

**Environmental
Product
Declaration**

According to EN15804+A2 (+indicators A1)

This declaration is for:
Hoogovencement CEM III/B 42,5 N LH SR

Provided by:
Hollandse Cement Maatschappij B.V.



MRPI® registration
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MRPI® REGISTRATION

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15-1-2030

SCOPE OF DECLARATION

This MRPI®-EPD certificate is verified by Gert-Jan Vroege, Eco Intelligence. The LCA study has been done by Odile Koenders, SGS Search. The certificate is based on an LCA-dossier according to EN15804+A2 (+indicators 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. 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.

PRODUCT

Hoogovencement CEM III/B 42,5 N LH SR

DECLARED UNIT / FUNCTIONAL UNIT

1 Mass (t)

DESCRIPTION OF PRODUCT

Hoogovencement CEM III/B 42,5 N LH SR is made by mixing ground granulated blast furnace slag and Portland cement clinker, to which gypsum and/or anhydrite are added as a binding agent. Hoogovencement CEM III/B 42,5 N LH SR has a normal initial and final strength and can therefore be used when there are no special initial strength requirements.

VISUAL PRODUCT

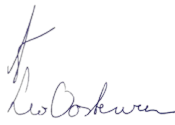
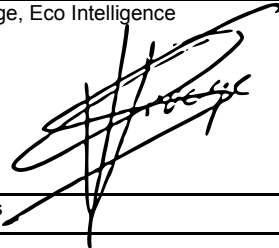


PROGRAM OPERATOR

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MORE INFORMATION

<https://www.hcmcement.nl/nl/producten/hoogovencement-br-cem-iii-b-42-5-n-lh-sr-br-hcm-cement-moerdijk/>

Ing. L. L. Oosterveen MSc. MBA Managing Director MRPI 	DEMONSTRATION OF VERIFICATION CEN standard EN15804 serves as the core PCR [1]
	Independent verification of the declaration an data according to EN15804+A2 (+indicators A1) internal: external: X Third party verifier: Gert-Jan Vroege, Eco Intelligence 
[1] PCR = Product Category Rules	

DETAILED PRODUCT DESCRIPTION (PART 1)

Hoogovencement CEM III/B 42,5 N LH SR is made by mixing ground granulated blast furnace slag and Portland cement clinker, to which gypsum and/or anhydrite are added as binding agents.

Blast furnace slag is a by-product released during the production of iron in blast furnaces. In this process, iron ore, scrap and fluxes, together with cokes are fed into a blast furnace as fuel. The cokes is burned to produce carbon monoxide, which reduces the iron ore to molten iron. On this iron floats the slag, which is drained simultaneously with it. After slag and iron are separated, the slag is rapidly cooled by injecting a large quantity of water, which causes the slag to break up into sand-like granules with a glass-like structure (no or only slight crystallisation occurs). This process is called granulation.

DETAILED PRODUCT DESCRIPTION (PART 2)

Hoogovencement CEM III/B 42,5 N LH SR has a normal initial and final strength and can therefore be used when there are no special initial strength requirements. Due to its composition, this cement is very suitable for preventing alkali-silica reaction or sulphate attack. To confirm this, it is assigned the code 'SR' (sulphate resisting). Application of these cements produces a concrete with a very dense structure, preventing the penetration of harmful substances such as chlorides. The hydration of blast-furnace cement releases comparatively little heat, so it can be used well when there is a risk of cracking due to temperature stresses, for example in thick structures. The cement has therefore been given the special property 'LH', which stands for low hydration heat (low heat). Due to the influence of ambient temperature on the hydration rate, the hardening of blast-furnace cement concrete at very low temperatures is greatly delayed. In contrast, blast furnace cement is ideally suited for accelerating hardening by 'firing'.

The cement can be used in combination with all other cements based on Portland cement clinker. This, for example, to accelerate a concrete composition with this cement in the initial phase. In particular, applying a Portland cement CEM I 52.5 R can give very positive results at low outdoor temperatures.

