epd-norge
Global program operatør

Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

Ecophon Saga (Grey)

The Norwegian EPD Foundation

Owner of the declaration:
Saint-Gobain Ecophon AB

Product:
Ecophon Saga (Grey)

Declared unit:
1 tonne

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

Program operator:
The Norwegian EPD Foundation

Declaration number:

NEPD-6690-5941-EN

Registration number:

NEPD-6690-5941-EN

Issue date: 23.05.2024

Valid to: 23.05.2029

EPD Software:
LCA.no EPD generator ID: 73531

General information

Product

Ecophon Saga (Grey)

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-6690-5941-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

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 tonne

Declared unit with option:

A1-A3,A4,A5,B1,B2,B3,B4,B5,C1,C2,C3,C4,D

Functional unit:

Verification:

Methodology and background data for the life cycle analysis have been verified by: Elisabet Amat, GREENZIE projects Additional requirements for the environmental declaration have been verified by:

Third party verifier:

Alexander Borg

Alexander Borg, Asplan Viak AS

(Independent verifier approved by EPD-Norway)

Owner of the declaration:

Saint-Gobain Ecophon AB
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Manufacturer:

Saint-Gobain Ecophon AB

Place of production:

Fabriksgatan 2
573 74 Ydre, Sweden

Management system:

Organisation no:

556142-5165

Issue date: 23.05.2024

Valid to: 23.05.2029

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.

The EPD has been worked out by:

Developer of EPD: Vegard Ruttenborg - NIRAS Norge AS

Approved:

Håkon Hauan

Håkon Hauan, CEO EPD-Norge

Product

Product description:

Ecophon Saga (Grey) is used in constructions such as complete exterior wall systems, interior/exterior cladding, joists, roofs, interior/ exterior ceilings and as internal sound absorbers.

For more information about the different Semullit wood wool cement products, please visit: www.ecophon.com

Product specification

Cement Grey products are manufactured with Portland limestone cement.

To calculate results from tonnes to m2 with a preferred thickness:
kg CO2-eq per m2 = (Density x Thickness) / (kg CO2-eq per ton x 1000)

Materials	Value	Unit
Spruce, dry weight	306,08	kg
Portland limestone cement	461,05	kg
Lime	62,87	kg
Water	170	kg
Plastic packaging	0,24	kg
Wood packaging	24,22	kg
Steel packaging	0,13	kg
Cardboard packaging	0,33	kg

Technical data:

Available in thicknesses of 25, 50, 70, 100 and 150mm. For wall systems: 400mm and 600mm.
The density is 400 kg/m3.

The product is produced according to NS 3919 - Classification of fire resistance and reaction to fire.

Market:

Global. The end-of-life scenarios are representative in a nordic context.

Reference service life, product

The reference service life of the product is equal to the building reference service life.

Reference service life, building or construction works

The reference service life of the building is 60 years.

LCA: Calculation rules

Declared unit:

1 tonne

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:

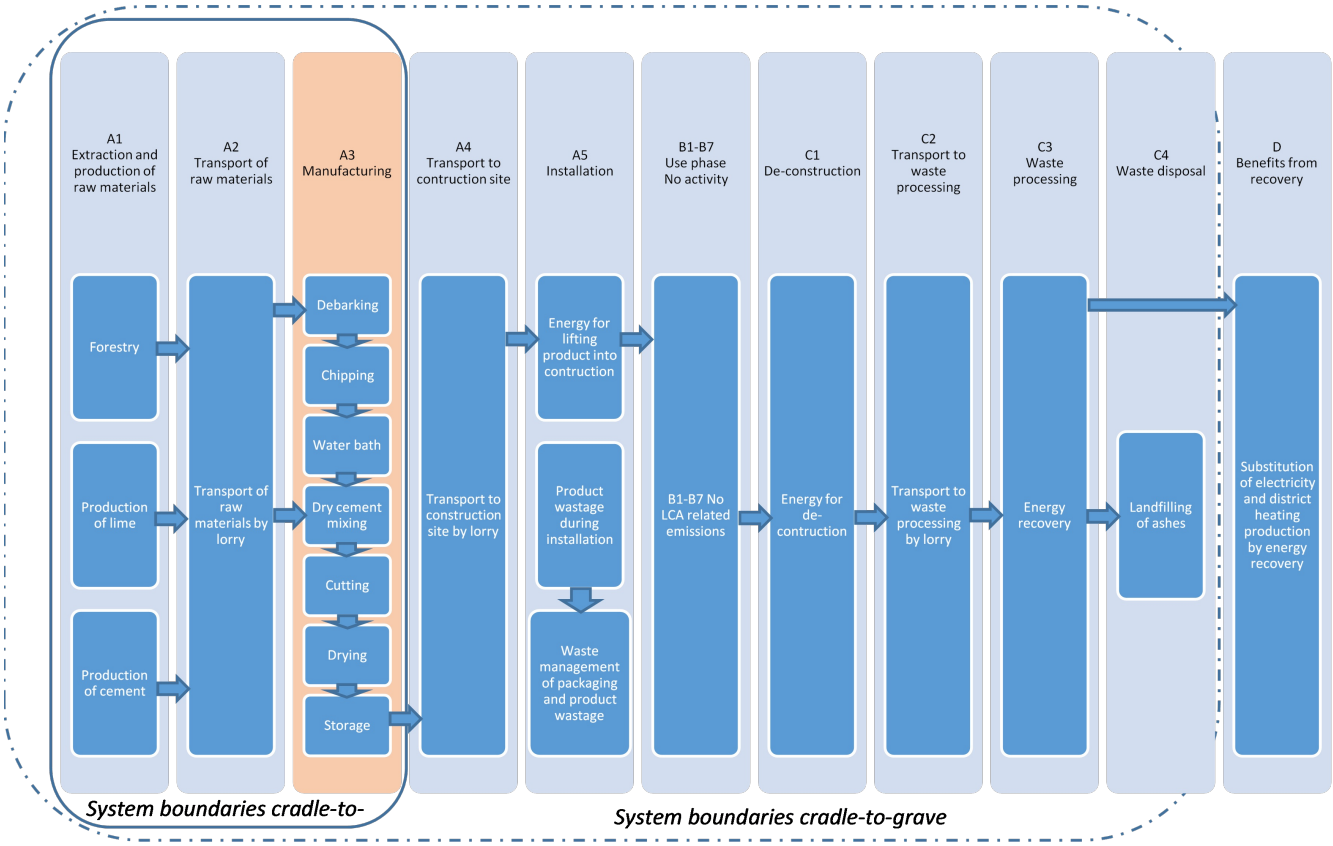
Specific data for the product composition are provided by the manufacturer. The data represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on EPDs according to EN 15804 and different LCA databases. The data quality of the raw materials in A1 is presented in the table below.
The data collection is representative for the year of 2022.

Materials	Source	Data quality	Year
Additives	ecoinvent 3.6	Database	2019
Packaging - Cardboard	ecoinvent 3.6	Database	2019
Packaging - Plastic	ecoinvent 3.6	Database	2019
Packaging - Steel straps	ecoinvent 3.6	Database	2019
Water	ecoinvent 3.6	Database	2019
Packaging - Wood	Modified ecoinvent 3.6	Database	2019
Cement	PD-HCG-20210274-CBA1-EN	EPD	2022
Tømmer	Treteknisk	Specific	2021

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	X	X	X	X	X	MNR	MNR	X	X	X	X	X

System boundary:



Additional technical information:

LCA: Scenarios and additional technical information

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

A4-A5 Transport and installation:
It is assumed an average transport distance from manufacturing and to a warehouse in Norway or Sweden on a large lorry, and then to a building site on a medium size lorry. The assembly at building site includes 5 % product wastage, energy for lifting and waste management of packaging and wastage.

B1-B5 Use phase:
The product requires normally no maintenance, repair or replacement throughout its lifetime.

C1-C4 End-of-life
The transport of waste wood-wool cement boards is based on an average distance for wood waste in Norway in 2007 and is 85 km. The waste processing is assumed to be incineration with energy recovery. Ash from incineration is disposed of in a landfill.

D Beyond the system boundary
The benefits of energy production from incineration is assumed to substitute Norwegian district heating mix and electricity mix.

