

Owner: Hørning Parket A/S  
No.: MD-23183-EN  
Issued: 14-03-2024  
Valid to: 14-03-2029

3<sup>rd</sup> PARTY VERIFIED

EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | ISO 14025 & EN 15804



## Owner of declaration

Hørning Parket A/S  
Christiansmindevej 12  
8660 Skanderborg, Denmark  
CVR-nr.: 33965362



**Issued:**  
14-03-2024

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## Programme

EPD Danmark  
[www.epddanmark.dk](http://www.epddanmark.dk)



- ☐ Industry EPD  
☒ Product EPD

## Declared product(s):

- Castleplank, Oak/Ash, 16/24 mm thickness (untreated)
- Castleplank, Smoked Oak, 16/21 mm thickness (untreated)
- Castleplank, Douglas Fir, 16/24 mm thickness (untreated)

The EPD covers three types of wood – oak, ash and douglas fir.  
The moisture content of the products is 8% ±2%

Number of product variations: 3

## Production site

Factory gate (A3) in Skanderborg, Denmark

## Product(s) use

Engineered wood flooring which is ready to be installed in accordance with the instructions of Hørning Parket A/S. Results are listed for floors with no surface treatment. Supplementary datasheets for two types of optional surface treatment at suppliers (A1) can be found in the section, Additional Information.

The floor is intended for indoor use.

## Declared unit

1 m<sup>2</sup> engineered wooden floor in oak, ash, douglas fir or smoked oak ready for installation

## Year of data

2021

## EPD version

[1], February 2024

## Basis of calculation

This EPD is developed in accordance with the European standard EN 15804:2012+A2:2019.

## Comparability

EPDs of construction products may not be comparable if they do not comply with the requirements in EN 15804:2012+A2:2019. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804:2012+A2:2019 and if the background systems are not based on the same database.

## Validity

This EPD has been verified in accordance with ISO 14025:2010 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 15804:2012+A2:2019 serves as the core PCR

Independent verification of the declaration and data, according to EN ISO 14025:2010

- ☐ internal ☒ external

Third party verifier:

Linda Høiby, Life Cycle Assessment Consulting

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
<b>X</b>	<b>X</b>	<b>X</b>	MND	MND	MND	MND	MND	MND	MND	MND	MND	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>

# Product Information

## Product Description:

The products assessed in this study are engineered wooden floors, which is ready to be installed in accordance with the instructions of Hørning Parket A/S. [LCA Results](#) are listed for untreated floors without surface treatment. Because of this, supplementary datasheets for surface treatment can be found in the section, [Additional Information](#), and subsequently added to the results to account for the optional surface treatment during the product stage (A1-A3). Datasheets for the declared products (untreated) can be found here:

- [Castleplank 16-24 mm thickness](#)

The main product components are shown in the table below excluding the optional surface treatment (See [Additional Information](#)). Materials account for 100% of the mass of the declared product.

Material	Weight-% of product
Solid wood (Untreated)	19-29%
Birch veneer	70-80%
Adhesive	1%
<b>Total</b>	<b>100%</b>

Table 1: Mass distribution of declared products.

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

Material	Weight-% of packaging
EUR Pallet, reusable	40.5%
Cardboard	42.5%
Packaging film	17.0%
<b>Total</b>	<b>100%</b>

Table 2: Mass distribution of product packaging

## Representativity:

This declaration, including data collection and the modelled foreground system including results, represents the production of the declared products by Hørning Parket A/S in Skanderborg, Denmark, which is also the representative geographical area. Product specific data are based on average values collected at the

production site for the year 2021. Background data are based on ecoinvent 3.9.1 (Released 12-2022) and complies with the EN 15804:2012 +A2:2019, Section 6.3.8.2, by being less than 10 years old. Generally, the background datasets used are of acceptable quality with a reference year of 2021 in line with release of the database. Almost all datasets are locally and/or regionally representative (e.g. Denmark, Lithuania or Europe), and electricity is country specific. In processes deemed particularly important (e.g. sawmill and birch veneer), the electricity mix has been modified to reflect local production conditions.

## Hazardous Substances:

The declared products by Hørning Parket A/S, do not contain any substances listed in the "Candidate List of Substances of Very High Concern for Authorization"

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

## Essential characteristics:

Hørning Parket A/S' products are generally CE certified in accordance with the EC declaration regarding wooden floors for indoor usage EN 14342:2013.

*Thermal resistance,  $[m^2 \text{ } ^\circ K/W]$ :*

- Castleplank 16 mm 0.10
- Castleplank 21 mm 0.12
- Castleplank 24 mm 0.14

*Thermal conductivity,  $[W/m^\circ K]$ :*

- Castleplank 16 mm 0.15
- Castleplank 21 mm 0.17
- Castleplank 24 mm 0.185

Further technical information can be obtained by contacting the manufacturer, Hørning Parket A/S, or on the manufacturers' website:

- <https://www.horningfloor.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 Products:**



**Figure 1: Example #1 - Castleplank, Ash**



**Figure 2: Example #2 - Castleplank, Oak**



**Figure 3: Example #3 - Castleplank, Smoked oak**



**Figure 4: Example #4 - Castleplank, Douglas fir**



# LCA Background

## Declared unit (DU):

The declared unit of this EPD is: *1 m<sup>2</sup> of engineered wooden flooring in oak, smoked oak, ash or douglas fir ready for installation*. The declared products include three different wood species (Oak, Ash and Douglas fir) at the lowest options for floor thickness with the option of scaling results. The properties of each product variation are presented in Table 3.

Product	Thickness (mm)	Total mass* (kg)	Conversion factor to 1 kg	Density (kg/m <sup>3</sup> )	Scaling factor
Castleplank, Oak or Ash	16	11.32	0.088	707	1.00
	24	16.92	0.059	705	1.50
Castleplank, Smoked Oak	16	11.32	0.088	707	1.00
	21	14.77	0.068	703	1.31
Castleplank, Douglas fir	16	10.68	0.094	667	1.00
	24	15.96	0.063	665	1.50

**Table 3: Product properties and scaling factor for each declared product. \* = Excluding product packaging**

The scaling factor can be applied to adjust results to the desired thickness within the appropriate range (16-24 mm). See the section, [Additional Information](#), for further guidance concerning scaling factors. The total weight per declared unit (1 m<sup>2</sup>) is calculated based on the measurements of the various floor components. The density of the products ranges from 665-707 kg/m<sup>3</sup> depending on the combinations of thicknesses of different layers and the wood species.

## Product Category Rules (PCR):

This EPD is developed according to the core rules for the product category of construction products in EN 15804:2012+A2:2019 (2019-11-04), and cPCR EN 16485:2014 (2014-05-02) concerning wood and wood-based products for use in construction.

