ENVIRONMENTAL PRODUCT DECLARATION

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

Owner of the Declaration	VdL - Verband der deutschen Lack- und Druckfarbenindustrie e.V.
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-VDL-20240612-IBN1-EN
Issue date	03.06.2025
Valid to	02.06.2030

Dispersion-based bonding agent

Verband der deutschen Lack- und Druckfarbenindustrie e. V. (VdL)

Institut Bauen und Umwelt e.V.

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1. General Information

Verband der deutschen Lack- und Druckfarbenindustrie e. V. (VdL)

Programme holder

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

Declaration number

EPD-VDL-20240612-IBN1-EN

This declaration is based on the product category rules:

Coatings with organic binders, 01.08.2021
(PCR checked and approved by the SVR)

Issue date

03.06.2025

Valid to

02.06.2030

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

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

Dispersion-based bonding agent

Owner of the declaration

VdL - Verband der deutschen Lack- und Druckfarbenindustrie e.V.
Mainzer Landstraße 55
60329 Frankfurt a. M.
Germany

Declared product / declared unit

This product declaration refers to the production of 1 kg dispersion-based bonding agent.

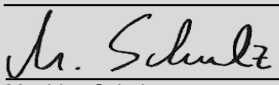
Scope:

This is an Association EPD of the Verband der deutschen Lack- und Druckfarbenindustrie e.V. (Association of the German Paint and Printing Ink Industry) (VdL). To calculate the Life Cycle Assessment (LCA), a representative worst-case composition was determined for a range of products with the highest environmental impact.
This worst-case declaration is based on the information provided by the members of the sector group group plasters & decorative coatingss at VdL. It applies exclusively to the products represented by the worst-case composition for plants in Germany, for five years from the date of issue. 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

Dispersion-based bonding agents are factory-produced, liquid mixtures comprising one or more aqueous polymer dispersions, mineral fillers, water, and additives. Solidification is achieved by drying and filming the polymer binders. The layer formed provides a high degree of adhesion between the finishing render and the substrate. The range of compositions and properties was specified by the manufacturers of dispersion-bound plasters in the sector group plasters & decorative coaings at Verband der deutschen Lack-- und Druckfarbenindustrie e.V. (VdL). This Environmental Product Declaration declares a representative worst-case composition for dispersion-based bonding agents. The product is not subject to any EU harmonisation legislation. For the use of the product, the respective national regulations apply at the place of use. *EN 13914-1* and, in general, the German Construction Contract Procedures (VOB) regulate the placing on the market and application.

2.2 Application

Dispersion-based bonding agents provide a high degree of high adhesion between organic finishing render and substrate.

2.3 Technical Data

The following technical data is relevant for the declared product.

Construction data

Name	Value	Unit
Density EN ISO 2811	1200 - 1800	kg/m^3
pH value	≤ 12	
water vapour diffusion equivalent air layer thickness sd ISO 7783	≤ 0,34	m
water vapour diffusion current density V ISO 7783	≥ 60	g/(m²·d)
water permeability rate w EN 1062-3	≤ 0,2	kg/(m²·h$^{1/2}$)

Further technical data according to the *PCR: Coatings with organic binders* are not relevant for the declared product.

2.4 Delivery status

Dispersion-based bonding agents are manufactured as liquid products in the factory and are mainly filled into plastic containers, tinted if necessary, stored temporarily, and delivered to the building site. Containers from 8 kg to 25 kg are typical delivery packaging. Filling into drums, big bags or wet silos is possible for larger applications.

2.5 Base materials/Ancillary materials

Dispersion-based bonding agents consist of at least one polymer dispersion, potassium silicate, pigments, mineral fillers (carbonates, silicates), and water. To adjust the product properties, additives such as thickeners, defoamers, dispersing aids, film-forming agents, in-can preservatives and, if necessary, film preservatives are used.

