

# Environmental Product Declaration

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

## Cementitious Repair Mortars from ALCHIMICA S.A.

Products included in the EPD:

**HYGROSMART®-BUILDING-F**

**HYGROSMART®- BUILDING 45-THIXO**

**HYGROSMART®- FIX & FINISH**

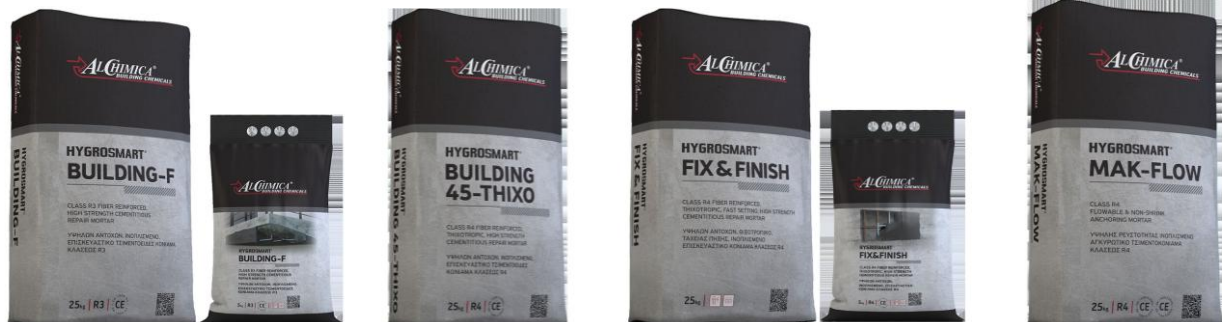
**HYGROSMART®- MAK FLOW**

EPD of multiple products, based on the average results of the product group



|                          |                                                                                          |
|--------------------------|------------------------------------------------------------------------------------------|
| Programme:               | The International EPD System, <a href="http://www.environdec.com">www.environdec.com</a> |
| Programme operator:      | EPD International AB                                                                     |
| EPD registration number: | <b>EPD-IES-0026134:002</b>                                                               |
| Version date:            | 2025-10-15                                                                               |
| Validity date:           | 2030-10-09                                                                               |

*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](http://www.environdec.com)*



## GENERAL INFORMATION

| Programme Information |                                                                     |
|-----------------------|---------------------------------------------------------------------|
| <b>Programme:</b>     | The International EPD® System                                       |
| <b>Address:</b>       | EPD International AB<br>Box 210 60<br>SE-100 31 Stockholm<br>Sweden |
| <b>Website:</b>       | <a href="http://www.environdec.com">www.environdec.com</a>          |
| <b>E-mail:</b>        | <a href="mailto:support@environdec.com">support@environdec.com</a>  |

| Product Category Rules (PCR)                                                                                                                                                                                                                                                                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CEN standard EN 15804 serves as the Core Product Category Rules (PCR)                                                                                                                                                                                                                                     |
| <b>Product Category Rules (PCR):</b> PCR 2019:14 Construction products, version 2.0.1, CPC code: 375 Articles of concrete, cement and plaster                                                                                                                                                             |
| <b>PCR review was conducted by:</b> The technical Committee of the International EPD System. A full list of members is available on <a href="http://www.environdec.com">www.environdec.com</a> . The review panel may be contacted via <a href="mailto:support@environdec.com">support@environdec.com</a> |

| Third-party Verification                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:                                                                                                                                                                                                                                       |
| <input checked="" type="checkbox"/> <b>Individual EPD verification without a pre-verified LCA/EPD tool</b><br>Third-party verifier: Business Quality Verification P.C.                                                                                                                                                                    |
| <br>Address: 5, Konitsis Street, GR 15125, Marousi, Attica / Greece<br><a href="http://www.bqv.gr">www.bqv.gr</a> – <a href="mailto:info@bqv.gr">info@bqv.gr</a><br>Accredited by: Hellenic Accreditation System (ESYD) with accreditation number 1218 |
| Procedure for follow-up of data during EPD validity involves third party verifier:                                                                                                                                                                                                                                                        |
| <input checked="" type="checkbox"/> Yes <input type="checkbox"/> 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: ALCHIMICA S.A.

Production site: 71<sup>st</sup> km Athens-Lamia National Road, 341 00

Contact: [alchimica@alchimica.com](mailto:alchimica@alchimica.com)

### Description of the organisation:

ALCHIMICA S.A. is a manufacturer of advanced construction chemicals, with over 40 years of expertise in the design, formulation, and production of high-performance systems for waterproofing, concrete repair, structural protection, ETICS and industrial flooring. Serving both new construction and renovation markets, our solutions are specified in projects ranging from residential developments to complex infrastructure works across more than 100 countries.

With a production capacity exceeding 40,000 tons annually, ALCHIMICA operates three fully owned manufacturing facilities with a total footprint of 55,000 m<sup>2</sup>. These include state-of-the-art dedicated units for resin-based and liquid-applied systems, alongside automated lines for polyurethane sealants and cement-based mortars. Every batch is monitored through integrated quality control protocols, ensuring consistency, traceability, and full compliance with applicable technical standards.

Our in-house R&D center plays a central role in product innovation, staffed by a multidisciplinary team of chemists and engineers. Close collaboration between R&D, production, and technical support ensures rapid development cycles and the ability to tailor solutions to market-specific demands. The result is a large portfolio of CE-marked products and systems that meet the latest regulatory and performance requirements in diverse climates and applications.

