epd-norway
Global Program Operator

ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025 and EN 15804+A2

SCHWENK Zement GmbH & Co. KG – CEM III/B 42,5 L-LH/SR - Karlstadt - 0840-CPR-3020-340585-22

SCHWENK

Owner of the declaration
SCHWENK Zement GmbH & Co. KG
Hindenburgring 15
89077 Ulm
Germany

Product
CEM III/B 42,5 L-LH/SR - Karlstadt - 0840-CPR-3020-340585-22

Declared product / Declared unit
1 t of CEM III/B 42,5 L-LH/SR - Karlstadt - 0840-CPR-3020-340585-22

This declaration is based on Product Category Rules
EN 15804:2012 + A2:2019,
EN 16908:2017+A1:2022: Cement and building lime - Environmental product declarations - Product category rules complementary to EN 15804

Program operator:
EPD-Norge
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Declaration number
NEPD-10052-10052-2

Registration number
NEPD-10052-10052-2

Issue date
14.03.2025

Valid to
13.03.2030

EPD Software
Emidat EPD Tool v1.0.0

General Information

Product
CEM III/B 42,5 L-LH/SR - Karlstadt - 0840-CPR-3020-340585-22

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Declaration Number
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EN 15804:2012 + A2:2019,
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Statements
The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer, life cycle assessment data and evidences.

Declared unit
1 t of CEM III/B 42,5 L-LH/SR - Karlstadt - 0840-CPR-3020-340585-22

General information on verification of EPD from EPD tools
Independent verification of data, other environmental information and the declaration according to ISO 14025:2010, § 8.1.3 and § 8.1.4. Verification of each EPD is made according to EPDNorway's guidelines for verification and approval requiring that tools are i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPD-Norway, and iii) the process is reviewed annually by an independent third party verifier. See Appendix G of EPD-Norway's General Programme Instructions for further information on EPD tools.

Verification of EPD tool
Charlotte Merlin, FORCE Technology
(no signature required)

Owner of the declaration
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Manufacturer
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Place of production
Karlstadt, Germany

Management system
ISO 9001, ISO 14001, ISO 50001

Organisation no
Registereintragung: HRA 1955, Amtsgericht Ulm

Issue date
14.03.2025

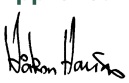
Valid to
13.03.2030

Year of study
2023

Comparability
EPDs of construction products may not be comparable if they do not comply with EN 15804 and are not seen in a building context. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804 and if the background systems are not based on the same database (including primary and secondary data).

Development and verification of EPD
The declaration was created using the Emidat EPD tool v1.0, developed by Emidat GmbH. The EPD tool has been approved by EPD Norway.

Developer of EPD: Dr. Klaus Raiber
Reviewer of company-specific input data and EPD: Thomas Arndt

Approved

Håkon Hauan, CEO EPD-Norge

Product

Product description

Cement is a hydraulically hardening binder for the production of concrete and mortar. It is a mixture of finely ground, non-metallic and inorganic components. After adding water to the cement, a suspension (cement paste) is formed, which solidifies and hardens both in air and under water due to the hydration reaction that then begins and remains permanently solid. The composition of the product complies with the specifications of EN 197-1.

Cement is the key ingredient in concrete. When mixed with water and aggregates such as sand and gravel, it forms a paste that binds the aggregates together to create concrete, the most widely used construction material in the world.

Cement can also be mixed with sand and water to create mortar or grout, used as a bonding agent between bricks, stones, or concrete blocks in masonry construction. Cement can also be used to stabilise and improve the properties of soil in construction projects. Soil-cement mixtures are created by mixing cement with soil to increase its strength, durability, and load-bearing capacity. This technique is commonly used in road construction, building foundations, and slope stabilisation.

