ENVIRONMENTAL PRODUCT DECLARATION

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

Natural Portland Stone
Albion Stone, Portland Stone

EPD HUB, HUB-1330
Published on 03.05.2024, last updated on 03.05.2024, valid until 03.05.2029.

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Albion Stone, Portland Stone
Address	Albion Stone Plc, Independent Offices, Easton Street, Portland, DT5 1BW
Contact details	jordan@albionstone.com
Website	https://www.albionstone.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 1.1, 5 Dec 2023
Sector	Construction product
Category of EPD	Third party verified EPD
Parent EPD number	-
Scope of the EPD	Cradle to gate with modules C1-C4, D
EPD author	Erin Davies
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Imane Uald lamkaddam, 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	Natural Portland Stone
Additional labels	-
Product reference	-
Place of production	Portland, United Kingdom
Period for data	2022
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	5 %

ENVIRONMENTAL DATA SUMMARY

Declared unit	1000
Declared unit mass	1000 kg
GWP-fossil, A1-A3 (kgCO2e)	4,55E+01
GWP-total, A1-A3 (kgCO2e)	4,47E+01
Secondary material, inputs (%)	0
Secondary material, outputs (%)	96
Total energy use, A1-A3 (kWh)	369
Net fresh water use, A1-A3 (m3)	9.89

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Albion Stone, deeply entrenched in the Portland Stone industry for almost a century and has extracted this renowned material for over 40 years. Pioneering the shift from quarrying to mining, we prioritize environmental preservation, ensuring our stones are globally recognized as eco-friendly building products.

Committed to unwavering quality, we adhere to the ISO 9001 Quality Management standard and prioritize workforce safety with ISO 45001

compliance. Our dedication to environmental responsibility is evident through our ISO 14001 Environmental Management certification.

PRODUCT DESCRIPTION

Portland Stone formed at the end of the Jurassic period, around 145 million years ago when what is now Portland, was much closer to the equator than it is today.

A chemical reaction in the warm, shallow seas where Portland stone was forming caused calcium and bicarbonate ions to combine, forming a muddy calcareous precipitate. Minute particles of sand or organic detritus, such as shell fragments, lying on or in suspension close to the sea floor, acted as nuclei which gradually became coated with this fine-grained calcium carbonate.

Over time more calcium carbonate accumulated around these nuclei in concentric layers, forming small calcareous spheres (less than 1mm diameter). Countless billions of these spherical sediments, called ooids or ooliths, ultimately became buried and partially cemented together by more calcium carbonate, resulting in the oolitic limestone we now call Portland stone.

The declared product is Grove Whitbed, a natural Portland stone with a typical thickness of 50mm weighted by their production volumes. At the quarry, Portland stone is extracted through various mining methods, and later go through the manufacturing process of block sawing, cutting, calibration and sizing in order to meet customer requirements on dimensions and finish.

Placing on the Market

For the placing on the market in the EU/EFTA the Regulation (EU No. 305/2011) applies. The product needs a declaration of performance taking into consideration the BS EN 771-6 - specification for masonry units; part 6: Natural stone masonry units, and the CE marking.

Application

For the application and use the respective national provisions apply. Portland stone slabs are used for flooring, cladding, stairs, monuments, kitchen tops, cubic building elements and many other applications. Portland stone, with its unique physical and aesthetics properties make it an ideal raw material for the construction industry.

Portland stone finds numerous uses in the construction industry from outdoor applications including stone patios, swimming pool copings, steps, walkways and stone walls to interior applications for flooring, bathroom/kitchen renovations, fireplaces, stairs and wall linings. These all contribute to the improvement of the quality, and overall aesthetics and performance of buildings and open spaces

Further information can be found at https://www.albionstone.com/.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	0	
Minerals	100	Portland
Fossil materials	0	
Bio-based materials	0	

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	15.65955764

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1000
Mass per declared unit	1000 kg
Functional unit	
Reference service life	100+

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	MND	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	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 1 tonne Natural Stone façade includes roughly four stages. The first is the separation of the natural stone from the rock face at the mine. This is done by cutting and lifting the block away from the face. After this, the large stone blocks are then transported to the manufacturing site. At the site the blocks are sawed into slabs, using small quantities of gypsum to keep them in place for the initial primary cutting, and then cut into the desired shapes and sizes. Finally, the stone products are given a finishing treatment. Gypsum is separated from sawing offcuts and goes to a waste treatment facility where it is 100% recycled. Trace quantities of gypsum that cannot be separated from offcuts is included in the restoration of the mine and quarries.

Eventually, the natural stone products are packed for shipping and moved to site by the purchaser.

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.

Transportation impacts are out of scope for this EPD.

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 demolition is assumed to be 10 kWh/1000 kg = 0,01 kWh/kg (Bozdağ, Ö & Seçer, M. 2007). The source of energy is diesel fuel used by work machines (C1).

