ENVIRONMENTAL PRODUCT DECLARATION

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

ALTW72cw Window System

Alutech Commercial UK

EPD HUB, HUB-0966

Publishing date 15.12. 2023, last updated date 15.12. 2023, valid until 15.12.2028

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Alutech Commercial UK
Address	Knights House 2 Parade, Sutton Coldfield, B72 1PD, United Kingdom
Contact details	Daria Yatsevich Yatsevich-d@alutech-mc.com
Website	www.alutech-group.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 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, C1-C4 and D
EPD author	Ipek Goktas, One Click LCA
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☒ 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	ALTW72cw window system
Place of production	Belarus and United Kingdom (continuous production)
Period for data	2022
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	-

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 m^2 of a double-glazed window consisting of a window frame and glass of a standard window size of 1.23 m x 1.48 m the range of glazing thicknesses can be facilitated between 16mm-54mm
Declared unit mass	≈ 35 kg
GWP-fossil, A1-A3 (kgCO2e)	107
GWP-total, A1-A3 (kgCO2e)	107
Secondary material, inputs (%)	0.841
Secondary material, outputs (%)	47.3
Total energy use, A1-A3 (kWh)	445
Total water use, A1-A3 (m3e)	1.71

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

The Alutech Group design, extrude and deliver architectural aluminium systems to produce commercial/residential doors, windows and building facade systems. We have a manufacturing capacity of 45,000 tons per year. With the manufacturing facility of 35,000 m2 which makes Alutech one of the largest aluminium extruders in the world. We have our own in-house powder coating and anodising facility as well as a fully automated stock facility to make sure we are ready to deliver within a short lead time.

Alutech was founded in 1996 and currently has over 4,300 employees as well as actively selling to over 40 countries. Alutech Commercial covers a nation-wide network of fully trained authorised fabricators, supported by a dedicated team providing industry leading customer service and technical support.

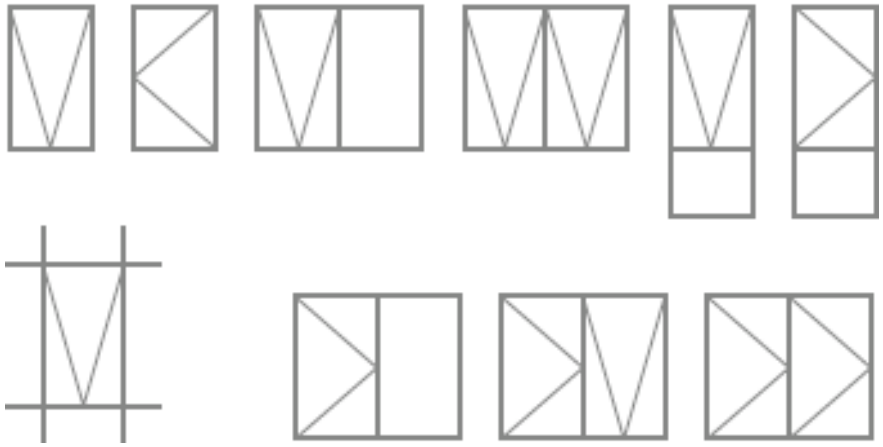
PRODUCT DESCRIPTION

ALT W72cw system is used to manufacture window, door, and more complex units for modern energy efficient buildings. New technologies and materials, modern design methods allow us to create products that meet the highest thermal and acoustic requirements.

The frame of the window is 72mm in depth and is made up of aluminium, polyamide and has a HI+ option with the use of enhanced closed-cell polyethylene insulating foams/upgraded gaskets and EPDM and cellular EPDM gaskets for sealing. The W72cw can facilitate a range of glazing thicknesses between 16mm-54mm.

Outward opening window types:

- Single sash
- Double Sash
- Composite with integral mullions/transoms.
- Top hung sash
- Side hung sash



Further information can be found at www.alutech-group.com.

