epd-norge
Global program operatør

Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

Smart Retur Plastic pallet 1200x800 NORWAY in Smart Retur system

SmartRetur

The Norwegian EPD Foundation

Owner of the declaration:
Smart Retur

Product:
Smart Retur Plastic pallet 1200x800 NORWAY in Smart Retur system

Declared unit:
1 loop

This declaration is based on Product Category Rules:
CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 023:2021 Packaging products and services

Program operator:
The Norwegian EPD Foundation

Declaration number:
NEPD-6134-5397-EN

Registration number:
NEPD-6134-5397-EN

Issue date: 20.02.2024

Valid to: 20.02.2029

EPD software:
LCAno EPD generator ID: 62131

General information

Product

Smart Retur Plastic pallet 1200x800 NORWAY in Smart Retur system

Owner of the declaration:

Smart Retur
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Program operator:

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The Norwegian EPD Foundation
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Manufacturer:

Smart Retur

Declaration number:

NEPD-6134-5397-EN

Place of production:

Smart Retur
Fugleåsen 10
1405 Langhus, Norway

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 023:2021 Packaging products and services

Management system:

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:

918 605 541

Declared unit:

1 loop Smart Retur Plastic pallet 1200x800 NORWAY in Smart Retur system

Issue date: 20.02.2024

Valid to: 20.02.2029

Declared unit with option:

A1-A3,A4,B1,B2,C1,C2,C3,C4,D

Year of study:

2023

Comparability:

EPD of construction products may not be comparable if they do not comply with EN 15804 and seen in a life cycle contest

Functional unit:

Kg/unit/loops
One produced unit of packaging per loop

100 loops per pallet is estimated

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.

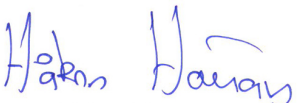
Developer of EPD: Stine Alvestad

Reviewer of company-specific input data and EPD: Tom Romanich

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

Approved:



Håkon Hauan
Managing Director of EPD-Norway

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:

Gaylord K. Booto, Norwegian Institute for Air Research (NILU)

(no signature required)

Product

Product description:

The Smart Retur plastic pallet is the main standard of transporting a load unit, and is compatible with the EUR pallet of wood. Its properties allows efficient handling, storage and increased cleanliness when being used.
It is a type of packaging product, which is used in logistics for transporting products of various kinds between product manufacturers, retailers and consumers, as well as for warehouse storage and other operations.
The pallet consist of High density polyethylen plastic and two recycable galvanized steelbeams. 4 RFID tags enables the pallet to be trackable for customers
This EPD documents one loop of usage of the Smart Retur plastic pallet in order to represent a circular flow with a high degree of reusage.

Product specification

Being a part of a circular flow, the physical plastic pallet is measured as a loop/full round through the market. The product is hence both the physical plastic pallet and the circular ECO system that handles the pallet.
Starting as a new produced pallet, it is introduced to the market. The pallet is shipped a number of times between different parties in the market. When the pallet is located at an end point in the market, when there is a surplus in the market or there is a need for maintenance of the pallet, it is sent to its ECO system hub for sorting, storage and/or repair. An average of 20 % is sent for inspection at the hub, while only 1 % is repaired. The pallet is then sent back into the marked for a new loop, until it no longer can be utilized as a funcional pallet - it will then be recycled

Materials	kg	%
Metal - Steel	0,02	11,77
Pigments and Fillers	0,00	1,01
Plast	0,12	77,22
Polypropylene (PP)	0,02	10,00
Total	0,16	

Technical data:

1200x800x150 mm (LxWxH) per declared unit.
Weight: 14,9 kg.
Strength: 5000 Kg static, 3000 kg dynamic, 1000 kg in rack

Materials: High density-polyethylen (HDPE)
Integrated anti skid material (HDPE)
Reinforcements: Two recyclable galvanized steel beams
Recycled raw material of HDPE can be included.
Temperatures: -40 °C to +70 °C
Recyclable: Yes

Market:

The Smart Retur plastic pallet can be used in all types of markets, where products are shipped on 1200x800 mm format pallets/carriers.

The product included in this EPD is considered representative for a Norwegian scenario. Average values has been applied regarding transport. Documented values has been applied for life cycle length and maintenance intervals based on the Norwegian food retail market

Reference service life, product

An assumption of 100 trips over a period of 15 years is applied. It is assumed that only 1 % needs to be repaired per loop.
These assumptions is based on documented historical values in a similar market.

