

Environmental Product Declaration

according to ISO 14025 and EN 15804



This declaration is for:

Spenner CEM III/B 42,5 N-LHSR

Provided by:

Spenner Werk Duisburg

spenner



program operator

Stichting MRPI®

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1.1.00076.2019

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00001042

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Nationale

Milieu DATABASE



PROGRAM OPERATOR

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COMPANY INFORMATION

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SCOPE OF DECLARATION

This MRPI®-EPD certificate is verified by **Niels Jonkers, Ecochain**.
 The LCA study has been done by **Pieter Stadhouders, EcoReview**.
 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'. EPD's 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.

VISUAL PRODUCT



PRODUCT

Spenner CEM III/B 42,5 N-LHSR

MRPI® REGISTRATION

1.1.00076.2019

EPD REGISTRATION

00001042

DATE OF ISSUE

14-11-2019

EXPIRY DATE

14-11-2024

DECLARED UNIT/FUNCTIONAL UNIT

tonne

DESCRIPTION OF PRODUCT

Blast furnace slag cement

MORE INFORMATION

<https://spenner-zement.de/produkte/zement/hochofenzement-cem-iiia-325-n-lhna/>

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

(where appropriate[b]) Third party verifier:

Niels Jonkers, Ecochain

[a] Product Category Rules [b] Optional for B-to-B communication,
 mandatory for B-to-C communication (see EN ISO 14025:2010, 9.4).

DETAILED PRODUCT DESCRIPTION

Product name: Spenner CEM III/B 42,5 N-LHSR

A mix consisting of portland cement and Ground Granulated Blastfurnace Slag (GGBS), sold in bulk quantities. The production processes needed to come to this product are: drying, grinding and mixing. This is an intermediate product for making cementitious-bound materials.

| COMPONENT (> 1%) | [kg / %] |
|------------------------------------|----------|
| Granulated Blastfurnace Slag (GBS) | 68.10% |
| CEM I 52,5 N | 27.80% |
| Anhydrite powder | 3.50% |
| Fuel ashes | 0.60% |

(*) > 1% van total mass

SCOPE AND TYPE

This product is produced in Duisburg (Germany). It is applied as an intermediate product for cementitious-bound materials.

Analysis has been done using the Ecochain software. Ecoinvent V3.4 was used for the analysis.

It is an intermediate product and therefore end-of-life scenarios are not clear. The specific EPD only covers A1-A3.

| PRODUCT STAGE | CONSTRUCTION | | | | | USE STAGE | | | | | | | END OF LIFE | | | | BENEFITS AND |
|---------------------|--------------|---------------|------------------------|----------|-----|-------------|--------|-------------|---------------|------------------------|-----------------------|----------------------------|-------------|------------------|----------|------------------------------------|-------------------|
| | PROCESS | | | | | | | | | | | | STAGE | | | | LOADS BEYOND THE |
| | STAGE | | | | | | | | | | | | | | | | 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

REPRESENTATIVENESS

Not applicable as this is an environmental product declaration for a specific product from a specific manufacturer on a specific location.

ENVIRONMENTAL IMPACT per functional unit or declared unit

| | UNIT | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|------------------------------------|----------------|--------------|--------------|--------------|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ADPE | kg Sb-eq. | 1.21 E -1 | 1.27 E -5 | 1.89 E -1 | 3.10 E -1 | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |
| ADPF | MJ | 5.95 E +2 | 6.87 E +1 | 3.70 E +2 | 1.03 E +3 | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |
| GWP | kg CO2-eq. | 2.26 E +2 | 4.48 E +0 | 2.40 E +1 | 2.55 E +2 | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |
| ODP | kg CFC11-eq. | 1.68 E -6 | 8.26 E -7 | 2.49 E -6 | 5.00 E -6 | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |
| POCP | kg ethene-eq. | 2.43 E -2 | 2.64 E -3 | 2.72 E -3 | 2.96 E -2 | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |
| AP | kg SO2-eq. | 2.82 E -1 | 1.94 E -2 | 1.01 E -1 | 4.02 E -1 | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |
| EP | kg (PO4)3--eq. | 7.63 E -2 | 3.88 E -3 | 2.05 E -2 | 1.01 E -1 | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |
| Toxicity indicators (Dutch market) | | | | | | | | | | | | | | | | | | | |
| HTP | kg DCB-eq. | 8.87 E +0 | 1.79 E +0 | 4.15 E +0 | 1.48 E +1 | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |
| FAETP | kg DCB-eq. | 2.36 E -1 | 5.26 E -2 | 4.90 E -2 | 3.37 E -1 | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |
| MAETP | kg DCB-eq. | 8.89 E +3 | 1.90 E +2 | 5.22 E +3 | 1.43 E +4 | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |
| TETP | kg DCB-eq. | 1.96 E -1 | 6.35 E -3 | 6.59 E -2 | 2.68 E -1 | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |
| ECI | Euro | 1.49 E +1 | 5.29 E -1 | 2.75 E +0 | 1.82 E +1 | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |

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 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|-------|------|--------------|--------------|--------------|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| PERE | MJ | 8.83 E +1 | 9.43 E -1 | 6.70 E +1 | 1.56 E +2 | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |
| PERM | MJ | 0 | 0 | 0 | 0 | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |
| PERT | MJ | 8.83 E +1 | 9.43 E -1 | 6.70 E +1 | 1.56 E +2 | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |
| PENRE | MJ | 5.74 E +2 | 7.37 E +1 | 4.30 E +2 | 1.08 E +3 | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |
| PENRM | MJ | 0 | 0 | 0 | 0 | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |
| PENRT | MJ | 5.74 E +2 | 7.37 E +1 | 4.30 E +2 | 1.08 E +3 | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |
| SM | kg | 0 | 0 | 0 | 0 | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |
| RSF | MJ | 0 | 0 | 0 | 0 | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |
| NRSF | MJ | 0 | 0 | 0 | 0 | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |
| FW | m3 | 2.63 E -1 | 1.33 E -2 | 8.88 E -2 | 3.65 E -1 | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |

INA = Indicator Not Assessed

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 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|------|------|--------------|--------------|--------------|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| HWD | kg | 9.62 E -3 | 5.09 E -4 | 2.06 E -3 | 1.22 E -2 | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |
| NHWD | kg | 3.66 E +0 | 4.24 E +0 | 7.31 E -1 | 8.63 E +0 | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |
| RWD | kg | 1.67 E -3 | 4.66 E -4 | 1.15 E -3 | 3.29 E -3 | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |
| CRU | kg | 0 | 0 | 0 | 0 | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |
| MFR | kg | 0 | 0 | 0 | 0 | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |
| MER | kg | 0 | 0 | 0 | 0 | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |
| EEE | MJ | 0 | 0 | 0 | 0 | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |
| ETE | MJ | 0 | 0 | 0 | 0 | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |

INA = Indicator Not Assessed

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

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 2018.

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 which can be accessed via the EcoChain tool. This data portfolio contains a summary of all the data used in this LCA, and correspondingly, in Spenner Duisburg account.

SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

A1. Raw materials supply

For all purchased materials, relevant EcoInvent records have been selected.

The use of GBS (Granulated Blastfurnace Slag) is free of burden. No emissions from the steel production are allocated onto the blast furnace slag. This approach is in accordance with CEN/TC 51 PCR for cement and building lime, 2015.

For modelling reasons, the Portland cement produced by Spenner Erwitte is used as an input product in the LCA of the product on this EPD. Therefore, all impacts allocated to the Portland cement are allocated to the A1 section of the product on this EPD.

A2. Transport of raw materials to manufacturer

All incoming transports of the purchased materials are done by truck. Truck transport from the Erwitte production facility to the Duisburg production facility and vice versa are modelled as one-way transports, since these trucks always carry full loads from one plant to the other.

A3. Manufacturing

This module covers the manufacturing of the Spenner products and includes all processes linked to production such as GBS drying, grinding and internal transportation. Use of electricity, fuels and auxiliary materials are taken into account as well. Also, the electricity for mixing the ingredients to create the mixes has been 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

- EN 15804:2012+A1:2013 Sustainability of construction works. Environmental product declarations. Core rules for the product category of construction products, of 11/2013.
- ISO 14040/14044 on Life Cycle Assessments.
- CEN/TC 51 PCR for cement and building lime, 2015



REMARKS

None