



ENVIRONMENTAL PRODUCT DECLARATION

In accordance
with **ISO 14025** and **EN 15804:2012+A2:2019/AC:2021** for

CEM II A-LL 42.5 R

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com.



Programme:

The International EPD® System
www.environdec.com

Programme Operator:

EPD International AB

Local Operator:

EPD Türkiye

S-P Code:

S-P-10661

Publication Date:

2024-05-23

Validity Date:

2029-05-22

Geographical Scope:

Global



The EPD owner has the sole ownership, liability, and responsibility for the EPD.

Programme Information

Programme

EPD registered through fully aligned regional programme: EPD Türkiye

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CEN standard EN 15804 serves as the core Product Category Rules (PCR)

Product Category Rules (PCR):

PCR 2019:14 Construction products, version 1.3.3, Construction EN 15804:2012+A2:2019/AC:2021 Sustainability of Construction Works and c-PCR-003 Concrete and concrete elements (EN 16757) (2023-01-02).

UN CPC code:

Division 37440 “Portland cement, aluminous cement, slag cement and similar hydraulic cements, except in the form of clinkers”

PCR review was conducted by: The Technical Committee of the International EPD® System.

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:

EPD process certification

EPD verification **X**

Third party verifier: Stephen Forson, ViridisPride

Approved by: The International EPD® System

Procedure for follow-up of data during EPD validity involves third party verifier:

Yes

No **X**

EPDs within the same product category but registered in different EPD programmes may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison.

About Company

Çimsa, a subsidiary of Sabancı Holding, was founded in Mersin in 1972. Today, Çimsa carries out its manufacturing operations via its three integrated factories in Mersin, Eskisehir and Afyonkarahisar, Turkey, an integrated cement plant in Bunol, Spain, a cement grinding facility in the USA and terminals in Germany, Spain, Italy and the TRNC. Çimsa is one of the leading global brands in white cement and sustains its global operations through Sabancı Building Solutions, a company founded by integrating the operational capability of Çimsa with the financial strength of Sabancı Holding, Çimsa's main shareholder. In addition to white cement and calcium aluminate cement with EPD certificate, it is strengthening its position as a global cement manufacturer by adding more environmentally friendly products to its portfolio with Gray Cement.

Thanks to its market-oriented approach and extensive distribution network, Çimsa meets the product and service requirements of its customers fully and on time. Being a reliable business partner for its stakeholders, the company provides the necessary materials for long-lasting living spaces

and infrastructures for the future generations. Çimsa pioneers the Turkish cement and building materials industry in terms of innovation via its special products including white cement and calcium aluminate cement, in addition to the gray cement. Focusing on profitable growth and creating value for all its stakeholders, Çimsa's goal is to sustain and expand these achievements in the future.

About Sabancı Building Solutions

Sabancı Building Solutions aims to grow Building Materials Portfolio of Sabancı Holding in developed geographies with sustainable products and solutions. Sabancı Building Solutions is going to transform existing portfolio through acquisitions of businesses, with an emphasis on ESG principles, in alignment with the commitment of Sabancı Holding to Net Zero in 2050.

Additionally, the Company will continue shaping the future through investments in Construction Tech ecosystem with a focus on advanced materials, decarbonization, digitalization and productivity.



About Product

Çimsa Izo Power 42,5 (CEM II/A-LL 42.5 R) Portland limestone cement consists solely of Portland cement clinker, limestone and gypsum in accordance with TS EN 197-1: 2012 standard at Çimsa's Afyon plant.

Thanks to the high purity limestone in its components, the product features sustainability and stability in ready-mix concrete with its lower carbon emission advantage as well as better workability and consistency preservation.

Produced in accordance with the production of all compressive strength classes, Portland-Limestone Cement provides stable ultimate strength. The product shows strength and durability performance equivalent to the Portland cement (CEM I 42.5 R).



