

# ENVIRONMENTAL

as per ISO 14025 and EN 15804+A2

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-20220309-CBA1-EN
Issue date	10/01/2023
Valid to	09/01/2028

## Modular carpet tiles

Pile material: polyamide 6 yarn with a maximum total pile weight of 1300 g/m<sup>2</sup>

Back2Back or Comfortback

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## General Information

modulyss®

### Programme holder

IBU – Institut Bauen und Umwelt e.V.  
Hegelplatz 1  
10117 Berlin  
Germany

### Declaration number

EPD-MOD-20220309-CBA1-EN

### This declaration is based on the product category rules:

Floor coverings, 02/2018  
(PCR checked and approved by the SVR)

### Issue date

10/01/2023

### Valid to

09/01/2028



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



Dr. Alexander Röder  
(Managing Director Institut Bauen und Umwelt e.V.)

### Modular carpet tiles

pile material: polyamide 6 yarn with a maximum total pile weight of 1300 g/m<sup>2</sup>

Back2Back or Comfortback

### Owner of the declaration

modulyss  
Zevensterestraat 21  
9240 Zele  
Belgium

### Declared product / declared unit

1 m<sup>2</sup> tufted modular carpet tiles with bitumen heavy backing and a pile material of PA 6

### Scope:

The manufacturer declaration applies to tufted carpet tiles with bitumen heavy backing, a pile material of PA 6 with a maximum total pile weight of 1300 g/m<sup>2</sup>. The products are produced in Zele, Belgium. LCA results for products with a maximum total pile weight of 480 g/m<sup>2</sup> 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.

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+A2. In the following, the standard will be simplified as EN 15804.

### Verification

The standard EN 15804 serves as the core PCR

Independent verification of the declaration and data according to ISO 14025:2011

☐ internally ☒ externally



Angela Schindler  
(Independent verifier)

## Product

### Product description/Product definition

The declaration applies to tufted carpet tiles having a surface pile of polyamide 6 with a maximum total pile weight of 1300 g/m<sup>2</sup>. Colouring of the surface is achieved using either solution-dyed yarn or aqueous dyeing methods. The backing of the carpet consists of a bitumen heavy backing. In the comfortback range, the bitumen heavy backing is covered by a PET fleece. The total recycled content of the carpet is 49 %.

For the placing on the market of the specific 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 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

The use class of the specific product as defined in EN 1307 can be found in the Product Information System (PRODIs) using the PRODIs registration number of the product.

### Technical Data

#### Constructional data according to EN 1307

Name	Value	Unit
Product Form	Modular carpet tiles, 50 cm x 50 cm	-
Type of manufacture	Tufted carpet	-
Yarn type	Polyamide 6	-
Total carpet weight	5277	g/m <sup>2</sup>
Secondary backing	Bitumen heavy backing with textile bottom	-

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.

#### Base materials/Ancillary materials

Name	Value	Unit
Polyamide 6	24.6	%
Polypropylene	0.6	%
Polyester	10.2	%
Limestone	41.0	%
Aluminiumhydroxide	5.3	%

## LCA: Calculation rules

### Declared Unit

Name	Value	Unit
Declared unit	1	m <sup>2</sup>
Grammage	5277	kg/m <sup>2</sup>

The declared unit refers to 1 m<sup>2</sup> produced textile floor covering. The output of module A5 'Assembly' is 1 m<sup>2</sup> installed textile floor covering.

The layer thickness of the specific product covered by the EPD 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.

### System boundary

Type of EPD: Cradle-to-gate with options  
System boundaries of modules A, B, C, D:  
Modules C3, C4 and D are indicated separately for three end-of-life scenarios:

Styrene butadiene rubber (SBR)	4.8	%
SBS Copolymer	1.1	%
Bitumen	11.3	%
Glass fibre	0.2	%
Additives	0.9	%

The specific product covered by the EPD contains substances listed in the ECHA candidate list (08.07.2021) or other carcinogenic, mutagenic or 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 GUT-PRODIs system ensures compliance with limitations of various chemicals and Volatile Organic Compound s(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

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 calculation of the reference service life according to ISO 15686 is not possible.

Alternatively, a reference service life of 10 years can be assumed, during which the functional and visual quality is guaranteed (BNB, Nutzungsdauer von Bauteilen). The technical service life can be significantly longer.

- 1 - landfill disposal
- 2 - municipal waste incineration
- 3 - recovery in a cement plant

#### 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.

Biogenic carbon that is stored in renewable material (wood resin, renewable additives, packaging paper) is taken into account as well as the associated carbon dioxide uptake from the air from which this biogenic carbon comes.

#### 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.

Biogenic carbon that is stored in renewable materials in installation waste and packaging paper is released as carbon dioxide emissions into the air at the end of life in module A5.

Preparation 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 Volatile Organic Compound (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.

#### B3 - B5:

The modules are not relevant within the assumed reference service life of 10 years.

#### B6 - B7:

No energy and water input are required for the operation of the carpet in the use stage. The modules do not cause any environmental impact.

#### 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:

Calculated benefits result from materials exclusive secondary materials (net materials).

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*, 2022-2. Remaining data gaps are covered by the *ecoinvent 3.7* database, 2020.

