Environmental Product Declaration

CEMENT BL 22.5 X

ÇIMSA CEMENTOS ESPAÑA S.A.U.
BUÑOL PLANT

EN ISO 14025:2010
EN 15804:2012+A2:2020
EN 16908:2017+A1:2022

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

EN 16908:2017+A1:2022

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

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

☐ Internal ☒ External

Verification body

AENOR

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

Índice

1. General Information

1.1. The Organization

Çimsa, the owner since 2021 of the cement plant in Buñol (Çimsa Cementos España S.A.U.), a subsidiary of Sabancı Holding, was founded in Mersin in 1972. Today, Çimsa conducts its production operations through its three integrated factories in Mersin, Eskişehir and Afyonkarahisar, Turkey, an integrated cement plant in Buñol, Spain, a cement grinding facility in the USA, and terminals in Germany, Spain, Italy, and the TRNC.

Çimsa is one of the world's leading brands in white cement and maintains its global operations through Sabancı Building Solutions B.V., a company established by integrating Çimsa's operational capacity and the financial strength of Sabancı Holding, the main shareholder of Çimsa.

Thanks to its market-oriented approach and extensive distribution network, Çimsa fully and promptly meets the product and service needs of its customers. As a trusted business partner for its shareholders, the company provides the necessary materials to create livable spaces and durable infrastructure for future generations.

Çimsa is a pioneer in the Turkish cement and building materials industry in terms of innovation through its special products, such as white cement and calcium aluminate cement, in addition to gray cement. Focusing on profitable growth and value creation for all its stakeholders, Çimsa aims to maintain and expand these achievements in the future.

The Buñol plant was established in 1966 with two Lepol-type lines and in 1975 with a Dopol-type line, all of them producing gray cement. In 2007, one of the Lepol lines was converted to white clinker with a precalcination tower, with a nominal production of 1800 t/day.

In 2021, after being acquired by Çimsa, the gray cement Dopol line was dismantled. Currently, only the white clinker and cement line is active.

1.2. Scope of the Declaration

This declaration includes **BL 22.5 X** manufactured in accordance with the EN 413-1 standard (MC 22.5 X), in an A1-A3 scheme. Cements do not declare beyond module A3 since 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 UNE-EN ISO 14025:2010 and UNE-EN 5804:2012+A2:2020 standards and the following Category Rule:

PRODUCT CATEGORY RULE INFORMATION	
Registration Code and Version	EN 16908:2017+A1:2022
Issue Date	2022
Conformity	UNE-EN 15804:2012 + A2:2020
Program Administrator	AENOR
Descriptive Title	Cements and Building Limes. Environmental Product Declarations. Product Category Rules complementary to the EN 15804 standard

This Environmental Declaration includes the following life cycle stages:

SYSTEM BOUNDARIES. INFORMATION MODULES CONSIDERED			
Product Stage	A1	Supply of raw materials	X
	A2	Transport to factory	X
	A3	Manufacturing	X
Construction Stage	A4	Transport to site	N/A
	A5	Installation / Construction	N/A
Use Stage	B1	Use	N/A
	B2	Maintenance	N/A
	B3	Repair	N/A
	B4	Replacement	N/A
	B5	Refurbishment	N/A
	B6	Operational energy use	N/A
	B7	Operational water use	N/A
End of Life	C1	Deconstruction / Demolition	N/A
	C2	Transport	N/A
	C3	Waste Treatment	N/A
	C4	Disposal	N/A
	D	Potential for Reuse, Recovery, and/or Recycling	N/A

X = Module included in the LCA; NR = Module not relevant; N/A = Module not evaluated

This EPD may not be comparable with those developed under other Programs or based on different reference documents, and in particular, may not be comparable with EPDs not prepared in accordance with the UNE-EN 15804+A2 standard.

Similarly, this EPD may not be comparable if the data source is different (e.g., databases), if all relevant information modules are not included, or if they are not based on the same scenarios.

The comparison of construction products should be made based on the same function, applying the same functional unit and at the building level (or architectural or engineering work), meaning that it should include the product's performance throughout its entire life cycle, as well as the specifications of section 6.7.2 of the UNE-EN ISO 14025 standard.

2. The Product

2.1. Product Identification

Cement is a hydraulic binder, meaning it is an inorganic material that, when finely ground and 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 in accordance with European cement standards and named according to its various types, when properly mixed with water and aggregates, will be able to produce concrete or mortar that maintains workability for a sufficient time and must achieve the specified strength levels within the defined time frames while also demonstrating long-term volume stability.

