

Environmental Product Declaration



In accordance with ISO 14025 and EN 15804 for:

Insulated precast concrete sandwich walls

From

Sollebrunns Betongelement AB

**Sollebrunns
Betongelement**

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-01658
Publication date:	2019-08-30
Valid until:	2024-08-29



General information

Information about the organization

Owner of the EPD: Per Antonsson, 0322-432 05, per@sollebrunnsbetong.se, Sollebrunns Betongelement AB, Magravägen 201, 441 74 Sollebrunn. The EPD owner has the sole ownership, liability, and responsibility for the EPD.

Description of the organization: Sollebrunns Betongelement offers a wide range of precast concrete products used in various buildings on the Swedish market.

Product-related or management system-related certifications: NordCert certifies all products from Sollebrunns Betongelement. It guarantees that all products fulfill all their technical requirements and that all products are manufactured according to current building norms.
<http://www.sollebrunnsbetong.se/om-oss/kvalitet-miljo/>

Name and location of production site: Insulated precast concrete sandwich walls are manufactured at the production site in Måra, Sweden.

About the Company

Sollebrunns Betongelement AB is an independent privately owned company founded in 1996.

The company has a highly skilled labour force that makes every effort to deliver customized and high quality products to our customers. Sollebrunns Betongelement offers a range from single product deliveries to a total concept including design, production and assembly at site.

Sollebrunns Betongelement has their own assembly team consisting of experienced personnel with many years of knowledge. Customer deliveries are made by a local transport company using 100 % renewable fuel.



The market for precast products is mainly Sweden, but occasionally also Norway.

Product information

Product name: Insulated precast concrete sandwich walls

Product description: The sandwich walls are stable, well isolated and maintenance free. The walls consists of an inner- and outer concrete slab with isolation in between.

The isolation varies in thickness and material due to customer specifications.

Sollebrunns Betongelement can offer various decorative surfaces, painting, window assembly and more according to customer needs.

The products in this EPD are registered and assessed in Byggvarubedömningen, SundaHus and BASTA.

Technical data:

Compressive strength (concrete)	$f_{ck} = 35 - 55 \text{ N/mm}^2$
Ultimate tensile strength (reinforcing steel)	$f_{tk} = 500 \text{ N/mm}^2$
Tensile yield strength (reinforcing steel)	$f_{yk} = 540 \text{ N/mm}^2$

Additional information for the product can be found at the Sollebrunns Betongelement website:

<http://www.sollebrunnsbetong.se/erbjudande/>

<http://www.sollebrunnsbetong.se/om-oss/kvalitet-miljo/>

Geographical scope (Sweden): Insulated precast concrete sandwich walls are manufactured at the production site in Måra, Sweden.



LCA information

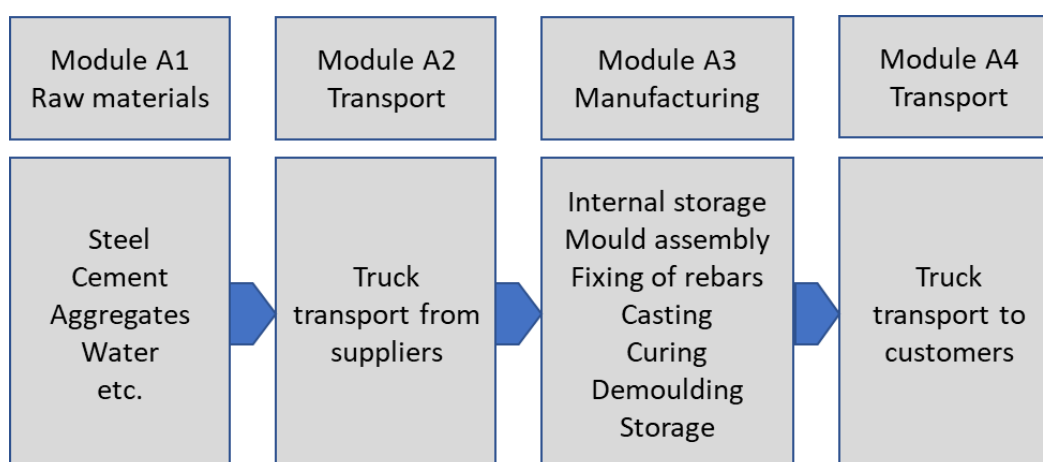
Declared unit: 1 tonne of insulated precast concrete sandwich walls

Reference service life: Normally 50-100¹ years and depending on customer requirements.

