ENVIRONMENTAL PRODUCT DECLARATION

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

Owner of the Declaration	IGI - The Global Wallcoverings Association
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-IGI-20230434-IBG1-EN
Issue date	18/01/2024
Valid to	17/01/2029

Vinyl wallcoverings on non-woven backing

IGI - The Global Wallcoverings Association

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

1. General Information

IGI - The Global Wallcoverings Association

Programme holder

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

Declaration number

EPD-IGI-20230434-IBG1-EN

This declaration is based on the product category rules:

Wall coverings, 01/08/2021
(PCR checked and approved by the SVR)

Issue date

18/01/2024

Valid to

17/01/2029

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

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

Vinyl wallcoverings on non-woven backing

Owner of the declaration

IGI - The Global Wallcoverings Association
Chaussée de Louvain 426
1380 LASNE
Belgium

Declared product / declared unit

The declared unit is 1m² (square meter) decorative vinyl based wallcovering on non-woven backing including packaging.

Scope:

This EPD focuses on the production, transport and disposal of a weighted average of 1m² vinyl wallcoverings on non-woven backing of participating members of the IGI - The Global Wallcoverings Association.
16 out of 71 IGI-members are involved in this EPD: A.S. Création Tapeten AG (DE), Anstey Wallpaper Co. Ltd. (GB), BN International (NL), Decoprint NV (BE), Erismann & Cie. GmbH (DE), Graham & Brown Ltd. (GB), Grandeco NV (BE), JV S.p.A. (IT), Marburger Tapetenfabrik J.B. Schaefer GmbH & Co. KG (DE), Muraspec Decorative Solutions Ltd. (GB), Rasch GmbH & Co. KG (DE), Roysons Corporation (US), UGÉPA SA (FR), Versa Wallcovering (US), York Wallcoverings (US), Zambaiti Parati S.p.A. (IT).
The technical properties are displayed in chapter 2.3.
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

Prof. Dr. Birgit Grahl,
(Independent verifier)

2. Product

2.1 Product description/Product definition

Vinyl wallcoverings on non-woven backing according to *EN 15102* involve plasticized PVC (vinyl) and a non-woven base. A non-woven base is a substrate composed of a blend of cellulose and polyester fibres. Non-woven wallcovering is available with relief or flat vinyl designs. The vinyl on non-woven wallcovering is dimensionally stable to aqueous paste and does not require a soak time. When the wallcovering is to be changed it can be stripped in its entirety by peeling the wallcovering lengths from the wall. This property as defined in *EN 235* is strippable.
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 (CPR)* applies. The product needs a Declaration of Performance taking into consideration *EN 15102* and CE-marking.
For the application and use the respective national provisions apply.
For the placing on the market in Great Britain the product needs a Declaration of Performance taking into consideration *BS EN 15102* and UK Conformity Assessed (UKCA) marking.
For placing on the market in Northern Ireland the product needs a Declaration of Performance taking into consideration *(BS) EN 15102* and CE or CE and UK Northern Ireland (UKNI) marking.
For the placing on the market in the USA the product has to conform to *ASTM F 1141 – 93* Standard Specification for Wallcovering and *ASTM F 793 – 06* Standard Classification of Wall Covering by Use Characteristics.

2.2 Application

Wallcoverings are used for the decorative wall design of interior spaces in private or commercial use.

2.3 Technical Data

Name	Value	Unit
Measures by categories EN 233	category 1 - 3	-
Straightness and parallelism in mm. according to EN 12956/	equal or less than 1	-
Washability according to EN 12956	Spongeable to extra-scrubbable	-
Colour fastness to light according to EN ISO 105-B02	3 - 6	-
Migration of heavy metals and certain other elements to EN 12149	fulfills the norm	-
Vinyl chloride monomer (VCM) content max. < 0,2 mg/m² according to EN 12149	fulfills the norm	-
Emissions of formaldehyde max. < 120 mg/kg according to EN 12149	fulfills the norm	-

In case of multiple answers, values need to be examined depending on the manufacturer.

