ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A2*

Owner of the Declaration	Uzin Utz SE
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-UZI-20230498-IBC1-EN
Issue date	29.01.2024
Valid to	28.01.2029

Fabric Tape

Sifloor AG

Institut Bauen und Umwelt e.V.

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1. General Information

Sifloor AG

Programme holder

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

Declaration number

EPD-UZI-20230498-IBC1-EN

This declaration is based on the product category rules:

Dispersion adhesives and primers for floor coverings, 01.08.2021
(PCR checked and approved by the SVR)

Issue date

29.01.2024

Valid to

28.01.2029

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

Florian Pronold
(Managing Director Institut Bauen und Umwelt e.V.)

Fabric Tape

Owner of the declaration

Uzin Utz SE
Dieselstraße 3
89079 Ulm
Germany

Declared product / declared unit

1 m^2 of: Fabric Tape

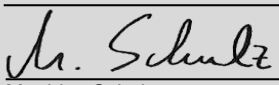
Scope:

This Environmental Product Declaration is an average EPD for dry adhesives covering the products: UZIN Sigaway Orginal, UZIN Sigaway Tape.
The data provided in this EPD refers to the arithmetic mean of the products mentioned. All products covered by this EPD are manufactured at the Sifloor AG plant in Sursee, Switzerland.
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



Matthias Schulz,
(Independent verifier)

2. Product

2.1 Product description/Product definition

This EPD comprises dry adhesives of the product category: Fabric-Tapes. All products considered here are based on the switchTec dry adhesive technology. This is a technology for floor bonding and fulfils the function of liquid adhesives as an alternative in flooring technology.
The following products can be assigned to this EPD:

- UZIN Sigaway Orginal
- UZIN Sigaway Tape
- UZIN Pluratex

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

The different fabric tapes are specially adapted to different substrates and floor coverings and are suitable for full-surface bonding of floor coverings. Substrates that meet the requirements of *DIN 18365* are suitable for the use of dry adhesives after levelling.

2.3 Technical Data

The various tapes are specially adapted to different substrates and floor coverings to comply with their requirements.

Constructional data

Name	Value	Unit
Dimensional changes (in transverse direction) acc. to ISO 22633 (Dispersion adhesives for textile and elastic floor coverings, not applicable for polyvinyl chloride floor coverings, rubber floor coverings, smooth polyolefin floor coverings, textile floor coverings)	<0.2%	max. %
Dimensional changes acc. to ISO 22635 (Dispersion adhesives for textile and elastic floor coverings, (not applicable for linoleum or textile floor coverings)	<0.2%	max. %

Other constructional data are not relevant for this product.

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

2.4 Delivery status

All products covered by this EPD are delivered ready to use. The content of one packaging unit for UZIN Sigaway Original is sufficient for 25 m^2, for UZIN Sigaway Tape it is sufficient for 1,25 m^2 and for UZIN Pluratex it is sufficient for 22,5 m^2.

2.5 Base materials/Ancillary materials

Dry adhesives in general consist of a carrier material with a self-adhesive layer on both sides. On average, the film tapes covered by this EPD are composed of:

Name	Value	Unit
Synthetic polymer dispersion (solid content)	40 - 60	%
Water	20 - 35	%
Additives	<0.3	%
Liner (protective paper)	10 - 35	%
Carrier material	5 - 15	%

UZIN Sigaway Orginal and UZIN Sigaway Tape are very low in volatile organic compound (VOC) emission. They are certified as *EMICODE* EC1 Plus according to the *EMICODE* requirements. Furthermore, these products are awarded with the *Blue Angel* (*DE-UZ 113*) due to their low emissions.

