

Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

Trapisu yleiningar (ST) / Trapezoidal mineral wool panels



The Norwegian EPD Foundation

Owner of the declaration:

Límtré Virnet

Product:

Trapisu yleiningar (ST) / Trapezoidal mineral wool panels

Declared unit:

1 m²

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-9971-9917

Registration number:

NEPD-9971-9917

Issue date:

07.05.2025

Valid to:

07.05.2030

EPD software:

LCAno EPD generator ID: 932143

General information

Product

Trapisu yleiningar (ST) / Trapezoidal mineral wool panels

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-9971-9917

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 m2 Trapisu yleiningar (ST) / Trapezoidal mineral wool panels

Declared unit with option:

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

Functional unit:

1 m2 of mineral wool panel with trapezoidal steel facing, a core density of 100 kg/m3 and thickness of ~138mm

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:

Limtré Vírnet
Contact person: Einar Bjarnason
Phone: +3544125300
e-mail: einar@limtrevirnet.is

Manufacturer:

Limtré Vírnet
Borgarbraut 74
310 Borgarnes, Iceland

Place of production:

Limtré Vírnet - Flúðum
846 Flúðum
, Iceland

Management system:

Organisation no:

Issue date:

07.05.2025

Valid to:

07.05.2030

Year of study:

2023

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.

Developer of EPD: Vincent Merida - Verkvisit

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

Approved:



Håkon Hauan, CEO EPD-Norge

Product

Product description:

The EPD applies to prefabricated double-skin steel faced sandwich panels with a core made of mineral wool, which are produced by Límtré Virnet ehf. (member of PPA-Europe).

The profiled internal and external faces are made of a core of 0,6 mm GreenCoat® steel, which is protected against corrosion with zinc and organic coatings.

The thermal insulating core material is made of mineral wool according to EN 13162 with sealing on the joints. The core is bonded with adhesive to the steel sheets on both sides, to ensure a certain resistance to shear forces of the panel.

The ST panels maintain a Declaration of Performance taking into consideration EN 14509 and the CE-marking. The data listed in the Declaration of Performance apply. For the application and use, the respective national provisions apply.

Product specification

The products are used for self-supporting and structural applications in roof, wall and ceiling structures. Sandwich panels in wall and roof applications take on tasks of the building physics, especially loads, sound, heat and moisture safety. They simultaneously perform the function of air tightness of the building envelope.

The ST panels are available in 6 different thicknesses from 107 to 240 mm.

Materials	kg	%
Adhesive	0,39	1,96
Insulation - stone wool	10,16	50,86
Metal - Steel	9,42	47,17
Total	19,98	100,00

Packaging	kg	%
Packaging - Plastic	0,11	47,00
Packaging - Polystyrene (PS)	0,07	29,42
Packaging - Wood	0,05	23,58
Total incl. packaging	20,21	100,00

Technical data:

This EPD covers the following thicknesses - 107mm, 126mm, 149mm, and 173mm. The table below depicts the factors for the estimation of the cradle-to-gate (A1-A3) GWPIOBC from different panel thicknesses. Simply multiply the environmental impact indicator by the factor in the table.

Product Variant	GWPIOBC (A1-A3)
ST107	0.95470
ST126	0.98832
ST149	1.02531
ST173	1.06567

Market:

Iceland

Reference service life, product

As building

Reference service life, building or construction works

60

LCA: Calculation rules

Declared unit:

1 m2 Trapisu yleiningar (ST) / Trapezoidal mineral wool panels

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.

