Environmental Product Declaration

In accordance with ISO 14025, EN 15804: 2012+A1:2013 and PCR 2012:01 for:

BALCONIES

From:

Dala Cement i Björbo AB

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-03024
Publication date:	2021-03-01
Valid until:	2026-03-01

DALA CEMENT

EPD®

Programme information

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

Product category rules (PCR): PCR 2012:01 (Construction products and construction services) Version 2.32 of 2020-07-01
PCR review was conducted by: The Technical Committee of the International EPD® System. Chair: Massimo Marino. Contact via info@environdec.com
Independent third-party verification of the declaration and data, according to ISO 14025:2006: ☐ EPD process certification ☒ EPD verification
Third party verifier: Mats Zackrisson, RISE Research Institutes of Sweden 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.

Company information

Owner of the EPD:
Dala Cement I Björbo AB

Description of the organisation:
Dala Cement i Björbo was established in 1946, initially producing concrete blocks. Today our production consists of prefabricated elements for a variety of buildings. The company is owned by Ulricehamns Betong AB, and currently employs around 80 skilled and dedicated co-workers.

Product information

Product name:
Balconies

Production site:
Industrivägen 28, SE-786 97 Björbo

UN CPC code:
375 – Articles of concrete, cement and plaster.

Geographical scope:
Sweden

Application
An apartments exterior space which can be used for many different functions.

Technical Data
The product complies with the following technical standards:

- SS-EN 13369:2018,
- EKS11,
- EN 206

Manufacturing of the product:
The following manufacturing process is applied for this product:

- Raw materials are purchased and delivered to the plant.
- A mould is prepared, and reinforcement is mounted together with other castings.
- Concrete is mixed and poured into the mould.
- When the concrete has hardened, the mould is removed.
- The product is moved to storage.
- The finished product is loaded on a truck and transported to the customer.

Packaging
The product does not require packaging.

Reference service life
The expected service life is 50-100 years, according to the exposure class and Euro codes applicable.

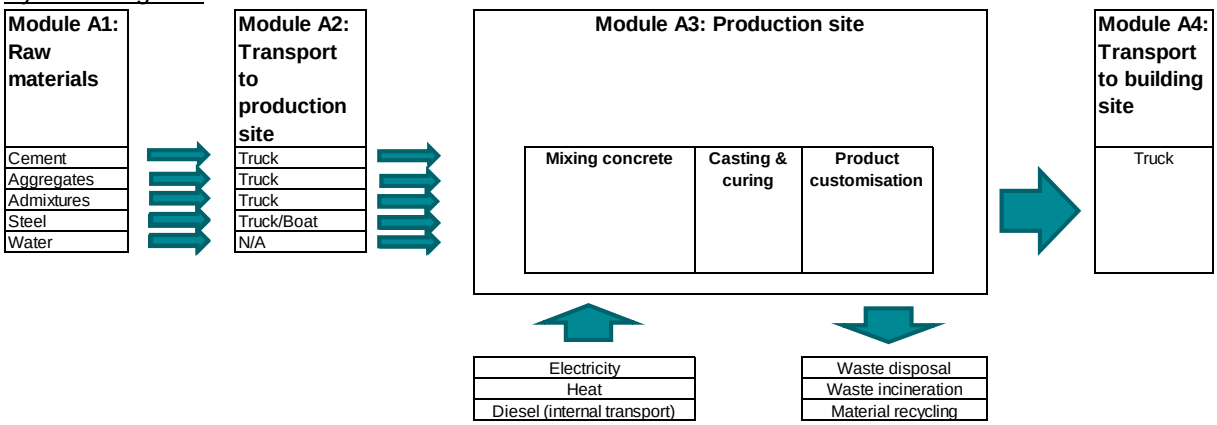
LCA information

Declared unit:
1 ton of prefabricated building element

Time representativeness:
The data used to model product manufacturing corresponds to 2019. The data from EPDs and generic databases are from 2011 – 2018. No data used is older than 10 years.

Database(s) and LCA software used:
Databases used are mainly from Thinkstep´s own database from 2020. The LCA software used is GaBi.

System diagram:



Description of system boundaries:
Cradle-to-gate.

Excluded lifecycle stages:
The life cycle modules included are those marked with an “X”.

Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
Raw material	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction, demolition	Transport	Waste processing	Disposal	Reuse, recycling or energy recovery potentials
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
x	x	x	x													

Allocation:
No other products are produced besides the concrete element and allocation procedure was not necessary.

Scenarios:
The analysis is carried out using factory-specific data for use of energy and utilities and waste generation, as well as product-specific data for use of raw materials. Therefore, the results represent the product system and no other scenarios were applied.

Data used:
Site-specific production data has been retrieved for 2019 from the production site. The upstream and downstream processes have been modelled based on data from EPDs and generic databases, mostly Thinkstep's database.

Cut-off:
The study applies a cut-off criterion of maximum 1% of the material and energy inputs of the system. This means that the sum of excluded material inputs does not exceed 1% of the total material inputs.

Transportation:
The transport of the raw materials to the production site is carried out by trucks, for the most part EURO6 with some exceptions. No empty return trips occur.

Energy utilities:
Only heat and electricity are used at the production site in Björbo. The company purchases electricity from hydropower, and data to model electricity generation has been obtained from the Thinkstep database. The heat is produced from heating oil, and generic data for Swedish oil heating has been used to model heat production.

