epd-norge
Global program operatør

Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

Foamrox Construction Element

FOAMROX®

The Norwegian EPD Foundation

Owner of the declaration:
Foamrox AS

Product:
Foamrox Construction Element

Declared unit:
1 m2

This declaration is based on Product Category Rules:
CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR Part A: Construction products and services. Ver. 2.0 March 2021

Program operator:
The Norwegian EPD Foundation

Declaration number:
NEPD-12606-12745

Registration number:
NEPD-12606-12745

Issue date:
09.10.2025

Valid to:
09.10.2030

EPD software:
LCAno EPD generator ID: 1170550 and 614856

General information

Product

Foamrox Construction Element

Owner of the declaration:

Foamrox AS
Contact person: Glenn Alexander Jakobsen
Phone: +47 915 27 408
e-mail: glenn@foamrox.no

Program operator:

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

Manufacturer:

Foamrox AS

Declaration number:

NEPD-12606-12745

Place of production:

Foamrox AS
Bjørumsvegen 19
4820 Froland, Norway

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR Part A: Construction products and services. Ver. 2.0 March 2021

Management system:

EN-ISO 14001 and EN-ISO 9001

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:

999 015 891

Declared unit:

1 m2 Foamrox Construction Element with a thickness of 128 mm

Issue date:

09.10.2025

Declared unit with option:

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

Valid to:

09.10.2030

Year of study:

2023

Functional unit:

Comparability:

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

The EPD has been worked out by:

Developer of EPD: Vegard Ruttenborg - NIRAS Norge AS

Verification:

Independent verification of the declaration and data, according to ISO14025:2010.

External third party verifier:

Kristine Bjordal, SpareBank 1 Regnskapshuset SMN AS

(Independent verifier approved by EPD-Norway)

Approved:

Håkon Hauan
Managing Director of EPD-Norway

Product

Product description:

Foamrox elements are tailor-made for each project. The elements are mainly used for non-load-bearing walls, fire walls, and tunnel inventory components. The elements are made of cellular glass insulation boards, coated with a strong membrane.

Product specification

Foamrox elements are used in environments where there is need for isolated, watertight solutions and strict fire requirements. Foamrox can be tailor made for different applications.

Materials	kg	%
Binders and Resins	2,80	7,07
Cellular glass	12,00	30,30
Gypsum board	24,80	62,63
Total	39,60	100,00

Packaging	kg	%
Packaging - Plastic	0,02	94,49
Packaging - Steel straps	0,00	5,51
Total incl. packaging	39,63	100,00

Technical data:

The weight of the Foamrox insulation element is 39,6 kg/m2. Thickness is 128 mm.

Market:

International. The Norwegian market is used for scenarios in module A4 and end-of-life stages.

Reference service life, product

Due to its closed-cell glass structure, foam glass has good insulation capabilities and a long life span. The membrane is made of polyurea, a strong coating material.

Reference service life, building or construction works

LCA: Calculation rules

Declared unit:

1 m2 Foamrox Construction Element with a thickness of 128 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.

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. Generic background data is from Ecoinvent v3.6 calculated with OpenLCA v1.11. Characterization factors from EN15804:2012+A2:2019, EF 3.0. Generic data <10 years old. Ecoinvent system model used: cut-off. The data quality of the raw materials in A1 is presented in the table below.
The data collection period for manufacturer data was from February to April 2024 and is an average of one year of 2023. The declaration is created using EPD tool lca.tools ver EPD2022.03, developed by LCA.no. Annex E Table E1 in EN 15804+A2:2019 has been used to assess the data quality of relevant data.

