

# ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A2

Owner of the Declaration	Holcim Spain
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
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## Production of CEM I 52,5 R at Villaluenga plant, Bulk

Portland cement  
CEM I grey 52,5 R  
EN 197-1

## Holcim Spain

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## 1. General Information

<p><b>Holcim Spain</b></p> <hr/> <p><b>Programme holder</b>          IBU - Institut Bauen und Umwelt e.V.          Hegelplatz 1          10117 Berlin          Germany</p> <hr/> <p><b>Declaration number</b>          IBU-CEI-HOL-2203120-ES2025001263-ISUE002-EN</p> <hr/> <p><b>This declaration is based on the product category rules:</b>          Cement, 07/2023          (PCR checked and approved by the SRV)</p> <hr/> <p><b>Issue date</b>          26/03/2025</p> <hr/> <p><b>Valid to</b>          25/03/2030</p> <hr/> <div style="text-align: center;">   <hr/> <p>Hans Peters          (Chairman Institut Bauen und Umwelt e.V.)</p> </div> <hr/> <div style="text-align: center;">   <hr/> <p>Florian Pronold          (Managing Director Institut Bauen und Umwelt e.V.)</p> </div>	<p><b>CEM I 52,5 R</b></p> <hr/> <p><b>Owner of the declaration</b>          Holcim Spain          Avenida de Manoteras, 20          28050 Madrid          Spain</p> <hr/> <p><b>Declared Product / Declared Unit</b>          Cement / 1000 kg</p> <hr/> <p><b>Scope:</b>          This environmental product declaration shows the life cycle assessment of the production of Portland cements CEM I 52,5 R (CEM I grey 52,5 R) at the Villaluenga plant of Holcim Spain.</p> <p>The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall no be liable with respect to manufacturer information, life cycle assessment data and evidences.</p> <p>The EPD was created according to the specifications of <i>EN 15804+A2</i>. In the following, the standard is simple referred to as <i>EN 15804</i>.</p> <p>The EPD was calculated with the pre-verified software CarbonCLARITY™ EN 15804 EPD Generator – Cement of Climate Earth.</p> <hr/> <p><b>Verification</b></p> <table border="1" style="width: 100%;"> <tr> <td colspan="2">The standard <i>EN 15804</i> serves as the core PCR</td> </tr> <tr> <td colspan="2">Independent verification of the declaration and data according to <i>ISO 14025:2011</i></td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/> intern</td> <td style="text-align: center;"><input checked="" type="checkbox"/> extern</td> </tr> </table> <hr/> <div style="text-align: center;">   <hr/> <p>Matthias Schulz          (Independent verifier)</p> </div>	The standard <i>EN 15804</i> serves as the core PCR		Independent verification of the declaration and data according to <i>ISO 14025:2011</i>		<input type="checkbox"/> intern	<input checked="" type="checkbox"/> extern
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## 2. Product

### 2.1 Product description/Product definition

CEM I 52,5 R is a Portland cement CEM I 52.5 R which is produced and monitored in accordance with *EN 197-1*.

This cement is a hydraulically hardening binder for the production of concrete and mortar. It consists of a mixture of finely ground, non-metallic, inorganic components. After adding water to the cement, a suspension (cement paste) is formed, which solidifies and hardens both in air and under water due to the onset of a hydration reaction and remains permanently solid. The composition of the product corresponds to the specifications of *EN 197-1*.

Regulation (EU) No. 305/2011 (CPR) applies to placing the product on the market in the EU/EFTA (with the exception of Switzerland). The product requires a declaration of performance taking into account EN 197-2:2014-05, Cement - Part 2: Conformity assessment and the CE marking.

The respective national regulations apply to their use.

### 2.2 Application

CEM I 52,5 R is used as a binder in the manufacture of concrete and mortar.

### 2.3 Technical Data

CEM I 52,5 R has according to EN 197-1 a standard compressive strength of class 52.5 R.

### Constructional Data

Name	Value	Unit
Strength class acc. to EN 197-1	52,5 R	N/mm <sup>2</sup>

Performance values of the product correspond to the performance declaration in relation to its essential characteristics according to EN 197-1:2011-11 Composition, requirements and conformity criteria of common cement.

### 2.4 Delivery status

CEM I 52,5 R is delivered in bulk.

