



AENOR



ENVIRONMENTAL PRODUCT DECLARATION

**III/A 42.5 N/SRC
CEM III/A 42.5 N**

ABOÑO FACTORY



Independent verification of the declaration and data, according to:

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

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The owner of the EPD shall be liable for the underlying life cycle assessment data and evidences.



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AENOR is a founding member of ECO Platform, the European Association of Environmental Product Declaration Verification Programmes.

Product Category Rule:

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

Independent verification of the declaration and data, in accordance with the Standard UNE EN ISO 14025:2010

Internal External

Third Party verified:



The Certification Body is accredited by ENAC 1/C-PR468

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INTRODUCTION

COMMITTED TO OUR ENVIRONMENT

The global consumption and manufacturing of goods and services (drivers of the global economy) are based on the use of the natural environment and the resources it offers us.

Both sustainable consumption and manufacturing are about doing more and better with less. We can understand sustainability as the adoption of lifestyle habits that allow us to transition towards a low-carbon energy model.

Masaveu Industria is aware that, to achieve the final objective of Sustainable Construction, it must supply construction projects with materials with increasingly reduced associated environmental impacts, both for their service and for their mere consumption.

A growing investment in R&D to achieve more efficient products, the circular economy as the main axis of our productive activity, as well as the adoption of a roadmap that allows carbon neutrality in 2050, are the main ways to achieve that our products contribute to the ultimate goal of a sustainable society.

In order to make it easier for our customers to make a purchasing decision based on a criterion of sustainability, both as a main criterion or as a complement to a need for benefits, we have incorporated the cataloging of the most sustainable products from among those in their family or group, through the acronym **Low Environmental Impact, BIA** (Bajo Impacto Ambiental).

The mitigation of climate change, the protection of water and marine resources, the transition towards a circular economy, the prevention and control of pollution, as well as the protection and recovery of biodiversity and ecosystems, are the factors that have been taken into account when a product has been marked with the **BIA** label.





Taking into account the above factors, we have created the following trademark:

BIACEM®

For those cements that, with a specific emission of less than 469 kg CO₂eq/t, contribute to the mitigation of climate change in accordance with the taxonomy of the European Union.

Specifically, the **BIACEM®** range initially includes three types of cement:

- **III/A 42.5 N/SRC**
- **CEM III/B 32.5 N-SR**
- **CEM V/A(S-V) 32.5 N**

Data calculated by Life Cycle Analysis (LCA) methodology and compared with a Portland cement, CEM I, average European (CEMBUREAU).

For all those concretes manufactured with cements from the **BIACEM®** range, we have created the **H-BIA®** range. In addition, we include even more sustainable concretes with the incorporation of recycled aggregates, creating the **H-BIA®+** (plus) range of concretes.

1. GENERAL INFORMATION

1.1. The organization

Cementos Tudela Veguín S.A. is one of the companies of Masaveu Industria, which has four production centers, which are located in Narón, Tudela Veguín, Aboño and La Robla.

The Aboño factory, which provides the framework for this EPD, has the following production capacities in tons/year:

- Gray clinker: 750,000
- Gray cement: 1,500,000
- Ground granulated blast furnace slag: 1,000,000

1.2. Scope of the Environmental Product Declaration

The EPD covers all product stages from 'cradle to gate' (A1-A3) throughout 2022. The selected system boundaries comprise of cement III/A 42.5 N/SRC include raw material extraction up to the finished product at the factory gate.