## Guarantees of Origin (GOs):

The declared products are not manufactured using guarantees of origin (GOs) for the energy consumption at the facilities of Hørning Parket A/S in Skanderborg (A3). The declared products are covered by [FSC/PEFC-certifications](#).

## Foreground System:

The production at Hørning Parket A/S (A3) is modelled based on site-specific data for the year 2021. The electricity consumption is modelled as a residual mix in Denmark. The remaining activities in the foreground system (i.e. sawmill activities) are likewise modelled with residual mixes representing the individual countries (e.g. LT) pertaining to the specific value chain.

## Background System:

The database, ecoinvent 3.9.1 (published in 12-2022) 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.

## System Boundary:

This study is cradle-to-gate 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 specified in EN 15804:2012+A2:2019, Section 6.3.6, 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. In this respect, conservative assumptions in combination with plausibility considerations and expert judgement has been used to demonstrate compliance with this criterion.

It should be noted, that the surface treatment is assessed as an optional product activity. The rules and criteria of the declared products are hence extended to the supplementary datasets,

which should not be applied to any other products than indicated in this EPD.

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

The product stage comprises the acquisition of all raw materials, products and energy, transport to the production site, 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 engineered wooden planks made with a base layer of birch veneer and a top layer of either oak, smoked oak, ash or douglas fir. The production process (A1-A3) covers sawmill activities for solid wood and manufacturing of birch veneer by applying resin between the veneer layers and pressing them together. The two respective layers are subsequently transported to for assembly, where are combined with an EPI adhesive after which they are packaged before transportation to storage at Hørning Parket A/S and sold.

As prescribed by the core PCR, EN 15804:2012 +A2:2019, material flows carrying specific inherent properties i.e. energy content or elementary composition (e.g. biogenic carbon content), shall always be allocated reflecting the physical flow, irrespective of the allocation chosen for the process. Consequently, all by-products from sawmill activities resulting in material flows (e.g. boards and sawdust) are attributed the burdens of the forestry activities and transport from forests to the sawmill by mass allocation, which has required modifications to the applied generic datasets.

Concerning the activities at the Hørning Parket A/S facilities (A3), electricity, district heating, diesel and propane (for forklifts) are used as energy sources. Due to the disparity between processing of locally produced and pre-manufactured products, economic allocation is applied to the energy consumption on the site. Consequently, the share of gross profit is used as an allocation key since the difference in profit represents the additional energy and work that has gone into drying, splitting, and planning, compared to the pre-manufactured products. Electricity is the main source for the operation of

the facilities, whereas heat is used for both drying planks and maintaining a comfortable working environment. Hørning Parket A/S uses water for both sanitary purposes and for the process of maintaining the humidity of all solid wooden floors in storage.

Lastly, the optional surface treatment assumes that coating is subsequently not necessary during installation of the floor (A5). The two optional surface treatment is a wood finish commonly used for wooden floors due to its protective properties and limited maintenance required. The UV oil coating is a treatment that is commonly used to protect and enhance the appearance of wooden surfaces, while lacquer which is a wood finish commonly used for wooden floors due to its protective properties and limited maintenance required. The coating is designed to penetrate into the wood, providing a durable, water-resistant finish that enhances the natural beauty of the wood grain. Due to the scope of this EPD, additional surface treatment during the use stage (B1-B7) is not accounted for in the supplementary datasets. Curing of optional surface treatment is done with ultraviolet (UV) light. It should be noted, that the same amount of surface treatment is applied regardless of floor thickness. Because of this, scaling factors (See Table 3) should always be applied before adding the supplementary datasets to the results of the declared product. For additional information regarding the supplementary datasets, please refer to the section, [Additional Information](#).

### **End-of-Life Stage (C1-C4):**

The deconstruction of the products covered by this study is assumed to be done manually, and thus does not require any processes with an environmental impact. The declared products are assumed to be transported from the demolition site to a waste facility where they are shredded. After this, the wood chips are transported to a municipal plant where they are incinerated for energy recovery. 100% of the product is processed by energy recovery through municipal incineration.

As specified in the cPCR, EN 16485:2014, Section 6.3.4.5, page 18, the default attribution of end-of-life processes of wood and wood-based products does not include landfilling (C4) after energy recovery.

### Re-use, Recovery, & Recycling Potential (D):

All of the materials used in the production and maintenance of pallets have potential benefits and load beyond the system boundary. Primarily this consists of the waste wood, which is sent for energy recovery through municipal incineration with fly ash extraction. Electricity generated

through the waste incineration at the CHP plant is assumed to replace the average Danish electricity mix, while thermal energy is utilized as district heating, which has been substituted as an average technological composition for the year 2021.

