

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A2



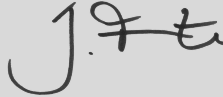
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m.look high pressure laminates
Fundermax GmbH

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



1. General Information

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|---|---|---|--|---|--|-------------------------------------|--|
| <p>Fundermax GmbH</p> <hr/> <p>Programme holder IBU – Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany</p> <hr/> <p>Declaration number EPD-FMX-20210204-IBC1-EN</p> <hr/> <p>This declaration is based on the product category rules: Laminates, 10.2018 (PCR checked and approved by the SVR)</p> <hr/> <p>Issue date 28.10.2021</p> <hr/> <p>Valid to 07.10.2026</p> <hr/> <p></p> <hr/> <p>Dipl. Ing. Hans Peters (chairman of Institut Bauen und Umwelt e.V.)</p> <hr/> <p></p> <hr/> <p>Dr. Alexander Röder (Managing Director Institut Bauen und Umwelt e.V.)</p> | <p>m.look high pressure laminates</p> <hr/> <p>Owner of the declaration Fundermax GmbH Klagenfurter Straße 87-89 9300 St. Veit/Glan Austria</p> <hr/> <p>Declared product / declared unit 1 m² m.look high pressure laminate with an average thickness of 7.24 mm (13 kg/m²)</p> <hr/> <p>Scope: This document refers to a declared unit of 1 m² average m.look high pressure laminate (13 kg/m²) produced in the Wiener Neudorf plant (Austria) under the brand names m.look, m.look NCore and NCore.</p> <p>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.</p> <p>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>.</p> <hr/> <p>Verification</p> <table border="1"> <tr> <td colspan="2">The standard <i>EN 15804</i> serves as the core PCR</td> </tr> <tr> <td colspan="2">Independent verification of the declaration and data according to <i>ISO 14025:2010</i></td> </tr> <tr> <td><input type="checkbox"/> internally</td> <td><input checked="" type="checkbox"/> externally</td> </tr> </table> <hr/> <p></p> <hr/> <p>Juliane Franze (Independent verifier)</p> | The standard <i>EN 15804</i> serves as the core PCR | | Independent verification of the declaration and data according to <i>ISO 14025:2010</i> | | <input type="checkbox"/> internally | <input checked="" type="checkbox"/> externally |
| The standard <i>EN 15804</i> serves as the core PCR | | | | | | | |
| Independent verification of the declaration and data according to <i>ISO 14025:2010</i> | | | | | | | |
| <input type="checkbox"/> internally | <input checked="" type="checkbox"/> externally | | | | | | |

2. Product

2.1 Product description/Product definition

Fundermax m.look high pressure laminates are decorative high pressure laminats based on *EN 438-4* and *EN 438-6* for the use as wall and ceiling panelling as well as furniture panels in interior and exterior applications.

m.look high pressure laminates are made of a heavy-duty, glass fleece-reinforced, predominantly mineral, non-combustible core with a highly weather-resistant decorative surface. The decorative surface is characterized above all by high scratch resistance, lightfastness, impact resistance, anti-graffiti properties, easy cleanability and hail resistance.

Properties tested acc. to *EN 438-2*.

Fundermax m.look high pressure can be glued, screwed or riveted to substructures made of metal and wood. In addition, a large number of other fastening and connecting means can be used.

For the use and application of the product the respective national provisions at the place of use apply, in Germany for example the building codes of

the federal states and the corresponding national specifications.

2.2 Application

Fundermax m.look high pressure laminates can be used in both private and public areas. They are particularly suitable for residential areas, hospitals, public buildings, train stations and airports, for public transport, hotels, schools, business premises, sports facilities and industrial applications. The special properties allow Fundermax m.look high pressure laminates to be used indoors as wall cladding, railing fillings, furniture, tables, column cladding, laboratory equipment, cubicles, ceilings, window sills, worktops, counters, washstands, etc.

