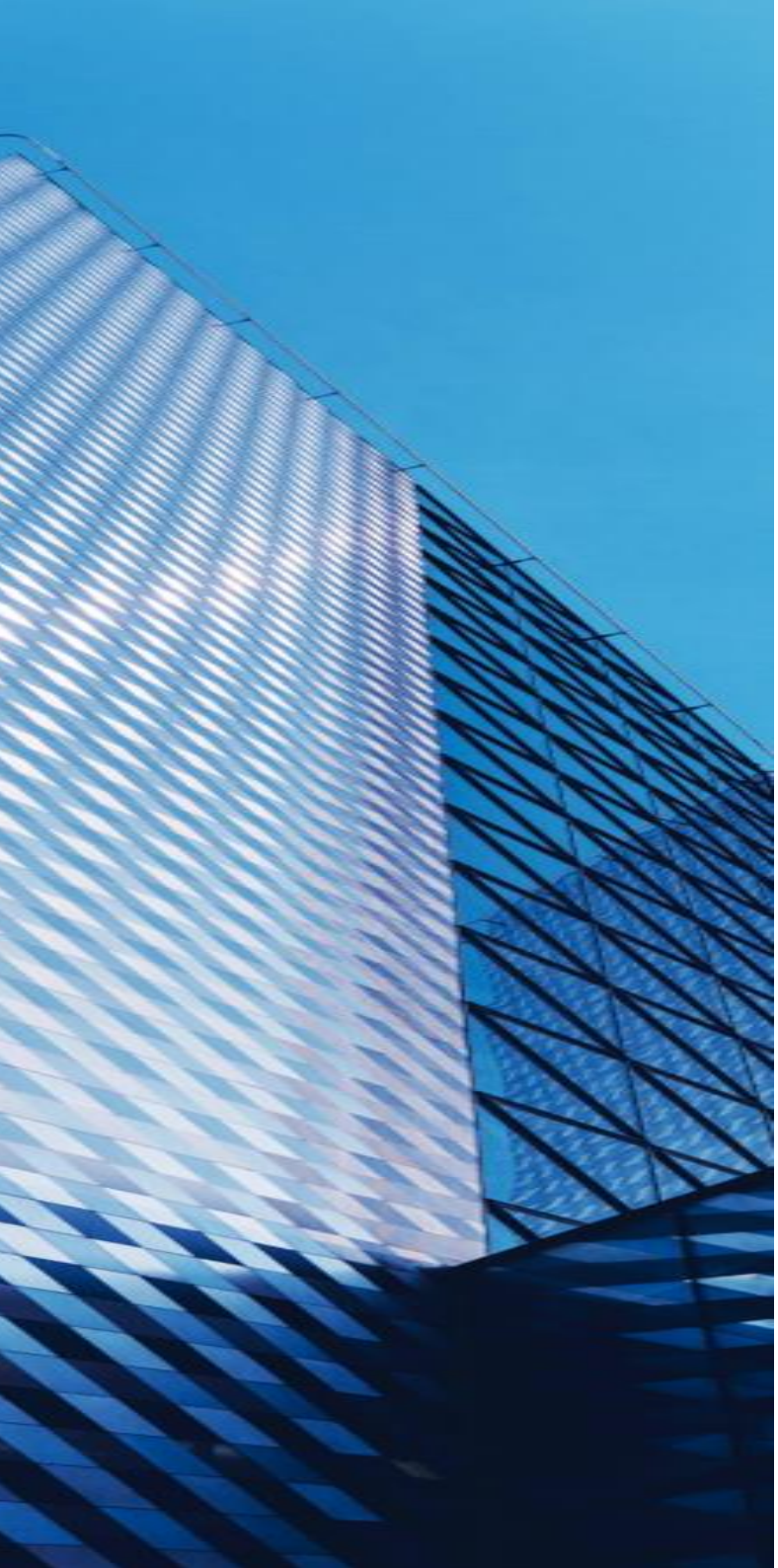


ENVIRONMENTAL PRODUCT DECLARATION

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

Siderise CW-FS – Perimeter Barriers and Firestops for Curtain Walling
Siderise Insulation Limited

EPD HUB, HUB-1301
Publishing on 12.04.2024, last updated on 12.04.2024, valid until 12.04.2029.

