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Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

CEM II/A-LL 42,5 R Radotín 2026

Owner of the declaration
Heidelberg Materials AG

Product
CEM II/A-LL 42,5 R Radotín 2026

Declared unit
1 tonne

This declaration is based on Product Category Rules
EN 15804:2012+A2:2019 serves as core PCR
EN 16908:2017 Cement and building lime

Program operator
EPD-Global

Declaration number
NEPD-17704-22205

Issue date
21.09.2026

Valid to
21.09.2031

EPD software:
LCA.no EPD generator ID: 1769027

EPD-Global

General information

Product
CEM II/A-LL 42,5 R Radotín 2026

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Declaration number
NEPD-17704-22205

Place of production
CZ12 Radotín
K cementárne 1261/25
15300 Praha-Radotín, Czech Republic

This declaration is based on Product Category Rules
EN 15804:2012+A2:2019 serves as core PCR
EN 16908:2017 Cement and building lime

Management system
ISO 9001, 14001, 45001, 50001

Statement of liability
The owner of the declaration shall be liable for the underlying information and evidence. EPD-Global shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Organisation no
DE143455653

Declared unit
1 tonne CEM II/A-LL 42,5 R Radotín 2026

Issue date
21.09.2026

Declared unit with option
A1-A3, A4

Valid to
21.09.2031

Year of study
2025

Functional unit

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

General information on verification of EPD from EPD tools
Independent verification of data, other environmental information and the declaration according to ISO 14025:2010, § 8.1.3 and § 8.1.4. Verification of each EPD is made according to EPD-Global's guidelines for verification and approval requiring that tools are i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPD-Global, and iii) the process is reviewed annually by an independent third party verifier. See Appendix G of EPD-Global's General Programme Instructions for further information on EPD tools

Development and verification of EPD
The declaration is created using EPD tool lca.tools ver EPD2022.03, developed by LCA.no. The EPD tool is integrated in the company's management system, and has been approved by EPD-Global. Approval number: NEPDT17

Developer of EPD Petr Wolanský

Reviewer of company-specific input data and EPD Hana Gurycová

Verification of EPD tool
Independent third party verification of the EPD tool, background data and test-EPD in accordance with EPD-Global's procedures and guidelines for verification and approval of EPD tools.

Third party verifier

Ellen Soldal, Norsus AS

(no signature required)

Approved
Håkon Hauan, CEO EPD-Global

Product

Product description

Cement is a hydraulic binder and is used in the production of e.g. concrete and mortar. It comprises a blend of finely ground, non-metallic inorganic substances. Upon mixing with water, a cement suspension (cement paste) is formed, which hardens and sets both in air and underwater through hydration reactions, resulting in a permanently solid structure. The relevant national regulations apply to its use.

Product specification

The declared product is a CEM II/A-LL 42,5 R in accordance with ČSN EN 197 standard. Performance data of the product are in accordance with the declaration of performance with respect to its essential characteristics according to ČSN EN 197-1.

Material	Value	Unit
Clinker	80–94	%
Limestone	6–20	%
Minor additional constituent	0–5	%

Technical data

The CEM II/A-LL 42,5 R is a Portland-composite cement manufactured by Heidelberg Materials CZ at the Radotín plant. The product complies with ČSN EN 197-1:2011. The conformity is assessed by the notified body Technical and Test Institute for Construction Prague. Its declared performance includes high early strength, standard strength class 42,5 R, controlled setting time, soundness, sulphate content and chloride content in accordance with the relevant harmonised standard. The cement is suitable for the preparation of concrete, mortars, injection mortars and other mixtures for construction and for the manufacture of construction products.

Market

Europe

Reference service life, product

No reference service life is declared as cement is an intermediate building product. A reference service life could be declared for downstream products such as ready-mix concrete, precast concrete, screed, plasters, masonry mortars or other building products in which cement is used.

Reference service life, building or construction works

For cement the reference service life of the building is not relevant.

LCA Calculation rules

Declared unit

1 tonne CEM II/A-LL 42,5 R Radotín 2026

Cut-off criteria

All major raw materials and all the essential energy are included. The production processes for raw materials and energy flows with very small amounts (less than 1%) may not be included. These cut-off criteria do not apply for hazardous materials and substances.

Allocation

The allocation is made in accordance with the provisions of EN 15804. Incoming energy and water and waste production in-house is allocated equally among all products through mass allocation. For co-products, an economic allocation is carried out. Furthermore, the processing, when applicable, and transportation of the co-product are included in this analysis.

Data quality

Specific data for the product composition are provided by the manufacturer. The data represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on EPDs in accordance with EN 15804 and different LCA databases. The data quality of the raw materials in A1 is presented in the table below.

