Environmental Product Declaration

Grouts

PRODUCTS

DEKOGROUT WHITE 5 KG	COLORBASE FS 23 ANTIQUE WHITE
DEKOGROUT MANHATTAN 5 KG	COLOURBASE FS 04 ARTIC BLUE
DEKOGROUT CEMENT GREY 7030	COLORBASE FS 59 ESPRESSO
DEKOGROUT OFF WHITE 5 KG	COLORBASE FS 45 RAVEN
DEKOGROUT CREMA MARFIL 9001	COLORBASE FS 24 NATURAL GREY
DEKOGROUT TRAVERTINO 5 KG	COLOURBASE FS 60 DUSTY GREY
DEKOGROUT CAMEL 1001 5 KG	COLOURBASE FS 22 MIDNIGHT BLACK
DEKOGROUT BEIGE 1013 5 KG	COLORBASE FS 61 PARCHMENT
DEKOGROUT NERO 9004 5 KG	COLORBASE FS 66 CHESTNUT BROWN
DEKOGROUT ANTRACITE 7037 5 KG	COLORBASE FS 81 BUTTER CREAM
DEKOGROUT TESTA DI MORO 8017	COLOURBASE FS 85 ALMOND
DEKOGROUT MARRONE 8011 5 KG	COLOURBASE FS 88 SILVER SHADOW
DEKOGROUT TOBACCO 8007 5 KG	COLOURBASE FS 89 SMOKE GREY
DEKOGROUT TORTORA	COLOURBASE FS 78 STERL SILVER
DEKOGROUT GREY 7042 5 KG	COLORBASE FL 23 ANTIQUE WHITE
DEKOGROUT LIGHT GREY 7035	COLORBASE FL 24 NATURAL GREY
DECO GROUT GIALLO 1012 5 KG	COLORBASE FL 44 BRIGHT WHITE
DECO GROUT GREEN 6019 5 KG	COLORBASE FL 45 RAVEN
DEKOGROUT GREEN SMERALDO 6024	COLORBASE FL 60 Dusty Grey
DEKOGROUT CROCUS 5 KG	COLOURBASE FL 81 BUTTER CREAM
DEKOGROUT AZZURRO 5012 5 KG	COLOURBASE FL 89 SMOKE GREY
DEKOGROUT BLUE 5013 5 KG	COLOURBASE FL 24 NATGREY 23 KG
DEKOGROUT PINK 3014 5 KG	COLORBASE FL 24 NATGREY 25 KG
DEKOGROUT ROSSO MARANELLO 3003	COLORBASE FL 78 STERLING SILVER
DECO GROUT CARAMELLO 5 KG	COLORBASE FL 78 PCS. SILVER 23 KG
DECORATIVE GROUT NOCCIOLA 5 KG	COLORBASE FL 78 ST. SILVER 25 KG
COLOURBASE FS 44 BRIGHT WHITE	PERMACOLOR SELECT
COLORBASE FS 03 SILK	PERMACOLOR SELECT FINE