Component (> 1%)	% (m/m)/ ton
Clinker	20-34%
Blast furnace slag	66-80%
Other	0-5%

SCOPE AND TYPE

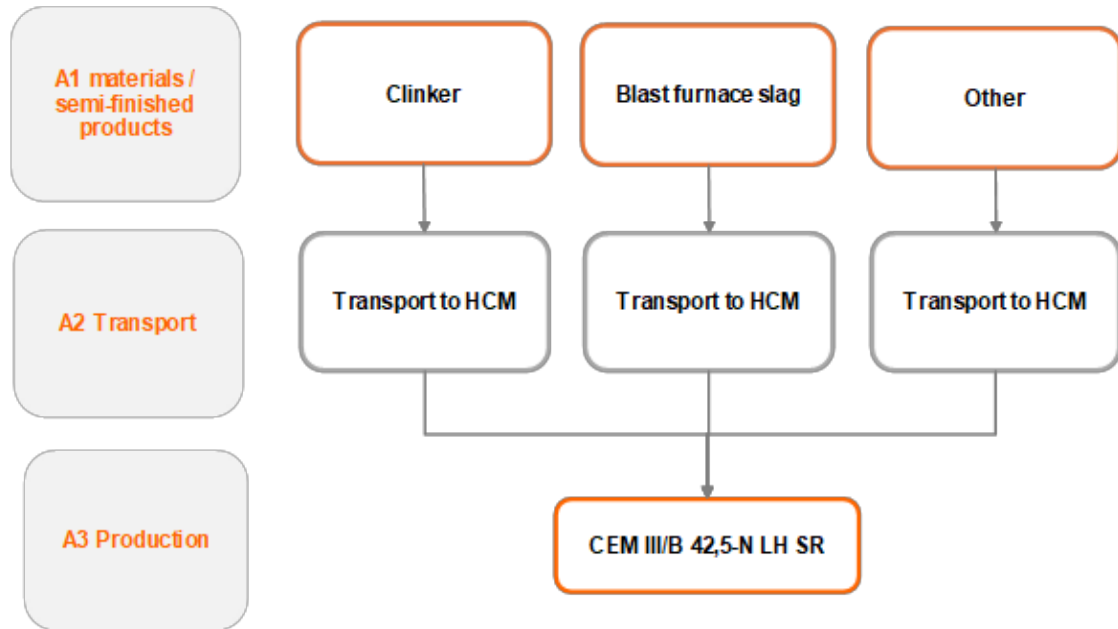
This EPD is a specific EPD made for Hoogovencement produced in facility Moerdijk, The Netherlands. The material input are from suppliers across the globe. The data collection is done in production year 2023. The results are calculated with SimaPro 9.5.0.0, using the databases ecoinvent 3.6 and the NMD process database 3.9 (cut-off method system model).

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USER 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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

X = Modules Assessed

ND = Not Declared





REPRESENTATIVENESS

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

Eenheid	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
ADPE kg Sb eq.	1,08E-03	1,95E-04	4,92E-05	1,32E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ADPF MJ	3,40E+03	1,20E+02	4,23E+00	3,53E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GWP kg CO2 eq.	3,58E+02	8,25E+00	3,55E-01	3,67E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ODP kg CFC11 eq.	1,35E-05	1,45E-06	2,49E-08	1,50E-05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
POCP kg ethene eq.	1,67E-01	4,28E-03	2,54E-04	1,71E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AP kg SO2 eq.	1,05E+00	2,76E-02	3,06E-03	1,08E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EP kg (PO4) 3- eq.	1,70E-01	5,10E-03	2,77E-04	1,75E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Toxicity indicators and ECI (Dutch market)

HTP kg DCB eq.	6,81E+01	3,06E+00	1,02E+00	7,21E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FAETP kg DCB eq.	8,22E-01	8,34E-02	1,84E-02	9,23E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MAETP kg DCB eq.	4,05E+03	3,13E+02	4,28E+01	4,40E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TETP kg DCB eq.	3,25E-01	1,14E-02	5,54E-02	3,91E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ECI euro	3,08E+01	8,96E-01	1,33E-01	3,18E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ADPF kg Sn eq.	1,64E+00	5,79E-02	2,03E-03	1,70E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

- 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



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

	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO2 eq	3,55E+02	8,33E+00	3,68E-01	3,64E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GWP-fossil	kg CO2 eq	3,55E+02	8,32E+00	3,66E-01	3,63E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GWP-biogenic	kg CO2 eq	5,16E-01	6,32E-03	1,29E-03	5,24E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GWP-luluc	kg CO2 eq	2,19E-01	5,48E-03	3,84E-04	2,25E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ODP	kg CFC11 eq	1,24E-05	1,81E-06	2,84E-08	1,43E-05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AP	mol H+ eq	1,37E+00	3,57E-02	3,61E-03	1,41E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EP-fresh water	kg PO4 eq	1,32E-02	7,32E-05	2,88E-05	1,33E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EP-marine	kg N eq	3,16E-01	1,09E-02	4,39E-04	3,27E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EP-terrestrial	mol N eq	4,10E+00	1,21E-01	4,89E-03	4,23E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
POCP	kg NMVOC eq	1,06E+00	3,65E-02	1,48E-03	1,10E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ADP-minerals & metals	kg Sb eq	1,08E-03	1,95E-04	4,92E-05	1,32E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ADP-fossil	MJ, net calorific value	3,08E+03	1,22E+02	3,98E+00	3,21E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
WDP	m3 world eq. Deprived	3,66E+01	3,86E-01	1,11E-01	3,71E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

