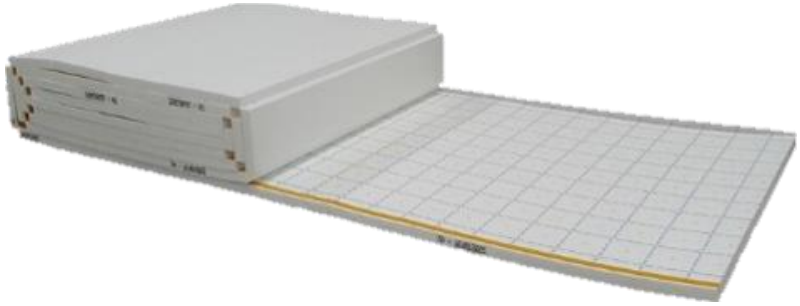
ENVIRONMENTAL PRODUCT DECLARATION

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

KLETT PANEL 25 WLS032
Uponor Corporation



EPD HUB, HUB-0163
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Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Uponor Corporation
Address	Äyritie 20, 01510 Vantaa, Finland
Contact details	info@uponor.com
Website	www.uponor.com

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 modules C1-C4, D
EPD author	Dr. Qian Wang
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
EPD verifier	E.A, 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	KLETT PANEL 25 WLS032
Additional labels	-
Product reference	1085788
Place of production	Alicante, Spain
Period for data	2021
Averaging in EPD	No averaging

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 m2
Declared unit mass	0.33 kg
GWP-fossil, A1-A3 (kgCO2e)	2.02
GWP-total, A1-A3 (kgCO2e)	1.71
Secondary material, inputs (%)	0.218
Secondary material, outputs (%)	43.0
Total energy use, A1-A3 (kWh)	9.54
Total water use, A1-A3 (m3e)	5.53

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Uponor is rethinking water for future generations. Our offering, including safe drinking water delivery, energy-efficient radiant heating and cooling and reliable infrastructure, enables a more sustainable living environment. We help our customers in residential and commercial construction, municipalities and utilities, as well as different industries to work faster and smarter. We employ about 3,800 professionals in 26 countries in Europe and North America. Over 100 years of expertise and trust form the basis of any successful partnership. This is the basis, on which they can build, in a literal and metaphorical sense. We create trust together with our partners: Customers, prospective customers and suppliers. We establish this with shared knowledge, quality and sustainable results.

PRODUCT DESCRIPTION

Uponor Klett is a panel used for heating / cooling applications as under floor heating systems. For use with cement and anhydrite based screeds. The panel serves to fix the tube and insulate thermally and acoustically. As one of the leading suppliers of plastic pipe systems, Uponor attaches great importance to product development. This Innovative radiant floor heating and cooling system consists on an EPS insulating panel covered with fabric that helps to fix the pipe. The EPS Panel is gray (HBCD free) and low thermal conductivity and acoustic insulation.

Further information can be found at www.uponor.com.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Fossil materials	100	EU
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	0.001

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 m2
Mass per declared unit	1 m2
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.

Uponor Klett panel is a panel, manufactured by Expanded polystyrene (EPS). The raw EPS is processed to convert it into panels ant then the foil (made of PE Film with nylon and polyester) is glued to them. The finished product (10m2) is wrapped with plastic film. Ready and packed products are supplied to construction site on pallets.

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.

Environmental impacts from installation into the building is considered as negligible due to the highly modularized products. The impacts of material production, its processing and its disposal as installation waste are not included because there is no significant installation waste.
The transportation distance is defined according to the standard. Average distance of transportation from production plant to building site is based on the actual sales average figures of the company in of the local markets and the transportation method is assumed to be lorry. 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 packaged properly. Also, volume capacity utilisation factor is assumed to be <1 for the nested packaged products. Each wooden pallet is assumed to be re-used for 120 times based on the actual re-use scenarios.

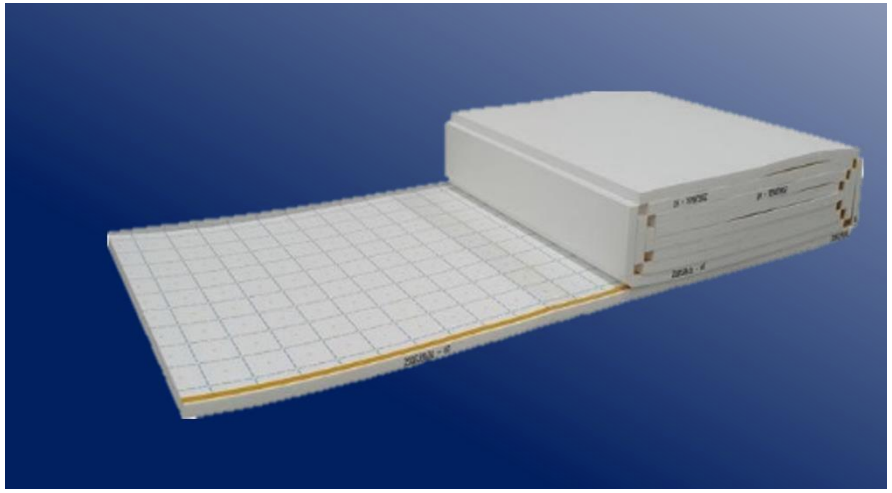
PRODUCT USE AND MAINTENANCE (B1-B7)

