epd-norge
Global program operatør

# Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

## NorDan Bor External Door with grooved decor (with glass)



The Norwegian EPD Foundation

**Owner of the declaration:**
NorDan AS

**Product:**
NorDan Bor External Door with grooved decor (with glass)

**Declared unit:**
1 pcs

**This declaration is based on Product Category Rules:**
CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 014:2019 Part B for Windows and doors

**Program operator:**
The Norwegian EPD Foundation

**Declaration number:**

**Registration number:**

**Issue date:**

**Valid to:**

**EPD software:**
LCAno EPD generator ID: 188250

## General information

**Product**

NorDan Bor External Door with grooved decor (with glass)

**Owner of the declaration:**

NorDan AS
Contact person: Fredrik Jonsson
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**Program operator:**

Post Box 5250 Majorstuen, 0303 Oslo, Norway
The Norwegian EPD Foundation
Phone: +47 23 08 80 00
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**Manufacturer:**

NorDan AB
Grebbestadsvägen 8
457 91 Tanumshede, Sweden

**Declaration number:**

**Place of production:**

Bor NorDan AB
Kvadervägen
331 74 Bor, Sweden

**This declaration is based on Product Category Rules:**

CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 014:2019 Part B for Windows and doors

**Management system:**

NS-ISO 9001:2015, NS-EN ISO 14001:2015

**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:**

979 776 233

**Declared unit:**

1 pcs NorDan Bor External Door with grooved decor (with glass)

**Issue date:**

**Declared unit with option:**

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

**Valid to:**

**Year of study:**

2020

**Functional unit:**

External door in size 1230x2180 mm (reference based on EN 14351-1). With expected service life of 30 yrs.

**Comparability:**

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

**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

**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: Jonas Jonsson

Reviewer of company-specific input data and EPD: Linda Jonsson

**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)

**Approved:**

Håkon Hauan, CEO EPD-Norge

## Product

### Product description:

External door for use in exterior walls of domestic and commercial buildings.

### Product specification

NorDan Bor external door triple glazed with grooved decor in size 1230x2180 mm is declared in this EPD. This EPD is based on the model 835G Vega and covers several door models. Minor differences in material consumption on the following models 302G, 302G2, 310G, 312G, 843G, 848G, 870G, 871G, 872G, 875G, 892G, 899G, 914G, 922G, 955G, 992G

| Materials | kg | % |
|---|---|---|
| Absorbent - IGU | 0,23 | 0,31 |
| Adhesive and sealant | 0,51 | 0,69 |
| Aluminium | 1,37 | 1,85 |
| Argon gas - IGU | 0,02 | 0,02 |
| Coating materials | 1,27 | 1,72 |
| Gasket | 0,39 | 0,52 |
| Glass | 11,15 | 15,10 |
| Insulation | 1,63 | 2,20 |
| Medium Density Fibreboard | 13,80 | 18,69 |
| Metal | 14,98 | 20,30 |
| Plastic | 0,14 | 0,19 |
| PVC | 1,19 | 1,62 |
| Sealant - IGU | 0,53 | 0,71 |
| Spacer - IGU | 0,27 | 0,37 |
| Wood | 26,35 | 35,70 |
| Total | 73,82 | |

| Packaging | kg | % |
|---|---|---|
| Packaging - Cardboard | 5,15 | 53,73 |
| Packaging - Plastic | 0,17 | 1,78 |
| Packaging - Steel | 0,06 | 0,66 |
| Packaging - Wood | 4,20 | 43,83 |
| Total incl. packaging | 83,40 | |

### Technical data:

External door, 105 mm frame with 69 mm door leaf. U-value 1,10 W/m2K
Tripple glazed 4+14G+4+14G+4
The total weight of the product is 73,82 kg. The packaging has a average weight of 9,58 kg.
Area of functional unit 2,68 m2. Conversion factor is 0,373 for 1 m2.

### Market:

Europe, but scenarios beyond cradle-to-gate are based on the situation in the Norwegian market.

### Reference service life, product

The reference service life is 30 years for external doors.