Product specification

Name of ingredient	Share of total weight	Country of origin
Blast furnace slag	65 - 79 %	Germany
Clinker	20 - 35 %	Germany
Ferrous sulphate	0 - 5 %	Germany
Grinding aid	0 - 5 %	Germany
Gypsum	5 - 12 %	Germany

Technical data

	Unit	Value
Compressive Strength (Prisms, EN 196-1)	N / mm²	42.5
Density	kg / m³	2850.0

Market

Germany

Reference service life

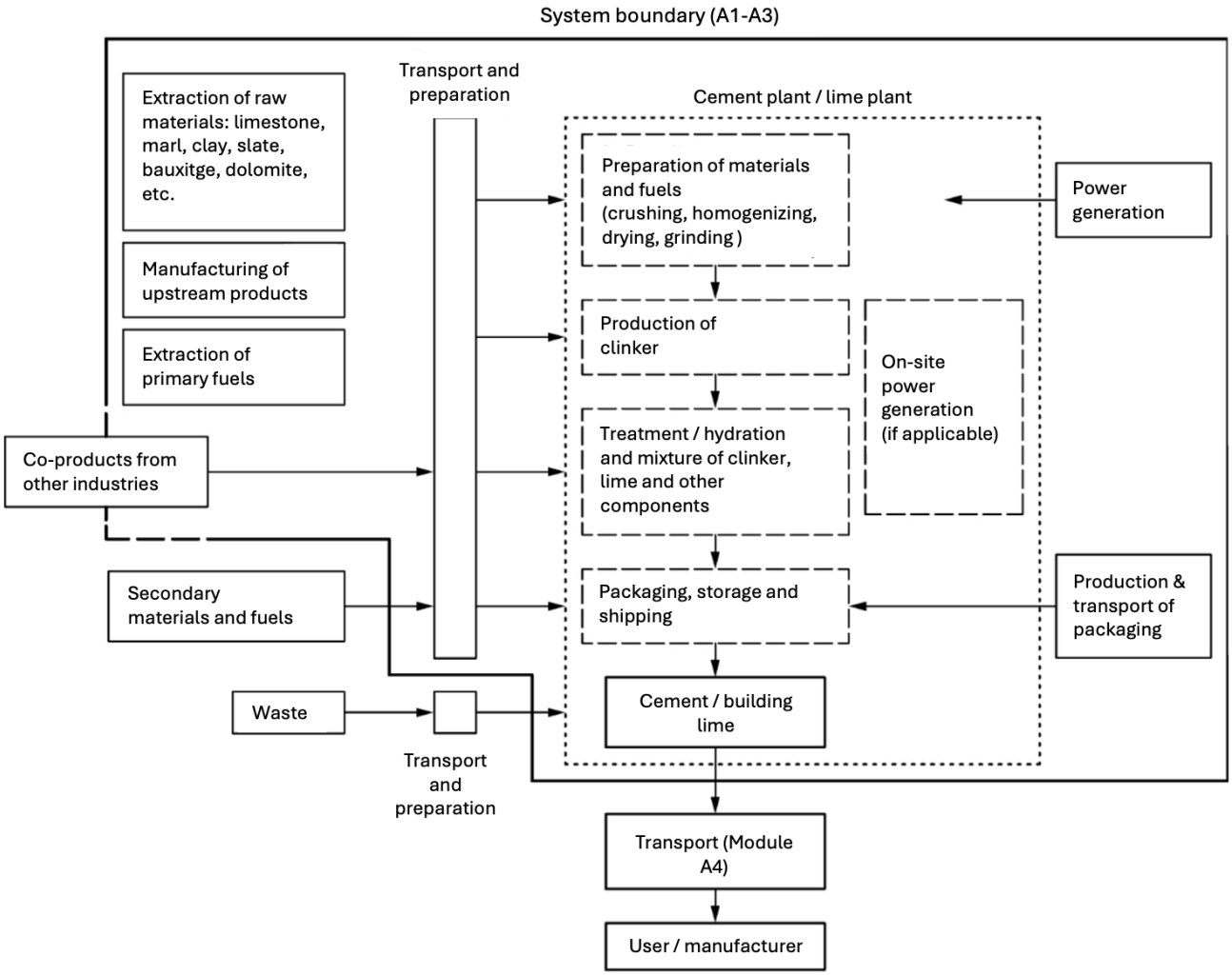
This study does not cover the use stage. Thus, the reference service life is irrelevant.

LCA: Calculation rules

Declared unit

1 t of CEM III/B 42,5 L-LH/SR - Karlstadt - 0840-CPR-3020-340585-22

System boundary



Data quality

The Emidat EPD Tool v1.0.0 was used for LCA modeling and calculation. Background data was used from ecoinvent database v3.10.

System boundaries (X=included, MND=module not declared)

	Production			Installation		Use stage							End-of-Life				Next product system
	Raw material supply	Transport	Manufacturing	Transport	Installation Process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	Demolition	Transport	Waste Processing	Disposal	Benefits and loads beyond the system boundary
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	x	x	x	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Geography			DE	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

For the geographies modeled in A1 and A2, refer to *Product specification*.

Type of EPD: cradle to gate (A1-A3)

Stage of Material Production and Construction

Module A1: Extraction and processing of cement raw materials

Module A2: Transportation of raw materials to the cement plant

Module A3: Cement production at the plant and waste treatment

Cut-off criteria

No cut-offs were applied.

Allocation

Elementary flows (energy and fuels, ancillary materials and waste) data was collected on production-process-level. Using the total output of the production process in 2023, elementary flows are assigned to 1 declared unit based on mass.

Granulated blast furnace slag (GBS) is a low revenue co-product of the blast furnace iron making process. Economic allocation was used to allocate impacts from the blast furnace process to the GBS, based on the market values of pig iron and GBS. In addition, water used in the granulation process is considered.

LCA: Results

Core environmental impact indicators

Indicator	Unit	A1-3
GWP-total	kg CO_2-eq.	2.67e+02 (1.94e+02)*
GWP-fossil	kg CO_2-eq.	2.37e+02 (1.93e+02)*
GWP-biogenic	kg CO_2-eq.	3.00e+01 (1.49e+00)*
GWP-luluc	kg CO_2-eq.	4.47e-02
ODP	kg CFC-11-Eq	5.08e-07
AP	mol H+-Eq	5.48e-01
EP-freshwater	kg P-Eq	4.31e-02
EP-marine	kg N-Eq	1.17e-01
EP-terrestrial	mol N-Eq	1.29e+00
POCP	kg NMVOC-Eq	3.95e-01
ADPE	kg Sb-Eq	2.32e-03
ADPF	MJ, net calorific value	1.42e+03
WDP	m^3 world Eq deprived	8.63e+00

GWP-total: Global Warming Potential - total **GWP-fossil**: Global warming potential - fossil **GWP-biogenic**: Global Warming Potential - biogenic **GWP-luluc**: Global Warming Potential - luluc **ODP**: Depletion potential of the stratospheric ozone layer **AP**: Acidification potential, Accumulated Exceedance **EP-freshwater**: Eutrophication potential - freshwater **EP-marine**: Eutrophication potential - marine **EP-terrestrial**: Eutrophication potential - terrestrial **POCP**: Photochemical Ozone Creation Potential **ADPE**: Abiotic depletion potential - non-fossil resources **ADPF**: Abiotic depletion potential - fossil resources **WDP**: Water (user) deprivation potential

* The first value is the gross value, it includes the impacts from all manufacturing activities. Gross values are more commonly used in Northern Europe. The value in brackets is the net value, it excludes the impact from the incineration of waste-derived fuels, and is more common in Central Europe and Germany.

Additional indicators

Indicator	Unit	A1-3
PM	disease incidence	5.35e-06
IRP	kBq U235-Eq	4.84e+00
ETP-fw	CTUe	4.13e+03
HTP-c	CTUh	1.51e-05
HTP-nc	CTUh	1.45e-06
SQP	dimensionless	1.55e+02

PM: Potential incidence of disease due to PM emissions **IRP**: Potential Human exposure efficiency relative to U235 **ETP-fw**: Potential Comparative Toxic Unit for ecosystems **HTP-c**: Potential Comparative Toxic Unit for humans - cancer effects **HTP-nc**: Potential Comparative Toxic Unit for humans - non-cancer effects **SQP**: Potential Soil quality index

IRP: 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.
ETP-fw, **HTP-c**, **HTP-nc** and **SQP**: The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with these indicators.