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)

Since the consumption of energy and natural resources is negligible for disassembling of the end-of-life product, the impacts of demolition are assumed zero (C1). The end-of-life product is assumed to be sent to the closest facilities by lorry and is assumed to be 50 km away (C2). All panel

materials will be retrieved and scratched off easily thanks to the modular products, and 100% of the end-of-life product is collected from the demolition site that are all recycled (C3). The end-of-life product is all recycled while energy and heat is produced from its incineration (D). The benefits and loads of waste packaging materials in A5 are also considered in module D.



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.

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 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_2e	1,03E0	7,45E-2	5,76E-1	1,68E0	1,88E-2	3,81E-3	MND	MND	MND	MND	MND	MND	MND	0E0	2,19E-3	1,03E0	0E0	3,25E-3
GWP – fossil	kg CO_2e	1,02E0	7,44E-2	8,86E-1	1,98E0	1,89E-2	1,04E-4	MND	MND	MND	MND	MND	MND	MND	0E0	2,18E-3	1,02E0	0E0	3,19E-5
GWP – biogenic	kg CO_2e	2,85E-3	5,4E-5	-3,11E-1	-3,08E-1	1,16E-5	3,7E-3	MND	MND	MND	MND	MND	MND	MND	0E0	9,89E-7	2,85E-3	0E0	3,22E-3
GWP – LULUC	kg CO_2e	1,32E-4	2,24E-5	1,24E-3	1,39E-3	6,68E-6	7,45E-8	MND	MND	MND	MND	MND	MND	MND	0E0	8,04E-7	1,32E-4	0E0	6,19E-9
Ozone depletion pot.	kg $CFC_{-11}e$	2,31E-8	1,75E-8	9,78E-8	1,38E-7	4,34E-9	2,11E-11	MND	MND	MND	MND	MND	MND	MND	0E0	4,8E-10	2,31E-8	0E0	2,57E-12
Acidification potential	mol H^+e	3,51E-3	3,12E-4	5,13E-3	8,95E-3	7,8E-5	4,59E-7	MND	MND	MND	MND	MND	MND	MND	0E0	9,14E-6	3,51E-3	0E0	3,6E-7
EP-freshwater[2)]	kg Pe	9,6E-6	6,05E-7	5,72E-4	5,82E-4	1,63E-7	2,82E-9	MND	MND	MND	MND	MND	MND	MND	0E0	2,18E-8	9,6E-6	0E0	4,27E-10
EP-marine	kg Ne	6,08E-4	9,41E-5	1,29E-2	1,36E-2	2,31E-5	1,18E-7	MND	MND	MND	MND	MND	MND	MND	0E0	2,65E-6	6,08E-4	0E0	1,7E-7
EP-terrestrial	mol Ne	6,73E-3	1,04E-3	1,37E-2	2,15E-2	2,55E-4	1,32E-6	MND	MND	MND	MND	MND	MND	MND	0E0	2,93E-5	6,73E-3	0E0	1,81E-6
POCP ("smog")[3)]	kg NMVOCe	2,86E-3	3,34E-4	2,87E-3	6,07E-3	8,01E-5	4,07E-7	MND	MND	MND	MND	MND	MND	MND	0E0	9,16E-6	2,86E-3	0E0	4,46E-7
ADP-minerals & metals[4)]	kg Sbe	3,3E-5	1,27E-6	1,16E-5	4,58E-5	4,72E-7	2,1E-9	MND	MND	MND	MND	MND	MND	MND	0E0	5,31E-8	3,3E-5	0E0	4,21E-10
ADP-fossil resources	MJ	3,55E1	1,16E0	1,46E1	5,13E1	2,89E-1	1,7E-3	MND	MND	MND	MND	MND	MND	MND	0E0	3,26E-2	3,55E1	0E0	2,8E-4
Water use[5)]	m^3e depr.	3,37E-1	4,3E-3	-1,11E1	-1,07E1	1,03E-3	9,69E-6	MND	MND	MND	MND	MND	MND	MND	0E0	1,35E-4	3,37E-1	0E0	-2,48E-5