Castelnuovo
Rangone (MO) **plant**

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

Programme Operator: EPD Italy

Publisher: EPD Italy

Declaration number:
EPDSIGILLANTI_2023_rev 1.0

Registration number: EPDITALY1148

Date of issue: 16/12/2025

Valid until: 16/12/2030

General information

EPD owner	
Company name	Laticrete Europe s.r.l.
Registered office	Via Paletti, snc – 41051 Castelnuovo Rangone (MO)
Contact for information on the EPD	cgirotti@laticreteeurope.com
Programme Operator	
EPD ITALY	Via Gaetano de Castillia n°10 – 20124 Milan, Italy
Information on the EPD	
Product names	Grouts[1]
Sites	Via Paletti, snc – 41051 Castelnuovo Rangone (MO)
Brief description and technical information about the products	Ready-to-use dry mixes consisting of cement, calcium carbonate, additives and, in some cases, hydraulic binders or polymers, dosed in precise proportions.
Field of application of the products	Building materials for the construction and industrial sectors, for sealing ceramic tiles for indoor and outdoor installation on walls and floors
Product reference standards (if applicable)	EN 13888
CPC Code	375 (Articles of concrete, cement and plaster)
Type of EPD	Product media EPD
Verification information	
PCR (title, version, date of publication or update)	PCR ICMQ-001/15 rev3.2 (compliant with EN 15804+A2) dated 03/11/2025
EPD Italy Regulation (version, date of publication or update)	EPD Italy programme regulation rev 7.1 dated 05/09/2025
Project report LCA	Life Cycle Assessment study aimed at obtaining EPD - Adhesives, mortars, screeds and grouts by LaticreteEurope Rev0.5. 05/12/2025
Technical support	Spin Life s.r.l – Spin-off of the University of Padua Via C. Cerato 14 – 35122 Padua mauro.fiorenzato@spinlife.it, anna.tinello@spinlife.it Tecno ESG SB Riviera di Chiaia, 270 – 80121 Naples m.travaglioni@tecno-group.eu
Independent verification statement	Independent verification of the statement and data carried out in accordance with ISO 14025:2010. ☐Internal ☒External Third-party verification/validation carried out by: ICMQ S.p.A., via Gaetano de Castillia n°10 – 20124 Milan, Italy. Accredited by Accredia
Comparability statement	Environmental declarations published within the same product category but originating from different programmes may not be comparable.

[1] The list of product codes included in this EPD is provided in the "Products" section of this declaration.

	In particular, EPDs for construction products may not be comparable if they do not comply with EN 15804:2012+A2:2019.
Statement of responsibility	The EPD Owner releases EPD Italy from any non-compliance with environmental legislation. The owner of the declaration shall be responsible for the information and supporting evidence. EPD Italy declines all responsibility for the information, data and results provided by the EPD Owner for the life cycle assessment.

Company

The Castelnuovo Rangone plant sells various products and systems in Europe for new buildings or buildings undergoing renovation. The product range includes self-levelling screeds, waterproofing products, adhesives and systems for laying technical porcelain stoneware and natural stone, continuous flooring systems, concrete repair systems and building restoration systems.
The plant was originally owned by Benfer srl, but in 2019 it became part of the Laticrete family, an American company that operates worldwide in the development of high-performance building materials and systems.

Objective and purpose of the EPD

Objective and purpose of the EPD	
Objective	Assessment of potential environmental impacts
Declared unit	1 tonne
Reference service life	The useful life (RSL) for the products under study, being intermediate products for construction, depends on the specific installation situation and the exposure associated with the product. product. It can be influenced by atmospheric agents and mechanical or chemical loads.
Reference period	01/01/2023-31/12/2023
System boundaries	*"from cradle to gate with options, modules A4-A5, modules C1-C4 and module D"*
Information on the LCA study	
Type of EPD	EPD product media
Number of products included in the EPD	56
Reference year for data	2023
Geographical validity of data	Global
Data quality	Quality level: 'very good'
Energy mix used	% IT *Electricity, medium voltage {IT}| electricity, medium voltage, residual mix | Cut-off*, U. *Climate change – total* = 0.641 kgCO2e/kWh
Software used	SimaPro Craft v 10.2 PhD
Database	Ecoinvent v 3.10, Cut-off by classification
Characterisation factors	Method EN 15804 (EF 3.1)

Products

Product description

Grouts are materials formulated to fill, seal or waterproof joints, cracks and connections between different surfaces or materials, preventing the passage of air, water, dust, gas or other substances. They are made of cement, calcium carbonate, additives and, in some cases, hydraulic binders or polymers, dosed in precise proportions.

The products are sold in various packaging configurations. In general, grouts are packaged in PE bags that are placed inside boxes and arranged on pallets for distribution.

Description of the production process

Laticrete Europe Srl formulates, manufactures and packages adhesives and grouts for tiles for the construction industry. These finished products are made using ready-to-use raw materials, which, after being mixed according to the specified formulations, produce solid powder products that are automatically packaged in various types of packaging. The finished products can be used after adequate mixing with water. In the reference year of this study, the company produced 1,204,987 kg of grouts.

