

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

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Valid to: 02/11/2020

Çimsa Super White - CEM I 52,5 R - White Portland Cement
Çimsa Çimento San. ve Tic. A.Ş.



General Information

Çimsa Çimento Sanayi ve Ticaret A.Ş

Programme holder

IBU - Institut Bauen und Umwelt e.V.
Panoramastr. 1
10178 Berlin
Germany

Declaration number

EPD-CIS-20150243-CAA1-EN

This Declaration is based on the Product Category Rules:

Cement, 07.2014
(PCR tested and approved by the SVR)

Issue date

03/11/2015

Valid to

02/11/2020



Prof. Dr.-Ing. Horst J. Bossenmayer
(President of Institut Bauen und Umwelt e.V.)



Dr. Burkhard Lehmann
(Managing Director IBU)

Çimsa Super White - CEM I 52,5 R - White Portland Cement

Owner of the Declaration

Çimsa Çimento San. ve Tic. A.Ş.
Toroşlar Mah. Tekke Cad. Yenitaşkent Mersin - Turkey

Declared product / Declared unit

Çimsa Super White - CEM I 52,5 R - White Portland Cement / 1 t

Scope:

Within this study a life cycle analysis according to ISO 14040/44 is performed for Çimsa Super White - CEM I 52,5 R - White Portland Cement produced by Çimsa Çimento San. ve Tic. A.Ş. at the production plant located in Mersin. This analysis relies on transparent, plausible and documented basis data. All the model assumptions, which influence the results, are declared. The life cycle assessment is representative for the products introduced in the declaration for the given system boundaries. The life cycle assessment covers the manufacturing of the products from cradle to gate.

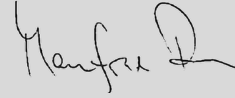
The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Verification

The CEN Norm /EN 15804/ serves as the core PCR

Independent verification of the declaration according to /ISO 14025/

internally externally



Manfred Russ
(Independent verifier appointed by SVR)

Product

Product description

The declared product is Çimsa Super White - CEM I 52,5 R - White Portland Cement (Çimsa Super White) manufactured in accordance with /EN197-1/ by Çimsa. Portland cement is composed of 90-95% of clinker as main constituent.

Cement is the adhesive or glue which, when sets, binds particles of fine aggregate together to produce mortar. When mixed with water the cement forms a paste called the fine matrix. Cements are hydraulic materials, this means that they depend upon a reaction with water rather than air for strengthening. When water is added to cement a chemical reaction called hydration commences immediately. The reaction continues while water is still present. After hardening, it retains its strength and stability even under water.

Application

Çimsa Super White is preferred in the building chemicals sector for both its superior adhesive

strength and high level of whiteness. Due to its superior strength characteristics, Çimsa Super White provides far more strength beyond grey cements and primarily preferred by precast producers. Building chemicals in which Çimsa Super White is used are grouting, ready-mixed plaster and mortars, satin plaster, cement based paint, floor mortars, ceramic adhesives, and insulation plasters.

Technical Data

The declared cement corresponds to the 52.5 standard compressive strength class with high early strength development (R) and has whiteness level of 85 and above in accordance with /EN 197-1/.

Constructional data

Name	Value	Unit
Strength class acc. to DIN EN 197-1	52.5	N/mm ²

Base materials / Ancillary materials

Çimsa Super White primarily consists of clinker and other cementitious materials. The average composition of 1 t of Portland cement is as follows:

Clinker: 90 - 95 %

Cement clinker is made of a raw material mixture that is added to the cement kiln and sintered at a temperature of 1400 °C. The basic materials for the production of cement clinker consist of calcium oxide (CaO), silicon dioxide (SiO₂) and small amounts of aluminum oxide (Al₂O₃) and iron oxide (Fe₂O₃). Raw materials that have these properties are limestone or chalk and clay or limestone marl as its natural occurring mixture.

Gypsum/Anhydrite/Residual gypsum: 0 - 5 %

Marble/Limestone: 0 - 5 %

Gypsum is added to cement as setting regulator to cement. Gypsum and anhydrite are added as setting regulators to cement.

Reference service life

The present study covers the manufacturing (A1-A3) stage information of the product. As no use stage is declared, the reference service life for cement is irrelevant.

LCA: Calculation rules

Declared Unit

The declared unit is 1 t of Çimsa Super White - CEM I 52,5 R - White Portland Cement.