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Siderise Insulation Limited
Address	Forge Industrial Estate, Maesteg, Bridgend, CF34 0AH, UK
Contact details	salesteam@siderise.com
Website	https://www.siderise.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	Sera Turkoglu, ESG Manager, Siderise Insulation Limited
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ 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	Siderise CW-FS – Perimeter Barriers and Firestops for Curtain Walling
Additional labels	This EPD is for the entire Siderise CW-FS range of products
Product reference	CW/FS120BJ/1.2-1.2/P
Place of production	Forge Industrial Estate, Maesteg, Bridgend, CF34 0AH, UK
Period for data	2022
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3	+4% / 0 %

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg
Declared unit mass	1 kg
GWP-fossil, A1-A3 (kgCO2e)	1.68E+00
GWP-total, A1-A3 (kgCO2e)	1.68E+00
Secondary material, inputs (%)	1.39
Secondary material, outputs (%)	6.08
Total energy use, A1-A3 (kWh)	6.28
Total water use, A1-A3 (m3e)	0.01

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

For 50 years Siderise has been providing innovative insulation solutions for fire, acoustic, and thermal applications internationally. As a global expert in passive fire protection, our market leading product ranges have become the trusted brand in high-rise buildings, construction and building services. With our unrivalled technical expertise and services coupled with our unique manufacturing processes, we are the manufacturer of choice for many major companies around the globe.

PRODUCT DESCRIPTION

Siderise CW-FS perimeter barrier and fire stop systems offer an extensive range of solutions for fire stop and acoustic barrier requirements in all curtain wall applications. The CW Systems also resist the passage of smoke and hot gases. CW systems may also be used in fire stop and cavity barrier applications in conjunction with weathertight façade systems such as precast concrete cladding and architectural cladding panels.

The primary function of the CW system is to maintain continuity of fire resistance by sealing the void between the compartment floors or walls and the external curtain wall both horizontally and vertically. Apart from being simple and quick to install CW systems' unique product construction also provides the ability to accommodate movement for the life of the building.

Siderise CW systems are manufactured using a unique method that provides resilient lateral compression. This facilitates installation, ensuring the requisite tight fit and enhancing the fire integrity of the product. Throughout the range, the materials comprise a one-piece product with a pre-compressed non-combustible stone wool core. The products also have integral aluminium foil facings to provide an overall Class A1 rating (to EN 13501-1). The systems can offer tested fire resistance options ranging from 30 mins to 3 hours (3 hours to EN 1364-4 only) and can accommodate void widths up to 600mm (600mm voids to EN 1366-4 only). In addition to providing an effective seal against the passage of smoke and fire, the products are also acoustically absorptive. The materials can be either supplied as pre-cut units to suit a specified void size or in sheet form for cutting on site. Standard sheet products are supplied 1200 x 1200 mm which may prove beneficial when the actual void size is not known or where it varies significantly. Please note that when ordered in sheet form, the requisite quantity of fixing brackets needs to be purchased separately. Pre-cut strips are available in 1 mm increments of width to suit the cavity size to provide a tight compressive fit within the void. Each pre-cut CW unit is supplied with appropriate fixing brackets as part of the system. The standard fixing brackets are supplied in galvanized mild steel in a flat form that is complete with a pre-notched facility for folding on site. Brackets are also available in stainless steel.

Further information can be found at https://www.siderise.com/.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	4.6	United Kingdom
Minerals	95.4	United Kingdom
Fossil materials	-	-
Bio-based materials	-	-

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0
Biogenic carbon content in packaging, kg C	0.00228

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 kg
Mass per declared unit	1 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.