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	2,72E-8	6,72E-9	6,03E-8	9,43E-8	1,46E-9	6,99E-12	MND	MND	MND	MND	MND	MND	MND	0E0	1,66E-10	2,72E-8	0E0	3,75E-12
Ionizing radiation[6)]	kBq U235e	2E-1	5,06E-3	4,16E-2	2,47E-1	1,26E-3	9,14E-6	MND	MND	MND	MND	MND	MND	MND	0E0	1,36E-4	2E-1	0E0	4,6E-7
Ecotoxicity (freshwater)	CTUe	1,1E1	8,84E-1	2,39E2	2,51E2	2,25E-1	1,25E-3	MND	MND	MND	MND	MND	MND	MND	0E0	2,79E-2	1,1E1	0E0	4,96E-4
Human toxicity, cancer	CTUh	2,53E-10	2,26E-11	2,34E-9	2,62E-9	6,39E-12	3,77E-14	MND	MND	MND	MND	MND	MND	MND	0E0	7,26E-13	2,53E-10	0E0	8,84E-14
Human tox. non-cancer	CTUh	1,06E-8	1,05E-9	6,43E-8	7,59E-8	2,59E-10	1,38E-12	MND	MND	MND	MND	MND	MND	MND	0E0	2,95E-11	1,06E-8	0E0	4,82E-12
SQP[7)]	-	1,21E-1	1,74E0	1,65E0	3,52E0	3,22E-1	1,52E-3	MND	MND	MND	MND	MND	MND	MND	0E0	3,59E-2	1,21E-1	0E0	7,26E-5

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	3,94E-1	1,46E-2	1,97E0	2,38E0	4,1E-3	8,65E-5	MND	MND	MND	MND	MND	MND	MND	0E0	3,74E-4	3,94E-1	0E0	6,4E-6
Renew. PER as material	MJ	1,68E-1	0E0	4,23E0	4,4E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	1,68E-1	0E0	0E0
Total use of renew. PER	MJ	5,62E-1	1,46E-2	6,2E0	6,78E0	4,1E-3	8,65E-5	MND	MND	MND	MND	MND	MND	MND	0E0	3,74E-4	5,62E-1	0E0	6,4E-6
Non-re. PER as energy	MJ	1,78E1	1,16E0	1,33E1	3,22E1	2,89E-1	1,7E-3	MND	MND	MND	MND	MND	MND	MND	0E0	3,26E-2	1,78E1	0E0	2,8E-4
Non-re. PER as material	MJ	1,77E1	0E0	1,39E0	1,91E1	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	1,77E1	0E0	0E0
Total use of non-re. PER	MJ	3,55E1	1,16E0	1,46E1	5,13E1	2,89E-1	1,7E-3	MND	MND	MND	MND	MND	MND	MND	0E0	3,26E-2	3,55E1	0E0	2,8E-4
Secondary materials	kg	1,73E-3	0E0	4,53E-4	2,18E-3	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	1,73E-3	0E0	0E0
Renew. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Non-ren. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Use of net fresh water	m^3	5,52E0	2,41E-4	8,47E-3	5,53E0	5,47E-5	3,75E-7	MND	MND	MND	MND	MND	MND	MND	0E0	6,23E-6	5,52E0	0E0	5,62E-7

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	7,63E-3	1,12E-3	5,66E-2	6,54E-2	3E-4	2,83E-6	MND	MND	MND	MND	MND	MND	MND	0E0	4,29E-5	0E0	0E0	1,2E-5
Non-hazardous waste	kg	3,24E-1	1,24E-1	1,29E0	1,74E0	2,5E-2	2,09E-4	MND	MND	MND	MND	MND	MND	MND	0E0	2,91E-3	0E0	0E0	2,19E-3
Radioactive waste	kg	2,03E-5	7,94E-6	3,45E-5	6,27E-5	1,97E-6	1,15E-8	MND	MND	MND	MND	MND	MND	MND	0E0	2,16E-7	0E0	0E0	6,17E-10

