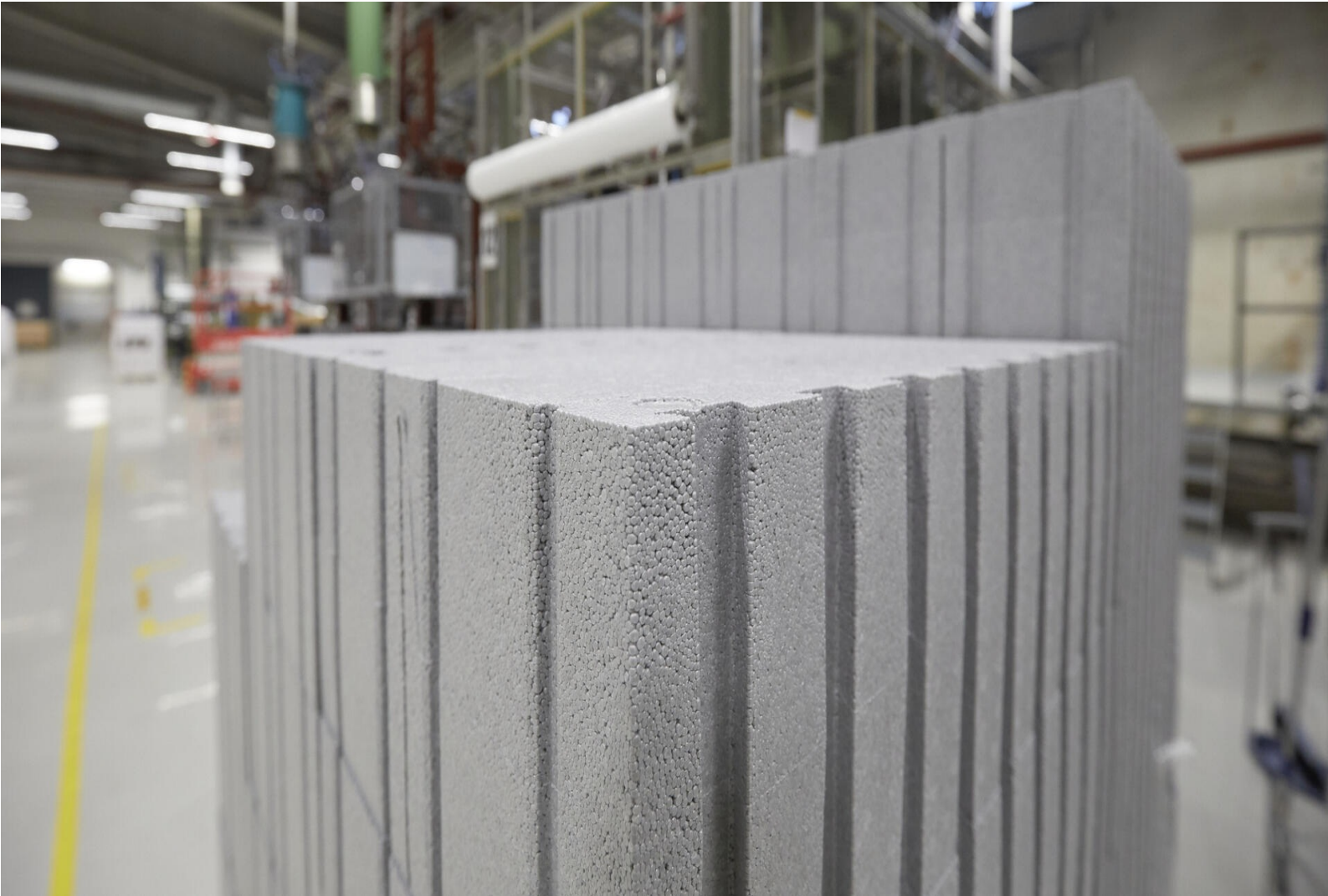


Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

Bewi Finland Oy Insulation For Concrete Block



BEWI

The Norwegian EPD Foundation

Owner of the declaration:

BEWI ASA, Insulation and Construction

Product:

Bewi Finland Oy Insulation For Concrete Block

Declared unit:

1 kg

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR.