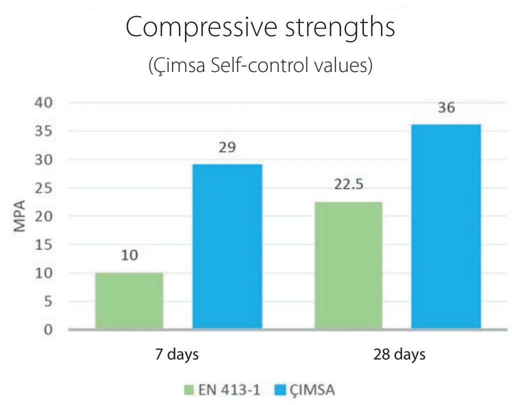
The hydraulic hardening of cement is primarily due to the hydration of calcium silicates, although other chemical compounds, such as aluminates, may also participate in the hardening process.

Çimsa's Super White cement (MC 22.5 X) is chosen for its high whiteness, stability, quality, and performance for paving and masonry work.

Some application areas of Çimsa's Super White cement include:

- Low-strength flooring and paving.
- Masonry mortars.
- White or colored plasters.
- White or colored joints.
- Low alkali content.

Çimsa's white cements do not require a Chromium (VI) reducing agent.



The classification of cement according to the UN Central Product Classification corresponds to code 37430.

2.2. Product Performance

Cement is primarily used for the manufacture of concrete, mortars, and prefabricated cement-based elements. It thus has countless applications in construction, meeting the required demands for durability and structural reliability. Its applications include, among others: structures, buildings, pavements, ports and marine works, airports, dams, canals, treatment plants, and hydraulic works. BL 22.5 X cement can be used in accordance with the specified guidelines in the Cement Reception Instruction RC16 and the Structural Code.

Performance	Test Method	Value	Unit
Chlorides	197-1	<0.1	%
Sulfates	197-1	≤3,5	%
Setting Time	197-1	≥60	min
Expansion	197-1	≤10	mm
Nominal Strength, 28 days	197-1	≥22.5≤42.5	MPa
Strength, 7 days	197-1	≥10	MPa

Product Composition

The composition of BL 22.5 X cement is included in the following table, as well as the grinding energy used in the production process.

Cement	Clinker (%)	Limestone LL (%)	Min Comp (%)	Grinding Energy kWh/ tcement
BL 22.5 X	60	40	0	50.0

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 life cycle analysis is described in the LCA project report from January 2024, taking 2023 data as a reference. The software tool called èdit® version 1.71.5 has been used for the evaluation of environmental impacts.

3.2. Declared Unit

Declared unit: 1,000 kg (1 ton of cement).

3.3. Reference Service Life (RSL)

The reference service life is linked to the reference service life of the structural elements in which it is integrated. Indicatively:

TYPE OF STRUCTURE	NOMINAL SERVICE LIFE
Temporary structures [2]	Between 3 and 10 years
Replaceable elements that are not part of the main structure (e.g., railings, pipe supports)	Between 10 and 25 years
Agricultural or industrial buildings (or facilities) and maritime works	Between 15 and 50 years
Residential or office buildings, bridges or overpasses with a total length of less than 10 meters, and civil engineering structures (except maritime works) with low or medium economic impact	50 years
Monumental buildings or buildings of special importance	100 years
Bridges with a total length equal to or greater than 10 meters and other civil engineering structures with high economic impact	100 years

3.4. Allocation Criteria

A physical, mass-based criterion has been applied to allocate the inputs and outputs of the production system to each product, based on production for the 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. Representativeness, Quality, and Data Selection

The EPDs have been prepared using primary data for the stages of supply, transport, and manufacturing.

These primary data collected at the factory come from the records of the facility's management systems and the control system. The primary data are fully traceable.

Transport models 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. Other Calculation Rules and Assumptions

It has not been necessary to use additional calculation rules beyond those mentioned so far.

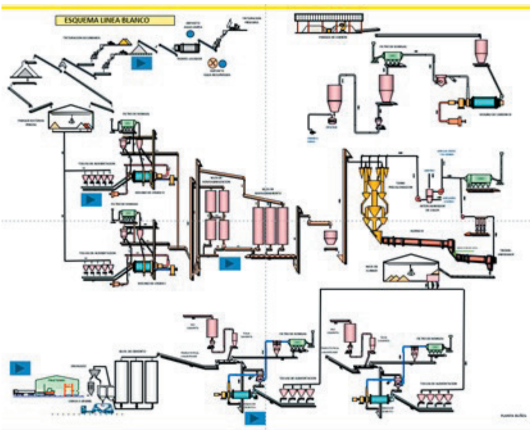
3.6.1 Biogenic Carbon

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

4. System Boundaries, Scenarios, and Additional Technical Information

This EPD includes only modules A1-A3, the product stage, in accordance with the modular scheme of the UNE EN 15804+A2 standard.

