epddanmark

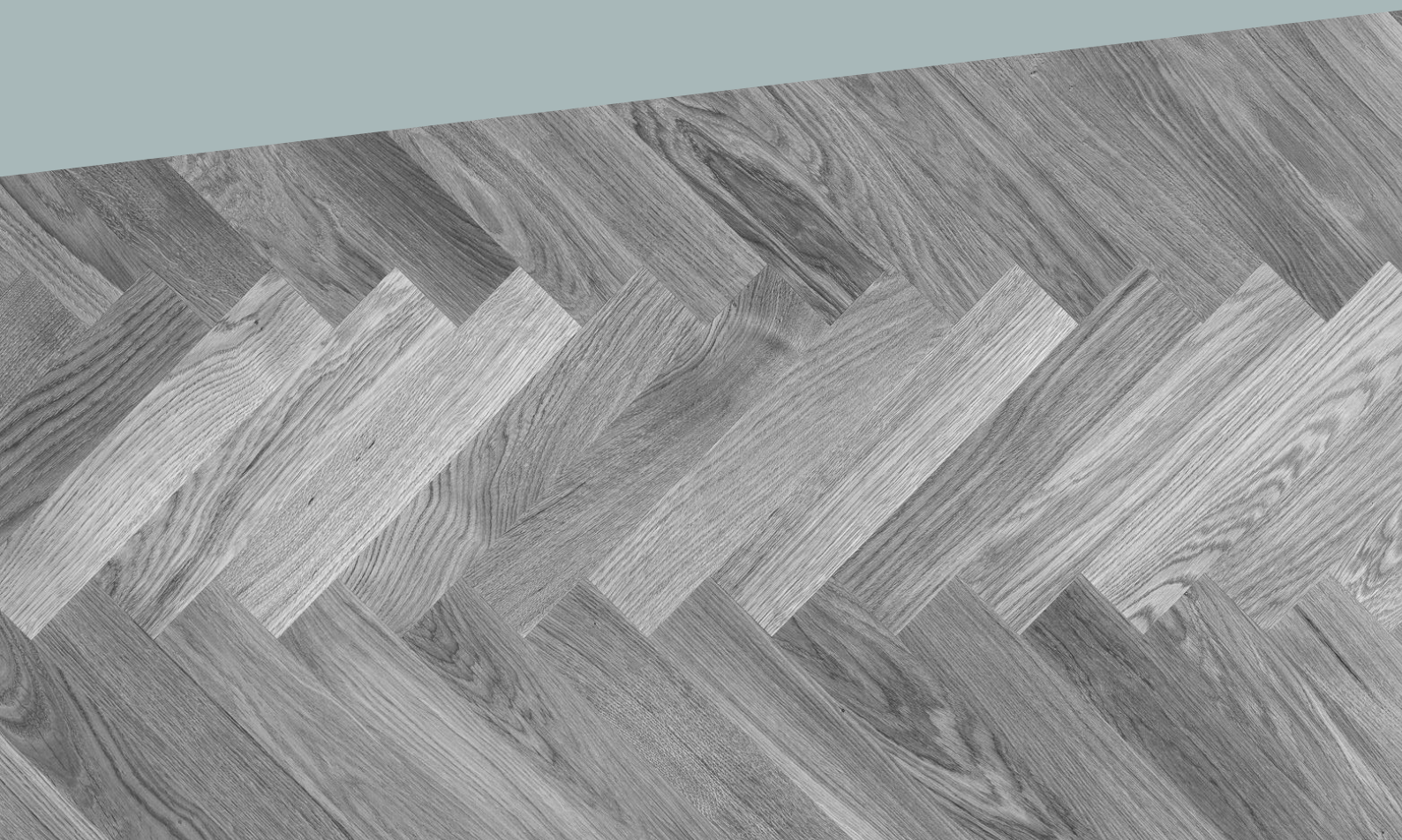
ECO PLATFORM EPD VERIFIED

Owner: Fionia Parket ApS
No.: MD-24092-EN
Issued: 13-09-2024
Valid to: 13-09-2029

3rd PARTY **VERIFIED**

# EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | **ISO 14025 & EN 15804**



**Owner of declaration**
Fionia Parket ApS
Lind Hansens Vej 13G
5000 Odense C, Denmark
CVR-nr.: 34879362

**Programme**
EPD Danmark
www.epddanmark.dk

☐ Industry EPD
☒ Product EPD

**Declared product(s)**
- Solid floor, Oak, 16 mm thickness (untreated)
- Solid floor, Oak, 22 mm thickness (untreated)

The EPD covers the two patterns, solid pattern parquet and whalebone, in one hardwood type – oak.
The moisture content of the products is 8% ±2%.

Number of declared datasets/product variations: 2

**Production site**
Lviv region, Ukraine

**Product(s) use**
The solid wood pattern floors, prepared for installation according to Fionia Parket ApS instructions. Results are listed for floors with no surface treatment.

The floor is intended for indoor use.