### 2.5 Base materials/Ancillary materials

#### Portland cement clinker (ca. 95-100 %)

Cement clinker is made from a mixture of raw materials that is heated in a kiln at a temperature of over 1400°C until it is sintered. The starting materials for the production of cement clinker must mainly contain calcium oxide (CaO) and silicon dioxide (SiO<sub>2</sub>) as well as small amounts of oxides of aluminum (Al<sub>2</sub>O<sub>3</sub>) and iron (Fe<sub>2</sub>O<sub>3</sub>). Rocks that provide these compounds are limestone, marl and clay or their naturally occurring mixture.

#### Minor constituents (ca. 0-5 %) + Gypsum / Anhydrite

Minor components are specially selected, inorganic, natural mineral substances, inorganic mineral substances from clinker production or main cement components, unless the latter are already contained as the main component in the cement. Secondary components can either be inert or have hydraulic, latently hydraulic or pozzolanic properties. Gypsum is also added to the binder as setting regulators.

This product contains substances listed in the candidate list (date: 07.11.2024) exceeding 0.1 percentage by mass: no

This product contains other CMR substances in categories 1A or 1B which are not on the candidate list, exceeding 0.1 percentage by mass: no

Biocide products were added to this construction product or it has been treated with biocide products (this then concerns a treated product as defined by the (EU) Ordinance on Biocide Products No. 528/2012): no

### 2.6 Manufacture

CEM I 52,5 R is manufactured at the Villaluenga plant.

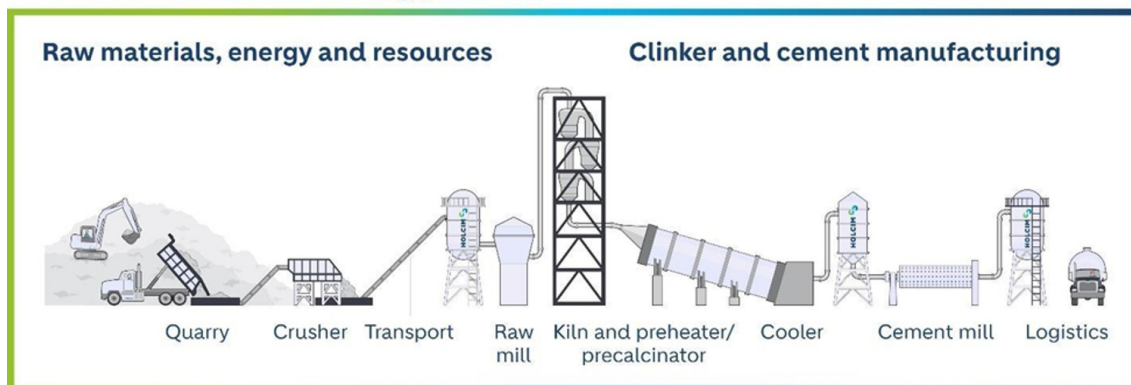
#### Production of Portland cement clinker

Limestone, marl, clay or their natural mixture, are required for the production of Portland cement clinker. These starting materials are mined in quarries, pre-crushed and transported to the nearby cement works. There they are homogenized into an intermediate product, with additional natural or secondary corrective substances being added to fine-tune the chemical composition. In the subsequent heating process, the Portland cement clinker is produced from the intermediate product. The firing process takes place in a rotary kiln, where the material is thermally converted at around 1450 °C and then rapidly cooled. The finished clinker is stored in silos.

#### Cement Production

To produce the ready-to-sell cement CEM I 52,5 R, the cement components are finely ground and combined. A sulfate carrier is added to control the setting behavior.

## Cement manufacturing process



**Note:** dashed lines indicate production steps that do not necessarily apply to this cement

### 2.7 Environment and health during manufacturing

The operation of the Villaluenga plant is subject to the provisions of the European Industrial Emission Directive that sets emission limit values for specific pollutants. In addition, exposure limits for respirable dust (RD) and respirable crystalline silica (RCS) during routine duties apply as established by the European

European Social Dialogue Agreements and *Negotiation Platform on Silica*.

An environmental management system according to ISO 14001 is installed in the plant.

### 2.8 Product processing/Installation

## General

Mixing cement and water creates the cement paste, which encases the individual grains of the aggregate in concrete or mortar and binds them together firmly as it hardens. The cement paste, which is liquid after the addition of water, turns into the solid cement paste. Today, fresh concrete is produced almost exclusively in ready-mixed concrete plants, on large construction sites or in precast plants in medium-sized and large mixing plants.

