

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A2

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|--------------------------|--------------------------------------|
| Owner of the Declaration | MeisterWerke Schulte GmbH |
| Programme holder | Institut Bauen und Umwelt e.V. (IBU) |
| Publisher | Institut Bauen und Umwelt e.V. (IBU) |
| Declaration number | EPD-MWS-20220201-ICA1-EN |
| Issue date | 16.09.2022 |
| Valid to | 15.09.2027 |

Longlife parquet
MeisterWerke Schulte GmbH

www.ibu-epd.com | <https://epd-online.com>






ECO PLATFORM

EPD
VERIFIED



1. General Information

| | |
|--|---|
| MeisterWerke Schulte GmbH Programme holder IBU – Institut Bauen und Umwelt e.V. Hegelplatz 1 10117 Berlin Germany | Longlife parquet Owner of the declaration MeisterWerke Schulte GmbH Johannes-Schulte-Allee 5 59602 R then-Meiste |
| Declaration number EPD-MWS-20220201-ICA1-EN | Declared product / declared unit 1 m  Longlife parquet (11 kg/m ). |
| This declaration is based on the product category rules: Solid wood products, 01.2019 (PCR checked and approved by the SVR) | Scope: This EPD applies for one square metre of Longlife parquet in the plank and 3-strip variants, manufactured in 59602 R then-Meiste, Germany. An average of these two products is declared. |
| Issue date 16.09.2022 | The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences. The EPD was created according to the specifications of <i>EN 15804+A2</i> . In the following, the standard will be simplified as <i>EN 15804</i> . |
| Valid to 15.09.2027 | Verification The standard <i>EN 15804</i> serves as the core PCR Independent verification of the declaration and data according to <i>ISO 14025:2011</i> <input type="checkbox"/> internally <input checked="" type="checkbox"/> externally |
|  Dipl. Ing. Hans Peters (chairman of Institut Bauen und Umwelt e.V.) |  Prof. Dr. Birgit Grahl (Independent verifier) |
|  Dr. Alexander R der (Managing Director Institut Bauen und Umwelt e.V.) | |

2. Product

2.1 Product description/Product definition

The product consists of multi-layer parquet flooring with high-density fibreboard (HDF) as a middle layer, a real wood covering layer made of oak and real wood veneer backing. Depending on the design, the top layer consists of a single lamella (plank / 1-strip) or sawn sections (ship's floor / 3-strip). The products feature an oiled or varnished surface ready for residential use and can be joined together as elements without glue using a special tongue-and-groove geometry. MEISTERWERKE markets the parquet products under the "MeisterParkett. longlife" brand (<http://meister.com>).

(EU) Directive No. 305/2011 (CPR) applies for placing the product on the market in the European Union / EFTA (with the exception of Switzerland). The products have a Declaration of Performance (DoP) and must bear a CE marking taking consideration of the harmonised *DIN EN 14342:2013-09, Wood flooring and parquet - Characteristics, evaluation of conformity and marking*.

The respective national regulations apply for usage.

The *EN 13489* is of relevance as another product-specific standard.

2.2 Application

MEISTER Longlife parquet are wood flooring products in accordance with *EN 13489*, which are suitable for private and commercial use, depending on the respective variant. The floor coverings are laid on screeds, tiles or wooden substructures in conjunction with suitable laying underlays (insulation underlays) as a floating installation or glued to the screed over the entire surface. In all cases, the corresponding MEISTERWERKE installation conditions and subfloor requirements must be observed (<http://www.meister.com>).

2.3 Technical Data

Constructional data

| Name | Value | Unit |
|--|----------------------|-------|
| Formaldehyde emissions in accordance with EN 717-1 | < 10 |  g/m  |
| Total thickness | 13 (+/- 1) | mm |
| Length (min. - max.) | 500 - 2400 | mm |
| Width (min. - max.) | 100 - 255 | mm |
| Wear layer with |   2,5 | mm |
| Basis weight | approx. 11 (+/- 0,5) | kg/m  |

| | | |
|--------------------------------|-----------|---|
| Covering layer timber moisture | 7 (+/- 2) | % |
|--------------------------------|-----------|---|

The formaldehyde emissions indicated are to be understood as maximum values.

Product according to Construction Products Regulation (CPR) with harmonised standards hEN:

Performance values of the product according to the Declaration of Performance (DoP) in relation to its essential characteristics according to *DIN EN 14342:2013-09, Wood flooring and parquet - Characteristics, evaluation of conformity and marking*.

