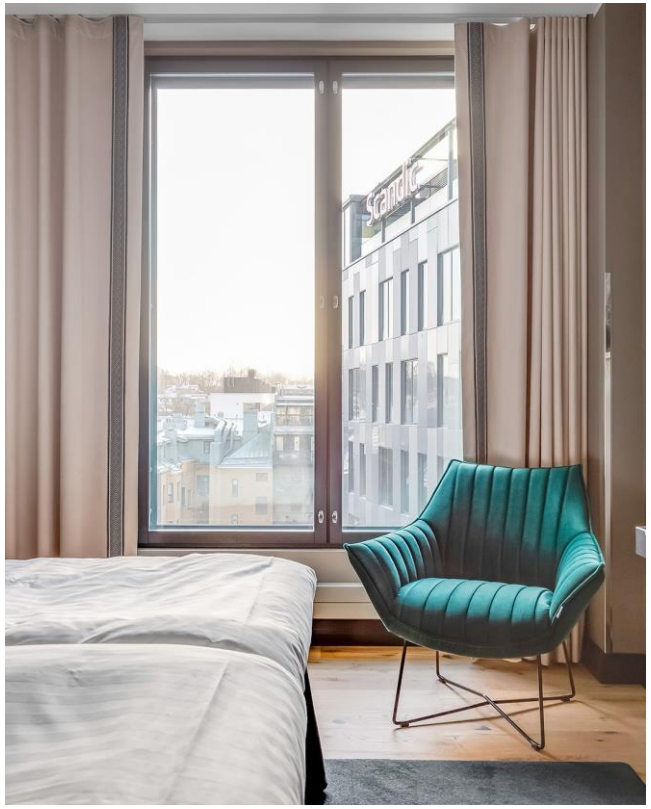
ENVIRONMENTAL PRODUCT DECLARATION

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

PihlaPro MSE1-A

Pihla Group Oy



EPD HUB, HUB-0209

Publishing date 16 December 2022, last updated date 16 December 2022, valid until 16 December 2027

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Pihla Group Oy
Address	Äyritie 16, 01510 Vantaa
Contact details	asiakaspalvelu@pihla.fi
Website	www.pihlapro.fi

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 17213 Windows and doors
Sector	Construction product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Timo Nissinen Pihla Group Oy
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
EPD verifier	H.U as an authorized verifier acting for EPD Hub

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	PihlaPro MSE1-A
Additional labels	Pihla MSE1-A
Product reference	-
Place of production	Kannus, Ruovesi and Haapajärvi
Period for data	2021
Averaging in EPD	Multiple factories
Variation in GWP-fossil for A1-A3	< 1 %

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 m2 of window
Declared unit mass	41.8 kg
GWP-fossil, A1-A3 (kgCO2e)	74.0
GWP-total, A1-A3 (kgCO2e)	50.9
Secondary material, inputs (%)	0.635
Secondary material, outputs (%)	47.3
Total energy use, A1-A3 (kWh)	401.0
Total water use, A1-A3 (m3e)	0.43

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Pihla Group Oy is a domestic window and door operator whose goal is to improve peoples quality of life with windows and doors. We develop and manufacture Finlands best window and door solutions for consumers, housing associations and construction industry customers as well under the Pihla, PihlaPRO, Tiivi, Profin, Klas1, Sydänpuu, Metallityö Välimäki and Puuseppien brands. Our wide range of brands serves all our customers, from renovation and new projects to the most architecturally challenging projects and various public and administrative buildings.

Pihla Group have seven production facilities located in Ruovesi, Kannus, Haapajärvi, Pudasjärvi, Kuusamo, Joutsa, Nokia and Hyvinkää. Group employ approximately 850 employees in Finland. Turnover in 2021 was 175 million euros, and during that year group manufactured approximately 366,000 window units and 58,000 doors, and did up to 8,000 window and door renovations. Pihla Group Oy is part of Inwido AB, which is Europes largest window and door manufacturer.

PRODUCT DESCRIPTION

The studied product is a double-sash, inward opening wood-aluminium window with a double-glazed insulating glass unit in the inner sash. The studied product is based on 1,23 x 1,48 m size. The outer sash is made of aluminium and has one pane of glass. Pihla MSE1-A is a reliable basic window and a suitable option for all properties.

Further information can be found at www.pihlapro.fi.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	7	EU
Minerals	59	EU
Fossil materials	3	EU
Bio-based materials	31	EU

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	6.08
Biogenic carbon content in packaging, kg C	2.27

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 m2 of window
Mass per declared unit	41.8 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	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.

