

EPD

ENVIRONMENTAL PRODUCT DECLARATION



Environmental Product Declaration

In accordance with ISO 14025:2006 and
15804:2012+A2:2019/AC:2021



EPD INFORMATION

Registration number of EPD(s):	EPD-IES-0030959:001
Product names:	<i>Diathonite line</i> Diathonite Evolution, Diathonite Acoustix+, Diathonite Deumix+, Diathonite Thermostep.060, Diathonite Thermactive, Diathonite Thermostep.047, Diathonite Sismactive
EPD owner:	<i>DIASEN S.r.l.</i>
Programme:	The International EPD System, www.environdec.com
Programme operator:	EPD International AB
Type of EPD:	EPD of multiple products from a company, based on worst case results
EPD new version date:	2026-10-02
EPD valid until:	2031-10-02

GENERAL INFORMATION

The address of the programme operator:	EPD International AB, Box 210 60, SE-100 31 Stockholm, Sweden
E-mail:	support@environdec.com

Product Category Rules (PCR)

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product category rules (PCR):	PCR 2019:14 Construction products, Version 2.0.1
PCR review was conducted by:	The Technical Committee of the International EPD System. See www.environdec.com/TC for a list of members
Review chair:	Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat: www.environdec.com/contact

Third-party Verification

Independent third-party verification of the declaration and data, according to ISO 14025:2010

☐ EPD process certification

☒ EPD verification

Third party verifier:	Certiquality S.r.l. Via Gaetano Giardino, 4, 20123 - Milan Tel. +39 02 806 9171 www.certiquality.it
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Accredited by:

Accredia

Accreditation Number: n.0027VV

Procedure for follow-up of data during EPD validity involves third party verifier

☐ Yes

☒ No

An EPD may be updated or depublished if conditions change. To find the last version of the EPD, and to confirm its validity, see www.environdec.com. The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but published in different EPD programmes may not be comparable. For two EPDs to be comparable:

- they shall be based on the same PCR (including the same first-digit version number) or be based on fully aligned PCRs or versions of PCRs;
- cover products with identical functions, technical performances and use (e.g. identical declared/functional units);
- have identical scope in terms of included life cycle stages (unless the excluded life cycle stage is demonstrated to be insignificant);
- apply identical impact assessment methods (including the same version of characterisation factors);
- and be valid at the time of comparison.

EPDs of construction products may not be comparable if they are not compliant with EN 15804. For further information on comparability, see EN 15804 and ISO 14025.

INFORMATION ABOUT EPD OWNER

Owner of the EPD: DIASEN S.R.L.

Address: Zona Industriale Berbentina, 5 - 60041 - Sassoferrato (AN) – Italy

Contact: Giulia Mengotti

Address and contact information of the LCA practitioner commissioned by the EPD owner:
Roberto Petrucci – University of Perugia - DICA - Strada di Pentima, 4 - 05100 – Terni (Italy)

DESCRIPTION OF THE ORGANISATION

Diasen is an Italian company specialized in developing materials and innovative solutions for architecture and green building, focusing on energy efficiency and indoor comfort. The company operates in the construction materials sector, engineering thermal and acoustic insulation systems, waterproofing solutions, and coatings for public, residential, and sports buildings.

Corporate activities are driven by compliance with current environmental regulations and the mitigation of related environmental impacts.

Since 2007, Diasen has implemented an Environmental Management System certified to ISO 14001:2015, and operates in accordance with ISO 9001:2015 and ISO 45001:2018 standards. The company has achieved B Corp® certification, and completed LEED®, WELL®, and BREEAM® mapping for more than 40 products.

Manufacturing processes incorporate cork and other natural raw materials, utilizing low-environmental-impact technical solutions.

Research and Development activities focus on the utilization of production by-products or recoverable materials, as well as enhancing thermal insulation performance to lower building energy demand.

Management system-related certifications

ISO 9001:2015 – ISO 14001:2015 – ISO 45001:2018

PRODUCT INFORMATION

1		
Product name	DIATHONITE EVOLUTION	
Product Identification	See Table 1	
Product Description	Bio-based EIFS plaster blending recycled cork (0-3 mm), clay, diatomaceous earth, and natural hydraulic lime (NHL 3.5). This breathable plaster regulates humidity and provides bacteriostatic and anti-mould protection. By merging cork's thermal insulation with mineral thermal inertia, it contributes to indoor thermal and hygrometric regulation. Non-combustible and low VOC, it is fully recyclable as an inert material at the end of its lifecycle.	
UN CPC Code	37410 – Plaster (Intonaci e malte termoisolanti)	
Diasen Product Code	001	

2

Product name	DIATHONITE ACOUSTIX ⁺	
Product Identification	see Table 2	
Product Description	Bio-based, acoustic-active (NRC 0.75; $\alpha_w = 0.75$) plaster blending recycled cork (0-3 mm), clay, and diatomaceous earth. It reduces reverberation and echoes through its porosity. Breathable and bacteriostatic, it regulates indoor humidity while providing thermal inertia. Formulated with natural hydraulic binders, it is non-combustible, low VOC, and recyclable as an inert material at the end of its lifecycle.	
UN CPC Code	37410 – Plaster (Intonaci e malte termoisolanti)	
Diasen Product Code	140	

3

Product name	DIATHONITE DEUMIX ⁺	
Product Identification	See Table 3	
Product Description	Bio-based, macroporous plaster combining recycled cork (0-3 mm), clay, and natural hydraulic lime (NHL 5). Engineered for capillary dehumidification and salt neutralization, its internal porosity captures saline efflorescence while facilitating water evaporation from the masonry. Non-combustible and low VOC, it ensures structural breathability, moisture regulation, and full end-of-life recyclability.	
UN CPC Code	37410 – Plaster (Intonaci e malte termoisolanti)	
Diasen Product Code	132	

4

Product name	DIATHONITE THERMOSTEP.060 ¹	
Product Identification	See Table 4	
Product Description	Lightweight thermal plaster for floor and roof insulation, blending recycled cork (0-3 mm), clay, and diatomaceous earth. This mineral compound insulates structures without excessive weight loading. Its porosity ensures breathability and hygrometric regulation in new builds and renovations. Non-combustible and low VOC, it provides thermal insulation while remaining recyclable as an inert material.	
UN CPC Code	37410 – Plaster (Intonaci e malte termoisolanti)	
Diasen Product Code	180	

5

Product name	DIATHONITE THERMACTIVE ²	
Product Identification	See Table 5	
Product Description	Bio-EIFS plaster ($\lambda=0.035$ W/mK) blending cork (0-3 mm), expanded silica, perlite, and pumice within a natural hydraulic lime (NHL 5) matrix.	

