Environmental Product Declaration

GRUPO CEMENTOS PORTLAND VALDERRIVAS

OLAZAGUTÍA

CEM II/B-L 32,5 N

EPD developed and verified according to:

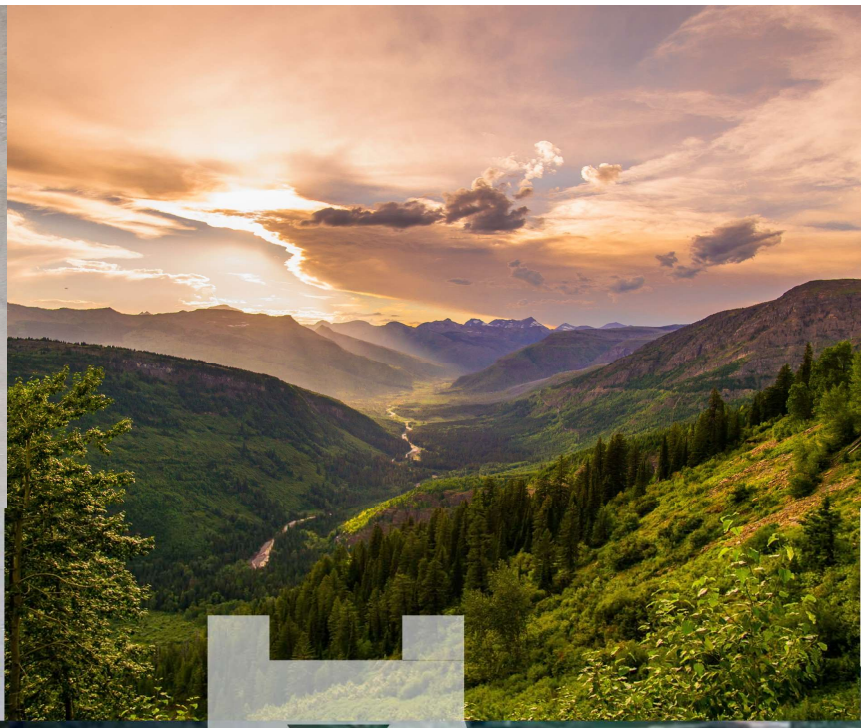
EN ISO 14025:2010
EN 15804:2012+A2:2019
EN 16908:2017+A1:2022

Date of first Issue: 2025-02-11

Expiry date: 2030-02-10

The declared validity is subject to registration and publication on www.aenor.com

Registration code: GlobalEPD EN 16908-080



The holder of this declaration is responsible for its content, as well as for retaining the supporting documentation that justifies the data and statements included during the validity period

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EN 16908:2017+A1:2022

The European Standard EN 15804:2012+A2:2019 serves as the basis for PCR

Independent verification of the declaration and data, according to
EN ISO 14025:2010

☐ Internal ☒ External

Verification Body

Product certification body accredited by ENAC with accreditation No. 1/C-PR468

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1. General information

1.1. Organization carrying out the EPD

Cementos Portland Valderrivas is a Spanish multinational company in the cement industry with over 100 years of experience in the production and distribution of cement and its related products: concrete, mortar, and aggregates.

Innovation and continuous improvement have placed us in a leadership position in the Spanish market, where we supply our products from the 7 factories spread across the country. In the markets of Tunisia and the United Kingdom, we also have factories and import terminals, establishing ourselves as industry leaders there as well. We are committed to the sustainability of our planet and are dedicated to developing responsible products that contribute to building the cities of the future.

The Olazagutía Factory, located in the municipality of Olazagutía in Navarra, has its origins in the Cementos Cangrejo Society, which decided to build a wet-process cement factory in 1903, making it one of the first in Spain.