The product is made of a mixture of primary and secondary metals, triple glazed glass and plastic parts. The materials are transported to Pihla Group production facility, where the main manufacturing processes include cutting of wood and aluminum parts, surface treatment, glazing and assembly. The finished products are packed on pallets and sent to the customer. The manufacturing process requires electricity and fuels for the different equipment as well as heating. Certain ancillary materials are also included.

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.

The transportation distance is defined according to the PCR. Average distance of transportation from production plant to building site is assumed as 413 km and the transportation method is assumed to be lorry. 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.

PRODUCT USE AND MAINTENANCE (B1-B7)

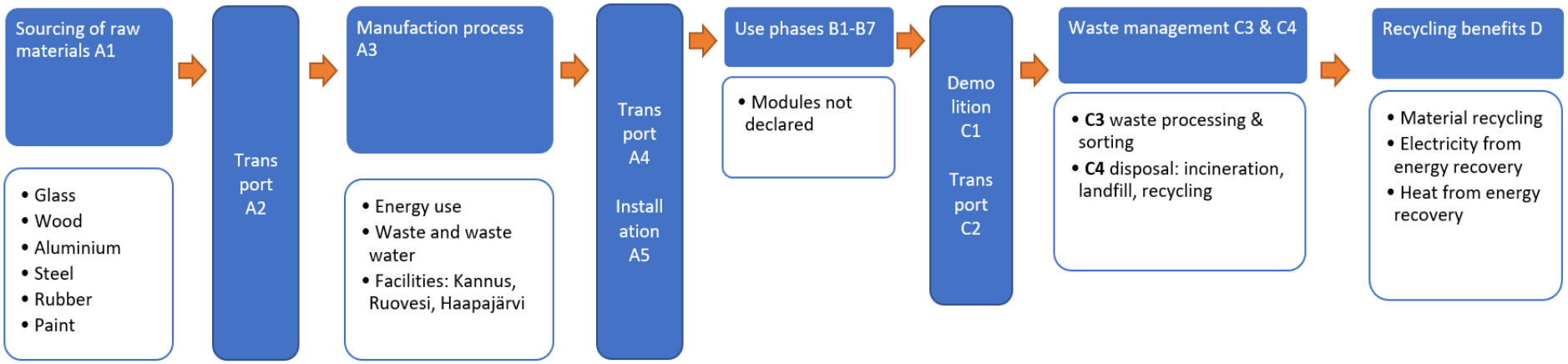
This EPD does not cover the use phase and its effects have not been studied.
Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

Consumption of energy and natural resources in demolition process is assumed to be negligible. End-of-life scenario according EN 17213:2020 has been used. The scenario recommends using a conservative recycling efficiency of 90 % for all types of secondary materials entering Module D. It is assumed that the waste is collected as mixed construction waste and transported to the waste treatment center. Transportation distance to treatment is assumed as 50 km 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.

MANUFACTURING PROCESS

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	Allocated by mass or volume
Ancillary materials	Not applicable
Manufacturing energy and waste	Allocated by mass or volume

AVERAGES AND VARIABILITY

Type of average	Multiple factories
Averaging method	Averaged by shares of total volume
Variation in GWP-fossil for A1-A3	< 1 %

EPD represents the production of three factories and the product structure is exactly the same. There is a small difference in energy consumption and transportation.