DECLARED UNIT

Declared unit	1m^2 of double-glazed window consisting of a window frame and glass of a standard window size of 1.23 m x 1.48 m
Mass per declared unit	≈ 35 kg

CONTENT DECLARATION

Aluminium profile	9.635 kg
▪ Aluminium	8.062 kg
▪ Powder coating	0.293 kg
▪ Thermal bridge: Glass filled polyamide	1.258 kg
▪ Foam filler: Closed cell polyethylene foam	0.022 kg
Glazing unit (double glazed)	21.918 kg
Gasket	0.924 kg
▪ EPDM	0.884 kg
▪ Closed cell polyethylene	0.040 kg
Hardware	2.446 kg
▪ Steel	2.430 kg
▪ Plastic (various)	0.016 kg
Accesories	0.229 kg
▪ Plastic (various)	0.193 kg
▪ EPDM	0.007 kg
▪ Cross linked polyurethane	0.029 kg
1 m² ALTW72cw Window System	**35.152 kg**
Packaging	2.493 kg
▪ Wooden pallet	1.183 kg
▪ Cardboard	1.041 kg
▪ Polyethylene	0.269 kg

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	30	Europe
Minerals	67	Europe
Fossil materials	3	Europe
Bio-based materials	-	-

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0.000
Biogenic carbon content in packaging, kg C	0.960

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

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 manufacturing process is divided into aluminium profile manufacturing and manufacturing of the final product - window W72CW. The production of aluminium profiles begins with the preparation of raw material - ingots - and the production of aluminium cylinders. Next, the prepared cylinders go through the extrusion process (this includes heating the ingot, pressing the ingot through the die to produce the profile and aging the profile). Next, the profile goes through the process of coating and thermal bridge insertion. The generated waste which is about 10% of the production volume is reused in the same system boundary as a closed loop system. The profile is packed (polyethylene air-bubble film, polypropylene nonwoven material, polyethylene stretch film, transparent tape, tape with logo is used) and sent to the territory of the manufacturer on a wooden pallet. Further, on the territory of the manufacturer is the final assembly of the product - cutting and milling of the profile, assembly of the window, packaging (cardboard, plastic film, wooden pallet, adhesive tape) and sending to the place of installation. It is assumed that wooden pallets are used 20 times in the market *(Deviatkin & Horttanainen, 2020)*.

TRANSPORT AND INSTALLATION (A4-A5)

Module A4: Transportation impacts occurred from final product's delivery to the construction site cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions. Average distance of transportation from production plant to building site is calculated based on the actual distances provided by the manufacturer. 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.

Module A5: There is no material loss during construction activities. The product does not require additional surface treatment in the installation process. Energy consumption required for the installation of the product is negligible according to the cut-off rule. Only waste resulting from packaging is evaluated. The reuse scenario of wooden pallets was taken into account in the disposal of the waste stream. The generic disposal method provided by background data is taken into account for packaging waste. Accordingly, 65% of packaging waste is incinerated and 35% is landfilled, respectively. In the UK, combustion efficiency is accepted as 22.5% for electricity and 4.8% for heat *(Debunking Efficient Recovery, Equanimator Ltd, 2023*), with an R1 value higher than 0.65 *(UK Energy from Waste Statistics, Tolvik, 2021)*.

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)