In 1993, it joined the Cementos Portland Group. The Olazagutía factory began clinker production using the dry process in the 1960s. Currently, it has two lines for gray cement and two cement mills. Along with the exceptional marl from the Olazagutía quarry, the factory is recognized for the quality and diversity of cement types

1.2. Scope

This EDP includes the cement CEM II/B-L 32,5 N manufactured according to the UNE-EN 197-1 standard within a scope of A1-A3. The cements do not declare beyond module A3 as they lose their physical identity or are not recognizable or separable on site.

1.3. Life Cycle and Compliance

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This EPD has been developed and verified in accordance with the Standards EN ISO 14025: 2010 y EN 15804:2012+A2:2019 and the following PCR:

PRODUCT CATEGORY RULES INFORMATION	
Descriptive Title	Cement and building lime - Environmental product declarations - Product category rules complementary to EN 15804
Registration Code and versión	EN 16908:2017+A1:2022
Issue Date	2019
Conformity	EN 15804:2012 + A2:2019
Program Administrator	AENOR

This EPD includes the following life cycles stages:

SYSTEM BOUNDARIES. INFORMATION MODULES CONSIDERED			
Product Stage	A1	Raw Material Supply	X
	A2	Transport	X
	A3	Manufacturing	X
Construction Stage	A4	Transport to const work	MNE
	A5	Construction / Installation process	MNE
Use Stage	B1	Use	MNE
	B2	Maintenance	MNE
	B3	Repair	MNE
	B4	Replacement	MNE
	B5	Refurbishment	MNE
	B6	Operational energy use	MNE
	B7	Operational water use	MNE
End of life Stage	C1	Deconstrution / demolition	MNE
	C2	Transport	MNE
	C3	Waste processing	MNE
	C4	Disposal	MNE
	D	Benefits and loads beyond the system boundary	MNE

X = Information module included in LCA/EPD
NR = Not relevant module ; MNE = Not evaluated

Similarly, EPDs may not be comparable if the origin of the data is different (for example, databases), not all relevant information modules are included, or they are not based on the same scenarios.

The comparison of construction products must be conducted based on the same function, applying the same functional/declared unit and at the building (or architectural or engineering work) level. This means considering the product´s behavior throughout its entire life cycle, as well as the specifications outlined in section 6.7.2 of the UNE-EN 14025 standard

2. Product

2.1. Product Identification

Cement is a hydraulic binder, which means it is an inorganic material finely ground that, when mixed with water, forms a paste that sets and hardens through hydration reactions and processes. Once hardened, it retains its strength and stability, even underwater.

Cement produced according to European cement standards and classified by its different types is capable, when appropriately dosed with water and aggregates, of producing concrete or mortar that retains its workability for a sufficient period. It should reach the specified levels of strength after defined periods and also exhibit long-term volume stability.

The hydraulic hardening of cement is primarily due of the hydration of calcium silicates, although other chemical compounds like aluminates can also participate in the hardening process

CEM II/B-L 32.5 N cement is used in ready-mix concrete plants to produce mass concrete, stabilized mortar, and self-compacting concrete.

It is also recommended to produce masonry mortars.

The classification of cement according to the UN Central Product Classification (CPC) corresponds to code 37440.

2.1. Product Performance

Cement is primarily used for the manufacturing of concrete, mortars, and cement-based prefabricated elements. As a result, it has numerous applications in construction, meeting the demands for durability and structural reliability. Its applications include, among others: structures, buildings, pavements and floors, ports and maritime works, airports, dams, purification plants and hydraulic works. CEM II/B-L 32,5 N cement can be used in accordance with the instructions specified in the Cement Reception Instruction (RC-16) and in the Structural Code.

Performance	Reference Standard	Specification	Unit
Chlorides	197-1	≤ 0,10	%
Sulphates	197-1	≤ 3,5	%
Initial setting time	197-1	≥ 75	min
Expansion	197-1	≤ 10	mm
Standard strength, 28 days	197-1	≥32,5 ≤52,5	MPa
Early strength, 2 days	197-1	≥ 16,0	MPa

2.2. Product Composition

The composition of cement CEM II/B-L 32,5 N according to the UNE- EN 197- 1 standard is included in the following table:

Cement	Clínker (%)	Limestone L (%)	Limestone LL (%)	Ashes (%)	Slag (%)	Pozzolans (%)	Minor components (%)
CEM II/B-L 32,5 N	65-79	21-35	-		-	-	0-5

None of the components of the final product are included in the “Candidate list of Substances of Very High Concern for Authorisation.

