EPD

ENVIRONMENTAL PRODUCT DECLARATION

DIASEN

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–0030970:001
Product names:	*Waterproofing Line* Acriflex Rapido, Acriflex X–Pro, Acriflex Fybro (A+B), Acriflex Pro, Acriflex Reflex, Oriplast Reflex, Ultragum, Ultrabit, Watstop (A+B+C), Revela Zero, L'Antipioggia Terrazzi
EPD owner:	*DIASEN S.r.l.*
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

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	ACRIFLEX RAPIDO	
Product identification	see ***Table 1***	
Product description	Single-component liquid waterproofing membrane formulated with elastomeric resins. Designed for application down to +1 °C and under high–humidity conditions, it exhibits resistance to rain within 2–4 hours of application. This continuous membrane is suitable for roofs, terraces, and damp substrates, and is certified for asbestos encapsulation (UNI 10686). Compliant with EOTA TR 003 and EN 14891 standards, it is a VOC–free solution (Dir. 2004/42/EC).	
UN CPC code	CPC 351110 - Paints and varnishes and related products (Liquid waterproofing compounds and fluid protective membranes for construction applications)	
DIASEN product code	081	

2

Product name	ACRIFLEX X–PRO	
Product identification	see ***Table 2***	
Product description	Liquid waterproofing membrane formulated with elastomeric binders and elastic fibres. Designed as a walkable coating, it exhibits resistance to UV exposure and water stagnation while maintaining flexibility at low temperatures. Certified according to EOTA TR 003 and EN 14891, it is a VOC–free solution (Dir. 2004/42/EC).	
UN CPC code	CPC 351110 - Paints and varnishes and related products (Liquid waterproofing compounds and fluid protective membranes for construction applications)	
DIASEN product code	128	

3

Product name	ACRIFLEX FYBRO (A+B)	
Product identification	see ***Table 3***	
Product description	Two–component, fibre-reinforced waterproofing membrane formulated with acrylic binders and hydraulic cements. The elastic matrix provides crack–bridging capacity (3.2 mm) and an elongation at break of 149% without reinforcement mesh. Engineered to withstand water pressure up to 9.5 bar, freeze-thaw cycles, and UV exposure, it serves as an interface for restoring bituminous membranes and water–retaining structures. VOC–free solution (Dir. 2004/42/EC).	
UN CPC code	CPC 351110 - Paints and varnishes and related products (Liquid waterproofing compounds and fluid protective membranes for construction applications)	
DIASEN product code	015	

4

Product name	ACRIFLEX PRO	
Product identification	See ***Table 4***	
Product description	Water–based, single-component liquid waterproofing formulated with elastomeric resins and mineral fillers. This ready–to–use solution creates a continuous watertight seal on flat roofs, pitched roofs, and wet areas, maintaining flexibility at low temperatures. Certified for asbestos encapsulation (D.M. 20/08/1999 and UNI 10686), it provides resistance to water stagnation and weathering. Exposed finish compliant with VOC thresholds (Dir. 2004/42/EC).	
UN CPC code	CPC 351110 - Paints and varnishes and related products (Liquid waterproofing compounds and fluid protective membranes for construction applications)	
DIASEN product code	127	

5

Product name	ORIPLAST REFLEX	
Product identification	see ***Table 5***	
Product description	Waterproofing membrane characterized by high solar reflectance (SRI = 102). Formulated to reflect over 90% of solar radiation, it contributes to reducing surface	

	temperature buildup. This elastic matrix (327% elongation) exhibits hydraulic tightness (7 atm) and Reaction to Fire rating Class B–s2, d0 (UNI EN 13501-1). VOC–free (Dir. 2004/42/EC).	
UN CPC code	CPC 351110 - Paints and varnishes and related products (Liquid waterproofing compounds and fluid protective membranes for construction applications)	
DIASEN product code	012	

6

Product name	ULTRAGUM	
Product identification	see ***Table 6***	
Product description	Water–based single-component bituminous membrane for low-temperature (+5 °C) and high-humidity (up to 98% RH) applications. The elastomeric matrix combines an elongation at break of 336% with thermal stability testing (100 days at 80 °C). Designed for substrate adhesion and classified for external fire exposure to roofs (*Class* B_{ROOF} *t4*).	
UN CPC code	CPC 351110 - Paints and varnishes and related products (Liquid waterproofing compounds and fluid protective membranes for construction applications)	
DIASEN product code	121	

7

Product name	ULTRABIT	
Product identification	see ***Table 7***	
Product description	Water–based single-component bituminous paste containing post-consumer recycled rubber (16.4% by mass). Designed for levelling and protecting external surfaces, it allows for single-layer applications up to 3 mm thickness. Formulated for application at +5 °C and 98% RH, it exhibits early rain resistance (30 minutes) and elasticity to accommodate structural movements.	
UN CPC code	CPC 351110 - Paints and varnishes and related products (Liquid waterproofing compounds and fluid protective membranes for construction applications)	
DIASEN product code	120	

