

# ENVIRONMENTAL PRODUCT DECLARATION

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

DAFA EPDM Membrane  
DAFA A/S



**EPD HUB, HUB-0728**

Publishing date 28 September 2023, last updated on 28 September 2023, valid until 28 September 2028.

## GENERAL INFORMATION

### MANUFACTURER

Manufacturer	DAFA A/S
Address	Holmstrupgårdvej 12, 8220 Brabrand, Denmark
Contact details	dbs@dafa-group.com
Website	<a href="https://dafa-build.com/en">https://dafa-build.com/en</a>

### 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 options, A4-A5, and modules C1-C4, D
EPD author	Ksenija Ruby, DAFA Building Solutions
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	DAFA EPDM Membrane
Place of production	Aarhus, Denmark
Period for data	2022
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	N.A.

### ENVIRONMENTAL DATA SUMMARY

<b>Declared unit</b>	1 m <sup>2</sup>
<b>Declared unit mass</b>	1.23 kg
<b>GWP-fossil, A1-A3 (kgCO<sub>2</sub>e)</b>	5,13E0
<b>GWP-total, A1-A3 (kgCO<sub>2</sub>e)</b>	5,12E0
<b>Secondary material, inputs (%)</b>	2.68
<b>Secondary material, outputs (%)</b>	100.0
<b>Total energy use, A1-A3 (kWh)</b>	32,0
<b>Total water use, A1-A3 (m<sup>3</sup>e)</b>	5,03E-2

# PRODUCT AND MANUFACTURER

## ABOUT THE MANUFACTURER

DAFA Building Solutions for the building industry with a focus on holistic and environmentally beneficial solutions. Products and systems that seal and make buildings long-lasting and more sustainable - both for renewal and new constructions.

## PRODUCT DESCRIPTION

DAFA EPDM membrane is a black, soft, and flexible EPDM membrane. It is a vulcanized EPDM rubber sheet for all kinds of waterproofing applications (roofs, pools, ponds water tables.)

Further information can be found at <https://dafa-build.com/en>.

## PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	0	-
Minerals	0	-
Fossil materials	100	EU
Bio-based materials	0	-

## BIOGENIC CARBON CONTENT

The products' biogenic carbon content at the factory gate

Biogenic carbon content in the product, kg C	0.002
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Biogenic carbon content in packaging, kg C	0.14476
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## FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 m2
Mass per declared unit	1.23 kg

## 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	Deconstruction/decommissioning	Transport	Waste processing	Disposal	Reuse	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, 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.

### Manufacturing:

The manufacturing is located in Aarhus, Denmark. The synthetic rubber is roll slit into size. The distance to the manufacturing site is 2478 km, performed by lorry. There is no internal transport.

### Packaging:

The rolls are packed in their dedicated foils and placed on reusable

pallets, which are also wrapped in PE plastic film. All packaging materials are recyclable or even reusable (pallets).

## TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurring from final product delivery to the 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 storage to the retailers' site is 216 km and the transportation method is by lorry.

The vehicle capacity utilization volume factor is assumed to be 1 which means full load. It may vary but as role of transportation emissions in total results is small, the variety in load is assumed to be negligible.

Empty returns are not considered as it is assumed that return trip is used by the transportation company to serve the needs of other clients. (Empty returns are considered in the ecoinvent database.)

Transportation does not cause losses as product is packaged properly.

Environmental impacts from installation into the building considers the generation of waste packaging materials, release of biogenic carbon dioxide from wood pallets.

