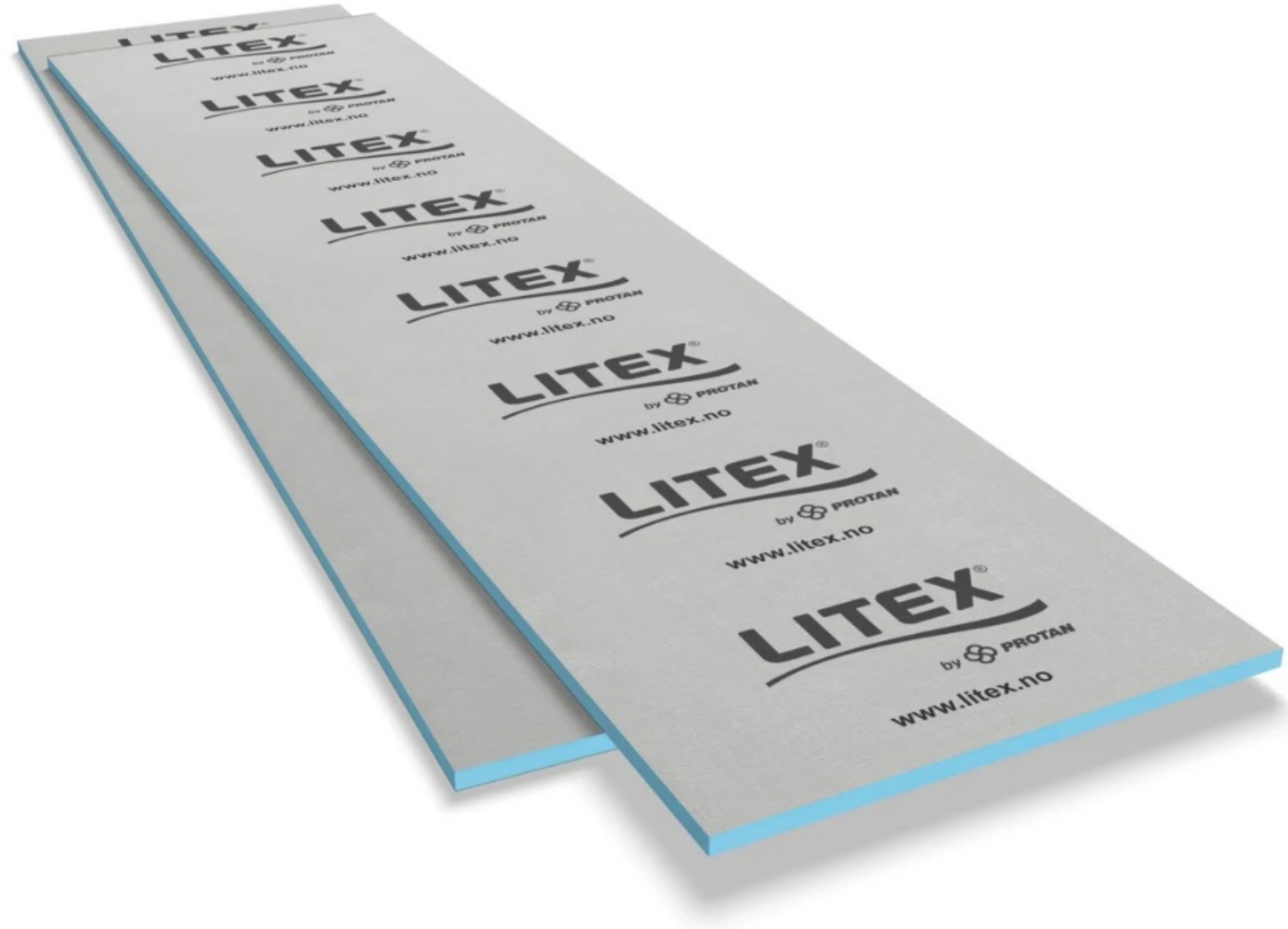


Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

Litex Membrane board - 13 mm



The Norwegian EPD Foundation

Owner of the declaration:

Litex AS

Product:

Litex Membrane board - 13 mm

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, v. 4.0 March 2022

Program operator:

The Norwegian EPD Foundation

Declaration number:

NEPD-4608-3856-EN

Registration number:

NEPD-4608-3856-EN

Issue date: 26.06.2023

Valid to: 26.06.2028

EPD Software:

LCA.no EPD generator ID: 62573

General information

Product

Litex Membrane board - 13 mm

Program operator:

Post Box 5250 Majorstuen, 0303 Oslo, Norway
The Norwegian EPD Foundation
Phone: +47 23 08 80 00
web: post@epd-norge.no

Declaration number: NEPD-4608-3856-EN

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, v. 4.0 March 2022

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 Litex Membrane board - 13 mm

Declared unit with option:

A1-A3,A4,A5,B4,C1,C2,C3,C4,D

Functional unit:

One squaremeter board used as a base for tiles or other materials. The board has an expected lifespan of at least 60 years after installation, and no maintenance is required during its lifespan after installation.