Highlights

- Controlled Heat of Hydration
- High Ultimate Strength



Advantages in applications;

- Due to its limestone content, the product exhibits improved workability in concrete production.
- Çimsa Izo Power 42,5 Portland-limestone cement produced to align with all concrete strength classes, provides stable final strength.
- The product demonstrates equivalent strength and durability performance with Portland cement (CEM I 42.5 R) in concrete production.
- Thanks to the thin filler materials within the product, sustainable properties are evident, contributing to reduced greenhouse gas emissions when compared to Portland cement.
- All typical concrete additives (e.g., plasticizing, air entraining, setting retarders) can be utilized with Çimsa Izo Power 42.5 cement.



Application areas;

- The product is suitable for utilization in ready-mixed concrete production and construction chemicals.
- The product is well-suited for producing a variety of reinforced concrete structures such as residential buildings, bridges, foundations, via ducts, and concrete road pavements.



Product Composition

Product Composition	Weight (%)	Post-consumer material weight- %	Biogenic material kg C / kg
Clinker	80 - 85	0	0
Cementitious materials	5 - 20	0	0
Gypsum	0 - 10	0	0
Limestone	0 - 5	0	0

About Product

This EPD is prepared for the declared product CEM II/A-LL 42.5R Portland limestone cement from Çimsa Izo Power product family manufactured by Çimsa at Afyon Plant in Turkey.

The product mainly consist of clinker, gypsum, and limestone.

As packaging materials, packaging films and kraft paper are used. Impact of the use of pallets are omitted due to their repetitive use.



Properties	Çimsa Values	Standart Limit (EN 197-1)	
		Min.	Max.
Specific Gravity	3.09 gr/cm ³	-	-
Specific Surface (Blaine)	4200 - 4800 cm ² /gr	-	-
Initial Setting	120 -190 Minutes	60	-
Final Setting	190 - 250	-	-
Water	%26.0 - %28.0	-	-
Volume Constancy (Le Chatelier)	1.0 mm	-	10
0.045 mm Retained Material	% 0.5-2.0	-	-
2-Day Compressive Strength	27-33 MPa	20	-
28-Day Compressive Strength	47-51 MPa	42.5	62.5

LCA Information

Declared Unit

1 tonnes of Çimsa Izo Power 42.5 (CEM II/A-LL 42.5 R) Portland limestone cement.

Time Representativeness

2022

Database(s) and LCA Software Used Ecoinvent 3.9.1, SimaPro 9.5

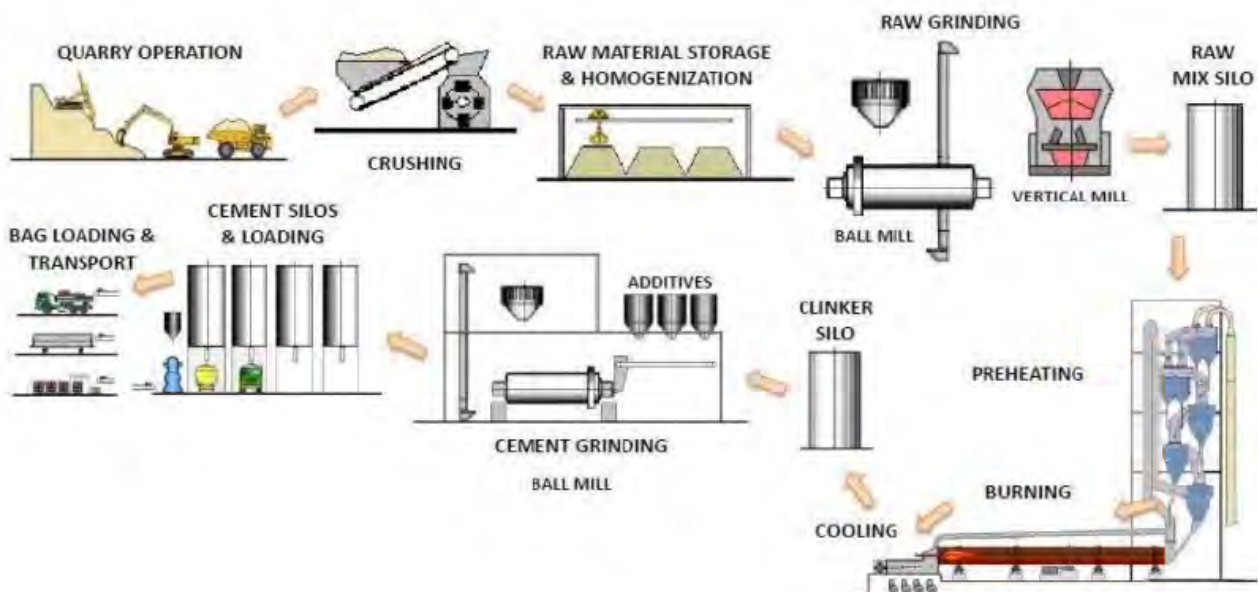
The inventory for the LCA study is based on the 2022 production figures for CEM II/A-LL 42.5R by Çimsa produced in Afyon, Türkiye.