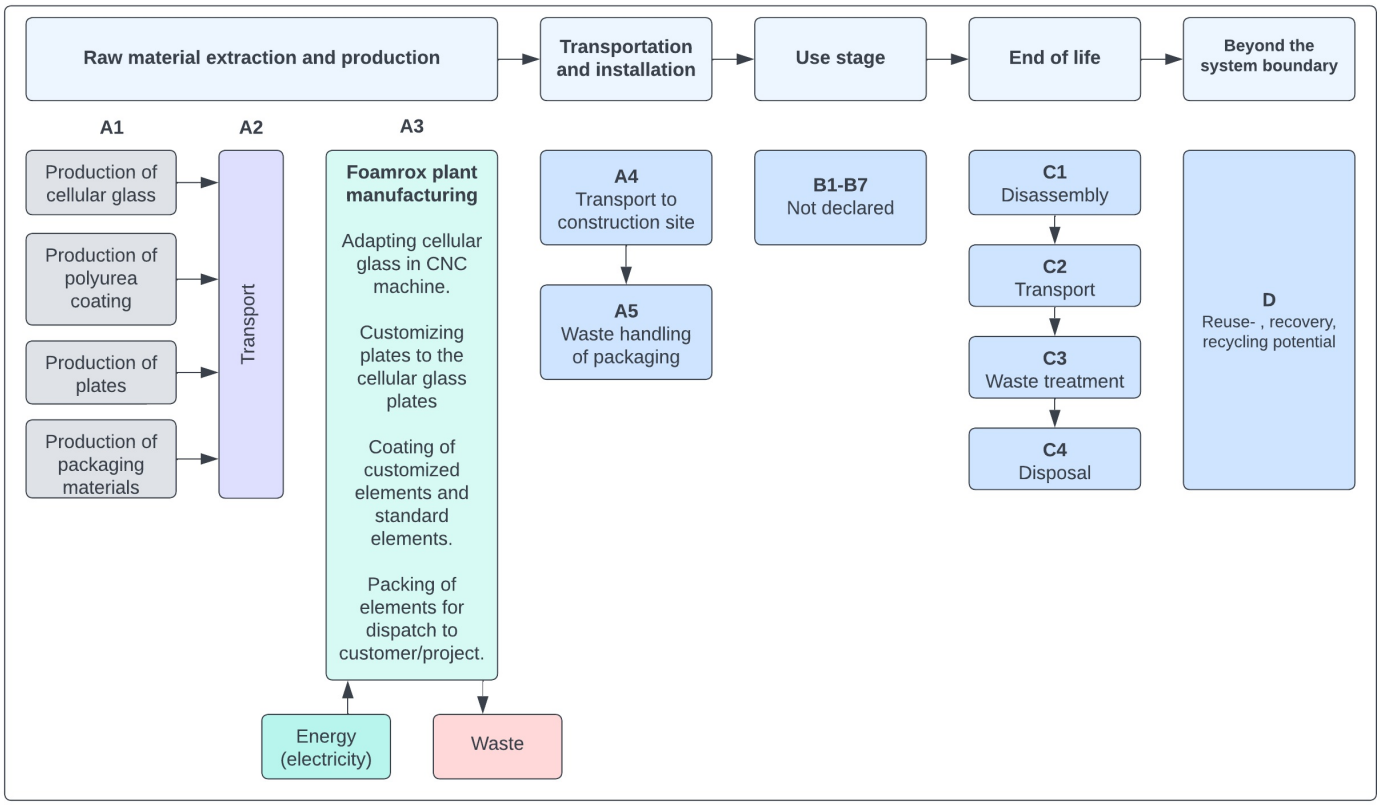
Materials	Source	Data quality	Year
Binders and Resins	Supplier	EPD	2023
Cellular glass	Supplier	EPD	2022
Gypsum board	Supplier	EPD	2022
Packaging - Plastic	ecoinvent 3.6	Database	2019
Packaging - Steel straps	ecoinvent 3.6	Database	2019

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:

Type of EPD: Cradle-to-grave with options (A1-A5, C1-C4, D). All processes from raw material extraction to production at the factory are included in the analysis (A1-A3) along with life cycle scenario for transportation to market (Norway) (A4) is included. In addition, end of life stage (C1-C4) and beyond the system boundaries (D) are included. Module A1-A4 are shown in the flow chart below. The main production processes at the Foamrox factory are cutting of cellular glass boards and coating with polyurea. The processes requires energy consumption and produces waste. The flow chart of the life cycle modules are shown below.



