

Environmental Product Declaration: Norlite Perlite, fire-proof thermal insulation

In accordance with ISO 14025 and EN 15804 +A2



The Norwegian
EPD Foundation

Owner of the declaration:
Nordisk Perlite ApS

Program holder and publisher:
The Norwegian EPD foundation

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Valid to: 03.08.2027

Product name

Norlite Perlite, fire-proof
thermal insulation

Manufacturer
Nordisk Perlite ApS

General information

Product:

Norlite Perlite 0515 SC, 0530 SC and 0560 SC

Program Operator:

The Norwegian EPD Foundation
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Declaration Number:

NEPD-3654-2600-EN

This declaration is based on Product Category Rules:

EN 15804:2012+A2:2019 and c-PCR EN 16783

Statements:

The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer, life cycle assessment data and evidences.

Declared unit:

1 m³ of Norlite Perlite

Declared unit with option:

1 m³ of Norlite Perlite

A1-A5, B1-B7, C1-C4 and D

Functional unit:

1 m³ of Norlite Perlite with bulk density 85 kg/m³ with insulation value of 0,042 W/m.K

Verification:

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

internal external



Silvia Vilčeková

Independent verifier approved by EPD Norway

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Place of production:

Hammersholt, Denmark

Management system:

ISO 9001

Organisation no:

DK48247717

Issue date:

03.08.2022

Valid to:

03.08.2027

Year of study:

2021

Comparability:

EPDs from other programmes than EPD Norway may not be comparable.

The EPD has been worked out by:

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Approved (Manager of EPD Norway)

Product

Product description:

Norlite Perlite 0515 SC, 0530 SC and 0560 SC are expanded perlite aggregates. The raw perlite is expanded 10 – 15 times in size in a furnace, at 1000°C, driven by natural gas. All SC-products are coated with a special water-proof membrane, preventing water and humidity from penetrating and have a capillary breaking height of 4 cm. Nordisk Perlite produces 3 different particle sizes, that all can be used for thermal insulation, with a value of 0.042 W/m.K. Norlite Perlite 0515 SC, 0530 SC and 0560 SC is a loose fill insulation tested according to DS/EN 12667:2001 and DS/EN 15501:2013. Other applications are light weight hydrophobic filler and selective absorber of oils.

Norlite Perlite 0515 SC, 0530 SC and 0560 SC has 0 % VOC as the product exists of a mineral with a polymeric coating; the polymeric siloxane is chemically bound to the perlite mineral. Norlite Perlite 0515 SC, 0530 SC and 0560 SC does not need a safety datasheet as the product has no health and safety sentences. It is therefore safe to use for all applications.

Norlite Perlite 0515 SC, 0530 SC and 0560 SC is used for floor, wall and roof insulation, shows noise absorption properties and forms a natural fire-proof layer, A1 in fire-class in all applications. Norlite Perlite 0515 SC, 0530 SC and 0560 SC are among the lightest mineral aggregates on the market.

Correctly installed, Norlite Perlite 0515 SC, 0530 SC and 0560 SC will last forever as insulation material as the products do not absorb water, are heat-, cold- and dimension-stable.

Product specification:

Norlite Perlite 0515 SC, 0530 SC and 0560 SC are produced by expanding raw perlite with natural gas in a furnace, hereafter the expanded grades 0515, 0530 and 0560 are treated with a siloxane and become the hydrophobic grades 0515 SC, 0530 SC and 0560 SC. Norlite Perlite 0515 SC, 0530 SC and 0560 SC are REACH exempt.

Materials	kg per m ³	%
Perlite	84.75 – 84.83	99.7 – 99.8
Siloxane	0.17 – 0.25	0.2 – 0.3

Technical data:

Norlite Perlite Expand comes in 3 sizes: 0515 SC (0,5-1,5 mm), 05 30 SC (0,5 – 3,0 mm) and 05 60 SC (0,5 -6,0 mm). All have a bulk density of 85 kg/m³ and an insulation value of 0.042 W/m.K

Market:

Europe

Reference service life, product:

Equal to the building service life, of at least 50 years.

Reference service life, building:

Equal to the building service life

LCA: Calculation rules

Declared unit:

1m³ of siloxane coated Norlite Perlite for building insulation, including A1-A5, B1-B7, C1-C4 and D.

