# ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A1*

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| Owner of the Declaration | modulyss® |
| Programme holder | Institut Bauen und Umwelt e.V. (IBU) |
| Publisher | Institut Bauen und Umwelt e.V. (IBU) |
| Declaration number | EPD-MOD-20210150-CBC1-EN |
| Issue date | 08/07/2021 |
| Valid to | 07/07/2026 |

**Tufted carpet tiles**
with a maximum total pile weight of 1300 g/m²,
a pile material of 100% polyamide 6,
ecoBack or comfortBack$^{eco}$ backing

**modulyss®**

Institut Bauen und Umwelt e.V.

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ECO PLATFORM EPD EN 15804 VERIFIED

## General Information

**modulyss®**

**Tufted carpet tiles**
max. total pile weight 1300 g/m²
100% PA 6, ecoBack or comfortBack$^{eco}$ backing

**Programme holder**
IBU – Institut Bauen und Umwelt e.V.
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Germany

**Owner of the declaration**
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9240 Zele
Belgium

**Declaration number**
EPD-MOD-20210150-CBC1-EN

**Declared product / declared unit**
1 m² tufted carpet tiles with a surface pile of 100% virgin PA 6 and an ecoBack or comfortBack$^{eco}$ backing.

**This declaration is based on the product category rules:**
Floor coverings, 02/2018
(PCR checked and approved by the SVR)

**Scope:**
The manufacturer declaration applies to modular carpet tiles with ecoBack or comfortBack$^{eco}$, a pile material of PA 6 with a maximum total pile weight of 1300 g/m$^2$. The products are produced in Zele, Belgium
LCA results for products with a maximum total pile weight of 500 g/m$^2$ can be taken from the corresponding tables of the annexe. Specific data for every product within the declared group of products in relation to its total pile weight can be calculated by using equation 1 given in the annexe (see annexe chapter: 'General Information on the annexe').
The declaration is only valid in conjunction with a valid *GUT-PRODIS* license of the product.

**Issue date**
08/07/2021

**Valid to**
07/07/2026

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 *EN 15804+A1*. In the following, the standard will be simplified as *EN 15804*.

**Verification**

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| The standard *EN 15804* serves as the core PCR |
| Independent verification of the declaration and data according to *ISO 14025:2010* |
| ☐ internally ☒ externally |

Dipl. Ing. Hans Peters
(chairman of Institut Bauen und Umwelt e.V.)

Dr. Alexander Röder
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Angela Schindler
(Independent verifier)

## Product

**Product description/Product definition**
Tufted carpet tiles having a surface pile of polyamide 6 and an ecoBack or comfortBack$^{eco}$ backing.
The colour of the carpet is generated either by solution dyed yarn or aqueous dyeing methods.
The total recycled content amounts to at least 36% with a total pile weight of 1300 g/m$^2$ and a comfortBack$^{eco}$ backing and at least 33% with a total pile weight of 1300 g/m$^2$ and an ecoBack backing.
The declaration applies to a group of products with a maximum total pile weight of 1300 g/m$^2$.

LCA results for products with a maximum total pile weight of 500 g/m$^2$ can be taken from the corresponding tables of the annexe. Results for specific products with any other total pile weight can be calculated by using equation 1 given in the annexe (see annexe chapter: 'General Information on the annexe').
For the placing on the market of the product in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) *Regulation (EU) No. 305/2011* Construction Product Regulation (CPR) applies. The product needs a

Declaration of Performance (DoP) taking into consideration *DIN EN 14041: 2018-05*, Resilient, textile and laminate floor coverings - Essential characteristics and the CE-marking. The DoP of the product can be found on the manufacturer's technical information section. For the application and use of the product the respective national provisions apply.

**Application**
According to the use class as defined in *EN 1307* the products can be used in professional areas. The use class can be found on the technical data sheet of the product.

**Technical Data**

**Constructional data**

| Name | Value | Unit |
|---|---|---|
| Type of manufacture | Tufted tiles, solution dyed yarn or aqueous dyeing methods | - |
| Product Form | Tiles 50 cm x 50 cm | - |
| Secondary backing | ecoBack or comfortBackeco | - |
| Yarn type | polyamide 6 | - |
| Total pile weight | max. 1300 | g/m² |
| Total carpet weight | max. 5000 | g/m² |

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to *EN 14041: 2018-05*, Resilient, textile and laminate floor coverings - Essential characteristics.
Additional product properties in accordance with *EN 1307* can be found on the Product Information System *PRODIS* using the *PRODIS* registration number of the product (www.pro-dis.info) or on the manufacturer's technical information section (www.modulyss.com).

**Base materials/Ancillary materials**

| Name | Value | Unit |
|---|---|---|
| Polyamide 6 | 26,0 | % |
| Polyester | 10,8 | % |
| Polypropylene | 0.6 | % |
| Limestone | 32,8 | % |
| Aluminiumhydroxide | 10,1 | % |
| SBR-latex | 9,8 | % |
| Polyolefin | 8,8 | % |
| Glass fibre | 0,2 | % |
| Additives | 0,8 | % |

This product contains substances listed in the *ECHA candidate list* (16.01.2020) or other carcinogenic, mutagenic and reprotoxic (CMR) substances in categories 1A or 1B which are not on the candidate list exceeding 0.1 percentage by mass: no
The products are registered in the *GUT-PRODIS* Information System. The *PRODIS* system ensures the compliance with limitations of various chemicals and Volatile Organic Compound (VOC)-emissions and a ban on the use of all substances that are listed as 'Substances of Very High Concern' (SVHC) under *REACH*.

**Reference service life**
A calculation of the reference service life according to *ISO 15686* is not possible.
The service life of textile floor coverings strongly depends on the correct installation taking into account the declared use classification and the adherence to cleaning and maintenance instructions.
A minimum service life of 10 years can be assumed, technical service life can be considerably longer.