Additional technical information:

LCA: Scenarios and additional technical information

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

Module A4-A5:
The distribution of the product is based on a generic scenario with a transport distance of 300 km. The product is used in a wide range of structures and is therefore installed using different techniques and with different requirements for materials and energy consumption. It is therefore assumed that it is not possible to provide an average scenario. Hence, the installation in module A5 only includes waste handling of packaging.

Module B1-B7:
Not declared.

Module C1-C4:
In this study, two scenarios are provided for C1-C4. Scenario 1 is a generic scenario that describes the typical activities for the end of life when there is not implemented any specific recycling scheme at the construction site. The second scenario describes how the cellular glass can be reused as an aggregate. Only scenario 1 is included in the original results tables. Additional results for scenario 2 are added to Additional Environmental Information.

Scenario 1:
The first scenario is a generic scenario where it is assumed that the product is manually deconstructed, thus module C1 does not contain any impacts. The gypsum board is separated from the product and recycled. The remaining materials are disposed of as residual waste and treated in an incineration plant with energy recovery.

Scenario 2:
The second scenario assumes that the polyurea and cellular glass is delaminated. The cellular glass is reused at the building site as an aggregate and the polyurea is disposed of as residual waste and sent to municipal incineration with energy recovery. The gypsum board is separated from the product and recycled. The deconstruction is assumed to be carried out manually, thus module C1 does not cause any impacts. The energy use to crush the cellular glass into glass gravel is taken from an EPD for cellular glass.

For the disposal of Foamrox products, specific procedures shall be carefully followed to ensure safe and environmentally friendly handling. The polyurea membrane is delaminated from the cellular glass using a knife or other sharp tools. After delamination, the membrane must be disposed of as residual waste and sent to incineration. It is important that both cellular glass and polyurea are delaminated correctly.
The cellular glass should be crushed with heavy or impact equipment, such as a wheel loader or sledgehammer. The crushed pieces of cellular glass gravel can be used as a fill material on site, as the it does not have a negative impact on the environment.
Reuse of cellular glass in production is not an option, as Foamrox is not a cellular glass manufacturer and it is not practical to transport the material to Germany for reuse.

Module D:

Scenario 1:
The benefits of exported energy from energy recovery in an incineration plant is calculated with substitution of Norwegian electricity market mix and district heating mix. The benefits of replacing primary gypsum is calculated as a net flow from input of recycled gypsum and output of gypsum to recycling. The manufacturing of gypsum board uses 16 % recycled gypsum. Hence, the net flow of gypsum in module D is 84 %.

Scenario 2:
The scenario includes the benefits from replacing natural crushed gravel, primary gypsum and exported energy from incineration of the polyurea membrane in a municipal waste incineration plant. The benefits of replacing natural crushed gravel and gypsum is calculated for the net flow of the difference between the input of glass cullets and recycled gypsum and output of recycled cellular glass and gypsum. The manufacturing of cellular glass uses 92 % recycled glass, and the net flow of cellular glass in module D is 8 %. The production of gypsum board utilises 16 % recycled gypsum, with a net flow of 84 % in module D.

