ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Kingsbury Brickworks
Wienerberger Limited

EPD HUB, HUB-4855
Publishing date 17 November 2023, last updated on 19 January 2026,
valid until 17 November 2028.

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Wienerberger Limited
Address	wienerberger House, Brooks Drive, Cheadle Royal Business Park, Cheshire, SK8 3SA
Contact details	wbukmarketing@wienerberger.com
Website	www.wienerberger.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
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	Aaminah Nisa, Wienerberger Limited
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	D.V, as 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	wienerberger Kingsbury Brickworks
Additional labels	-
Product reference	Blue Engineer (Solid), Blue Engineer Class B (Solid), Blue Wirecut Engineer, Granite Blue Dragface, Red Class B, Red Class B Engineer (Solid) Light, Staffordshire Blue Dragface, Staffordshire Cream Dragfaced, Staffordshire Smooth Blue, Staffordshire Smooth Brown, Staffordshire Smooth Cream, Staffordshire Smooth Crimson
Place of production	Rush Lane, Dosthill, Nr. Tamworth, Staffordshire, B77 1LT United Kingdom
Period for data	01/01/2022 - 31/12/2022
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3	4.25 %

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 tonne
Declared unit mass	1000 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	2.34E+02
GWP-total, A1-A3 ($kgCO_2e$)	2.34E+02
Secondary material, inputs (%)	0.05
Secondary material, outputs (%)	93.2
Total energy use, A1-A3 (kWh)	1120
Net freshwater use, A1-A3 (m^3e)	2.2

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Wienerberger Ltd is a provider of wall, roof and landscaping innovations, offering outstanding, sustainable solutions for new build and renovation. In the UK, we have head offices located in Cheadle and Doncaster, showrooms in London, Belfast and Surrey, with brick and roof tile production sites in Manchester, Durham, Worcestershire, North Warwickshire, West Midlands, North Kent, Surrey and West Sussex.

PRODUCT DESCRIPTION

Bricks have a wide range of applications across the construction industry. Generally, bricks are used in cavity walls in building projects, with a facing brick façade. In a typical wall element, behind the brick façade there is usually a cavity either full-filled or part-filled with insulation, then an internal skin of thermal blockwork, a timber or steel framed structure. The wall element is finished internally with either a dry lined or a wet plastered finish. Bricks can also be laid fair faced internally, replacing the internal blockwork and plasterwork, in the case of both free-standing walls and civil engineering structures.

In the UK, the 'extrusion' and 'soft mud' brick manufacturing processes are dominant. wienerberger Kingsbury Brickworks manufactures bricks using the extruded process. This LCA covers all brick products manufactured at Kingsbury Brickworks in 2022. It is based on actual production datasets from 2022.

In 2022, Kingsbury Brickworks produced 14 facing bricks and 6 Engineering bricks. The facing bricks are a range of: Granite Blue Dragface; Staffordshire (blue dragface, cream dragfaced, smooth blue, smooth brown, smooth cream, smooth crimson). The Engineering bricks are a range of: Blue Engineer (Solid); Blue Engineer Class B (Solid); Blue Wirecut Engineer; Red Class B and Red Class B Engineer (Solid) Light.

The average size is Length (MM) 215 x Width (MM) 102.5 x Height (MM) 65. Product weights range from 2.30 kg to 3.37 kg. The average weight for the facing brick products is 2.40 kg (mean) and 2.34 kg (median). The average weight for Engineers is 2.98 kg (mean) and 3.23 kg (median).

All UK manufactured bricks are produced according to the requirements of BS EN 771-1: Specification for masonry units: Clay masonry units.

Further information can be found at www.wienerberger.co.uk.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	-	0
Minerals	100	Clay, Sand, Sandstone: UK
Fossil materials	-	-
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	0.14

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 tonne
Mass per declared unit	1000 kg
Functional unit	-
Reference service life	150 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	x	ND	ND	ND	ND	ND	ND	ND	x	x	x	x	x		
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/ demolition	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = ND. 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.

The primary ingredient for brick manufacturing is clay. wienerberger Kingsbury Brickworks is supplied with clay from several quarries. One quarry is adjacent to the factory and owned by wienerberger, whilst clay from other quarries is transported by public highways to Kingsbury Brickworks. The sands used in the manufacturing process are transported by road to the factory.

After extraction from the quarry, the raw materials are stocked at the factory. During brick production, clay is moved from the stockpile to a milling process. Following milling, the other ingredients are added alongside water to create a malleable material. The material is then extruded through a dye and cut with wires to create individual bricks. The extrusion process creates the sharp arises which is characteristic of the extruded manufacturing process.

Once shaped, the bricks are transferred to a dryer which removes most of the moisture from the brick. The dried bricks are then transferred to a kiln where they are fired at over 1000°C to create a ceramic product. After firing and cooling, the bricks are packaged and stored in the stockyard ready for onward distribution.

