CEM I 52,5R (WHITE)

Environmental Product Declaration
for Portland Cement

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EPD programme website: www.environdec.com.
An EPD may be updated or depublished if conditions change.
To find the latest version of the EPD and to confirm its validity, see www.environdec.com

EPD INTERNATIONAL EPD SYSTEM

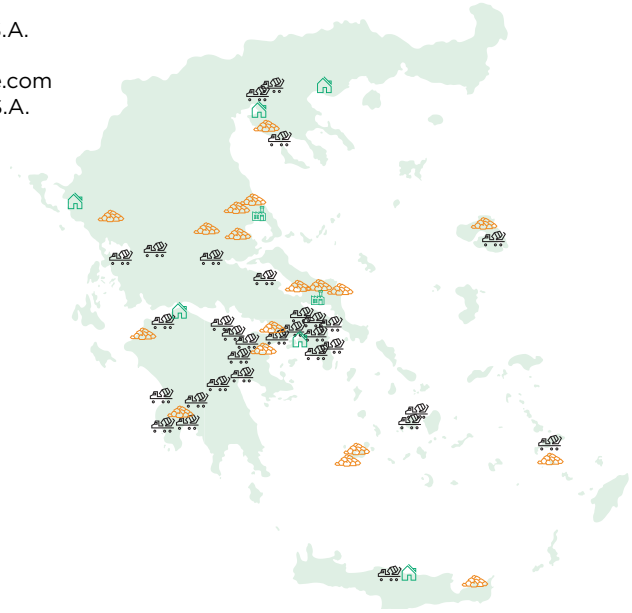
ECO PLATFORM EPD VERIFIED

HERACLES HOLCIM

EPD OWNER

EPD Owner: HERACLES GENERAL CEMENT COMPANY S.A.
Address: 32 D.Solomou Str., 14123 Lykovrissi, Greece
Contact: George Tzouvalas, george.tzouvalas@lafarge.com
LCA practitioner: HERACLES GENERAL CEMENT COMPANY S.A.

COMPANY INFORMATION



HERACLES Group of Companies, a member of Holcim, is the leader in cement sales in Greece, having more than 110 years of presence in the market. Having a network of 50 production and commercial facilities throughout Greece, the Company is active in the production and marketing of cement, aggregates, concrete and industrial minerals, offering products and solutions that meet the diversified needs of customers and the requirements of modern construction.

Main drivers for creating value are growth, the simplification of procedures and performance, financial strength and development of HERACLES Group people. Guided by sustainable development, the company implements effective resource management, which in combination with the organizational structure at all levels, enables to export cement, clinker, pumice, industrial materials and solid fuels, in more than 20 countries worldwide, contributing substantially to the national economy.

For HERACLES Group, Sustainable Development is a long-term commitment and non-negotiable priority that guides our daily business activity. We believe in building a more sustainable world for people and the planet. A world that operates with respect for water and nature and upgrades the quality of life for all. We advocate an innovative, climate-neutral construction industry that will apply the principles of circular economy regarding the use of resources. To this end, we focus on four strategic pillars for sustainable development - Local Communities, Climate & Energy, Circular Economy, Nature - that create value for our activities, shareholders and our social partners. We are leading the transition to a lower carbon sector through the development and delivery of more sustainable products and solutions, saving natural resources, using alternative fuels and promoting circular economy.

6 Companies
2 Cement plants
20 Types of cement
10 Third Party bag depots
12 Ports
32 Ready-Mix concrete plants
4.000 Customers
18 Quarries
6 Distribution centers
30 Points of presence

PRODUCT DESCRIPTION

Product name: CEM I 52,5 R (WHITE)
Product identification: CEM I 52,5 R (WHITE), According to EN 197-1
UN CPC code: 3744

Cement is one of the most important building materials used in the construction industry, working as binder that sets, hardens and adheres to other materials to bind them together. It is the main raw material for the production of concrete, mortars, grouts and plasters.