ALCHIMICA's range includes:

- Liquid-Applied Polyurethane Waterproofing Membranes
- Polyurethane Sealing Technologies
- Cementitious Mortars for Concrete Repairs
- High-Performance Cementitious Waterproofing Mortars
- ETICS Systems
- Tile Adhesives
- Industrial Flooring Systems

Certified under ISO 9001:2015, ISO 14001:2015, and ISO 45001:2018, our operations reflect a structured commitment to quality, environmental stewardship, and occupational safety. Sustainability is embedded in our manufacturing and R&D processes, with a focus on long-lasting systems that reduce resource use and lifecycle impacts. We actively pursue the development of low-emission, user-safe formulations that support healthier environments and align with modern green building standards.

Through energy-efficient production, waste minimization, and responsible sourcing, ALCHIMICA aims to reduce its environmental footprint while delivering reliable, high-performance solutions that contribute to the long-term resilience of the built environment.

A defining element of ALCHIMICA's approach is the technical support provided alongside its products. From initial specification to on-site application, our teams assist professionals with product selection, detailing, and installation training—ensuring both correct use and long-term performance. We are not simply suppliers, but long-term partners to the construction industry—offering proven solutions, industrial capability, and a legacy of performance.

## Product information

Product name: **HYGROSMART®-BUILDING-F**

Product identification: **HYGROSMART®-BUILDING-F** is a fiber-reinforced, one-component cementitious mortar designed for fast-setting structural repairs.



UN CPC code: 375 Articles of concrete, cement and plaster

Product description:

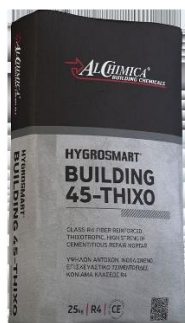
**HYGROSMART®-BUILDING-F** is a fiber-reinforced, one-component cementitious mortar designed for fast-setting structural repairs. With excellent adhesion, shrinkage control, and ease of application, it is suitable for overhead, vertical, and horizontal repair works, including reinforcement restoration, roof gutter formation, and surface smoothing. CE-certified as Class R3 under EN 1504-3, it offers reliable mechanical properties including high early strength, elasticity, and freeze-thaw resistance. The product can be applied in multiple layers without cracking and is paintable within hours of setting. Manufactured under ISO 9001, ISO 14001, and ISO 45001 standards, HYGROSMART® BUILDING F delivers dependable results in structural repair and rehabilitation projects.

Brief description of main processes : The manufacturing process commences with the precise weighing of raw materials such as calcium carbonate and cement. These materials are subsequently conveyed to an industrial mixer, where they are thoroughly blended until a homogeneous mixture is achieved. The resulting mixture is then packaged into paper bags for storage and distribution.

Location of manufacturing site: 71<sup>st</sup> km Athens-Lamia National Road, 341 00

Product name: **HYGROSMART®-BUILDING-45-THIXO**

Product identification: **HYGROSMART®-BUILDING-45-THIXO** is a high-strength, one-component, fiber-reinforced thixotropic mortar formulated for structural concrete repairs.



UN CPC code: 375 Articles of concrete, cement and plaster

Product description:

**HYGROSMART®-BUILDING-45-THIXO** is a high-strength, one-component, fiber-reinforced thixotropic mortar formulated for structural concrete repairs. With excellent workability and non-sag behavior, it is

suitable for vertical and overhead applications in single-layer thicknesses up to 20 mm. Certified as Class R4 repair mortar under EN 1504-3, it exhibits high compressive and flexural strength, exceptional adhesion, and resistance to thermal cycling and carbonation. Ideal for repairing damaged concrete, reinforcement zones, bridge elements, and forming roof gutters, it combines mechanical reliability with fast application. Manufactured by ALCHIMICA S.A. under ISO 9001, ISO 14001, and ISO 45001, the product supports high-performance repair strategies in both civil and commercial structures.

Brief description of main processes: The manufacturing process commences with the precise weighing of raw materials such as calcium carbonate and cement. These materials are subsequently conveyed to an industrial mixer, where they are thoroughly blended until a homogeneous mixture is achieved. The resulting mixture is then packaged into paper bags for storage and distribution.

Location of manufacturing site: 71<sup>st</sup> km Athens-Lamia National Road, 341 00

Product name: **HYGROSMART® FIX & FINISH**

Product identification: **HYGROSMART® FIX & FINISH** is a rapid-setting, shrinkage-compensated, thixotropic repair mortar formulated for high-precision patching and smoothing of concrete elements



UN CPC code: 375 Articles of concrete, cement and plaster

Product description:

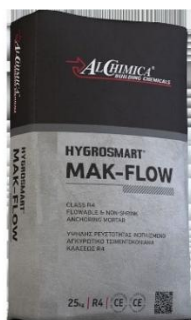
**HYGROSMART® FIX & FINISH** is a rapid-setting, shrinkage-compensated, thixotropic repair mortar formulated for high-precision patching and smoothing of concrete elements. Suitable for internal and external use, the product is applied in single layers from 3 mm to 40 mm thickness, without formwork. It is CE-certified as Class R4 repair mortar under EN 1504-3 and demonstrates excellent adhesion, rapid strength gain, and long-term durability under weather exposure or permanent water contact. Typical applications include beam edges, precast elements, balconies, pools, and decorative concrete repairs. Manufactured by ALCHIMICA S.A. under ISO 9001, ISO 14001, and ISO 45001 certifications, it is engineered for fast-track construction and reliable surface restoration.

