



AMREYAH CEMENT  
أسمنت العامرية

# ENVIRONMENTAL PRODUCT DECLARATION

CEM IVA(P) 42.5 N-SR

AMREYAH CEMENT COMPANY

IN ACCORDANCE WITH EN 15804+A2:2019/AC:2021 & ISO  
14025 / ISO 21930

**Programme:** The International EPD® System, [www.environdec.com](http://www.environdec.com)

**Programme operator:** EPD International AB

**EPD registration number:** S-P-07665

**Publication date:** 2024.05.17

**Valid until:** 2029.05.16

**Geographical scope:** Worldwide

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



## General Information

### Manufacturer Information

<b>Manufacturer</b>	Amreyah Cement Company
<b>Address</b>	Al Arbaneyat, Borg El Arab, Alexandria, Egypt
<b>Contact details</b>	m.abouelenien@royalcement.com
<b>Website</b>	http://www.amreyahcement.com/

### Product Identification

<b>Product name</b>	CEM IVA(P) 42.5 N-SR
<b>Additional label(s)</b>	Al Asas Cement
<b>Place(s) of production</b>	Alexandria, Egypt
<b>CPC code</b>	374 – Plaster, lime and cement




### The International EPD System

EPDs within the same product category but from different programmes may not be comparable.

### EPD Information

The EPD owner has the sole ownership, liability, and responsibility for the EPD. Construction products EPDs may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

<b>EPD program operator</b>	The International EPD System
<b>EPD standards</b>	This EPD is in accordance with EN 15804+A2 and ISO 14025/ISO 21930 standards.
<b>Product category rules</b>	The CEN standard EN 15804 serves as the core PCR. In addition, the Int'l EPD System PCR 2019:14 Construction products, version 1.3.2 and c-PCR-001 Cement and building lime (EN 16908) (2022-05-18) are used.
<b>EPD author</b>	Dr. Nasser Ayoub, Ashrakat Osama, and Asmaa El Maghraby 
<b>EPD verification</b>	Independent verification of this EPD and data, according to ISO 14025: <input type="checkbox"/> Internal certification <input checked="" type="checkbox"/> External verification
<b>Verification date</b>	From 2023.12.14 to 2024.04.17
<b>EPD verifier</b>	Elisabet Amat, GREENIZE Projects
<b>EPD number</b>	S-P-07665
<b>ECO Platform nr.</b>	-
<b>Publishing date</b>	2024.05.17
<b>EPD valid until</b>	2029.05.16

## Amreyah Cement

Founded in 1987, Amreyah Cement Company has been a cornerstone and a key player in the region for over 30 years. Our plant is strategically located on Matrouh North Coast Road, 55 km from Alexandria, achieving a production capacity of 5.5 million tons per annum (mtpa) through three production lines. As a major player in the national cement market, Amreyah Cement is committed to delivering high-quality and reliable cement using state-of-the-art technology.

With a long-standing history in the market, our cement has proudly built many of Egypt's most iconic landmarks, particularly in the beautiful Mediterranean city of Alexandria. Despite our established reputation, we continue to innovate and introduce new products to meet the evolving needs of the market.

Our top priority is the well-being of our community, driven by a relentless focus on innovation and continuous improvement to build a sustainable future. Amreyah Cement is home to a dedicated team of both white and blue-collar workers who benefit from continuous training and development.

At Amreyah Cement, we are committed to excellence and sustainability, ensuring our products and practices contribute positively to the community and the environment.



## Product Information

### Product Description

CEM IVA(P) 42.5 N-SR is cement that is mixed in specific proportions with basalt, gypsum, alum by product, slag, limestone, and red brick waste. This type of cement has a strength class of 42.5 MPa (indicating that the characteristic strength at 28 days is a minimum of 42.5 MPa) and it gains normal early strength. It is considered a high-grade cement with high sulphate resistance.

### Product Application

CEM IVA(P) 42.5 N-SR is recommended for all construction purposes as well as the foundation elements, raft footings and piles. In addition, it is also recommended for all substructure elements such as irrigation and sewage systems, which are exposed to severe sulfate salt attacks from ground water.