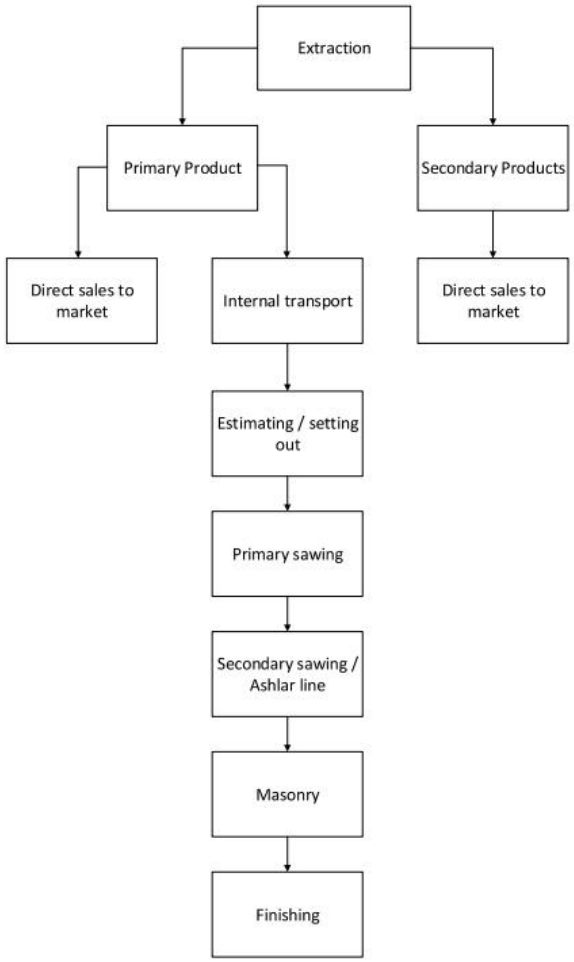
The product is demolished on site, waste arising from this is commonly used as building aggregates on site, therefore there are no transport impacts associated with this end of life stage (C2).

At the waste treatment plant, waste that can be reused, recycled or recovered for energy is separated and diverted for further use. The EEA

(2022) reported that 95.9% of the UKs mineral waste from construction was recycled. The process losses of the waste treatment plant are assumed to be negligible (C3). The remaining 4.1% mineral waste was assumed to be send to the landfill (C4).

Due to the recycling potential of natural stone, they can be used as secondary raw material, which avoids the use of virgin raw materials. 100% of mineral waste going to waste processing are converted into secondary raw materials after recycling. The recycled material content of the stone product is assumed to be 0 % (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	Partly allocated by mass or volume
Packaging materials	Allocated by mass or volume
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	5 %

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	5,37E+00	3,65E-01	3,90E+01	4,47E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	3,17E+00	1,21E-01	1,21E+00	5,01E-01	-8,46E+00
GWP – fossil	kg CO_2e	5,37E+00	3,65E-01	3,98E+01	4,55E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	3,17E+00	1,21E-01	3,73E-01	5,00E-01	-8,45E+00
GWP – biogenic	kg CO_2e	0,00E+00	0,00E+00	-8,31E-01	-8,31E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	8,31E-01	0,00E+00	0,00E+00
GWP – LULUC	kg CO_2e	6,10E-04	1,35E-04	1,74E-02	1,82E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	3,16E-04	4,47E-05	7,89E-04	4,50E-04	-1,07E-02
Ozone depletion pot.	kg CFC_{-11}e	1,14E-06	8,40E-08	6,75E-06	7,97E-06	MND	MND	MND	MND	MND	MND	MND	MND	MND	6,78E-07	2,79E-08	1,89E-08	1,35E-07	-6,42E-07
Acidification potential	mol H^+e	5,55E-02	1,55E-03	3,59E-01	4,16E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	3,30E-02	5,13E-04	1,75E-03	3,75E-03	-5,24E-02
EP-freshwater[2)]	kg Pe	2,10E-05	2,99E-06	9,58E-04	9,82E-04	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,05E-05	9,91E-07	3,06E-05	6,93E-06	-4,41E-04
EP-marine	kg Ne	2,45E-02	4,60E-04	1,56E-01	1,81E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,46E-02	1,52E-04	2,83E-04	1,36E-03	-1,13E-02
EP-terrestrial	mol Ne	2,68E-01	5,07E-03	1,54E+00	1,81E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,60E-01	1,68E-03	3,17E-03	1,40E-02	-1,46E-01
POCP ("smog")[3)]	kg NMVOCe	7,38E-02	1,62E-03	4,30E-01	5,05E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	4,40E-02	5,38E-04	9,10E-04	4,09E-03	-3,88E-02
ADP-minerals & metals[4)]	kg Sbe	6,13E-06	8,56E-07	7,34E-04	7,41E-04	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,61E-06	2,84E-07	1,24E-06	1,49E-06	-7,96E-05
ADP-fossil resources	MJ	7,23E+01	5,49E+00	1,43E+02	2,21E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	4,27E+01	1,82E+00	6,41E+00	1,02E+01	-1,39E+02
Water use[5)]	m^3e depr.	2,26E-01	2,46E-02	9,12E+00	9,37E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,15E-01	8,14E-03	1,68E-01	5,99E-02	-1,51E+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	1,48E-06	4,21E-08	8,62E-06	1,01E-05	MND	MND	MND	MND	MND	MND	MND	MND	MND	8,84E-07	1,40E-08	1,08E-08	7,51E-08	-6,70E-07
Ionizing radiation[6)]	kBq U235e	3,34E-01	2,61E-02	2,67E+00	3,03E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,96E-01	8,66E-03	1,61E-01	4,91E-02	-1,67E+00
Ecotoxicity (freshwater)	CTUe	4,57E+01	4,94E+00	8,48E+02	8,98E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	2,57E+01	1,64E+00	4,53E+00	7,82E+00	-1,42E+02
Human toxicity, cancer	CTUh	2,04E-09	1,21E-10	3,10E-08	3,31E-08	MND	MND	MND	MND	MND	MND	MND	MND	MND	9,84E-10	4,02E-11	3,77E-10	3,20E-10	-7,95E-09
Human tox. non-cancer	CTUh	3,45E-08	4,89E-09	6,10E-07	6,49E-07	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,86E-08	1,62E-09	6,48E-09	5,19E-09	-1,47E-07