## LCA: Scenarios and additional technical information

### Characteristic product properties

#### Information on biogenic Carbon

Name	Value	Unit
Biogenic carbon content in product at factory gate	0	kg C
Biogenic carbon content in accompanying packaging at factory gate	0.06	kg C

1 kg biogenic Carbon is equivalent to 44/12 kg of CO<sub>2</sub>.

### Transport to the construction site (A4)

Name	Value	Unit
Litres of fuel (truck, EURO 0-6 mix)	0.012	l/100km
Transport distance	700	km
Capacity utilisation (including empty runs)	55	%

### Installation in the building (A5)

Name	Value	Unit
Material loss	0.158	kg

Polyethylene packaging waste and installation waste are considered to be incinerated in a municipal waste incineration plant. Cardboard packaging waste is going 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 m<sup>2</sup> floor covering 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. Based on this useful life the effects of module B2 need to be calculated in order to obtain the overall environmental impacts.

Name	Value	Unit
Maintenance cycle (vacuum cleaning)	208	Number /year
Maintenance cycle (wet cleaning)	1,5	Number /year
Water consumption (wet cleaning)	0.004	m <sup>3</sup>
Cleaning agent (wet cleaning)	0.09	kg
Electricity consumption	0.314	kWh

For further information on cleaning and maintenance see [www.modulyss.com](http://www.modulyss.com)

## Service life

Name	Value	Unit
Life Span (according to BBSR)	10	a
Declared product properties (at the gate) and finishes	Corresponds to the specifications of EN 1307	-
An assumed quality of work, when installed in accordance with the manufacturer's instructions	Conforms to the manufacturer's instructions	-
Usage conditions, e.g. frequency of use, mechanical exposure	Use in areas defined by the use class according to EN 1307	-
Maintenance e.g. required frequency, type and quality and replacement of components	According to the manufacturers instructions	-

## 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 % recovery 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 (scenarios 1 and 2)	5.277	kg
Collected separately (scenario 3)	5.277	kg
Landfilling (scenario 1)	5.277	kg
Energy recovery (scenario 2)	5.277	kg
Energy recovery (scenario 3)	2,822	kg
Recycling (scenario 3)	2.455	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)

The organic material of the carpet is used as an alternative fuel in a cement kiln. It mainly substitutes for lignite (68.8%), hard coal (23.6%) and petrol coke (7.6%). The inorganic material is substantially integrated into the cement clinker and substitutes for original material input. VDZ e.V.

## LCA: Results

The LCA results refer to all declared products with a maximum total pile weight of 1300 g/m<sup>2</sup>. LCA results for products with a maximum total pile weight of 480 g/m<sup>2</sup> 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.

**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	X	X	X	X	MNR	MNR	MNR	ND	ND	X	X	X	X	X

### RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m<sup>2</sup> floor covering

Core Indicator	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3/2	C3/3	C4/1	D	D/1	D/2	D/3
GWP-total	[kg CO <sub>2</sub> -Eq.]	1.51E+1	3.21E-1	8.89E-1	0.00E+0	4.16E-1	0.00E+0	1.79E-2	6.58E+0	6.65E+0	3.70E-1	-6.07E-2	0.00E+0	-1.78E+0	-4.93E-1
GWP-fossil	[kg CO <sub>2</sub> -Eq.]	1.53E+1	3.16E-1	6.81E-1	0.00E+0	2.15E-1	0.00E+0	1.76E-2	6.58E+0	6.65E+0	3.74E-1	-6.04E-2	0.00E+0	-1.77E+0	-4.92E-1
GWP-biogenic	[kg CO <sub>2</sub> -Eq.]	-1.14E-1	4.09E-3	2.08E-1	0.00E+0	4.16E-3	0.00E+0	2.28E-4	8.58E-4	1.67E-3	0.00E+0	-3.08E-4	0.00E+0	-9.02E-3	-7.15E-4
GWP-luluc	[kg CO <sub>2</sub> -Eq.]	5.93E-3	1.79E-3	2.43E-4	0.00E+0	1.96E-1	0.00E+0	9.96E-5	2.60E-4	5.15E-4	1.82E-4	-6.63E-6	0.00E+0	-1.94E-4	-2.24E-4
ODP	[kg CFC11-Eq.]	1.48E-9	1.92E-14	4.43E-11	0.00E+0	3.42E-8	0.00E+0	1.07E-15	5.80E-13	9.79E-13	5.02E-13	-4.07E-13	0.00E+0	-1.19E-11	-7.50E-13
AP	[mol H <sup>+</sup> -Eq.]	2.69E-2	1.91E-3	1.07E-3	0.00E+0	8.32E-4	0.00E+0	1.06E-4	6.49E-3	6.82E-3	1.11E-3	-7.93E-5	0.00E+0	-2.32E-3	-1.69E-3
EP-freshwater	[kg P-Eq.]	5.82E-5	9.57E-7	1.81E-6	0.00E+0	5.19E-6	0.00E+0	5.33E-8	9.55E-7	1.17E-6	6.98E-5	-8.29E-8	0.00E+0	-2.42E-6	-5.10E-7
EP-marine	[kg N-Eq.]	7.99E-3	9.37E-4	3.66E-4	0.00E+0	1.97E-4	0.00E+0	5.22E-5	3.18E-3	3.32E-3	2.45E-4	-2.15E-5	0.00E+0	-6.30E-4	-5.31E-4
EP-terrestrial	[mol N-Eq.]	7.08E-2	1.04E-2	3.53E-3	0.00E+0	2.83E-3	0.00E+0	5.78E-4	3.54E-2	3.70E-2	2.69E-3	-2.31E-4	0.00E+0	-6.75E-3	-5.82E-3
POCP	[kg NMVOC-Eq.]	2.38E-2	1.77E-3	1.02E-3	4.18E-4	9.83E-4	0.00E+0	9.87E-5	8.15E-3	8.43E-3	7.89E-4	-6.03E-5	0.00E+0	-1.76E-3	-1.61E-3
ADPE	[kg Sb-Eq.]	2.28E-6	2.68E-8	7.03E-8	0.00E+0	2.30E-7	0.00E+0	1.49E-9	3.17E-8	4.28E-8	2.59E-8	-9.10E-9	0.00E+0	-2.66E-7	-4.58E-8
ADPF	[MJ]	3.18E+2	4.28E+0	9.80E+0	0.00E+0	5.90E+0	0.00E+0	2.39E-1	3.77E+0	4.86E+0	5.31E+0	1.03E+0	0.00E+0	3.00E+1	6.70E+1
WDP	[m <sup>3</sup> world-Eq deprived]	1.79E+0	2.87E-3	8.12E-2	0.00E+0	9.99E-2	0.00E+0	1.60E-4	8.66E-1	8.73E-1	-3.97E-3	-6.35E-3	0.00E+0	-1.86E-1	-7.52E-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 m<sup>2</sup> floor covering

