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<b>Programme Operator:</b>	EPD International AB
<b>Local Operator:</b>	EPD Turkey
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<b>Geographical Scope:</b>	Türkiye

# ENVIRONMENTAL PRODUCT DECLARATION

## CEM II/C PORTLAND COMPOSED CEMENT

Manufactured by Batçim Batı Anadolu Çimento Sanayii A.Ş.  
in accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021



# BATIÇİM

# Programme Information

ISO standard ISO 21930 and CEN standard EN 15804 serves as the core Product Category Rules (PCR).

Product Category Rules (PCR):

2019:14 Version 1.2.5, 2024-12-20, Construction Products and CPC 375 Construction Services, EN 15804:2012+A2:2019/AC:2021 Sustainability of Construction Works

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

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.

## Third-party verification

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

EPD Turkey

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## EPD verification by individual verifier

Third party verifier: Prof. Ing. Vladimír Kočí, Ph.D., MBA, LCA Studio Šárecká 5,16000 Prague 6 - Czech Republic

Approved by: The International EPD® System

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

Yes  No

**Batçim Batı Anadolu Çimento Sanayii A.Ş.** has the sole ownership, liability, and responsibility for this EPD.

## Life Cycle Assessment (LCA)

LCA Practitioner: Metsims Sustainability Consulting

# How To Read This EPD?

An Environmental Product Declaration (EPD) is an ISO Type III Environmental Declaration based on ISO 14025 standard. An EPD transparently reports the environmental performance of products or services from a lifecycle perspective. The preparation of an EPD includes different stages, from acquiring raw materials to the end of life of the final product/service. EPDs are based on international standards and consider the entire value chain. Additionally, **EPD is a third-party verified document**. This EPD includes the following sections described below.

## 1. General and Program Information

The first part of an EPD has information about the name of the manufacturer and product/service and other general information such as the validity and expiration dates of the document, the name of the program operator, geographical scope, etc. The second page states the standards followed and gives information about the program operator, third-party verifier, etc. The followed Product Category Rule (PCR) is indicated on the second page.

## 2. Company and Product/Service Information

Information about the company and the investigated product is given in this section. It summarizes the characteristics of the product provided by the manufacturer. It also includes information about the product such as product composition and packaging.

## 3. LCA Information

Life Cycle Analysis (LCA) information is one of the most important parts of the EPD as it describes the functional/declared unit, time

representativeness of the study, database(s) and LCA software, along with system boundaries. The table presented in this part has columns for each stage in the life cycle. The considered stages are marked 'X' whereas the ones that are not considered are labeled as 'ND' (Not Declared). Not all EPDs consider the full life cycle assessment for a product's entire life stages. The 'System Boundary' page is also the place where one can find detailed information about the stages and the assumptions made.

## 4. LCA Results

The results of the LCA analysis are presented in table format. The first column in each table indicates the name of the impact category and their measurement units are presented in the second column. These tables show an amount at each life cycle stage to see the impact of different indicators on different stages. Each impact can be understood as what is released through the production of the declared unit of the material. The benefits of reuse/recycling of the declared product are reflected in this section.