This is a trader's EPD for CEM I 52,5 R (WHITE) produced by ÇİMSA Çimento San. ve Tic. A.Ş. in Mersin plant. The product is delivered to Drapetsona and Thessaloniki Distribution Centers of HERACLES GCCo.

The product can be delivered in bulk and packed via the following
methods:
- Bulk in silo trucks
- Bulk in vessel carriers
- Bags of 20kg package under the brand name **HERACLES white**

HERACLES HOLCIM

The product's technical characteristics and composition are presented at the tables below. Product declarations and certificates can be found at the company's website www.lafarge.gr

Technical characteristics according to EN 197-1		CEM I 52,5 R (WHITE)
Mechanical properties	Compressive Strength 2 days (MPa)	≥ 30,0
	Compressive Strength 28 days (MPa)	≥ 52,5
Chemical properties	Sulfate content (SO 3 %)	≤ 4,0
	Chloride content (Cl %)	≤ 0,1
	Loss of Ignition (%)	≤ 5,0
	Insoluble residue	≤ 5,0
Physical properties	Initial setting time (min)	≥ 45
	Soundness (mm)	≤ 10

CONTENT DECLARATION

Product Components (according to EN 197-1*)	Composition* %	Post-consumer recycled material weight - %	Biogenic material, weight of % of product
Clinker	95 - 100	0	0
Minor additional constituents	0 - 5	0	0
SUM	**100**	**0**	**0**

**Product composition is in accordance to EN 197-1 standard and is reported without gypsum.*

Packaging materials	Mass, kg	Mass-% (versus the product)	Biogenic material, kg C/product or declared unit
Plastic Bag	0,009	0,001	0
Paper Bag	0,243	0,02	0,125
Plastic film	0,05	0,005	0
TOTAL	**0,302**	**0,026**	**0,125**

HERACLES GCCo hereby declares that all cement products are in compliance with the REACH Regulation (EC) No 1907/2006, concerning the Registration, Evaluation, Authorization and Restriction of Chemicals. Cement does not contain any Substances of Very High Concern (SVHC) currently on the candidate list. REACH SVHC list is not static and is updated frequently thus the company will continue to evaluate, research and review to fulfil the demands of the regulation. More information about cement safety handling is available at the Safety Data Sheet (SDS) published at the company's website www.lafarge.gr

LCA INFORMATION

Declared unit: 1 tonnes of CEM I 52,5 R (WHITE)
Time representativeness: 2024 (Full calendar year)
EPD/LCA Tool used: GCCA tool, version 5.2
System boundaries: The scope of this study is "cradle to gate" covering the product stage (modules A1-A3), since the product fulfils the conditions required.

CUT-OFF RULES
The criteria for exclusion were set so that individual input flows of 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%.

LCA AND DATA QUALITY
The results of the LCA with the indicators as per EPD requirements are given in the LCA result tables. There are no co-product allocations within the LCA study underlying this EPD. Manufacturer's EPD with id EPD-IES-0002234 was used in order to model the LCA, according to PCR rules. 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.

ELECTRICITY
Electricity was modeled according to the latest version of Renewable Energy Sources Operator & Guarantees of Origin (DAPEEP SA) Report for ''Residual Energy Mix 2024'' for Greece, the residual mix for provider METLEN ENERGY & METAL A.E. for 2024. The resulted CO2 footprint for GWP-GHG 0,4574 kg CO2 eq./kwh.

ALLOCATIONS
Electricity consumption and waste is weighted according to 2024 product volume.

ASSUMPTIONS
Transportation to HERACLES GCCo Distribution centers is modeled based on naval distances, using the preset dataset of GCCA tool.

Process	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1-A3
Processes controled by the Manufacturer (A1-A3)	**EPD**	**EPD-IES-0002234**	**2024**	**Primary**	**90,9%**
Transportation	**Calculated Data**	**EPD owner**	**2024**	**Primary**	**0,80%**
Electricity on-site	**Calculated Data**	**EPD owner**	**2024**	**Primary**	**0,13%**
Other Processes	**Databases**	**Ecoinvent 3.10**	**2024**	**Secondary**	**0%**
Total share of primary data, of GWP-GHG results for A1-A3					**91,8%**

SYSTEM BOUNDARY

The scope of this study is "cradle to gate" covering the product stage (modules A1-A3), since the product fulfills the three conditions required by EN 15804:2012+A2:2019, about the exclusion of modules C1-C4 and D. Product stage includes raw material supply, transportation, manufacturing and transportation to HERACLES GCCo Distribution Centers.

