Heidelberg Materials

# Environmental Product Declaration

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

## CEM II/ B-M (S-LL) 42,5 R

from

**Heidelberg Materials România S.A.**
**Tașca Cement Plant**

evoBUILD®
Low carbon Cement 30

| | |
|---|---|
| Programme: | The International EPD® System, www.environdec.com |
| Programme operator: | EPD International AB |
| Type of EPD: | EPD of a single product from a manufacturer |
| EPD registration number: | EPD-IES-0028986:001 |
| Version date: | 2026-03-16 |
| Validity date: | 2031-03-15 |

EPD INTERNATIONAL EPD SYSTEM

ECO PLATFORM EPD VERIFIED

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

# General information

## Programme information

| Programme: | The International EPD® System |
|---|---|
| Address: | EPD International AB<br>Box 210 60, SE-100 31 Stockholm, Sweden |
| Website: | www.environdec.com |
| E-mail: | support@environdec.com |

### Product Category Rules (PCR)

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

Product Category Rules (PCR):

- PCR 2019:14 Construction products; Version 2.0.1; 2025-06-05
- UN CPC 374

PCR review was conducted by:

The Technical Committee of the International EPD System. A full list of members is available on www.environdec.com. The review panel may be contacted via support@environdec.com. Members of the Technical Committee were requested to state any potential conflict of interest with the PCR Committee, and if there were conflicts of interest they were excused from the review. Rob Rouwette (chair), Noa Meron (co-chair).

c-PCR, if applicable:

c-PCR-001 Cement and Building Lime (EN 16908:2017+A1:2022); Version 1.0.0; 2025-04-08

### Third-party verification

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:

☒ Individual EPD verification with a pre-verified LCA/EPD tool

Third-party verifier: <Marcel Gómez Ferrer, Marcel Gómez Consultoría Ambiental S.L.>
Approved by: International EPD System

Pre-verified LCA tool or Pre-verified EPD tool:
GCCA Industry EPD Tool for Cement and Concrete; version 5.2

Third-party verifier, accountable for the tool verification:
Ugo Pretato and Elia Rillo
Studio Fieschi & soci Srl

Approved by: International EPD System

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

☐ Yes ☒ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit version number) or be based on fully aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison.
For further information about comparability, see EN 15804 and ISO 14025.

# INFORMATION ABOUT EPD OWNER

**Owner of the EPD:** Heidelberg Materials România S.A.
Address: 1 A, Șos. București-Ploiești, Bucharest Business Park, Building C2, 1st Floor, 1st District, 013681, Bucharest, Romania

**Contact:**
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**Address and contact information of the LCA practitioner commissioned by the EPD owner:**
Șerban Camelia, email: camelia.serban@heidelbergmaterials.com
Paleu Iuliana, email: iuliana.paleu@heidelbergmaterials.com

**Description of the organisation:**

**Heidelberg Materials Group**
For over 150 years, Heidelberg Materials has been a global leader in providing a diverse range of building materials and services. The Group's core activities include the production and distribution of cement, aggregates, concrete, and asphalt. Leveraging its shipping capabilities, Heidelberg Materials markets its products worldwide, with a focus on cement, clinker, secondary materials, and both solid and alternative fuels.

As one of the largest integrated building materials manufacturers globally by revenue, Heidelberg Materials operates across five continents. Its fully integrated business model spans the entire value chain - from raw material extraction and processing into cement, to ready-mix concrete production, recycling, and final distribution to customers. These operations are further supported by dedicated technology and service competence centers at regional and national levels, ensuring efficiency and innovation throughout the value chain.

**From HeidelbergCement România to Heidelberg Materials**
In 2023, we celebrated 25 years of HeidelbergCement's presence in Romania, a milestone that coincided with a significant rebranding initiative. As a result, HeidelbergCement România proudly became Heidelberg Materials România.

The rebranding process was a necessary evolution, as the "HeidelbergCement" brand no longer fully represented who we are, the values we uphold, and the future we envision. For years, we have been more than just a cement supplier, offering a diverse range of building materials, solutions, and services.

We remain true to the "Heidelberg" in our name: a trusted world leader in our industry, with 150 years of group-wide experience and 25 years of presence in Romania. Our new name marks continuity, but at the same time represents change.

## Heidelberg Materials România

With investments of more than €600 million, Heidelberg Materials România is one of the most important German investors in Romania and operates an extensive network comprising three cement plants, 18 RMC plants, 8 aggregate quarries, and 3 ballast pits. Active on the local market since 1998, the company has invested around €95 million in modernizing its cement, RMC, and aggregates divisions. These investments have been directed primarily toward reducing environmental impact and advancing sustainability across its operations.

## Entities in Romania:

**1. Cement**
- Tașca Cement Plant
- Chișcădaga Cement Plant
- Fieni Cement Plant
- Alternative fuels facility

**2. Aggregates**
- 8 quarries and 3 ballast pits

**3. Concrete**
- 18 RMC stations

## Products:

The company produces and sells various classes of cement and concrete, including high-strength, road paving, hydraulic works, and general use, as well as quarry and gravel pit aggregates.

This EPD covers information about cement type CEM II/ B-M (S-LL) 42,5 R, produced in Tașca Cement Plant.

## Product-related or management system-related certifications:

The company has implemented, certified, maintains and continuously improves an integrated management system, according to EN ISO 9001:2015 (certificate no. 1040), EN ISO 14001:2015 (certificate no. 070M), EN ISO 45001:2023 (certificate no. 015S) and a social accountability management system according to SA 8000:2014 (certificate no. 044R).