SQP[7)]	-	1,07E+01	6,32E+00	1,25E+02	1,42E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	5,55E+00	2,10E+00	1,50E+00	2,50E+01	-9,90E+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	2,07E+01	6,18E-02	6,84E+02	7,05E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	2,44E-01	2,05E-02	1,06E+00	1,79E-01	-8,88E+00
Renew. PER as material	MJ	0,00E+00	0,00E+00	2,00E+01	2,00E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	-1,99E+01	-1,13E-01	0,00E+00
Total use of renew. PER	MJ	2,07E+01	6,18E-02	7,04E+02	7,25E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	2,44E-01	2,05E-02	-1,88E+01	6,59E-02	-8,88E+00
Non-re. PER as energy	MJ	7,23E+01	5,49E+00	5,40E+02	6,17E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	4,27E+01	1,82E+00	6,40E+00	1,02E+01	-1,21E+02
Non-re. PER as material	MJ	0,00E+00	0,00E+00	3,65E+01	3,65E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	-3,43E+01	-2,19E+00	0,00E+00
Total use of non-re. PER	MJ	7,23E+01	5,49E+00	5,76E+02	6,54E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	4,27E+01	1,82E+00	-2,79E+01	8,06E+00	-1,21E+02
Secondary materials	kg	3,41E-02	1,52E-03	7,48E-01	7,84E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,67E-02	5,05E-04	4,77E-03	3,69E-03	3,22E-01
Renew. secondary fuels	MJ	1,09E-04	1,54E-05	4,50E-01	4,50E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	5,46E-05	5,09E-06	1,69E-05	1,42E-04	-8,77E-04
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	4,38E+00	4,38E+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
Use of net fresh water	m^3	2,26E-02	7,11E-04	9,87E+00	9,89E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	2,59E-03	2,36E-04	5,19E-03	1,10E-02	-3,63E-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	1,13E-01	7,28E-03	1,08E+00	1,20E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	5,71E-02	2,41E-03	2,83E-02	0,00E+00	-6,64E-01
Non-hazardous waste	kg	8,18E-01	1,20E-01	1,91E+01	2,00E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	4,02E-01	3,96E-02	1,41E+00	4,21E+01	-1,93E+01
Radioactive waste	kg	5,05E-04	3,67E-05	6,62E-04	1,20E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	3,01E-04	1,22E-05	4,49E-05	0,00E+00	-5,61E-04

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	1,97E+01	1,97E+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
Materials for recycling	kg	0,00E+00	0,00E+00	2,01E+00	2,01E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	9,60E+02	0,00E+00	0,00E+00
Materials for energy rec	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
Exported energy	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

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	5,31E+00	3,62E-01	3,73E+01	4,30E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	3,14E+00	1,20E-01	3,69E-01	5,19E-01	-8,21E+00
Ozone depletion Pot.	kg CFC_{-11}e	9,02E-07	6,66E-08	5,39E-06	6,36E-06	MND	MND	MND	MND	MND	MND	MND	MND	MND	5,37E-07	2,21E-08	1,62E-08	1,07E-07	-5,33E-07
Acidification	kg SO_2e	3,96E-02	1,20E-03	9,56E-02	1,36E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	2,35E-02	3,98E-04	1,47E-03	2,84E-03	-4,08E-02
Eutrophication	kg PO_4^3e	9,28E-03	2,74E-04	3,32E-02	4,28E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	5,45E-03	9,07E-05	1,28E-03	6,01E-03	-1,84E-02
POCP (“smog”)	kg C_2H_4e	8,85E-04	4,69E-05	7,57E-03	8,50E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	5,14E-04	1,55E-05	6,75E-05	1,31E-04	-2,86E-03
ADP-elements	kg Sbe	6,05E-06	8,29E-07	4,35E-04	4,42E-04	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,58E-06	2,75E-07	1,24E-06	1,44E-06	-7,88E-05
ADP-fossil	MJ	7,23E+01	5,49E+00	5,33E+02	6,11E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	4,27E+01	1,82E+00	6,40E+00	1,02E+01	-1,39E+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

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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.

Imane Uald lamkaddam, as an authorized verifier acting for EPD Hub Limited
03.05.2024