2.3 Technical Data

Technical data for buildings

| Name | Value | Unit |
|------------------------|--------------------------|-------------------|
| Raw density ISO 1183-1 | ≥ 1800 | kg/m ³ |
| Surface weight | 12.6 (7.0 mm) +2 / -1 | kg/m ² |

| | | |
|--|--|-------------------|
| Yield strength | No requirement according to EN 438 | - |
| Resistance to scratches according to EN 438 | ≥ 3 | Degree |
| Compressive strength | No requirement according to EN 438 | - |
| Tensile strength | No requirement according to EN 438 (anymore) | - |
| Flexural strength ISO 178 | ≥ 38 | MPa |
| E-Modulus ISO 178 | ≥ 9500 | MPa |
| Resistance to climatic shock EN 438-2 EN 438-2 | Passed | - |
| Impact resistance falling ball EN 438-2 EN 438-2 | ≤ 10 | mm |
| Light resistance EN 438-2.27 | ≥ 4 | Grey scale |
| Artificial weathering (UV resistance) EN 438-2 | ≥ 3 | Grey scale |
| Freeze/thaw testing EN 438-2 | Passed | |
| Weather resistance EN 438-2 | See Resistance to climatic shock | - |
| Dimensional stability at elevated temperature EN 438-2 | longitudinally 0.3 crosswise 0.4 | % |
| Water vapour diffusion resistance factor | Not relevant - No performance determined (NPD) | - |
| Sound absorption coefficient | No performance determined (NPD) | - |
| Formaldehyd emission ISO 16000 | ≤ 0.1 | ppm |
| VOC Emission (TVOC) ISO 16000 | 0 | mg/m ³ |
| Reaction to fire EN 13501-1 | A2-s1, d0 | - |
| Calorific value ISO 1716 | ≤ 3 | MJ/kg |

Performance data of the product with respect to its characteristics in accordance with the relevant technical provision (no CE-marking).

2.4 Delivery status

Fundermax m.look high pressure laminates are available as full size panels or cut-to-size sheets with a maximum length of 3660 mm, a maximum width of 1630 mm and thicknesses of 7 to 12 mm.

2.5 Base materials/Ancillary materials

m.look high pressure laminates with an average thickness of 7.24 mm and an average weight of 13 kg/m² consist of (data in% by mass per 1 m² of production):

- Mineral filler 65 – 75 %
- Glass fleece 17 – 23 %
- Melamine resin 6 – 10 %
- Iron oxide 1.5 – 2.5 %
- Decor paper 1.6 – 2 %
- Coating 0.5 – 1 %

This product/article/at least one partial article contains substances listed in the *ECHA-candidate list* (date:

07/14/2021) exceeding 0.1 percentage by mass: no

This product/article/at least one partial article contains other carcinogenic mutagenic reprotoxic (CMR) substances in categories 1A or 1B which are not on the candidate list, exceeding 0.1 percentage by mass: no

Biocide products were added to this construction product or it has been treated with biocide products (this then concerns a treated product as defined by the (EU) *Ordinance on Biocide Products* No. 528/2012): no

2.6 Manufacture

m.look high pressure laminates are produced by pressing glass fleece impregnated with thermosetting resins with mineral fillers, with simultaneous application of heat (temperature ≥ 120 ° C) and high pressure (≥ 5 MPa) giving a homogeneous, non-porous material with increased density (≥ 1.35 g / cm³) and the required surface quality.

2.7 Environment and health during manufacturing

Waste heat is recovered via heat exchangers.

2.8 Product processing/Installation

Custom cuts on the construction site are to be made with diamond-tipped tools. Sharp cutting edges and smooth running of the tools are required for perfect machining. Breaking, splintering and flaking of the decor side are the result of incorrect processing or unsuitable tools. Machining tables should be smooth and as seamless as possible, to avoid chips being stuck that could damage the surface.

Plunge-cut saws can be used for internal cutouts. All machines should be designed with encapsulated bearings. To avoid edge chipping, it is necessary to set a bevel with a sanding block (45 degrees, approx. 0.25 mm).

The usual safety regulations with regard to dust separation, dust extraction, fire prevention, etc. must be observed during machining and processing.

m.look high pressure laminates can be used self-supporting by attaching them to the appropriate substructure with screws or rivets.

2.9 Packaging

On wooden pallets with base and cover panels (particle board or polypropylene web plate), wrapped in polyethylene foil if required, secured by steel or plastic hoops. Plastic hoops are made of PET.

2.10 Condition of use

The resins and therefore the m.look high pressure laminates remain permanently stable even when used outdoors. No substances are leached. The mechanical properties remain constant.