2.4 Delivery status

All products are supplied in packaging units. The dimensions/quantities of the declared products as delivered are within the following ranges:

- Length: 500–2400 mm
- Width: 100–255 mm
- Thickness: 13 mm
- m²/pack: 0.40–2.45 m²

2.5 Base materials/Ancillary materials

The averaged proportions of ingredients per m² as a mass percentage for the EPD are as follows:

- 72% middle layer (HDF, high-density fibreboard)
- 16% covering layer (oak)
- 10% backing (spruce veneer)
- 2% glueing and surface treatment (varnishes and oils)

The product/at least part of the product contains substances on the *ECHA List of Candidates* (dated 17.01.2022) above 0.1% by mass: no

The product/at least one sub-product contains other 1A or 1B category CMR substances not on the list of candidates which are above 0.1% by mass in at least one sub-product: no

Biocidal products have been added to the present construction product or it has been treated with biocidal products (it is therefore a treated product according to the Biocidal Products Regulation (EU) No 528/2012): no

2.6 Manufacture

For the production of MEISTER Longlife parquet, partly-finished top layers, raw friezes and kiln-dried woods are used, which, depending on the design, are formatted, ripped and glued into finished top layers. The finished top layers are then sorted according to growth characteristics. A finished high-density fibreboard (HDF) is used for the middle layer and a spruce veneer is used as a backing. The three layers are glued and pressed together, and then separated into individual formats. In the case of individual formats, knots and cracks can be partially filled. The surface is then lacquered or oiled. For glue-free installation, the individual planks are equipped and packaged with a special tongue-and-groove geometry.

2.7 Environment and health during manufacturing

Due to the manufacturing conditions, no environmental and health protection measures beyond the regulations

of valid EU regulations as well as national legal and other regulations are required. This also includes compliance with or falling below the occupational exposure limit values (OELs) in the manufacturing process.

2.8 Product processing/Installation

MEISTER Longlife parquet can be sawn, milled, planed and drilled with standard stationary machines as well as (electric) hand machines. Respiratory protection should be worn when using hand tools without suction. Required tools and machines may only be used as intended and in accordance with the operating instructions of the respective manufacturer. The usual safety precautions (e.g., hearing protection depending on the machine, protective goggles and dust mask when sawing) must be taken into account. The resulting sawdust should be extracted. The products must be stored in a dry place. MEISTER Longlife parquet can be glued down or, in conjunction with suitable installation underlays, laid as a floating floor. In all cases, the corresponding MEISTERWERKE installation conditions and subfloor requirements must be observed (<http://www.meister.com>).

During processing/installation, the usual safety regulations for processing (protective goggles, dust mask in case of dust formation, ear protection depending on the machine, etc.) must be observed. For commercial processing, the regulations of the employers' liability insurance associations must be observed. Residual material (cuttings and packaging) generated on the construction site must be collected separately according to waste fractions. For disposal, the regulations of the local disposal authorities as well as the instructions given under 2.15 "Disposal" must be observed.

2.9 Packaging

Paper and cardboard, wood, polyethylene and other plastics are used. Packaging materials must be collected separately and recycled in accordance with local legal requirements. Euro pallets can be reused multiple times or, like disposable pallets, recycled as waste wood before thermal recovery.

2.10 Condition of use

The composition for the period of use corresponds to the basic material composition according to 2.5. "Base materials". Wood is a hygroscopic material which means it responds to changes in room climate. In the course of use, it is therefore important to ensure a balanced indoor climate to avoid possible dimensional changes. Appropriate measures to maintain the value must be observed in accordance with the installation/maintenance instructions (<http://www.meister.com>).

2.11 Environment and health during use

No health damage or impairment is to be expected under normal intended use. Hazards to water, air/atmosphere and soil cannot arise when multi-layered parquet flooring is used as directed. Multi-layered parquet flooring is a natural CO₂ reservoir. It can be sanded and resurfaced at

least once. Multiple use in other rooms is also possible. In addition, multi-layered parquet flooring can be recycled.

2.12 Reference service life

In the reference table of the BNB (sustainable building assessment system), a service life of 40 years is given for multi-layered parquet flooring (code no. 352.812).

2.13 Extraordinary effects

Fire

Indication of building material class in accordance with EN 13501-1. Building material class D corresponds to "normal flammability". When bonded over the entire surface with UZIN MK 250 NEW adhesive, building material class C "hardly flammable" is achieved.

Brandschutz

| Name | Value |
|---|-------|
| Building material class floating installation | Dfl |
| Burning droplets full-surface bonding | Cfl |
| Smoke gas development | s1 |

Water

When exposed to water, no ingredients are washed out that could be hazardous to water. The floor covering is not resistant to permanent exposure to water.

