epd-norge
Global program operatør

Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

Bewi Finland Oy EPS Routa 120

The Norwegian EPD Foundation

Owner of the declaration:
BEWI ASA, Insulation and Construction

Product:
Bewi Finland Oy EPS Routa 120

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-6665-5923-EN

Registration number:
NEPD-6665-5923-EN

Issue date:
27.05.2024

Valid to:
27.05.2029

ver-260824

EPD software:
LCAno EPD generator ID: 226102

General information

Product

Bewi Finland Oy EPS Routa 120

Owner of the declaration:

BEWI ASA, Insulation and Construction
Contact person: Marc Storm Andersen
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Program operator:

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Manufacturer:

BEWI Insulation Finland
Toravantie 18
38210 Sastamala, Finland

Declaration number:

NEPD-6665-5923-EN

Place of production:

BEWI Sastamala Toravantie
Toravantie 18
38210 SASTAMALA, Finland

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

Management system:

ISO 14001 og 9001 for all production sites

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:

925437948

Declared unit:

1 kg Bewi Finland Oy EPS Routa 120

Issue date:

27.05.2024

Declared unit with option:

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

Valid to:

27.05.2029

Year of study:

2022

Functional unit:

For the base is used density of 20,5 kg/m3. There is included conversion table for kg to m2

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.

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: Pirkka Ulmanen

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

Verification of EPD tool:

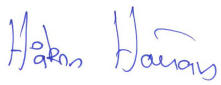
Independent third party verification of the EPD tool, background data and test-EPD in accordance with EPDNorway's procedures and guidelines for verification and approval of EPD tools.

Third party verifier:

Elisabet Amat, GREENIZE projects

(no signature required)

Approved:



Håkon Hauan, CEO EPD-Norge

Product

Product description:

The insulation board is provided in several dimensions and thicknesses. Please use the conversion table below for other sizes than the declared unit. 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. This LCA is based on EPS 120 Routa and can be used for all products with the conversion factor which can be found under System boundaries

Product specification

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 large 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. The average density of EPS Routa 120 is around 21 kg/m^3.

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)

Water Absorption: 2,5% (EN 16535/2A)

Typical size: 600 mm x 1000 mm, 1000 x 1200 mm, 1200x2000 mm (EN 822)

Typical thickness: 30 mm - 300 mm (EN 823)

Typical lambda : 0,033 - 0,036 W/mK (EN 12667)

Fire classification: F (EN 135101-1)

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 EPS Routa 120

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.

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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. 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.

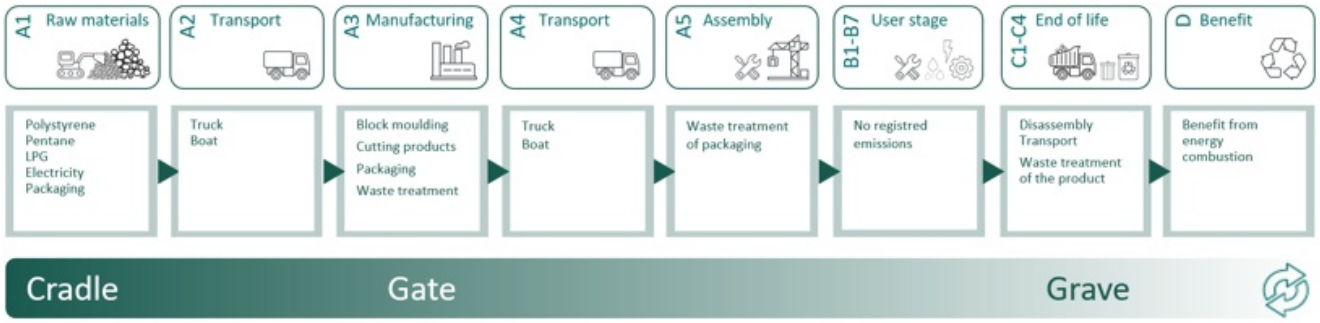
Materials	Source	Data quality	Year
Packaging - Plastic	ecoinvent 3.6	Database	2019
Plastic - Polystyrene expandable (EPS)	Supplier Specific	Project EPD	2024

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:

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.