8

Product name	WATSTOP A+B+C	
Product identification	see ***Table 8***	
Product description	Three-component hybrid waterproofing system formulated with epoxy resins and osmotic cements. It provides hydraulic tightness up to 9.5 atm, acting in both positive and negative water pressure conditions (tested per UNI EN 12390–8). Engineered as a vapor and moisture barrier, it provides an adhesion interface for underground walls and damp substrates.	
UN CPC code	CPC 351110 - Paints and varnishes and related products (Liquid waterproofing compounds and fluid protective membranes for construction applications)	
DIASEN product code	008	

9		
Product name	ACRIFLEX REFLEX	
Product identification	see ***Table 9***	
Product description	Single-component waterproofing coating featuring high solar reflectance (SRI = 109). Formulated for exterior applications, it reflects over 90% of solar radiation, reducing surface heat buildup and thermal gain. The elastic matrix (327% elongation at break) provides resistance to water stagnation.	
UN CPC code	CPC 351110 - Paints and varnishes and related products (Liquid waterproofing compounds and fluid protective membranes for construction applications)	
DIASEN product code	182	

10		
Product name	ANTIPIOGGIA TERRAZZI[1]	
Product identification	see ***Table 10***	
Product description	Transparent liquid waterproofing designed for application over existing paved surfaces. It seals surface capillaries and cracks without demolition, preserving the original visual appearance of the substrate. It ensures hydrophobic protection, adhesion to tiles (3.50 MPa per UNI EN 1542), and weather resistance	
UN CPC code	CPC 351110 - Paints and varnishes and related products (Liquid waterproofing compounds and fluid protective membranes for construction applications)	
DIASEN product code	177	

11		
Product name	REVELA ZERO	
Product identification	See ***Table** 11*	
Product description	Clear, deep–penetrating siloxane coating designed for stone, brick, and concrete substrates. It creates a hydrophobic surface treatment that repels liquid water while maintaining water vapor permeability. It reduces moisture ingress and freeze-thaw damage without altering the substrate's visual appearance.	
UN CPC code	CPC 351110 - Paints and varnishes and related products (Liquid waterproofing compounds and fluid protective membranes for construction applications)	
Diasen product code	184	

Table Section

***Table 1**: Acriflex Rapido*

Technical Feature	Value	Test method
Water permeability	No permeability	EOTA TR 003
Resistance to washing away	20 *min*	Proprietary method
Elongation at break (%)	160 ± 10	ISO 527 (1–3)
Tensile Strength (N/mm²)	1,4 ± 0,5	ISO 527 (1)

[1] Rebrand *O.R.A. ANTIPIOGGIA*

Adhesion test on concrete *Tensile mode (N/mm²)*	0,536 *Failure typology A/B*	UNI EN 1542
Accelerated weathering test	1680 h (10 y)	UNI EN ISO 11507
Viscosity at 23 °C (cPs)	20000 ± 5000	UNI EN ISO 2555
Total heavy metals *(see **Table 13**)* Table 13	Pass	CMAP 002–A/CMAP 002–B
Test VOC *(see **Table 12**)*	VOC–*free*	EU Directive compliant 2004/42/CE *(EU Decopaint Directive)*
Hazardous substances	Ammonia; Acetic acid; isoproturon (ISO); Terbutryn; 3–Iodo–2–Propynylbutylcarbamate; 1,2–benzisothiazol–3(2H)–one; Reaction mass of 5–chloro–2–methyl–2H–isothiazol–3–one and 2–methyl–2H–isothiazol–3–one (3:1) *(all < 1%)*	CE Regulation 878/2020

***Table 2**: Acriflex X–Pro*

Technical Feature	Value	Test method
Water permeability	No permeability	EOTA TR 003
Flexibility – cold conditions (°C)	–25	Proprietary method
Elongation at break (%)	90 ± 10	ISO 527 (1–3)
Tensile Strength (N/mm²)	4 ± 0,5	ISO 527 (1)
Adhesion test on concrete *Tensile mode (N/mm²)*	0,50 *Failure typology A/B*	UNI EN 1542
Accelerated weathering test	1680 ore (10 anni)	UNI EN ISO 11507
Viscosity at 23 °C (cPs)	20000 ± 5000	UNI EN ISO 2555
Total heavy metals *(see **Table 13**)* Table 13	Pass	CMAP 002–A/CMAP 002–B
Test VOC *(see **Table 12**)*	VOC–*free*	EU Directive compliant 2004/42/CE *(EU Decopaint Directive)*
Hazardous substances	3–Iodo–2–Propynylbutylcarbamate; isoproturon (ISO); 1,2–benzisothiazol–3(2H)–one; Reaction mass of 5–chloro–2–methyl–2H–isothiazol–3–one and 2–methyl–2H–isothiazol–3–one (3:1) *(all < 1%)*	CE Regulation 878/2020