REACH regulation:

Does this product/article/at least one partial article contains substances listed in the *candidate list* (date: 01.01.2024) exceeding 0.1 percentage by mass?
NO

Does this product/article/at least one partial article contains other CMR substances in categories 1A or 1B which are not on the candidate list, exceeding 0.1 percentage by mass?
NO

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

Information on hazardous substances (if any) contained in this product can be found in the product specific Safety Data sheet. The latest version is available at our Website:
https://int.uzin.com/

2.6 Manufacture

The ingredients of the adhesive component are first added together according to the corresponding formula and mixed under continuous stirring. In two steps, the adhesive component is then first applied to the carrier material on one side and dried in the drying line. The process is then repeated for the other side. Some substrates are such that the adhesive component penetrates the substrate. In this case, one coating cycle is sufficient and the second adhesive coating step is omitted. In order to prevent the fabric tape from sticking when it is rolled up, a protective paper (liner) is applied to one of the adhesive sides.

2.7 Environment and health during manufacturing

Apart from the standard precautions for occupational hygiene and safety, there are no special protective precautions to be observed during production.

2.8 Product processing/Installation

Dry adhesives are applied by hand on appropriately prepared substrates. To do so, first the edge tape is installed along walls and doors. Then the tapes are rolled out to an area to be installed and rubbed in thoroughly with a textile cork rubbing board. Following the tape is cut to size with a hook knife. Afterwards, the protective paper on the opposite side is peeled off, revealing a second adhesive side. In the last step, the floor covering can be applied to the second adhesive side by applying pressure on it.

2.9 Packaging

All products considered in this EPD are packed in a cardboard packaging. Emptied cores and cardboard packaging are recyclable. The weight and shape of the packaging are different for the products considered here. More details can be found under Section 2.4.

2.10 Condition of use

The substantial composition during the use phase refers to the composition during the manufacturing. Compared to liquid

adhesives, dry adhesives do not harden through chemical reactions, but are permanently adhesive and do not dry out.

2.11 Environment and health during use

UZIN Sigaway Orginal and UZIN Sigaway Tape have been awarded the emission label *EMICODE* EC 1 PLUS "very low emission" and the *Blue Angel* (*DE-UZ 113*). With the emission label, these dry adhesives contribute to preserving a healthy indoor climate. Details on the individual criteria of the *EMICODE* can be found under point 7 Requisite Evidence. Therefore UZIN Sigaway Orginal and UZIN Sigaway Tape also meet the highest *DGNB* Quality Level 4. Furthermore, the products contribute to further green building rating systems such as *LEED* and *BREEAM*. UZIN Sigaway Orginal and UZIN Sigaway Tape are also provided with the *Ü-mark*.

2.12 Reference service life

The service life of dry adhesives depends on the service life of the floor covering. In turn, the service life of different floor coverings show a high variability (10-50 years according to the table "Service lives of components for life cycle assessment according to Assessment System for Sustainable Building (*BNB*)"; BBSR: Bundesinstitut für Bau-, Stadt- und Raumforschung; www.nachhaltigesbauen.de/baustoff-undgebaeudedaten/nutzungsdauern-von-bauteilen.html)) Therefore, the specification of a reference service life according to *ISO 15686* is not possible.

2.13 Extraordinary effects

Fire

There are no normative requirements for fire protection for this product group. The fire behaviour of the floor construction is primarily determined by the type and nature of the installed floor covering or insulation layers. Therefore, the fire resistance class of the floor covering according to *EN 13501* must be taken into account when assessing the fire behaviour. The fire classification of the floor covering to be installed will be maintained when installed on switchTec dry adhesives.

Water

Excessive amounts of water can damage the substrate or the floor covering. When the dry adhesive comes into contact with water, the adhesive strength is weakened and returns to full strength after the water has fully evaporated. No substances are washed out that could be hazardous to water.

Mechanical destruction

Not of relevance.

2.14 Re-use phase

Since adhesive residues may remain on the covering and the substrate, it is usually disposed of together, respectively. The re-use of the tapes covered by this EPD is not possible.

2.15 Disposal

The *EWC* waste code in accordance with the *European Waste Catalogue* / List of Waste Ordinance for cured dispersion waste bears the *EWC* waste code 080410 (adhesive and sealing compound waste). Material residues can be disposed of as household waste.

2.16 Further information

Product and safety data sheet, *EMICODE* EC 1 PLUS and *Blue Angel* certificate, general building authority approval and further information at https://int.uzin.com/.