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

(no signature required)

Owner of the declaration:

Litex AS
Contact person: Jørn Helle
Phone: 0047 33489970
e-mail: post@litex.no

Manufacturer:

Litex AS

Place of production:

Litex AS
Pindsleveien 4
3221 Sandefjord, Norway

Management system:

ISO 9001 and ISO 14001

Organisation no:

915 050 832

Issue date: 26.06.2023

Valid to: 26.06.2028

Year of study:

2022

Comparability:

EPD of construction products may not be comparable if they not comply with EN 15804 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: Jørn Helle

Reviewer of company-specific input data and EPD: Jarle Brygmann

Approved:



Håkon Hauan, CEO EPD-Norge

Product

Product description:

Litex Membrane Boards are waterproof and vapor proof for use in bathroom and wet rooms, they can be tiled over directly, cutting down on installation time without having to add extra waterproofing. The boards come in a variety of thicknesses and configurations. Litex is also lightweight and can be cut with a regular utility knife, making it easy to build custom showers, bathtubs, counters, countertops, and vanity units in a fraction of the time it does using traditional building materials. The Litex Membrane Board is lightweight construction board made of XPS (extruded polystyrene) coated with a laminate of aluminum/polyester bonded to the core material with melt adhesive. The lamination is coated with water-based acrylic. The boards are waterproof and vapor-tight. They do not absorb moisture and are resistant to mold and rot. The boards have an extremely long lifespan and are durable even under extreme water exposure. The board can be installed on all types of solid substrates as well as on wooden or steel frames.

Product specification

Membrane Boards made of extruded polystyrene (XPS) coated with a laminate of aluminum/polyester, bonded to the core material with melt adhesive. The lamination is coated with a water-based acrylic.

Litex Membrane plate is supplied in the following dimensions:

2440 mm x 600 mm (length x width). Thicknesses:

13 mm, 20 mm, 30 mm and 50 mm.

Area per board: 1,464 m²

Materials	kg	%
Aluminium foil, laminated	0,22	18,03
Acrylate, water based	0,39	31,97
Extruded Polystyrene (XPS)	0,46	37,70
Glue	0,15	12,30
Total	1,22	

Packaging	kg	%
Packaging - Cardboard	0,00	3,32
Packaging - Plastic	0,02	96,68
Total incl. packaging	1,24	

Technical data:

The Litex Membrane Board has a core made of XPS with a compressive strength of 300 Kpa. Both sides of the board are coated with aluminum polymer and a layer of water-based acrylic. The product is typically available in thicknesses of 13mm, 20mm, 30mm, and 50mm. The Litex Board is waterproof and has a water vapor transmission rate (SD value) of 7800 M. The Norwegian requirement for wet zones in bathrooms are SD M 10, and the product's vapor barrier is 780 times higher than the minimum requirement for wet zones in bathrooms in Norway.

Market:

Norway, Europe. The scenario is based on the application in Norway.

Reference service life, product

The product has a lifespan of over 60 years, as stated by the manufacturer. This is a conservative estimate, and no maintenance is required for the product after installation.

Reference service life, building or construction works

60 years

LCA: Calculation rules

Declared unit:

1 m² Litex Membrane board - 13 mm

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. 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:

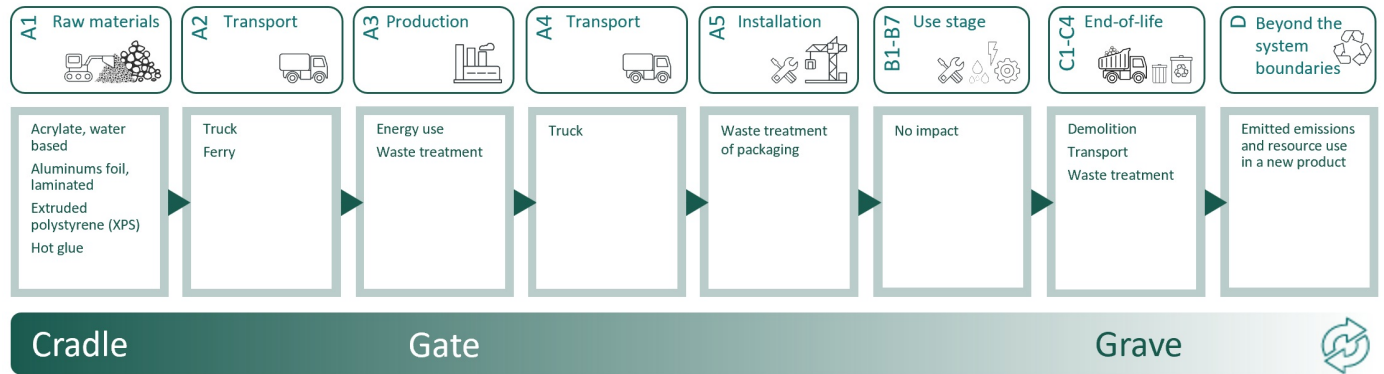
Specific data for the product composition are provided by the manufacturer. The data represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on EPDs according to EN 15804 and different LCA databases. The data quality of the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