1.3. Lifecycle and compliance

This EPD has been developed and verified in accordance with the UNE-EN ISO 14025:2010 and EN 15804:2012+A2:2019 Standards and the following Product Category Rule:

PRODUCT CATEGORY RULES INFORMATION

Descriptive title	UNE-EN 16908:2019 Cement and building lime - Environmental product declarations - Product category rules complementary to EN 15804.
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This Environmental Product Declaration includes the following life cycle stages:

SYSTEM BOUNDARIES. LIFE CYCLE STAGES

PRODUCT STAGE	A1	Raw materials supply	X
	A2	Transport	X
	A3	Manufacturing	X
CONSTRUCTION	A4	Transport	MNA
	A5	Construction installation process	MNA
STAGE OF USE	B1	Use	MNA
	B2	Maintenance	MNA
	B3	Repair	MNA
	B4	Replacement	MNA
	B5	Refurbishment	MNA
	B6	Operation energy use	MNA
	B7	Operational water use	MNA
END OF SERVICE LIFE	C1	De-construction/demolition	MNA
	C2	Transport	MNA
	C3	Waste processing	MNA
	C4	Disposal	MNA
	D	Reuse - Recovery - Recycling potential	MNA

X = Module included in the LCA; NR = Module not relevant; MNA = Module not assessed

This EPD may not be comparable with those developed in other programmes or in accordance with different reference documents, specifically it may not be comparable with EPDs not prepared according to the EN 15804+A2 Standard.

Likewise, this EPD may not be comparable if the data source 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 made on the same function, applying the same functional unit and at the level of the building (or architectural or engineering work), i.e. including the behaviour of the product throughout its life cycle, as well as the specifications of section 6.7.2 of UNE-EN ISO 14025.

2. PRODUCT INFORMATION

2.1. Product identification

Cement is a hydraulic binder, that is 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 cement under study is named under the UNE-EN 80301-1 standard as: **III/A 42.5 N/SRC** or **CEM III/A 42.5 N** under UNE-EN 197-1.

The CPC code of the product is 37440.



Aberdeen port expansion. Manufacture of concrete caissons. La Coruña. Galicia.

2.2. Technical characteristics

Conformity is ensured through compliance with the quality standards included in the CE marking. The aforementioned marking requires that the product present a series of characteristics:

	FEATURE	PERIOD	TYPICAL VALUE	LIMITS
Physical	Setting	Initial	235 min.	≥ 60 min.
		Final	295 min.	< 720 min.
Mechanical	Compressive strength	2 days	18.0 MPa	≥ 10.0 MPa
		28 days	54.5 MPa	≥ 42.5 MPa ≤ 62.5 MPa

It is applied in works with aggressive environments and media (saline soils, very pure and sulfated waters, wastewater conduits, water and marine environments, gypsum soils...).

It also applies to mass and reinforced concrete, as well as prefabrication.

2.3. Product composition

The composition of III/A 42.5 N/SRC according to the UNE-EN 197-1 standard is the following:

Main constituents (%)	Clinker (K)	35-64
	Granulated blast furnace slag (S)	36-65
Minor additional constituents (%)		0-5

The composition calculation basis does not include other compounds present in the cement such as: setting regulators, grinding aid additives or Cr(VI) reducing agents.

Also, none of the components of the final product are included in the 'Candidate List of Substances of Very High Concern for Authorization'.

3. LCA INFORMATION

3.1. Life cycle analysis

The LCA has a boundary 'from cradle to gate' covering the modules A1 to A3 (product stage) in reference to the year 2022. The life cycle analysis is described in the LCA report of III/A 42.5 N/SRC cement.

It is complemented by a series of annexes where particularities corresponding to the production process are described.

3.2. Declared unit

The declared unit is 1 ton (1,000 kg) of cement III/A 42.5 N/SRC.

3.3. Reference service life (RSL)

The cement loses its physical identity and is not recognizable or separable on site. Therefore, its reference service life is linked to the service life of the structural elements in which it is integrated.

3.4. Allocation criteria

Mass allocations have been made in the case of energy consumption, waste and landfill.

In the case of waste, the 'Polluter pays' principle has been applied, therefore, as established in Annex D of Standard UNE-EN 16908:2019, whoever generates the waste 'declares the use of the waste and the impact environmental of the use of the waste in the module where it is used'.

3.5. Cut-off rules

More than 99% of the materials and energy consumption have been included.

3.6. Representativeness, quality and selection of data

The LCA is limited to the production of III/A 42.5 N/SRC cement at the Aboño Factory in the time horizon of 2022.

