Environmental Product Declaration

In accordance with ISO 14025:2006 and
EN 15804:2012+A2:2019/AC:2021 for:

Kolmossementti CEM III/A 52.5 L Parainen

FINNSEMENTTI
A CRH COMPANY

PROGRAMME:
The International EPD® System,
www.environdec.com

PROGRAMME OPERATOR:
EPD International AB

EPD REGISTRATION NUMBER:
EPD-IES-0007418:004

TYPE OF EPD:
EPD of a single product from a manufacturer

VERSION DATE (version 3):
2026-05-12

APPROVAL DATE:
2026-05-27

VALID UNTIL
2031-05-12

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

GENERAL INFORMATION
Programme information

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

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

Product category rules (PCR):	PCR 2019:14 Construction Products – Version 2.0.1 c-PCR-001 Cement and building limes (EN 16908)
PCR review was conducted by:	The Technical Committee of the International EPD® System. A full list of members available on www.environdec.com. The review panel may be contacted via support@environdec.com.
Life Cycle Assessment (LCA)	The Global Concrete and Cement Association (GCCA) verified LCA Model (v5.2, International version, 24 June 2025) was used for the life cycle modelling of the considered product.
EN 15804 reference package	LCIA characterization factors using EF 3.1 for CFs used in the PEF framework
Independent third-party verification of the declaration and data, according to ISO 14025:2006:	☐ EPD process certification ☒ EPD verification
Third party verifier:	Hannu Karppi, Ramboll Finland Oy
Approved by:	The 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.

COMPANY INFORMATION

Owner of the EPD:
Finnsementti Oy, Skräbbölentie 18, 21600 Parainen, Finland
Contact:
Henna Heinonen +358 206 201 200 (info@finnsementti.fi)
Description of the organisation:
Finnsementti, A CRH company, is a Finnish manufacturer of cement. Harnessing our century-long experience, we produce consistently superior cement and create jobs within our industry. The majority of Finland's cement offering is produced at Finnsementti's plants in Parainen and Lappeenranta, in addition to which the company has eight terminals in Kirkkonummi, Koverhar, Mariehamn, Oulu, Jakobstad, Pori, Raahe and Vasa. In addition to cement, our offering includes various aggregates.
Product-related or management system-related certifications:
ISO 9001:2015, ISO 14001:2015
Name and location of production site(s):
Finnsementti Oy, Parainen cement plant, Skräbbölentie 18, 21600 Parainen, Finland

PRODUCT INFORMATION

Product name:
Kolmossementti Parainen
Product identification:
Kolmossementti, CEM III/A 52.5 (CE marked, DoP_PA_Kolmossementti_12900)
Product description:
Cement is a hydraulic binder, i.e. a finely ground inorganic material. When the cement is mixed with water, it forms a paste which sets and hardens by means of hydration reactions and processes. After hardening the formed paste, retains its strength and stability even under water.
UN CPC code:
3744 Cement
Geographical scope:
Europe

PRODUCT DESCRIPTION

Cement

Cement is an inorganic material which is a hydraulic binder. Finely ground and mixed with water, it forms a paste which sets and hardens by means of hydration reactions and processes. After hardening it retains its strength and stability, even under water.