3. LCA Information

3.1. Life Cycle Analysis

The life cycle analysis is described in the LCA project report by the plant, August 2024 taking as primary reference data those of the year 2023. And where necessary, the Ecoinvent 3.8 database has been used. For the assessment in terms of environmental impacts, the software tool called èdit® in its version 1.72.0 has been used.

3.2. Declared Unit

The declared unit is 1.000 kg (1 ton) of cement.

3.3. Reference Service Life

The reference service life is linked to the service life of the structural elements in which it is integrated. For indicative purposes

TYPE OF STRUCTURE	NOMINAL SERVICE LIFE
Temporary Structures	3 - 10 years
Replaceable elements that are not part of the main structure railings, pipes support)	10 - 25 years
Agricultural or industrial buildings (or facilities) and maritime works	15 - 50 years
Residential or office buildings, bridges or passages with a total length <10m, and civil engineering structures (except maritime works) of low or medium economic impact	50 years
Monumental or especially significant buildings	100 years
Bridges with a total length equal or greater than 10m and other civil engineering structures of high economic impact	100 years

3.4. Allocation criteria

A physical, mass-based criterion has been applied to allocate inputs and outputs of the production system to each product, based on production for flows associated with the production process, such as energy consumption and waste generation. For the allocation of co-products, an economic allocation has been followed in accordance with section 6.4.3.3 of EN 16908.

3.5. Representativity, Quality and Selection of data

The EPDs have been developed using primary data for the supply, transportation, and manufacturing stages. These primary data, collected in the factory, come from the records of the facility's management systems and the control system. The primary data is entirely traceable.

Transport and impact calculation models have also been used for those upstream stages of the process. In these cases, the Ecoinvent 3.8 database has been utilized.

3.6.1 Other Calculation Rules and Assumptions

No additional calculation rules have been required beyond the ones mentioned so far.

3.6.1 Biogenic carbon

The declaration of biogenic carbon is omitted in product and packaging due to the nature of product, both are well below 5% threshold in relation to the total mass of the product, as indicated in the standard UNE-EN 15804:2012+A2:2020.

4. System Boundaries, Scenarios and Additional Tecnichal Information

The present EPD declares a scope of the 'cradle to door', including modules A1-A3, product stage, according to the modular scheme of UNE EN 15804+ A2.

The cement manufacturing process comprises the following stages, all of which have been included in the life cycle analysis.

4.1. A1. Extraction and preparation of Raw Materials

The cement manufacturing process begins with the extraction of raw materials. Quarries are exploited through blasting or excavation, depending on the nature of the material being extracted. The main raw materials are limestone and marl.

4.2. A2. Transport

The material is crushed to the appropriate particle size and transported to the factory, if applicable, to the prehomogenization yard. The remaining raw materials and fuels are transported to the factory via shipping, road, and rail transport.

4.3 A3. Manufacturing of the product

Homogenization and Grinding of Raw Materials

If necessary, in the prehomogenization yard, the crushed material is stored in uniform layers to ensure a proper mixture of its components for subsequent grinding, reducing its variability. The material is then sent to vertical or ball mills, where it is ground and stored in silos awaiting further processing in the kiln.

Cyclone Preheater

The raw material, known as raw meal, is fed to the kiln through the cyclone preheater, which heats it to facilitate the subsequent calcination process. The raw meal is introduced at the top of the tower and descends countercurrent to the hot gases from the kiln, reaching a temperature to around 1000 ºC

Clinker manufacturing

The raw meal enters the rotating kiln, where the temperature rises to approximately 1500 ºC. During this phase, complex chemical reactions occur, resulting the formation of clinker. The kiln is fueled by materials like coke or coal, as well as alternative fuels such as tires or sewage sludge. The clinker is cooled as it exits the kiln by injecting air, reducing its temperature from about 1400ºC to around 100ºC.

