Environmental Product Declaration

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

AC Restoration Products

from

Programme:	The International EPD System, www.environdec.com
Programme operator:	EPD International AB
Type of EPD:	EPD of multiple products based on worst-case results
EPD registration number:	EPD-IES-0025470:003
Version date:	2025-10-08
Validity date:	2030-10-07

An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com

Family products

FERROSAN 1K KONCRETO 40 SPRITZ BETON (sack) SPRITZ BETON (bulk) SUPERGROUT COLABILE PSUPERGROUT COMPACT SUPERGROUT COMPACT FAST	SUPERGROUT FAST TIXOTROPICO R3 SUPERGROUT INIEZIONI SUPERGROUT RASATURA SUPERGROUT TIXOTROPICO R3 SUPERGROUT TIXOTROPICO R4 SUPERGROUT UNICO

GENERAL INFORMATION

Programme Information	
Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
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): 2019:14 Construction products (EN 15804+A2) 2.0.1
PCR review was conducted by: The Technical Committee of the International EPD System. See www.environdec.com for a list of members. **Review chair:** Rob Rouwette (chair), Noa Meron (co-chair). The review panel may be contacted via the Secretariat www.environdec.com/support.
c-PCR, if applicable: ***Not applicable***

Third-party Verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ **Individual EPD verification without a pre-verified LCA/EPD tool** Third-party verifier: *DNV Business Assurance Italy S.r.l.* Approved by: International EPD System Accredited by: Accredia ☐ **Individual EPD verification with a pre-verified LCA/EPD tool** ☐ **EPD process certification* without a pre-verified LCA/EPD tool** ☐ **EPD process certification* with a pre-verified LCA/EPD tool** ☐ **Fully pre-verified EPD tool** **EPD process certification involves an accredited certification body certifying and periodically auditing the EPD process and conducting external and independent verification of EPDs that are regularly published. More information can be found in the General Programme Instructions on www.envrondec.com.*
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

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.
For further information about comparability, see EN 15804 and ISO 14025.

INFORMATION ABOUT EPD OWNER

Owner of the EPD:
CVR S.p.a.

Address:
Via Garfagnana, 17 – Zona Industriale Padule 06024 Gubbio – Perugia – Italy

Contact:
Elena Calzuola - elena.calzuola@cvr.it

Address and contact information of the LCA practitioner commissioned by the EPD owner:
Ollum S.r.l. – Via Fratelli Lumiere 19, 52100 (AR)
Alessio Zapparoli - alessio.zapparoli@ollum.it
Luca Franceschin – luca.franceschin@ollum.it

Description of the organisation:
CVR S.p.A. is an Italian company with a long-standing industrial tradition, established in 1980. Headquartered in via Garfagnana 17, Zona Industriale Padule, 06024 Gubbio (Perugia), Italy, CVR specializes in the development and production of high-quality cement-based premixed materials for the professional construction sector. Over the decades, the company has built a solid reputation for technical excellence, reliability, and innovation in construction chemistry.
CVR's product offering includes adhesives, mortars, renders, plasters, waterproofing systems, structural reinforcements, underlays, and finishing materials. These are organized into distinct product families to meet the diverse needs of new construction, restoration, and renovation projects. The company serves a wide range of construction professionals, offering technical support and tailor-made solutions for site-specific applications.
Renowned for its expertise in formulation and materials science, CVR continues to evolve in line with modern construction demands, combining tradition with technological innovation. Its production site is highly automated and vertically integrated, ensuring consistency, efficiency, and full control over the manufacturing process.
With decades of industry experience, CVR S.p.A. stands as a trusted partner for building professionals, architects, and contractors in Italy and abroad.

