Environmental Product Declaration

according to ISO 14025 and EN 15804

This declaration is for:

CEM III/A 42,5 N / 52,5 L

Provided by:

ENCI B.V.

program operator

Stichting MRPI®

publisher

Stichting MRPI®

www.mrpi.nl

MRPI® registration

1.1.00148.2020

EPD registration

00001323

date of first issue

28-08-2020

date of this issue

28-08-2020

expiry date

28-08-2025

COMPANY INFORMATION

ENCI B.V.
Pettelaarpark 30
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www.enci.nl

PRODUCT

CEM III/A 42,5 N / 52,5 L

DECLARED UNIT/FUNCTIONAL UNIT

1 metric ton of bulk cement

DESCRIPTION OF PRODUCT

Blast furnace slag cement, clinker content between 35 and 64%wt. Blast furnace slag content between 36 and 65%wt.

VISUAL PRODUCT

MRPI® REGISTRATION

1.1.00148.2020

EPD REGISTRATION

00001323

DATE OF ISSUE

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MORE INFORMATION

www.enci.nl

SCOPE OF DECLARATION

This MRPI®-EPD certificate is verified by **Niels Jonkers, PLUK sustainability.**
The LCA study has been done by **Bob Roijen, SGS INTRON.**
The certificate is based on an LCA-dossier according to ISO14025 and NEN-EN15804+A1. It is verified according to the 'EPD-MRPI® verification protocol May 2017.v3.1'. EPDs of construction products may not be comparable if they do not comply with NEN-EN15804+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: Niels Jonkers, PLUK sustainability
[a] PCR = Product Category Rules

DETAILED PRODUCT DESCRIPTION

Cement is produced by intergrinding Portland cement clinker and other constituents. In this EPD only the production of bulk cement is considered. Packaging materials are not included.

COMPONENT (> 1%)	[kg / %]
Portland cement clinker	35 - 64
Blast furnace slag	36 - 65
Minor additional constituents	0 - 5

(*) > 1% of total mass

SCOPE AND TYPE

Cement is a hydraulic binder, mainly used for concrete, mortar and cement screed. Since it is semi-finished product, in this EPD only the product stage is included.

The environmental data in this EPD represents an average of cement produced at the product locations of HeidelbergCement in the Netherlands, Belgium and Germany and supplied on the Dutch market.

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	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
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA

X = Module assessed

MNA = Module not assessed

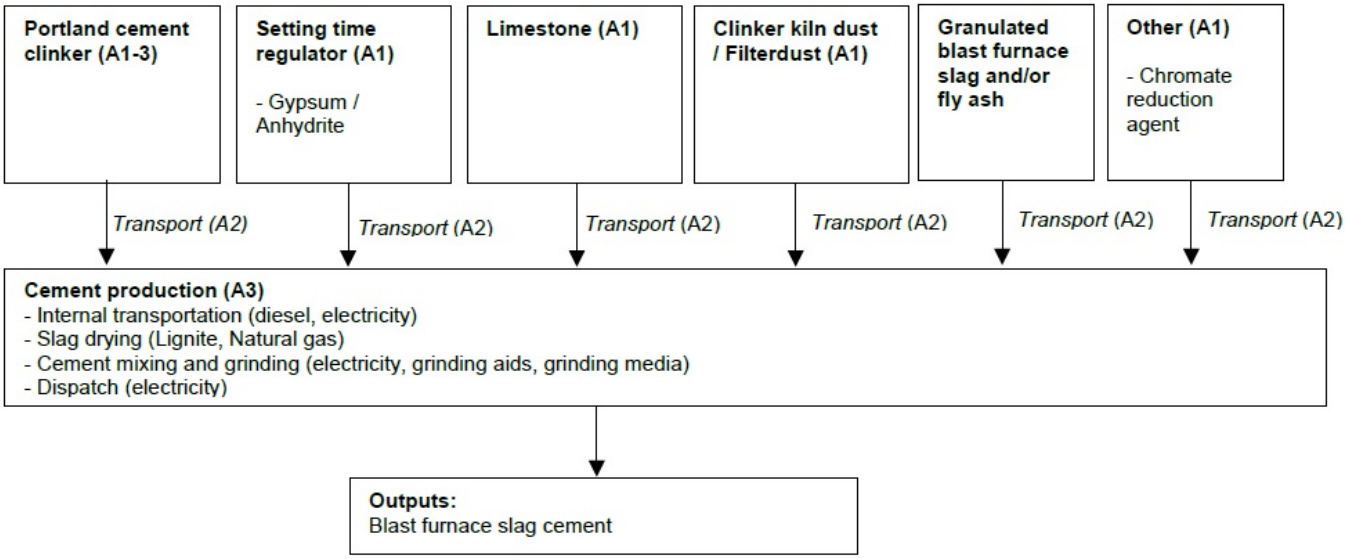

Figure 2.1c *Schematic overview of the production of blast furnace slag / composite cements*

REPRESENTATIVENESS

The data on this EPD is representative for the production on multiple locations based on the weighted average of product sold on the Dutch market.