¹ a.k.a. Diathonite Screed
² a.k.a. Diathonite Massetto

	This thermal plaster provides a spray-applied thermal insulation layer against temperature variations while ensuring humidity regulation. Bacteriostatic and non-combustible, it is a low-VOC, breathable solution fully recyclable as an inert material.	
UN CPC Code	37410 – Plaster (Intonaci e malte termoisolanti)	
Diasen Product Code	194	

6

Product name	DIATHONITE SISMACTIVE	
Product Identification	See Table 6	
Product Description	Bio-based structural plaster blending recycled cork (0-3 mm), clay, and diatomaceous earth within a hydraulic binder. Engineered as a technical matrix for CRM systems, it provides seismic reinforcement and consolidation for masonry, vaults, and historical buildings. This breathable product combines mechanical resistance with thermal insulation, correcting thermal bridges and assisting hygrometric balance. Non-combustible, low-VOC, and recyclable as an inert material.	
UN CPC Code	37410 – Plaster (Intonaci e malte termoisolanti)	
Diasen Product Code	142	

7

Product name	DIATHONITE THERMOSTEP.047	
Product Identification	see Table 7	
Product Description	Lightweight thermal plaster for floors, balconies, and roofs, blending recycled cork (0-3 mm), clay, and diatomaceous earth in a natural hydraulic lime (NHL 3.5) matrix. It corrects thermal bridges without overstressing existing structures, providing thermal insulation, hygrometric regulation, and acoustic attenuation. Non-combustible, low-VOC, and fully recyclable as an inert material.	
UN CPC Code	37410 – Plaster (Intonaci e malte termoisolanti)	
Diasen Product Code	171	

Table section

Table 1: Diathonite Evolution

Technical Feature	Value	Test Method	Technical Specification
Thermal conductivity (W/mK)	0,045	UNI EN 1745	EN 998-2
Compression Strength (N/mm ²)	M 2,20	UNI EN 998-2	
Fire reaction	Class A1	UNI EN 13501-1	
Vapour permeability coefficient - μ	4	UNI EN 1015-19	
Capillarity water absorption (kg/m ² h ^{0.5})	0,40	UNI EN 1015-18	
Adhesion (N/mm ²)	≥ 0,10 – FP:B	UNI EN 1015-12	
Specific weight (kg/m ³)	360 ± 20	UNI EN 1015-15	
Chloride Content (Cl) (%)	0,011	UNI EN 1015-17	

Total heavy metals (see Table 9)	Pass	CMAF 002-A/CMAF 002-B	
Test VOC (see Table 8)	VOC-free	EU Directive compliant 2004/42/CE (EU Decopaint Directive)	
Hazardous Substances	Calcium dihydroxide; Lime (chemical), hydraulic	CE Regulation 878/2020	

Table 2: Diathonite Acoustix*

Technical Feature	Value	Test Method	Technical Specification
Thermal conductivity (W/mK)	0,075	UNI EN 1745	EN 998-2
Compressive strength (N/mm ²)	M4	UNI EN 998-2	
Fire Reaction	Class A1	UNI EN 13501-1	
Vapour permeability coefficient - μ	4	UNI EN 1015-19	
Adhesion (N/mm ²)	ND:B	UNI EN 1015-12	
Specific weight (kg/m ³)	400 $\pm$ 20	UNI EN 1015-15	
Total heavy metals (see Table 9)	Pass	CMAF 002-A/CMAF 002-B	
Test VOC (see Table 8)	VOC-free	EU Directive compliant 2004/42/CE (EU Decopaint Directive)	
Hazardous Substances	Calcium dihydroxide; Lime (chemical), hydraulic	CE Regulation 878/2020	

Table 3: Diathonite Deumix*

Technical Feature	Value	Test Method	Technical Specification
Thermal conductivity (W/mK)	0,080	UNI EN 1745	EN 998-2
Compressive strength (N/mm ²)	M5	UNI EN 998-2	
Fire Reaction	Classe A1	UNI EN 13501-1	
Vapour permeability coefficient - μ	4	UNI EN 1015-19	
Adhesion (N/mm ²)	$\geq$ 0,20 – FP:B	UNI EN 1015-12	
Density (kg/m ³)	450 $\pm$ 10	UNI EN 1015-15	
CI Content (%)	0,015	UNI EN 1015-17	
Total heavy metals (see Table 9)	Pass	CMAF 002-A/CMAF 002-B	
Test VOC (see Table 8)	VOC-free	EU Directive compliant 2004/42/CE (EU Decopaint Directive)	
Hazardous Substances	Calcium dihydroxide; Lime (chemical), hydraulic	CE Regulation 878/2020	

Table 4: Diathonite Thermostep.060

Technical Feature	Value	Test Method	Technical Specification
Thermal conductivity (W/mK)	0,060	UNI EN 1745	EN 998-2
Compressive strength (N/mm ²)	M10	UNI EN 998-2	
Fire Reaction	Class A1	UNI EN 13501-1	
Vapour permeability coefficient - μ	4	UNI EN 1015-19	
Capillarity water absorption kg/m ² h ^{0,5})	ND	UNI EN 1015-18	
Specific weight (kg/m ³)	800 $\pm$ 80	UNI EN 1015-15	
Total heavy metals (see Table 9)	Pass	CMAF 002-A/CMAF 002-B	