Transport from production place to user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, over 32 tonnes, EURO 6 (km) - Europe	53,3 %	300,00	0,023	l/tkm	6,90

Assembly (A5)	Unit	Value			
Waste, packaging, plastic film (LDPE), to average treatment (kg)	kg	0,024			
Waste, metal, to average treatment (kg)	kg	0,0014			

Transport to waste processing (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, over 32 tonnes, EURO 6 (km) - Europe	53,3 %	83,00	0,023	l/tkm	1,91

Waste processing (C3)	Unit	Value			
Waste treatment per kg Glass, incineration with fly ash extraction (kg)	kg/DU	12,00			
Waste treatment per kg Polyurethane (PU), incineration with fly ash extraction (kg)	kg	2,80			
Sorting of waste gypsum plasterboard at sorting plant (kg)	kg	24,80			
Gypsum to recycling (kg)	kg	24,02			
Waste treatment per kg Paperboard, incineration with fly ash extraction (kg)	kg	0,7781			

Disposal (C4)	Unit	Value			
Landfilling of ashes from incineration of Glass, process of ashes and residues (kg)	kg	12,00			
Landfilling of ashes from incineration of Polyurethane (PU), process per kg ashes and residues (kg)	kg	0,1061			
Landfilling of ashes from incineration of Paperboard, process per kg ashes and residues - C4 (kg)	kg	0,0139			

Benefits and loads beyond the system boundaries (D)	Unit	Value			
Substitution of thermal energy, district heating, in Norway (MJ)	MJ	71,60			
Substitution of electricity, in Norway (MJ)	MJ	4,74			
Substitution of primary Gypsum (kg)	kg	20,15			

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-A3	A4	A5	C1	C2	C3	C4	D
	GWP-total	kg CO_2 -eq	2.99E+01	1.04E+00	1.92E-03	0	2.87E-01	8.56E+00	1.39E-01	-4.74E-01
	GWP-fossil	kg CO_2 -eq	3.03E+01	1.04E+00	1.92E-03	0	2.86E-01	7.62E+00	1.39E-01	-4.59E-01
	GWP-biogenic	kg CO_2 -eq	-3.33E-01	4.43E-04	2.70E-07	0	1.23E-04	9.38E-01	1.03E-04	-9.13E-04
	GWP-luluc	kg CO_2 -eq	3.63E-02	3.15E-04	1.53E-07	0	8.73E-05	8.53E-05	4.12E-05	-1.43E-02
	ODP	kg CFC11 -eq	2.65E-06	2.50E-07	1.19E-10	0	6.91E-08	4.76E-08	4.20E-08	-3.02E-02
	AP	mol H+ -eq	1.32E-01	3.33E-03	2.42E-06	0	9.22E-04	7.03E-03	9.64E-04	-4.50E-03
	EP-FreshWater	kg P -eq	8.05E-03	8.24E-06	4.07E-09	0	2.28E-06	4.87E-06	1.40E-06	-3.74E-05
	EP-Marine	kg N -eq	3.86E-02	7.30E-04	2.17E-06	0	2.02E-04	3.83E-03	3.43E-04	-1.49E-03
	EP-Terrestial	mol N -eq	3.21E-01	8.14E-03	8.66E-06	0	2.25E-03	3.67E-02	3.79E-03	-1.74E-02
	POCP	kg NMVOC -eq	1.08E-01	3.20E-03	2.84E-06	0	8.85E-04	8.85E-03	1.09E-03	-4.45E-03
	ADP-minerals&metals[1]	kg Sb-eq	2.80E-04	1.84E-05	1.07E-08	0	5.10E-06	1.96E-06	2.34E-06	-4.52E-06
	ADP-fossil[1]	MJ	5.26E+02	1.68E+01	8.14E-03	0	4.65E+00	4.20E+00	3.11E+00	-6.54E+00
	WDP[1]	m^3	1.91E+03	1.29E+01	2.80E-02	0	3.57E+00	7.25E+01	6.49E+00	-8.59E+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

The presented results are calculated with a country specific consumption mix for Norway. An additional set of results has not been calculated based on a market based approach for electricity consumption.