3. LCA: Calculation rules

3.1 Declared Unit

This declaration is an average EPD and refers to 1 m^2 of the fabric tapes UZIN Sigaway Orginal, UZIN Sigaway Tape and UZIN Pluratex, manufactured by SIFLOOR AG at the Sursee plant. All values stated in this EPD represent the arithmetic mean of the individual values of the products. The products mentioned are manufactured at the same plant, fulfil the same or a comparable function and differ only slightly in their formulation; other life cycle phases are the same, such as production. The declared unit of 1 m^2 was chosen as the operating data is recorded either per linear metre [m] or per square metre [m^2] and the sales unit is also given in m^2. Using the conversion factor of the average mass per square metre, the data given can be related to 1 kg.

Declared unit and mass reference

Name	Value	Unit
Declared Unit	1	m^2
Gross density	1 - 1.5	kg/m^3
Grammage (average over all products considered)	0.310	kg/m^2
Layer thickness (average over all products considered)	0.0003	m

The representativeness of the average LCA values is rated as good. Comparability with regard to temporal, geographical and technological factors is ensured by the fact that all the products considered here were manufactured in the same plant using the same machinery, while the same reference year was utilised. Differences may arise in the exact composition of the applied adhesive and its coating thickness, as well as the substrate material used.
Further information regarding the variability of specific impact indicators is given in Chapter 6.

3.2 System boundary

Type of EPD: Cradle to gate with options, modules C1–C4, and module D (A1–A3 + C + D and additional modules). The additional modules are A4 and A5. The underlying LCA addresses all life cycle stages of the average product. The other life cycle stages are not relevant for the product class and no environmental impacts occur in these. The following activities are covered by the relevant modules:

- A1: Production of raw and auxiliary materials
- A2: Transport of raw and auxiliary materials to the plant
- A3: Production in the plant (incl. provision of energy and waste treatment) and the manufacture of the packaging
- A4: Transport of the packed product to the construction site
- A5: Installation of the product and disposal of the packaging and waste produced during installation (including the protective paper)
- C1: Manual removal of the product
- C2: Transport for disposal
- C3: As a worst-case scenario thermal treatment of the product in an incineration plant is modelled as end-of-life scenario
- C4: Not relevant because the product is incinerated (respective impacts declared in C3)
- D: Credits resulting from thermal utilisation of the product and packaging waste

For the environmental impact, the use of green electricity was calculated taking into account the residual electricity mix for the remaining electricity. The proportion of the on-site electricity demand covered by green electricity in the total on-site electricity demand is 100 %.

3.3 Estimates and assumptions

No material loss was assumed in module A5 (installation), as this is strongly dependent on the application procedure. In order to determine the environmental burdens caused by the compensation of the additional material effort due to the material loss, the following scheme can be used: The material loss expressed as a percentage [%] is multiplied by the indicator values from modules A1-A4 and C3 and added to module A5. A subtraction of the indicator values from modules A1-A4 and C3 is not necessary, as only the additional material effort to compensate for the material loss is considered.
As end-of-life assumption for the packaging and the product, a 100 % thermal treatment scenario was chosen, respectively. Since the products considered in this EPD are delivered in different packaging, the packaging with the least favourable ratio of packaging weight to product weight was used for the calculation.

3.4 Cut-off criteria

The common rules according to *ISO 14044* were applied as cut-off criteria. These apply to the entire product system as well as to individual process modules and take into account mass, energy and environmental relevance. All inputs were included in the LCA that are more than 1 % with regard to the total impact of an impact category. Overall, no more than 5 % of the flows were neglected with regard to the cut-off criteria.

3.5 Background data

Factory-specific data was used for the production processes. For all other life cycle phases, data sets from Sphera Managed LCA Content (Content Version 2023.2) were used. The LCA model was created in the software *LCA for Experts* (Version 10) (former GaBi).