Product-related or management system-related certifications:
ISO 9001:2015

PRODUCTS INFORMATION

Family description	
The AC Restoration Products family offers a complete range of high-performance mortars, coatings, and protective systems specifically designed for the structural repair, protection, and restoration of reinforced concrete structures. These products combine advanced cementitious formulations, special hydraulic binders, pozzolanic additives, and polymer modifiers to ensure maximum durability, dimensional stability, and long-term compatibility with existing concrete. The line includes anti-corrosive primers for steel reinforcement, thixotropic structural mortars, castable and injectable grouts, shotcrete solutions, and protective finishing layers. All products are engineered to provide high mechanical strength, crack resistance, low shrinkage, and excellent adhesion even in demanding environments exposed to chlorides, sulfates, carbonation, and aggressive agents. Thanks to their structural reinforcement capacity, controlled reactivity, and long-lasting protective action, AC Restoration Products are ideal for infrastructure repair, building rehabilitation, tunnel and bridge maintenance, and precision consolidation works, guaranteeing both safety and durability of reinforced concrete elements.	
FERROSAN 1K – Anti-corrosive, passivating treatment for protecting steel reinforcement in reinforced concrete.	
KONCRETO 40 – Thixotropic structural fiber-reinforced mortar with semi-rapid setting, high strength, and low modulus of elasticity.	
SPRITZ BETON (sack/bulk) – Fiber-reinforced reoplastic mortar for shotcrete applications in tunnels, vaults, and structural consolidations.	
SUPERGROUT COLABILE – Castable fiber-reinforced grout with high mechanical strength for anchoring, injections, and precision repairs.	

SUPERGROUT COMPACT – Fine-grained thixotropic grout, fiber-reinforced, for structural repair with excellent workability.	
SUPERGROUT COMPACT FAST – Fine-grained thixotropic grout with rapid setting, designed for fast structural repair.	
SUPERGROUT Fast Thixotropic R3 – Rapid-setting, R3-class thixotropic fiber-reinforced mortar for precision structural repairs and centimeter-thick restoration.	
SUPERGROUT INIEZIONI – High-performance injectable grout for anchoring, precision joints, and structural consolidation.	
SUPERGROUT RASATURA – Fine-grained, thixotropic, fiber-reinforced surface finishing mortar for concrete protection.	
SUPERGROUT Thixotropic R3 – R3-class thixotropic fiber-reinforced mortar for localized structural repair and static consolidation of reinforced concrete elements.	

SUPERGROUT R4 – High-strength fiber-reinforced repair mortar with superior adhesion and long-term durability.	
SUPERGROUT UNICO - Rapid-setting, polymer-modified thixotropic fiber-reinforced mortar designed for both restoration and finishing of reinforced concrete structural elements.	

Process description:
The process for all the products within the family includes the drying of calcium carbonate followed by its blending with cement, lime, sand, and selected additives to obtain a homogeneous adhesive compound with consistent performance.

UN CPC code:
All products in this family are classified under CPC 37510: Non-refractory mortars and concretes.

Name and location of production site:
All products in this family are manufactured at the CVR S.p.A. plant, located at Via Garfagnana 17, Zona Industriale Padule, 06024 Gubbio (Perugia), Italy.
For more informations about CVR s.p.a. and product please visit https://cvr-italy.com/

Technical standards of the products within the family:

	Technical standards				
Product	**EN 998-2**	**EN 1504-2**	**EN 1504-3**	**EN 1504-6**	**EN 1504-7**
FERROSAN 1K					X
KONCRETO 40		X	X	X	X
SPRITZ BETON			X		
SUPERGROUT COLABILE			X	X	
SUPERGROUT COMPACT			X		
SUPERGROUT COMPACT FAST			X		
SUPERGROUT FAST TIXOTROPICO R3			X		
SUPERGROUT INIEZIONI	X		X	X	
SUPERGROUT RASATURA		X	X		
SUPERGROUT TIXOTROPICO R3			X		
SUPERGRUOT TIXOTROPICO R4			X		
SUPERGROUT UNICO			X		

CONTENT DECLARATION

The mass (weight) of one unit of a product, as purchased or per declared unit:
1 kg of product

Content declaration of multiple products:
The content declaration has been based on the raw material composition of the *worst-case product*, which was defined by combining the highest impacts recorded across all environmental indicators for modules A1-C4). In this case, the worst-case results were not associated with a single product but derived from two different products within the family: **FERROSAN 1K and SUPERGROUT UNICO.** The values reported in the column "Mass, kg" therefore reflect the raw material composition of this worst-case product, while the "Range, kg" column shows the minimum and maximum contributions calculated across all products in the family. With regard to packaging, the worst-case scenario is represented by the **bulk variant** in the family, which involves the lowest biogenic content.