Products manufactured for the USA need to be in accordance with ASTM F 793-0-06 Table 1 Classification Criteria.

Depending on whether products are intended for the European, UK or US markets, the following performance data must be declared.

1a:Product according to the *CPR*, based on *(BS) EN 15102*:
Performance data of the product in accordance with the Declaration of Performance with respect to its Essential Characteristics according to *EN 15102*

or:

1b
Performance Category I, II, III, IV, V or VI as described in Table 1 of *F 793-0-06* have to be declared.

2.4 Delivery status

The products declared are provided within the following dimensions:

Width metres		Length metres	
Min.	Max.	Min.	Max.
0,06	1,50	1,00	150,00

This table contains the range of all wallcoverings examined. For more precise information please contact the specific manufacturer.

2.5 Base materials/Ancillary materials

The weighted average of the primary product components is shown in the following table, in percentage:

Name	Value	Unit
Carrier material (Non-Woven, 80% Paper 20% PET)	25	%
Packaging	6	%
Additives	32	%
PVC plastisol	33	%
Ink & Pigment	3	%
Sum	100	%

Pallets were considered as part of the packaging.

This product contains substances listed in the candidate list (date: 06.12.2023) exceeding 0.1 percentage by mass: no.
This product contains other *CMR substances in categories 1A or 1B* that are not on the candidate list, exceeding 0.1 percentage by mass: no.
Biocide products were added to this construction product or it has been treated with biocide products (this then concerns a treated product as defined by the *(EU) Ordinance on Biocide Products No. 528/2012*): no.
Ancillary materials of the phthalate chemical group, specifically Diisononyl phthalate (DINP) and Dioctyl Terephthalate (DOTP), remain on the product and serve the function of softeners. Plasticizers can also be found in the products, in the plastisol used for vinyl finishing.
This EPD is a weighted average of a Manufacturer Group regarding several producers and product references. Therefore, it cannot be ruled out that individual wallcoverings may contain small amounts (>0.1% of product weight) of substances that are included in the Substance of Very High Concern *SVHC candidate list*, the *CMR substances in categories 1A or 1B* list or ancillary materials and additives serving the function of fire retardants, softeners or biocides.
This can be attributed, for example, to the contents of used waste paper. Further information can be obtained from the respective manufacturer.

2.6 Manufacture

The manufacturing process can be described with the help of the following graphic:

Base web
↓
Coating (optional)
↓
Printing
↓
Laminating (optional)
↓
Embossing (optional)
↓
Trimming/slitting
↓
Cut to length and winding
↓
Wrapping
↓
Packing

The order of manufacture may change and can slightly deviate for different producers.

2.7 Environment and health during manufacturing

Compliance with statutory health and safety for personnel is ensured. Further, the energy and environmental management is certified for some members according to *ISO 14001* and *ISO 50001*.
For greater detail please contact the specific manufacturer.

2.8 Product processing/Installation

Depending on the manufacturers suggestion, the adhesive is applied to the back of the wallcovering or the substrate using a wallpaper brush or short-napped roller. The wallcovering is pressed against the wall and is cut along the top and bottom edges to fit the wall.

2.9 Packaging

Product is wrapped in shrink wrap film, packed in corrugated cardboard boxes and palletised.

2.10 Condition of use

There are no special features to be noted within the limits of normal and customary usage.

2.11 Environment and health during use

No environmental problems can be expected when the product is handled and used
properly.

2.12 Reference service life

Given the wallcovering is professionally installed, the reference service life is 10 years according to the German Sustainable Building Assessment System (BNB).

Description of the influences on the ageing of the product when applied in accordance with the rules of technology.

2.13 Extraordinary effects

Fire

The reaction to fire performance according to *EN 13501* is shown in the following table:

Fire protection

Name	Value
Building material class	B-D
Burning droplets	s1-s3
Smoke gas development	d0-d2

This table contains the range of all wallcoverings examined. For more precise information please contact the specific manufacturer.