2.11 Environment and health during use

m.look high pressure laminates are a crosslinked, thermosetting material with mineral fillers. Formaldehyde or VOC emissions are extremely low and well below the legal requirements. In daily use, they are approved for contact with food. The decorative surfaces are largely resistant to all common household solvents and chemicals; the material has therefore been used for many years in

areas of application in which cleanliness and hygiene are essential.
The closed surface can easily be disinfected using hot water, steam or any disinfectant used in hospitals and commercial applications.

2.12 Reference service life

No uniform reference service life can be indicated on account of the multiple application possibilities. However, the life cycle can exceed 30 - >50 years even in areas subject to high levels of wear such as facades (*life cycle costs of facades*, 2015).

2.13 Extraordinary effects

Fire

Fire protection (tests according to *EN 13823* and *ISO 1716* in accordance with *EN13501-1*)
m.look laminate panels are classified as non-combustible, fire class A2 - s1, d0 according to *EN 13501-1*.

They can therefore be used in application areas with the highest fire protection requirements in compliance with the respective national requirements. Toxic substances can be contained in the smoke if the panels are not incinerated fully.

Fire protection

| Name | Value |
|------------------------------------|-------|
| Building material class EN 13501-1 | A2 |
| Smoke gas development EN 13501-1 | s1 |
| Burning droplets EN 13501-1 | d0 |

Water

m.look high pressure laminates are waterproof. Trapped moisture should be avoided. No ingredients are leached which could be hazardous to health.

Mechanical destruction

m.look high pressure laminates are distinguished by their very high level of mechanical resistance. If however the panels break, sharp-edged fragments can be formed.

2.14 Re-use phase

m.look high pressure laminates can be used again for the same or a different purpose after dismantling after removing the fastening means.

Material recycling is usually not possible.

Trimblings or damaged panels must be deposited in accordance with the applicable rules of the respective country.

2.15 Disposal

Disposal like building material.

Waste key number Austria: 91401 (*Abfallverzeichnis* according to the regulations BGBl. II Nr. 409/2020, BGBl. II Nr. 495/2020, BGBl. II Nr. 135/2013 and BGBl. II Nr. 181/2015)

Waste key number EU: 17 02 02 (Construction site waste) or 03 01 99 (Waste at processor) (*Europäischer Abfallkatalog – EAK*)

2.16 Further information

Further information on the properties and processing of m.look high pressure laminates is available at www.fundermax.at.

3. LCA: Calculation rules

3.1 Declared Unit

This EPD refers to a declared unit of 1 m² m.look high pressure laminate with an average thickness of 7.24 mm and an average surface weight of 13 kg/m². Packaging is considered in the LCA.

Declared unit

| Name | Value | Unit |
|--|-------|-------------------|
| Declared unit | 1 | m ² |
| Thickness | 7.24 | mm |
| Surface weight | 13 | kg/m ² |
| conversion factor [Mass/Declared Unit] | 13 | - |

High pressure laminates of the brands m.look, m.look NCore and NCore are manufactured at the Wiener Neudorf (Austria) site of Fundermax.

The EPD declares an average thickness and surface weight of the facade panels. The calculation of the weighted average was based on the produced square meters.

As all considered products have a similar composition, a linear relationship between product weight and environmental impacts can be expected. Product-related variances like the share of decor paper, its specific composition, and the share of coating layer, which are not linear scalable with the product weight but with the surface area, tend to be less dominant factors regarding their mass-related contribution and

the expected environmental impact. A good representativeness of the results can be assumed.

3.2 System boundary

The life cycle assessment of m.look high pressure laminate refers to a cradle-to-gate analysis of the environmental impacts with modules C1-C4 and D (A1-A3, + C, +D). The following life cycle phases are taken into consideration in the analysis:

Module A1-A3 | Production stage

The production stage includes the upstream burdens of raw material supply (mineral filler, melamine resin, glass fleece, iron oxide etc.) and their transports to the manufacturing plant in Wiener Neudorf.

Impregnation, coating, drying, cutting, pressing, and trimming, including the packaging of the product are taken into account. Material and energy flows for the production process are represented based on primary data of the manufacturing plant. Electrical energy is provided from the Austrian grid. Thermal energy is provided by natural gas and regenerative thermal oxidation (RTO).

Module C1 | Deconstruction and demolition

Manual removal of the panels is assumed. Associated efforts are negligible, no environmental impacts from the deconstruction of the products are declared.