### Reference service life, building or construction works

60 years

## LCA: Calculation rules

### Declared unit:

1 pcs NorDan Bor External Door with grooved decor (with glass)

### 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. 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. The PCR specific background data follow the allocation rules in the Ecoinvent v3.7.1 Cut-off database version. The allocation of water, energy and waste flows within the production facilities for windows and doors follows unit-based allocation adjusted with a point system to different product groups or products. This score system is regulated by a factor which increases with the resource intensity of each product. The unit-based allocation is adjusted by the weight of the product, excluding the weight of glass.

### Data quality:

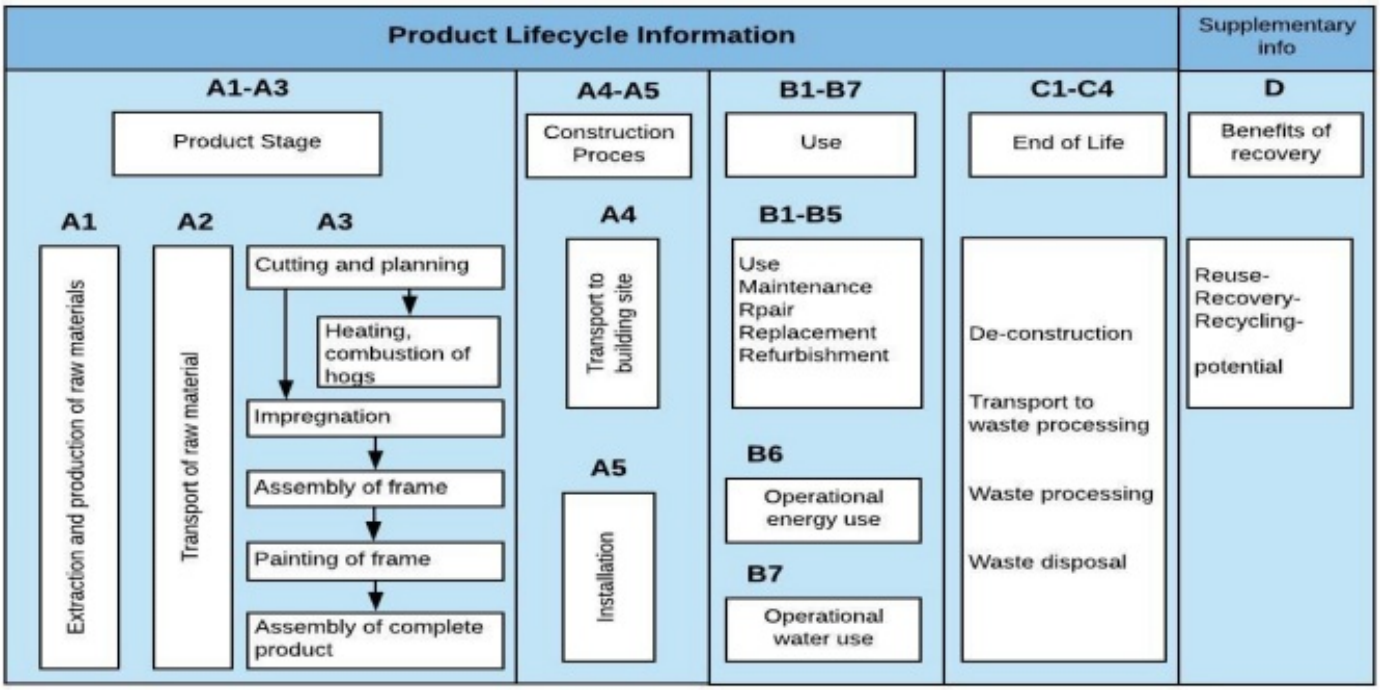
Specific data for the product composition are provided by the manufacturer. The data represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on EPDs according to EN 15804 and different LCA databases. The data quality of the raw materials in A1 is presented in the table below.
Material quantities of the specified product in reference size have been calculated by NorDan's business system.
The production data was collected in 2021 and is an average for 2020.