## LCA: Calculation rules

**Declared Unit**

| Name | Value | Unit |
|---|---|---|
| Declared unit | 1 | m² |
| Conversion factor to 1 kg | 5 | kg/m² |

The declared unit refers to 1 m² produced textile floor covering. Output of module A5 'Assembly' is 1 m² installed textile floor covering.

**System boundary**

*Type of EPD:* Cradle-to-grave

*System boundaries of modules A, B, C, D:*

A1-A3 Production:
Energy supply and production of the basic material, processing of secondary material, auxiliary material, transport of the material to the manufacturing site, emissions, waste water treatment, packaging material and waste processing up to the landfill disposal of residual waste (except radioactive waste). Benefits for generated electricity and steam due to the incineration of production waste are aggregated.

A4 Transport:
Transport of the packed textile floor covering from factory gate to the place of installation.

A5 Installation:
Installation of the textile floor covering, processing of installation waste and packaging waste up to the landfill disposal of residual waste (except radioactive waste), the production of the amount of carpet that occurs as installation waste including its transport to the place of installation.
Generated electricity and steam due to the incineration of waste are listed in the result table as exported energy.
Preparing of the floor and auxiliary materials (adhesives, fixing agents, PET connectors) are beyond the system boundaries and not taken into account.

B1 Use:
Indoor emissions during the use stage. After the first year, no product-related VOC emissions are relevant due to known VOC decay curves of the product.

B2 Maintenance:
Cleaning of the textile floor covering for a period of 1 year:
Vacuum cleaning – electricity supply
Wet cleaning – electricity, water consumption, production of the cleaning agent, waste water treatment.
The declared values in this module have to be multiplied by the assumed service life of the floor covering in the building in question (see annexe, chapter 'General information on use stage').

B3 - B7:
The modules are not relevant and therefore not declared.

C1 De-construction:
The floor covering is de-constructed manually and no additional environmental impact is caused.

C2 Transport:
Transport of the carpet waste to a landfill, to the municipal waste incineration plant (MWI) or to the waste collection facility for recycling.

C3 Waste processing:
C3-1: Landfill disposal needs no waste processing.
C3-2: Impact from waste incineration (plant with R1>0.6), generated electricity and steam are listed in the result table as exported energy.
C3-3: Collection of the carpet waste for recovery in the cement industry, waste processing (granulating), transport to the cement plant, emissions from the incineration.

C4 Disposal
C4-1: Impact from landfill disposal,
C4-2: The carpet waste leaves the system in module C3-2,
C4-3: The pre-processed carpet waste leaves the system in module C3-3

D Recycling potential:
D-A5: Benefits for generated energy due to incineration of packaging and installation waste (incineration plant with R1 > 0.6),
D-1: Benefits for generated energy due to landfill disposal of carpet waste at the end-of-life,
D-2: Benefits for generated energy due to incineration of carpet waste at the end-of-life (incineration plant with R1 > 0.6),
D-3: Benefits for saved fossil energy and saved inorganic material due to recovery of the carpet in a cement plant.

**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.

Background data are taken from the *GaBi database 2021-1*. Remaining data gaps are covered by the *ecoinvent 3.6* database 2019

## LCA: Scenarios and additional technical information

The following information refer to the declared modules and are the basis for calculations or can be used for further calculations. The indicated values refer to the declared functional unit of all products with a total pile weight of 1300 g/m².

**Transport to the construction site (A4)**

| Name | Value | Unit |
|---|---|---|
| Litres of fuel (truck, EURO 0-6 mix) | 0.0117 | l/100km |
| Transport distance | 700 | km |
| Capacity utilisation (including empty runs) | 55 | % |

**Installation in the building (A5)**

| Name | Value | Unit |
|---|---|---|
| Material loss | 0.15 | kg |

Polyethene packaging waste and installation waste are considered to be incinerated in a municipal waste incineration plant. Cardboard packaging waste is considered to be recycled.
Preparation of the floor and auxiliaries (adhesives, fixing agents, PET connectors, etc.) are not taken into account.

**Maintenance (B2)**
The values for cleaning refer to 1 m² floor covering used in commercial areas per year. Depending on the application based on *ISO 10874*, the technical service life recommended by the manufacturer and the anticipated strain on the floor by customers, the case-specific useful life can be established. The effects of Module B2 need to be calculated on the basis of this useful life in order to obtain the overall environmental impacts.

| Name | Value | Unit |
|---|---|---|
| Maintenance cycle (wet cleaning) | 1.5 | 1/year |
| Maintenance cycle (vacuum cleaning) | 208 | 1/year |
| Water consumption (wet cleaning) | 0.004 | m³ |
| Cleaning agent (wet cleaning) | 0.09 | kg |
| Electricity consumption | 0.314 | kWh |

Further information on cleaning and maintenance see www.modulyss.com

**End of Life (C1-C4)**
Three different end-of-life scenarios are declared and the results are indicated separately in module C.
Each scenario is calculated as a 100% scenario.

Scenario 1: 100% landfill disposal
Scenario 2: 100% municipal waste incineration (MWI) with R1>0.6
Scenario 3: 100% recycling in the cement industry

If combinations of these scenarios have to be calculated this should be done according to the following scheme:

EOL-impact = x% impact (Scenario 1)
+ y% impact (Scenario 2)
+ z% impact (Scenario 3)
with x% + y% + z% = 100%

| Name | Value | Unit |
|---|---|---|
| Collected as mixed construction waste (scenario 1 and 2) | 5 | kg |
| Collected separately (scenario 3) | 5 | kg |
| Landfilling (scenario 1) | 5 | kg |
| Energy recovery (scenario 2) | 5 | kg |
| Energy recovery (scenario 3) | 2.844 | kg |
| Recycling (scenario 3) | 2.156 | kg |

**Reuse, recovery and/or recycling potentials (D), relevant scenario information**
Recovery or recycling potentials due to the three end-of-life scenarios (module C) are indicated separately.