## PRODUCT USE AND MAINTENANCE (B1-B7)

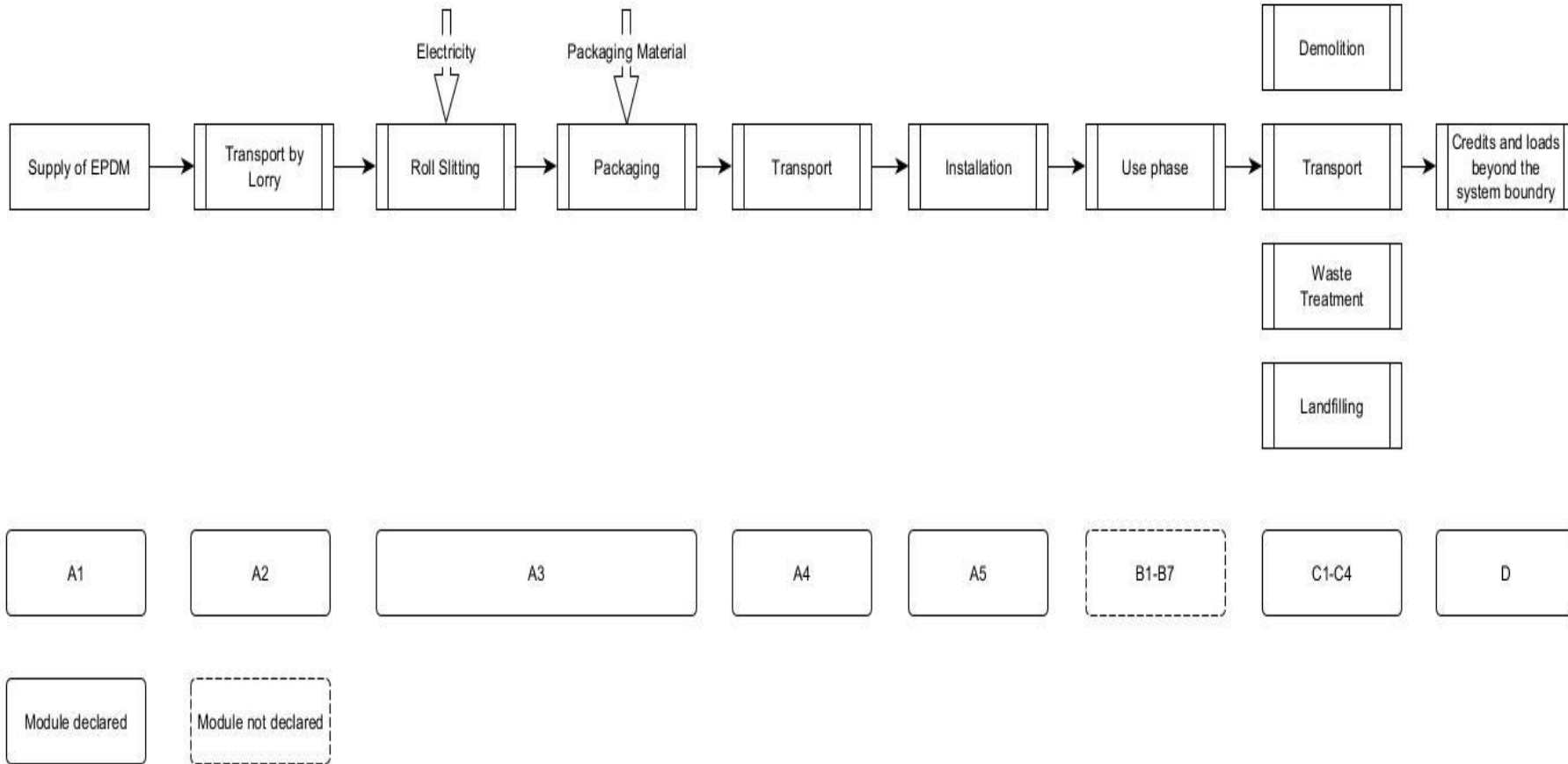
This EPD does not cover the use phase.

Air, soil, and water impacts during the use phase have not been studied.

### **PRODUCT END OF LIFE (C1-c4, D)**

For C1 it has been assumed that the product can be uninstalled manually by using hand-cutting tools. The end-of-life waste scenario per input material has been chosen, and for each raw material, 100% incineration has been modelled considering suitable loads and benefits. The transportation distance to treatment is assumed to be 50 km, and the transportation method is assumed to be a 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 of 90%. The energy recovered mitigates 85% district heat, and 15% electricity. Due to the material and energy recovery potential of parts in the end-of-life product and packaging, the energy recovered from incineration replaces electricity and heat production (D). The benefits and loads of incineration are included in Module D. All end-of-life product is assumed to be sent to the closest facilities.

# 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	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 3.8 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	4,14E0	9,87E-1	-2,57E-2	5,1E0	4,44E-2	3,95E-2	MND	MND	MND	MND	MND	MND	MND	0E0	5,77E-3	3,87E0	0E0	2,56E0
GWP – fossil	kg CO <sub>2</sub> e	4,13E0	9,86E-1	1,37E-2	5,13E0	4,44E-2	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	5,77E-3	3,88E0	0E0	2,56E0
GWP – biogenic	kg CO <sub>2</sub> e	7,41E-3	0E0	-3,95E-2	-3,21E-2	0E0	3,95E-2	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	-7,69E-3	0E0	0E0
GWP – LULUC	kg CO <sub>2</sub> e	2,19E-3	3,94E-4	4,81E-5	2,63E-3	1,78E-5	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	2,13E-6	3,31E-5	0E0	-6,14E-4
Ozone depletion pot.	kg CFC <sub>11</sub> e	2,01E-6	2,29E-7	1,23E-9	2,24E-6	1,03E-8	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	1,33E-9	7,07E-9	0E0	-5,89E-8
Acidification potential	mol H <sup>+</sup> e	2,7E-2	2,8E-3	6,56E-5	2,99E-2	1,26E-4	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	2,44E-5	5,82E-4	0E0	-9,55E-3
EP-freshwater <sup>2)</sup>	kg Pe	9,07E-5	7,04E-6	1E-6	9,87E-5	3,17E-7	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	4,73E-8	8,99E-7	0E0	-6,19E-5
EP-marine	kg Ne	3,34E-3	5,59E-4	1,66E-5	3,92E-3	2,52E-5	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	7,26E-6	2,19E-4	0E0	-9,98E-4
EP-terrestrial	mol Ne	3,72E-2	6,21E-3	1,93E-4	4,36E-2	2,8E-4	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	8,01E-5	2,42E-3	0E0	-1,21E-2
POCP (“smog”) <sup>3)</sup>	kg NMVOCe	1,64E-2	2,39E-3	6,3E-5	1,88E-2	1,07E-4	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	2,56E-5	5,97E-4	0E0	-3,32E-3
ADP-minerals & metals <sup>4)</sup>	kg Sbe	5,34E-5	3,57E-6	8,7E-8	5,7E-5	1,61E-7	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	1,35E-8	3,36E-7	0E0	-9,16E-7
ADP-fossil resources	MJ	1,52E2	1,47E1	2,25E-1	1,67E2	6,61E-1	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	8,67E-2	5,02E-1	0E0	-1,3E1
Water use <sup>5)</sup>	m <sup>3</sup> e depr.	1,9E0	6,87E-2	1,08E-2	1,98E0	3,09E-3	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	3,88E-4	1,09E-1	0E0	-1,23E-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	3,41E+00	2,16E-01	3,14E-01	3,94E+00	9,62E-03	1,66E-04	MND	MND	MND	MND	MND	MND	MND	0,00E+00	9,77E-04	2,56E-02	0,00E+00	-7,37E+00
Renew. PER as material	MJ	0,00E+00	0,00E+00	3,46E-01	3,46E-01	0,00E+00	-3,46E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	3,41E+00	2,16E-01	6,60E-01	4,28E+00	9,62E-03	-3,46E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	9,77E-04	2,56E-02	0,00E+00	-7,37E+00
Non-re. PER as energy	MJ	9,62E+01	1,49E+01	1,99E-01	1,11E+02	6,61E-01	8,27E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	8,67E-02	5,02E-01	0,00E+00	-2,16E+01
Non-re. PER as material	MJ	5,62E+01	0,00E+00	2,62E-02	5,63E+01	0,00E+00	-2,62E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	-5,62E+01	0,00E+00	-3,40E-03