Time representativeness: Data is representative for production year 2018. For materials, energy and transports generic industry data from Ecoinvent has been used. Specific EPD data has been used for cement and EPS insulation. Assessment time for background data is 2010-16.

Database and LCA software used: Ecoinvent 3.4 and SimaPro 8.4

System diagram: This is a cradle to gate EPD with options. The following life cycle stages are included:



See also table below for modules not declared:

Life cycle environmental information of							Other environmental information
Product stage			Construction process stage		Use stage	End of life stage	Reuse recovery stage
A1	A2	A3	A4	A5	B1-B7	C1-C4	D
X	X	X	X	MND	MND	MND	MND

(Description of the system boundary (X = included in LCA; MND = Module Not Declared))

Description of system boundaries:

A1: Extraction and processing of raw materials and generation of electricity and heat from primary energy resources

A2: Transports from suppliers to Sollebrunn Betongelement production site

A3: Manufacturing of the product at Sollebrunn Betongelement production site

A4: Average transport distance 150 km from Sollebrunn Betongelement production site to customer

¹ <https://www.svenskbetong.se/bygga-med-betong/bygga-med-prefab/miljo-och-hallbarhet/livslangd-for-byggnader>

Estimates and assumptions: Heat, electricity use and other energy use as well as waste in production are calculated as a weight average per produced tonne of all products using yearly production data and rate for 2018. No assumptions made.

There are variation in the mix of materials (cement, reinforcement, gravel etc.) in the concrete products. Material percentages in the table below are averages.

However, the variation in material composition for different mixes and the related environmental impact is within +/- 10% compared to the given average in this EPD.

Cut off criteria: All major materials, production energy use and waste are included. Materials less than 1% weight in the concrete product are not taken into account.

Data quality: The data quality can be described as fair for waste estimations and good for other data. The primary data collection has been done thoroughly, all relevant flows are considered.

Content declaration

Product

Weight % per tonne of precast concrete product	Reinforcement	Cement	Aggregate	Water	Insulation
Insulated precast concrete sandwich walls	5,1	16,2	70,6	7,0	1,1

There are no SVHC substances according to REACH in the product or in the waste.

Packaging

Distribution packaging: No packaging is used for distribution

Consumer packaging: No consumer packaging is used

Recycled material

Secondary materials and recovered energy are used in production of cement and steel reinforcement.

Environmental performance per tonne product

Potential environmental impact

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4
Global warming potential (GWP)	kg CO ₂ eq.	2,89E+02	7,53E+00	2,71E+00	2,99E+02	1,55E+01
Depletion potential of the stratospheric ozone layer, ODP	Kg CFC-11 eq.	1,00E-05	1,07E-06	4,88E-07	1,16E-05	1,92E-06
Acidification potential (AP)	kg SO ₂ eq.	8,42E-01	3,17E-02	6,13E-03	8,80E-01	2,22E-01
Eutrophication potential (EP)	kg PO ₄ ³⁻ eq.	3,36E-01	8,23E-03	8,32E-04	3,45E-01	1,45E-01
Formation potential of tropospheric ozone (POCP)	kg C ₂ H ₄ eq.	2,44E-01	1,96E-03	3,28E-04	2,46E-01	4,56E-03
Abiotic depletion potential – Elements	kg Sb eq.	8,59E-04	3,05E-05	1,52E-06	8,91E-04	1,15E-04
Abiotic depletion potential – Fossil resources	MJ, net calorific value	2,75E+03	1,00E+02	3,78E+01	2,89E+03	1,74E+02