Data quality:

The manufacturing process A3 is based on specific 2021 total production data obtained from Nordisk Perlite. Transportation data A2 was also provided by Nordisk Perlite. Some data was provided from a Turkish perlite mine, which was inserted into the Ecoinvent perlite quarry operation dataset. Other raw materials in A1 use generic data from GaBi and Ecoinvent datasets shown in the LCA scenarios section.

Allocation:

No allocation was required for the manufacturing of perlite. All expanded perlite is sold in a variety of formats. For example the perlite which cannot be used for insulation or filtration, is used as sterile underlay in cattle sheds. The energy required for coating is recorded separately to that of expansion, so no allocation required.

System boundary:

All life cycle stages are included in the study: product stage (A1-A3), construction process (A4-A5), end of life (module C) and module D. Module B is not associated with any activities or emissions causing any environmental impacts.

	Product stage			Assembly stage		Use stage							End of life stage				Benefits & loads beyond system boundary	
	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	
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
Module declared	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Geography	TR/EU	EU	DK	DK	DK	ND	ND	ND	ND	ND	ND	ND	DK	DK	DK	DK	DK	

A1, raw material supply

This module considers the extraction and processing of all raw materials, energy, and transportation which occur upstream to the studied manufacturing process, including packaging material (except for ancillary material used in product manufacturing process).

A2, transport to the manufacturer

The raw materials are transported to the manufacturing site. This also includes coatings and packaging material.

A3, manufacturing

This module includes manufacturing of expanded perlite and the coating of it for the following products:

Norlite Perlite 0515 SC

Norlite Perlite 0530 SC

Norlite Perlite 0560 SC

A4-A5 Construction process stage

A4, Transport

Transportation from Nordisk Perlite to the building site is taken into account.

A5, Construction installation

This stage includes any resources used during the installation of the product on the construction site. In this case the insulation can either be installed manually (no emissions) or by blower. Waste is negligible as perlite does not need to be cut into shape. 1% waste was assumed as spillage and dust and that it would be in quantities too small to be recycled. Treatment of the packaging waste on site is considered and assumes average Danish end of life rates for mixed construction waste.

B Use stage

B1-B7

This stage includes no activities or emissions related to the product.

C End of life stage

Norlite Perlite 0515 SC, 0530 SC and 0560 SC can be re-used, either as insulation, with the same properties as virgin perlite, or be used in concrete as light weight filler.

C1 Deconstruction/Demolition

Norlite Perlite 0515 SC, 0530 SC and 0560 SC can easily be collected by gathering the material in big bags through suction. This requires the same amount of energy and same type of equipment as to install the perlite. Therefore the values of C1 are the same as A5. Of course other methods to gather Norlite Perlite 0515 SC, 0530 SC and 0560 SC can be used, but these are not documented in this EPD. It is assumed that all perlite will be collected for reuse.

C2 Transport

Transport distance to waste processing for mixed construction waste.

C3 Waste processing

All Norlite Perlite can be reused in section D. Mixed construction waste follows Danish average values.

C4 Final disposal

All Norlite Perlite can be reused in section D. Mixed construction waste follows Danish average values.

D Benefits and loads beyond the system boundary

Emission credits are obtained from the reuse of perlite as a concrete filler, at the end of the life of the building.

At the manufacturing phase heat energy is recovered and used as local heating. It is assumed to be a substitute for thermal energy from natural gas. Much of the packaging is made from mono-materials which can be recycled and credited here.

Cut-off criteria:

All input and output flows in a unit process were considered i.e., taking into account the value of all flows in the unit process and the corresponding LCI where data was available. Data gaps were filled by conservative assumptions with average or generic data. Any assumptions in such case were documented. The use of cut-off criterion on mass inputs and primary energy at the unit process level (1%) and at the information module level (5%).

LCA: Scenarios and additional technical information

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

Raw materials: perlite mining and siloxane (A1)

Some data was provided from the Turkish perlite mines. This was inserted into the Ecoinvent dataset on perlite quarry operation.

