ENVIRONMENTAL PRODUCT DECLARATION

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

Concrete Masonry Thermal Insulated Block
Al Amaar Block Manufacturing Co. LLC

EPD HUB, HUB-0194
Publishing date 25 November 2022, last updated date 25 November 2022, valid until 25 November 2027

EPD Developed by Grey Matters

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Al Amaar Block Manufacturing Co. LLC
Address	Industrial Area 3, Jebel Ali, Dubai, UAE
Contact details	sales@amaarblock.com
Website	www.amaarblock.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 EN 16757 Product Category Rules for concrete and concrete elements
Sector	Construction product
Category of EPD	Third party verified EPD – Sister EPD (Parent EPD HUB-0196)
Scope of the EPD	Cradle to gate with modules C1-C4, D
EPD author	Praveen Dhilip Kumar, Grey Matters
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
EPD verifier	S.B, 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 Masonry Thermal Insulated Block
Additional labels	-
Product reference	ABMCO-THERMAL
Place of production	Dubai , United Arab Emirates
Period for data	Calendar year 2021
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	Not Relevant

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 tonne of concrete block
Declared unit mass	1000 kg
GWP-fossil, A1-A3 (kgCO2e)	117.0
GWP-total, A1-A3 (kgCO2e)	116.0
Secondary material, inputs (%)	0.00187
Secondary material, outputs (%)	80.0
Total energy use, A1-A3 (kWh)	279.0
Total water use, A1-A3 (m3e)	1.57

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

ABMCO (Al Amaar Block Manufacturing Co. LLC) is one of the leading manufacturers and suppliers of the concrete blocks in United Arab Emirates, serving the construction industry since 2004 with the quality product and services. ABMCO manufacture and supply thermal insulated (sandwich) blocks, Light Weight Insulated Blocks, Normal Weight Hollow Blocks, Normal Weight Solid Blocks, Hourdi Blocks and Lintels for Door/Window openings.

ABMCO patiently worked its way to the top and has consistently strived and invested to improve the management, production process, machineries/ technology and more importantly achieve and maintain the best quality of blocks for our clients.

PRODUCT DESCRIPTION

The product is a type of concrete block consist of cement, aggregate, sand, water and EPS insulation. The product complies with Dubai Municipality Local Order No. 44/1990, BS 6073.

Physical Properties:
Dimensions: Height 200mm, Length 400 mm, Thickness 200,250 & 300 mm

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

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	-	-
Minerals	99.6	UAE
Fossil materials	0.4	UAE
Bio-based materials	-	-

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	-
Biogenic carbon content in packaging, kg C	0.65

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 tonne of concrete block
Mass per declared unit	1000 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	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 product is made of aggregates (extracted from natural rock formations and reduced to usable sizes by mechanical crushing in the local quarry, UAE), cement (manufactured locally in UAE) and water (Sourced from local desalination plant in UAE through pipeline). The ingredients are brought from its source to the production facility and stored in the silo, bins and tanks. Concrete block production starts by feeding the binders, aggregates and additives from silos/bins to the mixer through a conveyor belt. Cement is then added to the ingredients, after which the material is mixed dry. Water and additives are then added to the mixture, followed by wet mixing. The wet mass is filled into molds, vibrated to its final shape and supplemented with EPS -insulation. The blocks are then transported on an automatic line to a dryer. The defected blocks from the dryer (Irregular shape, size, surface and other.) are discarded as waste, dumped into a waste bin in the production facility and then it is transported to a landfill area in Dubai. The satisfactory blocks from the dryer (the ingots) go to the packaging line, where they are taken for storage. Eventually, the finished product is packaged in plastic film (which is acquired from a local manufacturer in Dubai) and sent to the installation site and in rare cases with wooden pallet (Wooden Pallet is acquired from a local manufacturer in Dubai).

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.

This EPD does not cover the transport (A4) and 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 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 of a demolition process is on the average 10 kWh/m2 (Bozdağ, Ö & Seçer, M. 2007). Basing on a Level(s) project, an average mass of a reinforced concrete building is about 1000 kg/m2. Therefore, energy