Definition of the range of variability

This EPD refers to an average product. The grouts are manufactured using the same production process and are identical in terms of their absolute composition. Variations between products are associated with the use of different additives (which give them a specific color), differences in the percentage composition of the raw materials and the packaging configuration of the finished product.

Therefore, in order to identify variability in relation to the declared unit, with the same production process, the composition of the products and the configuration of the packaging were considered as variables.

Product codes included in the EPD declaration

The list of products included in this EPD declaration is provided below.

- DEKOGROUT WHITE 5 KG
- DEKOGROUT MANHATTAN 5 KG
- DEKOGROUT CEMENT GREY 7030
- DEKOGROUT OFF WHITE 5 KG
- DEKOGROUT CREMA MARFIL 9001
- DEKOGROUT TRAVERTINO 5 KG
- DECO GROUT CAMEL 1001 5 KG
- DEKOGROUT BEIGE 1013 5 KG
- DEKOGROUT NERO 9004 5 KG
- DEKOGROUT ANTHRACITE 7037 5 KG
- DEKOGROUT TESTA DI MORO 8017
- DEKOGROUT MARRONE 8011 5 KG
- DEKOGROUT TABACCO 8007 5 KG
- DEKOGROUT TORTORA
- DEKOGROUT GREY 7042 5 KG
- DEKOGROUT LIGHT GREY 7035
- DEKOGROUT YELLOW 1012 5 KG
- DEKOGROUT GREEN 6019 5 KG
- DEKOGROUT GREEN EMERALD 6024
- DEKOGROUT CROCUS 5 KG
- DEKOGROUT AZZURRO 5012 5 KG
- DEKOGROUT BLUE 5013 5 KG
- DEKOGROUT PINK 3014 5 KG
- DEKOGROUT ROSSO MARANELLO 3003
- DEKOGROUT CARAMELLO 5 KG
- DEKOGROUT HAZELNUT 5 KG
- COLORBASE FS 44 BRIGHT WHITE
- COLOURBASE FS 03 SILK
- COLOURBASE FS 23 ANTIQUE WHITE
- COLOURBASE FS 04 ARTIC BLUE
- COLOURBASE FS 59 ESPRESSO
- COLORBASE FS 45 RAVEN
- COLORBASE FS 24 NATURAL GREY
- COLORBASE FS 60 DUSTY GREY
- COLORBASE FS 22 MIDNIGHT BLACK
- COLORBASE FS 61 PARCHMENT
- COLORBASE FS 66 CHESTNUT BROWN
- COLORBASE FS 81 BUTTER CREAM
- COLORBASE FS 85 ALMOND
- COLORBASE FS 88 SILVER SHADOW
- COLORBASE FS 89 SMOKE GREY
- COLORBASE FS 78 STERL SILVER
- COLORBASE FL 23 ANTIQUE WHITE
- COLORBASE FL 24 NATURAL GREY
- COLORBASE FL 44 BRIGHT WHITE
- COLORBASE FL 45 RAVEN
- COLORBASE FL 60 Dusty Grey
- COLORBASE FL 81 BUTTER CREAM
- COLORBASE FL 89 SMOKE GREY
- COLORBASE FL 24 NATGREY 23 KG
- COLORBASE FL 24 NATGREY 25 KG
- COLORBASE FL 78 STERLING SILVER
- COLORBASE FL 78 ST. SILVER 23 KG
- COLORBASE FL 78 ST. SILVER 25 KG
- PERMACOLOR SELECT
- PERMACOLOR SELECT FINE

Information on LCA

System boundaries

The LCA considers upstream, core and downstream processes. In particular, the system boundaries "from cradle to gate with options, modules A4-A5, modules C1-C4 and module D" were considered, which take into account the procurement of raw materials and their transport to the production site, product formulation, distribution, application, disposal and potential reuse, recovery and recycling phases.