Declared unit

Name	Value	Unit
Declared unit	1	t
Conversion factor to 1 kg	0.001	-

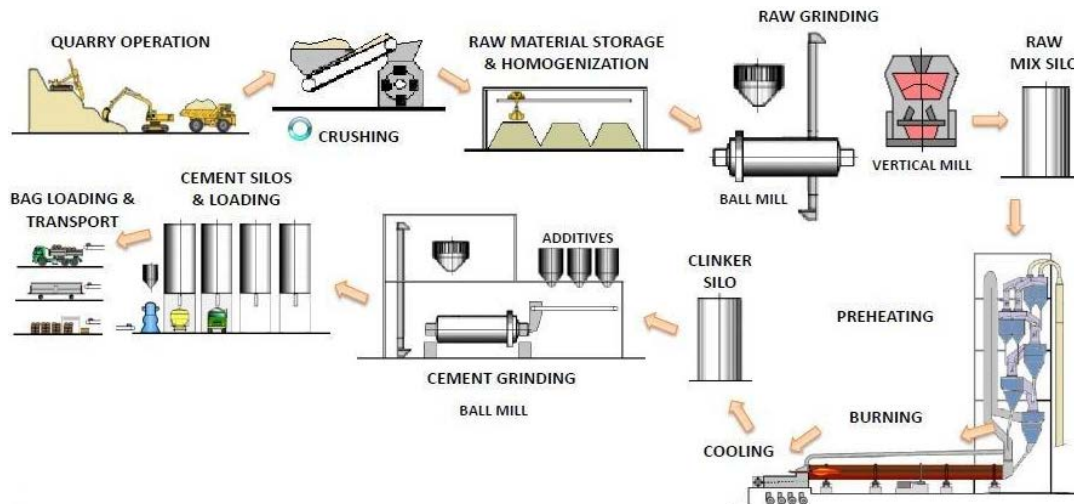
System boundary

Type of EPD: cradle to gate

The system boundary includes the production of Çimsa Super White - CEM I 52,5 R - White Portland Cement from extraction of raw material to the production of

finished packaged product at the factory gate (cradle to gate).

In this study, the product stage information modules A1, A2 and A3 are considered. These modules include raw material extraction and processing (A1), transport of the raw materials to the manufacturer (A2), manufacturing of the product which includes raw material mixing and grinding, preheating, firing and cement grinding (A3), energy and water consumption, waste management, air and water emissions from processing and energy combustion (A3) and the packaging of the product for final delivery (A3).



The construction stage, the use stage and the disposal stage are not included in the life cycle assessment of Çimsa Super White.

Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to /EN 15804/ and the building context, respectively the product-specific characteristics of performance, are taken into account.

LCA: Scenarios and additional technical information

As this EPD focuses on the upstream and manufacturing stages (modules A1-A3), it was not necessary to develop a product level scenarios. No information on modules A4, B1-B7, C1-C4 & D is provided in this section of the EPD.

To improve the data quality, where relevant, Ecoinvent specific datasets were modified by Metsims to Turkish conditions based on the latest energy mix.

LCA: Results

The table below give the LCA results for environmental impacts, resource use as well as output flows & wastes categories for the modules that are declared in this study.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: Çimsa Super White / 1 t

Parameter	Unit	A1-A3
Global warming potential	[kg CO ₂ -Eq.]	1.07E+3
Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	2.24E-5
Acidification potential of land and water	[kg SO ₂ -Eq.]	1.00E+0
Eutrophication potential	[kg (PO ₄) ³⁻ -Eq.]	6.29E-1
Formation potential of tropospheric ozone photochemical oxidants	[kg ethene-Eq.]	4.31E-2
Abiotic depletion potential for non-fossil resources	[kg Sb-Eq.]	1.30E-4
Abiotic depletion potential for fossil resources	[MJ]	3.07E+3

RESULTS OF THE LCA - RESOURCE USE: Çimsa Super White / 1 t

Parameter	Unit	A1-A3
Renewable primary energy as energy carrier	[MJ]	4.33E+2
Renewable primary energy resources as material utilization	[MJ]	0.00E+0
Total use of renewable primary energy resources	[MJ]	4.33E+2
Non-renewable primary energy as energy carrier	[MJ]	3.07E+3
Non-renewable primary energy as material utilization	[MJ]	0.00E+0
Total use of non-renewable primary energy resources	[MJ]	3.07E+3
Use of secondary material	[kg]	0.00E+0
Use of renewable secondary fuels	[MJ]	0.00E+0
Use of non-renewable secondary fuels	[MJ]	0.00E+0
Use of net fresh water	[m ³]	9.41E-1

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES:

Çimsa Super White / 1 t

Parameter	Unit	A1-A3
Hazardous waste disposed	[kg]	4.94E-3
Non-hazardous waste disposed	[kg]	6.86E-2
Radioactive waste disposed	[kg]	-
Components for re-use	[kg]	-
Materials for recycling	[kg]	-
Materials for energy recovery	[kg]	-
Exported electrical energy	[MJ]	-
Exported thermal energy	[MJ]	-

Note1: The total use of net fresh water including upstream processes is 1.98m³. Due to question on data quality from upstream processes, only manufacturing fresh water use is given. The total is provided for full transparency.
 Note2: Waste flows represents only manufacturing data due to no reliable data from upstream processes(A1&A2).

References

ISO 14040-44

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

EN 197-1:2011

Cement - part 1: Composition specification and conformity criteria for common cements

Institut Bauen und Umwelt

Institut Bauen und Umwelt e.V., Berlin(pub.): Generation of Environmental Product Declarations (EPDs);

General principles

for the EPD range of Institut Bauen und Umwelt e.V. (IBU), 2013/04
www.bau-umwelt.de

ISO 14025

DIN EN ISO 14025:2011-10: Environmental labels and declarations — Type III environmental declarations — Principles and procedures

EN 15804

EN 15804:2012-04+A1 2013: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

PCR Part A

Institut Bauen und Umwelt e.V., Berlin (pub.): Product Category Rules for Construction Products from the range of Environmental Product Declarations of Institut Bauen und Umwelt (IBU), Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Background Report. April 2013 www.bau-umwelt.de

PCR Part B

Institut Bauen und Umwelt e.V., Berlin (pub.): PCR Guidance-Texts for Building-Related Products and Services From the range of Environmental Product Declarations of Institute Construction and Environment e.V. (IBU), Part B: Requirements on the EPD for Cement. July 2014 www.bau-umwelt.de

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