed on wooden battens with a wind barrier, supporting only vertical mounting for optimal performance and aesthetic appeal. AluWood is available with or without paint. This EPD represents the "worst case" scenario, which includes the coating (paint), resulting in higher emissions. Excluding the emissions from the coating reflects AluWood without paint.

Product specification

This declaration, including data collection and the modelled foreground system including results, represents the production of 1 m2 of AluWood product at the production site located in Skaerbaek, Denmark.

Product specific data are based on average values collected in 2024. Background data are based on Ecoinvent 3.6 and are less than 10 years old. Generally, the used background datasets are of high quality, and the majority of the datasets are only a couple of years old. Additionally, the background data for wood and glue are derived from two EPDs. For wood, the source is Lunawood Thermowood of Nordic Pine and Spruce, while for glue, it is Products based on polyurethane or silane-modified polymer, group 1, with declaration number EPD-FEI-20220021-IBG1-EN.

The declared unit (1 m2) is calculated based on a 2.40m x 0.451m panel.

The main product components per declared unit are shown in Table 1 below.

Materials	kg	%
Adhesive and sealant	0,06	0,89
Binder	0,82	12,20
Wood - Solid spruce	2,89	43,01
Metal - Aluminium	2,95	43,90
Total	6,72	100,00

Packaging	kg	%
Packaging - Pallet	0,06	100,00
Total incl. packaging	6,78	100,00

Technical data:

AluWood facade cladding is in conformity with the provisions of the EC Regulation No. 305/2011, Construction Product Regulation system of assessment and verification of constancy of performance: System 3 and is in accordance with the requirements of EN 14915:2013 (Solid wood paneling and cladding – Characteristics evaluation of conformity and marking.

Further technical information can be obtained by contacting the manufacturer or on the manufacturers website:
https://woodupp.com/product/aluwood/

Market:

Primarily sold in Europe, but also available in rest of world.

Reference service life, product

30 years.

Reference service life, building or construction works

Not relevant.

LCA: Calculation rules

Declared unit:

1 m2 AluWood®

Cut-off criteria:

All major raw materials and all the essential energy is included. The production processes for raw materials and energy flows with very small amounts (less than 1%) are not included when specific information are missing. These cut-off criteria do not apply for hazardous materials and substances.

Allocation:

The allocation is made in accordance with the provisions of EN 15804. Incoming energy and water and waste production in-house is allocated equally among all products through mass allocation. Effects of primary production of recycled materials is allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.

Data quality:

Specific data for the product composition are provided by the manufacturer. The data represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on EPDs according to EN 15804 and different LCA databases. The data quality of the raw materials in A1 is presented in the table below.
Product specific data are based on average values collected in 2024, covering the production period from 01.02.2024 to 01.11.24. A followup to verify whether the data is accurate or varies by more than 10% will be performed in February 2025.

Materials	Source	Data quality	Year
Adhesive and sealant	EPD-FEI-20220021-IBG1-EN	EPD	2021
Binder	ecoinvent 3.6	Database	2019
Metal - Aluminium	ecoinvent 3.6	Database	2019
Packaging - Pallet	Modified ecoinvent 3.6	Database	2019
Wood - Solid spruce	RTS EPD nro: RTS_44_19	EPD	2019

System boundaries (X=included, MND=module not declared, MNR=module not relevant)

Product stage			Construction installation stage		Use stage							End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	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	X	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

System boundary:

This EPD is based on a cradle-to-gate LCA, in which 100 weight-% has been accounted for.

The general rules for the exclusion of inputs and outputs follows the requirements in EN 15804, 6.3.5, where the total of neglected input flows per module shall be a maximum of 5 % of energy usage and mass and 1 % of energy usage and mass for unit processes.

Product stage (A1-A3) includes:

A1 – Extraction and processing of raw materials
A2 – Transport to the production site
A3 – Manufacturing processes