- GWP-total = Global Warming Potential total
- GWP-fossil = Global Warming Potential fossil fuels
- GWP-biogenic = Global Warming Potential biogenic total
- 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 [1]
- ADP-fossil = Abiotic Depletion for fossil resources potential [1]
- WDP = Water (user) deprivation potential, deprivation-weighted water consumption [1]

Disclaimer [1]:

- 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	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PM	Disease incidence	9,67E-06	4,63E-07	2,84E-08	1,02E-05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
IRP	kBq U235 eq.	1,15E+01	5,32E-01	1,43E-02	1,21E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ETP-fw	CTUe	9,04E+03	9,97E+01	2,70E+01	9,16E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HTP-c	CTUh	2,66E-07	3,04E-09	2,31E-09	2,71E-07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HTP-nc	CTUh	3,63E-06	9,82E-08	5,65E-08	3,78E-06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SQP	-	6,13E+02	8,75E+01	7,85E+00	7,08E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

- 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.

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.

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

	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	5,84E-03	3,18E-04	2,61E-05	6,18E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NHWD	kg	1,26E+01	5,08E+00	4,07E-01	1,81E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
RWD	kg	1,03E-02	8,23E-04	1,43E-05	1,11E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MFR	kg	2,23E-04	0,00E+00	8,26E-02	8,28E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MER	kg	2,65E-05	0,00E+00	8,55E-03	8,58E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EEE	kg	0,00E+00	0,00E+00	8,10E-02	8,10E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ETE	kg	0,00E+00	0,00E+00	1,39E-01	1,39E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

- 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

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

	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	1,67E+02	1,93E+00	9,31E+01	2,62E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PERT	MJ	1,67E+02	1,93E+00	9,31E+01	2,62E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PENRE	MJ	3,25E+03	1,29E+02	4,25E+00	3,38E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PENRT	MJ	3,25E+03	1,29E+02	4,25E+00	3,38E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SM	kg	7,68E+01	0,00E+00	1,51E-02	7,68E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
RSF	MJ	6,22E+03	0,00E+00	0,00E+00	6,22E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NSRF	MJ	9,70E+01	0,00E+00	0,00E+00	9,70E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FW	m3	1,30E+00	1,48E-02	3,45E-03	1,32E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

- 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
- NSRF = Use of non-renewable secondary fuels
- FW = Use of net fresh water

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

	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
BBCpr	kg C	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BCCpa	kg C	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

- BCCpr = Biogenic carbon content in product
- BCCpa = Biogenic carbon content in packaging



CALCULATION RULES (PART 1)

Declared unit

The declared unit for the life cycle assessment is 1000 kg of Hoogovencement.

Data collection

Input- and output data has been provided by HCM of the production year 2023 for the following inventory categories:

- Materials (raw materials and auxiliary materials);
- Energy (electricity and heat);
- Emissions to air, water and soil;
- Treatment and disposal of production wastes.

Data quality

Data was validated by SGS at the process level. This means that not only the mass balance was verified, but that in the case of major deviations from the average (for all type of in- and output) the suppliers were asked for further explanation.

Allocations

Allocation of environmental interventions can apply to multi-input, multi-output, recycling and reuse processes. No allocation of multi output processes is applied in this study. For other allocations, the provisions from the EN 15804 are followed.

SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION (PART 1)

Product stage (A1-A3)

This stage consists of the extraction of raw materials, energy which occurs upstream to the manufacturing process, transportation of raw materials, processing of the raw materials into the final product with all processes and energy required for production as well as packaging materials.

Data collection was performed by HCM in cooperation with their suppliers. The manufacturer compiled mass and energy balances based on average production in year 2023. The production facility in Moerdrecht uses renewable electricity in their production process.

DECLARATION OF SVHC

No substances of very high concern are present in concentrations greater than 0,1% by weight in the product.

REFERENCES

NMD Bepalingsmethode Milieuprestatie Bouwwerken 1.2, NMD Januari 2025.

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REMARKS