Modules declared, geographical scope, share of primary data (in GWP-GHG results) and data variation (in GWP-GHG results):

X= Included, ND= Module Not Declared																
	Product stage			**Distribution \installation stage**		**Use stage**							**End of life stage**				**Resource recovery stage**
	Raw Materials Supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Modules	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	**X**	**X**	**X**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Geography	**GLO**	**GLO**	**GLO**														
Share of Primary data	**>91,8%**																
Variation-products	**Not relevant**																
Variation-sites*	**<1%**																

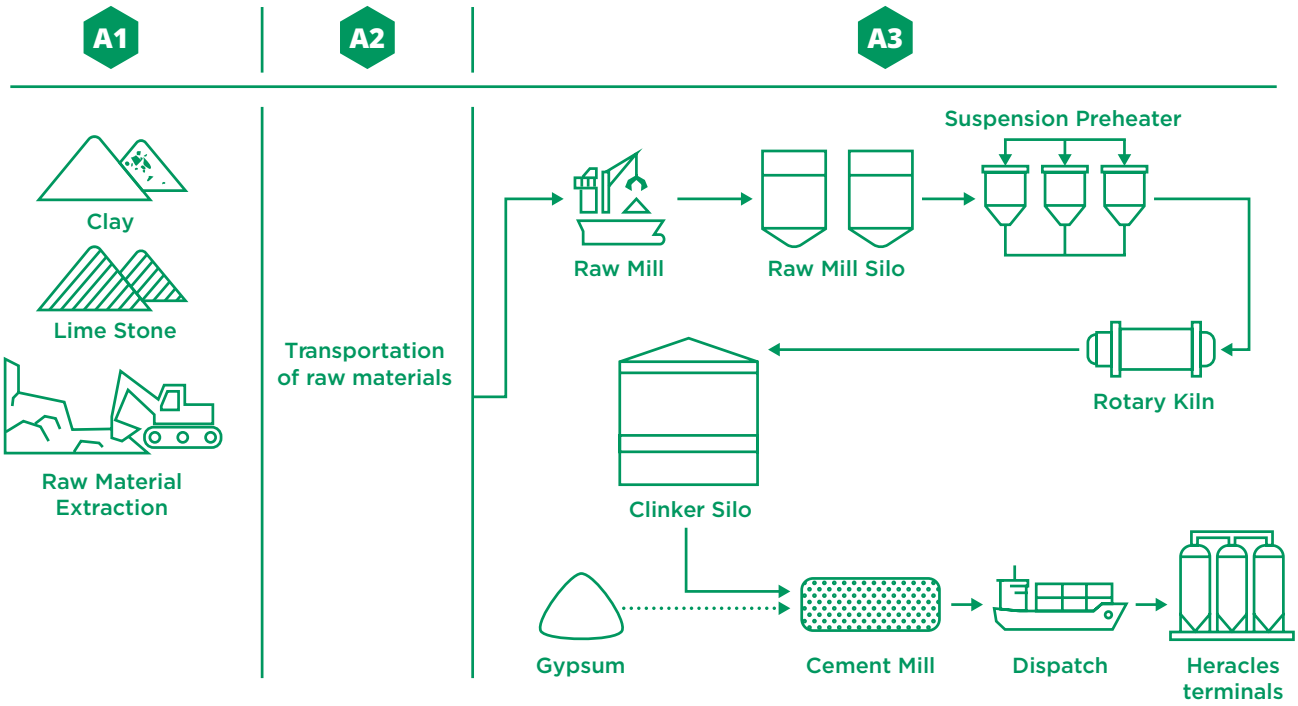
**Drapetsona & Thessaloniki Distribution Centers.*

A1: Raw Material Supply
This stage covers includes the extraction, processing, and supply of all raw materials required for the manufacture of the product. It includes upstream processes such as the mining and pre-treatment of natural resources. The assessed product is a white cement, produced entirely from white clinker. The clinker is obtained using raw materials such as limestone and kaolin. All environmental impacts associated with the extraction, processing, and transportation of these raw materials are accounted for within this stage.