Brief description of main processes: The manufacturing process commences with the precise weighing of raw materials such as calcium carbonate and cement. These materials are subsequently conveyed to an industrial mixer, where they are thoroughly blended until a homogeneous mixture is achieved. The resulting mixture is then packaged into paper bags for storage and distribution.

Location of manufacturing site: 71<sup>st</sup> km Athens-Lamia National Road, 341 00

Product name: **HYGROSMART® MAK FLOW**

Product identification: **HYGROSMART® MAK FLOW** is a one-component, cementitious, high-strength, shrinkage-compensated repair mortar designed for structural concrete restoration and anchoring applications.



UN CPC code: 375 Articles of concrete, cement and plaster

**Product description:**

**HYGROSMART® MAK FLOW** is a one-component, cementitious, high-strength, shrinkage-compensated repair mortar designed for structural concrete restoration and anchoring applications. Manufactured by ALCHIMICA S.A., it offers excellent flowability, impermeability, and mechanical performance, suitable for both horizontal and vertical elements in infrastructure and industrial projects. It is CE-certified as Class R4 structural repair mortar under EN 1504-3 and as anchoring mortar under EN 1504-6. With compressive strength exceeding 75 MPa, high bond performance, and resistance to freeze-thaw and carbonation, it is ideal for grouting, machinery foundations, bridge repairs, and reinforcement anchoring. Produced under ISO 9001, ISO 14001, and ISO 45001 management systems, it supports demanding structural applications with long-term durability and consistent performance.

**Brief description of main processes:** The manufacturing process commences with the precise weighing of raw materials such as calcium carbonate and cement. These materials are subsequently conveyed to an industrial mixer, where they are thoroughly blended until a homogeneous mixture is achieved. The resulting mixture is then packaged into paper bags for storage and distribution.

**Location of manufacturing site:** 71<sup>st</sup> km Athens-Lamia National Road, 341 00

| TECHNICAL SPECIFICATIONS      |                                         |                                         |                                        |                                         |                 |
|-------------------------------|-----------------------------------------|-----------------------------------------|----------------------------------------|-----------------------------------------|-----------------|
| PROPERTY                      | HYGROSMART®-<br>BUILDING-F              | HYGROSMART®-<br>BUILDING-45<br>THIXO    | HYGROSMART®-<br>FIX & FINISH           | HYGROSMART®-<br>MAK FLOW                | METHOD          |
| Form                          | cementitious<br>powder                  | cementitious<br>powder                  | cementitious<br>powder                 | cementitious<br>powder                  | -               |
| Colour                        | grey                                    | grey                                    | grey                                   | grey                                    | -               |
| Water demand                  | 17-19%                                  | 16-18%                                  | 17-18%                                 | 14-15%                                  | -               |
| Bulk density of dry<br>mortar | 1,6±0,2                                 | 1,3±0,2                                 | 1,3±0,2                                | 1,4±0,2                                 | EN 1015-10:1999 |
| Compressive<br>strength       | >25MPa                                  | >45MPa                                  | >45MPa                                 | >75MPa                                  | EN 12190:1998   |
| Adhesive strength             | ≥1,5MPa                                 | ≥2MPa                                   | ≥2MPa                                  | ≥2MPa                                   | EN 1542:1999    |
| Capillary water<br>absorption | 0,34kg/m <sup>2</sup> *h <sup>0.5</sup> | 0,05kg/m <sup>2</sup> *h <sup>0.5</sup> | 0,1kg/m <sup>2</sup> *h <sup>0.5</sup> | ≤0,5kg/m <sup>2</sup> *h <sup>0.5</sup> | EN 13057:2002   |

## Content declaration

It is an EPD of multiple products, based on the average results of the product group.

The average environmental impacts presented in this EPD represent a weighted average based on the production volumes of the individual products included.

Declared unit: 1 kilogram (kg) of an average cementitious repair mortar

The composition of the product is expressed in mass (%) per declared unit.

The content declaration below represents a weighted average content declaration based on the production volumes of the individual products included.

| Product content   | Weight, kg | Range, kg |          | Post-consumer recycled material, mass-% of product |
|-------------------|------------|-----------|----------|----------------------------------------------------|
| Fillers           | 6,65E-01   | 5,20E-01  | 6,89E-01 | 0                                                  |
| Inorganic binders | 3,12E-01   | 2,60E-01  | 3,50E-01 | 0                                                  |
| Additives         | 2,30E-02   | 1,40E-02  | 7,30E-02 | 0                                                  |

| Packaging materials | Mass-kg (per declared unit) | Mass-% (versus the product) |
|---------------------|-----------------------------|-----------------------------|
| Paper (bag)         | 3.66E-03                    | < 0,4%                      |
| LDPE (film)         | 6.10E-04                    | < 0,1%                      |
| PE/PET/ALU (bag)    | 4.97E-03                    | < 0,5%                      |
| Cardboard (box)     | 8.60E-04                    | < 0,1%                      |
| Wood (pallet)       | 1.30E-02                    | < 1,3%                      |

1 kg biogenic carbon in the product/packaging is equivalent to the uptake of 44/12 kg of CO<sub>2</sub>.