Materials	Source	Data quality	Year
Explosive	ecoinvent 3.10.1	Database	2023
Primary fuel	ecoinvent 3.10.1	Database	2023
Primary material	ecoinvent 3.10.1	Database	2023
Primary material	LCA.no	Database	2024
Primary material	Modified ecoinvent 3.11	Database	2024
Secondary material	LCA.no	Database	2024
Secondary material or Supplementary cementitious material	LCA.no	Database	2024
Sulphate carrier	LCA.no	Database	2024
Waste products	LCA.no	Database	2024

System boundaries (X=included, MND=module not declared, MNR=module not relevant)

Product stage			Construction installation stage		Use stage							End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

System boundary

Type of the EPD: cradle to gate (A1 – A3) with option A4.
The applied system boundaries cover the production of cement including extraction of raw materials up to the finished product at the factory gate.
The product stage includes:
- Module A1: Extraction and processing of raw materials
- Module A2: Transport of raw materials to the factory gate
- Module A3: Clinker and cement production
The construction process stage includes:
- Module A4: Transport

module A1
Raw material extraction and processing

- EXTRACTION OF FUEL
- PROCESSING OF FUEL
- EXTRACTION OF RAW MATERIAL
- PROCESSING OF RAW MATERIAL
- ELECTRICITY PRODUCTION
- ALLOCATED IMPACT OF CO-PRODUCT

module A2
Transport to manufacturer

- UPSTREAM TRANSPORT OF FUEL
- UPSTREAM TRANSPORT OF RAW MATERIAL

module A3
Manufacturing

- PREPARATION OF ANCILLARY MATERIAL OR PRE-PRODUCT
- RAW MATERIAL GRINDING
- PROCESSING OF CEMENT CONSTITUENT
- PRODUCTION OF CLINKER
- PRODUCTION OF CEMENT
- WASTE PROCESSING

MANUFACTURING WITH CSS:

- INFRASTRUCTURE
- CO_2 CAPTURE AND STORAGE

BAGGED CEMENT:

- PACKAGING OF CEMENT

module A4
Transport to customer

- TRANSPORT OF PRODUCT

Additional technical information

No further technical information is relevant.

LCA Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

The transport scenario presented in A4 refers to a transport with diesel-driven trucks over a distance of 100 km.

Transport from production place to user (A4)	Capacity utilisation, incl. return (%)	Distance (km)	Fuel/Energy Consumption	Unit	Value (l/t)
Transport|Truck, over 32 tonnes, EURO 6|km|RER	55.0 %	100.00	0.023	l/tkm	2.30

LCA Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document.

Environmental impact				
Indicator		Unit	A1-A3	A4
	GWP-total	kg CO_2 -eq	5.88E+02	1.04E+01
	GWP-fossil	kg CO_2 -eq	5.88E+02	1.03E+01
	GWP-biogenic	kg CO_2 -eq	4.63E-01	6.71E-03
	GWP-luluc	kg CO_2 -eq	2.19E-02	4.03E-03
	ODP	kg CFC11 -eq	5.12E-07	2.00E-07
	AP	mol H+ -eq	1.34E+00	2.44E-02
	EP-FreshWater	kg P -eq	7.41E-02	7.23E-04
	EP-Marine	kg N -eq	5.28E-01	6.40E-03
	EP-Terrestial	mol N -eq	6.17E+00	6.93E-02
	POCP	kg NMVOC -eq	1.38E+00	4.24E-02
	ADP-minerals&metals[1]	kg Sb-eq	8.70E-05	2.96E-05
	ADP-fossil[1]	MJ	2.65E+03	1.55E+02
	WDP[1]	m^3	1.27E+01	7.95E-01

GWP-total = Global Warming Potential total; GWP-fossil = Global Warming Potential fossil; 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

"Reading example: 9.0 E-03 = 9.0*10-3 = 0.009"

1. 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.

Remarks to environmental impacts

The LCA results in the EPD are calculated using a specific methodological approach for accounting energy resources, see the additional requirements section for more information. In this EPD the following approach was used: Market-based approach.

The core GWP indicators declared do not include the emissions from the combustion of waste fuels (GWP, net). The waste status of the waste-based fuels has been proven. The GWP indicators including the emissions from the combustion of waste fuels (GWP, gross) are reported separately in this EPD under "Additional Environmental Information".

Additional environmental impact indicators				
Indicator		Unit	A1-A3	A4
	PM	Disease incidence	5.04E-06	1.00E-06
	IRP[2]	kgBq U235 -eq	3.07E+01	1.87E-01
	ETP-fw[1]	CTUe	3.13E+02	1.83E+01
	HTP-c[1]	CTUh	2.64E-08	0.00E+00
	HTP-nc[1]	CTUh	1.87E-06	1.00E-07
	SQP[1]	dimensionless	3.65E+02	1.56E+02

PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Potential Soil Quality Index (dimensionless)

"Reading example: 9.0 E-03 = 9.0*10-3 = 0.009"

1. 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.
2. 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.

Resource use				
Indicator		Unit	A1-A3	A4
	PERE	MJ	5.21E+01	2.53E+00
	PERM	MJ	0.00E+00	0.00E+00
	PERT	MJ	5.21E+01	2.53E+00
	PENRE	MJ	2.65E+03	1.55E+02
	PENRM	MJ	0.00E+00	0.00E+00
	PENRT	MJ	2.65E+03	1.55E+02
	SM	kg	2.58E+01	0.00E+00
	RSF	MJ	6.02E+02	8.47E-04
	NRSF	MJ	1.53E+03	0.00E+00
	FW	m^3	2.06E+00	2.29E-02

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary materials; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water

"Reading example: 9.0 E-03 = 9.0*10-3 = 0.009"

End of life - Waste				
Indicator		Unit	A1-A3	A4
	HWD	kg	1.90E+01	2.25E-01
	NHWD	kg	3.71E+02	4.50E+00
	RWD	kg	7.31E-03	4.63E-05

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed

"Reading example: 9.0 E-03 = 9.0*10-3 = 0.009"

End of life - Output flow				
Indicator		Unit	A1-A3	A4
	CRU	kg	0.00E+00	0.00E+00
	MFR	kg	2.11E-01	0.00E+00
	MER	kg	5.75E-09	0.00E+00
	EEE	MJ	1.07E-04	0.00E+00
	EET	MJ	7.76E-05	0.00E+00

CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported energy electrical; EET = Exported energy thermal

"Reading example: 9.0 E-03 = 9.0*10-3 = 0.009"

Biogenic Carbon Content		
Indicator	Unit	At the factory gate
Biogenic carbon content in product	kg C	0.00E+00
Biogenic carbon content in accompanying packaging	kg C	0.00E+00

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO2

Additional requirements

Transparent reporting of energy

The table below presents GWPtotal values for energy resources used in the manufacturing phase (A3), calculated with both the location-based and market-based approach. This information is provided for transparency, allowing EPD users to understand the impact of these methodological choices. In this EPD, the following methodology was used in the main results: Market-based approach.

Electricity mix	Source	Amount	Unit	GWPtotal [kg CO2/Unit]	SUM [kg CO2]
Location-based approach.					
Electricity, Czechia, medium voltage	ecoinvent 3.10.1	9.68E+01	kWh	6.39E-01	6.18E+01
Market-based approach.					
Electricity, Czechia, medium voltage, residual mix	ecoinvent 3.10.1	9.68E+01	kWh	7.60E-01	7.35E+01

"Reading example: 9.0 E-03 = 9.0*10-3 = 0.009"

Dangerous substances

The product contains no substances given by the REACH Candidate list.

Indoor environment

As a component of downstream materials, cement does not release any harmful substances to indoor environment.

Additional Environmental Information

Additional environmental impact indicators required in NPCR Part A for construction products			
Indicator	**Unit**	A1-A3	A4
GWPIOBC	kg CO_2 -eq	5.88E+02	1.04E+01

GWP-IOBC: Global warming potential calculated according to the principle of instantaneous oxidation. In order to increase the transparency of biogenic carbon contribution to climate impact, the indicator GWP-IOBC is required as it declares climate impacts calculated according to the principle of instantaneous oxidation. GWP-IOBC is also referred to as GWP-GHG in context to Swedish public procurement legislation.

Additional GWP indicators in accordance with cPCR and more transparent reporting related to CCS		
Indicator	**Unit**	**A1-A3**
GWP-total, gross	kg CO_2 -eq	7.18E+02
GWP-fossil, gross	kg CO_2 -eq	7.18E+02
GWP-biogenic, gross	kg CO_2 -eq	4.63E-01
GWP-luluc, gross	kg CO_2 -eq	2.19E-02
GWP-total, net	kg CO_2 -eq	5.88E+02
GWP-fossil, net	kg CO_2 -eq	5.88E+02
GWP-biogenic, net	kg CO_2 -eq	4.63E-01
GWP-luluc, net	kg CO_2 -eq	2.19E-02
CWRS	kg CO_2 -eq	0.00E+00
CWNRS	kg CO_2 -eq	1.30E+02
CC	kg CO_2	4.21E+02
CCS	kg CO_2	0.00E+00

GWP-total, gross = Global Warming Potential total, gross (GWP-fossil, gross + GWP-biogenic, gross + GWP-luluc); GWP-total, net = Global Warming Potential total, net (GWP-fossil, net + GWP-biogenic, net + GWP-luluc); GWP-fossil, gross = Global Warming Potential fossil fuels, gross (includes emissions from combustion of waste fuels from non-renewable sources); GWP-fossil, net = Global Warming Potential fossil fuels, net (excludes emissions from combustion of waste fuels from non-renewable sources); GWP-biogenic, gross = Global Warming Potential biogenic, gross (includes emissions from combustion of waste fuels from renewable sources); GWP-biogenic, net = Global Warming Potential biogenic, net (excludes emissions from combustion of waste fuels from renewable sources); GWP-luluc = Global Warming Potential land use and land use change; CWRS = Emissions from combustion of waste from renewable sources; CWNRS = Emissions from combustion of waste from non-renewable sources; CC = Emissions from decarbonization of limestone in clinkering (process emissions, clinker); CCS = Amount of carbon reductions from carbon capture and storage considered in the main results of the EPD

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ČSN EN 197-2:2020 Cement - Part 2: Assessment and verification of constancy of performance

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