Module C2 | Transport to disposal

Module C2 includes the transport to disposal. For this

purpose, transport by truck over a distance of 50 km is assumed as a representative scenario.

Module C3 | Waste treatment

The declared scenario assumes landfilling of the panels. Referring environmental impacts are accounted for in module C4. No environmental impacts are expected from the waste treatment of the products in C3.

Module C4 | Disposal

Module C4 refers to the emissions from the disposal of the panels. Biogenic carbon in the decor paper of the products is treated as biogenic CO₂-emission from the technosphere into the natural environment.

Module D | Benefits and loads beyond the system boundary

The declared scenario assumes landfilling of the product. No benefits and burdens arise outside the system boundary.

3.3 Estimates and assumptions

Assumptions and approximations are applied in case of a lack of representative data. All assumptions and approximations are documented precisely and represent a best-guess representation of reality.

The environmental impacts of the glass fleece are represented based on *Rüter & Diederichs, 2012*.

3.4 Cut-off criteria

The LCA model covers all available input and output flows, which can be represented based on robust data and from which a significant contribution can be expected. Data gaps are filled with conservative assumptions of average data or generic data if available and are documented accordingly. Only data with a contribution of less than 1 % were cut off. Thus, no data were neglected, of which a substantial impact is to be expected. All relevant data were collected comprehensively. Cut-off material and energy flows were chosen carefully based on their expected quantitative contribution as well as potential environmental impacts. Thus, it can be assumed that the sum of all neglected input flows does not account for more than 5 % of the total material, water and energy flows.

3.5 Background data

This study uses generic background data for the evaluation of upstream environmental impacts from *GaBi* database version 2021.1.

3.6 Data quality

Data collection is based on industry-specific questionnaires. It follows an iterative process clarifying questions via e-mail, telephone calls or in personal and online meetings, respectively. Intensive discussions between Fundermax and Daxner & Merl result in an accurate mapping of product-related material and energy flows. This leads to a high quality of foreground data collected. Data collection relies on a consistent process according to *ISO 14044*.

The technological, geographical, and time-related representativeness of the database was kept in mind when selecting background data. Whenever specific data were missing, either generic datasets or representative average data were used instead. The implemented *GaBi* background datasets refer to the latest versions available (not more than ten years old) and are carefully chosen.

3.7 Period under review

Foreground data were collected in the 2019 production year (01.01. – 31.12.2019), and the data are based on the volumes produced on an annual basis.

3.8 Allocation

The allocation of input and output flows of panel production was recorded for the total annual production at the plant. A more precise allocation to individual product groups such as m.look is not possible. Energy input and emissions from the RTO were therefore allocated according to the mass share of m-look panels in total production.

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 was used to calculate the LCA (*GaBi* 10; 2021.1)

4. LCA: Scenarios and additional technical information

Characteristic product properties

Information on biogenic Carbon

The biogenic carbon content quantifies the amount of biogenic carbon stored in the declared product.

Information on the description of the biogenic carbon content at the factory gate

| Name | Value | Unit |
|---|-------|------|
| Biogenic carbon content in product | 0.1 | kg C |
| Biogenic carbon content in accompanying packaging | 0.07 | kg C |

Installation into the building (A5)

| Name | Value | Unit |
|-----------------------------|-------|-------------------|
| Packaging (particle board) | 0.098 | kg/m ² |
| Packaging (plastic foil) | 0.014 | kg/m ² |
| Packaging (strapping tapes) | 0.002 | kg/m ² |
| Packaging (paletts) | 0.057 | kg/m ² |

End of life (C1-C4)

| Name | Value | Unit |
|--------------------------------------|-------|------|
| Collected separately - whole product | 13 | kg |
| Landfilling | 13 | kg |

5. LCA: Results

The following table contains the life cycle assessment results for a declared unit of 1 m² average Fundermax m.look high pressure laminates with a surface weight of 13 kg/m² and a thickness of 7.24 mm.

Important note:

EP-freshwater: This indicator was calculated as "kg P-eq." in accordance with the characterisation model (EUTREND-model, Struijs et al., 2009b, as implemented in ReCiPe; <http://eplca.jrc.ec.europa.eu/LCDN/developerEF.xhtml>).