*Recycling in the cement industry (scenario 3)*
*VDZ e.V.*
The organic material of the carpet is used as secondary fuel in a cement kiln. It mainly substitutes for lignite (61.9%), hard coal (26.8%) and petrol coke (11.3%).
The inorganic material is substantially integrated in the cement clinker and substitutes for original material input.

## LCA: Results

The LCA results refer to all declared products with a maximum total pile weight of 1300 g/m². LCA results for products with a maximum total pile weight of 500 g/m² can be taken from the corresponding tables of the annexe. Results for specific products with any other total pile weight can be calculated by using equation 1 given in the annexe (see annexe chapter: 'General Information on the annexe'). The declared result figures in module B2 have to be multiplied by the assumed service life (in years) of the floor covering in the building under consideration. Information on non-relevant modules: Modules B3 - B7 are not relevant during the service life of the carpet. Modules C1, C3/1, C4/2 and C4/3 cause no additional impact (see chapter "LCA: Calculation rules" in this document). All these modules are declared and marked as 'modules not relevant/declared'. Module C2 represents the transport for scenarios 1, 2 and 3. Column D represents module D/A5. The calculations are based on the CML characterization factors (version August 2016).

### DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE 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 | X | X | X | X | MNR | MNR | MNR | MND | MND | MND | X | X | X | X |

### RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A1: 1 m² floorcovering

| Parameter | Unit | A1-A3 | A4 | A5 | B1 | B2 | C2 | C3/2 | C3/3 | C4/1 | D | D/1 | D/2 | D/3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GWP | [kg $CO_2$-Eq.] | 1.82E+1 | 2.98E-1 | 9.69E-1 | 0.00E+0 | 2.91E-1 | 1.66E-2 | 6.36E+0 | 6.42E+0 | 3.40E-1 | -6.20E-2 | 0.00E+0 | -1.81E+0 | -6.03E-1 |
| ODP | [kg CFC11-Eq.] | 3.32E-9 | 5.21E-17 | 9.96E-11 | 0.00E+0 | 1.21E-8 | 2.90E-18 | 2.31E-15 | 3.20E-15 | 1.15E-15 | -9.54E-16 | 0.00E+0 | -2.79E-14 | -3.07E-15 |
| AP | [kg $SO_2$-Eq.] | 2.81E-2 | 1.23E-3 | 1.02E-3 | 0.00E+0 | 1.14E-3 | 6.86E-5 | 4.43E-3 | 4.66E-3 | 8.81E-4 | -7.21E-5 | 0.00E+0 | -2.11E-3 | -1.92E-3 |
| EP | [kg $(PO_4)^{3-}$-Eq.] | 4.66E-3 | 3.14E-4 | 1.83E-4 | 0.00E+0 | 3.17E-4 | 1.75E-5 | 1.10E-3 | 1.15E-3 | 9.56E-4 | -9.89E-6 | 0.00E+0 | -2.89E-4 | -2.68E-4 |
| POCP | [kg ethene-Eq.] | 3.48E-3 | -5.28E-4 | 9.56E-5 | 6.29E-5 | 1.47E-4 | -2.94E-5 | 2.70E-4 | 2.00E-4 | 7.93E-5 | -6.60E-6 | 0.00E+0 | -1.93E-4 | -2.08E-4 |
| ADPE | [kg Sb-Eq.] | 1.01E-5 | 2.64E-8 | 3.10E-7 | 0.00E+0 | 4.43E-6 | 1.47E-9 | 2.01E-7 | 2.14E-7 | 6.52E-8 | -1.17E-8 | 0.00E+0 | -3.41E-7 | -3.06E-7 |
| ADPF | [MJ] | 3.60E+2 | 4.06E+0 | 1.10E+1 | 0.00E+0 | 6.77E+0 | 2.26E-1 | 3.41E+0 | 4.28E+0 | 5.07E+0 | -8.90E-1 | 0.00E+0 | -2.60E+1 | -6.94E+1 |

| 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 |
|---|---|

### RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A1: 1 m² floorcovering

| Parameter | Unit | A1-A3 | A4 | A5 | B1 | B2 | C2 | C3/2 | C3/3 | C4/1 | D | D/1 | D/2 | D/3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PERE | [MJ] | 3.10E+1 | 2.27E-1 | 1.36E+0 | 0.00E+0 | 1.24E+0 | 1.26E-2 | 5.41E-1 | 7.99E-1 | 3.79E-1 | -2.46E-1 | 0.00E+0 | -7.18E+0 | -7.35E-1 |
| PERM | [MJ] | 3.90E-1 | 0.00E+0 | -3.90E-1 | 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 |
| PERT | [MJ] | 3.14E+1 | 2.27E-1 | 9.66E-1 | 0.00E+0 | 1.24E+0 | 1.26E-2 | 5.41E-1 | 7.99E-1 | 3.79E-1 | -2.46E-1 | 0.00E+0 | -7.18E+0 | -7.35E-1 |
| PENRE | [MJ] | 2.99E+2 | 4.07E+0 | 1.18E+1 | 0.00E+0 | 7.86E+0 | 2.27E-1 | 7.94E+1 | 8.04E+1 | 5.23E+0 | -1.09E+0 | 0.00E+0 | -3.18E+1 | -6.98E+1 |
| PENRM | [MJ] | 7.89E+1 | 0.00E+0 | -2.15E-1 | 0.00E+0 | 0.00E+0 | 0.00E+0 | -7.57E+1 | -7.57E+1 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| PENRT | [MJ] | 3.78E+2 | 4.07E+0 | 1.16E+1 | 0.00E+0 | 7.86E+0 | 2.27E-1 | 3.73E+0 | 4.79E+0 | 5.23E+0 | -1.09E+0 | 0.00E+0 | -3.18E+1 | -6.98E+1 |
| SM | [kg] | 5.37E-1 | 0.00E+0 | 1.61E-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 | 4.80E-1 |
| 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 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 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 | 0.00E+0 | 0.00E+0 |
| FW | [m³] | 5.82E-2 | 2.60E-4 | 2.38E-3 | 0.00E+0 | 4.13E-3 | 1.45E-5 | 1.98E-2 | 2.00E-2 | 4.82E-5 | -2.40E-4 | 0.00E+0 | -7.01E-3 | -6.09E-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+A1: 1 m² floorcovering