Product content	Mass, kg	Range, kg	Post-consumer recycled material, mass-% of product	Biogenic material, mass-% of product	Biogenic material, kg C/product or declared unit
Cement	0,37 – 0,56	0,33 – 0,56	0,00	0,00	0,00
Lime	0,00 – 0,01	0,00 – 0,01	0,00	0,00	0,00
Calcium carbonate	0,00 – 0,20	0,00 – 0,56	0,00	0,00	0,00
Sand	0,28 – 0,37	0,04 – 0,43	0,00	0,00	0,00
Additives	0,07 – 0,15	0,05 – 0,15	0,00	0,00	0,00
TOTAL	-	-	0,00	0,00	0,00

Packaging materials	Mass, kg	Mass-% (versus the product)	Biogenic material, kg C/product or declared unit
Paper sack	0,00	0,00	0,00
Wooden pallet	0,00	0,00	0,00
LDPE film	0,00	0,00	0,00
TOTAL	0,00	0,00	0,00

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

Information on the environmental and hazardous/toxic properties of a substances contained in the product:
The products of this family do not contain any substances listed in the Candidate List of Substances of Very High Concern (SVHC) in concentrations exceeding 0.1% by weight.

LCA INFORMATION

Declared unit:	1 kg of product
Reference service life:	Not applicable
Time representativeness:	The LCA calculation and the data used in this EPD are representative of the year 2024.
Geographical scope:	Europe
Database and LCA software used:	Ecoinvent 3.10 database and SimaPro 9.6
Version of the EN 15804 reference package	EF Reference Package 3.1
Characterisation methods	Core environmental impact indicators: • Global warming potential - total – EN 15804 + A2 (adapted) , version 1.01, version 1.01 • Global warming potential - fossil fuels – EN 15804 + A2 (adapted) , version 1.01 • Global warming potential - biogenic – EN 15804 + A2 (adapted) , version 1.01 • Global warming potential - land use and land use change – EN 15804 + A2 (adapted) , version 1.01 • Depletion potential of the stratospheric ozone layer – EN 15804 + A2 (adapted) , version 1.01 • Acidification potential, accumulated exceedance – EN 15804 + A2 (adapted) , version 1.01 • Eutrophication potential - freshwater – EN 15804 + A2 (adapted) , version 1.01 • Eutrophication potential - marine – EN 15804 + A2 (adapted) , version 1.01 • Eutrophication potential - terrestrial – EN 15804 + A2 (adapted) , version 1.01 • Photochemical ozone creation potential – EN 15804 + A2 (adapted) , version 1.01 • Abiotic depletion potential - non-fossil resources – EN 15804 + A2 (adapted) , version 1.01 • Abiotic depletion potential - fossil resources – EN 15804 + A2 (adapted) , version 1.01 • Water (user) deprivation potential – EN 15804 + A2 (adapted) , version 1.01 Additional mandatory environmental impact indicators • Global warming potential (GWP-GHG) – IPCC 2021 GWP100, VERSION 1.03, version 1.03 Additional voluntary environmental impact indicators • Particulate matter emissions – EN 15804 + A2 (adapted) , version 1.01 • Ionizing radiation, human health – EN 15804 + A2 (adapted) , version 1.01 • Eco-toxicity - freshwater – EN 15804 + A2 (adapted) , version 1.01 • Human toxicity, cancer effect – EN 15804 + A2 (adapted) , version 1.01 • Human toxicity, non-cancer effects – EN 15804 + A2 (adapted) , version 1.01 • Land use related impacts/Soil quality – EN 15804 + A2 (adapted) , version 1.01 Indicators describing resource use • Use of renewable primary energy as energy carrier – Manually calculated as PERT-PERM • Use of renewable primary energy resources used as raw materials – The calorific value recommended by Ecoinvent is adopted • Total use of renewable primary energy – Cumulative Energy Demand (LHV) • Use of non-renewable primary energy as energy carrier – Manually calculated as PENRT-PERNM • Use of non-renewable primary energy resources used as raw materials – The calorific value recommended by Ecoinvent is adopted

