ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

CEM II/A-LL 42,5 R

CCB CEMENTIR HOLDING

GENERAL INFORMATION

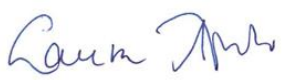
MANUFACTURER INFORMATION

Manufacturer	CCB Cementir Holding
Address	CCB SA, Grand'Route 260, 7530 Gaurain-Ramecroix, Belgium
Contact details	oumar.thiene@ccb.be
Website	www.ccb.group

PRODUCT IDENTIFICATION

Product name	CEM II/A-LL 42,5 R
Product number / reference	0695- CPR-C0342
Place(s) of production	Gaurain-Ramecroix, Belgium

Jessica Karhu
RTS EPD Committee secretary



Laura Apilo
Managing Director

EPD INFORMATION

EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

EPD program operator	Rakennustietosäätiö RTS / Rakennustieto Oy Malminkatu 16 A 00100 Helsinki http://cer.rts.fi
EPD standards	This EPD is in accordance with EN 15804+A2 and ISO 14025 standards.
Product category rules	The CEN standard EN 15804 serves as the core PCR. In addition, the RTS PCR (English version, 26.08.2020) is used.
EPD author	Stefan Emil Danielsson, Research and Quality Center, Cementir Holding S.p.A Aalborg, Denmark
EPD verification	Independent verification of this EPD and data, according to ISO 14025: □ Internal certification ☑ External verification
Verification date	16.2.2021
EPD verifier	Anni Oviir, Rangi Maja OÜ, www.lcasupport.com
EPD number	RTS_90_21
Publishing date	4.3.2021
EPD valid until	16.2.2026

PRODUCT INFORMATION

PRODUCT DESCRIPTION

The CCB CEM II/A-LL 42,5 R a grey limestone Portland cement consisting of clinker, limestone and other constituents.

PRODUCT APPLICATION

CCB CEM II/A-LL 42,5 R is suitable for the all cement and concrete applications.

TECHNICAL SPECIFICATIONS AND PHYSICAL PROPERTIES OF THE PRODUCT

Product sheet can be retrieved here:
https://ccb.group/fr_be/product/cem-ii-a-ll-425-r/

Further information can be found at www.ccb.group

PRODUCT STANDARDS

The CCB CEM II/A-LL 42,5 R is manufactured according to the European standard EN 197-1 and correspondingly labelled with the European CE quality mark. In addition, the cement is marked with the quality mark KOMO required for construction products marketed in the Netherlands.

PRODUCT RAW MATERIAL COMPOSITION

Material	Amount %
Clinker	80 - 94
Limestone	6 - 20
Other constituents	0 - 5

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	0	-
Minerals	96,4	Belgium, Europe, World
Fossil materials	3,6	Belgium, Europe
Bio-based materials	0	-

SUBSTANCES, REACH - VERY HIGH CONCERN

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

PRODUCT LIFE-CYCLE

MANUFACTURING AND PACKAGING (A1-A3)

The main component of clinker, limestone, is sourced from a local and a regional quarry. A mixture of raw materials composed of limestone, wet ash, aluminous and ferric additives is ground. The ground raw meal mixture is led into the kiln to be dehydrated, calcined at 550°C and melted at 1450°C using a pre-ground fuel mixture. This process transforms the raw meal into clinker which is the main component of the Portland cement. To achieve the desired cement quality, gypsum, and limestone, as well as pre-dried blast furnace slag, and finally the mixture is grinded to form the finished cement product. This EPD focuses on cement produced in bulk and thus excludes processes related to packaging.

TRANSPORT AND INSTALLATION (A4-A5)

Only distribution to end customers is considered (A4). Transportation of the CEM II/A-LL 42.5 R happens within BENELUX and France with truck and train. The emission and distance results are weighted average according to volume flows and distances from the CCB plant to each of the destined regions (see table under “Scenario documentation”). The data quality for the realized 2019 shipping is very high.