| Parameter | Unit | A1-A3 | A4 | A5 | B1 | B2 | C2 | C3/2 | C3/3 | C4/1 | D | D/1 | D/2 | D/3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HWD | [kg] | 1.28E-7 | 2.05E-10 | 4.22E-9 | 0.00E+0 | 5.90E-10 | 1.14E-11 | 1.25E-8 | 1.27E-8 | 9.40E-10 | -2.45E-10 | 0.00E+0 | -7.15E-9 | -2.66E-9 |
| NHWD | [kg] | 4.77E-1 | 6.05E-4 | 4.92E-2 | 0.00E+0 | 5.62E-3 | 3.37E-5 | 1.16E+0 | 1.16E+0 | 4.98E+0 | -5.11E-4 | 0.00E+0 | -1.49E-2 | -2.39E-1 |
| RWD | [kg] | 7.01E-3 | 4.93E-6 | 2.14E-4 | 0.00E+0 | 3.32E-4 | 2.74E-7 | 1.30E-4 | 2.03E-4 | 6.07E-5 | -7.91E-5 | 0.00E+0 | -2.31E-3 | -1.88E-4 |
| 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 | 0.00E+0 | 0.00E+0 |
| MFR | [kg] | 1.99E-2 | 0.00E+0 | 1.30E-1 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 1.26E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| MER | [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 | 0.00E+0 | 0.00E+0 |
| EEE | [MJ] | 0.00E+0 | 0.00E+0 | 2.96E-1 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 8.75E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| EET | [MJ] | 0.00E+0 | 0.00E+0 | 5.45E-1 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 1.62E+1 | 0.00E+0 | 0.00E+0 | 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; EEE = Exported |
|---|---|

## References

**EN 1307**
DIN EN 1307: 2014+A1:2016: Textile floor coverings - Classification

**EN 13501-1**
DIN EN 13501-1:2010-01: Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests

**EN 14041**
DIN EN 14041: 2018-05: Resilient, textile and laminate floor coverings - Essential characteristics

**EN 15804**
EN 15804:2012-04+A1 2013/, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

**EN 16810**
DIN EN 16810: 2017-08: Resilient, textile and laminate floor coverings – Environmental product declarations – Product category rules

**ISO 10874**
DIN EN ISO 10874: 2012-04: Resilient, textile and laminate floor coverings - Classification

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

**ISO 15686**
ISO 15686: Buildings and constructed assets - Service life planning
ISO 15686-1: 2011-05: Part 1: General principles and framework
ISO 15686-2: 2012-05: Part 2: Service life prediction procedures
ISO 15686-7: 2006-03: Part 7: Performance evaluation for feedback of service life data from practice
ISO 15686-8: 2008-06: Part 8: Reference service life and service-life estimation

**Regulation (EU) No. 305/2011**
Regulation No. 305/2011 Construction Products Regulation (CPR) of the European Council and of the European Parliament, April 2011

**CML characterization factors**
Impact assessment characterization factors, version 4.7, August 2016, Institute of Environmental Sciences - 'Centrum voor Milieuwetenschappen in Leiden' (CML), Leiden, The Netherlands

**ECHA candidate list**
Candidate List of substances of very high concern (SVHCs) for authorisation, 16.01.2020, European Chemicals Agency (ECHA), Helsinki, Finland

**ecoinvent 3.6**
ecoinvent, Zurich, Switzerland, database version 3.6, published September 2019

**GaBi database 2021-1**
GaBi Software-System and Database for Life Cycle Engineering, thinkstep AG, Leinfelden-Echterdingen, 2021-1

**IBU 2021**
IBU (2016): General Programme Instructions for the Preparation of EPDs at the Institut Bauen und Umwelt e.V., Version 2.0 Institut Bauen und Umwelt e.V., Berlin, www.ibu-epd.de

**PCR Part A**
Product Category Rules for Construction Products from the range of Environmental Product Declarations. Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Background Report, V1.9, Berlin: Institut Bauen und Umwelt e.V. (IBU), Januar 2021

**PCR Part B**
Product Category Rules for Construction Products from the range of Environmental Product Declarations of Institut Bauen und Umwelt (IBU), Part B: Requirements on the EPD for floor coverings, V1.2, Berlin: Institut Bauen und Umwelt e.V. (IBU), February 2018

**PRODIS**
Product Information System (PRODIS) of the European Carpet Industry, Gemeinschaft umweltfreundlicher Teppichboden e.V (GUT) and European Carpet and Rug Association (ECRA), http://www.pro-dis.info

**REACH**
Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH). Last update: 25.03.2014 (Status: 27.06.2018)

**VDZ e.V.**
Association of German Cement Works, Ed. Environmental Data of the German Cement Industry 2018

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# EPD

## Environmental Product Declaration

GUT/Prodis ID:

AFEA4BC1

## modulyss

## Pattern „ComfortBackEco“

surface pile weight: 372 g/m²

pile material: 100% polyamide 6

backing: ComfortBackEco

**These EPD data are only valid in combination with**

**the environmental product declaration EPD-MOD-20210150-CBC1-EN published by Institut Bauen und Umwelt e.V. (IBU) and a GUT/Prodis license**