Indicator	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3/2	C3/3	C4/1	D	D/1	D/2	D/3
PERE	[MJ]	3.14E+1	2.44E-1	1.23E+0	0.00E+0	3.69E+0	0.00E+0	1.36E-2	6.30E-1	9.36E-1	4.36E-1	-2.81E-1	0.00E+0	-8.23E+0	-6.36E-1
PERM	[MJ]	2.54E-1	0.00E+0	-2.54E-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	0.00E+0
PERT	[MJ]	3.17E+1	2.44E-1	9.77E-1	0.00E+0	3.69E+0	0.00E+0	1.36E-2	6.30E-1	9.36E-1	4.36E-1	-2.81E-1	0.00E+0	-8.23E+0	-6.36E-1
PENRE	[MJ]	2.44E+2	4.29E+0	1.00E+1	0.00E+0	5.90E+0	0.00E+0	2.39E-1	7.83E+1	7.94E+1	5.31E+0	-1.03E+0	0.00E+0	-3.00E+1	-6.70E+1
PENRM	[MJ]	7.48E+1	0.00E+0	-2.15E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-7.45E+1	-7.45E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PENRT	[MJ]	3.18E+2	4.29E+0	9.81E+0	0.00E+0	5.90E+0	0.00E+0	2.39E-1	3.77E+0	4.86E+0	5.31E+0	-1.03E+0	0.00E+0	-3.00E+1	-6.70E+1
SM	[kg]	2.75E+0	0.00E+0	8.24E-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	0.00E+0	1.90E-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	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	0.00E+0
FW	[m <sup>3</sup> ]	7.18E-2	2.75E-4	2.81E-3	0.00E+0	3.34E-3	0.00E+0	1.53E-5	2.05E-2	2.08E-2	6.22E-5	-2.69E-4	0.00E+0	-7.86E-3	-6.04E-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 m<sup>2</sup> floor covering

Indicator	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3/2	C3/3	C4/1	D	D/1	D/2	D/3
HWD	[kg]	1.29E-3	2.06E-11	3.87E-5	0.00E+0	4.19E-5	0.00E+0	1.15E-12	5.65E-10	6.10E-10	8.19E-10	-1.39E-10	0.00E+0	-4.07E-9	-2.86E-10
NHWD	[kg]	3.32E-1	6.15E-4	4.88E-2	0.00E+0	7.30E-3	0.00E+0	3.43E-5	1.29E+0	1.29E+0	5.26E+0	-5.18E-4	0.00E+0	-1.52E-2	-1.34E-1
RWD	[kg]	6.00E-3	5.29E-6	1.84E-4	0.00E+0	3.76E-4	0.00E+0	2.95E-7	1.36E-4	2.15E-4	6.52E-5	-8.07E-5	0.00E+0	-2.36E-3	-1.35E-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	0.00E+0
MFR	[kg]	3.50E-2	0.00E+0	1.31E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.41E+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	0.00E+0
EEE	[MJ]	0.00E+0	0.00E+0	2.92E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	8.62E+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	5.39E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.60E+1	8.61E+1	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; EET = Exported thermal energy

## RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 m<sup>2</sup> floor covering

Indicator	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3/2	C3/3	C4/1	D	D/1	D/2	D/3
PM	[Disease Incidence]	1.89E-7	1.10E-8	6.88E-9	0.00E+0	6.84E-8	0.00E+0	6.14E-10	2.83E-8	3.03E-8	1.07E-8	-6.57E-10	0.00E+0	0.00E+0	-2.29E-8
IRP	[kBq U235-Eq.]	9.73E-1	7.75E-4	2.99E-2	0.00E+0	6.78E-2	0.00E+0	4.32E-5	2.08E-2	3.42E-2	9.63E-3	-1.37E-2	0.00E+0	0.00E+0	-1.45E-2
ETP-fw	[CTUe]	1.58E+2	2.97E+0	4.89E+0	3.60E-3	2.69E+0	0.00E+0	1.66E-1	1.85E+0	2.48E+0	5.19E+0	-2.25E-1	0.00E+0	0.00E+0	-1.17E+1
HTP-c	[CTUh]	4.68E-9	6.01E-11	1.45E-10	0.00E+0	6.21E-10	0.00E+0	3.35E-12	9.29E-11	1.07E-10	2.33E-10	-1.04E-11	0.00E+0	0.00E+0	-1.27E-10
HTP-nc	[CTUh]	2.01E-7	3.57E-9	6.34E-9	2.60E-11	9.46E-9	0.00E+0	1.99E-10	6.40E-9	7.12E-9	1.95E-8	-3.98E-10	0.00E+0	0.00E+0	-7.28E-9
SQP	[-]	ND	ND	ND	ND	ND	0.00E+0	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

No substantiated values can be given for the SQP indicator with the existing database.

The result figures given in module B2 refer to a period of 1 year because a reference service life is not declared. They have to be multiplied by the assumed service life (in years) of the floor covering in the building under consideration.

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 or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators “abiotic depletion potential for non-fossil resources”, “abiotic depletion potential for fossil resources”, “water (user) deprivation potential, deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit for humans – cancerogenic”, “Potential comparative toxic unit for humans - not cancerogenic”, “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.

## References

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DIN EN 1307: 2014+A1:2016+A2:2018-05: Textile floor coverings - Classification

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### EN 13501-1

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### ISO 10874

DIN EN ISO 10874: 2012+A1:2021-04: Resilient, textile and laminate floor coverings - Classification

### EN 14041

DIN EN 14041: 2018-05 and DIN EN 14041: 2008-05: Resilient, textile and laminate floor coverings - Essential characteristics

### ISO 14025

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

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### EN 16810

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ISO 15686-8: 2008-06: Part 8: Reference service life  
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#### **ecoinvent**

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Product Category Rules for Building-Related Products  
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Report according to EN 15804+A2:2019, V1.1, Berlin:  
Institut Bauen und Umwelt e.V. (IBU), January 2021

#### **PCR Part B**

Product Category Rules for Building-Related Products  
and Services  
Part B: Requirements on the EPD for floor coverings,  
V1.2, Berlin: Institut Bauen und Umwelt e.V. (IBU),  
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#### **PRODIS**

Product Information System (PRODIS) of the  
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umweltfreundlicher Teppichboden e.V (GUT) and  
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Parliament and of the Council of 18 December 2006  
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#### **VDZ e.V.**

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mental Data of the German Cement Industry 2020



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# EPD

Environmental  
Product  
Declaration

1F6470AB



[www.gut-prodis.eu](http://www.gut-prodis.eu)



**modulyss®**

**HAZE CP**

surface pile weight: 840 g/m<sup>2</sup>

pile material: polyamide 6

backing: Back2Back

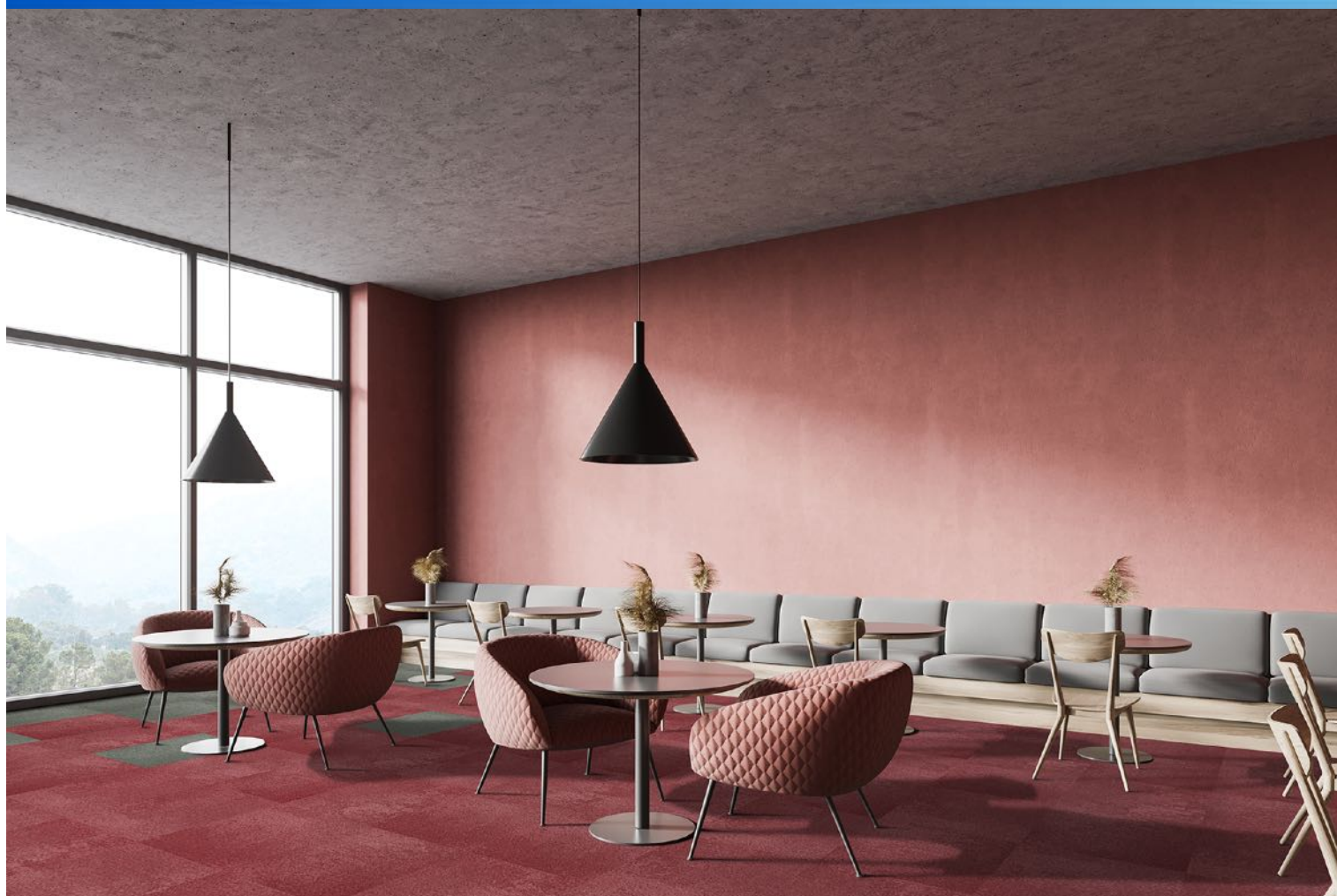
**These EPD data are only valid in combination with**