Use

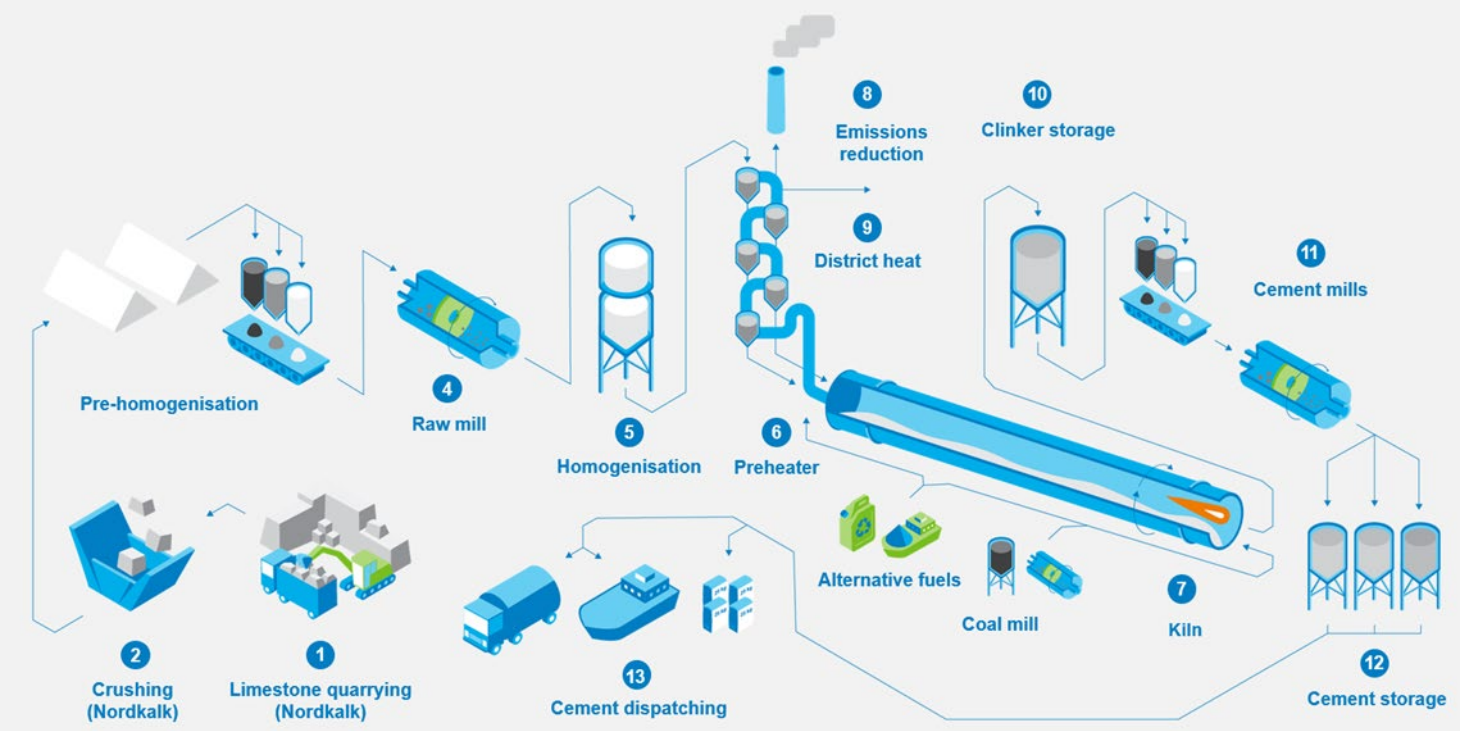
Cement is mainly used as a binder for concrete, mortar or cement screed.

Manufacturing process

The most important component of cement according to EN 197-1 is clinker. It is produced from raw materials such as limestone and industrial co-products or wastes which are crushed, homogenized and fed into a rotary kiln. The raw materials are sintered at a temperature of 1450°C to form new compounds. Clinker consists mainly of calcium-, silicium-, aluminium- and iron-oxides.

In a second phase calcium sulphates and possibly additional cementitious or inert materials are added to the clinker. All constituents are ground leading to a fine and homogenous powder, cement.

The following figure is a schematic representation of the cement manufacturing process from quarry to dispatch (production stage, information modules A1 to A3).



CONTENT INFORMATION

Cement according to EN 197-1 is produced by grinding and mixing the constituents defined in the standard.

This product does not contain substances listed in the Candidate List of Substances of Very High Concern (SVHCs) for Authorisation (date: 8.4.2025) exceeding 0.1 percentage by mass.