For USA information on fire performanceaccording to *ASTM E 84* Test method for Surface Burning Characteristics of Building Materials.

Water

The product is not water resistant. There is no risk of a hazardous environmental impact in the event of water flooding.

Mechanical destruction

There is no risk of a hazardous environmental impact following unforeseen mechanical destruction.

2.14 Re-use phase

The product is not re-usable.

2.15 Disposal

Wallcoverings are subject to the waste *code 170904* (mixed construction and demolition waste other than those mentioned in 170901, 170902 and 170903) in accordance with the *European Waste Catalogue (EWC)*.

Wallcoverings can therefore be disposed of as normal household waste, that is in the dustbin or in additional refuse sacks. Used wallcoverings should not be placed in the waste paper bank. Most household waste is incinerated or landfilled depending on regional legal regulations in the EU or in the US.

2.16 Further information

For further information please visit www.igiwallcoverings.org.

3. LCA: Calculation rules

3.1 Declared Unit

The declared unit is 1 m² of wallcovering including packaging. The model is based on a weighted average of the produced square meters of each participating manufacturer.

Declared unit

Name	Value	Unit
Declared unit	1	m^2
Grammage	0.223	kg/m^2
Conversion factor to 1 kg	4.484	-
Layer thickness	0.001	m
Density	2231	kg/m^3

The production processes and location may vary between individual companies. The weighted average represents the most likely scenario by production volumes and the selected datasets correspond to all regarded regions.

3.2 System boundary

Type of the EPD: cradle to gate - with Options.
The EPD is considered a declaration of an average product as calculated from the output of several manufacturers (2b).

Modules A1-3, A4 and A5

The product stage begins with the consideration of the production of the necessary raw materials and energies including all corresponding upstream processes as well as transport.
Furthermore, the entire production phase was investigated, including the treatment of production waste until reaching the end-of-waste status (EoW). In addition, distribution transport and installation in the building were taken into account.

Modules C1-C4

The modules include the environmental impacts of the reoval and waste treatment until reaching the end-of-waste status (EoW) including the associated transport at the end of the product life cycle.

Module D
Calculation of potential benefits through the generated energy (electric & thermic) by the incineration processes in the life cycle stages in A5 C3 and C4. The burdens resulting from the waste-to-energy plants are assigned in module C3 or C4 in case of landfill gas combustion.

3.3 Estimates and assumptions

'Non-woven' lacks information on the proportions of cellulose and polyester. According to one manufacturer it contains 80% cellulose and 20% polyester (PET). These proportions were applied to all other non-woven carrier materials.
Most solvents were modelled as a generic mix of solvents.

3.4 Cut-off criteria

No materials were cut-off from the study. No energy consumption was neglected.

3.5 Background data

For modelling the lifecycle, the *LCA for Experts Software System and Database for Life Cycle Engineering (GaBi)* was used. All background data records relevant for production and disposal were almost exclusively taken from various *GaBi* supplementary databases or rarely also from *ecoinvent (v.3.6)*. The data records included in the databases are documented online.

3.6 Data quality

Data collection for the investigated products was carried out on the basis of evaluations of the internal production and environmental data, the collection of LCA-relevant data within the supply chain as well as through the measurement of relevant energy supply data. The collected data were checked for plausibility and consistency. A good representation is to be assumed.
The data were collected in 2022 and refer to the calendar year 2021.

3.7 Period under review

The LCA data were collected for the calendar year 2021.

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: Global

3.9 Allocation

Potential benefits resulting from the thermal utilization of the packaging waste (module A5) as well as from the thermal utilization or landfilling of the wallcoverings at the end of life (modules C3 and C4) are allocated to module D.

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 used background database is GaBi service package 1 of 2023.

4. LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon
The biogenic carbon content quantifies the amount of biogenic carbon in a construction product leaving the factory gate, and it is separately declared for the product and for any accompanying packaging.