Conversion table from kg to m²

		120 kPa	200 kPa
Thickness mm	30	0,618	0,96
	50	1,03	1,6
	70	1,442	2,24
	75	1,545	2,4
	100	2,06	3,2
	150	3,09	4,8
	200	4,12	6,4
	250	5,15	8
	300	6,18	9,6

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 %	200	0,043	l/tkm	8,60

Assembly (A5)	Unit	Value			
Waste, packaging, plastic to average treatment - A5 (inkl transport) (kg)	kg	0,01			

De-construction demolition (C1)	Unit	Value			
Waste treatment, PS, Insulation, Finland (kg)	kg/DU	1,00			

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 %	25	0,023	l/tkm	0,58

Waste processing (C3)	Unit	Value			
Recycling of PS	kg	0,04			
Waste, Polystyrene, incineration	kg	0,91			

Disposal (C4)	Unit	Value			
Landfilling of ashes from incineration of PS	kg	0,00			
Waste, inert waste, to landfill (kg)	kg	0,04			

Benefits and loads beyond the system boundaries (D)	Unit	Value			
substitution of electricity (MJ)	MJ	0,53			
Substitution of expandable polystyrene, EPS, granulate (kg)	kg	0,04			
Substitution of thermal energy (MJ)	MJ	29,15			

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	2,08E+00	2,38E-02	1,42E-01	3,27E-02	8,71E-04	0,00E+00	2,18E-03	2,91E+00	4,95E-04	-3,16E-01
	GWP-fossil	kg CO_2 -eq	2,08E+00	2,38E-02	1,38E-01	3,27E-02	8,71E-04	0,00E+00	2,18E-03	2,91E+00	4,95E-04	-3,10E-01
	GWP-biogenic	kg CO_2 -eq	9,39E-03	1,02E-05	2,59E-03	1,35E-05	1,20E-07	0,00E+00	9,33E-07	2,01E-05	4,87E-07	-1,08E-03
	GWP-luluc	kg CO_2 -eq	4,71E-04	7,25E-06	8,97E-04	1,16E-05	6,68E-08	0,00E+00	6,63E-07	3,18E-06	1,08E-07	-5,78E-03
	ODP	kg CFC11 -eq	1,38E-07	5,74E-09	1,49E-08	7,40E-09	5,20E-11	0,00E+00	5,25E-10	2,09E-09	1,49E-10	-1,23E-02
	AP	mol H+ -eq	4,14E-03	7,66E-05	9,17E-04	9,39E-05	1,07E-06	0,00E+00	7,01E-06	3,46E-04	3,64E-06	-1,84E-03
	EP-FreshWater	kg P -eq	9,70E-06	1,89E-07	4,51E-06	2,61E-07	1,79E-09	0,00E+00	1,73E-08	2,06E-07	5,91E-09	-1,70E-05
	EP-Marine	kg N -eq	1,07E-03	1,68E-05	1,86E-04	1,86E-05	9,83E-07	0,00E+00	1,54E-06	1,66E-04	1,32E-06	-5,25E-04
	EP-Terrestial	mol N -eq	1,10E-02	1,87E-04	2,88E-03	2,08E-04	3,85E-06	0,00E+00	1,71E-05	1,78E-03	1,46E-05	-5,65E-03
	POCP	kg NMVOC -eq	4,38E-03	7,35E-05	3,06E-02	7,96E-05	1,27E-06	0,00E+00	6,72E-06	4,27E-04	4,17E-06	-1,78E-03
	ADP-minerals&metals[1]	kg Sb-eq	2,30E-06	4,24E-07	1,05E-06	9,02E-07	4,64E-09	0,00E+00	3,88E-08	8,99E-08	3,97E-09	-1,03E-06
	ADP-fossil[1]	MJ	7,47E+01	3,87E-01	2,39E+00	4,94E-01	3,59E-03	0,00E+00	3,54E-02	1,78E-01	1,10E-02	-5,61E+00
	WDP[1]	m^3	9,27E+00	2,96E-01	1,17E+02	4,78E-01	1,27E-02	0,00E+00	2,71E-02	3,96E-01	7,32E-02	-8,45E+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	3,05E-08	2,19E-09	7,17E-09	2,00E-09	1,90E-11	0,00E+00	2,00E-10	1,46E-09	7,30E-11	-8,87E-08
	IRP[2]	kgBq U235 -eq	4,53E-02	1,69E-03	5,28E-02	2,16E-03	1,62E-05	0,00E+00	1,55E-04	2,98E-04	5,04E-05	-1,32E-02
	ETP-fw[1]	CTUe	3,79E+02	2,83E-01	5,19E+00	3,66E-01	3,43E-03	0,00E+00	2,59E-02	4,30E-01	7,67E-03	-1,32E+01
	HTP-c[1]	CTUh	8,92E-10	0,00E+00	9,00E-11	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,22E-10	0,00E+00	-2,44E-10
	HTP-nc[1]	CTUh	3,46E-08	2,73E-10	2,57E-09	4,00E-10	3,00E-12	0,00E+00	2,50E-11	4,84E-09	8,00E-12	-1,23E-08
	SQP[1]	dimensionless	7,27E+00	4,43E-01	1,54E+01	3,46E-01	6,27E-03	0,00E+00	4,05E-02	2,12E-02	4,09E-02	-1,61E+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	2,46E+00	4,86E-03	3,73E+00	7,07E-03	9,07E-05	0,00E+00	4,45E-04	5,13E-03	4,23E-04	-1,33E+01
	PERM	MJ	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
	PERT	MJ	2,46E+00	4,86E-03	3,73E+00	7,07E-03	9,07E-05	0,00E+00	4,45E-04	5,13E-03	4,23E-04	-1,33E+01
	PENRE	MJ	5,71E+01	3,87E-01	2,83E+00	4,94E-01	3,59E-03	0,00E+00	3,54E-02	1,78E-01	1,10E-02	-5,61E+00
	PENRM	MJ	3,66E+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	9,37E+01	3,87E-01	2,83E+00	4,94E-01	3,59E-03	0,00E+00	3,54E-02	1,78E-01	1,10E-02	-5,61E+00
	SM	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
	RSF	MJ	1,12E-01	1,70E-04	7,68E-02	2,53E-04	2,38E-06	0,00E+00	1,56E-05	1,43E-04	9,08E-06	-1,34E-03
	NRSF	MJ	1,48E-02	5,70E-04	2,50E-02	9,04E-04	6,23E-06	0,00E+00	5,22E-05	0,00E+00	3,13E-04	-8,82E-01
	FW	m^3	3,75E-02	4,40E-05	3,42E-03	5,28E-05	1,90E-06	0,00E+00	4,02E-06	5,05E-04	1,31E-05	-8,48E-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	4,39E-03	2,12E-05	8,08E-04	2,55E-05	0,00E+00	0,00E+00	1,94E-06	0,00E+00	2,35E-03	-9,26E-05
	NHWD	kg	1,04E-01	3,36E-02	1,22E-02	2,40E-02	1,10E-02	0,00E+00	3,07E-03	0,00E+00	4,42E-02	-4,91E-02
	RWD	kg	8,55E-05	2,64E-06	2,54E-05	3,36E-06	0,00E+00	0,00E+00	2,42E-07	0,00E+00	7,78E-09	-1,16E-05