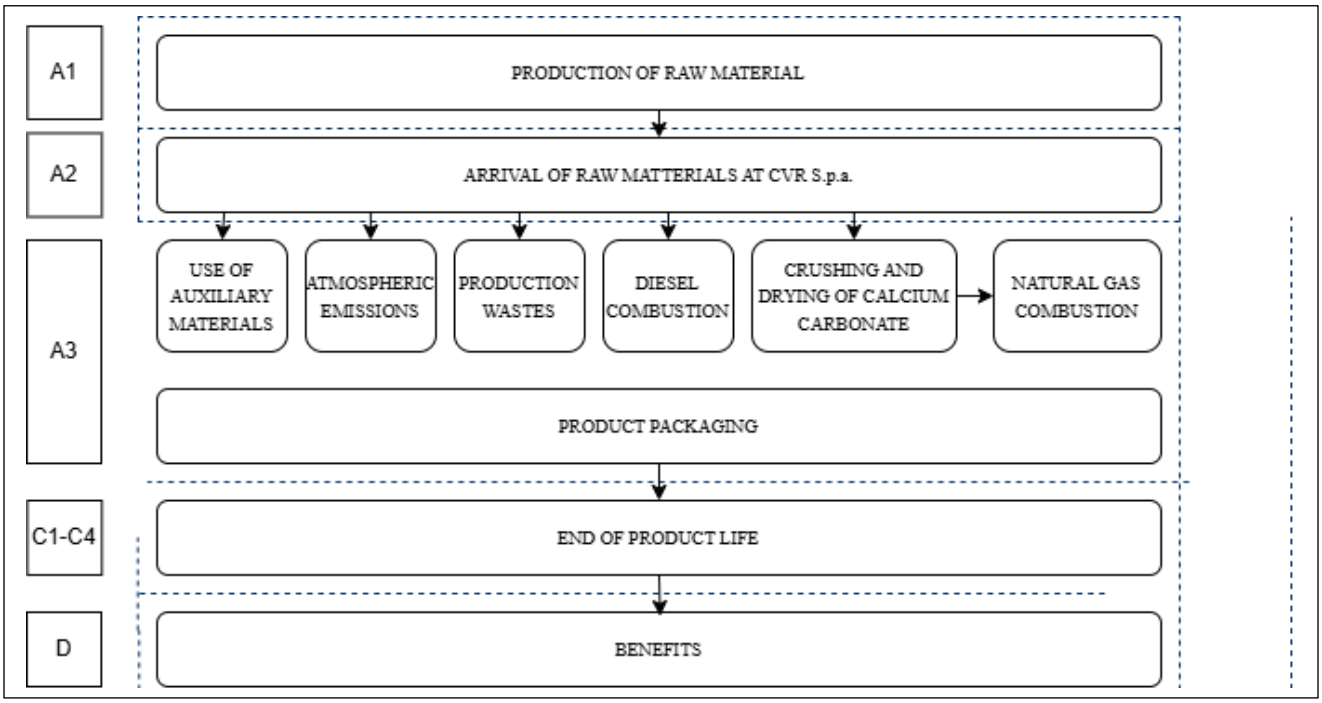
	• Total use of non-renewable primary energy resource – Cumulative Energy Demand (LHV) • Use of secondary material – Calculated by hand based on the input/output data to the system • Use of renewable secondary fuels – Calculated by hand based on the input/output data to the system • Use of non-renewable secondary fuels – Calculated by hand based on the input/output data to the system • Net use of fresh water – Selected LCI results method is used Environmental information describing waste categories • Hazardous waste disposed – EDIP 2003 • Non-hazardous waste disposed – EDIP 2003 • Radioactive waste disposed – EDIP 2003 Environmental information describing output flows • Components for re-use – Calculated by hand based on the input/output data to the system • Materials for recycling – Calculated by hand based on the input/output data to the system • Materials for energy recovery – Calculated by hand based on the input/output data to the system • Exported electrical energy – Calculated by hand based on the input/output data to the system • Exported thermal energy – Calculated by hand based on the input/output data to the system EN 15804 + A2 (adapted) , version 1.01: This method represents one of the main European standards for assessing the environmental performance of construction products. Its adapted version includes the modifications introduced by Addendum A2 and focuses on the quantification of core and additional environmental impacts as presented in the table. Cumulative Energy Demand (LHV): This method allows the calculation of the cumulative energy demand associated with all life cycle stages, using the lower heating value (LHV) to quantify the consumption of primary energy from renewable and non-renewable sources. Selected LCI results (additional): In addition to the methods mentioned above, selected life cycle inventory (LCI) results were calculated to assess the water consumption indicator. For the calculation of the GWP-GHG indicator, the IPCC 2021 GWP100, version 1.03 was used. For the calculation of the PERE, PERM, PENRE and PENRM indicators, the guidance provided by the SimaPro Help Center was followed: https://support.simapro.com/s/article/How-to-calculate-EN-15804-A2-indicators-in-desktop-SimaPro%20 and Annex 3: Guidance for calculating primary energy consumption indicators of the applied PCR. For the calculation of the remaining indicators such as SM, RSF, NRSF, CRU, MFR, MER, EEE, and EET, specific characterization factors were created for each indicator following the guidance: https://support.simapro.com/s/article/How-to-calculate-EN-15804-A2-indicators-in-desktop-SimaPro%20