**the environmental product declaration EPD-MOD-20220309-CBA1-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/m<sup>2</sup>**.

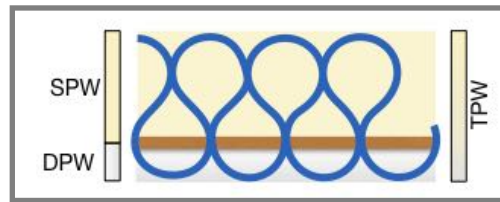
The respective declaration number is **EPD-MOD-20220309-CBA1-EN**

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<sub>x</sub>) for every carpet (x) within the declared group of products in relation to its total pile weight (P<sub>x</sub>).

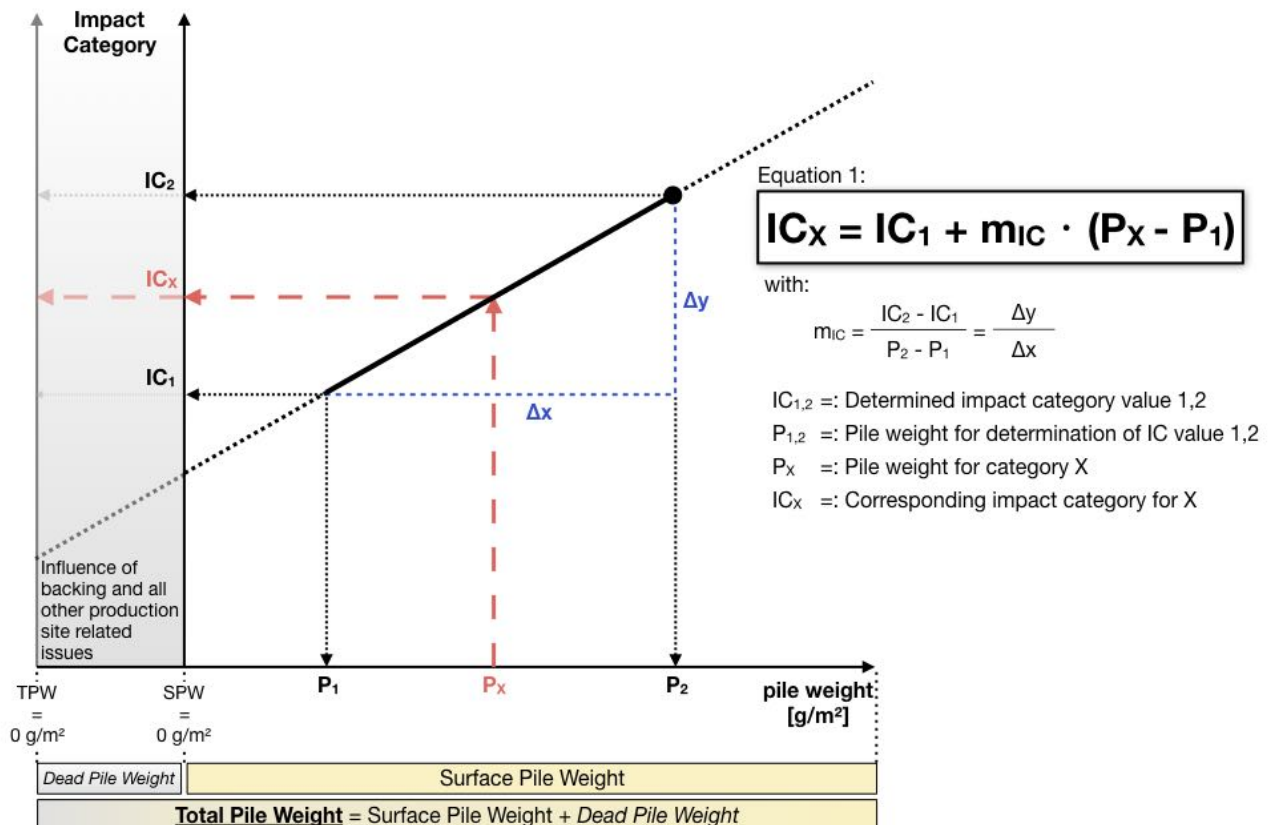
The total pile weight (TPW) is the sum of surface pile weight (SPW) and dead pile weight (DPW):

$$TPW = SPW + DPW$$



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 (IC<sub>x</sub>).

