

ENVIRONMENTAL PRODUCT DECLARATION

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

Armourplan P

IKO PLC



EPD HUB, HUB-0756

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

GENERAL INFORMATION

MANUFACTURER

Manufacturer	IKO PLC
Address	IKO PLC Coney Green Rd, Clay Cross, Chesterfield S45 9HZ
Contact details	polymeric.technical.uk@iko.com
Website	ikogroup.co.uk

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 17388-2 Flexible sheets for waterproofing - Part 2: Cradle to gate with options
Sector	Construction product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate with options, A4, and modules C1-C4, D
EPD author	Andrew Hafford and Alex Fullard IKO Polymeric
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	Haiha Nguyen, 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	Armourplan P
Additional labels	-
Product reference	470***** - Aplan P MG, 472***** - Aplan P SL, 473***** - Aplan P LG * Denotes various width and thickness
Place of production	IKO PLC Coney Green Rd, Clay Cross, Chesterfield S45 9HZ
Period for data	2021
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	N.A.

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 m ²
Declared unit mass	1.7 kg
GWP-fossil, A1-A3 (kgCO ₂ e)	4.64E0
GWP-total, A1-A3 (kgCO ₂ e)	4.65E0
Secondary material, inputs (%)	0.844
Secondary material, outputs (%)	100.0
Total energy use, A1-A3 (kWh)	19.0
Total water use, A1-A3 (m ³ e)	3.83E-2

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

IKO Group is a global leader in the manufacture and supply of quality roofing products. They formed the IKO Polymeric division in 2005 specifically to develop its single ply business. IKO Polymeric is now a market leader in the UK.

PRODUCT DESCRIPTION

IKO Armourplan P is a robust polyester reinforced mechanically fixed PVC membrane which offers enhanced mechanical properties over standard PVC membranes and has UV stability throughout. IKO Armourplan P is a versatile membrane which can be mechanically fixed, adhered or ballasted. It is suitable for a variety of roofing applications on both flat and sloping roofs.

Further information can be found at ikogroup.co.uk.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	0.3	EU
Minerals	0.7	EU
Fossil materials	97.6	EU
Bio-based materials	1.4	EU

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C 0.016

Biogenic carbon content in packaging, kg C 0.022

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit 1 m²

Mass per declared unit 1.7 kg

Functional unit -

Reference service life 35 Years

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	MN D	MN D	MN D	MN D	MN D	MN D	MN D	MN D	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.

Raw materials are mixed and compounded into pellet form on the compound plant. These pellets are allowed to cool and then extruded into a sheet which is reinforced with a scrim. The packaging line cuts the resulting sheet into 20m rolls, labels and wraps the rolls, palletises the wrapped rolls then bands the final pallet. An operator applies the final product labels. No losses are made with the use of raw materials due to a hopper system. All product cuts and losses are repurposed as raw material for a separate manufacturing process outside the scope of Armourplan P. Therefore, there are no cuts and losses to be declared in the production of

this product. Manufacturing energy is based on site energy consumption divided by square metres of product produced in the year 2021.

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.

Transport data is based on the transportation of products to the IKO Hub Dudley distribution centre due to the varied locations of customers around the UK. Installation energy cannot be determined as methods and energy uses may vary between customers. Polypropylene banding to be recycled where possible and all other packaging waste to be incinerated in line with IKO recommendations. The waste flow model for this section assumes these recommendations are followed.