### Technical Specifications

CEM IVA(P) 42.5 N-SR	EN 197-1/2011	
<b>Mechanical properties</b>	2 days compressive strength (N/mm <sup>2</sup> )	19.36
	28 days compressive strength (N/mm <sup>2</sup> )	42.34
<b>Chemical properties</b>	Loss of ignition (%)	2.58
	Sulfur Trioxide (%)	2.47
	Chloride (Cl-) (%)	0.03
	Chromium hexavalent (Cr <sup>+6</sup> ) (ppm)	1.91
<b>Physical properties</b>	Initial Setting Time (min)	211
	Soundness (Le Chatelier) (mm)	1.18

## Product Raw Material Composition

This cement product is certified as CEM IVA(P) 42.5 N-SR according to the requirements of EN 197-1 where its composition is determined as following.

Material	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg	Country Region of origin
<b>Raw Material</b>				
Limestone	663.91	0	0 resp. 0	Egypt
Clay	45.47	0	0 resp. 0	Egypt
Iron Ore	2.34	0	0 resp. 0	Egypt
Marl	17.16	0	0 resp. 0	Egypt
Basalt	50.13	0	0 resp. 0	Egypt
Gypsum	30.81	0	0 resp. 0	Egypt
Cement Clinker	122.71	0	0 resp. 0	Egypt
Alum	2.34	0	0 resp. 0	Egypt
Arc Slag	43.83	0	0 resp. 0	Egypt
Red Brick Waste	21.30	0	0 resp. 0	Egypt
Total	1000	0	0 resp. 0	-
<b>Product Packaging</b>				
Material	Weight, kg	Weight-% (versus the product)	Weight biogenic carbon, kg C/kg	Country Region of origin
Kraft Paper	2.68	0.268	0.4	Egypt
Total	2.68	0.268	0.4	-

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

## Product Lifecycle

### Manufacturing and Packaging (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Transport concerns the delivery of raw materials from the supplier to the gate of the manufacturing plant. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

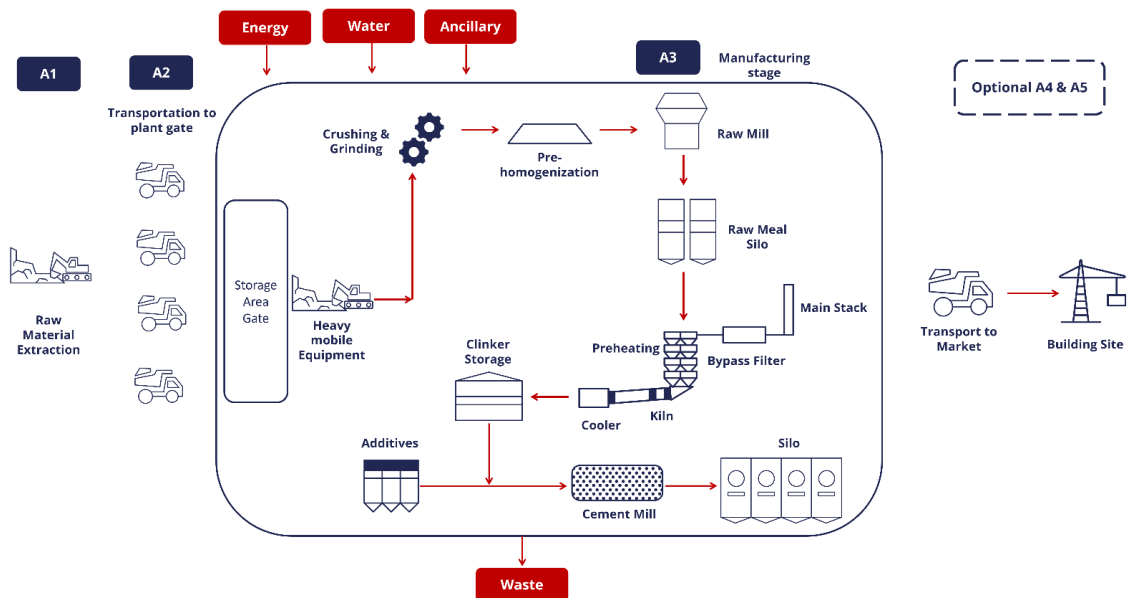
Cement manufacturing starts with crushing and grinding the raw materials until they are ground. The raw materials are then heated to 100°C to evaporate any moisture content. This results in the formation of a raw materials homogeneous stockpile. This stockpile contains mainly limestone, clay, and iron ore with additional materials in smaller proportions like gypsum, basalt, and steel slag. The stockpile is reclaimed, regularly analyzed, and adjusted by correctives addition to fulfill the raw mix design requirements in terms of chemistry.