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



4.1. A1. Raw Material Acquisition and Preparation

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

4.2. A2. Transport to Factory

The material is crushed to the appropriate particle size and then transported to the factory, if applicable to the pre-homogenization yard. The remaining raw materials and fuels are transported to the factory by ship, road, and rail.

4.3. Product Manufacturing

Raw Material Homogenization and Grinding

If necessary, in the pre-homogenization yard, the crushed material is stored in uniform layers so that its subsequent grinding results in an appropriate mixture of its components, reducing variability. The material is then fed into vertical or ball mills, and once ground, it is stored in silos awaiting kiln processing.

Cyclone Preheater

The kiln feed is done through the cyclone preheater, which heats the raw material, known as raw meal, to facilitate its calcination. The raw meal, introduced at the top of the tower, descends counter-current to the kiln gases, preheating it to a temperature of 1000°C.

Clinker Manufacturing

The raw meal enters the kiln while it rotates. The temperature rises to approximately 1500°C at which point complex chemical reactions take place producing clinker.

The fuels that power the kiln are petroleum coke or coal, as well as alternative fuels such as biomass, tires, sewage sludge, etc. The white clinker is cooled as it exits the kiln by injecting water, which reduces its temperature from 1500°C to approximately 100°C.

Cement Grinding

The clinker, mixed with gypsum and additives in the proportions indicated in section 2.3, is ground in a ball mill to the required fineness.

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

	t/tck	Distance (Km)
Sand	0.0777	56.3
Fluorite	0.0016	579
Limestone	1.2393	20
Kaolin	0.2220	1132

Additionally, the fuels used in clinker production are:

		t/tck	Distance (Km)
Conventional Fuels	Petroleum coke	0.103	359
	Fuel oil	0.0004	658
Alternative Fuels	Waste-derived fuels	0.0046	23
	Meat and bone meal	0.0195	417
	Biomass fuels	0.0782	23

Dispatch

Finally, the cement is stored in silos, separated by type, before being bagged or loaded into a tanker truck for transport by road or rail.

5. Declaration of Environmental Parameters of the LCA and LCI

Environmental Impacts

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 risk.

Parameter	Units	A1	A2	A3	A1-A3
GWP-total	kg CO_2 eq	6,14E+01	2,77E+01	5,17E+02	6,06E+02
GWP-biogenic	kg CO_2 eq	1,38E+00	7,24E-02	2,73E-01	1,72E+00
GWP-fossil	kg CO_2 eq	6,00E+01	2,77E+01	5,17E+02	6,05E+02
GWP-LULUC	kg CO_2 eq	7,78E-02	1,14E-02	5,01E-02	1,39E-01
ODP	kg CFC11 eq	4,18E-05	6,38E-06	1,76E-06	4,99E-05
AP	mol H+ eq	4,97E-01	9,70E-02	8,22E-02	6,77E-01
EP-freshwater	kg P eq	1,49E-02	1,80E-03	5,85E-03	2,25E-02
EP-marine	kg N eq	8,05E-02	2,02E-02	1,69E-01	2,70E-01
EP-terrestrial	mol N eq	9,03E-01	2,21E-01	5,01E-01	1,62E+00
POCP	Kg NMVOC eq	2,20E-01	5,66E-02	4,32E-01	7,09E-01
ADP-minerals & metals	kg Sb eq	1,42E-04	9,67E-05	2,36E-05	2,62E-04
ADP-fossil	MJ	3,07E+03	4,18E+02	4,22E+02	3,91E+03
WDP	m^3 worl eq depriv	2,64E+01	1,26E+00	9,01E+00	3,67E+01

GWP - total: Global Warming Potential; **GWP - fossil:** Global Warming Potential from fossil fuels; **GWP - biogenic:** Biogenic Global Warming Potential; **GWP - luluc:** Global Warming Potential from land use and land-use change; **ODP:** Ozone Depletion Potential of the stratospheric ozone layer; **AP:** Acidification Potential, accumulated surplus; **EP-freshwater:** Eutrophication Potential, fraction of nutrients reaching the final freshwater compartment; **EP-marine:** Eutrophication Potential, fraction of nutrients reaching the final marine water compartment; **EP-terrestrial:** Eutrophication Potential, accumulated surplus; **POCP:** Photochemical Ozone Creation Potential; **ADP-minerals & metals:** Abiotic Depletion Potential for non-fossil resources; **ADP-fossil:** Abiotic Depletion Potential for fossil resources; **WDP:** Water Deprivation Potential (user), water deprivation-weighted consumption. **NR:** Not relevant.

