ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025 and EN15804+A2

CEM II/A-L 42.5 N bagged cement

Owner of the declaration:
Mannok Cement Limited

Product:
CEM II/A-L 42.5 N bagged cement

Declared unit:
1 tonne

This declaration is based on Product Category Rules:
EN 15804:2012+A2:2019, EPD Ireland PCR Part A, Version 2.1, 2022
EN 16908:2017 Cement and building lime

Program operator:
EPD Ireland - Irish Green Building Council

Declaration number:
EPDIE-24-197

Issue date:
14.10.2025

Valid to:
13.10.2030

General information

Product

CEM II/A-L 42.5 N bagged cement

Owner of the declaration:

Mannok Cement Limited
Contact person: Colin Lunney
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Program operator:

EPD Ireland - Irish Green Building Council
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Phone: +353 (01) 6815862
web: https://www.igbc.ie/epd-home/

Manufacturer:

Mannok Cement Limited

Declaration number:

EPDIE-24-197

Place of production:

Mannok Cement Limited
Scotchtown, Ballyconnell
H14YR25 Cavan, Ireland

This declaration is based on Product Category Rules:

EN 15804:2012+A2:2019, EPD Ireland PCR Part A, Version 2.1, 2022
EN 16908:2017 Cement and building lime

Statement of liability:

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

Type of EPD

Specific product EPD

Issue date:

14.10.2025

Declared unit:

1 tonne CEM II/A-L 42.5 N bagged cement

Valid to:

13.10.2030

Scope of the EPD:

A1-A3

Year of study:

2023

Functional unit:

1 tonne of CEM II/A-L 42.5 N bagged cement

Comparability:

Environmental Product Declarations from different programmes may not be directly comparable if not compliant with EN 15804:2012+A2:2019. Comparability is further dependent on the specific product category rules, system boundaries and allocations, and background data sources. See clause 5.3 of EN 15804:2012+A2:2019

LCA consultant or person responsible for LCA: .
EcoReview, Peter Seymour

Verification:

Independent verification of the declaration and data, according to ISO14025:2010

Third party verifier:
Callum Hill

Approved:

SIGNATURE OF PROGRAMME OPERATOR

Pat Barry, CEO - Irish Green Building Council

Product

Product description:

Cement is a composite of synthetic minerals exhibiting hydraulic properties on mixing with water and is used to produce concrete and concrete products. The main material components of the cement are clinker, ground limestone and gypsum. The cement is manufactured in accordance with EN 197-1:2011 Cement. Composition, specifications and conformity criteria for common cements.

The cement manufacturing process involves crushing, blending and melting, at extreme temperatures, local limestones, clays and shales. These materials provide the four basic ingredients that are essential for cement, Calcium, Silicon, Aluminium and Iron. In simple terms these essential ingredients are extracted from the raw materials and rearranged into clinker inside the high temperature cement kiln.

Co-processing with the alternative fuel SRF (Solid Recovered Fuel) is an important part of the process to replace imported coal in combustion fuels and to reduce greenhouse gas emissions. Co-processing is the combination of simultaneous material recycling and energy recovery from waste in a thermal process, which results in replacing natural mineral resources and fossil fuels such as coal and petroleum products. This simultaneous process in the kiln sees the organic component of the waste products fuel the cement kiln, and the mineral elements of the waste become part of the cement clinker. This means that co-processing results in no leftover materials, like ash.

As the clinker exits the kiln it is cooled and then stored on site. It is later ground in energy efficient mills with other materials to make the final cement products. CEM II/A-L Cement is made by blending clinker with small amounts of minor additional constituents i.e. limestone chips and gypsum, as well as a chromate-reducing agent. A grinding aid is also added to assist in the grinding process.

Product specification:

The cement is manufactured at the Mannok cement plant at Scotchtown, Ballyconnell, Co. Cavan, Ireland in accordance with I.S. EN 197-1:2011, Compositions, specifications and conformity criteria for common cements.

Technical data:

The technical data for CEM II/A-L 42.5 N bagged cement is given the table below.

28 day strength	Specific density (kg/m^3)	Specific surface (m^2/kg)	Initial setting time (min)	Soundness (mm)
42.5 - 48.0	3100 - 3250	360 - 430	160 - 200	0 - 2.0

Market/Geographical Area:

Republic of Ireland and United Kingdom.

Reference service life, product

Not applicable for EN 197-1 cements.

Reference service life, building or construction works

LCA: Calculation rules

Declared unit:

1 tonne CEM II/A-L 42.5 N bagged cement

kg per Declared unit 1000

Cut-off criteria:

All relevant inputs and outputs - like emissions, energy and materials - have been taken into account in this LCA, and in accordance with EN15804+A2:2019. The study covers at least 95% of the materials and energy per module and at least 99% of the total use of materials and energy of each unit process. Long term emissions have been excluded from the study.