Information on describing the biogenic Carbon Content at factory gate

Name	Value	Unit
Biogenic carbon content in product	0.016	kg C
Biogenic carbon content in accompanying packaging	0.004	kg C

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

Transport to the building site (A4)

Name	Value	Unit
Truck transport	27	t payload
Transport distance	488	km
Train transport	726	t payload
Transport distance	12	km
Ship transport	27500	dwt payload
Transport distance	272	km
Cargo plane transport	65	t payload
Transport distance	49	km
Capacity utilisation (including empty runs)	80 - 90	%

Because many different countries are involved, there were always global data sets used to model the transport distances.

The treatment of packaging as waste was modelled in Module A5 as a weighted average.
Modules B1-B7 are deemed not relevant since the product needs no maintenance or operational energy or water use and are therefore, not declared.

Installation into the building (A5)
The treatment of packaging as waste was modeled in Module A5 as a weighted average. The following table depicts the packaging materials treated in A5 with more than 1 gram of participation in the weighted average.
Modules B1-B7 are deemed not relevant since the product needs no maintenance or operational energy or water use and are, therefore, not declared.

Name	Value	Unit
Cardboard	0.010	kg
Pallet	0.004	kg
Polyethylene	0.001	kg

Reference service life

Name	Value	Unit
Reference service life	10	a

End of life (C1-C4)

Name	Value	Unit
Incineration	97	%
Landfilling	3	%

For the calculation of this LCA landfilling is chosen for the US and incineration for the EU. Different disposal routes are available but not taken into account for this industry average LCA.

Reuse, recovery and/or recycling potentials (D), relevant scenario information

In module D the potential benefits of the thermal combustion of the wallcoverings (C3) and their packaging (A5) as well as the incineration of landfill gases (C4) are displayed. The benefits from thermal combustion of the wallcoverings are calculated in Module D. From the total paper used as backing, 48.3% of recycled paper in the product does not receive benefits, as it is a secondary material coming burden-free to the system.

5. LCA: Results

In this section, the LCA results for 1 m² wallcoverings are presented. It should be borne in mind that the LCA results only indicate possible effects.

Indicators used for evaluation:

The EN 15804+A2 LCIA methodology with the characterization factors infrom *EU-JRC* were used to evaluate the possible environmental effects of the wallcoverings. The characterization factors are available at the following internet link: http://eplca.jrc.ec.europa.eu/LCDN/developerEF.xhtml.

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	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m² vinyl wallcoverings on non-woven backing

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	5.1E-01	4.72E-02	1.75E-02	2.66E-05	1.96E-03	3.28E-01	1.12E-03	-1.09E-01
GWP-fossil	kg CO_2 eq	5.83E-01	4.71E-02	3.58E-03	2.66E-05	1.94E-03	2.71E-01	3.53E-04	-1.09E-01
GWP-biogenic	kg CO_2 eq	-7.22E-02	0	1.4E-02	0	0	5.74E-02	7.7E-04	0
GWP-luluc	kg CO_2 eq	-1.28E-03	8.99E-05	1.09E-06	8.89E-09	1.79E-05	1.53E-05	3.15E-07	-6.83E-06
ODP	kg CFC11 eq	1.1E-09	3.72E-15	1.99E-15	1.62E-16	2.51E-16	1.6E-13	5.43E-16	-8.04E-13
AP	mol H^+ eq	1.54E-03	2.38E-04	5.28E-06	6.73E-08	1.61E-05	8.66E-05	1.18E-06	-1.31E-04
EP-freshwater	kg P eq	1.51E-05	4.14E-08	2.95E-09	2.34E-09	7.06E-09	5.2E-08	5.94E-08	-1.66E-07
EP-marine	kg N eq	4.19E-04	1.06E-04	2.01E-06	2.36E-08	8.05E-06	2.87E-05	3.54E-07	-3.87E-05
EP-terrestrial	mol N eq	4.38E-03	1.16E-03	2.48E-05	1.63E-07	8.89E-05	3.84E-04	3.24E-06	-4.15E-04
POCP	kg NMVOC eq	1.4E-03	2.72E-04	5.05E-06	4.41E-08	1.52E-05	7.81E-05	1.17E-06	-1.08E-04
ADPE	kg Sb eq	8.59E-08	1.01E-09	2.53E-11	1.53E-12	1.27E-10	1.4E-09	1.01E-11	-7.41E-09
ADPF	MJ	1.23E+01	6.36E-01	6.72E-03	4.75E-04	2.63E-02	3.42E-01	5.05E-03	-1.97E+00
WDP	m^3 world eq deprived	2.66E-01	1.75E-04	2.1E-03	8.59E-03	2.33E-05	3.72E-02	7.59E-07	-9.74E-03