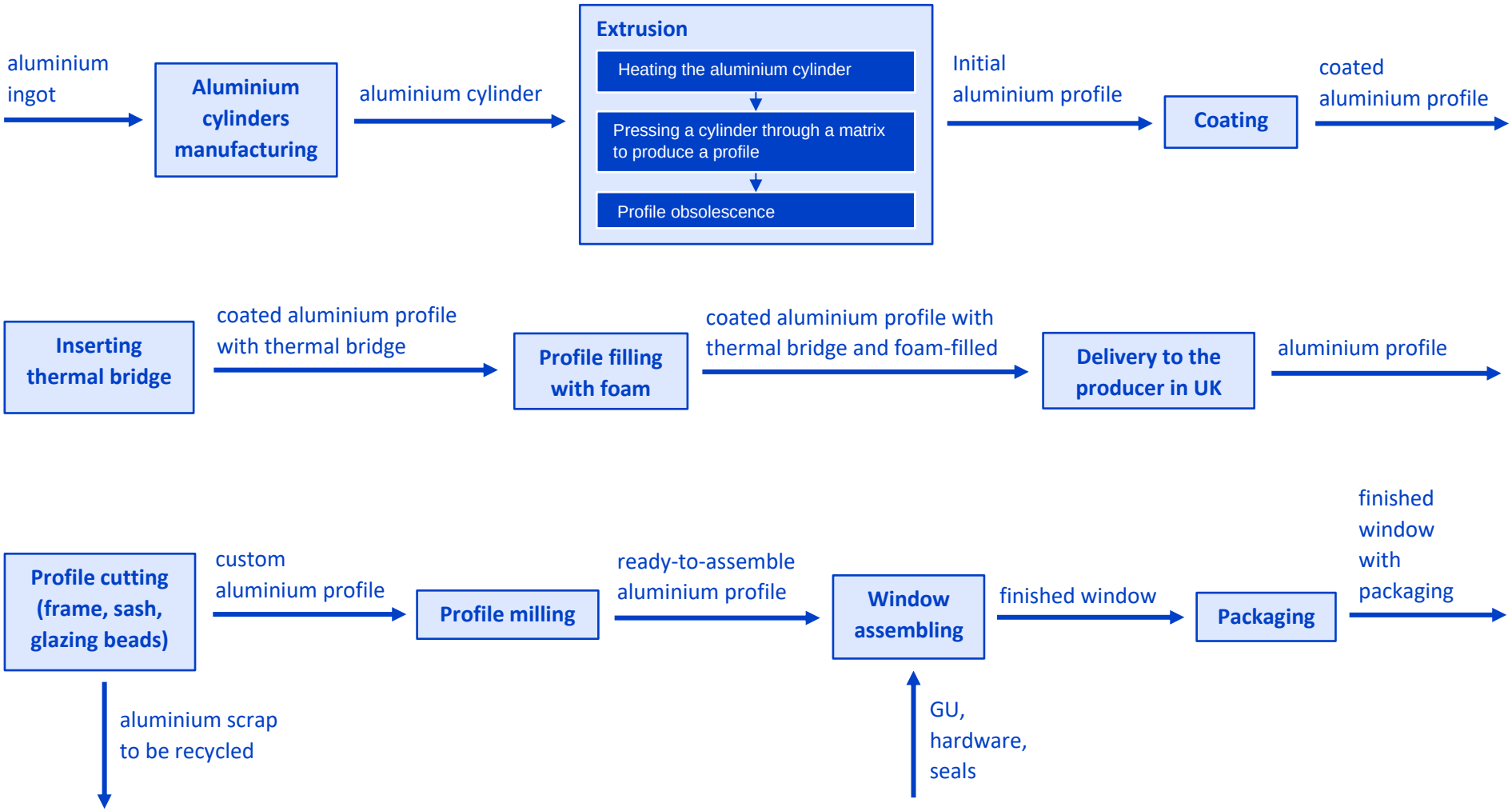
Module C1: End-of-life product is dismantled from the building and sent to waste treatment centre for sorting. The consumption of energy and other resources during the demolition process is assumed to be negligible.

Module C2: Transport method and distance between the demolition site and waste sorting plant are estimated as truck and 50 km.

ModuleS C3, C4: Based on the suggestions in EN 17213, 95% of aluminium frame and steel sections, and 30% of glass are assumed to be recycled. 95% of plastic section is assumed to be incinerated. The rest of the aluminium frame, steel and plastic sections and glass are assumed to be landfilled.

Module D: Avoided primary material use due to the recycling of aluminium, steel and glass, and obtained energy from incineration of packaging materials and plastic sections of the product are taken into account as the benefits in the next product systems.

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	Allocated by mass or volume
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

Estimates and assumptions can be found in the section “PRODUCT LIFE-CYCLE”.

AVERAGES AND VARIABILITY

Type of average	No averaging
Averaging method	Not applicable
Variation in GWP-fossil for A1-A3	-

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. Additionally, the sources 'Deviatkin & Horttanainen, 2020', 'Debunking Efficient Recovery, Equanimator Ltd, 2023' ve 'UK Energy from Waste Statistics, Tolvik, 2021' are used for the assumptions.