Allocation:

The measurement of environmental impacts in this EPD uses the LCIA methodologies recommended for PEF 3.0. In this EPD, the waste processes are allocated in the relevant module. In the case of the use of secondary materials or energy recovered from secondary fuels, the system boundary between the system under study and the previous system (providing the secondary materials) is set where outputs of the previous system, e.g. materials, products, building elements or energy, reach the end-of-waste state. The modularity and the polluter payer principles have been followed.

Data quality:

Time Representativeness: The production year of this LCA is 2023, and the Ecoinvent version 3.9.1 (March 2023) database is used. These are less than 2 years apart.
Time representativeness is considered to be Very Good.

Geographical Representativeness: The processes used in the production of the cement are geographically representative, insofar as the production location (Ireland) lies within the region for which the relevant Ecoinvent environmental records have been selected. The dataset is up-to-date and representative for the current technology and the materials used in the processes of manufacturing the cement.
Geographical Representativeness is considered to be Very Good.

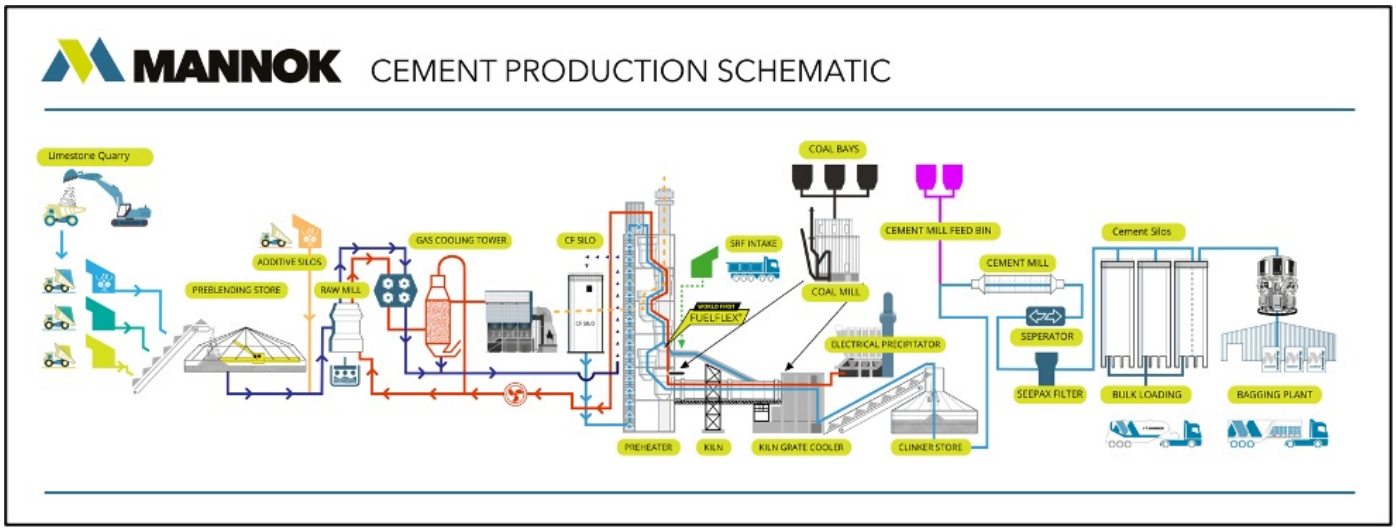
Technical Representativeness: Data is from the processes and products under study. The same state of technology that is used by Mannok is that defined in the goal and scope. The processes at Mannok use electricity, coal, fuel oil, SRF fuel and diesel. The dominant environmental impacts of clinker/cement manufacture arise from CO2 emissions, from process emissions and burning of fuels. The data on CO2 emissions for the clinker/cements in this LCA have been taken from the annual AER Installation Report for the Mannok cement factory, published by the Irish Environmental Protection Agency, under the EU'S Emissions Trading Scheme.
Technical Representativeness is considered to be Very Good.

Scope and type of EPD (X = Module declared; ND = Module not declared)

Product stage			Construction installation stage		Use stage							End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

System boundary:

This LCA covers the Product Stage modules: A1, A2 and A3. This is termed 'cradle to gate'.



Additional technical information:

Electricity modelling

This LCA assumes that the reference for electricity used is 100% renewable. The CO2 intensity of the electricity is 0.07 kg CO2 eq per kWH.

LCA: Scenarios and additional technical information

The following information describes the scenarios in the different modules of the EPD.

This LCA covers the Product Stage modules: A1, A2 and A3. This is termed 'cradle to gate'.

LCA: Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document.