Materials	Source	Data quality	Year	Geography
Diesel, mix at filling station	Sphera	Database	2018	EU28
Electricity, high voltage production mix	Ecoinvent 3.8	Database	2018	TR
Lubricants at refinery	Sphera	Database	2018	EU28
Market for mine infrastructure, vermiculite	Ecoinvent 3.8	Database	2011	GLO
Perlite quarry operation	Ecoinvent 3.8	Database	2000 with updates	DE
Polydimethylsiloxane, market for	Ecoinvent 3.8	Database	2015	GLO
Tap water from ground water	Sphera	Database	2020	EU28
Thermal energy from heavy fuel oil	Sphera	Database	2018	GR

The mine infrastructure dataset is old, but there was no other data available. Analysis was completed to show its impact on the total environmental impact was negligible (maximum of 0.28%) for all of the main impact indicators.

Transport from production place to assembly/user (A4)

Type	Capacity utilisation %	Type of vehicle	Distance km	Fuel/Energy consumption
Truck	28%	Truck trailer with 27t payload	250	0.0167 kg/tkm

This distance is estimated based on knowledge of consumer locations. Perlite once expanded is a very low density at 85 kg/m³, so one truck can carry only 7.65 tonnes, which is unusually low.

Fuel type	Source	Data quality	Year
EU 28: Diesel mix (6,35% bio-content)	Sphera	Database	2017

Assembly (A5)

	Unit	Value /m ³
Electricity consumption	kWh	0.018
Material loss	%	1

Perlite can either be installed manually (no energy required) or by blow machine. The same amount of waste is assumed for each.

Use Stage(B)

B1-B7: Perlite is stable and inert. Therefore there are no environmental impacts expected in the use phase and no harmful substances are released to air, water or ground during the use of the product.

End of Life (C1, C3, C4)

Norlite Perlite 0515 SC, 0530 SC and 0560 SC can be re-used, either as insulation, showing the same parameters as new product, or be used in concrete as light weight filler. The method to remove Norlite Perlite 0515 SC, 0530 SC and 0560 SC documented in this EPD is to gather the material in big bags through suction. This requires the same amount of energy and same type of equipment as to install the perlite by blowing it in place. Therefore the values of C1 are the same as A5. Other methods to gather Norlite Perlite 0515 SC, 0530 SC and 0560 SC can be used, but these are not documented in this EPD.

Nordisk Perlite we work for circular economic products. This criteria Norlite Perlite 0515 SC, 0530 SC and 0560 SC can fulfill by reuse or use as light weight filler in concrete. Therefore disposal is only considered for waste during construction phase (ie dust and spillage).

Transport to waste processing (C2)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption
Truck	61%	Truck trailer	100	0.0167 kg/tkm

Transportation distance to waste processing facility is assumed to be 100km

Benefits and loads beyond the system boundaries (D)

Norlite Perlite 0515 SC, 0530 SC and 0560 SC can be reused, fulfilling the circular economic criteria of using the product as intended when producing the virgin product, we have a cradle-to-cradle application.

Norlite Perlite 0515 SC, 0530 SC and 0560 SC can be used as light weight filler in concrete. A known problem in the concrete industry is the need for light and good quality aggregates. As it might not be possible to reuse Norlite Perlite 0515 SC, 0530 SC and 0560 SC as insulation in all cases, we have documented this solution. Concrete cubes were made according to DS/EN 206-9 NA: 5 cubes per formulation of Concrete 35. In the table below, the average results are presented. Weight reduction can be achieved, but the strength of the concrete should be observed. Larger amounts of Norlite Perlite 05 15 SC, 05 30 SC and 05 60 SC can be added to concrete, but this was not tested at the time. In the test 0.1 and 0.25 % of sand were replaced by Norlite Perlite 05 60 SC on a 1:1 weight basis. Type 05 60 SC was used as this is the mostly used insulation type.

Sample	Compressive Strength (kN)	Compressive Strength (MPa)	Weight Cube (kg)	Density (kg/m ³)
Concrete 35 reference	772	34.31	7.22	2139
Concrete 35 + 0,1 % Norlite Perlite 05 60 SC	628	27.91	7.20	2131
Concrete 35 + 0,25 % Norlite Perlite 05 60 SC	568	25.24	6.96	2062

As noted in section A3, waste heat is used as district heating for which there is credit. Recycled and incinerated packaging materials also gain credits here.