### Flowchart:

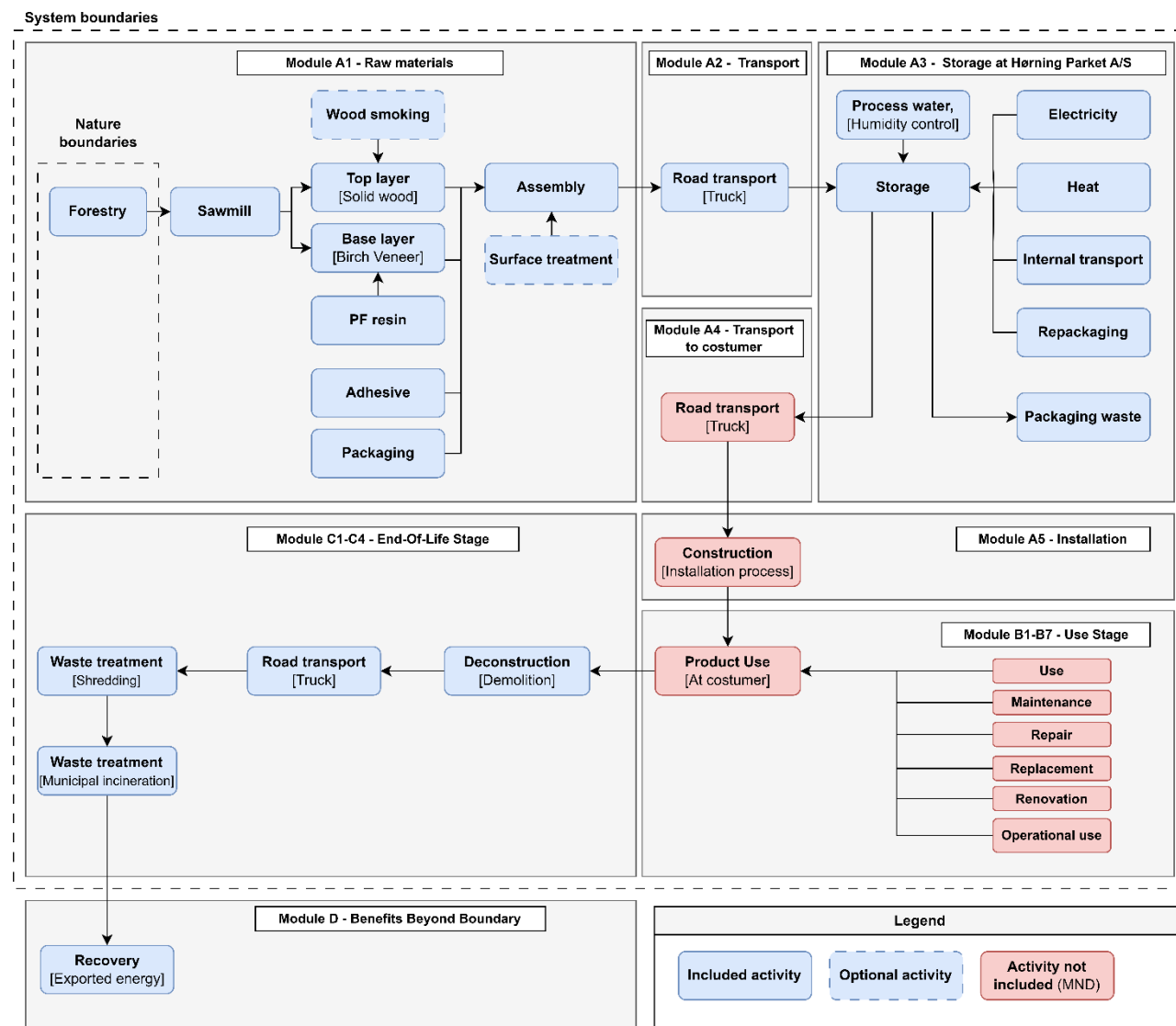


Figure 5: Life cycle of the declared products illustrated as a flowchart

# LCA Results

Due to the multiple declared products covered by this EPD, a series of results for each product are presented. It should be recognized, that the results of the LCA are relative expressions and do not indicate the endpoints of environmental impacts, exceeding of thresholds, safety margins, or risks associated with the declared products. The results for each of the declared products can be found on the following pages:

- **Page 8-9:** [Castleplank, Oak and Ash 16-24 mm thickness \(Untreated\).](#)
- **Page 10-11:** [Castleplank, Smoked Oak 16-21 mm thickness \(Untreated\).](#)
- **Page 12-13:** [Castleplank, Douglas Fir 16-24 mm thickness \(Untreated\).](#)

## Castleplank, Oak and Ash 16 mm thickness (Untreated):

Castleplank, Oak and Ash 16 mm thickness (Untreated) ENVIRONMENTAL IMPACTS PER 1 m <sup>2</sup>							
Parameter	Unit	A1-A3	C1	C2	C3	C4	D
GWP-total	[kg CO <sub>2</sub> eq.]	-2.86E+00	0.00E+00	2.12E-01	2.05E+01	0.00E+00	-4.23E+00
GWP-fossil	[kg CO <sub>2</sub> eq.]	1.36E+01	0.00E+00	2.12E-01	3.32E+00	0.00E+00	-3.96E+00
GWP-biogenic	[kg CO <sub>2</sub> eq.]	-1.65E+01	0.00E+00	1.55E-04	1.71E+01	0.00E+00	-2.55E-01
GWP-luluc	[kg CO <sub>2</sub> eq.]	5.84E-02	0.00E+00	7.87E-05	2.04E-04	0.00E+00	-1.06E-02
ODP	[kg CFC 11 eq.]	1.97E-07	0.00E+00	4.53E-09	9.79E-09	0.00E+00	-1.10E-07
AP	[mol H <sup>+</sup> eq.]	8.71E-02	0.00E+00	6.55E-04	4.40E-03	0.00E+00	-1.83E-02
EP-freshwater	[kg PO <sub>4</sub> eq.]	5.60E-03	0.00E+00	1.23E-05	9.72E-05	0.00E+00	-2.50E-03
EP-marine	[kg N eq.]	2.66E-02	0.00E+00	2.32E-04	2.98E-03	0.00E+00	-4.61E-03
EP-terrestrial	[mol N eq.]	2.82E-01	0.00E+00	2.45E-03	2.30E-02	0.00E+00	-6.02E-02
POCP	[kg NMVOC eq.]	9.29E-02	0.00E+00	1.01E-03	5.67E-03	0.00E+00	-1.33E-02
ADPm <sup>1</sup>	[kg Sb eq.]	4.38E-05	0.00E+00	5.01E-07	7.59E-07	0.00E+00	-2.00E-05
ADPf <sup>1</sup>	[MJ]	2.19E+02	0.00E+00	2.93E+00	3.15E+00	0.00E+00	-6.09E+01
WDP <sup>1</sup>	[m <sup>3</sup> world eq. deprived]	9.85E+00	0.00E+00	1.08E-02	6.09E-02	0.00E+00	-5.56E-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 = Acidification; 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 use						
Disclaimer	<sup>1</sup> 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.						

Table 4: Core environmental impact indicators for 1 m<sup>2</sup> of Castleplank, Oak and Ash 16 mm.

Castleplank, Oak and Ash 16 mm thickness (Untreated) ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 m <sup>2</sup>							
Parameter	Unit	A1-A3	C1	C2	C3	C4	D
PM	[Disease incidence]	1.84E-06	0.00E+00	1.63E-08	2.60E-08	0.00E+00	-1.60E-07
IRP <sup>2</sup>	[kBq U235 eq.]	3.85E-01	0.00E+00	4.02E-03	2.24E-02	0.00E+00	-1.08E+00
ETP-fw <sup>1</sup>	[CTUe]	1.02E+02	0.00E+00	1.25E+00	9.20E+00	0.00E+00	-1.05E+01
HTP-c <sup>1</sup>	[CTUh]	3.89E-08	0.00E+00	3.88E-11	3.19E-10	0.00E+00	-1.10E-09
HTP-nc <sup>1</sup>	[CTUh]	9.05E-08	0.00E+00	8.29E-10	1.95E-08	0.00E+00	-2.10E-08
SQP	-	1.49E+03	0.00E+00	1.77E+00	1.56E+00	0.00E+00	-1.73E+02
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)						
Disclaimer	<sup>1</sup> 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.						
	<sup>2</sup> 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.						

Table 5: Additional environmental impact indicators for 1 m<sup>2</sup> of Castleplank, Oak and Ash 16 mm.