Mechanical destruction

Mechanical damage can be repaired locally. The fracture pattern of multi-layered parquet depends on the type of wood. Splinters and splinter formation may occur at the fracture edges (risk of injury).

2.14 Re-use phase

The product can be easily reused or re-purposed in case of selective deconstruction after the end-of-use phase. If repeated use as flooring is no longer possible, the wood can continue to be used materially, e.g., as a raw material for the production of wood-based panels, again with several cascades of use possible. If the product cannot be recycled, it is sent for thermal utilisation to generate process heat and electricity due to its high calorific value of approx. 18 MJ/kg.

2.15 Disposal

Residues and waste from multi-layered parquet are to be recycled according to AVV 17 02 01 and AVV 03 01 05. Landfilling of waste wood is not permitted in Germany according to the Waste Wood Ordinance (AltholzV) and AVV 17 02 01, nor is it necessary according to 2.14 "Reuse phase".

2.16 Further information

Further information is available at www.meister.com.

3. LCA: Calculation rules

3.1 Declared Unit

The declared unit is 1 m² Longlife parquet. The averaging was based on the square metre produced in the period under consideration for the weighting of inputs and outputs.

Declared unit

| Name | Value | Unit |
|---------------------------|--------|-------------------|
| Declared unit | 1 | m ² |
| Grammage | 10.858 | kg/m ² |
| Gross density | 835 | kg/m ³ |
| Wood moisture on delivery | 5 - 9 | % |
| Thickness | 13 | mm |

3.2 System boundary

Type of EPD: Cradle to plant gate, with options

Modules A1–A3 and A5

Modules A1–A3 take into account the production of the necessary raw materials and energies, including all corresponding upstream chains as well as procurement transports.

In addition, the entire manufacturing phase, including the treatment of production waste until the end-of-waste (EoW) status is reached, is considered. Module A5 balances the recycling of packaging materials.

Modules B2 and B5

Module B2 considers the cleaning and oiling of the parquet, including the ancillary materials required for this, as well as the treatment of the waste and wastewater produced in the process.

Module B5 declares the renovation of the parquet, including the treatment of the waste generated in the process.

Modules C1–C4 and D

No expenses are considered for dismantling (Module C1), since manual dismantling is assumed.

In Module C2, the transports to the disposal processes are considered.

Module C3 contains the necessary processes for waste treatment at the end of the product life cycle. Two scenarios were considered: Thermal recycling (Scenario 1) and material recycling (Scenario 2). The loads for the waste treatment are represented in this until the end of the waste property is reached.

Resulting potentials and avoided loads outside the system boundary are assigned to Module D.

No materials are landfilled, so no loads/benefits are modelled in Module C4.

3.3 Estimates and assumptions

For the disposal transports (Module C2), a distance of 100 km and a utilisation rate of 50% were assumed.

3.4 Cut-off criteria

The sum of the neglected processes is <1% of the material inputs.

It can therefore be assumed that the sum of the neglected processes does not exceed 5% of the impact categories considered

3.5 Background data

As a general rule, the *GaBi* background database in content version 2021.1 was used. If no matching records were available in the *GaBi* background

database, records from the *ecoinvent 3.6* database were used.

3.6 Data quality

The foreground data were provided by MeisterWerke Schulte GmbH and checked for plausibility. The quality and representativeness of the primary data can therefore be considered high.

The data quality of the background data was rated as good in terms of temporal, technical, and geographic representativeness.

With regard to the robustness of the LCA values, it can be stated that the balanced potential environmental impacts largely result from the background data.

3.7 Period under review

Primary data was collected for the year 2019.

3.8 Allocation

Modules A1–A3

Wood residues that are thermally recycled internally were considered in the closed loop.

An economic allocation of the by-products was not performed, since the product value exceeds that of the by-products many times over and no significant influence on the LCA results is to be expected.

3.9 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account.

The *GaBi* background database Content Version 2021.1 was used.

4. LCA: Scenarios and additional technical information

Characteristic product properties

Information on biogenic carbon

Information describing the biogenic carbon content at the plant gate

| Name | Value | Unit |
|---|-------|------|
| Biogenic Carbon Content in product | 4.99 | kg C |
| Biogenic Carbon Content in accompanying packaging | 0.11 | kg C |

The following technical information was used for modelling. A service life of 40 years was assumed.