No substances included in the Candidate List of Substances of Very High Concern for authorization under the REACH Regulations that exceed 0.1% of the total weight are present in the final product.

| Carbon electricity intensity |                                                      |
|------------------------------|------------------------------------------------------|
| Environmental effects        | CO <sub>2</sub> Emissions (Kg CO <sub>2</sub> /KWh)* |
| <b>0.24</b>                  |                                                      |

\* Residual Greek Mix: **DAPEEP Report 2022** In accordance with section 1.4 of PCR 2019: 14 “Construction Products” version 1.3.2, it is required to disclose the climate impact (measured in kilograms of CO<sub>2</sub> eq. per kilowatt-hour (kWh) using the GWP-GHG indicator) associated with the electricity acquisition during the manufacturing process in A3.

## LCA information

Declared unit: 1 kilogram (kg) of an average cementitious repair mortar

Time representativeness: The data used for the analysis refer to the year 2024

Geographical scope: Global

Database(s) and LCA software used: Ecoinvent database v.3.11, OpenLCA v.2.5.0 software

Characterization factors (JRC): Based on Reference package EF 3.1

Production of infrastructure and capital goods are excluded from the study.

Description of system boundaries: The system boundaries are cradle to gate (A1-A3) with modules C1-C4 and module D.

### **A1: Raw Material Supply**

The production starts with the material supply. This stage includes the manufacture of raw materials like portland cement and calcium carbonate.

### **A2: Transportation of raw materials to manufacturer**

Transportation stage is relevant to delivery of raw materials from the supplier to the gate of manufacturing plant.

Raw materials are transported by trucks or by ships from different suppliers in Europe and Asia.

### **A3: Manufacturing**

Manufacturing starts with weighing of raw materials. After weighing, raw materials are mixed. Last stage of manufacturing is the packaging of final products.

Concerning **electricity** mix, the national residual energy mix (2023) as published in DAPEEP SA was used.

### **C1: De-construction, demolition**

Demolition of cementitious repair mortars takes place with the whole demolition of the building/construction. Thus, it is assumed that the energy used for the demolition of cementitious repair mortars has minor significance and the environmental impact of this module is set to be zero.

### **C2: Transportation of waste**

A distance of 100 km by a 16-32 tonne lorry from construction/demolition sites to disposal sites has been chosen as an assumption.

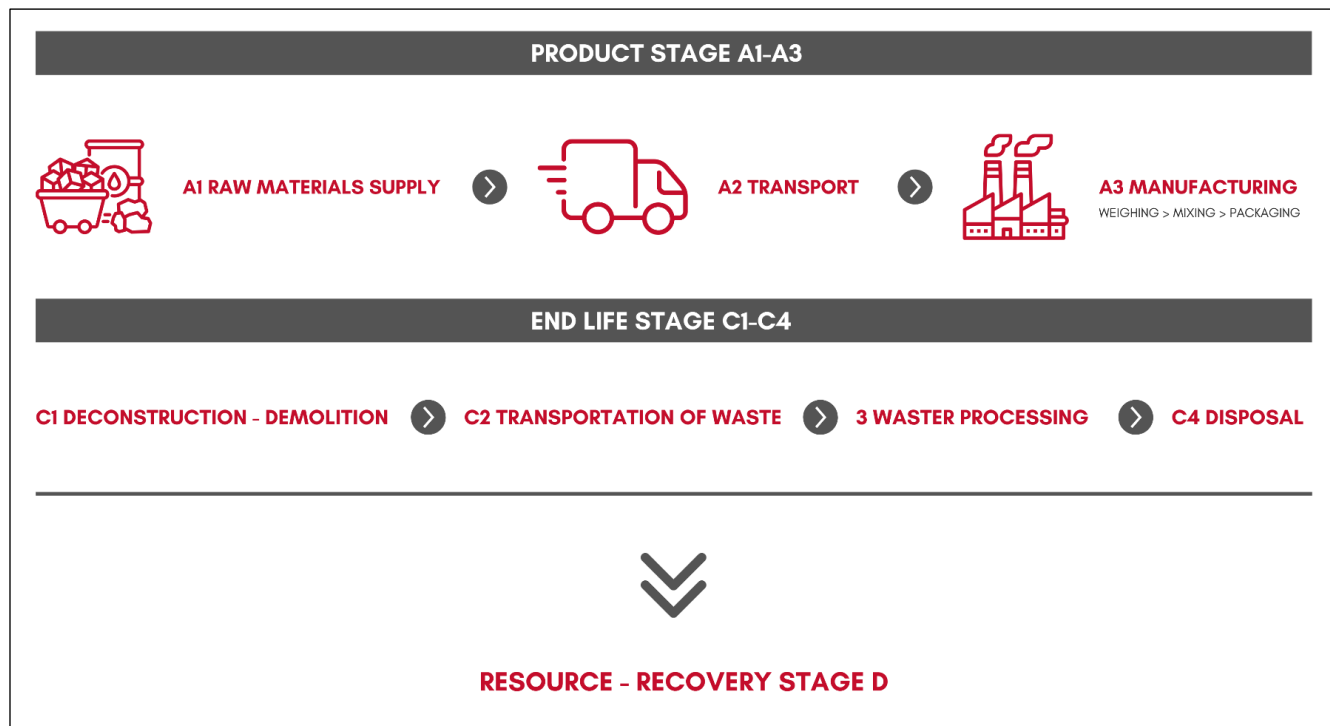
### **C3: Waste processing for re-use, recovery and/or recycling**

This module includes waste processing of the product after its life cycle in order to be recycled and reused in another product system. It is assumed that 100% of the end-of-life waste of cementitious repair mortars will be landfilled and the environmental impact of this module is set to be zero.

