

Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

Royal-impregnated timber



Owner of the declaration:

Talgø MøreTre AS

Product:

Royal-impregnated timber

Declared unit:

1 m³

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core

PCR

NPCR 015:2021 Part B for wood and wood-based products for use in construction

Program operator:

The Norwegian EPD Foundation

Declaration number:

NEPD-6979-6377-EN

Registration number:

NEPD-6979-6377-EN

Issue date: 28.06.2024

Valid to: 28.06.2029

EPD software:

LCAno EPD generator ID: 313926

The Norwegian EPD Foundation

General information

Product

Royal-impregnated timber

Program operator:

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

Declaration number:

NEPD-6979-6377-EN

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 015:2021 Part B for wood and wood-based products for use in
construction

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 m3 Royal-impregnated timber

Declared unit with option:

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

Functional unit:

General information on verification of EPD from EPD tools:

Independent verification of data, other environmental information
and the declaration according to ISO 14025:2010, § 8.1.3 and § 8.1.4.
Verification of each EPD is made according to EPD-Norway's
guidelines for verification and approval requiring that tools are i)
integrated into the company's environmental management system, ii)
the procedures for use of the EPD tool are approved by EPD-Norway,
and iii) the process is reviewed annually by an independent third
party verifier. See Appendix G of EPD-Norway's General Programme
Instructions for further information on EPD tools

Verification of EPD tool:

Independent third party verification of the EPD tool, background
data and test-EPD in accordance with EPDNorway's procedures and
guidelines for verification and approval of EPD tools.

Third party verifier:

Method and background data for life cycle assessment are verified by
Alexander Borg, Asplan Viak AS

Further requirements for EPDs are verified by
Ellen Soldal, Sweco
(Independent verifier approved by EPD-Norway)

Owner of the declaration:

Talgø MøreTre AS
Contact person: Bjørnar Brøske
Phone: +47 71 65 80 00
e-mail: Kundeservice.moreroyal@talgo.no

Manufacturer:

Talgø MøreTre AS

Place of production:

Talgø MøreTre AS
Industriveien 7
6652 Surnadal, Norway

Management system:

Organisation no:

978706843

Issue date:

28.06.2024

Valid to:

28.06.2029

Year of study:

2023

Comparability:

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

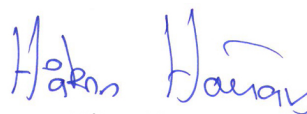
Development and verification of EPD:

The declaration is created using EPD tool lca.tools ver EPD2022.03,
developed by LCA.no. The EPD tool is integrated in the company's
management system, and has been approved by EPD Norway.

Developer of EPD: Martina Vårdal - Norsk Treteknisk Institutt

Reviewer of company-specific input data and EPD: Vegard Ruttenborg
- NIRAS Norge AS

Approved:



Håkon Hauan
Managing Director of EPD-Norway

Product

Product description:

MøreRoyal is for outdoor use as terrace boards, cladding and roof boards. Oil sealing reduces absorption of moisture, swelling, shrinking and splitting.

Product specification

MøreRoyal is a specially treated pine timber that has been initially pressure-impregnated with a copper-based impregnating agent, which ensures good and effective protection against rot. The timber is then boiled for 10-12 hours in oil under vacuum (with or without pigment), which reduces moisture absorption, swelling, shrinking and splitting. MøreRoyal is therefore very suitable for outdoor terrace boards, cladding and roof boards.

Materials	kg	%
Impregneringsmiddel	4,65	0,88
Royalolje	16,47	3,11
Trevirke, tørr masse	435,00	82,06
Vann, i trevirke	74,00	13,96
Total	530,12	100,00

Packaging	kg	%
Stålemballasje	0,57	13,97
Treemballasje	3,51	86,03
Total incl. packaging	534,20	100,00

Technical data:

The declared unit consists of timber with a dry weight of 435 kg/m³. At 17% timber humidity, it has a density of 509 kg/m³. Cladding is produced according to SN/TS 3186, construction timber according to NS-EN 14081 and terrace boards according to SN/TS 3188. Talgø Møretre AS is a member of NIK 'Norsk Impregneringskontroll' (Norwegian impregnation control).