The database used in this inventory is Ecoinvent v3.8, which incorporates data related to materials, energy, transportation, processing, use, waste scenario or waste treatment. These data comply with the system of quality indicators set forth in UNE-EN ISO 14041, which evaluates their suitability by granting them a score based on temporal, geographical, and technological criteria.

In the modeling of the process, in the absence of specific data, data at the national level have been selected, whenever possible. If not, European or global data have been used in that same order of priority.

For modeling, generation of inventories and calculation of environmental impact, the SimaPro 9.4.0.2 tool has been used.

3.7. Other calculation rules and assumptions

3.7.1. Biogenic carbon content

The declaration of biogenic carbon content is omitted because due to the nature of the product its proportion is well below the limit of 5% with respect to the total mass, according to what is indicated in the EN 15804:2012+A2:2019 standard.

4. SYSTEM BOUNDARIES, SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

This EPD includes only modules A1-A3, product stage, according to the modular scheme of the EN 15804+A2 standard, and presents the results in an aggregated form.

In the cement manufacturing process, the following stages have been included in the life cycle analysis.

A1. Raw material supply

The main raw materials are limestone and shale obtained from our own quarries. External and alternative natural raw materials are also incorporated.

A2. Transport

External raw materials and fuels arrive by truck or ship and are incorporated into the production process.

A3. Manufacturing

PREHOMOGENIZATION

The flow of raw materials, after a crushing process, is stored in the prehomogenization warehouse, where it is positioned in uniform layers ensuring that the mixture has an adequate composition and its variability is reduced.

GRINDING OF RAW MATERIALS

The raw materials are ground to obtain a product of uniform composition and to reduce its size in order to facilitate calcination in the kiln. This grinding is carried out using a ball mill.

CALCINATION

The kiln is fed through a cyclone preheater, which heats the ground raw material with exhaust gases from the kiln and with a contribution of fossil and/or alternative fuels.

CLINKERIZATION

The ground raw material advances through the rotary kiln, where temperatures, above 1,400 °C are reached, giving rise to the clinker sintering process. To reach these temperatures, it is necessary, as in calcination, to consume fuels that, again, can be fossil and/or alternative.

COOLING

Upon leaving the kiln, the clinker is introduced into the cooler, which injects cold air to reduce its temperature and set the desired mineralogical composition.