Cement grinding

The clinker, blended with gypsum and appropriate additive, is ground in ball mills to obtain a fine and homogeneous powder that constitutes Portland cement.

The main raw materials used for clinker production are highlighted in the following table:

MMPP	ton/ton ck	Distance (km)
Limestone	0,1008	3,2
Marl	1,3406	0.0

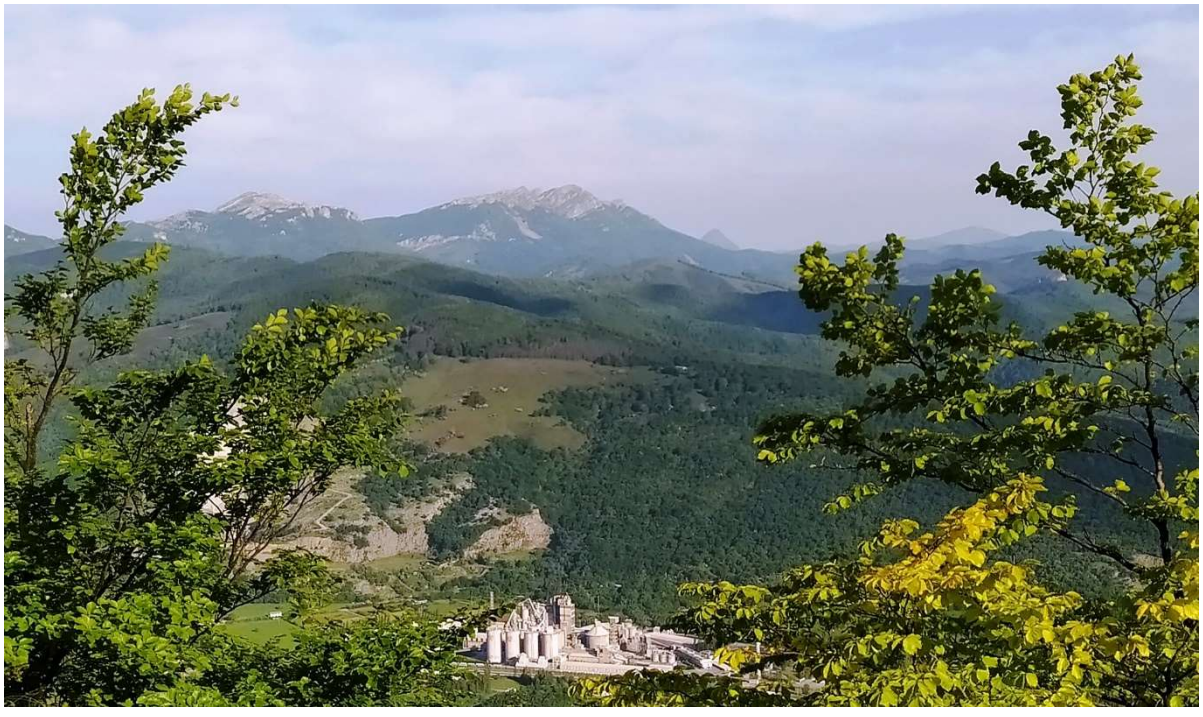
As well, the fuels used in clinker manufacturing are:

		ton/ton ck	Distance (km)
Conventional fuels	Petroleum coke	0,1102	122
	Fuel oil	0,0011	118
	National coall	0,0060	367

Dispatch

Finally, the cement is stored in silos, separated by type, before being packaged in bags or loaded into tank trucks for transportation by road or rail.

CEM II/B-L 32,5 N is sold in 35 kg bags (32,4%) and in bulk.