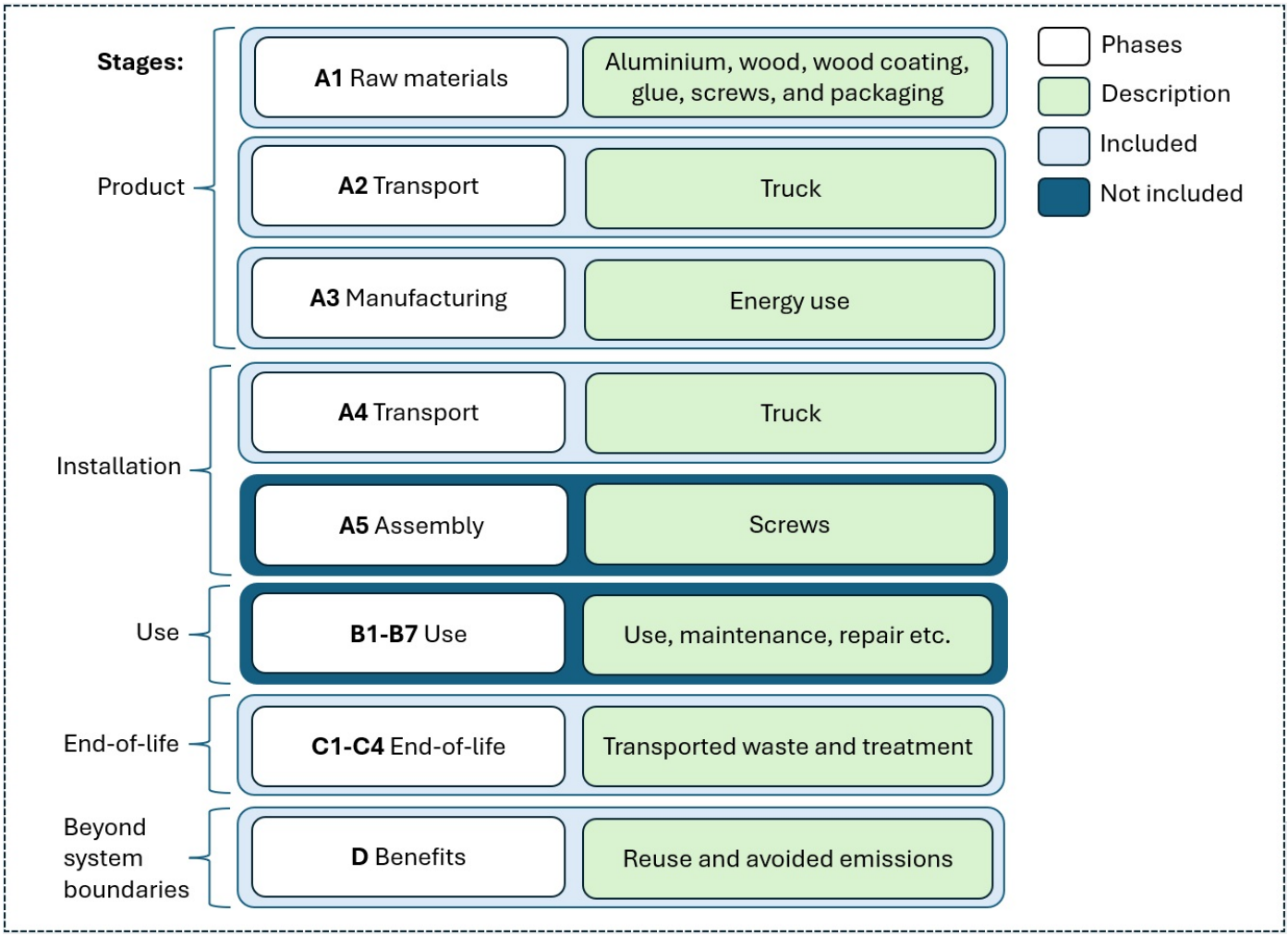
The product stage comprises the acquisition of all raw materials, products and energy, transport to the production site, packaging and waste processing up to the "end-of-waste" state or final disposal. The LCA results are declared in aggregated form for the product stage, which means, that the sub-modules A1, A2 and A3 are declared as one module A1-A3.

Transport (A4) is assumed to cover a distance of 300 km. Screws used for installation are excluded, as per NPCR 013 Part B for Steel and Aluminium Construction Products, they are considered part of the building-level assessment. Additionally, installation is carried out manually using hand tools, resulting in minimal energy consumption.¨

End of Life (C1-C4) includes:
End of Life (C1-C4) includes only modules C2 and C3 in the declaration. In module C1 disassembly is assumed to be performed manually, possibly using hand tools, with minimal energy consumption. The AluWood facade elements are designed and assembled to allow for easy disassembly at the end of their use phase, which should take place on-site. After disassembly, the components are transported to a relevant waste processing facility. The transport distance is estimated to be 84 km.

The components of the AluWood facade elements are either recycled or incinerated with additional benefits. Treated wood is incinerated at waste-to-energy facilities, assuming that the glue and coating remain on the wood during incineration. Aluminum sheets and screws are assumed to be recycled, replacing primary aluminum ingots.

