

Environmental Product Declaration

according to ISO 14025 and EN 15804



This declaration is for:

Cement: BauMineral - CEM II BV 32,5 R

Provided by:

BauMineral GmbH



program operator
Stichting MRPI®
publisher
Stichting MRPI®
www.mrpi.nl

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1.1.00246.2021
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COMPANY INFORMATION



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PRODUCT

Cement: BauMineral - CEM II BV 32,5 R

DECLARED UNIT/FUNCTIONAL UNIT

The production of 1 metric ton of cement

DESCRIPTION OF PRODUCT

Fly Ash cement: CEM II BV 32,5 R

VISUAL PRODUCT



MRPI® REGISTRATION

1.1.00246.2021

DATE OF ISSUE

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MORE INFORMATION

www.baumineral.de

SCOPE OF DECLARATION

This MRPI®-EPD certificate is verified by **Anne Kees Jeeninga, Advieslab VOF**.

The LCA study has been done by **Ruben van Gaalen, EcoReview B.V.** .

The certificate is based on an LCA-dossier according to ISO14025 and EN15804+A2 (incl. A1). 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 (incl. A1). 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

Stichting MRPI®
 Kingsfordweg 151
 1043GR
 Amsterdam



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:



Anne-Kees Jeeninga, Advieslab v.o.f.

[a] PCR = Product Category Rules

Baumineral Process diagram 2020

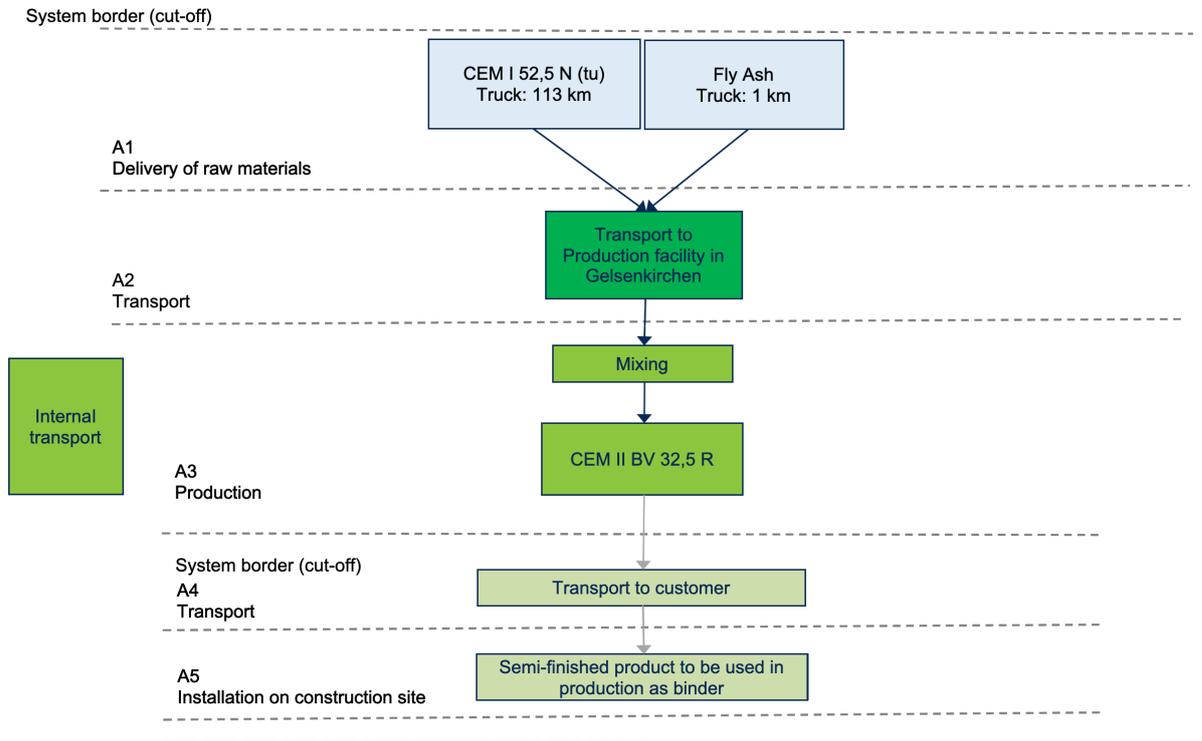


Figure: LCA process diagram according to EN 15804 (7.2.1)