NPCR 012:2022 Part B for Thermal insulation products

Program operator:

The Norwegian EPD Foundation

Declaration number:

NEPD-8745-8408

Registration number:

NEPD-8745-8408

Issue date: 15.01.2025

Valid to: 15.01.2030

EPD software:

LCAno EPD generator ID: 739906

General information

Product

Bewi Finland Oy Insulation For Concrete Block

Program operator:

The Norwegian EPD Foundation
Post Box 5250 Majorstuen, 0303 Oslo, Norway
Phone: +47 977 22 020
web: www.epd-norge.no

Declaration number:

NEPD-8745-8408

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR.
NPCR 012:2022 Part B for Thermal insulation products

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.

Declared unit:

1 kg Bewi Finland Oy Insulation For Concrete Block

Declared unit with option:

A1,A2,A3,A4,A5,C1,C2,C3,C4,D

Functional unit:

1 m² EPS insulation board with 48 mm thickness at R=1 m²K/W, transportation to site, waste handling and recovery.

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

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)

Owner of the declaration:

BEWI ASA, Insulation and Construction
Contact person: Marc Storm Andersen
Phone: +45 72157902
e-mail: marc.andersen@bewi.com

Manufacturer:

BEWI ASA, Insulation and Construction

Place of production:

BEWI ASA, Insulation and Construction
Hammarvikringen 64
HAMAR 7263, Norway

Management system:

ISO 14001 og 9001 for all production sites

Organisation no:

925437948

Issue date:

15.01.2025

Valid to:

15.01.2030

Year of study:

2024

Comparability:

EPD of construction products may not be comparable if they not comply with EN 15804:2012+A2:2019 and seen in a building context.

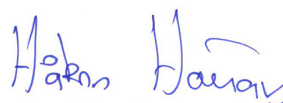
Development and verification of EPD:

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. NEPDT97

Developer of EPD: Pirkka Ulmanen

Reviewer of company-specific input data and EPD: Mark Plate

Approved:



Håkon Hauan

Managing Director of EPD-Norway

Product

Product description:

Expanded polystyrene (EPS) is a common material used for thermal insulation of buildings and constructions. As most of the material is air, EPS provides good insulating properties at a low weight. Other characteristics of the material include low moisture absorption, long service life and high compressive strength.

Insulation block for concrete blocks are made by moulding. The EPS is pre-expanded for known density and after pre-expanding it is moulded with small moulding machine where the insulation block gets its own shape. The usual density for insulation blocks is 21 kg/m³. These insulation block are used for insulation of small concrete blocks which are used to build energy efficient houses.

Product specification

EPS beads are made fully from PS. EPS beads expand up to 40 times when exposed to steam. The expanded polystyrene beads are then fed into a block molding machine, where steam and pressure form insulation blocks of EPS. During these processes, the final density of the product is determined. EPS density is the main contributor to the mechanical and thermal resistances of EPS.

Materials	kg	%
Plastic - Polystyrene expandable (EPS)	1,00	100,00
Total	1,00	100,00

Packaging	kg	%
Packaging - Plastic	0,01	100,00
Total incl. packaging	1,01	100,00

Technical data:

CE marking: EPS insulation boards are CE certified according to SFS-EN 13163:2013 + A2:2016

Typical compressive strength: 120 kPa (EN 826)

Typical bending strength: 170 kPa (EN 12089)

Typical lambda : 0,030 W/mK (SFS-EN 12667)

Market:

Finland

Reference service life, product

As in the construction where it is used

Reference service life, building or construction works

As in the construction where it is used

LCA: Calculation rules

Declared unit:

1 kg Bewi Finland Oy Insulation For Concrete Block

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. 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+A2. 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:

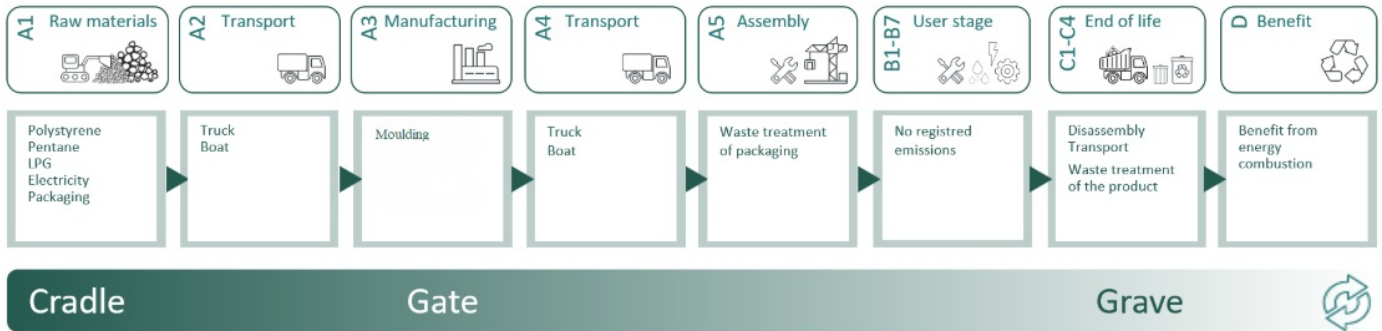
Specific data for the product composition are provided by the manufacturer. The data represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on EPDs according to EN 15804 and different LCA databases. The data quality of the raw materials in A1 is presented in the table below.

Materials	Source	Data quality	Year
Packaging - Plastic	ecoinvent 3.6	Database	2019
Plastic - Polystyrene expandable (EPS)	Supplier Specific	Project EPD	2024

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	X	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

System boundary:



Conversion table from kg to m²

Thickness mm	kg	m ²
30		0,63
50		1,05
70		1,47
75		1,575
100		2,1
150		3,15
200		4,2
250		5,25
300		6,3

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, 16-32 tonnes, EURO 6 (kgkm)	36,7 %	170	0,043	l/tkm	7,31
Assembly (A5)					
Unit	Value				
Waste, packaging, plastic to average treatment - A5 (inkl transport) (kg)	kg	0,010			
De-construction demolition (C1)					
Unit	Value				
Manual demolition of EPS in C1	kg	1,000000000			
Transport to waste processing (C2)					
Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)	
Truck, over 32 tonnes, EURO 6 (kgkm)	53,3 %	50	0,023	l/tkm	1,15
Waste processing (C3)					
Unit	Value				
Waste, Polystyrene, incineration	kg	1,000000000			
Disposal (C4)					
Unit	Value				
Landfilling of ashes from incineration of PS	kg	0,0030			
Benefits and loads beyond the system boundaries (D)					
Unit	Value				
substitution of electricity (MJ)	MJ	0,58			
Substitution of thermal energy (MJ)	MJ	31,93			