## Environment and health during product processing

The dust particles of the product can irritate the eyes and respiratory system.

If the product comes into contact with water or if the product gets wet, an alkaline solution will be formed which may cause skin and eye irritation.

The abrasiveness of the aggregate in concrete and mortar can also support skin irritation. Water-soluble chromate may develop allergic chromate dermatitis with prolonged contact.

Further details are available in the product's material safety data sheet.

## 2.9 Packaging

No packaging material is used as the product is delivered in bulk.

## 2.10 Condition of use

Not relevant for CEM I 52,5 R.

## 2.11 Environment and health during use

Not relevant for CEM I 52,5 R.

## 2.12 Reference service life

Not relevant for CEM I 52,5 R.

## 2.13 Extraordinary Effects

### Fire

CEM I 52,5 R is neither flammable nor explosive. The product is classified in Class A1 according to *EN 13501-1*.

### Water

When cement reacts with water, the so-called hydrate phases arise, which causes the cement paste to solidify and harden to form cement paste. If larger amounts of cement are accidentally released into bodies of water, the pH value in the body of water can increase.

Water hazard class: slightly hazardous to water

### Mechanical destruction

Not relevant for CEM I 52,5 R.

## 2.14 Re-use phase

Not relevant for CEM I 52,5 R.

## 2.15 Disposal

If CEM I 52,5 R has to be disposed of, it should be hardened with water and disposed off in accordance with local regulations.

Waste code according to Waste Catalogue Ordinance (*WCO*): depending on the origin 170101 (concrete) or 101314 (concrete waste and concrete slurry).

Law 7/2022, of 8 April, on waste and contaminated soil for a circular economy, which publishes waste recovery and disposal operations and the European list of waste, in which the list of LER codes for waste appears.

## 2.16 Further information

For more information: <https://www.holcim.es/>.



### 3. LCA: Rules of calculation

#### 3.1 Declared unit

The declared unit is 1000 kg.

#### Declared unit

Name	Value	Unit
Declared unit	1000	kg
Conversion factor to 1 kg	0.001	-

#### 3.2 System boundary

**Type of EPD:** cradle-to-factory gate

The system boundaries include the manufacture of CEM I 52,5 R including the extraction of raw materials through 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 and internal transport



**Module A3:** Manufacture of final product

The construction stage, the use stage and the disposal stage are not taken into account in the life cycle assessment for the final product.

#### 3.3 Estimates and assumptions

No estimates or assumptions were made that would be relevant for the interpretation of the life cycle assessment results.

#### 3.4 Cut-off criteria

The flows not taken into account are less than 0.01% of the total incoming mass of each elementary process and in total for module A1-A3.

#### 3.5 Background data

The data on which the life cycle assessment is based comes from data collection at the Villaluenga plant. Information on the use of material and energy resources as well as transport distances was provided by Holcim Spain.

The emission data used in the life cycle assessment of clinker production are based on the legally prescribed emission measurements on rotary kilns of Holcim Spain for the period 31/12/2022 to 30/12/2023. Gaps in kiln emission reporting were filled with proxy data from generic clinker profiles of the ecoinvent database.

The CarbonCLARITY™ EN 15804 EPD Generator – Cement, version 1.2.0 dated 07/11/2022 with the configuration file dated 13/03/2025 was used for the life cycle assessment. The calculation used the Ecoinvent database v3.8.

#### 3.6 Data quality

The data basis for this EPD is the continuous data acquisition in the Villaluenga plant.

The data was collected for the calendar year 31/12/2022 to 30/12/2023 by Holcim Spain and checked for plausibility by Climate Earth. The data quality can be rated as very good. Any gaps in the

collected data were filled in with conservative proxy data.

The background datasets are on average less than 5 years old and their quality is rated as good or very good.

#### 3.7 Period under review

Data from the period 31/12/2022 to 30/12/2023 were used for the life cycle assessment of CEM I 52,5 R.

#### 3.8 Geographic Representativeness

Land or region, in which the declared product system is manufactured, used or handled at the end of the product's lifespan: Spain.

#### 3.9 Allocation

There are no co-products at the Villaluenga plant and therefore all environmental impacts are allocated to the final product.