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Additional environmental impact indicators										
Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	PM	Disease incidence	5.99E-01	9.51E-08	4.30E-11	0	2.63E-08	1.44E-07	1.75E-08	-2.27E-07
	IRP[2]	kgBq U235 -eq	6.10E-01	7.35E-02	3.67E-05	0	2.03E-02	1.58E-02	1.25E-02	-4.17E-02
	ETP-fw[1]	CTUe	1.62E+02	1.23E+01	7.70E-03	0	3.40E+00	2.28E+01	1.89E+00	-7.71E+01
	HTP-c[1]	CTUh	8.16E-08	0.00E+00	0.00E+00	0	0.00E+00	7.65E-10	6.90E-11	-6.11E-10
	HTP-nc[1]	CTUh	3.89E+02	1.19E-08	7.00E-12	0	3.29E-09	2.49E-08	1.86E-09	-3.15E-08
	SQP[1]	dimensionless	1.82E+02	1.93E+01	1.39E-02	0	5.33E+00	7.80E-01	6.75E+00	-4.18E+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.

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Resource use										
Indicator		**Unit**	A1-A3	A4	A5	C1	C2	C3	C4	D
	PERE	MJ	1.72E+02	2.12E-01	2.02E-04	0	5.85E-02	3.95E-01	5.94E-02	-3.67E+01
	PERM	MJ	2.45E+00	0.00E+00	0.00E+00	0	0.00E+00	-2.45E+00	0.00E+00	0.00E+00
	PERT	MJ	1.75E+02	2.12E-01	2.02E-04	0	5.85E-02	-2.06E+00	5.94E-02	-3.67E+01
	PENRE	MJ	5.19E+02	1.68E+01	8.14E-03	0	4.65E+00	4.20E+00	3.11E+00	-6.54E+00
	PENRM	MJ	2.43E+01	0.00E+00	-1.02E+00	0	0.00E+00	-2.32E+01	0.00E+00	0.00E+00
	PENRT	MJ	5.43E+02	1.68E+01	-1.01E+00	0	4.65E+00	-1.90E+01	3.11E+00	-6.54E+00
	SM	kg	3.17E+01	0.00E+00	0.00E+00	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	RSF	MJ	2.13E-01	7.40E-03	5.34E-06	0	2.05E-03	8.38E-03	1.57E-03	-6.42E-03
	NRSF	MJ	4.06E-01	2.48E-02	1.41E-05	0	6.86E-03	0.00E+00	5.39E-02	-2.17E+00
	FW	m^3	1.57E+00	1.91E-03	4.18E-06	0	5.29E-04	1.34E-02	2.80E-03	-4.44E-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-A3	A4	A5	C1	C2	C3	C4	D
	HWD	kg	1.34E-01	9.20E-04	0.00E+00	0	2.55E-04	0.00E+00	1.21E+01	-3.29E-04
	NHWD	kg	9.39E+00	1.46E+00	2.54E-02	0	4.04E-01	1.20E+01	1.57E-01	-1.42E-01
	RWD	kg	2.39E-03	1.15E-04	0.00E+00	0	3.18E-05	0.00E+00	1.92E-05	-3.54E-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-A3	A4	A5	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
	MFR	kg	2.96E-01	0.00E+00	1.37E-02	0	0.00E+00	2.40E+01	0.00E+00	0.00E+00
	MER	kg	4.30E-01	0.00E+00	1.20E-06	0	0.00E+00	4.04E+01	0.00E+00	0.00E+00
	EEE	MJ	2.59E-01	0.00E+00	1.84E-06	0	0.00E+00	4.73E+00	0.00E+00	0.00E+00
	EET	MJ	3.92E+00	0.00E+00	2.79E-05	0	0.00E+00	7.16E+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	2.55E-01
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

Location based electricity mix 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 the grid) of applied electricity for the manufacturing process (A3).

Electricity source	[kWh]	GWP total [kg/CO2-eq/kWh]	SUM [kg CO2-eq]
Norwegian mix (market for electricity, low voltage, ecoinvent 3.6)	30,7	0,024	0,74

Guaranetees of origin from the use of electricity in the manufacturing phase

Where guarantees of origin is applied in stead of national production mix - the electricity for the manufacturing process (A3) shall be stated clearly in the EPD per functional unit.