END OF LIFE – OUTPUT FLOWS

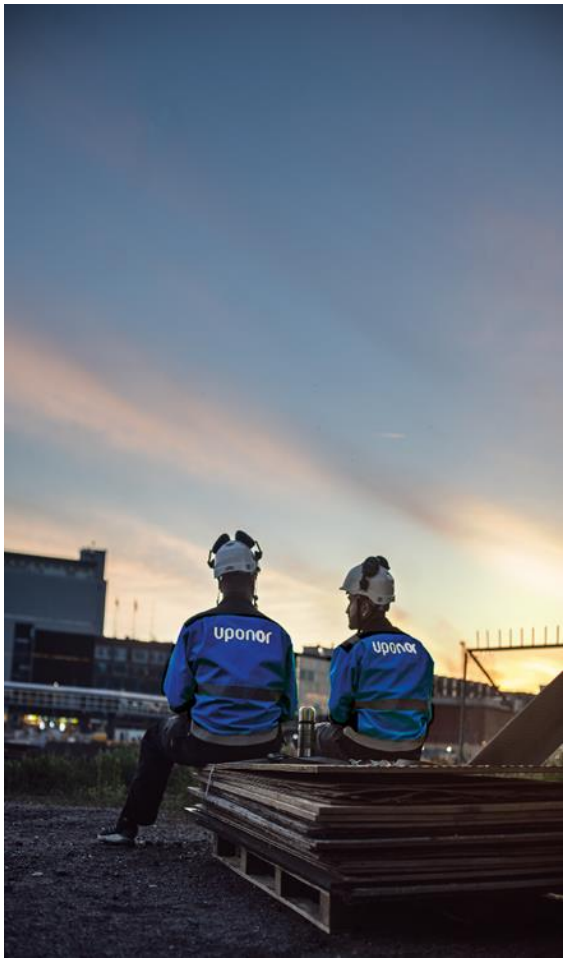
Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Materials for recycling	kg	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	4,3E-1	0E0	0E0
Materials for energy rec	kg	0E0	0E0	0E0	0E0	0E0	4,4E-3	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0

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	9,74E-1	7,37E-2	8,66E-1	1,91E0	1,88E-2	1,03E-4	MND	MND	MND	MND	MND	MND	MND	0E0	2,16E-3	9,74E-1	0E0	3,13E-5
Ozone depletion Pot.	kg CFC_{-11}e	2,02E-8	1,39E-8	8,8E-8	1,22E-7	3,45E-9	1,74E-11	MND	MND	MND	MND	MND	MND	MND	0E0	3,81E-10	2,02E-8	0E0	2,16E-12
Acidification	kg SO_2e	2,96E-3	1,51E-4	3,95E-3	7,06E-3	3,86E-5	2,67E-7	MND	MND	MND	MND	MND	MND	MND	0E0	6,63E-6	2,96E-3	0E0	2,5E-7
Eutrophication	kg PO_4^3e	4,3E-4	3,06E-5	8,52E-3	8,98E-3	8,02E-6	1,02E-7	MND	MND	MND	MND	MND	MND	MND	0E0	1,52E-6	4,3E-4	0E0	2,81E-7
POCP (“smog”)	kg C_2H_4e	5,09E-4	9,59E-6	2,09E-4	7,28E-4	2,49E-6	1,5E-8	MND	MND	MND	MND	MND	MND	MND	0E0	2,87E-7	5,09E-4	0E0	5,19E-9
ADP-elements	kg Sbe	3,3E-5	1,27E-6	1,16E-5	4,58E-5	4,72E-7	2,1E-9	MND	MND	MND	MND	MND	MND	MND	0E0	5,31E-8	3,3E-5	0E0	4,21E-10
ADP-fossil	MJ	3,55E1	1,16E0	1,46E1	5,13E1	2,89E-1	1,7E-3	MND	MND	MND	MND	MND	MND	MND	0E0	3,26E-2	3,55E1	0E0	2,8E-4

ENVIRONMENTAL IMPACTS – TRACI 2.1. / 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	9,81E-1	7,36E-2	8,69E-1	1,92E0	1,87E-2	1,03E-4	MND	MND	MND	MND	MND	MND	MND	0E0	2,16E-3	9,81E-1	0E0	3,13E-5
Ozone Depletion	kg $CFC_{-11}e$	2,61E-8	1,85E-8	1,09E-7	1,54E-7	4,6E-9	2,3E-11	MND	MND	MND	MND	MND	MND	MND	0E0	5,08E-10	2,61E-8	0E0	2,74E-12
Acidification	kg SO_2e	2,91E-3	2,72E-4	4,2E-3	7,38E-3	6,78E-5	3,94E-7	MND	MND	MND	MND	MND	MND	MND	0E0	7,99E-6	2,91E-3	0E0	3,33E-7
Eutrophication	kg Ne	1,99E-4	3,83E-5	1,78E-2	1,81E-2	9,57E-6	6,04E-8	MND	MND	MND	MND	MND	MND	MND	0E0	1,11E-6	1,99E-4	0E0	1,34E-7
POCP (“smog”)	kg O_3e	3,83E-2	5,97E-3	5,01E-2	9,44E-2	1,46E-3	7,47E-6	MND	MND	MND	MND	MND	MND	MND	0E0	1,68E-4	3,83E-2	0E0	1,04E-5
ADP-fossil	MJ	5,27E0	1,66E-1	1,76E0	7,2E0	4,12E-2	2E-4	MND	MND	MND	MND	MND	MND	MND	0E0	4,58E-3	5,27E0	0E0	3,72E-5



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
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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.

Elma Avdyli, as an authorized verifier acting for EPD Hub Limited
28.10.2022