3.6 Data quality

The data quality can be classified as good. The plant-specific data refer to the year 2022. All remaining data originate from the above-mentioned database, the contents of which are regularly reviewed to ensure their currency. Thus, the data used for the life cycle assessment are representative. For some input materials, proxy datasets had to be used. All background datasets used are less than 10 years old. Data sets are complete and comply with the system boundaries and the cut-off rules for inputs and outputs. The data quality thus meets the requirements of *PCR Part A*.

3.7 Period under review

The year 2022 is used as the reference year.

3.8 Geographic Representativeness

Land or region, in which the declared product system is manufactured, used or handled at the end of the product´s lifespan: Europe

3.9 Allocation

Site-specific operating data was distributed to the different products according to the machine utilisation.

3.10 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 background database is used from *Sphera* Managed LCA Content. In this EPD, dry adhesives are considered. These differ from liquid dispersion adhesives in their specific characteristics of performance and response to (punctual) stresses, so a direct comparison is not possible.

4. LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon
(A1-A3)

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO_2.

Information on describing the biogenic carbon content at factory gate

Name	Value	Unit
Biogenic carbon content in product (arithmetic mean)	4.70E-02	kg C
Biogenic carbon content in accompanying packaging	2.01E-02	kg C

In the following, the technical scenario information is presented, which enables a better understanding of the declared modules.

Transport to the building site (A4)

The transport was divided into two phases, which best correspond to the actual situation. In the first stage, the product is transported to a wholesaler by a large truck. The second stage represents the transport from the wholesaler to the construction site, which is mostly done by the craftsman with a small truck.

Name	Value	Unit
Transport distance (Stage 1)	450	km
Gross weight (Stage 1)	34 - 40	t
Payload capacity (Stage 1)	27	t
Utilisation by mass (Stage 1)	0.61	
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Transport distance (Stage 2)	50	km
Gross weight (Stage 2)	7.5 - 12	t
Payload capacity (Stage 2)	5	t
Utilisation by mass (Stage 2)	0.61	

Installation into the building (A5)

Name	Value	Unit
Auxiliary	-	kg
Water consumption	-	m^3
Other resources	-	kg
Electricity consumption	-	kWh
Other energy carriers	-	MJ
Material loss	-	kg
Output substances following waste treatment on site	0.09	kg
Dust in the air	-	kg
VOC in the air	-	kg

No material loss was assumed in module A5 (installation), as this is strongly dependent on the application procedure. In order to determine the environmental burdens caused by the compensation of the additional material effort due to the material loss, the following scheme can be used: The material loss expressed as a percentage [%] is multiplied by the indicator values from modules A1-A4 and C3 and added to module A5. A subtraction of the indicator values from modules A1-A4 and C3 is not necessary, as only the additional material effort to compensate for the material loss is considered.
The protective paper, attached to the product is disposed of during the installation phase. Thermal treatment was assumed as a worst-case scenario.

End of life (C1-C4)

Name	Value	Unit
Collected as mixed construction waste (arithmetic mean)	0.22	kg
Reuse	-	kg
Recycling	-	kg
Energy recovery	100	%
Landfilling	0	%

The difference in mass between the product shipped and the product installed and thus to be disposed of in C3 differs due to the protective paper which is removed during installation. The waste treatment of the protective paper is declared in module A5.