Electricity source	[kWh]	GWP total [kg/CO2-eq/kWh]	SUM [kg CO2-eq]
Amount of guarantee of origin electricity used in the foreground	0		
Amount of residual mix electricity used in the foreground	30,7	0,6	19,2

The residual mix is calculated using the following methodology [Ecoinvent v3.10, Residual mix Norway, LCIA method IPCC 2021 GWP100]

Dangerous substances

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

Indoor environment

Not relevant

Additional Environmental Information

Additional environmental impact indicators required in NPCR Part A for construction products									
Indicator	**Unit**	A1-A3	A4	A5	C1	C2	C3	C4	D
GWPIOBC	kg CO_2 -eq	3.08E+01	1.04E+00	1.92E-03	0	2.87E-01	7.62E+00	1.39E-01	-4.74E-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.

Additional Waste Scenario

The following information describes the additional waste scenarios in the different modules of the EPD.

The scenario description is given in "LCA: Scenarios and additional technical information" on page 5.

Transport to waste processing (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, over 32 tonnes, EURO 6 (km) - Europe	53,3 %	83,00	0,023	l/tkm	1,91

Waste processing (C3)	Unit	Value			
Waste treatment per kg Polyurethane (PU), incineration with fly ash extraction (kg)	kg	2,80			
Waste treatment of cellular glass, crushing (kg)	kg/DU	12,00			
Sorting of waste gypsum plasterboard at sorting plant (kg)	kg	24,80			
Gypsum to recycling (kg)	kg	24,02			
Waste treatment per kg Paperboard, incineration with fly ash extraction (kg)	kg	0,7781			

Disposal (C4)	Unit	Value			
Landfilling of ashes from incineration of Polyurethane (PU), process per kg ashes and residues (kg)	kg	0,1061			
Landfilling of ashes from incineration of Paperboard, process per kg ashes and residues - C4 (kg)	kg	0,0139			

Benefits and loads beyond the system boundaries (D)	Unit	Value			
Substitution of electricity, in Norway (MJ)	MJ	4,58			
Substitution of thermal energy, district heating, in Norway (MJ)	MJ	69,17			
Substitution of primary light weight aggregates (kg)	kg/DU	0,96			
Substitution of primary Gypsum (kg)	kg	20,15			

LCA: Results - Additional waste scenario

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

Environmental impact							
Indicator		Unit	C1	C2	C3	C4	D
	GWP-total	kg CO_2 -eq	0	2.00E-01	8.58E+00	1.00E-02	-7.01E-01
	GWP-fossil	kg CO_2 -eq	0	2.00E-01	7.65E+00	1.00E-02	-6.86E-01
	GWP-biogenic	kg CO_2 -eq	0	8.55E-05	9.36E-01	5.08E-06	-1.48E-03
	GWP-luluc	kg CO_2 -eq	0	6.08E-05	7.83E-05	1.38E-06	-1.39E-02
	ODP	kg CFC11 -eq	0	4.81E-08	4.43E-08	8.66E-10	-2.92E-02
	AP	mol H+ -eq	0	6.43E-04	7.01E-03	3.16E-05	-6.30E-03
	EP-FreshWater	kg P -eq	0	1.59E-06	6.76E-06	1.39E-07	-4.81E-05
	EP-Marine	kg N -eq	0	1.41E-04	3.82E-03	9.54E-06	-1.69E-03
	EP-Terrestial	mol N -eq	0	1.57E-03	3.67E-02	1.09E-04	-1.99E-02
	POCP	kg NMVOC -eq	0	6.16E-04	8.74E-03	2.98E-05	-5.11E-03
	ADP-minerals&metals[1]	kg Sb-eq	0	3.56E-06	1.69E-06	4.42E-08	-7.56E-06
	ADP-fossil[1]	MJ	0	3.24E+00	4.79E+00	7.69E-02	-8.78E+00
	WDP[1]	m^3	0	2.49E+00	7.06E+01	9.94E-01	-8.79E+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

An additional set of results has not been calculated based on a market based approach for electricity consumption.