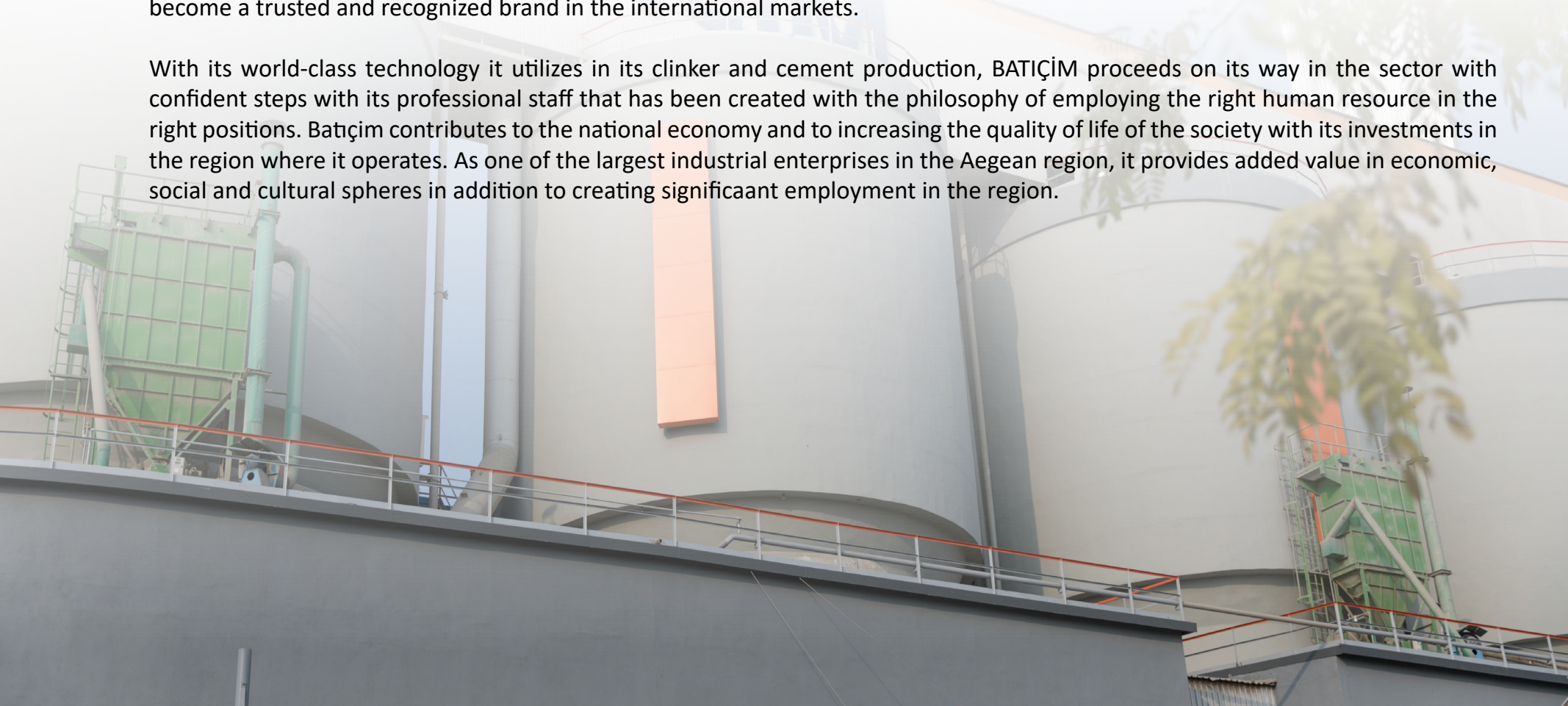
The first impact in the table is global warming potential (GWP), which shows how much CO<sub>2</sub> is released at each stage. Other impacts include eutrophication potential, acidification potential, ozone layer depletion, land use related impacts, etc. The second table provides results for resource use and the third table is about the waste produced during production. The fourth and final table shows the results for the GWP-GHG indicator, which is almost equivalent to the GWP-Total indicator mentioned previously. The only difference is that this indicator excludes the biogenic carbon content by following a certain methodology.

## About **BATIÇİM**

BATIÇİM Batı Anadolu Cement Industry Co. Ltd. was established in 1966 with 100% Turkish capital and became one of the strongest companies of Turkish Cement Industry.

During a period of more than half a century since its foundation, it wasn't contented with just meeting a significant portion of our country's cement need, with its environmentally friendly products of superior quality, which it has offered to the service of the building sector with the understanding of "quality first" it has adopted and with its perfect service understanding, and has also become a trusted and recognized brand in the international markets.

With its world-class technology it utilizes in its clinker and cement production, BATIÇİM proceeds on its way in the sector with confident steps with its professional staff that has been created with the philosophy of employing the right human resource in the right positions. Batıçim contributes to the national economy and to increasing the quality of life of the society with its investments in the region where it operates. As one of the largest industrial enterprises in the Aegean region, it provides added value in economic, social and cultural spheres in addition to creating significant employment in the region.