Castleplank, Oak and Ash 16 mm thickness (Untreated) RESOURCE USE PER 1 m <sup>2</sup>							
Parameter	Unit	A1-A3	C1	C2	C3	C4	D
PERE	[MJ]	3.19E+02	0.00E+00	4.30E-02	1.04E+02	0.00E+00	-7.44E+01
PERM	[MJ]	1.03E+02	0.00E+00	0.00E+00	-1.03E+02	0.00E+00	0.00E+00
PERT	[MJ]	4.22E+02	0.00E+00	4.30E-02	8.58E-01	0.00E+00	-7.44E+01
PENRE	[MJ]	1.81E+02	0.00E+00	2.93E+00	4.10E+01	0.00E+00	-6.09E+01
PENRM	[MJ]	3.79E+01	0.00E+00	0.00E+00	-3.79E+01	0.00E+00	0.00E+00
PENRT	[MJ]	2.19E+02	0.00E+00	2.93E+00	3.15E+00	0.00E+00	-6.09E+01
SM	[kg]	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
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m <sup>3</sup> ]	2.44E-01	0.00E+00	3.92E-04	8.17E-03	0.00E+00	-1.04E-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						

Table 6: Parameters describing resource use for 1 m<sup>2</sup> of Castleplank, Oak and Ash 16 mm

Castleplank, Oak and Ash 16 mm thickness (Untreated) WASTE CATEGORIES AND OUTPUT FLOWS PER 1 m <sup>2</sup>							
Parameter	Unit	A1-A3	C1	C2	C3	C4	D
HWD	[kg]	7.13E-04	0.00E+00	1.86E-05	3.57E-05	0.00E+00	-1.30E-04
NHWD	[kg]	6.89E+00	0.00E+00	1.47E-01	1.14E+01	0.00E+00	-3.32E-01
RWD	[kg]	1.00E-04	0.00E+00	9.80E-07	5.32E-06	0.00E+00	-2.50E-04
CRU	[kg]	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
MER	[kg]	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	2.82E+01	0.00E+00	0.00E+00
EET	[MJ]	0.00E+00	0.00E+00	0.00E+00	1.06E+02	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; EE = Exported energy						

Table 7: End-of-life (waste categories and output flows) for 1 m<sup>2</sup> of Solid Parquet Block (DK) 16 mm

Castleplank, Oak and Ash 16 mm thickness (Untreated) BIOGENIC CARBON CONTENT PER 1 m <sup>2</sup>		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	[kg C]	4.50E+00
Biogenic carbon content in accompanying packaging	[kg C]	9.59E-03
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO <sub>2</sub>	

Table 8: Biogenic carbon content at factory gate for 1 m<sup>2</sup> of Castleplank, Oak and Ash 16 mm

### Castleplank, Smoked Oak 16 mm thickness (Untreated):

Castleplank Smoked Oak 16 mm thickness (Untreated) ENVIRONMENTAL IMPACTS PER 1 m <sup>2</sup>							
Parameter	Unit	A1-A3	C1	C2	C3	C4	D
GWP-total	[kg CO <sub>2</sub> eq.]	-1.75E+00	0.00E+00	2.12E-01	2.24E+01	0.00E+00	-4.23E+00
GWP-fossil	[kg CO <sub>2</sub> eq.]	1.47E+01	0.00E+00	2.12E-01	3.32E+00	0.00E+00	-3.96E+00
GWP-biogenic	[kg CO <sub>2</sub> eq.]	-1.65E+01	0.00E+00	1.55E-04	1.90E+01	0.00E+00	-2.55E-01
GWP-luluc	[kg CO <sub>2</sub> eq.]	5.89E-02	0.00E+00	7.87E-05	2.04E-04	0.00E+00	-1.06E-02
ODP	[kg CFC 11 eq.]	2.24E-07	0.00E+00	4.53E-09	9.79E-09	0.00E+00	-1.10E-07
AP	[mol H <sup>+</sup> eq.]	9.00E-02	0.00E+00	6.55E-04	4.40E-03	0.00E+00	-1.83E-02
EP-freshwater	[kg PO <sub>4</sub> eq.]	5.68E-03	0.00E+00	1.23E-05	9.72E-05	0.00E+00	-2.50E-03
EP-marine	[kg N eq.]	2.76E-02	0.00E+00	2.32E-04	2.98E-03	0.00E+00	-4.61E-03
EP-terrestrial	[mol N eq.]	2.92E-01	0.00E+00	2.45E-03	2.30E-02	0.00E+00	-6.02E-02
POCP	[kg NMVOC eq.]	9.72E-02	0.00E+00	1.01E-03	5.67E-03	0.00E+00	-1.33E-02
ADPm <sup>1</sup>	[kg Sb eq.]	4.76E-05	0.00E+00	5.01E-07	7.59E-07	0.00E+00	-2.00E-05
ADPf <sup>1</sup>	[MJ]	2.35E+02	0.00E+00	2.93E+00	3.15E+00	0.00E+00	-6.09E+01
WDP <sup>1</sup>	[m <sup>3</sup> world eq. deprived]	1.01E+01	0.00E+00	1.08E-02	6.09E-02	0.00E+00	-5.56E-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 = Acidification; 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 use						
Disclaimer	<sup>1</sup> 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.						

Table 9: Core environmental impact indicators for 1 m<sup>2</sup> of Castleplank, Smoked Oak 16 mm.

Castleplank, Smoked Oak 16 mm thickness (Untreated) ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 m <sup>2</sup>							
Parameter	Unit	A1-A3	C1	C2	C3	C4	D
PM	[Disease incidence]	1.90E-06	0.00E+00	1.63E-08	2.60E-08	0.00E+00	-1.60E-07
IRP <sup>2</sup>	[kBq U235 eq.]	4.12E-01	0.00E+00	4.02E-03	2.24E-02	0.00E+00	-1.08E+00
ETP-fw <sup>1</sup>	[CTUe]	1.06E+02	0.00E+00	1.25E+00	9.20E+00	0.00E+00	-1.05E+01
HTP-c <sup>1</sup>	[CTUh]	3.91E-08	0.00E+00	3.88E-11	3.19E-10	0.00E+00	-1.10E-09
HTP-nc <sup>1</sup>	[CTUh]	9.40E-08	0.00E+00	8.29E-10	1.95E-08	0.00E+00	-2.10E-08
SQP	-	1.49E+03	0.00E+00	1.77E+00	1.56E+00	0.00E+00	-1.73E+02
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)						
Disclaimer	<sup>1</sup> 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.						
	<sup>2</sup> 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.						

Table 10: Additional environmental impact indicators for 1 m<sup>2</sup> of Castleplank, Smoked Oak 16 mm.