### **C4: Disposal**

This module includes the final disposal of the discarded product. As mentioned above, 100% of the end-of-life waste of cementitious repair mortars will be landfilled.

System diagram:



## Additional LCA information

### Assumptions:

**Module A2+C2:** It is assumed that a EURO5, 16-32 tonne lorry is used for road transportation and a container ship for sea transportation.

**Module C1:** Demolition of cementitious repair mortars takes place with the whole demolition of the building. It is assumed that the energy used for the demolition of cementitious repair mortars has minor significance and the environmental impact of this module is set to be zero.

**Module C2:** A distance of 100 kilometers (km) between construction sites and waste treatment facilities was considered in within the study's calculations.

**Module C3+C4:** It is assumed that 100% of the end-of-life waste of cementitious repair mortars will be landfilled.

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

Modules declared, geographical scope, share of primary data (in GWP-GHG results) and data variation (in GWP-GHG results):

|                       | Product stage       |           |               | Distribution/<br>installation<br>stage |                           | Use stage |             |        |             |               |                        |                       | End of life stage          |           |                  |          | Beyond<br>product<br>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-<br>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             | GLOBAL              |           | GR            | -                                      | -                         | -         | -           | -      | -           | -             | -                      | -                     | EU                         | EU        | EU               | EU       | EU                                     |
| Share of primary data | 68%                 |           |               |                                        |                           | -         | -           | -      | -           | -             | -                      | -                     | -                          | -         | -                | -        | -                                      |
| Variation – products  | <10%                |           |               |                                        |                           | -         | -           | -      | -           | -             | -                      | -                     | -                          | -         | -                | -        | -                                      |
| Variation – sites     | 0%                  |           |               |                                        |                           | -         | -           | -      | -           | -             | -                      | -                     | -                          | -         | -                | -        | -                                      |

## Description of data quality assessment and reference years

All primary data used for Modules A2 and A3 were provided directly by Alchimica and refer to actual operations carried out in the year 2024. These data were collected from the company's internal records.

Generic data were obtained using the OpenLCA v2.5.0 software, with datasets sourced from the Ecoinvent v3.11 database.

### Data Quality Information according to EN 15941:2024

**Period of Data Collection:** 01/01/2024 – 31/12/2024

**Geography:** Greece, production site located at 71st km Athens-Lamia National Road, 341 00

Market scope: European market, primarily Southern Europe

**Technology:** Production includes mixing, sieving and robotic packaging operations using electric energy and an electric forklift (electric-powered forklift truck). All production steps and equipment are located within the same facility.

**Completeness:** The datasets cover all relevant processes from raw material acquisition, production, packaging, and energy use.

No significant processes were excluded.

**LCI/LCA database:** Ecoinvent v3.11 database

**Primary data:** Company's internal records for all production operations in 2024.

**Secondary data:** Generic datasets from Ecoinvent v3.11 used for energy, raw materials, packaging, waste and transport.

#### **Share of primary data, of GWP-GHG results for A1-A3**

| Process                                                          | Source type | Source                 | Reference year | Data category | Share of primary data, of GWP-GHG results for A1-A3 |
|------------------------------------------------------------------|-------------|------------------------|----------------|---------------|-----------------------------------------------------|
| Production of cement                                             | EPD         | S-P-03609<br>S-P-03611 | 2022           | Primary data  | 64%                                                 |
| Production of calcium carbonate                                  | Database    | Ecoinvent v3.11        | 2024           | Generic data  | 22,17%                                              |
| Production of raw materials                                      | Database    | Ecoinvent v3.11        | 2024           | Generic data  | 7,66%                                               |
| Production of packaging materials                                | Database    | Ecoinvent v3.11        | 2024           | Generic data  | 2,15%                                               |
| Packaging and waste treatment                                    | Database    | Ecoinvent v3.11        | 2024           | Generic data  | 0,41%                                               |
| Transport of raw materials & packaging                           | Database    | Ecoinvent v3.11        | 2024           | Primary data  | 3,55%                                               |
| Generation of electricity used in manufacturing of product       | DAPEEP SA   | Residual energy mix    | 2023           | Primary data  | 0,06%                                               |
| <b>Total share of primary data, of GWP-GHG results for A1-A3</b> |             |                        |                |               | <b>67,61%</b>                                       |

The reported share of primary data is associated with uncertainty, as an EPD used as data source lack information on the share of primary data.