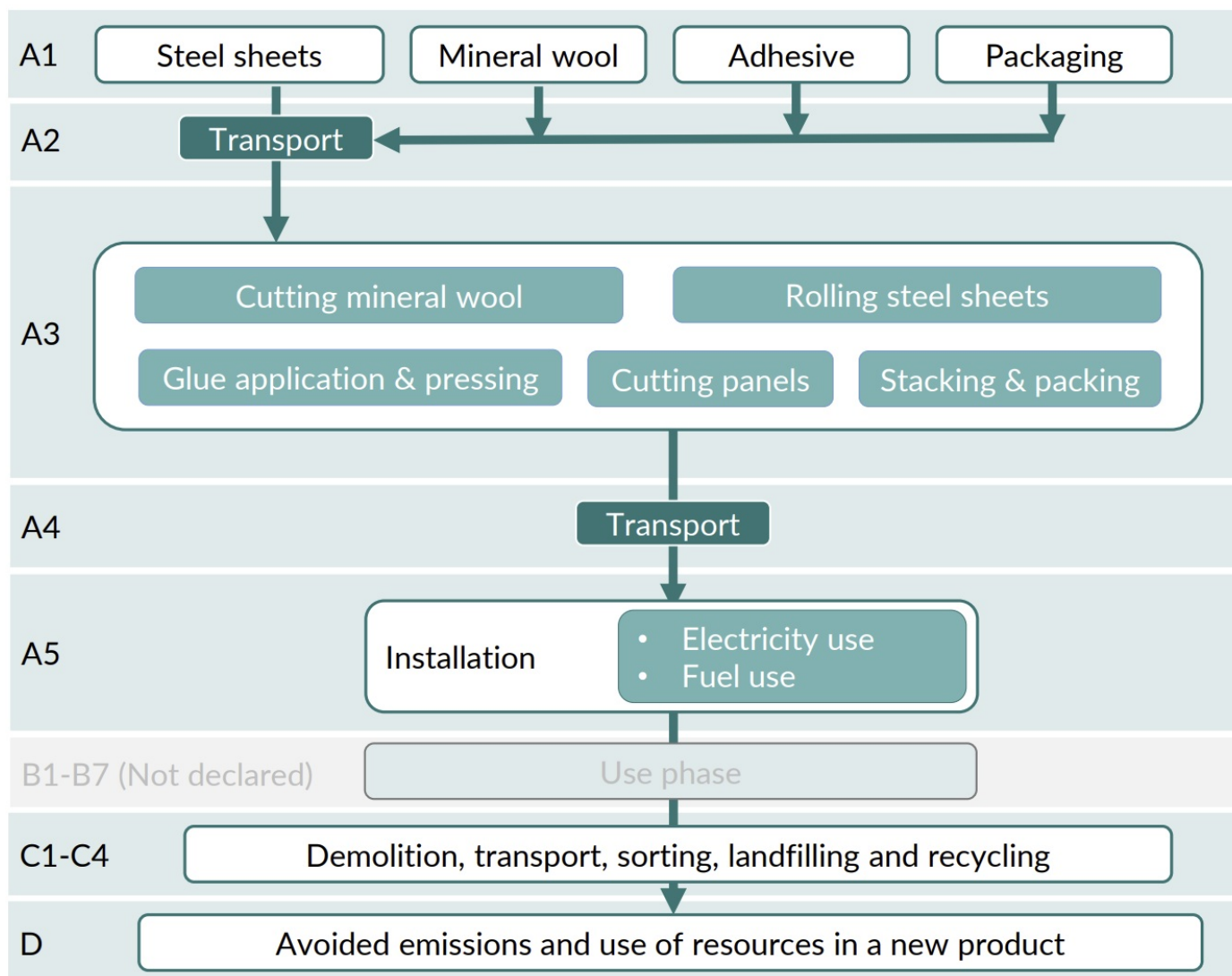
Materials	Source	Data quality	Year
Adhesive	ecoinvent 3.6	Database	2019
Insulation - stone wool	NEPD-3413-2026-EN	EPD	2022
Metal - Steel	S-P-01919	EPD	2020
Packaging - Plastic	ecoinvent 3.6	Database	2019
Packaging - Polystyrene (PS)	ecoinvent 3.6	Database	2019
Packaging - Wood	ecoinvent 3.6	Database	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	X	MND	MND	MND	MND	MND	MND	MND		X	X	X	X	X

System boundary:

Cradle-to-gate with options



Additional technical information:

LCA: Scenarios and additional technical information

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

The distance in A4 was based on the average distance between the manufacturing location and construction site. A5 and C1 energy values are based on values from similar product EPD's. At the end-of-life, it is assumed that the steel is separated from the mineral wool and sent abroad for recycling. The mineral wool and packaging are treated as municipal solid waste and sent to landfill.

