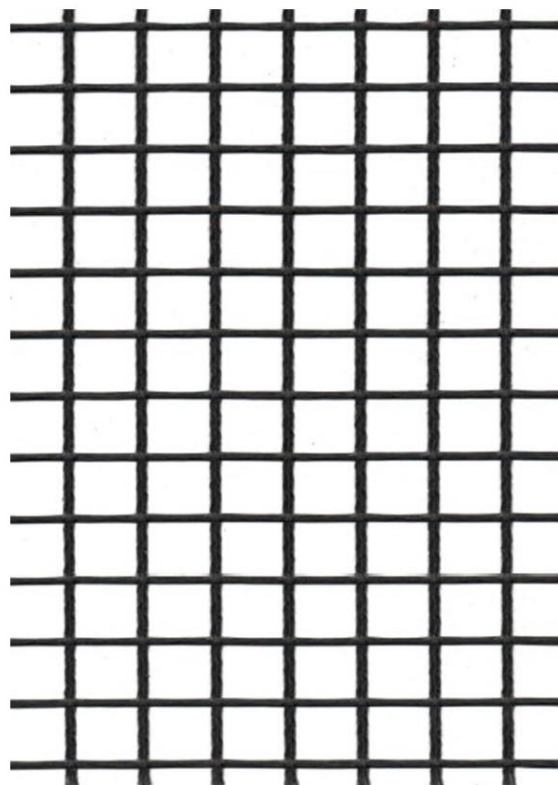


# ENVIRONMENTAL PRODUCT DECLARATION

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

StrataGrid™ SGU 60

Strata Geosystems (India) Pvt Limited



**EPD HUB, HUB-0692**

Publishing date 13 September 2023, last updated on 13 September 2023, valid until 13 September 2028.

## GENERAL INFORMATION

### MANUFACTURER

Manufacturer	Strata Geosystems (India) Pvt Limited
Address	Survey No 284, Next to Sutlej Textiles, Daheli, Off Bhilad Sanjan Road, Tal- Umergaon, Dist- Valsad. 396105.
Contact details	info@strataindia.com
Website	www.strataglobal.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	Suraj Vedpathak
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	StrataGrid™ SGU 60
Additional labels	-
Product reference	-
Place of production	Survey No 284, Next to Sutlej Textiles, Daheli, Off Bhilad Sanjan Road, Tal- Umergaon, Dist- Valsad. 396105.
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 m <sup>2</sup>
Declared unit mass	0.22 kg
GWP-fossil, A1-A3 (kgCO <sub>2</sub> e)	1.45E0
GWP-total, A1-A3 (kgCO <sub>2</sub> e)	1.44E0
Secondary material, inputs (%)	3.98
Secondary material, outputs (%)	76.4
Total energy use, A1-A3 (kWh)	6.74
Total water use, A1-A3 (m <sup>3</sup> e)	1.77E-2

## PRODUCT AND MANUFACTURER

### ABOUT THE MANUFACTURER

Strata Geosystems is a global leader in the geosynthetics market. Strata Geosystems manufactures products that can re-engineer and strengthen locally available soil to build structures. Strata constantly strives to provide the best quality product with un-matched technical and customer service. Strata Geosystems manufactures products that can re-engineer and strengthen locally available soil to build structures.

The offerings include soil reinforcement products that can be used for reinforced soil walls, slope protection, ground stabilization, erosion control, foundation improvement for embankments, steep slope embankments, strengthening of paved and unpaved roads, container yards and ports, warehouse flooring, and even pre-cast concrete arch bridges.

Strata's products have been used in highways, landfills, container yards, roads, green roofs, steep slopes, railway tracks, and many more.

Strata's cutting-edge products when allied to the subject matter experts on call ensure that the right turn-key solution is provided no matter how weak the soil.

### PRODUCT DESCRIPTION

StrataGrid™ uniaxial (SGU) is a high-performance soil reinforcement solution that is produced by knitting high-tenacity polyester yarn into a dimensionally stable network of apertures to form a geometric grid. SGU tensile strength and high molecular weight offers soil reinforcement for both vertical and horizontal structures, and its proprietary UV-stabilized coating compound provides enhanced durability against the elements. SGU provides industry leading elongation and stress strain values and guarantees a structure life of more than 100 years. SGU is engineered to be mechanically and chemically durable, in both the harsh construction installation phase and in the aggressive soil environments.

Further information can be found at [www.strataglobal.com](http://www.strataglobal.com).

### PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	0	-
Minerals	0	-
Fossil materials	100	India
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	0.002624

### FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 m <sup>2</sup>
Mass per declared unit	0.22 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 StrataGrid™ SGU 60 geogrid is made from polyester fibres coated with polymer modified coating. For transportation(A2), the distances have been averagely considered from the supplier source to Production plant at Daheli. The production losses of < 2% were considered.

The process of manufacturing of Geogrid is divided into three steps i.e beaming, knitting and coating. For packaging HDPE sheets and woven sacks are being used.