The materials then move towards the raw mill for grinding where a fine powder, called raw meal, is produced. Then, it is fed to the pre-heater the materials where the bypass dust is reclaimed. From the pre-heater, the materials are fed to the rotary kiln for sintering where the temperature rises at around 1450°C by fuels burning and clinkerization reactions take place.

At the end of the kiln, the sintered material is rapidly cooled, and clinker is formed. Finally, cement is produced in the cement mills where clinker is ground with gypsum and other additives and then stored into silos. Portions of bypass dust exiting from the pre-heater are also used in the cement mills to help fulfill the composition standard of the final cement product.

### Transport and Installation (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions. Only distribution to end customers is considered (A4). Transportation happens by truck to client in Alexandria, Egypt. The treatment of the kraft paper packaging in which the cement is packaged in, is considered in A5 stage.



## Product Use and Maintenance (B1-B7)

As cement is an intermediate product, no other lifecycle phases are relevant to cover. Hence, the use and maintenance have not been studied. So, they are marked as “Modules Not Relevant”.

## Product end of Life (C1-C4, D)

The end-of-life modules (C1-C4, and D) are omitted as the material fulfils the exemption criteria based on EN 15804+A2.

## Life-Cycle Assessment

### Life-Cycle Assessment Information

Period for data	Sep 2021 - Aug 2022
-----------------	---------------------

### Declared and Functional Unit

Declared unit	1 tonnes
Mass per declared unit	1000 kg

### Biogenic Carbon Content

#### Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0
Biogenic carbon content in packaging, kg C	1.074

### System Boundary

According to EN 15804 Section 5.2, this EPD is a type e) Cradle to gate with options (A1–A3 and additional modules A4 and A5). The omission of other modules met the following conditions:

- the product is physically integrated with other products during installation so it cannot be physically separated from them at the end-of-life,
- it is no longer identifiable at the end-of-life as a result of a physical transformation processes (e.g., mixing with other aggregates and building material components), and
- it does not contain biogenic carbon.

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	D	D
x	x	x	x	x	MNR	MNR	MNR	MNR	MNR	MNR	MNR	MND	MND	MND	MND	MND	MND	MND
Geography, by two-letter ISO country code or regions. The International EPD System only.																		
EG	EG	EG	EG	EG	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstr./demol.	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = MND. Modules not relevant = MNR.



## Cut-Off Criteria

The study does not exclude any modules or processes which are stated mandatory in the EN 15804:2012+A2:2019 and the applied PCR. The study does not exclude any hazardous materials or substances.

The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

## Allocation, Estimates and Assumptions

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation.

In this study, as per EN 15804, allocation is conducted in the following order.

1. Allocation should be avoided.
2. Allocation should be based on physical properties (e.g. mass, volume) when the difference in revenue is small.
3. Allocation should be based on economic values.

The allocation could not be avoided for raw, ancillary material, energy consumption and waste production as some information was only measured on a factory level and in other cases some unit processes have more than one output flow. The inputs were physically allocated to the studied product based on annual production volume. Allocation used in Ecoinvent 3.6 environmental data sources follows the methodology 'allocation, cut-off by classification'. This methodology is in line with the requirements of the EN 15804 -standard.

## Averages and Variability

The International EPD System additional data requirements

Data specificity and GWP-GHG variability for GWP-GHG for A1-A3.

<b>Supply-chain specific data for GWP-GHG</b>	>90%
<b>Variation in GWP-GHG between products</b>	- %
<b>Variation in GWP-GHG between sites</b>	- %