***Table 3**: Acriflex Fybro (A+B)*

Technical Feature	Value		Test method
Water permeability	9,40		EOTA TR 003
Flexibility – cold conditions (°C)	–26		Proprietary method
Elongation at break (%)	149,33		ISO 527 (1–3)
Tensile Strength (N/mm²)	2,37		ISO 527 (1)
Adhesion test on concrete *Tensile mode (N/mm²)*	1,089		UNI EN 1542
Accelerated weathering test	1680 ore (10 anni)		UNI EN ISO 11507
Total heavy metals *(see **Table 13**)*	Pass		CMAP 002–A/CMAP 002–B
Test VOC *(see **Table 12**)*	VOC–*free*		EU Directive compliant 2004/42/CE *(EU Decopaint Directive)*
Hazardous substances	*A*	*B*	CE Regulation 878/2020
	3–Iodo–2–Propynylbutylcarbamate; isoproturon (ISO); Terbutryn; 1,2–benzisothiazol–3(2H)–one;	Cement,portland; Flue dust, portland cement	

	Reaction mass of 5–chloro–2–methyl–2H–isothiazol–3–one and 2–methyl–2H–isothiazol–3–one (3:1)		

***Table 4**: Acriflex Pro*

Technical Feature	Value	Test method
Water permeability	succeeded	UNI EN 12390–8 EN 14891
Elongation at break (%)	64,40 ± 10	ISO 527 (1–3)
Tensile Strength (N/mm²)	1,50 ± 0,50	ISO 527 (1)
Adhesion test on concrete *Tensile mode (N/mm²)*	0,50	UNI EN 1542
Water Vapor permeability	8827	UNI EN ISO 7783
Viscosity at 23 °C (mPa×s)	18000 ± 5000	UNI EN ISO 2555
Total heavy metals *(see **Table 13**)*	Pass	CMAP 002–A/CMAP 002–B
Test VOC *(see **Table 12**)*	VOC–*free*	EU Directive compliant 2004/42/CE *(EU Decopaint Directive)*
Hazardous substances	3–Iodo–2–Propynylbutylcarbamate; isoproturon (ISO); 1,2–benzisothiazol–3(2H)–one; Reaction mass of 5–chloro–2–methyl–2H–isothiazol–3–one and 2–methyl–2H–isothiazol–3–one (3:1) *(all < 1%)*	CE Regulation 878/2020

***Table 5**: Oriplast Reflex*

Technical Feature	Value	Test method
Water permeability	Pressure of 7 atm	EOTA TR 003
Flexibility – cold conditions (°C)	12 mm (ISO 1519)	Proprietary method
Elongation at break (%)	327 (166 after weathering)	ISO 527 (1–3)
Tensile Strength (N/mm²)	1,20	ISO 527 (1)
Adhesion test on concrete *Tensile mode (N/mm²)*	0,78 *Failure typology A/B*	UNI EN 1542
Accelerated weathering test	3000 hr (> 17 yr)	UNI EN ISO 11507
Viscosity at 23 °C (mPa×s)	50000 – 65000 *(Brookfiled DV–E)*	UNI EN ISO 2555
Fire reaction	Classe B – s_2, d_0	UNI EN 13501–1
Hazardous substances	3–Iodo–2–Propynylbutylcarbamate; isoproturon (ISO); 1,2–benzisothiazol–3(2H)–one; Reaction mass of 5–chloro–2–methyl–2H–isothiazol–3–one and 2–methyl–2H–isothiazol–3–one (3:1) *(all < 1%)*	CE Regulation 878/2020

***Table 6**: Ultragum*

Technical Feature	Value	Test method
Resistance to washing away	30 *min*	Proprietary method
Elongation at break (%)	336 ± 67	ISO 527 (1–3)
Tensile Strength (N/mm²)	1 ± 0,3	ISO 527 (1)
Adhesion test on concrete *Tensile mode (N/mm²)*	0,53 *Failure typology A/B*	UNI EN 1542
Accelerated weathering test	100 days (> 180°C)	UNI EN ISO 11507
Fire reaction	B_{ROOF} t4	UNI EN 13501–1

Hazardous substances	Ammonia; Acetic acid; 3–Iodo–2–Propynylbutylcarbamate; isoproturon (ISO); 1,2–benzisothiazol–3(2H)–one; Reaction mass of 5–chloro–2–methyl–2H–isothiazol–3–one and 2–methyl–2H–isothiazol–3–one (3:1) *(all < 1%)*	CE Regulation 878/2020

***Table 7**: Ultrabit*

Technical Feature	Value	Test method
Resistance to washing away	30 *min*	Proprietary method
Elongation at break (%)	94,1 ± 19,9	ISO 527 (1–3)
Tensile Strength (N/mm²)	0,42 ± 0,08	ISO 527 (1)
Adhesion test on concrete *Tensile mode (N/mm²)*	0,11 *Failure typology B*	UNI EN 1542
Hazardous substances	Zinc Oxide; Acetic acid; 1,2–benzisothiazol–3(2H)–one; Reaction mass of 5–chloro–2–methyl–2H–isothiazol–3–one and 2–methyl–2H–isothiazol–3–one (3:1) *(all < 1%)*	CE Regulation 878/2020