Market:

Europe.

Reference service life, product

Reference lifetime for Royal-impregnated timber cladding is at least 60 years, depending on climatic conditions and external effects. When used as terrace boards the lifetime is set to 30 years.

Reference service life, building or construction works

LCA: Calculation rules

Declared unit:

1 m³ Royal-impregnated timber

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. In forestry, economic allocation between sawn timber and solid wood is used. At sawmills, energy, water, waste, materials and internal transport are divided into sub-processes and then allocated according to income between the main and secondary products. Environmental impact and resource consumption for the primary production of recycled materials is allocated to the original product system.

NB: Economic allocation is used in production processes throughout the value chain that are considered joint co-processes according to EN 15804. Different interpretations of the regulations have led to different methodologies in Europe. This life cycle assessment follows "school 2" as described by EPD-Norway (2024). Changes to the results may occur upon final harmonization of the regulations.

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.

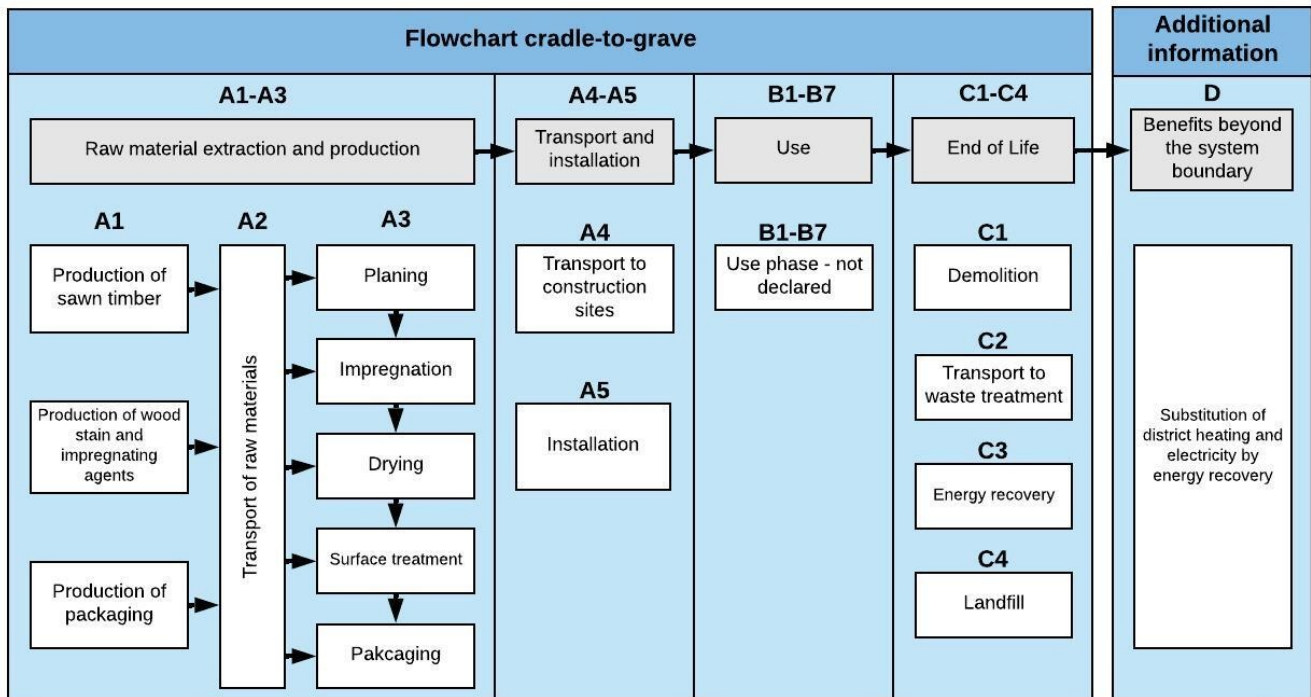
Production data is collected in 2023 with a reference year of 2022.