## Environmental Impact Data

### Core Environmental Impact Indicators – EN 15804+A2, PEF

Impact category	Unit	A1-A3	A4	A5
GWP – total	kg CO <sub>2</sub> e	8,29E+02	5,17E+00	5,51E+00
GWP – fossil	kg CO <sub>2</sub> e	8,32E+02	5,16E+00	7,04E-02
GWP – biogenic	kg CO <sub>2</sub> e	-3,86E+00	2,00E-03	5,44E+00
GWP – LULUC	kg CO <sub>2</sub> e	6,84E-02	1,90E-03	8,53E-05
Ozone depletion pot.	kg CFC-11e	5,78E-05	1,19E-06	1,23E-08
Acidification potential	mol H <sup>+</sup> e	2,01E+00	2,19E-02	7,41E-04
EP-freshwater <sup>2)</sup>	kg Pe	2,92E-03	4,23E-05	1,86E-06
EP-marine	kg Ne	4,55E-01	6,50E-03	4,58E-03
EP-terrestrial	mol Ne	5,04E+00	7,17E-02	1,61E-03
POCP (“smog”)	kg NMVOCe	1,34E+00	2,29E-02	1,91E-03
ADP-minerals & metals <sup>3)</sup>	kg Sbe	2,30E-03	1,21E-05	2,37E-07
ADP-fossil resources <sup>3)</sup>	MJ	4,47E+03	7,75E+01	1,17E+00
Water use <sup>3)</sup>	m <sup>3</sup> e depr.	2,84E+01	3,47E-01	1,15E-02

1) GWP = Global Warming Potential; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential/ 2) Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e. 3) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

### Additional (Optional) Environmental Impact Indicators – EN 15804+A2,PEF

Impact category	Unit	A1-A3	A4	A5
Particulate matter	Incidence	1,44E-05	5,95E-07	7,77E-09
Ionizing radiation <sup>4)</sup>	kBq U235e	1,63E+01	3,69E-01	7,57E-03
Ecotoxicity (freshwater)	CTUe	6,69E+03	6,97E+01	1,28E+01
Human toxicity, cancer	CTUh	3,45E-05	1,71E-09	5,68E-11
Human tox. non-cancer	CTUh	4,19E-06	6,90E-08	9,88E-09
SQP <sup>5)</sup>	-	1,80E+03	8,93E+01	1,86E+00

4) EN 15804+A2 disclaimer for Ionizing radiation, human health: 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. 5) SQP = Land use related impacts/soil quality.

### Use of Natural Resources

Impact category	Unit	A1-A3	A4	A5
Renew. PER <sup>5)</sup> as energy	MJ	1,41E+02	8,73E-01	5,54E-02
Renew. PER as material	MJ	3,82E+01	0,00E+00	0,00E+00
Total use of renew. PER	MJ	1,80E+02	8,73E-01	5,54E-02
Non-re. PER as energy	MJ	1,98E+03	7,75E+01	1,17E+00
Non-re. PER as material	MJ	2,49E+03	0,00E+00	0,00E+00
Total use of non-re. PER	MJ	4,47E+03	7,75E+01	1,17E+00
Secondary materials	kg	4,23E-01	2,15E-02	3,19E-04
Renew. secondary fuels	MJ	4,83E+02	2,17E-04	1,03E-05



<b>Non-ren. secondary fuels</b>	MJ	3,15E-01	0,00E+00	0,00E+00
<b>Use of net fresh water</b>	m <sup>3</sup>	6,89E-01	1,00E-02	9,18E-04

5) PER = Primary energy resources

## End of Life – Waste

Impact category	Unit	A1-A3	A4	A5
<b>Hazardous waste</b>	kg	1,09E+01	1,03E-01	2,50E-04
<b>Non-hazardous waste</b>	kg	1,43E+02	1,69E+00	2,68E+00
<b>Radioactive waste</b>	kg	2,38E-02	5,19E-04	1,26E-06

## End of Life – Output Flows

Impact category	Unit	A1-A3	A4	A5
<b>Components for re-use</b>	kg	0,00E+00	0,00E+00	0,00E+00
<b>Materials for recycling</b>	kg	0,00E+00	0,00E+00	0,00E+00
<b>Materials for energy rec</b>	kg	0,00E+00	0,00E+00	0,00E+00
<b>Exported energy</b>	MJ	0,00E+00	0,00E+00	0,00E+00

## Environmental Impacts – GWP-GHG - The International EPD System

Impact category	Unit	A1-A3	A4	A5
<b>GWP-GHG <sup>6)</sup></b>	kg CO <sub>2</sub> e	8,32E+02	5,16E+00	7,04E-02

6) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013) This indicator is almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

## Environmental Impacts – EN15804+A1, CML / ISO 21930

Impact category	Unit	A1-A3	A4	A5
<b>Global Warming Pot.</b>	kg CO <sub>2</sub> e	8,49E2	4,95E0	2,97E0
<b>Ozone depletion Pot.</b>	kg CFC-11e	5,03E-5	9,34E-7	1,03E-8
<b>Acidification</b>	kg SO <sub>2</sub> e	2,87E0	1,02E-2	1,28E-3
<b>Eutrophication</b>	kg PO <sub>4</sub> <sup>3</sup> e	3,03E-1	2,05E-3	7,19E-3
<b>POCP ("smog")</b>	kg C <sub>2</sub> H <sub>4</sub> e	1,09E-1	6,44E-4	8,93E-4
<b>ADP-elements</b>	kg Sbe	1,98E-2	8,53E-5	6,03E-7
<b>ADP-fossil</b>	MJ	4,73E3	7,77E1	1,19E0