Castleplank, Smoked Oak 16 mm thickness (Untreated) RESOURCE USE PER 1 m <sup>2</sup>							
Parameter	Unit	A1-A3	C1	C2	C3	C4	D
PERE	[MJ]	3.13E+02	0.00E+00	4.30E-02	1.11E+02	0.00E+00	-7.44E+01
PERM	[MJ]	1.10E+02	0.00E+00	0.00E+00	-1.10E+02	0.00E+00	0.00E+00
PERT	[MJ]	4.23E+02	0.00E+00	4.30E-02	8.58E-01	0.00E+00	-7.44E+01
PENRE	[MJ]	1.97E+02	0.00E+00	2.93E+00	4.10E+01	0.00E+00	-6.09E+01
PENRM	[MJ]	3.79E+01	0.00E+00	0.00E+00	-3.79E+01	0.00E+00	0.00E+00
PENRT	[MJ]	2.35E+02	0.00E+00	2.93E+00	3.15E+00	0.00E+00	-6.09E+01
SM	[kg]	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
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m <sup>3</sup> ]	2.34E-01	0.00E+00	3.70E-04	7.95E-03	0.00E+00	-9.95E-02
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						

Table 11: Parameters describing resource use for 1 m<sup>2</sup> of Castleplank, Smoked Oak 16 mm.

Castleplank, Smoked Oak 16 mm thickness (Untreated) WASTE CATEGORIES AND OUTPUT FLOWS PER 1 m <sup>2</sup>							
Parameter	Unit	A1-A3	C1	C2	C3	C4	D
HWD	[kg]	7.13E-04	0.00E+00	1.86E-05	3.57E-05	0.00E+00	-1.30E-04
NHWD	[kg]	6.89E+00	0.00E+00	1.47E-01	1.14E+01	0.00E+00	-3.32E-01
RWD	[kg]	1.00E-04	0.00E+00	9.80E-07	5.32E-06	0.00E+00	-2.50E-04
CRU	[kg]	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
MER	[kg]	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	2.96E+01	0.00E+00	0.00E+00
EET	[MJ]	0.00E+00	0.00E+00	0.00E+00	1.11E+02	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; EE = Exported energy						

Table 12: End-of-life (waste categories and output flows) for 1 m<sup>2</sup> of Castleplank, Smoked Oak 16 mm.

Castleplank Smoked Oak 16 mm thickness (Untreated) BIOGENIC CARBON CONTENT PER 1 m <sup>2</sup>		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	[kg C]	4.50E+00
Biogenic carbon content in accompanying packaging	[kg C]	9.59E-03
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO <sub>2</sub>	

Table 13: Biogenic carbon content at factory gate for 1 m<sup>2</sup> of Castleplank, Smoked Oak 16 mm.

## Castleplank, Douglas Fir 16 mm thickness (Untreated):

Castleplank, Douglas Fir 16 mm thickness (Untreated) ENVIRONMENTAL IMPACTS PER 1 m <sup>2</sup>							
Parameter	Unit	A1-A3	C1	C2	C3	C4	D
GWP-total	[kg CO <sub>2</sub> eq.]	-1.85E+00	0.00E+00	2.00E-01	2.13E+01	0.00E+00	-4.03E+00
GWP-fossil	[kg CO <sub>2</sub> eq.]	1.35E+01	0.00E+00	2.00E-01	3.31E+00	0.00E+00	-3.78E+00
GWP-biogenic	[kg CO <sub>2</sub> eq.]	-1.54E+01	0.00E+00	1.47E-04	1.80E+01	0.00E+00	-2.43E-01
GWP-luluc	[kg CO <sub>2</sub> eq.]	6.19E-02	0.00E+00	7.43E-05	1.94E-04	0.00E+00	-1.01E-02
ODP	[kg CFC 11 eq.]	1.96E-07	0.00E+00	4.28E-09	9.54E-09	0.00E+00	-1.10E-07
AP	[mol H <sup>+</sup> eq.]	8.62E-02	0.00E+00	6.18E-04	4.29E-03	0.00E+00	-1.74E-02
EP-freshwater	[kg PO <sub>4</sub> eq.]	5.63E-03	0.00E+00	1.16E-05	9.19E-05	0.00E+00	-2.38E-03
EP-marine	[kg N eq.]	2.63E-02	0.00E+00	2.19E-04	2.93E-03	0.00E+00	-4.39E-03
EP-terrestrial	[mol N eq.]	2.78E-01	0.00E+00	2.31E-03	2.25E-02	0.00E+00	-5.74E-02
POCP	[kg NMVOC eq.]	9.30E-02	0.00E+00	9.50E-04	5.54E-03	0.00E+00	-1.27E-02
ADPm <sup>1</sup>	[kg Sb eq.]	4.35E-05	0.00E+00	4.73E-07	7.27E-07	0.00E+00	-1.90E-05
ADPf <sup>1</sup>	[MJ]	2.18E+02	0.00E+00	2.77E+00	3.03E+00	0.00E+00	-5.80E+01
WDP <sup>1</sup>	[m <sup>3</sup> world eq. deprived]	9.85E+00	0.00E+00	1.01E-02	5.90E-02	0.00E+00	-5.30E-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 = Acidification; 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 use						
Disclaimer	<sup>1</sup> 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.						

**Table 14: Core environmental impact indicators for 1 m<sup>2</sup> of Castleplank, Douglas Fir 16 mm.**

Castleplank, Douglas Fir 16 mm thickness (Untreated) ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 m <sup>2</sup>							
Parameter	Unit	A1-A3	C1	C2	C3	C4	D
PM	[Disease incidence]	1.77E-06	0.00E+00	1.54E-08	2.49E-08	0.00E+00	-1.50E-07
IRP <sup>2</sup>	[kBq U235 eq.]	3.65E-01	0.00E+00	3.80E-03	2.13E-02	0.00E+00	-1.03E+00
ETP-fw <sup>1</sup>	[CTUe]	1.02E+02	0.00E+00	1.18E+00	9.11E+00	0.00E+00	-1.00E+01
HTP-c <sup>1</sup>	[CTUh]	3.89E-08	0.00E+00	3.66E-11	3.00E-10	0.00E+00	-1.10E-09
HTP-nc <sup>1</sup>	[CTUh]	9.21E-08	0.00E+00	7.82E-10	1.84E-08	0.00E+00	-2.00E-08
SQP	-	1.44E+03	0.00E+00	1.67E+00	1.48E+00	0.00E+00	-1.65E+02
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)						
Disclaimer	<sup>1</sup> 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.						
	<sup>2</sup> 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.						