| Materials | Source | Data quality | Year |
|---|---|---|---|
| Absorbent - IGU | ecoinvent 3.7.1 | Specific | 2020 |
| Adhesive and sealant | ecoinvent 3.7.1 | Specific | 2020 |
| Aluminium | ecoinvent 3.7.1 | Specific | 2020 |
| Argon gas - IGU | ecoinvent 3.7.1 | Database | 2020 |
| Coating materials | ecoinvent 3.7.1 | Specific | 2020 |
| Gasket | ecoinvent 3.7.1 | Specific | 2020 |
| Glass | ecoinvent 3.7.1 | Database | 2020 |
| Insulation | ecoinvent 3.7.1 | Specific | 2020 |
| Medium Density Fibreboard | ecoinvent 3.7.1 | Specific | 2020 |
| Metal | ecoinvent 3.7.1 | Specific | 2020 |
| Packaging - Cardboard | ecoinvent 3.6 | Database | 2019 |
| Packaging - Plastic | ecoinvent 3.6 | Database | 2019 |
| Packaging - Steel | ecoinvent 3.6 | Database | 2019 |
| Packaging - Wood | Modified ecoinvent 3.6 | Database | 2019 |
| Plastic | ecoinvent 3.7.1 | Specific | 2020 |
| PVC | ecoinvent 3.7.1 | Specific | 2020 |
| Sealant - IGU | ecoinvent 3.7.1 | Specific | 2020 |
| Spacer - IGU | ecoinvent 3.7.1 | Specific | 2020 |
| Wood | ecoinvent 3.7.1 | Specific | 2020 |

## 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 | X | MND | X | MND | MND | MND | X | X | X | X | X |

### System boundary:




### Additional technical information:

For the products with different sizes from the declared unit, the environmental impacts must be converted by using a conversion factor. The Norwegian EPD Foundation has published instructions on how to interpret EPDs for windows on its website (www.epdnorge.no) where different calculation methods have been stated. (Document: Bruksanvisninger i hvordan tolke EPD'er - Vinduer).

## LCA: Scenarios and additional technical information

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

A4

The transport from production to construction site is based on a scenario where the product is transported from factory to terminal which is assumed to be 75 km on a medium-sized truck. Transport from terminal to warehouse in Oslo, Norway on a large lorry (439 km). Transport from warehouse to a construction site is assumed to be 50 km on a medium truck.

A5

According to the report from EPD-Norge Harmonising the documentation of scenarios beyond cradle to gate, EN 15804 there is no loss on site during construction activities. The door product in this EPD is painted and surface treated in the production and not at the building site. Therefore, there is only 2 items left in this module. 1) Waste treatment of packaging which is considered in the EPD calculations. 1) Energy use during installation. This can be varied depending on the floor, type of building and several other unknown parameters, and therefore ignored in the calculation.

B2/B3

The maintenance scenario includes cleaning and painting. Cleaning is performed two times per year. It is calculated with 30 ml of detergent and 3 liters of water each year. Doors are assumed to be painted 1 time during its lifetime from inside and 2 times from the outside. It is assumed that 5 gr of lubricating oil is used every year for fittings and moving parts. No repair is assumed during the product lifetime.

B4/B5

* Number or RSL (Reference Service Life). The door has RSL of 30 years and is assumed to have one entire door replacement during the lifetime of the building. It is assumed that this change is occurred after 30 years. There is no need for refurbishment during the product lifetime.

C1

As there are no data for de-construction, it is assumed no activities in C1 in this study. The door is assumed to be treated as mixed waste and sent to incineration. The combustible materials are then energy recovered, while glass is assumed to end up in the bottom ash and then landfilled. The metals are usually sorted out of the bottom ash and then recycled, but there is no data of the share which are recycled and therefore standard values from Ecoinvent is utilized.

C2

The transport of doors as waste is calculated based on a scenario with 50 km distance.

C3

Doors are assumed to be sorted as mixed construction waste and treated with incineration with energy recovery.
BPD (building product declaration) is published on NorDan's public document system, Ndocs.
Name: BPD_NorDan Bor External Door with grooved decor (with glass) . Searchable ID number: 000B7B
URL: https://portal.nordan.no/ndocs/search?category=document_EPD
In the documentation, Chapter 10, the specific material recovery, and energy recovery potential is reported for the product.