5. LCA: Results

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

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m^2 Fabric Tapes

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	D
GWP-total	kg CO_2 eq	7.11E-01	1.45E-02	1.99E-01	0	4.77E-04	2.78E-01	-1.15E-01
GWP-fossil	kg CO_2 eq	9.47E-01	1.43E-02	1.17E-02	0	4.71E-04	9.61E-02	-1.15E-01
GWP-biogenic	kg CO_2 eq	-2.44E-01	3.32E-05	1.87E-01	0	1.09E-06	1.81E-01	-5.19E-04
GWP-luluc	kg CO_2 eq	8.59E-03	1.34E-04	3.69E-06	0	4.43E-06	5.74E-06	-7.43E-06
ODP	kg CFC11 eq	6.8E-09	1.27E-15	2.89E-14	0	4.18E-17	5.05E-14	-8.88E-13
AP	mol H^+ eq	2.49E-03	5.03E-05	7.84E-05	0	1.64E-06	1.45E-04	-1.42E-04
EP-freshwater	kg P eq	9.26E-06	5.29E-08	1.45E-08	0	1.74E-09	2.8E-08	-1.83E-07
EP-marine	kg N eq	8.25E-04	2.32E-05	3.01E-05	0	7.57E-07	5.64E-05	-4.18E-05
EP-terrestrial	mol N eq	7.81E-03	2.61E-04	3.5E-04	0	8.51E-06	6.43E-04	-4.48E-04
POCP	kg NMVOC eq	2.26E-03	4.54E-05	7.86E-05	0	1.48E-06	1.47E-04	-1.17E-04
ADPE	kg Sb eq	3.01E-06	9.42E-10	2.6E-10	0	3.1E-11	4.36E-10	-8.13E-09
ADPF	MJ	2.18E+01	1.97E-01	7.75E-02	0	6.5E-03	1.34E-01	-2.12E+00
WDP	m^3 world eq deprived	1.34E-01	1.67E-04	2.24E-02	0	5.51E-06	3.47E-02	-1.08E-02

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^2 Fabric Tapes

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	D
PERE	MJ	4.63E+00	1.4E-02	1.8E+00	0	4.6E-04	6.24E-01	-6.06E-01
PERM	MJ	2.38E+00	0	-1.78E+00	0	0	-5.94E-01	0
PERT	MJ	7E+00	1.4E-02	2E-02	0	4.6E-04	3E-02	-6.06E-01
PENRE	MJ	1.63E+01	1.98E-01	3.84E-01	0	6.52E-03	5.4E+00	-2.12E+00
PENRM	MJ	5.57E+00	0	-3.06E-01	0	0	-5.26E+00	0
PENRT	MJ	2.19E+01	1.98E-01	7.8E-02	0	6.52E-03	1.4E-01	-2.12E+00
SM	kg	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0
FW	m^3	5.86E-03	1.54E-05	5.29E-04	0	5.07E-07	8.19E-04	-4.91E-04

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^2 Fabric Tapes

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	D
HWD	kg	5.11E-05	7.32E-13	2.61E-12	0	2.41E-14	4.72E-12	-1.17E-10
NHWD	kg	4.91E-02	2.85E-05	1.78E-02	0	9.39E-07	3.8E-02	-1.04E-03
RWD	kg	3.75E-04	2.56E-07	3.51E-06	0	8.43E-09	5.85E-06	-1.61E-04
CRU	kg	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0	0
MER	kg	0	0	0	0	0	0	0
EEE	MJ	0	0	2.26E-01	0	0	3.09E-01	0
EET	MJ	0	0	4.19E-01	0	0	5.79E-01	0

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^2 Fabric Tapes

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	D
PM	Disease incidence	ND	ND	ND	ND	ND	ND	ND
IR	kBq U235 eq	ND	ND	ND	ND	ND	ND	ND
ETP-fw	CTUe	ND	ND	ND	ND	ND	ND	ND
HTP-c	CTUh	ND	ND	ND	ND	ND	ND	ND
HTP-nc	CTUh	ND	ND	ND	ND	ND	ND	ND
SQP	SQP	ND	ND	ND	ND	ND	ND	ND

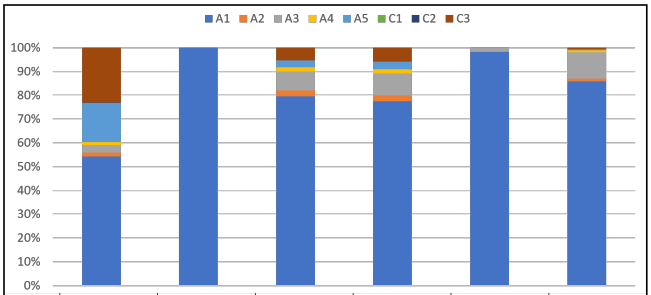
PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic);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

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, 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 as there is limited experience with the indicator.

Disclaimer 3: Additional environmental impact indicators (*EN 15804*, Table 4) are not declared in the EPD. The results of these environmental impact indicators should be used with caution as the uncertainties in these results are high and there is limited experience with the indicators (see ILCD classification in *EN 15804*, Table 5). For this reason, the results based on these indicators are not reported.

6. LCA: Interpretation



	GWP-total [kg CO2 eq.]	ODP [kg CFC-11 eq.]	AP [Mole of H+ eq.]	POCP [kg NMVOC eq.]	ADPE [kg Sb eq.]	ADPF [MJ]
Coefficients of variation						
A1-A3	31%	64%	30%	29%	5%	24%
A4-A5	5%	4%	8%	8%	14%	13%
C1-C3	26%	26%	26%	26%	26%	26%

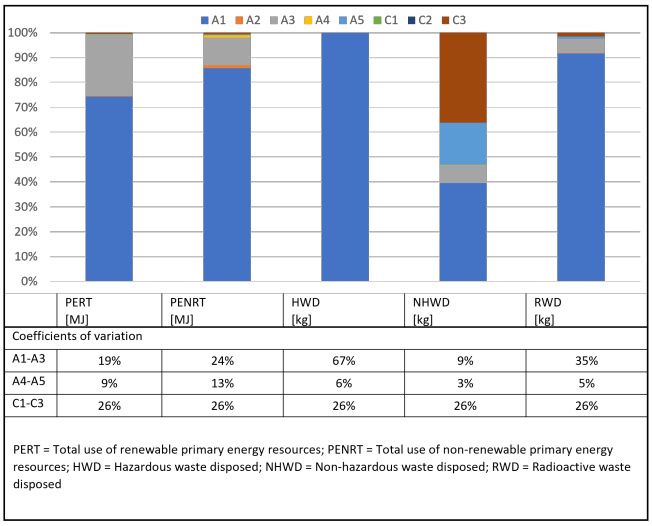
GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources

The dominance analysis of the impact assessment indicators shows a large contribution from the manufacturing phase (A1-A3). A large proportion of the environmental impact stems from the raw materials used (A1), with the synthetic polymer dispersions making the highest contributions (with regard to the impact indicator Climate Change - total, an average of 90% of the impact in A1 is attributable to this component).
In addition, the waste treatment of the packaging and the product (A5, C3) plays a major role for the Climate Change - total impact assessment indicator. In these modules, thermal utilisation was modelled as a worst-case scenario. The large proportion in module A5 in particular can be explained by the fact that in addition to the waste treatment of the packaging, the waste treatment of the protective paper is also declared in this module, which on average accounts for one fourth of the total mass of the product. Furthermore, both the packaging and the protective paper contain biogenic carbon, which is accounted for in Module A5 in the form of biogenic CO_2 emissions.

The coefficient of variation is a measure of the relative scatter. It indicates what percentage of the average the standard deviation is. It is therefore the percentage ratio of the standard deviation to the arithmetic mean. It is used to make it easier to compare the spread of different distributions. The spread of the impact indicators is generally low and at about the same level for all indicators.

Alongside the coefficient of variation, the maximum deviation of individual products' impact from the average value for specific impact indicators was also analysed (see table below). These show that some impact indicators such as Ozone Depletion react sensitively to individual substances contained, resulting in a high deviation. In general, however, the results are in the same order of magnitude, which indicates a appropriate grouping.

Indicator	Maximum deviation from the mean value [%]
01 EN15804+A2 (EF 3.1) Climate Change - total [kg CO2 eq.]	35%
05 EN15804+A2 (EF 3.1) Ozone depletion [kg CFC-11 eq.]	88%
12 EN15804+A2 (EF 3.1) Resource use, fossils [MJ]	33%



	PERT [MJ]	PENRT [MJ]	HWD [kg]	NHWD [kg]	RWD [kg]
Coefficients of variation					
A1-A3	19%	24%	67%	9%	35%
A4-A5	9%	13%	6%	3%	5%
C1-C3	26%	26%	26%	26%	26%

PERT = Total use of renewable primary energy resources; PENRT = Total use of non-renewable primary energy resources; HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed

In relation to the life cycle inventory indicators Total use of renewable primary energy resources (PERT) and Total use of non-renewable primary energy resources (PENRT), the largest share of energy consumption in the life cycle occurs in the manufacturing phase (A1-A3). Significant contributions to primary energy demand - non-renewable (PENRT) come from the energy resources contained in the raw materials. The largest contribution to primary energy demand - renewable (PERT) is the consumption of renewable energy resources needed to generate and provide electricity, as well as the renewable energy resources contained in the raw materials and packaging materials with biogenic content.
The coefficients of variation of the life cycle inventory indicators generally show a low level of scatter. Among the life cycle inventory indicators, the results for the indicators Hazardous waste disposed, Non-hazardous waste disposed (NHWD) and Radioactive waste disposed (RWD) show the highest scatter, which is due to differences in the product formulations considered.

The assumptions used to determine the reported impact indicator results are presented in Chapter 3.3. Specific data was used for operational activities in phases A2-A3. Raw material inputs (A1) were mainly modelled using generic background data sets. Raw material inputs in particular have a major influence on all the indicators shown, so care was taken here to use data sets that are representative in terms of technological aspects. In order to achieve this, also data sets were used whose reference year was up to 10 years in the past, which led to an overall medium temporal representativeness. With regard to geographical aspects, the results presented in this EPD are representative for Europe. Activities in the downstream life cycle phases (A4-A5; C1-C3) were modelled using scenarios, whereby assumptions were made regarding transport distance, for example. However, these life cycle phases are not dominant for the reported impact indicators.

7. Requisite evidence

Technical data sheet, Safety Data Sheet, license of *EMICODE* EC1 PLUS, certificate of the German *Blue Angel* and other product-related information are available for download at https://int.uzin.com 7.1 VOC emissions according to *ISO 16000-11* in a test chamber. Testing for carcinogenic, mutagenic, reprotoxic (CMR) substances and TVOC/TSVOC after 3 and 28 days.
Furthermore, the emission of volatile organic compounds from building products in accordance with the award criteria for the eco-label "Low-emission floor covering adhesives and other flooring installation materials, *DE-UZ 113*', were determined.

TVOC* limit values EMICODE following the AgBB scheme for EMICODE EC1 Plus (28 days [µg/m³])

Name	Value	Unit
TVOC (C6 - C16)	≤ 60	µg/m³
Sum SVOC (C16 - C22)	≤ 40	µg/m³
R (dimensionless)	≤ 1	-
VOC without NIK	≤ 40	µg/m³
Carcinogenic Substances	≤ 1	µg/m³

TVOC* limit values BLUE ANGEL DE-UZ 113 following the AgBB scheme (28 days [µg/m³])

Name	Value	Unit
TVOC (C6 - C16) Specific concentration	≤ 60	µg/m³
Sum SVOC (C16 - C22) Specific concentration	≤ 50	µg/m³
R (dimensionless)	≤ 1	
VOC without LCI Specific concentration	≤ 40	µg/m³
Carcinogenic Substances Specific concentration	≤ 1 per single value	µg/m³
Acetic acid	≤ 140	µg/m³
Formaldehyde	≤ 0.05	ppm
Other aldehydes	≤ 0.05	ppm

Test institute: WESSLING GmbH, Germany, 48341 Altenberge

Measuring process: GEV test method for determining the emissions of volatile organic compounds from building products

Date of test report: Test report dated 24 February 2022;

Result: The product complies with the requirements according to the GEV test method for '*EMICODE* EC 1 PLUS – very low emissions' classification and fulfils the requirements according to the award basis for *DE-UZ 113*.

AgBB scheme
The requirements on emission performance according to *AgBB* for the *ü-mark* are automatically regarded as satisfied for products availing of *EMICODE* EC 1 PLUS classification.

8. References

Standards:

DIN 18356
DIN 18356: German construction contract procedures (VOB) - Part C: General technical specifications in construction contracts (ATV) - Laying of parquet flooring and wood block flooring.