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 (km) - Europe	36,7 %	50	0,043	l/tkm	2,15
Truck, over 32 tonnes, EURO 6 (kgkm) - RER	53,3 %	350	0,023	l/tkm	8,05

Assembly (A5)	Unit	Value			
Material loss and waste treatment of material loss (psc)	Units/DU	0,05			
Waste, packaging, folding boxboard, to average treatment (kg)	kg	0,33			
Waste, packaging, metal, average treatment (kg)	kg	0,13			
Waste, packaging, pallet, EUR wooden pallet, reusable, average treatment (kg)	kg	24,22			
Waste, packaging, plastic film (LDPE), to average treatment (kg)	kg	0,24			

De-construction demolition (C1)	Unit	Value			
Electricity, Norway (kWh)	kWh/DU	0,56			

Transport to waste processing (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, unspecified (km) - Europe	48,7 %	85	0,051	l/tkm	4,34

Waste processing (C3)	Unit	Value			
Waste treatment per kg cement-fibre slab, dismantled, incineration with fly ash extraction (kg)	kg/DU	1000,00			

Disposal (C4)	Unit	Value			
Landfilling of ashes from incineration of Cement-fibre slab, dismanteled, process per kg ashes and residues (kg)	kg	429,75			

Benefits and loads beyond the system boundaries (D)	Unit	Value			
Substitution of electricity, in Norway (MJ)	MJ	252,48			
Substitution of Packaging, steel straps (kg)	kg	0,13			
Substitution of polyethylene, LDPE, granulate (kg)	kg	0,12			
Substitution of pulpwood (kg)	kg	0,31			
Substitution of thermal energy, district heating, in Norway (MJ)	MJ	3819,85			

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	B1	B2	B3
	GWP-total	kg CO_2 -eq	-2,02E+02	3,87E+01	6,01E+01	0	0	0
	GWP-fossil	kg CO_2 -eq	3,93E+02	3,87E+01	2,27E+01	0	0	0
	GWP-biogenic	kg CO_2 -eq	-5,97E+02	1,64E-02	3,73E+01	0	0	0
	GWP-luluc	kg CO_2 -eq	8,69E-01	1,22E-02	4,44E-02	0	0	0
	ODP	kg CFC11 -eq	1,77E-05	9,20E-06	1,58E-06	0	0	0
	AP	mol H+ -eq	1,16E+00	1,22E-01	7,08E-02	0	0	0
	EP-FreshWater	kg P -eq	2,15E-02	3,08E-04	1,10E-03	0	0	0
	EP-Marine	kg N -eq	2,28E-01	2,61E-02	1,51E-02	0	0	0
	EP-Terrestial	mol N -eq	4,69E+00	2,92E-01	2,75E-01	0	0	0
	POCP	kg NMVOC -eq	9,37E-01	1,14E-01	6,01E-02	0	0	0
	ADP-minerals&metals[1]	kg Sb -eq	2,58E-03	7,69E-04	1,89E-04	0	0	0
	ADP-fossil[1]	MJ	1,77E+03	6,19E+02	1,36E+02	0	0	0
	WDP[1]	m^3	6,02E+04	4,99E+02	3,07E+03	0	0	0

Indicator		Unit	B4	B5	C1	C2	C3	C4	D
	GWP-total	kg CO_2 -eq	0	0	1,36E-02	1,12E+01	5,67E+02	4,74E+00	-2,37E+01
	GWP-fossil	kg CO_2 -eq	0	0	1,32E-02	1,12E+01	5,80E+00	4,74E+00	-2,29E+01
	GWP-biogenic	kg CO_2 -eq	0	0	3,65E-04	4,80E-03	5,61E+02	3,57E-03	-5,73E-02
	GWP-luluc	kg CO_2 -eq	0	0	5,45E-05	3,96E-03	1,38E-03	1,44E-03	-7,64E-01
	ODP	kg CFC11 -eq	0	0	9,06E-10	2,55E-06	4,25E-07	1,48E-06	-1,61E+00
	AP	mol H+ -eq	0	0	1,03E-04	6,37E-02	2,76E-02	3,37E-02	-1,86E-01
	EP-FreshWater	kg P -eq	0	0	9,50E-07	9,21E-05	1,49E-04	4,70E-05	-2,01E-03
	EP-Marine	kg N -eq	0	0	1,13E-05	2,28E-02	1,03E-02	1,20E-02	-6,03E-02
	EP-Terrestial	mol N -eq	0	0	1,48E-04	2,51E-01	1,02E-01	1,33E-01	-6,52E-01
	POCP	kg NMVOC -eq	0	0	3,97E-05	7,18E-02	3,24E-02	3,83E-02	-1,81E-01
	ADP-minerals&metals[1]	kg Sb -eq	0	0	9,85E-07	2,90E-04	3,20E-05	8,26E-05	-2,35E-04
	ADP-fossil[1]	MJ	0	0	1,80E-01	1,72E+02	4,46E+01	1,09E+02	-3,32E+02
	WDP[1]	m^3	0	0	3,14E+01	1,63E+02	1,79E+02	2,11E+02	-3,99E+03