### General formula for the calculation of all impact categories IC<sub>x</sub>



**Graph 1:** General formula for the calculation of all impact categories IC<sub>x</sub>.

## 1. Information on the product HAZE CP

### Product description

#### Constructional data according to EN 1307

Name	Value	Unit
Product form	Modular carpet tiles	-
Type of manufacture	Tufted carpet	-
Yarn type	Polyamide 6	-
Total carpet weight	max. 5037	g/m <sup>2</sup>
Surface pile weight	max. 840	g/m <sup>2</sup>
Secondary backing	Bitumen heavy backing with textile bottom	-

#### Base materials/Ancillary materials

Name	Value	Unit
Polyamide 6	21,0	%
Polyester	10,7	%
Polypropylene	0,6	%
SBR-Latex	5,1	%
SBS-Copolymer	1,1	%
Bitumen	11,8	%
Limestone	43,0	%
Aluminium hydroxide (ATH)	5,5	%
Glass fibre	0,2	%
Additives	1,0	%

### LCA: Calculation rules

#### Declared Unit

Name	Value	Unit
Declared unit	1	m <sup>2</sup>
Grammage	5,037	kg/m <sup>2</sup>

### LCA: Scenarios and additional technical information

All indicated values refer to the declared functional unit

#### Characteristic product properties: Information on biogenic Carbon

Name	Value	Unit
Biogenic Carbon Content in accompanying packaging at factory gate	0,057	kg C

1 kg biogenic Carbon is equivalent to 44/12 kg of CO<sub>2</sub>

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

Name	Value	Unit
Litres of fuel (truck, EURO 0-6 mix)	0,0118	l/100km
Transport distance	700	km
Capacity utilisation (including empty runs)	55	%

#### Installation in the building (A5)

Name	Value	Unit
Material loss	0,151	kg

#### Maintenance (B2)

Name	Value	Unit
Maintenance cycle (vacuum cleaning)	208	1/year
Maintenance cycle (wet cleaning)	1,50	1/year
Water consumption (wet cleaning)	0,004	m <sup>3</sup>
Cleaning agent (wet cleaning)	0,09	kg
Electricity consumption	0,314	kWh

Indication per m<sup>2</sup> and year

#### Service life

Name	Value	Unit
Life Span (according to BBSR)	10	year
Declared product properties (at the gate) and finishes	Corresponds to the specifications of EN 1307	-
An assumed quality of work, when installed in accordance with the manufacturer's instructions	Conforms to the manufacturer's instructions	-
Usage conditions, e.g. frequency of use, mechanical exposure	Use in areas defined by the use class according to EN 1307	-
Maintenance e.g. required frequency, type and quality and replacement of components	According to the manufacturers instructions	-

#### End of life scenarios (SC1-SC3)

Name	SC1	SC2	SC3	Unit
Collected as mixed construction waste	5,04	5,04	-	kg
Collected separately	-	-	5,04	kg
Landfilling	5,04	-	-	kg
Energy recovery	-	5,04	2,58	kg
Recycling	-	-	2,45	kg

**SC1:** 100% landfill disposal, **SC2:** 100% municipal waste incineration (MWI) with R1>0.6, **SC3:** 100% recovery in the cement industry

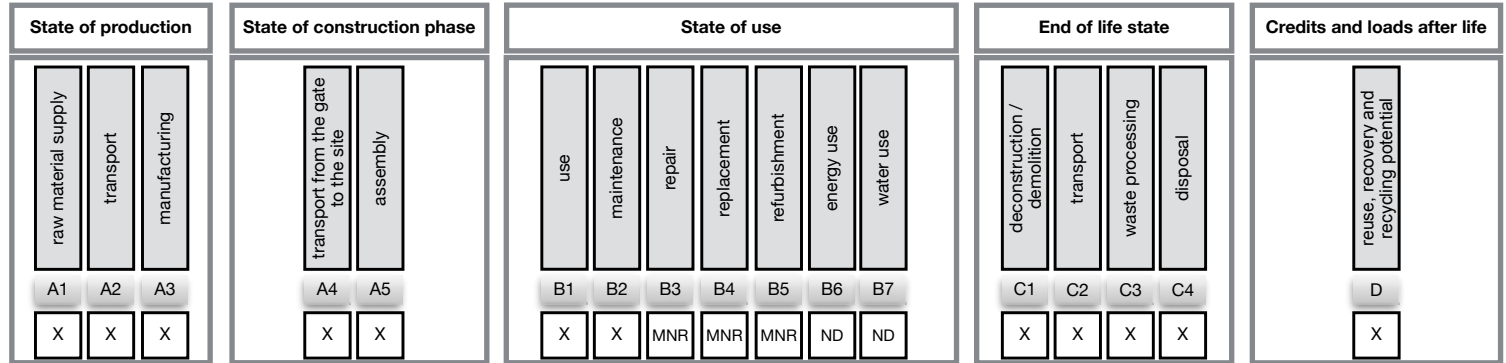


## LCA: Results

The modules C3/1, C4/2 and C4/3 cause no additional impact (see chapter "LCA: Calculation rules"). Module C2 represents the transport for scenarios 1, 2 and 3. The values in column D result from module A5.