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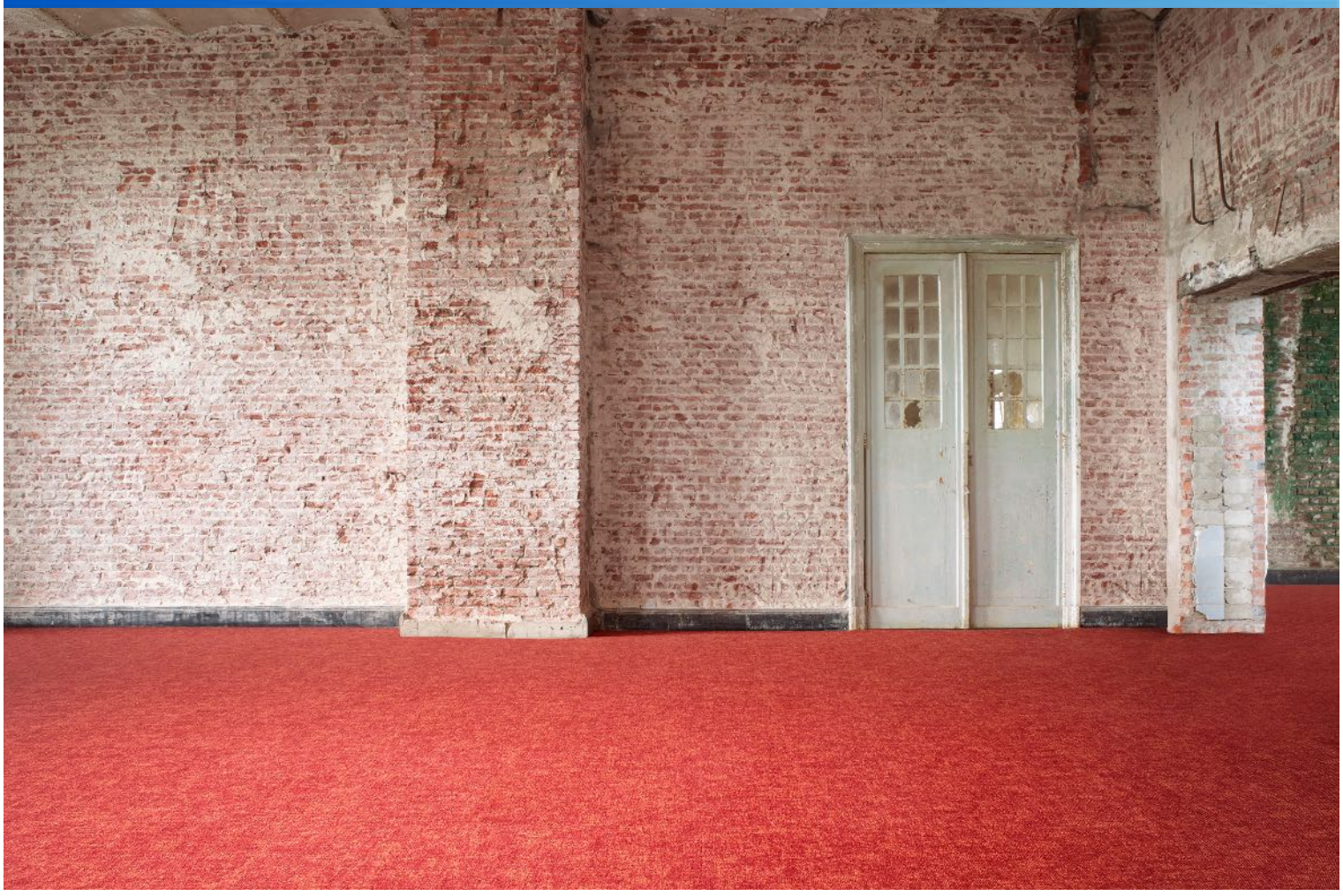
**This data set gives product specific LCA results**

**based on the calculation procedure described in the above mentioned EPD.**



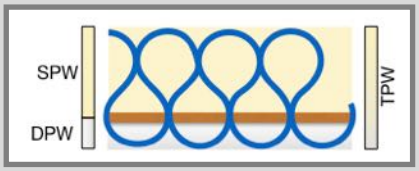
## Calculation method for similar Products of the EPD document

The EPD document is valid for all products with a surface pile weight lower or equal to the declared maximum pile weight of 1300 g/m².
The respective declaration number is EPD-MOD-20210150-CBC1-EN.