C1, C3, C4

The benefits beyond life cycle have been modeled based on the output flows from module C3. This includes energy from incineration and scrap metal recovered from the ashes. The amount recovered metal is assumed to avoid production of primary metals in accordance to 6.4.3.3 in EN 15804. The exported energy is substituting Norwegian district heating mix and electricity mix. Inventory processes causing substitution of avoided virgin raw materials has been constructed for each material.

| 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 (kgkm) - RER | 36,7 % | 125 | 0,043 | l/tkm | 5,38 |
| Truck, over 32 tonnes, EURO 6 (kgkm) - RER | 53,3 % | 439 | 0,023 | l/tkm | 10,10 |

| Assembly (A5) | Unit | Value | | | |
|---|---|---|---|---|---|
| Waste, metal, average treatment (kg) | kg | 0,06 | | | |
| Waste, packaging, folding boxboard, to average treatment (kg) | kg | 5,15 | | | |
| Waste, packaging, pallet, EUR wooden pallet, reusable, average treatment (kg) A5 | kg | 4,20 | | | |
| Waste, packaging, PET straps, 0% recycled, to average treatment (kg) | kg | 0,07 | | | |
| Waste, packaging, plastic film (LDPE), to average treatment (kg) | kg | 0,10 | | | |

| Maintenance (B2) | Unit | Value | | | |
|---|---|---|---|---|---|
| Detergent, Husvask (kg) | kg/DU | 1,84 | | | |
| Lubricating oil (kg) - RER | kg/DU | 0,30 | | | |
| Paint, 40% water, wet mass (kg) | kg/DU | 2,10 | | | |
| Truck, over 32 tonnes, EURO 5 (kgkm) - RER | kgkm/DU | 1272,00 | | | |
| Waste paint, 40% water, wet mass, incineration in Norway (kg) | kg | 2,10 | | | |
| Water, tap water (kg) - Europe without Switzerland | kg/DU | 180,00 | | | |

| Replacement (B4) | Unit | Value | | | |
|---|---|---|---|---|---|
| Replacement (p) | Units/DU | 1,00 | | | |
| Waste treatment of replaced materials (p) | Units | 1,00 | | | |

| Transport to waste processing (C2) | Capacity utilisation (incl. return) % | Distance (km) | Fuel/Energy Consumption | Unit | Value (Liter/tonne) |
|---|---|---|---|---|---|
| Truck, unspecified (kgkm) - RER | 48,7 % | 50 | 0,051 | l/tkm | 2,55 |

| Waste processing (C3) | Unit | Value | | | |
|---|---|---|---|---|---|
| Materials to recycling (kg) | kg | 5,03 | | | |
| Waste treatment per kg Expanded Polystyrene (EPS), incineration (kg) | kg | 1,63 | | | |
| Waste treatment per kg Glass, incineration with fly ash extraction (kg) - CH - C3 | kg | 11,16 | | | |
| Waste treatment per kg Hazardous waste, incineration (kg) | kg | 0,00 | | | |
| Waste treatment per kg municipal solid waste, incineration with fly ash extraction (kg) | kg | 0,00 | | | |
| Waste treatment per kg Paint, hazardous waste incineration (kg) - C3 | kg | 1,38 | | | |
| Waste treatment per kg Plastic, Mixture, municipal incineration with fly ash extraction (kg) | kg | 1,76 | | | |
| Waste treatment per kg Polyurethane (PU), incineration (kg) | kg | 2,66 | | | |
| Waste treatment per kg Rubber, municipal incineration with fly ash extraction (kg) | kg | 0,39 | | | |
| Waste treatment per kg Scrap aluminium, incineration with fly ash extraction (kg) - CH - C3 | kg | 2,37 | | | |
| Waste treatment per kg Scrap steel, incineration with fly ash extraction (kg) - CH - C3 | kg | 14,10 | | | |
| Waste treatment per kg Wood, from incineration (kg) | kg | 43,00 | | | |

