

Environmental Product Declaration

according to ISO 14025 and EN 15804



This declaration is for:

**Cement: FUTURECEM® - CEM II/B-M
(Q-LL) 52.5 N**

Provided by:

**CCB CIE DES CIMENTS BELGES,
C.C.B.S.A**



CCB

CEMENTIR HOLDING



program operator

Stichting MRPI®

publisher

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ECO PLATFORM

EPD

VERIFIED



COMPANY INFORMATION



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PRODUCT

Cement: FUTURECEM® - CEM II/B-M (Q-LL) 52.5 N

DECLARED UNIT/FUNCTIONAL UNIT

1 t

DESCRIPTION OF PRODUCT

FUTURECEM® - CEM II/B-M(Q-LL) 52.5N is a limestone calcined clay cement manufactured by CCB using FUTURECEM® patented technology which enables CO2 emission reduction.

VISUAL PRODUCT



MORE INFORMATION

https://ccb.group/nl_be/

MRPI® REGISTRATION

1.1.00488.2023

DATE OF ISSUE

19-12-2023

EXPIRY DATE

19-12-2028

SCOPE OF DECLARATION

This MRPI®-EPD certificate is verified by **Kamiel Jansen, Aveco de Bondt**.

The LCA study has been done by **Bob Roijen, SGS INTRON**.

The certificate is based on an LCA-dossier according to ISO14025 and EN15804+A2/Bepalingsmethode. It is verified according to the 'MRPI®-EPD verification protocol November 2020.v4.0'. EPDs of construction products may not be comparable if they do not comply with EN15804+A2/Bepalingsmethode. Declaration of SVHC that are listed on the 'Candidate List of Substances of Very High Concern for authorisation' when content exceeds the limits for registration with ECHA.

PROGRAM OPERATOR

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ir. J-P den Hollander, Managing director MRPI®

DEMONSTRATION OF VERIFICATION

CEN standard EN15804 serves as the core PCR[a]

Independent verification of the declaration and data,

according to EN ISO 14025:2010:

internal: external: X

Third party verifier:

Kamiel Jansen, Aveco de Bondt

[a] PCR = Product Category Rules

DETAILED PRODUCT DESCRIPTION

FUTURECEM® - CEM II/B-M(Q-LL) 52.5N is a limestone calcined clay cement manufactured by CCB using FUTURECEM® patented technology which enables CO2 emission reduction. The main constituents of this cement are mentioned in the table below.

COMPONENT > 1% of total mass	[%]
Portland cement clinker	65-79
Other constituents	21-35

SCOPE AND TYPE

The cement in this EPD is produced at the production location of CCB in Gaurain-Ramecroix.

Cement is a hydraulic binder, mainly used for concrete, mortar and cement screed. Since cement is a semi-finished product, only the production of the cement is included in the LCA.