Description of system boundaries:

a) Cradle to gate with modules C1–C4 and module D (A1–A3 + C + D);

Process flow diagram:

A1 – Raw Materials and Energy Carriers: Includes the extraction, processing, and production of raw materials, as well as upstream energy carriers such as electricity and natural gas used for drying calcium carbonate.
A2 – Transport to Manufacturer: Covers the transport of raw materials and packaging components from suppliers to the CVR S.p.A. production site.
A3 – Manufacturing: Involves all on-site operations, including the use of auxiliary materials (e.g. lubricants), combustion of diesel and natural gas, emissions to air, generation of production waste, and packaging of the final product.
C1–C4 – End-of-Life: Encompasses product dismantling/demolition (C1), transport to treatment or landfill (C2), treatment for recycling (C3), and final disposal (C4). Default PCR values were applied.
D – Benefits Beyond the System Boundary: Accounts for environmental credits due to material recovery at end-of-life, assuming substitution of natural sand with recycled aggregates.



Data quality assessment

Description of data quality assessment and reference years*:*

This EPD covers products manufactured by CVR S.p.A. at its production site in Gubbio (Perugia, Italy). The facility, operating since 1958, provided comprehensive primary data for the reference year 2024. The production process includes the drying of calcium carbonate, milling and mixing of raw materials, and packaging for finished products where required.

The life cycle inventory is based on high-quality datasets representative of the processes with the greatest contribution to environmental impacts, specifically "*Cement, Portland {Europe without Switzerland} | cement production", "Esters of versatic acid {RER} | esters of versatic acid production", and "Vinyl acetate {RER} | vinyl acetate production"*. Background data were sourced from the Ecoinvent 3.10 database to ensure consistency, transparency, and methodological robustness. Upstream and downstream processes, such as raw material transport and end-of-life management, were modelled using representative European datasets.