Total use of non-re. PER	MJ	1,52E+02	1,49E+01	2,25E-01	1,68E+02	6,61E-01	-1,80E-02	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	8,67E-02	-5,57E+01	0,00E+00	-2,16E+01
Secondary materials	kg	3,30E-02	5,06E-03	1,31E-03	3,93E-02	2,25E-04	1,18E-05	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,41E-05	5,52E-04	0,00E+00	-2,42E-03
Renew. secondary fuels	MJ	1,18E-02	5,57E-05	1,17E-02	2,35E-02	2,48E-06	4,11E-08	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,43E-07	1,87E-05	0,00E+00	-1,62E-05
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m <sup>3</sup>	4,80E-02	1,90E-03	3,85E-04	5,03E-02	8,43E-05	-6,33E-06	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,12E-05	4,99E-03	0,00E+00	-2,55E-02

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	1,38E-01	1,69E-02	1,24E-03	1,56E-01	7,52E-04	5,37E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,15E-04	0,00E+00	0,00E+00	-1,82E-01
Non-hazardous waste	kg	3,94E+00	3,01E-01	3,41E-02	4,28E+00	1,34E-02	3,27E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,89E-03	1,23E+00	0,00E+00	-7,36E+00
Radioactive waste	kg	9,16E-04	1,02E-04	8,56E-07	1,02E-03	4,55E-06	2,74E-08	MND	MND	MND	MND	MND	MND	MND	0,00E+00	5,80E-07	0,00E+00	0,00E+00	-6,60E-05

### 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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,00E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,08E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	3,01E+01	0,00E+00	0,00E+00

### 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	4,14E+00	4,13E-01	1,35E-02	4,57E+00	4,40E-02	7,53E-04	MND	MND	MND	MND	MND	MND	MND	0,00E+00	5,71E-03	3,88E+00	0,00E+00	-2,08E+00
Ozone depletion Pot.	kg CFC-11e	1,00E-06	7,65E-08	1,04E-09	1,08E-06	8,16E-09	7,90E-11	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,05E-09	6,44E-09	0,00E+00	-8,58E-08
Acidification	kg SO <sub>2</sub> e	1,82E-02	9,72E-04	5,08E-05	1,93E-02	1,04E-04	4,39E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,90E-05	4,29E-04	0,00E+00	-1,38E-02
Eutrophication	kg PO <sub>4</sub> <sup>3</sup> e	3,86E-03	2,10E-04	3,80E-05	4,11E-03	2,23E-05	4,49E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	4,32E-06	3,15E-04	0,00E+00	-3,62E-03
POCP ("smog")	kg C <sub>2</sub> H <sub>4</sub> e	8,98E-04	4,91E-05	5,09E-06	9,52E-04	5,23E-06	1,56E-07	MND	MND	MND	MND	MND	MND	MND	0,00E+00	7,41E-07	1,18E-05	0,00E+00	-6,00E-04
ADP-elements	kg Sbe	5,35E-05	1,47E-06	8,57E-08	5,51E-05	1,57E-07	2,22E-09	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,31E-08	2,48E-07	0,00E+00	-1,99E-06
ADP-fossil	MJ	4,05E+01	6,20E+00	2,25E-01	4,69E+01	6,61E-01	8,27E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	8,67E-02	5,02E-01	0,00E+00	-2,16E+01

## 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  
28.09.2023