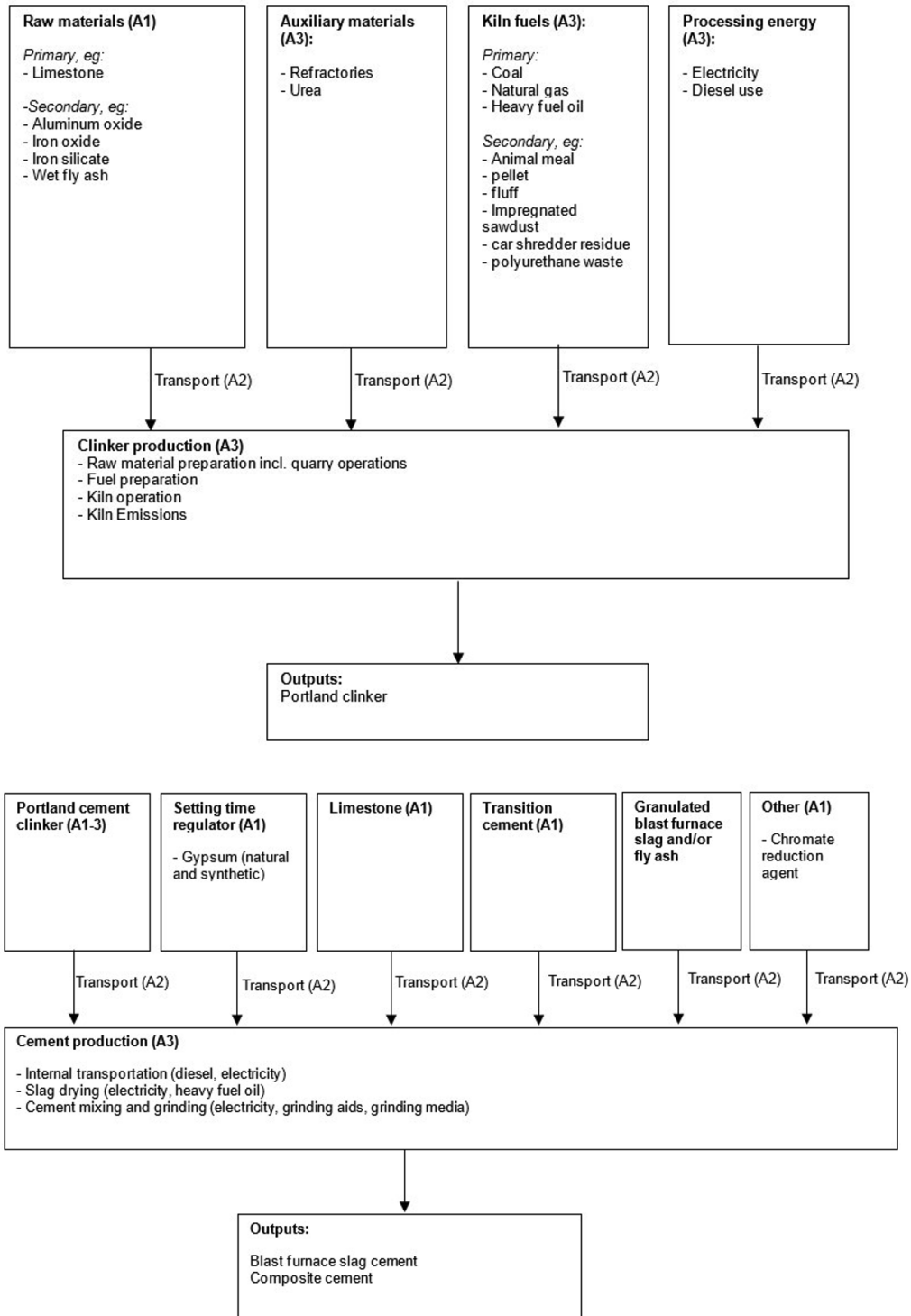
The LCA is compiled using the “Bepalingsmethode milieuprestaties bouwwerken werken v1.1”, and the European PCR for cement EN 16908.

The LCA is made using SimaPro 9 LCA software using Ecoinvent v3.6 for background processes. The main impact categories have been calculated with the characterization factors in “SBK Bepalingsmethode version 3.4”

PRODUCT STAGE	CONSTRUCTION					USE STAGE							END OF LIFE			BENEFITS AND	
	PROCESS												STAGE			LOADS BEYOND THE	
	STAGE															SYSTEM BOUNDARIES	
Raw material supply	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Transport	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Manufacturing																	
Transport gate to site																	
Assembly																	
Use																	
Maintenance																	
Repair																	
Replacement																	
Refurbishment																	
Operational energy use																	
Operational water use																	
De-construction demolition																	
Transport																	
Waste processing																	
Disposal																	
Reuse-Recovery-Recycling-potential																	ND

X = Modules Assessed

ND = Not Declared



LCA process diagram according to EN 15804 (7.2.1)

REPRESENTATIVENESS

Not applicable, in this study a specific product is considered produced at a specific production site.

ENVIRONMENTAL IMPACT per functional unit or declared unit (indicators A1)

	UNIT	A1	A2	A3	A1-A3
ADPE	kg Sb eq.	4.77E-4	1.57E-4	1.76E-4	8.10E-4
ADPF	MJ	3.02E+3	1.31E+2	1.74E+3	4.88E+3
GWP	kg CO2 eq.	5.29E+1	9.36E+0	5.80E+2	6.42E+2
ODP	kg CFC11 eq.	6.05E-6	1.56E-6	1.33E-5	2.10E-5
POCP	kg ethene eq.	1.92E-2	8.60E-3	1.41E-1	1.69E-1
AP	kg SO2 eq.	1.67E-1	1.25E-1	9.64E-1	1.26E+0
EP	kg (PO4) ³⁻ eq.	8.67E-2	1.50E-2	1.99E-1	3.01E-1

