ENVIRONMENTAL PRODUCT DECLARATION

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

ISIDAÇ40

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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

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EPD International AB

Licensee:
EPD Türkiye

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Global

EPD® TÜRKİYE
THE INTERNATIONAL EPD® SYSTEM

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Programme Information

Licensee

EPD registered through fully aligned regional programme: EPD Türkiye

www.epdturkey.org
info@epdturkey.org

NEF O9 B Blok No:7/15, 34415
Kağıthane/İstanbul, TÜRKİYE

Programme Operator

The International EPD® System

EPD International AB
Box 210 60 SE-100 31
Stockholm, Sweden

www.environdec.com
info@environdec.com

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

Product Category Rules (PCR):

PCR 2019:14 Construction products, version 1.3.4, Construction EN 15804:2012+A2:2019/AC:2021 Sustainability of Construction Works and c-PCR-001 Cement and building lime (EN 16908) (2024-04-30).

UN CPC Code: 3744
"Portland cement, aluminous cement, slag cement, and similar hydraulic cement, except in the form of clinkers."

PCR review was conducted by: The Technical Committee of the International EPD® System. Review chair: Claudia A. Peña, University of Concepción, Chile

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 Ltd.

Approved by: The International EPD® System

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

Yes No **X**

LCA practitioner: Yıldıray Yılmaz & Işıl Atalay Sırt -- Metsims Sustainability Consulting

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

About Company

Çimsa, a subsidiary of Sabancı Holding, was founded in Mersin in 1972. Today, Çimsa conducts its manufacturing operations through its three integrated plants in Mersin, Eski ehir, 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 leading global brands in white cement and sustains its global operations through Sabancı Building Solutions, a company founded by integrating Çimsa's operational capability with the financial strength of Sabancı Holding, Çimsa's main shareholder. In addition to white cement and calcium aluminate cement with an EPD certificate, it is strengthening its position as a global cement manufacturer by adding more environmentally friendly products to its portfolio, including grey 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. As a reliable business partner for its stakeholders, the company provides the necessary materials for long-lasting living spaces and infrastructure for future generations. Çimsa pioneers the Turkish cement and building materials industry in terms of innovation with its special products, including white cement and calcium aluminate cement, in addition to grey 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 the Building Materials Portfolio of Sabancı Holding in developed geographies with sustainable products and solutions. Sabancı Building Solutions plans to transform its existing portfolio through the acquisition of businesses, with an emphasis on ESG principles, in alignment with Sabancı Holding's commitment to achieving Net Zero by 2050.

Additionally, the company will continue shaping the future through investments in the Construction Tech ecosystem, focusing on advanced materials, decarbonization, digitalization, and productivity.

About Product

Isıdaç40 is a calcium aluminate cement developed by Çimsa Research and Application Center and sold to more than 60 countries with 15+ years of experience. Çimsa Aluminates products are manufactured in L-type kilns using the fusion method with cooling system. After cooling, the clinker is ground in a ball mill and packaging is carried out.

Çimsa Aluminates family products are produced according to EN 14647 standards. Production processes are certified according to EN ISO 9001, EN ISO 45001 and EN ISO 14001 standards.

Isıdaç40 offers various advantages for construction chemicals applications;

· Adjustable setting time,
· Thermal resistance up to 1300 C,
· High early and final strength,
· High wear resistance

Highlights

- High durability
- Helps to prevent cracks
- Low carbon footprint

Some application areas of Isıdaç40;

- Construction chemicals applications,
- Refractory applications,
- Pipe coating applications,
- Mining applications.

Product Composition

*Product components	Weight, %	Post-consumer recycled material, weight-%	Biogenic material, weight of % of product
Calcium aluminate (CAC) clinker	100	0	0
SUM	100	0	0

Packaging Composition

Packaging materials	Weight, kg	Weight-% (versus the product)	Biogenic material, kg C/declared unit
Big bag	1.72	0.172	0
Paper bag	1.72	0.172	0.68
SUM	3.44	0.344	0.68

*Product composition is presented as percentages rather than specific weights to maintain confidentiality while transparently communicating the relative proportions of each component.