**Table 15: Additional environmental impact indicators for 1 m<sup>2</sup> of Castleplank, Douglas Fir 16 mm.**

Castleplank, Douglas Fir 16 mm thickness (Untreated) RESOURCE USE PER 1 m <sup>2</sup>							
Parameter	Unit	A1-A3	C1	C2	C3	C4	D
PERE	[MJ]	2.91E+02	0.00E+00	4.06E-02	1.04E+02	0.00E+00	-7.09E+01
PERM	[MJ]	1.03E+02	0.00E+00	0.00E+00	-1.03E+02	0.00E+00	0.00E+00
PERT	[MJ]	3.95E+02	0.00E+00	4.06E-02	8.11E-01	0.00E+00	-7.09E+01
PENRE	[MJ]	1.80E+02	0.00E+00	2.77E+00	4.09E+01	0.00E+00	-5.80E+01
PENRM	[MJ]	3.79E+01	0.00E+00	0.00E+00	-3.79E+01	0.00E+00	0.00E+00
PENRT	[MJ]	2.18E+02	0.00E+00	2.77E+00	3.03E+00	0.00E+00	-5.80E+01
SM	[kg]	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
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m <sup>3</sup> ]	2.34E-01	0.00E+00	3.70E-04	7.95E-03	0.00E+00	-9.95E-02
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						

Table 16: Parameters describing resource use for 1 m<sup>2</sup> of Castleplank, Douglas Fir 16 mm.

Castleplank, Douglas Fir 16 mm thickness (Untreated) WASTE CATEGORIES AND OUTPUT FLOWS PER 1 m <sup>2</sup>							
Parameter	Unit	A1-A3	C1	C2	C3	C4	D
HWD	[kg]	6.19E-04	0.00E+00	1.76E-05	3.41E-05	0.00E+00	-1.30E-04
NHWD	[kg]	6.29E+00	0.00E+00	1.38E-01	1.08E+01	0.00E+00	-3.17E-01
RWD	[kg]	8.90E-05	0.00E+00	9.25E-07	5.04E-06	0.00E+00	-2.40E-04
CRU	[kg]	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
MER	[kg]	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	2.82E+01	0.00E+00	0.00E+00
EET	[MJ]	0.00E+00	0.00E+00	0.00E+00	1.06E+02	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; EE = Exported energy						

Table 17: End-of-life (waste categories and output flows) for 1 m<sup>2</sup> of Castleplank, Douglas Fir 16 mm

Castleplank, Douglas Fir 16 mm thickness (Untreated) BIOGENIC CARBON CONTENT PER 1 m <sup>2</sup>		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	[kg C]	4.20E+00
Biogenic carbon content in accompanying packaging	[kg C]	9.59E-03
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO <sub>2</sub>	

Table 18: Biogenic carbon content at factory gate for 1 m<sup>2</sup> of Castleplank Douglas Fir 16 mm



# Additional Information

## Interpretation:

The [LCA results](#) for the declared products indicate, that the majority of environmental impacts are associated with raw material extraction and production of components (A1) particularly due to the use of adhesives in birch veneer and sawmill activities. In this respect, the use of resins for birch veneer and electricity consumption associated with production of components are considered the most significant contributors within the product system. It should be noted, that for the global warming potential (GWP), the uptake of biogenic carbon in Module A1 is equal to the release of biogenic carbon during the end-of-life stage (C1-C4) due to the mass balance approach (MBA) applied in the model. Module D is seen to counteract environmental impact throughout all impact categories by ≈15-25%. This can largely be attributed to the fact, that the declared products have a high calorific value since they primarily contain wood and resin. In this regard, municipal incineration implies the export of a relatively high quantity of energy (i.e. electricity and district heat), which in turn provides value to the subsequent product systems by substitution of energy elsewhere.

Regarding the supplementary dataset for optional surface treatment (See [Additional Information](#)), the environmental impacts are evenly distributed between the product stage (A1-A3) and municipal incineration during waste processing (C3). Overall, limited environmental impacts are seen given the limited mass per 1 m<sup>2</sup> of engineered wooden floor.

## Supplementary Datasets & Scaling Factors:

The following section provides a supplementary dataset that can be added onto the [LCA results](#) in order to account for two types of optional surface treatment at Hørning Parket A/S' suppliers during the raw material supply stage (A1). Scaling factors are simply calculated by dividing the desired thickness by thickness of the default dataset (16 mm). See the following example for calculating the scaling factor for the 24 mm variation of the declared product. Scaling factors should only be utilized within the declared range of the product i.e. 16-24 mm.

$$\frac{24 \text{ mm}}{16 \text{ mm}} = 1.5 \quad (\text{Eq. 1})$$

It should be noted, that the same amount of surface treatment is applied regardless of floor thickness. Because of this, scaling factors (See Table 3) should always be applied before adding the supplementary datasets to the results of the declared product. When applying a scaling factor to adjust the floor thickness or adding the optional surface treatment, the results of a specific module should hence be calculated using the following linear equation:

$$y = a * x + b \quad (\text{Eq. 2})$$

Where...

**y** = the impact results of the solid wooden floor. The specific results of a given floor variation depends on the thickness and optional surface treatment.

**a** = the impact of the untreated floor at the default thickness as listed in the [LCA results](#), which are displayed in Table 4 - Table 13

**x** = the scaling factor for adjusting the thickness of the solid wooden floor (See Table 3) if it deviates from the default dataset at 16 mm.

**b** = the impact of the optional surface treatment for the relevant products as listed in the supplementary datasets of Table 19 - Table 22.

The optional surface treatment come in the two variations: **UV oil treatment** (Table 19 - Table 22) and **Lacquer Treatment** (Table 23- Table 26) on the following pages.