| Disposal (C4) | Unit | Value | | | |
|---|---|---|---|---|---|
| Landfilling of ashes from incineration of expanded polystyrene (EPS), process per kg ashes and residues - C4 (kg) | kg | 0,06 | | | |
| Landfilling of ashes from incineration of Glass, process of ashes and residues (kg) - CH - C4 | kg | 11,16 | | | |
| Landfilling of ashes from incineration of Hazardous waste, from incineration (kg) | kg | 0,00 | | | |
| Landfilling of ashes from incineration of Municipal solid waste, process per kg ashes and residues (kg) | kg | 0,00 | | | |
| Landfilling of ashes from incineration of Plastics, Mixture, municipal incineration with fly ash extraction, process per kg ashes and residues (kg) | kg | 0,06 | | | |
| Landfilling of ashes from incineration of Polyurethane (PU), process per kg ashes and residues - C4 (kg) | kg | 0,10 | | | |
| Landfilling of ashes from incineration of Rubber, process per kg ashes and residues - C4 (kg) | kg | 0,02 | | | |
| Landfilling of ashes from incineration of Scrap aluminium, process of ashes and residues (kg) - CH - C4 | kg | 2,12 | | | |
| Landfilling of ashes from incineration of Scrap steel, process of ashes and residues (kg) - CH - C4 | kg | 9,31 | | | |
| Landfilling of ashes from incineration of Wood, process per kg ashes and residues - C4 (kg) | kg | 0,49 | | | |
| Landfilling of ashes from incineration per kg Paint, hazardous waste incineration (kg) | kg | 0,04 | | | |

| Benefits and loads beyond the system boundaries (D) | Unit | Value | | | |
|---|---|---|---|---|---|
| Substitution of electricity, in Norway (MJ) | MJ | 39,50 | | | |
| Substitution of primary aluminium with net scrap (kg) | kg | 0,11 | | | |
| Substitution of primary steel with net scrap (kg) | kg | 0,57 | | | |
| Substitution of thermal energy, district heating, in Norway (MJ) | MJ | 597,55 | | | |

## 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 | B2 | B4 | C1 | C2 | C3 | C4 | D |
| | GWP-total | kg $CO_2$ -eq | 8,33E+01 | 4,90E+00 | 1,51E+01 | 1,21E+01 | 1,03E+02 | 0 | 5,49E-01 | 8,82E+01 | 2,90E-01 | -5,18E+00 |
| | GWP-fossil | kg $CO_2$ -eq | 1,61E+02 | 4,89E+00 | 1,03E-01 | 1,06E+01 | 1,66E+02 | 0 | 5,49E-01 | 2,28E+01 | 2,90E-01 | -5,04E+00 |
| | GWP-biogenic | kg $CO_2$ -eq | -7,83E+01 | 2,07E-03 | 1,50E+01 | 2,76E-02 | -6,33E+01 | 0 | 2,36E-04 | 6,53E+01 | 2,09E-04 | -1,18E-02 |
| | GWP-luluc | kg $CO_2$ -eq | 1,03E+00 | 1,58E-03 | 3,03E-05 | 1,53E+00 | 1,03E+00 | 0 | 1,94E-04 | 6,09E-04 | 8,17E-05 | -1,38E-01 |
| | ODP | kg CFC11 -eq | 1,88E-05 | 1,15E-06 | 1,95E-08 | 9,14E-07 | 1,99E-05 | 0 | 1,25E-07 | 3,77E-07 | 8,18E-08 | -2,52E-01 |
| | AP | mol H+ -eq | 1,08E+00 | 1,52E-02 | 4,60E-04 | 9,04E-02 | 1,09E+00 | 0 | 3,13E-03 | 1,93E-02 | 1,91E-03 | -3,80E-02 |
| | EP-FreshWater | kg P -eq | 7,78E-03 | 3,90E-05 | 7,86E-07 | 5,16E-04 | 7,82E-03 | 0 | 4,52E-06 | 2,35E-05 | 3,03E-06 | -3,83E-04 |
| | EP-Marine | kg N -eq | 2,34E-01 | 3,22E-03 | 1,66E-04 | 1,18E-02 | 2,38E-01 | 0 | 1,12E-03 | 8,51E-03 | 6,75E-04 | -1,08E-02 |
| | EP-Terrestial | mol N -eq | 2,61E+00 | 3,59E-02 | 1,69E-03 | 8,30E-02 | 2,64E+00 | 0 | 1,23E-02 | 8,73E-02 | 7,48E-03 | -1,16E-01 |
| | POCP | kg NMVOC -eq | 8,08E-01 | 1,40E-02 | 4,83E-04 | 3,88E-02 | 8,23E-01 | 0 | 3,52E-03 | 2,21E-02 | 2,15E-03 | -3,40E-02 |
| | ADP-minerals&metals[1] | kg Sb-eq | 4,96E-03 | 1,04E-04 | 2,21E-06 | 1,04E-04 | 5,07E-03 | 0 | 1,42E-05 | 8,81E-06 | 4,55E-06 | -4,38E-05 |
| | ADP-fossil[1] | MJ | 2,91E+03 | 7,75E+01 | 1,30E+00 | 1,44E+02 | 2,99E+03 | 0 | 8,42E+00 | 2,62E+01 | 6,09E+00 | -6,68E+01 |
| | WDP[1] | $m^3$ | 6,89E+04 | 6,46E+01 | 1,79E+00 | 5,00E+01 | 6,90E+04 | 0 | 7,98E+00 | 1,03E+02 | 1,51E+01 | -1,13E+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