Construction-installation process (A5)

| Name | Value | Unit |
|---|-------|------|
| Output substances following waste treatment on site | 0.292 | kg |

Maintenance (B2)

| Name | Value | Unit |
|---|--------|-------------|
| Information on maintenance (vacuuming, damp cleaning, oiling) | - | - |
| Maintenance cycle (vacuuming, twice weekly) | 4160 | Number/R SL |
| Electricity consumption (vacuum cleaning) | 12.48 | kWh |
| Maintenance cycle (damp cleaning, twice monthly) | 960 | Number/R SL |
| Water consumption (damp cleaning) | 0,19 | m3 |
| Cleaning agents (damp cleaning) | 0,38 | litres |
| Maintenance cycle (oiling, every 5 years) | 6 | Number/R SL |
| Water consumption (oiling) | 0,0003 | m3 |
| Cleaning agents (oiling) | 0,0007 | litres |
| Pads (oiling) | 0,06 | pieces |
| Oil | 0,05 | kg |

Reference service life

| Name | Value | Unit |
|-------------------------------|-------|------|
| Life Span (according to BBSR) | 40 | a |

End of Life (C1–C4)

| Name | Value | Unit |
|-----------------------------------|--------|------|
| Collected separately (waste wood) | 10.531 | kg |
| Recycling (scenario 2) | 10.531 | kg |
| Energy recovery (scenario 1) | 10.531 | kg |
| Landfilling | 0 | kg |

Reuse, recovery and recycling potential (D), relevant scenario information

| Name | Value | Unit |
|------------|--------|------|
| Waste wood | 10,531 | kg |

5. LCA: Results

The LCA results for the B modules (use phase) refer to a service life of 40 years. The parameters used as a basis can be found in section 4.

Two scenarios were considered for the end-of-life journey:

- Scenario 1: Thermal utilisation
- Scenario 2: Material utilisation

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; ND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

| PRODUCT STAGE | | | CONSTRUCTION PROCESS STAGE | | USE STAGE | | | | | | | END OF LIFE STAGE | | | | BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES |
|---------------------|-----------|---------------|-------------------------------------|----------|-----------|-------------|--------|-------------|---------------|------------------------|-----------------------|----------------------------|-----------|------------------|----------|---|
| Raw material supply | Transport | Manufacturing | Transport from the gate to the site | Assembly | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-construction demolition | Transport | Waste processing | Disposal | |
| A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| X | X | X | ND | X | ND | X | MNR | MNR | X | ND | ND | X | X | X | X | X |

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m² Longlife parquet

| Core Indicator | Unit | A1-A3 | A5 | B2 | B5 | C1 | C2 | C3/1 | C3/2 | C4 | D/1 | D/2 |
|----------------|------------------------------------|----------|----------|----------|----------|---------|----------|----------|---------|---------|-----------|----------|
| GWP-total | [kg CO ₂ -Eq.] | -9.09E+0 | 4.92E-1 | 5.39E+0 | 8.57E-2 | 0.00E+0 | 1.23E-1 | 1.91E+1 | 1.82E+1 | 0.00E+0 | -6.87E+0 | -1.67E-1 |
| GWP-fossil | [kg CO ₂ -Eq.] | 9.56E+0 | 1.01E-1 | 5.43E+0 | 7.32E-1 | 0.00E+0 | 1.22E-1 | 2.82E-1 | 9.21E-2 | 0.00E+0 | -6.86E+0 | -3.29E-1 |
| GWP-biogenic | [kg CO ₂ -Eq.] | -1.87E+1 | 3.91E-1 | 0.00E+0 | -6.47E-1 | 0.00E+0 | 0.00E+0 | 1.88E+1 | 1.81E+1 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| GWP-luluc | [kg CO ₂ -Eq.] | 2.41E-2 | 3.13E-5 | 7.18E-3 | 6.11E-4 | 0.00E+0 | 1.00E-3 | 1.81E-4 | 2.07E-4 | 0.00E+0 | -4.76E-3 | -1.83E-3 |
| ODP | [kg CFC11-Eq.] | 1.92E-8 | 5.85E-17 | 1.21E-13 | 8.30E-15 | 0.00E+0 | 2.42E-17 | 2.50E-15 | 7.71E-9 | 0.00E+0 | -7.87E-14 | -2.77E-8 |
| AP | [mol H ⁺ -Eq.] | 3.05E-2 | 6.83E-5 | 1.11E-2 | 1.45E-3 | 0.00E+0 | 1.43E-4 | 2.71E-3 | 5.09E-4 | 0.00E+0 | -8.99E-3 | -1.84E-3 |
| EP-freshwater | [kg P-Eq.] | 9.07E-5 | 1.78E-8 | 1.35E-4 | 1.58E-6 | 0.00E+0 | 3.64E-7 | 3.42E-7 | 8.85E-5 | 0.00E+0 | -9.00E-6 | -1.38E-4 |
| EP-marine | [kg N-Eq.] | 1.31E-2 | 2.14E-5 | 3.11E-3 | 3.76E-4 | 0.00E+0 | 4.79E-5 | 8.90E-4 | 8.80E-5 | 0.00E+0 | -2.55E-3 | -4.69E-4 |
| EP-terrestrial | [mol N-Eq.] | 1.19E-1 | 3.22E-4 | 2.80E-2 | 4.17E-3 | 0.00E+0 | 5.65E-4 | 1.29E-2 | 8.34E-4 | 0.00E+0 | -2.73E-2 | -4.89E-3 |
| POCP | [kg NMVOC-Eq.] | 3.70E-2 | 5.84E-5 | 7.53E-3 | 1.18E-3 | 0.00E+0 | 1.25E-4 | 2.42E-3 | 2.18E-4 | 0.00E+0 | -7.17E-3 | -1.54E-3 |
| ADPE | [kg Sb-Eq.] | 9.06E-6 | 1.18E-9 | 1.50E-6 | 1.30E-7 | 0.00E+0 | 1.09E-8 | 3.81E-8 | 3.55E-7 | 0.00E+0 | -1.14E-6 | -3.26E-6 |
| ADPF | [MJ] | 1.78E+2 | 1.40E-1 | 9.76E+1 | 1.55E+1 | 0.00E+0 | 1.63E+0 | 4.14E+0 | 2.13E+0 | 0.00E+0 | -1.19E+2 | -5.07E+0 |
| WDP | [m ³ world-Eq deprived] | 1.01E+0 | 4.87E-2 | 8.79E-1 | 2.34E-1 | 0.00E+0 | 1.14E-3 | 1.97E+0 | 6.70E-2 | 0.00E+0 | -5.28E-1 | -8.40E-2 |

