epd-norway
Global Program Operator

Environmental product declaration

In accordance with ISO 14025 and EN 15804 +A2

Infracement CEM I 42,5 N-SR3

SCHWENK

The Norwegian EPD Foundation

Owner of the declaration:
SCHWENK Sverige AB

Declared unit:
1 tonne Infracement CEM I 42,5 N-SR3

This declaration is based on Product Category Rules:
CEN Standard EN 15804:2012+A2:2019 serves as core PCR and EN 16908 is used as PCR Part B
EN 16908:2017 Cement and building lime

Program operator:
The Norwegian EPD Foundation

Declaration number:
NEPD-3764-2700-EN

Registration number:
NEPD-3764-2700-EN

Issue date:
11.10.2022

Valid to:
11.10.2027

EPD Software:
LCA.no EPD generator

System ID:
51999

General information

Product

Infracement CEM I 42,5 N-SR3

Program operator:

Post Box 5250 Majorstuen, 0303 Oslo, Norway
The Norwegian EPD Foundation
Phone: +47 23 08 80 00
web: post@epd-norge.no

Declaration number:
NEPD-3764-2700-EN

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR and EN 16908 is used as PCR Part B
EN 16908:2017 Cement and building lime

Statement of liability:

The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Declared unit:

1 tonne Infracement CEM I 42,5 N-SR3

Declared unit with option:

A1-A3,A4

Functional Unit

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. Individualthird party verification of each EPD is not required when the EPD tool is i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPDNorway, and iii)the proccess is reviewed annualy. See Appendix G of EPD-Norway's General Programme Instructions for further information on EPD tools.

Verification of EPD tool:

Independent third party verification of the EPD tool, background data and test-EPD in accordance with EPDNorway's procedures and guidelines for verification and approval of EPD tools.

Third party verifier:

Martin Erlandsson, IVL Swedish Environmental Research Institute
(no signature required)

Owner of the declaration:

SCHWENK Sverige AB
Contact person: Urs Müller
Phone: +46 40-31 75 52
e-mail: urs.mueller@schwenk.com

Manufacturer:
SCHWENK Latvija SIA
Plant Broceni ,
Latvia

Place of production:
SCHWENK Latvija SIA
Plant Broceni ,
Latvia

Management system:

ISO 9001 – certifikat 1689ISO 14001 – certifikat 1689MISO 27001 – certifikat 1689I

Organisation no:

556089-9287

Issue date:

11.10.2022

Valid to:
11.10.2027

Year of study:

2021

Comparability:
EPD of construction products may not be comparable if they not comply with EN 15804 and seen in a building context.

Development and verification of EPD:
The declaration is created using EPD tool lca.tools ver EPD2022.03, developed by LCA.no. The EPD tool is integrated in the company's management system, and has been approved by EPD Norway.

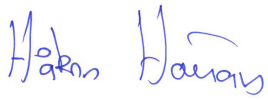
Developer of EPD:

Urs Mueller

Reviewer of company-specific input data and EPD:

Lars Busterud

Approved:



Håkon Hauan

Product

Product description:

Binder for concrete production, dry mortars and ground stabilisation

Product specification

Materials	kg	%
Additives	93,76	6,73
Aggregate	175,67	12,61
Raw materials, Mineral	1123,61	80,66
SCM	0,05	0,00
Total	1393,09	

Technical data:

CEM I 42,5 N-SR3
More information at www.schwenk.se

Market:

Reference service life, product

Depending of the area of use

Reference service life, building or construction works

LCA: Calculation rules

Declared unit:

1 tonne Infracement CEM I 42,5 N-SR3

Cut-off criteria:

All major raw materials and all the essential energy is included. The production processes for raw materials and energy flows with very small amounts (less than 1%) are not included. These cut-off criteria do not apply for hazardous materials and substances.

Allocation:

The allocation is made in accordance with the provisions of EN 15804. Incoming energy and water and waste production in-house is allocated equally among all products through mass allocation. The recycling process and transportation of the material is allocated to this analysis.

Data quality:

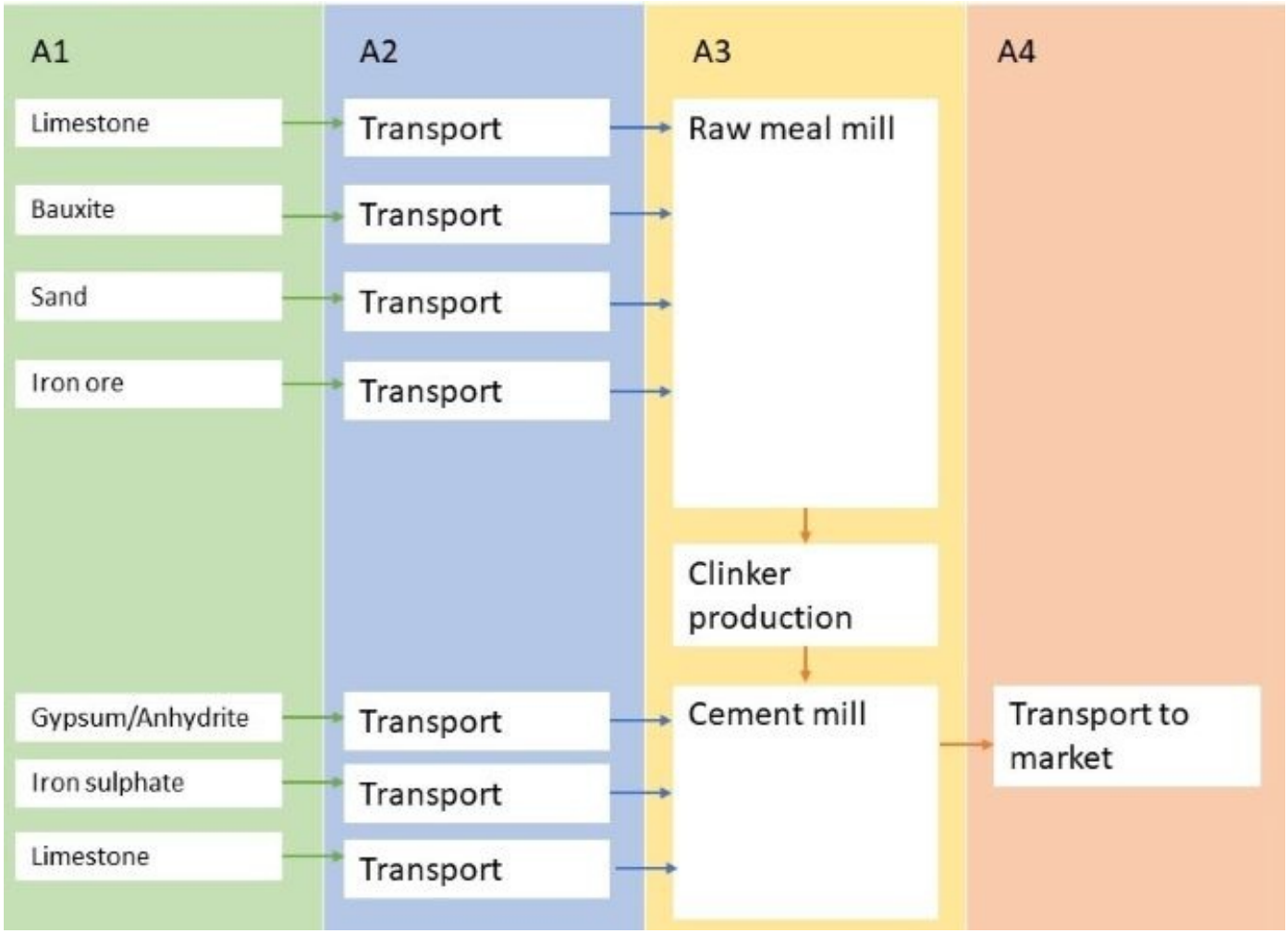
Specific data for the product composition are provided by the manufacturer. The data represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on EPDs according to EN 15804 and different LCA databases. The data quality of the raw materials in A1 is presented in the table below.