## Environmental performance

### Mandatory impact category indicators according to EN 15804

| Indicator            | Unit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | A1-A3     | C1       | C2       | C3       | C4       | D        |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------|----------|----------|----------|----------|
| GWP-total            | kg CO <sub>2</sub> eq.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 4,83E-01  | 0,00E+00 | 1,94E-02 | 0,00E+00 | 6,26E-03 | 0,00E+00 |
| GWP-fossil           | kg CO <sub>2</sub> eq.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 4,82E-01  | 0,00E+00 | 1,94E-02 | 0,00E+00 | 6,25E-03 | 0,00E+00 |
| GWP-biogenic         | kg CO <sub>2</sub> eq.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 7,14E-04  | 0,00E+00 | 3,36E-06 | 0,00E+00 | 1,69E-06 | 0,00E+00 |
| GWP-luluc            | kg CO <sub>2</sub> eq.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 3,11 E-04 | 0,00E+00 | 6,33E-06 | 0,00E+00 | 3,22E-06 | 0,00E+00 |
| ODP                  | kg CFC 11 eq.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1,01E-07  | 0,00E+00 | 3,85E-10 | 0,00E+00 | 1,81E-10 | 0,00E+00 |
| AP                   | mol H <sup>+</sup> eq.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1,97E-03  | 0,00E+00 | 6,06E-05 | 0,00E+00 | 4,43E-05 | 0,00E+00 |
| EP-freshwater        | kg P eq.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 6,29E-05  | 0,00E+00 | 1,29E-06 | 0,00E+00 | 5,17E-07 | 0,00E+00 |
| EP-marine            | kg N eq.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2,97E-04  | 0,00E+00 | 2,04E-05 | 0,00E+00 | 1,69E-05 | 0,00E+00 |
| EP-terrestrial       | mol N eq.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 5,19E-03  | 0,00E+00 | 2,22E-04 | 0,00E+00 | 1,84E-04 | 0,00E+00 |
| POCP                 | kg NMVOC eq.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1,76E-03  | 0,00E+00 | 9,49E-05 | 0,00E+00 | 6,60E-05 | 0,00E+00 |
| ADP-minerals&metals* | kg Sb eq.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4,28E-06  | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| ADP-fossil*          | MJ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 5,33E+00  | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| WDP*                 | m <sup>3</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 9,83E-02  | 0,00E+00 | 1,31E-03 | 0,00E+00 | 4,29E-04 | 0,00E+00 |
| 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.*

### Additional mandatory and voluntary impact category indicators

| Indicator                                                                                                                        | Unit                   | A1-A3    | C1       | C2       | C3       | C4       | D        |
|----------------------------------------------------------------------------------------------------------------------------------|------------------------|----------|----------|----------|----------|----------|----------|
| GWP-GHG <sup>1</sup>                                                                                                             | kg CO <sub>2</sub> eq. | 4,82E-01 | 0,00E+00 | 1,94E-02 | 0,00E+00 | 6,26E-03 | 0,00E+00 |
| Additional voluntary indicators e.g. the voluntary indicators from EN 15804 or the global indicators according to ISO 21930:2017 |                        |          |          |          |          |          |          |

<sup>1</sup> 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<sub>2</sub> is set to zero.

### Resource use indicators

| Indicator | Unit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | A1-A3    | C1       | C2       | C3       | C4       | D        |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|----------|----------|----------|----------|
| PERE      | MJ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 6,99E-01 | 0,00E+00 | 4,61E-01 | 0,00E+00 | 1,42E-03 | 0,00E+00 |
| PERM      | MJ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 5,28E-03 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PERT      | MJ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 7,05E-01 | 0,00E+00 | 4,61E-03 | 0,00E+00 | 1,42E-03 | 0,00E+00 |
| PENRE     | MJ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 5,33E+00 | 0,00E+00 | 2,47E-01 | 0,00E+00 | 1,39E-01 | 0,00E+00 |
| PENRM     | MJ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1,58E-03 | 0,00E+00 | 2,53E-02 | 0,00E+00 | 1,47E-02 | 0,00E+00 |
| PENRT     | MJ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 5,33E+00 | 0,00E+00 | 2,72E-01 | 0,00E+00 | 1,53E-01 | 0,00E+00 |
| SM        | kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 3,24E-02 | 0,00E+00 | 3,07E-04 | 0,00E+00 | 7,16E-05 | 0,00E+00 |
| RSF       | MJ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 7,33E-02 | 0,00E+00 | 8,59E-05 | 0,00E+00 | 1,47E-05 | 0,00E+00 |
| NRSF      | MJ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 6,67E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| FW        | m <sup>3</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2,48E-03 | 0,00E+00 | 3,61E-05 | 0,00E+00 | 1,59E-04 | 0,00E+00 |
| 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

| Indicator | Unit | A1-A3    | C1       | C2       | C3       | C4       | D        |
|-----------|------|----------|----------|----------|----------|----------|----------|
| HWD       | kg   | 1,12E-02 | 0,00E+00 | 2,66E-04 | 0,00E+00 | 1,14E-04 | 0,00E+00 |
| NHWD      | kg   | 1,91E-01 | 0,00E+00 | 2,95E-03 | 0,00E+00 | 1,66E-03 | 0,00E+00 |
| RDW       | kg   | 5,31E-06 | 0,00E+00 | 8,66E-08 | 0,00E+00 | 2,38E-08 | 0,00E+00 |

## Output flow indicators

| Indicator | Unit | A1-A3    | C1       | C2       | C3       | C4       | D        |
|-----------|------|----------|----------|----------|----------|----------|----------|
| CRU       | kg   | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| MFR       | kg   | 1,14E-02 | 0,00E+00 | 2,78E-04 | 0,00E+00 | 5,91E-05 | 0,00E+00 |
| MER       | kg   | 0,00E+00 | 0,00E+00 | 3,86E-08 | 0,00E+00 | 6,62E-09 | 0,00E+00 |
| EEE       | MJ   | 3,83E-03 | 0,00E+00 | 4,57E-05 | 0,00E+00 | 9,19E-06 | 0,00E+00 |
| EET       | MJ   | 3,54E-03 | 0,00E+00 | 6,47E-05 | 0,00E+00 | 5,95E-06 | 0,00E+00 |