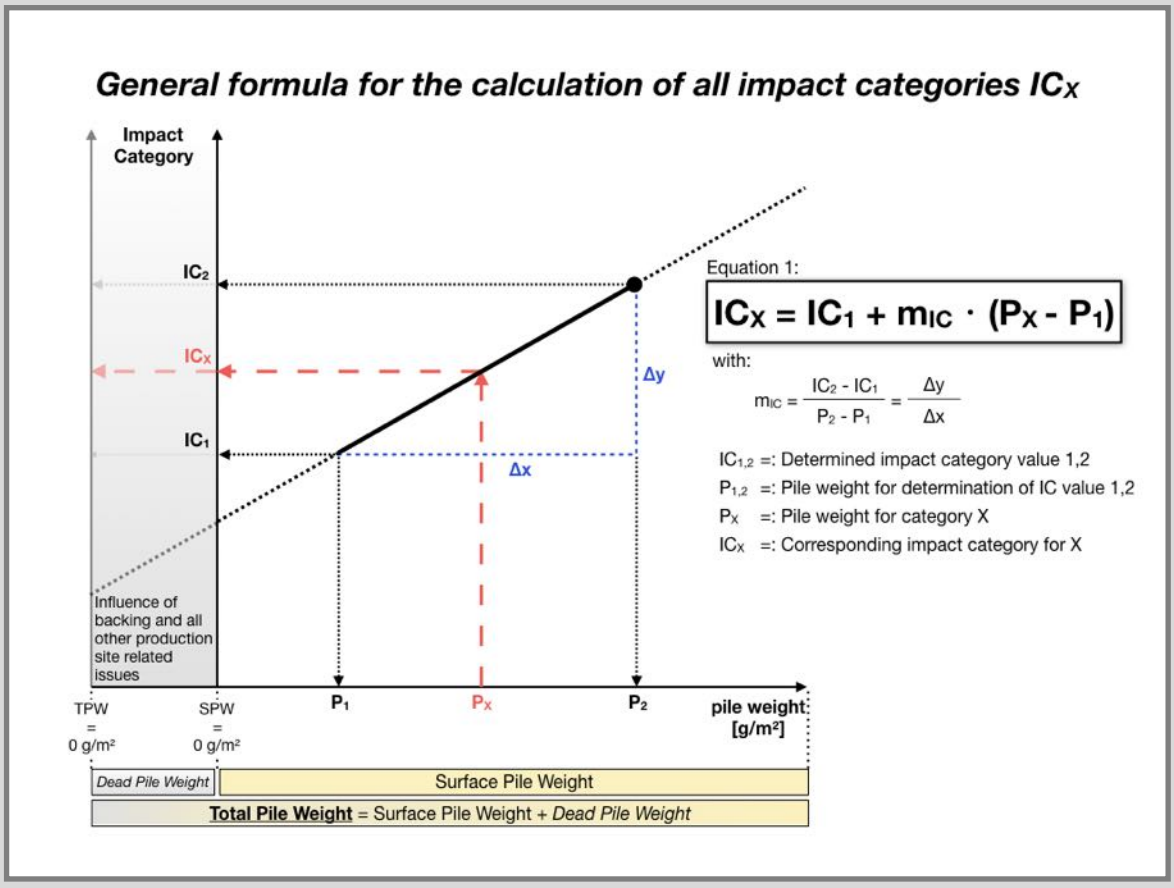
This document indicates more specific LCA results for (a) product(s) with identical material compositions and production parameters. The product(s) belong(s) to the same family of products and only differ in its/their pile weight(s).

LCA results show a linear correlation with the total pile weight, for all impact categories (IC) and all modules (A-D). It is possible to calculate specific LCA results ($IC_x$) for every carpet (x) within the declared group of products in relation to its total pile weight ($P_x$).
The total pile weight (TPW) is the sum of surface pile weight (SPW) and dead pile weight (DPW):

$$TPW = SPW + DPW$$




The surface pile weight is the technical relevant value according to EN 1307 and has to be mentioned in technical specification. As shown in the figure below alternatively to the total pile weight the surface pile weight can be used to calculate LCA results (ICx).




**Graph 1:** General formula for the calculation of all impact categories ICx.

## General Information on use stages B1 to B7

LCA results indicate environmental impacts resulting from use stage B1 to B7.

For textile floor coverings only modules B1 (use) and B2 (maintenance) are taken into account. Modules B3 (repair), B4 (replacement), B5 (refurbishment), B6 (operational energy use) and B7 (operational water use) are not relevant during the service life of textile floor coverings.

**Module B1** 'use' includes emissions to the indoor air during the use stage. Relevant emissions only occur in the first year of life (see LCA: Calculation rules).

**Module B2** 'maintenance' includes cleaning procedures.

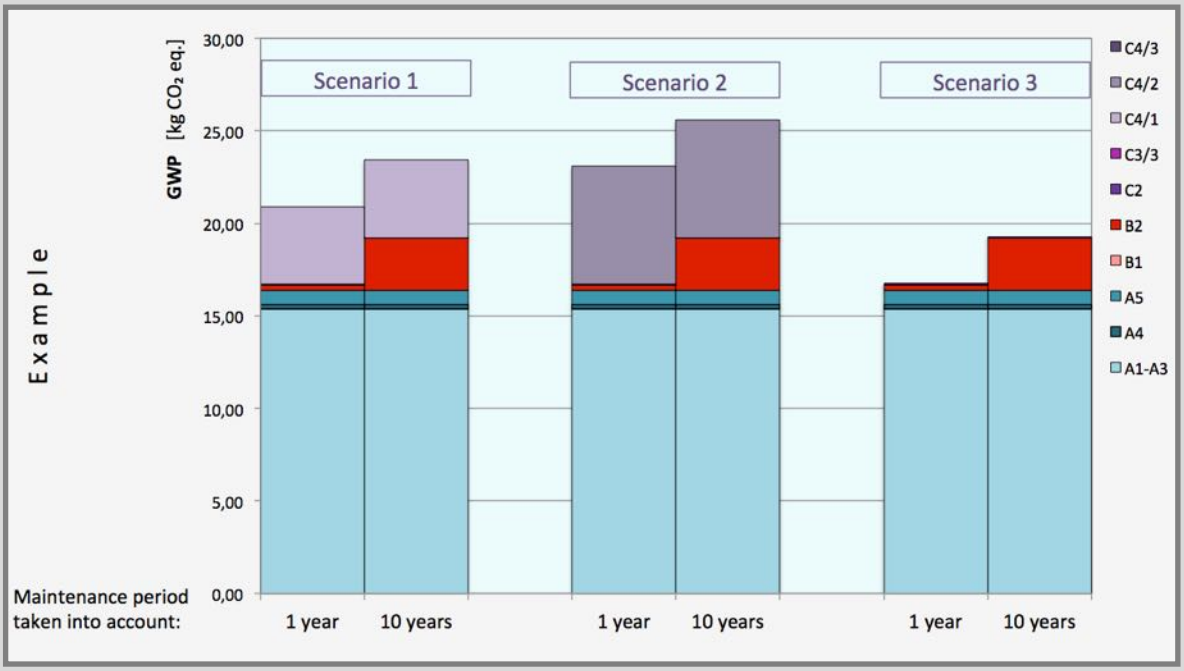
**Reference service life (RSL)**
The actual service life of textile floor coverings depends on a wide range of various impact factors such as the allocation of the application area to the use class, maintenance, intensity of use and most often fashion and building related aspects. Therefore, technical service life cannot be defined for textile floor coverings.