Test VOC (see Table 8)	VOC-free	EU Directive compliant 2004/42/CE (EU Decopaint Directive)	
Hazardous Substances	Calcium dihydroxide; Lime (chemical), hydraulic	CE Regulation 878/2020	

Table 5: Diathonite Thermactive

Technical Feature	Value	Test Method	Technical Specification
Thermal conductivity (W/mK)	0,035	UNI EN 1745	EN 998-2
Compressive strength (N/mm ²)	M2,5	UNI EN 998-2	
Fire reaction	Class A1	UNI EN 13501-1	
Vapour permeability coefficient - μ	3	UNI EN 1015-19	
Capillarity water absorption (kg/m ² h ^{0.5})	1,00	UNI EN 1015-18	
Adhesion (N/mm ²)	≥ 0,10 – FP:B	UNI EN 1015-12	
Specific weight (kg/m ³)	250 ± 10	UNI EN 1015-15	
CI Content (%)	0,012	UNI EN 1015-17	
Total heavy metals (see Table 9)	Pass	CMAF 002-A/CMAF 002-B	
Test VOC (see Table 8)	VOC-free	EU Directive compliant 2004/42/CE (EU Decopaint Directive)	
Hazardous Substances	Calcium dihydroxide; Lime (chemical), hydraulic	CE Regulation 878/2020	

Table 6: Diathonite Sismactive

Technical Feature	Value	Test Method	Technical Specification
Thermal conductivity (W/mK)	0,065	UNI EN 1745	EN 998-2
Compressive strength (N/mm ²)	M10	UNI EN 998-2	
Fire reaction	Class A1	UNI EN 13501-1	
Vapour permeability coefficient - μ	5	UNI EN 1015-19	
Capillarity water absorption (kg/m ² h ^{0.5})	0,30	UNI EN 1015-18	
Adhesion (N/mm ²)	≥ 0,50 – FP:B	UNI EN 1015-12	
Specific weight (kg/m ³)	800 ± 80	UNI EN 1015-15	
CI Content (%)	0,015	UNI EN 1015-17	
Total heavy metals (see Table 9)	Pass	CMAF 002-A/CMAF 002-B	
Test VOC (see Table 8)	VOC-free	EU Directive compliant 2004/42/CE (EU Decopaint Directive)	
Hazardous Substances	Calcium dihydroxide; Lime (chemical), hydraulic	CE Regulation 878/2020	

Table 7: Diathonite Thermostep.047

Technical Feature	Value	Test Method	Technical Specification
Thermal conductivity (W/mK)	0,047	UNI EN 1745	EN 998-2
Compressive strength (N/mm ²)	M5	UNI EN 998-2	
Fire reaction	Class A1	UNI EN 13501-1	
Vapour permeability coefficient - μ	4	UNI EN 1015-19	
Capillarity water absorption (kg/m ² h ^{0.5})	ND	-	

(Footsteps) Soud proofing index (dB)	L _{nw} = 58	-	
Specific weight (kg/m ³)	ND	UNI EN 1015-15	
Total heavy metals (see Table 9)	Pass	CMAF 002-A/CMAF 002-B	
Test VOC (see Table 8)	VOC-free	EU Directive compliant 2004/42/CE (EU Decopaint Directive)	
Hazardous Substances	Calcium dihydroxide; Lime (chemical), hydraulic	CE Regulation 878/2020	

Table 8: VOC test results for “Diathonite” Line

Technical Feature	Value		Test method
Organic Volatile Compounds (VOC) Test	CDPH (Standard Method)	Pass	CDPH/EHLB/Standard Method V1.2 (2017)
	Indoor Air Comfort GOLD®	Pass	Indoor Air Comfort GOLD® (v7.0, 2020)
	BREEAM	International	BREEAM International (New Construction 2016)
		NOR	BREEAM-NOR (2016)
	French Regulation		DEVL1101903D and DEVL1104875A
	CAM Edilizia (Italy)		CAM Edilizia 11/10/2017
	AgBB / ABG (Germany)		AgBB 2011 and ABG norm
	Blue Angel		Dx10-UZ 113 (2019)
Belgian Regulation		Pass	C-2014/24239

Eurofins Analytical Report Nr. 392-2020-00509001_A_EN_rev 1

Table 9: Heavy Metal Analysis Results – “Diathonite” Line

Parameter	Result	Guideline Limit	Outcome
Lead (Pb)	7,3 mg/kg	< 100 mg/kg	PASS
Chromium (Cr)	13,7 mg/kg	< 100 mg/kg	PASS
Nickel (Ni)	19,1 mg/kg	< 250 mg/kg	PASS
Arsenic (As)	< 0,50 mg/kg	< 50 mg/kg	PASS
Cadmium (Cd)	< 0,50 mg/kg	< 20 mg/kg	PASS
Mercury (Hg)	< 4,0 mg/kg	< 4 mg/kg	PASS

Eurofins Analytical Report Nr. AR-24-T5-008331-01, conducted using the ICP-OES (Inductively Coupled Plasma Optical Emission Spectrometry) technique

Additional Relevant Information

The whole range of the products are delivered in bags, made on paper and plastic-based, according to a weight ratio of about 80:20.

The products *Diathonite Evolution* and *Diathonite Thermostep.047* are supplied in 18 kg bags. *Diathonite Deumix+* is supplied with 20 kg bags. *Diathonite Acoustix+* is supplied with 19 kg bags. *Diathonite Thermostep.060* and *Diathonite Sismactive* are supplied in 25 kg bags. *Diathonite Thermactive* is supplied in 15 kg bags.