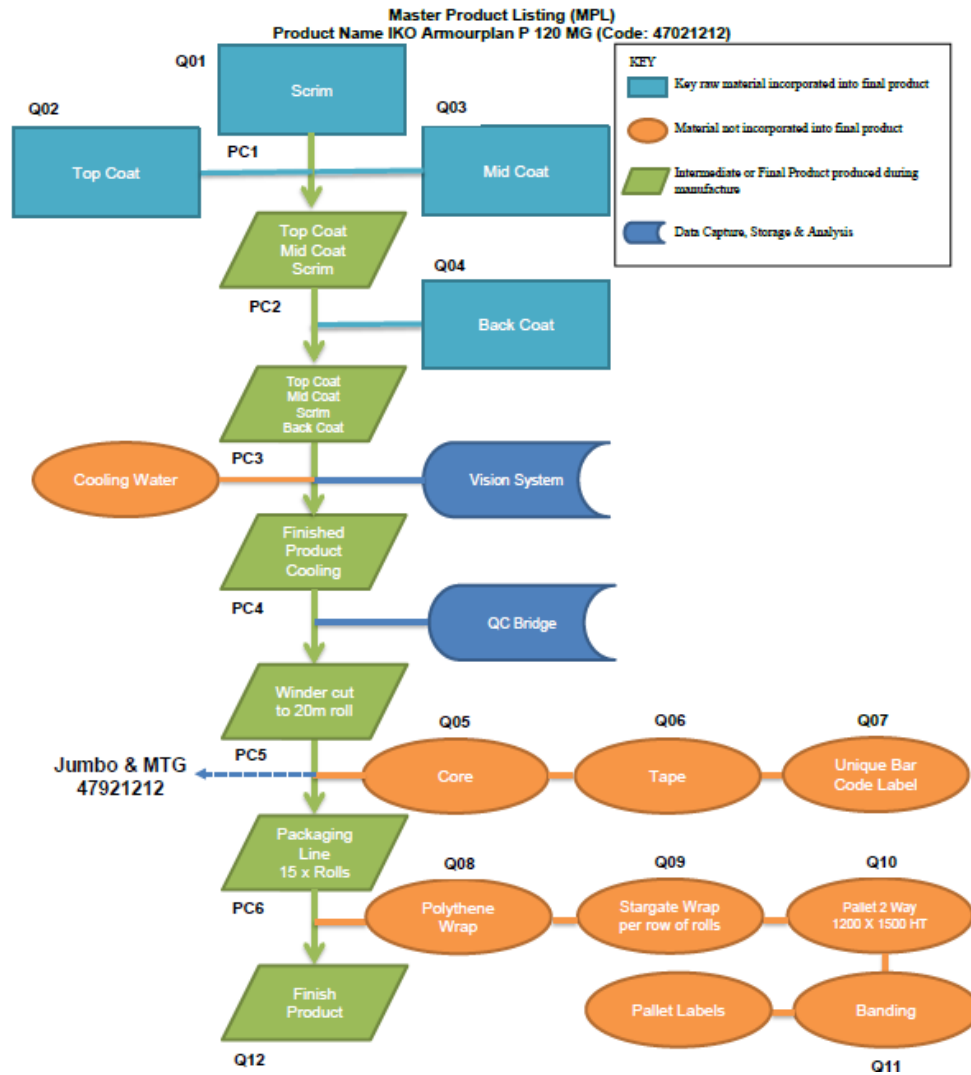
PRODUCT USE AND MAINTENANCE (B1-B7)

The use stage has not been considered as product use after purchase may vary drastically from customer to customer. Although maintenance guidelines are given, if these guidelines are followed cannot be controlled. Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

Removal at end of life is typically done by hand or with power tools to remove the fixings. This scenarios energy use is modelled in this EPD. Upon removal, waste product can either be recycled, sent to landfill or incinerated for energy recovery. As IKO recommend incineration for energy recovery as the desired disposal method, this scenario has been used for the end-of-life section of this EPD. A 50km range is assumed for the transportation of waste to the nearest waste centre. Benefits from incineration have been assumed to be at 62% efficiency for heat production and 11% for electricity production.

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	Not applicable
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	N.A.

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.