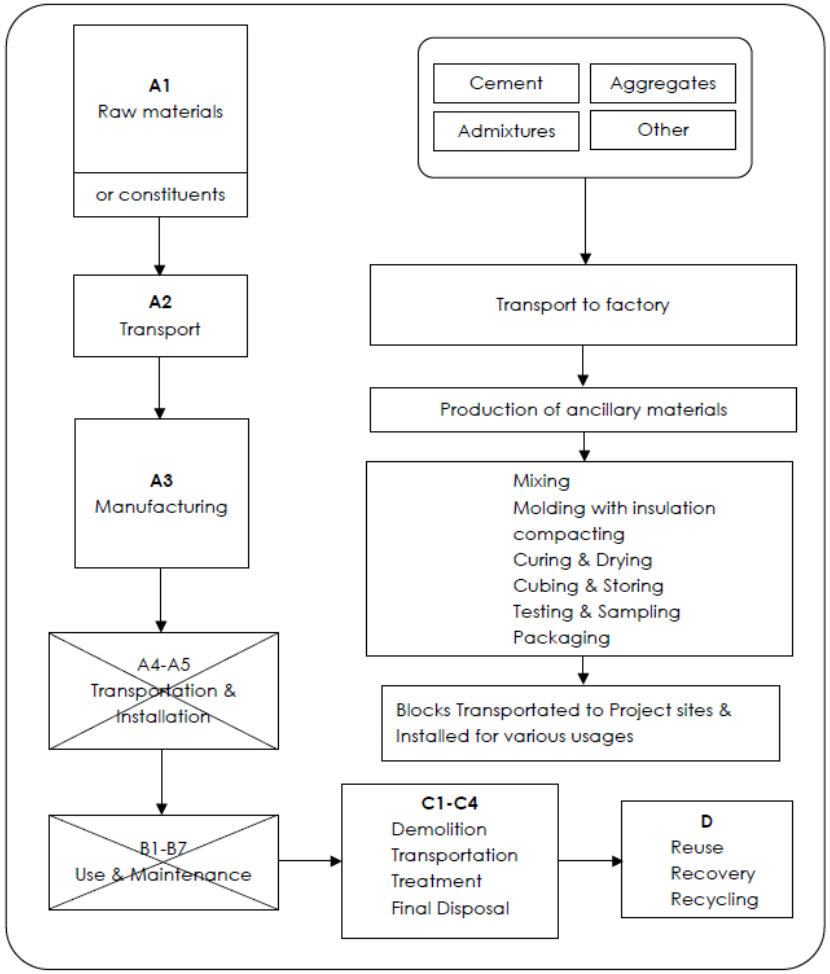
consumption demolition is assumed to be 10 kWh/1000 kg = 0,01 kWh/kg. The source of energy is diesel fuel used by work machines (C1).

The dismantled concrete blocks are delivered to the nearest construction waste treatment plant. It is estimated that there is no mass loss during the use of the product, therefore the end-of-life product is assumed that it has the same weight with the declared product. Transportation distance to the closest disposal area is estimated as 55 km and the transportation method is >32 ton truck which is the most common (C2).

At the waste treatment plant, waste that can be reused, recycled or recovered for energy is separated and diverted for further use. It can be assumed that 100% of the concrete blocks are transported to a waste treatment plant in Dubai, where the blocks are crushed and separated. About 80% of concrete is recycled. The process losses of the waste treatment plant are assumed to be negligible (C3). The remaining 20% of concrete are assumed to be sent to the landfill in Dubai, UAE. The EPS insulation is landfilled, Dubai, UAE (C4).

Due to the recycling potential of concrete, they can be crushed and used as secondary raw material, which avoids the use of virgin raw materials. The 80 % of concrete going to waste processing is converted into secondary raw materials after recycling. The recycled material content in the concrete itself 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	No allocation
Packaging materials	No allocation
Ancillary materials	No allocation
Manufacturing energy and waste	No allocation

AVERAGES AND VARIABILITY

Type of average	No averaging
Averaging method	Not applicable
Variation in GWP-fossil for A1-A3	Not Relevant %

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.

Bozdağ, Ö., & Seçer, M. (2007): Energy consumption of RC buildings during their life cycle

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	9,9E1	1,71E1	-6,08E-2	1,16E2	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	3,3E0	9,18E0	3,2E0	1,06E0	-5,98E0
GWP – fossil	kg CO_2e	9,79E1	1,71E1	2,14E0	1,17E2	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	3,3E0	9,17E0	3,2E0	1,05E0	-7,85E0
GWP – biogenic	kg CO_2e	1E0	1,05E-2	-2,21E0	-1,19E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	9,17E-4	4,89E-3	8,9E-4	2,09E-3	1,88E0
GWP – LULUC	kg CO_2e	4,92E-2	5,77E-3	1,62E-3	5,66E-2	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	2,79E-4	3,25E-3	2,7E-4	3,13E-4	-1,06E-2
Ozone depletion pot.	kg $CFC_{-11}e$	3,68E-6	3,93E-6	2,89E-7	7,9E-6	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	7,12E-7	2,08E-6	6,91E-7	4,34E-7	-6,73E-7
Acidification potential	mol H^+e	3,21E-1	7,08E-2	1,15E-2	4,03E-1	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	3,45E-2	3,74E-2	3,35E-2	1E-2	-5,21E-2
EP-freshwater[2)]	kg Pe	6,73E-4	1,43E-4	3,3E-5	8,49E-4	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	1,33E-5	7,67E-5	1,29E-5	1,27E-5	-4,78E-4
EP-marine	kg Ne	7,87E-2	2,11E-2	2,41E-3	1,02E-1	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	1,52E-2	1,11E-2	1,48E-2	3,44E-3	-1,01E-2
EP-terrestrial	mol Ne	9,13E-1	2,33E-1	2,6E-2	1,17E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	1,67E-1	1,23E-1	1,62E-1	3,79E-2	-1,32E-1
POCP ("smog")[3)]	kg NMVOCe	2,54E-1	7,29E-2	8,83E-3	3,35E-1	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	4,59E-2	3,76E-2	4,46E-2	1,1E-2	-3,41E-2
ADP-minerals & metals[4)]	kg Sbe	7,72E-3	4E-4	1,54E-5	8,14E-3	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	5,03E-6	2,48E-4	4,89E-6	9,62E-6	-7,33E-4
ADP-fossil resources	MJ	7,68E2	2,6E2	3,66E1	1,07E3	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	4,54E1	1,38E2	4,41E1	2,94E1	-1,15E2
Water use[5)]	m^3e depr.	5,29E1	8,92E-1	5,2E-1	5,43E1	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	8,46E-2	4,45E-1	8,22E-2	1,36E0	-1,21E1