Use of resources

PARAMETER		UNIT	A1	A2	A3	TOTAL A1-A3	A4
Primary energy resources – Renewable	Use as energy carrier	MJ, net calorific value	3,70E+02	5,49E+00	4,24E-01	3,76E+02	2,35E+02
	Used as raw materials	MJ, net calorific value	5,74E+00	0,00E+00	0,00E+00	5,74E+00	0,00E+00
	TOTAL	MJ, net calorific value	3,76E+02	5,49E+00	4,24E-01	3,82E+02	2,35E+02
Primary energy resources – Non- renewable	Use as energy carrier	MJ, net calorific value	2,53E+03	1,09E+02	4,11E+01	2,68E+03	2,00E+02
	Used as raw materials	MJ, net calorific value	4,88E+02	0,00E+00	0,00E+00	4,88E+02	0,00E+00
	TOTAL	MJ, net calorific value	3,02E+03	1,09E+02	4,11E+01	3,17E+03	2,00E+02
Secondary material		kg	2,01E+01	0,00E+00	0,00E+00	2,01E+01	0,00E+00
Renewable secondary fuels		MJ, net calorific value	9,83E+01	0,00E+00	0,00E+00	9,83E+01	0,00E+00
Non-renewable secondary fuels		MJ, net calorific value	1,39E+02	0,00E+00	0,00E+00	1,39E+02	0,00E+00
Net use of fresh water		m³	8,24E+01	8,40E-01	7,60E-02	8,33E+01	8,21E+00

Waste production and output flows per tonne product

Waste production

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4
Hazardous waste disposed	kg	1,31E-03	0,00E+00	4,00E-02	4,13E-02	0,00E+00
Non-hazardous waste disposed	kg	7,53E+00	0,00E+00	3,80E-01	7,91E+00	0,00E+00
Radioactive waste disposed	kg	2,74E-02	0,00E+00	0,00E+00	2,74E-02	0,00E+00

Output flows

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4
Components for reuse	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	0,00E+00	0,00E+00	2,05E+00	2,05E+00	0,00E+00
Materials for energy recovery	kg	0,00E+00	0,00E+00	5,28E+00	5,28E+00	0,00E+00
Exported energy, electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, thermal	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Interpretation of LCA results

Environmental impact for 1 tonne of precast insulated concrete wall is mainly caused by extraction and processing of cement, iron reinforcement and expanded polystyrene insulation (EPS) used in the product (calculated in module A1). Impact in A1 is further increased by product waste mainly in the form of reinforcement and wood from molds to create cast products. Impact from other waste in the process is insignificant.

More than 90% of the greenhouse warming potential comes from raw materials in the product (A1). For impact factors acidification and eutrophication potential raw materials accounts for more than 70-80% of the total.

Impact for extraction of fuel oil and generation of electricity are also calculated in module A1. An average dataset representing environmental impact from Swedish electricity from waterpower is used in the calculations.

Lorry transport is used to ship materials from suppliers to Sollebrunn Betongelement production site. Environmental impact from these transports is calculated in module A2 and is less than 2% in relation to impact in module A1.

In module A3, environmental impact from energy use is calculated. Impact comes from use of fuel oil the manufacturing process. Almost 1% of the total greenhouse warming potential comes from fuel oil used in the process. For impact factors acidification and eutrophication, fuel oil in the process accounts for less than 1% of the total potential for A1+A2+A3+A4 together.



Programme information

Programme:	The International EPD® System EPD International AB Box 210 60 SE-100 31 Stockholm Sweden www.environdec.com info@environdec.com
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CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product category rules (PCR): PCR 2012:01. Construction products and construction services. V2.3 dated 2018-11-15. UN CPC code 37550 - Articles of concrete, cement and plaster
Independent third-party verification of the declaration and data, according to ISO 14025:2006: <input type="checkbox"/> EPD process certification <input checked="" type="checkbox"/> EPD verification
Third party verifier: Third party verifier: Carl-Otto Nevén, NEVÉN Miljökonsult
Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804.

References

General Programme Instructions of the International EPD® System. Version 3.0.

PCR 2012:01. Construction products and construction services. V2.3
PCR 2012:01-Sub-PCR-G

EN 15804: 2012+A1 Sustainability of construction works - Environmental Product Declarations - Core rules for the product category of construction products

Ecoinvent 3.4 database, <http://www.ecoinvent.org/>

LCA software SimaPro Analyst 8.4

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Material Safety Data sheets for:

- SikaViscoCrete-1030
- Sika® AirPRO(SE)conc
- SikaAccelerator

LCA report. Sollebrunns Betongelement. Precast concrete products. Date of report: 19.8.2019

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