Table 1 Modules declared in EPD

Product stage			Construction process Stage		Use stage							End of life stage				Resource recovery stage
Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling potential
A1	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X

* Balancing-out reporting of biogenic carbon

Data quality

The following were used in this study:

- raw data on process consumption, emission measurements, product and waste composition, and product procurement and sales;
- specific data relating to EPD declarations from suppliers of certain raw materials;
- General data from the Ecoinvent 3.10 database.

Exclusions from the study

The inputs subject to cut-off are listed below:

- Machinery maintenance oils were excluded, as they are insignificant in quantity and therefore considered negligible;
- Production process yield, estimated from plant waste associated with the EER code and quantitatively below the cut-off threshold.

The contribution of infrastructure was excluded from the processes that originally contained it, such as, for example, the processes in the Ecoinvent database.

Assumptions and limitations

Where available, primary data was used to conduct this study. Where access to this type of data was not possible, datasets from the Ecoinvent v 3.10 database were used as a reference.

The main assumptions made in this study are listed below:

- the packaging of raw materials was assumed to be based on the packaging waste from the plant;
  The modelling of composite and mixed packaging waste was carried out by re-proportioning plastic, paper and wood packaging in equal quantities.

- All hazardous waste was grouped and modelled using a conservative incineration dataset: *'Hazardous waste, for incineration {Europe without Switzerland}| treatment of hazardous waste, hazardous waste incineration | Cut-off,* U";
- for the transport of packaging waste from finished products to treatment plants, a distance of 100 km was assumed;
- In the absence of precise data regarding the type, class and fuel consumption of the vehicles used for transport, we have assumed a Euro 5 diesel lorry weighing 16-32 tonnes.
- for intermodal transport (lorry-ship-lorry/lorry-train-lorry), it was assumed that 10% is by lorry and the remainder by ship/train;
- for the distribution of products in the Middle East, in the absence of primary data, the distance between the Laticrete plant and the capitals of the countries of the Arabian Peninsula was taken as a reference.