**Total environmental impacts from module B2**
Total environmental impacts have to be calculated by taking into account the service life of textile floor coverings. Therefore, the assumed real life (ARSL) has to be used for the calculation of total environmental impacts taking into account the expected use conditions (see RSL). Module B2 (maintenance) is depending on the service life.
Values for module B2 given in the result tables are indicated for the period of one year. They have to be multiplied by the ARSL of the textile floor covering taking into account building related aspects.

The influence of the maintenance period on the Global Warming Potential (GWP) of the whole life cycle of a textile floor covering - differentiated for 3 end-of-life scenarios - is illustrated in the graph below.

3 end-of-life scenarios:

Scenario 1: 100 % Landfill disposal
Scenario 2: 100 % Municipal waste incineration
Scenario 3: 100 % Recycling in the cement industry




**Graph 2:** Global Warming Potential (GWP) - aggregation of module A to module C - taking into account a maintenance period of 1 year compared to a maintenance period of 10 years - for the three declared end-of-life scenarios.

# 1. Information on the product Pattern „ComfortBackEco“

## Product description

| Name | Value | Unit |
|---|---|---|
| Type of manufacture | tufted tiles | - |
| Yarn type | 100% polyamide 6 | - |
| Total pile weight | 605 | g/m² |
| Surface pile weight | 372 | g/m² |
| Dead pile weight | 233 | g/m² |
| Secondary backing | ComfortBackEco | - |
| Product Form | tiles 50 cm x 50 cm | - |
| Max. total carpet weight | 4305 | g/m² |

**Base materials / Ancillary materials**

| Name | Value for category | Unit |
|---|---|---|
| Polyamide 6 | 14,1 | % |
| Polyester | 12,5 | % |
| Polypropylene | 0,7 | % |
| Limestone | 38,1 | % |
| Aluminiumhydroxide | 11,7 | % |
| SBR-Latex | 11,4 | % |
| Polyolefin | 10,3 | % |
| Glass fibre | 0,3 | % |
| Additives | 1,0 | % |
| Recycled content out of total weight | 42 % | % |

## LCA: Declared Unit

| Name | Value for category | Unit |
|---|---|---|
| Declared unit | 1,0 | m² |
| Conversion factor to 1 kg | 4,3 | kg/m² |

## LCA: Scenarios and additional technical information

All indicated values refer to the declared functional unit

**Transport to the construction site (A4)**

| Name | Value for category | Unit |
|---|---|---|
| Litres of fuel (truck, EURO 0-5 mix) | 0,0101 | l/100km |
| Transport distance | 700 | km |
| Capacity utilisation (including empty runs) | 55 | % |

**Installation in the building (A5)**

| Name | Value for category | Unit |
|---|---|---|
| Material lost | 0,13 | kg |

**Maintenance (B2)**

Indication per m² and year

| Name | Value for category | Unit |
|---|---|---|
| Maintenance cycle (wet cleaning) | 1,5 | 1/year |
| Maintenance cycle (vacuum cleaning) | 208 | 1/year |
| Water consumption (wet cleaning) | 0,004 | m³ |
| Cleaning agent (wet cleaning) | 0,09 | kg |
| Electricity consumption | 0,314 | kWh |

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

| Name | Value for category | Unit |
|---|---|---|
| Collected as mixed construction waste (scenario 1 and 2) | 4,31 | kg/m² |
| Collected separately (scenario 3) | 4,31 | kg/m² |
| Landfilling (scenario 1) | 4,31 | kg/m² |
| Energy recovery (scenario 2) | 4,31 | kg/m² |
| Energy recovery (scenario 3) | 2,15 | kg/m² |
| Recycling (scenario 3) | 2,16 | kg/m² |

## LCA: Results for Pattern „ComfortBackEco“ (calculated with a total pile weight of 605 g/m²)

**The declared result figures in module B2 have to be multiplied by the assumed service time (in years) of the floor covering in the building considered** (see chapter: ‘General Information on use stages B1 to B7’).

**Information on un-declared modules:**
Modules B3 - B7 are not relevant during the service life of the carpet and are therefore not declared.
Modules C1, C3/1, C4/2 and C4/3 cause no additional impact and are therefore not declared.
Module C2 represents the transport for scenarios 1, 2 and 3.

## Description of the system boundary

(X = Included in LCA; MDN = Module not declared)

| State of production | | | State of construction phase | | State of use | | | | | | | End of life state | | | | Credits and loads after life |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| raw material supply | transport | manufacturing | delivery | installation | use | maintenance | repair | replacement | renewal | energy use | water use | stop of use / demolition | transport | waste management | disposal | reuse, recovery and recycling potential |
| A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| X | X | X | X | X | X | X | MND | MND | MND | MND | MND | MND | X | X | X | X |