Materials	Source	Data quality	Year
Impregneringsmiddel	Supplier	Specific	2017
Royalolje	Supplier	Specific	2021
Stålemballasje	ecoinvent 3.6	Database	2019
Treemballasje	Modified ecoinvent 3.7.1	Database	2020
Trevirke, tørr masse	Treteknisk	LCI	2022
Vann, i trevirke	LCA.no	Database	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	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

System boundary:



Additional technical information:

Certifications and environmental information that is relevant for the declared product is:
 PEFC ST 2002:2020, PEFC ST 2001:2020, DNVSE-PEFC-COC-264
 FSC-STD-40-004, DNV-COC-002472, DNV-CW-002472

LCA: Scenarios and additional technical information

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

[A4] It is assumed that the length of transport to retailers/warehouses is 451 km on a large-sized truck and the transport distance to consumers is 30 km with a medium-sized truck.

[A5] 5% wastage of the product and 1 MJ of energy use is presumed per cubic meter timber for the installation of the product. Waste management of product packaging and loss is included.

[B] There are no LCA-related environmental impacts in the use phase.

[C1] For disassembly, 1 MJ energy use is assumed per cubic meter timber.














[C2] The transport of wood waste is based on an average distance for 2007 in Norway and was estimated to be 85 km (Raadal et al., 2009).

[C3-D] Energy recovery is assumed for treated timber. It is assumed that energy is recovered from a communal waste management facility and is estimated through replacement of a Norwegian electric-mix and Norwegian district heating mix. Data for electric-mix is the same that is used in A1-A3 and the district heating-mix is based on production for 2022.

Transport from production place to user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Lastebil med henger, EURO 6 (kgkm)	53,3 %	451	0,023	l/tkm	10,37
Lastebil, 16-32 tonn, EURO 5 (kgkm)	36,7 %	30	0,044	l/tkm	1,32
Assembly (A5)		Unit	Value		
Avfallsbehandling metall - A3, A5 (kg)		kg	0,60		
Avfallsbehandling treemballasje, inkl. biogent karbon (kg)		kg	3,69		
Elektrisitet, Norge (MJ)		MJ/DU	1,00		
Materialsvinn produkt, installasjon, inkludert avfallshåndtering (andel)		Units/DU	0,05		
De-construction demolition (C1)		Unit	Value		
Elektrisitet, Norge (MJ)		MJ/DU	1,00		
Transport to waste processing (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Lastebil, uspesifisert kapasitet (kgkm)	48,7 %	85	0,051	l/tkm	4,34
Waste processing (C3)		Unit	Value		
Avfallsbehandling CU-impregneringsmiddel i treverk, 0% vann, forbrenning, Norge - C3 (kg)		kg	4,65		
Avfallsbehandling pigment - Royalolje, forbrenning av farlig avfall, Norge (kg)		kg	0,90		
Avfallsbehandling Royalolje, forbrenning av farlig avfall, Norge - C3 (kg)		kg	15,57		
Avfallsbehandling ubehandlet tre, 0% vann, forbrenning, Norge - C3 (kg)		kg/DU	435,00		
Disposal (C4)		Unit	Value		
Avfallsbehandling CU-impregneringsmiddel i treverk, 0% vann, deponering av aske, Norge - C4 (kg)		kg	4,65		
Avfallsbehandling pigment - Royalolje, deponering av aske, Norge (kg)		kg	0,90		
Avfallsbehandling Royalolje, deponering av aske, Norge - C4 (kg)		kg	15,57		
Avfallsbehandling ubehandlet tre, 0% vann, deponering av aske, Norge - C4 (kg)		kg	435,00		
Benefits and loads beyond the system boundaries (D)		Unit	Value		
Avfallsbehandling CU-impregneringsmiddel i treverk, 0% vann, substitusjon elektrisitet og varme, Norge - D (kg)		kg	4,65		
Avfallsbehandling pigment - Royalolje, substitusjon elektrisitet og varme, Norge (kg)		kg	0,90		
Avfallsbehandling Royalolje, substitusjon av elektrisitet og varme, Norge - D (kg)		kg	15,57		
Avfallsbehandling ubehandlet tre, 0% vann, substitusjon av elektrisitet og varme, Norge - D (kg)		kg	435,00		