# Name and location of production site(s):

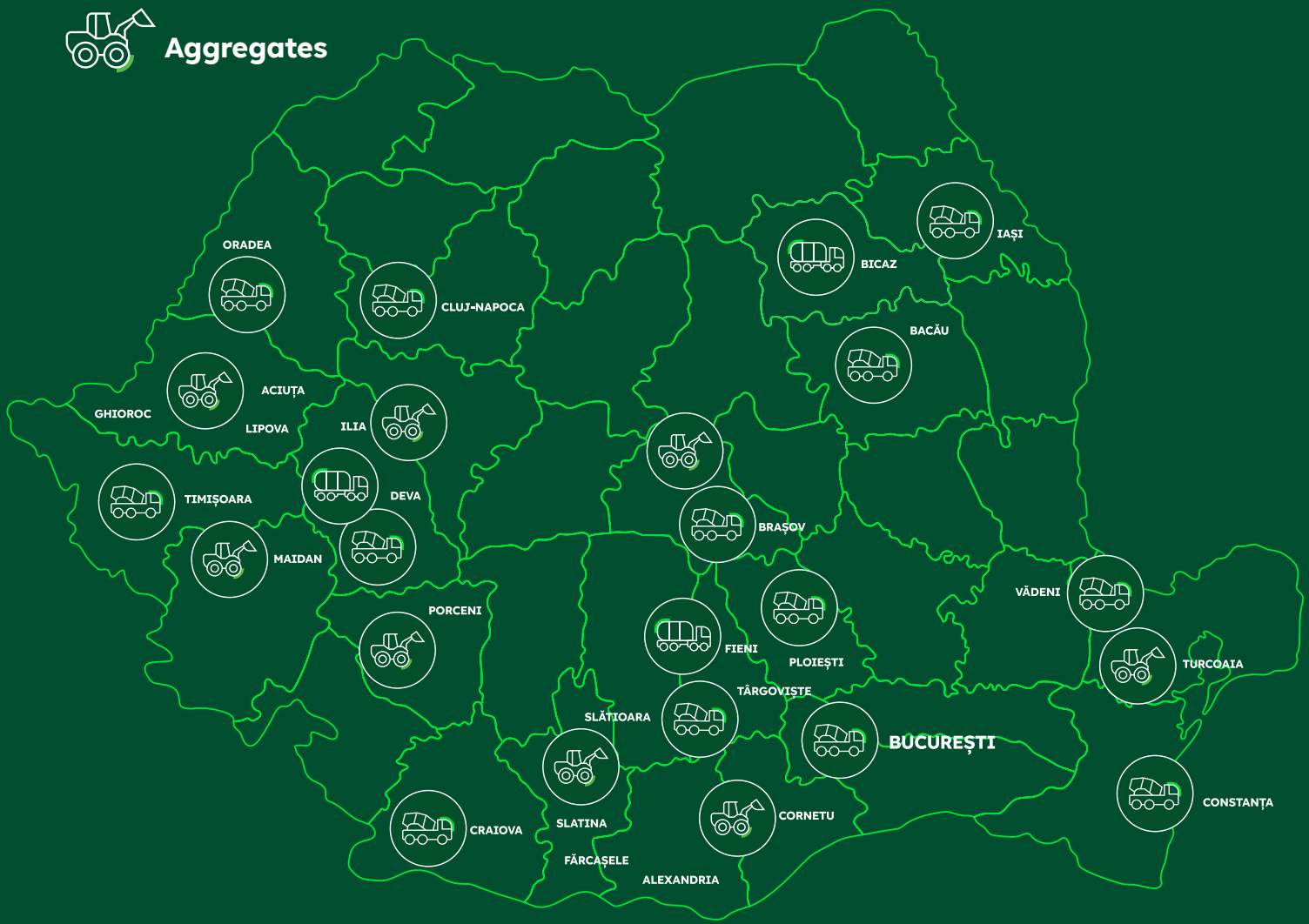
## Tașca Cement Plant

Tașca Village, Tașca Commune, 617455,
Neamț county, Romania

Cement

RMC

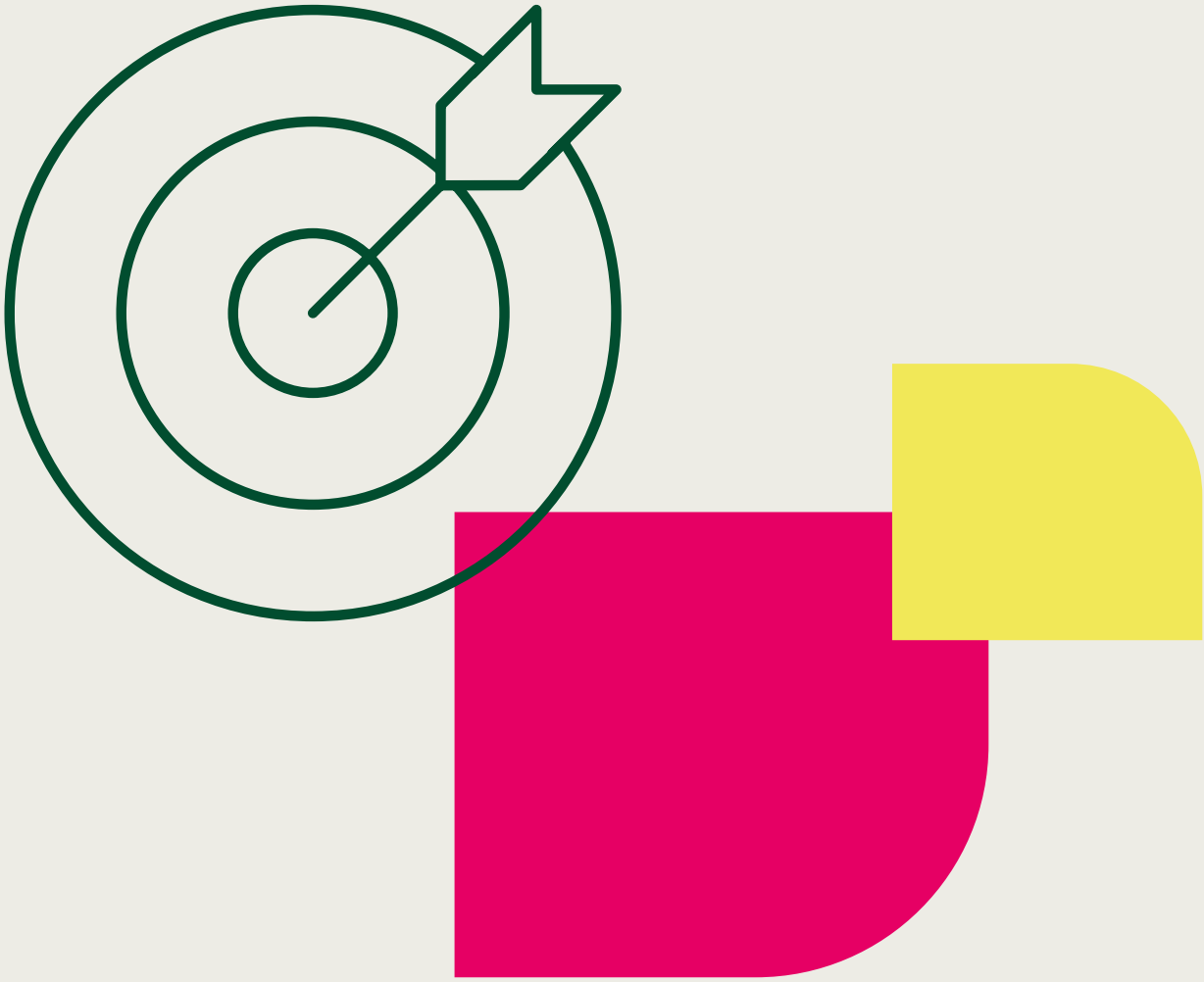
Aggregates



## Sustainability strategy

As a member of the Heidelberg Materials Group, we are dedicated to tackling global challenges that go beyond the climate crisis and demographic shifts.