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	A2	A3	A4	A5	C1	C2	C3	C4	D	
GWP-total	kg CO ₂ -eq	1,86E+00	2,37E-02	1,77E+00	2,81E-02	7,92E-04	0,00E+00	4,40E-03	3,19E+00	1,55E-04	-1,82E-01	
GWP-fossil	kg CO ₂ -eq	1,85E+00	2,37E-02	1,76E+00	2,80E-02	7,92E-04	0,00E+00	4,40E-03	3,19E+00	1,55E-04	-1,75E-01	
GWP-biogenic	kg CO ₂ -eq	7,79E-03	1,01E-05	6,50E-03	1,16E-05	1,09E-07	0,00E+00	1,88E-06	2,20E-05	8,24E-08	-1,05E-04	
GWP-luluc	kg CO ₂ -eq	9,01E-04	7,21E-06	8,33E-04	9,98E-06	6,07E-08	0,00E+00	1,34E-06	3,48E-06	2,38E-08	-6,34E-03	
ODP	kg CFC11-eq	2,58E-08	5,71E-09	3,42E-07	6,35E-09	4,80E-11	0,00E+00	1,06E-09	2,29E-09	1,70E-11	-1,35E-02	
AP	mol H ⁺ -eq	4,43E-03	7,62E-05	5,28E-03	8,06E-05	9,76E-07	0,00E+00	1,42E-05	3,79E-04	5,47E-07	-1,45E-03	
EP-FreshWater	kg P -eq	3,26E-05	1,88E-07	1,03E-05	2,24E-07	1,63E-09	0,00E+00	3,50E-08	2,26E-07	2,10E-09	-1,57E-05	
EP-Marine	kg N -eq	1,07E-03	1,67E-05	1,30E-03	1,59E-05	8,93E-07	0,00E+00	3,10E-06	1,82E-04	1,71E-07	-4,90E-04	
EP-Terrestrial	mol N -eq	1,16E-02	1,86E-04	1,43E-02	1,78E-04	3,50E-06	0,00E+00	3,46E-05	1,95E-03	1,94E-06	-5,28E-03	
POCP	kg NMVOC-eq	4,42E-03	7,31E-05	3,49E-02	6,83E-05	1,15E-06	0,00E+00	1,36E-05	4,68E-04	5,36E-07	-1,46E-03	
ADP-minerals&metals ¹	kg Sb-eq	6,67E-06	4,22E-07	3,49E-06	7,75E-07	4,22E-09	0,00E+00	7,84E-08	9,85E-08	8,70E-10	-1,09E-06	
ADP-fossil ¹	MJ	6,31E+01	3,84E-01	2,38E+01	4,24E-01	3,27E-03	0,00E+00	7,14E-02	1,95E-01	1,41E-03	-2,51E+00	
WDP ¹	m ³	-1,35E+00	2,95E-01	1,10E+02	4,10E-01	1,15E-02	0,00E+00	5,48E-02	4,33E-01	1,46E-02	-9,11E+00	

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	A2	A3	A4	A5	C1	C2	C3	C4	D	
PM	Disease incidence	3,35E-08	2,17E-09	5,74E-08	1,72E-09	1,80E-11	0,00E+00	4,04E-10	1,60E-09	7,00E-12	-9,19E-08	
IRP ²	kgBq U235 -eq	4,58E-02	1,68E-03	1,37E-01	1,85E-03	1,48E-05	0,00E+00	3,12E-04	3,27E-04	6,71E-06	-1,44E-02	
ETP-fw ¹	CTUe	2,91E+02	2,81E-01	1,43E+01	3,14E-01	3,12E-03	0,00E+00	5,22E-02	4,71E-01	2,60E-03	-1,38E+01	
HTP-c ¹	CTUh	1,42E-09	0,00E+00	5,75E-10	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,34E-10	0,00E+00	-2,35E-10	
HTP-nc ¹	CTUh	3,17E-08	2,72E-10	1,76E-08	3,43E-10	3,00E-12	0,00E+00	5,10E-11	5,30E-09	5,00E-12	-1,31E-08	
SQP ¹	dimensionless	5,97E+00	4,41E-01	4,10E+00	2,97E-01	5,70E-03	0,00E+00	8,19E-02	2,33E-02	3,90E-03	-1,76E+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	A2	A3	A4	A5	C1	C2	C3	C4	D	
PERE	MJ	7,77E-01	4,84E-03	7,27E-01	6,07E-03	8,25E-05	0,00E+00	8,99E-04	5,62E-03	8,24E-05	-1,46E+01	
PERM	MJ	1,75E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	
PERT	MJ	7,57E-01	4,84E-03	7,27E-01	6,07E-03	8,25E-05	0,00E+00	8,99E-04	5,62E-03	8,24E-05	-1,46E+01	
PENRE	MJ	3,92E+01	3,84E-01	2,39E+01	4,24E-01	3,27E-03	0,00E+00	7,14E-02	1,95E-01	1,41E-03	-2,51E+00	
PENRM	MJ	2,92E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	
PENRT	MJ	6,65E+01	3,84E-01	2,39E+01	4,24E-01	3,27E-03	0,00E+00	7,14E-02	1,95E-01	1,41E-03	-2,51E+00	
SM	kg	2,10E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	
RSF	MJ	8,51E-03	1,69E-04	1,04E-02	2,17E-04	2,16E-06	0,00E+00	3,14E-05	1,57E-04	2,05E-06	-1,47E-03	
NRSF	MJ	2,71E-03	5,67E-04	6,92E-02	7,77E-04	5,66E-06	0,00E+00	1,05E-04	0,00E+00	3,26E-04	-9,66E-01	
FW	m ³	4,12E-02	4,37E-05	7,97E-03	4,54E-05	1,73E-06	0,00E+00	8,13E-06	5,53E-04	1,30E-06	-6,45E-03	