Kiln dust or bypass dust can be co-produced during clinker production. The sum of the inputs and outputs of this production process are assigned to the clinker.

The materials resulting from reuse, recycling or recovery in the context of the manufacture of cements are:

- Alternative fuels
- Alternative raw materials

The alternative fuels used for production are classified as either secondary fuels or waste. Emissions from secondary fuels are included in the environmental impact assessment results, while emissions from the incineration of waste are reported as additional information according to the IBU Cement PCR. The waste status of the fuels concerned was verified using the waste key number. The exclusion of environmental impacts from the incineration of combustible waste was only applied to CO2 emissions, as other emissions (e.g. NOx, SOx, etc.) could not be easily distinguished from different fuel types.

#### 3.10 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to EN 15804 and the building context, respectively the product-specific characteristics of performance, are taken into account.

The Ecoinvent background database is used (version 3.8).

## 4. LCA: Scenarios and additional technical information

The development of scenarios must be based on the end product (e.g. concrete) and not on the preliminary product CEM I 52,5 R.

### Information on describing the biogenic carbon content at factory gate

Name	Value	Unit
Biogenic carbon content in product	0	kg C
Biogenic carbon content in accompanying packaging	0	kg C

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO<sub>2</sub>.

### Module A3: Manufacturing

The carbon intensity of the electricity used in manufacturing is 0.03 kgCO<sub>2</sub>eq./kWh.

## 5. LCA: Results

The following table contains the results of the life cycle assessment for a declared unit of 1000 kg of CEM I 52,5 R.

The characterization factors of the "Environmental Footprint reference Package 3.1" were used to determine the impact balance.

### DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; ND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

Product stage			Construction process stage		Use stage							End of life stage				Benefits and loads beyond the system boundaries
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	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	ND	ND	ND	ND	MNR	MNR	MNR	ND	ND	ND	ND	ND	ND	ND

### RESULTS OF THE LCA – ENVIRONMENTAL IMPACT according to EN 15804+A2: 1000 kg CEM I 52,5 R

Core indicator	Core indicator	Unit	A1-A3
GWP-total	Global warming potential - total	[kg CO <sub>2</sub> -Eq.]	563
GWP-fossil	Global warming potential - fossil fuels	[kg CO <sub>2</sub> -Eq.]	562
GWP-biogenic	Global warming potential - biogenic	[kg CO <sub>2</sub> -Eq.]	0.11
GWP-luluc	GWP from land use and land use change	[kg CO <sub>2</sub> -Eq.]	0.60
ODP	Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	2.1E-5
AP	Acidification potential, accumulated exceedance	[mol H <sup>+</sup> -Eq.]	1.66
EP-freshwater	Eutrophication, fraction of nutrients reaching freshwater end compartment	[kg P-Eq.]	4.82E-3
EP-marine	Eutrophication, fraction of nutrients reaching marine end compartment	[kg N-Eq.]	0.74
EP-terrestrial	Eutrophication, accumulated exceedance	[mol N-Eq.]	8.44
POCP	Formation potential of tropospheric ozone photochemical oxidants	[kg NMVOC-Eq.]	1.95
ADPE	Abiotic depletion potential for non-fossil resources	[kg Sb-Eq.]	2.85E-3
ADPF	Abiotic depletion potential for fossil resources	[MJ]	1373
WDP	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	[m <sup>3</sup> world-Eq deprived]	40.9

### RESULTS OF THE LCA – INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1000 kg CEM I 52,5 R

Indicator	Indicator	Unit	A1-A3
PERE	Renewable primary energy as energy carrier	[MJ]	467
PERM	Renewable primary energy resources as material utilization	[MJ]	0
PERT	Total use of renewable primary energy resources	[MJ]	467
PENRE	Non-renewable primary energy as energy carrier	[MJ]	1373
PENRM	Non-renewable primary energy as material utilization	[MJ]	0
PENRT	Total use of non-renewable primary energy resources	[MJ]	1373
SM	Use of secondary material	[kg]	106
RSF	Use of renewable secondary fuels	[MJ]	1110
NRSF	Use of non-renewable secondary fuels	[MJ]	1435
FW	Use of net fresh water	[m <sup>3</sup> ]	0.69

### RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1000 kg CEM I 52,5 R

Indicator	Indicator	Unit	A1-A3
HWD	Hazardous waste disposed	[kg]	1.31
NHWD	Non-hazardous waste disposed	[kg]	19.2
RWD	Radioactive waste disposed	[kg]	9.22E-3
CRU	Components for re-use	[kg]	0
MFR	Materials for recycling	[kg]	0
MER	Materials for energy recovery	[kg]	0
EEE	Exported electrical energy	[MJ]	0
EET	Exported thermal energy	[MJ]	0

**RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1000 kg CEM I 52,5 R**

Indicator	Indicator	Unit	A1-A3
PM	Potential incidence of disease due to PM emissions	[Disease Incidence]	1.49E-5
IRP	Potential Human exposure efficiency relative to U235	[kBq U235-Eq.]	7.07
ETP-fw	Potential comparative toxic unit for ecosystems	[CTUe]	452
HTP-c	Potential comparative toxic unit for humans - cancerogenic	[CTUh]	3.15E-8
HTP-nc	Potential comparative toxic unit for humans - not cancerogenic	[CTUh]	9.43E-7
SQP	Potential soil quality index	[-]	764



$$2.51e2 = 2.51 \times 10^2 = 251$$

$$4.25e-3 = 4.25 \times \frac{1}{10^3} = 0.00425$$

**On Global Warming Potential (GWP):**

Net values are declared for all GWP indicators in A1 – A3. The waste status of the (waste-based) fuels has been verified. Gross emissions (i.e. including CO<sub>2</sub> from incineration of waste) are 685 kg CO<sub>2</sub>-eq. / t (GWP-total), 684 kg CO<sub>2</sub>-eq. / t (GWP fossil), 0.11 kg CO<sub>2</sub> eq. / t (GWP-biogenic).

For wastes with biogenic carbon content, gross CO<sub>2</sub> emissions correspond to the uptake of biogenic CO<sub>2</sub> during the biomass growth phase.

**Disclaimer 1** - for the indicator “potential Human exposure efficiency relative to U235”. 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 radioactive waste disposal in underground facilities.

Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

**Disclaimer 2** - for the indicators: “abiotic depletion potential for fossil resources”, “abiotic depletion potential for non-fossil resources”, “water (user) deprivation potential”, “deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit for humans - cancer effects”, “potential comparative toxic unit for humans – non-cancer effects”, “potential soil quality index”.

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.



## 6. LCA: Interpretation

The following table shows the most important influencing factors on important indicators of the impact and life cycle inventory analysis.

	GWP <sub>total</sub>	AP	EP <sub>terrestrial</sub>	POCP	PERT	PENRT	ADPE	FW	PM
Clinker production	99.3 %	98.2 %	98.9 %	98.8 %	58.4 %	94.8 %	10.2 %	72.5 %	97.3 %
Blast furnace slag production	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %
Fly ash production	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %
Burnt oil shale production	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %
Sulfate production	0.03 %	0.23 %	0.22 %	0.20 %	0.03 %	0.17 %	87.9 %	0.11 %	0.59 %
Cement production	0.33 %	0.99 %	0.67 %	0.61 %	40.1 %	1.63 %	0.75 %	22.9 %	1.45 %
Dispatch	8.01E-3 %	0.03 %	0.02 %	0.02 %	1.22 %	0.05 %	0.02 %	0.69 %	0.04 %
Other materials and processes	0.33 %	0.55 %	0.22 %	0.35 %	0.32 %	3.38 %	1.12 %	3.79 %	0.66 %
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
Legend	<p><b>Clinker production:</b> Includes the impacts related to the production of cement clinker. <b>Blast furnace slag production:</b> Includes the upstream and processing impacts for the production of blast furnace slag. <b>Fly ash production:</b> Includes the upstream and processing impacts for the production of fly ash. <b>Burnt oil shale production:</b> Includes the impacts associated with burnt oil shale production. <b>Sulfate production:</b> Includes the impacts related to the production of primary and secondary sulfates. <b>Cement production:</b> Includes the impacts associated with the final grinding or mixing stage to produce the final product. <b>Dispatch:</b> Includes the impact related to product preparation for shipping. <b>Other materials and processes:</b> Includes the impacts of materials or production processes not covered by the above categories.</p>								

The contribution of clinker production to the indicators GWP (Global Warming Potential), AP (Acidification Potential of Soil and Water), EP-terrestrial (Eutrophication Potential), POCP (Tropospheric Ozone Creation Potential) and PM (Potential Occurrence of Diseases due to Particulate matter emissions) is

largely determined by the exhaust air emissions from the rotary kiln, while the contribution to the PENRT indicator (non-renewable primary energy) is due to the use of fossil fuels and electrical energy.