CONSTITUENTS OF FINNSEMENTTI CEMENTS AS DEFINED IN EN 197-1

Main constituents	Portland cement clinker and limestone, blast furnace slag
Calcium sulphate (gypsum)	added to the other constituents of cement during its manufacture to control setting
Minor additional constituents	added to improve the physical properties of the cement, such as workability or water retention
Additives	the total quantity of additives shall not exceed 1.0 % by mass of the cement

In **CEM III A**-type cements the total of main constituents and minor additional constituents is composed of 35-64 M.-% cement clinker, 36-65 M.% main constituent blast furnace slag or limestone and 0-5 M.% minor additional constituents.

		CEM III A	CEM III A
Product components	**CAS number**	**Conc. Range (%w/w)**	**Conc. Range (kg)**
Portland cement clinker	65 997-15-1	35 - 64	350 - 640
Blast Furnace Slag	65 996-69-2	36 - 65	360 - 650
Limestone	1317-65-3	0 - 5	0 - 50
Gypsum	7778-18-9	3 - 6	30 - 60
Flue dust from production of cement clinker	68475-76-3	0 - 5	0 - 50

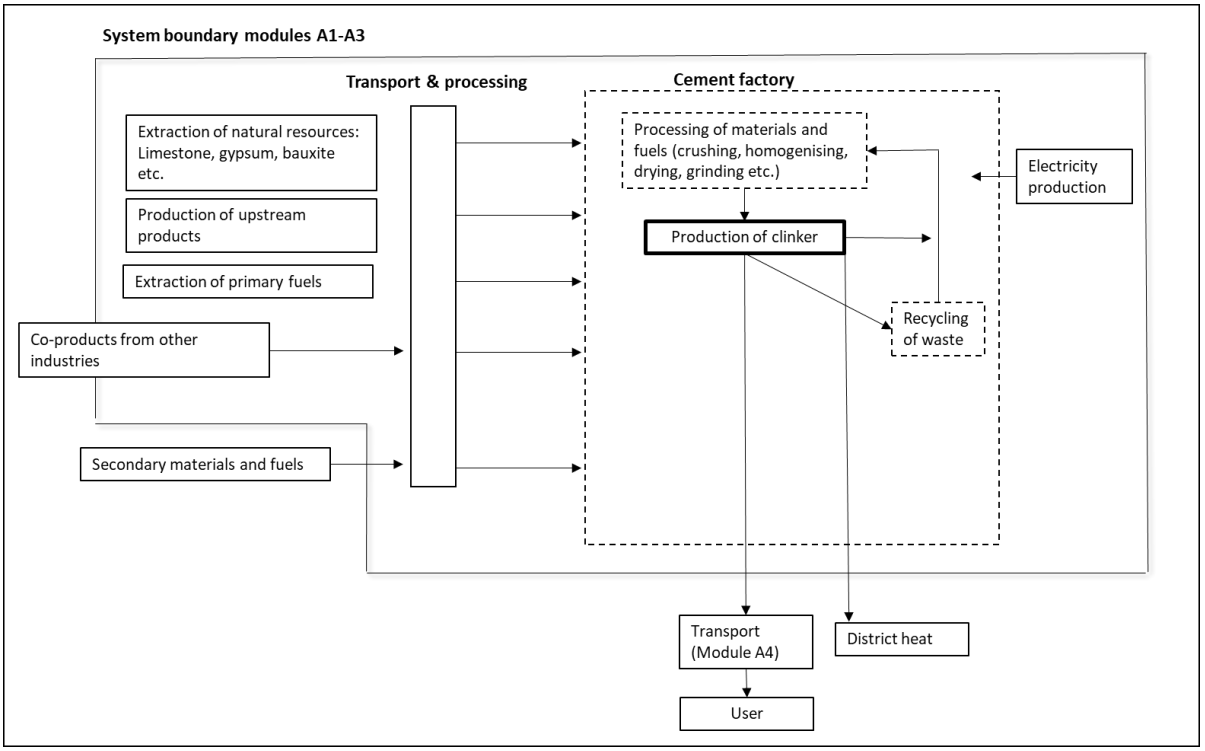
LCA INFORMATION

Declared unit:
1 metric ton of bulk cement (dry)
Reference service life:
NA
Time representativeness:
All material flows of the processes are based on site-specific data gathered for one year of operation, for the period 1st January 2025 – 31st December 2025.
Database(s) and LCA software used:
The Global Concrete and Cement Association (GCCA) verified LCA Model (v5.2, International version, 15 May 2025) was used for the life cycle modelling of the considered product.