The primary energy sources for Kingsbury Brickworks are natural gas and electricity. In this LCA natural gas is modelled using Ecoinvent v3.8 dataset: heat production, natural gas, at industrial furnace >100kW. The electricity is supplied via the national grid on a renewable electricity tariff. The renewable electricity generation mix is apportioned according to the REGO certificate from the electricity tariff provider using Ecoinvent v3.8 datasets for: Electricity production, photovoltaic, 570kWp open ground installation, multi-site; Electricity production, wind, 1-3MW turbine, offshore; and Electricity production, wind, >3MW turbine, onshore.

In this LCA the packaging materials are included as a material input in A3 and the impact of waste treatment of packaging is allocated in A5. The packaging materials modelled are LDPE for plastic wrap, HDPE for edge strips, PET granulate for green banding straps and wooden pallets.

Extruded bricks from wienerberger Kingsbury Brickworks are typically perforated and castellated. Both perforations and castellations reduce the amount of raw material in the brick and increase the surface area. These design details aid airflow around the product, improving the energy efficiency of the drying and firing process.

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.

Products from Kingsbury Brickworks are either delivered directly to a construction site, to a merchant yard or collected by the customer. wienerberger used actual transport delivery data to calculate delivery distances, which averaged 145.42km in 2022. Deliveries are made by Heavy Goods Vehicle, the impact of the vehicle transporting products is modelled using Ecoinvent v3.8 dataset: transport, freight, lorry 16-32 metric ton, euro5.

The packaging is removed during product installation into brickwork, so the impact of waste treatment for plastic packaging materials is allocated in A5.

PRODUCT USE AND MAINTENANCE (B1-B7)

Bricks are usually laid by hand on-site and are bonded with a cementitious or lime-based mortar to fix the bricks together. The impact of the mortar is not included in this LCA.
B1 Use: Bricks do not emit any emissions to air during their use, so this module is not relevant.
B2 Maintenance: Once installed, brickwork requires no maintenance for a minimum of 60 years. The most common maintenance required after this time is the repointing of mortar, impacts are negligible.
B3 Repair: It is assumed that the brick should not need any repair during its reference service life of 150 years or the study period, so impacts are negligible.
B4 Replacement: The reference service life of the brick extends beyond the 60-year study period and likely life of the building so no replacements are expected.
B5 Refurbishment: It has been assumed that no refurbishment action that relates to the brick will be required during the 60-year study period.
B6 Operational Energy Use: No energy is consumed during operation, so this module is not relevant.
B7 Operational Water Use: No water is consumed during operation, so this module is not relevant.

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

PRODUCT END OF LIFE (C1-C4, D)

At the end of life stage, brickwork can be dismantled and the individual brickworks can be cleaned, sorted and reused. Alternatively, the brickwork can be demolished and crushed into aggregate.

In this LCA, the end of life scenario for 1 tonne of bricks is assumed to be building demolition, with brickwork crushed for aggregate. The aggregate then follows the typical disposal route for non-hazardous construction and demolition waste in England, which is 93.2% recovered and 6.8% landfilled. [Statistics source: Defra (2022). Table 8: Recovery rate from non-hazardous construction and demolition waste, England, 2010–2020. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1073644/Table_8.csv/preview]

C1 End of life deconstruction: The brickwork is demolished, with the impacts from demolition attributed to the whole structure. The impact of demolition allocated to the bricks is considered to be 0.001kW/kg which is an average value for all building materials.

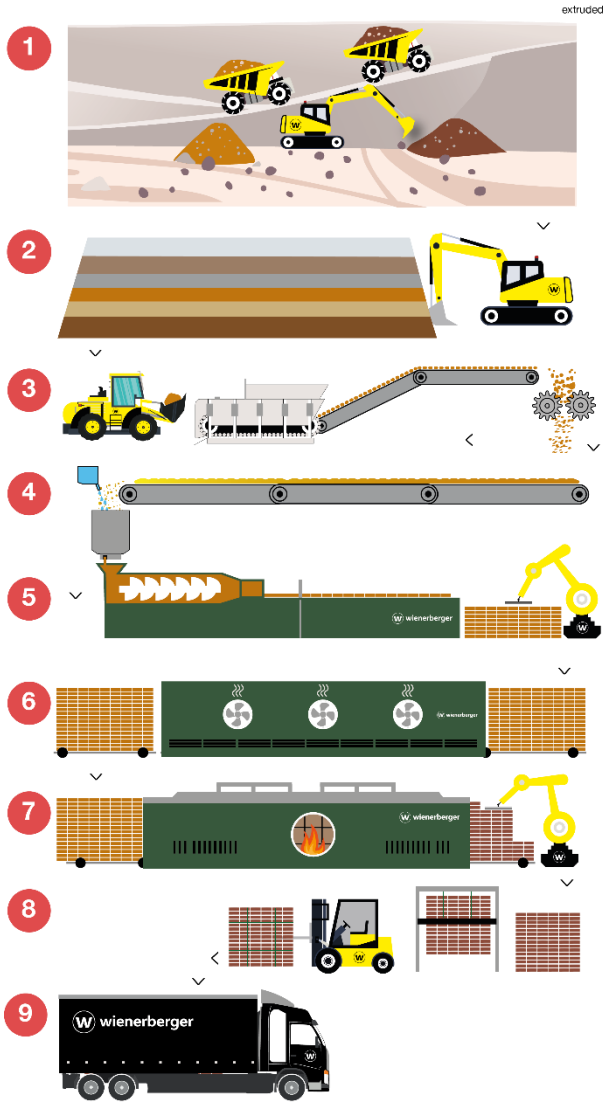
C2 End of life transport to waste processing: The 1000 kg demolished bricks is transported to a waste sorting plant.

