ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

SOLID STAIRS

BENDERS BYGGSYSTEM AB

Programme: **The International EPD® System, www.environdec.com**	Programme operator: **EPD International AB**	EPD registration number: **S-P-05309**	Publication date: 2022-04-04	Valid until: 2027-04-03	Geographical scope: **Sweden**

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com.

GENERAL INFORMATION

MANUFACTURER INFORMATION

Manufacturer	Benders Byggsystem AB
Address	Svarvarvägen 22, 738 33 Norberg
Contact details	info@benders.se
Website	https://www.bendersbyggsystem.se/

PRODUCT IDENTIFICATION

Product name	Solid stairs
Additional label(s)	Straight, curved and round stairs
Product number / reference	-
Place(s) of production	Norberg, Sweden
CPC code	375 – Articles of concrete, cement and plaster

The International EPD System

EPDs within the same product category but from different programmes may not be comparable.

EPD INFORMATION

The EPD owner has the sole ownership, liability, and responsibility for the EPD. Construction products EPDs may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

EPD program operator	EPD International AB
EPD standards	This EPD is in accordance with EN 15804+A2 and ISO 14025 standards.
Product category rules	The CEN standard EN 15804 serves as the core PCR. In addition, the Int'l EPD System PCR 2019:14 Construction products, version 1.11 (05.02.2021) is used.
EPD author	Anna Ahlgren and Erica Bender, Benders Byggsystem AB
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
Verification date	2022-03-21
EPD verifier	Silvia Vilčeková, Silcert, Ltd
EPD number	S-P-05309
ECO Platform nr.	-
Publishing date	2022-04-04
EPD valid until	2027-04-03

PRODUCT INFORMATION

PRODUCT DESCRIPTION

Concrete stairs without cladding or tiling, railings or bannisters. The prefabricated concrete stairs from Benders are more than just a construction intended to facilitate the passage between two levels. With stairs in concrete, you get a solid and beautiful staircase that fits into the buildings environment at the same time as it is durable and feels comfortable to walk on.

Benders offers stairs in three different designs - Straight, Curved and Round, for different types of constructions. Our concrete stairs are durable and are coated with terrazzo as standard. The stairs can also be delivered in gray concrete as a finished surface, or gray concrete for other cladding such as tiles, granite or carpet.

PRODUCT APPLICATION

The stairs are used indoor in buildings such as apartment buildings, office buildings, parking garages, shopping malls.

TECHNICAL SPECIFICATIONS

Concrete:
Compressive strength - fck= 30-45N/mm2
Reinforcing steel:
Ultimate tensile strength - ftk = 500 N/mm2
Tensile yield strength - fyk= 540N/mm2

PRODUCT STANDARDS

EN 14843 Trappor
The technical standard followed is: SS-EN 13369

PHYSICAL PROPERTIES OF THE PRODUCT

Additional information can be found at www.bendersbyggsystem.se/byggkomponenter/trappor/".

ADDITIONAL TECHNICAL INFORMATION

Further information can be found at https://www.bendersbyggsystem.se/.

PRODUCT RAW MATERIAL COMPOSITION

Product and Packaging Material	Weight, kg	Post-consumer %	Renewable %	Country Region of origin
Concrete	971	-	0	Sweden
Steel	29	99	0	Sweden
Wood beam	2,714	-	100	Sweden

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

PRODUCT LIFE-CYCLE

MANUFACTURING AND PACKAGING (A1-A3)

The production of the solid stairs begins with the preparation of the mould, which includes cleaning and applying form oil. Reinforcement steel is placed in the right place after drawing. After casting the stairs are left to cure. After curing, the stairs are lift out from the mould and refurbished. The stairs are placed on wooden beams during storage. Eventually, the elements are moved out and transported to the construction site.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

The transportation distance is defined according to the PCR. Average distance of transportation from production plant to building site is assumed as 170 km and the transportation method is assumed to be lorry. Vehicle fuels varies from diesel to biodiesel. Vehicle capacity utilization volume factor is assumed to be 100 % which means full load. In reality, it may vary but as role of transportation emissions in total results is small, the variety in load is assumed to be negligible. Empty returns are not taken into account as it is assumed that return trip is used by the transportation company to serve the needs of other clients. Transportation does not cause losses as product are fastened properly.

Installation includes the energy use and material consumption as well as the packaging waste generated. Production loss at installation is assumed negligible as the precast elements are delivered ready made from the factory. Energy consumption of a construction process for a precast element is on the average 132.5 MJ/m3 (Abey and Anand, 2019). Therefore, energy consumption is 132,5/2,4=55,2 MJ/ton product. (Concrete density 2,4 ton/m3). The source of energy is diesel fuel used by work machines.

PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD covers the carbonation process in B1 and rest of the modules in B are not declared.

PRODUCT END OF LIFE (C1-C4, D)

At the end-of-life, in the demolition phase 100% of the waste is assumed to be collected as separate construction waste. The demolition process consumes energy in the form of diesel fuel used by building machines. Energy consumption of a demolition process is on the average 10 kWh/m2 (Bozdağ, Ö & Seçer, M. 2007). Basing on a Level(s) project, an average mass of a reinforced concrete building is about 1000 kg/m2. Therefore, energy consumption demolition is assumed to be 10 kWh/1000 kg = 0,01 kWh/kg. The source of energy is diesel fuel used by work machines (C1).

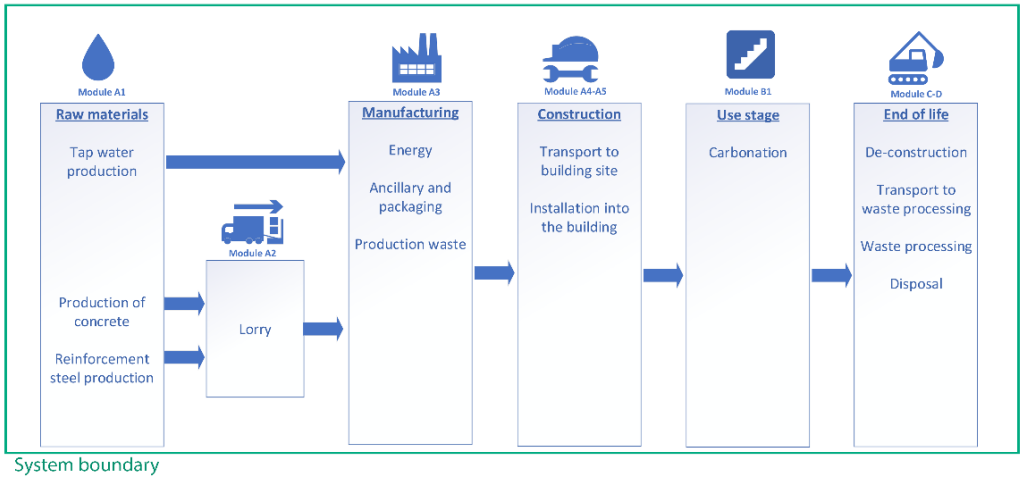
The dismantled stairs are delivered to the nearest construction waste treatment plant. It is estimated that there is no mass loss

during the use of the product, therefore the end-of-life product is assumed that it has the same weight with the declared product. Transportation distance to the closest disposal area is estimated as 50 km and the transportation method is lorry which is the most common (C2).

At the waste treatment plant, waste that can be reused, recycled or recovered for energy is separated and diverted for further use. It can be assumed that 100% of the stairs are transported to a waste treatment plant, where the stairs are crushed and steel is separated. About 95% of steel (World Steel Association. 2020) and 80% of concrete (Betoniteollisuus ry, 2020) are recycled. The process losses of the waste treatment plant are assumed to be negligible (C3). The remaining 20% of concrete and 5% of steel are assumed to be sent to landfill (C4).

Due to the recycling potential of reinforcement steel and concrete, they can be used as secondary raw material, which avoids the use of virgin raw materials. The 80 % of concrete and 95% of steel going to waste processing are converted into secondary raw materials after recycling. The recycled material content in the concrete itself is assumed to be 0 % but in steel is assumed to be >99 % (D).

MANUFACTURING PROCESS



LIFE-CYCLE ASSESSMENT

LIFE-CYCLE ASSESSMENT INFORMATION

Period for data	2020
Geographical scope:	Sweden

DECLARED AND FUNCTIONAL UNIT

Declared unit	1 tonne
Mass per declared unit	1000 kg
Functional unit	-
Reference service life	100 years

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0
Biogenic carbon content in packaging, kg C	0,6919

SYSTEM BOUNDARY

This EPD covers the *cradle to gate with options* scope with following modules; A1 (Raw material supply), A2 (Transport) and A3 (Manufacturing), A4 (Transport), A5 (Assembly), B1 (Carbonation) as well as C1 (Deconstruction), C2 (Transport at end-of-life), C3 (Waste processing) and C4 (Disposal). In addition, module D - benefits and loads beyond the system boundary is included.

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	D	D
x	x	x	x	x	x	MND	MND	MND	MND	MND	MND	x	x	x	x	x	x	x
Geography, by two-letter ISO country code or regions. The International EPD System only.																		
SE	SE	SE	SE	SE	EU	-	-	-	-	-	-	SE	SE	SE	SE	SE		
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstr./demol.	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = MND. Modules not relevant = MNR.

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the EN 15804:2012+A2:2019 and the applied PCR. The study does not exclude any hazardous materials or substances.

The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation.

In this study, as per EN 15804, allocation is conducted in the following order;

1. Allocation should be avoided.
2. Allocation should be based on physical properties (e.g. mass, volume) when the difference in revenue is small.

3. Allocation should be based on economic values.

Waste materials are generated in the production which is used as filling material for example in roads. A conservative assumption is made that all environmental impact is allocated to the products and not to the co-product (i.e. the filling material). The total amount of filling material is 0.011 ton per declared unit (1,1 %).

Allocation used in Ecoinvent 3.6 environmental data sources follows the methodology 'allocation, cut-off by classification'. This methodology is in line with the requirements of the EN 15804 - standard.

AVERAGES AND VARIABILITY

The International EPD System additional data requirements

Data specificity and GWP-GHG variability for GWP-GHG for A1-A3.

Supply-chain specific data for GWP-GHG	>90 %
Variation in GWP-GHG between products	-%
Variation in GWP-GHG between sites	-%

ENVIRONMENTAL IMPACT DATA

Note: additional environmental impact data may be presented in annexes.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total	kg CO_2e	1,31E2	3,12E0	2,93E0	1,37E2	2,46E1	1,13E1	-9,35E0	MND	MND	MND	MND	MND	MND	3,3E0	4,55E0	5,68E0	1,03E0	-4,99E0
GWP – fossil	kg CO_2e	1,29E2	3,11E0	5,51E0	1,38E2	2,5E1	8,68E0	-9,35E0	MND	MND	MND	MND	MND	MND	3,3E0	4,54E0	5,67E0	1,03E0	-6,18E0
GWP – biogenic	kg CO_2e	1,38E0	2,26E-3	-2,58E0	-1,19E0	-3,65E0	2,57E0	0E0	MND	MND	MND	MND	MND	MND	9,17E-4	3,3E-3	8,55E-3	2,04E-3	1,2E0
GWP – LULUC	kg CO_2e	6,05E-2	9,37E-4	1,82E-3	6,33E-2	2,11E-2	2,48E-3	0E0	MND	MND	MND	MND	MND	MND	2,79E-4	1,37E-3	1,35E-3	3,06E-4	-1,15E-2
Ozone depletion pot.	kg CFC_{-11}e	8,62E-6	7,32E-7	1,2E-6	1,05E-5	4,24E-6	1,32E-6	0E0	MND	MND	MND	MND	MND	MND	7,12E-7	1,07E-6	2,03E-6	4,24E-7	-7,02E-7
Acidification potential	mol H^+e	5,97E-1	1,31E-2	5,32E-2	6,64E-1	4,05E-1	6,84E-2	0E0	MND	MND	MND	MND	MND	MND	3,45E-2	1,91E-2	5,53E-2	9,78E-3	-4,78E-2
EP-freshwater[2)]	kg Pe	2,1E-3	2,53E-5	5,26E-5	2,17E-3	2,15E-3	1,07E-4	0E0	MND	MND	MND	MND	MND	MND	1,33E-5	3,7E-5	5,58E-5	1,24E-5	-4,9E-4
EP-marine	kg Ne	1,76E-1	3,94E-3	2,24E-2	2,02E-1	2,83E-1	2,67E-2	0E0	MND	MND	MND	MND	MND	MND	1,52E-2	5,75E-3	2,07E-2	3,37E-3	-1,04E-2
EP-terrestrial	mol Ne	2E0	4,35E-2	2,46E-1	2,29E0	1,79E0	2,93E-1	0E0	MND	MND	MND	MND	MND	MND	1,67E-1	6,35E-2	2,27E-1	3,71E-2	-1,44E-1
POCP (“smog”)	kg NMVOCe	5,29E-1	1,4E-2	7,26E-2	6,16E-1	2,64E-1	8,12E-2	0E0	MND	MND	MND	MND	MND	MND	4,59E-2	2,04E-2	6,48E-2	1,08E-2	-2,9E-2
ADP-minerals & metals	kg Sbe	8,79E-5	5,39E-5	3,19E-5	1,74E-4	1,15E-3	3,58E-4	0E0	MND	MND	MND	MND	MND	MND	5,03E-6	7,75E-5	3,98E-5	9,41E-6	-8,85E-4
ADP-fossil resources	MJ	6,42E2	4,91E1	8,19E1	7,73E2	3,15E2	1E2	0E0	MND	MND	MND	MND	MND	MND	4,54E1	7,07E1	1,36E2	2,88E1	-1,02E2
Water use[1)]	m^3e depr.	2,3E1	1,8E-1	2,36E-1	2,34E1	8,8E0	1,46E0	0E0	MND	MND	MND	MND	MND	MND	8,46E-2	2,63E-1	5,33E0	1,33E0	-1,41E1

1) GWP = Global Warming Potential; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential. 2) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. 3) Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO_4e.

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	4,68E-6	2,82E-7	1,34E-6	6,31E-6	3,57E-6	1,54E-6	0E0	MND	MND	MND	MND	MND	MND	9,14E-7	4,11E-7	1,19E-6	1,9E-7	-5,15E-7
Ionizing radiation[3)]	kBq U235e	2,97E0	2,12E-1	3,41E-1	3,52E0	1,22E0	3,82E-1	0E0	MND	MND	MND	MND	MND	MND	1,94E-1	3,09E-1	5,62E-1	1,18E-1	-7,57E-1
Ecotoxicity (freshwater)	CTUe	1,64E3	3,7E1	5,71E1	1,74E3	5,65E2	1,1E2	0E0	MND	MND	MND	MND	MND	MND	2,66E1	5,4E1	8,49E1	1,82E1	-1,05E2
Human toxicity, cancer	CTUh	9,73E-8	9,47E-10	3,19E-9	1,01E-7	2,64E-8	2,83E-9	0E0	MND	MND	MND	MND	MND	MND	9,53E-10	1,38E-9	2,17E-9	4,3E-10	-7,04E-9
Human tox. non-cancer	CTUh	3,08E-6	4,39E-8	5,67E-8	3,18E-6	1,23E-6	9,32E-8	0E0	MND	MND	MND	MND	MND	MND	2,35E-8	6,4E-8	6,4E-8	1,33E-8	-5,06E-7
SQP	-	1,73E3	7,31E1	3,8E0	1,8E3	9,22E2	2,37E1	0E0	MND	MND	MND	MND	MND	MND	1,16E0	1,07E2	1,95E2	4,9E1	-7,68E1

4) SQP = Land use related impacts/soil quality.5) EN 15804+A2 disclaimer for Ionizing radiation, human health. 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.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy	MJ	2,83E2	6,18E-1	5,34E2	8,18E2	2,49E2	2,27E0	0E0	MND	MND	MND	MND	MND	MND	2,45E-1	8,9E-1	1,04E0	2,33E-1	-3,35E1
Renew. PER as material	MJ	3,03E-1	0E0	2,26E1	2,29E1	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Total use of renew. PER	MJ	2,83E2	6,18E-1	5,57E2	8,41E2	2,49E2	2,27E0	0E0	MND	MND	MND	MND	MND	MND	2,45E-1	8,9E-1	1,04E0	2,33E-1	-3,35E1
Non-re. PER as energy	MJ	9,57E2	4,91E1	8,19E1	1,09E3	3,15E2	1E2	0E0	MND	MND	MND	MND	MND	MND	4,54E1	7,07E1	1,36E2	2,88E1	-1,02E2
Non-re. PER as material	MJ	4,07E0	0E0	0E0	4,07E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Total use of non-re. PER	MJ	9,61E2	4,91E1	8,19E1	1,09E3	3,15E2	1E2	0E0	MND	MND	MND	MND	MND	MND	4,54E1	7,07E1	1,36E2	2,88E1	-1,02E2
Secondary materials	kg	3,73E1	0E0	2,47E-3	3,73E1	0E0	9,72E-3	0E0	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	-8,98E-1
Renew. secondary fuels	MJ	8,89E1	0E0	0E0	8,89E1	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Non-ren. secondary fuels	MJ	1,31E2	0E0	0E0	1,31E2	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Use of net fresh water	m^3	2,14E0	1,02E-2	2,78E-2	2,18E0	1,11E0	5,88E-2	0E0	MND	MND	MND	MND	MND	MND	4,01E-3	1,47E-2	1,27E-1	3,15E-2	-1,13E0

6) PER = Primary energy resources

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	1,99E-1	4,77E-2	1,63E-1	4,1E-1	1,12E0	3,08E-1	0E0	MND	MND	MND	MND	MND	MND	4,88E-2	6,87E-2	0E0	2,69E-2	-3,67E-1
Non-hazardous waste	kg	9,37E0	5,28E0	3,05E0	1,77E1	5,03E1	4,67E0	0E0	MND	MND	MND	MND	MND	MND	5,22E-1	7,6E0	0E0	1,96E2	-2,11E1
Radioactive waste	kg	3,38E-2	3,37E-4	5,4E-4	3,46E-2	1,72E-3	5,77E-4	0E0	MND	MND	MND	MND	MND	MND	3,18E-4	4,85E-4	0E0	1,91E-4	-5,47E-4

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0E0	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Materials for recycling	kg	2,81E1	0E0	3,06E0	3,11E1	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	0E0	0E0	8,04E2	0E0	0E0
Materials for energy rec	kg	6,46E-2	0E0	0E0	6,46E-2	0E0	1,32E0	0E0	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Exported energy	MJ	3,85E-3	0E0	0E0	3,85E-3	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0

ENVIRONMENTAL IMPACTS – GWP-GHG - THE INTERNATIONAL EPD SYSTEM

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG	kg CO_2e	1,29E2	3,11E0	5,51E0	1,38E2	2,5E1	8,68E0	-9,35E0	MND	MND	MND	MND	MND	MND	3,3E0	4,54E0	5,67E0	1,03E0	-6,18E0

8) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013) This indicator Is almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

SCENARIO DOCUMENTATION

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Electricity production, hydro, run-to-river (ref.product: electricity, high voltage),Ecoinvent 3.6 (2019), Sweden.
Electricity CO_2e / kWh	0,0039

BIBLIOGRAPHY

ISO 14025:2010 Environmental labels and declarations – Type III environmental declarations. Principles and procedures.

ISO 14040:2006 Environmental management. Life cycle assessment. Principles and frameworks.

ISO 14044:2006 Environmental management. Life cycle assessment. Requirements and guidelines.

Ecoinvent database v3.6 (2019) and One Click LCA database.

EN 15804:2012+A2:2019 Sustainability in construction works – Environmental product declarations – Core rules for the product category of construction products.

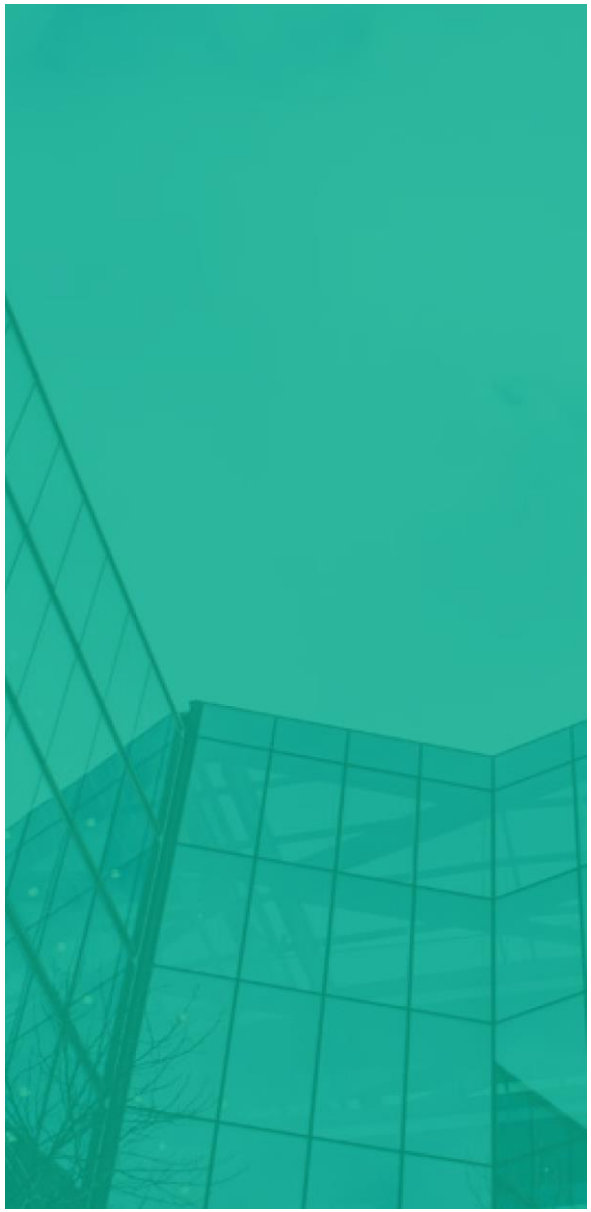
Int'l EPD System PCR 2019:14 Construction products, version 1.11 (05.02.2021)

General Programme Instructions of the international EPD® system. Version 4.0

LCA Background report Solid Stairs 211207.

ABOUT THE MANUFACTURER

Ever since starting in 1960, our ambition has been to satisfy customer needs. Our operations are permeated by a local presence and a local responsiveness to the business climate. Together with receptiveness, this provides the foundations for long and strong relations with customers, suppliers and, not least, personnel. From the start onwards, positive development has contributed to Benders now being active in several different business areas and establishing itself as one of the market-leading producers of concrete and natural stone products in the Nordic countries. At the same time, our shares of the new markets in Europe are ever increasing and our ranges in construction products and construction systems grow with every season.



AUTHOR AND CONTRIBUTORS

Manufacturer	Benders Byggsystem AB
EPD author	Anna Ahlgren and Erica Bender, Benders Byggsystem AB
EPD verifier	Silvia Vilčeková, Silcert, Ltd
EPD program operator	The International EPD System
Background data	This EPD is based on Ecoinvent 3.6 (cut-off) and One Click LCA databases.
LCA software	The LCA and EPD have been created using One Click LCA Pre-Verified EPD Generator for Cementitious Products

VERIFICATION STATEMENT

VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with EN 15804, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The background report (project report) for this EPD

Why does verification transparency matter? Read more online.

VERIFICATION OVERVIEW

Following independent third party has verified this specific EPD:

EPD verification information	Answer
Independent EPD verifier	Silvia Vilčeková, Silcert, Ltd
EPD verification started on	2022-02-25
EPD verification completed on	2022-03-21
Supply-chain specific data %	>90
Approver of the EPD verifier	The International EPD System

Author & tool verification	Answer
EPD author	Anna Ahlgren and Erica Bender,
EPD author training completion	2021-08-18
EPD Generator module	Cementitious Products
Independent software verifier	Ugo Pretato, Studio Fieschi & soci
Software verification date	2021-05-11

THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of

- the data collected and used in the LCA calculations,
- the way the LCA-based calculations have been carried out,
- the presentation of environmental data in the EPD, and
- other additional environmental information, as present

with respect to the procedural and methodological requirements in ISO 14025:2010 and EN 15804:2012+A2:2019.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

Silvia Vilčeková, Silcert, Ltd

VERIFICATION AND REGISTRATION (ENVIRONDEC)

ISO standard ISO 21930 and CEN standard EN 15804 serves as the core Product Category Rules (PCR)	
PCR	PCR 2019:14 Construction products, version 1.11
PCR review was conducted by:	The Technical Committee of the International EPD® System. See www.environdec.com/TC for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact.
Independent third-party verification of the declaration and data, according to ISO 14025:2006:	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
Third party verifier	Silvia Vilčeková, Silcert, Ltd
	Approved by: The International EPD® System Technical Committee, supported by the Secretariat
Procedure for follow-up during EPD validity involves third party verifier	☐ yes ☑ no

THE INTERNATIONAL EPD® SYSTEM

EPD International AB, Box 210 60, SE-100 31 Stockholm, Sweden, E-mail: info@environdec.com

ANNEX 1 : ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2e	1,32E2	3,13E0	5,45E0	1,41E2	2,46E1	8,58E0	-9,35E0	MND	MND	MND	MND	MND	MND	3,27E0	4,5E0	5,58E0	1,01E0	-6,1E0
Ozone depletion Pot.	kg CFC_{-11}e	3,76E-6	5,9E-7	9,54E-7	5,31E-6	3,72E-6	1,09E-6	0E0	MND	MND	MND	MND	MND	MND	5,63E-7	8,49E-7	1,6E-6	3,36E-7	-6,42E-7
Acidification	kg SO_2e	2,66E-1	6,43E-3	1,06E-2	2,83E-1	2,43E-1	1,98E-2	0E0	MND	MND	MND	MND	MND	MND	4,87E-3	9,25E-3	1,85E-2	4,08E-3	-2,82E-2
Eutrophication	kg PO_4^3e	5,91E-2	1,3E-3	2,48E-3	6,29E-2	1,49E-1	5,12E-3	0E0	MND	MND	MND	MND	MND	MND	8,57E-4	1,87E-3	3,54E-3	7,89E-4	-1,46E-2
POCP (“smog”)	kg C_2H_4e	2,12E-2	4,07E-4	9,52E-4	2,26E-2	5,02E-3	1,62E-3	0E0	MND	MND	MND	MND	MND	MND	5,01E-4	5,86E-4	1,43E-3	2,99E-4	-1,2E-3
ADP-elements	kg Sbe	8,79E-5	5,39E-5	3,19E-5	1,74E-4	1,15E-3	3,58E-4	0E0	MND	MND	MND	MND	MND	MND	5,03E-6	7,75E-5	3,98E-5	9,41E-6	-8,85E-4
ADP-fossil	MJ	6,42E2	4,91E1	8,19E1	7,73E2	3,15E2	1E2	0E0	MND	MND	MND	MND	MND	MND	4,54E1	7,07E1	1,36E2	2,88E1	-1,02E2