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	kg CO_2e	9.79E+1	2.66E+0	6.31E+0	1.07E+2	7.18E-1	2.23E+0	MND	MND	MND	MND	MND	MND	MND	0.00E+0	1.66E-1	5.44E+0	1.70E-1	-5.71E+1
GWP – fossil	kg CO_2e	9.67E+1	2.66E+0	7.83E+0	1.07E+2	7.17E-1	5.94E-1	MND	MND	MND	MND	MND	MND	MND	0.00E+0	1.66E-1	5.43E+0	1.68E-1	-5.63E+1
GWP – biogenic	kg CO_2e	4.37E-1	1.06E-3	-1.62E+0	-1.18E+0	2.85E-4	1.64E+0	MND	MND	MND	MND	MND	MND	MND	0.00E+0	6.62E-5	1.12E-2	1.10E-3	-8.16E-2
GWP – LULUC	kg CO_2e	7.80E-1	9.55E-4	9.90E-2	8.80E-1	2.58E-4	2.89E-5	MND	MND	MND	MND	MND	MND	MND	0.00E+0	5.98E-5	1.23E-3	1.52E-4	-6.90E-1
Ozone depletion pot.	kg CFC_{-11}e	9.07E-6	6.34E-7	4.84E-7	1.02E-5	1.71E-7	8.27E-9	MND	MND	MND	MND	MND	MND	MND	0.00E+0	3.97E-8	1.25E-7	5.08E-8	-3.71E-6
Acidification potential	mol H^+e	7.11E-1	1.11E-2	2.05E-2	7.42E-1	2.99E-3	4.80E-4	MND	MND	MND	MND	MND	MND	MND	0.00E+0	6.94E-4	9.30E-3	1.41E-3	-4.12E-1
EP-freshwater	kg Pe	2.96E-3	1.82E-5	1.77E-4	3.16E-3	4.91E-6	7.02E-7	MND	MND	MND	MND	MND	MND	MND	0.00E+0	1.14E-6	4.66E-5	2.16E-6	-1.97E-3
EP-marine	kg Ne	1.13E-1	3.35E-3	6.24E-3	1.23E-1	9.06E-4	7.80E-4	MND	MND	MND	MND	MND	MND	MND	0.00E+0	2.10E-4	1.79E-3	4.89E-4	-5.85E-2
EP-terrestrial	mol Ne	1.19E+0	3.70E-2	5.21E-2	1.28E+0	9.99E-3	1.90E-3	MND	MND	MND	MND	MND	MND	MND	0.00E+0	2.32E-3	2.03E-2	5.30E-3	-7.82E-1
POCP (“smog”)	kg NMVOCe	3.51E-1	1.19E-2	1.57E-2	3.79E-1	3.21E-3	7.03E-4	MND	MND	MND	MND	MND	MND	MND	0.00E+0	7.45E-4	5.64E-3	1.53E-3	-2.07E-1
ADP-minerals & metals	kg Sbe	2.02E-3	6.23E-6	2.92E-5	2.06E-3	1.68E-6	1.85E-7	MND	MND	MND	MND	MND	MND	MND	0.00E+0	3.90E-7	9.06E-5	5.20E-7	-2.30E-4
ADP-fossil resources	MJ	1.16E+3	4.06E+1	1.35E+2	1.34E+3	1.10E+1	6.44E-1	MND	MND	MND	MND	MND	MND	MND	0.00E+0	2.54E+0	1.52E+1	3.76E+0	-6.29E+2
Water use	m^3e depr.	5.84E+1	1.88E-1	4.93E+0	6.35E+1	5.07E-2	6.81E-2	MND	MND	MND	MND	MND	MND	MND	0.00E+0	1.17E-2	4.69E-1	1.91E-2	5.91E+1

1) GWP = Global Warming Potential; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential

2) 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 experienced with the indicator.

3) Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO_4e.

ADDITIONAL 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	8.64E-6	3.12E-7	1.70E-7	9.13E-6	8.44E-8	9.05E-9	MND	MND	MND	MND	MND	MND	MND	0.00E+0	1.96E-8	1.60E-7	2.89E-8	-4.94E-6
Ionizing radiation	kBq U235e	8.39E+0	2.09E-1	5.97E-1	9.20E+0	5.66E-2	3.09E-3	MND	MND	MND	MND	MND	MND	MND	0.00E+0	1.31E-2	1.48E-1	1.69E-2	-6.13E+0
Ecotoxicity (freshwater)	CTUe	4.36E+3	3.38E+1	7.07E+1	4.46E+3	9.13E+0	3.66E+0	MND	MND	MND	MND	MND	MND	MND	0.00E+0	2.12E+0	5.46E+1	2.52E+2	-1.46E+3
Human toxicity, cancer	CTUh	1.47E-7	8.91E-10	2.03E-9	1.50E-7	2.41E-10	1.91E-10	MND	MND	MND	MND	MND	MND	MND	0.00E+0	5.58E-11	2.47E-9	1.20E-10	-1.17E-7
Human tox. non-cancer	CTUh	2.47E-6	3.58E-8	4.80E-8	2.55E-6	9.66E-9	5.28E-9	MND	MND	MND	MND	MND	MND	MND	0.00E+0	2.24E-9	6.98E-8	1.85E-9	-1.62E-6
SQP	-	3.20E+2	4.74E+1	6.44E+1	4.32E+2	1.28E+1	6.26E-1	MND	MND	MND	MND	MND	MND	MND	0.00E+0	2.97E+0	1.33E+1	9.44E+0	-1.28E+2

4) SQP = Land use related impacts/soil quality

5) 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.