# About Product

## Product Description

The innovative product ecoBATI CEM II C/M (L-W) 42.5 N, developed with intensive R&D studies, is a new generation cement product that is compatible with the EN 197-5 standard that entered into force in Europe in 2021.

While showing similar durability characteristics with CEM II B products, ecoBATI CEM II C/M (L-W) 42.5 N also targets lower CO<sub>2</sub> emissions thanks to its innovative formula. The new generation cement ecoBATI, which is suitable for all kinds of uses including industrial structures, dams and water channels, coastal and port structures, housing, social facilities and building elements, extends the service life of the structures with its strength performance.

Thanks to its formula containing approximately 20% more additives, ecoBATI aims to reduce emissions from clinker.

Raw Material	Composition (%)
Clinker	60-65
Fly Ash	20-25
Limestone	5-10
Others	0-5



## Packaging

There is no packaging used in the final product as it is sold in bulks in 2022. All calculations are made according to the bulk sale of the product, but it is also possible to sell it in.

# Technical Specifications

## CEMENT TYPE

## CEM II/C-M(L-W) 42.5 N

### CHEMICAL SPECIFICATIONS

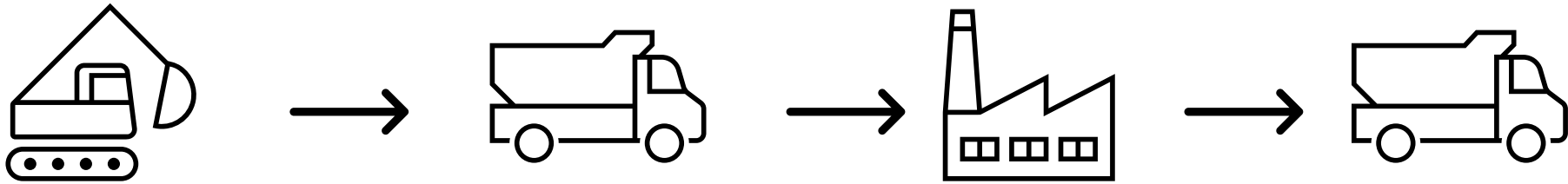
Specifications	Method	TS EN 197-1	Results	Unit
Cement Composition (Additive)	TS CEN/TR 196/4	$\geq 36.0 - \leq 50.0$	38.65	%
Loss on Ignition(L.O.I)	TS EN 196-2	-	5.66	%
Sulfate Content (SO <sub>3</sub> )	TS EN 196-2	$\leq 4.0$	3.31	%
Chloride Content (Cl <sup>-</sup> )	TS EN 196-2	$\leq 0.1$	0.0184	%

### CHEMICAL SPECIFICATIONS

Initial Setting Time	TS EN 196-3	$\geq 60.0$	165	minutes
Final Setting Time	TS EN 196-3	-	210	minutes
Specific Gravity	TS EN 196-3	-	2.95	gr/cm <sup>3</sup>
Specific Surface (Blaine)	TS EN 196-3	-	4662	cm <sup>2</sup> /gr
Expansion	TS EN 196-3	$\leq 10.0$	1.0	mm

### STRENGTH SPECIFICATIONS

Early Strength (Two Days)	TS EN 196-1	$\geq 10.0$	21.5	MPa
Strength	TS EN 196-1	$\geq 42.5 - \leq 62.5$	52.3	MPa



### A1- RAW MATERIAL SUPPLY

'Raw material supply' includes raw material extraction and pretreatment processes before production. The main materials used in the product are clinker, gypsum, and limestone.

### A2- RAW MATERIAL TRANSPORT

Transport is relevant for delivery of raw materials and other materials to the plant and the transport of materials within the plant. The transport distances and routes are calculated based on the given information from the manufacturer for 2022.

### A3- MANUFACTURING

Cement production starts with quarry operation. After the crushing and homogenization process, raw material mix is sent to the raw mills. Production continues with burning and cooling. Finally, additional raw materials are added to the mixture, mixed and ready for use. Additionally, since BATIÇİM produces clinker used in the cement, the effects of clinker production is included in this stage. Türkiye medium voltage local electric power mix data is used in the model.

