

Environmental Product Declaration

Specific EPD

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

CEM II/A-S 42,5 R

CEMMAC a.s.



Programme

EPD Square | www.epdsquare.com

Programme operator

EPD Square, s.r.o.

EPD Registration number

SQ 00-059

Publication date

26.03.2026

Valid until

25.03.2031

General information

Product

CEM II/A-S 42,5 R

Program operator

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Owner of the declaration

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Manufacturer

CEMMAC a.s.
Cementárska 14, 914 42 Horné Srnie, Slovakia
Email: A.Cervenkova@cemmac.sk
Website: <https://www.pcla.sk/sk/stranka/uvod>

Place of production

Cementárska 14
914 42 Horné Srnie
Slovakia

Product Category Rules (PCR)

The CEN standard EN 15804+A2 serves as the core PCR.
In addition, EPD Square PCR v1.0.1, 2025 is used.

Declared unit

1 ton

Mass per DU

1000 kg

UN CPC code

37440

Geographical scope

Slovakia, Europe

Year of study

October 2024 - September 2025

Comparability

EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in the context of the building.

EPD author

Sarah Curpen, Silvia Vilčeková, EPD Clarity s.r.o.

Verification type

Independent verification of the declaration and data,
according to ISO14025:2006
External: ☒ / ☐

Verified by

Stanislava Borisová, dotEnvironment AB



*The owner of the declaration shall be liable for the underlying information and evidence.
EPD Square shall not be liable with respect to manufacturer, life cycle assessment data and evidence.*

System boundaries

This EPD is based on system boundary cradle to gate (A1-A3). In accordance with EN 15804+A2, end-of-life stages (C1–C4) are not modelled for cement, as cement is an intermediate product that is incorporated into concrete and does not exist as a standalone product at the building end of life. The end-of-life impacts of cement are therefore considered to be included within the end-of-life modelling of the concrete or construction product in which the cement is used. Excluding end-of-life stages at the cement level avoids double counting and is consistent with the modular structure and intent of EN 15804 for intermediate products.

Modules declared and geographical scope

	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	✓	✓	✓	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Geographic scope	SK	SK	SK	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

Modules not declared = MND

Description of organization

CEMMAC a.s. is a leading producer of high-quality cement and related building materials in Slovakia, with a long-standing tradition in the cement industry. The company operates a modern cement plant in Horné Srnie, established in 1885, and focuses on sustainable production through investments in green projects and advanced technologies. CEMMAC a.s. has implemented the quality management system EN ISO 9001, the environmental management system EN ISO 14001, and related standards for occupational health and safety, emphasizing continuous improvement in operations. For CEMMAC a.s., sustainability is a core value, committing to the highest standards of environmental management across all activities, including modernization projects like the replacement of raw material mills to enhance efficiency. Our management systems are optimized and regularly audited, drawing on best practices in the cement industry. Knowledge sharing within the organization plays a key role in driving innovation.

Our policy, applied throughout our operations, obliges us to:

- follow all relevant environmental regulations,
- improve environmental management to achieve industry-leading practices,
- monitor and report on environmental performance in line with our commitments,
- maintain open communication and ensure employees and partners fulfill their environmental responsibilities,
- proactively address climate change challenges,
- prevent pollution, reduce emissions, and optimize the use of energy, water, and natural resources,
- promote sustainable products, processes, and innovative business solutions,
- build positive relationships with stakeholders and strive to be good neighbors in the communities where we operate.

Product information

Product name

CEM II/A-S 42,5 R

Product description

CEM II/A-S 42.5R is a cement made by finely grinding Portland clinker, granulated blast furnace slag (6-20% according to EN 197-1) and gypsum. It achieves exceptionally high initial 2-day strength in the range of 25 to 29 MPa and normalized 28-day strengths of 57 to 61 MPa. Advantages: rapid increase in initial strengths and high final strengths very good workability and volume stability and higher development of hydration heat.