Materials	Source	Data quality	Year
Additives	ecoinvent 3.6	Database	2019
Aggregate	ecoinvent 3.6	Database	2019
Raw materials, Mineral	ecoinvent 3.6	Database	2019
Aggregate	LCA.no	Database	2021
Raw materials, Mineral	LCA.no	Database	2021
SCM	LCA.no	Database	2021

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

Product stage			Construction installation stage	Use stage								End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	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	D1
X	X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

System boundary:



Additional technical information:

Transport A4 is for Broceni - Västerås
The value for Broceni - Halmstad is 21,4 kgCO2/tonne cement

LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

Transport from production place to user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonn)
Ship, Cement boat	50,0 %	409	0,005	l/tkm	2,05
Truck, over 32 tonnes, EURO 5	53,3 %	110	0,023	l/tkm	2,53

Assembly (A5)

.	Unit	Value
Auxiliary	kg	
Water consumption	m^3	
Electricity consumption	kWh	
Other energy carriers	MJ	
Material loss	kg	
Output materials fr ste treatment	kg	
Dust in the air	kg	
VOC emissions	kg	

Use (B1)

.	Unit	Value

Maintenance (B2)/Repair (B3)

.	Unit	Value
Maintenance cycle*		
Auxiliary		
Other resources		
Water consumption	m^3	
Electricity consumption	kWh	
Other energy carriers	MJ	
Material loss	kg	
VOC emissions	kg	

Replacement (B4)/Refurbishment (B5)

.	Unit	Value
Replacement cycle*		
Electricity consumption	kWh	
Replacement of worn parts		

* Described above if relevant

Operational energy (B6) and water consumption (B7)

.	Unit	Value
Water consumption	m^3	
Electricity consumption	kWh	
Other energy carriers	MJ	
Power output of equipment	kW	

End of Life (C1, C

.	Unit	Value
Hazardous waste disposed	kg	
Collected as mixed construction wa	kg	
Reuse	kg	
Recycling		
Energy recovery		
To landfill	kg	

Scenarios after A1-A4 are not included

Transport to waste processing (C2)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Unit	Value (l/t)
Truck					l/tkm	
Railway					l/tkm	
Boat					l/tkm	
Other Transportation					l/tkm	

LCA: Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document.

Environmental impact				
Parameter		Unit	A1-A3	A4
	GWP-total	kg CO_2 -eq	7,26E+02	1,63E+01
	GWP-fossil	kg CO_2 -eq	7,25E+02	1,63E+01
	GWP-biogenic	kg CO_2 -eq	6,25E-01	5,39E-03
	GWP-luluc	kg CO_2 -eq	8,45E-02	5,35E-03
	ODP	kg CFC11 -eq	1,47E-05	3,54E-06
	AP	mol H+ -eq	2,14E+00	2,32E-01
	EP-FreshWater	kg P -eq	3,73E-03	9,38E-05
	EP-Marine	kg N -eq	8,13E-01	5,52E-02
	EP-Terrestial	mol N eq	9,03E+00	6,18E-01
	POCP	kg NMVOC -eq	2,19E+00	1,69E-01
	ADP-minerals&metals[1]	Kg Sb-eq	5,17E-04	1,97E-04
	ADP-fossil[1]	MJ	1,64E+03	2,37E+02
	WDP[1]	m^3	7,24E+04	1,37E+02

GWP total Global Warming Potential total; GWP fossil Global Warming Potential fossil fuels ; GWP biogenic Global Warming Potential biogenic; GWP luluc Global W Potential land use change; ODP Ozone Depletion; AP Acidification; EP freshwater Eutrophication aquatic freshwater; EP marine Eutrophication aquatic marine; EP terrestrial Eutrophication terrestrial ;POCP Photochemical zone formation; ADPE Abiotic Depletion Potential minerals and metals; ADPf Abiotic Depletion Potential fossil fuels; WPD Water Depletion Potential

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

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 experienced with the indicator
3. Eutrophication aquatic freshwater shall be in kg P-eq., there is a typo in EN 15804:2012+A2:2019 regarding this unit. Eutrophication calculated as PO4-eq is presented on page 11

Remarks to environmental impacts

The parameter GWP (A1-A3) includes 134,0 kg CO2-eq. from the combustion of alternative fossil fuels during clinker production. In accordance with the "polluter pays" principle /
EN 15804 /, the emissions will be added to the production system that caused the waste. In this EPD, the CO2 contribution from alternative fossil fuels has not been deducted.
This is to be able to compare calculated global warming from cement regardless of the status of the waste in different countries.