Our strategy not only addresses environmental issues but also prioritizes objectives such as occupational health and safety, diversity and inclusion, and a strong commitment to the well-being of the communities surrounding our factories and workplaces.



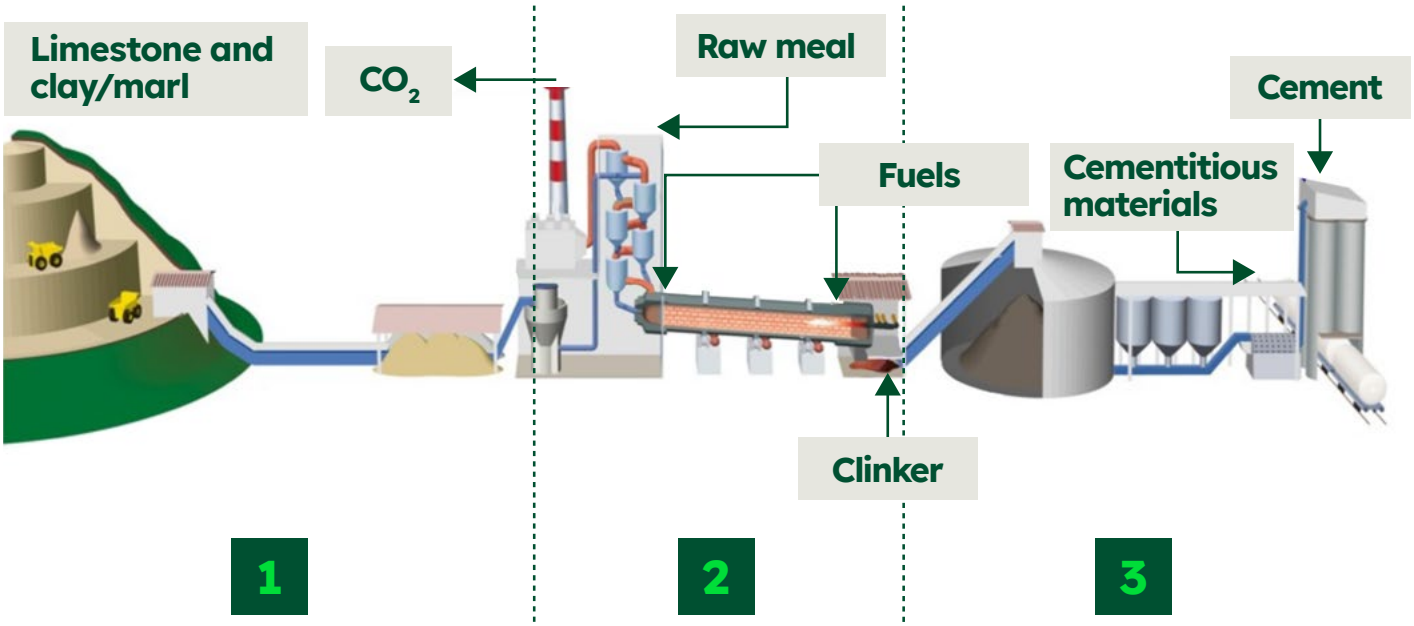
# Product information

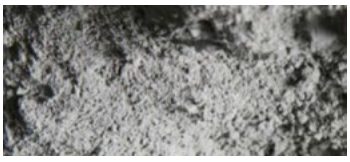
Cement and concrete will play an important role in the infrastructure of the future.

Cement is a hydraulic binder, i.e. a finely ground inorganic material which, when mixed with water, forms a paste which sets and hardens by means of hydration reactions and processes and which, after hardening, retains its strength and stability even under water.

The most important component of cement according to EN 197-1 is clinker. It is produced from raw materials such as limestone and marl which are crushed, homogenized and fed into a rotary kiln. The raw materials are sintered at a temperature of 1450°C to form new compounds. Clinker consists mainly of calcium, silicium, aluminium and iron-oxides.

In a second phase calcium sulphates and possibly additional cementitious or inert materials are added to the clinker. All constituents are ground leading to a fine and homogenous powder.
The following figure is a schematic representation of the cement manufacturing process from quarry to dispatch (production stage, information modules A1 to A3).



