ENVIRONMENTAL PRODUCT DECLARATION

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

Lindab Atrium Plana and Plana Matrix
Lindab Ventilation AB

EPD Registration number: HUB-0953
Version: 1.1
Publication date: 15 December 2023
Valid until: 15 December 2028
Revision date: 18 September 2024

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Lindab Ventilation AB
Address	Stålhögavägen 115, 269 82 Båstad, Sweden
Contact details	lindab@lindab.com
Website	https://www.lindab.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 options, A4-A5, and modules C1-C4, D
EPD author	Jørgen Andersen
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ 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	Lindab Atrium Plana, Plana Matrix
Additional labels	
Product reference	Atrium Plana: C-40, C-60, C-90, C-120, H-40, H-60, H-90, H-120, HC-40, HC-60, HC-90, HC-120, Plana Matrix C-60, C-100, C-120
Place of production	Grevie, Sweden
Period for data	Calendar year 2022
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	-

More information on page 7.

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg of heating and cooling panel
Declared unit mass	1 kg
GWP-fossil, A1-A3 (kgCO2e)	4.92
GWP-total, A1-A3 (kgCO2e)	4.61
Secondary material, inputs (%)	15.9
Secondary material, outputs (%)	95.1
Total energy use, A1-A3 (kWh)	27.0
Total water use, A1-A3 (m3e)	0.987

MANUFACTURER

ABOUT LINDAB

Lindab is a leading ventilation company in Europe, offering solutions for energy-efficient ventilation and a healthy indoor climate. The products are characterised by high quality, ease of installation and environmental thinking. In northern Europe, Lindab also offers an extensive range of roof, wall and rainwater systems.

FOR A BETTER CLIMATE

We want to create a better climate. Most of us spend a majority of our time indoors. The air we breathe, in our homes, at our workplaces and at school, affects our well-being. Since air is not visible, we do not always think about it. However, the indoor climate is crucial for how we feel, for our energy levels and whether we stay healthy. Lindab wants to contribute to the architecture and indoor climate of tomorrow. We also want a better climate for our planet. That is why we develop energy-efficient solutions for healthy indoor environments

OUR VISION

We want to be the leading player in the area in which we are strongest – ventilation in Europe. We focus on air distribution and air diffusion. Since we offer high-quality products, we focus on Europe where demand for good ventilation is high, and we can offer superior availability. We specialise in those parts of the ventilation system where we are the strongest. We adapt our offering to the local market, with our core ventilation offering as the clear common denominator in all markets.

THE IMPORTANCE OF VENTILATION

About 90 percent of the global population breathes poor air every day. A common misconception is that outdoor air is more polluted due to emissions, smog, and harmful chemicals. In fact, indoor air in homes, schools, offices, and factories can be as much as five times more polluted. People nonetheless spend most of their life indoors. The most common causes of indoor air pollution are mold, chemicals in, for example, furniture and building materials, dust, radon, and cigarette smoke but, above all, airborne particles from combustion and industrial processes, which are so small they can enter the human bloodstream via the respiratory system. Today, air pollution is a risk factor in several of the world's most common causes of death, including heart disease, pneumonia, stroke, diabetes, and lung cancer. Ventilation is an efficient and convenient method to remove those indoor air pollutants.

SUSTAINABILITY PLAN

For us, sustainability is a way of thinking and working. This affects how we work with Lindab's strategy in all areas. Everything from the purchases we make, to the deliveries and the service we offer our customers. Lindab has three long-term, non-financial targets for the business, one that focuses on increasing our attractiveness as an employer, one for reducing our own carbon dioxide emissions, and one for a better working environment.

Read more about Lindab Groups sustainability work and non-financial targets on www.lindabgroup.com.

PRODUCT

PRODUCT DESCRIPTION

Atrium Plana is a heating and cooling panel. It has a flat surface which makes its appearance similar to the false ceiling and can be installed recessed or into a suspended ceiling.

Atrium Plana is a discreet and unique radiant panel solution from Lindab. Atrium Plana the lightest cooling panel on the market with a high degree of radiant cooling and heating. It is easy to clean. Plana Matrix cooling panels are developed together with Ecophon to be an important part of the Solo Matrix Celsius ceiling system. The radiation share for the panels exceeds 50% to 60%, compared to approx. 5% for conventional fin coil products. Since the air velocities can be kept low, the result is a draught-free environment.

