Environmental Product Declaration

In accordance with ISO 14025 and EN 15804 for:

Solid precast concrete wall/slab/balcony

From

Gripen Betongelement AB

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-02100
Publication date:	2020-08-06
Version:	2021-12-21
Valid until:	2026-12-20

General information

Information about the organization

Owner of the EPD: Gripen Betongelement AB, Anders Olofsson, phone +46 (0)703 848 716, anders.olofsson@gripenbetong.se. Gripen Betongelement AB, Stekelgatan 4 A, 212 23 Malmö, Sweden. The EPD owner has the sole ownership, liability, and responsibility for the EPD.

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

Product-related or management system-related certifications:
All products are CE-certified by CERTBUD. It guaranties that all products fulfil all their technical requirements and that all products are manufactured according to current building norms. See https://gripenbetong.se/om-oss.aspx for more information.

Name and location of production site: Precast concrete products are manufactured at Gripen Betongelement production site in Kartoszyno in Poland.

About the Company

Gripen Betongelement AB manufactures prefabricated concrete frames.

The production facility is located in in Kartoszyno in Poland and has been producing high quality concrete frames since 1995. Gripen Betongelement build on the trust of some of Sweden's largest builders and have delivered elements to hundreds of buildings over the years.

Gripen Betongelement have solutions for all types of buildings, such as apartment buildings, townhouses, industrial halls, offices. Gripen Betongelement has an integrated organization and a well-worked working model. This means that they can work efficiently - with fast deliveries, high product quality and economically sustainable solutions.

Product information

Product name: Solid precast concrete wall/slab/balcony.

Product description: The wall is manufactured in varying thicknesses. The walls and slabs can be prepared with embedded conduits for electrical installations and holes.

The walls come with good surface finish and is easy to paint and wallpaper, with minimal preparatory work.

Technical data: Products are manufactured according to technical data in customer design specification. Products are CE-certified by CERTBUD, which guaranties that they fulfil all their technical requirements and are manufactured according to current building norms. See https://gripenbetong.se/om-oss.aspx for more information.

Additional information for the product can be found at the Gripen Betongelement website: https://gripenbetong.se/

Production process:

Geographical scope (Poland)**:** Precast concrete products are manufactured at Gripen Betongelement production site in Kartoszyno in Poland and mainly sold in the south of Sweden.

LCA information

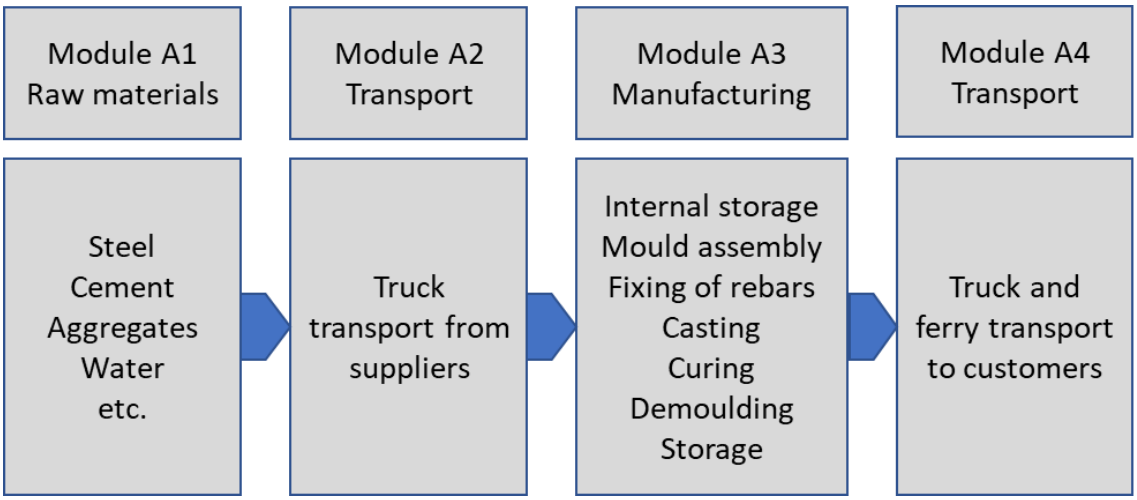
Declared unit: 1 tonne of solid precast concrete wall/slab/balcony including transport to construction site.

Service life: Normally 50-100 years[1] and depending on customer requirements.

Time representativeness: Data is representative for production year 2021. For materials, energy and transports generic industry data from Ecoinvent has been used. Assessment time for background data is 2013-20.

Database and LCA software used: Ecoinvent 3.7 and SimaPro 9.1.1.1.

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 from primary energy resources
A2: Specific transport distance from suppliers of different materials to Gripen Betongelement production site
A3: Manufacturing of the product at Gripen Betongelement production site

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

A4: Average transport distance (320 km lorry and 250 km ferry transport) from Gripen Betongelement production site to customer

Estimates and assumptions: Electricity use as well as waste in production are calculated as a weight average per produced tonne of all products using yearly production data representative for 2021. No assumptions are made and no co-products are made.

There is 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% of the weight in the concrete product are not considered.

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
Solid precast concrete wall/slab/balcony	2	13.5	76.8	7.7

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 in the precast concrete product.

