ENVIRONMENTAL PRODUCT DECLARATION

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

Owner of the Declaration	Sika Services AG
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-SIK-20250228-CBA1-EN
Issue date	09.07.2025
Valid to	08.07.2030

Retardan®-2010 P

Sika Deutschland CH AG & Co KG

Institut Bauen und Umwelt e.V.

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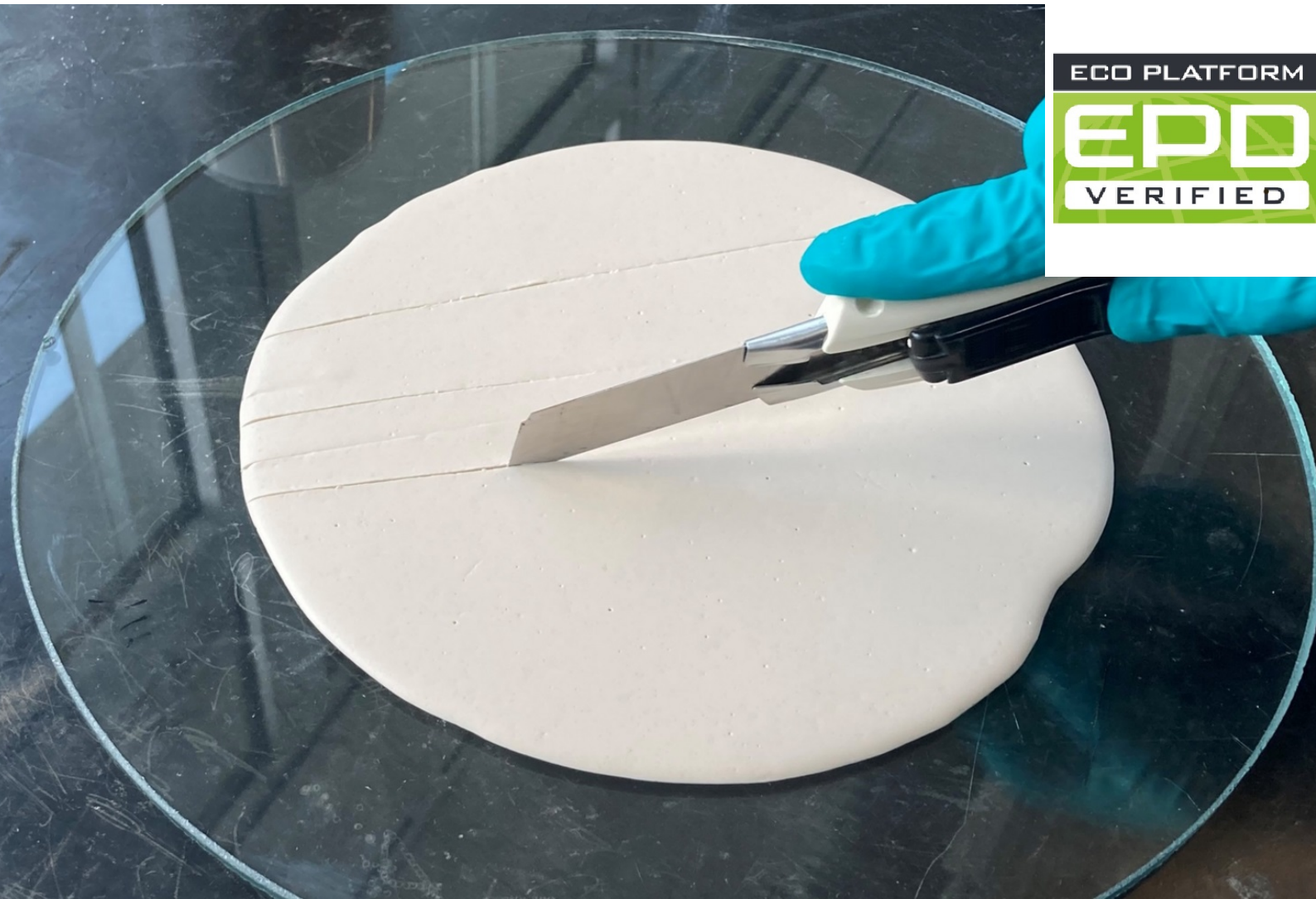

General Information

Sika Deutschland CH AG & Co KG

Programme holder

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

Declaration number

EPD-SIK-20250228-CBA1-EN

This declaration is based on the product category rules:

Gypsum additives, 01.12.2024
(PCR checked and approved by the SVR)

Issue date

09.07.2025

Valid to

08.07.2030

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

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

Retardan®-2010 P

Owner of the declaration

Sika Services AG
Tüffenwies 16-22
8064 Zurich
Switzerland

Declared product / declared unit

1 kg of Retardan®-2010 P applied into the building with a density of approx. 1.04 g/cm3.

Scope:

This core-EPD relates to 1 kg of Retardan®-2010 P, a highly efficient set retarder in powder form for calcium sulphate (Gypsum) based binders, produced in Rosendahl, Germany, and is representative for the year 2023. The results in this core-EPD were calculated using an LCA-tool verified by IBU in 2025.
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)

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Product

Product description/Product definition

Retardan®-2010 P is a highly efficient set retarder in powder form for calcium sulphate (Gypsum) based binders. There exists no standard for this kind of product. Thus, the product needs no declaration of performance and no CE marking for the placing of the product on the market in the European Union/European Free Trade Association (EU/EFTA).

Application

Retardan®-2010 P provides excellent performance in the control and adjustment of setting time and workability with calcium sulphate binders, especially in neutral to slightly alkaline alpha and beta-hemihydrate binders.
The product is especially suitable for the following applications:

- Production of self-levelling screeds and underlayments
- Production of moulding and modelling plaster
- Production of dental and medical plaster

Technical Data

Constructional data

Name	Value	Unit
Composition	Modified amino acid	
Appearance / Colour	Gray-beige powder	
Bulk density	Approx. 1.04	g/cm*3
pH-Value	Approx. 9 (3% solution)	-
Recommended dosage	0.01 - 0.2	% of dry weight

Additional technical data are not relevant for this product. There exists no EU harmonized performance standard for gypsum additives. Thus, the product needs no declaration of performance.

Base materials/Ancillary materials

Retardan®-2010 P is based on the following main raw materials:

- Modified amino acid: 5 - 20 %
- Inorganic additives: 80 - 95 %

1. This product/article/at least one partial article contains substances listed in the *ECHA* candidate list (date: 21.01.2025) exceeding 0.1 percentage by mass: no
2. This product/article/at least one partial article contains other cancerogenic, mutagenic, reprotoxic (CMR) substances in categories 1A or 1B which are not on the *ECHA* candidate list, exceeding 0.1 percentage by mass: no
3. 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 *REGULATION (EU) No 528/2012*: Yes
   Small volumes (< 0.5 % by mass) of biocides with functional chemical groups for example isothiazolinones are used as preservatives in gypsum additives during storage. More detailed information is available in the respective manufacturer's documentation (e.g. product data sheets, safety data sheets).

Reference service life

A reference service life according to the ISO 15686:1, -2, -7 and -8 standards cannot be declared as the additives are fully integrated into gypsum products.
The durability of gypsum additives is normally at least as long as the lifetime of the building in which they are used. Experimental data show that the reference life is greater than 50 years. Documentation of the RSL is not required for the EPDs calculated using the EPD tool from Sika since the entire life cycle is not declared. Only modules A1-A3, A4, A5, C1-C4 and D are considered.

LCA: Calculation rules

Declared Unit

The EPD refers to the declared unit of 1 kg of Retardan®-2010 P, powdery gypsum additive (retarder), applied into the building.

Declared unit and mass reference

Name	Value	Unit
Declared unit	1	kg
Density (liquids)	-	kg/m^3
Bulk density (powders)	Approx. 1.04	g/cm^3

System boundary

Declaration type with respect to life cycle stages covered according to clause 5.2 *EN 15804+A2* is cradle to gate with modules C1–C4 and module D (A1–A3, A4, A5, C and D).
Modules taken into account:

- A1 Production of preliminary products
- A2 Transport to the plant
- A3 Production including provision of energy, production of auxiliaries and consumables and waste treatment
- A4 Transport from the production site to the site where the product is consumed/used
- A5 The impact of the production and treatment of product installation residue (equal to 1 %) and the impact related to the packaging end-of-life treatment are considered in this module.
- C1-C2-C3-C4 The building deconstruction (demolition process) takes place in the C1 module which considers energy production and consumption in terms of diesel and all the emissions connected with the fuel-burning process. After the demolition, the additive is transported to the end-of-life processing (C2 module) where all the impacts related to the transport processes are considered. One scenario is considered for the final treatment of the waste:100 % disposal, modelled by landfill process where additives end their life cycle.
- Module D accounts for benefits that are beyond the defined system boundaries. Credits are generated during the incineration of the installation scrap and packaging in module A5.

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

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. *Sphera LCA for Expert software* (version 10) and *Managed LCA Content* (2024.1) have been used.

LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

The packaging material contains biogenic carbon content which is presented below.

Information on describing the biogenic carbon content at factory gate

Name	Value	Unit
Biogenic carbon content in product	0.0135	kg C
Biogenic carbon content in accompanying packaging	0.0109	kg C

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

For the preparation of building life cycle assessments, it must be taken into account that in modules A5 (installation in thebuilding) and C4 (disposal) the biogenic amount of CO_2 of the packaging and product bound in modules A1-A3 is mathematically booked out:

- 0.0109 kg C * 3.67 = 0.04 kg CO_2-eq.
- 0.0135 kg C * 3.67 = 0.0495 kg CO_2-eq.

Transport from the gate to the site (A4)

Name	Value	Unit
Transport distance	421	km
Gross weight	34 - 40	t
Payload capacity	27	t

Installation into the building (A5)

Name	Value	Unit
Material loss	0.01	kg
Other resources	-	kg

Material loss regards the amount of product not used during the application phase into the building. This amount is 1 % of the product, impacts related to the production of this part are charged to the A5 module. This percentage is considered as waste to incineration since the product has a calorific value and impacts of its end of life have been considered in the LCA model and declared in A5.

End of life (C1-C4)

C1: This module considers the use of machinery (7.5E-5 kg of diesel for kg handled) to dismantle the product to enable its subsequent transport.
C2: The concrete demolition waste is transported from the building site to a treatment plant or disposal site by truck and an average distance of 50 km is considered.
C4: The results for the end-of-life are declared for one scenario:

Name	Value	Unit
Collected as mixed construction waste	1	kg
Landfilling	1	kg

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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 of Retardan®-2010 P