Toxicity indicators for Dutch market

HTP	kg DCB eq.	3.76E+1	4.49E+0	2.70E+1	6.90E+1
FAETP	kg DCB eq.	4.21E-1	9.83E-2	3.37E-1	8.56E-1
MAETP	kg DCB eq.	1.21E+3	3.95E+2	3.73E+3	5.33E+3
TETP	kg DCB eq.	4.34E-2	1.49E-2	3.19E-1	3.78E-1
ECI	Euro	7.98E+0	1.58E+0	3.78E+1	4.74E+1
ADPF	kg Sb. eq.	2.07E+0	6.27E-2	2.86E-1	2.42E+0

ADPE = Abiotic Depletion Potential for non-fossil resources
 ADPF = Abiotic Depletion Potential for fossil resources
 GWP = Global Warming Potential
 ODP = Depletion potential of the stratospheric ozone layer
 POCP = Formation potential of tropospheric ozone photochemical oxidants
 AP = Acidification Potential of land and water
 EP = Eutrophication Potential
 HTP = Human Toxicity Potential
 FAETP = Fresh water aquatic ecotoxicity potential
 MAETP = Marine aquatic ecotoxicity potential
 TETP = Terrestrial ecotoxicity potential
 ECI = Environmental Cost Indicator
 ADPF = Abiotic Depletion Potential for fossil resources expressed in [kg Sb-eq.]

ENVIRONMENTAL IMPACT per functional unit or declared unit (core indicators A2)

	UNIT	A1	A2	A3	A1-A3
GWP-total	kg CO2 eq.	5.35E+1	9.43E+0	5.65E+2	6.28E+2
GWP-fossil	kg CO2 eq.	5.42E+1	9.43E+0	5.64E+2	6.28E+2
GWP-biogenic	kg CO2 eq.	-6.19E-1	1.14E-3	6.18E-1	0.00
GWP-luluc	kg CO2 eq.	1.45E-2	6.62E-3	1.01E-1	1.22E-1
ODP	kg CFC11 eq.	7.47E-6	1.96E-6	9.43E-6	1.89E-5
AP	mol H+ eq.	2.29E-1	1.57E-1	1.41E+0	1.80E+0
EP-freshwater	kg PO4 eq.	1.92E-2	7.37E-5	9.68E-4	2.03E-2
EP-marine	kg N eq.	5.33E-2	4.00E-2	4.74E-1	5.67E-1
EP-terrestrial	mol N eq.	7.73E-1	4.45E-1	6.44E+0	7.66E+0
POCP	kg NMVOC eq.	1.65E-1	1.19E-1	1.36E+0	1.64E+0
ADP-minerals & metals	kg Sb eq.	4.77E-4	1.57E-4	1.76E-4	8.10E-4
ADP-fossil	MJ, net calorific value	3.02E+3	1.31E+2	1.74E+3	4.88E+3
WDP	m3 world eq. deprived	9.68E+0	3.80E-1	1.57E+1	2.57E+1

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 Exceedence

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 Exceedence

POCP = Formation potential of tropospheric ozone photochemical oxidants

ADP-minerals&metals = Abiotic Depletion Potential for non fossil resources [2]

ADP-fossil = Abiotic Depletion for fossil resources potential [2]

WDP = Water (user) deprivation potential, deprivation-weighted water consumption [2]

Disclaimer [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 experience with the indicator.

ENVIRONMENTAL IMPACT per functional unit or declared unit (additional indicators A2)

	UNIT	A1	A2	A3	A1-A3
PM	Disease incidence	2.04E-6	5.46E-7	6.24E-6	8.83E-6
IRP	kBq U235 eq.	2.26E+0	5.53E-1	1.95E+1	2.23E+1
ETP-fw	CTUe	6.37E+3	1.04E+2	4.10E+3	1.06E+4
HTP-c	CTUh	1.66E-8	5.09E-9	2.51E-8	4.68E-8
HTP-nc	CTUh	3.36E-7	1.01E-7	3.21E-6	3.65E-6
SQP	---	3.52E+2	7.27E+1	4.22E+2	8.47E+2

PM = Potential incidence of disease due to PM emissions
 IRP = Potential Human exposure efficiency relative to U235 [1]
 ETP-fw = Potential Comparative Toxic Unit for ecosystems [2]
 HTP-c = Potential Comparative Toxic Unit for humans [2]
 HTP-nc = Potential Comparative Toxic Unit for humans, non-cancer [2]
 SQP = Potential soil quality index [2]

Disclaimer [1]

- 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.

Disclaimer [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 experience with the indicator.