About Product

ISIDAÇ 40 is a Calcium Aluminate Cement designed by Çimsa Formülhane over 20 years ago and produced in accordance with the TS EN 14647 standard. The product is composed entirely of calcium aluminate clinker, made from limestone and bauxite, ensuring high performance and durability. Classified under the UN CPC Code 3744, it falls into the category of "Portland cement, aluminous cement, slag cement, and similar hydraulic cement, except in the form of clinkers."

Physical and Mechanical Properties

Initial set (min)	≥ 180	EN 196-3
Final set (min)	≤ 330	EN 196-3
Specific gravity (g/cm^3)	≤ 3.3	EN 196-6
Compressive strength (MPa)	6 hr ≥ 35.0 24 hr ≥ 60.0	EN 196-1
Residue at 45 microns (%)	≤ 10	EN 196-6
Residue at 90 microns (%)	≤ 2	EN 196-6
Blaine (cm^2/g)	≥ 3000	EN 196-6

Çimsa Aluminates products are produced according to EN 14647 standard. Production processes are certified according to EN ISO 9001, EN ISO 45001 and EN ISO 14001.

LCA Information

Declared Unit	1 tonnes of ISIDAÇ40 cement
Time Representativeness	2023
Database(s) and LCA Software Used	Ecoinvent 3.10 & SimaPro 9.6

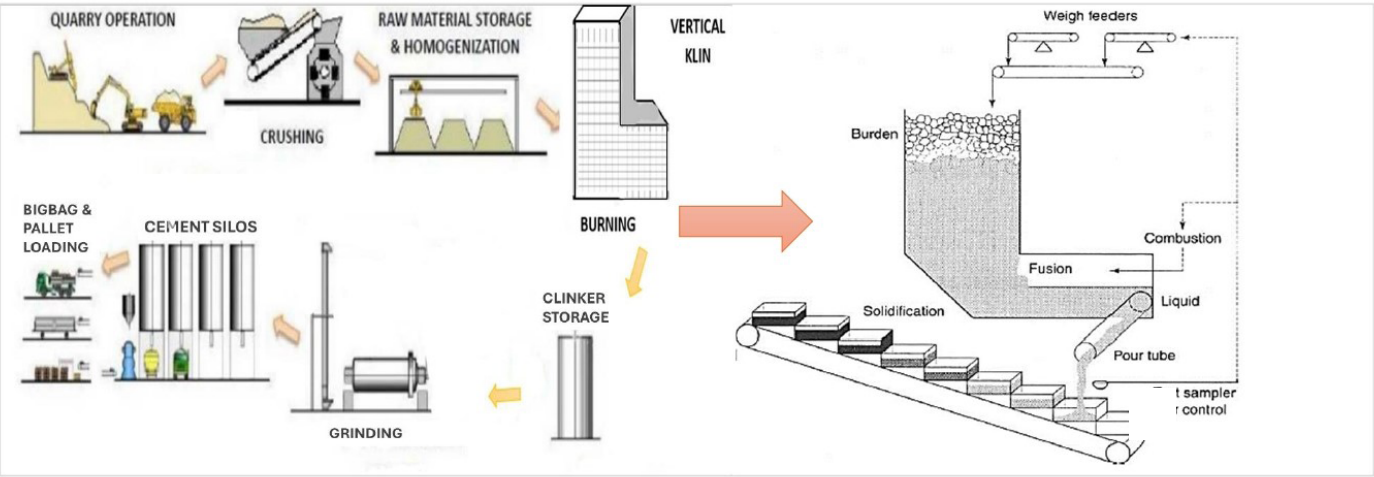
The inventory for the LCA study is based on the 2023 production figures for Isıdaç40 cement by Çimsa produced in Mersin, Türkiye.