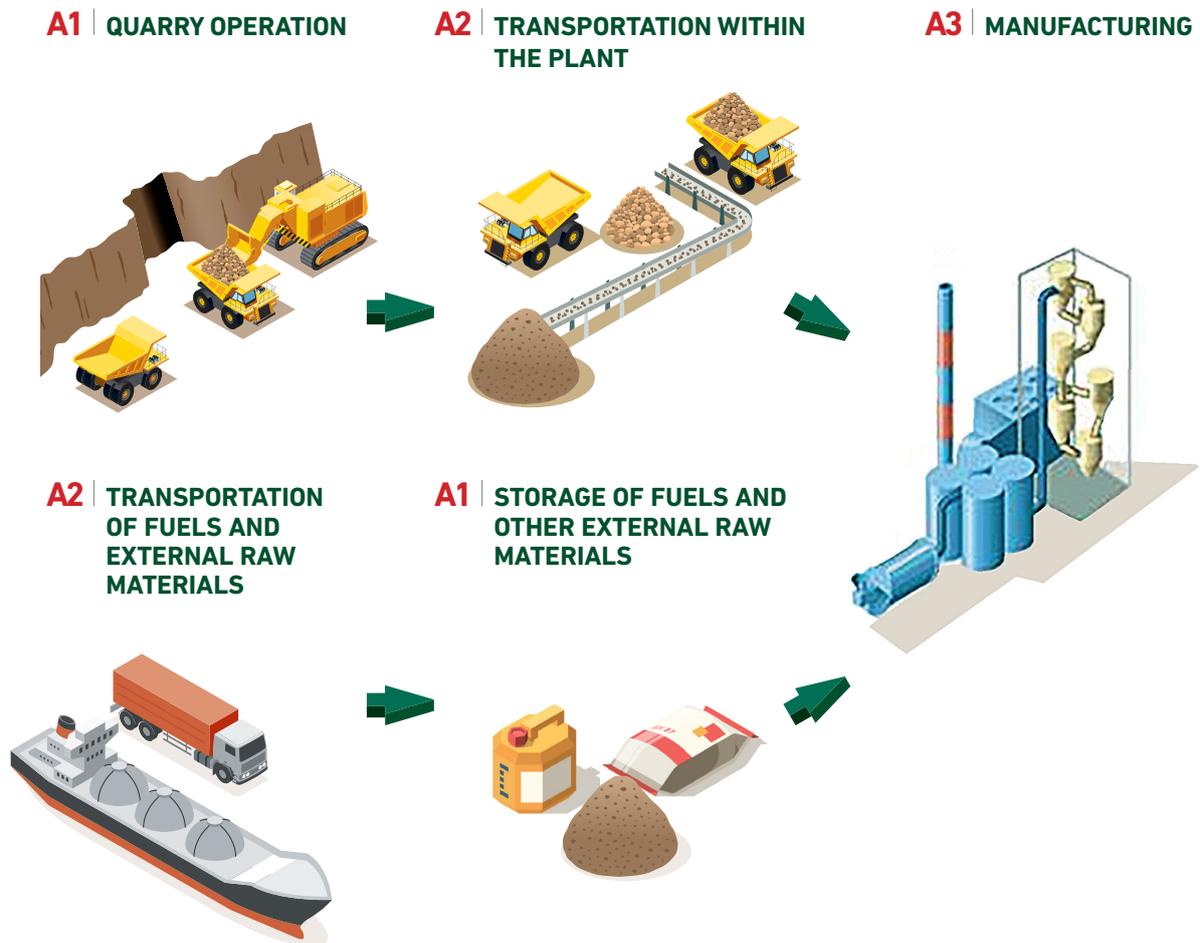
GRINDING

The joint homogenization of the clinker grinding with gypsum, together with the ground granulated blast furnace slag to the appropriate particle sizes and compositions, results in III/A 42.5 N/SRC.