References to any relevant websites for more information or explanatory materials

For more information, please refer to www.diasen.com

MANUFACTURING

The manufacturing process begins with the receipt and storage of raw materials from suppliers. Depending on their characteristics, some raw materials arrive in big bags, while bulk materials are delivered unpackaged and stored directly in dedicated silos; both types are automatically fed into the production mixer. Other packaged ingredients are stored in the warehouse and subsequently transported to the mixer via electric forklifts. Additionally, a specific bulk raw material is stored in dedicated containers and undergoes a volume reduction process through a specialized milling stage before being added to the mixer according to the product formula.

Production is a batch (discontinuous) process where all components are mechanically blended. Once mixed, the final product is packaged in bags, palletized on wooden pallets, secured with a protective polymer hooding film, and stored in the *finished goods* warehouse. Quality control is strictly performed both during the production phase and prior to shipment.

This manufacturing process requires no water and operates virtually as a closed-loop system, generating no scraps or waste. Furthermore, most of the residual dust collected by the filtration system during production is recycled back into the process.

Please refer to the *Preliminary Production Phase Outline for the Diathonite Line (Figure 1)* for further details.

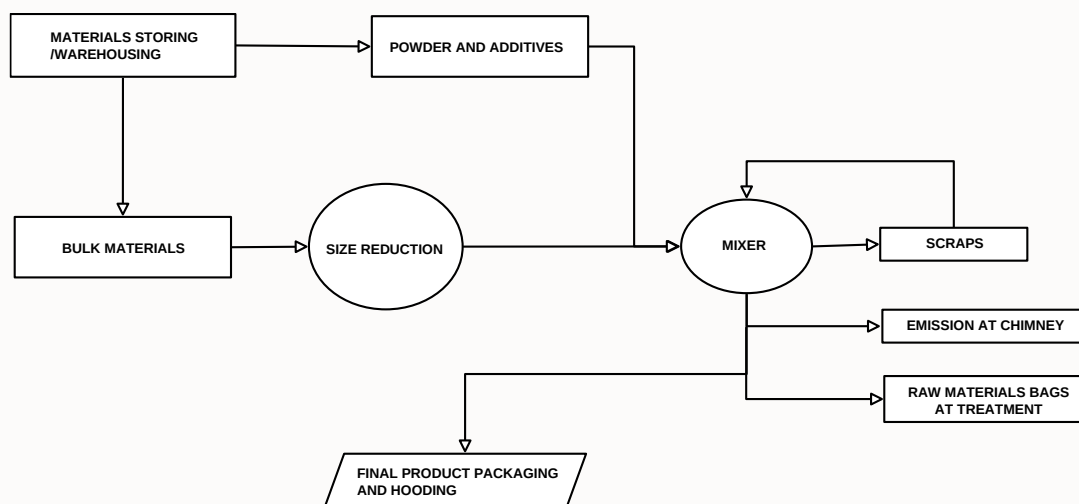


Figure 1: Preliminary scheme of the Diathonite Line Production phase.

CONTENT DECLARATION

Table 10: Content declaration and substances list for the Diathonite Line (the indicated mass values refer to the minimum and maximum found among all products included in the EPD).

Product content	Mass, kg	Post-consumer recycled material, mass-% of product	Biogenic material mass-% of product	Biogenic material kg C/product or declared unit
Cork	$7.72 \times 10^{-2} - 0.23$	0	$7.72 - 23.03$	$4.17 \times 10^{-2} - 0.125$
Clay	$0.00 - 0.16$	0	0	0
Perlite	$0.00 - 0.146$	0	0	0
Binders	$0.551 - 0.866$	0	0	$2.26 \times 10^{-6} - 3.06 \times 10^{-6}$
Cellulose Fibres	$6.00 \times 10^{-4} - 8.00 \times 10^{-3}$	0	$0.05 - 0.64$	$2.21 \times 10^{-4} - 2.94 \times 10^{-3}$
Organic Additives	$4.00 \times 10^{-3} - 1.30 \times 10^{-2}$	0	$0.00 - 1.25$	$0.00 - 6.59 \times 10^{-3}$
Inorganic Additives	$6.10 \times 10^{-3} - 1.93 \times 10^{-2}$	0	0	0
Calcium Carbonates	$0.00 - 1.99 \times 10^{-2}$	0	0	0
Pumice	$0.00 - 5.61 \times 10^{-2}$	0	0	0

Table 11: Content declaration and substances list for the used packaging for the Diathonite Line.

Packaging materials	Mass, kg	Mass % (versus the product)	Biogenic material kg C/product or declared unit
Wood	2.00×10^{-2} - 2.78×10^{-2}	2.00 - 2.78	7.84×10^{-4} - 1.09×10^{-2}
Paper/PE Box	6.48×10^{-3} - 1.08×10^{-2}	0.47 - 0.78	1.94×10^{-3} - 3.24×10^{-3}
LDPE Film	3.18×10^{-4} - 3.70×10^{-3}	0	6.29×10^{-5} - 1.01×10^{-4}

1 kg biogenic carbon in the product/packaging is equivalent to the uptake of 44/12 kg of CO₂.

Table 12: Content of hazardous substances used on the Diathonite Line.

Declaration of hazardous substances	EC No.	CAS No.	Mass-% per product or declared unit
Hydrated Lime	215-137-3	1305-62-0	31.80 - 43.07
Organic Additives	N.A.	9004-65-3	0.40 - 0.74
Inorganic Additives	205-592-53	143-22-6	0.61 - 1.93
Hydraulic Lime	285-561-1	85117-09-5	19.00 - 30.34

The products are not classified as hazardous to human health or the environment in accordance with Regulation (EC) No **878/2020** (CLP). They do not contain any substances included in the Candidate List of Substances of Very High Concern (SVHC) for Authorization, nor any substances listed in Annex XIV (Authorization List) issued by the European Chemicals Agency (ECHA).

