ENVIRONMENTAL PRODUCT DECLARATION

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

Sandwich wall element
Benders Byggsystem AB

EPD HUB, HUB-1677
Publishing date 28 June 2024, last updated on 28 June 2024, valid until 28 June 2029.

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Benders Byggsystem AB
Address	Mariefredsvägen 41, Strängnäs, Sweden
Contact details	info@benders.se
Website	https://www.bendersbyggsystem.se/

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804+A2:2019 and ISO 14025
PCR	EPD Hub Core PCR version 1.1, 5 Dec 2023
Sector	Construction product
Category of EPD	Third party verified EPD
Parent EPD number	
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Sofia Bender
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Magaly González Vázquez, as an authorized verifier acting for EPD Hub Limited

The manufacturer 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 and if they are not compared in a building context.

PRODUCT

Product name	Sandwich wall element
Additional labels	-
Product reference	-
Place of production	Strängnäs, Sweden
Period for data	Calender year 2023
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	-

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 ton
Declared unit mass	1000 kg
GWP-fossil, A1-A3 (kgCO2e)	1,53E+02
GWP-total, A1-A3 (kgCO2e)	1,53E+02
Secondary material, inputs (%)	2.5
Secondary material, outputs (%)	0.1
Total energy use, A1-A3 (kWh)	393
Net fresh water use, A1-A3 (m3)	1.87

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Benders Byggsystem is a part of the Benders group. Benders' ambition is to be a Swedish family-owned company that develops, produces and markets competitive high-quality products and services for the construction and civil engineering sector. Benders is being active in several different business areas and is one of the market-leading producers of concrete and natural stone products in the Nordic countries.

PRODUCT DESCRIPTION

Sandwich Wall elements are made of two concrete slabs with intermediate insulation. Application: Carrying and non-supporting elements in combination with floor joints laid on or adjacent to the facade. The technical standard followed is: SS-EN 14992. The product number is: SS-EN 14992 W-vägg. Technical information: Concrete: Compressive strength - fck= 30-45N/mm2 Reinforcing steel: Ultimate tensile strength - ftk = 500 N/mm2 Tensile yield strength - fyk= 540N/mm2

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

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	2,6	Sweden
Minerals	96,8	Sweden
Fossil materials	0,58	Sweden
Bio-based materials	N/A	-

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	-
Biogenic carbon content in packaging, kg C	-

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 ton
Mass per declared unit	1000 kg
Functional unit	-
Reference service life	-

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

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

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		
x	x	x	x	x	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	x		
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.

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

The production starts by transporting the raw materials from our suppliers to the factory. The casting table/pallet is prepared and form oil is applied. Reinforcement steel, insulation and cast in materials are placed according to the element drawing. The mold is then filled with the concrete mixture and the wall is left to cure. After curing the wall is lifted out from the mold and placed into storage. Eventually, the elements are moved out and transported to the construction site. Production losses are taken into account by measuring the concrete waste used as landfill. The factory uses hydro based electricity. Waste is transported to a waste facility. The included outer panel of the sandwich wall is concrete.

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 100 km and the transportation method is assumed to be lorry. Vehicle fuel is diesel. 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 products are loaded properly. Also, volume capacity utilisation factor is assumed to be 100 % for the loaded products. Installation includes the energy use and material consumption. No waste is generated during installation. 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.

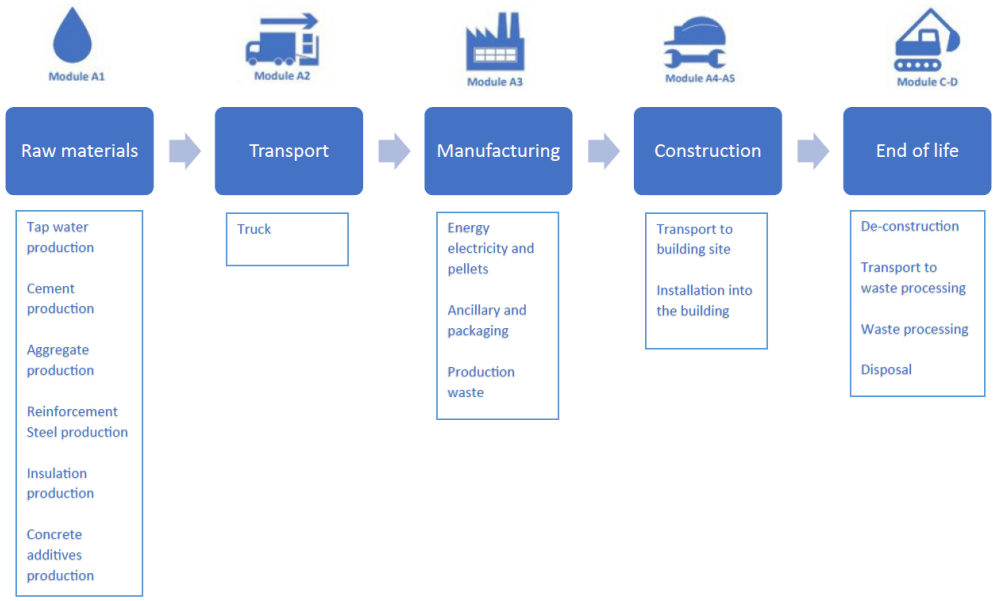
PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase.
Air, soil, and water impacts during the use phase have not been studied.

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 solid wall element is delivered to the nearest construction waste 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. So it can be assumed that 100% of solid wall element are transported to a waste treatment plant, where the walls 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 send to the 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 it is assumed to be 100% according to the supplier (D).

MANUFACTURING PROCESS



LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard 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. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	No allocation
Packaging materials	Not applicable
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

AVERAGES AND VARIABILITY

Type of average	No averaging
Averaging method	Not applicable
Variation in GWP-fossil for A1-A3	-

This EPD is product and factory specific and does not contain average calculations.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.8, Plastics Europe, Federal LCA Commons and One Click LCA databases as sources of environmental data.

ENVIRONMENTAL IMPACT DATA

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[1)]	kg CO_2e	1,44E+02	2,97E+00	6,12E+00	1,53E+02	9,39E+00	6,76E+00	MND	MND	MND	MND	MND	MND	MND	9,19E-01	4,69E+00	1,05E+01	2,97E+00	-2,23E+01
GWP – fossil	kg CO_2e	1,43E+02	2,97E+00	6,11E+00	1,53E+02	9,38E+00	6,76E+00	MND	MND	MND	MND	MND	MND	MND	9,19E-01	4,69E+00	1,05E+01	2,97E+00	-2,22E+01
GWP – biogenic	kg CO_2e	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-2,45E-02
GWP – LULUC	kg CO_2e	3,82E-02	1,09E-03	6,08E-03	4,54E-02	3,46E-03	1,96E-03	MND	MND	MND	MND	MND	MND	MND	9,15E-05	1,73E-03	5,75E-04	5,14E-03	-2,81E-02
Ozone depletion pot.	kg CFC_{-11}e	2,29E-06	6,82E-07	6,00E-07	3,57E-06	2,16E-06	1,20E-06	MND	MND	MND	MND	MND	MND	MND	1,97E-07	1,08E-06	9,70E-07	7,92E-07	-8,39E-07
Acidification potential	mol H^+e	3,47E-01	1,26E-02	3,90E-02	3,98E-01	3,97E-02	5,97E-02	MND	MND	MND	MND	MND	MND	MND	9,55E-03	1,99E-02	4,78E-02	2,56E-02	-1,58E-01
EP-freshwater[2)]	kg Pe	8,48E-03	2,43E-05	1,05E-04	8,61E-03	7,68E-05	2,69E-05	MND	MND	MND	MND	MND	MND	MND	3,05E-06	3,84E-05	1,79E-05	2,35E-05	-9,01E-04
EP-marine	kg Ne	4,74E-02	3,73E-03	1,56E-02	6,67E-02	1,18E-02	2,51E-02	MND	MND	MND	MND	MND	MND	MND	4,23E-03	5,90E-03	2,11E-02	1,01E-02	-2,41E-02
EP-terrestrial	mol Ne	1,09E+00	4,12E-02	1,79E-01	1,31E+00	1,30E-01	2,76E-01	MND	MND	MND	MND	MND	MND	MND	4,64E-02	6,51E-02	2,32E-01	1,10E-01	-2,90E-01
POCP ("smog")[3)]	kg NMVOCe	3,08E-01	1,32E-02	4,22E-02	3,64E-01	4,17E-02	7,57E-02	MND	MND	MND	MND	MND	MND	MND	1,28E-02	2,08E-02	6,36E-02	3,11E-02	-8,19E-02
ADP-minerals & metals[4)]	kg Sbe	9,49E-05	6,95E-06	9,73E-06	1,12E-04	2,20E-05	2,70E-06	MND	MND	MND	MND	MND	MND	MND	4,66E-07	1,10E-05	3,51E-06	5,32E-06	-9,59E-05
ADP-fossil resources	MJ	7,91E+02	4,45E+01	3,96E+01	8,75E+02	1,41E+02	6,91E+01	MND	MND	MND	MND	MND	MND	MND	1,24E+01	7,05E+01	6,16E+01	5,33E+01	-3,11E+02
Water use[5)]	m^3e depr.	3,18E+01	1,99E-01	3,72E+00	3,58E+01	6,31E-01	9,61E-01	MND	MND	MND	MND	MND	MND	MND	3,32E-02	3,15E-01	3,54E-01	1,89E-01	-1,75E+01

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) 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 experience with the indicator.

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	3,43E-06	3,42E-07	7,40E-07	4,52E-06	1,08E-06	1,48E-06	MND	MND	MND	MND	MND	MND	MND	2,56E-07	5,41E-07	7,21E-06	2,07E-06	-2,61E-06
Ionizing radiation[6)]	kBq U235e	6,72E+03	2,12E-01	2,56E-01	6,73E+03	6,71E-01	3,70E-01	MND	MND	MND	MND	MND	MND	MND	5,68E-02	3,36E-01	2,85E-01	2,47E-01	-4,06E+00
Ecotoxicity (freshwater)	CTUe	2,63E+02	4,01E+01	2,21E+02	5,23E+02	1,27E+02	6,81E+01	MND	MND	MND	MND	MND	MND	MND	7,43E+00	6,34E+01	3,94E+01	3,72E+01	-6,16E+02
Human toxicity, cancer	CTUh	1,70E-07	9,85E-10	5,74E-09	1,77E-07	3,11E-09	2,07E-09	MND	MND	MND	MND	MND	MND	MND	2,85E-10	1,56E-09	1,84E-09	1,18E-09	-1,24E-08
Human tox. non-cancer	CTUh	1,55E-06	3,97E-08	1,39E-07	1,73E-06	1,25E-07	4,61E-08	MND	MND	MND	MND	MND	MND	MND	5,38E-09	6,27E-08	3,61E-08	2,79E-08	-2,77E-07
SQP[7)]	-	3,26E+02	5,13E+01	4,97E+02	8,74E+02	1,62E+02	2,48E+01	MND	MND	MND	MND	MND	MND	MND	1,61E+00	8,12E+01	9,05E+00	7,24E+01	-2,00E+02

6) 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; 7) SQP = Land use related impacts/soil quality.

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[8)]	MJ	1,74E+02	5,02E-01	1,74E+02	3,48E+02	1,59E+00	1,37E+00	MND	MND	MND	MND	MND	MND	MND	7,07E-02	7,94E-01	4,21E-01	5,43E-01	-3,69E+01
Renew. PER as material	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	1,74E+02	5,02E-01	1,74E+02	3,48E+02	1,59E+00	1,37E+00	MND	MND	MND	MND	MND	MND	MND	7,07E-02	7,94E-01	4,21E-01	5,43E-01	-3,69E+01
Non-re. PER as energy	MJ	7,12E+02	4,46E+01	3,72E+01	7,94E+02	1,41E+02	8,18E+01	MND	MND	MND	MND	MND	MND	MND	1,24E+01	7,05E+01	6,16E+01	5,33E+01	-2,66E+02
Non-re. PER as material	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-re. PER	MJ	7,12E+02	4,46E+01	3,72E+01	7,94E+02	1,41E+02	8,18E+01	MND	MND	MND	MND	MND	MND	MND	1,24E+01	7,05E+01	6,16E+01	5,33E+01	-2,66E+02
Secondary materials	kg	2,50E+01	1,24E-02	3,17E-02	2,51E+01	3,91E-02	2,70E-02	MND	MND	MND	MND	MND	MND	MND	4,84E-03	1,96E-02	2,80E-02	1,66E-02	9,84E-01
Renew. secondary fuels	MJ	1,03E+02	1,25E-04	2,14E-04	1,03E+02	3,95E-04	8,97E-05	MND	MND	MND	MND	MND	MND	MND	1,58E-05	1,97E-04	1,10E-04	2,20E-04	-1,00E-02
Non-ren. secondary fuels	MJ	1,68E+02	0,00E+00	0,00E+00	1,68E+02	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	1,80E+00	5,77E-03	6,90E-02	1,87E+00	1,83E-02	5,13E-02	MND	MND	MND	MND	MND	MND	MND	7,51E-04	9,13E-03	4,77E-03	3,42E-02	-4,26E-01

8) 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	9,22E-01	5,91E-02	2,41E-01	1,22E+00	1,87E-01	1,45E-01	MND	MND	MND	MND	MND	MND	MND	1,66E-02	9,34E-02	9,24E-02	7,01E-02	-1,41E+00
Non-hazardous waste	kg	6,95E+02	9,71E-01	1,33E+01	7,09E+02	3,07E+00	2,56E+00	MND	MND	MND	MND	MND	MND	MND	1,16E-01	1,54E+00	2,66E+00	2,00E+00	-3,79E+01
Radioactive waste	kg	6,17E-03	2,98E-04	2,31E-04	6,70E-03	9,43E-04	5,38E-04	MND	MND	MND	MND	MND	MND	MND	8,71E-05	4,71E-04	4,29E-04	3,58E-04	-1,17E-03

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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	2,47E+01	0,00E+00	9,98E-01	2,57E+01	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	1,05E+00	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	1,10E+01	1,10E+01	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

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	1,46E+02	1,58E+00	6,55E+00	1,55E+02	9,29E+00	6,70E+00	MND	MND	MND	MND	MND	MND	MND	9,09E-01	4,64E+00	1,04E+01	2,90E+00	-2,16E+01
Ozone depletion Pot.	kg CFC_{-11}e	4,05E-06	2,91E-07	5,13E-07	4,86E-06	1,71E-06	9,50E-07	MND	MND	MND	MND	MND	MND	MND	1,56E-07	8,55E-07	7,69E-07	6,27E-07	-6,94E-07
Acidification	kg SO_2e	3,55E-01	5,26E-03	2,68E-02	3,87E-01	3,09E-02	4,33E-02	MND	MND	MND	MND	MND	MND	MND	6,81E-03	1,54E-02	3,41E-02	1,88E-02	-1,31E-01
Eutrophication	kg PO_4^3e	1,10E-01	1,20E-03	1,24E-02	1,23E-01	7,03E-03	1,03E-02	MND	MND	MND	MND	MND	MND	MND	1,58E-03	3,52E-03	8,79E-03	1,03E-02	-3,56E-02
POCP (“smog”)	kg C_2H_4e	1,59E-02	2,05E-04	1,30E-03	1,74E-02	1,21E-03	1,04E-03	MND	MND	MND	MND	MND	MND	MND	1,49E-04	6,03E-04	7,56E-04	6,23E-04	-7,41E-03
ADP-elements	kg Sbe	1,01E-02	3,63E-06	8,78E-06	1,01E-02	2,13E-05	1,27E-04	MND	MND	MND	MND	MND	MND	MND	4,59E-07	1,07E-05	3,43E-06	5,22E-06	-9,51E-05
ADP-fossil	MJ	1,17E+03	2,40E+01	3,96E+01	1,24E+03	1,41E+02	8,18E+01	MND	MND	MND	MND	MND	MND	MND	1,24E+01	7,05E+01	6,16E+01	5,33E+01	-3,11E+02

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[9)]	kg CO_2e	1,43E+02	2,97E+00	6,11E+00	1,53E+02	9,38E+00	6,76E+00	MND	MND	MND	MND	MND	MND	MND	9,19E-01	4,69E+00	1,05E+01	2,97E+00	-2,22E+01

9) 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). In addition, the characterisation factors for the flows - CH4 fossil, CH4 biogenic and Dinitrogen monoxide - were updated in line with the guidance of IES PCR 1.2.5 Annex 1. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterization factor for biogenic CO2 is set to zero.

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 reference standard, 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 digital background data for this EPD

Why does verification transparency matter? Read more online
This EPD has been generated by One Click LCA EPD generator, which has been verified and approved by the EPD Hub.

THIRD-PARTY VERIFICATION STATEMENT

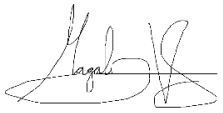
I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried 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 reference standard.

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.

Magaly González Vázquez, as an authorized verifier acting for EPD Hub Limited
28.06.2024



VERIFIED ISO 14025