**Declared unit**
Declared unit is 1 $m^2$ of untreated solid hardwood floor in oak.

**Year of production site data (A3)**
2023

**EPD version**
First version – version 1.0

**Issued:** 13-09-2024
**Valid to:** 13-09-2029

**Basis of calculation**
This EPD is developed in accordance with the European standard EN 15804+A2.

**Comparability**
EPDs of construction products may not be comparable if they do not comply with the requirements in EN 15804. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804 and if the background systems are not based on the same database.

**Validity**
This EPD has been verified in accordance with ISO 14025 and is valid for 5 years from the date of issue.

**Use**
The intended use of an EPD is to communicate scientifically based environmental information for construction products, for the purpose of assessing the environmental performance of buildings.

**EPD type**
☒Cradle-to-gate with modules C1-C4 and D
☐Cradle-to-gate with options, modules C1-C4 and D
☐Cradle-to-grave and module D
☐Cradle-to-gate
☐Cradle-to-gate with options

CEN standard EN 15804 serves as the core PCR

Independent verification of the declaration and data, according to EN ISO 14025

☐ internal ☒ external

Third party verifier:

*Charlotte B. Merlin*

*Martha Katrine Sørensen*
*EPD Danmark*

| Life cycle stages and modules (MND = module not declared) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Product | | | Construction process | | Use | | | | | | | End of life | | | | Beyond the system boundary |
| Raw material supply | Transport | Manufacturing | Transport | Installation process | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-construction demolition | Transport | Waste processing | Disposal | Re-use, recovery and recycling potential |
| A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| X | X | X | X | MND | MND | MND | MND | MND | MND | MND | MND | X | X | X | X | X |

# Product information

### Product description

The products assessed in this study are solid wooden pattern parquet floors, which are ready to be installed in accordance with the instructions of Fionia Parket ApS. LCA results are listed for untreated floors without surface treatment.

The main product components are shown in the table below. Materials account for 100% of the mass of the declared product.

*Table 1: Mass distribution of declared products.*

| Material | Weight-kg of declared product | Weight-% of declared product |
|---|---|---|
| **Solid wood floor, Oak, 16 mm** | | |
| Wood dry, weight | 10.48 | 100% |
| **Solid wood floor, Oak, 22 mm** | | |
| Wood dry, weight | 14.41 | 100% |

### Product packaging:

The product packaging is shown in the table below. Materials account for 100% of the mass of the product packaging.

*Table 2: Mass distribution of product packaging.*

| Material | Weight-kg of packaging | Weight-% of packaging |
|---|---|---|
| EUR pallet, reusable | 0.015 | 19.56% |
| Cardboard | 0.0065 | 8.47% |
| Packaging film | 0.055 | 71.97% |
| **Total** | | **100%** |

### Representativity

This declaration, including data collection and the modelled foreground system including results, represents the production of 1 $m^2$ of the declared product by the manufacturer located in Lviv region, Ukraine. Fionia Parket ApS acts as a trader/distributor that handles and sells the pre-manufactured products in Denmark. Product specific data are based on average values and has been collected for the year 2023. Background data are based on SimaPro 9.5 including database EcoInvent 3.9.1 and complies with EN 15804:2012+A2:2019, Section 6.3.8.2, and are less than 10 years old. Generally, the background datasets used are of acceptable quality with reference year of 2021 in line with release of the database. Almost all datasets are locally and/or regionally representative (e.g. Ukraine, or Europe), and electricity is country specific.

### Hazardous substances

The solid wooden floors by Fionia Parket ApS, that are analysed in this study, does not contain substances listed on the "Candidate List of Substances of Very High Concern for authorisation"

(http://echa.europa.eu/candidate-list-table)

### Essential characteristics

Products made for Fionia Parket ApS are generally CE certified in accordance with the EC declaration regarding wooden floors for indoor usage EN 14342:2013.

In practice, products made for Fionia Parket ApS are manufactured using materials that are CE-certified and FSC-certified.

*Thermal resistance, [m² °K/W]:*

- *Solid wood floor, Oak, 16 mm: 0.10*
- *Solid wood floor, Oak, 22 mm: 0.14*

*Thermal conductivity, [W/m°K]:*

- *Solid wood floor, Oak, 16 mm: 0.15*
- *Solid wood floor, Oak, 22 mm: 0.18*

Further technical information can be obtained by contacting the manufacturer/distributor, Fionia Parket ApS, or on the manufacturer's website:

- https://www.fioniaparket.dk/

### Reference Service Life (RSL)

No reference service life (RSL) is declared since the scope of this EPD is cradle-to-gate with modules C1-C4 and D. As a result, the construction stage (A4-A5) and the use stage (B1-B7) of the declared products are not included in the scope of the study.

## Picture of product(s)

Photography: Torben Eskerod

*Figure1: Solid Oak, Herringbone, Premium.*

Photography: Torben Eskerod

*Figure 2: Solid Oak, Herringbone, Classic.*

Photography: Torben Eskerod

*Figure 1: Solid Oak, Whalebone, Classic.*

# LCA background

### Declared unit

The LCI and LCIA results in this EPD relates to 1 $m^2$ of solid hardwood floor in two patterns: Solid pattern parquet and whalebone. The product variations include one hardwood type – oak with different thicknesses (16/22mm) without surface treatment. The specifications for each variation are presented in the tables below.