## Supplementary Dataset – UV Oil Coating

UV Oil Coating (Optional) ENVIRONMENTAL IMPACTS PER 1 m <sup>2</sup>							
Parameter	Unit	A1-A3	C1	C2	C3	C4	D
GWP-total	[kg CO <sub>2</sub> eq.]	7.98E-02	0.00E+00	5.81E-04	7.31E-02	0.00E+00	-6.28E-03
GWP-fossil	[kg CO <sub>2</sub> eq.]	7.84E-02	0.00E+00	5.80E-04	7.30E-02	0.00E+00	-5.88E-03
GWP-biogenic	[kg CO <sub>2</sub> eq.]	1.03E-03	0.00E+00	4.38E-07	1.61E-05	0.00E+00	-3.50E-04
GWP-luluc	[kg CO <sub>2</sub> eq.]	3.32E-04	0.00E+00	2.06E-07	3.06E-06	0.00E+00	-1.40E-05
ODP	[kg CFC 11 eq.]	7.84E-09	0.00E+00	1.24E-11	6.26E-10	0.00E+00	-2.00E-10
AP	[mol H <sup>+</sup> eq.]	3.38E-04	0.00E+00	1.81E-06	5.26E-05	0.00E+00	-3.10E-05
EP-freshwater	[kg PO <sub>4</sub> eq.]	2.78E-05	0.00E+00	3.32E-08	7.75E-07	0.00E+00	-3.00E-06
EP-marine	[kg N eq.]	6.82E-05	0.00E+00	6.44E-07	9.85E-06	0.00E+00	-7.90E-06
EP-terrestrial	[mol N eq.]	6.83E-04	0.00E+00	6.81E-06	9.97E-05	0.00E+00	-1.10E-04
POCP	[kg NM/OC eq.]	3.49E-04	0.00E+00	2.83E-06	6.23E-05	0.00E+00	-2.40E-05
ADPm <sup>1</sup>	[kg Sb eq.]	5.43E-07	0.00E+00	1.20E-09	2.38E-08	0.00E+00	-2.40E-08
ADPf <sup>1</sup>	[MJ]	1.91E+00	0.00E+00	8.11E-03	3.25E-01	0.00E+00	-8.59E-02
WDP <sup>1</sup>	[m <sup>3</sup> world eq. deprived]	2.88E-02	0.00E+00	3.14E-05	1.31E-03	0.00E+00	-7.50E-04
Caption	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 = Ozone Depletion; AP = Acidification; 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 use						
Disclaimer	<sup>1</sup> 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.						

Table 19: Core environmental impact indicators for 1 m<sup>2</sup> of floor surface treatment with UV oil coating

UV Oil Coating (Optional) ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 m <sup>2</sup>							
Parameter	Unit	A1-A3	C1	C2	C3	C4	D
PM	[Disease incidence]	2.81E-09	0.00E+00	5.02E-11	5.70E-10	0.00E+00	-2.90E-10
IRP <sup>2</sup>	[kBq U235 eq.]	2.00E-02	0.00E+00	1.07E-05	2.76E-04	0.00E+00	-1.16E-03
ETP-fw <sup>1</sup>	[CTUe]	1.71E+00	0.00E+00	3.42E-03	1.31E-01	0.00E+00	-1.71E-02
HTP-c <sup>1</sup>	[CTUh]	3.45E-11	0.00E+00	1.02E-13	3.76E-12	0.00E+00	-1.90E-12
HTP-nc <sup>1</sup>	[CTUh]	1.65E-09	0.00E+00	2.24E-12	4.43E-11	0.00E+00	-3.60E-11
SQP	-	3.57E-01	0.00E+00	6.19E-03	2.12E-02	0.00E+00	-3.57E-01
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)						
Disclaimer	<sup>1</sup> 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.						
	<sup>2</sup> 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.						

Table 20: Additional environmental impact indicators for 1 m<sup>2</sup> of floor surface treatment with UV oil coating

UV Oil Coating (Optional) RESOURCE USE PER 1 m <sup>2</sup>							
Parameter	Unit	A1-A3	C1	C2	C3	C4	D
PERE	[MJ]	1.86E-01	0.00E+00	1.15E-04	2.52E-03	0.00E+00	-8.59E-02
PERM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	1.86E-01	0.00E+00	1.15E-04	2.52E-03	0.00E+00	-8.59E-02
PENRE	[MJ]	1.32E+00	0.00E+00	8.11E-03	7.19E-01	0.00E+00	-1.23E-01
PENRM	[MJ]	3.94E-01	0.00E+00	0.00E+00	-3.94E-01	0.00E+00	0.00E+00
PENRT	[MJ]	1.71E+00	0.00E+00	8.11E-03	3.25E-01	0.00E+00	-1.23E-01
SM	[kg]	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
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m <sup>3</sup> ]	9.80E-04	0.00E+00	1.11E-06	3.97E-05	0.00E+00	-2.50E-04
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						

**Table 21: Parameters describing resource use for 1 m<sup>2</sup> of floor surface treatment with UV oil coating**

UV Oil Coating (Optional) WASTE CATEGORIES AND OUTPUT FLOWS PER 1 m <sup>2</sup>							
Parameter	Unit	A1-A3	C1	C2	C3	C4	D
HWD	[kg]	5.69E-06	0.00E+00	5.10E-08	4.01E-06	0.00E+00	-4.20E-07
NHWD	[kg]	1.10E-02	0.00E+00	5.24E-04	1.74E-03	0.00E+00	-9.00E-04
RWD	[kg]	4.31E-06	0.00E+00	2.60E-09	6.70E-08	0.00E+00	-5.10E-07
CRU	[kg]	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
MER	[kg]	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	7.88E-02	0.00E+00	0.00E+00
EET	[MJ]	0.00E+00	0.00E+00	0.00E+00	2.95E-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; EE = Exported energy						

**Table 22: End-of-life (waste categories and output flows) for 1 m<sup>2</sup> of floor surface treatment with UV oil coating**

## Supplementary Dataset – Lacquer Treatment

Lacquer Treatment (Optional) ENVIRONMENTAL IMPACTS PER 1 m <sup>2</sup>							
Parameter	Unit	A1-A3	C1	C2	C3	C4	D
GWP-total	[kg CO <sub>2</sub> eq.]	2.33E-01	0.00E+00	1.45E-03	1.19E-01	0.00E+00	-2.74E-02
GWP-fossil	[kg CO <sub>2</sub> eq.]	2.31E-01	0.00E+00	1.45E-03	1.19E-01	0.00E+00	-2.56E-02
GWP-biogenic	[kg CO <sub>2</sub> eq.]	1.65E-03	0.00E+00	1.10E-06	1.15E-05	0.00E+00	-1.65E-03
GWP-luluc	[kg CO <sub>2</sub> eq.]	4.02E-04	0.00E+00	5.15E-07	2.35E-07	0.00E+00	-6.90E-05
ODP	[kg CFC 11 eq.]	3.52E-09	0.00E+00	3.10E-11	3.45E-11	0.00E+00	-7.20E-10
AP	[mol H <sup>+</sup> eq.]	9.43E-04	0.00E+00	4.53E-06	9.83E-06	0.00E+00	-1.20E-04
EP-freshwater	[kg PO <sub>4</sub> eq.]	5.79E-05	0.00E+00	8.31E-08	1.38E-07	0.00E+00	-1.60E-05
EP-marine	[kg N eq.]	1.72E-04	0.00E+00	1.61E-06	4.60E-06	0.00E+00	-3.00E-05
EP-terrestrial	[mol N eq.]	1.80E-03	0.00E+00	1.70E-05	5.04E-05	0.00E+00	-3.90E-04
POCP	[kg NMVOC eq.]	1.77E-03	0.00E+00	7.07E-06	1.29E-05	0.00E+00	-8.60E-05
ADPm <sup>1</sup>	[kg Sb eq.]	1.11E-06	0.00E+00	3.01E-09	2.03E-09	0.00E+00	-1.30E-07
ADPf <sup>1</sup>	[MJ]	4.56E+00	0.00E+00	2.03E-02	7.81E-03	0.00E+00	-3.93E-01
WDP <sup>1</sup>	[m <sup>3</sup> world eq. deprived]	1.66E-01	0.00E+00	7.85E-05	2.45E-04	0.00E+00	-3.59E-03
Caption	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 = Ozone Depletion; AP = Acidification; 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 use						
Disclaimer	<sup>1</sup> 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.						