Name	Value	Unit
Polymer dispersionens 50 % *	≤ 30,0	% by mass
Aggregates / fillers	≤ 60,0	% by mass
Pigments	1,0 - 10,0	% by mass
In-can preservation	≤ 0,6	% by mass
Film preservation	≤ 0,3	% by mass
Water	≤ 35,0	% by mass
Film-forming agents	≤ 4,0	% by mass
Dispersing agents	≤ 0,5	% by mass
Defoamer	≤ 1,0	% by mass
Thickener	≤ 1,0	% by mass

* If the delivery form is different (e.g. concentration not 50 %), the mass specification (e.g. < 5 % by mass) must be corrected/adjusted..

The composition of products that comply with the EPD may deviate from the concentration bands mentioned in individual cases. More detailed information can be found in the respective manufacturer's specifications (e.g. product data sheets).

1) The product contains substances on the *ECHA candidate list* of substances of very high concern (SVHC) for authorisation (date: 21.01.2025) above 0.1% by mass: no.

2) The product contains other CMR substances of category 1A or 1B that are not on the candidate list, above 0.1% by mass: no.

3) Biocidal products have been added to this construction product or it has been treated with biocidal products (it is therefore a treated product within the meaning of the *Biocidal Products Regulation* No. 528/2012): yes.

In-can preservatives: bis(3-aminopropyl)(dodecyl)amine (BDA); benzisothiazolinone (BIT); bronopol (BNPD); chloromethylisothiazolinone (CIT); chloromethylisothiazolinone (CIT) /methylisothiazolinone (MIT) 3:1; dibromodicyanobutane (DBDCB);(ethylenedioxy) dimethanol (EDDM); 3-iodine-2-propinyl butylcarbamate (IPBC); methylisothiazolinone (MIT); sodium pyrithione; silver chloride; tetramethylolacetylenediurea (TMAD); zinc pyrithione.

Film preservatives: diuron (DMCU), isoproturon, terbutryn, dichloroctylisothiazolinone (DCOIT), octylisothiazolinone (OIT), 3-iodine-2-propinyl butylcarbamate (IPBC), zinc pyrithione.

The functional chemical groups of the basic substances are:

- organic solvents for film-forming agents,
- cellulose derivatives, polyacrylate, and PU resins for thickeners.

2.6 Manufacture

Dispersion-based bonding agents are produced in mixing plants in the following steps:
1. Filling the storage or weighing hoppers
2. Conveying the input materials into the mixer
3. Dispersing and mixing
4. Quality control, adjustment of consistency if necessary
5. Filling products into storage and transport containers
6. Loading and delivery

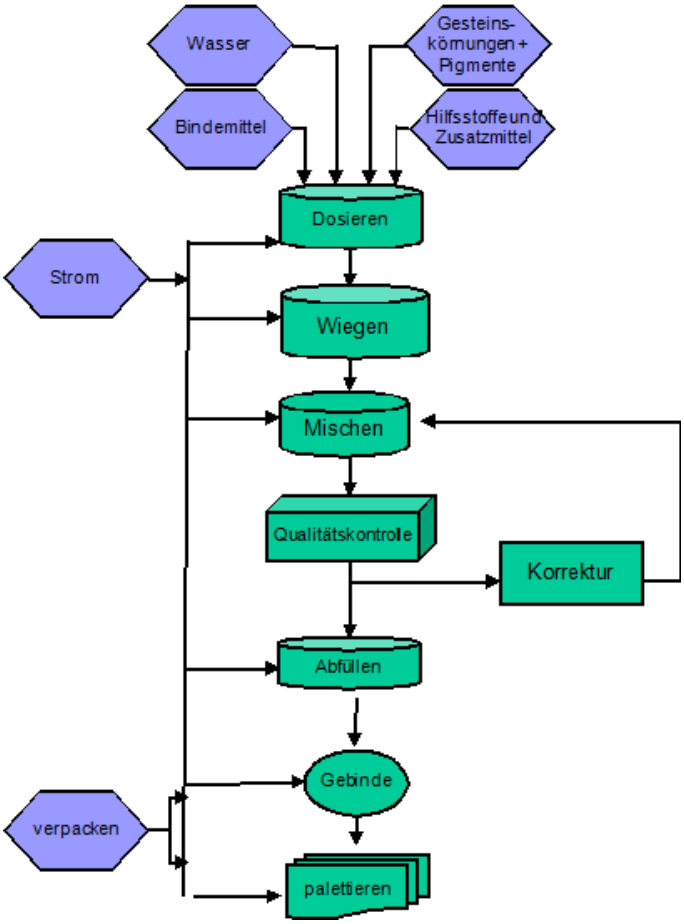


Figure:

Wasser	Water
Bindemittel	Binder
Gesteinskörnungen + Pigmente	Aggregates + pigments
Hilfsstoffe und Zusatzmittel	Ancillary materials and additives
Dosieren	Dosing
Wiegen	Weighing
Mischen	Mixing
Qualitätskontrolle	Quality control
Korrektur	Correction
Abfüllen	Filling
Gebinde	Container
Palettieren	Palletising
Strom	Electricity
verpacken	Packing

The raw materials arestored at the production plant in silos, big bags, drums or sacks. They aredosed gravimetrically and mixed intensively according to the respectiveformulation. After filling and packaging, they may be tinted, temporarilystored, or delivered directly. On the building site, it is possible to adjustthe consistency of the products to the application and weather conditions withwater.

2.7 Environment and health during manufacturing

The regulations of the *BetrSichV* apply to manufacturing companies. The raw materials are stored in accordance with *TRGS 509* and *TRGS 510*. When storing and handling preservatives, the *Biocidal Products Regulation* and the manufacturer's instructions must be observed. Goggles, gloves and, if necessary, a hard hat are mandatory in the chemical industry. Today's mixing plants have automatic dosing of raw materials so that employees have virtually no contact with raw materials.

2.8 Product processing/Installation

Dispersion-based bonding agents are almost exclusively applied manually. After the product has been applied to the intended surfaces, they are levelled using a suitable tool. Specific instructions for processing and other handling of these products are described in detail in the respective technical data sheet. The regulations of the trade associations and the product safety data sheets apply.
Direct contact with eyes and skin must be avoided by taking personal protective measures. Dispersion-based bonding agents must not be allowed to enter the sewage system, surface water, or groundwater. The cleaning water from the appliances should be collected and disposed of via a suitable cleaning system.
Due to the value of these products, the residual material is kept and processed at the next construction site.

2.9 Packaging

Packaging such as film and paper is collected separately and directed to recycling. The plastic containers can be collected by authorised disposal companies and sent for recycling.
The reusable wooden pallets are taken back by the manufacturers and reused or thermally recycled in return for a refund in the deposit system.
The composition of the packaging (18-litre plastic bucket) per declared unit is as follows:

- Polypropylene: 0.001 kg
- Polyethylene: 0.008 kg
- Steel: 0.001 kg.

2.10 Condition of use

Dispersion-based bonding agents form a solid layer after drying and during the utilisation phase, which ensures good adhesion to both the substrate and the finishing render.

2.11 Environment and health during use

During the processing and drying of dispersion-based bonding agents, film-forming agents (solvents) are released into the atmosphere.
During the utilisation phase, the dispersion-based bonding agents have no contact with the atmosphere and therefore no further environmental pollution is to be expected.

2.12 Reference service life

Dispersion-based bonding agents have no contact with the atmosphere during the use phase and are therefore not subject to the effects of weathering. The durability is therefore very high and is primarily linked to the durability of the entire construction system. The main applications for dispersion-based bonding agents are finishing plasters or external thermal insulation composite systems. The loaded outer layers are replaced after approx. 50 years, depending on the location, construction, and material quality.
With appropriate care of the system connections and by painting over with facade paint, they can reach the service life of the structures (approx. 100 years). The renovation intervals for repainting are generally 15 to 25 years.

2.13 Extraordinary effects

Fire

Primers are not categorised as such in terms of fire protection alone, but always in combination with the substrate and top coat. The fire classification of the composite is in accordance with *EN 13501-1*.