*Table 3: Product properties of 16 mm solid floor.*

| Name | Value | Unit |
|---|---|---|
| Declared unit | 1 | $m^2$ |
| Area density | 10.48 | $kg/m^2$ |
| Density | 655 | $kg/m^3$ |
| Conversion factor to 1 kg. | 0.095 | $m^2/kg$ |

*Table 4: Product properties of 22 mm solid floor.*

| Name | Value | Unit |
|---|---|---|
| Declared unit | 1 | $m^2$ |
| Area density | 14.41 | $kg/m^2$ |
| Density | 655 | $kg/m^3$ |
| Conversion factor to 1 kg. | 0.069 | $m^2/kg$ |

### Functional unit

Not defined.

### PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804:2012+A2:2019, and the following complimentary c-PCR standard:

- DS/EN 16485:2014 – Product category rules for wood and wood-based products for use in construction

### Geographical area

The set geographical boundary for the sale and end-of-life is Denmark.

### Allocation

Energy consumption in between the products for manufacturing process is allocated based on mass. The wood chips as generated waste isphysically used internally for heating as part of the system.

### Guarantee of Origin – certificates

The declared products are not manufactured using guarantees of origin (GOs) for the energy consumption at the facilities of manufacturer in Ukraine (A3). The declared products are covered by FSC-certifications.

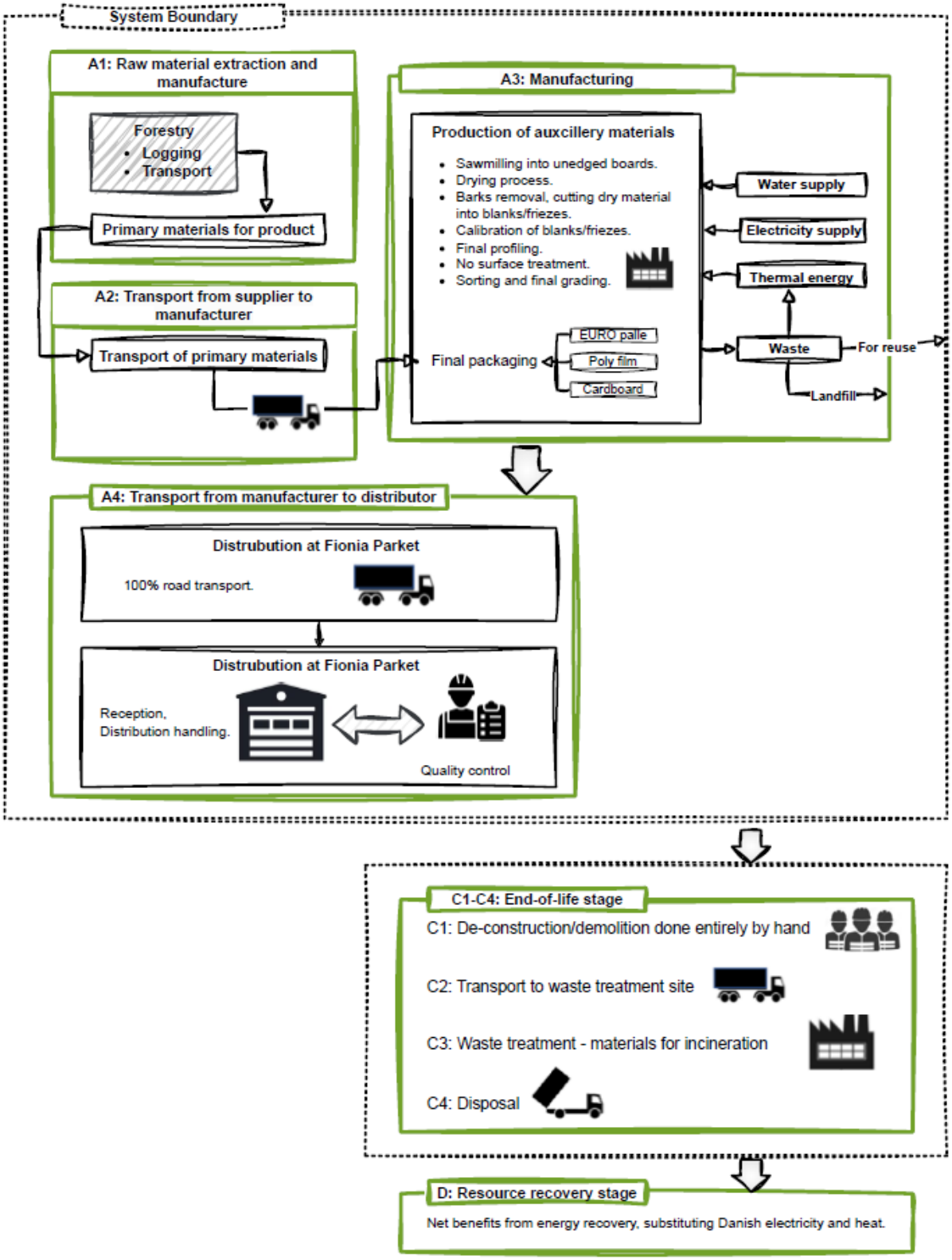
### Foreground system:

The production at Lion Wood LLC (A1) is modelled based on site-specific data for the year 2023. The electricity consumption is modelled as country specific supply production mix in Ukraine.