Reference service life, number of loops for reusable packaging

LCA: Calculation rules

Declared unit:

1 loop Smart Retur Plastic pallet 1200x800 NORWAY in Smart Retur system

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:

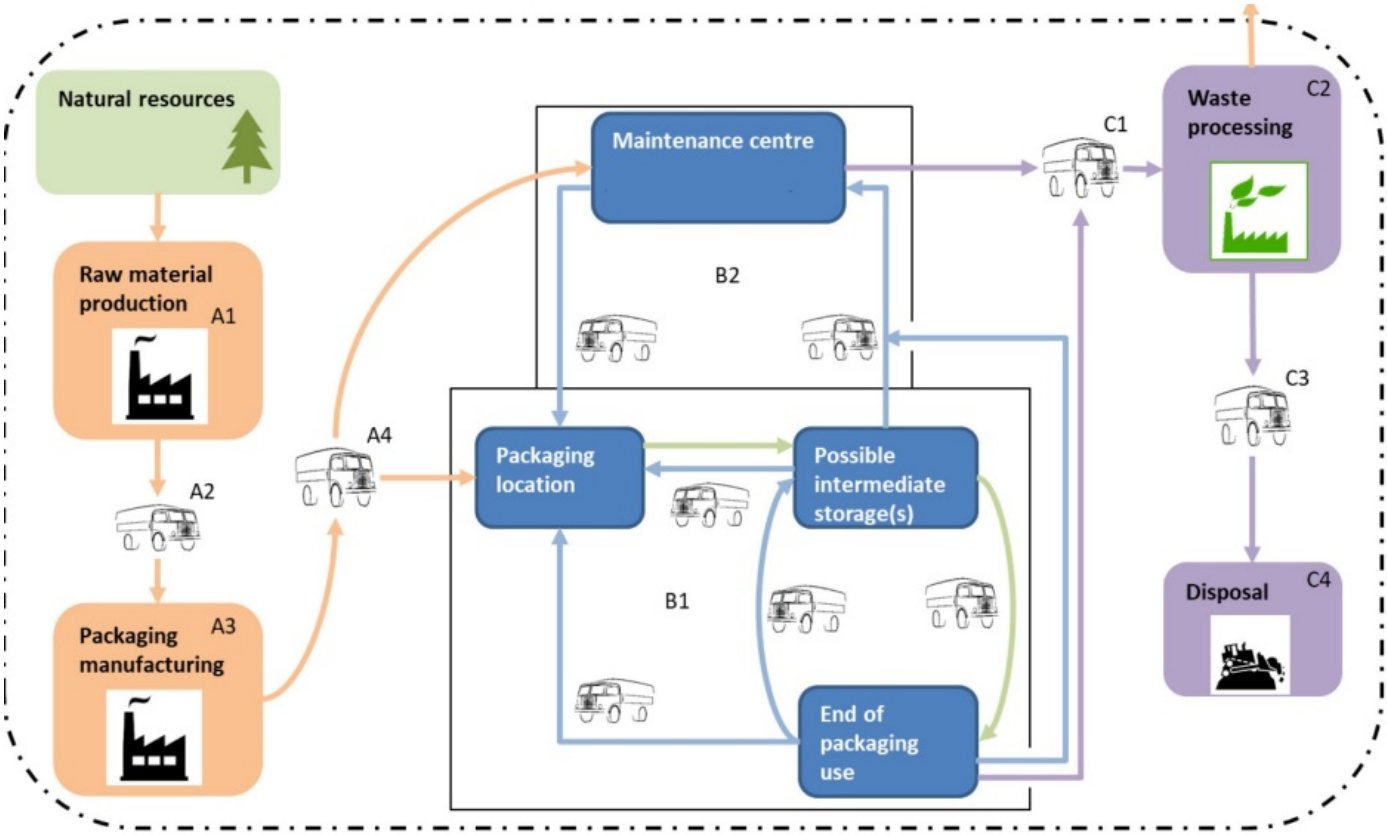
Specific data for the product composition are provided by the manufacturer. The data represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on EPDs according to EN 15804 and different LCA databases. The data quality of the raw materials in A1 is presented in the table below.
Data is overall considered of good quality. The A1 til A4 are data from the producer itself. For the user stage, the data are collected from existing system from NLP (Norsk Lastebærer Pool).