This EPD's system boundary is cradle to gate with options. The results of the LCA with the indicators as per EPD requirement are given in the following tables for product manufacture (A1, A2, A3), transportation (A4) and installation (A5). According to EN 15804+A2:2019 standard, if the product or material is physically integrated with other products during installation then they cannot be physically separated at the end of life stage. For this reason, modules C1-C4 and Module D are excluded.

	Product Stage			Construction Process Stage		Use Stage							End of Life Stage			Benefits and Loads	
	Raw Material Supply	Transport	Manufacturing	Transport	Construction Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	Deconstruction / Demolition	Transport	Waste Processing		Disposal
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules Declared	X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Geography	GLO	GLO	TR	GLO	GLO	-	-	-	-	-	-	-	-	-	-	-	-
Specific Data Used	82.6*				-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - Products	0%				-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - Sites	0%				-	-	-	-	-	-	-	-	-	-	-	-	-

GLO: Global, TR: Türkiye, X = Module included, ND = Not declared

*Direct emissions (calcination + combustion) during the clinker manufacturing and upstream & downstream transportation are considered as specific data according to the relevant PCR.



Process Flow Diagram

A1: Raw Material Supply

This stage includes raw materials extraction and pre-treatment processes before production. Main materials used in the production of the investigated product is clinker, gypsum, limestone and supplementary cementitious materials. Impacts of these materials are considered at this stage.

A2: Raw Material Transport

This stage includes transportation related impacts of needed materials for the production of clinker. It is observed that both highway and seaway transportation are heavily involved at this stage. Transport routes and distances are supplier-specific and provided by the manufacturer.

A3: Manufacturing

This stage includes production-related environmental impacts of the investigated product. Main steps of cement production including the clinker production are raw material extraction, grinding, blending, pre-heating, kiln phase, cooling, and final grinding. All energy-related inputs are supplied by the manufacturer for the year 2022. The manufacturing data is for ÇİMSA's Afyon plant.

A4: Transport to Customer

This stage is relevant for the delivery of final product to the intended markets and customers. Highway and seaway transportation are involved in this stage. The transport routes and distances are supplier-specific and provided by the manufacturer.

A5: Installation

This stage includes end-of-life impact of packaging material used in the product.

More Information

System Boundary

Cradle to gate with optional modules (A4 & A5).

Cut-Off Rules

1% cut-off is applied. Data for elementary flows to and from the product system contributing to a minimum of 99% of the declared environmental impacts have been included.

REACH Regulation

No substances included in the Candidate List of Substances of Very High Concern for authorization under the REACH regulations are present in this product either above the threshold for registration with the European Chemicals Agency or above 0.1% (wt/wt).