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 | Reuse-Recovery-Recycling-potential | |
| A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D | |
| X | X | X | ND | ND | ND | ND | MNR | MNR | MNR | ND | ND | X | X | X | X | X | |

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m² m.look high pressure laminate (13 kg/m²)

| Core Indicator | Unit | A1-A3 | C1 | C2 | C3 | C4 | D |
|--|------------------------------------|----------|---------|----------|---------|----------|---------|
| Global warming potential - total | [kg CO ₂ -Eq.] | 2.54E+1 | 0.00E+0 | 3.96E-2 | 0.00E+0 | 4.22E-1 | 0.00E+0 |
| Global warming potential - fossil fuels | [kg CO ₂ -Eq.] | 2.58E+1 | 0.00E+0 | 3.93E-2 | 0.00E+0 | 1.97E-1 | 0.00E+0 |
| Global warming potential - biogenic | [kg CO ₂ -Eq.] | -4.21E-1 | 0.00E+0 | -4.67E-5 | 0.00E+0 | 2.24E-1 | 0.00E+0 |
| GWP from land use and land use change | [kg CO ₂ -Eq.] | 1.76E-2 | 0.00E+0 | 3.21E-4 | 0.00E+0 | 5.78E-4 | 0.00E+0 |
| Depletion potential of the stratospheric ozone layer | [kg CFC11-Eq.] | 8.75E-13 | 0.00E+0 | 7.75E-18 | 0.00E+0 | 7.63E-16 | 0.00E+0 |
| Acidification potential, accumulated exceedance | [mol H ⁺ -Eq.] | 7.79E-2 | 0.00E+0 | 7.74E-5 | 0.00E+0 | 1.40E-3 | 0.00E+0 |
| Eutrophication, fraction of nutrients reaching freshwater end compartment | [kg PO ₄ -Eq.] | 9.16E-5 | 0.00E+0 | 1.17E-7 | 0.00E+0 | 3.30E-7 | 0.00E+0 |
| Eutrophication, fraction of nutrients reaching marine end compartment | [kg N-Eq.] | 2.13E-2 | 0.00E+0 | 3.21E-5 | 0.00E+0 | 3.63E-4 | 0.00E+0 |
| Eutrophication, accumulated exceedance | [mol N-Eq.] | 1.54E-1 | 0.00E+0 | 3.64E-4 | 0.00E+0 | 3.99E-3 | 0.00E+0 |
| Formation potential of tropospheric ozone photochemical oxidants | [kg NMVOC-Eq.] | 4.19E-2 | 0.00E+0 | 6.92E-5 | 0.00E+0 | 1.10E-3 | 0.00E+0 |
| Abiotic depletion potential for non-fossil resources | [kg Sb-Eq.] | 1.11E-5 | 0.00E+0 | 3.48E-9 | 0.00E+0 | 1.85E-8 | 0.00E+0 |
| Abiotic depletion potential for fossil resources | [MJ] | 4.22E+2 | 0.00E+0 | 5.23E-1 | 0.00E+0 | 2.61E+0 | 0.00E+0 |
| Water (user) deprivation potential, deprivation-weighted water consumption (WDP) | [m ³ world-Eq deprived] | 1.50E+0 | 0.00E+0 | 3.64E-4 | 0.00E+0 | 2.11E-2 | 0.00E+0 |

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 m² m.look high pressure laminate (13 kg/m²)

| Indicator | Unit | A1-A3 | C1 | C2 | C3 | C4 | D |
|--|-------------------|---------|---------|----------|---------|---------|---------|
| Renewable primary energy as energy carrier | [MJ] | 5.61E+1 | 0.00E+0 | 3.01E+0 | 0.00E+0 | 3.51E-1 | 0.00E+0 |
| Renewable primary energy resources as material utilization | [MJ] | 2.98E+0 | 0.00E+0 | -2.98E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| Total use of renewable primary energy resources | [MJ] | 5.90E+1 | 0.00E+0 | 3.01E-2 | 0.00E+0 | 3.51E-1 | 0.00E+0 |
| Non-renewable primary energy as energy carrier | [MJ] | 3.27E+2 | 0.00E+0 | 9.54E+1 | 0.00E+0 | 2.61E+0 | 0.00E+0 |
| Non-renewable primary energy as material utilization | [MJ] | 9.49E+1 | 0.00E+0 | -9.49E+1 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| Total use of non-renewable primary energy resources | [MJ] | 4.22E+2 | 0.00E+0 | 5.24E-1 | 0.00E+0 | 2.61E+0 | 0.00E+0 |
| Use of secondary material | [kg] | 8.68E-2 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| Use of renewable secondary fuels | [MJ] | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| Use of non-renewable secondary fuels | [MJ] | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| Use of net fresh water | [m ³] | 1.42E-1 | 0.00E+0 | 3.44E-5 | 0.00E+0 | 6.44E-4 | 0.00E+0 |