***Table 8**: Watstop (A+B+C)*

Technical Feature	Value			Test method
Water permeability	9,50			UNI EN ISO 12390–8
Vapour permeability coefficient – μ	13361			UNI EN ISO 7783
Tensile Strength (N/mm²)	Cementitious		2.50	UNI EN ISO 4624
	Tuff blocks		3.00	
	Pav. Grit and PUR Panels		1.50	
	Expanded PS		1.25	
Accelerated weathering test	2000 hr (> 10 yr)			UNI EN ISO 11507
Total heavy metals *(see **Table 13**)*	Pass			CMAP 002–A/CMAP 002–B
Hazardous substances	*A*	*B*	*C*	CE Regulation 878/2020
	2,3–epoxypropyl neodecanoate; Quartz (RCS > 10%); bisphenol–A–(epichlorhydrin), epoxy resin number average molecular weight ≤ 700	Fatty acids, C18–unsatd., dimers, aligomeric reaction products with tall–oil fatty acids, tetraethylenepentamine and triethylenetetramine; Fatty acids, tall–oil, reaction products with tepa; 3–aminopropyldimethylamine	Cement, portland; Flue dust, portland cement	

***Table 9**: Acriflex Reflex*

Technical Feature	Value		Test method
Elongation at break	327 *(166 after weathering)*		ISO 527 (1–3)
Vapour permeability coefficient – μ	13361		UNI EN ISO 7783
Tensile Strength (N/mm²)	1,20		ISO 527 (1)
Adhesion test on concrete *Tensile mode (N/mm²)*	0,78		UNI EN 1542
	Zinc coated coil.	1,70	UNI EN ISO 4624

Adhesion test on other substrates (N/mm²) *Tensile mode*	Slate	2,50	
	PUR Panels	1,50	
	Plexiglass	2,00	
Viscosity at 23 °C (mPa×s)	50000 – 65000 *(Brookfiled DV–E)*		UNI EN ISO 2555
Total heavy metals *(see **Table 13**)*	Pass		CMAP 002–A/CMAP 002–B
Test VOC *(see **Table 12**)*	VOC–*free*		EU Directive compliant 2004/42/CE *(EU Decopaint Directive)*
Hazardous substances	3–Iodo–2–Propynylbutylcarbamate; isoproturon (ISO); 1,2–benzisothiazol–3(2H)–one; Reaction mass of 5–chloro–2–methyl–2H–isothiazol–3–one and 2–methyl–2H–isothiazol–3–one (3:1) *(all < 1%)*		CE Regulation 878/2020

Table 10: *Antipioggia Terrazzi*

Technical Feature	Value	Test method
Vapour permeability coefficient – μ	1941	UNI EN ISO 7783
Adhesion test on tiles *Tensile mode (N/mm²)*	3.50	UNI EN 1542
Viscosity at 23 °C (mPa×s)	50000 – 65000 *(Brookfiled DV–E)*	UNI EN ISO 2555
Accelerated weathering test	1680 hr (> 10 yr)	UNI EN ISO 11507
Hazardous substances	1,2–benzisothiazol–3(2H)–one; Reaction mass of 5–chloro–2–methyl–2H–isothiazol–3–one and 2–methyl–2H–isothiazol–3–one (3:1) *(all < 1%)*	CE Regulation 878/2020

Table 11: *Revela Zero*

Technical Feature	Value	Test method
Adhesion for Direct Tensile mode	0,53 MPa *(Failure Type A/B)*	UNI EN 1542
Flammability	Class B	UNIEN 13501–1
Hazardous substances	Reaction mass of 5–chloro–2–methyl–2H–isothiazol–3–one and 2–methyl–2H–isothiazol–3–one (3:1) *(< 1%)*	CE Regulation 878/2020

Table 12: *VOC test results for "Acriflex" 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)*
	LEED v4 e v4.1 BETA		Compliant	LEED v4 and v4.1 BETA (2021)
	EMICODE		EC 1 PLUS	EMICODE (2020)
	BREEAM	*International*	Exemplary Level	BREEAM International *(New Construction 2016)*
		NOR	Compliant	BREEAM–NOR (2016)
	French Regulation		A+	DEVL1101903D and DEVL1104875A
	CAM Edilizia (Italy)		Pass	CAM Edilizia 11/10/2017
	Blue Angel		Pass	D×10-UZ 113
	AgBB / **ABG** (Germany)		Pass	AgBB 2011 and ABG norm
	Belgian Regulation		Pass	C–2014/24239

Table 13: *Heavy Metal Analysis Results – "Acriflex" Line*

Parameter	Result	Guideline Limit	Outcome
Lead (Pb)	11,4 mg/kg	< 100 mg/kg	PASS
Chromium (Cr)	< 0,50 mg/kg	< 100 mg/kg	PASS
Nickel (Ni)	< 0,50 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 **ICP–OES** (Inductively Coupled Plasma Optical Emission Spectrometry) technique			