Background Data / Specific Data

For LCA modelling and calculation, ecoinvent database (v3.9.1) and SimaPro (v9.5) LCA software were used. Characterization factors of EN 15804 reference package based on EF 3.1 are utilized. Impact of infrastructure and capital goods are excluded from the analysis.

Biogenic Carbon Content

The product does not contain biogenic carbon thus there is no biogenic carbon content in the product. The biogenic carbon content due to the use of paper bags in packaging is considered.

Period Under Review

The data used for LCA study concerns the year 2022.

Allocations

Energy consumptions were weighted according to the production figures in relevant period. In addition, hazardous and non-hazardous waste amounts were also allocated from the total waste generation in the considered time interval.

Electricity

The electricity data used in the manufacturing is taken from Ecoinvent 3.9.1 database which represent medium voltage electric production in Türkiye. The used data has a GWP-GHG impact of 0.578 kg CO₂ eq. / kWh based on the reference year 2017. The breakdown of electricity generation in Türkiye is provided below.

- Coal, 37%
- Hydro, 33%
- Natural gas, 17 %
- Wind, 8%
- Geothermal, 3%
- Biogas, 1%
- Other, 1%
- Biomass, <1%

Assumptions

Upstream and downstream road transportation are assumed to be carried out with Euro5 motor vehicles with a size class of > 32 metric tonnes where distances acquired through Google Maps. The packaging content is assumed to be landfilled.

LCA Results

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

Core environmental impact indicators (Mandatory)				
Impact Category	Unit	A1-A3	A4	A5
GWP - Fossil	kg CO ₂ eq.	8.51E+02	2.34E+01	8.73E-02
GWP - Biogenic	kg CO ₂ eq.	5.08E-02	7.54E-03	4.84E-01
GWP - Luluc	kg CO ₂ eq.	6.80E-01	1.10E-02	1.15E-05
GWP - Total	kg CO ₂ eq.	8.52E+02	2.34E+01	5.71E-01
ODP	kg CFC-11 eq.	6.54E-06	5.11E-07	2.44E-10
AP	mol H ⁺ eq.	2.08E+00	7.86E-02	9.75E-05
EP - Freshwater	kg P eq.	1.09E-02	1.89E-04	3.59E-07
EP - Marine	kg N eq.	5.43E-01	2.69E-02	4.01E-04
EP - Terrestrial	mol N eq.	6.14E+00	2.88E-01	3.24E-04
POCP	kg NMVOC	2.01E+00	1.22E-01	2.03E-04
*ADPE	kg Sb eq.	1.53E-04	6.30E-05	3.10E-08
*ADPF	MJ	5.28E+03	3.42E+02	2.38E-01
*WDP	m ³ depriv.	8.01E+01	1.63E+00	9.29E-03
Additional environmental impact indicators (Mandatory)				
**GWP-GHG	kg CO ₂ eq.	8.53E+02	2.34E+01	2.98E-01
Additional environmental impact indicators (Optional)				
PM	disease inc.	1.27E-05	2.35E-06	1.62E-09
***IR	kBq U-235 eq.	2.73E+00	1.64E-01	2.19E-04
ETP-FW	CTUe	2.26E+03	1.64E+02	7.91E-01
*HTP - C	CTUh	1.08E-07	1.01E-08	7.91E-12
*HTP - NC	CTUh	5.00E-06	2.46E-07	6.49E-10
*SQP	Pt	5.42E+02	3.47E+02	4.86E-01
Acronyms	GWP-total: Climate change, GWP-fossil: Climate change- fossil, GWP-biogenic: Climate change - biogenic, GWP-luluc: Climate change - land use and transformation, ODP: Ozone layer depletion, AP: Acidification terrestrial and freshwater, EP-freshwater: Eutrophication freshwater, EP-marine: Eutrophication marine, EP-terrestrial: Eutrophication terrestrial, POCP: Photochemical oxidation, ADPE: Abiotic depletion - elements, ADPF: Abiotic depletion - fossil resources, WDP: Water scarcity, PM: Respiratory inorganics - particulate matter, IR: Ionising radiation, ETP-FW: Ecotoxicity freshwater, HTP-c: Cancer human health effects, HTP-nc: Non-cancer human health effects, SQP: Land use related impacts, soil quality.			
Legend	A1: Raw Material Supply, A2: Transport, A3: Manufacturing, A4: Transport, A5: Installation			