Under normal storage and use conditions, these products can be handled without any specific precautions or personal protective equipment (PPE). The detailed composition of the products constitutes DIASEN S.r.l. proprietary know-how and remains strictly confidential.

LCA INFORMATION

The environmental performance of the products was assessed using the Life Cycle Assessment (LCA) method in accordance with the **EN ISO 14044:2021** standard. The Life Cycle Impact Assessment (LCIA) was performed according to the **EN 15804:2012+A2:2019** standard, which served as the core PCR. In this regard, the Product Category Rules (PCR) **2019:14** "Construction products" (**Version 2.0.1**) was used as the primary reference document.

Among the other reference standards, the following ones have been taken into account for the development of the LCA and the LCIA other than to carry out this EPD:

- ISO 14025:2010 - Environmental labels and declarations - Type III environmental declarations – Principles and procedures;
- ISO 15942:2021 - Sustainability of construction works — Environmental product declarations — Communication format business-to-business;
- ISO 14020:2023 - Environmental labels and declarations — General principles;
- General Programme Instructions For The International EPD System - Version 5.0 2024-06-19;

The results of the estimated environmental impacts are relative statements and do not indicate the endpoints of impact categories, the exceeding of threshold values, safety margins, or risks. Although the specific properties of the various products may differ slightly, their fields of application are substantially equivalent.

Furthermore, each product can perform multiple functions or deliver varying levels of performance within a building component, making the definition of a single, specific functionality for each item highly complex. For this reason, and in accordance with the reference standards, a declared unit has been adopted instead of a functional unit.

For all products covered by this EPD, the declared unit is defined as **1.00 kg of product**, ready for sale and transport to the end-user (builder). This includes its packaging (bag), along with its proportional share of plastic protective film, palletized on the Euro-pallet used for transport.

Finally, it should be noted that the manufacturing of all investigated systems takes place exclusively at the Diasen production plant in Sassoferrato (AN), Italy. Multiple products are included in the same EPD as they share the same core PCR, are manufactured by the same company, and undergo the same production process.

Declared unit

1 kg of product as dry product mix is defined as Declared Unit (DU).

Reference service life

The environmental impact of 1 kg of powder product (packaging included) for each products involved is described. According to the system boundary of this EPD, a Reference Service Life has not been provided.

Time representativeness

Data are referred to the production carried out in 2025 and have been provided by Diasen Srl. Also, data regarding the geographic origin of any raw materials, packaging materials etc. have been provided, as well as the transportation media.

Database and LCA software used

Ecoinvent 3.11 used as a database and **SimaPro Version 10.3.0** as a software.

Geographical scope

Global.

Description of system boundaries

Cradle to gate (A1–A3) with the addition of Modules C1–C3 and Module D.

Within each of the assessed life cycle stages, all material and energy input and output flows have been included. No raw materials or components have been omitted, regardless of their individual contribution to the overall environmental impact or to any specific impact indicators. Lifecycle modules that were not evaluated in this LCA are explicitly marked as **“ND” (Not Declared)**, as shown in **Table 13**.

Table 13: Reporting table for the Diathonite Line.

	Product stage				Distribution / installation stage				Use stage				End of life stage				Beyond product life cycle
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	ND	X
Geography	GLO	GLO	IT	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	ND	X
Share of primary data	12.14 – 54.69 %			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Variation products	47.17%			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Variation sites	0 %			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Cut-off criteria

The consumption of raw materials and energy related to ordinary and extraordinary maintenance operations was included, as well as energy consumption associated to illumination and heating of personnel, despite they were not relevant to environmental impact calculations. No consumption of auxiliary materials and waste related to extraordinary activities (A3), having a periodicity exceeding 3 years, take place.

Allocation criteria

Each manufacturing cycle yields a single product output, with no co-products or by-products generated. Furthermore, since the manufacturer provided primary data regarding material and energy consumption, as well as scraps and waste, no allocation procedures were required.

Production is carried out strictly on a batch-by-batch basis (discontinuous process), even under steady-state operating conditions; therefore, only one specific product is manufactured inside the facility at any given time. After a straightforward cleaning procedure, the same equipment can be seamlessly used to process a completely different material.

Data quality

As previously stated, the background data used in this EPD were retrieved from the **Ecoinvent 3.11 database**, and **SimaPro 10.3.0** software was utilized for inventory modelling. The geographical reference is Italy or, where necessary, Central Europe, while the datasets used span the last 5 years.

Data collection involved analysing internal production and environmental data from the Diasen S.r.l. manufacturing site, acquiring site-specific data for all production processes included in the LCA, and mapping the energy sources utilized (modelled via the Italian Residual Mix).⁸ Regarding raw materials, the most relevant datasets are either European averages or specific to the suppliers. The reference time period for all inventory data (product composition, transport, production rates, etc.) is 2025.

Background data are based on EPDs compliant with EN 15804 and recognized LCA databases. The data quality for raw materials in stage A1 is presented in the table below.

Table 14: Data quality of the raw materials in A1.

Material	Source	Quality	Reference year
Virgin Cork	Diasen	Ecoinvent 3.11	2025
Expanded materials (Perlite, Pumice, Clay)	Diasen	Ecoinvent 3.11	2025
Hydrated and Hydraulic Lime	Diasen	Ecoinvent 3.11	2025
Fibers	Diasen	Ecoinvent 3.11	2025
Additives (Organic and Inorganic)	Diasen	Ecoinvent 3.11	2025
Carbonates	Diasen	Ecoinvent 3.11	2025
Packaging (Pallet, Bags, Film)	Diasen	Ecoinvent 3.11	2025

Manufacturing operations are powered by an energy mix, of which **19.10%** is self-produced via a proprietary photovoltaic plant. The remaining **80.90%** is purchased from the national grid and has been modelled using the Italian Residual Mix.

Data quality assessment (DQIs) is carried out based on five categories and on a scale from 1 (excellent) to 5 (poor) (**Table 15**).