Table 14: *Heavy Metal Analysis Results product Watstop*

Parameter	Result			Guideline Limit	Outcome
	A	*B*	*C*		
Piombo (Pb)	< 0,50 mg/kg	< 0,50 mg/kg	< 0,50 mg/kg	< 100 mg/kg	PASS
Cromo (Cr)	< 0,50 mg/kg	< 0,50 mg/kg	9,3 mg/kg	< 100 mg/kg	PASS
Nichel (Ni)	< 0,50 mg/kg	< 0,50 mg/kg	< 0,50 mg/kg	< 250 mg/kg	PASS
Arsenico (As)	< 0,50 mg/kg	< 0,50 mg/kg	4,3 mg/kg	< 50 mg/kg	PASS
Cadmio (Cd)	< 0,50 mg/kg	< 0,50 mg/kg	< 0,50 mg/kg	< 20 mg/kg	PASS
Mercurio (Hg)	< 4,0 mg/kg	< 4,0 mg/kg	< 4,0 mg/kg	< 4 mg/kg	PASS
Eurofins Analytical Report Nr. **AR–24–T5–008329–01**, conducted using **ICP–OES** (Inductively Coupled Plasma Optical Emission Spectrometry) technique					

Additional Relevant Information

The products *Acriflex Rapido*, *Acriflex X–Pro*, *AcriflexPro*, *Oriplast Reflex*, and *Ultragum* are supplied in plastic buckets containing an amount of product of 20 kg. The product *Ultrabit* is supplied in plastic buckets containing an amount of product of 21,25 kg. The product *Acriflex Reflex* is supplied in plastic buckets containing an amount of product of 25 kg. The product *Watstop* is supplied in plastic buckets containing an amount of product of 10 kg. The product *L'Antipioggia Terrazzi* is supplied in plastic buckets containing an amount of product of 5 L. *Revela Zero* is supplied in plastic buckets containing an amount of product of about 5 kg.

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, materials arrive in plastic or metal buckets, kraft paper and plastic bags, or unpackaged in bulk; the latter are stored directly in dedicated silos.

These materials are fed into the liquid production mixer either automatically or manually. Packaged ingredients stored in the warehouse are subsequently transported to the mixing station via electric forklifts. For cork–based products, the raw cork undergoes a preliminary milling stage before being transferred to the final production phase. Production is a batch (discontinuous) process where all components are mechanically blended.

The finished product is then packaged in buckets, 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 production and prior to shipment.

This manufacturing process requires water and operates virtually as a closed–loop system, generating no material scraps.

Water from the municipal aqueduct is used exclusively to clean the mixer between different production cycles and is subsequently discharged as industrial wastewater. For further details, please refer to the *Preliminary Production Phase Outline* for the *Waterproofing* line (***Figure 1***) for further details.