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	-7,15E+02	2,36E+01	1,44E+01	6,76E-03	5,96E+00	8,58E+02	3,74E-01	-4,58E+01	
 GWP-fossil	kg CO ₂ -eq	1,08E+02	2,36E+01	8,84E+00	6,55E-03	5,95E+00	3,79E+01	3,73E-01	-4,41E+01	
 GWP-biogenic	kg CO ₂ -eq	-8,25E+02	1,00E-02	5,41E+00	1,81E-04	2,55E-03	8,20E+02	3,08E-04	-1,16E-01	
 GWP-luluc	kg CO ₂ -eq	1,93E+00	7,30E-03	9,71E-02	2,70E-05	2,11E-03	1,88E-03	1,15E-04	-1,27E-01	
 ODP	kg CFC11 -eq	2,06E-05	5,65E-06	1,42E-06	4,49E-10	1,36E-06	4,12E-07	6,11E-08	-5,01E-06	
 AP	mol H+ -eq	1,21E+00	7,82E-02	7,08E-02	5,12E-05	3,39E-02	8,59E-02	1,42E-03	-3,37E-01	
 EP-FreshWater	kg P -eq	1,23E-02	1,87E-04	6,43E-04	4,71E-07	4,90E-05	3,12E-04	6,40E-06	-1,46E-03	
 EP-Marine	kg N -eq	5,58E-01	1,80E-02	3,16E-02	5,63E-06	1,21E-02	4,15E-02	4,28E-04	-1,32E-01	
 EP-Terrestrial	mol N -eq	4,43E+00	2,00E-01	2,62E-01	7,32E-05	1,34E-01	4,44E-01	4,82E-03	-1,50E+00	
 POCP	kg NMVOC -eq	9,66E-01	7,55E-02	5,96E-02	1,97E-05	3,82E-02	1,07E-01	1,33E-03	-3,87E-01	
 ADP-minerals&metals ¹	kg Sb-eq	1,19E-03	4,44E-04	9,14E-05	4,88E-07	1,54E-04	1,78E-05	1,17E-06	-5,01E-04	
 ADP-fossil ¹	MJ	1,84E+03	3,80E+02	1,19E+02	8,94E-02	9,14E+01	4,15E+01	3,71E+00	-6,11E+02	
 WDP ¹	m ³	4,89E+03	2,99E+02	2,80E+02	1,56E+01	8,66E+01	1,94E+00	6,31E-02	-1,30E+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 results for global warming in A1-A3 have a major impact on the uptake of carbon dioxide through photosynthesis during the growth of the wood. This applies both to the wood in the declared product and any wood packaging used. The same amount of carbon dioxide is emitted by waste incineration in C3 and by waste incineration of wood packaging in A5 when wood packaging is part of the product packaging. In the table for resource use and module C3, the indicator for energy as a raw material will be negative and energy used as an energy carrier will be correspondingly positive. This is because the amount of energy in the material is recovered by incineration and then used as an energy carrier instead of a material. All indicators have been assessed in the study, but some are considered to be below the cut-off limits and the value is therefore set to zero.