A2: Raw Material Transport
This stage covers the transportation of all raw materials from their extraction or processing sites to the clinker and cement production facilities. The environmental impacts associated with fuel consumption and emissions from the transportation processes are included. Both road and maritime transport modes are utilized in this stage. Transport routes, modes, and distances are supplier-specific and have been provided by the manufacturer.

A3: Manufacturing
White cement is produced from carefully selected raw materials with very low levels of iron and manganese oxides to ensure high whiteness. The primary raw materials, including pure limestone and kaolin or other low-iron clays, are finely ground and homogeneously blended. The raw mix is processed in specially designed rotary kilns operating at temperatures of around 1,450 °C, under conditions optimized to minimize coloring impurities. After clinker formation, the material is rapidly cooled to preserve its whiteness and ground with high-purity gypsum to achieve the desired fineness and performance characteristics.

This stage also covers the transportation of cement to Drapetsona and Thessaloniki Distribution Centers, as well as the processes performed there (loading and packaging).



ENVIRONMENTAL PERFORMANCE

LCA results of the product(s) - main environmental performance 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.

ENVIRONMENTAL IMPACTS per 1 ton CEM I 52,5 R (WHITE)		Unit	A1-A3
GWP-total	Global warming potential - total	kg CO_2 eq	9,90E+02
GWP-fossil	Global warming potential - fossil	kg CO_2 eq	9,91E+02
GWP-biogenic[1]	Global warming potential - biogenic	kg CO_2 eq	7,55E-02
GWP-luluc	Global warming potential - luluc	kg CO_2 eq	3,92E-02
ODP	Ozone Depletion Potential	kg CFC 11 eq	5,54E-06
AP	Acidification Potential	mol H^+ eq	1,84E+00
EP-freshwater	Eutrophication potential - freshwater	kg P eq	1,15E-03
EP-marine	Eutrophication potential - marine	kg P eq	5,24E-01
EP-terrestrial	Eutrophication potential - terrestrial	mol N eq	5,82E+00
POCP	Photochemical oxidant formation Potential	kg NMVOC eq	1,98E+00
$ADPE_2$	Abiotic depletion potential - non fossil resources	kg Sb eq	6,36E-05
$ADPF_2$	Abiotic depletion potential - fossil resources	MJ	4,72E+03
WDP_2	Water deprivation potential	m^3 eq	4,09E+01

1 Biogenic carbon leaving the product in module A5 have been balanced out already in modules A1-A3
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.

Additional mandatory and voluntary impact category indicators

ENVIRONMENTAL IMPACTS per 1 ton CEM I 52,5 R (WHITE)		Unit	A1-A3
GWP-GHG	Global warming potential - GHG	kg CO_2 eq	9,90E+02

Resource use indicators

RESOURCE USE per 1 ton CEM I 52,5 R (WHITE)		Unit	A1-A3
PERE	Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	1,80E+03
PERM	Use of renewable primary energy resources used as raw materials	MJ	4,33E+01
PERT	Total use of renewable primary energy resources	MJ	1,84E+03
PENRE	Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ	4,69E+03
PENRM	Use of non-renewable primary energy resources used as raw materials	MJ	2,87E+01
PENRT	Total use of non-renewable primary energy resources	MJ	4,73E+03
SM	Use of secondary material	kg	3,13E-02
RSF	Use of renewable secondary fuels	MJ	2,91E-02
NRSF	Use of non-renewable secondary fuels	MJ	0,00E+00
FW	Use of net fresh water	m^3	9,67E-01