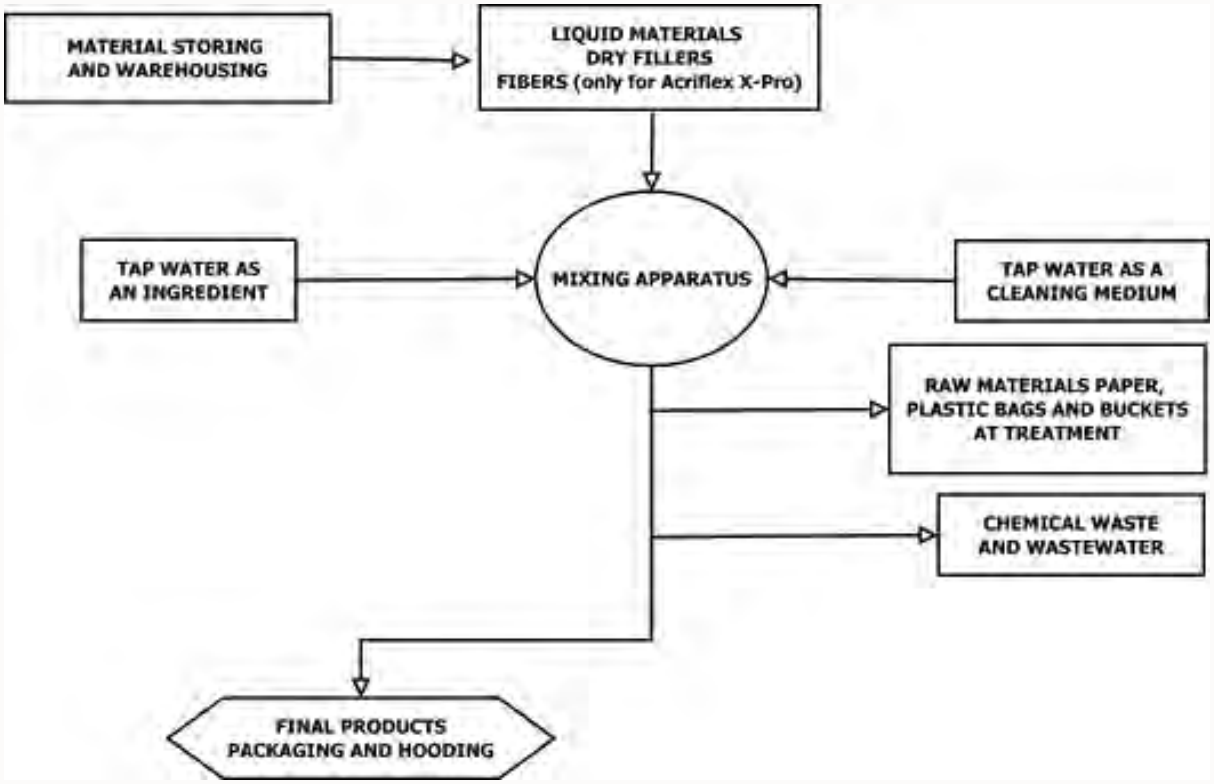

Figure 1: *Preliminary scheme of the Waterproofing Line production's phase.*

CONTENT DECLARATION

Table 15: *Content declaration and substances list for the Waterproofing 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*** *kgC/product or declared unit*
Water	4.80×10^{-2} – 0.87	0	0	0
Quartz	0.00 – 0.30	0	0	0
Talcum powder	0.00 – 0.20	0	0	0
Cement	0.00 – 0.37	0	0	0
PAN fibers	0.00 – 9.85×10^{-3}	0	0	0
Organic Additives	0.00 – 5.46×10^{-2}	0	0	0
Inorganic Additives	0.00 – 1.96×10^{-2}	0	0	0
Titanium dioxide	0.00 – 0.10	0	0	0
Recycled rubber	0.00 – 0.164	0	0	0
Siloxane Emulsion	0.00 – 0.124	0	0 – 1.45	0.00 – 1.45×10^{-2}
Acrylic Resin	0.00 – 0.633	0	0	0
Epoxy Resin	0.00 – 0.18	0	0	0
Aliphatic Diammine	0.00 – 0.08	0	0 – 2.76	0.00 – 2.76×10^{-2}

Table 16: *Content declaration and substances list for the used packaging of the for the Waterproofing Line.*

Packaging materials	***Mass, kg***	***Mass %*** *(versus the product)*	***Biogenic material*** *kg C/product or declared unit*
Wood	4.35×10^{-3} – 6.25×10^{-2}	0.44–6.25	8.65×10^{-3} – 2.45×10^{-2}
Paper	0.00–0.314	0.00–31.40	0 – 0.141
PP bucket	5.88×10^{-4}–9.52×10^{-3}	0.06–1.00	0
LDPE Film	3.33×10^{-4}–8.40×10^{-3}	0.03–0.884	0

1 kg biogenic carbon in the product/packaging is equivalent to the uptake of 44/12 kg of CO_2.

Table 17: *Content of hazardous substances used in the Waterproofing Line.*

Declaration of Hazardous substances	***EC No.***	***CAS No.***	***Mass %*** *per product or declared unit*
Quartz	238-878-4	14808-60-7	0.00 – 30.00
Acrylic Resin	N.D.	9063–87–0	0.00 – 63.50
Inorganic additives	227-808-3	68915-3-1	0,00 – 3.00
	231-545-4	7631-86-9	
	236-657-5	13463-67-7	
	Not relevant	93763-70-3	
	284–660–7	84961–70–6	
Organic additives	200-580-7	64-19-7	0,00 – 5.35
	215-647-6	1336-21-6	
	259-627-5	55406-53-6	
	251-835-4	34123-59-6	
	220-120-9	2634-33-5	
	212-950-5	886-50-0	
	Not relevant	55965-84-9	
	238-878-4	14808-60-7	
	203-680-9	109-55-7	
	247-979-2	26761-45-5	
Portland Cement	266–043–4	65997-15-1	0,00 – 40.00
	270-659-9	68475-76-3	
Epoxy Resin	500-033-5	25068-38-6	0,00 – 18.00
Aliphatic Diamine	268-945-3	68155-17-9	0,00 – 8.00

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 (bucket), 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 liquid product mix is defined as Declared Unit (DU).

Reference service life

The environmental impact of 1 kg of liquid 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 S.R.L. 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).

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 18***.

Table 18: *Reporting table for the Waterproofing 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	ND	ND	ND	ND	ND
Geography	GLO	GLO	IT	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Share of primary data	1.38 – 15.63%			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Variation products	83.71%			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. Only water has been included, as it is used in the cleaning operations of the mixing apparatus, form a production to the subsequent one (of another system). Also, energy flows have been included in the inventory related to energy consumption of production phase (A3).

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 sit×10-specific data for all production processes included in the LCA, and mapping the energy sources utilized (modelled via the Italian Residual Mix).[10] 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 of the raw materials in A1 is presented in ***Table 19***.