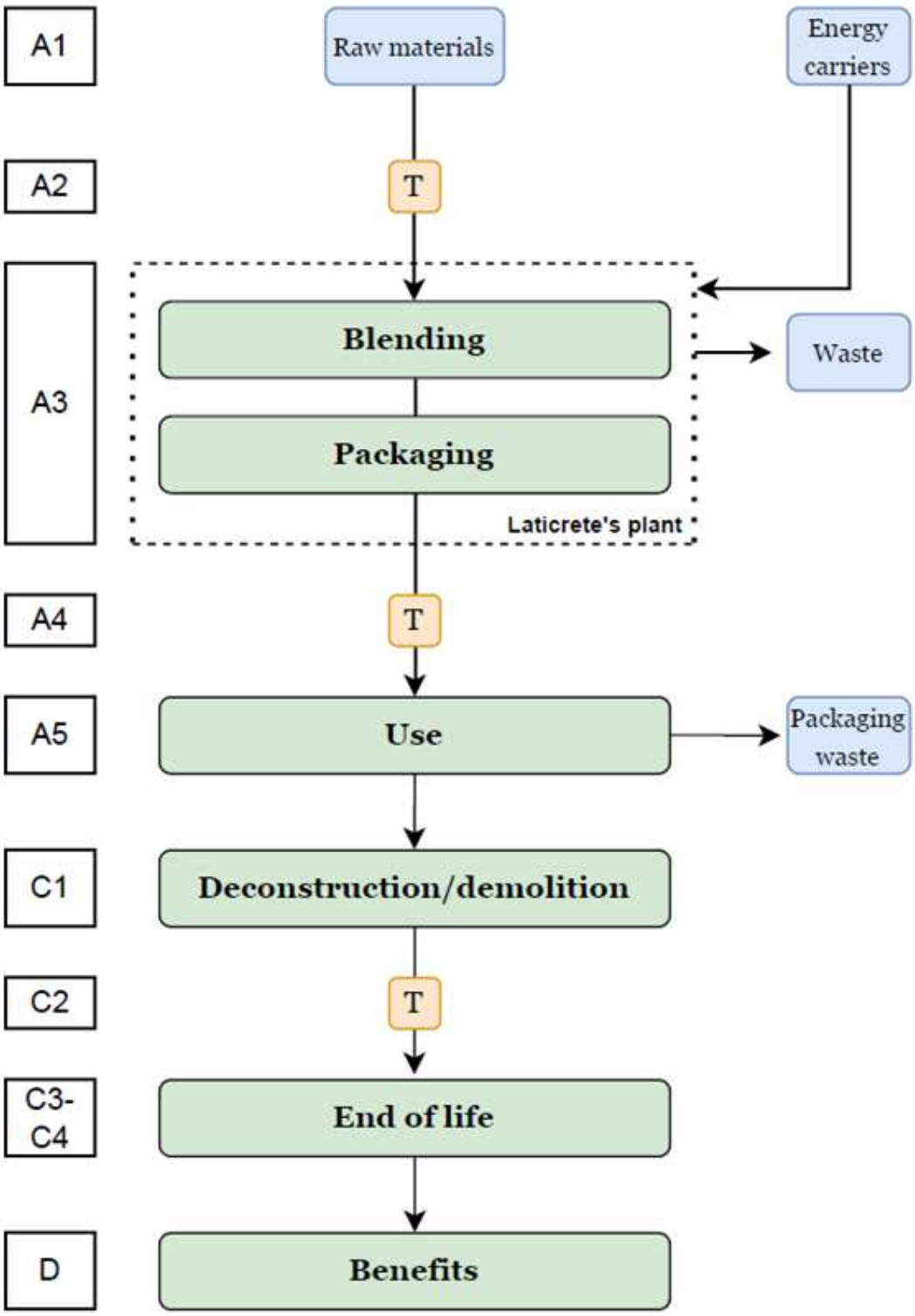
Allocation rules

In the case under study, the two products under study are produced simultaneously. In this LCA study, *a* "*co-product* allocation" was carried out because the company simultaneously produces two main products, namely cementitious premixes (further subdivided into two categories, namely "mortars and screeds" and "adhesives") and grouts. In the reference year, the production of grouts represents 2.4% of total production. In this study, it was therefore decided to use a mass-based allocation. The physical allocation coefficients were calculated on the basis of the kilograms of cementitious premixes and grouts produced at the plant in 2023.

Disposal and end of life

Module	Description	Processes involved
C1	Product demolition	This includes all processes and activities involved in the demolition of products. In the absence of specific data, the consumption associated with the demolition of concrete structures was considered to be [0.07 MJ/kg] (*JRC, Model for Life Cycle Assessment (LCA) of buildings*).
C2	Transport to the treatment site	End-of-life products are sent to sorting centres, so a distance of 100 km is assumed as a precaution. In the absence of information on the means of transport used, the following datasets have been used as a precaution: *Transport, freight, lorry, unspecified {RER}| transport, freight, lorry, all sizes, EURO5 to generic market for transport, freight, lorry, unspecified* **|** *Cut-off, U* and *Transport, freight, lorry, unspecified {RoW}| transport, freight, lorry, all sizes, EURO5 to generic market for transport, freight, lorry, unspecified* **|** *Cut-off, U* depending on the geographical area of distribution (65.9% RER and 34.1% ROW).
C3	Preliminary treatment prior to recovery	It is assumed that the products will be managed according to the disposal scenario in accordance with European Directive 2008/98/EC, which considers a recycling rate of 70%.
C4	Disposal of materials	It is assumed that the products will be managed according to the disposal scenario in accordance with European Directive 2008/98/EC, which considers a disposal rate of 30%, characterised by the dataset "*Inert waste {RER}| treatment of inert waste, sanitary landfill* **|** *Cut-off, U*".

