

# ENVIRONMENTAL PRODUCT DECLARATION

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

**EVAshelters**

**Rakennusbetoni- ja Elementti Oy (FI)**



**EPD HUB, HUB-2328**

Published on 22.02.2025, last updated on 22.02.2025, valid until 21.02.2030

## GENERAL INFORMATION

### MANUFACTURER

Manufacturer	Rakennusbetoni- ja Elementti Oy (FI)
Address	Kukonkankaantie 8, 15880 Hollola, Finland
Contact details	vss@rakennusbetoni.fi
Website	<a href="https://www.rakennusbetoni.fi">https://www.rakennusbetoni.fi</a>

### EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	and ISO 14025
PCR	EPD Hub Core PCR Version 1.1, 5 Dec 2023 EN 16757 Product Category Rules for concrete and concrete elements
Sector	Construction product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate with options, A4, and modules C1-C4, D
EPD author	Sami Hallikainen
EPD verification	Independent verification of this EPD and data, according to ISO 14025: <input type="checkbox"/> Internal verification <input checked="" type="checkbox"/> External verification
EPD verifier	Haiha Nguyen, 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	EVAshelters
Additional labels	Civil defence shelter
Product reference	-
Place of production	Hollola, Finland
Period for data	Calendar year 2023
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	0%

### ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg
Declared unit mass	1 kg
GWP-fossil, A1-A3 (kgCO <sub>2</sub> e)	1,74E-01
GWP-total, A1-A3 (kgCO <sub>2</sub> e)	1,75E-01
Secondary material, inputs (%)	3.87
Secondary material, outputs (%)	84.7
Total energy use, A1-A3 (kWh)	0.46
Net freshwater use, A1-A3 (m <sup>3</sup> )	0

## PRODUCT AND MANUFACTURER

### ABOUT THE MANUFACTURER

Rakennusbetoni- ja Elementti Oy is a family-owned company specializing in the manufacture of high-quality concrete products. As a leading player in the construction of civil defence shelters in Finland, the company also offers a wide range of other key products including room height lightweight partition walls, bathroom modules, concrete blocks, pavement stones, green roofs, and various special concrete foundation elements. All our products are for the domestic- and international markets.

Located in Hollola, Finland, Rakennusbetoni- ja Elementti Oy benefits from its proximity to major construction companies, house builders, and land developers of all sizes. The company employs 90 people and is proud to hold ISO certifications for quality, environmental management, occupational health, and safety standards.

### PRODUCT DESCRIPTION

Civil defence shelter consist of wall and roof elements, which are designed individually for each construction site. The area, height and shape can be modified to suit the construction project. The standard weight is 2400 kg/m<sup>3</sup>. The precast concrete elements consisting of aggregate, cement, water, rebar and cast in material of steel for assembling. The shelter needs also air conditioning equipment, hatches and doors ordered by customers and therefore they are not included in the calculations as part of this product. The elements are manufactured ready to install under controlled conditions at the factory. This product can be used in industrial halls, public buildings, shopping centers, sport halls, school buildings and residential buildings.

Further information can be found at <https://www.rakennusbetoni.fi>.

### PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	10	EU
Minerals	90	EU
Fossil materials	-	
Bio-based materials	-	

### 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

### FUNCTIONAL UNIT AND SERVICE LIFE

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

### 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	MND	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	Deconstruction/ demolition	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 manufacturing prefabricated element begins with the preparation of the mould. This includes assembly of the mould depending on the element dimensions and

application of the form oil. The reinforcement is prepared by bending and cutting meshes and bars into the designed dimensions. After reinforcement and all necessary cast-in-materials are mounted, the element is casted. After casting and finishing, the element is left to cure. When element is dry, it is then transported to storage to wait the transportation to the customers installation site. Storage is inside the element factory. Precast elements doesn't need any to packaging materials for the storage or duration of the transport. Air raid shelter isn't a stock product. The product is designed individually for each 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.

Scope of the EPD is cradle to gate with module A4, C1-C4 and D. The transportation distance is from production plant to building site is calculated based on real average distance from factory to customer to be 154 km. The transportation method is assumed to be lorry. Vehicle capacity utilization is assumed to be full load. 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. The elements are transported without any packaging. In the building site, the installation group dismantles and install the elements with cranes and they may use work machines like drills or cut-off machines. This EPD does not cover installation (A5) phase.