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

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 m² vinyl wallcoverings on non-woven backing

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	1.56E+00	1.15E-02	1.84E-01	9.67E-05	1.91E-03	9.12E-01	9.06E-03	-5.49E-01
PERM	MJ	1.02E+00	0	-1.82E-01	0	0	-8.25E-01	-8.59E-03	0
PERT	MJ	2.58E+00	1.15E-02	1.34E-03	9.67E-05	1.91E-03	8.68E-02	4.65E-04	-5.49E-01
PENRE	MJ	9.19E+00	6.38E-01	4.83E-02	4.75E-04	2.64E-02	3.31E+00	1.01E-01	-1.97E+00
PENRM	MJ	3.11E+00	0	-4.16E-02	0	0	-2.97E+00	-9.62E-02	0
PENRT	MJ	1.23E+01	6.38E-01	6.72E-03	4.75E-04	2.64E-02	3.42E-01	5.05E-03	-1.97E+00
SM	kg	3.36E-03	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0
FW	m^3	6.83E-03	1.3E-05	4.95E-05	2E-04	2.1E-06	9.06E-04	1.84E-07	-4.45E-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 m² vinyl wallcoverings on non-woven backing

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	2.41E-05	1.35E-12	1.78E-13	1.35E-14	8.17E-14	2.14E-12	4.3E-13	-1.15E-10
NHWD	kg	4.57E-02	6.58E-05	6.6E-04	6.08E-05	4.02E-06	8.44E-02	5.63E-03	-9.54E-04

RWD	kg	1.99E-04	7.76E-07	2.73E-07	1.9E-08	4.94E-08	1.24E-05	5.95E-08	-1.46E-04
CRU	kg	0	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0	0	0
MER	kg	2.51E-02	0	1.13E-02	0	0	1.78E-01	0	0
EEE	MJ	5.47E-02	0	0	0	0	0	0	4.84E-01
EET	MJ	1.03E-01	0	0	0	0	0	0	9.5E-01

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

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional:
1 m² vinyl wallcoverings on non-woven backing

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	Disease incidence	2.06E-08	1.1E-09	3.1E-11	1.08E-12	1.15E-10	1.18E-09	1.17E-11	-1.11E-09
IR	kBq U235 eq	1.42E-01	1.11E-04	4.33E-05	2.91E-06	7.36E-06	1.66E-03	8.69E-06	-2.42E-02
ETP-fw	CTUe	7.74E+00	4.47E-01	3.62E-03	9.77E-04	1.87E-02	1.96E-01	4.72E-03	-4.13E-01
HTP-c	CTUh	8.1E-10	8.41E-12	1.75E-13	1.86E-14	3.85E-13	9.22E-12	2.29E-13	-2.15E-11
HTP-nc	CTUh	8.14E-08	4.61E-10	8.43E-12	1.74E-12	2.33E-11	8.01E-10	2.06E-11	-6.77E-10
SQP	SQP	4.42E+00	5.63E-02	2.09E-03	7.06E-05	1.1E-02	8.09E-02	4.63E-04	-3.61E-01