In the model it is assumed that whole waste from the A3 - manufacturing process is collected and sorted out for further processing therefore there is no factory waste that will end up for incineration or landfilling.

## 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. Impacts from modules A4-A5 are not included in the scope of 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)

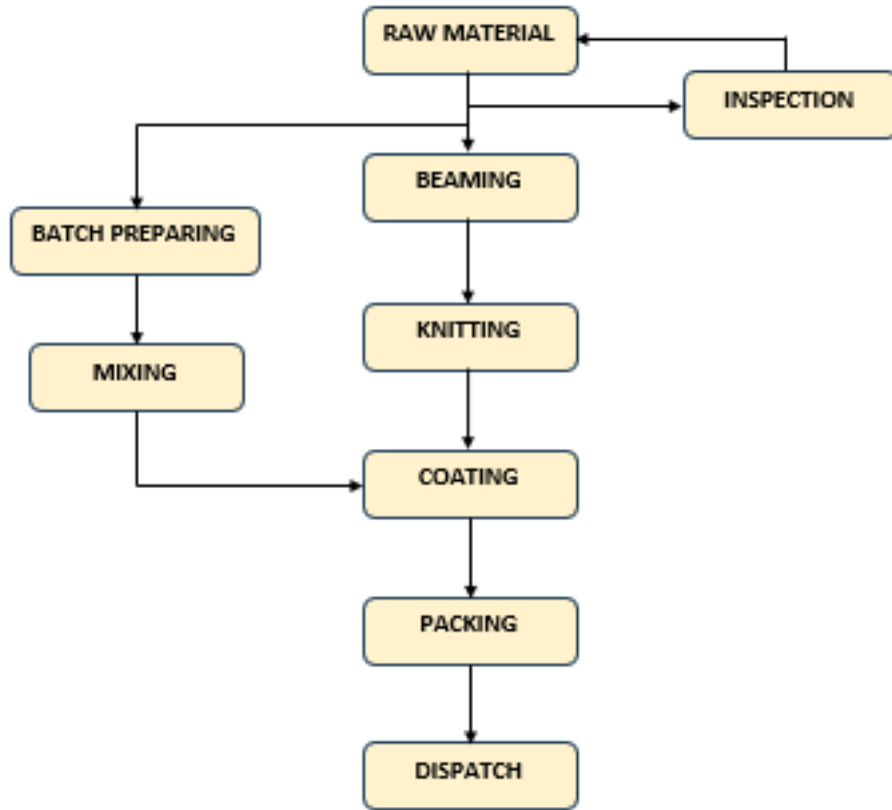
Consumption of energy in de-construction process is considered. It is assumed that the waste is collected separately and transported to the waste treatment plant. Transportation distance to treatment is assumed to be 50 kms and the transportation method is assumed to be lorry (C2). Module C3 accounts for energy and resource inputs for sorting and treating these waste streams for recycling and incineration with energy recovery with efficiency greater than 60%. Additionally, waste that is incinerated without energy recovery or landfilled is included in Module C4. Due to the material and energy recovery potential of parts in the end of life product and packaging, recycled raw materials lead to avoided virgin material production, while the energy recovered from incineration replaces electricity and heat production (D). The benefits and loads of incineration and recycling are included in Module D.

For modelling EOL we used conservative assumptions (50% landfill and 50% incineration) based on data from CSE (Centre of Science and Environment)\* and EPR Portal\*\* developed by the Ministry of Environment, Forest and Climate Change Government of India.

\*<https://www.cseindia.org/the-plastic-life-cycle-11509>

\*\*<https://eprplastic.cpcb.gov.in/#/plastic/home>

# 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	Allocated by mass or volume
Packaging materials	Allocated by mass or volume
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	- %

Out of the scope.