RESOURCE USE per functional unit or declared unit (A1 / A2)

	UNIT	A1	A2	A3	A1-A3
PERE	MJ	1.95E+1	1.48E+0	1.49E+2	1.70E+2
PERM	MJ	0.00	0.00	0.00	0.00
PERT	MJ	1.95E+1	1.48E+0	1.49E+2	1.70E+2
PENRE	MJ	3.17E+3	1.39E+2	1.78E+3	5.10E+3
PENRM	MJ	0.00	0.00	0.00	0.00
PENRT	MJ	3.17E+3	1.39E+2	1.78E+3	5.10E+3
SM	kg	1.79E+2	0.00	0.00	1.79E+2
RSF	MJ	4.88E+2	0.00	1.80E+4	1.85E+4
NRSF	MJ	2.27E+2	0.00	0.00	2.27E+2
FW	m3	2.66E-1	1.33E-2	5.80E-1	8.60E-1

PERE = Use of renewable energy excluding renewable primary energy resources

PERM = Use of renewable energy resources used as raw materials

PERT = Total use of renewable primary energy resources

PENRE = Use of non-renewable primary energy resources excluding non-renewable 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 = Use of net fresh water

OUTPUT FLOWS AND WASTE CATEGORIES per functional unit or declared unit (A1 / A2)

	UNIT	A1	A2	A3	A1-A3
HWD	kg	4.30E-4	2.47E-4	7.53E-4	1.43E-3
NHWD	kg	2.20E+0	4.45E+0	3.40E+0	1.01E+1
RWD	kg	3.38E-3	8.75E-4	1.67E-2	2.10E-2
CRU	kg	0.00	0.00	0.00	0.00
MFR	kg	0.00	0.00	6.68E-4	6.68E-4
MER	kg	0.00	0.00	7.95E-5	7.95E-5
EEE	MJ	0.00	0.00	0.00	0.00
ETE	MJ	0.00	0.00	0.00	0.00

HWD = Hazardous Waste Disposed

RWD = Radioactive Waste Disposed

MFR = Materials for recycling

EEE = Exported Electrical Energy

NHWD = Non Hazardous Waste Disposed

CRU = Components for reuse

MER = Materials for energy recovery

ETE = Exported Thermal Energy

BIOGENIC CARBON CONTENT per functional unit or declared unit (A1 / A2)

	UNIT	A1	A2	A3	A1-A3
BCCpr	kg C	0.00	0.00	0.00	0.00
BCCpa	kg C	0.00	0.00	0.00	0.00

BCCpr = Biogenic carbon content in product

BCCpa = Biogenic carbon content in packaging

CALCULATION RULES

Virtually no materials or processes have been excluded from the study (cut-of rule is well below 1%).

Data collected in 2022 over base year 2021.

The “production” of secondary fuels and materials is allocated to the previous life cycle. Only transportation to the production site of CCB is allocated to the production of cement.

In the set 1 and the environmental cost indicator (ECI) the CO₂ emission from secondary fuels are included.

In the set 2 indicators the emissions from the combustion of secondary fuels in the clinker kiln are not included (in line with EN 16908). However the CO₂ from secondary fuels are mentioned separately.

Biogenic CO₂ emissions in A1-3 are balanced (total is 0).

Infrastructure processes in Ecoinvent processes have been included, long term emissions in Ecoinventprocesses have been excluded from the LCA calculations.

SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

Natural raw materials (mainly limestone) are quarried, crushed and ground into raw meal. The raw meal is fed into the clinker kiln together with primary and secondary raw materials and fuels. In the kiln the raw materials are calcinated and sintered into Portland cement clinker.

The second step is the production of cement. Cement is produced by intergrinding Portland cement clinker and the other constituents.

DECLARATION OF SVHC

No substances that are listed in the latest "Candidate List of Substances of Very High Concern for authorisation" are included in the product that exceeds the limit for registration.

REFERENCES

- Stichting Nationale Milieudatabase, Bepalingsmethode Milieuprestatie Bouwwerken Versie 1.0 (juli 2020).
- EN 15804:2012+A2:2019, Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products, 2019.
- ISO 14040:2006. Environmental management – Life cycle assessment – Principles and framework. 2006.
- ISO 14044:2006. Environmental management – Life cycle assessment – Requirements and guidelines. 2006.
- ISO 21930:2017. Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services. 2017.
- ISO 14025:2006. Environmental labels and declarations – Type III environmental declarations – Principles and procedures. 2006.
- NEN-EN 16908:2017+A1:2022 Cement and building lime - Environmental product declarations - Product category rules complementary to EN 15804, 2022.
- SGS INTRON report: A119070/R20220873, August 2023

REMARKS

In set 2, the value for GWP-fossil including the kiln emission of secondary fuels 6,48E+02 kg CO₂ e.q.