Siderise CW-FS 'Perimeter Barriers and Firestops for Curtain Walling' are made of a non-combustible stone wool lamella core, with reinforced aluminium foil faces. The stone wool is manufactured in the UK, the aluminium foil faces are manufactured in mainland Europe and they are shipped to the manufacturing facility in Maesteg, Bridgend, Wales. The representative product CW/FS120BJ/1.2-1.2/P mainly uses galvanised brackets. These brackets are manufactured in the UK and shipped to the manufacturing facility in Maesteg. The CW range is manufactured using state-of-the-art production equipment to rigorous quality assurance standards complying with the ISO 9001 standard. Environmental management of the manufacturing process is certified to ISO 14001. The manufacturing process takes the stone wool core, which is cut into strips and rotated through 90 degrees so the fibres are perpendicular to the cavity barrier top and bottom surfaces. The strips are also subjected to lateral compression which eliminates any gaps and produces a more homogenous board with substantially better rigidity than a standard stone wool slab of the same density. Whilst under compression the product is faced with reinforced aluminium foil. The product is then cut into widths depending on customer order requirements, or supplied as full sheets. The process requires electricity for the machinery, heating oil for heating and propane for forklifts. Water is used in the manufacturing facility for cleaning and drinking purposes and does not enter the product. Wastewater treatment is also considered. A wood pallet, cardboard edge protectors (full sheets only - incl. the representative product), a cardboard top lid (full sheets only - incl. the representative product), a cardboard box (pre-cut widths only), vinyl tape (pre-cut widths only) and packaging film are used as packaging materials for transporting the finished product from the plant.

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.

All transportation distances are calculated using Google Maps and averaged based on weighted sales to various locations. The assumed average transportation distances from the production plant to the building site are as follows: 323 km by a lorry >32 metric ton, EURO6; 19 km by a lorry 16-32 metric ton, EURO5; 95 km by a lorry 16-32 metric ton, EURO6; 0.4 km by a lorry 7.5-16 metric ton, EURO6; 5.6 km by a light commercial vehicle; 21 km by sea via ferry and 13 km by an aircraft. The vehicle

capacity utilization volume factor is assumed to be 1, indicating a full load. Although load variation may occur in reality, it is considered negligible as transportation emissions play a relatively small role in the overall results. Empty returns are not accounted for separately, as it is assumed that the return trip is utilized by the transportation company to serve other clients. The datasets used incorporate an average load factor for empty returns. Transportation is not considered to cause losses, as the product is assumed to be properly packaged. Environmental impacts resulting from installation into the building include waste from packaging materials (A5) and the release of biogenic carbon dioxide from the wood pallet, cardboard edge protectors, and cardboard top lid. The assessment also incorporates the environmental impacts of material production, processing, and disposal as installation waste. Raw material waste scenarios are derived from interviews with installers, suppliers, and waste management companies, while packaging waste scenarios are based on Defra statistics. A 5% loss of the stone wool and foil facings is assumed during installation due to offcuts, with 3% being recycled and 97% sent to landfill. For cardboard edge protectors and top lid, 70.6% is recycled, and the remainder is incinerated. 44.2% of plastic pallet wrap is recycled, and the rest is incinerated. For wood pallets, 44.1% is recycled, and the remainder is incinerated. Electricity consumption for the installation of brackets is included based on an average scenario for product installation. A typical installation scenario requires the use of a hammer drill driver (20 sec, 800 W) to drill a hole in concrete and an electrical screwdriver (10 sec, 800 W) to drive in the fixings.