## 7. Requisite evidence

### 7.1 Radioactivity

The radioactivity of cements is currently not routinely measured in Spain. Literature shows that the activity index for cement, is in the order of magnitude of the activity index for natural soils and rocks (IAEA).

### 7.2 Chromate

According to legal requirements (European Regulation (EG) 1907/2006 REACH Regulation and Chemicals Prohibition Regulation), cements or cement-containing preparations that contain more than 2 ppm water-

soluble chromate based on the mass of dry cement may not be placed on the market. Exceptions to this are cements that are only used in closed and fully automated processes and where there is no risk of skin contact. This cement complies with the regulations on water-soluble chromate.

The content of water-soluble chromium(VI) is determined according to EN 196-10. Evidence of compliance with the limit value is provided as part of the factory production control.

## 8. References

### Norms

#### UNE 80305

UNE 80305:2012, White cements

#### UNE 80303

UNE 80303-1:2017, Cements with additional characteristics. Part 1: Sulfate resisting cements

#### RP 15.01

Special requirements RP 15.01 (02/2023) rev33 for trademarks AENOR N and AENOR N sostenible for cements

#### API 10A

API Specification 10A:2019, Cements and materials for well cementing

#### EN 196-10

EN 196-10:2016, Methods of testing cement - Part 10: Determination of the water-soluble chromium (VI) content of cement

#### ISO 14001

EN ISO 14001:2015-11, Environmental management systems - Requirements with guidance for use

#### EN 13501-1

EN 13501-1:2018, Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests.

#### EN 197-1

EN 197-1:2011-11, Cement – Part 1: Composition, specifications and conformity criteria for common cements

#### EN 197-2

EN 197-2:2014-05, Cement - Part 2: Conformity of evaluation

#### EN 15804

EN 15804:2012+A2+AC:2021, Sustainability of construction works. Environmental product declarations. Core rules for the product category of construction products.

#### ISO 14025

EN ISO 14025:2011-10, Environmental labels and declarations - Type III environmental declarations - Principles and procedures.

### Other Literature

#### CarbonCLARITY™ EN 15804 EPD Generator – Cement

Version 1.2.0 dated 07/11/2022

[www.climateearth.com](http://www.climateearth.com)

#### CPR

Construction Products Regulation  
Establishing harmonized conditions for the marketing of construction products, (EU) No. 305/2011, March 09, 2011.

#### ECHA

European Chemicals Agency (ECHA): Candidate list of substances of very high concern.  
<https://echa.europa.eu/>

#### IBU 2021

Institut Bauen und Umwelt e.V.: General instructions for the EPD program of Institut Bauen und Umwelt e.V. Version 2.0, Berlin: Institut Bauen und Umwelt e.V., 2021. [www.ibu-epd.com](http://www.ibu-epd.com)

#### PCR Part A

Product category rules for building related products and services. Part A: Calculation rules for the life cycle assessment and requirements for the project report according to EN 15804+A2:2021 (v1.3). Berlin: Institut Bauen und Umwelt e.V., 31/8/2022

#### PCR Cement

Product category rules for building related products and services. Part B: Requirements for the EPD for cement, version 5. Berlin: Institut Bauen und Umwelt e.V. (ed.), 04/07/2023.  
[www.ibu-epd.com](http://www.ibu-epd.com)

#### IAEA

International Atomic Energy Agency, Radioactivity in Building Materials: a first Overview of the European Scenario, 2008.

#### Directive 2008/1/EC

Directive 2008/1/EC of the European Parliament and of the Council of 15 January 2008 concerning integrated pollution prevention and control

#### Negotiation Platform on Silica

Negotiation Platform on Silica (NePSi) 'Agreement on workers' health protection through the good handling and use of crystalline silica and products containing it

#### REACH-Regulation

Registration, Evaluation, Authorisation and Restriction of Chemicals, EG 1907/2006:2006-12-18.

#### WCO

Waste Catalog Ordinance (WCO), December 10th 2001

#### Law 7/2022

Law 7/2022, of 8 April, on waste and contaminated soil for a circular economy, which includes the list of LER codes for waste.

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