Caption GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 m² Longlife parquet

| Indicator | Unit | A1-A3 | A5 | B2 | B5 | C1 | C2 | C3/1 | C3/2 | C4 | D/1 | D/2 |
|-----------|-------------------|---------|---------|---------|---------|---------|---------|----------|---------|---------|----------|----------|
| PERE | [MJ] | 1.43E+2 | 2.12E-2 | 4.13E+1 | 3.03E+0 | 0.00E+0 | 9.39E-2 | 1.79E+2 | 3.13E-1 | 0.00E+0 | -2.70E+1 | -4.72E+1 |
| PERM | [MJ] | 1.82E+2 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | -1.78E+2 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| PERT | [MJ] | 3.25E+2 | 2.12E-2 | 4.13E+1 | 3.03E+0 | 0.00E+0 | 9.39E-2 | 8.04E-1 | 3.13E-1 | 0.00E+0 | -2.70E+1 | -4.72E+1 |
| PENRE | [MJ] | 1.72E+2 | 1.40E-1 | 9.77E+1 | 1.55E+1 | 0.00E+0 | 1.64E+0 | 9.69E+0 | 2.13E+0 | 0.00E+0 | -1.19E+2 | -5.07E+0 |
| PENRM | [MJ] | 6.81E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | -5.54E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| PENRT | [MJ] | 1.79E+2 | 1.40E-1 | 9.77E+1 | 1.55E+1 | 0.00E+0 | 1.64E+0 | 4.15E+0 | 2.13E+0 | 0.00E+0 | -1.19E+2 | -5.07E+0 |
| SM | [kg] | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| RSF | [MJ] | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 1.78E+2 | 0.00E+0 |
| NRSF | [MJ] | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| FW | [m ³] | 5.48E-2 | 1.15E-3 | 4.19E-2 | 7.27E-3 | 0.00E+0 | 1.08E-4 | 4.63E-2 | 1.56E-3 | 0.00E+0 | -2.64E-2 | -1.96E-3 |