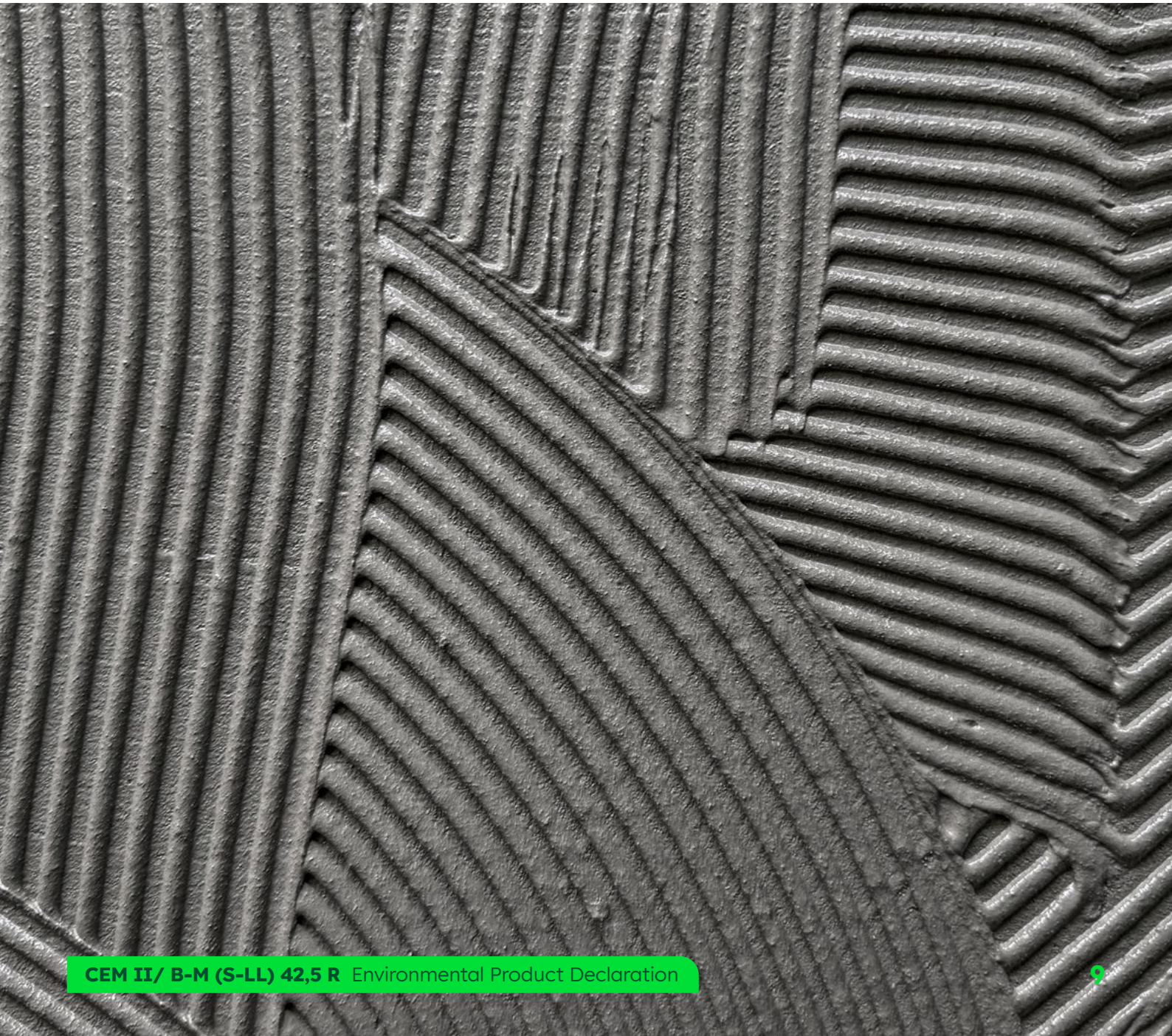

| | |
|---|---|
| **Product name:** | CEM II/ B-M (S-LL) 42,5 R |
| **Product identification:** | Portland-composite cement EN 197-1 – CEM II/ B-M (S-LL) 42,5 R<br><br>The Certificate of Constancy of Performance and the Declaration of Performance for this product can be downloaded from http://www.heidelbergmaterials.ro/ro/certificate. |
| **Visual representation (e.g., an image) of the product:** |  |
| **UN CPC code:** | 374 - Plaster, lime and cement |
| **Product description:** | CEM II/ B-M (S-LL) 42,5 R is a usual cement with a clinker content of 65-79%, produced according to EN 197-1 standard. CEM II/ B-M (S-LL) 42,5 R is suitable for preparation of plain and reinforced concrete, mortar, grout and other mixes for construction and for the manufacture of construction products, according to national application rules. |
| **Possible applications:** | - Usual and high compressive concrete strength for civil constructions, according to national application rules.<br>- Usual and precast elements.<br>- Mortars, grouts and other mixes for construction and for the manufacture of construction products. |

**Technical applications for this product can be downloaded from https://www.heidelbergmaterials.ro/ro/ciment.**

## Technical characteristics according to EN 197-1

| Mechanical & Physical Properties | Value | Unit |
|---|---|---|
| Early compressive strength (2 days) | ≥20 | MPa |
| Standard compressive strength (28 days) | ≥42.5 … ≤62.5 | MPa |
| Initial setting time | ≥60 | min |
| Soundness (expansion) | ≤10 | mm |

**Name and location of production site(s):**
Taşca Cement Plant - Taşca Village, Taşca Commune, 617455, Neamț county, Romania



# CONTENT DECLARATION

**The mass (weight) of one unit of a product, as purchased or per declared unit:**
The declared unit is 1 tone of CEM II/ B-M (S-LL) 42,5 R.

**Content of the product in the form of a list of materials and substances, and their mass:**

| Product content | Mass, kg | Post-consumer recycled material, mass-% of product | Biogenic material, mass-% of product | Biogenic material, kg C/ product or declared unit |
|---|---|---|---|---|
| Clinker | 650-750 | 5.1 | 0 | 0 |
| Limestone | 80-150 | 0 | 0 | 0 |
| Blast furnace slag | 100-200 | 0 | 0 | 0 |
| Other constituents | 50-100 | 0 | 0 | 0 |
| Minor constituents | 0-50 | 3.2 | 0 | 0 |
| TOTAL | 1.000 | 8.3 | 0 | 0 |

The blast furnace slag is a co-product and it is considered a pre-consumer material (12.2%).

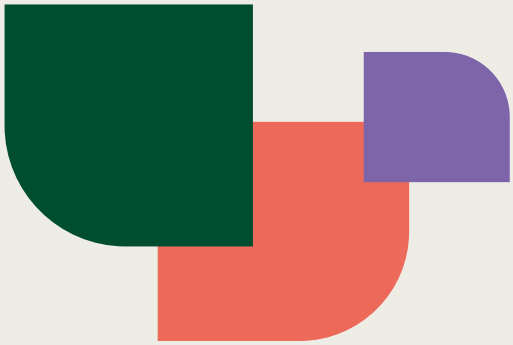
**The mass and the content of distribution and/or consumer packaging:**
This type of cement is delivered in bulk.

**Information on the environmental and hazardous/toxic properties of substances contained in the product:**
Declared products contain less than 0.1% or no hazardous substance, from the "Candidate list of Substances of Very High Concern".

The cement does not meet the criteria for PBT (persistent, bioaccumulative and toxic substances) or vPvB (very persistent and very bioaccumulative substances) according to Annex XIII of REACH (Regulation (EC) No. 1907/2006).
According to REACH, cement is a mixture and is not subject to the obligation of registration. Cement clinker is exempted from the obligation of registration (Art. 2.7 (b) and Annex V.10. of REACH).