Global warming potential in A1-A3 includes sequestration of carbon in the wood. This amount is accounted as an emission in module C3. Additionally, it is included sequestration in the wood packaging. This is accounted as an emission in module A5.

## Additional environmental impact indicators

| Indicator | | Unit | A1-A3 | A4 | A5 | B2 | B4 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PM | Disease incidence | 2,06E-05 | 3,97E-07 | 6,74E-09 | 4,53E-07 | 2,10E-05 | 0 | 5,00E-08 | 2,37E-07 | 3,42E-08 | -1,85E-06 |
| | IRP[2] | kgBq U235 -eq | 2,92E+01 | 3,39E-01 | 5,54E-03 | 3,65E-01 | 2,96E+01 | 0 | 3,68E-02 | 9,95E-02 | 2,47E-02 | -3,66E-01 |
| | ETP-fw[1] | CTUe | 6,52E+03 | 5,70E+01 | 1,69E+00 | 2,07E+02 | 6,58E+03 | 0 | 6,30E+00 | 7,63E+01 | 4,04E+00 | -3,19E+02 |
| | HTP-c[1] | CTUh | 8,71E-07 | 0,00E+00 | 5,60E-11 | 1,70E-08 | 8,71E-07 | 0 | 0,00E+00 | 1,30E-08 | 1,53E-10 | -1,03E-08 |
| | HTP-nc[1] | CTUh | 4,61E-06 | 5,75E-08 | 2,42E-09 | 1,73E-07 | 4,67E-06 | 0 | 8,34E-09 | 1,38E-07 | 4,44E-09 | -2,21E-07 |
| | SQP[1] | dimensionless | 1,33E+04 | 7,74E+01 | 9,26E-01 | 1,25E+02 | 1,34E+04 | 0 | 7,21E+00 | 1,02E+01 | 1,37E+01 | -3,32E+02 |