Standardized strength (28 days): 57-61 MPa

Product application

Concrete for demanding concrete structures

Concrete elements and structures requiring rapid increase in initial strength

Prefabricated concrete elements and building components (paving, permanent formwork, curbs, etc.)

Industrial floors

External concrete reinforced surfaces

Plain concrete and reinforced concrete, including higher strength classes

Cement screeds

Product standards

EN 197-1:2011 Cement. Part 1: Composition, specifications and conformity criteria for common cements

Geographical scope

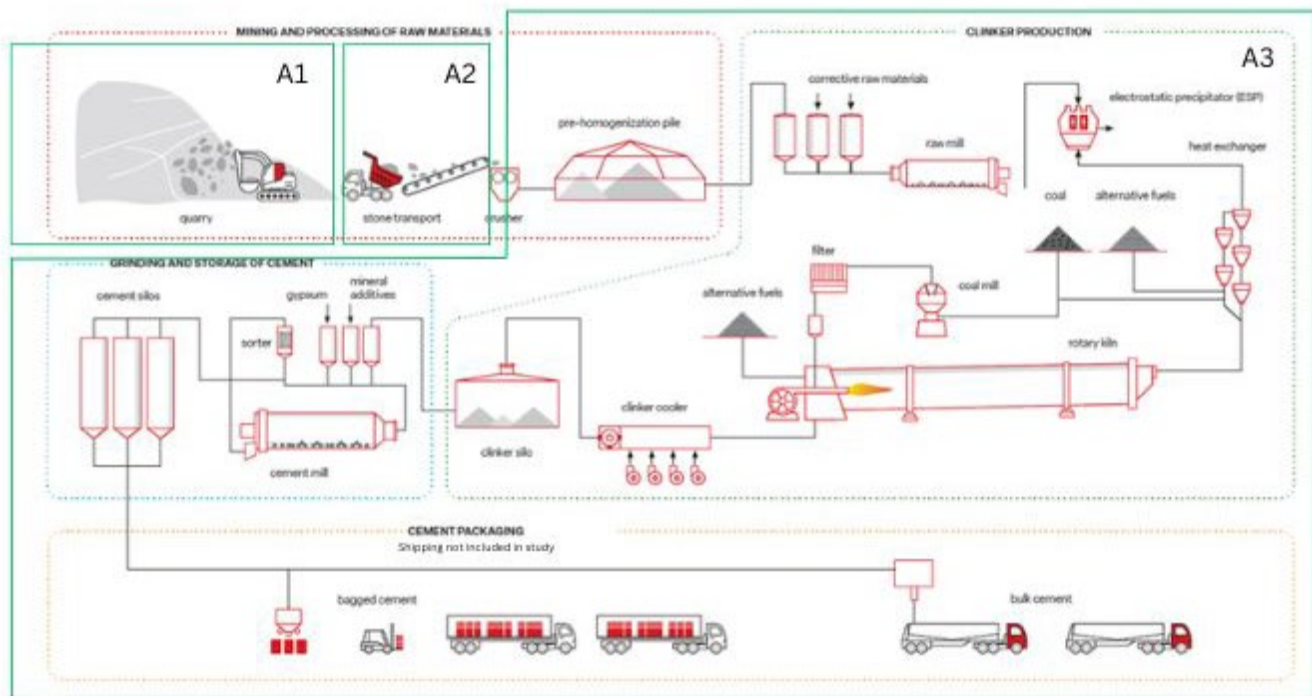
Slovakia, Europe

Product contents information

Product components	Weight, kg	Post-consumer material, weight-%	Renewable material, weight-%
Clinker	855	0	0
Gypsum	40,0	0	0
Blast furnace slag	82,6	0	0
Others	22,4	0	0
TOTAL	1000	0	0
Packaging materials	Weight, kg	Weight-% (versus the product)	
Wooden Pallet	0,221	0	
Paper	0,0122	0	
Plastic	0,0163	0	
TOTAL	0,250	0	