Waste indicators

OUTPUT FLOWS AND WASTE CATEGORIES per 1 ton CEM I 52,5 R (WHITE)		Unit	A1-A3
HWD	Hazardous waste disposed	MJ	8,85E-01
NHWD	Non-hazardous waste disposed	MJ	5,91E+01
RWD	Radioactive waste disposed	m^3	8,51E-04

Output flow indicators

OUTPUT FLOWS AND WASTE CATEGORIES per 1 ton CEM I 52,5 R (WHITE)		Unit	A1-A3
CRU	Components for re-use	kg	0,00E+00
MFR	Materials for recycling	kg	0,00E+00
MER	Materials for energy recovery	kg	0,00E+00
EEE	Exported energy Electricity	MJ	0,00E+00
EET	Exported energy Thermal	MJ	0,00E+00

GENERAL INFORMATION

Programme information

Programme

EPD INTERNATIONAL EPD SYSTEM

Address: EPD International AB
Box 210 60
SE-100 31 Stockholm
Sweden
Website: www.environdec.com
E-mail: support@environdec.com

Product Category Rules (PCR)

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

Product Category Rules (PCR):
Construction Products, PCR 2019:14, version 2.0.1, valid until: 2031-04-22; UN CPC CODE 3744

PCR review was conducted by: The Technical Committee of the International EPD System. See www.environdec.com for a list of members.
Review chair: Rob Rouwette (chair), Noa Meron (co-chair). The review panel may be contacted via the Secretariat www.environdec.com/support

c-PCR: Cement and building lime (EN 16908), c-PCR 001, version 1.0.0

Third-party Verification

Independent third-party verification of the declaration and data, according to ISO14025:2006, via:

Individual EPD verification with a pre-verified LCA/EPD tool
EUROCERT S.A., Chlois 89, Athens, 144 52, Greece
Accredited by: Hellenic Accreditation System SA (E.S.Y.D), Accreditation No. 21

Pre-verified LCA tool or Pre-verified EPD tool: GCCA LCA Tool, version 5.2

Third-party verifier, accountable for the tool verification: Ugo Pretato and Elia Rillo, Studio Fieschi & Soci Srl.

Approved by: International EPD System.

Procedure for follow-up of data during EPD validity involves third party verifier:
☒ **Yes** ☐ **No**

The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit 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 identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison.
For further information about comparability, see EN 15804 and ISO 14025.

VERSION HISTORY

Original Version of the EPD, 2026-04-23
Version 2 of the EPD, 2026-05-29, update of pictures on 2nd page

ABBREVIATIONS

Abbreviation	Definition
General Abbreviations	
EN	European Norm (Standard)
EF	Environmental Footprint
GPI	General Programme Instructions
ISO	International Organization for Standardization
CEN	European Committee for Standardization
CPC	Central product classification
SVHC	Substances of Very High Concern
ND	Not Declared

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REFERENCES

GPI v.5.0.1:2026-02-27 General Programme Instructions of the International EPD® System

- **PCR 2019:14 v.2.0.1** Product Category rules | Construction products | The International EPD® System
- **EN 15804:2012+A2:2019/AC:2021** Sustainability of construction works - Environmental Product Declarations – Core rules for the product category of construction products
- **c-PCR-001** Cement and building lime (EN 16908:2017+A1:2022) | The International EPD® System
- **EN 16908:2017+A1:2022** Cement and building lime - Environmental product declarations - Product category rules complementary to EN 15804
- **EN 197-1:2011** Cement Composition, specifications and conformity criteria for common cements
- **ISO 14020:2000** Environmental labels and declarations - General principles
- **ISO 14025:2006** Environmental labels and declarations - Type III environmental declarations - Principles and procedures
- **ISO 14040:2006** Environmental management - Life Cycle Assessment - Principles and framework
- **ISO 14044:2006** Environmental management - Life Cycle Assessment - Requirements and guidelines
- **Ecoinvent Centre|** www.Eco-invent.org
- **DAPEEP SA:** Renewable Energy Sources Operator & Guarantees of Origin | Greece | www.dapeep.gr
- **EPD-IES-0002234** Super White (Mersin), The International EPD® System

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