EN 13501-1
DIN EN 13501-1:2019, Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests.

EN 15804
EN 15804:2012+A2:2019+AC:2021, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products.

ISO 14025
EN ISO 14025:2011, Environmental labels and declarations — Type III environmental declarations — Principles and procedures.

ISO 14040
DIN EN ISO 14040: 2006, Environmental management – Life cycle assessment – Principles and framework (ISO 14040:2006); German and English versions EN ISO 14040:2006.

ISO 14044
DIN EN ISO 14044: 2006, Environmental management – Life cycle assessment – Requirements and guidelines (ISO 14044:2006); German and English versions EN ISO 14044:2006.

ISO 15686
DIN ISO 15686:2017, Buildings and constructed assets -- Service life planning. DIN EN 13501.

ISO 16000-11
DIN EN ISO 16000-11:2006-06, Indoor air – Part 11: Determination of the emission of volatile organic compounds from building products and furnishings – Sampling, storage of samples and preparation of test specimens.

ISO 22633
DIN EN ISO 22632:2019, Adhesives - Test methods for adhesives for floor coverings and wall coverings - Determination of dimensional changes of a linoleum floor covering in contact with an adhesive.

ISO 22635
Adhesives - Test method for adhesives for plastic or rubber floor coverings or wall coverings - Determination of dimensional changes after accelerated ageing. **Further References:**

Blue Angel (DE-UZ 113)
Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit, Umweltbundesamt, DE Deutsches Institut für Gütesicherung und Kennzeichnung e.V.; Jury Ecolabel; https://www.blauer-engel.de/en [2023]

BNB
Assessment System for Sustainable Building; https://www.bnb-nachhaltigesbauen.de/en/assessment-system/ [2023]

BREEAM
BREEAM (Building Research Establishment Environmental Assessment Methodology); https://bregroup.com/products/breeam [2023]

Candidate list
List of substances of very high concern for Authorisation, published in accordance with Article 59(10) of the REACH Regulation, ECHA, www.echa.europa.eu/candidate-list-table [2023]

DGNB
DGNB – German Sustainable Building Council; www.dgnb.de [2023]

EMICODE
GEV (Gemeinschaft Emissionskontrollierte Verlegewerkstoffe, Klebstoffe und Bauprodukte e.V. Düsseldorf); www.emicode.com/en [2023]

EWC
European Waste Catalog established by Commission decision 2000/532/EC. http://www.environment-agency.gov.uk/ [2023]

German AgBB
Committee for Health-related Evaluation of Building Products: health-related evaluation of emissions of volatile organic compounds (VOC and SVOC) from building products; www.umweltbundesamt.de/produkte/bauprodukte/agb b.htm [2012]

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LCA For Experts Software
LCA For Experts Software system (Version 10) and Database for Life Cycle Engeneering (Content Version 2023.2). Sphera Solutions GmbH, Leinfelden-Echterdingen [2023]

LEED
LEED (Leadership in Energy and Environmental Design); https://worldgbc.org/ [2023]

Ordinance on Biocide Products No. 528/2012
Regulation (EU) No 528/2012 of the European Parliament and of the Council of 22 May 2012 concerning the making available on the market and use of biocidal products[2012]

PCR Part A
Product Category Rules for Building-Related Products and Services, Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project report, Version 1.3, Institut Bauen und Umwelt e.V. [08/2022]

PCR Part B
Product Category Rules for Construction Products. Part B: Dispersion adhesives and primers for floor coverings, Version 3, [06/2023]

REACH
Directive (EG) No. 1907/2006 of the European Parliament and of the Council dated 18 December 2006 on the registration, evaluation, approval and restriction of chemical substances (REACH), for establishing a European Agency for chemical

substances, for amending Directive 1999/45/EC and for annulment of Directive (EEC) No. 793/93 of the Council, Directive (EC) No. 1488/94 of the Commission, Guideline 76/769/EEC of the Council and Guidelines 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC of the Commission. [2006]

Ü-mark
Ü-mark-Übereinstimmungszeichen; https://www.dibt.de/de [2023]

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