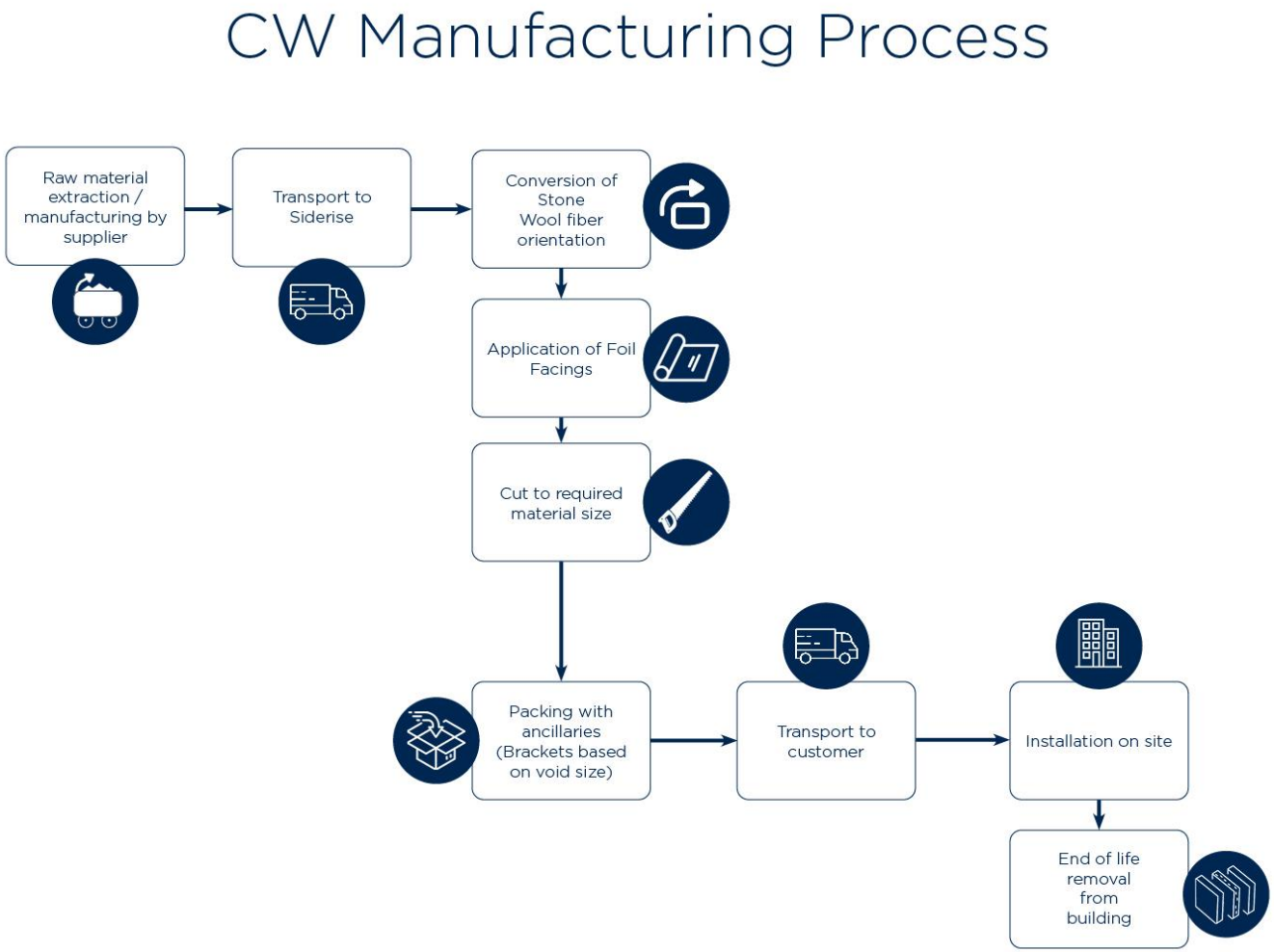
PRODUCT USE AND MAINTENANCE (B1-B7)

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)

Energy consumption during the deconstruction process (removing the bracket - (10 sec, 800 W with an electrical screwdriver) is taken into consideration. Raw material waste scenarios are derived from interviews with suppliers, waste management companies, and data gathered from trade associations. It is assumed that the waste is collected separately and transported to the waste treatment centre, with transportation distance assumed to be 50 km, using a lorry as the mode of transportation (C2). Regarding stone wool and foil facings: 3% is recycled, while 97% is sent to landfill. For galvanized brackets, 87% is recycled, 10% is reused, and 3% is sent to landfill. Module C3 accounts for energy and resource inputs associated with sorting and treating these waste streams, including incineration with energy recovery efficiency exceeding 60%. Additionally, waste that is incinerated without energy recovery or landfilled is included in Module C4 while the flow is not included in Module D for benefits. Due to the material and energy recovery potential of parts in the end-of-life product and packaging, recycled raw materials lead to avoided virgin material production, while the energy recovered from incineration displaces electricity and heat production (D). The benefits and loads of packaging materials are included.