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	4,75E1	1,38E0	2E0	50.9	1,74E0	8,38E0	MND	MND	MND	MND	MND	MND	MND	0E0	3,83E-1	2,45E1	3,5E0	-1,46E1
GWP – fossil	kg CO_2e	6,99E1	1,38E0	2,73E0	74.0	1,76E0	2,1E-1	MND	MND	MND	MND	MND	MND	MND	0E0	3,83E-1	3,26E0	2,25E0	-3,99E1
GWP – biogenic	kg CO_2e	-2,35E1	8,83E-4	-7,35E-1	-2,42E1	1,28E-3	8,17E0	MND	MND	MND	MND	MND	MND	MND	0E0	2,06E-4	2,12E1	1,25E0	2,58E1
GWP – LULUC	kg CO_2e	1,07E0	4,54E-4	8,39E-3	1,08E0	5,3E-4	1,12E-4	MND	MND	MND	MND	MND	MND	MND	0E0	1,38E-4	1,99E-3	4,07E-4	-4,76E-1
Ozone depletion pot.	kg $CFC_{-11}e$	6,78E-6	3,2E-7	3,77E-7	7,47E-6	4,14E-7	1,45E-8	MND	MND	MND	MND	MND	MND	MND	0E0	8,71E-8	2,07E-7	1,79E-7	-4,09E-6
Acidification potential	mol H^+e	5,21E-1	4,95E-3	2,19E-2	5,48E-1	7,39E-3	4,5E-4	MND	MND	MND	MND	MND	MND	MND	0E0	1,1E-3	3E-2	8,98E-3	-3,11E-1
EP-freshwater[2)]	kg Pe	8,93E-3	1,15E-5	2,85E-4	9,23E-3	1,43E-5	4,95E-6	MND	MND	MND	MND	MND	MND	MND	0E0	3,26E-6	2,42E-4	5,03E-5	-1,81E-3
EP-marine	kg Ne	7,89E-2	1,31E-3	6,65E-3	8,69E-2	2,23E-3	9,79E-5	MND	MND	MND	MND	MND	MND	MND	0E0	2,18E-4	2,64E-3	1,33E-3	-3,75E-2
EP-terrestrial	mol Ne	8,98E-1	1,45E-2	7,46E-2	9,87E-1	2,46E-2	1,12E-3	MND	MND	MND	MND	MND	MND	MND	0E0	2,44E-3	3,38E-2	1,64E-2	-4,4E-1
POCP ("smog")[3)]	kg NMVOCe	2,67E-1	4,9E-3	2,52E-2	2,97E-1	7,91E-3	3,28E-4	MND	MND	MND	MND	MND	MND	MND	0E0	9,33E-4	9,57E-3	7,2E-3	-1,32E-1
ADP-minerals & metals[4)]	kg Sbe	1,42E-3	3,02E-5	3,98E-5	1,49E-3	3E-5	9,7E-7	MND	MND	MND	MND	MND	MND	MND	0E0	1,06E-5	1,42E-4	1,06E-5	-3,83E-4
ADP-fossil resources	MJ	9,19E2	2,12E1	5,14E1	9,92E2	2,74E1	1,61E0	MND	MND	MND	MND	MND	MND	MND	0E0	5,79E0	2,74E1	1,53E1	-5,4E2
Water use[5)]	m^3e depr.	5,78E6	7,46E-2	-2,74E0	5,78E6	1,02E-1	1,39E-2	MND	MND	MND	MND	MND	MND	MND	0E0	1,9E-2	2,22E0	4,03E-1	-4,8E0

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	4,06E-6	1,08E-7	1,61E-6	5,78E-6	1,59E-7	4,95E-9	MND	MND	MND	MND	MND	MND	MND	0E0	2,44E-8	1,35E-7	1,02E-7	-2,87E-6
Ionizing radiation[6)]	kBq U235e	2,53E0	9,27E-2	2,23E-1	2,85E0	1,2E-1	1,07E-2	MND	MND	MND	MND	MND	MND	MND	0E0	2,53E-2	1,05E-1	3,91E-2	-3,95E0
Ecotoxicity (freshwater)	CTUe	1,29E3	1,63E1	1,28E2	1,44E3	2,09E1	1,1E0	MND	MND	MND	MND	MND	MND	MND	0E0	4,5E0	2,6E2	1,44E2	-8,26E2
Human toxicity, cancer	CTUh	4,4E-8	4,41E-10	5,63E-9	5,01E-8	5,35E-10	3,88E-11	MND	MND	MND	MND	MND	MND	MND	0E0	1,29E-10	4,37E-9	1,12E-9	-4,35E-8
Human tox. non-cancer	CTUh	2,55E-6	1,87E-8	1,32E-7	2,7E-6	2,48E-8	1,31E-9	MND	MND	MND	MND	MND	MND	MND	0E0	4,91E-9	2,75E-7	8,75E-8	-9,55E-8
SQP[7)]	-	2,51E2	2,56E1	9,15E0	2,85E2	4,13E1	1,12E0	MND	MND	MND	MND	MND	MND	MND	0E0	4,91E0	7,31E0	1,84E1	-4,53E1