Per m ³ perlite	Unit	Value
Waste heat that substitutes natural gas in a district heating plan	kWh	41.5
Perlite replacing concrete	kg	85
Electricity from incinerating waste perlite	kWh	-0.67
Thermal energy from incinerating waste perlite	kWh	-0.17
Recycled polypropylene produced	kg	0.84
Electricity from packaging disposal	kWh	0.58
Thermal energy from packaging disposal	kWh	1.00
Recycled HDPE produced	kg	0.19

Additional technical information

Nordisk Perlite is a supplier of perlite products for many different applications; from filtration to horticulture to insulation. The products are all based on expanded perlite. The insulation products have an indefinite service life and require no maintenance during use. Norlite Perlite 0515 SC, 0530 SC and 0560 SC can be reused either for new insulating jobs or as light weight aggregate in concrete.

LCA: Results

System boundaries (X=included)

Product stage			Assembly stage		Use stage							End of life stage				Benefits & loads beyond system boundary
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	X	X	X	X	X	X	X	X	X	X	X	X

Core environmental impact indicators

Indicator	Unit	A1-A3	A4	A5	B	C1	C2	C3	C4	D
GWP-total	kg CO2 eq.	2.09E+01	2.38E+00	2.48E-01	0	4.75E-03	5.12E-01	6.03E-01	0	-7.86E+00
GWP-fossil	kg CO2 eq.	2.08E+01	2.37E+00	2.44E-01	0	4.73E-03	5.10E-01	5.76E-01	0	-7.85E+00
GWP-biogenic	kg CO2 eq.	1.81E-02	-3.25E-03	4.26E-03	0	2.22E-05	-7.00E-04	2.59E-02	0	-6.90E-03
GWP-LULUC	kg CO2 eq.	1.19E-02	1.31E-02	9.05E-05	0	1.68E-06	2.83E-03	1.14E-03	0	-5.79E-03
ODP	kg CFC11 eq.	1.48E-04	1.41E-13	7.18E-10	0	8.25E-14	3.04E-14	5.33E-09	0	-1.21E-11
AP	mol H ⁺ eq.	2.35E-01	5.03E-03	4.63E-04	0	7.50E-06	9.51E-04	2.31E-03	0	-1.47E-02
EP-freshwater	kg P eq.	1.28E-03	7.02E-06	1.23E-06	0	2.69E-08	1.51E-06	1.15E-06	0	-5.81E-06
EP-marine	kg N eq.	5.79E-02	2.16E-03	1.63E-04	0	2.54E-06	3.96E-04	9.30E-04	0	-4.86E-03
EP-terrestrial	mol N eq.	6.33E-01	2.44E-02	1.65E-03	0	2.48E-05	4.50E-03	1.02E-02	0	-5.33E-02
POCP	kg NMVOC eq.	1.64E-01	4.54E-03	4.06E-04	0	6.06E-06	8.52E-04	2.54E-03	0	-1.37E-02
ADP-M&M	kg Sb eq.	1.59E-05	1.97E-07	1.14E-07	0	2.51E-09	4.24E-08	2.89E-07	0	-3.41E-07
ADP-fossil	MJ	3.04E+02	3.14E+01	2.92E+00	0	5.67E-02	6.77E+00	9.47E+00	0	-4.50E+01
WDP	m ³	2.92E+00	2.11E-02	5.82E-02	0	3.98E-04	4.55E-03	3.74E-01	0	-5.74E-01

GWP-total: Global Warming Potential; **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; See "additional Norwegian requirements" for indicator given as PO4 eq. **EP-marine:** Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **EP-terrestrial:** Eutrophication potential, Accumulated Exceedance; **POCP:** Formation potential of tropospheric ozone; **ADP-M&M:** Abiotic depletion potential for non-fossil resources (minerals and metals); **ADP-fossil:** Abiotic

depletion potential for fossil resources; **WDP**: Water deprivation potential, deprivation weighted water consumption