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	7.21E-01	3.64E-02	7.54E-02	2.96E-04	7.56E-03	0	6.04E-02	-2.22E-02
GWP-fossil	kg CO_2 eq	8.05E-01	3.64E-02	2.81E-02	2.95E-04	7.56E-03	0	1.5E-02	-2.21E-02
GWP-biogenic	kg CO_2 eq	-8.51E-02	3.34E-05	4.73E-02	2.71E-07	6.92E-06	0	4.54E-02	-9.53E-05
GWP-luluc	kg CO_2 eq	5.4E-04	4.7E-06	6.41E-06	3.81E-08	9.74E-07	0	8.98E-05	-2E-06
ODP	kg CFC11 eq	2.5E-12	4.54E-15	3.29E-14	3.68E-17	9.41E-16	0	4.04E-14	-1.96E-13
AP	mol H^+ eq	1.68E-03	1.23E-04	3.19E-05	3.66E-06	2.56E-05	0	1.06E-04	-2.31E-05
EP-freshwater	kg P eq	9.47E-06	9.58E-09	9.7E-08	7.77E-11	1.99E-09	0	3.4E-08	-3.66E-08
EP-marine	kg N eq	6.65E-04	5.86E-05	1.17E-05	1.67E-06	1.21E-05	0	2.74E-05	-7.06E-06
EP-terrestrial	mol N eq	6.17E-03	6.46E-04	1.31E-04	1.83E-05	1.34E-04	0	3.01E-04	-7.58E-05
POCP	kg NMVOC eq	1.42E-03	1.22E-04	2.74E-05	5.04E-06	2.53E-05	0	8.37E-05	-2E-05
ADPE	kg Sb eq	7.24E-08	9.75E-10	7.97E-10	7.92E-12	2.02E-10	0	9.7E-10	-1.91E-09
ADPF	MJ	1.33E+01	4.84E-01	1.56E-01	3.92E-03	1E-01	0	1.97E-01	-3.94E-01
WDP	m^3 world eq deprived	1.62E-01	9.13E-05	9.31E-03	7.41E-07	1.89E-05	0	1.71E-03	-2.4E-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 kg of Retardan®-2010 P

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	3.35E+00	3.54E-03	4.38E-01	2.87E-05	7.34E-04	0	3.44E-02	-1.31E-01
PERM	MJ	6.08E-01	0	-4.04E-01	0	0	0	0	0
PERT	MJ	3.96E+00	3.54E-03	3.35E-02	2.87E-05	7.34E-04	0	3.44E-02	-1.31E-01
PENRE	MJ	7.14E+00	4.84E-01	3.44E-01	3.92E-03	1E-01	0	1.97E-01	-3.94E-01
PENRM	MJ	6.17E+00	0	-2.04E-01	0	0	0	0	0
PENRT	MJ	1.33E+01	4.84E-01	1.4E-01	3.92E-03	1E-01	0	1.97E-01	-3.94E-01
SM	kg	0	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	6.03E-03	3.87E-06	2.41E-04	3.14E-08	8.02E-07	0	5.23E-05	-1.01E-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 kg of Retardan®-2010 P

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	6.51E-09	1.76E-11	7.53E-11	1.43E-13	3.65E-12	0	4.92E-11	-2.65E-10
NHWD	kg	1.77E-02	5.04E-05	2.24E-03	4.09E-07	1.04E-05	0	1E+00	-2.05E-04
RWD	kg	3.78E-04	7.7E-07	4.68E-06	6.25E-09	1.6E-07	0	2.07E-06	-2.9E-05
CRU	kg	0	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0	0	0
MER	kg	0	0	0	0	0	0	0	0
EEE	MJ	0	0	1.04E-01	0	0	0	0	0
EET	MJ	0	0	1.92E-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 of Retardan®-2010 P

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	Disease incidence	2.37E-08	8.34E-10	3.38E-10	1.94E-10	1.89E-10	0	1.33E-09	-1.9E-10
IR	kBq U235 eq	5.34E-02	1.1E-04	6.77E-04	8.94E-07	2.29E-05	0	2.4E-04	-4.77E-03
ETP-fw	CTUe	1.23E+00	3.62E-01	2.37E-02	2.94E-03	7.5E-02	0	1.14E-01	-5.55E-02
HTP-c	CTUh	2.16E-10	6.6E-12	3E-12	5.35E-14	1.37E-12	0	2.69E-12	-4.51E-12
HTP-nc	CTUh	1.25E-08	2.12E-10	1.81E-10	1.76E-12	4.41E-11	0	1.04E-10	-1.06E-10
SQP	SQP	1.72E+01	3.53E-03	1.77E-01	2.87E-05	7.32E-04	0	5.44E-02	-7.67E-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.

This EPD was created using a software tool.

References

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Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures, as of February 03-2021

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ISO 15686-1:2000, Buildings and constructed assets - Service life planning - Part 1: General principles

ISO 15686-2:2012
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