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	2,33E2	2,83E-1	1,39E2	3,72E2	3,45E-1	1,58E-1	MND	MND	MND	MND	MND	MND	MND	0E0	8,29E-2	3,9E0	4,81E-1	-1,77E2
Renew. PER as material	MJ	3,36E2	0E0	7,85E1	4,14E2	0E0	-7,85E1	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	-1,94E2	-1,02E1	0E0
Total use of renew. PER	MJ	5,68E2	2,83E-1	2,18E2	7,86E2	3,45E-1	-7,83E1	MND	MND	MND	MND	MND	MND	MND	0E0	8,29E-2	-1,9E2	-9,74E0	-1,77E2
Non-re. PER as energy	MJ	1E3	2,12E1	4,95E1	1,07E3	2,74E1	1,61E0	MND	MND	MND	MND	MND	MND	MND	0E0	5,79E0	2,74E1	1,53E1	-5,4E2
Non-re. PER as material	MJ	7,2E1	0E0	1,91E0	7,39E1	0E0	-1,91E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	-1,23E1	-3,42E-1	0E0
Total use of non-re. PER	MJ	1,07E3	2,12E1	5,14E1	1,14E3	2,74E1	-3,04E-1	MND	MND	MND	MND	MND	MND	MND	0E0	5,79E0	1,52E1	1,49E1	-5,4E2
Secondary materials	kg	2,64E-1	0E0	1,06E-3	2,65E-1	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	2,52E0
Renew. secondary fuels	MJ	4E-2	0E0	0E0	4E-2	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Non-ren. secondary fuels	MJ	9,34E-2	0E0	0E0	9,34E-2	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Use of net fresh water	m^3	4,11E-1	4,07E-3	1,48E-2	0.43	5,7E-3	4,54E-4	MND	MND	MND	MND	MND	MND	MND	0E0	1E-3	3,55E-2	1,2E-2	-1,99E-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	5,27E0	2,12E-2	4,14E-1	5,71E0	2,66E-2	4,75E-3	MND	MND	MND	MND	MND	MND	MND	0E0	5,96E-3	0E0	3,6E-1	-5,93E0
Non-hazardous waste	kg	8,88E1	1,93E0	5,92E0	9,66E1	2,94E0	3,21E-1	MND	MND	MND	MND	MND	MND	MND	0E0	4,1E-1	0E0	1,81E1	-5,84E1
Radioactive waste	kg	3,96E-3	1,45E-4	2,29E-4	4,33E-3	1,88E-4	1,06E-5	MND	MND	MND	MND	MND	MND	MND	0E0	3,97E-5	0E0	5,31E-5	-2,91E-3

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	3,22E-2	0E0	0E0	3,22E-2	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	1,02E1	0E0	0E0
Materials for energy rec	kg	2,93E-2	0E0	4,3E0	4,32E0	0E0	7,3E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	9,57E0	0E0	0E0
Exported energy	MJ	1,64E-1	0E0	0E0	1,64E-1	0E0	1,4E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	7,54E0	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	5,02E1	1,37E0	2,68E0	5,43E1	1,74E0	2,09E-1	MND	MND	MND	MND	MND	MND	MND	0E0	3,8E-1	3,22E0	2,23E0	-3,96E1
Ozone depletion Pot.	kg $CFC\text{-}_{11}e$	4,82E-6	2,54E-7	3,26E-7	5,4E-6	3,29E-7	1,3E-8	MND	MND	MND	MND	MND	MND	MND	0E0	6,93E-8	1,84E-7	2,03E-7	-3,9E-6
Acidification	kg SO_2e	2,21E-1	2,8E-3	1,59E-2	2,4E-1	3,58E-3	3,11E-4	MND	MND	MND	MND	MND	MND	MND	0E0	7,73E-4	2,78E-2	7,05E-3	-2,2E-1
Eutrophication	kg PO_4^3e	7,03E-2	5,71E-4	6,55E-3	7,74E-2	7,23E-4	1,72E-4	MND	MND	MND	MND	MND	MND	MND	0E0	1,6E-4	1,08E-2	3,65E-3	-6,34E-2
POCP (“smog”)	kg C_2H_4e	1,1E-2	1,73E-4	1,06E-3	1,22E-2	2,27E-4	1,46E-5	MND	MND	MND	MND	MND	MND	MND	0E0	4,62E-5	1,1E-3	2E-3	-1,56E-2
ADP-elements	kg Sbe	1,42E-3	3,02E-5	3,98E-5	1,49E-3	3E-5	9,7E-7	MND	MND	MND	MND	MND	MND	MND	0E0	1,06E-5	1,42E-4	1,06E-5	-3,83E-4
ADP-fossil	MJ	9,19E2	2,12E1	5,14E1	9,92E2	2,74E1	1,61E0	MND	MND	MND	MND	MND	MND	MND	0E0	5,79E0	2,74E1	1,53E1	-5,4E2

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.

Hetal Parekh Udas as an authorized verifier acting for EPD Hub Limited
16.12.2022