REPRESENTATIVENESS

This EPD is representative for products produced and sold in the EU. The CEM II is produced in one production site of BauMineral in Gelsenkirchen.

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

	UNIT	A1	A2	A3	A1-A3
ADPE	kg Sb. eq.	3.62E-5	3.92E-4	1.54E-5	4.44E-4
ADPF	MJ	3.04E+3	2.12E+2	2.77E+1	3.28E+3
GWP	kg CO2 eq.	4.78E+2	1.41E+1	1.86E+0	4.94E+2
ODP	kg CFC 11 eq.	2.34E-6	2.58E-6	8.96E-8	5.01E-6
POCP	kg ethene eq.	6.21E-2	7.02E-3	2.81E-4	6.94E-2
AP	kg SO2 eq.	5.89E-1	3.35E-2	4.17E-3	6.27E-1
EP	kg (PO4)3- eq.	1.96E-1	5.19E-3	1.29E-3	2.02E-1

Toxicity indicators and ECI (Dutch market)

HTP	kg DCB-eq.	1.87E+1	5.65E+0	2.54E-1	2.46E+1
FAETP	kg DCB-eq.	5.91E-1	1.56E-1	8.54E-3	7.56E-1
MAETP	kg DCB-eq.	2.39E+3	5.99E+2	3.49E+1	3.02E+3
TETP	kg DCB-eq.	2.56E-1	2.01E-2	1.09E-2	2.87E-1
ECI	Euro	3.03E+1	1.49E+0	1.50E-1	3.20E+1
ADPF	kg Sb. eq.	1.46E+0	1.02E-1	1.33E-2	1.58E+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.]
 ND = Not Declared

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

	UNIT	A1	A2	A3	A1-A3
GWP-total	kg CO2 eq.	5.02E+2	1.42E+1	2.00E+0	5.18E+2
GWP-fossil	kg CO2 eq.	4.81E+2	1.42E+1	1.85E+0	4.97E+2
GWP-biogenic	kg CO2 eq.	2.08E+1	7.64E-3	1.49E-1	2.10E+1
GWP-luluc	kg CO2 eq.	2.78E-1	5.06E-3	2.24E-3	2.85E-1
ODP	kg CFC11 eq.	2.54E-6	3.23E-6	7.26E-8	5.84E-6
AP	mol H+ eq.	8.01E-1	4.08E-2	5.38E-3	8.47E-1
EP-freshwater	kg PO4 eq.	3.54E-2	1.14E-4	2.81E-4	3.58E-2
EP-marine	kg N eq.	2.20E-1	8.09E-3	8.32E-4	2.29E-1
EP-terrestrial	mol N eq.	2.90E+0	9.04E-2	1.32E-2	3.00E+0
POCP	kg NMVOC eq.	5.96E-1	3.46E-2	2.50E-3	6.33E-1
ADP-minerals&metals	kg Sb eq.	3.32E-5	3.92E-4	1.54E-5	4.41E-4
ADP-fossil	MJ, net calorific value	1.81E+3	2.15E+2	2.52E+1	2.05E+3
WDP	m3 world eq. deprived	2.83E+1	6.08E-1	9.59E-2	2.90E+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]

ND = Not Declared

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 experienced with the indicator.