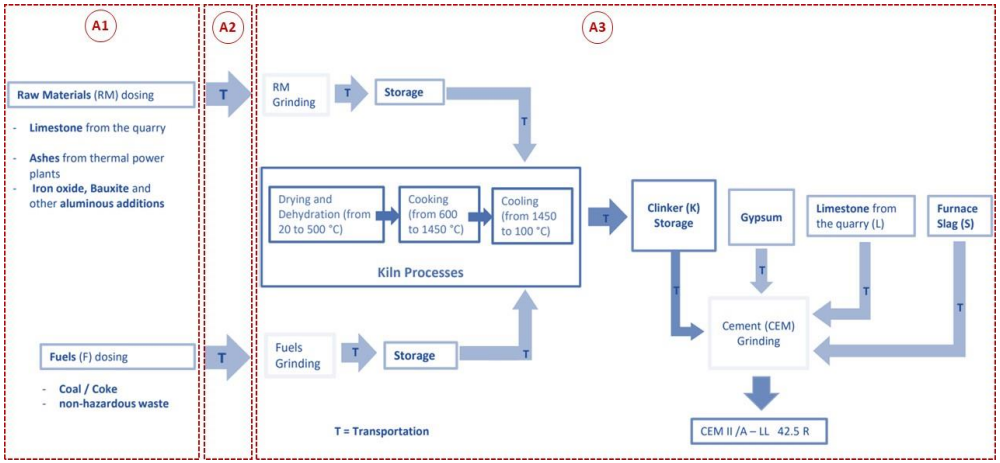
PRODUCT USE AND MAINTENANCE (B1-B7)

As cement is an intermediate product, no other lifecycle phases are relevant to cover. Air, soil and water impacts during the use phase have not been studied. As such they are marked as “Modules Not Declared”

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.

MANUFACTURING PROCESS



LIFE-CYCLE ASSESSMENT

LIFE-CYCLE ASSESSMENT INFORMATION

Period for data	2019
Declared unit	1 tonne
Mass per declared unit	1000 kg

BIOGENIC CARBON CONTENT

The product and its packaging do not have biogenic carbon content.

SYSTEM BOUNDARY

This EPD covers cradle-to-gate with options scope with following modules; A1 (Raw material supply), A2 (Transport) and A3 (Manufacturing). As cement is an intermediate product, no other lifecycle phases are relevant to cover. Only A4 is also included as per the recommendation in EN 15804+A2.

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	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
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

All major raw materials and essential energy flows are included. The 1% cut-off rule does not apply for hazardous materials and substances: as such, all flows with environmental significance are included. All solid waste emissions, including those that weight less than 1% of the sum of the masses of the inputs, are reported in the end-results.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is made in accordance with the provisions of EN 15804+A2 and the PCR. According to the “polluter pays principle” burdens from alternative fuels are excluded. However, the burden from its incineration is voluntarily added to the GWP category in A3 to be directly comparable with most other EPD’s.

The data quality is generally high as most are retrieved directly from the Manufacturer and are well below the cut-off rule. Additional background processes such as transportation and electricity consumption have been modelled using Ecoinvent v.3.6 LCI database, with less than 2 years old data.

AVERAGES AND VARIABILITY

Essentially, for this EPD, minor inputs such as electricity, internal transport, and waste have been averaged over the entire cement and clinker production of CCB.