This EPD's system boundary is cradle to gate. The results of the LCA with the indicators as per EPD requirement are given in the following tables for product manufacture (A1, A2, A3), and transportation stages (A4). 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	Future reuse, recycling or energy recovery potentials
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	91%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - Products	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - Sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

System Boundary



Process Flow Diagram

A1: Raw Material Supply

This stage includes raw materials extraction and pre-treatment processes before production. The investigated product is a specific calcium aluminate cement produced entirely with calcium aluminate clinker. To produce this clinker, raw materails such as limestone and bauxite are used. The impact of these raw materials are calculated at this stage.

A2: Raw Material Transport

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

Transport Mode	Type
Road	Vehicle: Lorry, Size class: >32 metric ton, Emission standard: Euro6, Fuel Type: Diesel
Sea	Vehicle: Bulk carrier, DWT (Load capacity): 51000 tonnes, Fuel Type: Heavy fuel oil

System Boundary

A3: Manufacturing

Calcium aluminate cement (CAC) is produced by blending finely ground limestone ($CaCO_3$) and bauxite (Al_2O_3) in precise proportions. The mixture is heated in a L-shaped kilns at minimum 1,600°C to form clinker rich in calcium aluminate phases. The clinker is then cooled and ground into a fine powder to create the cement. All energy inputs are sourced from the manufacturer's 2023 supply.

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.

Transport Mode	Type
Road	Vehicle: Lorry, Size class: >32 metric ton, Emission standard: Euro6, Fuel Type: Diesel
Sea	Vehicle: Bulk carrier, DWT (Load capacity): 51,000 tonnes, Fuel Type: Heavy fuel oil

A5: Installation

This stage includes end-of-life impacts of packaging materials. Due to the lack of information, these packaging products are assumed to be landfilled in order not to provide false carbon benefit to the manufacturer.

More Information

System Boundary

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

Cut-Off Rules

The criteria for exclusion were set so that individual input flows less than 1% of the total, with a cumulative limit of less than 5%, could be omitted. This was contingent upon confirming that these excluded flows did not significantly alter the reported data, with "significant" defined as affecting the total by less than 5%.

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).

LCA Modelling, Calculation and Data Quality

The results of the LCA with the indicators as per EPD requirements are given in the LCA result tables. All energy calculations were obtained using Cumulative Energy Demand (LHV) methodology, while freshwater use is calculated with selected inventory flows in SimaPro according to the PCR. There are no co-product allocations within the LCA study underlying this EPD. The regional energy datasets were used for all energy calculations.

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.

Period Under Review

The data used for LCA study concerns the year 2023.

Source of Electricity

The modeled electricity data for the manufacturing of the investigated producut is taken from ecoinvent 3.10 database which has carbon density of 0.575 kg CO_2 eq. / kWh for medium voltage electricity production. The selected electricity data consists of around 35% electricity production from hard coal and lignite, 29.2% hydro, 19.4% natural gas, 9.4% wind, 3.5% geothermal, 1.2% co-generation from natural gas, 1.1% biogas and around 1.2% from various other sources.

Allocations

Energy consumption and raw material transportation were weighted according to 2023 production figures. In addition, hazardous and non-hazardous waste amounts were also allocated from the total waste generation in 2023.

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. In addition, 100 km distance for the waste transport at C2 stage is assumed.

Reason for the revision

The EPD has been revised to comply with the latest requirements of the Construction PCR, and the data period has also been updated.

LCA Results

The LCA results provided below are for 1 tonne of Isıdaç cement. 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 - Total	kg CO_2 eq.	9.05E+02	4.81E+01	2.73E+00
GWP - Fossil	kg CO_2 eq.	9.07E+02	4.81E+01	2.33E-01
GWP - Biogenic	kg CO_2 eq.	-2.41E+00	8.38E-03	2.49E+00
GWP - Luluc	kg CO_2 eq.	8.15E-02	2.94E-02	1.16E-05
ODP	kg CFC-11 eq.	1.53E-06	6.98E-07	1.29E-09
AP	mol H+ eq.	2.67E+00	1.09E+00	6.05E-04
EP - Freshwater	kg P eq.	2.79E-01	2.11E-03	1.33E-05
EP - Marine	kg N eq.	8.26E-01	2.49E-01	6.77E-04
EP - Terrestrial	mol N eq.	9.05E+00	2.78E+00	2.91E-03
POCP	kg NMVOC	2.32E+00	7.85E-01	8.43E-04
*ADPE	kg Sb eq.	1.71E-04	6.82E-05	1.25E-07
*ADPF	MJ	5.40E+03	3.71E+01	9.43E-02
*WDP	m^3 depriv.	5.54E+01	1.88E+00	4.09E-04
Additional environmental impact indicators (Mandatory)				
**GWP-GHG	kg CO_2 eq.	9.09E+02	4.82E+01	2.35E-01
Additional environmental impact indicators (Optional)				
PM	disease inc.	1.54E-05	1.91E-06	6.61E-09
***IR	kBq U-235 eq.	9.43E+00	3.65E-01	1.69E-03
ETP-FW	CTUe	1.00E+03	1.24E+02	1.14E+00
*HTP - C	CTUh	3.80E-07	2.40E-07	6.46E-10
*HTP - NC	CTUh	6.65E-06	1.97E-07	5.01E-09
*SQP	Pt	1.03E+03	1.48E+02	1.13E+00
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	1.27E+02	5.88E+00	2.43E+01
PERM	MJ	2.43E+01	0.00E+00	-2.43E+01
PERT	MJ	1.51E+02	5.88E+00	2.73E-02
PENRE	MJ	5.35E+03	3.71E+01	5.66E+01
PENRM	MJ	5.65E+01	0.00E+00	-5.65E+01
PENRT	MJ	5.40E+03	3.71E+01	9.43E-02
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	4.87E+00	6.03E-02	1.61E-03
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	4.31E-02	1.09E-02	1.78E-01
NHWD	kg	1.17E+01	9.96E+00	3.44E+00
RWD	kg	2.37E-03	8.92E-05	4.19E-07
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.			
*Disclamer 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			
**Disclamer 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. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013			
***Disclamer 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.			

References

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

European Committee for Standardization (CEN). (2005). EN 14647: Calcium aluminate cement - Composition, specifications and conformity criteria. Brussels, Belgium: CEN.

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International Organization for Standardization (ISO). (2015). ISO 14001: Environmental management systems - Requirements with guidance for use. Geneva, Switzerland: ISO.

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 1.3.4.

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

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SimaPro/ SimaPro LCA Software, Pré Consultants, the Netherlands, www.pre-sustainability.com

www.cimsa.com.tr

www.metsims.com

Contact Information

Programme & Programme Operator	The International EPD® System www.environdec.com  	EPD International AB Box 210 60 SE-100 31 Stockholm, Sweden www.environdec.com info@environdec.com
Licensee	EPD registered through fully aligned regional licensee: EPD Türkiye  	www.epdturkey.org info@epdturkey.org NEF O9 B Blok No:7/15, 34415 Kağıthane/İstanbul, Türkiye
Owner of the declaration	 Allianz Tower Küçükbakkalköy Mah. Kayışdağı Cad. No: 1 Kat:23-24 34750 Ataşehir/İstanbul	Merve Özkan Batmaz Marketing Manager 0530 035 42 03 m.ozkanbatmaz@cimsa.com.tr www.cimsa.com.tr info@cimsa.com.tr
LCA practitioner & EPD Design	 Metsims Sustainability Consulting	The United Kingdom 4 Clear Water Place Oxford OX2 7NL, UK 0 800 722 0185 www.metsims.com info@metsims.com Türkiye Nef 09 B Blok No:7/46-47 34415 Kağıthane/İstanbul, Türkiye +90 212 281 13 33

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