5. Declaration of Environmental Parameters derived from LCA and LCI

Environmental Impacts

The estimated impact results are relative and do not indicate the final value of impact categories, nor do they refer to threshold values, safety margins, or risks.

Indicators	Units	A1	A2	A3	A1-A3
GWP-total	kg CO_2 eq	52,02	4,25	646,92	703,20
GWP-biogenic	kg CO_2 eq	0,33	0,01	0,13	0,48
GWP-fossil	kg CO_2 eq	51,66	4,24	646,77	702,66
GWP-LULUC	kg CO_2 eq	0,03	0,00	0,02	0,05
ODP	kg CFC11 eq	5,0E-05	9,8E-07	3,1E-07	5,2E-05
AP	mol H+ eq	4,9E-01	1,2E-02	1,1E-01	6,1E-01
EP-freshwater	kg P eq	7,0E-03	2,8E-04	1,9E-03	9,2E-03
EP-marine	kg N eq	8,1E-02	2,4E-03	2,9E-01	3,7E-01
EP-terrestrial	mol N eq	9,4E-01	2,7E-02	8,0E-01	1,8E+00
POCP	Kg NMVOC eq	2,3E-01	6,9E-03	7,9E-01	1,0E+00
ADP-minerals & metals[2]	kg Sb eq	3,1E-04	1,5E-05	9,6E-05	4,2E-04
ADP-fossil	MJ	3,4E+03	6,4E+01	1,8E+02	3,6E+03
WDP	m^3	1,3E+01	2,0E-01	4,9E+00	1,8E+01

GWP - total: Global Warming Potential total; **GWP - fossil**: Global Warming Potential of fossil fuels; **GWP - biogenic**: Biogenic Global Warming Potential; **GWP - luluc** : Global Warming Potential of Land Use and Land Use Change; **ODP:** Ozone Depletion Potential; **AP:** Acidification Potential, cumulative excess; **EP-freshwater**: Eutrophication Potential, freshwater final compartment fraction; **EP-marine**: Eutrophication Potential, marine final compartment fraction; **EP-terrestrial**: Eutrophication Potential, cumulative excess; **POCP**: Photochemical Ozone Creation Potential; **ADP-minerals&metals:** Abiotic Depletion Potential for non-fossil resources; **APD-fossil**: Abiotic Depletion Potential for fossil resources; **WDP**: Water Deprivation Potential (user), weighted water deprivation consumption. **NR:** Not relevant

The **GWP Gross** data, which includes fossil emissions from alternative fuels **703,20 kg CO2 eq.**

Additional Environmental Indicators

Indicators	Units	A1	A2	A3	A1-A3
PM	Disease Incidence	3,6E-06	2,7E-07	1,7E-05	2,0E-05
IRP[1]	kBq U235 eq	1,9E+01	3,3E-01	5,2E+00	2,5E+01
ETP-fw[2]	CTUe	4,1E+03	5,0E+01	1,1E+02	4,2E+03
HTP-c[2]	CTUh	3,0E-08	1,6E-09	1,6E-07	1,9E-07
HTP-nc[2]	CTUh	6,3E-07	5,1E-08	4,1E-06	4,8E-06
SQP[2]	-	7,2E+02	4,5E+01	2,8E+02	1,0E+03

PM: Potential incidence of disease due to particulate matter emissions; **IRP**: Ionising Radiation, potential human exposure efficiency relative to U235; **ETP-fw:** Freshwater Eco-toxicity Potential; **HTP-c:** Comparative Eco-toxicity Potential – Carcinogenic Effects; **HTP-nc:** Comparative Eco-toxicity Potential – Non-Carcinogenic Effects; **SQP:** Soil Quality Potential Index.; **NR**: Not Relevant

1: This impact category deals mainly with the eventual impacts of low dose ionising 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 ionising radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