Flow chart


A1
Raw materials
Energy carriers
A2
T
A3
Blending
Waste
Packaging
Laticrete's plant
A4
T
A5
Use
Packaging waste
C1
Deconstruction/demolition
C2
T
C3-C4
End of life
D
Benefits

Data collection and inventory

Product characteristics	
Product names	Grouts
Identification code	Specific to the product and indicated on the packaging
Technical characteristics	Ready-to-use grouts consisting of a mixture of hydraulic binders, sand, carbonate and specific additives.
Application/intended use	Grouts for ceramic tiles for indoor and outdoor installation on walls and floors.
Physical properties	Apparent density ~ 1.20 kg/dm3 Maximum grain size ~ 0.15 mm Hazardous: No. Possible skin and eye irritation due to contact with cement content Flammability: No Application temperature from +5°C to +35°C Application width from 1 mm to 8 mm Temperature resistance from -30°C to +90°C

The study aims to analyze the potential environmental impacts associated with the life cycle of the family of grouts intended for the construction sector. All products are manufactured using the same production process, i.e. mixing ready-to-use raw materials, and differ in terms of color and properties (conferred by additives), percentage composition of the various raw material inputs and packaging of the finished product. Consequently, all inputs and outputs to the production flow were considered on a large scale.

Table 2 Product composition

Substance	Range [%]
Tartaric acid	<1
Additive	<1%
Anti-foaming agent	<1%
Titanium dioxide	1-2
Calcium formate	<1%
Calcium carbonate	66-67
Industrial casein	<1%
Cellulose	<1%
Cement	7-8
White cement	15-16
Grey cement	<1
Copolymer	1-2
Gypsum	<1
Binder	<1%
Chromium oxide	<1%

Iron oxide	<1%
Inorganic pigment	<1
Organic pigment	<1%
Red pigment	<1%
Polymer	<1%
Aluminium powder	<1%
Quartz	3-4
Zinc stearate	<1%

Table 3 Further product information

	Quantity [kgC/kg]
Biogenic C content in the product	3.30E-03
Biogenic C content in packaging	1.16E-04

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

This product does not contain post-consumer materials.
The functional unit does not contain any substances included in the *Candidate List of Substances of Very High Concern* (SVHC).

Data quality

Data collection	01/01/2023 – 31/12/2023
Sites	Data referring only to the site in Castelnuovo Rangone (MO)
Geography	Latricrete Europe produces 100% of the products covered by this EPD. The market for these products is global, with shipments to various countries located on different continents.
Technology	The products are manufactured by measuring raw materials in precise formulations and mixing them to create products in solid powder form.
Representativeness of the average	The average product covers 100% of the Grout products manufactured.
Database LCI/LCA used	Ecoinvent v3.10
EPDs used	• EPD ItalbiancoCEM I 52.5 R (EPD process certification number: P4687) • EPD Duracem42.5 R (EPD process certification number: P4687)
Data quality scheme	EN 15804:2012+A2:2019, Annex E, Table E.1
Use of "fair" data with impacts > 30%	No "fair" data with an impact greater than 30% in core categories was used
Use of 'poor' data	No "poor" data with an impact greater than 30% in core categories was used
Use of 'very poor' data	No "very poor" data with an impact greater than 30% in core categories was used