Manufacturing process

It is produced by grinding silicate (Portland) clinker together with granulated blast furnace slag and gypsum, which acts as a cement setting regulator. The slag, which can constitute up to 35% by weight of the cement, improves the mixability of the cement and reduces the heat of hydration. After firing in a rotary kiln, the clinker is transported to clinker silos. From there, it is conveyed in specified proportions to the clinker feed tank of the cement mill. Limestone and calcium sulfate are stored in separate tanks at the cement mill. Each tank is equipped with a weighing system that enables precise dosing of the individual components into the mill feed. The fineness of grinding is controlled by adjusting the speed of the classifier located downstream of the mill. The finished product is then transported to the appropriate shipping silos. Quality control during the grinding process is ensured through sampling using an automatic sampler. The samples are conveyed via pipeline to the laboratory, where the chemical composition and fineness of grinding are analysed.



Life cycle assessment

Cut-off criteria

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

Allocation, estimations, and assumptions

Allocation is based on annual production rate and made with high accuracy and precision. The values for 1 ton of the products which are used within this study are calculated by considering the total product weight per annual production. In the production plant, several kinds of products are produced; since the production processes of these products are similar, the annual production percentages are taken into consideration for allocation. According to the ratio of the annual production of the declared product to the total annual production at the factory, the annual total energy consumption, packaging materials and the generated waste per the declared product are allocated. Subsequently, the produced products output fixed to 1 ton and the corresponding amount of product is used in the calculations.

The assumptions made were related to the distances to disposal and recycling facilities for waste treatment which was estimated as 50km.

Module A1: This stage considers the extraction and processing of all raw materials. Within the product stage accurate data has been used.

Module A2: This stage accounts for transport activities.

Module A3: In the plant, electricity and heat is allocated to yearly consumption.

Database(s) and LCA software

This EPD has been created using One Click LCA Pre-Verified EPD Generator. Ecoinvent v3.11 and One Click LCA databases were used as sources of environmental data. Characterisation factors based on Environmental Footprint 3.1. (EF 3.1) have been used throughout the study.

LCA scenarios and additional technical information

Module A1

This module includes the extraction and processing of all raw materials which occur upstream to the manufacturing site. Data on the raw materials were provided directly by the manufacturer. Specific data were collected to reflect the actual inputs and sourcing.

Module A2

The considered transportation impacts include exhaust emissions resulting from transportation of all raw materials from suppliers to production plant as well as the environmental impacts of production of the used fuel. Transport modes and distances were based on the manufacturer's logistics records covering the period from October 2024 to September 2025.

Transportation scenario (A2)

Vehicle type used for transport	Transport, freight, lorry 16-32 metric ton, EURO6
Capacity utilization	100
Capacity utilization factor	1

Module A3

The environmental impacts considered for the production stage cover the manufacturing of the production materials and fuels used by machines. The environmental impacts of this stage have been calculated using the most recent data in regard to what was applied in the factory. The data is from the period from October 2024 to September 2025. The study considers the losses of main raw materials occurring during the manufacturing process. The production waste is considered to be transferred to the landfill. Electricity data were collected directly from the manufacturer, reflecting actual process energy use on-site. In the plant, electricity and gas are allocated on yearly consumption.

Manufacturing energy scenario (A3)

Electricity data source and quality	Electricity, high voltage, production mix	Ecoinvent 3.10.1
Electricity CO _{2e} / kWh	0,190 CO _{2e} / kWh	
Energy data source and quality	Heat and power co-generation, natural gas, 1MW electrical, lean burn	Ecoinvent 3.11
Energy kg CO _{2e} / MJ	0,0291 kg CO _{2e} / MJ	
Electricity data source and quality	Electricity production, photovoltaic, 3kWp slanted-roof installation, multi-Si, panel, mounted	Ecoinvent 3.11
Electricity kg CO _{2e} / kWh	0,0819 kg CO _{2e} / kWh	

End of Life (C1-C4) and module D

The end-of-life modules (C1-C4) and module D are omitted as the material fulfils the exemption criteria based on EN 15804+A2.