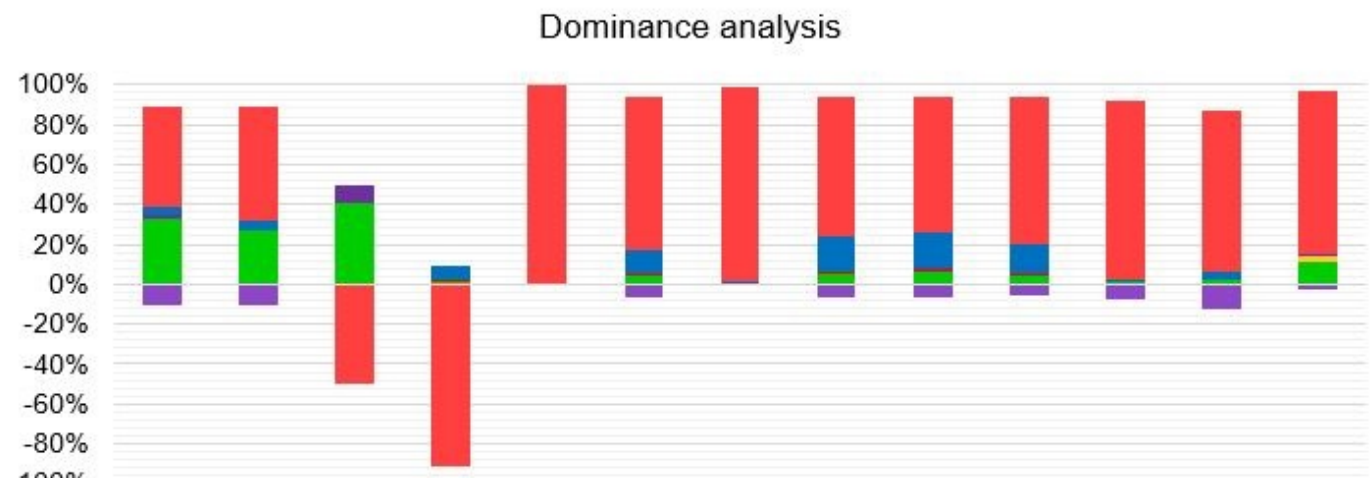
PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic);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

This EPD was created using a software tool.

6. LCA: Interpretation



	GWP-total	GWP-fossil	GWP-biogenic	GWP-luluc	ODP	AP	EP-freshwater	EP-marine	EP-terrestrial	POCP	ADPE	ADPF	WDP
A1-A3	5,10E-01	5,83E-01	-7,22E-02	-1,28E-03	1,10E-09	1,54E-03	1,51E-05	4,19E-04	4,38E-03	1,40E-03	8,59E-08	1,23E+01	2,66E-01
A4	4,72E-02	4,71E-02	0,00E+00	8,99E-05	3,72E-15	2,38E-04	4,14E-08	1,06E-04	1,16E-03	2,72E-04	1,01E-09	6,36E-01	1,75E-04
A5	1,75E-02	3,58E-03	1,40E-02	1,09E-06	1,99E-15	5,28E-06	2,95E-09	2,01E-06	2,48E-05	5,05E-06	2,53E-11	6,72E-03	2,10E-03
C1	2,66E-05	2,66E-05	0,00E+00	8,89E-09	1,62E-16	6,73E-08	2,34E-09	2,36E-08	1,63E-07	4,41E-08	1,53E-12	4,75E-04	8,59E-03
C2	1,96E-03	1,94E-03	0,00E+00	1,79E-05	2,51E-16	1,61E-05	7,06E-09	8,05E-06	8,89E-05	1,52E-05	1,27E-10	2,63E-02	2,33E-05
C3	3,28E-01	2,71E-01	5,74E-02	1,53E-05	1,60E-13	8,66E-05	5,20E-08	2,87E-05	3,84E-04	7,81E-05	1,40E-09	3,42E-01	3,72E-02
C4	1,12E-03	3,53E-04	7,70E-04	3,15E-07	5,43E-16	1,18E-06	5,94E-08	3,54E-07	3,24E-06	1,17E-06	1,01E-11	5,05E-03	7,59E-07
D	-1,09E-01	-1,09E-01	0,00E+00	-6,83E-06	-8,04E-13	-1,31E-04	-1,66E-07	-3,87E-05	-4,15E-04	-1,08E-04	-7,41E-09	-1,97E+00	-9,74E-03