The GCCA EPD Tool is a web-based calculation tool for EPDs. The life cycle assessment in the tool has been implemented in compliance with EN 15804:A2, PCR 2019:14 Construction products (EN 15804:A2) and complementary PCRs c-PCR-001 Cement and building limes (EN 16908) and c-PCR-003 Concrete and concrete elements (EN 16757), as well as with the General Programme Instructions (GPI 5.0) of the International EPD® System. This tool is referred to throughout the document as the "GCCA EPD tool". This tool was originally developed by WBCSD-CSI. Management of this tool has now been taken over by the Global Cement and Concrete Association (GCCA), of which CRH is a member.

Description of system boundaries:
The EPD covers the product stage, cradle to gate (A1–A3). The selected system boundaries comprise the production of cement including raw material extraction up to the finished product at the factory gate. They are in accordance with the system boundaries given in EN 16908.
As cement is an intermediate product, no other lifecycle phases are relevant to cover.

SYSTEM DIAGRAM:



Assumptions about electricity production:
Finnsementti Oy electricity mix is based on the Finnish 2025 Electricity breakdown (Energiateollisuus ry, Energiavuosi 2025). The electricity is market priced electricity. The emission factor used for the electricity is 55.3 g CO_2-eq./kWh. The emission factor includes the total CO_2-eq. emissions from electricity production and building the power plants.

Cut-off rules:
1 % cut-off rule was applied for input flows in the inventory.

Processes that have been excluded from the LCA study:
- Ball mill charge wear (less than 1% mass)
- Kiln refractory wear (less than 1% mass)
- Internal traffic (less than 1% of primary energy usage

LCA approach applied
Finnsementti is reducing its use of virgin primary fuels by utilizing waste-derived fuels.
Mineral recovery in clinker and cement production enables the use of waste and secondary materials, reducing the demand for virgin resources and avoiding landfill burdens**.**
For transparency—and to accommodate users who prefer the “gross approach”—the Global Warming Potential (GWP) results including the burdens from waste combustion are provided in a footnote.

The LCA is based primarily on data collected directly from the manufacturer and external partners. Where primary data is unavailable, recent generic data from EcoInvent v3.10 is used to ensure consistency and reliability.

Averages and variability
EPD is based on plant specific data covering a full calendar year to eliminate risk of seasonality impact and random fluctuations. Burdens from internal clinker production is assigned to cement according to clinker factor. Minor inputs such as waste handling and internal transport are averaged over all clinker production, since no specific data was available.
For co-product allocation from upstream processes, the rules of EN 15804:2012+A2:2019/AC:2021 apply. Allocation is based on economic value.

Data Quality assessment:
The data collection period of primary data is the year 2025. Allocation procedures are followed. Geographical representativeness is Very Good since the data is collected from EPD owner manufacturing plant. Electricity mix is based on the Finnish 2025 Electricity breakdown (Energiateollisuus ry, Energiavuosi 2025). The electricity is market priced electricity. For the secondary data Ecoinvent database v.3.1has been used (GCCA tool). Ecoinvent database has very good time representativeness, but geographical representativeness is fair.