Further information can be found at www.lindab.com/.

All assumptions and results in this EPD are based on H-60-2,4. EPD represents Atrium Plana and Plana Matrix range mentioned in page 3 under product references. GWP fossil (A1-A3) variation of the range is confirmed to be less than 10%.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	96	EU
Minerals	-	-
Fossil materials	4	EU
Bio-based materials	-	-

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	-
Biogenic carbon content in packaging, kg C	0.1

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 kg of heating and cooling panel
Mass per declared unit	1 kg
Functional unit	-
Reference service life	> 50 years

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0.1 % (1000 ppm). More detailed information about the products material content can be found in the Building Product Declaration available online.

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 generated 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 Aluminium raw material is received by Lindab Group´s own steel service centre, Lindab Steel AB and cut to length and transported to production unit. Together with all other materials/components the material is quality inspected at arrival to the manufacturing facility. The product parts are punched with a punching machine (waste from the process is pure aluminium scrap. Aluminium scrap is sold for recycling) Copper pipe is fixed to the product by laser welding and parts are formed in a bending machine. After bending all components are assembled and then the complete product is powder coated. For protection and transport, the products are protected with plastic film, EPS and wooden pallets. Lubrication oil is used for the above machines.

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. Installation spills and handling of packaging material is considered. Material loss during installation is estimated to be zero. Transport from production site to customer is calculated as an

average of the 5 largest consumer countries weighted by revenue. Transport from distribution centre to customer is set to 300 km.

Transport from production place to user (A4)

Country	Distance 1 (km)	Distance 2 Ferry (km)	Distance 3 (km)
Finland	730	206	300
UK	1491	19	300
Norway	466	-	300
Denmark	147	-	300

Distance1: From production place to Distribution centre (16-32 metric ton lorry, Euro 6, Diesel truck)
Distance2: Ferry (Transport, freight sea)
Distance3: From Distribution centre to customer is set to 300 Km.

Products sold as ready to install with no expected losses during the installation.

PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase. These life cycle stages are dependent on how the product is used and should be developed and included as part of a holistic assessment of specific construction works.

PRODUCT END OF LIFE (C1-C4, D)

Energy (0,1 kWh) for deconstruction is included in C1. The distance for transportation to disposal is assumed as 50 km and the transportation method is assumed to be lorry in C2. Activities related to recycling is included in C3. See below tables for scenarios used in Modules A5, C and D.

Transport to waste processing scenario (A5, C2)

