Environmental Product Declaration

In accordance with EN 15804 for:

CEM II A-M (S-LL) 52.5 N
CEM I 52.5 N
CEM I 42.5 R
CEM I 42.5 SR-3

From **SCHWENK Latvija SIA**

SCHWENK

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Declaration information

CEN standard EN 15804 served as the core PCR
Independent third-party verification of the declaration and data ☐ EPD process certification ☒ EPD verification
Third party verifier: Marcel Gómez Marcel Gómez Consultoría Ambiental info@marcegomez.com
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs of construction products may not be comparable if they do not comply with EN 15804.

Company information

Owner of the EPD: **SCHWENK Latvija SIA**
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Description of the organisation: SCHWENK was founded in 1847 in Ulma, Germany. This is the oldest family company in the German construction materials sector, which is also one of the most innovative and modern companies. SCHWENK has a strong experience in the production of cement, concrete, sand & gravel and pumps in one value-added chain. There is several cement plants in Europe but also in Namibia. SCHWENK Latvija employs around 350 staff and is the only cement plant in Latvia. With an annual production capacity of 1.6 million tonnes, it can supply cement, ready-mix concrete, aggregates and a range of other construction products and services.

For additional information about SCHWNEK Latvija please visit the company web site at www.schwenk.lv

Product-related or management system-related certifications: ISO 50001:2012, ISO 9001:2015, ISO 14001:2015 and ISO 45001:2018 – certificates.

Name and location of production site: Brocēni cement plant in Latvia

Product information

Product name: This product family covers the following references

- CEM II A-M (S-LL) 52.5 N
- CEM I 52.5 N
- CEM I 42.5 R
- CEM I 42.5 SR-3

UN CPC code: 3744

Geographical scope: Manufactured in Latvia
Use and end of life not included in the study

Product description: Cement is a hydraulic binder. It is a finely ground inorganic material which, when mixed with water, forms a paste which sets and hardens by means of hydration reactions and processes. After hardening, it retains its strength and stability even under water.

Technical characteristics:

Product references	Compressive strength class (acc. to /DIN EN 197-1/	Application
CEM II A-M (S-LL) 52.5 N	52.5 N/mm²	The main application of cement is in the production of concrete goods, concrete precast, ready-mix concrete.
CEM I 52.5 N	52.5 N/mm²	The main application of cement is in the production of concrete goods, concrete precast, ready-mix concrete.
CEM I 42.5 R	42.5 N/mm²	The main application of cement is in the production of concrete goods, concrete precast, ready-mix concrete.
CEM I 42.5 SR-3	42.5 N/mm²	The main application of cement is in the production of concrete goods, concrete precast, ready-mix concrete.

LCA information

Standard compliance: The LCA study has been in compliance with the EN 15804 and the EN 16908

Declared unit: 1000 kg

Reference service life: According to EN 16 908, no RSL (Reference service life) is declared for cements as they are intermediate building products.

Time representativeness: Data were collected by SCHWENK Latvija from June 2019 to September 2019 and are representative of 2018 manufacturing technologies.

Database(s) and LCA software used: BDD used are CODDE-2018-11, ELCD version 3.2, Ecoinvent 3.0.1 Allocation at the point of substitution. The software used is EIME v5.8.1

Environmental indicators calculated according to EN 15804 (CEM baseline).

Description of system boundaries:

- According to EN 16908, as cement is an intermediate product with many different final used (ready-mixed concrete, precast concrete, screed, plasters, masonry mortars, etc…), it is generally not possible to provide information about the environmental impacts of the products during the construction, the use and the end of life stages because they greatly depend on the cement end used. Hence a cradle-to-gate LCA is preferred for the cement: including A1 to A3 stages.

Excluded lifecycle stages: From A4 to D

Cut-off criteria: Flows that can be excluded from the study because of the difficulty of attributing them to a particular reference flow are the following:

- The lighting, heating, sanitation and cleaning of facilities
- The transportation of employees and the staff catering facilities.
- The manufacture and maintenance of production tools and infrastructures
- Flows from R&D, administrative, management, and marketing poles.