Direct emissions from production site:
The only direct emissions from the production site come from an oil-powered boiler used for factory heating.

Content declaration

Material content:
The material content (in % weight, before curing) for the product is:

- Ballast: 68%,
- Cement: 18 %,
- Water: 8 %,
- Steel: <6 %,
- Admixtures: <1 %

No substances that appear in the REACH candidate list of SVHC (Candidate List of Substances of Very High Concern) are present or used in the product concerning this EPD.

Recycled material:
The product contains recycled material in the steel used as raw material.

Environmental performance

Potential environmental impact per ton of prefabricated element

Indicator	PRODUCTION				CONS TRUCTION
	Raw material supply (A1)	Transport (A2)	Manufacturing (A3)	Sum of A1-A3	Transport (A4)
Global warming potential – fossil (GWP) [kg CO_2 eq.]	2.06E+02	8.28E+00	1.24E+01	2.27E+02	2.34E+01
Depletion potential of the stratospheric ozone layer (ODP) [kg CFC-11 eq.]	4.11E-06	1.33E-15	7.89E-09	4.11E-06	3.83E-15
Acidification potential (AP) [kg SO_2 eq.]	3.15E-01	2.50E-02	3.65E-02	3.77E-01	1.96E-02
Eutrophication potential (EP) [kg $(PO_4)^{3-}$ eq.]	1.09E-01	5.87E-03	7.48E-03	1.22E-01	3.74E-03
Formation potential of tropospheric ozone (POCP) [kg C_2H_4 eq.]	3.67E-02	-1.56E-03	-6.61E-03	2.85E-02	-6.75E-04
Abiotic depletion potential (ADP-elements) for non-fossil resources [kg Sb eq.]	1.29E-03	5.61E-07	1.89E-06	1.30E-03	1.71E-06
Abiotic depletion potential (ADP-fossil fuels) for fossil resources [MJ]	1.11E+03	1.12E+02	1.38E+02	1.36E+03	3.17E+02

Use of resources per ton of prefabricated element

Indicator	PRODUCTION				CONS TRUCTION
	Raw material supply (A1)	Transport (A2)	Manufacturing (A3)	Sum of A1-A3	Transport (A4)
Use of renewable primary energy excluding renewable primary energy resources used as raw materials [MJ]	2.88E+02	5.57E+00	5.26E+01	3.46E+02	1.79E+01
Use of renewable primary energy resources used as raw materials [MJ]	1.19E+01	0.00E+00	0.00E+00	1.19E+01	0.00E+00
Total use of renewable primary energy resources, sum of two above (PERT) [MJ]	3.00E+02	5.57E+00	5.26E+01	3.58E+02	1.79E+01
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials [MJ]	1.26E+03	1.13E+02	2.62E+02	1.64E+03	3.18E+02
Use of non-renewable primary energy resources used as raw material [MJ]	4.84E+01	0.00E+00	0.00E+00	4.84E+01	0.00E+00
Total use of non-renewable primary energy resources (PENRT), sum of two above [MJ]	1.31E+03	1.13E+02	2.62E+02	1.68E+03	3.18E+02
Use of secondary material (SM) [kg]	5.37E+01	0.00E+00	0.00E+00	5.37E+01	0.00E+00
Use of renewable secondary fuels (RSF) [MJ]	9.15E+01	0.00E+00	0.00E+00	9.15E+01	0.00E+00
Use of non-renewable secondary fuels (NRSF) [MJ]	1.32E+02	0.00E+00	0.00E+00	1.32E+02	0.00E+00
Net use of fresh water (FW) [m3]	1.23E+03	6.48E-03	1.01E-01	1.23E+03	2.07E-02

Waste production per ton of prefabricated element

Indicator	PRODUCTION				CONS TRUCTION
	Raw material supply (A1)	Transport (A2)	Manufacturing (A3)	Sum of A1-A3	Transport (A4)
Hazardous waste disposed (HWD) [kg]	9.07E-03	4.58E-06	1.09E-01	1.18E-01	1.48E-05
Non-hazardous waste disposed (NHWD) [kg]	4.40E+01	1.65E-02	2.77E-01	4.43E+01	4.87E-02
Radioactive waste disposed (RWD) [kg]	1.39E-02	1.37E-04	5.14E-02	6.54E-02	3.94E-04

Output flows per ton of prefabricated element

Indicator	PRODUCTION				CONS TRUCTION
	Raw material supply (A1)	Transport (A2)	Manufacturing (A3)	Sum of A1-A3	Transport (A4)
Components for re-use [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling [kg]	3.25E+00	0.00E+00	0.00E+00	3.25E+00	0.00E+00
Materials for energy recovery [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported electrical energy [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported thermal energy [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

LCA: Interpretation

A contribution analysis shows that most of the environmental impact of the product can be attributed to the upstream (A1) production of the cement raw material, followed by the production of reinforcement steel. The manufacturing process contributes with relatively low shares of the impact of the product, which is caused for the most part using diesel for internal transport and the production of heat from oil.

Additional environmental information

Whenever a concrete structure has been deemed to be removed and demolished the concrete forms can be crushed. This crushed material can be used as filler in many building applications including the creation of new concrete forms.

References

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PCR 2012:01-SUB-PCR-G Concrete and concrete elements (EN 16757:2017).

Thinkstep (2017). GaBi Databases. http://www.gabi-software.com/international/databases/gabi-databases/

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