Materials	Source	Data quality	Year
Metal - Steel	ecoinvent 3.6	Database	2019
Pigments and Fillers	ecoinvent 3.6	Database	2019
Plast	ecoinvent 3.6	Database	2019
Polypropylene (PP)	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	MND	X	X	MND	MND	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)
Skip oversjøisk transport	65,0 %	6265	0,003	l/tkm	18,80
Skip, 10 000 DWT	50,0 %	1027	0,010	l/tkm	10,27
Train USA	42,0 %	1000	0,051	kWh/tkm	51,00
Truck, over 32 tonnes, EURO 6 (kgkm) - RER	53,3 %	47	0,023	l/tkm	1,08

Use (B1)	Unit	Value			
Truck, over 32 tonnes, EURO 6 (kgkm) - RER	kgkm/DU	150,00			

Maintenance (B2)	Unit	Value			
alkyl sulphate (C12-14) , industrial detergent (kg) - GLO	kg/DU	0,00			
District heating, Norway (kWh)	kWh/DU	0,10			
Electricity, Norway (kWh)	kWh/DU	0,10			
Packaging, plastic film (LDPE) (kg)	kg/DU	0,00			
Polydimethylsiloxane, defoaming agent (kg) - GLO	kg/DU	0,00			
Polyethylene, HDPE granulate (kg) - RER	kg/DU	0,00			
Train, Norway (kgkm)	kgkm/DU	42,00			
Truck, over 32 tonnes, EURO 6 (kgkm) - RER	kgkm/DU	32,60			
Water, tap water (kg) - Europe without Switzerland	kg/DU	0,55			

Transport to waste processing (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, over 32 tonnes, EURO 6 (kgkm) - RER	53,3 %	587	0,023	l/tkm	13,50

Waste processing (C3)	Unit	Value			
Steel to recycling (kg)	kg	0,02			
Waste treatment per kg Plastic waste, Material recycling - C3 (kg) - RER	kg	0,09			
Waste treatment per kg Plastic, Mixture, municipal incineration with fly ash extraction (kg)	kg	0,05			

Disposal (C4)	Unit	Value			
Landfilling of ashes from incineration of Plastics, Mixture, municipal incineration with fly ash extraction, process per kg ashes and residues - C4 (kg)	kg	0,00			
Waste, scrap steel, to landfill (kg)	kg	0,00			

Benefits and loads beyond the system boundaries (D)	Unit	Value			
Substitution of electricity, in Norway (MJ)	MJ	0,08			
Substitution of Polyethylene, HDPE granulate (kg) - RER	kg	0,09			
Substitution of primary steel with net scrap (kg)	kg	0,01			
Substitution of thermal energy, district heating, in Norway (MJ)	MJ	1,22			

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	B1	B2	C1	C2	C3	C4	D
	GWP-total	kg CO_2 -eq	4,78E-01	1,99E-02	1,96E-01	6,44E-02	0	7,67E-03	1,50E-01	1,32E-05	-1,95E-01
	GWP-fossil	kg CO_2 -eq	4,77E-01	1,99E-02	1,96E-01	6,24E-02	0	7,67E-03	1,50E-01	1,32E-05	-1,94E-01
	GWP-biogenic	kg CO_2 -eq	7,42E-04	3,17E-05	8,39E-05	1,46E-03	0	3,28E-06	2,70E-06	9,43E-09	-9,16E-04
	GWP-luluc	kg CO_2 -eq	1,88E-04	2,64E-05	5,97E-05	5,76E-04	0	2,34E-06	1,94E-05	2,29E-09	-3,03E-04
	ODP	kg CFC11 -eq	1,71E-08	3,40E-09	4,73E-08	3,38E-08	0	1,85E-09	2,47E-09	4,00E-12	-5,15E-04
	AP	mol H+ -eq	2,04E-03	4,66E-04	6,31E-04	2,86E-04	0	2,47E-05	1,19E-04	9,43E-08	-7,50E-04
	EP-FreshWater	kg P -eq	1,78E-05	3,86E-07	1,56E-06	1,41E-06	0	6,10E-08	9,14E-07	1,31E-10	-4,48E-06
	EP-Marine	kg N -eq	3,85E-04	1,11E-04	1,38E-04	7,65E-05	0	5,41E-06	3,59E-05	3,42E-08	-1,40E-04
	EP-Terrestial	mol N -eq	4,31E-03	1,23E-03	1,54E-03	7,50E-04	0	6,03E-05	3,92E-04	3,79E-07	-1,54E-03
	POCP	kg NMVOC -eq	1,67E-03	3,23E-04	6,05E-04	2,56E-04	0	2,37E-05	1,15E-04	1,08E-07	-7,06E-04
	ADP-minerals&metals[1]	kg Sb-eq	4,30E-06	1,44E-07	3,49E-06	1,33E-06	0	1,37E-07	8,61E-08	9,30E-11	-1,87E-06
	ADP-fossil[1]	MJ	1,22E+01	2,60E-01	3,18E+00	9,54E-01	0	1,25E-01	3,27E-01	2,97E-04	-6,29E+00
	WDP[1]	m^3	2,60E+00	2,38E-01	2,44E+00	8,42E+00	0	9,55E-02	1,29E-01	1,06E-03	-6,86E+00