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

	UNIT	A1	A2	A3	A1-A3
PM	Disease incidence	4.49E-6	9.04E-7	2.09E-8	5.41E-6
IRP	kBq U235 eq.	3.58E+0	9.40E-1	7.93E-2	4.60E+0
ETP-fw	CTUe	2.63E+4	1.73E+2	2.10E+1	2.65E+4
HTP-c	CTUh	2.36E-8	4.82E-9	4.82E-10	2.89E-8
HTP-nc	CTUh	1.43E-6	1.82E-7	1.90E-8	1.63E-6
SQP	---	2.52E+2	1.50E+2	6.06E+0	4.08E+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]
 ND = Not Declared

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 experienced with the indicator.

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

	UNIT	A1	A2	A3	A1-A3
PERE	MJ	2.01E+2	0.00	0.00	2.01E+2
PERM	MJ	0.00	0.00	0.00	0.00
PERT	MJ	2.01E+2	3.08E+0	4.59E+0	2.09E+2
PENRE	MJ	2.01E+3	0.00	0.00	2.01E+3
PENRM	MJ	0.00	0.00	0.00	0.00
PENRT	MJ	2.02E+3	2.28E+2	2.70E+1	2.28E+3
SM	kg	0.00	0.00	0.00	0.00
RSF	MJ	0.00	0.00	0.00	0.00
NRSF	MJ	0.00	0.00	0.00	0.00
FW	m3	3.10E-1	2.30E-2	1.15E-2	3.45E-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

ND = Not Declared

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

	UNIT	A1	A2	A3	A1-A3
HWD	kg	7.01E-4	5.63E-4	3.16E-5	1.30E-3
NHWD	kg	4.58E+0	1.05E+1	1.06E-1	1.52E+1
RWD	kg	2.63E+0	1.46E-3	1.02E-4	2.63E+0
CRU	kg	0.00	0.00	0.00	0.00
MFR	kg	0.00	0.00	0.00	0.00
MER	kg	0.00	0.00	0.00	0.00
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

ND = Not Declared

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 (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

ND = Not Declared

CALCULATION RULES

Data quality

Data flows have been modeled as realistically as possible. Data quality assessment is based on the principle that the primary data used for processes occurring at the production site is selected in the first instance. Where this is not available, other reference data is selected from appropriate sources.

Data collection period

The dataset is representative for the production processes used in 2020.

Methodology and reproducibility

The process descriptions and quantities in this study are reproducible in accordance to the reference standards that have been used. The references of all sources, both primary and public sources and literature, have been documented. In addition, to facilitate the reproducibility of this LCA, a full set of data records has been generated.

SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

A1. Raw materials supply

For all purchased materials, relevant EPD or EcoInvent has been used.

The use of Fly Ash is free of burden, although on the EPD usages for storage of the Fly Ash is included.

A2. Transport of raw materials to manufacturer

Incoming transports of the purchased materials are done by truck.

A3. Manufacturing

This module covers the manufacturing of the BauMineral CEM II and includes the process of mixing. Use of electricity is taken into account.

DECLARATION OF SVHC

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 threshold with the European Chemicals Agency.

REFERENCES

- CML - Department of Industrial Ecology, CML-IA Characterisation Factors, Dated August 2016, Leiden University, Leiden, Netherlands Available at:
<https://www.universiteitleiden.nl/en/research/research-output/science/cml-ia-characterisation-factors>
- Simapro 9.1.1.1
- EN 15804: Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products', I.S. EN 15804:2012+A1:2013 and EN 15804:2019+A2.
- ISO 14040: Environmental management - Life cycle assessment – Principles and Framework', International Organization for Standardization, ISO14040:2006.
- ISO 14044: Environmental management - Life cycle assessment - Requirements and guidelines', International Organization for Standardization, ISO14044:2006.
- ISO 14025: Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures', International Organization for Standardization, ISO14025:2006.
- EPD – BauMineral GmbH, Declaration number: EPD-Baumineral-022-DE. Date of issue: 11-12-2017. EPD-Baumineral-022-EFA-Füller-S-B-F_ENG.pdf

REMARKS

EPD of construction products may not be comparable if they do not comply with EN15804