Safety Data Sheet for cement, issued according to Regulation (EC) No. 1907/2006 (REACH) and Regulation (EC) No. 1272/2008, as further amended and supplemented, is available on www.heidelbergmaterials.ro.

**Packaging material:**
This type of cement is delivered in bulk.



# LCA information

**Declared unit:**
The declared unit is 1 tone of CEM II/ B-M (S-LL) 42,5 R, produced and delivered in bulk from Tașca Cement Plant.

**Reference service life:**
Not relevant due to the „cradle to gate" boundary conditions.

**Time representativeness:**
The production data correspond to the period from January 1st, 2025 to December 31st, 2025, except for the energy grid mix, which is based on 2024 data.

**Geographical scope:**
CEM II/ B-M (S-LL) 42,5 R is produced in Romania.
Coverage of global for raw materials (A1) and transport (A2).

**Database(s) and LCA software used:**
GCCA Industry EPD Tool for Cement and Concrete (V5.2), International version and LCA Database (v.5.2), Ecoinvent version 3.10.

**EPD/LCA Tool used:**
GreenDelta, GCCA Industry EPD Tool for Cement and Concrete, International Version, V5.2.

**Description of system boundaries:**
The LCA for CEM II/ B-M (S-LL) 42,5 R has a "cradle-to-gate" scope, with the end of life cycle being the outbound weigh bridges of the cement plant, including modules A1 to A3. This declaration includes all product stages "from cradle-to-gate" (modules A1-A3), and the product complies with the conditions required in EN 15804:2012+A2:2019/AC:2021 relating to the exclusion of modules B1 to D (the product is physically integrated into another product during installation in a way that it cannot be physically separated at end of life, the product is no longer identifiable at end of life as a result of a physical or chemical transformation process and it does not contain biogenic carbon).

Scenarios for these modules will be developed on the final product (for example: concrete and mortar).

The selected system boundaries comprise the production of cement including raw material extraction up to the finished product at the plant gate.

**Module A1 - Raw materials supply:** This module takes into account extraction and processing raw materials and primary fuels used in production process. Granulated blast furnace slag (GBFS) is used as a supplementary cementitious material in the composition of this type of cement. GBFS is a by-product of metallurgical industry, resulting from the production process of steel in blast furnaces. For the clinker used in the production of this type of cement, specific data from the manufacturer was used.

**Module A2 - Transport:** This module includes transportation of raw materials and fuels from supplier to plant gate and internal transports. Transportation types are considered as railway and roadway. The transport routes and the distances are supplier-specific.

**Module A3 - Manufacturing:** This module includes energy and water consumption during the manufacturing process, as well as the processing of any waste arising from this stage. The main production processes are:

- Quarrying and raw materials extraction
- Raw materials crushing
- Raw meal preparation
- Clinker production (pyro processing)
- Cement grinding and slag drying
- Cement dispatch/ loading

**Power mix -** Heidelberg Materials România purchased electrical energy for the cement production needs at the Tașca Cement Plant from the market.

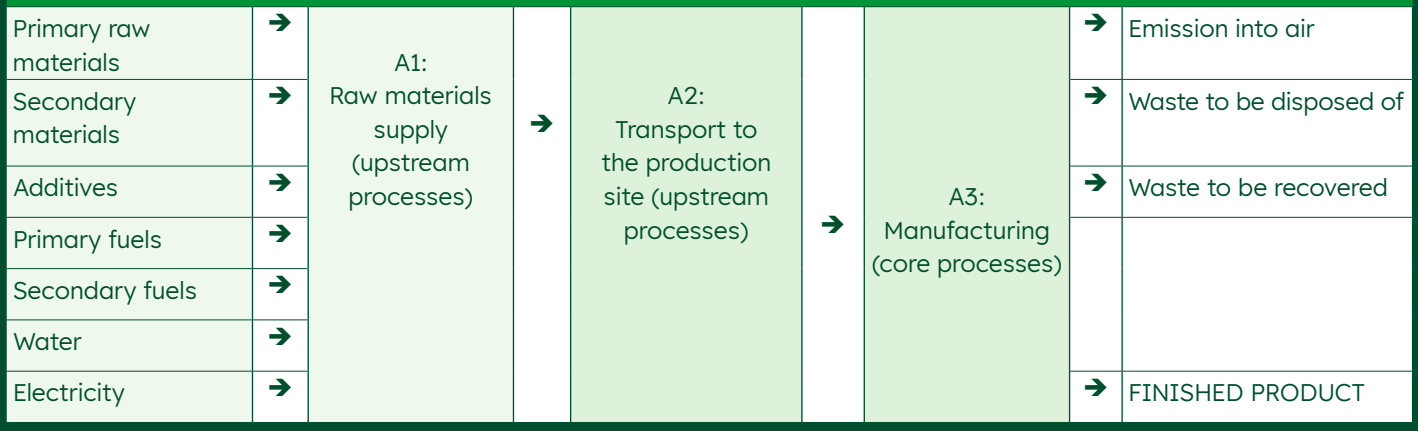
The source of electrical energy provided by the supplier comes from a mix of renewable and non-renewable primary energy and is confirmed by Romanian Energy Regulatory Authority.

The GHG-GWP of electricity is 0.301 kg $CO_2$ eq./kWh of electricity mix.

The GHG-GWP of natural gas is 0.2 kg $CO_2$ eq./kWh of natural gas.

**Process flow diagram:**
Process flow diagram of the product system, divided into the life-cycle stages and modules (or other division of the product life cycle, if defined in the PCR), showing the main processes included and the system boundary of the LCA. The diagram shall make it clear when the end-of-waste state is reached for main input flows of reused/recycled materials and recovered energy, and for output flows of reused/recycled materials and recovered energy exiting the end-of-life stage.

**Process Flow Diagram**



## Data collection and quality

Below is presented a summary of the data quality assessment, in line with EN 15941.

For the calculation of the LCA, the software GCCA's Industry EPD Tool for Cement and Concrete (V5.2), International version, was used. The Ecoinvent v3.10 database was used for general data.

All material flows of the processes are based on company and site-specific data gathered for one year of operation.

The technical staff provided all the necessary raw data and no data was missing.
The specific data production and background data has been collected on plant level. The reliability of the data is additionally confirmed by validation and verification process.

$CO_2$ emission factors for fuels and raw materials are measured throughout the year by accredited laboratories.