## Results for the LCA - Environmental impact: 1 m² floor covering

| Para-meter | Unit | A1-A3 | A4 | A5 | B1 | B2 | C2 | C3/2 | C3/3 | C4/1 | D/A5 | D/1 | D/2 | D/3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **GWP** | [kg CO2-eq] | 1,13E+01 | 2,58E-01 | 7,35E-01 | 0,00E+00 | 2,91E-01 | 1,43E-02 | 5,43E+00 | 5,49E+00 | 2,92E-01 | -5,07E-02 | 0,00E+00 | -1,44E+00 | -4,73E-01 |
| **ODP** | [kg CFC11-eq] | 2,70E-09 | 4,51E-17 | 8,11E-11 | 0,00E+00 | 1,21E-08 | 2,49E-18 | 2,01E-15 | 2,78E-15 | 9,92E-16 | -7,79E-16 | 0,00E+00 | -2,21E-14 | -2,59E-15 |
| **AP** | [kg SO2-eq] | 1,84E-02 | 1,06E-03 | 6,66E-04 | 0,00E+00 | 1,14E-03 | 5,90E-05 | 2,59E-03 | 2,78E-03 | 7,59E-04 | -5,90E-05 | 0,00E+00 | -1,67E-03 | -1,58E-03 |
| **EP** | [kg PO4)3-eq] | 3,04E-03 | 2,71E-04 | 1,19E-04 | 0,00E+00 | 3,17E-04 | 1,51E-05 | 6,16E-04 | 6,59E-04 | 8,23E-04 | -8,09E-06 | 0,00E+00 | -2,29E-04 | -2,15E-04 |
| **POCP** | [kg ethen-eq] | 1,94E-03 | -4,57E-04 | 4,85E-05 | 6,29E-05 | 1,47E-04 | -2,53E-05 | 1,63E-04 | 1,03E-04 | 6,83E-05 | -5,40E-06 | 0,00E+00 | -1,53E-04 | -1,61E-04 |
| **ADPE** | [kg Sb-eq] | 6,66E-06 | 2,28E-08 | 2,07E-07 | 0,00E+00 | 4,43E-06 | 1,27E-09 | 1,90E-07 | 2,01E-07 | 5,61E-08 | -9,55E-09 | 0,00E+00 | -2,71E-07 | -2,92E-07 |
| **ADPF** | [MJ] | 2,36E+02 | 3,51E+00 | 7,26E+00 | 0,00E+00 | 6,77E+00 | 1,95E-01 | 2,72E+00 | 3,46E+00 | 4,37E+00 | -7,28E-01 | 0,00E+00 | -2,06E+01 | -4,95E+01 |

| 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 |
|---|---|

## Results for the LCA - Resource use: 1 m² floor covering

| Para-meter | Unit | A1-A3 | A4 | A5 | B1 | B2 | C2 | C3/2 | C3/3 | C4/1 | D/A5 | D/1 | D/2 | D/3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PERE** | [MJ] | 2,27E+01 | 1,97E-01 | 1,11E+00 | 0,00E+00 | 1,24E+00 | 1,09E-02 | 4,78E-01 | 7,00E-01 | 3,27E-01 | -2,01E-01 | 0,00E+00 | -5,69E+00 | -6,13E-01 |
| **PERM** | [MJ] | 3,90E-01 | 0,00E+00 | -3,90E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| **PERT** | [MJ] | 2,31E+01 | 1,97E-01 | 7,13E-01 | 0,00E+00 | 1,24E+00 | 1,09E-02 | 4,78E-01 | 7,00E-01 | 3,27E-01 | -2,01E-01 | 0,00E+00 | -5,69E+00 | -6,13E-01 |
| **PENRE** | [MJ] | 1,94E+02 | 3,52E+00 | 7,86E+00 | 0,00E+00 | 7,86E+00 | 1,95E-01 | 5,64E+01 | 5,73E+01 | 4,50E+00 | -8,91E-01 | 0,00E+00 | -2,53E+01 | -4,99E+01 |
| **PENRM** | [MJ] | 5,41E+01 | 0,00E+00 | -2,15E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | -5,35E+01 | -5,35E+01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| **PENRT** | [MJ] | 2,48E+02 | 3,52E+00 | 7,65E+00 | 0,00E+00 | 7,86E+00 | 1,95E-01 | 3,00E+00 | 3,91E+00 | 4,50E+00 | -8,91E-01 | 0,00E+00 | -2,53E+01 | -4,99E+01 |
| **SM** | [kg] | 5,37E-01 | 0,00E+00 | 1,61E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 4,80E-01 |
| **RSF** | [MJ] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| **NRSF** | [MJ] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| **FW** | [m³] | 4,20E-02 | 2,24E-04 | 1,82E-03 | 0,00E+00 | 4,13E-03 | 1,25E-05 | 1,75E-02 | 1,77E-02 | 4,15E-05 | -1,97E-04 | 0,00E+00 | -5,55E-03 | -4,48E-03 |

| | |
|---|---|
| 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 for the LCA - Output flows and waste categories: 1 m² floor covering

| Para-meter | Unit | A1-A3 | A4 | A5 | B1 | B2 | C2 | C3/2 | C3/3 | C4/1 | D/A5 | D/1 | D/2 | D/3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **HWD** | [kg] | 9,38E-08 | 1,77E-10 | 3,19E-09 | 0,00E+00 | 5,90E-10 | 9,83E-12 | 1,23E-08 | 1,24E-08 | 8,09E-10 | -2,00E-10 | 0,00E+00 | -5,67E-09 | -2,55E-09 |
| **NHWD** | [kg] | 4,16E-01 | 5,23E-04 | 4,72E-02 | 0,00E+00 | 5,62E-03 | 2,90E-05 | 1,15E+00 | 1,15E+00 | 4,29E+00 | -4,18E-04 | 0,00E+00 | -1,19E-02 | -2,39E-01 |
| **RWD** | [kg] | 4,90E-03 | 4,26E-06 | 1,51E-04 | 0,00E+00 | 3,32E-04 | 2,36E-07 | 1,16E-04 | 1,80E-04 | 5,23E-05 | -6,47E-05 | 0,00E+00 | -1,83E-03 | -1,58E-04 |
| **CRU** | [kg] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| **MFR** | [kg] | 2,28E-02 | 0,00E+00 | 1,30E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,26E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| **MER** | [kg] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 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 | 2,46E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 7,11E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| **EET** | [MJ] | 0,00E+00 | 0,00E+00 | 4,56E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,32E+01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |

| | |
|---|---|
| Caption | **HWD** = Hazardous waste disposed; **NHWD** = Non-hazardous waste disposed; **RWD** = Radioactive waste disposed; **CRU** = Components for re-use; **MFR** = Materials for recycling; **MER** = Materials for energy recovery; **EEE** = Exported electrical energy; **EEE** = Exported thermal energy |