Water

Under temporary flooding, the bonding layer may soften. After drying, the original strength and adhesion are regained. Water-soluble components can be washed out. The main components of the products are not hazardous to water or only slightly hazardous to water according to the Ordinance on Installations for Handling Substances Hazardous to Water (*AwSV*). Therefore, no relevant contribution to environmental

damage is to be anticipated from the building in the event of exceptional water impacts.

Mechanical destruction
Dispersion-based bonding agents adhere firmly to the substrate and are protected by top coats. Mechanical destruction is only possible by destroying the entire component.

2.14 Re-use phase
Dried and solidified dispersion-based bonding agent cannot be reused.

2.15 Disposal
Dispersion-based bonding agents are firmly bonded to the corresponding component. It is not possible to separate the individual layers. The dried bonding agent can be disposed of. However, it is not separated due to the composite, but is landfilled in the composite with the remaining structure. The *waste code* is 170107 or 170904.

2.16 Further information
The various product types, along with many other terms, are explained in the *Technical Lexicon* of the VdL's sector group plasters & decorative coatings or described in the brochure Paste-like plasters for facades and interiors (https://www.putz.de/publikationen).
Detailed information on the product can be found in the technical data sheet or safety data sheet of the respective manufacturer.

3. LCA: Calculation rules

3.1 Declared Unit
The declared unit is the production of 1 kg dispersion-based bonding agent. The product with the highest environmental impact is used as the representative product for calculating the LCA results.

Declared unit and mass reference

Name	Value	Unit
Declared unit	1	kg
Gross density	1200 - 1800	kg/m^3
Conversion factor to 1 kg	1	-

3.2 System boundary
Modules A1, A2, A3, A4, A5, C1, C2, C3, C4 and D are taken into account in the LCA:

- A1 - Production of primary products
- A2 - Transport to the factory
- A3 - Production incl. energy supply, production of packaging, ancillary and operating materials, and waste treatment
- A4 - Transport to the warehouse and building site
- A5 - Installation (disposal of packaging and product residues as well as emissions during installation)
- C1 - Manual removal
- C2 - Transport for disposal (50 km)
- C3 - No expenses
- C4 - Disposal of the product
- D - Credits from the incineration of packaging materials and the recycling of the steel components in the packaging.

This is therefore a Declaration from the cradle to the factory gate with options, modules C1-C4 and module D (A1-A3 + C + D and additional modules A4 and A5).

3.3 Estimates and assumptions
Formulations: If no specific *Sphera MLC processe*s are available, the individual components of the formulations are estimated according to the manufacturer or references.
Packaging: This study only considers the manufacture of the product packaging (18-litre plastic container) and its disposal.

3.4 Cut-off criteria
No cut-off criteria are applied for the calculation of the LCA. All raw materials sent by the Association for the formulations are taken into account.
Packaging such as film and paper as well as reusable wooden pallets are negligible and therefore not included in the LCA. The plastic container is included in the calculation.
The sum of the neglected processes contributes less than 5 % to the impact categories considered. The manufacture of the machinery, equipment and other infrastructure required to produce the products under review is not included in the LCA.

3.5 Background data
Sphera Life Cycle Assessment for Experts (LCA FE) software system developed by Sphera GmbH is used to model the life cycle of the declared product. The underlying database is the *Sphera Managed Lifecycle Content (MLC) modelling database*.

3.6 Data quality
The data quality can be described as good. The primary data was collected in full, taking into account all relevant flows. The background data was taken from the *Sphera MLC databases*. The databases were last updated in 2023.

3.7 Period under review
The formulation data corresponds to the practical mass specifications that were drawn up with the members of the sector group plasters & decorative coatings in the VdL in spring 2024. The production data refers to the year 2023.

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: Germany

3.9 Allocation
Primary data:
No allocations are used for production. When incinerating the packaging, a multi-input allocation with a credit for electricity and thermal energy is used according to the simple credit method. The credits from packaging disposal are recognised in module D.
Background data:
The data sets used are listed in the background report. The allocation methods used in background data (materials and energy), which originate from the *Sphera MLC 2023 databases*, are documented online at https://sphera.com/life-cycle-assessment-lca-database/.