### Background system:

The database, EcoInvent 3.9.1 is utilized for the background system. As a result, both upstream- and downstream activities are based on average supply mixes for the specific country or region depending on the given dataset.

## Flow Diagram



### System boundary

This EPD is based on a cradle-to-gate LCA with modules C1-C4 and D, in which 100 weight-% has been accounted for.

The general rules for the exclusion of inputs and outputs follows the requirements in EN 15804, 6.3.5, where the total of neglected input flows per module shall be a maximum of 5 % of energy usage and mass and 1 % of renewable and non-renewable primary energy usage and mass for unit processes. In addition, particular care has been taken to include materials and flows known to have the potential to cause significant emissions into air, water and soil related to the environmental indicators assessed in this study.

**Product stage (A1-A3) includes**:

A1 – Extraction and processing of raw materials
A2 – Transport to the production site
A3 – Manufacturing processes

The product stage comprises the acquisition of all raw materials, products and energy, transport to the production site, production, packaging, and waste processing up to the ”end-of-waste” state or final disposal. The LCA results are declared in aggregated form for the product stage, which means, that the sub-modules A1, A2 and A3 are declared as one module A1-A3.

All the floor products in this study consist of solid hardwood planks made of oak. The system boundary to nature for wood and wood-based product starts with the extraction and harvesting of wood from forests or plantations. This includes activities such as timber harvesting, logging, and wood processing. Environmental impacts associated with forest management practises, logging methods, and soil disturbance are considered. In A2 the transportation from forestry activities to production site is considered. Wood production encompasses the processes involved in converting harvested timber into wood products. These processes include planning, sawmilling, drying, calibrating, profiling, final grading, and packing of final product (A3). The environmental impacts associated with manufacturing wood products, including energy consumption, water, emissions, and resource use, are within the system boundary.

**Transport to construction site (A4) includes:**

The final product is transported to Denmark. Fionia Parket ApS warehouse (A4) acts as a distributor/trader in Denmark, where the product is sold.

**End of Life (C1-C4) includes:**

The deconstruction process in module C1, as examined in this study, is presumed to be performed manually (by hand), eliminating the need for any processes that could have environmental consequences. Consequently, no environmental impact is documented in this module.

Deconstructed plank floors, in module C2, are assumed to be transported from the demolition/construction site to a waste facility where they are undergoing shredding process into wood chips (C3). After this, the wood chips are transported to a municipal plant where they are incinerated for energy recovery.

In module C3, 100% of the waste wood is processed by energy recovery through municipal incineration and represents a 100% scenario.

As a result, in module C4, no landfilling occurs, leading to no documented environmental impact.

**Re-use, recovery, and recycling potential (D):**

Notably, waste wood undergoes energy recovery through municipal incineration with fly ash extraction. The electricity generated via this incineration at the Combined Heat and Power (CHP) plant is anticipated to supply the average Danish electricity mix, while the thermal energy is harnessed for district heating. Given the prevailing limitations of market technologies, it is evidentthat this thermal energy displaces natural gas for heating applications.

### Note

It should be noted that the biogenic carbon in the wood and wood-based material is balanced across the life cycle, as carbon included in the wood is released again, when the wood is incinerated.

# LCA results

The tables below cover the environmental impacts from 1 $m^2$ of Fionia Parket ApS solid floor products of two patterns, solid pattern parquet and whalebone in one hardwood type – oak, with two different thicknesses: 16 mm and 22 mm.

**Solid floor, Oak, 16 mm thickness (untreated):**

| ENVIRONMENTAL IMPACTS PER 1 $m^2$ SOLID FLOOR 16 mm THICKNESS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1-A3** | **A4** | **C1** | **C2** | **C3** | **C4** | **D** |
| GWP-total | [kg $CO_2$ eq.] | -1.07E+01 | 1.38E+00 | 0.00E+00 | 9.07E-02 | 1.66E+01 | 0.00E+00 | -3.03E+00 |
| GWP-fossil | [kg $CO_2$ eq.] | 5.62E+00 | 1.38E+00 | 0.00E+00 | 9.06E-02 | 2.39E-01 | 0.00E+00 | -3.00E+00 |
| GWP-biogenic | [kg $CO_2$ eq.] | -1.64E+01 | 1.35E-03 | 0.00E+00 | 8.85E-05 | 1.64E+01 | 0.00E+00 | -2.48E-02 |
| GWP-luluc | [kg $CO_2$ eq.] | 2.35E-02 | 5.17E-04 | 0.00E+00 | 3.39E-05 | 2.47E-04 | 0.00E+00 | -1.92E-03 |
| ODP | [kg CFC 11 eq.] | 4.10E-07 | 3.47E-07 | 0.00E+00 | 2.28E-08 | 1.54E-08 | 0.00E+00 | -3.89E-07 |
| AP | [mol $H^+$ eq.] | 7.36E-02 | 4.44E-03 | 0.00E+00 | 2.91E-04 | 2.17E-03 | 0.00E+00 | -6.55E-03 |
| EP-freshwater | [kg P eq.] | 2.40E-03 | 9.05E-05 | 0.00E+00 | 5.93E-06 | 1.53E-04 | 0.00E+00 | -8.09E-04 |
| EP-marine | [kg N eq.] | 2.25E-02 | 9.94E-04 | 0.00E+00 | 6.52E-05 | 9.82E-04 | 0.00E+00 | -1.35E-03 |
| EP-terrestrial | [mol N eq.] | 2.44E-01 | 1.09E-02 | 0.00E+00 | 7.12E-04 | 9.36E-03 | 0.00E+00 | -1.32E-02 |
| POCP | [kg NMVOC eq.] | 6.69E-02 | 4.27E-03 | 0.00E+00 | 2.80E-04 | 2.33E-03 | 0.00E+00 | -4.06E-03 |
| ADPm[1] | [kg Sb eq.] | 1.19E-05 | 3.33E-06 | 0.00E+00 | 2.18E-07 | 6.32E-07 | 0.00E+00 | -8.06E-06 |
| ADPf[1] | [MJ] | 1.27E+02 | 2.27E+01 | 0.00E+00 | 1.49E+00 | 3.16E+00 | 0.00E+00 | -5.48E+01 |
| WDP[1] | [$m^3$ world eq. deprived] | 1.68E+00 | 7.84E-02 | 0.00E+00 | 5.14E-03 | -9.68E-02 | 0.00E+00 | -2.48E-01 |
| Caption | GWP-total = Globale 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 = Ozone Depletion; AP = Acidifcation; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water depletion potential | | | | | | | |
| | The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: $1.95*10^2$ or 195, while 1.12E-11 is the same as $1.12*10^{-11}$ or 0,0000000000112. | | | | | | | |
| Disclaimer | | | | | | | | |

| ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 $m^2$ SOLID FLOOR 16 mm THICKNESS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1-A3** | **A4** | **C1** | **C2** | **C3** | **C4** | **D** |
| PM | [Disease incidence] | 4.61E-06 | 1.62E-07 | 0.00E+00 | 1.06E-08 | 2.00E-08 | 0.00E+00 | -2.07E-08 |
| IRP[2] | [kBq U235 eq.] | 3.32E+00 | 1.15E-01 | 0.00E+00 | 7.52E-03 | 5.07E-02 | 0.00E+00 | -4.74E-01 |
| ETP-fw[1] | [CTUe] | 3.01E+01 | 1.23E+01 | 0.00E+00 | 8.09E-01 | 2.51E+00 | 0.00E+00 | -3.76E+00 |
| HTP-c[1] | [CTUh] | 2.51E-09 | 2.25E-10 | 0.00E+00 | 1.48E-11 | 1.43E-10 | 0.00E+00 | -2.09E-10 |
| HTP-nc[1] | [CTUh] | 2.40E-09 | 6.29E-10 | 0.00E+00 | 4.12E-11 | 8.30E-11 | 0.00E+00 | -5.26E-10 |
| SQP[1] | - | 1.54E+03 | 2.59E+01 | 0.00E+00 | 1.70E+00 | 7.17E-01 | 0.00E+00 | -3.62E+00 |
| Caption | 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 = Soil Quality (dimensionless) | | | | | | | |
| | The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: $1.95*10^2$ or 195, while 1.12E-11 is the same as $1.12*10^{-11}$ or 0.0000000000112. | | | | | | | |
| Disclaimers | [1] The results of this environmental 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 PER 1 m² SOLID FLOOR 16 mm THICKNESS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1-A3** | **A4** | **C1** | **C2** | **C3** | **C4** | **D** |
| PERE | [MJ] | 1.08E+02 | 2.88E-01 | 0.00E+00 | 1.89E-02 | 1.99E+02 | 0.00E+00 | -3.51E+00 |
| PERM | [MJ] | 1.99E+02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | -1.99E+02 | 0.00E+00 | 0.00E+00 |
| PERT | [MJ] | 3.07E+02 | 2.88E-01 | 0.00E+00 | 1.89E-02 | 3.45E-01 | 0.00E+00 | -3.51E+00 |
| PENRE | [MJ] | 1.27E+02 | 2.27E+01 | 0.00E+00 | 1.49E+00 | 3.16E+00 | 0.00E+00 | -5.48E+01 |
| PENRM | [MJ] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PENRT | [MJ] | 1.27E+02 | 2.27E+01 | 0.00E+00 | 1.49E+00 | 3.16E+00 | 0.00E+00 | -5.48E+01 |
| SM | [kg] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RSF | [MJ] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| NRSF | [MJ] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| FW | [$m^3$] | 1.66E+00 | 7.66E-02 | 0.00E+00 | 5.02E-03 | -9.66E-02 | 0.00E+00 | -2.49E-01 |
| Caption | 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 material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water | | | | | | | |