PRODUCT STORAGE

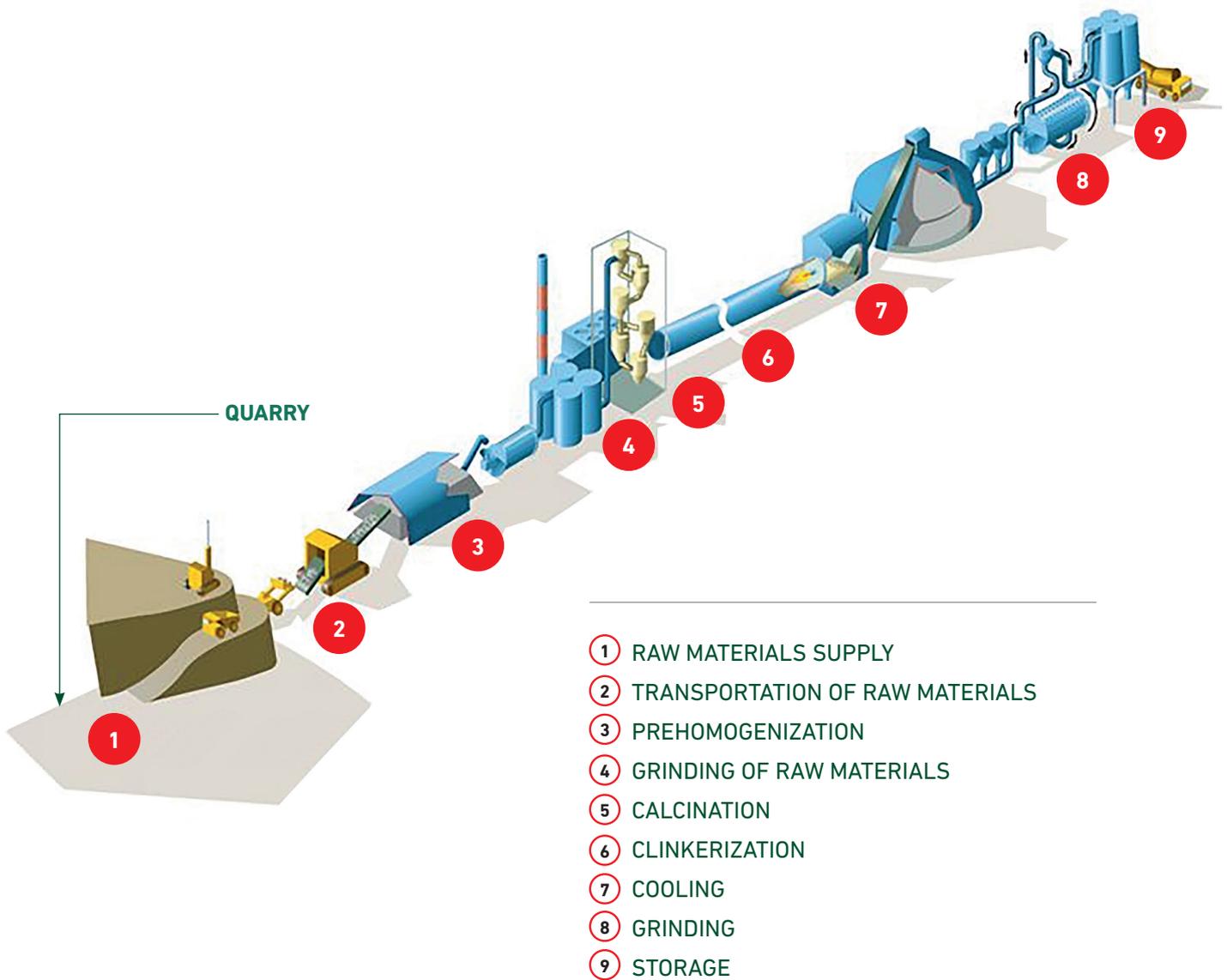
Cement is stored in silos for future shipment.

PRODUCT STAGE



- A1** RAW MATERIAL SUPPLY
- A2** TRANSPORT
- A3** MANUFACTURING

A3 | STEPS IN CEMENT MANUFACTURING



5. DECLARATION OF ENVIRONMENTAL LCA AND LCI PARAMETERS

ENVIRONMENTAL IMPACTS

IMPACT CATEGORY	UNITS	A1-A3
GWP- total	kg CO ₂ -equivalent	4.15E+02
GWP- fossil	kg CO ₂ -equivalent	4.15E+02
GWP- biogenic	kg CO ₂ -equivalent	1.74E-01
GWP- lu&luc	kg CO ₂ -equivalent	6.09E-03
ODP	kg CFC ₁₁ -equivalent	2.85E-05
AP	mol H ⁺ _{equivalent}	3.19E-01
EP- freshwater	kg P _{equivalent}	6.39E-04
EP- marine	kg N _{equivalent}	1.99E-01
EP- terrestrial	mol N _{equivalent}	9.44E-01
POCP	kg NMVOC _{equivalent}	5.59E-01
ADP - minerals & metals ⁽¹⁾	kg Sb _{equivalent}	1.63E-05
ADP - fossil ⁽¹⁾	MJ	2.45E+03
WDP ⁽¹⁾	m ³	1.44E+01

GWP - total: Global warming potential total

GWP - fossil: Global warming potential fossil

GWP - biogenic: Global warming potential biogenic

GWP - lu&luc: Global warming potential of 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 potential for fossil resources

WDP: Water (user) deprivation potential, deprivation weighted water consumption

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

(1) The results of this environmental impact indicator shall be used with caution, since the uncertainties of the results are high and there is limited experience with the indicator.