D C4 C3 C2 C1 A5 A4 A1-A3

The production stage (module A1-A3) clearly dominates the LCA results. The loads caused by the disposal stage (modules C3 and C4) become noticeable, especially as the biogenic carbon leaves the product system, reflected in the total and biogenic global warming potential. Transports play a subordinate yet not insignificant role.
The main environmental impacts are in all categories located in module A1-A3. For GWP-fossil and ADPF the highest precursor of impact is the use of PVC plastisol for vinyl coating. The production and use of thermal and electric energy for general production and heating/drying processes in A3 is the second-highest precursor in both categories. The production of Titanium dioxide (TiO2) pigment and Di-isononyl phthalate (DINP) are substantial sources of GWP-fossil and ADPF.
The highest source of environmental impact in most categories is the production of PVC plastisol, not only because it constitutes 33% of the product mass; but because of the energy-intensive production of PVC itself.
The production of paper has a noticeable effect. It has a relatively high share of the greenhouse potential due to energy demands. In the GWP category, the biogenic carbon dioxide contained in the paper is treated first as a credit; after incineration in a waste-to-energy facility, it is treated as a load (C3). Moreover, paper production has a relatively large influence on the acidification potential (AP), the eutrophication potential (EP), the ozone depletion (ODP), and the Potential for the formation of tropospheric ozone (POCP).
Transport processes do also affect GWP-fossil, AP, EP, POCP, and ADPF. The main reason is the combustion of fuels.
The waste treatment in module C3 in the GWP-fossil impact is dominated by the incineration of PVC plastisol at End-of-Life.

Range of the results
The individual results of the participating companies differ from the average results in the present environmental product declaration. Regarding GWP, the results may be 245% higher or 41% lower than the average for this EPD.
The main reason for the deviations is differences in the grammage of the individual wallcoverings. In addition, there are different materials used as well as varying heat and electricity consumptions depending on the manufacturer.

7. Requisite evidence

Members of the The Global Wallcoverings Association have the following certificates:

- The declared products comply with *EN 15102*.
- According to the (emission) test chamber assessment, which follows to the French measurement method *Arrêté du 19/04/11* the wallcoverings meet the requirements of the test standard *ISO 16000*.
- Optional according to the chamber test which follows the *German AgBB (Committee for health-related evaluation of building products)* regulations the wallcoverings meet the requirements of test standard *ISO 16000*.
- Optional compliance with German *RAL-GZ 479*.
- Optional compliance with USA Wallcovering Association *W-101 (2013)* paragraph 8.1 when tested by California Specification Section 01350 to criteria *CDPH/EHLB* Standard Method V1.1 (2010).

The certificates and classifications for the various wallcoverings can be obtained from the respective manufacturers.

8. References

Standards and Norms

Arrêté du 19/04/11
Order of 19 April 2011 relating to the labeling of construction products or wall or floor coverings and paints and varnishes on their emissions of volatile pollutants

ASTM E 84
ASTM E 84:2016: Standard Test Method for Surface Burning Characteristics of Building Materials

ASTM F 793
ASTM F793 / F793M-15, Standard Classification of Wall Coverings by Use Characteristics, ASTM International, West Conshohocken, PA, 2015

ASTM F1141 - 93
ASTM F1141-93(2009), Standard Specification for Wallcovering, ASTM International, West Conshohocken, PA, 2009

BNB
Lifetimes of components for life cycle analyses according to the Bewertungssystem Nachhaltiges Bauen, 2011.