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

AVERAGES AND VARIABILITY

Type of average	Multiple products
Averaging method	Representative product
Variation in GWP-fossil for A1-A3	+4% / 0 %

The representative product code CW/FS120BJ/1.2-1.2/P stands for below:
- CW: Curtain Wall
- FS: Fire Stop
- 120: 120 mins fire resistance
- BJ: Butt Jointed
- 1.2 x1.2: length and width dimensions of the board in metres
- P: Pallet

The representative product represents the entire CW-FS range of products including:
- CW-CB30
- CW-FS60
- CW-FS120
- CW-FS60-X
- CW-FS180

All products in the CW range are made using the same raw materials, meaning they have the same nominal density. The only difference across the range is that the thickness will increase where more fire resistance is required, and we may advise different amounts of compression to be used when installing the product.

The smallest product is CW/CB30/BJ/020 and the largest product is CW/FS180BJ/1.2-1.2/P within the CW range.

The representative product has a 4% higher GWP than the largest product; therefore minus (-) sign was not used. The analysis showed that the largest product exhibited a 4% lower GWP, despite its size. This phenomenon might be attributed to variations in the distribution of raw materials per 1

kg declared unit, with potentially more environmentally impactful materials having a reduced presence in the largest product compared to the representative product. The representative product has the same GWP as the smallest product.

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. The EPD Generator uses Ecoinvent v3.8, Plastics Europe, Federal LCA Commons and One Click LCA databases 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	1.61E+00	5.52E-03	6.24E-02	1.68E+00	7.23E-02	1.04E-01	MND	MND	MND	MND	MND	MND	MND	MNR	8.50E-03	2.22E-03	4.95E-03	1.69E-02
GWP – fossil	kg CO_2e	1.61E+00	5.52E-03	7.07E-02	1.68E+00	7.22E-02	9.53E-02	MND	MND	MND	MND	MND	MND	MND	MNR	8.50E-03	2.22E-03	4.94E-03	1.69E-02
GWP – biogenic	kg CO_2e	0.00E+00	0.00E+00	-8.39E-03	-8.39E-03	0.00E+00	8.39E-03	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GWP – LULUC	kg CO_2e	1.92E-03	2.23E-06	1.29E-04	2.06E-03	2.83E-05	1.11E-04	MND	MND	MND	MND	MND	MND	MND	MNR	3.56E-06	4.67E-07	4.67E-06	4.74E-06
Ozone depletion pot.	kg CFC_{-11}e	8.70E-08	1.26E-09	5.36E-09	9.37E-08	1.61E-08	5.85E-09	MND	MND	MND	MND	MND	MND	MND	MNR	1.83E-09	4.92E-10	2.00E-09	-2.42E-10
Acidification potential	mol H^+e	1.56E-02	2.47E-05	3.89E-04	1.60E-02	2.80E-04	8.34E-04	MND	MND	MND	MND	MND	MND	MND	MNR	2.50E-05	2.25E-05	4.65E-05	-1.92E-04
EP-freshwater[2)]	kg Pe	6.01E-05	4.58E-08	5.66E-06	6.58E-05	6.00E-07	3.62E-06	MND	MND	MND	MND	MND	MND	MND	MNR	7.22E-08	1.16E-08	5.18E-08	-6.05E-07
EP-marine	kg Ne	1.54E-03	6.14E-06	6.27E-05	1.61E-03	7.46E-05	8.81E-05	MND	MND	MND	MND	MND	MND	MND	MNR	5.00E-06	9.74E-06	1.61E-05	3.38E-06
EP-terrestrial	mol Ne	3.24E-02	6.80E-05	6.23E-04	3.30E-02	8.26E-04	1.74E-03	MND	MND	MND	MND	MND	MND	MND	MNR	5.56E-05	1.07E-04	1.77E-04	-3.79E-04
POCP ("smog")[3)]	kg NMVOCe	7.24E-03	2.23E-05	1.88E-04	7.45E-03	2.73E-04	3.98E-04	MND	MND	MND	MND	MND	MND	MND	MNR	2.09E-05	2.95E-05	5.15E-05	7.55E-05
ADP-minerals & metals[4)]	kg Sbe	2.40E-05	1.52E-08	1.86E-07	2.42E-05	3.09E-07	1.24E-06	MND	MND	MND	MND	MND	MND	MND	MNR	3.01E-08	2.07E-09	1.14E-08	-1.05E-06
ADP-fossil resources	MJ	1.90E+01	8.36E-02	1.40E+00	2.04E+01	1.07E+00	1.15E+00	MND	MND	MND	MND	MND	MND	MND	MNR	1.23E-01	3.22E-02	1.36E-01	9.78E-01
Water use[5)]	m^3e depr.	5.13E-01	3.68E-04	3.42E-02	5.48E-01	4.75E-03	2.95E-02	MND	MND	MND	MND	MND	MND	MND	MNR	5.45E-04	1.54E-04	4.30E-04	4.44E-02