## PRODUCT USE AND MAINTENANCE (B1-B7)

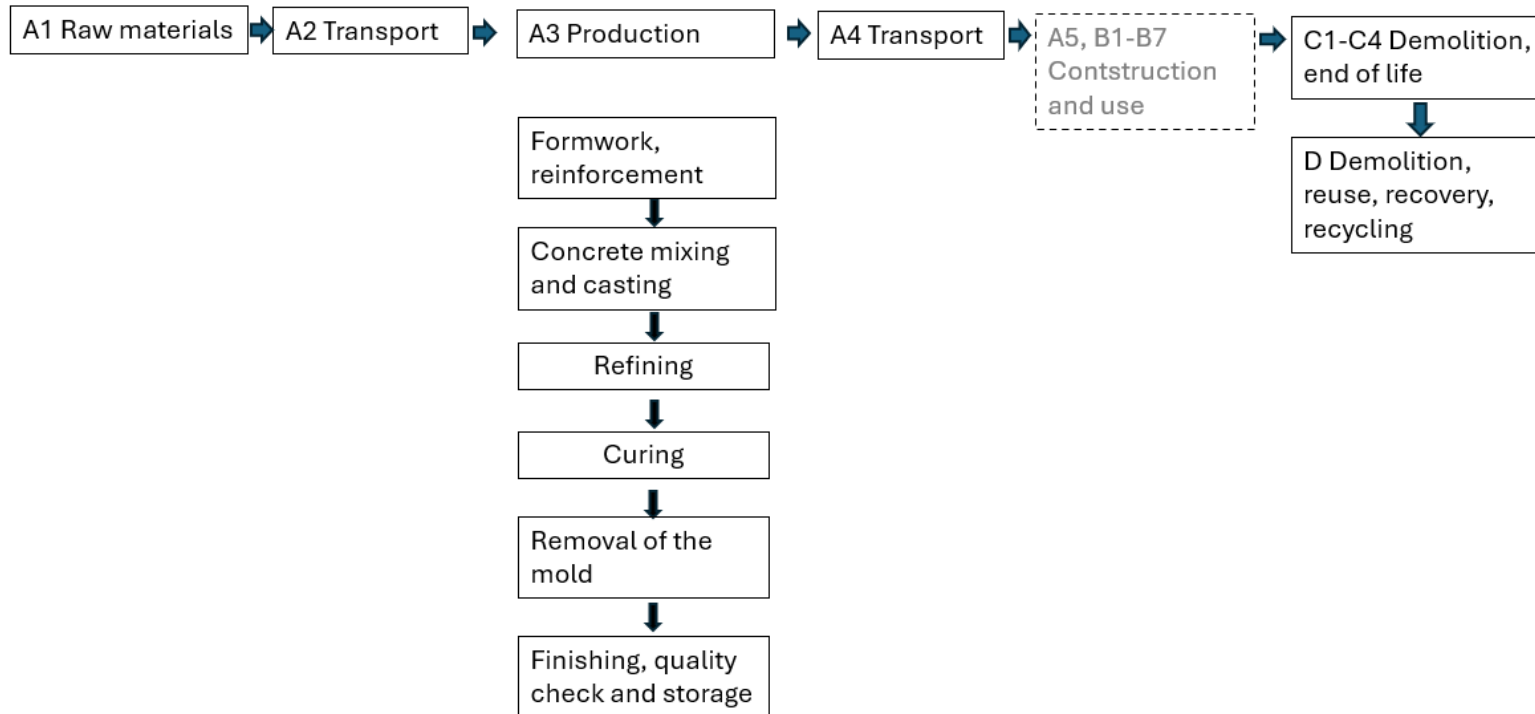
This EPD does not cover the use phase.

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 of the waste is assumed to be collected as construction waste. The demolition process consumes energy, diesel fuel used by building machines. The waste handling scenario is that deconstruction and demolition energy consumption is 0,01 kwh/kg of concrete building material (C1). Transportation distance to the closest disposal area is estimated as 50 km and the transportation method is lorry. This is the most common in Finland (C2). It can be assumed that 100 % of the concrete elements are transported to a waste treatment plant, where the elements are crushed and separated. About 95 % of steel and 80 % of concrete (Betoniteollisuus ry, 2020) is recycled. The process losses of the waste treatment plant are assumed to be negligible (C3). The 80 % of concrete going to waste processing is converted into secondary raw materials after recycling. The remaining 20 % of reinforced concrete are assumed to be sent to the landfill (C4). Due to the recycling potential of concrete, it can be crushed and used as secondary raw material, which avoids the use of virgin raw materials. Concrete waste can be used to replace virgin gravel in some applicable road and other land construction purposes and recycled steel can be used as secondary raw materials (D).

## Manufacturing process and system boundary in A1-A3 modules



## 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 material	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	0%

Primary data represents the manufacturing of EVAshelter in this production plant. The data was used to calculate average impacts for the products. The variability of the primary data and the emissions between the products was 0 %, due to same mix design per 1 kg of product. The primary data was averaged by using a one years production volume of product and the products consumption of raw materials, energy and waste.

### 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 <sup>1)</sup>	kg CO <sub>2</sub> e	1,60E-01	3,03E-03	1,23E-02	1,75E-01	1,34E-02	MND	MND	MND	MND	MND	MND	MND	MND	3,40E-03	8,63E-03	1,19E-02	1,12E-03	-4,85E-02
GWP – fossil	kg CO <sub>2</sub> e	1,59E-01	3,02E-03	1,22E-02	1,74E-01	1,34E-02	MND	MND	MND	MND	MND	MND	MND	MND	3,40E-03	8,62E-03	1,19E-02	1,12E-03	-4,84E-02
GWP – biogenic	kg CO <sub>2</sub> e	5,00E-04	1,16E-06	1,62E-07	5,02E-04	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,50E-06	3,41E-05	7,27E-07	0,00E+00
GWP – LULUC	kg CO <sub>2</sub> e	5,44E-04	1,47E-06	3,36E-06	5,49E-04	5,02E-06	MND	MND	MND	MND	MND	MND	MND	MND	3,38E-07	3,45E-06	2,17E-05	1,05E-06	-1,47E-05
Ozone depletion pot.	kg CFC-11e	5,19E-09	7,05E-10	9,65E-10	6,86E-09	3,34E-09	MND	MND	MND	MND	MND	MND	MND	MND	7,26E-10	2,00E-09	3,34E-09	4,52E-10	-1,55E-09
Acidification potential	mol H <sup>+</sup> e	6,36E-04	2,64E-05	3,19E-05	6,94E-04	4,27E-05	MND	MND	MND	MND	MND	MND	MND	MND	3,53E-05	2,45E-05	1,08E-04	1,05E-05	-1,99E-04
EP-freshwater <sup>2)</sup>	kg Pe	1,80E-06	2,02E-08	1,12E-07	1,94E-06	9,57E-08	MND	MND	MND	MND	MND	MND	MND	MND	1,12E-08	6,16E-08	9,89E-08	1,17E-08	-4,95E-07
EP-marine	kg Ne	2,08E-04	6,05E-06	8,88E-06	2,23E-04	9,42E-06	MND	MND	MND	MND	MND	MND	MND	MND	1,56E-05	4,89E-06	4,24E-05	3,63E-06	-4,06E-05
EP-terrestrial	mol Ne	2,28E-03	6,73E-05	9,72E-05	2,44E-03	1,04E-04	MND	MND	MND	MND	MND	MND	MND	MND	1,71E-04	5,43E-05	4,65E-04	4,00E-05	-4,83E-04
POCP (“smog”) <sup>3)</sup>	kg NMVOCe	5,85E-04	2,00E-05	3,38E-05	6,39E-04	4,11E-05	MND	MND	MND	MND	MND	MND	MND	MND	4,71E-05	2,09E-05	1,31E-04	1,16E-05	-2,27E-04
ADP-minerals & metals <sup>4)</sup>	kg Sbe	2,45E-07	7,25E-09	7,13E-08	3,24E-07	3,28E-08	MND	MND	MND	MND	MND	MND	MND	MND	1,72E-09	3,12E-08	2,24E-08	2,57E-09	-7,27E-07
ADP-fossil resources	MJ	7,94E-01	4,53E-02	1,34E-01	9,74E-01	2,14E-01	MND	MND	MND	MND	MND	MND	MND	MND	4,57E-02	1,28E-01	2,25E-01	3,06E-02	-4,15E-01
Water use <sup>5)</sup>	m <sup>3</sup> e depr.	1,07E+01	1,99E-04	9,30E-04	1,07E+01	9,88E-04	MND	MND	MND	MND	MND	MND	MND	MND	1,23E-04	6,01E-04	7,93E-04	9,71E-05	-2,06E-02

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 PO<sub>4</sub>e; 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	6,82E-09	2,85E-10	6,39E-10	7,75E-09	1,55E-09	MND	MND	MND	MND	MND	MND	MND	MND	9,46E-10	6,95E-10	8,78E-09	2,11E-10	-2,90E-09
Ionizing radiation <sup>6)</sup>	kBq 11235e	2,24E-03	2,27E-04	2,41E-04	2,71E-03	1,10E-03	MND	MND	MND	MND	MND	MND	MND	MND	2,10E-04	6,74E-04	1,04E-03	1,38E-04	-1,62E-03
Ecotoxicity (freshwater)	CTUe	1,18E+00	3,68E-02	1,10E-01	1,32E+00	1,78E-01	MND	MND	MND	MND	MND	MND	MND	MND	2,75E-02	1,07E-01	1,56E-01	2,00E-02	-1,62E+00
Human toxicity, cancer	CTUh	2,61E-11	1,27E-12	5,74E-12	3,31E-11	4,63E-12	MND	MND	MND	MND	MND	MND	MND	MND	1,05E-12	3,29E-12	4,98E-12	4,99E-13	5,86E-11
Human tox. non-cancer	CTUh	5,14E-10	3,52E-11	1,40E-10	6,89E-10	1,81E-10	MND	MND	MND	MND	MND	MND	MND	MND	1,99E-11	1,05E-10	1,17E-10	1,31E-11	6,63E-09
SQP <sup>7)</sup>	-	2,04E+00	4,23E-02	1,65E-02	2,10E+00	2,49E-01	MND	MND	MND	MND	MND	MND	MND	MND	5,94E-03	9,12E-02	3,04E-01	6,55E-02	-2,36E-01

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 <sup>8)</sup>	MJ	1,88E-01	5,42E-04	4,08E-02	2,30E-01	2,77E-03	MND	MND	MND	MND	MND	MND	MND	MND	2,61E-04	1,87E-03	2,28E-03	2,66E-04	-3,71E-02
Renew. PER as material	MJ	5,96E-04	0,00E+00	0,00E+00	5,96E-04	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	-3,20E-04	0,00E+00	0,00E+00
Total use of renew. PER	MJ	1,89E-01	5,42E-04	4,08E-02	2,30E-01	2,77E-03	MND	MND	MND	MND	MND	MND	MND	MND	2,61E-04	1,87E-03	1,96E-03	2,66E-04	-3,71E-02
Non-re. PER as energy	MJ	7,98E-01	4,53E-02	1,33E-01	9,76E-01	2,14E-01	MND	MND	MND	MND	MND	MND	MND	MND	4,57E-02	1,28E-01	2,25E-01	3,06E-02	-4,06E-01
Non-re. PER as material	MJ	6,21E-05	0,00E+00	1,21E-03	1,27E-03	0,00E+00	MND	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	7,98E-01	4,53E-02	1,34E-01	9,78E-01	2,14E-01	MND	MND	MND	MND	MND	MND	MND	MND	4,57E-02	1,28E-01	2,25E-01	3,06E-02	-4,06E-01
Secondary materials	kg	3,87E-02	1,52E-05	8,50E-05	3,88E-02	6,03E-05	MND	MND	MND	MND	MND	MND	MND	MND	1,79E-05	4,37E-05	6,99E-05	6,43E-06	2,52E-02
Renew. secondary fuels	MJ	7,58E-02	1,12E-07	6,61E-07	7,58E-02	5,32E-07	MND	MND	MND	MND	MND	MND	MND	MND	5,84E-08	4,81E-07	9,17E-07	1,68E-07	-6,56E-06
Non-ren. secondary fuels	MJ	3,80E-01	0,00E+00	0,00E+00	3,80E-01	0,00E+00	MND	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 <sup>3</sup>	1,14E-03	5,48E-06	2,25E-05	1,16E-03	2,84E-05	MND	MND	MND	MND	MND	MND	MND	MND	2,77E-06	1,64E-05	1,44E-04	3,35E-05	-5,32E-04

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	1,52E-03	5,49E-05	3,65E-04	1,94E-03	2,29E-04	MND	MND	MND	MND	MND	MND	MND	MND	6,11E-05	1,46E-04	2,97E-04	0,00E+00	-1,90E-02
Non-hazardous waste	kg	3,82E-02	8,29E-04	4,56E-03	4,36E-02	3,99E-03	MND	MND	MND	MND	MND	MND	MND	MND	4,30E-04	2,59E-03	3,94E-03	2,12E-01	-7,81E-02
Radioactive waste	kg	1,02E-05	3,12E-07	1,41E-07	1,06E-05	1,48E-06	MND	MND	MND	MND	MND	MND	MND	MND	3,22E-07	8,83E-07	1,52E-06	0,00E+00	-2,55E-07

## 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	MND	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	2,65E-03	0,00E+00	0,00E+00	2,65E-03	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	8,47E-01	0,00E+00	0,00E+00
Materials for energy rec	kg	6,41E-05	0,00E+00	0,00E+00	6,41E-05	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	5,40E-05	0,00E+00	0,00E+00
Exported energy	MJ	2,85E-04	0,00E+00	0,00E+00	2,85E-04	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	2,36E-04	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 <sub>2</sub> e	1,85E-01	3,00E-03	1,19E-02	2,00E-01	1,33E-02	MND	MND	MND	MND	MND	MND	MND	MND	3,36E-03	8,55E-03	1,17E-02	1,09E-03	-4,61E-02
Ozone depletion Pot.	kg CFC <sub>11</sub> e	6,14E-09	5,59E-10	8,05E-10	7,51E-09	2,65E-09	MND	MND	MND	MND	MND	MND	MND	MND	5,75E-10	1,58E-09	2,64E-09	3,57E-10	-1,63E-09
Acidification	kg SO <sub>2</sub> e	5,85E-04	2,13E-05	2,51E-05	6,31E-04	3,46E-05	MND	MND	MND	MND	MND	MND	MND	MND	2,51E-05	2,01E-05	7,94E-05	7,93E-06	-1,67E-04
Eutrophication	kg PO <sub>4</sub> <sup>3</sup> e	1,73E-04	2,93E-06	6,74E-06	1,83E-04	7,34E-06	MND	MND	MND	MND	MND	MND	MND	MND	5,83E-06	4,34E-06	1,82E-05	1,71E-06	-8,43E-05
POCP ("smog")	kg C <sub>2</sub> H <sub>4</sub> e	3,24E-05	7,00E-07	2,90E-06	3,60E-05	1,61E-06	MND	MND	MND	MND	MND	MND	MND	MND	5,50E-07	1,02E-06	2,54E-06	3,33E-07	-2,45E-05
ADP-elements	kg Sbe	3,64E-07	7,07E-09	7,11E-08	4,42E-07	3,19E-08	MND	MND	MND	MND	MND	MND	MND	MND	1,69E-09	3,05E-08	2,19E-08	2,53E-09	-7,22E-07
ADP-fossil	MJ	1,09E+00	4,53E-02	1,34E-01	1,26E+00	2,14E-01	MND	MND	MND	MND	MND	MND	MND	MND	4,57E-02	1,28E-01	2,25E-01	3,06E-02	-4,15E-01

## 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 <sup>9)</sup>	kg CO <sub>2</sub> e	1,60E-01	3,02E-03	1,23E-02	1,75E-01	1,34E-02	MND	MND	MND	MND	MND	MND	MND	MND	3,40E-03	8,63E-03	1,19E-02	1,12E-03	-4,85E-02

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 - CH<sub>4</sub> fossil, CH<sub>4</sub> 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 CO<sub>2</sub> 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.

HaiHa Nguyen, as an authorized verifier acting for EPD Hub Limited  
20.02.2025