## Description of the system boundary

(X = Included in LCA; ND = Module or indicator not declared; MNR = Module not relevant)



## Results of the LCA - Environmental impact according to EN 15804+A2: for 1 m<sup>2</sup> floor covering

Core Indicator	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3/2	C3/3	C4/1	D	D/1	D/2	D/3
GWP-total	[kg CO <sub>2</sub> -Eq.]	1,29E+01	3,07E-01	8,05E-01	0,00E+00	4,16E-01	0,00E+00	1,71E-02	6,03E+00	6,10E+00	3,53E-01	-5,31E-02	0,00E+00	-1,53E+00	-4,51E-01
GWP-fossil	[kg CO <sub>2</sub> -Eq.]	1,31E+01	3,02E-01	5,97E-01	0,00E+00	2,15E-01	0,00E+00	1,68E-02	6,03E+00	6,10E+00	3,57E-01	-5,29E-02	0,00E+00	-1,52E+00	-4,50E-01
GWP-biogenic	[kg CO <sub>2</sub> -Eq.]	-1,25E-01	3,91E-03	2,08E-01	0,00E+00	4,16E-03	0,00E+00	2,17E-04	7,92E-04	1,57E-03	0,00E+00	-2,70E-04	0,00E+00	-7,74E-03	-6,68E-04
GWP-luluc	[kg CO <sub>2</sub> -Eq.]	5,19E-03	1,71E-03	2,18E-04	0,00E+00	1,96E-01	0,00E+00	9,51E-05	2,59E-04	5,02E-04	1,74E-04	-5,80E-06	0,00E+00	-1,66E-04	-2,06E-04
ODP	[kg CFC <sub>11</sub> -Eq.]	1,21E-09	1,84E-14	3,62E-11	0,00E+00	3,42E-08	0,00E+00	1,02E-15	5,24E-13	9,05E-13	4,79E-13	-3,56E-13	0,00E+00	-1,02E-11	-6,73E-13
AP	[kg H <sup>+</sup> -Eq.]	2,31E-02	1,83E-03	9,22E-04	0,00E+00	8,32E-04	0,00E+00	1,01E-04	5,52E-03	5,83E-03	1,06E-03	-6,94E-05	0,00E+00	-1,99E-03	-1,57E-03
EP-freshwater	[kg P-Eq.]	4,94E-05	9,15E-07	1,54E-06	0,00E+00	5,19E-06	0,00E+00	5,09E-08	9,37E-07	1,14E-06	6,66E-05	-7,25E-08	0,00E+00	-2,07E-06	-4,69E-07
EP-marine	[kg N-Eq.]	6,86E-03	8,95E-04	3,16E-04	0,00E+00	1,97E-04	0,00E+00	4,98E-05	2,68E-03	2,82E-03	2,34E-04	-1,88E-05	0,00E+00	-5,41E-04	-4,90E-04
EP-terrestrial	[kg N-Eq.]	6,15E-02	9,93E-03	3,07E-03	0,00E+00	2,83E-03	0,00E+00	5,52E-04	2,99E-02	8,94E-03	2,57E-03	-2,02E-04	0,00E+00	-5,79E-03	-5,37E-03
POCP	[kg NMVOC-Eq.]	2,05E-02	1,69E-03	8,80E-04	4,18E-04	9,83E-04	0,00E+00	9,42E-05	6,88E-03	7,15E-03	7,53E-04	-5,28E-05	0,00E+00	-1,51E-03	-1,48E-03
ADPE	[kg Sb-Eq.]	1,97E-06	2,56E-08	6,10E-08	0,00E+00	2,30E-07	0,00E+00	1,42E-09	2,99E-08	4,05E-08	2,47E-08	-7,96E-09	0,00E+00	-2,28E-07	-4,21E-08
ADPF	[MJ]	2,76E+02	4,09E+00	8,52E+00	0,00E+00	5,90E+00	0,00E+00	2,28E-01	3,51E+00	4,55E+00	5,07E+00	-9,02E-01	0,00E+00	-2,58E+01	-6,02E+01
WDP	[m <sup>3</sup> world-Eq. deprived]	1,54E+00	2,74E-03	7,21E-02	0,00E+00	9,99E-02	0,00E+00	1,53E-04	8,09E-01	8,15E-01	-3,79E-03	-5,56E-03	0,00E+00	-1,59E-01	-6,84E-02
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: for 1 m<sup>2</sup> floor covering