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 | B2 | B4 | C1 | C2 | C3 | C4 | D |
| | PERE | MJ | 1,50E+03 | 1,02E+00 | 2,21E-02 | 2,26E+01 | 1,50E+03 | 0 | 1,21E-01 | 4,15E+00 | 1,27E-01 | -3,11E+02 |
| | PERM | MJ | 8,81E+02 | 0,00E+00 | -1,99E+02 | 0,00E+00 | 6,82E+02 | 0 | 0,00E+00 | -6,82E+02 | 0,00E+00 | 0,00E+00 |
| | PERT | MJ | 2,38E+03 | 1,02E+00 | -1,99E+02 | 2,26E+01 | 2,18E+03 | 0 | 1,21E-01 | -6,78E+02 | 1,27E-01 | -3,11E+02 |
| | PENRE | MJ | 2,63E+03 | 7,75E+01 | 1,30E+00 | 1,46E+02 | 2,70E+03 | 0 | 8,42E+00 | 2,62E+01 | 6,09E+00 | -6,68E+01 |
| | PENRM | MJ | 2,21E+02 | 0,00E+00 | -5,88E+00 | 0,00E+00 | 2,15E+02 | 0 | 0,00E+00 | -2,13E+02 | 0,00E+00 | 0,00E+00 |
| | PENRT | MJ | 2,85E+03 | 7,75E+01 | -4,58E+00 | 1,46E+02 | 2,92E+03 | 0 | 8,42E+00 | -1,86E+02 | 6,09E+00 | -6,68E+01 |
| | SM | kg | 2,19E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,19E-01 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| | RSF | MJ | 3,36E+00 | 3,60E-02 | 7,20E-04 | 3,44E-02 | 3,40E+00 | 0 | 4,30E-03 | 8,66E-02 | 3,34E-03 | -3,27E-02 |
| | NRSF | MJ | 4,63E+00 | 1,24E-01 | 3,20E-03 | 1,46E-02 | 4,76E+00 | 0 | 1,51E-02 | 0,00E+00 | 2,94E-01 | -1,75E+01 |
| | FW | $m^3$ | 3,77E+00 | 8,65E-03 | 6,29E-04 | 3,35E-01 | 3,78E+00 | 0 | 9,53E-04 | 3,12E-02 | 5,50E-03 | -3,94E-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 | B2 | B4 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | HWD | kg | 3,51E+00 | 4,16E-03 | 0,00E+00 | 7,20E-02 | 3,52E+00 | 0 | 4,54E-04 | 0,00E+00 | 2,30E+01 | -1,60E-03 |
| | NHWD | kg | 4,71E+01 | 5,75E+00 | 5,59E+00 | 3,32E+00 | 5,84E+01 | 0 | 5,22E-01 | 1,12E+01 | 4,73E-01 | -1,70E+00 |
| | RWD | kg | 1,69E-02 | 5,29E-04 | 0,00E+00 | 4,12E-04 | 1,74E-02 | 0 | 5,73E-05 | 0,00E+00 | 3,72E-05 | -3,07E-04 |

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 | B2 | B4 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CRU | kg | 0,00E+00 | 0,00E+00 | 3,99E+00 | 0,00E+00 | 3,99E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| | MFR | kg | 3,94E+00 | 0,00E+00 | 4,94E+00 | 0,00E+00 | 8,87E+00 | 0 | 0,00E+00 | 5,03E+00 | 0,00E+00 | 0,00E+00 |
| | MER | kg | 6,76E+00 | 0,00E+00 | 5,68E-01 | 0,00E+00 | 7,33E+00 | 0 | 0,00E+00 | 7,71E+01 | 0,00E+00 | 0,00E+00 |
| | EEE | MJ | 3,95E+00 | 0,00E+00 | 4,39E-01 | 1,24E+00 | 4,39E+00 | 0 | 0,00E+00 | 4,00E+01 | 0,00E+00 | 0,00E+00 |
| | EET | MJ | 5,19E+01 | 0,00E+00 | 6,65E+00 | 8,60E+00 | 5,86E+01 | 0 | 0,00E+00 | 6,05E+02 | 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 | 2,31E+01 |
| Biogenic carbon content in accompanying packaging | kg C | 4,10E+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, Poland (kWh) | ecoinvent 3.6 | 1060,47 | g CO2-eq/kWh |
| Electricity, Sweden (kWh) | ecoinvent 3.6 | 54,94 | g CO2-eq/kWh |

### Dangerous substances

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

### Indoor environment

The product has not been tested for emissions to indoor environments.

## Additional Environmental Information

| Additional environmental impact indicators required in NPCR Part A for construction products | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Indicator** | **Unit** | A1-A3 | A4 | A5 | B2 | B4 | C1 | C2 | C3 | C4 | D |
| GWPIOBC | kg $CO_2$ -eq | 1,66E+02 | 4,89E+00 | 1,03E-01 | 1,21E+01 | 1,71E+02 | 0 | 5,49E-01 | 2,29E+01 | 2,97E-01 | -5,40E+00 |

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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|---|---|---|
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