Type	Distance
Lorry	50 km

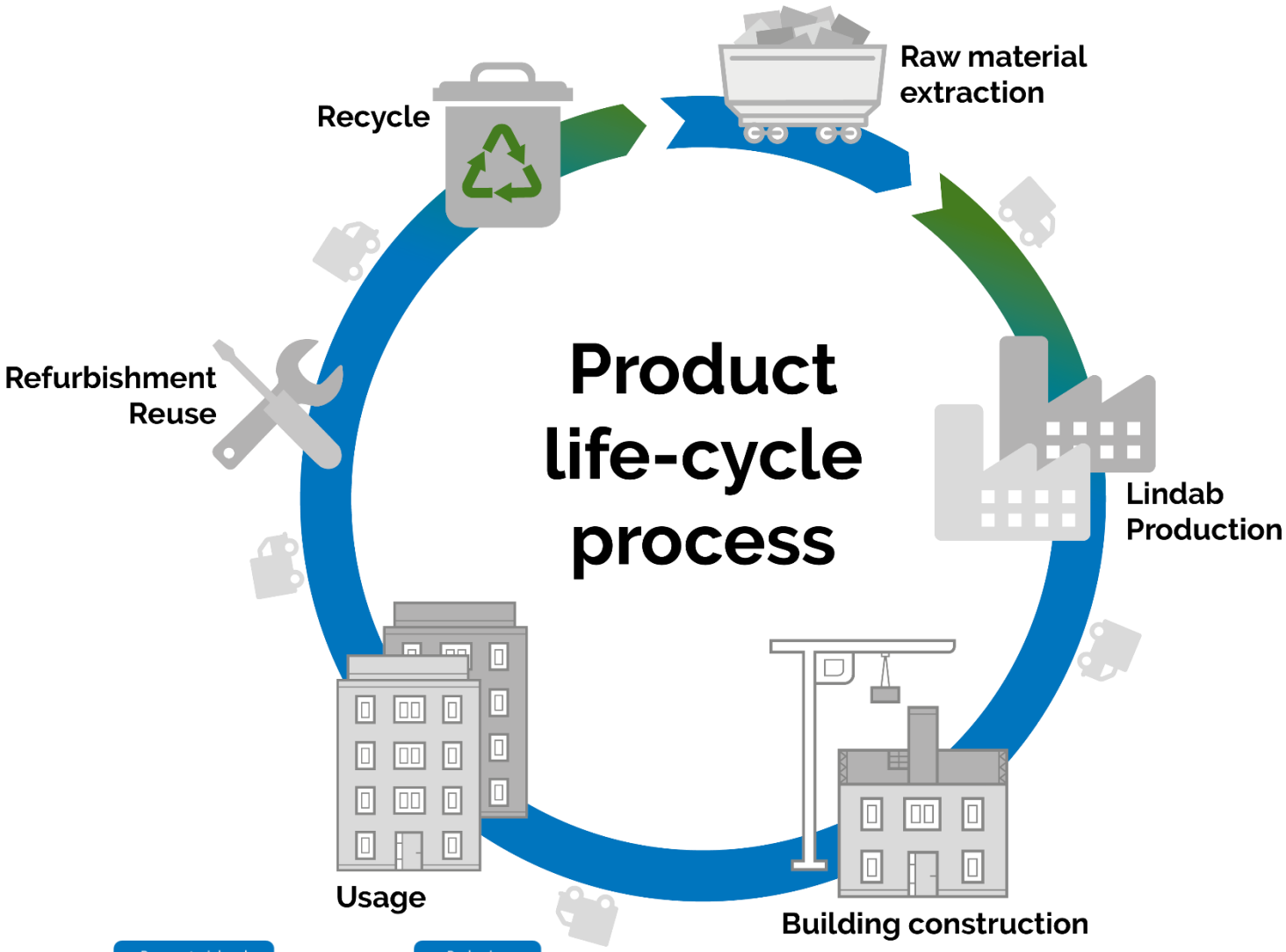
End of Life Scenarios (A5, C3, C4, D)

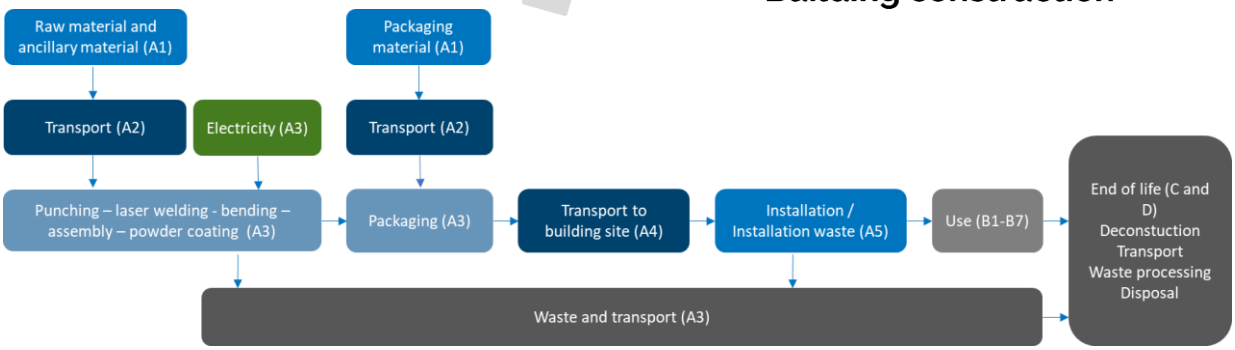
	%
Aluminium to recycling	95*
Aluminium to landfill	5*
Copper to recycling	95*
Copper to landfill	5*
EPS to recycling	30*
EPS to incineration	70*
Plastic to recycling	37***
Plastic to incineration	53***
Plastic to landfill	9***
Wood to incineration	33**
Wood to reuse	66**

According to:
*: Lindab sustainability reporting 2022
**: EUROSTAT European statistics and Lindab sales 2021

***: Plastic Europe statistics and Lindab sales 2021

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. While cut-off criteria according to the PCR were employed, much data which would have fallen within that scope were included regardless, if available, resulting in a data set which is robust and captures all significant contributors to the LCA results.