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	B1	B2	C1	C2	C3	C4	D
	PM	Disease incidence	1,78E-08	5,10E-10	1,80E-08	5,93E-09	0	7,04E-10	1,40E-09	2,00E-12	-9,90E-09
	IRP[2]	kgBq U235 -eq	1,62E-02	1,24E-03	1,39E-02	4,38E-03	0	5,44E-04	8,41E-04	1,32E-06	-4,63E-03
	ETP-fw[1]	CTUe	7,34E+00	2,14E-01	2,33E+00	1,21E+00	0	9,11E-02	4,64E-01	2,16E-04	-2,35E+00
	HTP-c[1]	CTUh	5,06E-10	0,00E+00	0,00E+00	1,30E-11	0	0,00E+00	3,30E-11	0,00E+00	-1,30E-10
	HTP-nc[1]	CTUh	5,03E-09	1,57E-10	2,25E-09	1,52E-09	0	8,80E-11	7,14E-10	0,00E+00	2,70E-11
	SQP[1]	dimensionless	8,73E-01	9,75E-02	3,65E+00	1,35E+00	0	1,43E-01	2,45E-01	1,06E-03	-8,77E-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**	A1-A3	A4	B1	B2	C1	C2	C3	C4	D
	PERE	MJ	3,02E-01	1,12E-02	4,00E-02	8,30E-01	0	1,57E-03	1,56E-02	6,78E-06	-7,37E-01
	PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	PERT	MJ	3,02E-01	1,12E-02	4,00E-02	8,30E-01	0	1,57E-03	1,56E-02	6,78E-06	-7,37E-01
	PENRE	MJ	6,44E+00	2,60E-01	3,18E+00	9,46E-01	0	1,25E-01	3,27E-01	2,97E-04	-2,92E+00
	PENRM	MJ	5,76E+00	0,00E+00	0,00E+00	1,06E-02	0	0,00E+00	0,00E+00	0,00E+00	-3,63E+00
	PENRT	MJ	1,22E+01	2,60E-01	3,18E+00	1,08E+00	0	1,25E-01	3,27E-01	2,97E-04	-6,55E+00
	SM	kg	6,41E-04	0,00E+00	0,00E+00	8,27E-07	0	0,00E+00	0,00E+00	0,00E+00	-3,74E-04
	RSF	MJ	6,21E-03	1,72E-04	1,40E-03	1,01E-03	0	5,48E-05	2,04E-05	1,51E-07	-5,60E-03
	NRSF	MJ	4,14E-02	8,90E-04	4,69E-03	1,23E-02	0	1,84E-04	0,00E+00	6,83E-06	-2,17E-02
	FW	m^3	4,13E-03	6,35E-05	3,62E-04	5,68E-03	0	1,42E-05	2,90E-04	3,43E-07	-2,86E-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	B1	B2	C1	C2	C3	C4	D
	HWD	kg	1,67E-03	4,21E-05	1,74E-04	1,20E-04	0	6,82E-06	2,58E-07	4,87E-05	-2,01E-04
	NHWD	kg	4,33E-02	2,58E-03	2,77E-01	6,94E-02	0	1,08E-02	1,87E-02	1,91E-03	-1,41E-02
	RWD	kg	1,17E-05	1,63E-06	2,17E-05	5,85E-06	0	8,51E-07	1,10E-06	2,42E-10	-4,09E-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	B1	B2	C1	C2	C3	C4	D
	CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MFR	kg	3,81E-04	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	9,52E-02	0,00E+00	-6,00E-05
	MER	kg	1,49E-05	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	5,68E-02	0,00E+00	-2,26E-04
	EEE	MJ	2,15E-04	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	9,05E-02	0,00E+00	-3,32E-04
	EET	MJ	3,26E-03	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	1,24E+00	0,00E+00	-5,02E-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

Biogenic Carbon Content

Indicator	Unit	At the factory gate
Biogenic carbon content in product	kg C	0,00E+00
Biogenic carbon content in accompanying packaging	kg C	0,00E+00

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO2

Additional requirements

Greenhouse gas emissions from the use of electricity in the manufacturing phase

National production mix from import, low voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3).

Electricity mix	Data source	Amount	Unit
Electricity, USA (kWh)	ecoinvent 3.6	593,81	g CO2-eq/kWh

Dangerous substances

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

Indoor environment

Additional Environmental Information

Additional environmental impact indicators required in NPCR Part A for construction products										
Indicator	**Unit**	A1-A3	A4	B1	B2	C1	C2	C3	C4	D
GWPIOBC	kg CO_2 -eq	5,27E-01	1,99E-02	1,96E-01	6,30E-02	0	7,67E-03	1,50E-01	1,64E-04	-1,93E-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.

Bibliography

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ISO 21930:2017 Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products.
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NPCR 023Part B for Packaging products and services, Ver. 1.1, 20.12.2021, EPD Norway.

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