### A4- PRODUCT TRANSPORT

Transport of final product to customers are considered and the routes and distances are calculated accordingly. Since the main market of the relevant product is Europe, an approximate value has been accepted at this stage.



# LCA Information

## Functional / Declared Unit

The declared unit is 1 tonne of CEM II C/M (L-W) 42.5 N Portland Cement.

## 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).

## System Boundary

The system boundary covers cradle to gate with options. (A1+A2+A3+A4)

## 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.

## Background Data

For all LCA modelling and calculation, Ecoinvent database (v3.9.1) and SimaPro (v9.5) LCA software were used.

## 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. 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.

## Period Under Review

The data used for LCA study concerns the year 2022.

## Allocations

Water consumption, energy consumption and raw material transportation were weighted according to 2022 production figures. In addition, hazardous and nonhazardous waste amounts were also allocated from the 2022 total waste generation.

## Biogenic Carbon Content

This product does not contain biogenic carbon.



# LCA Information

	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Geography	GLO	GLO	TR	GLO	-	-	-	-	-	-	-	-	-	-	-	-	-
Specific Data Used	>90%				-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - Products	0%				-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - Sites	0%				-	-	-	-	-	-	-	-	-	-	-	-	-

(ND = Not declared, X = Module included)

# LCA Results

Impact Category	Unit	A1-A3	A4
GWP - Fossil	kg CO <sub>2</sub> eq	654	63.1
GWP - Biogenic	kg CO <sub>2</sub> eq	10.4	0.028
GWP - Luluc	kg CO <sub>2</sub> eq	0.678	0.038
GWP - Total	kg CO <sub>2</sub> eq	666	63.2
ODP	kg CFC-11 eq	3.62E-06	1.20E-06
AP	mol H+ eq	1.65	0.860
*EP - Freshwater	kg P eq	0.270	0.003
EP - Marine	kg N eq	0.443	0.215
EP - Terrestrial	mol N eq	4.51	2.360
POCP	kg NMVOC	1.23	0.707
ADPE	kg Sb eq	3.80E-04	1.46E-04
ADPF	MJ	2821	845
WDP	m <sup>3</sup> depriv.	31.8	2.88
PM	disease inc.	1.03E-05	3.52E-06
IR	kBq U-235 eq	17.6	0.86
HTTP - C	CTUh	9.64E-08	2.82E-08
HTTP - NC	CTUh	4.01E-06	4.65E-07
SQP	Pt	517	341

## 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

## Disclaimer 1

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.

## Disclaimer 2

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.

# LCA Results

Resource Use			
Impact Category	Unit	A1-A3	A4
PERE	MJ	301	10.5
PERM	MJ	0	0
PERT	MJ	301	10.5
PENRE	MJ	2821	845
PENRM	MJ	0	0
PENRT	MJ	2821	845
SM	kg	0	0
RSF	MJ	0	0
NRSF	MJ	0	0
FW	m <sup>3</sup>	3.60	0.114

**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.

Waste & Output Flows			
Impact Category	Unit	A1-A3	A4
HWD	kg	2.88E-04	0
NHWD	kg	5.68E-06	0
RWD	kg	0	0
CRU	kg	0	0
MFR	kg	0	0
MER	kg	0	0
EE (Electrical)	MJ	0	0
EE (Thermal)	MJ	0	0

**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.

Climate Impact			
Indicator	Unit	A1-A3	A4
*GHG-GWP	kg CO <sub>2</sub> eq	656	63.1

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

**Legend**

A1: Raw Material Supply, A2: Transport, A3: Manufacturing, A4: Transport

# 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/ 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 1.11 DATE 2019-12-20

/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](http://www.environdec.com)

/Ecoinvent / Ecoinvent Centre, [www.ecoinvent.org](http://www.ecoinvent.org)

/SimaPro/ SimaPro LCA Software, Pré Consultants, the Netherlands, [www.pre-sustainability.com](http://www.pre-sustainability.com)

/Batçim/ [www.baticim.com.tr/en/](http://www.baticim.com.tr/en/)

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ENVIRONMENTAL PRODUCT DECLARATION

## Programme operator

## Owner of the declaration



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