Environmental impact			
Indicator		Unit	A1-A3
	GWP-total	kg CO_2 -eq	6.80E+02
	GWP-fossil	kg CO_2 -eq	6.78E+02
	GWP-biogenic	kg CO_2 -eq	7.49E-01
	GWP-luluc	kg CO_2 -eq	4.71E-01
	ODP	kg CFC11 -eq	6.25E-06
	AP	mol H+ -eq	2.27E+00
	EP-FreshWater	kg P -eq	9.15E-03
	EP-Marine	kg N -eq	5.68E-01
	EP-Terrestial	mol N -eq	6.50E+00
	POCP	kg NMVOC -eq	1.60E+00
	ADP-minerals&metals[1]	kg Sb-eq	7.07E-04
	ADP-fossil[1]	MJ	2.27E+03
	WDP[1]	m^3	2.56E+01

GWP-total = Global Warming Potential total; GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment: EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

"Reading example: 9.0 E-03 = 9.0*10-3 = 0.009"
*INA Indicator Not Assessed

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

Remarks on environmental impacts

The indicated GWP-total value of 679.6 kg CO2-eq/tonne (net value) does not include the greenhouse gas emissions from the combustion of secondary fuels at clinker production. The gross GWP-total (including the emissions from the combustion of secondary fuels at clinker production) is 733.9 kg CO2 eq.

The biogenic CO2 emission from the combustion of secondary fuels at clinker production for the CEM II/A-L bagged cement cement is 53.4 kg CO2-eq per tonne.

Additional environmental impact indicators			
Indicator		Unit	A1-A3
	PM	Disease incidence	1.10E-05
	IRP[2]	kgBq U235 -eq	2.18E+00
	ETP-fw[1]	CTUe	3.18E+03
	HTP-c[1]	CTUh	5.37E-08
	HTP-nc[1]	CTUh	1.77E-06
	SQP[1]	dimensionless	8.92E+02

PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Potential Soil Quality Index (dimensionless)

"Reading example: 9.0 E-03 = 9.0*10-3 = 0.009"
*INA Indicator Not Assessed

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
2. 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.

Resource use			
Indicator		Unit	A1-A3
	PERE	MJ	4.55E+02
	PERM	MJ	0.00E+00
	PERT	MJ	4.55E+02
	PENRE	MJ	2.40E+03
	PENRM	MJ	0.00E+00
	PENRT	MJ	2.40E+03
	SM	kg	0.00E+00
	RSF	MJ	0.00E+00
	NRSF	MJ	0.00E+00
	FW	m^3	8.18E-01

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non-renewable primary energy 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 resources; SM = Use of secondary materials; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water

"Reading example: 9.0 E-03 = 9.0*10-3 = 0.009"
*INA Indicator Not Assessed

End of life - Waste

Indicator		Unit	A1-A3
	HWD	kg	2.91E-03
	NHWD	kg	1.96E+01
	RWD	kg	2.91E-03

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed

"Reading example: 9.0 E-03 = 9.0*10-3 = 0.009"
*INA Indicator Not Assessed

End of life - Output flow

Indicator		Unit	A1-A3
	CRU	kg	0.00E+00
	MFR	kg	0.00E+00
	MER	kg	0.00E+00
	EEE	MJ	0.00E+00
	EET	MJ	0.00E+00

CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported energy electrical; EET = Exported energy thermal

"Reading example: 9.0 E-03 = 9.0*10-3 = 0.009"
*INA Indicator Not Assessed

Biogenic Carbon Content

Indicator	Unit	At the factory gate
Biogenic carbon content in product	kg C	0.00E+00
Biogenic carbon content in accompanying packaging	kg C	0.00E+00

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO2

Additional requirements

Dangerous substances

None of the substances contained in the product are listed in the “Candidate List of Substances of Very High Concern for authorisation”, or they do not exceed the limit for registration with the European Chemicals Agency.

Mandatory additional information on release of dangerous substances to indoor air, soil and water.

Not applicable

Bibliography

[1] 'ISO 14040: Environmental management - Life cycle assessment – Principles and Framework', International Organization for Standardization, ISO14040:2006.

[2] 'ISO 14044: Environmental management - Life cycle assessment - Requirements and guidelines', International Organization for Standardization, ISO14044:2006.

[3] 'ISO 14025: Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures', International Organization for Standardization, ISO14025:2006.

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

[5] Ecochain 4.3.1, 2024, web: http://app.Ecochain.com.

[6] Product Category Rules: Part A, Implementation and use of EN 15804:2012+A2:2019 and CEN TR 16970:2016 in Ireland for the development of Environmental Product Declarations; Version 2.0, issue date: 17.08.2021, published by the EPD Ireland Programme operator (Irish Green Building Council).

[7] IS-EN-16908 Cement and building lime. Environmental product declarations. Product Category Rules complementary to EN 15804:2012+A2:2019.

[8] AER Installation Report AER-64035, for Scotchtown Cement Works, version 1.19, for 2023.

[9] PEF methodology final draft.pdf (europa.eu)

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