The environmental data in this EPD represents an average of cement produced at the production locations of Heidelberg Cement in:

- IJmuiden
- Gent
- Lixhe
- Ennigerloh

ENVIRONMENTAL IMPACT per functional unit or declared unit

	UNIT	A1	A2	A3	A1-A3
ADPE	kg Sb-eq.	1.15E-5	8.49E-6	2.00E-5	4.00E-5
ADPF	MJ	7.70E+1	9.31E+1	1.15E+3	1.32E+3
GWP	kg CO2-eq.	4.68E+0	6.90E+0	3.70E+2	3.82E+2
ODP	kg CFC11-eq.	6.69E-7	1.09E-6	7.58E-6	9.33E-6
POCP	kg ethene-eq.	3.06E-3	4.02E-3	4.40E-2	5.11E-2
AP	kg SO2-eq.	2.65E-2	4.38E-2	4.37E-1	5.08E-1
EP	kg (PO4)3--eq.	4.61E-3	9.47E-3	7.01E-2	8.42E-2
Toxicity indicators (Dutch market)					
HTP	kg DCB-eq.	1.77E+0	1.89E+0	1.32E+1	1.68E+1
FAETP	kg DCB-eq.	8.59E-2	5.16E-2	2.01E-1	3.39E-1
MAETP	kg DCB-eq.	2.05E+2	1.72E+2	1.14E+3	1.52E+3
TETP	kg DCB-eq.	5.12E-3	8.44E-3	6.29E-1	6.43E-1
Environmental Cost Indicator (Dutch market)					
ECI	Euro	5.76E-1	8.10E-1	2.24E+1	2.38E+1
ADPF in kg Sb-eq. (Dutch market)					
ADPF	kg Sb-eq.	3.56 E -2	4.59 E -2	7.51 E -1	8.33 E -1

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

RESOURCE USE per functional unit or declared unit

	UNIT	A1	A2	A3	A1-A3
PERE	MJ	1.81E+0	1.27E+0	4.17E+1	4.48E+1
PERM	MJ	4.51E-1	5.46E-1	3.84E+1	3.94E+1
PERT	MJ	2.26E+0	1.81E+0	8.02E+1	8.42E+1
PENRE	MJ	7.87E+1	7.47E+1	2.31E+3	2.46E+3
PENRM	MJ	0.00	0.00	0.00	0.00
PENRT	MJ	7.87E+1	9.57E+1	1.75E+3	1.92E+3
SM	kg	5.37E+2	0.00	5.62E+0	5.43E+2
RSF	MJ	0.00	0.00	6.18E+2	6.18E+2
NRSF	MJ	0.00	0.00	3.60E+2	3.60E+2
FW	m3	5.26E-2	2.01E-2	5.72E-1	6.44E-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

	UNIT	A1	A2	A3	A1-A3
HWD	kg	3.73E-4	6.93E-4	9.23E-3	1.03E-2
NHWD	kg	2.07E-1	2.11E+0	1.61E+0	3.93E+0
RWD	kg	0.00	0.00	0.00	0.00
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
NHWD = Non Hazardous Waste Disposed
RWD = Radioactive Waste Disposed
CRU = Components for reuse
MFR = Materials for recycling
MER = Materials for energy recovery
EEE = Exported Electrical Energy
ETE = Exported Thermal Energy

CALCULATION RULES

Virtually no materials or processes have been excluded from the study (cut-of rule is well below 1%). Refractories, grinding media and grinding aids are included. Primary data at the production locations of HeidelbergCement where collected in 2019-2020 from base year 2018.

The “production” of secondary fuels and materials is allocated to the previous life cycle. Transportation to the production site of heidelbergCement is allocated to the production of cement. Also, the emissions from the combustion of secondary fuels for clinker production are allocated to the cement production. Biogenic CO2 emissions are not included.

The LCA calculations are made using the Ecoinvent database v3.4. 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

Module A1:
This module includes the supply of raw materials and fuels.

Module A2:
This module includes the transport of raw materials and fuels to the cement plant.

Module A3:
This module includes the grinding of the raw materials, the production of the clinker and the processing and blending of the cement 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 Bouwkwaliteit, Bepalingsmethode Milieuprestatie Gebouwen en GWW Werken versie 3.0.

SGS INTRON report: A104910/R20200100, june 2020

REMARKS

None