## Additional impacts

| Indicator | Unit              | A1-A3    | C1       | C2       | C3       | C4       | D        |
|-----------|-------------------|----------|----------|----------|----------|----------|----------|
| ETP-fw    | CTUe              | 1,30E+00 | 0,00E+00 | 7,30E-02 | 0,00E+00 | 2,10E-02 | 0,00E+00 |
| HTP-nc*   | CTUh              | 3,53E-09 | 0,00E+00 | 1,75E-10 | 0,00E+00 | 2,76E-11 | 0,00E+00 |
| HTP-c*    | CTUh              | 1,56E-10 | 0,00E+00 | 1,35E-10 | 0,00E+00 | 2,83E-11 | 0,00E+00 |
| IRP**     | kBq U235 eq.      | 2,18E-02 | 0,00E+00 | 3,49E-04 | 0,00E+00 | 9,78E-05 | 0,00E+00 |
| PM        | Disease Incidence | 1,26E-08 | 0,00E+00 | 1,52E-09 | 0,00E+00 | 1,01E-09 | 0,00E+00 |
| SQP*      | Dimensionless     | 2,72E+00 | 0,00E+00 | 1,62E-01 | 0,00E+00 | 3,02E-01 | 0,00E+00 |

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

\*\* Disclaimer: 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.

## Variations of included products

### Mandatory impact category indicators according to EN 15804 - Variations

| Indicator            | Variations % |
|----------------------|--------------|
| GWP-total            | 13.12%       |
| GWP-fossil           | 12.73%       |
| GWP-biogenic         | 1395.50%     |
| GWP-luluc            | 91.71%       |
| GWP-GHG              | 8.70%        |
| ODP                  | 2938.46%     |
| AP                   | 48.18%       |
| EP-freshwater        | 78.56%       |
| EP-marine            | 79.35%       |
| EP-terrestrial       | 43.04%       |
| POCP                 | 46.77%       |
| ADP-minerals&metals* | 48.51%       |
| ADP-fossil*          | 45.93%       |
| WDP*                 | 53.17%       |

### Resource use indicators - Variations

| Indicator | Variations % |
|-----------|--------------|
| PERE      | 148.80%      |
| PERM      | 0.78%        |
| PERT      | 149.10%      |
| PENRE     | 45.67%       |
| PENRM     | 77.23%       |
| PENRT     | 45.93%       |
| SM        | 24.21%       |
| RSF       | 72.14%       |

|      |         |
|------|---------|
| NRSF | 249.18% |
| FW   | 50.59%  |

### Waste indicators – Variations

| Indicator | Variations % |
|-----------|--------------|
| HWD       | 55.39%       |
| NHWD      | 209.11%      |
| RWD       | 117.39%      |

### Output flow indicators – Variations

| Indicator | Variations % |
|-----------|--------------|
| CRU       | 0.00%        |
| MFR       | 89.55%       |
| MER       | 0.00%        |
| EEE       | 98.43%       |
| EET       | 100.49%      |

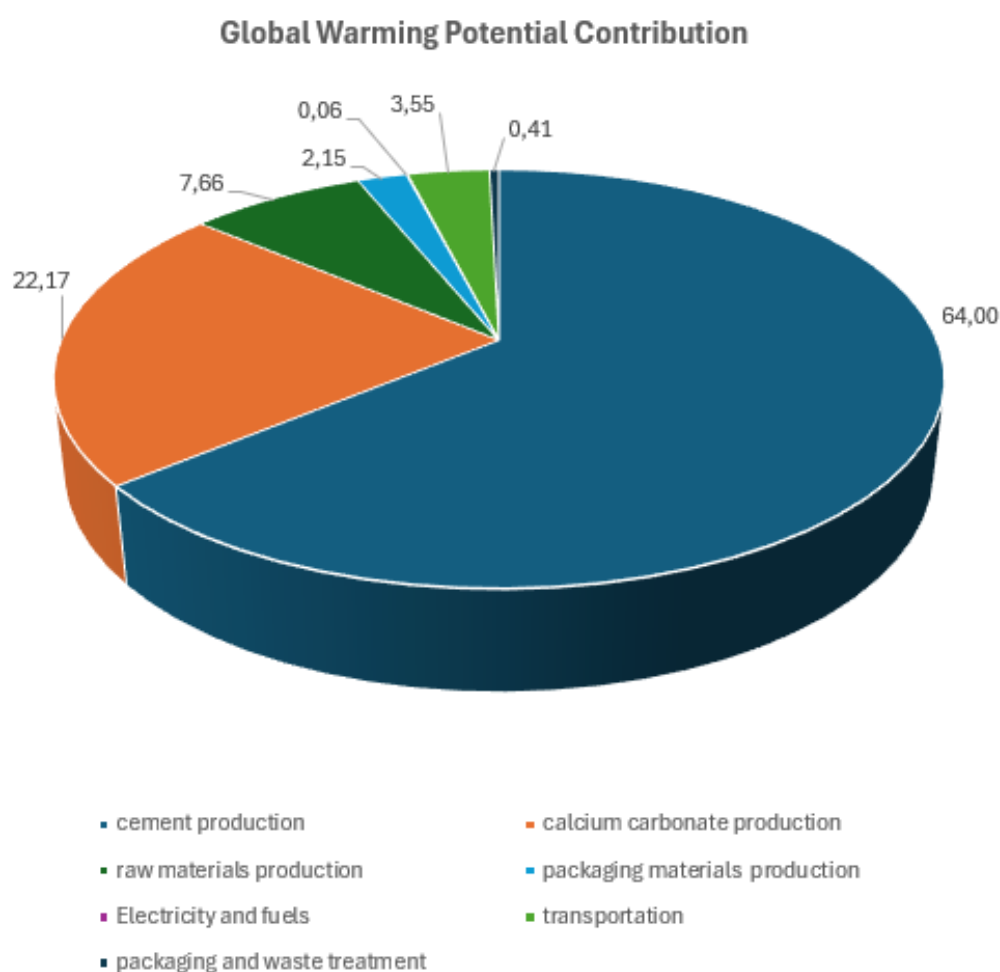
### Additional impacts - Variations

| Indicator | Variations % |
|-----------|--------------|
| ETP-fw    | 61.29%       |
| HTP-nc*   | 57.94%       |
| HTP-c*    | 56.47%       |
| IRP**     | 118.52%      |
| PM        | 92.00%       |
| SQP*      | 187.07%      |