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

Sequestration and emissions of biogenic carbon is calculated according to EN16485:2014. This approach is based on the modularity principle in EN15804:2019 that states that all environmental aspects and impacts are declared in the life cycle module where they appear. The calculation of biogenic carbon content and conversion to carbon dioxide is done according to NS-EN 16449:2014. The timber originates from sustainable forestry according to the EU Timber Regulation (EUTR).

Additional environmental impact indicators

Indicator		Unit	A1-A3	A4	A5	B1	B2	B3
	PM	Disease incidence	1,66E-05	3,30E-06	1,17E-06	0	0	0
	IRP[2]	kgBq U235 -eq	1,78E+04	2,70E+00	8,92E+02	0	0	0
	ETP-fw[1]	CTUe	6,31E+03	4,54E+02	3,57E+02	0	0	0
	HTP-c[1]	CTUh	4,92E-07	0,00E+00	2,60E-08	0	0	0
	HTP-nc[1]	CTUh	1,01E-05	4,50E-07	5,76E-07	0	0	0
	SQP[1]	dimensionless	6,69E+04	6,54E+02	3,40E+03	0	0	0

Indicator		Unit	B4	B5	C1	C2	C3	C4	D
	PM	Disease incidence	0	0	7,40E-10	1,02E-06	1,71E-06	6,18E-07	-1,11E-05
	IRP[2]	kgBq U235 -eq	0	0	3,27E-03	7,51E-01	1,33E-01	4,39E-01	-2,06E+00
	ETP-fw[1]	CTUe	0	0	8,21E-01	1,28E+02	1,67E+02	6,38E+01	-1,75E+03
	HTP-c[1]	CTUh	0	0	3,90E-11	0,00E+00	2,40E-08	2,15E-09	-3,47E-08
	HTP-nc[1]	CTUh	0	0	9,23E-10	1,70E-07	7,05E-07	5,97E-08	-1,67E-06
	SQP[1]	dimensionless	0	0	9,08E-02	1,47E+02	1,08E+01	2,37E+02	-2,17E+03

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	B1	B2	B3
	PERE	MJ	5,84E+03	8,00E+00	2,93E+02	0	0	0
	PERM	MJ	6,59E+03	0,00E+00	-1,57E+01	0	0	0
	PERT	MJ	1,24E+04	8,00E+00	2,77E+02	0	0	0
	PENRE	MJ	1,76E+03	6,19E+02	1,36E+02	0	0	0
	PENRM	MJ	1,02E+01	0,00E+00	-9,68E+00	0	0	0
	PENRT	MJ	1,77E+03	6,19E+02	1,26E+02	0	0	0
	SM	kg	4,53E+00	0,00E+00	2,26E-01	0	0	0
	RSF	MJ	1,46E+02	2,81E-01	7,31E+00	0	0	0
	NRSF	MJ	3,07E+02	9,56E-01	1,55E+01	0	0	0
	FW	m^3	2,05E+00	6,96E-02	1,19E-01	0	0	0