The data quality assessment was conducted in accordance with *EN 15804:2012+A2:2019, Annex E (E.2)*. The quality of the relevant data used for this EPD, in terms of temporal, geographical, and technological representativeness, is assessed as mostly very good.

Process	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1-A3[1]
A1 - Manufacturing of raw materials	Collected data, database	EPD owner, Ecoinvent v3.10	2024	Primary data, secondary data	4,01%
A1 - Energy carriers (electricity, natural gas and diesel)	Collected data, database	Ecoinvent v3.10	2024	Primary data	0,03%
A2 - Transport of Raw materials	Collected data, database	Ecoinvent v3.10	2024	Primary data	5,24%
A3 - Manufacturing of product (diesel and natural gas combustion, atmospheric emissions and production waste management)	Collected data, database	Ecoinvent v3.10	2024	Primary data	0,004%
Other processes	Collected data, database	Ecoinvent v3.10	2024	Secondary data	0,00%
Total share of primary data, of GWP-GHG results for A1-A3					**9,28%**

Method used to calculate residual electricity mix:

In 2024, CVR S.p.A. covered its electricity demand through three different supply channels:

- 91.7% purchased from the medium-voltage grid
- 0.4% purchased from the low-voltage grid
- 7.9% self-produced by the company's photovoltaic plant

For the electricity purchased from the grid, CVR adopted a supply system based on Guarantees of Origin (GO), certifying that 100% of the purchased energy comes from renewable wind sources.

In the LCA modelling phase, the standard Ecoinvent processes for grid electricity were replaced with processes representative of wind-sourced electricity, consistent with the characteristics certified by the

[1] *The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that supports the use of more primary data, to increase the representativeness of and comparability between EPDs. Note that the indicator does not capture all relevant aspects of data quality and is not comparable across product categories.*

supplier through GOs. Conversely, the share of electricity self-produced through the photovoltaic plant is not subject to Guarantees of Origin, since it is generated directly on-site. Consequently, in the LCA model, the specific environmental profile of on-site photovoltaic electricity, already available in the Ecoinvent database, was applied.

Electricity used in the manufacturing process in A3		
Type of electricity mix	Specific electricity mix as generated, or purchased from an electricity supplier, demonstrated by a contractual instrument	
Energy sources	Hydro	0,0%
	Wind	92,1%
	Solar	7,9%
	Biomass	0,0%
	Geothermal	0,0%
	Waste	0,0%
	Nuclear	0,0%
	Natural gas	0,0%
	Coal	0,0%
	Oil	0,0%
	Peat	0,0%
	Other	0,0%
Climate impact (GWP-GHG)	0.03 kg CO_2 eq./kWh	

SCENARIOS

Module A1-A3 – Manufacturing stage

Name of the default scenario	Manufacturing stage
Description of the default scenario	A1 covers raw material extraction and energy carriers. Natural gas for drying calcium carbonate (99% of site gas use) and electricity from the Italian residual mix are included. A2 includes transport from manufacturer to supplier and then to CVR (Gubbio), with real distances and tkm calculated per kg of product. A3 includes on-site production: combustion of natural gas and diesel, use of auxiliary oils, measured air emissions, and waste generation and transport. Waste treatment follows Eurostat data

Module C1-C4 – End of life Stage

Name of the default scenario	End of life stage
Description of the default scenario	End-of-life is modelled in accordance with the default assumptions provided in PCR 2019:14, Paragraph 4.8.4. The model covers demolition, transport, treatment, and final disposal. Fuel consumption is based on ISPRA and DEFRA data, while recovery and disposal rates reflect EU-27 Eurostat statistics for construction and demolition mineral waste (90.38% recovery). Considering that the recovery scenario represents the most plausible end-of-life option, and in accordance with the PCR provisions requiring the use of a single representative scenario, a 100% recycling scenario has been adopted as the reference. Combustion and fuel supply processes are modelled separately.

Module D – Beyond product life cycle stage

Name of the default scenario	Beyond product life cycle stage
Description of the default scenario	In line with the end-of-life scenario described, the model accounts for the avoided environmental impacts associated with the material recovery of products. A 100% recycling rate is assumed. The recovered material is considered to substitute natural sand used in the construction sector.