Data quality

The data quality information has been provided according to the requirements of EN 15941. The data assessment was done using the Product Environmental Footprint Category Rules. The data has been collected internally, considering the latest available average production amounts and measurements during the time period of 2024-2025. The quality level in this study is qualified as Good. Data quality rating procedure has been performed using a rating system where “1” means Very good quality, and “5” means Very poor quality. No fair, poor or very poor data was found during the assessment of relevant data.

Geographical rating	Technology Rating	Time-related rating
1,95 Good	1,0 Very Good	1,0 Very Good

Additional environmental information

Declared unit is 1 ton of the aggregates. If it is necessary to quantify the results to a product weight of 1 kg, the conversion factor is 0,001.

LCA results

Results are presented per 1 ton (DU) of the product. Estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

Core environmental impact indicators – EN 15804+A2

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	4,4E+02	MND	MND	MND	MND	MND	MND	MND
GWP-fossil	kg CO ₂ eq.	4,4E+02	MND	MND	MND	MND	MND	MND	MND
GWP-biogenic	kg CO ₂ eq.	0,0E+00	MND	MND	MND	MND	MND	MND	MND
GWP-LULUC	kg CO ₂ eq.	2,4E-02	MND	MND	MND	MND	MND	MND	MND
ODP	kg CFC-11 eq.	2,4E-06	MND	MND	MND	MND	MND	MND	MND
AP	mol H ⁺ eq.	3,1E-01	MND	MND	MND	MND	MND	MND	MND
EP-freshwater	kg P eq.	6,4E-03	MND	MND	MND	MND	MND	MND	MND
EP-marine	kg N eq.	5,7E-02	MND	MND	MND	MND	MND	MND	MND
EP-terrestrial	mol N eq.	6,8E-01	MND	MND	MND	MND	MND	MND	MND
POCP	kg NMVOC eq.	2,3E-01	MND	MND	MND	MND	MND	MND	MND
ADP-M&M	kg Sb eq.	2,9E-03	MND	MND	MND	MND	MND	MND	MND
ADP-fossil	MJ	7,5E+03	MND	MND	MND	MND	MND	MND	MND
WDP	m ³	2,9E+01	MND	MND	MND	MND	MND	MND	MND

GWP-total: Global Warming Potential; **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; See “additional requirements” for indicator given as PO₄ eq. **EP-marine:** Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **EP-terrestrial:** Eutrophication potential, Accumulated Exceedance; **POCP:** Formation potential of tropospheric ozone; **ADP-M&M:** Abiotic depletion potential for non-fossil resources (minerals and metals); **ADP-fossil:** Abiotic depletion potential for fossil resources; **WDP:** Water deprivation potential, deprivation weighted water consumption

Additional (optional) environmental impact indicators – EN 15804+A2

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	Disease incidence	3,8E-06	MND	MND	MND	MND	MND	MND	MND
IRP	kBq U235 eq.	2,5E+00	MND	MND	MND	MND	MND	MND	MND
ETP-fw	CTUe	2,1E+03	MND	MND	MND	MND	MND	MND	MND
HTP-c	CTUh	1,3E-08	MND	MND	MND	MND	MND	MND	MND
HTP-nc	CTUh	5,9E-07	MND	MND	MND	MND	MND	MND	MND
SQP	Dimensionless	6,4E+02	MND	MND	MND	MND	MND	MND	MND

PM: Particulate matter emissions; **IRP:** Ionising radiation, human health; **ETP-fw:** Ecotoxicity (freshwater); **ETP-c:** Human toxicity, cancer effects; **HTP-nc:** Human toxicity, non-cancer effects; **SQP:** Land use related impacts / soil quality