Indicator		Unit	B4	B5	C1	C2	C3	C4	D
	PERE	MJ	0	0	2,33E+00	2,46E+00	2,44E+00	2,00E+00	-1,97E+03
	PERM	MJ	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	PERT	MJ	0	0	2,33E+00	2,46E+00	2,44E+00	2,00E+00	-1,97E+03
	PENRE	MJ	0	0	1,81E-01	1,72E+02	4,46E+01	1,09E+02	-3,27E+02
	PENRM	MJ	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-5,20E+00
	PENRT	MJ	0	0	1,81E-01	1,72E+02	4,46E+01	1,09E+02	-3,32E+02
	SM	kg	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-3,49E-02
	RSF	MJ	0	0	1,83E-03	8,77E-02	4,74E-02	5,32E-02	-3,85E-01
	NRSF	MJ	0	0	4,57E-03	3,08E-01	-1,76E+00	3,64E+00	-1,16E+02
	FW	m^3	0	0	1,74E-02	1,94E-02	1,12E-01	9,85E-02	-2,36E+00

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	B1	B2	B3
	HWD	kg	7,52E-01	3,35E-02	2,15E+01	0	0	0
	NHWD	kg	3,10E+01	4,90E+01	6,63E+00	0	0	0
	RWD	kg	5,59E-03	4,22E-03	5,83E-04	0	0	0

Indicator		Unit	B4	B5	C1	C2	C3	C4	D
	HWD	kg	0	0	1,16E-04	9,26E-03	0,00E+00	4,29E+02	-1,93E-02
	NHWD	kg	0	0	1,39E-02	1,06E+01	0,00E+00	3,76E+00	-7,67E+00
	RWD	kg	0	0	1,61E-06	1,17E-03	0,00E+00	6,74E-04	-1,69E-03

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	B1	B2	B3
	CRU	kg	0,00E+00	0,00E+00	2,30E+01	0	0	0
	MFR	kg	4,28E-02	0,00E+00	5,62E-01	0	0	0
	MER	kg	8,07E-08	0,00E+00	5,12E+01	0	0	0
	EEE	MJ	5,45E-03	0,00E+00	1,34E+01	0	0	0
	EET	MJ	8,25E-02	0,00E+00	2,03E+02	0	0	0

Indicator		Unit	B4	B5	C1	C2	C3	C4	D
	CRU	kg	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MFR	kg	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MER	kg	0	0	0,00E+00	0,00E+00	1,00E+03	0,00E+00	0,00E+00
	EEE	MJ	0	0	0,00E+00	0,00E+00	2,52E+02	0,00E+00	0,00E+00
	EET	MJ	0	0	0,00E+00	0,00E+00	3,81E+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	1,53E+02
Biogenic carbon content in accompanying packaging	kg C	1,02E+01

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

Guarantees of origin are applied to all consumption of electricity in module A3 production (250,7 kWh). The emission factor is presented in the table below. The emissions from consumption of electricity in module A3 production for GWP (Total) are 18,16 kg CO2eq. To calculate the emission factor for location based electricity consumption, the emission factor is 0,0549 kg CO2e/kWh. This corresponds to 13,77 kg CO2eq in module A3 production. All values are given per declared unit.
The provided documentation is missing a validity period and a registration number and therefore updated documentation has to be provided for the EPD to be valid. In addition, the results in the EPD has to be checked to be within +/- 10% if there are changes to the electricity mix in the utilized GoO. The deadline for updating the documentation and a check of the results is set 01.12.2024.

Electricity mix	Data source	Amount	Unit
Electricity, renewable with guarantee of origin, low voltage, Sweden, 2022 (kWh)	Database	79,15	g CO2-eq/kWh

Dangerous substances

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

Indoor environment

The product has been tested according to the "Emissions classification of building materials" by The building Information Foundation RTS and has been approved belonging to emission class M1 for building materials. The classification is valid until 19.03.2025 (LCA report Träullit AB).

Additional Environmental Information

Additional environmental impact indicators required in NPCR Part A for construction products								
Indicator	**Unit**	A1-A3	A4	A5	B1	B2	B3	
GWPIOBC	kg CO_2 -eq	3,96E+02	3,87E+01	2,29E+01	0	0	0	

Indicator	**Unit**	B4	B5	C1	C2	C3	C4	D
GWPIOBC	kg CO_2 -eq	0	0	1,36E-02	1,12E+01	5,97E+00	4,74E+00	-2,34E+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.

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