	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	X	X
Geography	Europe	Europe	Europe	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Europe	Europe	Europe	Europe	Europe
Share of primary data	9,28%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	58,0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0,0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

ENVIRONMENTAL PERFORMANCE

Environmental performance based on worst case results. For each indicator and module A-C, it is declared the highest result of the included products, and for module D, it is declared the lowest benefit of avoided processes and the highest load of included processes. This option corresponds to the results of a "worst-case product", which consist of results from one or several of the included products.

Mandatory impact category indicators according to EN 15804

Results per functional or declared unit							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO_2 eq.	8,74E-01	3,67E-03	4,07E-05	1,93E-03	5,65E-05	-1,17E-02
GWP-fossil	kg CO_2 eq.	9,05E-01	3,67E-03	4,07E-05	1,90E-03	5,64E-05	-1,17E-02
GWP-biogenic	kg CO_2 eq.	8,37E-03	1,06E-06	2,79E-08	4,66E-02	1,62E-08	-4,73E-06
GWP-luluc	kg CO_2 eq.	4,24E-04	3,09E-07	1,33E-08	2,10E-06	4,75E-09	-6,04E-06
ODP	kg CFC 11 eq.	7,25E-06	7,02E-11	8,08E-13	3,53E-11	1,08E-12	-1,56E-10
AP	mol H^+ eq.	2,88E-03	3,24E-05	1,27E-07	1,44E-05	4,98E-07	-7,88E-05
EP-freshwater	kg P eq.	1,63E-04	1,10E-07	2,71E-09	6,12E-07	1,69E-09	-1,60E-06
EP-marine	kg N eq.	7,05E-04	1,51E-05	4,29E-08	5,75E-06	2,32E-07	-2,72E-05
EP-terrestrial	mol N eq.	7,09E-03	1,65E-04	4,66E-07	6,16E-05	2,54E-06	-2,99E-04
POCP	kg NMVOC eq.	2,72E-03	5,02E-05	1,99E-07	1,89E-05	7,72E-07	-9,48E-05
ADP-minerals&metals*	kg Sb eq.	3,25E-06	1,28E-09	1,30E-10	1,85E-09	1,97E-11	-4,65E-08
ADP-fossil*	MJ	1,01E+01	4,74E-02	5,71E-04	3,15E-02	7,28E-04	-1,56E-01
WDP*	m^3	2,30E-01	8,98E-05	2,34E-06	2,03E-04	1,38E-06	-4,14E-02
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						

** Disclaimer: 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 experienced with the indicator.*

** Disclaimer: 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.*
** Disclaimer: The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3).*

Additional mandatory and voluntary impact category indicators

Results per functional or declared unit							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[2]	kg CO_2 eq.	9,04E-01	3,67E-03	4,07E-05	1,91E-03	5,64E-05	-1,17E-02
Particulate matter emissions (PM)	Disease incidence	3,41E-08	9,25E-10	3,19E-12	3,29E-10	1,42E-11	-1,42E-09
Ionizing radiation, human health (IRP)[3]	kBq U235 eq.	5,29E-02	3,03E-05	7,32E-07	4,36E-04	4,66E-07	-3,34E-04
Eco-toxicity - freshwater (ETP-fw)[4]	CTUe	3,89E+00	6,16E-03	1,53E-04	4,07E-03	9,48E-05	-4,58E-02
Human toxicity, cancer effect (HTP-c)[3]	CTUh	2,37E-09	1,43E-11	2,84E-13	6,21E-12	2,20E-13	-7,36E-11
Human toxicity, non-cancer effects (HTP-nc)[3]	CTUh	9,79E-09	6,02E-12	3,56E-13	6,99E-12	9,25E-14	-8,93E-11
Land use related impacts/Soil quality (SQP)[3]	dimensionless	6,62E+00	3,20E-03	3,40E-04	3,69E-03	4,92E-05	-7,54E-01