| WASTE CATEGORIES AND OUTPUT FLOWS PER 1 m² SOLID FLOOR 16 mm THICKNESS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1-A3** | **A4** | **C1** | **C2** | **C3** | **C4** | **D** |
| HWD | [kg] | 9.55E-05 | 5.49E-05 | 0.00E+00 | 3.60E-06 | 3.99E-06 | 0.00E+00 | -6.21E-05 |
| NHWD | [kg] | 1.89E+00 | 2.12E+00 | 0.00E+00 | 139E-01 | 1.33E-01 | 0.00E+00 | -7.39E-02 |
| RWD | [kg] | 9.16E-04 | 1.53E-04 | 0.00E+00 | 1.01E-05 | 1.54E-05 | 0.00E+00 | -1.43E-04 |
| | | | | | | | | |
| CRU | [kg] | 2.76E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| MFR | [kg] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| MER | [kg] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| EEE | [MJ] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.17E+00 | 0.00E+00 | 0.00E+00 |
| EET | [MJ] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.38E+01 | 0.00E+00 | 0.00E+00 |
| Caption | HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy | | | | | | | |
| | The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: $1.95*10^2$ or 195, while 1.12E-11 is the same as $1.12*10^{-11}$ or 0.0000000000112. | | | | | | | |

| BIOGENIC CARBON CONTENT PER 1 m² SOLID FLOOR 16 mm THICKNESS | | |
|---|---|---|
| **Parameter** | **Unit** | **At the factory gate** |
| Biogenic carbon content in product | kg C | 4.46E+00 |
| Biogenic carbon content in accompanying packaging | kg C | 8.16E-03 |

## Solid floor, Oak, 22 mm thickness (untreated):

| ENVIRONMENTAL IMPACTS PER 1 m² SOLID FLOOR 22 mm THICKNESS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1-A3** | **A4** | **C1** | **C2** | **C3** | **C4** | **D** |
| GWP-total | [kg $CO_2$ eq.] | -1.50E+01 | 1.90E+00 | 0.00E+00 | 1.24E-04 | 2.28E+01 | 0.00E+00 | -4.17E+00 |
| GWP-fossil | [kg $CO_2$ eq.] | 7.45E+00 | 1.90E+00 | 0.00E+00 | 1.24E-04 | 3.28E-01 | 0.00E+00 | -4.13E+00 |
| GWP-biogenic | [kg $CO_2$ eq.] | -2.25E+01 | 1.86E-03 | 0.00E+00 | 1.21E-07 | 2.25E+01 | 0.00E+00 | -3.41E-02 |
| GWP-luluc | [kg $CO_2$ eq.] | 3.24E-02 | 7.11E-04 | 0.00E+00 | 4.65E-08 | 3.39E-04 | 0.00E+00 | -2.64E-03 |
| ODP | [kg CFC 11 eq.] | 5.25E-07 | 4.78E-07 | 0.00E+00 | 3.13E-11 | 2.12E-08 | 0.00E+00 | -5.35E-07 |
| AP | [mol $H^+$ eq.] | 1.00E-01 | 6.10E-03 | 0.00E+00 | 3.99E-07 | 2.99E-03 | 0.00E+00 | -9.01E-03 |
| EP-freshwater | [kg P eq.] | 3.28E-03 | 1.24E-04 | 0.00E+00 | 8.14E-09 | 2.11E-04 | 0.00E+00 | -1.11E-03 |
| EP-marine | [kg N eq.] | 3.07E-02 | 1.37E-03 | 0.00E+00 | 8.94E-08 | 1.35E-03 | 0.00E+00 | -1.86E-03 |
| EP-terrestrial | [mol N eq.] | 3.33E-01 | 1.49E-02 | 0.00E+00 | 9.77E-07 | 1.29E-02 | 0.00E+00 | -1.81E-02 |
| POCP | [kg NMVOC eq.] | 9.13E-02 | 5.88E-03 | 0.00E+00 | 3.85E-07 | 3.20E-03 | 0.00E+00 | -5.58E-03 |
| ADPm[1] | [kg Sb eq.] | 1.57E-05 | 4.58E-06 | 0.00E+00 | 3.00E-10 | 8.69E-07 | 0.00E+00 | -1.11E-05 |
| ADPf[1] | [MJ] | 1.70E+02 | 3.12E+01 | 0.00E+00 | 2.04E-03 | 4.34E+00 | 0.00E+00 | -7.54E+01 |
| WDP[1] | [$m^3$ world eq. deprived] | 2.25E+00 | 1.08E-01 | 0.00E+00 | 7.05E-06 | -1.33E-01 | 0.00E+00 | -3.41E-01 |
| Caption | GWP-total = Globale 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 = Ozone Depletion; AP = Acidifcation; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water depletion potential | | | | | | | |
| | The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: $1.95*10^2$ or 195, while 1.12E-11 is the same as $1.12*10^{-11}$ or 0,0000000000112. | | | | | | | |
| Disclaimer | | | | | | | | |

| ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 m² SOLID FLOOR 22 mm THICKNESS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1-A3** | **A4** | **C1** | **C2** | **C3** | **C4** | **D** |
| PM | [Disease incidence] | 6.32E-06 | 2.22E-07 | 0.00E+00 | 1.45E-11 | 2.76E-08 | 0.00E+00 | -2.84E-08 |
| IRP[2] | [kBq U235 eq.] | 4.55E+00 | 1.58E-01 | 0.00E+00 | 1.03E-05 | 6.97E-02 | 0.00E+00 | -6.52E-01 |
| ETP-fw[1] | [CTUe] | 3.97E+01 | 1.70E+01 | 0.00E+00 | 1.11E-03 | 3.46E+00 | 0.00E+00 | -5.18E+00 |
| HTP-c[1] | [CTUh] | 3.43E-09 | 3.10E-10 | 0.00E+00 | 2.03E-14 | 1.96E-10 | 0.00E+00 | -2.88E-10 |
| HTP-nc[1] | [CTUh] | 3.20E-09 | 8.65E-10 | 0.00E+00 | 5.66E-14 | 1.14E-10 | 0.00E+00 | -7.24E-10 |
| SQP[1] | - | 2.13E+03 | 3.56E+01 | 0.00E+00 | 2.33E-03 | 9.86E-01 | 0.00E+00 | -4.97E+00 |
| Caption | 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 = Soil Quality (dimensionless) | | | | | | | |
| | The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: $1.95*10^2$ or 195, while 1.12E-11 is the same as $1.12*10^{-11}$ or 0.0000000000112. | | | | | | | |
| Disclaimers | [1] The results of this environmental 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 PER 1 m² SOLID FLOOR 22 mm THICKNESS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1-A3** | **A4** | **C1** | **C2** | **C3** | **C4** | **D** |
| PERE | [MJ] | 1.51E+02 | 3.96E-01 | 0.00E+00 | 2.59E-05 | 2.74E+02 | 0.00E+00 | -4.83E+00 |
| PERM | [MJ] | 2.74E+02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | -2.74E+02 | 0.00E+00 | 0.00E+00 |
| PERT | [MJ] | 4.25E+02 | 3.96E-01 | 0.00E+00 | 2.59E-05 | 4.74E-01 | 0.00E+00 | -4.83E+00 |
| PENRE | [MJ] | 1.70E+02 | 3.12E+01 | 0.00E+00 | 2.04E-03 | 4.34E+00 | 0.00E+00 | -7.54E+01 |
| PENRM | [MJ] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PENRT | [MJ] | 1.70E+02 | 3.12E+01 | 0.00E+00 | 2.04E-03 | 4.34E+00 | 0.00E+00 | -7.54E+01 |
| SM | [kg] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RSF | [MJ] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| NRSF | [MJ] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| FW | [$m^3$] | 2.22E+00 | 1.05E-01 | 0.00E+00 | 6.90E-06 | -1.33E-01 | 0.00E+00 | -3.42E-01 |
| Caption | 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 material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water | | | | | | | |

| WASTE CATEGORIES AND OUTPUT FLOWS PER 1 m² SOLID FLOOR 22 mm THICKNESS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1-A3** | **A4** | **C1** | **C2** | **C3** | **C4** | **D** |
| HWD | [kg] | 1.25E-04 | 7.54E-05 | 0.00E+00 | 4.94E-06 | 5.49E-06 | 0.00E+00 | -8.55E-05 |
| NHWD | [kg] | 2.36E+00 | 2.91E+00 | 0.00E+00 | 1.91E-01 | 1.82E-01 | 0.00E+00 | -1.02E-01 |
| RWD | [kg] | 1.24E-03 | 2.11E-04 | 0.00E+00 | 1.38E-05 | 2.12E-05 | 0.00E+00 | -1.97E-04 |
| CRU | [kg] | 3.85E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| MFR | [kg] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| MER | [kg] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| EEE | [MJ] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 9.86E+00 | 0.00E+00 | 0.00E+00 |
| EET | [MJ] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.03E+01 | 0.00E+00 | 0.00E+00 |
| Caption | HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy | | | | | | | |
| | The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: $1.95*10^2$ or 195, while 1.12E-11 is the same as $1.12*10^{-11}$ or 0.0000000000112. | | | | | | | |

| BIOGENIC CARBON CONTENT PER 1 m² SOLID FLOOR 22 mm THICKNESS | | |
|---|---|---|
| **Parameter** | **Unit** | **At the factory gate** |
| Biogenic carbon content in product | kg C | 6.14E+00 |
| Biogenic carbon content in accompanying packaging | kg C | 8.16E-03 |

# Additional information

### LCA interpretation

The results of the Life Cycle Assessment (LCA) for the designated products reveal that the main environmental impacts stem from the production of components (A3), notably due to sawmill operations. Specifically, the electricity and thermal energy consumption in component production is identified as the primary contributors to these impacts within the product system.

It's important to highlight that, for the global warming potential (GWP), the intake of biogenic carbon in module A1 balances out the release of biogenic carbon during the end-of-life stage (C1-C4) owing to the mass balance approach (MBA) employed in the model.

Module D plays a significant role in mitigating environmental impact across all categories by approximately 10-20%. This is largely due to the high calorific value of the declared products, which are predominantly composed of wood. Consequently, municipal incineration leads to the exportation of a considerable amount of energy (namely, electricity and industrial heat), thereby offering value to subsequent product systems by substituting energy.