MODULES DECLARED, GEOGRAPHICAL SCOPE AND SHARE OF SPECIFIC DATA:

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material 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
MODULE	**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	EU 27	EU 27	EU 27														
Specific data used	84 %					-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	Not relevant					-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	Not relevant					-	-	-	-	-	-	-	-	-	-	-	-

X = included in LCA MND = Module Not Declared

Process	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1-A3
Product manufacturing	Collected data	EPD owner	2025	Primary data	**82.1 %**
Generation of electricity	Database	ecoinvent v3.10	2025	Primary data	**0.6 %**
Transportation of raw materials	Database	ecoinvent v3.10	2025	Primary data	**0.9 %**
Total share of primary data, of GWP-GHG results for A1-A3					**83.5 %**

ENVIRONMENTAL INFORMATION

LCA results per 1 metric t of Kolmossementti (dry)

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.

Core environmental impact indicators			A1-A3
Global warming potential, total*	**GWP-tot**	kg $CO_{2\ eq.}$	**419**
Global warming potential, GHG**	**GWP-GHG**	kg $CO_{2\ eq.}$	**419**
Global warming potential, fossil fuels*	**GWP-fos**	kg $CO_{2\ eq.}$	**419**
Global warming potential, biogenic*	**GWP-bio**	kg $CO_{2\ eq.}$	**3.70E-01**
Global warming potential, land use and land use change	**GWP-luc**	kg $CO_{2\ eq.}$	**5.29E-02**
Ozone depletion potential	**ODP**	kg $CFC_{11\ eq.}$	1.98E-06
Acidification potential	**AP**	mol H+ eq.	**1.15E+00**
Eutrophication potential, freshwater	**EP-fw**	kg $PO_{4\ eq.}$	**5.44E-03**
Eutrophication potential, marine	**EP-mar**	kg $N_{eq.}$	1.06E-01
Eutrophication potential, accumulated exceedance	**EP-ter**	mol $N_{eq.}$	**4.63E+00**
Formation potential of tropospheric ozone	**POCP**	kg $NMVOC_{eq.}$	**1.29E+00**
Abiotic depletion potential for non-fossil resources	**ADPE**	kg $Sb_{eq.}$	2.13E-03
Abiotic depletion for fossil resources potential	**ADPF**	MJ	**2.28E+03**
Water deprivation potential	**WDP**	m^3 eq.	**2.69E+01**

* The indicated values (net values) do not include the greenhouse gas emissions from the incineration of secondary fuels at clinker production. The gross GWP-tot (including the emissions from the incineration of secondary fuels at clinker production) is 4.43E+02 kg CO2–eq. The gross GWP-fos is 4.43E+02 kg CO2-eq. The gross GWP-bio is 4.46E-01 kg CO2-eq.
** The indicated values (net values) do not include the greenhouse gas emissions from the incineration of secondary fuels at clinker production. The gross GWP-GHG (including the emissions from the incineration of secondary fuels at clinker production) is 4.43E+02 kg CO2–eq
This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero.

Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

Additional environmental impact indicators			A1-A3
Potential incidence of disease due to pm emissions	PM	Disease incidence	1.10E-05
Potential human exposure efficiency relative to U235	IRP	kBq U235 eq.	3.02E+01
Potential comparative toxic unit for ecosystems	ETP	CTUe	2.56E+02
Potential comparative toxic unit for humans	HTPC	CTUh	7.24E-07
Potential comparative toxic unit for humans	HTPNC	CTUh	8.49E-06
Potential soil quality index	SQP	dimensionless	9.50E+02

Parameters describing resource use			A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PERE	MJ	3.32E+02
Use of renewable primary energy resources used as raw materials	PERM	MJ	0.00E+00
Total use of renewable primary energy resources	PERT	MJ	3.32E+02
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	PENRE	MJ	2.28E+03
Use of non-renewable primary energy resources used as raw materials	PENRM	MJ	0.00E+00
Total use of non-renewable primary energy resources	PENRT	MJ	2.28E+03
Use of secondary material	SM	kg	4.94E+02
Use of renewable secondary fuels	RSF	MJ	2.83E+02
Use of non-renewable secondary fuels	NRSF	MJ	3.50E+02
Net use of fresh water	FW	m^3	6.53E-01

