ENVIRONMENTAL PRODUCT DECLARATION

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

TerraLam® Structural CLT
Sterling Site Access Solutions, LLC

EPD HUB, EPDHUB-0175
Publishing date 11 November 2022, last updated date 24 May 2022, valid until 11 November 2027

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Sterling Site Access Solutions, LLC
Address	501 E 151st St, Phoenix, IL 60426
Contact details	info@sterlingstructural.com
Website	https://www.sterlingsolutions.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	Sister EPD
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Aurimas Bukauskas
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
EPD verifier	S.V, 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	Sterling Structural CLT
Additional labels	-
Product reference	-
Place of production	United States
Period for data	2019
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	-

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 m^3 of TerraLam® Structural CLT
Declared unit mass	511.71 kg
GWP-fossil, A1-A3 (kgCO2e)	171
GWP-total, A1-A3 (kgCO2e)	-1170
Secondary material, inputs (%)	0.00018%
Secondary material, outputs (%)	100%
Total energy use, A1-A3 (kWh)	1990.0
Total water use, A1-A3 (m3e)	1.28

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

PRODUCT DESCRIPTION

TerraLam® Structural Cross-Laminated Timber (CLT) panels consist of 3-7 layers of kiln-dried softwood lumber, glued together in layers with alternating orientations to create an efficient structural panel optimized for use in floor and roof applications. TerraLam® structural CLT panels use Southern Yellow Pine grown within the USA and are certified to ANSI PRG-320 by ICC-ES represented in ESR-5053. Panels are available in standard format modules with lengths up to 18’ and widths up to 8’ and are fabricated to suit the project. As a domestically produced, renewable resource, CLT promises to minimize emissions associated with traditional construction while supporting local economies and environments.

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

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals		
Minerals		
Fossil materials	1.42%	Adhesive sourced from the USA.
Bio-based materials	98.58%	Southern Yellow Pine sourced from the USA.

BIOGENIC CARBON CONTENT

Product’s biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	368.18
Biogenic carbon content in packaging, kg C	0.72

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 m^3 of TerraLam® Structural CLT
Mass per declared unit	511.71 kg
Functional unit	
Reference service life	

SUBSTANCES, REACH - VERY HIGH CONCERN

Substances of very high concern	EC	CAS
Diphenylmethane diisocyanate, isomers and homologs		9016-87-9
Ethylene oxide-propylene oxide-polymeric MDI copolymer		67423-05-6
Methylenebis(phenylisocyanate)		101-68-8

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.

A1-A3

Kiln-dried lumber is shipped to Sterling's manufacturing facility. This is cut to length as needed, then glued and pressed into panels of varying dimensions. Panels are trimmed. Waste shavings and trimmings are co-products which are sold for use in agricultural and landscaping applications.

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.

A4:

Polypropylene banding and polypropylene corner supports are used to secure packages of Sterling CLT structural panels. Panels are wrapped in polypropylene sheet. Packages are transported on wooden dunnage.

A5:

CLT matting is installed onto the job site using cranes and manual labor. Diesel fuel consumption from crane operation to install panels is accounted for in Module A5.