ENVIRONMENTAL IMPACT DATA

NOTE: ENVIRONMENTAL IMPACTS - EN 15804+A1, CML / ISO 21930 AND TRACI 2.1. / ISO 21930 ARE PRESENTED IN ANNEX.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Climate change – total	kg $CO_{2\text{-eq}}$	5,11E+00	1,36E+01	6,21E+02	6,40E+02	1,91E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Climate change – fossil	kg $CO_{2\text{-eq}}$	5,04E+00	1,35E+01	6,19E+02	6,38E+02	1,90E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Climate change – biogenic	kg $CO_{2\text{-eq}}$	6,48E-02	7,36E-02	1,85E+00	1,99E+00	1,31E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Climate change – LULUC	kg $CO_{2\text{-eq}}$	1,69E-03	7,51E-03	2,15E-02	3,07E-02	7,17E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Ozone depletion	kg $CFC11_{\text{-eq}}$	1,24E-06	2,88E-06	2,48E-06	6,60E-06	4,25E-06	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Acidification	mol $H^{+}_{\text{-eq}}$	1,72E-02	1,67E-01	1,53E+00	1,71E+00	6,03E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Eutrophication, aquatic freshwater	kg $PO_{4\text{-eq}}$	1,24E-03	9,88E-04	5,61E-02	5,84E-02	1,55E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Eutrophication, aquatic marine	kg $N_{\text{-eq}}$	3,06E-03	3,69E-02	1,74E-01	2,14E-01	1,43E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Eutrophication, terrestrial	mol $N_{\text{-eq}}$	3,62E-02	4,09E-01	1,81E+00	2,26E+00	1,54E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Photochemical ozone formation	kg $NMVOC_{\text{-eq}}$	1,98E-02	1,14E-01	5,24E-01	6,58E-01	5,43E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Abiotic depletion, minerals & metals	kg $Sb_{\text{-eq}}$	1,15E-03	2,62E-04	8,83E-05	1,50E-03	4,77E-04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Abiotic depletion of fossil resources	MJ	1,40E+02	1,90E+02	2,13E+03	2,46E+03	2,82E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Water use	$m^3_{\text{-eq}}$ depr.	1,65E+02	2,55E+02	1,56E+03	1,98E+03	4,50E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

EN 15804+A2 disclaimer for Abiotic depletion and Water use indicators and all 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.

The GWP parameter (A1-A3) for the cement content includes 22,4 kg $CO_{2\text{-eq.}}$ from the combustion of fossil part of alternative fuels during clinker production. In accordance with the "polluter pays" principle / EN 15804 /, the emissions will be added to the production system that caused the waste. In this EPD, the fossil CO_2 contribution from alternative fuels has not been deducted. This makes it easier to compare calculated global warming potential of the cement regardless of the status of the waste in different countries. The net total GWP (without alternative fuel contribution) is 618 kg $CO_{2\text{-eq}}$ per ton cement.

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	8,41E-07	7,28E-07	1,49E-05	1,64E-05	1,33E-06	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Ionizing radiation, human health	kBq U235$_{eq}$	4,02E-01	9,52E-01	6,95E+00	8,31E+00	1,47E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Eco-toxicity (freshwater)	CTU$_{eq}$	7,44E-01	4,65E+00	4,51E+00	9,91E+00	8,74E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Human toxicity, cancer effects	CTUh	8,12E-09	6,29E-09	2,75E-08	4,19E-08	6,68E-09	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Human toxicity, non-cancer effects	CTUh	1,80E-06	2,19E-07	4,37E-06	6,39E-06	3,74E-07	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Land use related impacts/soil quality	-	2,70E+01	1,03E+02	-8,12E+01	4,90E+01	2,19E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

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

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renewable PER used as energy	MJ	0,00E+00	2,55E+00	3,56E+01	3,82E+01	4,39E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Renewable PER used as materials	MJ	4,23E+00	0,00E+00	0,00E+00	4,23E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Total use of renewable PER	MJ	4,23E+00	2,55E+00	3,56E+01	4,24E+01	4,39E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Non-renew. PER used as energy	MJ	0,00E+00	1,93E+02	2,24E+03	2,44E+03	2,88E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Non-renew. PER used as materials	MJ	1,46E+02	0,00E+00	0,00E+00	1,46E+02	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Total use of non-renewable PER	MJ	1,46E+02	1,93E+02	2,24E+03	2,58E+03	2,88E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of secondary materials	kg	1,10E-01	1,05E-01	1,83E-01	3,98E-01	1,46E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of renewable secondary fuels	MJ	7,80E-02	7,84E-02	1,37E+00	1,53E+00	1,46E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of non-renew. secondary fuels	MJ	7,98E-02	4,76E-01	3,06E+00	3,62E+00	6,07E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of net fresh water	m^3	1,51E+00	2,80E+00	3,97E+00	8,28E+00	4,29E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