Use of resources

Indicator	Unit	A1-3
PERE	MJ	3.16e+02
PERM	MJ	0
PERT	MJ	3.16e+02
PENRE	MJ	1.40e+03
PENRM	MJ	2.53e+01
PENRT	MJ	1.42e+03
SM	kg	7.07e+02
RSF	MJ	4.09e+02
NRSF	MJ	6.89e+02
FW	m^3	9.92e-01

PERE: Primary energy resources - renewable: use as energy carrier **PERM**: Primary energy resources - renewable: used as raw materials **PERT**: Primary energy resources - renewable: total **PENRE**: Primary energy resources - non-renewable: use as energy carrier **PENRM**: Primary energy resources - non-renewable: used as raw materials **PENRT**: Primary energy resources - non-renewable: total **SM**: Use of secondary material **RSF**: Renewable secondary fuels **NRSF**: Non-renewable secondary fuels **FW**: Net use of fresh water

Waste flows

Indicator	Unit	A1-3
HWD	kg	5.14e+00
NHWD	kg	2.24e+02
RWD	kg	1.38e-03

HWD: Hazardous waste disposed **NHWD**: Non hazardous waste disposed **RWD**: Radioactive waste disposed

Output flows

Indicator	Unit	A1-3
CRU	kg	0
MFR	kg	0
MER	kg	0
EEE	MJ	0
EET	MJ	0

CRU: Components for re-use **MFR**: Materials for recycling **MER**: Materials for energy recovery **EEE**: Exported electrical energy **EET**: Exported thermal energy

Name	Value	Unit
Biogenic carbon content in product	0	kg C
Biogenic carbon content in accompanying packaging	0	kg C

Additional requirements

Greenhouse gas emissions from the use of electricity in the manufacturing phase

Electricity consumption in the manufacturing phase is composed from the source below. Electricity is represented by data in ecoinvent 3.10 regionalised for Germany.

Electricity	Unit	Value
Electricity from grid	kg CO_2-eq. / kWh	0.47

Dangerous substances

The product contains no substances given by the REACH candidate list.

Additional environmental information

Additional environmental impact indicators required in NPCR Part A for construction products

Indicator	Unit	A1-3
GWP-IOBC	kg CO_2-eq.	1.89e+02

GWP-IOBC: Global Warming Potential - Instantaneous oxidation of biogenic carbon

Bibliography

DIN EN ISO 14025:2011-10	Environmental labels and declarations - Type III environmental declarations - Principles and procedures
DIN EN ISO 14040:2021-02	Environmental management - Life cycle assessment - Principles and framework
DIN EN ISO 14044:2021-02	Environmental management - Life cycle assessment - Requirements and guidelines
EN 15804:2012+A2:2019	Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
DIN CENTR 15941:2010-11	Sustainability of construction works - Environmental product declarations - Methodology for selection and use of generic data
DIN EN 15942:2022-04	Sustainability of construction works - Environmental product declarations - Communication format business-to-business
ISO 21930:2017-07	Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products and services
Ecoinvent v3.10	ecoinvent, Zurich, Switzerland, database version 3.10
PCR	EN 16908:2017+A1:2022: Cement and building lime - Environmental product declarations - Product category rules complementary to EN 15804
EN 16908:2017+A1:2022	Cement and building lime - Environmental product declarations - Product category rules complementary to EN 15804
	Basic principles and recommendations for describing the dismantling, post use, and disposal stage of construction products: https://www.umweltbundesamt.de/sites/default/files/medien/1410/publikationen/2020-07-06_texte_130-2020_guidance-document-construction-industry.pdf
	ILCD Handbook: https://eplca.jrc.ec.europa.eu/uploads/ILCD-Handbook-LCIA-Background-analysis-online-12March2010.pdf

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