The emissions data used in the life cycle assessment are based on emissions measurements required by the environment legislation and come from continuous measurements collected at the on-site for the year 2025.

WBCSD Cement Sustainability Initiative Cement $CO_2$ and Energy Protocol, Version 3.1, $CO_2$ Emissions and Energy Inventory is used in case of lack of basic data.

The data quality assessment covers geographical, technological and temporal representativeness, and is based on the data quality criteria of Annex E, Table E.2 of EN 15804.

No poor or very poor relevant data used for geographical, technological and temporal representativeness.

The scale of values used is from 1 to 5, where 1 is the lowest score and 5 is the highest.
The overall data quality has been evaluated as good, obtaining 4.1 points out of 5, as detailed below.

Geographical Representativeness for each input:
- Raw materials - is mostly European and the score is 4 points;
- Manufacturing - the production process takes place in our own plant and the score is 5 points;
- Energy Source - electricity grid comes from specific supplier and the score is 5 points;
- Transport to the production site – the data is Global and the score is 3 points.

Technical Representativeness for each input:
- Raw materials – the data is from site-specific and the score is 5 points;
- Manufacturing – the production process was modelled using the site-specific data and the score is 5 points;
- Energy Source - electricity grid is known and is site-specific data, so the score is 4 points;
- Transport to the production site – not fully from site-specific transport and the score is 4 points.

Time Representativeness – the score is 3.5 points, as follows:
- site-specific data for 2025 were used, except for the energy grid mix, which is for the 2024;
- database used is Ecoinvent 3.10.

| Input | Representativeness | | |
|---|---|---|---|
| | Geographical | Technical | Time |
| Raw materials | 4 | 5 | 4 |
| Manufacturing | 5 | 5 | 4 |
| Energy source | 5 | 4 | 3 |
| Transport to the production site | 3 | 4 | 3 |
| **Total** | **4.3** | **4.5** | **3.5** |

### Cut-off rules

According to EN 15804, the cut-off criteria are 1% of renewable and non-renewable primary energy consumption and 1% of the total mass of materials input to these elementary processes.
The total neglected input flows per module, for modules A1-A3 must be a maximum of 5% of the consumption of energy and mass.

More than 99% of the materials and energy consumption have been included, as well as available emission measurements transportation where necessary.

The following processes have been excluded from the LCA study:

- the use of grinding balls;
- capital equipment production;
- equipment maintenance;
- human labor and employee transport;
- long term emissions.

### Allocation

Wherever possible, allocation has been avoided. The production process was divided into two sub-processes: clinker production and cement production.

Input and output data associated with each sub-process were meticulously recorded. When data couldn't be directly attributed to a specific product, they were assigned based on physical properties (such as mass).

The volumes of water (both consumed and recycled) and waste were allocated to each product based on the mass ratio of clinker to cement.

### Secondary materials, co-product allocations

No co-products occur during the production of clinker and cement, thus eliminating the need for allocations related to by-products.

In the case of blast furnace slag, a co-product from steel production used as a cement constituent, was applied an allocation factor according to the economic value of material.

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

| | 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 | De-construction demolition | Transport | Waste processing | Disposal | Reuse-Recovery-Recycling-potential |
| **Module** | **A1** | **A2** | **A3** | **A4** | **A5** | **B1** | **B2** | **B3** | **B4** | **B5** | **B6** | **B7** | **C1** | **C2** | **C3** | **C4** | **D** |
| Modules declared | X | X | X | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Geography | GLO | GLO | RO | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Share of primary data | 88% | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Variation – products | 0% | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Variation – sites | 0% | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

(X=included; ND=module not declared; GLO=Global; RO=Romania)

Declaration of sources and share of primary data: The share of primary data is calculated in accordance with the pre-verified tool. The quality data assessment has been conducted in conformity with the requirements of the applicable PCR and has been developed in an external calculation file. The assessment covers at least 88% of the results.

| Process | Source type | Source | Reference year | Data category | Share of primary data, of GWP-GHG results for A1-A3 |
|---|---|---|---|---|---|
| Clinker | Collected data, modelled via GGCA tool | Product specific processes data | 2025 | Primary data | 85% |
| Electricity | Collected data | Specific processes data | 2024 | Primary data | 3% |
| Manufacturing | Database | Ecoinvent 3.10 | 2025 | Secondary data | 0% |
| Transport to the production site | Database | Ecoinvent 3.10 | 2025 | Secondary data | 0% |
| Other processes | Database | Ecoinvent 3.10 | 2025 | Secondary data | 0% |
| **Total share of primary data, of GWP-GHG results for A1-A3** | | | | | **88%** |

# ENVIRONMENTAL PERFORMANCE

## LCA results of the product(s) - main environmental performance results

In the following tables is presented the environmental performance of the declared unit "1 tone of CEM II/ B-M (S-LL) 42,5 R, produced and delivered in bulk from Tașca Cement Plant", for modules A1 - A3.
The results are relative expressions and do not predict impacts on endpoint categories, exceedance of certain levels, safety margins or risks.

## Mandatory impact category indicators according to EN 15804

| Results per functional or declared unit of 1 tone of CEM II/ B-M (S-LL) 42,5 R | | |
|---|---|---|
| **Indicator** | **Unit** | **A1-A3** |
| Global Warming Potential fossil fuels (GWP-fossil) | kg $CO_2$ eq. | 6.46E2** |
| Global Warming Potential biogenic (GWP-biogenic) | kg $CO_2$ eq. | 1.87E-1** |
| Global Warming Potential land use and land use change (GWP-luluc) | kg $CO_2$ eq. | 1.11E-1 |
| Global Warming Potential Total (GWP-total) | kg $CO_2$ eq. | 6.46E2** |
| Depletion potential of the stratospheric ozone layer (ODP) | kg CFC 11 eq. | 1.45E-6 |
| Acidification potential, Accumulated Exceedance (AP) | mol $H^+$ eq. | 1.48E0 |
| Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-fresh water) | kg P eq. | 2.04E-2 |
| Eutrophication potential, fraction of nutrients reaching marine end compartment (EP-marine) | kg N eq. | 1.56E-1 |
| Eutrophication potential, Accumulated Exceedance (EP-terrestrial) | mol N eq. | 5.43E0 |
| Formation potential of tropospheric ozone (POCP) | kg NMVOC eq. | 1.34E0 |
| Abiotic depletion potential for non-fossil resources (ADP-mineral&metals*) | kg Sb eq. | 2.44E-3 |
| Abiotic depletion for fossil resources potential (ADP-fossil*) | MJ, net calorific value | 2.71E3 |
| Water (user) deprivation potential, deprivation-weighted water consumption (WDP*) | $m^3$ world eq. Deprived | 5.65E1 |

* Disclaimer:
The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.
** The indicated values (gross values) include the greenhouse gas emissions from the incineration of secondary fuels at clinker production. The net GWP-total (excluding the emissions from the incineration of secondary fuels at clinker production) is 6.02E2 kg $CO_2$-eq. The net GWP-fossil is 6.02E2 kg $CO_2$-eq. The net GWP-biogenic is 7.51E-2 kg $CO_2$-eq.