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	2,94E-6	1,32E-6	1,33E-7	4,4E-6	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	9,14E-7	6,39E-7	4,06E-6	1,94E-7	-5,79E-7
Ionizing radiation[6)]	kBq U235e	1,96E0	1,14E0	8,1E-2	3,18E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	1,94E-1	6,04E-1	1,89E-1	1,21E-1	-7,39E-1
Ecotoxicity (freshwater)	CTUe	1,13E3	2,01E2	2,23E1	1,35E3	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	2,66E1	1,07E2	2,58E1	1,86E1	-1,41E2
Human toxicity, cancer	CTUh	2,4E-8	5,77E-9	1,4E-9	3,11E-8	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	9,53E-10	3,1E-9	9,26E-10	4,4E-10	-6,19E-9
Human tox. non-cancer	CTUh	7,71E-7	2,32E-7	1,69E-8	1,02E-6	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	2,35E-8	1,21E-7	2,28E-8	1,36E-8	-1,48E-7
SQP[7)]	-	2,95E2	2,81E2	6,55E0	5,82E2	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	1,16E0	1,15E2	1,13E0	5,01E1	-6,65E1

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	4,02E1	3,56E0	6,08E0	4,98E1	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	2,45E-1	1,95E0	2,38E-1	2,38E-1	-1,24E1
Renew. PER as material	MJ	0E0	0E0	2,12E1	2,12E1	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Total use of renew. PER	MJ	4,02E1	3,56E0	2,72E1	7,1E1	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	2,45E-1	1,95E0	2,38E-1	2,38E-1	-1,24E1
Non-re. PER as energy	MJ	6,62E2	2,6E2	3,23E1	9,55E2	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	4,54E1	1,38E2	4,41E1	2,94E1	-1,1E2
Non-re. PER as material	MJ	1,06E2	0E0	4,3E0	1,1E2	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	-4,3E0
Total use of non-re. PER	MJ	7,68E2	2,6E2	3,66E1	1,07E3	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	4,54E1	1,38E2	4,41E1	2,94E1	-1,15E2
Secondary materials	kg	1,72E-2	0E0	1,52E-3	1,87E-2	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	8,86E-2
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	1,51E0	4,81E-2	1,1E-2	1,57E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	4,01E-3	2,36E-2	3,89E-3	3,22E-2	-9,47E-1

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	2,49E0	2,62E-1	4,86E-2	2,8E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	4,88E-2	1,4E-1	0E0	2,75E-2	-5,78E-1
Non-hazardous waste	kg	7,71E1	2,18E1	1,44E1	1,13E2	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	5,22E-1	9,64E0	0E0	2E2	-2,08E1
Radioactive waste	kg	1,9E-3	1,79E-3	1,13E-4	3,8E-3	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	3,18E-4	9,48E-4	0E0	1,95E-4	-5,12E-4

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	8E2	0E0	0E0
Materials for energy rec	kg	0E0	0E0	0E0	0E0	0E0	0E0	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	9,55E1	1,69E1	2,09E0	1,15E2	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	3,27E0	9,09E0	3,18E0	1,03E0	-7,66E0
Ozone depletion Pot.	kg CFC_{-11}e	3,28E-6	3,12E-6	2,32E-7	6,63E-6	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	5,63E-7	1,66E-6	5,47E-7	3,44E-7	-6,19E-7
Acidification	kg SO_2e	2,44E-1	3,48E-2	8,71E-3	2,87E-1	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	4,87E-3	1,84E-2	4,73E-3	4,17E-3	-3,44E-2
Eutrophication	kg PO_4^3e	7,48E-2	7,16E-3	1,49E-3	8,34E-2	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	8,57E-4	3,78E-3	8,32E-4	8,06E-4	-1,58E-2
POCP (“smog”)	kg C_2H_4e	1,26E-2	2,28E-3	5,63E-4	1,54E-2	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	5,01E-4	1,21E-3	4,87E-4	3,06E-4	-2,59E-3
ADP-elements	kg Sbe	7,72E-3	4E-4	1,54E-5	8,14E-3	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	5,03E-6	2,48E-4	4,89E-6	9,62E-6	-7,33E-4
ADP-fossil	MJ	7,68E2	2,6E2	3,66E1	1,07E3	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	4,54E1	1,38E2	4,41E1	2,94E1	-1,15E2

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.

Sergio A. Ballén Zamora, as an authorized verifier acting for EPD Hub Limited
25.11.2022

VERIFIED ISO 14025