LCA results

Table 4 Results of potential environmental impacts

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D	Δ max	Δ min
GWP total	kg CO2e	4.20E+02	4.77E+01	1.01E+02	5.69E+02	1.90E+02	9.19E+01	6.05E+00	1.45E+01	6.88E+00	1.45E+01	-2.87E+00	38.8	-1.7
GWP fossil	kg CO2e	4.32E+02	4.76E+01	1.01E+02	5.80E+02	1.90E+02	3.27E+01	6.01E+00	1.44E+01	6.87E+00	2.87E+00	-2.86E+00	42.3	-1.0
GWP biogenic	kg CO2e	-1.17E+01	8.51E-03	7.02E-01	-1.10E+01	3.34E-02	5.91E+01	1.50E-02	2.62E-03	7.23E-03	1.16E+01	6.67E-04	1.3	-13.8
GWP-luluc	kg CO2e	1.63E-01	1.60E-02	1.84E-02	1.97E-01	6.74E-02	5.89E-02	1.86E-02	5.24E-03	6.32E-03	6.96E-04	-7.19E-03	6.2	-22.8
ODP	kg CFC11 eq	1.54E-05	9.36E-07	1.01E-06	1.74E-05	3.34E-06	7.16E-07	1.04E-07	2.59E-07	5.49E-08	8.99E-08	-1.25E-07	351.3	-5.4
AP	mol H+ eq	3.03E+00	1.95E-01	1.13E-01	3.34E+00	6.14E-01	1.47E-01	3.07E-02	4.65E-02	4.18E-02	3.17E-02	-9.80E-03	18.4	-46.1
EP-freshwater	kg P eq	7.41E-02	3.14E-03	2.87E-02	1.06E-01	1.36E-02	1.18E-02	5.36E-03	1.05E-03	2.19E-03	4.82E-03	-3.74E-04	99.5	-72.4
EP-marine	kg N eq	2.01E-01	6.13E-02	3.07E-02	2.93E-01	2.03E-01	5.11E-02	5.32E-03	1.54E-02	9.84E-03	7.90E-03	1.74E-04	19.2	-18.0
EP-terrestrial	mol N eq	3.56E+00	6.70E-01	2.66E-01	4.50E+00	2.21E+00	4.17E-01	4.62E-02	1.68E-01	1.19E-01	8.48E-02	-2.39E-02	35.1	-3.5
POCP	kg NMVOC eq	1.28E+00	2.64E-01	1.15E-01	1.66E+00	9.15E-01	9.66E-02	1.53E-02	7.10E-02	3.29E-02	3.10E-02	-3.81E-03	27.3	-2.4
ADP minerals&metals2	kg Sb eq	1.51E-03	1.48E-04	1.51E-04	1.81E-03	6.08E-04	1.10E-04	1.31E-05	4.46E-05	3.58E-05	5.49E-06	-6.15E-06	5017.7	-28.9
ADP-fossil2	MJ	2.49E+03	5.42E+01	9.92E+01	2.64E+03	2.35E+02	1.96E+02	1.02E+02	1.83E+01	4.59E+01	4.51E+00	-8.48E+00	75.6	-13.1
WDP2	m3 depriv.	1.52E+02	2.70E+00	2.87E+02	4.42E+02	1.14E+01	1.28E+04	1.61E+00	9.33E-01	-2.21E+01	-3.75E+01	-3.22E+00	4.8	-1.2

*balancing out-reporting part C biogenic

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 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."*

This study does not comply with ISO 21930:2017.
In general, the variation of more than 10% is due to the different ratio of raw materials and the different type and quantity of materials used for packaging (for cement premixes).
As evident from the results reported in the previous tables, there is a significant variation compared to the average product, particularly for certain impact categories. Specifically, for grouts, there is a substantial variation in the impact categories of ***ozone depletion*** and ***resource use, minerals and metals.*** With regard to the ***climate change – biogenic*** category, the variations are mainly associated with the amount of packaging associated with the product. In fact, this study considered three main types of packaging, each associated with different quantities of packaging that have a significantly different impact on the impact category in question. As regards the ***Resource use, minerals and metals*** category***,*** the deviation from the average product is mainly associated with the different composition of the products and, in particular, with the different quantitative use of the additive CEM PROTECTOR AKT-10, which is associated with the main contributions to the impact category in question. Finally, also with regard to the ***Ozone depletion*** category***,*** the deviation from the average product is mainly (for a contribution of approximately 50%) related to the different composition of the products and, in particular, to the different use in quantitative terms of white cement 24-RC-0002, which is associated with the main contributions to the impact category in question.
All products studied are kept grouped together, even if they vary by more than 10%, as they belong to the same product category, have the same components and are manufactured using the same production process. It is therefore in the company's interest to maintain this grouping.