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 m² m.look high pressure laminate (13 kg/m²)

| Indicator | Unit | A1-A3 | C1 | C2 | C3 | C4 | D |
|-------------------------------|------|---------|---------|----------|---------|----------|---------|
| Hazardous waste disposed | [kg] | 5.53E-6 | 0.00E+0 | 2.76E-11 | 0.00E+0 | 2.77E-10 | 0.00E+0 |
| Non-hazardous waste disposed | [kg] | 7.71E+0 | 0.00E+0 | 8.23E-5 | 0.00E+0 | 1.30E+1 | 0.00E+0 |
| Radioactive waste disposed | [kg] | 6.73E-3 | 0.00E+0 | 9.51E-7 | 0.00E+0 | 2.73E-5 | 0.00E+0 |
| Components for re-use | [kg] | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| Materials for recycling | [kg] | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| Materials for energy recovery | [kg] | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| Exported electrical energy | [MJ] | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| Exported thermal energy | [MJ] | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 m² m.look high pressure laminate (13 kg/m²)

| Indicator | Unit | A1-A3 | C1 | C2 | C3 | C4 | D |
|--|---------------------|-------|----|----|----|----|----|
| Potential incidence of disease due to PM emissions | [Disease Incidence] | ND | ND | ND | ND | ND | ND |
| Potential Human exposure efficiency relative to U235 | [kBq U235-Eq.] | ND | ND | ND | ND | ND | ND |
| Potential comparative toxic unit for ecosystems | [CTUe] | ND | ND | ND | ND | ND | ND |
| Potential comparative toxic unit for humans - cancerogenic | [CTUh] | ND | ND | ND | ND | ND | ND |
| Potential comparative toxic unit for humans - not cancerogenic | [CTUh] | ND | ND | ND | ND | ND | ND |
| Potential soil quality index | [-] | ND | ND | ND | ND | ND | ND |

The additional and optional impact categories according to *EN 15804+A2* are not declared, as this is not required according to *PCR Part A*.

Disclaimer 1 – for the indicator “potential Human exposure efficiency relative to U235”:

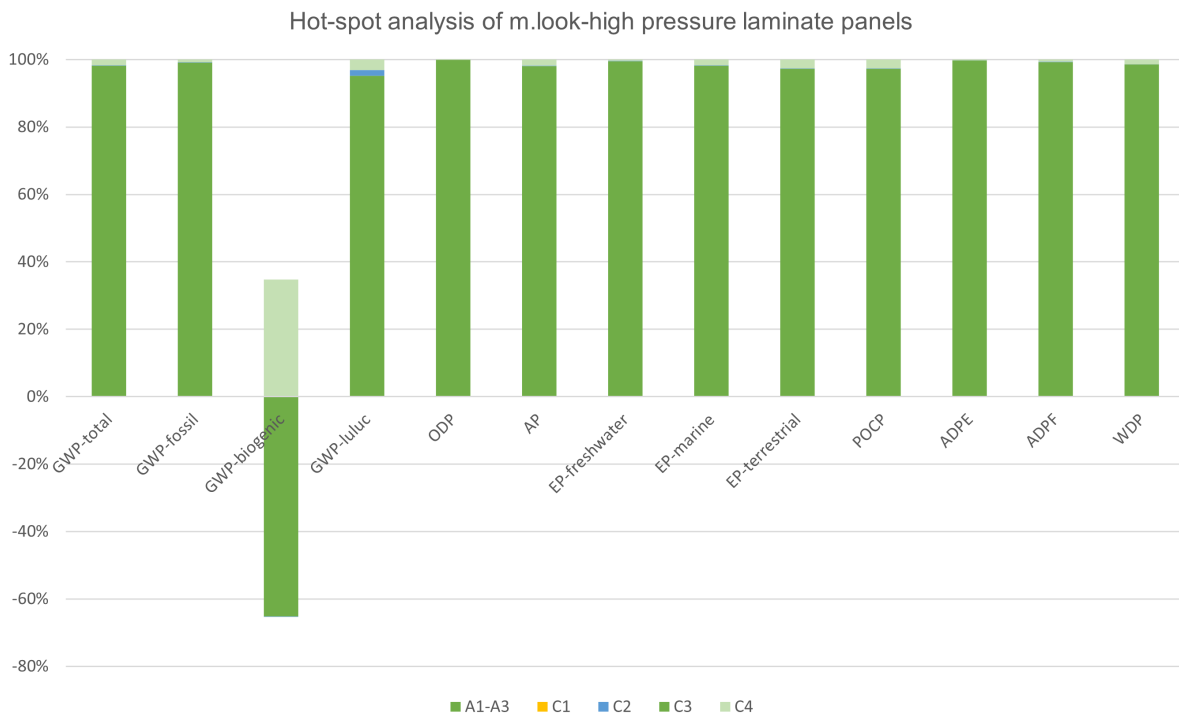
This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators: “abiotic depletion potential for fossil resources”, “abiotic depletion potential for non-fossil resources”, “water (user) deprivation potential”, “deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit for humans - cancer effects”, “potential comparative toxic unit for humans – non-cancer effects”, “potential soil quality index”:

The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

6. LCA: Interpretation

The following interpretation contains a summary of the LCA results related to a declared unit of 1 m² average Fundermax m.look high pressure laminate.



The comparison of the product's life cycle phases shows a clear dominance of the production phase (modules A1-A3) in all environmental impact categories. Transport to waste treatment and landfilling of the panels represent a minor effect in the environmental performance of the panels.

The provision of raw materials can be identified as the main influencing factor in all environmental impact categories, with melamine resin and glass fleece as

the main drivers. This also applies to the renewable and non-renewable primary energy use with energy supply in production also playing an important role.

In addition to the impacts from the upstream supply chain of the raw materials used, direct emissions at the site have an important influence on global warming potential (GWP), potential eutrophication in marine and terrestrial ecosystems (EP-marine & EP-terrestrial) as

well as formation potential of tropospheric ozone photochemical oxidants (POCP).

A linear correlation of the LCA results of product thicknesses other than the declared reference thickness with respect to the specific surface weight is to be expected. This results in an uncertainty, as the

proportion of decorative paper and the coating layer cannot be scaled linearly, but based on surface area depending on the design of the respective product. Apart from the abiotic depletion potential for non-fossil resources (ADPE), a good representativeness of the results can be assumed.

7. Requisite evidence

7.1 Formaldehyde

EPH Test report Nr. 2515443/A1
Measurement of VOC- and formaldehyde emission acc to *AgBB-Schema 2015, ISO 16000* parts 3, 6 and 9

1. Measurement 0.065 ppm after 3 days
 2. Measurement 0.065 ppm after 7 days
 3. Measurement 0.055 ppm after 28 days
- Requirements after 28 days: 0.1 ppm

7.2. Melamine

Not applicable – product is not foreseen for the direct contact with foodstuff

7.3. Total migration

Not applicable – product is not foreseen for the direct contact with foodstuff.

7.4 Eluat analysis

m.look high pressure laminates are classified eluate class IIIa acc. to *ÖNORM S2072*. The waste key number is 91401 (Austria) resp. EU: 17 02 02 (construction site waste) or 03 01 99 (processor waste) Disposal as building material

7.5 VOC

EPH Test report Nr. 2515443/A1
Measurement of VOC- and formaldehyde emission acc. to *AgBB-Schema 2015, ISO 16000* parts 3, 6 and 9

AgBB results in overview (28 days)

| Name | Value | Unit |
|-----------------|-------|-------------------|
| TVOC | 6 | µg/m ³ |
| SVOC | 0 | µg/m ³ |
| R | 0.682 | µg/m ³ |
| VOC without NIK | 0 | µg/m ³ |

8. References

Standards

EN 317

ÖNORM EN 317:2005-12, Particle boards and fireboards – Determination of swelling in thickness after immersion in water.

EN 438-2

ÖNORM EN 438-2:2019-02, High-pressure decorative laminates (HPL) - Sheets based on thermosetting resins (Usually called Laminates) - Part 2: Determination of properties.