Table 19: *Data quality of the raw materials in A1*

Material	Source	Quality	Reference year
Quartz	Diasen	Ecoinvent 3.11	2025
Talcum Powder	Diasen	Ecoinvent 3.11	2025
Epoxy resin	Diasen	Ecoinvent 3.11	2025
Acrylic resins	Diasen	Ecoinvent 3.11	2025
PAN Fibers	Diasen	Ecoinvent 3.11	2025
Additives (Organic and Inorganic)	Diasen	Ecoinvent 3.11	2025
Portland Cement	Diasen	Ecoinvent 3.11	2025
Bituminous Emulsion	EPD Owner	Ecoinvent 3.11	2025
Aliphatic Diamine	Diasen	Ecoinvent 3.11	2025
Recycled Rubber	EPD Owner	Ecoinvent 3.11	2025
Packaging (Pallet, Bags, Film)	Diasen	Ecoinvent 3.11	2025

Data Quality Indicators (DQIs) are assessed based on five categories on a scale from 1 (excellent) to 5 (poor) (***Table 20***).

Table 20: *Data Quality Indicators (DQIs) for the Waterproofing 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	1.0	1.1	1.0	1.9	Excellent / Good

In compliance with the system boundaries defined for this product (*Cradle-to-Gate*), the index reflects the extremely high level of accuracy of the primary data collected directly at the manufacturing facility. The overall average score for the entire product line is **(1.4, 1.0, 1.2, 1.0, 1.9)**. The excellent methodological quality of the dataset is reflected in the ideal scores for completeness and geographical correlation (both equal to 1.0) and in the outstanding temporal

alignment (1.2). The only expected drop, which pushes the further technological correlation indicator to a value of 1.9, is entirely due to the high formulation complexity of the primers and coatings; these require the massive use of synthetic polymers, isocyanates, and specific emulsions, whose background modeling must necessarily rely on generic industrial literature datasets. 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. The related details have been summarized in ***Table 21***.

Table 21: *Details on the used Electricity mix*

	Data Source			GWP–GHG	Unit
Diasen Electricity Mix	Diasen photovoltaic	Residual Mix (AIB)	Ecoinvent 3.11	0.486	Kg CO_2 eq./kWh

Table 22: *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	1.38 – 15.63%
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					1.38 – 15.63%

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.

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" approach has been adopted, including stages A1–A3. 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 only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks." The characterisation factors considered are based on the assessment tool **methodology (EF) 3.1.** About the mandatory impact category indicators and, in particular, the Biogenic Carbon dioxide, the biogenic carbon leaving the product system in subsequent modules, not included into the life cycle, as A5 and C (according to the PCR guidelines), have been balanced out already in 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 23: *Mandatory impact category indicators according to EN 15804+A2:2019*

Results per functional or declared unit		
Indicator	**Unit**	**A1–A3**
GWP–total	kg CO_2 eq.	3.08
GWP–fossil	kg CO_2 eq.	2.94
GWP–biogenic	kg CO_2 eq.	4.46×10^{-5}
GWP–luluc	kg CO_2 eq.	0.14
ODP	kg CFC 11 eq.	5.81×10^{-5}
AP	mol H^+eq.	1.19×10^{-2}
EP–freshwater	kg P eq.	7.30×10^{-4}
EP–marine	kg N eq.	4.07×10^{-3}
EP–terrestrial	mol N eq.	2.65×10^{-2}
POCP	kg NMVOC eq.	1.08×10^{-2}
ADP–minerals &metals*	kg Sb eq.	1.49×10^{-5}
ADP–fossil*	MJ	52.80
WDP*	m^3	0.57
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 24: *Additional mandatory and voluntary impact category indicators*

Results per functional or declared unit		
Indicator	**Unit**	**A1–A3**
GWP–GHG	kg CO_2 eq.	2.76
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 – CH4 fossil, CH4 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 CO2 is set to zero.	

Table 25*: Resource use indicators*

Results per functional or declared unit		
Indicator	**Unit**	**A1–A3**
PERE	MJ	10.27
PERM	MJ	0.00
PERT	MJ	10.27
PENRE	MJ	50.41
PENRM	MJ	4.45
PENRT	MJ	55.02
SM	kg	0.00
RSF	MJ	0.00
NRSF	MJ	0.16
FW	m^3	0.55
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 r×10-sources; 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 26** : Waste indicators*

Results per functional or declared unit		
Indicator	**Unit**	**A1–A3**
HWD	kg	1.08×10^{-4}
NHWD	kg	1.92
RWD	kg	3.76×10^{-5}
Acronyms	HWD = Hazardous waste disposed; NHWD =Non azardous waste disposed; RWD = Radiactive waste disposed;	

***Table 27** : Output flow indicators*

Results per functional or declared unit		
Indicator	**Unit**	**A1–A3**
CRU	kg	0
MFR	kg	0
MER	kg	0
EEE	MJ	0
EET	MJ	0
Acronyms	CRU = Componentsfor r×10-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy;	