ADDITIONAL ENVIRONMENTAL IMPACTS

IMPACT CATEGORY	UNITS	A1-A3
PM	Disease incidence	2.60E-06
IRP ⁽²⁾	kBq U235 _{equivalent}	1.78E+01
ETP-fw ⁽¹⁾	CTUe	1.14E+03
HTP-c ⁽¹⁾	CTUh	8.48E-09
HTP-nc ⁽¹⁾	CTUh	3.34E-07
SQP ⁽¹⁾	Pt	1.93E+02

PM: Potential for disease incidence due to particulate matter emissions

IRP: Human potential exposure efficiency relative to U235

ETP-fw: Comparative potential toxic unit for humans - freshwater

HTP-c: Comparative potential toxic unit for humans - carcinogenic effects

HTP-nc: Comparative potential toxic unit for humans - non-carcinogenic effects

SQP: Soil quality potential index

PARAMETERS DESCRIBING RESOURCE USE

PARAMETER	UNITS	A1-A3
PERE	MJ	5.18E+01
PERM	MJ	0.00E+00
PERT	MJ	5.18E+01
PENRE	MJ	2.59E+03
PENRM	MJ	0.00E+00
PENRT	MJ	2.59E+03
SM	kg	6.72E+01
FW	m ³	5.29E-03

PERE: Use of renewable primary energy excluding renewable primary energy resources used as raw materials

PERM: Use of renewable primary energy used as raw material

PERT: Total use of primary renewable energy

PENRE: Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials

PENRM: Use of non-renewable primary energy used as raw material

PENRT: Total use of primary non-renewable energy

SM: Use of secondary materials

FW: Net use of running water resources

(1) The results of this environmental impact indicator shall be used with caution, since the uncertainties of the results are high and there is limited experience with the indicator.

(2) This impact category deals mainly with the eventual impacts of low doses of ionizing radiation on human health, from the nuclear fuel cycle. It does not consider the effects due to possible nuclear accidents or occupational exposure due to the disposal of radioactive waste in underground facilities. The potential for ionizing radiation of the soil, due to radon or some construction materials, is not measured in this parameter either.

WASTE CATEGORIES

PARAMETER	UNITS	A1-A3
HWD	kg	9.21E-04
NHWD	kg	9.61E+00
RWD	kg	1.75E-02

HWD: Hazardous waste disposed

NHWD: Non-hazardous waste disposed

RWD: Radioactive waste disposed

OUTPUT FLOWS

PARAMETER	UNITS	A1-A3
CRU	kg	0.00E+00
MFR	kg	2.29E-02
MER	kg	1.89E+00
EE	MJ	0.00E+00

CRU: Components for re-use

MFR: Materials for recycling

MER: Materials for energy recovery

EE: Exported energy

REFERENCES

- LCA Report III/A 42.5 N/SRC Version V1.2. September 2023.
- General Rules of the GlobalEPD Program, 2nd revision. AENOR. February 2016.
- UNE-EN ISO 14025:2010 Environmental labels. Type III environmental declarations. Principles and procedures (ISO 14025:2006).
- EN 15804:2012+A2:2019 Sustainability in construction. Environmental product declarations. Basic product category rules for construction products.
- UNE-EN ISO 14040 Environmental Management. Life cycle analysis. Principles and frame of reference. 2006.
- UNE-EN ISO 14044 Environmental Management. Life cycle analysis. Requirements and guidelines. 2006.
- UNE-EN 197-1: 2011 Cement. Part 1.
- UNE-EN 15171:1:2006 Granulated ground blast furnace slag for use in concrete, mortars and pastes. Part 1: Definitions, specifications and conformance criteria.
- UNE-EN 16908:2019+A1:2022 Construction cements and limes. Environmental product declarations. Product category rules complementary to Standard EN 15804.
- Commission Delegated Regulation (EU) 2021/21 39 of 4 June 2021. Technical selection criteria to determine the conditions under which an economic activity is considered to contribute substantially to the mitigation of climate change or to adaptation to it.

MASAVEU ● INDUSTRIA



GlobalEPD
A VERIFIED ENVIRONMENTAL DECLARATION



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