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 = Use of net fresh water

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 m² Longlife parquet

| Indicator | Unit | A1-A3 | A5 | B2 | B5 | C1 | C2 | C3/1 | C3/2 | C4 | D/1 | D/2 |
|-----------|------|---------|----------|---------|---------|---------|----------|----------|---------|---------|----------|---------|
| HWD | [kg] | 3.30E-7 | 1.96E-11 | 2.41E-8 | 3.18E-9 | 0.00E+0 | 8.63E-11 | 7.48E-10 | 0.00E+0 | 0.00E+0 | -2.68E-8 | 0.00E+0 |
| NHWD | [kg] | 2.15E-1 | 3.16E-3 | 2.64E-1 | 2.22E-2 | 0.00E+0 | 2.57E-4 | 1.37E-1 | 0.00E+0 | 0.00E+0 | -5.60E-2 | 0.00E+0 |
| RWD | [kg] | 7.44E-3 | 5.41E-6 | 1.33E-2 | 8.95E-4 | 0.00E+0 | 2.97E-6 | 2.30E-4 | 0.00E+0 | 0.00E+0 | -8.70E-3 | 0.00E+0 |
| CRU | [kg] | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| MFR | [kg] | 0.00E+0 | 4.11E-2 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| MER | [kg] | 1.02E+0 | 2.44E-1 | 6.34E-2 | 4.84E-1 | 0.00E+0 | 0.00E+0 | 1.05E+1 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| EEE | [MJ] | 0.00E+0 | 7.58E-1 | 0.00E+0 | 1.36E+0 | 0.00E+0 | 0.00E+0 | 2.76E+1 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| EET | [MJ] | 0.00E+0 | 1.36E+0 | 0.00E+0 | 2.44E+0 | 0.00E+0 | 0.00E+0 | 4.95E+1 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |

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

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 m² Longlife parquet

| Indicator | Unit | A1-A3 | A5 | B2 | B5 | C1 | C2 | C3/1 | C3/2 | C4 | D/1 | D/2 |
|-----------|---------------------|-------|----|----|----|----|----|------|------|----|-----|-----|
| PM | [Disease Incidence] | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| IRP | [kBq U235-Eq.] | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| ETP-fw | [CTUe] | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| HTP-c | [CTUh] | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| HTP-nc | [CTUh] | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| SQP | [-] | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

| | |
|---------|---|
| Caption | PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index |
|---------|---|

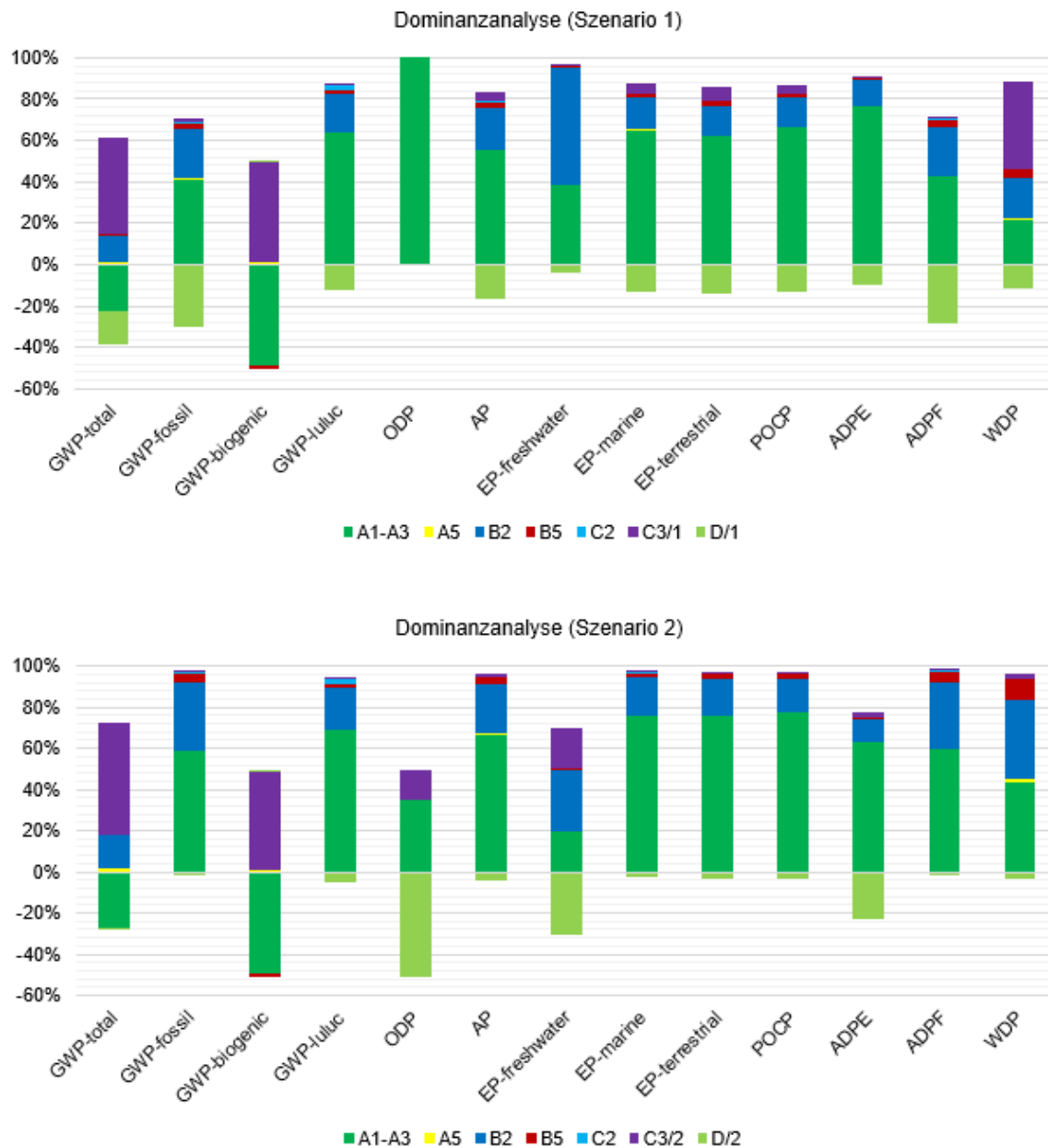
Limitation note 1 - applies to the indicator "Potential effect from human exposure to U235".