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 data comes from the *Sphera MLC database CUP 2023.2*.

4. LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

Information on describing the biogenic carbon content at the factory gate

Name	Value	Unit
Biogenic carbon content in product	0.0008	kg C
Biogenic carbon content in accompanying packaging	-	kg C

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

The following technical information is the basis for the declared modules or can be used for the development of specific scenarios in the context of a building assessment if modules are not declared (MND).

Transport to the building site (A4)

Two sections are considered for transport to the building site: Transport to the warehouse followed by transport to the building site.

Name	Value	Unit
Litres of fuel to the warehouse	0.00159	l/100km
Transport distance to the warehouse	250	km
Capacity utilisation (including empty runs) to the warehouse	85	%
Litres of fuel to the building site	0,1238	l/100km
Transport distance to the building site	50	km
Capacity utilisation (including empty runs) to the building site to the building site	3	%
Gross density of products transported	1200 - 1800	kg/m^3
Capacity utilisation volume factor	1	-

Installation in the building (A5)

Name	Value	Unit
Auxiliary	-	kg
Water consumption	-	m^3
Other resources	-	kg
Electricity consumption	-	kWh
Other energy carriers	-	MJ
Material loss (water vapour)	0.367	kg
Output substances following waste treatment on site (product residues during installation)	0.01	kg
Dust in the air	-	kg
VOC in the air	0.008	kg
Polypropylene (packaging)	0,001	kg
Polyethylene (packaging)	0,008	kg
Stahle (packaging)	0,001	kg

Reference service life

Name	Value	Unit
Reference service life	25 - 50	a

End of Life (C1-C4)

Name	Value	Unit
Collected separately waste type construction waste	0.615	kg
Collected as mixed construction waste	-	kg
Reuse	-	kg
Recycling	-	kg
Energy recovery	-	kg
Landfilling	0.615	kg

Reuse, recovery and recycling potential (D), relevant scenario information

Module D contains the credits from the incineration processes and recycling from A5 (packaging waste).
A waste incineration plant with an R1 value of > 0.6 was assumed.

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	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 kg Haftvermittler auf Dispersionsbasis

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	7.11E-01	2.82E-01	2.89E-02	0	2.26E-03	0	1.21E-02	-1.64E-02
GWP-fossil	kg CO_2 eq	7.08E-01	2.8E-01	2.89E-02	0	2.24E-03	0	9.11E-03	-1.63E-02
GWP-biogenic	kg CO_2 eq	9.23E-04	7.96E-04	1.4E-06	0	6.37E-06	0	2.93E-03	-9.93E-05
GWP-luluc	kg CO_2 eq	1.71E-03	1.69E-03	5.09E-07	0	1.36E-05	0	2.87E-05	-2.25E-06
ODP	kg CFC11 eq	2.98E-12	6.99E-14	2.87E-15	0	5.6E-16	0	2.38E-14	-1.67E-13
AP	mol H^+ eq	1.53E-03	3.26E-04	5.45E-06	0	2.67E-06	0	6.55E-05	-1.95E-05
EP-freshwater	kg P eq	2.76E-06	6.68E-07	9.04E-10	0	5.35E-09	0	1.87E-08	-3.87E-08
EP-marine	kg N eq	4E-04	1.12E-04	9.74E-07	0	9.46E-07	0	1.69E-05	-6.54E-06
EP-terrestrial	mol N eq	4.37E-03	1.37E-03	2.35E-05	0	1.14E-05	0	1.86E-04	-6.97E-05
POCP	kg NMVOC eq	1.57E-03	2.81E-04	6.53E-03	0	2.34E-06	0	5.11E-05	-1.77E-05
ADPE	kg Sb eq	7.58E-07	2.05E-08	2.56E-11	0	1.64E-10	0	4.28E-10	-1.26E-09
ADPF	MJ	1.59E+01	3.85E+00	6.3E-03	0	3.08E-02	0	1.23E-01	-2.38E-01
WDP	m^3 world eq deprived	1.04E-01	1.49E-03	2.66E-03	0	1.19E-05	0	1.01E-03	-2.2E-04