The proportion of non-modelled elements is in compliance with the 1 % of renewable and non-renewable primary energy usage and the 1%-in-weight cut-off rule over the life-cycle considered. The total of neglected input flows per module, e.g. per module A1-A3 shall be a maximum of 5 % of energy usage and mass.

More information: cement products are manufactured from a succession of three fabrication processes:

- **Process 1 "Preparation of raw materials":** production of clinker from raw materials (limestone, clay, sand …)
- **Process 2 "Clinker burning":** raw materials are burned to form clinker and dust
- **Process 3 "Cement grinding and storage":** other constituents (anhydrite, limestone, dusts..) are added to the clinker to form cement

- For the cement products manufacturing, different alternatives to fossil fuels are used at Brocēni cement plant:
  - **used tires**
  - **tyre fluffy**
  - **NPS**: Neutralized Polluted Soil obtained by mixing Sulphur Acid Tar Waste (SATW) with raw material mix and wood chips
  - **SRF**: Solid Recovered Fuel produced from municipal waste including paper, card, wood, textiles and plastics

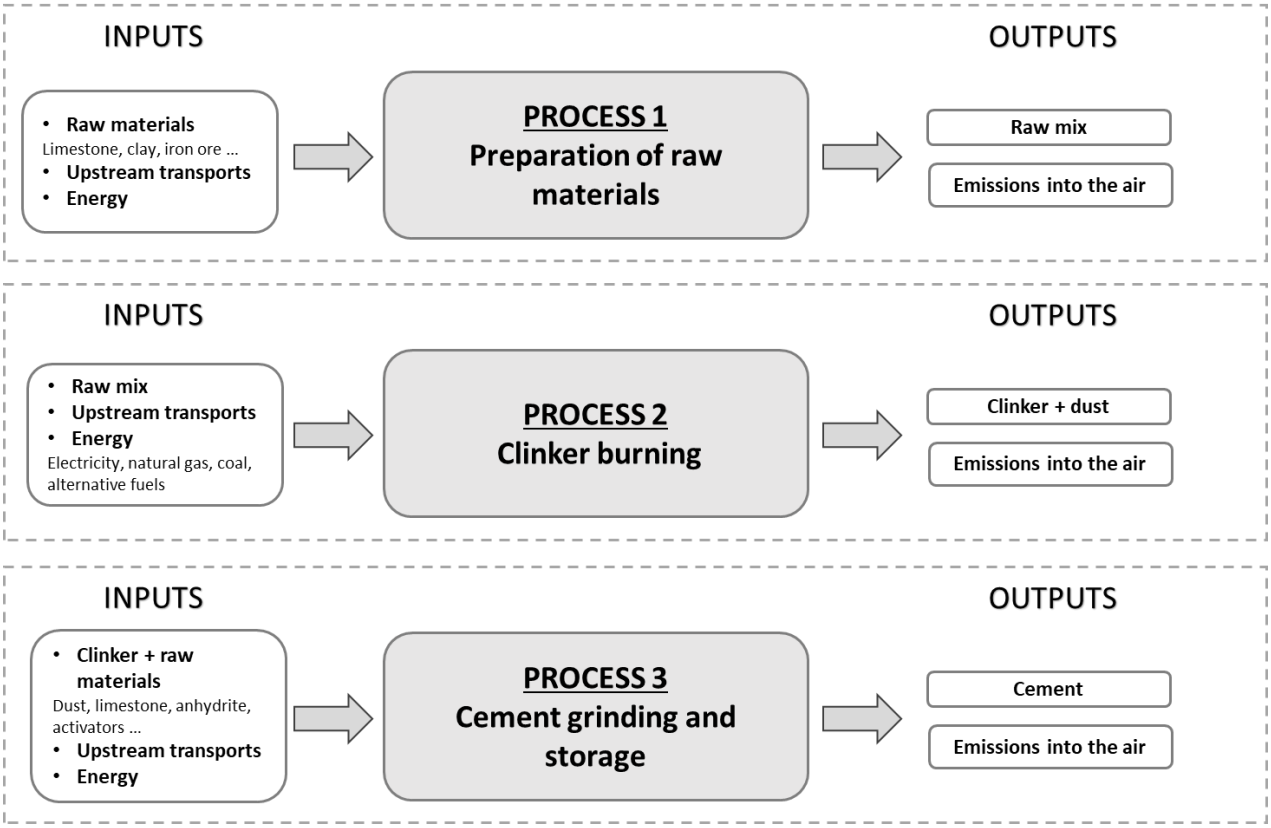
- According the EN 16 908, CO_2 emitted by the co-incineration of the secondary fuels have been excluded.
- Energetic consumption and waste production have been allocated per m² of final product.
- The energetic mix used to model the electricity consumption during the cement manufacturing is the 2014 Latvian mix provided by Ecoinvent.