This effect category mainly deals with the possible effect of low-dose ionising radiation on human health in the nuclear fuel cycle. It does not consider effects attributable to possible nuclear accidents and occupational exposures, nor does it consider radioactive waste disposal in underground facilities. The potential ionising radiation from soil, radon and some building materials is also not measured by this indicator.

Limitation note 2 – applies to the indicators: "Potential for abiotic resource depletion for non-fossil resources", "Potential for abiotic resource depletion for fossil resources", "Water depletion potential (user), depletion-weighted water use", "Potential toxicity comparison for ecosystems", "Potential toxicity comparison for humans (carcinogenic effect)", "Potential toxicity comparison for humans (non-carcinogenic effect)", "Potential soil quality index".

The results of this environmental impact indicator must be used with caution, as uncertainties in these results are high or because there is limited experience with the indicator.

6. LCA: Interpretation



The dominance analysis shows that especially the manufacturing phase (Modules A1–A3) as well as maintenance (Module B2) contribute to the potential environmental impacts in the listed indicators. In Module B2, the energy requirement for vacuuming in particular has an influence on the potential environmental impacts. End-of-life parquet recovery (Module C3) contributes significantly to the Global Warming Potential – total (GWP total), Global Warming Potential – biogenic (GWP biogenic), and Water Removal Potential (WDP) indicators. When the parquet floor is thermally recycled, the biogenic carbon stored in the product is emitted as biogenic CO₂ emissions. During material recycling, biogenic carbon leaves the system boundary. This is the rationale for balancing the sum of biogenic CO₂ emissions over the life cycle of the product.

In the manufacturing phase (Modules A1–A3), the electrical energy required for production and the materials for the middle layer in particular contribute to the potential environmental impacts. The influence of the middle layer can be explained by the high proportion of mass in the product. For example, middle-layer materials contribute 44% to the Global Warming Potential – Fossil (GWP fossil) indicator, and electrical energy demand contributes 30%. The indicators stratospheric ozone depletion potential (ODP), eutrophication potential – fresh water (EP fresh water), and potential for depletion of abiotic resources – non-fossil resources (ADPE) are exceptions. ODP and EP fresh water are dominated by the data set used for the log, ADPE by the glue.

Range of results

Due to the low variance of the products in terms of thickness and weight per m² (see section 2.3), a significant range of results cannot be assumed.

7. Requisite evidence

VOC emissions

The products were tested at *eco-INSTITUT* on 22.04.2021 (test report 56207-001 / -002) according to AgBB scheme with the following values..

AgBB result overview (28 days [$\mu\text{g}/\text{m}^3$])

| Name | Value | Unit |
|-------------------------|-------|--------------------------|
| TVOC (C6 - C16) | 160 | $\mu\text{g}/\text{m}^3$ |
| Sum SVOC (C16 - C22) | < 5 | $\mu\text{g}/\text{m}^3$ |
| R (dimensionless) | 0.63 | - |
| VOC without NIK | 20 | $\mu\text{g}/\text{m}^3$ |
| Carcinogenic Substances | < 1 | $\mu\text{g}/\text{m}^3$ |

AgBB result overview (3 days [$\mu\text{g}/\text{m}^3$])

| Name | Value | Unit |
|-------------------------|-------|--------------------------|
| TVOC (C6 - C16) | 730 | $\mu\text{g}/\text{m}^3$ |
| Sum SVOC (C16 - C22) | < 5 | $\mu\text{g}/\text{m}^3$ |
| R (dimensionless) | 1.56 | - |
| VOC without NIK | 160 | $\mu\text{g}/\text{m}^3$ |
| Carcinogenic Substances | < 1 | $\mu\text{g}/\text{m}^3$ |

The values given are to be understood as maximum values and may be lower depending on the surface treatment. The real values can be requested from MEISTERWERKE.