The GWP gross value that includes fossil emissions from alternative fuels is 6.05E+02. The GWP biogenic gross value that includes biogenic carbon from alternative fuels is 1.72E+00.

Additional Environmental Impacts

Parameter	Units	A1	A2	A3	A1-A3
PM	Disease incidence	3,19E-06	1,73E-06	3,97E-01	3,97E-01
IRP[1]	kBq U235 eq	2,97E+01	2,15E+00	1,24E+01	4,42E+01
ETP-fw[2]	CTUe	4,02E+03	3,26E+02	2,48E+02	4,60E+03
HTP-c[2]	CTUh	1,89E-08	1,08E-08	2,42E-07	2,72E-07
HTP-nc[2]	CTUh	5,27E-07	3,27E-07	1,76E-05	1,84E-05
SQP[2]		3,83E+02	2,86E+02	7,05E+02	1,37E+03

PM: Potential incidence of diseases due to particulate matter (PM) emissions; **IRP:** Human exposure efficiency relative to U235 potential; **ETP-fw:** Comparative Toxic Unit Potential for ecosystems - freshwater; **HTP-c:** Comparative Toxic Unit Potential for ecosystems - carcinogenic effects; **HTP-nc:** Comparative Toxic Unit Potential for ecosystems - non-carcinogenic effects; **SQP:** Soil Quality Potential Index; **NR:** Not relevant.

Notice 1: This impact category primarily addresses the potential health impacts from low doses of ionizing radiation from the nuclear fuel cycle. It does not consider the effects of potential nuclear accidents or occupational exposure due to radioactive waste disposal in underground facilities. The ionizing radiation potential from soil, due to radon or certain construction materials, is also not measured by this parameter.

Notice 2: The results of this environmental impact indicator should be used with caution, as the uncertainties in the results are high and experience with this parameter is limited.

Resource Use

Parameter	Units	A1	A2	A3	A1-A3
PERE	MJ	8,58E+01	5,91E+00	1,46E+02	2,38E+02
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	8,58E+01	5,91E+00	1,46E+02	2,38E+02
PENRE	MJ	1,70E-02	1,80E-02	1,44E-02	4,94E-02
PENRM	MJ	3,26E+03	4,43E+02	4,43E+02	4,15E+03
PENRT	MJ	3,26E+03	4,43E+02	4,43E+02	4,15E+03
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	1,15E+03	1,15E+03
NRSF	MJ	0,00E+00	0,00E+00	8,73E+00	8,73E+00
FW	m^3	2,59E+01	1,27E+00	9,11E+00	3,63E+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; **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; **SM:** Use of secondary materials; **RSF:** Use of renewable secondary fuels; **NRSF:** Use of non-renewable secondary fuels; **FW:** Net use of fresh water resources; **NR:** Not relevant.

Waste Categories

Parameter	Units	A1	A2	A3	A1-A3
HWD	kg	1,21E-03	1,08E-03	4,15E-02	4,38E-02
NHWD	kg	2,98E+00	2,14E+01	6,64E+00	3,11E+01
RWD	kg	2,09E-02	2,83E-03	2,98E-03	2,67E-02

HWD: Hazardous waste disposed; **NHWD:** Non-hazardous waste disposed; **RWD**: Radioactive waste disposed; **NR:** Not relevant.