Additional environmental impact indicators

Parameter		Unit	A1-A3	A4
	PM	Disease incidence	8,87E-06	8,80E-07
	IRP[2]	kgBq U235 eq.	5,70E+00	1,03E+00
	ETP-fw[1]	CTUe	2,23E+03	1,56E+02
	HTP-c[1]	CTUh	5,60E-08	0,00E+00
	HTP-nc[1]	CTUh	5,72E-07	1,10E-07
	SQP[1]	Pt	8,70E+02	1,89E+02

PM Particulate Matter emissions; IRP Ionizing radiation – human health; ETP-fw Eco toxicity – freshwater; HTP-c Human toxicity – cancer effects; HTP-nc Human toxicity – non cancer effects; SQP Soil Quality (dimensionless)

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

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 experienced with the indicator
2. 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.

Resource use				
Parameter		Unit	A1-A3	A4
	PERE	MJ	3,21E+02	2,36E+00
	PERM	MJ	0,00E+00	0,00E+00
	PERT	MJ	3,21E+02	2,36E+00
	PENRE	MJ	1,65E+03	2,37E+02
	PENRM	MJ	0,00E+00	0,00E+00
	PENRT	MJ	1,65E+03	2,37E+02
	SM	kg	1,20E+00	0,00E+00
	RSF	MJ	5,03E+02	8,38E-02
	NRSF	MJ	2,45E+03	3,35E-01
	FW	m^3	5,06E-01	2,00E-02

PERE Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM Use of renewable primary energy resources used as raw materials; PERT Total use of renewable primary energy resources; PENRE Use of non renewable primary energy excluding non-renewable primary 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

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

End of life - Waste

Parameter		Unit	A1-A3	A4
	HWD	kg	7,79E-02	1,11E-02
	NHWD	kg	9,16E+00	1,36E+01
	RWD	kg	6,16E-03	1,63E-03

HWD Hazardous waste disposed; NHWD Non-hazardous waste disposed; RWD Radioactive waste disposed;

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

End of life - Output flow

Parameter		Unit	A1-A3	A4
	CRU	kg	0,00E+00	0,00E+00
	MFR	kg	1,12E-01	0,00E+00
	MER	kg	2,70E-01	0,00E+00
	EEE	MJ	2,72E-02	0,00E+00
	EET	MJ	4,11E-01	0,00E+00

CRU Components for re-use; MFR Materials for recycling; MER Materials for energy recovery; EEE Exported electrical energy; EET Exported energy Thermal

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

Biogenic Carbon Content

Parameter	Unit	At the factory gate
Biogenic carbon content in product	kg C	0,00E+00
Biogenic carbon content in accompanying packaging	kg C	0,00E+00

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO2

Additional Norwegian requirements

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

National production mix from import, low voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3).

Electricity mix	Data source	Amount	Unit
Electricity, Latvia (kWh)	ecoinvent 3.6	542,92	g CO2-eq/kWh

Dangerous substances

The product contains no substances given by the REACH Candidate list or the Norwegian priority list.

Indoor environment

Additional Environmental Information

Environmental impact indicators EN 15804+A1 and NPCR Part A v2.0			
Parameter	**Unit**	A1-A3	A4
GWP	kg CO_2 -eq	7,37E+02	1,62E+01
ODP	kg CFC11 -eq	1,25E-05	3,10E-06
POCP	kg C_2H_4-eq	7,56E-02	5,46E-03
AP	kg SO_2 -eq	1,54E+00	1,73E-01
EP	kg PO_4^{3-} -eq	2,85E-01	1,72E-02
ADPM	kg Sb -eq	5,17E-04	1,97E-04
ADPE	MJ	1,64E+03	2,33E+02
GWPIOBC	kg CO_2 -eq	1,02E+02	1,63E+01

GWP Global warming potential; ODP Depletion potential of the stratospheric ozone layer; POCP Formation potential of tropospheric photochemical oxidants; AP Acidification potential of land and water; EP Eutrophication potential; ADPM Abiotic depletion potential for non fossil resources; ADPE Abiotic depletion potential for fossil resources; GWP-IOBC/GHG Global warming potential calculated according to the principle of instantanious oxidation (except emissions and uptake of biogenic carbon)

Bibliography

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EN 15804:2012+A2:2019 Environmental product declaration - Core rules for the product category of construction products.
ISO 21930:2017 Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products.
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CEN PCR EN 16908:2017 Cement and building lime

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