The products meet the requirements of the *Blue Angel eco-label* according to RAL UZ 176 (label usage contract no. 26003).

Formaldehyde

The products were tested at *EPH* on 20.08.2021 (test report 2721282) with the maximum value given in section 2.3.

8. References

Standards

EN 717-1

DIN EN 717-1:2005-01, Wood-based panels - Determination of formaldehyde emission - Part 1: Formaldehyde release according to the test chamber method

EN 13183-1

DIN EN 13183-1:2002-07, Moisture content of a piece of sawn timber - Part 1: Determination by oven dry method

EN 13489

DIN EN 13489:2017-12, Wood flooring and parquet - Multi-layer parquet elements

EN 13501-1

DIN EN 13501-1:2019-05, Fire classification of construction products and types of construction - Part 1: Classification with the results from the tests on the fire behaviour of building products

EN 14342

DIN EN 14342:2013-09, Wood flooring and parquet - Characteristics, evaluation of conformity and marking

EN 15804

DIN EN 15804:2012+A2:2019, Sustainability of construction works - Environmental product declarations - Basic rules for the product category construction products

ISO 14025

DIN EN ISO 14025:2011-10, Environmental labels and declarations - Type III environmental declarations - Principles and procedures

Other literature

AgBB scheme

AgBB scheme, August 2018: Indoor air quality requirements for buildings. Committee for the health evaluation of emissions of volatile organic compounds (VOCs, VOCs and SVOCs) from building products.

AltholzV

Ordinance on Requirements for the Recovery and Disposal of Waste Wood (AltholzV) of 15 August 2002 (BGBl. I p. 3302), as last amended by Article 120 of the Ordinance of 19 June 2020 (BGBl. I p. 1328)

AVV

Waste Catalogue Ordinance (AVV) of 10 December 2001 (BGBl. I p. 3379), last amended by Article 2 of the Ordinance of 30 June 2020 (BGBl. I p. 1533).

Blue Angel

Blue Angel eco-label in accordance with RAL UZ 176, eco-label for low-emission floor coverings, panels and doors made of wood and wood-based materials for interiors; label utilisation contract no. 26003

BNB

BNB code no. 352.812. Service lives of building components for life cycle analyses according to the Sustainable Building Assessment System, 2017: Multi-layered parquet. Berlin: Federal Ministry of the Interior, Construction and Homeland

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List of Substances of Very High Concern (SVHC) Candidates for Authorisation (ECHA List of Candidates), dated 17.01.2022, published in accordance with Article 59(10) of the REACH Regulation. Helsinki: European Chemicals Agency

eco-INSTITUT

eco-INSTITUT Germany GmbH, D-51063 Cologne; Test report 56207-001 / -002, 22.04.2021

ecoinvent 3.6

ecoinvent 3.6 Database on Life Cycle Inventories (Life Cycle Inventory data), ecoinvent Association, Zurich, 2020

EPH

Entwicklungs- und Prüflabor Holztechnologie GmbH, D-01217 Dresden; Test report 2721282, 20.08.2021

GaBi

GaBi 10.6: Software system and database for life cycle engineering, Sphera Solutions GmbH, Leinfelden-Echterdingen, 2021

IBU 2021

General instructions for the EPD range of Institut Bauen und Umwelt e.V. (IBU); Version 2.0, Berlin:

Institut Bauen und Umwelt e.V., 2021. www.ibu-epd.com

PCR, Part A

Product category rules for building-related products and services Part A: Calculation rules for LCA and requirements for the project report according to EN 15804+A2:2019, version 1.2.; Berlin: Institut Bauen und Umwelt e.V. (pub.), 2021

PCR: Solid wood products

Product category rules for building-related products and services Part B: Requirements on the EPD for solid wood products, version 1.1.; Berlin: Institut Bauen und Umwelt e.V. (pub.), 10.12.2018

Regulation (EU) No. 305/2011

Regulation (EU) No. 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonized conditions for the marketing of construction products and repealing Council Directive 89/106/EEC

<https://eur-lex.europa.eu/legal-content/DE/TXT/PDF/?uri=CELEX:02011R0305-20210716&from=EN>

**Publisher**

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