Materials	Source	Data quality	Year
Extruded Polystyrene (XPS)	ecoinvent 3.6	Database	2019
Glue	ecoinvent 3.6	Database	2019
Packaging - Cardboard	ecoinvent 3.6	Database	2019
Packaging - Plastic	ecoinvent 3.6	Database	2019
Acrylate, water based	Modified ecoinvent 3.6	Database/Supplier	2019
Aluminium foil, laminated	Modified ecoinvent 3.6	Database/Supplier	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	X	MND	MND	MND	X	X	X	X	X

System boundary:



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 %	300	0,043	l/tkm	12,90
Assembly (A5)					
	Unit	Value			
Waste, packaging, cardboard corners, to average treatment (kg)	kg	0,00			
Waste, packaging, plastic film (LDPE), to average treatment (kg)	kg	0,02			
De-construction demolition (C1)					
	Unit	Value			
Demolition of board (psc)	kg/DU	1,22			
Transport to waste processing (C2)					
	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, 16-32 tonnes, EURO 6 (kgkm)	36,7 %	85	0,043	l/tkm	3,66
Waste processing (C3)					
	Unit	Value			
Waste treatment per kg municipal solid waste, incineration with fly ash extraction (kg)	kg	1,22			
Disposal (C4)					
	Unit	Value			
Landfilling of ashes from incineration of Municipal solid waste, process per kg ashes and residues (kg)	kg	0,29			
Benefits and loads beyond the system boundaries (D)					
	Unit	Value			
Substitution of electricity, in Norway (MJ)	MJ	0,72			
Substitution of thermal energy, district heating, in Norway (MJ)	MJ	10,97			

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	A5	B4	C1	C2	C3	C4	D	
 GWP-total	kg CO ₂ -eq	7,61E+00	6,06E-02	2,21E-03	0	0,00E+00	1,72E-02	2,86E+00	8,03E-04	-6,59E-02	
 GWP-fossil	kg CO ₂ -eq	7,54E+00	6,06E-02	1,28E-03	0	0,00E+00	1,72E-02	2,86E+00	8,03E-04	-6,36E-02	
 GWP-biogenic	kg CO ₂ -eq	2,75E-02	2,51E-05	9,34E-04	0	0,00E+00	7,11E-06	0,00E+00	0,00E+00	-1,31E-04	
 GWP-luluc	kg CO ₂ -eq	4,02E-02	2,16E-05	1,00E-07	0	0,00E+00	6,11E-06	4,79E-05	2,47E-07	-2,19E-03	
 ODP	kg CFC11 -eq	6,58E-06	1,37E-08	7,80E-11	0	0,00E+00	3,89E-09	1,89E-08	2,69E-10	-4,63E-03	
 AP	mol H+ -eq	2,20E-02	1,74E-04	1,60E-06	0	0,00E+00	4,93E-05	4,08E-04	5,87E-06	-5,24E-04	
 EP-FreshWater	kg P -eq	1,51E-04	4,84E-07	2,68E-09	0	0,00E+00	1,37E-07	1,89E-06	8,08E-09	-5,65E-06	
 EP-Marine	kg N -eq	3,26E-03	3,45E-05	1,44E-06	0	0,00E+00	9,76E-06	1,52E-04	2,09E-06	-1,71E-04	
 EP-Terrestrial	mol N -eq	3,56E-02	3,85E-04	5,75E-06	0	0,00E+00	1,09E-04	1,51E-03	2,31E-05	-1,85E-03	
 POCP	kg NMVOC -eq	1,72E-02	1,48E-04	1,88E-06	0	0,00E+00	4,18E-05	3,71E-04	6,67E-06	-5,11E-04	
 ADP-minerals&metals ¹	kg Sb -eq	5,37E-05	1,67E-06	6,96E-09	0	0,00E+00	4,74E-07	7,56E-07	1,43E-08	-6,32E-07	
 ADP-fossil ¹	MJ	9,73E+01	9,16E-01	5,35E-03	0	0,00E+00	2,60E-01	4,90E-01	1,96E-02	-9,09E-01	
 WDP ¹	m ³	6,03E+02	8,86E-01	1,86E-02	0	0,00E+00	2,51E-01	-8,34E+00	3,74E-02	-1,13E+01	