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 done as per the reference standards and the applied PCR. In this study, allocation done in the following ways:

Data type	Allocation
Raw materials	No allocation
Packaging materials	Allocated by mass or volume
Ancillary materials	Allocated by mass or volume
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	Less than 10%

This EPD is represented by the article Atrium Plana H-60-2,4. Atrium Plana H-60-2,4 is a high runner and represents Atrium Plana well for parameter in this EPD. The range in scope vary only in sizes, shapes and insulation material.

Impacts on GWP fossil in A1-A3 modules, because of variance in weights of raw materials and packaging materials between each article, is less than +/-10 %. Production process, transportation, installation, demolition, and waste treatment are the same for all articles. The product is only produced in Grevie, Sweden.

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. Data from World Steel Association and available supplier EPDs. For other inputs 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[1)]	kg CO_2e	4,81E+00	1,00E-01	-3,07E-01	4,61E+00	1,92E-01	4,66E-01	MND	MND	MND	MND	MND	MND	MND	4,38E-02	7,62E-03	2,22E-01	6,94E-04	-5,26E+00
GWP – fossil	kg CO_2e	4,76E+00	1,00E-01	6,50E-02	4,92E+00	1,92E-01	9,51E-02	MND	MND	MND	MND	MND	MND	MND	4,37E-02	7,62E-03	2,24E-01	6,92E-04	-5,12E+00
GWP – biogenic	kg CO_2e	2,41E-03	0,00E+00	-3,72E-01	-3,70E-01	0,00E+00	3,71E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	-1,22E-03	0,00E+00	-1,21E-02
GWP – LULUC	kg CO_2e	5,03E-02	3,76E-05	1,30E-04	5,04E-02	8,18E-05	2,59E-06	MND	MND	MND	MND	MND	MND	MND	6,43E-05	2,97E-06	8,44E-05	1,85E-06	-1,22E-01
Ozone depletion pot.	kg CFC_{-11}e	9,29E-07	2,31E-08	4,90E-09	9,57E-07	4,38E-08	4,14E-10	MND	MND	MND	MND	MND	MND	MND	2,10E-09	1,76E-09	6,70E-09	1,57E-10	-6,38E-07
Acidification potential	mol H^+e	7,87E-02	4,20E-04	3,45E-04	7,95E-02	1,13E-03	2,16E-05	MND	MND	MND	MND	MND	MND	MND	2,36E-04	3,11E-05	5,83E-04	4,32E-06	-5,38E-02
EP-freshwater[2)]	kg Pe	1,24E-04	7,93E-07	3,61E-06	1,28E-04	1,29E-06	9,31E-08	MND	MND	MND	MND	MND	MND	MND	5,43E-06	5,45E-08	3,67E-06	1,15E-08	-3,53E-04
EP-marine	kg Ne	6,28E-03	1,25E-04	9,01E-05	6,50E-03	2,59E-04	8,03E-06	MND	MND	MND	MND	MND	MND	MND	3,01E-05	9,28E-06	6,64E-05	1,40E-06	-4,39E-03
EP-terrestrial	mol Ne	7,57E-02	1,38E-03	9,79E-04	7,81E-02	2,87E-03	8,59E-05	MND	MND	MND	MND	MND	MND	MND	3,41E-04	1,02E-04	7,98E-04	1,54E-05	-5,34E-02
POCP (“smog”)[3)]	kg NMVOCe	2,30E-02	4,37E-04	3,34E-04	2,38E-02	8,78E-04	2,26E-05	MND	MND	MND	MND	MND	MND	MND	9,38E-05	3,15E-05	2,31E-04	4,85E-06	-1,84E-02
ADP-minerals & metals[4)]	kg Sbe	6,64E-04	2,64E-07	1,03E-06	6,65E-04	6,47E-07	1,08E-08	MND	MND	MND	MND	MND	MND	MND	9,58E-08	2,59E-08	7,56E-06	2,54E-09	-5,38E-04
ADP-fossil resources	MJ	4,44E+01	1,50E+00	1,15E+00	4,70E+01	2,81E+00	4,27E-02	MND	MND	MND	MND	MND	MND	MND	8,76E-01	1,13E-01	9,95E-01	1,26E-02	-7,83E+01
Water use[5)]	m^3e depr.	1,41E+01	6,78E-03	3,01E-02	1,41E+01	1,27E-02	2,71E-03	MND	MND	MND	MND	MND	MND	MND	1,93E-02	5,22E-04	2,59E-02	1,85E-03	-5,13E-01

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.