***Table 28:** Additional environmental performance indicators according to EN 15804+A2:2019*

Results per functional or declared unit		
Indicator	**Unit**	**A1–A3**
PM	Disease incidence	2.25×10^{-7}
IRP[1]	kBq U235 eq.	0.15
ETP–fw[2]	CTUe	75.20
HTP–c[2]	CTUh	2.74×10^{-9}
HTP–nc[2]	CTUh	1.23×10^{-7}
SQP	–	16.73
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;	

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 29:** Environmental Impacts Results Variation*

Indicator	A1–A3 Results variation (%)
GWP–total	79.23
GWP–fossil	97.07
GWP–biogenic	78.42

GWP–luluc	99.45
ODP	99.10
AP	79.30
EP–freshwater	76.77
EP– marine	86.55
EP–terrestrial	79.56
POCP	79.75
ADP–minerals & metals	81.19
ADP–fossil	79.13
WDP	69.92
PERE	85.58
PERM	-
PERT	84.07
PENRE	81.17
PENRM	99.99
PENRT	80.72
NRSF	99.70
FW	69.46
PM	88.28
IRP	73.08
ETP–fw	79.21
HTP–c	81.49
HTP–nc	96.40
SQP	52.57
HWD	81.41
NHWD	98.94
RWD	99.26

Table 30: *GWP–GHG Impacts Results Variation*

Indicator	Unit	A1–A3 Results variation (%)
GWP–GHG	Kg CO_2eq.	83.71

ADDITIONAL ENVIRONMENTAL INFORMATION

Recycled percentages

The product *Ultrabit* contains 100% post-consumer recycled materials (***Table 15***). Specifically, the formulation (mix design) is characterized by the inclusion of crumb rubber derived from the mechanical shredding of End-of-Life Tyres (ELTs). While this raw material consists of **100% recycled content**, it represents a weight fraction of approximately **16.40%** within the overall mix design, as summarized in ***Table 31***.

Table 31: *Information on recycled material content for the Waterproofing Line*

Product	Typo of recycled material	Recycled Content *(% Mass)*
Ultrabit	Post-consumer	16.40
Definition of recycled Material: material generated by households or commercial, industrial or institutional facilities acting as end-user of the product, which can't be used for its intended purpose. This includes returned material from the supply chain.		

REFERENCES

[1]. General Programme Instructions For The International Epd System – Version 5.0.1 2025–02–27;

[2]. Product Category Rules (PCR) – Construction Products PCR 2019:14 – Version 2.0.1;

[3]. ISO 14025:2010 – Environmental labels and declarations – Type III environmental declarations – Principles and procedures;

[4]. ISO 14040:2021 – Environmental Management – Life cycle assessment – Principles and framework;

[5]. ISO 14044:2021 – Environmental Management – Life cycle assessment – Requirements and guidelines;

[6]. ISO 15804:2021 – Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products;

[7]. ISO 15942:2021 – Sustainability of construction works — Environmental product declarations — Communication format business–to–business;

[8]. ISO 14020:2023 – Environmental labels and declarations — General principles;

[9]. Sito web: https://www.enel.it/content/dam/enel–it/documenti–supporto/mercatolibero–luce/Tabella%20Mix%20Energetico%20Enel%20Energia.pdf

[10]. L. Dalhgren, H. Stripple, "A comparative Study of Various Concept for Shopping Bags and Cements Sacks". Study commissioned by Billerud Korsnäs AB. IVL Swedish Environmental Research Institute 2016. Report Number: U5732;

[11]. Association of Issuing Bodies, "European Residual Mixes Results of the calculation of Residual Mixes for the calendar year 2023". Version 1.0, 2024–05–30;

[12]. P. Guo, W. Meng, J. Du, L. Stevenson, B. Han, Y. Bao, "Lightweight ultra–high–performance concrete (UHPC) with expanded glass aggregate: Development, characterization, and lif×10-cycle assessment". Construction and Building Materials 371 (2023);

[13]. E.Battiston, F.Carollo, G.Tameni, E. Bernardo, A.Mazzi, "Life Cycle Assessment of Industrial Glass Cullet Recycling Process Based on Alkaline Activation". Ceramics2025;8,09;

[14]. G. Manthos, D.Zagklis, C.Georgopoulos, C.Zafiri, M.Kornaros, "Life Cycle Assessment of Waste Glass Geopolymerization for the Production of Sustainable Construction Materials" Processes 2025, 13, 331;

[15]. CONAI, "Relazione Generale Consuntiva 2024". (2025);

[16]. ISPRA, "Rapporto Rifiuti Speciali" – Edizione 2025;

[17]. R.N. Pereira, I. Malico, P. Mesquita, A.M.O. Sousa, A.C Goncalves, "Energy use of cork residues in the Portuguese cork industry". Conference Paper · October 2017;

VERSION HISTORY

Original Version of the EPD, 2026-10-02