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	1.10E-07	5.59E-10	2.53E-09	1.13E-07	6.40E-09	6.15E-09	MND	MND	MND	MND	MND	MND	MND	MNR	6.77E-10	8.04E-10	9.36E-10	-4.17E-10
Ionizing radiation[6)]	kBq U235e	7.45E-02	3.96E-04	2.84E-02	1.03E-01	5.16E-03	7.02E-03	MND	MND	MND	MND	MND	MND	MND	MNR	5.77E-04	1.70E-04	6.13E-04	-1.13E-03
Ecotoxicity (freshwater)	CTUe	4.17E+01	7.47E-02	9.16E-01	4.27E+01	9.54E-01	2.24E+00	MND	MND	MND	MND	MND	MND	MND	MNR	1.13E-01	2.06E-02	8.85E-02	-1.18E+00
Human toxicity, cancer	CTUh	5.90E-09	1.99E-12	3.24E-11	5.93E-09	3.63E-11	3.00E-10	MND	MND	MND	MND	MND	MND	MND	MNR	3.18E-12	8.10E-13	2.21E-12	9.80E-12
Human tox. non-cancer	CTUh	2.46E-08	7.07E-11	7.81E-10	2.55E-08	9.94E-10	1.38E-09	MND	MND	MND	MND	MND	MND	MND	MNR	1.03E-10	1.47E-11	5.78E-11	6.56E-10

SQP[7)]	-	1.37E+01	8.15E-02	7.29E-01	1.45E+01	8.54E-01	7.98E-01	MND	MND	MND	MND	MND	MND	MND	MNR	8.64E-02	1.35E-02	2.90E-01	-4.64E-01

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	2.18E+00	9.44E-04	2.21E-01	2.40E+00	1.31E-02	1.31E-01	MND	MND	MND	MND	MND	MND	MND	MNR	1.46E-03	6.19E-04	1.18E-03	-1.21E-01
Renew. PER as material	MJ	0.00E+00	0.00E+00	7.77E-02	7.77E-02	0.00E+00	-7.77E-02	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	0.00E+00	2.46E-02
Total use of renew. PER	MJ	2.18E+00	9.44E-04	2.98E-01	2.48E+00	1.31E-02	5.29E-02	MND	MND	MND	MND	MND	MND	MND	MNR	1.46E-03	6.19E-04	1.18E-03	-9.64E-02
Non-re. PER as energy	MJ	1.88E+01	8.36E-02	1.30E+00	2.02E+01	1.07E+00	1.14E+00	MND	MND	MND	MND	MND	MND	MND	MNR	1.23E-01	3.22E-02	1.36E-01	-2.10E-01
Non-re. PER as material	MJ	1.44E-01	0.00E+00	9.78E-02	2.42E-01	0.00E+00	-9.78E-02	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	-4.32E-03	-1.40E-01	4.17E-02
Total use of non-re. PER	MJ	1.90E+01	8.36E-02	1.40E+00	2.04E+01	1.07E+00	1.04E+00	MND	MND	MND	MND	MND	MND	MND	MNR	1.23E-01	2.79E-02	-4.09E-03	-1.68E-01
Secondary materials	kg	1.39E-02	2.50E-05	2.01E-03	1.60E-02	3.20E-04	8.28E-04	MND	MND	MND	MND	MND	MND	MND	MNR	4.12E-05	1.32E-05	2.85E-05	2.77E-02
Renew. secondary fuels	MJ	1.12E-02	2.71E-07	1.92E-03	1.31E-02	3.47E-06	6.56E-04	MND	MND	MND	MND	MND	MND	MND	MNR	5.33E-07	5.90E-08	7.44E-07	1.40E-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	MNR	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m^3	1.24E-02	1.04E-05	1.04E-03	1.34E-02	1.30E-04	7.35E-04	MND	MND	MND	MND	MND	MND	MND	MNR	1.47E-05	7.79E-06	1.48E-04	3.56E-04