Re-use, recovery and recycling potential (D) includes:
The materials in the AluWood facade system contribute to benefits and burdens beyond its system boundaries. When the materials are incinerated, they generate both electricity and heat. The electricity replaces the Danish electricity grid mix, while the heat substitutes district heating in Denmark, with the energy distribution comprising 25% electricity and 75% heat. The energy and heat potential from the reused wood are accounted for in accordance with cPCR 16485. Additionally, in module C3, 95% of the aluminum sheets are recycled, replacing the average European aluminum ingots



Additional technical information:

LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

Transport from production place to user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, unspecified, EURO 6 (kgkm) - RER	46,1 %	300	0,034	l/tkm	10,20

Transport to waste processing (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, unspecified, EURO 6 (kgkm) - RER	46,1 %	84	0,034	l/tkm	2,86

Waste processing (C3)	Unit	Value			
Materials to recycling (kg)	kg	2,95			
Balancing waste - Biogenic carbon in product (kg) - (Type 4)	kg	4,68			
Balancing waste - RPEM (MJ) - (Type 4)	MJ	54,094			
Balancing waste - NRPM (MJ) - (Type 4)	MJ	1,56			
Waste treatment per kg Wood, incineration with fly ash extraction (kg)	kg	2,95			
Waste treatment per kg Paint, hazardous waste incineration (kg)	kg	0,82			

Disposal (C4)	Unit	Value			
Landfilling of ashes from incineration of Wood, process per kg ashes and residues (kg)	kg	0,033			
Landfilling of ashes from incineration of Paint, hazardous waste incineration, process of ashes and residues (kg)	kg	0,024			

Benefits and loads beyond the system boundaries (D)	Unit	Value			
Substitution of primary aluminium with net scrap (kg)	kg	2,80			
Substitution of Electricity, Denmark (kWh)	kWh	2,055			
Substitution of District heating, Denmark (MJ)	MJ	31,095			

LCA: Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document.

Environmental impact									
	Indicator	**Unit**	A1-A3	A4	C1	C2	C3	C4	D
	GWP-total	kg CO_2 -eq	1,67E+01	2,64E-01	0	7,39E-02	7,40E+00	8,52E-03	-2,69E+01
	GWP-fossil	kg CO_2 -eq	2,11E+01	2,64E-01	0	7,38E-02	2,71E+00	8,51E-03	-2,63E+01
	GWP-biogenic	kg CO_2 -eq	-4,68E+00	1,16E-04	0	3,25E-05	4,69E+00	4,04E-06	-1,17E-01
	GWP-luluc	kg CO_2 -eq	3,17E-01	9,67E-05	0	2,71E-05	2,57E-04	1,02E-06	-4,74E-01
	ODP	kg CFC11 -eq	2,42E-06	6,05E-08	0	1,69E-08	1,64E-07	4,99E-10	-2,15E-06
	AP	mol H+ -eq	1,37E-01	7,97E-04	0	2,23E-04	2,76E-03	2,30E-05	-1,78E-01
	EP-FreshWater	kg P -eq	1,23E-03	2,24E-06	0	6,26E-07	4,84E-06	1,22E-07	-1,05E-03
	EP-Marine	kg N -eq	1,88E-02	1,62E-04	0	4,55E-05	6,46E-04	6,61E-06	-2,28E-02
	EP-Terrestial	mol N -eq	2,18E-01	1,82E-03	0	5,08E-04	7,27E-03	7,69E-05	-2,55E-01
	POCP	kg NMVOC -eq	6,94E-02	7,04E-04	0	1,97E-04	2,26E-03	2,05E-05	-8,35E-02
	ADP-minerals&metals[1]	kg Sb-eq	1,21E-02	7,14E-06	0	2,00E-06	2,41E-06	2,43E-08	2,98E-05
	ADP-fossil[1]	MJ	3,33E+02	4,09E+00	0	1,15E+00	1,03E+01	4,98E-02	-3,33E+02
	WDP[1]	m^3	6,19E+03	3,97E+00	0	1,11E+00	4,40E+01	8,96E-01	-1,44E+04

GWP-total = Global Warming Potential total; GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment: EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

1. 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 experienced with the indicator

Remarks to environmental impacts

Additional environmental impact indicators									
Indicator		Unit	A1-A3	A4	C1	C2	C3	C4	D
	PM	Disease incidence	1,19E-06	1,81E-08	0	5,08E-09	6,00E-08	2,08E-10	-1,82E-06
	IRP[2]	kgBq U235 -eq	1,82E+00	1,79E-02	0	5,01E-03	4,86E-02	2,67E-04	-1,43E+00
	ETP-fw[1]	CTUe	4,79E+02	3,08E+00	0	8,63E-01	1,18E+01	1,48E-01	-4,23E+02
	HTP-c[1]	CTUh	4,84E-08	0,00E+00	0	0,00E+00	5,85E-09	8,00E-12	-6,36E-08
	HTP-nc[1]	CTUh	8,30E-07	4,03E-09	0	1,13E-09	1,57E-08	2,98E-10	-7,55E-07
	SQP[1]	dimensionless	1,67E+02	3,50E+00	0	9,79E-01	5,27E+00	2,93E-01	-8,12E+01

PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Potential Soil Quality Index (dimensionless)