PER abbreviation stands for primary energy resources

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	2,21E+00	2,53E-01	1,73E+01	1,98E+01	3,43E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Non-hazardous waste	kg	2,58E+00	1,02E+01	2,67E+02	2,80E+02	1,95E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Radioactive waste	kg	4,54E-04	1,31E-03	2,32E-03	4,09E-03	1,94E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for reuse	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Materials for recycling	kg	3,62E-02	1,04E-01	1,26E-01	2,65E-01	1,26E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Materials for energy recovery	kg	5,18E-03	8,70E-04	1,54E-02	2,15E-02	1,61E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

KEY INFORMATION TABLE (RTS) – KEY INFORMATION PER KG OF PRODUCT

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Climate change – total	kg $CO_{2\text{-eq}}$	5,11E-03	1,36E-02	5,99E-01	6,18E-01	1,91E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Abiotic depletion, minerals & metals	kg $Sb_{\text{-eq}}$	1,15E-06	2,62E-07	8,83E-08	1,50E-06	4,77E-07	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Abiotic depletion of fossil resources	MJ	1,40E-01	1,90E-01	2,13E+00	2,46E+00	2,82E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Water use	$m^3_{\text{-eq}}$ depr.	1,51E-03	2,80E-03	3,97E-03	8,28E-03	4,29E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of secondary materials	kg	1,10E-04	1,05E-04	1,83E-04	3,98E-04	1,46E-04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Biogenic carbon content in product	kg C	N/A	N/A	0,00E+00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Biogenic carbon content in packaging	kg C	N/A	N/A	0,00E+00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – DUTCH MARKET

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Abiotic depletion, fuel (ADPF)	kg Sb_{-eq}	4.37E-02	9.39E-02	1.01E+00	1.15E+00	1.34E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Human toxicity (HT)	kg 1,4-DB_{-eq}	5.56E+00	6.71E+00	3.85E+01	5.07E+01	8.61E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Ecotoxicity, fresh water (FAETP)	kg 1,4-DB_{-eq}	9.20E+00	2.38E+00	3.93E+01	5.09E+01	3.34E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Ecotoxicity, marine water (MAETP)	kg 1,4-DB_{-eq}	1.34E+03	1.99E+03	8.63E+04	8.97E+04	2.48E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Ecotoxicity, terrestric (TETP)	kg 1,4-DB_{-eq}	1.87E-02	2.11E-02	4.58E-02	8.56E-02	2.70E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Environmental Cost Indicator ECI	EUR	1.50E+00	2.27E+00	5.13E+01	5.51E+01	2.40E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

SCENARIO DOCUMENTATION

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Ecoinvent v.3.6 data has been applied as the only valid dataset
Electricity $CO_{2\text{-eq}}$ / kWh	0,25
District heating data source and quality	n/a
District heating $CO_{2\text{-eq}}$ / kWh	n/a

Transport scenario documentation

Scenario parameter	Value
Transport, freight, lorry 16-32 tonnes, EURO 5, kg $CO_{2\text{-eq}}$ / t-km	0,1668
Transport, freight, sea, bulk carrier for dry goods, kg $CO_{2\text{-eq}}$ / t-km	0,00939
A4 average transport $CO_{2\text{-eq}}$ emissions, kg $CO_{2\text{-eq}}$ / t-km	0,139
A4 average transport distance, km	139
Transport capacity utilization, %	36%
Bulk density of transported products, kg/m^3	3050
Volume capacity utilization factor for nested package products, %	100

End of life scenario documentation

Scenario parameter	Value
Collection process – kg collected separately	n/a
Collection process – kg collected with mixed waste	n/a
Recovery process – kg for re-use	n/a
Recovery process – kg for recycling	n/a
Recovery process – kg for energy recovery	n/a
Disposal (total) – kg for final deposition	n/a
Scenario assumptions e.g. transportation	n/a

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 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.