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

Resource use

Indicators	Units	A1	A2	A3	A1-A3
PERE	MJ	1,9E+02	1,1E+00	1,5E+02	3,4E+02
PERM	MJ	0,0E+00	0,0E+00	3,3E+00	3,3E+00
PERT	MJ	1,9E+02	1,1E+00	1,5E+02	3,4E+02
PENRE	MJ	3,5E+03	6,8E+01	1,7E+02	3,7E+03
PENRM	MJ	0,0E+00	0,0E+00	6,8E+00	6,8E+00
PENRT	MJ	3,5E+03	6,8E+01	1,8E+02	3,7E+03
SM	kg	3,5E-01	0,0E+00	0,0E+00	3,5E-01
RSF	MJ	0,0E+00	0,0E+00	0,0E+00	0,0E+00
NRSF	MJ	0,0E+00	0,0E+00	0,0E+00	0,0E+00
FW	m^3	9,2E+00	2,0E-01	1,9E+00	1,1E+01

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 Freshwater; **NR:** Not Relevant

Waste Categories

Indicators	Units	A1	A2	A3	A1-A3
HWD	kg	5,5E-02	1,7E-03	1,3E-01	1,8E-01
NHWD	kg	5,4E+00	3,4E+00	1,5E+00	1,0E+01
RWD	kg	2,2E-02	4,3E-04	1,2E-03	2,4E-02

HWD: Hazardous Waste Disposed; **NHWD**: Non-Hazardous Waste Disposed; **RWD**: Radioactive Waste Disposed; **NR**: Not Relevant

Output Flows

Indicators	Units	A1	A2	A3	A1-A3
CRU	kg	0.0E+00	0.0E+00	0.0E+00	0.0E+00
MFR	kg	0.0E+00	0.0E+00	0.0E+00	0.0E+00
MER	kg	0.0E+00	0.0E+00	0.0E+00	0.0E+00
EE	MJ	0.0E+00	0.0E+00	0.0E+00	0.0E+00

CRU: Components for Re-use; **MFR:** Materials for Recycling; **MER**: Materials for Energy Recovery; **EE:** Exported Energy; **NR**: Not Relevant

6. Additional Environmental Information

The Olazagutía plant has an ISO 9001 Quality Management System, ISO 14001 Environmental Management System and European EMAS Regulation, ISO 50001 Energy Management System and ISO 45001 Health and Safety Management System.

7. References

- General Rules of the GlobalEPD, 3th version 9-10-2023.
- LCA Plant report August 2024.
- Specific regulation of the N mark and N sustainable mark for cements. AENOR RP 15.01
- RD 256/2016 Instruction for the reception of cements RC-16
- RD 470/2021 Structural Code
- UNE-EN ISO 14025:2010 Standard Environmental labels and declarations. Type III environmental declarations. Principles and procedures (ISO 14025:2006).
- Standard UNE-EN 15804:2012+A2:2020/AC:2021 Sustainability in construction Environmental product declarations. Basic product category rules for building products.
- UNE-EN ISO 14040:2006/A1:2021 standard. Environmental management. Life cycle analysis. Principles and framework of reference. Modification 1. (ISO 14040:2006/Amd 1:2020).
- UNE-EN ISO 14044:2006/A2:2021 standard. Environmental management. Life cycle analysis. Requirements and guidelines. Modification 2. (ISO 14044:2006/Amd 2:2020).
- Standard UNE-EN 197-1:2011 Composition, specifications and conformity criteria of cements. Standard UNE-EN 197-2:2020 Evaluation and verification of the constancy of benefits.
- UNE-EN-ISO 9001:2015 Quality Management Systems Standard. Requirements (ISO 9001:2015).
- UNE-EN-ISO 14001:2015 Environmental Management Systems Standard. Requirements with guidance for their use. (ISO 14001:2015).
- UNE-EN-ISO 50001:2018 Energy Management Systems Standard. Requirements with guidance for their use. (ISO 50001:2018).
- UNE-EN-ISO 45000:2023 Occupational Health and Safety Management Systems. Requirements with guidance for their use. (ISO 45001:2018).

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A VERIFIED ENVIRONMENTAL DECLARATION

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