Environmental performance per tonne product

Potential environmental impact

Results for one tonne of concrete wall/slab/balcony including transport to construction site.			
PARAMETER	**UNIT**	**TOTAL A1-A3**	**A4**
Global warming potential (GWP)	kg CO_2 eq.	1.60E+02	5.46E+01
Depletion potential of the stratospheric ozone layer, ODP	Kg CFC-11 eq.	7.51E-06	9.38E-06
Acidification potential (AP)	kg SO_2 eq.	3.91E-01	1.98E-01
Eutrophication potential (EP)	kg PO_4^{3-} eq.	1.52E-01	4.81E-02
Formation potential of tropospheric ozone (POCP)	kg C_2H_4 eq.	2.81E-02	6.31E-03
Abiotic depletion potential – Elements	kg Sb eq.	4.31E-04	1.74E-04
Abiotic depletion potential – Fossil resources	MJ, net calorific value	1.02E+03	7.80E+02

Use of resources

Results for one tonne of concrete wall/slab/balcony including transport to construction site.				
PARAMETER		**UNIT**	**TOTAL A1-A3**	**A4**
Primary energy resources – Renewable	Use as energy carrier	MJ, net calorific value	1.83E+02	1.30E+01
	Used as raw materials	MJ, net calorific value	0.00E+00	0.00E+00
	TOTAL	MJ, net calorific value	1.83E+02	1.30E+01
Primary energy resources – Non-renewable	Use as energy carrier	MJ, net calorific value	1.19E+03	8.52E+02
	Used as raw materials	MJ, net calorific value	0.00E+00	0.00E+00
	TOTAL	MJ, net calorific value	1.19E+03	8.52E+02
Secondary material		kg	3.21E+01	0.00E+00
Renewable secondary fuels		MJ, net calorific value	1.49E+01	0.00E+00
Non-renewable secondary fuels		MJ, net calorific value	3.54E+01	0.00E+00
Net use of fresh water		m^3	7.57E+01	2.52E+00

Waste production and output flows per tonne product

Waste production

Results for one tonne of concrete wall/slab/balcony including transport to construction site.			
PARAMETER	**UNIT**	**TOTAL A1-A3**	**A4**
Hazardous waste disposed	kg	3.73E-03	2.08E-03
Non-hazardous waste disposed	kg	2.38E+01	3.06E+01
Radioactive waste disposed	kg	4.86E-03	5.48E-03

Output flows

Results for one tonne of concrete wall/slab/balcony including transport to construction site.			
PARAMETER	**UNIT**	**TOTAL A1-A3**	**A4**
Components for reuse	kg	0.00E+00	0.00E+00
Material for recycling	kg	7.50E-01	0.00E+00
Materials for energy recovery	kg	7.40E-01	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00
Exported energy, thermal	MJ	0.00E+00	0.00E+00

Interpretation of LCA results

Environmental impact for 1 tonne of solid precast concrete wall/slab/balcony is mainly caused by extraction and processing of cement and iron reinforcement 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 moulds to create cast products. Impact from other waste in the process is insignificant.

Approximately 70% of the greenhouse warming potential comes from raw materials in the product (A1). For the impact factors acidification and eutrophication potential the relation is similar.

Impact for generation of electricity are also calculated in module A1. An average dataset representing environmental impact from Polish electricity mix is used in the calculations.

Lorry transport is used to ship materials from suppliers to Gripen Betongelement production site. Environmental impact from these transports is calculated in module A2 and is less than 5% in relation to impact total impact A1-A4. Transport to customer is done by lorry and ferry transport. A4 accounts for approximately 25% of total environmental impact A1-A4.

Programme information

Programme:	The International EPD® System EPD International AB Box 210 60 SE-100 31 Stockholm Sweden www.environdec.com info@environdec.com

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product category rules (PCR): PCR 2012:01. Construction products and construction services. V2.34 dated 2021-11-08. UN CPC code 37550 - Articles of concrete, cement and plaster
Independent third-party verification of the declaration and data, according to ISO 14025:2006: ☐ EPD process certification ☒ 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: ☒ Yes ☐ 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.

Revision history

Date and type	Description of change
Version 1.0	
Original version published 2020-08-06	
Version 2.0	
Updated version published 2021-12-21	Updated recipe, energy mix, and editorial updates of pictures, descriptions, and address.

References

General Programme Instructions of the International EPD® System. Version 4.0.

PCR 2012:01. Construction products and construction services. V2.34
PCR 2012:01-Sub-PCR-G

EN 15804:2012+A1:2013 Sustainability of construction works - Environmental Product Declarations - Core rules for the product category of construction products

Ecoinvent 3.7 database, http://www.ecoinvent.org/

LCA software SimaPro Analyst 9.1.1.1

LCA report. Gripen Betongelement. Precast concrete products. Date of report: 2021-12-13.

Contact information:

EPD owner:	Gripen Betongelement AB, Stekelgatan 4 A, 212 23 Malmö, Sweden. Anders Olofsson, phone +46 (0)703 848 716, anders.olofsson@gripenbetong.se
LCA author:	WSP Sverige AB, www.wsp.com Ulf Liljenroth, ulf.liljenroth@wsp.com +46 702 883 626 Lisa Rasmusson, lisa.rasmusson@wsp.com +46 790 983 307
Programme operator:	EPD International AB info@environdec.com www.environdec.com

EPD®

www.environdec.com