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	A5	B4	C1	C2	C3	C4	D
 PM	Disease incidence	1,88E-07	3,71E-09	2,90E-11	0	0,00E+00	1,05E-09	2,29E-09	1,08E-10	-3,17E-08
 IRP ²	kgBq U235 -eq	1,85E-01	4,00E-03	2,42E-05	0	0,00E+00	1,13E-03	1,91E-03	7,93E-05	-5,81E-03
 ETP-fw ¹	CTUe	5,93E+01	6,79E-01	5,15E-03	0	0,00E+00	1,92E-01	7,51E+00	2,05E-02	-4,95E+00
 HTP-c ¹	CTUh	4,95E-09	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	2,34E-10	1,00E-12	-9,10E-11
 HTP-nc ¹	CTUh	6,48E-08	7,42E-10	5,00E-12	0	0,00E+00	2,10E-10	4,97E-09	3,90E-11	-4,74E-09
 SQP ¹	dimensionless	1,07E+01	6,41E-01	9,21E-03	0	0,00E+00	1,82E-01	9,81E-02	2,74E-02	-6,08E+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-A3	A4	A5	B4	C1	C2	C3	C4	D	
 PERE	MJ	2,37E+01	1,31E-02	1,34E-04	0	0,00E+00	3,72E-03	4,77E-02	3,55E-04	-5,62E+00	
 PERM	MJ	1,26E-02	0,00E+00	-4,51E-03	0	0,00E+00	0,00E+00	-8,09E-03	0,00E+00	0,00E+00	
 PERT	MJ	2,37E+01	1,31E-02	-4,38E-03	0	0,00E+00	3,72E-03	3,97E-02	3,55E-04	-5,62E+00	
 PENRE	MJ	6,54E+01	9,16E-01	5,35E-03	0	0,00E+00	2,60E-01	6,16E-01	1,97E-02	-9,09E-01	
 PENRM	MJ	3,21E+01	0,00E+00	-6,80E-01	0	0,00E+00	0,00E+00	-3,15E+01	0,00E+00	0,00E+00	
 PENRT	MJ	9,75E+01	9,16E-01	-6,74E-01	0	0,00E+00	2,60E-01	-3,08E+01	1,97E-02	-9,09E-01	
 SM	kg	1,98E-04	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	
 RSF	MJ	1,06E-01	4,69E-04	3,53E-06	0	0,00E+00	1,33E-04	1,20E-03	9,13E-06	-9,84E-04	
 NRSF	MJ	5,78E-02	1,68E-03	9,34E-06	0	0,00E+00	4,75E-04	0,00E+00	0,00E+00	-3,33E-01	
 FW	m ³	2,23E-01	9,80E-05	2,82E-06	0	0,00E+00	2,78E-05	8,58E-04	1,82E-05	-6,76E-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-A3	A4	A5	B4	C1	C2	C3	C4	D
 HWD	kg	4,10E-02	4,73E-05	0,00E+00	0	0,00E+00	1,34E-05	0,00E+00	2,48E-01	-4,27E-05
 NHWD	kg	5,95E-01	4,46E-02	1,66E-02	0	0,00E+00	1,26E-02	0,00E+00	4,11E-02	-2,15E-02
 RWD	kg	1,59E-04	6,24E-06	0,00E+00	0	0,00E+00	1,77E-06	0,00E+00	4,66E-07	-4,76E-06

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	A5	B4	C1	C2	C3	C4	D
 CRU	kg	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
 MFR	kg	2,97E-02	0,00E+00	8,68E-03	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
 MER	kg	4,15E-06	0,00E+00	3,92E-05	0	0,00E+00	0,00E+00	1,22E+00	0,00E+00	0,00E+00
 EEE	MJ	2,73E-02	0,00E+00	3,27E-05	0	0,00E+00	0,00E+00	4,23E-04	0,00E+00	0,00E+00
 EET	MJ	4,13E-01	0,00E+00	4,95E-04	0	0,00E+00	0,00E+00	6,40E-03	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	2,55E-04

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	Data source	Amount	Unit
Electricity, Norway (kWh)	ecoinvent 3.6	24,33	g CO ₂ -eq/kWh

Dangerous substances

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

Indoor environment

No impact






Additional Environmental Information

Additional environmental impact indicators required in NPCR Part A for construction products										
Indicator	Unit	A1-A3	A4	A5	B4	C1	C2	C3	C4	D
GWPIOBC	kg CO ₂ -eq	7,55E+00	6,06E-02	0,00E+00	0	0,00E+00	1,72E-02	1,54E+00	3,27E-03	-6,49E-02

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.

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 NPCR 010 Part B for Building Boards. Ver. 4.0, March 2022, EPD-Norge.

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