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	A2	A3	A4	A5	C1	C2	C3	C4	D	
	HWD	kg	8,49E-03	2,10E-05	1,22E-02	2,19E-05	0,00E+00	0,00E+00	3,91E-06	0,00E+00	2,58E-03	-3,65E-05
	NHWD	kg	2,42E-01	3,34E-02	5,64E-02	2,06E-02	1,00E-02	0,00E+00	6,21E-03	0,00E+00	1,28E-03	-5,20E-02
	RWD	kg	1,28E-05	2,62E-06	1,67E-04	2,89E-06	0,00E+00	0,00E+00	4,88E-07	0,00E+00	8,52E-09	-1,26E-05

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

*Reading example: 9,0 E-03 = $9,0 \cdot 10^{-3} = 0,009$

*INA Indicator Not Assessed

End of life - Output flow												
Indicator	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D	
	CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MFR	kg	0,00E+00	0,00E+00	1,28E-02	0,00E+00	5,10E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MER	kg	0,00E+00	0,00E+00	4,98E-02	0,00E+00	5,00E-07	0,00E+00	0,00E+00	1,00E+00	0,00E+00	0,00E+00
	EEE	MJ	0,00E+00	0,00E+00	3,00E-02	0,00E+00	7,68E-07	0,00E+00	0,00E+00	1,76E+00	0,00E+00	0,00E+00
	EET	MJ	0,00E+00	0,00E+00	4,54E-01	0,00E+00	1,16E-05	0,00E+00	0,00E+00	2,67E+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 = $9,0 \cdot 10^{-3} = 0,009$

*INA Indicator Not Assessed

Biogenic Carbon Content		
Indicator	Unit	At the factory gate
Biogenic carbon content in product	kg C	0,00E+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, Finland (kWh)	ecoinvent 3.6	255,20	g CO ₂ -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	A2	A3	A4	A5	C1	C2	C3	C4	D
GWPIOBC	kg CO ₂ -eq	1,84E+00	2,37E-02	1,78E+00	2,81E-02	7,92E-04	0,00E+00	4,40E-03	3,19E+00	1,61E-04	-1,79E-01

GWPI-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 et. al., (2022) EPD generator for NPCR 012 Thermal insulation, Background information for EPD generator application and LCA data, LCA.no report number: 07.22.

NPCR Part A: Construction products and services. Ver. 2.0. April 2021, EPD-Norge.

NPCR 012 Part B for Part B for Thermal insulation products, Ver. 2.0, 31.03.2022, EPD Norway.

 <small>Global program operator</small>	Program operator and publisher The Norwegian EPD Foundation Post Box 5250 Majorstuen, 0303 Oslo, Norway	Phone: +47 977 22 020 e-mail: post@epd-norge.no web: www.epd-norge.no
	Owner of the declaration: BEWI ASA, Insulation and Construction Hammarvikringen 64, HAMAR 7263, Norway	Phone: +45 72157902 e-mail: marc.andersen@bewi.com web: https://bewi.com
	Author of the Life Cycle Assessment LCA.no AS Dokka 6A, 1671 Kråkerøy, Norway	Phone: +47 916 50 916 e-mail: post@lca.no web: www.lca.no
	Developer of EPD generator LCA.no AS Dokka 6A, 1671 Kråkerøy, Norway	Phone: +47 916 50 916 e-mail: post@lca.no web: www.lca.no
	ECO Platform ECO Portal	web: www.eco-platform.org web: ECO Portal