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

1. 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 experienced with the indicator
2. 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 nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Resource use									
Indicator		Unit	A1-A3	A4	C1	C2	C3	C4	D
	PERE	MJ	1,25E+02	6,00E-02	0	1,68E-02	2,27E+00	4,70E-03	-1,36E+02
	PERM	MJ	5,41E+01	0,00E+00	0	0,00E+00	-5,41E+01	0,00E+00	0,00E+00
	PERT	MJ	1,79E+02	6,00E-02	0	1,68E-02	-5,18E+01	4,70E-03	-1,36E+02
	PENRE	MJ	3,32E+02	4,09E+00	0	1,15E+00	1,03E+01	4,98E-02	-3,33E+02
	PENRM	MJ	1,56E+00	0,00E+00	0	0,00E+00	-1,56E+00	0,00E+00	0,00E+00
	PENRT	MJ	3,33E+02	4,09E+00	0	1,15E+00	8,77E+00	4,98E-02	-3,33E+02
	SM	kg	1,15E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	RSF	MJ	7,20E-01	2,14E-03	0	5,98E-04	4,72E-02	1,16E-04	-3,98E-01
	NRSF	MJ	4,15E-02	7,52E-03	0	2,11E-03	0,00E+00	2,48E-02	1,64E-01
	FW	m^3	7,44E-01	4,70E-04	0	1,32E-04	2,44E-03	4,65E-05	-6,60E-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 materials; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

End of life - Waste									
Indicator		Unit	A1-A3	A4	C1	C2	C3	C4	D
	HWD	kg	1,89E-01	2,23E-04	0	6,25E-05	0,00E+00	2,47E-02	1,02E-01
	NHWD	kg	5,24E+00	2,53E-01	0	7,09E-02	0,00E+00	5,81E-02	-7,33E+00
	RWD	kg	1,82E-03	2,78E-05	0	7,78E-06	0,00E+00	2,74E-07	-1,31E-03

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

End of life - Output flow									
Indicator		Unit	A1-A3	A4	C1	C2	C3	C4	D
	CRU	kg	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MFR	kg	9,21E-04	0,00E+00	0	0,00E+00	2,95E+00	0,00E+00	0,00E+00
	MER	kg	1,11E-05	0,00E+00	0	0,00E+00	2,95E+00	0,00E+00	0,00E+00
	EEE	MJ	1,21E-04	0,00E+00	0	0,00E+00	2,05E+00	0,00E+00	0,00E+00
	EET	MJ	1,83E-03	0,00E+00	0	0,00E+00	3,11E+01	0,00E+00	0,00E+00

CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported energy electrical; EET = Exported energy thermal

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

Biogenic Carbon Content		
Indicator	Unit	At the factory gate
Biogenic carbon content in product	kg C	1,42E+00
Biogenic carbon content in accompanying packaging	kg C	0,00E+00

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO2

Additional requirements

Greenhouse gas emissions from the use of electricity in the manufacturing phase

National production mix from import, low voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3).

Electricity mix	Source	Amount	Unit
Electricity, Denmark (kWh)	ecoinvent 3.6	338,20	g CO2-eq/kWh

Dangerous substances

The product contains no substances given by the REACH Candidate list.

Indoor environment

Additional Environmental Information

Additional environmental impact indicators required in NPCR Part A for construction products								
Indicator	**Unit**	A1-A3	A4	C1	C2	C3	C4	D
GWPIOBC	kg CO_2 -eq	2,16E+01	2,64E-01	0	7,39E-02	2,71E+00	8,57E-03	-2,60E+01

GWP-IOBC: Global warming potential calculated according to the principle of instantaneous oxidation. In order to increase the transparency of biogenic carbon contribution to climate impact, the indicator GWP-IOBC is required as it declares climate impacts calculated according to the principle of instantaneous oxidation. GWP-IOBC is also referred to as GWP-GHG in context to Swedish public procurement legislation.

Bibliography

ISO 14025:2010 Environmental labels and declarations - Type III environmental declarations - Principles and procedures.
ISO 14044:2006 Environmental management - Life cycle assessment - Requirements and guidelines.
EN 15804:2012+A2:2019 Environmental product declaration - Core rules for the product category of construction products.
ISO 21930:2017 Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products.
ecoinvent v3, Allocation, cut-off by classification, Swiss Centre of Life Cycle Inventories.
Iversen et al., (2021) eEPD v2021.09 Background information for EPD generator tool system verification, LCA.no Report number: 07.21
Vold, M. et al. (2022) EPD generator for Building boards
Background information for EPD generator application and LCA data, LCA.no report number 05.22
NPCR Part A: Construction products and services. Ver. 2.0. April 2021, EPD-Norge.
NPCR 010 Part B for Building Boards. Ver. 4.0, March 2022, EPD-Norge.

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