Resource use indicators[5]

Results per functional or declared unit							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	1,04E+00	3,54E-04	9,38E-06	3,60E-03	5,44E-06	-4,55E-03
PERM	MJ	5,78E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,35E+00	3,54E-04	9,38E-06	3,60E-03	5,44E-06	-4,55E-03
PENRE	MJ	8,17E+00	4,74E-02	5,71E-04	3,15E-02	7,28E-04	-1,56E-01

[2] This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero.
[3] This impact category mainly addresses the potential effects of low-dose ionizing radiation on human health related to the nuclear fuel cycle. It does not account for potential impacts from nuclear accidents, occupational exposure, or radioactive waste disposal in underground facilities. Potential ionizing radiation from soil, radon, or certain construction materials is also not included in this indicator.
[4] The results of this environmental impact indicator should be interpreted with caution, as the uncertainties are high and there is limited experience with its application.
[5] With reference to PCR 2019:14 "Construction products" (International EPD® System), v2.0.1 – Annex 3: Guidance to calculating the primary energy use indicators, the quantification of the indicator energy used as raw material has been carried out according to Approach A.

PENRM	MJ	1,97E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	1,01E+01	4,74E-02	5,71E-04	3,15E-02	7,28E-04	-1,56E-01
SM	kg	5,49E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	1,49E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	2,45E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	2,22E-01	9,09E-05	2,34E-06	2,01E-04	1,40E-06	-4,14E-02
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 re-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						

Waste indicators

Results per functional or declared unit							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	2,74E-04	4,34E-07	1,41E-08	6,29E-07	6,67E-09	-7,78E-06
Non-hazardous waste disposed	kg	6,10E-02	2,91E-05	2,71E-05	4,11E-05	4,46E-07	-5,12E-03
Radioactive waste disposed	kg	1,80E-05	7,53E-09	1,82E-10	1,12E-07	1,16E-10	-8,20E-08

Output flow indicators

Results per functional or declared unit							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	7,56E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recovery	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, thermal	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

ABBREVIATIONS

Abbreviation	Definition
General Abbreviations	
EN	European Norm (Standard)
EF	Environmental Footprint
GPI	General Programme Instructions
ISO	International Organization for Standardization
CEN	European Committee for Standardization
CLC	Co-location centre
CPC	Central product classification
GHS	Globally harmonized system of classification and labelling of chemicals
GRI	Global Reporting Initiative
SVHC	Substances of Very High Concern
ND	Not Declared

REFERENCES

a) **UNI EN ISO 14040:2021**, Environmental management – Life cycle assessment – Principles and framework
b) **UNI EN ISO 14044:2021**, Environmental management – Life cycle assessment – Requirements and guidelines
c) **UNI EN ISO 14025:2010**, Environmental labels and declarations – Type III environmental declarations – Principles and procedures
d) **EN 15804:2021**, Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products
e) **PCR 2019:14 "Construction products" (International EPD® System), v2.0.1**
f) **General Programme Instructions for The International EPD® System, GPI v5.0.1.**
g) **Special Waste Report, 2023 Edition, ISPRA** – https://www.isprambiente.gov.it/it/pubblicazioni/rapporti/rapporto-rifiuti-speciali-edizione-2023
h) **SimaPro Support** – *How to calculate EN 15804-A2 indicators in desktop SimaPro*. Available at: https://support.simapro.com/s/article/How-to-calculate-EN-15804-A2-indicators-in-desktop-SimaPro
i) **LCA study version v01** – source of the data reported in this EPD.

VERSION HISTORY

Initial Version of the EPD, 2025-09-09
Third Version of the EPD, 2026-06-12

- Changes: the EPD registration number has been updated to 003, and the field 'Procedure for follow-up of data during EPD validity involves third-party verifier' has been changed from 'Yes' to 'No'. No other changes were made.

EPD
INTERNATIONAL EPD SYSTEM
www.environdec.com