Use of natural resources

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
RPEE	MJ	2,4E+02	MND	MND	MND	MND	MND	MND	MND
RPEM	MJ	3,5E+00	MND	MND	MND	MND	MND	MND	MND
TPE	MJ	2,5E+02	MND	MND	MND	MND	MND	MND	MND
NRPE	MJ	7,5E+02	MND	MND	MND	MND	MND	MND	MND
NRPM	MJ	1,0E+00	MND	MND	MND	MND	MND	MND	MND
TRPE	MJ	7,5E+02	MND	MND	MND	MND	MND	MND	MND
SM	kg	9,2E+00	MND	MND	MND	MND	MND	MND	MND
RSF	MJ	1,2E-01	MND	MND	MND	MND	MND	MND	MND
NRSF	MJ	2,0E-03	MND	MND	MND	MND	MND	MND	MND
W	m ³	3,5E-01	MND	MND	MND	MND	MND	MND	MND

RPEE: Renewable primary energy resources used as energy carrier; **RPEM:** Renewable primary energy resources used as raw materials; **TPE:** Total use of renewable primary energy resources; **NRPE:** Non-renewable primary energy resources used as energy carrier; **NRPM:** Non-renewable primary energy resources used as materials; **TRPE:** Total use of non-renewable primary energy resources; **SM:** Use of secondary materials; **RSF:** Use of renewable secondary fuels; **NRSF:** Use of non-renewable secondary fuels; **W:** Use of net fresh water

End of life – Waste

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HW	kg	3,0E+00	MND	MND	MND	MND	MND	MND	MND
NHW	kg	6,1E+01	MND	MND	MND	MND	MND	MND	MND
RW	kg	9,9E-04	MND	MND	MND	MND	MND	MND	MND

HW: Hazardous waste disposed; **NHW:** Non-hazardous waste disposed; **RW:** Radioactive waste disposed

End of life – Output flows

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
CR	kg	0,0E+00	MND	MND	MND	MND	MND	MND	MND
MR	kg	3,6E-04	MND	MND	MND	MND	MND	MND	MND
MER	kg	3,6E-04	MND	MND	MND	MND	MND	MND	MND
EEE	MJ	3,4E-03	MND	MND	MND	MND	MND	MND	MND
ETE	MJ	0,0E+00	MND	MND	MND	MND	MND	MND	MND

CR: Components for reuse; **MR:** Materials for recycling; **MER:** Materials for energy recovery; **EEE:** Exported electric energy; **ETE:** Exported thermal energy

Information describing biogenic carbon content at factory gate

Biogenic carbon content	Value	Unit
Biogenic carbon content in product	-	kg C
Biogenic carbon content in the accompanying packaging	0,110	kg C

Specific data (GWP-GHG) and data variation for A1-A3

Specific data and data variation	Value-%
Specific data	95,3%
Variation - product	-
Variation - site	-

Hazardous substances

- ☒ The product does not contain any REACH SVHC substances in amounts greater than 0,1 %.

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Bibliography

ISO 14020:2000

Environmental labels and declarations – General principles

ISO 14025:2010

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

EN 15804:2012+A2:2019/AC:2021

Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products

EN 15941:2024

Sustainability of construction works - Data quality for environmental assessment of products and construction work - Selection and use of data

EPD Square PCR v.1.0.1, 2025

EPD Square, General Programme Instructions v.1, 2024

Ecoinvent database v3.11 (2024) and One Click LCA database

Annex

Environmental impacts – EN 15804+A1, CML/ISO 21930

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP	kg CO ₂ eq.	4,4E+02	MND	MND	MND	MND	MND	MND	MND
ODP	kg CFC-11 eq.	1,9E-06	MND	MND	MND	MND	MND	MND	MND
AP	kg SO ₂ eq.	2,5E-01	MND	MND	MND	MND	MND	MND	MND
EP	kg PO ₄ eq.	5,3E-02	MND	MND	MND	MND	MND	MND	MND
POCP	kg C ₂ H ₄ eq.	1,5E-02	MND	MND	MND	MND	MND	MND	MND
ADP-M&M	kg Sb eq.	5,8E-04	MND	MND	MND	MND	MND	MND	MND
ADP-fossil	MJ	7,4E+02	MND	MND	MND	MND	MND	MND	MND

Environmental impacts – GWP-GHG

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP - GHG	kg CO ₂ e	4,4E+02	MND	MND	MND	MND	MND

GWP- GHG: Global Warming Potential, greenhouse gases