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) - RER	36,7 %	265	0,043	l/tkm	11,40
Assembly (A5)					
Electricity, Iceland (kWh)	kWh	0,061			
Waste, municipal solid waste, to landfill (kg) inkl. 85 km transport	kg	0,23			
De-construction demolition (C1)					
Diesel, burned in Excavator, 30 ton (L)	L	0,052			
Transport to waste processing (C2)					
Ship, Freight, Transoceanic (kgkm)	65,0 %	2000	0,003	l/tkm	6,00
Truck, unspecified (kgkm) - RER	48,7 %	100	0,051	l/tkm	5,10
Waste processing (C3)					
Materials to recycling (kg) - C3	kg	10,17			
Waste treatment per kg Bulk iron waste, excluding reinforcement, sorting plant (kg)	kg	19,98			
Balancing waste - NRPM (MJ) - (Type 4)	MJ	23,027			
Disposal (C4)					
Waste, municipal solid waste, to landfill (kg)	kg	12,94			
Benefits and loads beyond the system boundaries (D)					
Substitution of primary steel with net scrap (kg)	kg	4,57			

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	3,57E+01	1,43E+00	2,13E+00	8,75E-01	1,94E-01	1,79E-01	4,44E-01	6,74E-03	1,05E+01	-5,04E+00
	GWP-fossil	kg CO ₂ -eq	3,56E+01	1,43E+00	1,83E-01	8,75E-01	1,63E-02	1,79E-01	4,44E-01	6,65E-03	6,67E-01	-5,04E+00
	GWP-biogenic	kg CO ₂ -eq	6,18E-02	5,16E-04	1,93E+00	3,62E-04	1,76E-01	4,20E-05	1,63E-04	7,27E-05	9,81E+00	-2,78E-03
	GWP-luluc	kg CO ₂ -eq	1,27E-02	6,95E-04	7,78E-03	3,11E-04	1,87E-03	3,99E-05	2,17E-04	1,15E-05	5,64E-05	-2,26E-03
	ODP	kg CFC11-eq	9,68E-08	3,16E-07	1,92E-08	1,98E-07	1,56E-09	3,97E-08	9,83E-08	1,26E-09	4,32E-08	-1,60E-07
	AP	mol H ⁺ -eq	1,43E-01	2,05E-02	5,24E-04	2,51E-03	5,00E-05	8,60E-04	7,28E-03	4,89E-05	1,70E-03	-2,50E-02
	EP-FreshWater	kg P -eq	1,66E-04	9,31E-06	1,35E-05	6,99E-06	1,27E-06	9,62E-07	2,92E-06	5,32E-07	6,49E-05	-3,10E-04
	EP-Marine	kg N -eq	2,72E-02	4,91E-03	3,26E-03	4,97E-04	2,94E-04	3,06E-04	1,96E-03	1,12E-05	1,63E-02	-5,18E-03
	EP-Terrestrial	mol N -eq	4,25E-01	5,47E-02	1,43E-03	5,56E-03	1,25E-04	3,37E-03	2,18E-02	1,34E-04	5,11E-03	-5,30E-02
	POCP	kg NMVOC-eq	7,77E-02	1,49E-02	9,75E-04	2,13E-03	8,71E-05	1,00E-03	5,80E-03	3,56E-05	4,19E-03	-2,53E-02
	ADP-minerals&metals ¹	kg Sb-eq	1,79E-03	2,84E-05	1,97E-06	2,42E-05	2,20E-07	1,29E-06	8,21E-06	1,08E-07	1,29E-06	-8,70E-05
	ADP-fossil ¹	MJ	4,62E+02	2,04E+01	1,42E+00	1,32E+01	1,19E-01	2,55E+00	6,35E+00	2,36E-01	3,49E+00	-4,24E+01
	WDP ¹	m ³	5,10E+01	1,43E+01	8,69E+01	1,28E+01	1,81E+01	8,63E-01	4,32E+00	2,89E+01	9,11E+01	2,61E+02