Additional environmental information:

- Since September 2019, manufacturing site of Brocēni has the "Powered by green" certificate which confirms that
- The company buy electricity produced in Latvia from 100% renewable energy sources.

Cradle-to-gate system boundaries diagram

Life Cycle Stages																
Product stage			Construction process stage		Use stage							End of life stage				Recovery stage
Raw material supply	Transport	Manufacturing	Transport	Construction - installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction - 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			MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND



Content declaration

Product

Materials / chemical substances	CEM II A-M (S-LL) 52.5 N	CEM I 52.5 N	CEM I 42.5 R	CEM I 42.5 SR-3
Clinker	80-94%	95-100%	95-100%	95-100%
Slag	5-15%	-	-	-
Limestone	5-15%	0-5%	0-5%	0-5%
Minor constituents	<0,5%	<0,5%	<0,5%	-

During the life cycle of the product any hazardous substance listed in the “Candidate List of Substances of Very High Concern (SVHC) for authorization” has been used in a percentage higher than 0.1% of the weight of the product.

The declared portland cements are low on chromate. By addition of a chromate reducer the contents of water soluble chromium VI < 2 ppm.

Packaging

Distribution packaging: No packaging, delivered as bulk material
Consumer packaging: No packaging, delivered as bulk material

Recycled material

Provenience of recycled materials (pre-consumer or post-consumer) in the product: Cement products contain the following recycled materials: granulated blast furnace slag and by pass dust.

Environmental performance

CEM II A-M (S-LL) 52.5 N

Potential environmental impact

PARAMETER	UNIT	A1-A3	A4-D
Global Warming Power (GWP)	kg CO_2 eq.	620	MND
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC 11 eq.	6,49E-06	MND
Acidification potential (AP)	kg SO_2 eq.	1,93	MND
Eutrophication potential (EP)	kg PO_4^{3-} eq.	0,421	MND
Formation potential of tropospheric ozone (POCP)	kg C_2H_4 eq.	0,132	MND
Abiotic depletion potential – Elements	kg Sb eq.	1,15E-04	MND
Abiotic depletion potential – Fossil resources	MJ, net calorific value	2250	MND

Use of resources

PARAMETER		UNIT	A1-A3	A4-D
Primary energy resources – Renewable	Use as energy carrier	MJ, net calorific value	167	MND
	Used as raw materials	MJ, net calorific value	0,00	MND
	TOTAL	MJ, net calorific value	167	MND
Primary energy resources – Non-renewable	Use as energy carrier	MJ, net calorific value	2260	MND
	Used as raw materials	MJ, net calorific value	0,00	MND
	TOTAL	MJ, net calorific value	2260	MND
Secondary material		kg	3,29	MND
Renewable secondary fuels		MJ, net calorific value	1,445	MND
Non-renewable secondary fuels		MJ, net calorific value	2211	MND
Net use of fresh water		m^3	0,591	MND

Waste production and output flows

Waste production

PARAMETER	UNIT	A1-A3	A4-D
Hazardous waste disposed	kg	0,00	MND
Non-hazardous waste disposed	kg	0,269	MND
Radioactive waste disposed	kg	1,73E-04	MND

Output flows

PARAMETER	UNIT	A1-A3	A4-D
Components for reuse	kg	0	MND
Material for recycling	kg	0	MND
Materials for energy recovery	kg	0	MND
Exported energy	MJ	0	MND

CEM I 52.5 N and CEM I 42.5 R

CEM 52.5 N and CEM 42.5 R are the same products, only their commercial reference are different. Hence the environmental impacts are the same for both and they are presented in the same tables.