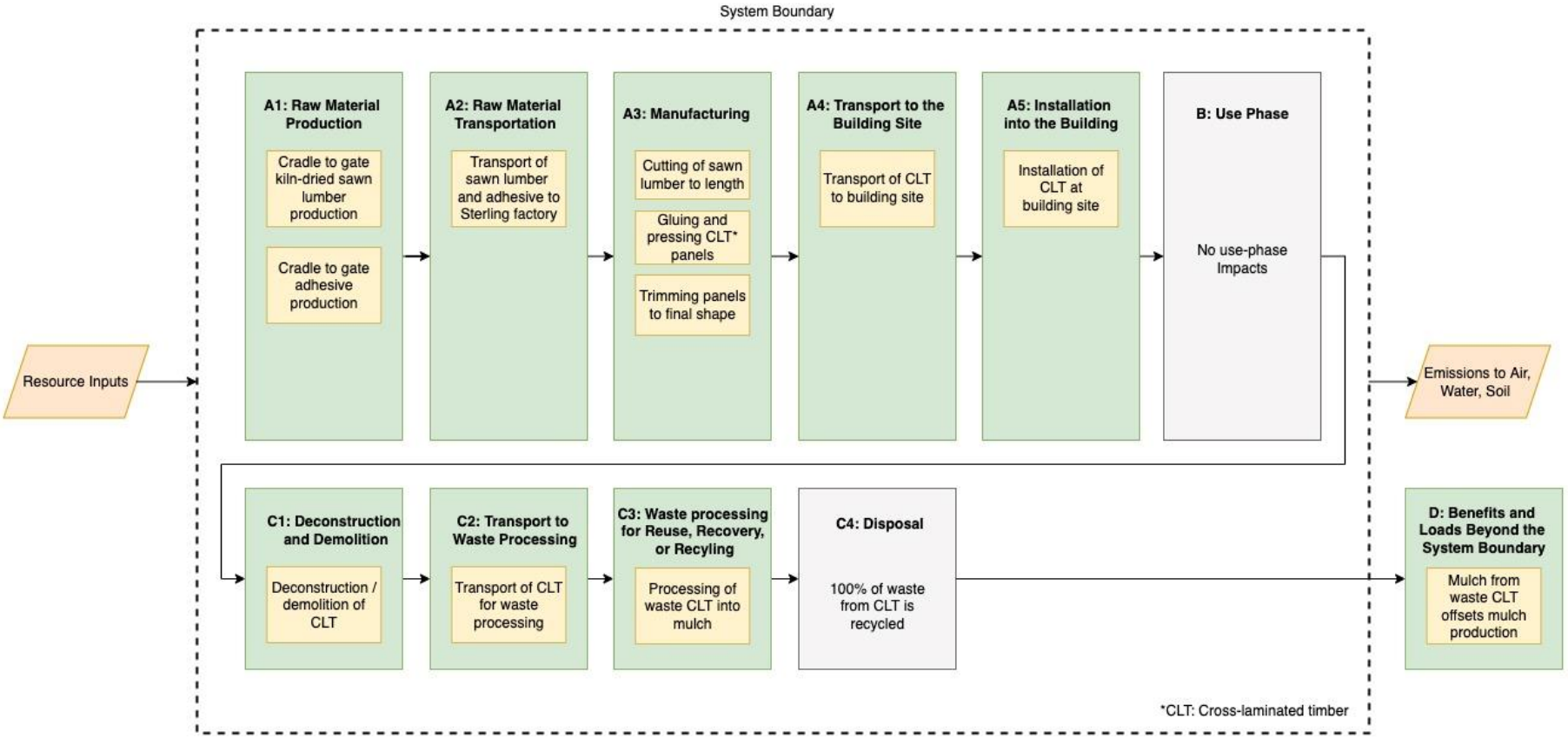
PRODUCT USE AND MAINTENANCE (B1-B7)

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 end of life, CLT structural panels are ground into mulch and sold for use in agricultural and landscaping applications.

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	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	-

The data in this EPD corresponds to CLT production and impacts from Sterling's Phoenix, Illinois facility.