EN 438-4

ÖNORM EN 438-4:2016-05, High-pressure decorative laminates (HPL) - Sheets based on thermosetting resins (Usually called Laminates) – Part 4: Classification and specifications for compact laminates of thickness 2 mm and greater.

EN 438-6

ÖNORM EN 438-4:2016-05, High-pressure decorative laminates (HPL) - Sheets based on thermosetting resins (Usually called Laminates) – Part 6: Classification and specifications for Exterior-grade compact laminates of thickness 2 mm and greater.

EN 13501-1

ÖNORM EN 13501-1:2020-01, Fire classification of construction products and building elements - Part 1:

Classification using data from reaction to fire tests.

EN 13823

ÖNORM EN 13823:2020-09, Reaction to fire tests for building products. Building products excluding floorings exposed to the thermal attack by a single burning item.

EN 15804

ÖNORM EN 15804+A2:2020-02-15, Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products.

ISO 178

ÖNORM EN ISO 178:2019-08, Plastics. Determination of flexural properties.

ISO 1716

ÖNORM EN ISO 1716:2019-02, Reaction to fire tests for products. Determination of the gross heat of combustion (calorific value).

ISO 1183-1

ÖNORM EN ISO 1183-1:2019-07, Plastics. Methods for determining the density of non-cellular plastics. Immersion method, liquid pycnometer method and titration method.

ISO 14025

ÖNORM EN ISO 14025:2010-07-01, Environmental

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

ISO 14044

DIN EN ISO 14044:2006-10, Environmental management – Life cycle assessment – Requirements and guidelines.

ISO 16000-3

DIN ISO 16000-3:2013-01, Indoor air. Part 3. Determination of formaldehyde and other carbonyl compounds in indoor and test chamber air. Active sampling method.

ISO 16000-6

DIN ISO 16000-6:2012-11, Indoor air. Part 6. Determination of organic compounds (VVOC, VOC, SVOC) in indoor and test chamber air by active sampling on sorbent tubes, thermal desorption and gas chromatography using MS or MS FID.

ISO 16000-9

ÖNORM EN ISO 16000-9:2011-12, Indoor air. Determination of the emission of volatile organic compounds from building products and furnishing. Emission test chamber method.

ÖNORM S 2072

ÖNORM 2072 Eluate classes; (Hazard potential) of waste: 2009.

Further references

AgBB Scheme

AgBB – Evaluation scheme for VOC from building products.

ECHA-List

List of substances of very high concern for authorization (as of July 14, 2021) in accordance with Article 59 (10) of the REACH regulation. European Chemicals Agency.

European waste catalog - EAK

REGULATION (EU) No. 849/2010 OF THE COMMISSION of September 27, 2010 amending Regulation (EC) No. 2150/2002 of the European Parliament and of the Council on waste statistics.

GaBi

GaBi 10, DB 2021.1. Software System and Database for Life Cycle Engineering. Stuttgart, Leinfelden-Echterdingen: Sphera Solutions GmbH, 1992-2021. Available at: <http://documentation.gabi-software.com>

IBU 2021

Institut Bauen und Umwelt e.V.: Allgemeine Anleitung für das EPD-Programm des Institut Bauen und Umwelt e.V. (IBU). Version 2.0, Berlin: Institut Bauen und Umwelt e.V., 2021. www.ibu-epd.com

Life cycle costs of facades

Lebenszykluskosten von Fassaden: Lebenszykluskostenanalyse ausgewählter Fassadensysteme anhand eines mehrgeschossigen Modell-Wohngebäudes und verschiedener Instandhaltungs- und Reinigungsszenarien. Department für Bauen und Umwelt, Donau-University Krems, 2015.

List of waste

List of waste according to the regulations BGBl. II Nr. 409/2020, BGBl. II Nr. 495/2020, BGBl. II Nr. 135/2013 und BGBl. II Nr. 181/2015).

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Product category rules for building-related products and services. Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report according to EN 15804+A2:2019. Version 1.1. Berlin: Institut Bauen und Umwelt e.V., 2021.

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Product Category Rules for building-related products and services – Part B: Requirements on the EPD for laminates, Version 1.1. Berlin: Institut Bauen und Umwelt e.V., 2018.

Rüter & Diederichs

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