Other environmental information describing waste categories			A1-A3
Hazardous waste disposed	HWD	kg	8.60E-02
Non-hazardous waste disposed	NHWD	kg	2.92E-02
Radioactive waste disposed	RWD	kg	6.75E-03

Environmental information describing output flows			A1-A3
Components for re-use	CRU	kg	0.00E+00
Materials for recycling	MR	kg	2.42E+00
Materials for energy recovery	MER	kg	2.42E-02
Exported energy	EE	MJ	4.71E+01

Information on biogenic carbon content

The removals and emissions associated with biogenic carbon content of i) the product and ii) the packaging is not calculated. It is not relevant for the cement production.

Extra indicators			A1-A3
Emissions from calcination and removals from carbonation	CC	kg CO eq.	2.42E+02
Emissions from combustion of waste from renewable sources	CWRS	kg CO eq.	7.53E-02
Emissions from combustion of waste from non-renewable sources	CWNRS	kg CO eq.	2.37E+01

ADDITIONAL INFORMATION

The development of scenarios shall be made on the finished product (e.g. concrete) and not on the upstream product cement clinker.

Carbonation

During and after the lifetime of concrete structures or other clinker-containing products, hydrated clinker/cement contained within the product reacts with CO_2 in the air. Part of the CO_2 emitted during cement production is reabsorbed by the cement through carbonation, a reaction also referred to as cement carbonation. The quantity of CO_2 taken up will depend on the type of application and its treatment after its lifetime. This reaction takes place mainly on the surface of cement-based products. Structural concrete applications are designed according to strict codes which ensure that carbonation at the concrete surface does not lead to corrosion of reinforcement. Carbonation can nevertheless be particularly relevant after demolition when the surface in contact with air increases very significantly. Carbonation contributes to a reduced GWP impact of cement products over their whole life.

Since carbonation will depend on the application in question, please refer to the respective PCR/EPDs for ready-mix concrete, precast concrete, mortar, cement screed or other cement-based products.

Additional information on release of dangerous substances to indoor air, soil and water during the use stage

For additional information on emissions to indoor air, soil and water during the use stage, please refer to the respective EPDs for the downstream products such as ready-mix concrete, precast concrete, screed, plasters, mortars, grouts etc.

More information regarding Finnsementti's environmental objectives and activities as well as regarding safe and effective use and disposal of cement are available on www.finnsementti.fi.

Changes versus previous versions of the EPD

2025-06-19 Version 1

2025-09-03 Version 2
All material flows of the processes are based on site-specific data gathered for one year of operation, now for the period 1st January 2024 – 31st December 2024.
Change of methodology from “Gross” to “Net” to align with common practice in Europe Document formatting and descriptive data updated to align with PCR.

2026-05-12 Version 3
The main change compared to previous version is related to an update of specific data used for LCA-calculations. All material flows of the processes are based on site-specific data gathered for one year of operation, now for the period 1st January 2025 – 31st December 2025. Electricity mix is based on the Finnish 2025 Electricity breakdown, previous version used 2024 figures. All LCA-results are updated.

REFERENCES

General Programme Instructions of the International EPD® System. Version 5.0.
PCR 2019:14
Construction Products. Construction Products – Version 2.0.1
c-PCR-001 Cement and building limes (EN 16908)

EN 15804:2012-04 + A2 2019/AC:2021
Sustainability of construction works – Environmental Product Declarations – Core rules for the product category of construction products

EN 16908: 2017+A2:2022
Cement and building lime - Environmental product declarations – Product category rules complementary to EN 15804

EN 197-1: 2012
Cement. Part 1: Composition, specifications and conformity criteria for common cements.

Global Concrete and Cement Association (GCCA) verified LCA Model
(v5.2, International version, 23 June 2025)

Candidate List of Substances of Very High Concern for Authorization European Chemical Agency www.echa.europa.eu