ENVIRONMENTAL IMPACTS – GWP-GHG - THE INTERNATIONAL EPD SYSTEM

IMPACT CATEGORY	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG[9)]	kg CO_2e	4,76E+00	1,00E-01	6,50E-02	4,92E+00	1,92E-01	9,51E-02	MND	MND	MND	MND	MND	MND	MND	4,37E-02	7,62E-03	2,24E-01	6,92E-04	-5,12E+00

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013). In addition, the characterisation factors for the flows - CH4 fossil, CH4 biogenic and Dinitrogen monoxide - were updated in line with the guidance of IES PCR 1.2.5 Annex 1. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterization factor for biogenic CO2 is set to zero.

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	3,82E+01	1,80E-02	7,22E+00	4,54E+01	3,89E-02	2,88E-03	MND	MND	MND	MND	MND	MND	MND	1,27E-01	1,58E-03	1,44E-01	2,44E-04	-3,49E+01
Renew. PER as material	MJ	1,09E-02	0,00E+00	3,25E+00	3,26E+00	0,00E+00	-3,25E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	-1,08E-02	0,00E+00	-1,55E+00
Total use of renew. PER	MJ	3,82E+01	1,80E-02	1,05E+01	4,87E+01	3,89E-02	-3,25E+00	MND	MND	MND	MND	MND	MND	MND	1,27E-01	1,58E-03	1,34E-01	2,44E-04	-3,65E+01
Non-re. PER as energy	MJ	4,91E+01	1,50E+00	1,06E+00	5,16E+01	2,81E+00	4,27E-02	MND	MND	MND	MND	MND	MND	MND	8,77E-01	1,13E-01	9,94E-01	1,26E-02	-7,79E+01
Non-re. PER as material	MJ	9,34E-01	0,00E+00	6,05E-01	1,54E+00	0,00E+00	-6,17E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	-9,22E-01	0,00E+00	-2,41E-01
Total use of non-re. PER	MJ	5,00E+01	1,50E+00	1,67E+00	5,32E+01	2,81E+00	-5,74E-01	MND	MND	MND	MND	MND	MND	MND	8,77E-01	1,13E-01	7,20E-02	1,26E-02	-7,81E+01
Secondary materials	kg	1,59E-01	4,38E-04	1,27E-03	1,61E-01	9,74E-04	3,08E-05	MND	MND	MND	MND	MND	MND	MND	6,63E-05	3,72E-05	6,52E-04	1,14E-04	7,62E-01
Renew. secondary fuels	MJ	2,20E-04	4,52E-06	2,91E-04	5,16E-04	9,88E-06	2,27E-07	MND	MND	MND	MND	MND	MND	MND	3,73E-07	4,06E-07	2,40E-05	3,79E-07	-3,95E-03
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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	8,77E-01	1,93E-04	1,10E-01	9,87E-01	3,41E-04	3,65E-05	MND	MND	MND	MND	MND	MND	MND	6,78E-04	1,43E-05	7,23E-04	-1,01E-05	-4,28E-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	1,86E-01	1,92E-03	3,84E-03	1,92E-01	3,23E-03	1,08E-04	MND	MND	MND	MND	MND	MND	MND	3,13E-03	1,30E-04	1,55E-02	0,00E+00	-1,27E+00
Non-hazardous waste	kg	2,30E+01	3,21E-02	1,51E-01	2,32E+01	5,43E-02	3,55E-02	MND	MND	MND	MND	MND	MND	MND	2,49E-01	2,28E-03	3,79E-01	4,89E-02	-1,83E+01
Radioactive waste	kg	2,09E-04	1,01E-05	4,35E-06	2,23E-04	1,94E-05	2,26E-07	MND	MND	MND	MND	MND	MND	MND	6,00E-06	7,77E-07	3,96E-06	0,00E+00	-4,55E-04

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	1,55E-01	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	9,25E-02	9,25E-02	0,00E+00	2,32E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	9,36E-01	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	9,52E-04	9,52E-04	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	3,42E-04	0,00E+00	1,23E-02	1,26E-02	0,00E+00	4,77E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	4,71E-01	0,00E+00	0,00E+00

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
15.12.2023

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VERIFIED ISO 14025