## Additional mandatory and voluntary impact category indicators

| Results per functional or declared unit of 1 tone of CEM II/ B-M (S-LL) 42,5 R | | |
|---|---|---|
| **Indicator** | **Unit** | **A1-A3** |
| GWP-GHG[1] | kg $CO_2$ eq. | 6.46E2* |

* The indicated values (gross values) include the greenhouse gas emissions from the incineration of secondary fuels at clinker production. The net GWP-GHG (excluding the emissions from the incineration of secondary fuels at clinker production) is 6.02E2 kg $CO_2$-eq.

[1]This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic $CO_2$ is set to zero.

## Resource use indicators

| Results per functional or declared unit of 1 tone of CEM II/ B-M (S-LL) 42,5 R | | |
|---|---|---|
| **Indicator** | **Unit** | **A1-A3** |
| Use of renewable primary energy excluding renewable primary energy resources used as raw materials (PERE) | MJ, net calorific value | 2.78E2 |
| Use of renewable primary energy resources used as raw materials (PERM) | MJ, net calorific value | 0E0 |
| Total use of renewable primary energy resources (PERT) | MJ, net calorific value | 2.78E2 |
| Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials (PENRE) | MJ, net calorific value | 2.71E3 |
| Use of non-renewable primary energy resources used as raw materials (PENRM) | MJ, net calorific value | 0E0 |
| Total use of non-renewable primary energy resources (PENRT) | MJ, net calorific value | 2.71E3 |
| Use of secondary material (SM) | kg | 2.05E2 |
| Use of renewable secondary fuels (RSF) | MJ, net calorific value | 3.36E2 |
| Use of non-renewable secondary fuels (NRSF) | MJ, net calorific value | 4.07E2 |
| Use of net fresh water (FW) | $m^3$ | 1.31E0 |

## Waste indicators

| Results per functional or declared unit of 1 tone of CEM II/ B-M (S-LL) 42,5 R | | |
|---|---|---|
| **Indicator** | **Unit** | **A1-A3** |
| Hazardous waste disposed (HWD) | kg | 4.44E-3 |
| Non-hazardous waste disposed (NHWD) | kg | 3.38E-2 |
| Radioactive waste disposed (RWD) | kg | 4.49E-3 |

## Output flow indicators

| Results per functional or declared unit of 1 tone of CEM II/ B-M (S-LL) 42,5 R | | |
|---|---|---|
| **Indicator** | **Unit** | **A1-A3** |
| Components for re-use (CRU) | kg | 0E0 |
| Material for recycling (MFR) | kg | 4.66E-1 |
| Materials for energy recovery (MER) | kg | 0E0 |
| Exported energy, electricity (EE) | MJ per energy carrier | 0E0 |

## Other non mandatory extra indicators

| Results per functional or declared unit of 1 tone of CEM II/ B-M (S-LL) 42,5 R | | |
|---|---|---|
| **Indicator** | **Unit** | **A1-A3** |
| Emissions from calcination and removals from carbonation (CC) | kg $CO_2$ eq. | 3.57E2 |
| Emissions from combustion of secondary fuels from renewable sources used in production processes (CWRS) | kg $CO_2$ eq. | 1.12E-1 |
| Emissions from combustion of secondary fuels from non-renewable sources used in production processes (CWNRS) | kg $CO_2$ eq. | 4.41E1 |
| Removals and emissions associated with biogenic carbon content of the bio-based product (GWP-prod) | kg $CO_2$ | 0E0 |
| Removals and emissions associated with biogenic carbon content of the bio-based packaging (GWP-pack) | kg $CO_2$ | 0E0 |

## Other non mandatory environmental performance indicators

| Results per functional or declared unit of 1 tone of CEM II/ B-M (S-LL) 42,5 R | | |
|---|---|---|
| **Indicator** | **Unit** | **A1-A3** |
| Potential incidence of disease due to PM emissions (PM) | Disease incidence | 8.81E-6 |
| Potential Human exposure efficiency relative to U235 (IRP) | kBq U235 eq. | 2E1 |
| Potential Comparative Toxic Unit for ecosystems (ETP) | CTUe | 2.06E3 |
| Potential Comparative Toxic Unit for humans - cancer (HTPC) | CTUh | 6.87E-6 |
| Potential Comparative Toxic Unit for humans - non-cancer (HTPNC) | CTUh | 6.64E-6 |
| Potential soil quality index (SQP) | dimensionless | 5.41E2 |