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	1.50E-01	1.14E-04	4.17E-03	1.55E-01	1.49E-03	8.04E-03	MND	MND	MND	MND	MND	MND	MND	MNR	1.78E-04	4.96E-05	0.00E+00	-1.52E-02
Non-hazardous waste	kg	2.45E+00	1.82E-03	2.81E-01	2.74E+00	2.47E-02	2.02E-01	MND	MND	MND	MND	MND	MND	MND	MNR	2.85E-03	4.63E-04	9.39E-01	-1.02E-01
Radioactive waste	kg	3.01E-05	5.61E-07	8.49E-06	3.92E-05	7.20E-06	2.78E-06	MND	MND	MND	MND	MND	MND	MND	MNR	8.20E-07	2.24E-07	0.00E+00	-4.02E-07

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	MNR	0.00E+00	3.32E-03	0.00E+00	0.00E+00
Materials for recycling	kg	0.00E+00	0.00E+00	3.59E-02	3.59E-02	0.00E+00	7.37E-03	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	5.79E-02	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	MNR	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	4.49E-02	MND	MND	MND	MND	MND	MND	MND	MNR	0.00E+00	0.00E+00	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_2e	1.56E+00	5.46E-03	6.98E-02	1.64E+00	7.15E-02	9.30E-02	MND	MND	MND	MND	MND	MND	MND	MNR	8.42E-03	2.19E-03	4.84E-03	1.46E-02
Ozone depletion Pot.	kg CFC_{-11}e	8.45E-08	1.00E-09	4.46E-09	8.99E-08	1.27E-08	5.43E-09	MND	MND	MND	MND	MND	MND	MND	MNR	1.45E-09	3.90E-10	1.58E-09	-4.12E-10
Acidification	kg SO_2e	1.21E-02	1.97E-05	3.28E-04	1.25E-02	2.21E-04	6.51E-04	MND	MND	MND	MND	MND	MND	MND	MNR	2.05E-05	1.62E-05	3.51E-05	-1.48E-04
Eutrophication	kg PO_4^3e	3.36E-03	3.90E-06	2.00E-04	3.56E-03	4.95E-05	1.93E-04	MND	MND	MND	MND	MND	MND	MND	MNR	4.53E-06	3.81E-06	7.57E-06	-9.10E-05
POCP (“smog”)	kg C_2H_4e	6.84E-04	7.82E-07	1.68E-05	7.01E-04	1.11E-05	3.63E-05	MND	MND	MND	MND	MND	MND	MND	MNR	1.02E-06	3.85E-07	1.47E-06	7.26E-05
ADP-elements	kg Sbe	2.21E-05	1.48E-08	1.84E-07	2.23E-05	3.04E-07	1.14E-06	MND	MND	MND	MND	MND	MND	MND	MNR	2.94E-08	2.05E-09	1.12E-08	-1.04E-06
ADP-fossil	MJ	1.90E+01	8.36E-02	1.40E+00	2.04E+01	1.07E+00	1.15E+00	MND	MND	MND	MND	MND	MND	MND	MNR	1.23E-01	3.22E-02	1.36E-01	9.78E-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.

HaiHa Nguyen, as an authorized verifier acting for EPD Hub Limited
12.04.2024

VERIFIED ISO 14025