The negative environmental impact for GWP-biogenic is caused by wood material used in for packaging system and Fionia Parket ApS product itself in module A1. The $CO_2$ is then released again during incineration in module A3, and C3.

| Impact category | Unit | Contribution | % of Category | Process |
|---|---|---|---|---|
| GWP-total | [kg CO2 eq.] | 1.66E+01 | 57.17 | C3: Incineration |
| GWP-fossil | [kg CO2 eq.] | 3.50E+00 | 49.43 | A3: Electricity supply |
| GWP-biogenic | [kg CO2 eq.] | 1.64E+01 | 50.00 | C3: Incineration |
| GWP – luluc | [kg CO2 eq.] | 1.88E-02 | 78.18 | A1: Solid wood logs |
| ODP | [kg CFC 11 eq.] | 1.28E-07 | 16.49 | A4: Transport |
| AP | [mol H+ eq.] | 3.59E-02 | 50.73 | A3: Electricity supply |
| EP – fresh water | [kg P eq.] | 1.63E-03 | 65.05 | A3: Electricity supply |
| EP - marine | [kg N eq.] | 1.49E-02 | 74.51 | A3: Heat supply |
| EP – terrestrial | [mole of N eq.] | 1.67E-01 | 77.84 | A3: Heat supply |
| POCP | [kg NMVOC eq.] | 4.09E-02 | 66.64 | A3: Heat supply |
| ADP – mm | [kg Sb eq.] | 5.39E-06 | 37.21 | A3: Heat supply |
| ADP – fossils | [MJ] | 9.37E+01 | 62.40 | A3: Electricity supply |
| WDP | [m³] | 1.00E+00 | 55.12 | A3: Electricity supply |

### Technical information on scenarios

### Reference service life

| RSL information | | Unit |
|---|---|---|
| Reference service Life | Not relevant | Years |
| Declared product properties | Information on the technical characteristics, design, and installation guidelines, as well as conditions during use can be found on the website of Fionia Parket ApS at https://www.fioniaparket.dk/ | |
| Design application parameters | | |
| Assumed quality of work | | |
| Outdoor environment | | |
| Indoor environment | | |
| Usage conditions | | |
| Maintenance | | |

### End of life (C1-C4)

| Scenario information | **16 mm** | **22 mm** | Unit |
|---|---|---|---|
| Collected separately | 10.48 | 14.41 | kg |
| Collected with mixed waste | 0 | 0 | kg |
| For reuse | 0 | 0 | kg |
| For recycling | 0 | 0 | kg |
| For energy recovery | 10.48 | 14.41 | kg |
| For final disposal | 0 | 0 | kg |
| Assumptions for scenario development | 100% of Fionia Parket ApS product reach its End-of-life stage, and it is sent for incineration. | | As appropriate |

### Re-use, recovery and recycling potential (D)

| Scenario information/Materiel | **16 mm** | **22 mm** | Unit |
|---|---|---|---|
| Electricity produced from waste incineration | 7.17 | 9.86 | MJ |
| Thermal energy produced from waste incineration | 43.8 | 60.3 | MJ |

### Indoor air

*The EPD does not give information on release of dangerous substances to indoor air because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.1.*

*Any additional performance certifications are available upon request from manufacturer, or at the following link:*

*https://www.fioniaparket.dk/*

### Soil and water

*The EPD does not give information on release of dangerous substances to soil and water because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.2.*

# References

| | |
|---|---|
| **Publisher** | epddanmark<br><br>www.epddanmark.dk |
| **Program operator** | Danish Technological Institute<br>Buildings & Environment<br>Gregersensvej 8<br>DK-2630 Taastrup<br>www.teknologisk.dk |
| **LCA-practitioner** | BUREAU VERITAS<br><br>Edvinas Damukaitis, Waldemar Corydon Hemdrup, Julie Marie Vejsgaard Larsen<br><br>Bureau Veritas, HSE Danmark<br>Oldenborggade 25-31<br>7000 Fredericia<br>Denmark<br>https://www.bureauveritas.dk/da |
| **LCA software /background data** | SimaPro 9.5 / ecoinvent 3.9.1 |
| **3rd party verifier** | FORCE TECHNOLOGY<br><br>**FORCE Technology**<br>Park Allé 345<br>2605 Brøndby<br><br>Charlotte B. Merlin<br>Senior Team Leader<br><br>Phone: +45 43 25 00 00<br>Mobile: +45 42 62 78 56<br>e-mail: chme@forcetechnology.com<br>www: forcetechnology.com |

**General programme instructions**
General Programme Instructions, version 2.0, spring 2020
www.epddanmark.dk

**ecoinvent 3.9.1**
https://ecoinvent.org/

**EN 15804**
DS/EN 15804 + A2:2019 - "Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products"

**EN 14342:2013**
Wood flooring - Characteristics, evaluation of conformity and marking.

**EN 16449:2014**
Wood and wood-based products – Calculation of the biogenic carbon content pf wood and conversion to carbon dioxide.

**EN 16485:2014**
Round and sawn timber – Environmental Product Declarations – Product category rules for wood and wood-based products for use in construction.

**EN 15942**
DS/EN 15942:2011 – " Sustainability of construction works – Environmental product declarations – Communication format business-to-business"

**ISO 14025**
DS/EN ISO 14025:2010 – " Environmental labels and declarations – Type III environmental declarations – Principles and procedures"

**ISO 14040**
DS/EN ISO 14040:2008 – " Environmental management – Life cycle assessment – Principles and framework"

**ISO 14044**
DS/EN ISO 14044:2008 – " Environmental management – Life cycle assessment – Requirements and guidelines".