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 kg Haftvermittler auf Dispersionsbasis

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	1.7E+00	2.58E-01	1.54E-03	0	2.07E-03	0	2.01E-02	-8.18E-02
PERM	MJ	3E-02	0	0	0	0	0	0	0
PERT	MJ	1.73E+00	2.58E-01	1.54E-03	0	2.07E-03	0	2.01E-02	-8.18E-02
PENRE	MJ	1.3E+01	3.86E+00	4.27E-01	0	3.09E-02	0	1.23E-01	-2.38E-01
PENRM	MJ	2.88E+00	0	-4.21E-01	0	0	0	0	0
PENRT	MJ	1.59E+01	3.86E+00	6.3E-03	0	3.09E-02	0	1.23E-01	-2.38E-01
SM	kg	0	0	0	0	0	0	0	1.2E-03
RSF	MJ	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0
FW	m^3	4.92E-03	2.3E-04	6.24E-05	0	1.84E-06	0	3.1E-05	-3.15E-05

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 kg Haftvermittler auf Dispersionsbasis

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	5.56E-06	6.5E-12	1.06E-13	0	5.21E-14	0	2.65E-12	-1.34E-11
NHWD	kg	4.02E-01	5.78E-04	1.01E-02	0	4.63E-06	0	6.16E-01	-9.3E-05
RWD	kg	3.28E-04	5.08E-06	1.48E-07	0	4.07E-08	0	1.38E-06	-8.45E-06
CRU	kg	0	0	0	0	0	0	0	0
MFR	kg	0	0	1.2E-03	0	0	0	0	0
MER	kg	0	0	0	0	0	0	0	0
EEE	MJ	0	0	5.23E-02	0	0	0	0	0
EET	MJ	0	0	1.2E-01	0	0	0	0	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 kg Haftvermittler auf Dispersionsbasis

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	Disease incidence	2.41E-08	2.4E-09	4.05E-11	0	1.87E-11	0	8.06E-10	-1.79E-10
IR	kBq U235 eq	4.57E-02	5.44E-04	1.58E-05	0	4.36E-06	0	1.57E-04	-8.92E-04
ETP-fw	CTUe	9E+00	2.81E+00	7.88E-03	0	2.25E-02	0	6.66E-02	-3.73E-02
HTP-c	CTUh	8.86E-10	5.61E-11	1.37E-10	0	4.49E-13	0	1.03E-11	-6.22E-12
HTP-nc	CTUh	9.03E-08	2.35E-09	3.09E-10	0	1.88E-11	0	1.09E-09	-6.92E-11
SQP	SQP	1.62E+00	1.37E+00	1.82E-03	0	1.1E-02	0	3.1E-02	-5.72E-02

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.

6. LCA: Interpretation

Production (A1-A3)
As shown in the figure, the main environmental impact for all impact categories comes from the product phase. The impacts in this phase are mainly caused by the upstream chains of the raw materials (raw materials within modules A1-A3 with a share of > 50 %).
An exception to this statement is the POCP impact category. The environmental impacts caused by raw materials (A1) are in the region of 70 % in most impact categories. The environmental impact caused by the use of resources and energy in A3 is between 0 % and 11 %.
Transport (module A2) is rather unimportant within the impact categories.

Transport to the building site (A4)
Due to the assumed distribution chain of the declared product (factory - warehouse - building site with a transport utilisation of 3% from the warehouse to the building site), the transport of the products to the building site is very important for EP and moderately important for GWP and ADPF. The impacts range from 1 % to 20 % in various categories.

Installation (A5)
Module A5 takes into account the emissions of the solvents contained in the product as well as the treatment of the packaging and the product residue remaining in the bucket. The environmental impacts in this module play a rather subordinate role in the LCA results. The exception is the POCP category (formation potential for tropospheric ozone). Here, the emissions of the film-forming agent ethylene glycol butyl ether during installation lead to module A5 dominating the POCP impact category with a share of approx. 78 %.

Disposal stage (C1-C4)
Disposal of the declared product plays a negligible role for all impact categories.