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	MJ	2.96E+2	5.26E-1	4.30E+1	3.39E+2	1.42E-1	1.16E+1	MND	MND	MND	MND	MND	MND	MND	0.00E+0	3.30E-2	1.96E+0	6.45E-2	-2.63E+2
Renew. PER as material	MJ	1.84E-1	0.00E+0	3.05E+1	3.06E+1	0.00E+0	-3.05E+1	MND	MND	MND	MND	MND	MND	MND	0.00E+0	0.00E+0	-1.60E-1	-8.43E-3	0.00E+0
Total use of renew. PER	MJ	2.96E+2	5.26E-1	7.34E+1	3.70E+2	1.42E-1	-1.88E+1	MND	MND	MND	MND	MND	MND	MND	0.00E+0	3.30E-2	1.80E+0	5.61E-2	-2.63E+2
Non-re. PER as energy	MJ	1.10E+3	4.06E+1	1.24E+2	1.26E+3	1.10E+1	1.02E+1	MND	MND	MND	MND	MND	MND	MND	0.00E+0	2.54E+0	4.09E+1	5.50E+0	-6.30E+2
Non-re. PER as material	MJ	3.56E+1	0.00E+0	1.19E+1	4.75E+1	0.00E+0	-1.27E+1	MND	MND	MND	MND	MND	MND	MND	0.00E+0	0.00E+0	-3.31E+1	-1.74E+0	0.00E+0
Total use of non-re. PER	MJ	1.13E+3	4.06E+1	1.36E+2	1.31E+3	1.10E+1	-2.49E+0	MND	MND	MND	MND	MND	MND	MND	0.00E+0	2.54E+0	7.77E+0	3.76E+0	-6.30E+2
Secondary materials	kg	2.95E-1	1.15E-2	1.10E+0	1.41E+0	3.09E-3	4.49E-4	MND	MND	MND	MND	MND	MND	MND	0.00E+0	7.17E-4	1.02E-2	1.28E-3	1.65E+1
Renew. secondary fuels	MJ	4.94E-2	1.01E-4	1.11E-1	1.61E-1	2.73E-5	6.83E-6	MND	MND	MND	MND	MND	MND	MND	0.00E+0	6.33E-6	3.20E-4	2.58E-5	-1.22E-2
Non-ren. secondary fuels	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	MND	MND	MND	MND	MND	MND	MND	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.92E-4
Use of net fresh water	m^3	1.58E+0	5.39E-3	1.26E-1	1.71E+0	1.46E-3	1.06E-3	MND	MND	MND	MND	MND	MND	MND	0.00E+0	3.38E-4	1.27E-2	4.10E-3	5.83E+0

6) 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	1.61E+1	4.36E-2	2.05E-1	1.63E+1	1.18E-2	1.57E-2	MND	MND	MND	MND	MND	MND	MND	0.00E+0	2.73E-3	1.90E-1	0.00E+0	-1.39E+1
Non-hazardous waste	kg	9.94E+1	7.58E-1	6.09E+0	1.06E+2	2.05E-1	1.35E+0	MND	MND	MND	MND	MND	MND	MND	0.00E+0	4.75E-2	7.77E+0	1.60E+1	-8.10E+1
Radioactive waste	kg	4.12E-3	2.80E-4	1.75E-4	4.57E-3	7.57E-5	3.10E-6	MND	MND	MND	MND	MND	MND	MND	0.00E+0	1.75E-5	6.27E-5	0.00E+0	-2.23E-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	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	MND	MND	MND	MND	MND	MND	MND	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Materials for recycling	kg	1.17E-2	0.00E+0	0.00E+0	1.17E-2	0.00E+0	0.00E+0	MND	MND	MND	MND	MND	MND	MND	0.00E+0	0.00E+0	1.65E+1	0.00E+0	6.58E+0
Materials for energy rec	kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	MND	MND	MND	MND	MND	MND	MND	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Exported energy	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.57E+0	MND	MND	MND	MND	MND	MND	MND	0.00E+0	0.00E+0	7.40E+0	0.00E+0	0.00E+0

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

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 Life Cycle Assessment (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
15.12.2023