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	-1.23E3	4.38E1	7.91E0	-1.17E3	4.63E1	7.85E0	MND	MND	MND	MND	MND	MND	MND	7.62E0	3.3E0	0E0	0E0	0E0
GWP – fossil	kg CO_2e	1.15E2	4.37E1	1.2E1	1.71E2	4.67E1	7.68E0	MND	MND	MND	MND	MND	MND	MND	7.62E0	3.29E0	0E0	0E0	-7.42E0
GWP – biogenic	kg CO_2e	-1.34E3	5.95E-2	-4.14E0	-1.35E3	3.39E-2	1.67E-1	MND	MND	MND	MND	MND	MND	MND	2.12E-3	2.39E-3	0E0	0E0	9.26E2
GWP – LULUC	kg CO_2e	5.62E-1	4.21E-2	3.16E-3	6.07E-1	1.4E-2	6.55E-4	MND	MND	MND	MND	MND	MND	MND	6.44E-4	9.91E-4	0E0	0E0	-1.17E-2
Ozone depletion pot.	kg $CFC_{-11}e$	1.29E-5	8E-6	6.08E-7	2.15E-5	1.1E-5	1.65E-6	MND	MND	MND	MND	MND	MND	MND	1.65E-6	7.74E-7	0E0	0E0	-5.99E-7
Acidification potential	mol H^+e	7.9E-1	3.01E-1	9.23E-2	1.18E0	1.96E-1	7.98E-2	MND	MND	MND	MND	MND	MND	MND	7.97E-2	1.38E-2	0E0	0E0	-2.71E-2
EP-freshwater[2)]	kg Pe	7.71E-3	8.66E-4	5.18E-4	9.1E-3	3.8E-4	3.12E-5	MND	MND	MND	MND	MND	MND	MND	3.08E-5	2.68E-5	0E0	0E0	-4.19E-4
EP-marine	kg Ne	2.47E-1	1.09E-1	1.39E-2	3.7E-1	5.91E-2	3.53E-2	MND	MND	MND	MND	MND	MND	MND	3.52E-2	4.17E-3	0E0	0E0	-2.29E-3
EP-terrestrial	mol Ne	2.64E0	1.2E0	1.53E-1	3.99E0	6.53E-1	3.87E-1	MND	MND	MND	MND	MND	MND	MND	3.86E-1	4.6E-2	0E0	0E0	-2.84E-2
POCP ("smog")[3)]	kg NMVOCe	7.81E-1	3.39E-1	4.34E-2	1.16E0	2.1E-1	1.06E-1	MND	MND	MND	MND	MND	MND	MND	1.06E-1	1.48E-2	0E0	0E0	-7.63E-3
ADP-minerals & metals[4)]	kg Sbe	4.16E-3	5.21E-4	3.66E-5	4.71E-3	7.97E-4	1.19E-5	MND	MND	MND	MND	MND	MND	MND	1.16E-5	5.62E-5	0E0	0E0	3.48E-5
ADP-fossil resources	MJ	1.62E3	6.15E2	3.95E2	2.63E3	7.26E2	1.05E2	MND	MND	MND	MND	MND	MND	MND	1.05E2	5.12E1	0E0	0E0	-1.1E2
Water use[5)]	m^3e depr.	3.29E1	4.64E0	2.44E1	6.19E1	2.7E0	2.17E-1	MND	MND	MND	MND	MND	MND	MND	1.96E-1	1.91E-1	0E0	0E0	-6.88E-1

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	4.6E3	2.17E1	2.43E1	4.65E3	9.14E0	5.76E-1	MND	MND	MND	MND	MND	MND	MND	5.67E-1	6.45E-1	0E0	0E0	4.89E0
Renew. PER as material	MJ	1.12E4	0E0	3.63E1	1.13E4	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	-1.24E1
Total use of renew. PER	MJ	1.58E4	2.17E1	6.06E1	1.59E4	9.14E0	5.76E-1	MND	MND	MND	MND	MND	MND	MND	5.67E-1	6.45E-1	0E0	0E0	-7.5E0
Non-re. PER as energy	MJ	1.51E3	6.15E2	3.83E2	2.5E3	7.26E2	1.05E2	MND	MND	MND	MND	MND	MND	MND	1.05E2	5.12E1	0E0	0E0	-1.1E2
Non-re. PER as material	MJ	1.11E2	0E0	1.48E1	1.26E2	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Total use of non-re. PER	MJ	1.62E3	6.15E2	3.98E2	2.63E3	7.26E2	1.05E2	MND	MND	MND	MND	MND	MND	MND	1.05E2	5.12E1	0E0	0E0	-1.1E2
Secondary materials	kg	1.04E-2	0E0	1.31E-3	1.17E-2	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	-5.12E2
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	8.11E-1	1.69E-1	3.01E-1	1.28	1.51E-1	9.81E-3	MND	MND	MND	MND	MND	MND	MND	9.26E-3	1.07E-2	0E0	0E0	-3.61E-2