LCA Results

Indicators describing resource use (Mandatory)				
Impact Category	Unit	A1-A3	A4	A5
PERE	MJ	2.42E+02	5.01E+00	1.17E+01
PERM	MJ	1.17E+01	0.00E+00	-1.17E+01
PERT	MJ	2.53E+02	5.01E+00	7.38E-03
PENRE	MJ	5.25E+03	3.42E+02	3.01E+01
PENRM	MJ	2.99E+01	0.00E+00	-2.99E+01
PENRT	MJ	5.28E+03	3.42E+02	2.38E-01
SM	kg	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00
FW	m ³	4.69E+00	6.80E-02	2.41E-04
Acronyms	PERE: Use of renewable primary energy excluding 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 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: Secondary material, RSF: Renewable secondary fuels, NRSF: Non-renewable secondary fuels, FW: Net use of fresh water.			
Environmental information describing waste categories (Mandatory)				
Impact Category	Unit	A1-A3	A4	A5
HWD	kg	2.75E-05	0.00E+00	0.00E+00
NHWD	kg	2.44E-04	0.00E+00	0.00E+00
RWD	kg	0.00E+00	0.00E+00	0.00E+00
Environmental information describing Output flow (Mandatory)				
CRU	kg	0.00E+00	0.00E+00	0.00E+00
MFR	kg	0.00E+00	0.00E+00	0.00E+00
MER	kg	0.00E+00	0.00E+00	0.00E+00
EE (Electrical)	MJ	0.00E+00	0.00E+00	0.00E+00
EE (Thermal)	MJ	0.00E+00	0.00E+00	0.00E+00
Acronyms	HWD: Hazardous waste disposed, NHWD: Non-hazardous waste disposed, RWD: Radioactive waste disposed, CRU: Components for reuse, MFR: Material for recycling, MER: Materials for energy recovery, EE (Electrical): Exported energy electrical, EE (Thermal): Exported energy thermal.			
*Disclaimer 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.			
**Disclaimer 2	GWP-GHG = Global Warming Potential total excl. biogenic carbon following IPCC AR5 methodology. The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. The GWP-GHG indicator is identical to GWP-total except that the characterisation factor (CF) for biogenic CO ₂ is set to zero.			
***Disclaimer 3	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.			

ISO 9001:2015/ Quality Management Systems

ISO 50001:2018/ Energy Management Systems

GPI/ General Programme Instructions of the International EPD® System. Version 4.0.

ISO 14020:2000/ Environmental Labels and Declarations – General principles

EN 15804:2012+A2:2019/AC:2021 Sustainability of construction works - Environmental Product Declarations – Core rules for the product category of construction products

ISO 14025/ DIN EN ISO 14025:2009-11: Environmental labels and declarations - Type III environmental declarations – Principles and procedures

ISO 14040/44/ DIN EN ISO 14040:2006-10, Environmental management - Life cycle assessment - Principles and framework (ISO14040:2006) and Requirements and guidelines (ISO 14044:2006)

PCR for Construction Products and Construction Services/ Prepared by IVL Swedish Environmental Research Institute, Swedish environmental Protection Agency, SP Trä, Swedish Wood Preservation Institute, Swedisol, SCDA, Svenskt Limträ AB, SSAB, The International EPD System, 2019:14 version 1.3.3.

The International EPD® System/ The International EPD® System is a programme for type III environmental declarations, maintaining a system to verify and register EPD®s as well as keeping a library of EPD®s and PCRs in accordance with ISO 14025. www.environdec.com

Ecoinvent / Ecoinvent Centre, www.ecoinvent.org

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