Core Indicator	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3/2	C3/3	C4/1	D	D/1	D/2	D/3
PERE	[MJ]	2,78E+01	2,33E-01	1,12E+00	0,00E+00	3,69E+00	0,00E+00	1,30E-02	5,98E-01	8,90E-01	4,16E-01	-2,46E-01	0,00E+00	-7,06E+00	-5,89E-01
PERM	[MJ]	2,54E-01	0,00E+00	-2,54E-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	0,00E+00
PERT	[MJ]	2,81E+01	2,33E-01	8,68E-01	0,00E+00	3,69E+00	0,00E+00	1,30E-02	5,98E-01	8,90E-01	4,16E-01	-2,46E-01	0,00E+00	-7,06E+00	-5,89E-01
PENRE	[MJ]	2,09E+02	4,10E+00	8,73E+00	0,00E+00	5,90E+00	0,00E+00	2,28E-01	7,04E+01	7,14E+01	5,07E+00	-9,02E-01	0,00E+00	-2,58E+01	-6,02E+01
PENRM	[MJ]	6,71E+01	0,00E+00	-2,15E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-6,68E+01	-6,68E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	[MJ]	2,76E+02	4,10E+00	8,53E+00	0,00E+00	5,90E+00	0,00E+00	2,28E-01	3,51E+00	4,55E+00	5,07E+00	-9,02E-01	0,00E+00	-2,58E+01	-6,02E+01
SM	[kg]	2,75E+00	0,00E+00	8,24E-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	0,00E+00	1,90E-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	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	0,00E+00
FW	[m <sup>3</sup> ]	6,19E-02	2,63E-04	2,47E-03	0,00E+00	3,34E-03	0,00E+00	1,46E-05	5,61E-01	1,94E-02	5,94E-05	-2,35E-04	0,00E+00	-6,74E-03	-5,45E-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 of the LCA - Waste categories and output flows according to EN 15804+A2: for 1 m<sup>2</sup> floor covering

Core Indicator	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3/2	C3/3	C4/1	D	D/1	D/2	D/3
HWD	[kg]	1,05E-03	1,97E-11	3,16E-05	0,00E+00	4,19E-05	0,00E+00	1,10E-12	5,19E-10	5,62E-10	7,82E-10	-1,22E-10	0,00E+00	-3,50E-09	-2,75E-10
NHWD	[kg]	3,09E-01	5,88E-04	4,80E-02	0,00E+00	7,30E-03	0,00E+00	3,27E-05	1,29E+00	1,29E+00	5,02E+00	-4,54E-04	0,00E+00	-1,30E-02	-1,34E-01
RWD	[kg]	5,30E-03	5,06E-06	1,63E-04	0,00E+00	3,76E-04	0,00E+00	2,82E-07	1,30E-04	2,05E-04	6,22E-05	-7,06E-05	0,00E+00	-2,02E-03	-1,26E-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	0,00E+00
MFR	[kg]	2,91E-02	0,00E+00	1,31E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,41E+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	0,00E+00
EEE	[MJ]	0,00E+00	0,00E+00	2,58E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,49E+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	4,79E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,40E+01	7,84E+01	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; EET = Exported thermal energy														

## Results of the LCA - Additional impact categories according to EN 15804+A2: for 1 m<sup>2</sup> floor covering

Core Indicator	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3/2	C3/3	C4/1	D	D/1	D/2	D/3
PM	[Disease Incidence]	1,64E-07	1,05E-08	6,04E-09	0,00E+00	6,84E-08	0,00E+00	5,86E-10	2,60E-08	2,79E-08	1,02E-08	-5,75E-10	0,00E+00	0,00E+00	-2,13E-08
IRP	[kBq U235-Eq.]	8,61E-01	7,41E-04	2,65E-02	0,00E+00	6,78E-02	0,00E+00	4,12E-05	1,98E-02	3,26E-02	9,19E-03	-1,20E-02	0,00E+00	0,00E+00	-1,37E-02
ETP-fw	[CTUe]	1,37E+02	2,84E+00	4,26E+00	3,60E-03	2,69E+00	0,00E+00	1,58E-01	1,79E+00	2,39E+00	4,96E+00	-1,97E-01	0,00E+00	0,00E+00	-1,06E+01
HTP-c	[CTUh]	4,07E-09	5,74E-11	1,27E-10	0,00E+00	6,21E-10	0,00E+00	3,20E-12	8,83E-11	1,02E-10	2,22E-10	-9,10E-12	0,00E+00	0,00E+00	-1,17E-10
HTP-nc	[CTUh]	1,79E-07	3,41E-09	5,67E-09	2,60E-11	9,46E-09	0,00E+00	1,90E-10	6,21E-09	6,89E-09	1,86E-08	-3,49E-10	0,00E+00	0,00E+00	-6,77E-09
SQP	[-]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Caption	PM = Potential incidence of disease due to PM emissions; IRP = 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														

No substantiated values can be given for the SQP indicator with the existing database.

The result figures given in module B2 refer to a period of 1 year because a reference service life is not declared. They have to be multiplied by the assumed service life (in years) of the floor covering in the building under consideration.

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 due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators “abiotic depletion potential for non-fossil resources”, “abiotic depletion potential for fossil resources”, “water (user) deprivation potential, deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit for humans – cancerogenic”, “Potential comparative toxic unit for humans - not cancerogenic”, “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 experienced with the indicator.

## References

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### EN 13501-1

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### EN 14041

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### EN 15804

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### EN 16810

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### ISO 10874

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### ISO 14025

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### ISO 14040

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### ISO 14044

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### 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: 2017-04: Part 7: Performance evaluation for feedback of service life data from practice

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