Additional environmental impact indicators							
Indicator		Unit	C1	C2	C3	C4	D
	PM	Disease incidence	0	1.83E-08	1.24E-07	3.50E-10	-2.37E-07
	IRP[2]	kgBq U235 -eq	0	1.42E-02	1.74E-02	3.82E-04	-4.55E-02
	ETP-fw[1]	CTUe	0	2.37E+00	2.13E+01	1.71E-01	-8.19E+01
	HTP-c[1]	CTUh	0	0.00E+00	5.49E-10	9.00E-12	-6.99E-10
	HTP-nc[1]	CTUh	0	2.29E-09	2.34E-08	3.27E-10	-3.34E-08
	SQP[1]	dimensionless	0	3.72E+00	7.38E-01	2.39E-01	-4.38E+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	C1	C2	C3	C4	D
	PERE	MJ	0	4.08E-02	3.75E-01	5.42E-03	-3.61E+01
	PERM	MJ	0	0.00E+00	-2.45E+00	0.00E+00	0.00E+00
	PERT	MJ	0	4.08E-02	-2.08E+00	5.42E-03	-3.61E+01
	PENRE	MJ	0	3.24E+00	4.79E+00	7.69E-02	-8.78E+00
	PENRM	MJ	0	0.00E+00	-2.32E+01	0.00E+00	0.00E+00
	PENRT	MJ	0	3.24E+00	-1.85E+01	7.69E-02	-8.78E+00
	SM	kg	0	0.00E+00	0.00E+00	0.00E+00	-3.60E-03
	RSF	MJ	0	1.43E-03	7.89E-03	1.34E-04	-2.36E-02
	NRSF	MJ	0	4.78E-03	0.00E+00	1.39E-02	-2.11E+00
	FW	m^3	0	3.69E-04	1.32E-02	7.09E-05	-4.46E-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	C1	C2	C3	C4	D
	HWD	kg	0	1.77E-04	1.31E-06	9.03E-02	-5.88E-04
	NHWD	kg	0	2.82E-01	2.32E-03	8.99E-02	-1.54E-01
	RWD	kg	0	2.21E-05	7.38E-06	4.60E-07	-4.16E-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	C1	C2	C3	C4	D
	CRU	kg	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	MFR	kg	0	0.00E+00	3.60E+01	0.00E+00	-2.92E-03
	MER	kg	0	0.00E+00	2.84E+01	0.00E+00	-1.75E-04
	EEE	MJ	0	0.00E+00	4.57E+00	0.00E+00	-3.81E-04
	EET	MJ	0	0.00E+00	6.92E+01	0.00E+00	-5.77E-03

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

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epd-norge Global program operatør	**Program operator and publisher** The Norwegian EPD Foundation Post Box 5250 Majorstuen, 0303 Oslo, Norway	Phone: e-mail: web:	+47 977 22 020 post@epd-norge.no www.epd-norge.no
FOAMROX®	**Owner of the declaration:** Foamrox AS Bjørumsvegen 19, 4820 Froland, Norway	Phone: e-mail: web:	+47 915 27 408 glenn@foamrox.no www.foamrox.no
NIRAS	**Author of the Life Cycle Assessment** NIRAS Norge AS Innspurten 11 D, 0663 Oslo, Norway	Phone: e-mail: web:	 norgeadmin@niras.com www.nirasnorge.no
LCA.no	**Developer of EPD generator** LCA.no AS Dokka 6A, 1671 Kråkerøy, Norway	Phone: e-mail: web:	+47 916 50 916 post@lca.no www.lca.no
ECO PLATFORM EPD VERIFIED	ECO Platform ECO Portal	web: web:	www.eco-platform.org ECO Portal