CDPH/EHLB
Standard method for measuring and evaluating chemical emissions from indoor sources using environmental chambers, Version 1.1

CPR
Construction Product Regulation EU

EN 12149:1997
Wallcoverings in roll form - Determination of migration of heavy metals and certain other elements, of vinyl chloride monomer and of formaldehyde release.

EN 12956:1999
Wallcoverings in roll form - Determination of dimensions, straightness, spongeability and washability.

EN 13501-1:2018
Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire Tests.

EN 15102:2007+A1:2011
Decorative wallcoverings - Roll and panel form.

EN 233:2016
Wallcoverings in roll form - Specification for finished wallpapers, wall vinyls and plastics wallcoverings.

EN 234:2019
Wallcoverings in roll form – Specification for wallcoverings for subsequent decoration

EN 235:2001
Wallcoverings - Vocabulary and Symbols.

EN 259-1:2001
Wallcoverings in roll form - Heavy duty wallcoverings - Part 1: Specifications.

EN ISO 105-B02
Textiles - Tests for colour fastness - Part B02: Colour fastness to artificial light: Xenon arc fading lamp test (ISO 105-B02:2014).

EN ISO 14025:2006
Environmental labels and declarations — Type III environmental declarations — Principles and procedures; 2009-11.

EN ISO 14044:2006
Environmental management - Life cycle assessment - Requirements and guidelines (ISO 14044:2006).

EN ISO 16000:2006
Indoor air - Part 3: Determination of formaldehyde and other carbonyl compounds in indoor air and test chamber air - Active sampling method.
Indoor air - Part 6: Determination of volatile organic compounds in indoor and test chamber air by active sampling on Tenax TA® sorbent, thermal desorption and gas chromatography using MS or MS-FID.
Indoor air - Part 9: Determination of the emission of volatile organic compounds from building products and furnishing - Emission test chamber method.
Indoor air - Part 11: Determination of the emission of volatile organic compounds from building products and furnishing - Sampling, storage of samples and preparation of test specimens.

ISO 14001:2015
Environmental management systems - Requirements with guidance for use.

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 50001:2011
Energy management systems - Requirements with guidance for use.

SVHC
Candidate List of substances of very high concern for Authorisation (SVHC)
Published in accordance with Article 59(10) of the REACH Regulation. European chemicals agency (ECHA).

RAL-GZ 479
Wallpapers - Quality assurance

Regulation (EU) No 305/2011
of the European Parliament and of the Council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC Text with EEA relevance. Current consolidated version: 16/07/2021

WA-101
WA Quality Standard for Polymer Coated Fabric Wallcovering

Further documentation

Ecoinvent
Database for Life Cycle Assessment, version 3.6. Swiss Center for Life Cycle Inventories, St. Gallen, 2023.

European Commission
List of substances banned for use in cosmetic products. CMR substances of category 1A, 1B or 2 under Commission Regulation (EC) No 790/2009. 01/12/2010. Updated 01/07/2015.

European Parliament
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.

European Waste Catalogue (EWC)
European Waste Catalogue / Ordinance on European List of Wastes

EU-JRC
EN 15804 reference package. Flows, Methods, Characterisation Factors, Unit Groups and Flow Properties based on EF Reference Package 3.0.

German AgBB
Committee for health-related evaluation of building products. Umweltbundesamt Deutschlands.

Institut Bauen und Umwelt e. V.
Product Category Rules for Building-Related Products and Services – PCR-A: Part A+A2: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report according to EN 15804+A2:2019, version: 1.3 from 31/08/2022.

Institut Bauen und Umwelt e. V.
PCR Guidance-Texts for Building-Related Products and Services - Part B: Requirements on the EPD for Wallcoverings. Version: 8 from 01/08/2021.

LCA for Experts (GaBi)
LCA for Experts 10.7.0.183: Software System and Database for Life Cycle Engineering. 1992-2023. Sphera Solutions GmbH

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