## Interpretation

The majority of the total Global Warming Potential (GWP) is attributed to the upstream processes, primarily due to the extraction of raw materials and the production of Portland Cement and is followed by transportation to the production unit. The production of the final product and the manufacturing of packaging, has a relatively minor impact on GWP.

It is evident that raw material acquisition and processing are major drivers of the environmental impact, especially in terms of global warming potential, with Portland Cement production representing a significant contributor.



### Note:

The use of the results of modules A1-A3 is discouraged without considering the results of module C.

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.

## List of abbreviations

|                       |                                                                         |
|-----------------------|-------------------------------------------------------------------------|
| <b>GWP-biogenic</b>   | Global Warming Potential - biogenic                                     |
| <b>GWP-fossil</b>     | Global Warming Potential - fossil fuels                                 |
| <b>GWP-luluc</b>      | Global Warming Potential - land use and land use change                 |
| <b>GWP-total</b>      | Global Warming Potential - total                                        |
| <b>GWP-IOBC/GHG</b>   | Global warming potential except emissions and uptake of biogenic carbon |
| <b>ETP-fw</b>         | Potential Comparative Toxic Unit for ecosystems                         |
| <b>HTP-nc</b>         | Potential Comparative Toxic Unit for humans - non-cancer effects        |
| <b>ADPF</b>           | Abiotic depletion potential - fossil resources                          |
| <b>ADPE</b>           | Abiotic depletion potential - non-fossil resources                      |
| <b>AP</b>             | Acidification potential, Accumulated Exceedance                         |
| <b>ODP</b>            | Depletion potential of the stratospheric ozone layer                    |
| <b>EP-freshwater</b>  | Eutrophication potential - freshwater                                   |
| <b>EP-marine</b>      | Eutrophication potential - marine                                       |
| <b>EP-terrestrial</b> | Eutrophication potential - terrestrial                                  |
| <b>POCP</b>           | Photochemical Ozone Creation Potential                                  |
| <b>HTP-c</b>          | Potential Comparative Toxic Unit for humans - cancer effects            |
| <b>IRP</b>            | Potential Human exposure efficiency relative to U235                    |
| <b>PM</b>             | Potential incidence of disease due to PM emissions                      |
| <b>SQP</b>            | Potential Soil quality index                                            |
| <b>WDP</b>            | Water (user) deprivation potential                                      |
| <b>CRU</b>            | Components for re-use                                                   |
| <b>EEE</b>            | Exported electrical energy                                              |
| <b>EET</b>            | Exported thermal energy                                                 |
| <b>MER</b>            | Materials for energy recovery                                           |
| <b>MFR</b>            | Materials for recycling                                                 |
| <b>PENRT</b>          | Total use of non renewable primary energy resources                     |
| <b>PERT</b>           | Total use of renewable primary energy resources                         |
| <b>FW</b>             | Use of net fresh water                                                  |
| <b>PENRE</b>          | Use of non renewable primary energy resources used as energy carrier    |
| <b>PENRM</b>          | Use of non renewable primary energy resources used as raw materials     |
| <b>NRSF</b>           | Use of non renewable secondary fuels                                    |
| <b>PERE</b>           | Use of renewable primary energy resources used as energy carrier        |
| <b>PERM</b>           | Use of renewable primary energy resources used as raw materials         |
| <b>RSF</b>            | Use of renewable secondary fuels                                        |
| <b>SM</b>             | Use of secondary materials                                              |
| <b>HWD</b>            | Hazardous waste disposed                                                |
| <b>NHWD</b>           | Non hazardous waste disposed                                            |
| <b>RWD</b>            | Radioactive waste disposed                                              |

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

## References

- General Programme Instructions of the International EPD® System. Version 5.0.1.
- PCR 2019:14 v.2.0.1 Construction products. EPD System.
- EN 15804:2012+A2:2019/AC:2021, Sustainability of construction works — Environmental Product Declarations - Core rules for the product category of construction products
- ISO 14020:2000 Environmental labels and declarations - General principles
- ISO 14025:2006 Environmental labels and declarations - Type III environmental declarations - Principles and procedures
- ISO 14040:2006 Environmental management - Life cycle assessment - Principles and framework
- ISO 14044:2006 Environmental management — Life cycle assessment — Requirements and guidelines
- Ecoinvent / Ecoinvent Centre, [www.Eco-invent.org](http://www.Eco-invent.org)
- Residual Energy Mix 2023 from Renewable Energy Sources Operator & Guarantees of Origin (DAPEEP SA)

## Version history

**2025-10-09/ EPD Version 001 Original version of EPD (unpublished version)**

**2025-10-15/ EPD Version 002 Added information regarding data quality assessment**