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	6,34E-07	5,38E-08	7,53E-09	5,36E-08	6,67E-10	2,81E-09	2,43E-08	5,59E-10	2,17E-08	-4,18E-07
 IRP ²	kgBq U235 -eq	1,13E-01	8,84E-02	7,89E-03	5,78E-02	6,67E-04	1,09E-02	2,76E-02	4,29E-03	2,40E-02	1,81E-02
 ETP-fw ¹	CTUe	3,78E+01	1,40E+01	9,40E+00	9,80E+00	1,04E+00	1,59E+00	4,37E+00	1,78E-01	3,82E+01	-2,81E+02
 HTP-c ¹	CTUh	9,99E-09	0,00E+00	1,18E-10	0,00E+00	1,30E-11	7,80E-11	0,00E+00	0,00E+00	4,66E-10	-2,42E-08
 HTP-nc ¹	CTUh	4,07E-08	1,08E-08	2,14E-09	1,07E-08	2,49E-10	1,68E-09	4,04E-09	1,60E-10	5,68E-09	5,27E-07
 SQP ¹	dimensionless	1,53E+02	1,02E+01	2,62E+00	9,25E+00	2,12E-01	3,20E-01	3,80E+00	2,17E-01	1,14E+01	-3,17E+00

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	9,26E+01	2,38E-01	1,35E+00	1,89E-01	3,09E-01	1,78E-02	7,39E-02	1,35E-01	4,47E-01	-3,44E+00
 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	9,26E+01	2,38E-01	1,35E+00	1,89E-01	3,09E-01	1,78E-02	7,39E-02	1,35E-01	4,47E-01	-3,44E+00
 PENRE	MJ	4,32E+02	2,04E+01	1,42E+00	1,32E+01	1,19E-01	2,55E+00	6,35E+00	2,37E-01	3,49E+00	-4,24E+01
 PENRM	MJ	2,30E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-2,30E+01	0,00E+00	0,00E+00
 PENRT	MJ	4,55E+02	2,04E+01	1,42E+00	1,32E+01	1,19E-01	2,55E+00	6,35E+00	-2,28E+01	3,49E+00	-4,24E+01
 SM	kg	2,62E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,91E-03	0,00E+00	2,20E-04	0,00E+00	0,00E+00
 RSF	MJ	3,59E-02	7,97E-03	2,25E-03	6,77E-03	2,08E-04	5,78E-04	2,46E-03	2,77E-03	9,25E-03	1,82E-01
 NRSF	MJ	4,04E-03	4,05E-02	3,10E-03	2,42E-02	4,06E-04	-6,65E-03	1,25E-02	2,34E-04	4,15E-03	5,30E+00
 FW	m ³	8,12E-02	1,79E-03	6,86E-03	1,41E-03	1,50E-03	1,45E-04	5,80E-04	4,48E-04	4,76E-03	-1,06E-02

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	6,57E-01	9,86E-04	6,09E-05	6,82E-04	1,27E-05	9,71E-05	3,17E-04	2,55E-05	1,01E-02	-2,62E-02
	NHWD	kg	1,97E+00	6,63E-01	2,57E+00	6,43E-01	2,33E-01	4,12E-03	2,58E-01	8,28E-04	1,30E+01	-2,06E+00
	RWD	kg	7,20E-03	1,40E-04	1,21E-06	9,01E-05	2,78E-08	1,76E-05	4,35E-05	2,59E-06	2,53E-05	1,39E-05

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

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

*INA Indicator Not Assessed

End of life - Output flow

And of the Output												
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	7,52E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,02E+01	0,00E+00	0,00E+00
	MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,73E-05	0,00E+00	0,00E+00
	EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,70E-05	0,00E+00	0,00E+00
	EET	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,11E-04	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 = $9,0 \times 10^{-3}$ = 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, Iceland (kWh)	ecoinvent 3.6	55,84	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	3,56E+01	1,43E+00	2,12E+00	8,75E-01	1,94E-01	1,79E-01	4,44E-01	6,73E-03	1,05E+01	-7,55E+00

GWPIOBC: 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 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.
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 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.

 epd-norge Global program operator	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: Límtré Virnet Borgarbraut 74 , 310 Borgarnes, Iceland	Phone: +3544125300 e-mail: einar@limtrevirnet.is web: limtrevirnet.is
	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