## Scenario Documentation

### Manufacturing energy scenario documentation

Scenario parameter	Value
<b>Electricity data source and quality</b>	Market for electricity, high voltage (Ecoinvent 3.6) based on Egypt BUR
<b>Electricity CO<sub>2</sub>e / kWh</b>	0.6

## Bibliography

ISO 14025:2010 Environmental labels and declarations – Type III environmental declarations. Principles and procedures.

ISO 14040:2006 Environmental management. Life cycle assessment. Principles and frameworks.

ISO 14044:2006 Environmental management. Life cycle assessment. Requirements and guidelines.

Ecoinvent database v3.6 (2019) and One Click LCA database.


EN 15804:2012+A2:2019 Sustainability in construction works – Environmental product declarations – Core rules for the product category of construction products.

Int'l EPD System PCR 2019:14 Construction products, version 1.3.2

EPD. General Programme Instructions of the international EPD® system. Version 4.0

CEM IVA(P) 42.5 N-SR LCA background report 23.01.2023

## EPD Author and Contributors

<b>Manufacturer</b>	Amreyah Cement Company
<b>EPD author</b>	Dr. Nasser Ayoub, Ashrakat Osama, and Asmaa El Maghraby 
<b>EPD verifier</b>	Elisabet Amat, GREENIZE Projects
<b>EPD program operator</b>	The International EPD System
<b>Background data</b>	This EPD is based on Ecoinvent 3.6 (cut-off) and One Click LCA databases.
<b>LCA software</b>	The LCA and EPD have been created using One Click LCA Flexible EPD Generator Tool

## Verification Statement

### Verification Process for This EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with EN 15804, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:


- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The background report (project report) for this EPD

Why does verification transparency matter? [Read more online.](#)

### Verification Overview

Following independent third party has verified this specific EPD:

EPD verification information	Answer
Independent EPD verifier	Elisabet Amat, GREENIZE Projects
EPD verification started on	2023.12.14
EPD verification completed on	2024.04.17
Supply-chain specific data %	>90%
Approver of the EPD verifier	The International EPD System

Author & tool verification	Answer
EPD author	Dr. Nasser Ayoub, Ashrakat Osama, and Asmaa El Maghraby
EPD Generator module	One Click LCA Pre-Verified EPD Generator 
Software verification date	17 January 2021

### Third-Party Verification Statement

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of

- the data collected and used in the LCA calculations,
- the way the LCA-based calculations have been carried out,
- the presentation of environmental data in the EPD, and
- other additional environmental information, as present

with respect to the procedural and methodological requirements in ISO 14025:2010 and EN 15804:2012+A2:2019.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

Signature



## Verification and Registration (Environdec)

ISO STANDARD ISO 21930 AND CEN STANDARD EN 15804 SERVES AS THE CORE PRODUCT CATEGORY RULES (PCR)	
PCR	PCR 2019:14 Construction products, version 1.3.2 c-PCR-001 Cement and building lime (EN 16908) (2022-05-18)
PCR review was conducted by:	The Technical Committee of the International EPD® System. See <a href="http://www.environdec.com/TC">www.environdec.com/TC</a> for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat <a href="http://www.environdec.com/contact">www.environdec.com/contact</a> .
Independent third-party verification of the declaration and data, according to ISO 14025:2006:	Independent verification of this EPD and data, according to ISO 14025:  <input type="checkbox"/> INTERNAL CERTIFICATION <input checked="" type="checkbox"/> EXTERNAL VERIFICATION
Third party verifier	Elisabet Amat, GREENIZE Projects
	Approved by: The International EPD® System Technical Committee, supported by the Secretariat
Procedure for follow-up during EPD validity involves third party verifier	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO



EPD International AB, Box 210 60, SE-100 31 Stockholm, Sweden, E-mail: [info@environdec.com](mailto:info@environdec.com)



**AMREYAH CEMENT**  
**أسمنت العامرية**