Additional environmental impact indicators

Indicator	Unit	A1-A3	A4	A5	B	C1	C2	C3	C4	D
PM	Disease incidence	3.51E-06	2.69E-08	4.38E-09	0	6.76E-11	5.32E-09	3.33E-08	0	-1.91E-07
IRP	kBq U235 eq.	2.79E-01	5.68E-03	2.40E-02	0	5.24E-04	1.23E-03	8.17E-02	0	-4.02E-01
ETP-fw	CTUe	6.09E+02	2.18E+01	3.62E+00	0	1.93E-02	4.70E+00	2.45E+01	0	-2.28E+01
HTP-c	CTUh	5.02E-09	4.40E-10	9.63E-11	0	1.92E-12	9.48E-11	1.55E-10	0	-1.01E-09
HTP-nc	CTUh	1.34E-07	2.41E-08	3.06E-09	0	4.23E-11	5.16E-09	1.20E-08	0	-1.03E-07
SAP	Dimensionless	-3.01E+01	1.08E+01	3.76E+00	0	8.26E-02	2.33E+00	2.04E+00	0	-9.92E+00

PM: Particulate matter emissions; **IRP**: Ionising radiation, human health; **ETP-fw**: Ecotoxicity (freshwater); **ETP-c**: Human toxicity, cancer effects; **HTP-nc**: Human toxicity, non-cancer effects; **SQP**: Land use related impacts / soil quality

Classification of disclaimers to the declaration of core and additional environmental impact indicators

ILCD classification	Indicator	Disclaimer
ILCD type / level 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
	Potential incidence of disease due to PM emissions (PM)	None
ILCD type / level 2	Acidification potential, Accumulated Exceedance (AP)	None
	Eutrophication potential, Fraction of nutrients reaching freshwater end compartment (EP-freshwater)	None
	Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine)	None
	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	None
	Formation potential of tropospheric ozone (POCP)	None
	Potential Human exposure efficiency relative to U235 (IRP)	1
ILCD type / level 3	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	2
	Abiotic depletion potential for fossil resources (ADP-fossil)	2
	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	2
	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	2
	Potential Comparative Toxic Unit for humans (HTP-c)	2
	Potential Comparative Toxic Unit for humans (HTP-nc)	2
	Potential Soil quality index (SQP)	2
Disclaimer 1 – 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.		
Disclaimer 2 – 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		

Resource use

Indicator	Unit	A1-A3	A4	A5	B	C1	C2	C3	C4	D
RPEE	MJ	3.31E+01	1.79E+00	5.42E+00	0	1.20E-01	3.85E-01	1.82E+00	0	-9.05E+00
RPEM	MJ	2.85E+00	0.00E+00	0.00E+00	0	0.00E+00	0.00E+00	0.00E+00	0	0.00E+00
TPE	MJ	3.31E+01	1.79E+00	5.42E+00	0	1.20E-01	3.85E-01	1.82E+00	0	-9.05E+00
NRPE	MJ	3.04E+02	3.15E+01	2.92E+00	0	5.67E-02	6.79E+00	9.48E+00	0	-4.51E+01
NRPM	MJ	4.48E+01	0.00E+00	0.00E+00	0	0.00E+00	0.00E+00	0.00E+00	0	0.00E+00
TRPE	MJ	3.04E+02	3.15E+01	2.92E+00	0	5.67E-02	6.79E+00	9.48E+00	0	-4.51E+01
SM	kg	0.00E+00	0.00E+00	0.00E+00	0	0.00E+00	0.00E+00	0.00E+00	0	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0	0.00E+00	0.00E+00	0.00E+00	0	3.74E-02
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0	0.00E+00	0.00E+00	0.00E+00	0	1.46E-01
W	m ³	7.59E-02	2.02E-03	2.82E-03	0	4.15E-05	4.35E-04	9.57E-03	0	-1.77E-02

RPEE Renewable primary energy resources used as energy carrier; RPEM Renewable primary energy resources used as raw materials; TPE Total use of renewable primary energy resources; NRPE Non-renewable primary energy resources used as energy carrier; NRPM Non-renewable primary energy resources used as materials; TRPE 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; W Use of net fresh water