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 ₂ e	4.44E0	5.86E-2	1.47E-1	4.65E0	1.91E-2	1.77E-1	MND	MND	MND	MND	MND	MND	MND	1.06E-3	7.73E-3	4.1E0	0E0	-4.84E0
GWP – fossil	kg CO ₂ e	4.36E0	5.85E-2	2.23E-1	4.64E0	1.91E-2	2.43E-3	MND	MND	MND	MND	MND	MND	MND	1.06E-3	7.72E-3	4.04E0	0E0	-4.71E0
GWP – biogenic	kg CO ₂ e	-5.76E-2	3.27E-5	-7.65E-2	-1.34E-1	1.39E-5	1.75E-1	MND	MND	MND	MND	MND	MND	MND	6.2E-7	5.61E-6	6.03E-2	0E0	-1.32E-1
GWP – LULUC	kg CO ₂ e	1.38E-1	1.83E-5	3.93E-4	1.39E-1	5.75E-6	7.34E-7	MND	MND	MND	MND	MND	MND	MND	1.37E-6	2.32E-6	2.42E-5	0E0	-1.08E-3
Ozone depletion pot.	kg CFC-11e	1.06E-6	1.33E-8	2.3E-8	1.09E-6	4.49E-9	2.29E-10	MND	MND	MND	MND	MND	MND	MND	1.08E-10	1.82E-9	9.6E-9	0E0	-1.41E-7
Acidification potential	mol H ⁺ e	2.01E-2	2.49E-4	8.13E-4	2.12E-2	8.02E-5	1.6E-5	MND	MND	MND	MND	MND	MND	MND	3.77E-6	3.24E-5	9.32E-4	0E0	-3.5E-2
EP-freshwater ²⁾	kg Pe	1.35E-4	5.53E-7	7.26E-6	1.43E-4	1.55E-7	2.86E-8	MND	MND	MND	MND	MND	MND	MND	3.19E-8	6.28E-8	1.05E-6	0E0	-1.65E-4
EP-marine	kg Ne	4.46E-3	7.38E-5	1.83E-4	4.72E-3	2.42E-5	6.74E-6	MND	MND	MND	MND	MND	MND	MND	7.26E-7	9.78E-6	4.35E-4	0E0	-4.03E-3
EP-terrestrial	mol Ne	3.6E-2	8.15E-4	2.02E-3	3.89E-2	2.67E-4	7.12E-5	MND	MND	MND	MND	MND	MND	MND	8.58E-6	1.08E-4	4.48E-3	0E0	-4.52E-2
POCP (“smog”) ³⁾	kg NMVOCe	1.21E-2	2.61E-4	5.45E-4	1.29E-2	8.58E-5	1.82E-5	MND	MND	MND	MND	MND	MND	MND	2.16E-6	3.47E-5	1.08E-3	0E0	-1.31E-2
ADP-minerals & metals ⁴⁾	kg Sbe	1.18E-4	9.83E-7	9.43E-7	1.2E-4	3.26E-7	3.03E-8	MND	MND	MND	MND	MND	MND	MND	2.55E-9	1.32E-7	1.43E-6	0E0	-2.31E-6
ADP-fossil resources	MJ	7.9E1	8.95E-1	4.98E0	8.49E1	2.97E-1	2.08E-2	MND	MND	MND	MND	MND	MND	MND	2.59E-2	1.2E-1	7.36E-1	0E0	-4.75E1
Water use ⁵⁾	m ³ e depr.	3.06E0	3.79E-3	2.1E-2	3.08E0	1.11E-3	5.96E-4	MND	MND	MND	MND	MND	MND	MND	3.1E-5	4.47E-4	1.96E-1	0E0	-1.66E-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 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	1.71E-7	5.2E-9	5.32E-9	1.81E-7	1.73E-9	1.75E-10	MND	MND	MND	MND	MND	MND	MND	1.11E-11	6.99E-10	4.38E-9	0E0	-5.06E-7
Ionizing radiation ⁶⁾	kBq U235e	1.18E-1	3.77E-3	6.79E-2	1.9E-1	1.3E-3	5.73E-5	MND	MND	MND	MND	MND	MND	MND	4.32E-4	5.25E-4	1.51E-3	0E0	-2.75E-1
Ecotoxicity (freshwater)	CTUe	2.46E2	7.38E-1	5.48E0	2.53E2	2.27E-1	6.5E-2	MND	MND	MND	MND	MND	MND	MND	1.3E-2	9.18E-2	8.38E0	0E0	-1.49E2
Human toxicity, cancer	CTUh	2.17E-9	1.76E-11	8.05E-11	2.26E-9	5.81E-12	4.34E-12	MND	MND	MND	MND	MND	MND	MND	2.14E-13	2.35E-12	3.49E-10	0E0	-1.25E-9
Human tox. non-cancer	CTUh	6.15E-8	8.16E-10	1.92E-9	6.42E-8	2.69E-10	1.91E-10	MND	MND	MND	MND	MND	MND	MND	8.08E-12	1.09E-10	1.38E-8	0E0	-3.88E-8
SQP ⁷⁾	-	8.08E0	1.33E0	2.98E-1	9.71E0	4.49E-1	1.33E-2	MND	MND	MND	MND	MND	MND	MND	6.51E-4	1.81E-1	2.08E-1	0E0	-4.59E0