Additional environmental impact indicators











Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
 PM	Disease incidence	1,74E-05	2,11E-06	1,06E-06	3,67E-10	5,43E-07	1,17E-06	1,73E-08	-2,47E-05
 IRP ²	kgBq U235 -eq	6,85E+00	1,66E+00	4,57E-01	1,62E-03	3,99E-01	1,11E-01	1,68E-02	-3,62E+00
 ETP-fw ¹	CTUe	1,15E+04	2,78E+02	6,00E+02	4,07E-01	6,83E+01	1,31E+02	6,59E+00	-2,92E+03
 HTP-c ¹	CTUh	1,51E-07	0,00E+00	9,22E-09	1,90E-11	0,00E+00	3,16E-08	5,32E-10	-5,77E-08
 HTP-nc ¹	CTUh	3,81E-06	2,72E-07	2,60E-07	4,58E-10	9,04E-08	9,96E-07	1,05E-08	-1,77E-06
 SQP ¹	dimensionless	8,57E+03	4,17E+02	4,59E+02	4,50E-02	7,82E+01	8,87E+01	5,52E+00	-1,04E+04

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	C1	C2	C3	C4	D	
 PERE	MJ	9,22E+03	4,84E+00	9,44E+02	1,16E+00	1,31E+00	8,38E+03	2,17E-01	-3,92E+03	
 PERM	MJ	9,27E+03	0,00E+00	-4,36E+01	0,00E+00	0,00E+00	-8,88E+03	0,00E+00	0,00E+00	
 PERT	MJ	1,85E+04	4,84E+00	9,01E+02	1,16E+00	1,31E+00	-5,01E+02	2,17E-01	-3,92E+03	
 PENRE	MJ	1,47E+03	3,80E+02	1,34E+02	8,95E-02	9,14E+01	7,20E+02	3,71E+00	-6,11E+02	
 PENRM	MJ	3,74E+02	0,00E+00	-1,57E+01	0,00E+00	0,00E+00	-6,87E+02	0,00E+00	0,00E+00	
 PENRT	MJ	1,85E+03	3,80E+02	1,19E+02	8,95E-02	9,14E+01	3,28E+01	3,71E+00	-6,11E+02	
 SM	kg	6,01E-04	0,00E+00	3,01E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	
 RSF	MJ	4,15E-01	1,70E-01	9,77E-01	9,09E-04	4,67E-02	1,89E+01	0,00E+00	-2,62E+03	
 NRSF	MJ	2,13E+00	5,73E-01	7,47E-01	2,27E-03	1,64E-01	1,20E+01	0,00E+00	-1,67E+03	
 FW	m ³	1,45E+01	4,29E-02	7,44E-01	8,65E-03	1,03E-02	1,70E-01	3,91E-03	-1,38E+01	

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	5,69E-01	2,06E-02	3,55E-01	5,74E-05	4,93E-03	5,08E-02	6,46E+00	-3,22E-01	
 NHWD	kg	4,59E+01	3,14E+01	5,00E+00	6,89E-03	5,66E+00	1,58E+00	2,52E+00	-1,66E+01	
 RWD	kg	1,01E-02	2,59E-03	6,79E-04	8,01E-07	6,21E-04	1,25E-04	2,12E-05	-2,53E-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	C1	C2	C3	C4	D	
 CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	
 MFR	kg	1,72E+00	0,00E+00	7,03E-01	0,00E+00	0,00E+00	3,74E-01	0,00E+00	0,00E+00	
 MER	kg	1,33E+00	0,00E+00	3,01E+01	0,00E+00	0,00E+00	5,26E+02	0,00E+00	0,00E+00	
 EEE	MJ	1,13E+00	0,00E+00	7,64E+01	0,00E+00	0,00E+00	1,53E+03	0,00E+00	-6,69E+01	
 EET	MJ	2,12E+01	0,00E+00	2,98E+02	0,00E+00	0,00E+00	5,93E+03	0,00E+00	-4,64E+02	

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	2,18E+02
Biogenic carbon content in accompanying packaging	kg C	1,47E+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	Source	Amount	Unit
Elektrisitet, Norge (kWh)	ecoinvent 3.6	24,33	g CO ₂ -eq/kWh

Dangerous substances

The product contains substances given by the REACH Candidate list that are less than 0,1 % by weight.

Indoor environment

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	1,11E+02	2,36E+01	8,99E+00	6,75E-03	5,96E+00	3,80E+01	3,74E-01	-4,57E+01

GWPI-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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