ENVIRONMENTAL PRODUCT DECLARATION

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

Concrete wall elements
Porin Elementtitehdas Oy

EPD HUB, HUB-3017
Published on 07.03.2025, last updated on 07.03.2025, valid until 06.03.2030

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Porin Elementtitehdas Oy
Address	Karjalankatu 18, 28130 Pori
Contact details	roni.virtanen@elementtitehdas.fi
Website	https://elementtitehdas.fi/

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
Scope of the EPD	Cradle to gate with modules C1-C4 and D
EPD author	Kasper Karjalainen
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Lucas Rodriguez, 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	Concrete wall elements
Additional labels	-
Product reference	-
Place of production	Pori, Finland
Period for data	2023
Averaging in EPD	Average product
Variation in GWP-fossil for A1-A3	<1.0 %

ENVIRONMENTAL DATA SUMMARY

Declared unit	1kg of produced product
Declared unit mass	1 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	1,51E-01
GWP-total, A1-A3 ($kgCO_2e$)	1,51E-01
Secondary material, inputs (%)	0.79
Secondary material, outputs (%)	80.3
Total energy use, A1-A3 (kWh)	0.44
Net freshwater use, A1-A3 (m^3)	0

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Porin Elementtitehdas Oy is a Finnish company that manufactures and supplies concrete elements. The company offers a wide range of concrete products for the construction industry, including wall and slab structures as well as special elements. The goal of Porin Elementtitehdas Oy is to provide its customers with high-quality, durable, and cost-effective solutions for construction projects.

The company's operations are based on flexibility and customer service, and it invests in continuous product development and quality control. Porin Elementtitehdas Oy is known as a reliable partner and collaborates closely with stakeholders in the construction sector.

PRODUCT DESCRIPTION

A solid concrete wall element is a type of building element. These elements are commonly used in the construction of walls for industrial, commercial, and residential buildings, providing structural. Elements are typically 150-200mm thick solid reinforced concrete panels.

This EPD is an average EPD that includes all of the solid concrete wall elements produced by Porin Elementtitehdas Oy.

Further information can be found at https://elementtitehdas.fi/.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	1.36	EU
Minerals	91.12	EU
Fossil materials	0.12	EU
Bio-based materials	0	-
Water	7.40	Finland

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 of produced product
Mass per declared unit	1 kg

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	ND	ND	ND	ND	ND	ND	ND	ND	ND	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 = ND.

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 of elements begins with building moulds used for casting the concrete. They are constructed from timber and plywood. Next reinforcement is assembled. Most of the steel is cut and bent on the production plant, while larger series and specialized components are ordered pre-cut to specific measurements. The moulds, complete with reinforcement, are prepared on the days preceding the casting or on the morning of the casting day, in accordance with the drawings. Assembly is carried out on the casting day on the casting beds.

The raw materials for concrete production are delivered to the storage area of the batching plant. Aggregates are transported to silos, binders are pumped directly into silos, and additives are brought to the production site in containers. The ready-mixed concrete, prepared at the batching plant, is transported to the production facilities by tractor, where it is poured into the moulds assembled on the casting beds using a casting machine. The concrete is compacted after pouring using the vibration system of the casting beds.

The day after casting, the moulds are dismantled, and the elements are finished (grinding, surface washing, and any necessary repairs). The completed elements are then stored, awaiting transportation to their destination.

TRANSPORT AND INSTALLATION (A4-A5)

This EPD does not cover transportation to site and installation.

PRODUCT USE AND MAINTENANCE (B1-B7)

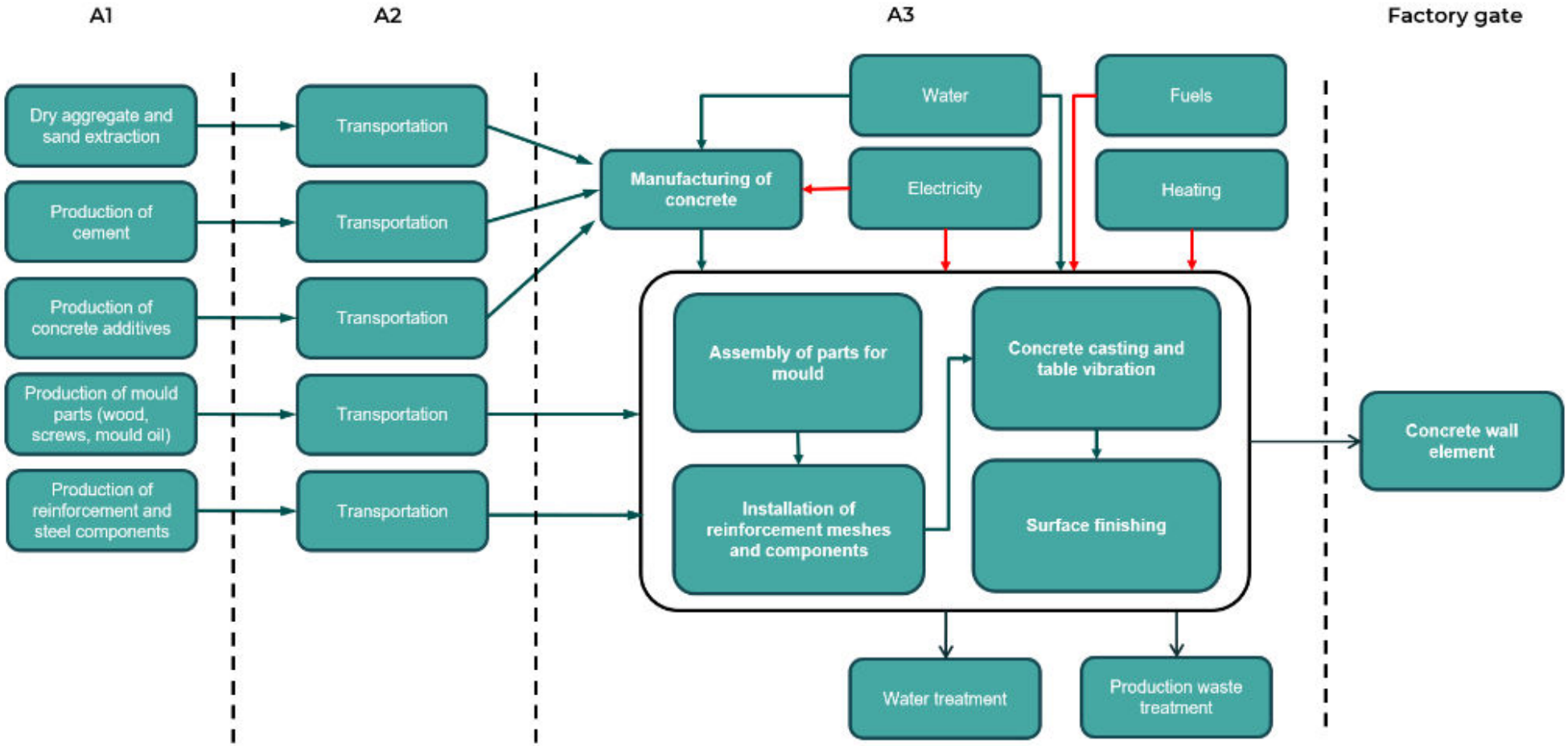
This EPD does not cover the use phase.
Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

At the end of life, the element is dismantled from the building and transported to a waste treatment facility. The demolition process requires energy, primarily in the form of diesel fuel used by construction machinery (C1). The dismantled elements are then transported to the nearest waste treatment facility, estimated to be approximately 50 km away. According to the Finnish Environment Institute, 80% of the concrete and 98% of the steel are recycled, while the remaining portions are disposed of as landfill waste (C3 and C4).

Recycling concrete and steel reduces the need for virgin materials, and their impact is accounted for in the D-module. Additionally, energy production from combustible waste generated during production is included. Carbonation is not considered in the calculation of D-module benefits. According to the Finnish Ministry of the Environment's low-carbon methodology, the benefits of carbonation can be calculated separately as part of building-level calculations.

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 material	No allocation
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

AVERAGES AND VARIABILITY

Type of average	Production weighted averaging
Averaging method	Multiple products
Variation in GWP-fossil for A1-A3	<1.0 %

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 v3.10 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	1,32E-01	7,13E-03	1,18E-02	1,51E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	2,52E-02	9,71E-03	1,13E-02	1,25E-03	-1,40E-02
GWP – fossil	kg CO_2e	1,32E-01	7,12E-03	1,17E-02	1,51E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	2,52E-02	9,70E-03	1,13E-02	1,25E-03	-1,40E-02
GWP – biogenic	kg CO_2e	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
GWP – LULUC	kg CO_2e	2,38E-05	2,65E-06	5,66E-06	3,22E-05	MND	MND	MND	MND	MND	MND	MND	MND	MND	2,59E-06	3,43E-06	5,53E-06	7,15E-07	-9,59E-06
Ozone depletion pot.	kg $CFC\text{-}_{11}$e	1,20E-09	1,38E-10	3,71E-10	1,71E-09	MND	MND	MND	MND	MND	MND	MND	MND	MND	3,86E-10	1,93E-10	2,14E-10	3,62E-11	-2,48E-10
Acidification potential	mol H^+e	2,48E-04	4,03E-05	7,54E-05	3,64E-04	MND	MND	MND	MND	MND	MND	MND	MND	MND	2,28E-04	3,03E-05	8,58E-05	8,86E-06	-7,02E-05
EP-freshwater[2)]	kg Pe	3,31E-06	4,48E-07	1,79E-06	5,54E-06	MND	MND	MND	MND	MND	MND	MND	MND	MND	7,28E-07	6,43E-07	3,73E-06	1,03E-07	-3,35E-06
EP-marine	kg Ne	9,22E-05	1,18E-05	1,15E-05	1,16E-04	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,06E-04	1,02E-05	3,29E-05	3,38E-06	-1,70E-05
EP-terrestrial	mol Ne	4,13E-04	1,30E-04	2,02E-04	7,44E-04	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,16E-03	1,11E-04	3,58E-04	3,69E-05	-2,02E-04
POCP ("smog")[3)]	kg NMVOCe	1,56E-04	4,67E-05	5,30E-05	2,56E-04	MND	MND	MND	MND	MND	MND	MND	MND	MND	3,45E-04	4,76E-05	1,14E-04	1,32E-05	-5,62E-05
ADP-minerals & metals[4)]	kg Sbe	1,89E-07	2,17E-08	3,10E-08	2,41E-07	MND	MND	MND	MND	MND	MND	MND	MND	MND	9,05E-09	3,17E-08	5,01E-08	1,99E-09	-7,77E-08
ADP-fossil resources	MJ	5,14E-01	9,88E-02	3,06E-01	9,19E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	3,30E-01	1,36E-01	1,75E-01	3,07E-02	-1,35E-01
Water use[5)]	m^3e depr.	1,70E+00	4,67E-04	1,78E-02	1,72E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	8,25E-04	6,69E-04	1,30E-03	8,85E-05	-1,33E-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 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	1,83E-09	5,26E-10	5,97E-10	2,96E-09	MND	MND	MND	MND	MND	MND	MND	MND	MND	6,47E-09	7,63E-10	7,82E-09	2,02E-10	-9,94E-10
Ionizing radiation[6]	kBq U235e	2,59E-03	1,19E-04	5,72E-03	8,42E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,46E-04	1,74E-04	7,89E-04	1,93E-05	-6,82E-04
Ecotoxicity (freshwater)	CTUe	2,76E-01	1,25E-02	8,88E-02	3,77E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,82E-02	1,79E-02	3,69E-02	2,57E-03	-7,79E-02
Human toxicity, cancer	CTUh	8,10E-12	1,24E-12	4,06E-12	1,34E-11	MND	MND	MND	MND	MND	MND	MND	MND	MND	2,59E-12	1,65E-12	2,66E-12	2,30E-13	-3,44E-12
Human tox. non-cancer	CTUh	4,43E-10	5,88E-11	8,43E-11	5,86E-10	MND	MND	MND	MND	MND	MND	MND	MND	MND	4,11E-11	8,56E-11	1,17E-10	5,29E-12	-1,13E-10
SQP[7]	-	1,04E+00	5,44E-02	4,35E-01	1,53E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	2,31E-02	8,11E-02	1,44E-01	6,04E-02	-1,17E-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[8]	MJ	8,41E-02	1,63E-03	3,66E-02	1,22E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	2,09E-03	2,36E-03	8,85E-03	2,96E-04	-1,09E-02
Renew. PER as material	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	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 renew. PER	MJ	8,41E-02	1,63E-03	3,66E-02	1,22E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	2,09E-03	2,36E-03	8,85E-03	2,96E-04	-1,09E-02
Non-re. PER as energy	MJ	6,06E-01	9,88E-02	2,44E-01	9,49E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	3,30E-01	1,36E-01	1,75E-01	3,07E-02	-1,35E-01
Non-re. PER as material	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	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	6,06E-01	9,88E-02	2,44E-01	9,49E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	3,30E-01	1,36E-01	1,75E-01	3,07E-02	-1,35E-01
Secondary materials	kg	7,89E-03	4,54E-05	2,46E-02	3,26E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,37E-04	6,24E-05	7,27E-05	7,71E-06	1,08E-03
Renew. secondary fuels	MJ	4,23E-02	5,31E-07	9,17E-06	4,23E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	3,58E-07	7,88E-07	8,00E-07	1,60E-07	-9,08E-07
Non-ren. secondary fuels	MJ	4,74E-01	0,00E+00	1,52E-06	4,74E-01	MND	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^3	4,92E-04	1,27E-05	1,59E-04	6,63E-04	MND	MND	MND	MND	MND	MND	MND	MND	MND	2,18E-05	1,83E-05	-3,42E-04	3,19E-05	-3,10E-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	4,54E-04	1,41E-04	3,63E-04	9,58E-04	MND	MND	MND	MND	MND	MND	MND	MND	MND	3,67E-04	1,95E-04	2,91E-04	3,39E-05	-1,45E-03
Non-hazardous waste	kg	1,02E-02	2,89E-03	5,99E-02	7,29E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	5,01E-03	4,12E-03	4,85E-01	7,75E-04	-1,88E-02
Radioactive waste	kg	1,26E-05	2,98E-08	2,20E-06	1,48E-05	MND	MND	MND	MND	MND	MND	MND	MND	MND	3,63E-08	4,35E-08	2,01E-07	4,77E-09	-2,01E-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	MND	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	2,68E-04	0,00E+00	2,55E-02	2,58E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	8,03E-01	0,00E+00	-9,56E-08
Materials for energy rec	kg	1,00E-04	0,00E+00	5,65E-15	1,00E-04	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-3,60E-16
Exported energy	MJ	1,48E-04	0,00E+00	2,72E-02	2,73E-02	MND	MND	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	1,19E-01	7,08E-03	1,23E-02	1,39E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	2,51E-02	9,64E-03	1,12E-02	1,24E-03	-1,40E-02
Ozone depletion Pot.	kg CFC_{-11}e	7,83E-10	1,10E-10	3,36E-10	1,23E-09	MND	MND	MND	MND	MND	MND	MND	MND	MND	3,06E-10	1,54E-10	1,71E-10	2,88E-11	-1,66E-10
Acidification	kg SO_2e	3,66E-05	3,14E-05	5,78E-05	1,26E-04	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,60E-04	2,31E-05	6,35E-05	6,56E-06	-5,30E-05
Eutrophication	kg PO_4^3e	1,05E-04	5,66E-06	1,29E-05	1,23E-04	MND	MND	MND	MND	MND	MND	MND	MND	MND	3,74E-05	5,86E-06	1,47E-05	2,09E-06	-9,68E-06
POCP (“smog”)	kg C_2H_4e	2,08E-05	2,26E-06	3,55E-06	2,66E-05	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,20E-05	2,20E-06	4,64E-06	6,20E-07	-4,74E-06
ADP-elements	kg Sbe	1,57E-07	2,12E-08	3,08E-08	2,09E-07	MND	MND	MND	MND	MND	MND	MND	MND	MND	8,79E-09	3,10E-08	4,96E-08	1,95E-09	-7,70E-08
ADP-fossil	MJ	2,70E-01	9,68E-02	3,03E-01	6,70E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	3,28E-01	1,33E-01	1,62E-01	3,04E-02	-1,26E-01

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.

Lucas Rodriguez, as an authorized verifier acting for EPD Hub Limited.
07.03.2025

VERIFIED ISO 14025