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	3.69E0	9.62E-3	1.05E0	4.75E0	3.74E-3	6.68E-4	MND	MND	MND	MND	MND	MND	MND	4.25E-3	1.51E-3	2.8E-2	0E0	-5.7E0
Renew. PER as material	MJ	7.53E-1	0E0	7.39E-1	1.49E0	0E0	-7.4E-1	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	-7.5E-1	0E0	2.24E-1
Total use of renew. PER	MJ	4.44E0	9.62E-3	1.79E0	6.24E0	3.74E-3	-7.39E-1	MND	MND	MND	MND	MND	MND	MND	4.25E-3	1.51E-3	-7.22E-1	0E0	-5.48E0
Non-re. PER as energy	MJ	5.79E1	8.95E-1	4.9E0	6.37E1	2.97E-1	2.08E-2	MND	MND	MND	MND	MND	MND	MND	2.59E-2	1.2E-1	7.36E-1	0E0	-4.75E1
Non-re. PER as material	MJ	2.12E1	0E0	8.19E-2	2.12E1	0E0	-8E-2	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	-2.12E1	0E0	0E0
Total use of non-re. PER	MJ	7.9E1	8.95E-1	4.98E0	8.49E1	2.97E-1	-5.92E-2	MND	MND	MND	MND	MND	MND	MND	2.59E-2	1.2E-1	-2.04E1	0E0	-4.75E1
Secondary materials	kg	1.44E-2	0E0	2.66E-5	1.44E-2	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	4.21E-3
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	3.64E-2	1.87E-4	1.79E-3	3.83E-2	6.18E-5	5.28E-5	MND	MND	MND	MND	MND	MND	MND	6.22E-6	2.5E-5	6.73E-3	0E0	-9.22E-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	2.11E-1	1.08E-3	1.35E-2	2.25E-1	2.89E-4	6.27E-4	MND	MND	MND	MND	MND	MND	MND	7.46E-5	1.17E-4	0E0	0E0	-2.61E-1
Non-hazardous waste	kg	5.2E0	9.82E-2	2.29E-1	5.53E0	3.19E-2	6.37E-2	MND	MND	MND	MND	MND	MND	MND	1.07E-3	1.29E-2	0E0	0E0	-6.24E0
Radioactive waste	kg	9.93E-5	5.98E-6	3.25E-5	1.38E-4	2.04E-6	7.85E-8	MND	MND	MND	MND	MND	MND	MND	2.01E-7	8.25E-7	0E0	0E0	-1.51E-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	1.63E-3	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Materials for energy rec	kg	0E0	0E0	0E0	0E0	0E0	6.3E-2	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	1.7E0	0E0	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	6.8E-1	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	3.82E1	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 ₂ e	4.28E0	5.8E-2	2.19E-1	4.55E0	1.89E-2	2.39E-3	MND	MND	MND	MND	MND	MND	MND	1.04E-3	7.66E-3	4.04E0	0E0	-4.55E0
Ozone depletion Pot.	kg CFC ₁₁ e	1.6E-6	1.05E-8	2.42E-8	1.64E-6	3.57E-9	2.07E-10	MND	MND	MND	MND	MND	MND	MND	1.23E-10	1.44E-9	1.04E-8	0E0	-1.34E-7
Acidification	kg SO ₂ e	1.69E-2	1.75E-4	6.48E-4	1.77E-2	3.89E-5	1.1E-5	MND	MND	MND	MND	MND	MND	MND	3.15E-6	1.57E-5	6.72E-4	0E0	-3.12E-2
Eutrophication	kg PO ₄ ³ e	5.18E-3	3.96E-5	2.3E-4	5.45E-3	7.85E-6	9.86E-6	MND	MND	MND	MND	MND	MND	MND	9.83E-7	3.17E-6	4.32E-4	0E0	-5.56E-3
POCP ("smog")	kg C ₂ H ₄ e	9.82E-4	7.51E-6	3.44E-5	1.02E-3	2.46E-6	3.48E-7	MND	MND	MND	MND	MND	MND	MND	1.32E-7	9.96E-7	1.42E-5	0E0	-1.36E-3
ADP-elements	kg Sbe	1.18E-4	9.83E-7	9.43E-7	1.2E-4	3.26E-7	3.03E-8	MND	MND	MND	MND	MND	MND	MND	2.55E-9	1.32E-7	1.43E-6	0E0	-2.31E-6
ADP-fossil	MJ	7.9E1	8.95E-1	4.98E0	8.49E1	2.97E-1	2.08E-2	MND	MND	MND	MND	MND	MND	MND	2.59E-2	1.2E-1	7.36E-1	0E0	-4.75E1

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.

HaiHa Nguyen, as an authorized verifier acting for EPD Hub Limited
13.10.2023