# ABBREVIATIONS

| Abbreviation | Definition |
|---|---|
| **General Abbreviations** | |
| EN | European Norm (Standard) |
| EPD | Environmental Product Declaration |
| ISO | International Organization for Standardization |
| LCA | Life Cycle Assessment |
| PCR | Product Category Rules |
| c-PCR | Complementary Product Category Rules |
| CEN | European Committee for Standardization |
| CPC | Central product classification |
| **Environmental Impact Indicators (EN 15804)** | |
| GHG | Greenhouse gas |
| GWP | Global Warming Potential (kg $CO_2$ eq.) |
| GWP-fossil | Global Warming Potential fossil fuels (kg $CO_2$ eq.) |
| GWP-biogenic | Global Warming Potential biogenic (kg $CO_2$ eq.) |
| GWP-luluc | Global Warming Potential land use and land use change (kg $CO_2$ eq.) |
| GWP-total | Global Warming Potential Total (kg $CO_2$ eq.) |
| GWP-GHG | Global Warming Potential for greenhouse gases (kg $CO_2$ eq.) |
| ODP | Depletion Potential of the stratospheric ozone layer (kg CFC-11 eq.) |
| AP | Acidification Potential, Accumulated Exceedance (mol $H^+$ eq.) |
| EP | Eutrophication Potential |
| EP-freshwater | Eutrophication Potential, fraction of nutrients reaching freshwater end compartment (kg P eq.) |
| EP-marine | Eutrophication Potential, fraction of nutrients reaching marine end compartment (kg N eq.) |
| EP-terrestrial | Eutrophication Potential, Accumulated Exceedance (mol N eq.) |
| POCP | Formation potential of tropospheric ozone (kg NMVOC eq.) |
| ADP | Abiotic Depletion Potential |
| ADP-minerals&metals | Abiotic depletion potential for non-fossil resources (kg Sb eq.) |
| ADP-fossil | Abiotic depletion for fossil resources potential (MJ) |
| WDP | Water (user) deprivation potential, deprivation-weighted water consumption ($m^3$) |
| **Resource Use Indicators** | |
| PERE | Use of renewable primary energy excluding renewable primary energy resources used as raw materials (MJ) |
| PERM | Use of renewable primary energy resources used as raw materials (MJ) |
| PERT | Total use of renewable primary energy resources (MJ) |
| PENRE | Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials (MJ) |
| PENRM | Use of non-renewable primary energy resources used as raw materials (MJ) |
| PENRT | Total use of non-renewable primary energy resources (MJ) |
| SM | Use of secondary material (kg) |
| RSF | Use of renewable secondary fuels (MJ) |
| NRSF | Use of non-renewable secondary fuels (MJ) |
| FW | Use of net fresh water ($m^3$) |

| Abbreviation | Definition |
|---|---|
| **Waste Indicators** | |
| HWD | Hazardous Waste disposed (kg) |
| NHWD | Non-Hazardous Waste disposed (kg) |
| RWD | Radioactive Waste disposed (kg) |
| **Output Flow Indicators** | |
| CRU | Components for Re-use (kg) |
| MFR | Material for Recycling (kg) |
| MER | Materials for Energy Recovery (kg) |
| EEE | Exported Energy, Electricity (MJ) |
| EET | Exported Energy, Thermal (MJ) |
| **Other non mandatory extra indicators** | |
| CC | Emissions from calcination and removals from carbonation (kg $CO_2$ eq.) |
| CWRS | Emissions from combustion of secondary fuels from renewable sources used in production processes (kg $CO_2$ eq.) |
| CWNRS | Emissions from combustion of secondary fuels from non-renewable sources used in production processes (kg $CO_2$ eq.) |
| GWP-prod | Removals and emissions associated with biogenic carbon content of the bio-based product (kg $CO_2$) |
| GWP-pack | Removals and emissions associated with biogenic carbon content of the bio-based packaging (kg $CO_2$) |
| **Other non mandatory environmental performance indicators** | |
| PM | Potential incidence of disease due to PM emissions (Disease incidence) |
| IRP | Potential Human exposure efficiency relative to U235 (kBq U235 eq.) |
| ETP | Potential Comparative Toxic Unit for ecosystems (CTUe) |
| HTPC | Potential Comparative Toxic Unit for humans – cancer (CTUh) |
| HTPNC | Potential Comparative Toxic Unit for humans - non-cancer (CTUh) |
| SQP | Potential soil quality index (dimensionless) |
| **Lifecycle Stages / Modules** | |
| A1 | Raw material supply |
| A2 | Transport |
| A3 | Manufacturing |
| A4 | Transport to site |
| A5 | Construction/Installation |
| B1 | Use |
| B2 | Maintenance |
| B3 | Repair |
| B4 | Replacement |
| B5 | Refurbishment |
| B6 | Operational energy use |
| B7 | Operational water use |
| C1 | Deconstruction/Demolition |
| C2 | Transport to waste processing |
| C3 | Waste processing |
| C4 | Disposal |
| D | Reuse-Recovery-Recycling potential |

| Abbreviation | Definition |
|---|---|
| **Other Relevant Terms** | |
| MJ | Megajoule |
| kg | Kilogram |
| $m^3$ | Cubic Meter |
| NMVOC | Non-Methane Volatile Organic Compounds |
| Sb eq. | Antimony Equivalents |
| P eq. | Phosphorus Equivalents |
| N eq. | Nitrogen Equivalents |
| CFC-11 eq. | Chlorofluorocarbon-11 Equivalents |
| $CO_2$ eq. | Carbon Dioxide Equivalents |
| kg C | Kilograms of Carbon |
| kg $CO_2$ eq. | Kilograms of Carbon Dioxide Equivalent |
| ND | Not Declared |
| GLO | Global |
| RO | Romania |
| GCCA | Global Cement and Concrete Association |
| RMC | Ready-mixed Concrete |
| REACH | Registration, Evaluation, Authorisation and Restriction of Chemicals |
| GBFS | Granulated blast furnace slag |
| WBCSD | World Business Council for Sustainable Development |

## References


**a)** General Programme Instructions of International EPD System. Version 5.0.1

**b)** PCR 2019:14. Construction Products. Version 2.0.1, date 2025-06-05

**c)** c-PCR-001 (TO PCR 2019:14) Cement and Building Lime (EN 16908:2017+A1:2022), Product Group Classification: UN CPC 374, Version 1.0.0, date 2025-04-08

**d)** EN 197-1:2011 „Cement. Part 1: Composition, specifications and conformity criteria for common cements"

**e)** ISO 14025:2010 „Environmental labels and declarations. Type III environmental declarations. Principles and procedures"

**f)** EN 15804:2012+A2:2019 and EN 15804:2012+A2:2019/AC:2021 „Sustainability of construction works – Environmental product declarations - Core rules for the product category of construction products"

**g)** EN 16908:2017+A1:2022 „Cement and building lime - Environmental product declarations - Product category rules complementary to EN 15804"

**h)** GCCA Industry EPD Tool for Cement and Concrete (V5.2, June 2025), International version and LCA Database (v.5.2, June 2025)

**i)** Background Reports (V5.2) and Environmental Data Sheet|Self Declaration (V5.2) for Portland cement clinker and cement CEM II/ B-M (S-LL) 42,5 R, generated by GCCA Industry EPD Tool for Cement and Concrete, 05.02.2026


## VERSION HISTORY

**Original Version of the EPD, 2026-03-16**

Heidelberg Materials

EPD
INTERNATIONAL EPD SYSTEM

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