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	6.16E0	1.71E0	5.53E-1	8.42E0	7.06E-1	1.14E-1	MND	MND	MND	MND	MND	MND	MND	1.13E-1	4.98E-2	0E0	0E0	-5.35E-1
Non-hazardous waste	kg	1.6E2	6.63E1	2.14E1	2.48E2	7.81E1	3.16E0	MND	MND	MND	MND	MND	MND	MND	1.21E0	5.51E0	0E0	0E0	-2.25E1
Radioactive waste	kg	6.48E-3	3.74E-3	4.49E-3	1.47E-2	4.98E-3	7.37E-4	MND	MND	MND	MND	MND	MND	MND	7.34E-4	3.52E-4	0E0	0E0	-4.67E-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	1.64E3	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	1.12E2	4.32E1	1.32E1	1.69E2	4.63E1	7.69E0	MND	MND	MND	MND	MND	MND	MND	7.56E0	3.26E0	0E0	0E0	-7.21E0
Ozone depletion Pot.	kg CFC_{-11}e	1.06E-5	6.42E-6	5.88E-7	1.76E-5	8.72E-6	1.31E-6	MND	MND	MND	MND	MND	MND	MND	1.3E-6	6.15E-7	0E0	0E0	-5.48E-7
Acidification	kg SO_2e	5.5E-1	2.14E-1	8.31E-2	8.47E-1	9.5E-2	1.14E-2	MND	MND	MND	MND	MND	MND	MND	1.12E-2	6.7E-3	0E0	0E0	-2.04E-2
Eutrophication	kg PO_4^3e	1.86E-1	6.24E-2	1.98E-2	2.69E-1	1.92E-2	7.88E-3	MND	MND	MND	MND	MND	MND	MND	1.98E-3	1.35E-3	0E0	0E0	-1.1E-2
POCP (“smog”)	kg C_2H_4e	3.6E-2	7.93E-3	3.28E-3	4.72E-2	6.02E-3	1.19E-3	MND	MND	MND	MND	MND	MND	MND	1.16E-3	4.25E-4	0E0	0E0	-8.27E-4
ADP-elements	kg Sbe	4.16E-3	5.21E-4	3.66E-5	4.71E-3	7.97E-4	1.19E-5	MND	MND	MND	MND	MND	MND	MND	1.16E-5	5.62E-5	0E0	0E0	3.48E-5
ADP-fossil	MJ	1.62E3	6.15E2	3.95E2	2.63E3	7.26E2	1.05E2	MND	MND	MND	MND	MND	MND	MND	1.05E2	5.12E1	0E0	0E0	-1.1E2

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	8.02E1	4.32E1	1.33E1	1.37E2	4.62E1	7.66E0	MND	MND	MND	MND	MND	MND	MND	7.53E0	3.26E0	0E0	0E0	-7.26E0
Ozone Depletion	kg CFC_{-11}e	2.89E-6	8.59E-6	8.32E-7	1.23E-5	1.16E-5	1.74E-6	MND	MND	MND	MND	MND	MND	MND	1.74E-6	8.2E-7	0E0	0E0	-7.38E-7
Acidification	kg SO_2e	5.93E-1	2.7E-1	8.08E-2	9.44E-1	1.71E-1	7.32E-2	MND	MND	MND	MND	MND	MND	MND	7.31E-2	1.21E-2	0E0	0E0	-2.24E-2
Eutrophication	kg Ne	2.74E-1	2.95E-2	6.53E-3	3.11E-1	2.4E-2	6.53E-3	MND	MND	MND	MND	MND	MND	MND	6.44E-3	1.69E-3	0E0	0E0	-3.96E-3
POCP (“smog”)	kg O_3e	1.45E1	6.92E0	8.85E-1	2.23E1	3.75E0	2.24E0	MND	MND	MND	MND	MND	MND	MND	2.24E0	2.64E-1	0E0	0E0	-1.38E-1
ADP-fossil	MJ	8.71E2	7.84E1	3.4E1	9.84E2	1.04E2	1.56E1	MND	MND	MND	MND	MND	MND	MND	1.55E1	7.34E0	0E0	0E0	-7.26E0

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.

Silvia Vilčeková, as an authorized verifier acting for EPD Hub Limited
11.11.2022

VERIFIED ISO 14025