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	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	9,28E-04	0,00E+00	5,61E-03	0,00E+00	0,00E+00	4,00E-02	0,00E+00	0,00E+00
	MER	kg	0,00E+00	0,00E+00	1,23E-03	0,00E+00	5,50E-07	0,00E+00	0,00E+00	9,13E-01	0,00E+00	0,00E+00
	EEE	MJ	0,00E+00	0,00E+00	8,06E-04	0,00E+00	8,45E-07	0,00E+00	0,00E+00	1,61E+00	0,00E+00	0,00E+00
	EET	MJ	0,00E+00	0,00E+00	1,22E-02	0,00E+00	1,28E-05	0,00E+00	0,00E+00	2,43E+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	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 CO2-eq/kWh
5363 - Electricity, low voltage, solar (kWh) - FI	ecoinvent 3.6	77,03	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	A2	A3	A4	A5	C1	C2	C3	C4	D
GWPIOBC	kg CO_2 -eq	2,08E+00	2,38E-02	1,64E-01	3,27E-02	8,71E-04	0,00E+00	2,18E-03	2,91E+00	5,00E-04	-3,14E-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

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ISO 21930:2017 Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products.
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NPCR 012 Part B for Part B for Thermal insulation products, Ver. 2.0, 31.03.2022, EPD Norway.

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ECO PLATFORM EPD VERIFIED	ECO Platform ECO Portal	web: www.eco-platform.org web: ECO Portal