**Table 23: Core environmental impact indicators for 1 m<sup>2</sup> of floor surface treatment with acrylic lacquer**

Lacquer Treatment (Optional) ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 m <sup>2</sup>							
Parameter	Unit	A1-A3	C1	C2	C3	C4	D
PM	[Disease incidence]	9.32E-09	0.00E+00	1.26E-10	8.22E-11	0.00E+00	-1.00E-09
IRP <sup>2</sup>	[kBq U235 eq.]	2.35E-02	0.00E+00	2.68E-05	2.61E-05	0.00E+00	-6.96E-03
ETP-fw <sup>1</sup>	[CTUe]	2.38E+00	0.00E+00	8.55E-03	2.50E-02	0.00E+00	-6.78E-02
HTP-c <sup>1</sup>	[CTUh]	4.00E-11	0.00E+00	2.56E-13	8.54E-11	0.00E+00	-7.20E-12
HTP-nc <sup>1</sup>	[CTUh]	9.08E-10	0.00E+00	5.61E-12	3.59E-10	0.00E+00	-1.30E-10
SQP	-	7.61E-01	0.00E+00	1.55E-02	3.36E-03	0.00E+00	-1.12E+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)						
Disclaimer	<sup>1</sup> 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.						
	<sup>2</sup> 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.						

**Table 24: Additional environmental impact indicators for 1 m<sup>2</sup> of floor surface treatment with acrylic lacquer**

Lacquer Treatment (Optional) RESOURCE USE PER 1 m <sup>2</sup>							
Parameter	Unit	A1-A3	C1	C2	C3	C4	D
PERE	[MJ]	3.18E-01	0.00E+00	2.87E-04	3.72E-04	0.00E+00	-4.81E-01
PERM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	3.18E-01	0.00E+00	2.87E-04	3.72E-04	0.00E+00	-4.81E-01
PENRE	[MJ]	3.58E+00	0.00E+00	2.03E-02	9.93E-01	0.00E+00	-3.93E-01
PENRM	[MJ]	9.85E-01	0.00E+00	0.00E+00	-9.85E-01	0.00E+00	0.00E+00
PENRT	[MJ]	4.56E+00	0.00E+00	2.03E-02	7.81E-03	0.00E+00	-3.93E-01
SM	[kg]	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
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m <sup>3</sup> ]	4.45E-03	0.00E+00	2.77E-06	2.68E-05	0.00E+00	-6.73E-04
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						

**Table 25: Parameters describing resource use for 1 m<sup>2</sup> of floor surface treatment with acrylic lacquer**

Lacquer Treatment (Optional) WASTE CATEGORIES AND OUTPUT FLOWS PER 1 m <sup>2</sup>							
Parameter	Unit	A1-A3	C1	C2	C3	C4	D
HWD	[kg]	9.66E-06	0.00E+00	1.28E-07	2.74E-07	0.00E+00	-8.60E-07
NHWD	[kg]	2.58E-02	0.00E+00	1.31E-03	1.47E-03	0.00E+00	-2.14E-03
RWD	[kg]	5.33E-06	0.00E+00	6.51E-09	6.44E-09	0.00E+00	-1.60E-06
CRU	[kg]	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
MER	[kg]	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	1.90E-01	0.00E+00	0.00E+00
EET	[MJ]	0.00E+00	0.00E+00	0.00E+00	7.20E-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; EE = Exported energy						

**Table 26: End-of-life (waste categories and output flows) for 1 m<sup>2</sup> of floor surface treatment with acrylic lacquer**



## Technical Information on Scenarios:

### End-of-life (C1-C4)

Scenario information	Unit	Value
For reuse	%	0
For recycling	%	0
For incineration	%	100
For final disposal	%	0
Assumptions for scenario development	As appropriate	N/A

**Table 27: Scenario information for the end-of-life stage (C1-C4)**

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

Scenario information	Unit	Value
Electricity	%	20%
Heat	%	75%
Loss	%	5%

**Table 28: Scenario information for re-use, recovery, and recycling potential (D)**

#### Indoor Air:

*The EPD does not give information on release of dangerous substances to indoor air because the horizontal standards on measurement of release of regulated dangerous substances from construction products using harmonized test methods according to the provisions of the respective technical committees for European product standards are not available.*



Certificates for indoor Air Comfort can be found at Hørning Parquet's webpage:

- <https://www.horningfloor.dk/miljoe/>

#### Soil and Water:

*The EPD does not give information on release of dangerous substances to soil and water because the horizontal standards on measurement of release of regulated dangerous substances from construction products using harmonized test methods according to the provisions of the respective technical committees for European product standards are not available.*

## References

<b>Publisher</b>	 epddanmark <a href="http://www.epddanmark.dk">www.epddanmark.dk</a>
<b>Programme operator</b>	Danish Technological Institute Buildings & Environment Gregersensvej DK-2630 Taastrup <a href="http://www.teknologisk.dk">www.teknologisk.dk</a>
<b>LCA-practitioner</b>	 NIRAS A/S Østre Havnegade 12 9000 Aalborg, Denmark LCA practitioners: Asbjørn Ulbjerg Bundgaard & Vegard Ruttenborg Internal review: Jesper Jakobsen
<b>LCA software /background data</b>	SimaPro 9.5.0.2 / ecoinvent 3.9.1
<b>3<sup>rd</sup> party verifier</b>	Life Cycle Assessment Consulting Linda Højbye

### General Programme Instructions

Version 2.0

[www.epddanmark.dk](http://www.epddanmark.dk)

### ecoinvent 3.9.1

<https://ecoinvent.org/>

### PR-23085-EN

LCA-report for Castleplank, NIRAS A/S (January 2024)

### EN 15804:2012+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 of 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

**CEN/TC 16970**

Sustainability of construction works – Guidance for the implementation of EN 15804

**ISO 14025:2010**

Environmental labels and declarations – Type III environmental declarations – Principles and procedures

**ISO 14040:2008**

Environmental management – Life cycle assessment – Principles and framework

**ISO 14044:2008**

Environmental management – Life cycle assessment – Requirements and guidelines