Table 15: Data Quality Indicators (DQIs) for the Diathonite Product Line

Flow Category	Approach / Data Source	DQIs (Min – Max Range)					Qualitative Assessment
		Reliability	Completeness	Temporal correlation	Geographical correlation	Further technological correlation	
Materials, Energy and Process (A1-A3)	Primary factory data and specific datasets	1.4	1.1	1.0	1.1	1.2	Excellent / Good
End-of-Life Scenarios and Transport (C1-C4, D)	Standard scenarios from PCR and generic datasets (Ecoinvent)	4.0	1.0	2.0	1.0	3.0	Good / Fair

The overall average score for the entire product line is (**1.8, 1.1, 1.1, 1.1, 1.5**), obtained by averaging the scores of all 30 inventory flows column by column. This highlights an almost optimal precision (values close to 1) regarding the completeness, temporal proximity, and geographical specificity of the factory data.

The only slight decrease is found in the source reliability indicator (**1.8**), which is due to the necessary use of generic literature datasets to model secondary transport and end-of-life forecasting scenarios (modules C1-C4 and D), for which it is methodologically impossible to have direct primary data.

The related details have been summarized in **Table 16**.

Table 16: Details on the used Electricity mix

	Data Source			GWP-GHG	Unit
	Diasen photovoltaic	Residual Mix (AIB)	Ecoinvent 3.11		
Diasen Electricity Mix				0.486	Kg CO ₂ eq./kWh

The share of primary data is calculated based on the GWP-GHG results. This simplified data quality indicator is intended to encourage the use of primary data, thereby enhancing both the representativeness and the comparability of EPDs. Please note that this indicator does not capture all aspects of data quality and is not comparable across different product categories.

Table 17: Share of primary data of the GWP-GHG

Process	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1-A3
Manufacturing of product	Collected data	EPD owner	2025	Primary data	0%
Generation of electricity used in manufacturing of product	Collected data and Database	EPD Owner and AIB Residual Mix	2025	Primary data	12.14 – 54.69 %
Input Raw materials	Collected data	EPD Owner Ecoinvent 3.11	2025	Primary data, Secondary data	0%
Other processes	Databases	Ecoinvent 3.11	2025	Secondary data	0%
Total share of primary data, of GWP-GHG results for A1-A3					12.14 – 54.69 %

ENVIRONMENTAL PERFORMANCE

This section presents the environmental profiles of the products covered by this EPD, calculated using the LCA methodology. In accordance with the system boundaries defined for this study, a "Cradle-to-gate with modules C1-C4 and module D" approach has been adopted, thereby including stages A1-A3, C1-C4, and D.

All calculations were performed using compliant software tools, as required by the EPD Programme General Instructions.

LCA RESULTS OF THE PRODUCT – WORST CASE

The estimated impact results are relative statements and do not indicate the endpoints of impact categories, the exceeding of threshold values, safety margins, or potential risks. The characterization factors applied are based on the **Environmental Footprint (EF) 3.1 methodology**. The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product's stage (modules A1-A3).

Regarding the mandatory impact indicators — specifically biogenic carbon dioxide — the biogenic carbon leaving the product system in subsequent lifecycle stages not included in this study (such as A5 and C, in accordance with the PCR guidelines) has already been balanced out within modules A1-A3.

Disclaimer 1: This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator;

Disclaimer 2: The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

Table 18: Mandatory impact category indicators according to EN 15804+A2:2019

Results per functional or declared unit							
Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	0.91	3.79×10 ⁻³	4.24×10 ⁻³	0.18	6.06×10 ⁻⁴	-6.50×10 ⁻³
GWP-fossil	kg CO ₂ eq.	1.08	3.78×10 ⁻³	4.24×10 ⁻³	2.75×10 ⁻³	6.06×10 ⁻⁴	-6.48×10 ⁻³
GWP-biogenic	kg CO ₂ eq.	-0.18	3.69×10 ⁻⁶	9.71×10 ⁻⁷	0.18	5.90×10 ⁻⁷	-6.45×10 ⁻⁶
GWP-luluc	kg CO ₂ eq.	5.17×10 ⁻³	9.93×10 ⁻⁷	1.52×10 ⁻⁶	5.12×10 ⁻⁷	1.59×10 ⁻⁷	-6.70×10 ⁻⁶
ODP	kg CFC 11 eq.	1.47×10 ⁻⁶	5.51×10 ⁻¹¹	9.27×10 ⁻¹¹	5.30×10 ⁻¹¹	8.81×10 ⁻¹²	-3.64×10 ⁻¹¹
AP	mol H ⁺ eq.	3.25×10 ⁻³	4.53×10 ⁻⁵	1.40×10 ⁻⁵	2.11×10 ⁻⁵	7.25×10 ⁻⁶	-4.87×10 ⁻⁵
EP-freshwater	kg P eq.	1.44×10 ⁻⁴	2.16×10 ⁻⁷	2.99×10 ⁻⁷	3.30×10 ⁻⁷	3.46×10 ⁻⁸	-1.77×10 ⁻⁶
EP-marine	kg N eq.	6.61×10 ⁻⁴	2.03×10 ⁻⁵	4.76×10 ⁻⁶	8.50×10 ⁻⁶	3.25×10 ⁻⁶	-1.42×10 ⁻⁵
EP-terrestrial	mol N eq.	6.87×10 ⁻³	2.22×10 ⁻⁴	5.18×10 ⁻⁵	9.26×10 ⁻⁵	3.55×10 ⁻⁵	-1.64×10 ⁻⁴