Table 5 Resource use results

Impact category	Unit	A	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	2.04E+02	1.08E+01	3.39E+01	2.49E+02	3.98E+01	2.29E+02	3.25E+01	3.16E+00	7.93E+00	1.34E+00	-6.97E+00
PERM	MJ	9.21E+00	0.00E+00	1.55E+00	1.08E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	2.13E+02	1.08E+01	3.54E+01	2.59E+02	3.98E+01	2.29E+02	3.25E+01	3.16E+00	7.93E+00	1.34E+00	-6.97E+00
PENRE	MJ	4.31E+03	6.65E+02	4.91E+02	5.47E+03	2.67E+03	4.06E+02	1.42E+02	2.05E+02	8.42E+01	6.68E+01	-6.04E+01
PENRM	MJ	1.04E+02	0.00E+00	1.73E+01	1.22E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	4.42E+03	6.65E+02	5.08E+02	5.59E+03	2.67E+03	4.06E+02	1.42E+02	2.05E+02	8.42E+01	6.68E+01	-6.03E+01
SM	kg	6.89E+00	0.00E+00	9.88E-02	6.99E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	1.30E+01	0.00E+00	0.00E+00	1.30E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m	3.58E+00	8.56E-02	5.38E+00	9.05E+00	3.41E-01	2.97E+02	1.18E-01	2.79E-02	-5.04E-01	-8.07E-01	-1.49E-01

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 6 Waste production and output flows results

Impact category	Unit	A	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	3.04E+00	4.45E-03	1.37E-02	3.06E+00	1.81E-02	1.72E-03	2.11E-04	1.38E-03	3.39E-04	4.47E-04	-6.40E-04
NHWD	kg	6.36E+01	3.06E+01	9.84E+00	1.04E+02	1.26E+02	8.21E+00	2.96E-01	1.29E+01	1.11E+00	2.87E+02	-2.22E-01
RWD	kg	3.47E-03	2.09E-04	7.20E-04	4.40E-03	7.29E-04	1.78E-03	1.02E-03	5.88E-05	1.63E-04	2.19E-05	-2.97E-05
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	MJ	0.00E+00	0.00E+00	2.16E+02	2.16E+02	0.00E+00	4.19E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Acronyms	HWD = hazardous waste disposed of; NHWD = non-hazardous waste disposed of; RWD = radioactive waste disposed of; CRU = components for reuse; MFR = materials for recycling; MER = materials for energy recovery; EEE = exported electrical energy; EET = exported thermal energy

The values of the additional environmental impact categories were calculated in the LCA report but not included in the EPD.

The results show that the main contribution to the total impact is associated with:

- raw materials, for all impact categories except *Climate change – Biogenic and Eutrophication, marine*;
- distribution of the finished product, particularly for the impact categories *Eutrophication, marine, Eutrophication, terrestrial and Photochemical ozone formation.*

Other contributions such as packaging, transport of raw materials, factory and electricity consumption, waste and atmospheric emissions are less significant.
Furthermore, the assessment of the ranges of variability shows a variation of more than 10% for all impact categories, due to the different ratio of raw materials and the different types.

References

The following standards and/or guidelines were used as a reference for this study:

- ISO 1404:2006+A1:2020 Environmental management – Life Cycle Assessment – Principles and framework
- ISO 14044:2006+A1:2017+A2:2020 Environmental management – Life Cycle Assessment – Requirements and guidelines
- ISO 14025:2006 Environmental labels and declarations – Type III environmental declarations – Principles and procedures
- EN 15804:2012+A2:2019/AC:2021 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction works
- EPD-IES-0014604 - CALCE IDRATA dated 28/10/2024 valid until 27/10/2029
- ITALBIANCO CEM I 52.5 R, process certification no. EPD P4687 dated 19/07/2024 valid until 19/07/2029
- Duracem 42.5 R, process certification no. EPD P4687 dated 19/07/2024, valid until 19/07/2029
- DIMOVA, Silvia. "Model for life cycle assessment (LCA) of buildings." (2018).
- João, P. A. C. H. E. C. O., DE BRITO Jorge, and LAMPERTI TORNAGHI Marco. "Use of recycled aggregates in concrete: opportunities for upscaling in Europe." (2023).
- Regolamento del programma EPD Italy rev 7.1 del 05/09/2025
- PCR ICMQ-001/15 – Products and services for construction rev3.2 (compliant with EN 15804+A2) dated 03/11/2025
- Report LCA: Life Cycle Assessment study aimed at obtaining EPD - Adhesives, mortars, screeds and grouts from Laticrete Europe Rev0.5. 05/12/2025