### 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 <sup>1)</sup>	kg CO <sub>2</sub> e	1.29E0	5.87E-3	1.44E-1	1.44E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	1.08E-1	2.92E-3	4E-1	2.98E-2	-1.09E0
GWP – fossil	kg CO <sub>2</sub> e	1.29E0	5.86E-3	1.53E-1	1.45E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	1.09E-1	2.92E-3	3.99E-1	2.03E-2	-1.07E0
GWP – biogenic	kg CO <sub>2</sub> e	-3.38E-3	2.25E-6	-9.84E-3	-1.32E-2	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	-4.09E-4	1.12E-6	2.81E-5	9.5E-3	-2.1E-2
GWP – LULUC	kg CO <sub>2</sub> e	1.06E-3	2.19E-6	2.76E-5	1.09E-3	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	7.64E-6	1.08E-6	2.39E-6	1.24E-6	-1.1E-4
Ozone depletion pot.	kg CFC-11e	1.27E-7	1.27E-9	7.14E-9	1.35E-7	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	7.9E-9	6.33E-10	9.49E-10	5.81E-10	-2.76E-8
Acidification potential	mol H <sup>+</sup> e	6.09E-3	2.44E-5	5.53E-4	6.66E-3	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	5.08E-4	1.21E-5	9.21E-5	1.77E-5	-7.28E-3
EP-freshwater <sup>2)</sup>	kg Pe	5.55E-5	5.75E-8	5.73E-6	6.13E-5	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	3.33E-6	2.85E-8	1.04E-7	4.07E-8	-3.85E-5
EP-marine	kg Ne	1.2E-3	7.11E-6	1.03E-4	1.31E-3	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	1.41E-4	3.52E-6	4.3E-5	3.27E-5	-8.66E-4
EP-terrestrial	mol Ne	1.15E-2	7.86E-5	1.17E-3	1.28E-2	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	1.58E-3	3.89E-5	4.42E-4	6.22E-5	-9.75E-3
POCP (“smog”) <sup>3)</sup>	kg NMVOCe	5.7E-3	2.39E-5	3.33E-4	6.06E-3	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	4.4E-4	1.19E-5	1.07E-4	2.43E-5	-2.85E-3
ADP-minerals & metals <sup>4)</sup>	kg Sbe	1.34E-4	1.55E-7	3E-7	1.35E-4	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	1.14E-7	7.66E-8	1.41E-7	2.04E-8	-6.03E-7
ADP-fossil resources	MJ	2.82E1	8.64E-2	2.15E0	3.04E1	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	1.52E0	4.3E-2	7.28E-2	4.55E-2	-1.02E1
Water use <sup>5)</sup>	m <sup>3</sup> e depr.	7.93E-1	3.33E-4	1.02E-1	8.96E-1	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	6.03E-2	1.65E-4	1.94E-2	1.98E-3	-2.17E-1

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 PO<sub>4</sub>e; 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.

## 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 <sup>8)</sup>	MJ	1.03E0	9.69E-4	4.42E-1	1.47E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	1.41E-1	4.8E-4	2.77E-3	9.46E-4	-1.04E0
Renew. PER as material	MJ	0E0	0E0	6.8E-2	6.8E-2	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	-7E-2	0E0
Total use of renew. PER	MJ	1.03E0	9.69E-4	5.1E-1	1.54E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	1.41E-1	4.8E-4	2.77E-3	-6.91E-2	-1.04E0
Non-re. PER as energy	MJ	2.06E1	8.64E-2	2.15E0	2.28E1	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	1.52E0	4.3E-2	7.28E-2	4.55E-2	-1.02E1
Non-re. PER as material	MJ	1.25E1	0E0	0E0	1.25E1	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	-6.24E0	-6.24E0	0E0
Total use of non-re. PER	MJ	3.3E1	8.64E-2	2.15E0	3.52E1	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	1.52E0	4.3E-2	-6.16E0	-6.19E0	-1.02E1
Secondary materials	kg	8.76E-3	0E0	3.68E-3	1.24E-2	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	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 <sup>3</sup>	1.69E-2	1.49E-5	8.01E-4	1.77E-2	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	3.44E-4	7.42E-6	6.65E-4	4.99E-5	-2.08E-3

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	6.75E-2	1.13E-4	8.21E-3	7.58E-2	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	4.98E-3	5.62E-5	0E0	8.93E-5	-5.69E-2
Non-hazardous waste	kg	1.77E0	6.28E-3	2.21E-1	2E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	1.31E-1	3.13E-3	0E0	1.76E-1	-1.49E0
Radioactive waste	kg	5.94E-5	5.71E-7	7.66E-7	6.07E-5	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	2E-6	2.84E-7	0E0	2.67E-7	-7.67E-6

### 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	5.76E-3	5.76E-3	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Materials for energy rec	kg	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	1.68E-1	0E0	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	7.45E0	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 <sub>2</sub> e	1.23E0	5.81E-3	1.51E-1	1.39E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	1.07E-1	2.89E-3	3.99E-1	1.89E-2	-1.03E0
Ozone depletion Pot.	kg CFC <sub>11</sub> e	1.08E-7	1.01E-9	5.81E-9	1.15E-7	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	6.29E-9	5.03E-10	1.02E-9	4.64E-10	-2.22E-8
Acidification	kg SO <sub>2</sub> e	5.15E-3	1.8E-5	4.67E-4	5.63E-3	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	2.95E-4	8.95E-6	6.64E-5	4.3E-5	-6.47E-3
Eutrophication	kg PO <sub>4</sub> <sup>3</sup> e	1.69E-3	4.13E-6	1.93E-4	1.89E-3	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	1.07E-4	2.05E-6	4.27E-5	8.33E-4	-1.28E-3
POCP ("smog")	kg C <sub>2</sub> H <sub>4</sub> e	2.74E-4	7.74E-7	2E-5	2.95E-4	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	1.39E-5	3.84E-7	1.4E-6	4.37E-6	-2.82E-4
ADP-elements	kg Sbe	1.34E-4	1.55E-7	3E-7	1.35E-4	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	1.14E-7	7.66E-8	1.41E-7	2.04E-8	-6.03E-7
ADP-fossil	MJ	2.82E1	8.64E-2	2.15E0	3.04E1	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	1.52E0	4.3E-2	7.28E-2	4.55E-2	-1.02E1

## 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  
13.09.2023