POCP	kg NMVOC eq.	2.66×10 ⁻³	6.23×10 ⁻⁵	2.22×10 ⁻⁵	2.71×10 ⁻⁵	9.97×10 ⁻⁶	-4.85×10 ⁻⁵
ADP-minerals & metals*	kg Sb eq.	1.76×10 ⁻⁶	1.44×10 ⁻⁸	1.19×10 ⁻⁸	7.52×10 ⁻⁹	2.30×10 ⁻⁹	-4.11×10 ⁻⁸
ADP-fossil*	MJ	9.87	4.97×10 ⁻²	6.38×10 ⁻²	4.10×10 ⁻²	7.95×10 ⁻³	-9.20×10 ⁻²
WDP*	m ³	0.11	1.19×10 ⁻⁴	2.82×10 ⁻⁴	1.67×10 ⁻⁴	1.90×10 ⁻⁵	-7.10×10 ⁻³
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption						

Table 19: Additional mandatory and voluntary impact category indicators

Results per functional or declared unit							
Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP-GHG	kg CO ₂ eq.	0.86	3.78×10 ⁻³	4.22×10 ⁻³	4.90×10 ⁻³	1.09×10 ⁻³	-8.75×10 ⁻³
Note	This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. In addition, the characterisation factors for the flows - CH ₄ fossil, CH ₄ biogenic and Dinitrogen monoxide were updated in line with the guidance of PCR 2019:14 Construction products, version 2.0.1 Annex 1. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterization factor for biogenic CO ₂ is set to zero.						

Table 20: Resource use indicators

Results per functional or declared unit							
Indicator	Unit	A1-A3	C1	C2	C3	C4	D
PERE	MJ	24.47	5.53×10 ⁻⁴	9.56×10 ⁻⁴	4.04	1.59×10 ⁻⁴	-7.02×10 ⁻³
PERM	MJ	4.26	0.00	0.00	-4.04	0.00	0.00
PERT	MJ	28.73	5.53×10 ⁻⁴	9.56×10 ⁻⁴	2.35×10 ⁻³	1.59×10 ⁻⁴	-7.02×10 ⁻³
PENRE	MJ	10.73	5.14×10 ⁻²	6.59×10 ⁻²	7.53×10 ⁻²	1.48×10 ⁻²	-0.12
PENRM	MJ	0.25	0.00	0.00	0.00	0.00	0.00
PENRT	MJ	10.52	5.14×10 ⁻²	6.59×10 ⁻²	7.53×10 ⁻²	1.48×10 ⁻²	-0.12
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00
RSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00
NRSF	MJ	5.97×10 ⁻³	4.03×10 ⁻⁷	3.21×10 ⁻⁶	4.77×10 ⁻⁷	1.16×10 ⁻⁷	-4.84×10 ⁻⁶
FW	m ³	0.12	1.20×10 ⁻⁴	2.82×10 ⁻⁴	3.06×10 ⁻⁴	3.46×10 ⁻⁵	-7.33×10 ⁻³
Acronyms	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						

Table 21: Waste indicators

Results per functional or declared unit							
Indicator	Unit	A1-A3	C1	C2	C3	C4	D
HWD	kg	0.00	0.00	0.00	0.00	0.00	0.00
NHWD	kg	0.13	0.00	0.00	0.00	0.00	0.00
RWD	kg	6.67×10 ⁻⁶	6.07×10 ⁻⁹	1.70×10 ⁻⁸	4.82×10 ⁻⁸	1.75×10 ⁻⁹	1.32×10 ⁻⁷
Acronyms	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radiactive waste disposed;						

Table 22: Output flow indicators

Results per functional or declared unit							
Indicator	Unit	A1-A3	C1	C2	C3	C4	D
CRU	kg	0	0.00	0.00	0.00	ND	0.00

MFR	kg	0	0.00	0.00	0.00	ND	0.60
MER	kg	0	0.00	0.00	0.00	ND	0.00
EEE	MJ	0	0.00	0.00	0.00	ND	0.00
EET	MJ	0	0.00	0.00	0.00	ND	0.00
Acronyms	CRU = Components for rx10-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy;						

Table 23: Additional environmental performance indicators according to EN 15804+A2:2019

Results per functional or declared unit							
Indicator	Unit	A1-A3	C1	C2	C3	C4	D
PM	Disease incidence	2.61×10^{-7}	8.84×10^{-11}	4.29×10^{-10}	8.32×10^{-11}	2.55×10^{-11}	-8.47×10^{-10}
IRP ¹	kBq U235 eq.	2.48×10^{-2}	2.47×10^{-5}	6.94×10^{-5}	1.71×10^{-4}	7.10×10^{-6}	-5.44×10^{-4}
ETP-fw ²	CTUe	5.41	4.24×10^{-3}	7.26×10^{-3}	5.47×10^{-3}	1.22×10^{-3}	-2.50×10^{-2}
HTP-c ²	CTUh	3.37×10^{-10}	4.55×10^{-13}	6.92×10^{-13}	5.48×10^{-13}	1.31×10^{-13}	-3.14×10^{-12}
HTP-nc ²	CTUh	4.97×10^{-09}	1.39×10^{-11}	3.99×10^{-11}	1.71×10^{-11}	4.00×10^{-12}	-7.39×10^{-11}
SQP	-	74.48	3.79×10^{-3}	6.23×10^{-2}	8.65×10^{-3}	1.09×10^{-3}	-8.90×10^{-2}
Acronyms	PM = Particulate matter Emission; IRP = Ionizing radiation, human health; ETP-fw = Ecotoxicity (Freshwater); HTP-c = Human toxicity, cancer effects; HTP-nc = Human toxicity, non-cancer effects; SQP = Soil quality potential/Land use related impacts;						