Credits (D)
Module D contains the credits of energy or secondary material production from the disposal of the packaging buckets (i.e. thermal utilisation and recovery of steel).

Figure: Influence of life cycle phases on the environmental impacts of dispersion-based bonding agents

GWP-total	GWP total
ODP	ODP
AP	AP
EP-Süßwasser	EP fresh water
EP-Salzwasser	EP marine water
EP-Land	EP land
POCP	POCP
ADP - Mineralien & Metalle	ADP - minerals & metals
ADP-fossil	ADP fossil
WDP	WDP

7. Requisite evidence

VOC evidence
Special tests and verifications have not been carried out or provided as part of the preparation of this Environmental Product Declaration.
If the products are used in an area of application (e.g. habitable rooms) in which testing / evidence of VOC emission is required,

the evidence should always be submitted by the manufacturers.

Leaching
There are currently no European or national assessment criteria or emission scenarios for a sprinklered components scenario.
A technical test verification analogue to the indoor area (*AgBB* scheme) is therefore not possible.

Fire gas toxicity
The fire gases from organic products contain hazardous substances, but no particularly dangerous emissions. Testing the toxicity of fire gases is particularly useful in the system structure of the products and is not carried out for the individual coatings for this reason.

8. References

Standards

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EN 13501-1
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ISO 14025
EN ISO 14025:2011, Environmental labels and declarations – Type III environmental declarations – Principles and procedures

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 2811
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Paints and varnishes – Determination of density – Part 3: Oscillation method (ISO 2811-3:2011); German version EN ISO 2811-3:2011

ISO 7783
DIN EN ISO 7783:2011-11, Paints and varnishes – Determination of water-vapour transmission rate – Cup method (ISO 7783:2018); German version EN ISO 7783:2019

Further references

Waste code
Ordinance on the European Waste Catalogue (AVV), 2001-12

AgBB
Committee for Health Evaluation of Construction Products, 2024-09

AwSV
Ordinance on installations for handling substances hazardous to water, 2017-04

BetrSichV
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Product category rules for building-related products and services. Part A: Calculation rules for the Life Cycle Assessment and requirements for the project report, Berlin: Institut Bauen und Umwelt e.V. (ed.), Version 1.3, 31.08.2022 (www.ibu-epd.com)

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Product category rules for building-related products and services. Part B: Requirements for the EPD for coatings with organic binders, Institut Bauen und Umwelt e.V., www.ibu-epd.com, Version 7, 24 July 2023

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Regulation (EC) No. 19072006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 199945/EC and repealing Council Regulation (EEC) No. 79393 and Commission Regulation (EC) No. 148894 as well as Council Directive 76769/EEC and Commission Directives 91155/EEC, 9367/EEC, 93105/EEC and 200021/EEC, 2006 12

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https:sphera.comproduct-sustainability-gabi-data-search
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TRGS 509
Storage of liquid and solid hazardous substances in stationary containers and filling and emptying points for transportable containers, 2017-04

TRGS 510
Storage of hazardous substances in transportable containers, 2013-01

In my capacity as a public translator for the English language, duly registered, commissioned and sworn by the President of the Landgericht (Regional Court) Saarbrücken, I hereby certify the foregoing to be a true and complete translation of the copy which has been submitted to me.
Marius Schütz, 66636 Tholey, 25 July 2025

Publisher

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

+49 (0)30 3087748- 0
info@ibu-epd.com
www.ibu-epd.com

Programme holder

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

+49 (0)30 3087748- 0
info@ibu-epd.com
www.ibu-epd.com

Author of the Life Cycle Assessment

Sphera Solutions GmbH
Hauptstraße 111- 113
70771 Leinfelden-Echterdingen
Germany

+49 711 341817-0
info@sphera.com
www.sphera.com

Owner of the Declaration

VdL - Verband der deutschen Lack- und
Druckfarbenindustrie e.V.
Mainzer Landstraße 55
60329 Frankfurt a. M.
Germany

+49 69 2556-1411
vdl@vci.de
www.wirsindfarbe.de