End of life - Waste

Indicator	Unit	A1-A3	A4	A5	B	C1	C2	C3	C4	D
HW	kg	1.31E-08	1.51E-10	6.37E-10	0	1.37E-11	3.25E-11	3.89E-10	0	-1.51E-09
NHW	kg	1.28E-01	4.51E-03	5.28E-01	0	1.92E-04	9.73E-04	3.30E+00	0	-2.56E+00
RW	kg	1.15E-03	3.88E-05	2.26E-04	0	4.72E-06	8.36E-06	5.65E-04	0	-2.38E-03

HW Hazardous waste disposed; NHW Non-hazardous waste disposed; RW Radioactive waste disposed

End of life – output flow

Indicator	Unit	A1-A3	A4	A5	B	C1	C2	C3	C4	D
CR	kg	0.00E+00	0.00E+00	1.53E-01	0	0.00E+00	0.00E+00	0.00E+00	0	0.00E+00
MR	kg	3.44E-03	0.00E+00	1.09E+00	0	0.00E+00	0.00E+00	0.00E+00	0	8.50E+01
MER	kg	0.00E+00	0.00E+00	3.76E-01	0	0.00E+00	0.00E+00	2.55E-03	0	0.00E+00
EEE	MJ	-1.54E-01	0.00E+00	-1.87E-01	0	0.00E+00	0.00E+00	1.40E+00	0	0.00E+00
ETE	MJ	-1.51E+02	0.00E+00	-4.81E-02	0	0.00E+00	0.00E+00	3.59E-01	0	0.00E+00

CR Components for reuse; MR Materials for recycling; MER Materials for energy recovery; EEE Exported electric energy; ETE Exported thermal energy

Reading example: 9,0 E-03 = 9,0*10⁻³ = 0,009

Information describing the biogenic carbon content at the factory gate

Biogenic carbon content	Unit	Value
Biogenic carbon content in product	kg C	0
Biogenic carbon content in the accompanying packaging	kg C	0.0048

44/12 is the ratio between the molecular mass of CO₂ and C molecules

Additional Norwegian requirements

Greenhouse gas emission 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).

National electricity grid	Unit	Value
Denmark (residual fuel mix, Carbon Footprint, 2022)	kg CO ₂ -eq/kWh	0.428

Additional environmental impact indicators required in NPCR Part A for construction products

In order to increase the transparency of biogenic carbon contribution to climate impact, the indicator for GWP has been sub-divided into the following:

GWP-IOBC Climate impacts calculated according to the principle of instantaneous oxidation
GWP-BC Climate impacts from the net uptake and emission of biogenic carbon from each module.

In addition, EP-freshwater shall also be declared as PO₄ eq.

Indicator	Unit	A1	A2	A3	A1-A3
EP-freshwater*	kg PO ₄ eq.	9.13E-03	1.63E-02	1.10E-03	2.65E-02
GWP-IOBC	kg CO ₂ eq.	5.59E+00	5.62E+00	9.62E+00	2.08E+01
GWP-BC	kg CO ₂ eq.	6.22E-02	4.81E-03	-4.89E-02	1.81E-02
GWP	kg CO ₂ eq.	5.66E+00	5.63E+00	9.57E+00	2.09E+01

EP-freshwater* Eutrophication potential, fraction of nutrients reaching freshwater end compartment. Declared as PO₄ eq. **GWP-IOBC** Global warming potential calculated according to the principle of instantaneous oxidation. **GWP-BC** Global warming potential from net uptake and emissions of biogenic carbon from the materials in each module. **GWP** Global warming potential

Hazardous substances

The declaration is based upon reference to threshold values and/or test results and/or material safety data sheets provided to EPD verifiers. Documentation available upon request to EPD owner.

- ✓ The product contains no substances given by the REACH Candidate list or the Norwegian priority list.
- The product contains substances given by the REACH Candidate list or the Norwegian priority list that are less than 0,1 % by weight.
- The product contain dangerous substances, more then 0,1% by weight, given by the REACH Candidate List or the Norwegian Priority list, see table.
- The product contains no substances given by the REACH Candidate list or the Norwegian priority list. The product is classified as hazardous waste (Avfallsforskriften, Annex III), see table.

Indoor environment

The product meets the requirements for low emissions.

Carbon footprint

Carbon footprint has not been worked out for the product.

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