Table 24: End-of-life scenario - recovery and landfill

Indicator	% Recovery					% Landfill				
	100%					100%				
	C1	C2	C3	C4	D	C1	C2	C3	C4	D
Climate change	$3,79 \times 10^{-3}$	$4,24 \times 10^{-3}$	$2,76 \times 10^{-3}$	0,00	$-8,12 \times 10^{-3}$	$3,79 \times 10^{-3}$	$4,24 \times 10^{-3}$	0,00	$7,81 \times 10^{-3}$	0,00
Climate change - Biogenic	$3,69 \times 10^{-6}$	$9,71 \times 10^{-7}$	$1,59 \times 10^{-6}$	0,00	$-8,07 \times 10^{-6}$	$3,69 \times 10^{-6}$	$9,71 \times 10^{-7}$	0,00	$6,35 \times 10^{-6}$	0,00
Climate change - Fossil	$3,78 \times 10^{-3}$	$4,24 \times 10^{-3}$	$2,75 \times 10^{-3}$	0,00	$-8,10 \times 10^{-3}$	$3,78 \times 10^{-3}$	$4,24 \times 10^{-3}$	0,00	$7,80 \times 10^{-3}$	0,00
Climate change - Land use and LU change	$9,93 \times 10^{-7}$	$1,52 \times 10^{-6}$	$5,12 \times 10^{-7}$	0,00	$-8,37 \times 10^{-6}$	$9,93 \times 10^{-7}$	$1,52 \times 10^{-6}$	0,00	$3,42 \times 10^{-6}$	0,00
Ozone depletion	$5,51 \times 10^{-11}$	$9,27 \times 10^{-11}$	$5,30 \times 10^{-11}$	0,00	$-4,55 \times 10^{-11}$	$5,51 \times 10^{-11}$	$9,27 \times 10^{-11}$	0,00	$2,25 \times 10^{-10}$	0,00
Acidification	$4,53 \times 10^{-5}$	$1,40 \times 10^{-5}$	$2,11 \times 10^{-5}$	0,00	$-6,09 \times 10^{-5}$	$4,53 \times 10^{-5}$	$1,40 \times 10^{-5}$	0,00	$6,87 \times 10^{-5}$	0,00
Eutrophication, freshwater	$2,16 \times 10^{-7}$	$2,99 \times 10^{-7}$	$3,30 \times 10^{-7}$	0,00	$-2,21 \times 10^{-6}$	$2,16 \times 10^{-7}$	$2,99 \times 10^{-7}$	0,00	$4,88 \times 10^{-6}$	0,00
Eutrophication, marine	$2,03 \times 10^{-5}$	$4,76 \times 10^{-6}$	$8,50 \times 10^{-6}$	0,00	$-1,77 \times 10^{-5}$	$2,03 \times 10^{-5}$	$4,76 \times 10^{-6}$	0,00	$2,29 \times 10^{-5}$	0,00
Eutrophication, terrestrial	$2,22 \times 10^{-4}$	$5,18 \times 10^{-5}$	$9,26 \times 10^{-5}$	0,00	$-2,05 \times 10^{-4}$	$2,22 \times 10^{-4}$	$5,18 \times 10^{-5}$	0,00	$2,49 \times 10^{-4}$	0,00
Photochemical ozone formation	$6,23 \times 10^{-5}$	$2,22 \times 10^{-5}$	$2,71 \times 10^{-5}$	0,00	$-6,06 \times 10^{-5}$	$6,23 \times 10^{-5}$	$2,22 \times 10^{-5}$	0,00	$8,73 \times 10^{-5}$	0,00
Resource use, minerals and metals	$1,44 \times 10^{-8}$	$1,19 \times 10^{-8}$	$7,52 \times 10^{-9}$	0,00	$-5,14 \times 10^{-8}$	$1,44 \times 10^{-8}$	$1,19 \times 10^{-8}$	0,00	$1,34 \times 10^{-8}$	0,00
Resource use, fossils	$4,97 \times 10^{-2}$	$6,38 \times 10^{-2}$	$4,10 \times 10^{-2}$	0,00	-0,11	$4,97 \times 10^{-2}$	$6,38 \times 10^{-2}$	0,00	0,19	0,00
Water scarcity	$1,19 \times 10^{-4}$	$2,82 \times 10^{-4}$	$1,67 \times 10^{-4}$	0,00	$-8,87 \times 10^{-3}$	$1,19 \times 10^{-4}$	$2,82 \times 10^{-4}$	0,00	$-2,89 \times 10^{-2}$	0,00
GHG	$3,78 \times 10^{-3}$	$4,22 \times 10^{-3}$	$2,72 \times 10^{-3}$	0,00	$-8,02 \times 10^{-3}$	$3,78 \times 10^{-3}$	$4,22 \times 10^{-3}$	0,00	$7,75 \times 10^{-3}$	0,00

DECLARATION OF THE VARIATION IN RESULTS

This EPD is characterized by high variability among the majority of the calculated impact indicators, with variations exceeding 10%. In accordance with **PCR 2019:14** "Construction products" (**Version 2.0.1**), this variation has been formally declared within the EPD.

The specific percent variations between the highest and lowest impacts across the included products are detailed in the tables below for both the core environmental indicators and the GWP-GHG indicator.

Table 25: Environmental Impacts Results Variation

Indicator	A1-A3 Results variation (%)
GWP-total	52.16
GWP-fossil	64.71
GWP-biogenic	12.81
GWP-luluc	94.41
ODP	62.94
AP	27.45
EP-freshwater	18.68
EP- marine	20.26
EP-terrestrial	16.44
POCP	20.42
ADP-minerals & metals	47.99
ADP-fossil	26.24
WDP	43.50
PERE	65.26
PERM	62.44
PERT	64.84
PENRE	25.54
PENRM	60.22
PENRT	26.36
NRSF	93.51
FW	55.04
PM	71.86
IRP	27.02
ETP-fw	8.18
HTP-c	26.76
HTP-nc	58.79
SQP	44.57
NHWD	71.69
RWD	26.89

Table 26: GWP-GHG Impacts Results Variation

Indicator	Unit	A1-A3 Results variation (%)
GWP-GHG	Kg CO ₂ eq.	47.17

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VERSION HISTORY

Original Version of the EPD, 2026-10-02