Output Flows

Parameter	Units	A1	A2	A3	A1-A3
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00

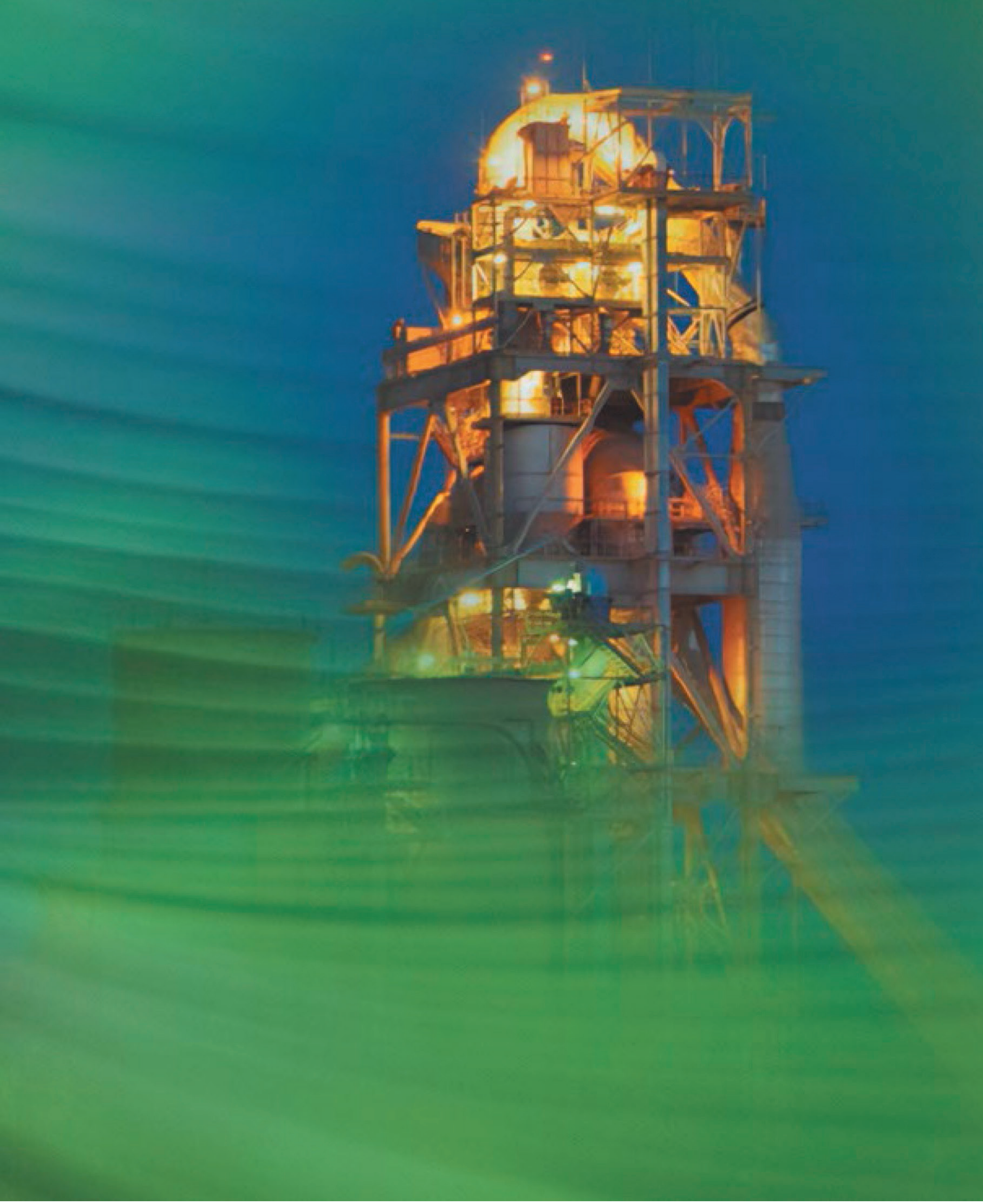
CRU: Components for reuse; **MFR:** Materials for recycling; **MER:** Materials for energy recovery; **EE:** Exported energy; **NR:** Not relevant.

6. Additional Environmental Information

The Çimsa Cementos España S.A.U. factory in Buñol is equipped with ISO 9001, ISO 14001, ISO 45001, and ISO 50001 management systems. Its ICPS in accordance with the Structural Code, as well as its Recycling Index, are included in the Ns Mark.

7. References

- General Rules of the GlobalEPD Program, 3rd Revision dated 09-10-2023.
- UNE-EN ISO 14025:2010 Environmental labels. Type III environmental declarations. Principles and procedures (ISO 14025:2006).
- UNE-EN 15804:2012+A2:2020 Sustainability in construction. Environmental product declarations. Basic product category rules for construction products.
- UNE-EN ISO 14040 Environmental Management. Life Cycle Assessment. Principles and framework. 2006.
- UNE-EN ISO 14044 Environmental Management. Life Cycle Assessment. Requirements and guidelines. 2006.
- LCA Report of January 2024.



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