RTS PCR EN 15804:2019 RTS PCR in line with EN 15804+A2. Published by the Building Information Foundation RTS (English version, 26.08.2020).

ABOUT THE MANUFACTURER

CCB is specialized in the production of cement, pellets and ready-to-pay concrete. For more than one hundred years, CCB offered innovative products and customized solutions for different applications in the market, including a wide range of grey cements of the types CEM I, CEM II, CEM III, CEM V. CCB has the largest cement plant in France and the Benelux. For more than eighty years, it has relied on cutting-edge technology and large limestone reserves. Our factory is located near the French border and has a production capacity of 2,3 million tonnes of cement. This allows us to serve the Belgian, French, Dutch and German markets. In addition, CCB has three limestone quarries near the cement plant, one of which is even the largest in Europe. With its fourteen concrete batching plants, CCB can count on unique industrial facilities which together produce around 1 million m^3 of ready-mixed concrete each year.

EPD AUTHOR AND CONTRIBUTORS

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Background data	This EPD is based on Ecoinvent 3.6 (cut-off) and One Click LCA databases.
LCA software	The LCA and EPD have been created using One Click LCA Pre-Verified EPD Generator for Cementitious Products

ANNEX

ENVIRONMENTAL IMPACTS - EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global warming potential	kg $CO_{2\text{-eq}}$	7,21E+00	1,36E+01	6,26E+02	6,49E+02	2,02E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Depletion of stratospheric ozone	kg CFC-11$_{\text{-eq}}$	1,21E-06	2,29E-06	2,39E-06	5,88E-06	3,54E-06	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Acidification	kg $SO_{2\text{-eq}}$	2,22E-02	1,36E-01	1,38E+00	1,54E+00	6,28E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Eutrophication	kg $PO_{4\text{-eq}}$	1,40E-02	1,66E-02	2,32E-01	2,62E-01	1,34E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Photochemical ozone formation	kg $C_2H_{4\text{-eq}}$	1,83E-03	4,46E-03	5,88E-02	6,51E-02	3,08E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Abiotic depletion of non-fossil res.	kg $Sb_{\text{-eq}}$	1,15E-03	2,62E-04	8,83E-05	1,50E-03	4,85E-04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Abiotic depletion of fossil resources	MJ	1,40E+02	1,90E+02	2,13E+03	2,46E+03	2,96E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

The GWP parameter (A1-A3) for the cement content includes 22,4 kg $CO_{2\text{-eq.}}$ from the combustion of fossil part of alternative fuels during clinker production. In accordance with the "polluter pays" principle / EN 15804 /, the emissions will be added to the production system that caused the waste. In this EPD, the fossil CO_2 contribution from alternative fuels has not been deducted. This makes it easier to compare calculated global warming potential of the cement regardless of the status of the waste in different countries. The net total GWP (without alternative fuel contribution) is 627 kg $CO_{2\text{-eq}}$ per ton cement.

ENVIRONMENTAL IMPACTS - TRACI 2.1. / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global warming potential	kg $CO_{2\text{-eq}}$	5,02E+00	1,34E+01	1,68E+02	1,87E+02	1,89E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Ozone depletion	kg CFC11$_{\text{-eq}}$	1,32E-06	3,05E-06	3,08E-06	7,44E-06	4,50E-06	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Acidification	kg $SO_{2\text{-eq}}$	1,41E-02	1,40E-01	1,28E+00	1,43E+00	5,12E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Eutrophication	kg $N_{\text{-eq}}$	1,26E-02	1,59E-02	4,39E-01	4,68E-01	1,94E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Photochemical Smog Formation	kg $O_{3\text{-eq}}$	1,82E-01	2,33E+00	1,04E+01	1,29E+01	8,84E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Depletion of non-renewable energy	MJ	1,29E+01	2,72E+01	3,40E+01	7,41E+01	4,03E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND