

ENVIRONMENTAL PRODUCT DECLARATION


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

**Wood-framed thermally insulated roof element with bitumen roofing underlay
Kerabit Kattoelementit Oy**



EPD HUB, HUB-0723

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Kerabit



GENERAL INFORMATION

MANUFACTURER

Manufacturer	Kerabit Kattoelementit Oy
Address	Reiniläntie 61, 61400 Ylistaro, Finland
Contact details	kattoelementit@kerabit.fi
Website	www.kerabit.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 1.0, 1 Feb 2022
Sector	Construction product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Jaana Valjus, Kerabit Oy
EPD verification	Independent verification of this EPD and data, according to ISO 14025: <input type="checkbox"/> Internal certification <input checked="" type="checkbox"/> 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	Wood-framed thermally insulated roof element with bitumen roofing underlay
Additional labels	Kerabit Kattoelementti
Product reference	1
Place of production	Ylistaro, Finland
Period for data	01/01/2022-31/12/2022
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	%

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 m2 of roof structure
Declared unit mass	44.04 kg
GWP-fossil, A1-A3 (kgCO2e)	2,64E+01
GWP-total, A1-A3 (kgCO2e)	-3,24E+01
Secondary material, inputs (%)	12.0
Secondary material, outputs (%)	8.02
Total energy use, A1-A3 (kWh)	209.0
Total water use, A1-A3 (m3e)	1,39E+00

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Kerabit Kattoelementit Oy designs, manufactures and installs large wooden frame roof elements. Prefabricated elements shorten construction time on the construction site and are cost-effective thanks to reasonable prefabrication. All production is project-specific, where the elements are developed in close dialogue with builders and architects to achieve the best design and solution. Manufacturing takes place indoors in a controlled climate. Project-based production means that each order is unique and therefore production is difficult to automate and is largely done by carpenters and installers.

PRODUCT DESCRIPTION

The wood-framed thermally insulated roof element is manufactured in Finland at the Ylistaro factory of Kerabit Kattoelementit Oy. The elements are manufactured ready to install under controlled conditions at the factory. The studied product is a basic roof element without accessories.

Product composition

The top surface of the thermally insulated roof element features an OSB roofing board with a factory-installed bitumen underlay membrane. Under the OSB roofing board is a ventilation-gap beam structure, which rests on top of the LVL beams, serving as the load-bearing structure. The element is thermally insulated with mineral wool coated with sheathing fabric on the top surface. The vapour barrier is under the thermal insulation. The bottom surface material is typically plasterboard. The topmost layer of waterproofing is to be installed at the construction site, and it is not included in the calculations as part of this product.

Product use

The thermally insulated roof element can be used, for example, in production halls, public buildings, shops, sports halls, farm buildings and residential buildings. The product can be used in both new buildings and

in renovation projects. The main market for the product is Finland.

Physical properties

Dimensions: Thermally insulated roof elements are typically 2.5 m wide and 8 to 24 m long. The roof element has a ventilated structure.

U-value: 0.09 W/m²K

Fire-resistance rating: REI30

Further information can be found at www.kerabit.fi.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	0,85	World
Minerals	30,47	Finland
Fossil materials	7,99	Finland and EU
Bio-based materials	60,68	Finland and EU

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	18
Biogenic carbon content in packaging, kg C	-

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 m2 of roof structure
Mass per declared unit	44.04 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 manufacturing of the product includes the following steps: cutting the materials to the right dimensions, assembling the frame, installing the thermal insulation, fastening the internal and external materials, sheeting, battening and waterproofing, packaging and storing. Production loss is included in the study.

Renewable electricity was used during the manufacturing process and LPG was used for installing the underlay membrane.

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.

Average distance of transportation (A4) from production plant to building site is estimated at 50 km and the transportation method is lorry (16-32 ton). Vehicle capacity utilization volume factor is assumed to be 100 % which means full load. Empty returns are not included as it is assumed that the carrier will use the return journey to serve the needs of other clients. Transportation does not cause losses as products are well secured.

The installation phase at the construction site (A5) comprises the raw-material manufacture and machining of the needed mounting screws, the energy consumption of a truck-mounted crane and a boom lift, the energy consumption of the LPG used for sealing the underlay membrane and the emissions from the waste management of the packaging materials (no other waste than packaging film, which is assumed to be incinerated to energy). A thin strip of wool needed in stage A5 and the vapour barrier tape are not included, because the amount needed is small. There arent any material losses during installation because the roof elements are dimensioned according to the roof size.

PRODUCT USE AND MAINTENANCE (B1-B7)

The use stage was not included in the study.

Air, soil, and water impacts during the use phase have not been studied.

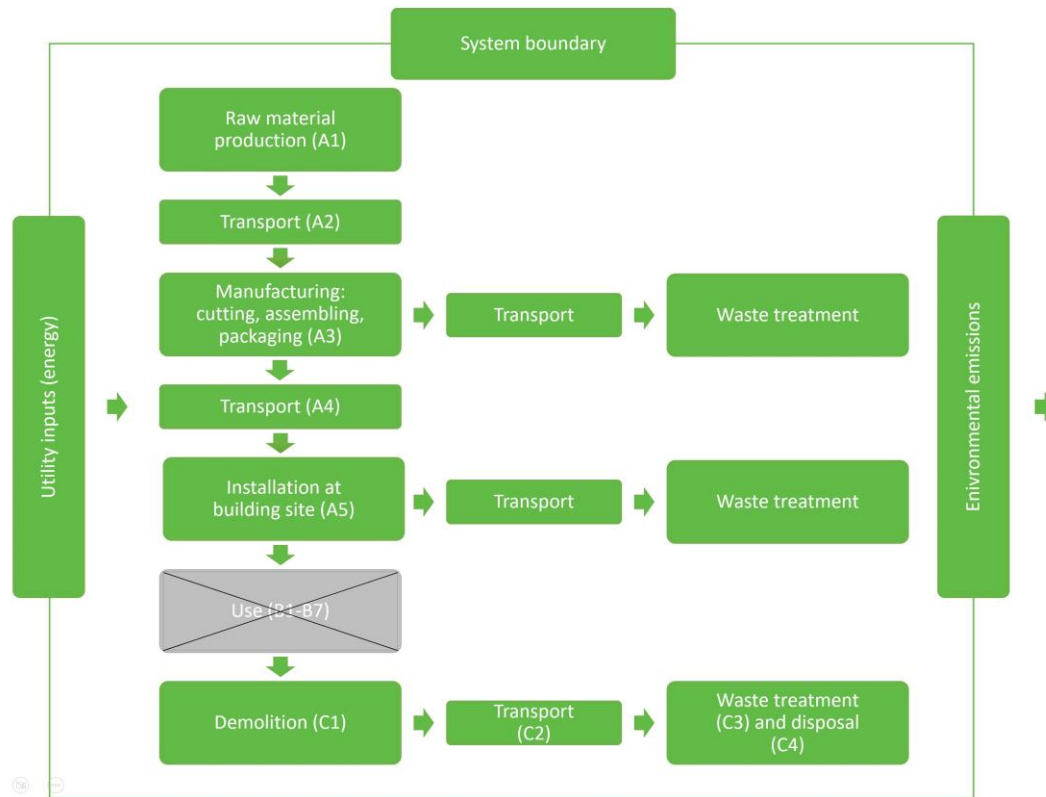
PRODUCT END OF LIFE (C1-C4, D)

At the end of the product life cycle, the roof elements are dismantled. The dismantling process comprises the energy used by machinery (C1). Amount of energy spent by the machines used in demolition is assumed to be 0,01 kWh/kg (diesel). The dismantled roof elements are transported to a construction waste processing plant (C2), where the waste fractions suitable for reuse, recycling or energy production are separated for further use (C3). Unusable materials are disposed of in a landfill (C4). By recycling materials, the use of virgin raw materials is avoided. In addition, energy recovered by burning materials replaces the use of fossil fuels in energy production (D).

Metals were assumed to be recycled. Bitumen roofing membranes were assumed to be recycled and used as a secondary raw material in asphalt manufacturing. Recycling of bitumen roofing membrane avoids the use of virgin bitumen raw material. Wood and plastic materials were assumed to be incinerated for energy production. Mineral wool and gypsum boards were assumed to be disposed of in a landfill.

Approx. 8 % of materials are assumed to be recycled, 62 % incinerated and 30 % to be disposed in a landfill at the end of the product life cycle.

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	No allocation
Ancillary materials	No allocation
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. Ecoinvent 3.6 and One Click LCA databases were used 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 ₂ e	-3,99E+01	1,28E+00	6,22E+00	-3,24E+01	3,69E-01	8,62E-01	MND	MND	MND	MND	MND	MND	MND	1,45E-01	3,67E-01	6,01E+01	7,05E-02	-
GWP – fossil	kg CO ₂ e	2,20E+01	1,28E+00	3,07E+00	2,64E+01	3,69E-01	8,60E-01	MND	MND	MND	MND	MND	MND	MND	1,45E-01	3,67E-01	1,27E+00	7,04E-02	-
GWP – biogenic	kg CO ₂ e	-6,19E+01	6,77E-04	3,15E+00	-5,88E+01	1,97E-04	2,30E-03	MND	MND	MND	MND	MND	MND	MND	4,04E-05	1,96E-04	5,88E+01	1,40E-04	1,44E-03
GWP – LULUC	kg CO ₂ e	4,58E-02	4,56E-04	1,44E-03	4,77E-02	1,31E-04	5,90E-05	MND	MND	MND	MND	MND	MND	MND	1,23E-05	1,30E-04	1,65E-04	2,09E-05	-4,12E-02
Ozone depletion pot.	kg CFC-11e	9,15E-06	2,90E-07	5,32E-07	9,97E-06	8,37E-08	7,19E-08	MND	MND	MND	MND	MND	MND	MND	3,14E-08	8,34E-08	3,95E-08	2,90E-08	-3,96E-06
Acidification potential	mol H ⁺ e	1,53E-01	5,31E-03	1,48E-02	1,73E-01	1,51E-03	2,93E-03	MND	MND	MND	MND	MND	MND	MND	1,52E-03	1,50E-03	4,91E-03	6,68E-04	-1,93E-01
EP-freshwater ²⁾	kg Pe	1,12E-03	1,07E-05	4,52E-05	1,17E-03	3,08E-06	4,14E-06	MND	MND	MND	MND	MND	MND	MND	5,87E-07	3,07E-06	6,40E-06	8,50E-07	-1,07E-03
EP-marine	kg Ne	4,10E-02	1,57E-03	4,17E-03	4,67E-02	4,47E-04	1,19E-03	MND	MND	MND	MND	MND	MND	MND	6,71E-04	4,46E-04	2,28E-03	2,30E-04	-2,30E-02
EP-terrestrial	mol Ne	4,61E-01	1,74E-02	4,55E-02	5,23E-01	4,94E-03	1,31E-02	MND	MND	MND	MND	MND	MND	MND	7,36E-03	4,92E-03	2,43E-02	2,53E-03	-2,69E-01
POCP (“smog”) ³⁾	kg NMVOCe	1,31E-01	5,30E-03	1,44E-02	1,51E-01	1,51E-03	3,69E-03	MND	MND	MND	MND	MND	MND	MND	2,02E-03	1,51E-03	6,02E-03	7,36E-04	-7,90E-02
ADP-minerals & metals ⁴⁾	kg Sbe	8,16E-04	3,47E-05	1,41E-05	8,65E-04	9,97E-06	1,41E-06	MND	MND	MND	MND	MND	MND	MND	2,22E-07	9,93E-06	5,89E-06	6,43E-07	-4,38E-05
ADP-fossil resources	MJ	3,93E+02	1,93E+01	5,72E+01	4,69E+02	5,56E+00	4,97E+00	MND	MND	MND	MND	MND	MND	MND	2,00E+00	5,54E+00	4,17E+00	1,97E+00	-
Water use ⁵⁾	m ³ e depr.	1,42E+01	6,23E-02	5,98E-01	1,48E+01	1,79E-02	2,14E-02	MND	MND	MND	MND	MND	MND	MND	3,73E-03	1,78E-02	-2,99E-01	9,10E-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	4,03E-06	8,89E-08	2,26E-07	4,34E-06	2,57E-08	7,05E-08	MND	MND	MND	MND	MND	MND	MND	4,03E-08	2,56E-08	5,43E-08	1,30E-08	-1,63E-06
Ionizing radiation ⁶⁾	kBq U235e	1,44E+00	8,42E-02	1,70E-01	1,69E+00	2,43E-02	2,09E-02	MND	MND	MND	MND	MND	MND	MND	8,56E-03	2,42E-02	1,28E-02	8,07E-03	-
Ecotoxicity (freshwater)	CTUe	5,67E+02	1,49E+01	4,04E+01	6,22E+02	4,29E+00	4,12E+00	MND	MND	MND	MND	MND	MND	MND	1,17E+00	4,27E+00	7,15E+00	1,24E+00	-
Human toxicity, cancer	CTUh	2,37E-08	4,34E-10	7,67E-10	2,49E-08	1,25E-10	3,10E-10	MND	MND	MND	MND	MND	MND	MND	4,20E-11	1,24E-10	1,14E-09	2,94E-11	-1,10E-08
Human tox. non-cancer	CTUh	3,87E-07	1,68E-08	2,16E-08	4,25E-07	4,85E-09	4,50E-09	MND	MND	MND	MND	MND	MND	MND	1,03E-09	4,83E-09	6,12E-08	9,07E-10	-1,36E-07
SQP ⁷⁾	-	6,67E+01	1,60E+01	2,51E+00	8,52E+01	4,63E+00	2,41E-01	MND	MND	MND	MND	MND	MND	MND	5,13E-02	4,61E+00	9,60E-01	3,34E+00	-

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	3,58E+02	2,71E-01	5,03E+00	3,63E+02	7,84E-02	7,72E-02	MND	MND	MND	MND	MND	MND	MND	1,08E-02	7,81E-02	1,66E-01	1,59E-02	-8,77E-01
Renew. PER as material	MJ	6,47E+02	0,00E+00	-1,66E+01	6,30E+02	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	-6,30E+02	0,00E+00	-2,62E-01
Total use of renew. PER	MJ	1,00E+03	2,71E-01	-1,15E+01	9,93E+02	7,84E-02	7,72E-02	MND	MND	MND	MND	MND	MND	MND	1,08E-02	7,81E-02	-6,30E+02	1,59E-02	-8,80E+01
Non-re. PER as energy	MJ	3,27E+02	1,93E+01	4,32E+01	3,90E+02	5,56E+00	4,97E+00	MND	MND	MND	MND	MND	MND	MND	2,00E+00	5,54E+00	4,17E+00	1,97E+00	-4,26E+02
Non-re. PER as material	MJ	9,79E+01	0,00E+00	8,91E+00	1,07E+02	0,00E+00	-8,80E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	-8,67E+01	-1,13E+01	-6,93E+01
Total use of non-re. PER	MJ	4,25E+02	1,93E+01	5,21E+01	4,97E+02	5,56E+00	-3,82E+00	MND	MND	MND	MND	MND	MND	MND	2,00E+00	5,54E+00	-8,25E+01	-9,33E+00	-5,05E+02
Secondary materials	kg	5,26E+00	0,00E+00	4,68E-03	5,27E+00	0,00E+00	5,60E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,90E-01
Renew. secondary fuels	MJ	6,10E-24	0,00E+00	0,00E+00	6,10E-24	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
Non-ren. secondary fuels	MJ	7,17E-23	0,00E+00	0,00E+00	7,17E-23	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	1,38E+00	3,29E-03	8,51E-03	1,39E+00	9,50E-04	1,06E-03	MND	MND	MND	MND	MND	MND	MND	1,77E-04	9,46E-04	7,23E-03	2,15E-03	-6,96E-02

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	8,33E-01	1,97E-02	7,24E-02	9,25E-01	5,64E-03	1,59E-02	MND	MND	MND	MND	MND	MND	MND	2,15E-03	5,62E-03	0,00E+00	1,84E-03	-2,05E+00
Non-hazardous waste	kg	2,37E+01	1,34E+00	3,27E+00	2,83E+01	3,87E-01	3,42E-01	MND	MND	MND	MND	MND	MND	MND	2,30E-02	3,86E-01	0,00E+00	1,34E+01	-3,83E+01
Radioactive waste	kg	3,68E-03	1,32E-04	2,48E-04	4,06E-03	3,81E-05	3,25E-05	MND	MND	MND	MND	MND	MND	MND	1,40E-05	3,79E-05	0,00E+00	1,30E-05	-2,63E-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	1,89E-01	0,00E+00	0,00E+00	1,89E-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
Materials for recycling	kg	5,57E-02	0,00E+00	1,94E-01	2,50E-01	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	6,79E+00	0,00E+00	0,00E+00
Materials for energy rec	kg	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
Exported energy	MJ	0,00E+00	0,00E+00	1,11E+01	1,11E+01	0,00E+00	6,42E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	3,19E+02	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 ₂ e	2,09E+01	1,27E+00	3,00E+00	2,52E+01	3,65E-01	8,56E-01	MND	MND	MND	MND	MND	MND	MND	1,44E-01	3,64E-01	1,26E+00	6,91E-02	-2,36E+01
Ozone depletion Pot.	kg CFC ₁₁ e	8,72E-06	2,31E-07	4,27E-07	9,38E-06	6,66E-08	5,75E-08	MND	MND	MND	MND	MND	MND	MND	2,48E-08	6,64E-08	3,35E-08	2,30E-08	-3,41E-06
Acidification	kg SO ₂ e	1,10E-01	2,65E-03	8,27E-03	1,21E-01	7,39E-04	7,02E-04	MND	MND	MND	MND	MND	MND	MND	2,14E-04	7,36E-04	3,27E-03	2,78E-04	-1,69E-01
Eutrophication	kg PO ₄ ³ e	3,70E-02	5,40E-04	2,23E-03	3,98E-02	1,52E-04	2,32E-04	MND	MND	MND	MND	MND	MND	MND	3,78E-05	1,51E-04	3,56E-03	5,39E-05	-3,46E-02
POCP ("smog")	kg C ₂ H ₄ e	6,97E-03	1,70E-04	7,12E-04	7,85E-03	4,87E-05	6,88E-05	MND	MND	MND	MND	MND	MND	MND	2,21E-05	4,85E-05	7,27E-05	2,04E-05	-7,30E-03
ADP-elements	kg Sbe	8,16E-04	3,47E-05	1,41E-05	8,65E-04	9,97E-06	1,41E-06	MND	MND	MND	MND	MND	MND	MND	2,22E-07	9,93E-06	5,89E-06	6,43E-07	-4,38E-05
ADP-fossil	MJ	3,93E+02	1,93E+01	5,72E+01	4,69E+02	5,56E+00	4,97E+00	MND	MND	MND	MND	MND	MND	MND	2,00E+00	5,54E+00	4,17E+00	1,97E+00	-4,36E+02

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
28.09.2023