Potential environmental impact

PARAMETER	UNIT	A1-A3	A4-D
Global Warming Power (GWP)	kg CO_2 eq.	681	MND
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC 11 eq.	6,79E-06	MND
Acidification potential (AP)	kg SO_2 eq.	2,01	MND
Eutrophication potential (EP)	kg PO_4^{3-} eq.	0,438	MND
Formation potential of tropospheric ozone (POCP)	kg C_2H_4 eq.	0,140	MND
Abiotic depletion potential – Elements	kg Sb eq.	1,24E-04	MND
Abiotic depletion potential – Fossil resources	MJ, net calorific value	2412	MND

Use of resources

PARAMETER		UNIT	A1-A3	A4-D
Primary energy resources – Renewable	Use as energy carrier	MJ, net calorific value	179	MND
	Used as raw materials	MJ, net calorific value	0,00	MND
	TOTAL	MJ, net calorific value	179	MND
Primary energy resources – Non-renewable	Use as energy carrier	MJ, net calorific value	2424	MND
	Used as raw materials	MJ, net calorific value	0,00	MND
	TOTAL	MJ, net calorific value	2424	MND
Secondary material		kg	3,75	MND
Renewable secondary fuels		MJ, net calorific value	1579	MND
Non-renewable secondary fuels		MJ, net calorific value	2416	MND
Net use of fresh water		m^3	0,635	MND

Waste production and output flows

Waste production

PARAMETER	UNIT	A1-A3	A4-D
Hazardous waste disposed	kg	0,00	MND
Non-hazardous waste disposed	kg	0,273	MND
Radioactive waste disposed	kg	1,76E-04	MND

Output flows

PARAMETER	UNIT	A1-A3	A4-D
Components for reuse	kg	0	MND
Material for recycling	kg	0	MND
Materials for energy recovery	kg	0	MND
Exported energy	MJ	0	MND

CEM I 42.5 SR-3

Potential environmental impact

PARAMETER	UNIT	A1-A3	A4-D
Global Warming Power (GWP)	kg CO_2 eq.	625	MND
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC 11 eq.	8,00E-06	MND
Acidification potential (AP)	kg SO_2 eq.	1,82	MND
Eutrophication potential (EP)	kg PO_4^{3-} eq.	0,384	MND
Formation potential of tropospheric ozone (POCP)	kg C_2H_4 eq.	0,124	MND
Abiotic depletion potential – Elements	kg Sb eq.	1,02E-04	MND
Abiotic depletion potential – Fossil resources	MJ, net calorific value	2484	MND

Use of resources

PARAMETER		UNIT	A1-A3	A4-D
Primary energy resources – Renewable	Use as energy carrier	MJ, net calorific value	81	MND
	Used as raw materials	MJ, net calorific value	0,00	MND
	TOTAL	MJ, net calorific value	81	MND
Primary energy resources – Non-renewable	Use as energy carrier	MJ, net calorific value	2495	MND
	Used as raw materials	MJ, net calorific value	0	MND
	TOTAL	MJ, net calorific value	2495	MND
Secondary material		kg	3,74	MND
Renewable secondary fuels		MJ, net calorific value	1614	MND
Non-renewable secondary fuels		MJ, net calorific value	2470	MND
Net use of fresh water		m^3	0,704	MND

Waste production and output flows

Waste production

PARAMETER	UNIT	A1-A3	A4-D
Hazardous waste disposed	kg	0,00	MND
Non-hazardous waste disposed	kg	0,272	MND
Radioactive waste disposed	kg	1,71E-04	MND

Output flows

PARAMETER	UNIT	A1-A3	A4-D
Components for reuse	kg	0	MND
Material for recycling	kg	0	MND
Materials for energy recovery	kg	0	MND
Exported energy	MJ	0	MND

References

EN 15804: Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction

EN 16908: Cement and building lime – Environmental product declarations – Product category rules complementary to EN 15804 (2017)

ISO 14040: Environmental management -- Life cycle assessment -- Principles and framework (2006)

EIME v5 guides1 2: for the modelling of the different processes.

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