C3 Waste processing for reuse, recovery and/or recycling: Of the 1000 kg arriving at the waste sorting plant, 93.2% is recovered as aggregate material and exits the system boundary. The impact of recovering waste brick and processing to produce recycled aggregate is modelled using Ecoinvent v3.8 dataset: treatment of waste brick, sorting plant (Reference product: waste brick).

C4 End of life disposal: For the 6.8% landfilled waste brick material, the impact is modelled using Ecoinvent v3.8 dataset: market for inert waste, for final disposal (Reference product: inert waste, for final disposal).

D Benefits and loads beyond the system boundary: The 93.2% recycled aggregate material equates to 932 kg of aggregate that can displace virgin aggregate in construction projects. The benefit of this 932 kg secondary aggregate is modelled using OneClickLCA dataset: Brick recycling - D, combining Ecoinvent v3.8 datasets for rock crushing plus gravel and sand quarry operation (Reference product: sand). The benefits of recycling brick packaging, weight 0.69 kg, are also accounted for. Benefits are modelled using Ecoinvent v3.8 dataset: Recycled PE - Module D (Option 2) & Wood incineration with efficiency over 60% - Module D (Option 4).

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 material	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	Multiple products
Averaging method	Averaged by shares of total mass
Variation in GWP-fossil for A1-A3	4.25%

This EPD for wienerberger Kingsbury Brickworks describes the average impacts for all products manufactured at this site. The names of products manufactured here in 2022 are: Blue Engineer (Solid), Blue Engineer Class B (Solid), Blue Wirecut Engineer, Granite Blue Dragface, Red Class B, Red Class B Engineer (Solid) Light, Staffordshire Blue Dragface, Staffordshire Cream Dragfaced, Staffordshire Smooth Blue, Staffordshire Smooth Brown, Staffordshire Smooth Cream, Staffordshire Smooth Crimson.

The average weight for the facing brick products is 2.40 kg (mean) and 2.34 kg (median). The average weight for the Engineering brick is 2.98 kg (mean) and 3.23 kg (median). The range of weight across the product portfolio is 1.06 kg.

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 v3.8 and One Click LCA databases were used as sources of environmental data.

ENVIRONMENTAL IMPACT DATA

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

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	7.57E+00	1.91E+00	2.24E+02	2.34E+02	2.53E+01	1.41E+01	ND	ND	ND	ND	ND	ND	ND	3.31E-01	3.90E+00	8.61E+00	5.74E-01	-4.54E+00
GWP – fossil	kg CO_2e	9.99E+00	1.91E+00	2.22E+02	2.34E+02	2.53E+01	1.36E+01	ND	ND	ND	ND	ND	ND	ND	3.31E-01	3.90E+00	8.59E+00	5.72E-01	-4.57E+00
GWP – biogenic	kg CO_2e	-2.43E+00	0.00E+00	1.95E+00	-4.87E-01	0.00E+00	4.87E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.62E-02
GWP – LULUC	kg CO_2e	1.43E-02	7.53E-04	1.15E-02	2.65E-02	1.03E-02	2.84E-03	ND	ND	ND	ND	ND	ND	ND	3.30E-05	1.50E-03	1.49E-02	1.74E-03	-3.84E-03
Ozone depletion pot.	kg $CFC\text{-}_{11}e$	1.29E-06	4.42E-07	3.18E-05	3.36E-05	5.57E-06	2.06E-06	ND	ND	ND	ND	ND	ND	ND	7.07E-08	9.01E-07	1.42E-06	1.86E-07	-3.66E-07
Acidification potential	mol H^+e	9.24E-02	7.96E-03	1.32E+00	1.42E+00	1.05E-01	8.11E-02	ND	ND	ND	ND	ND	ND	ND	3.44E-03	1.61E-02	6.72E-02	4.70E-03	-3.04E-02
EP-freshwater[2)]	kg Pe	3.07E-04	1.34E-05	3.73E-04	6.93E-04	2.13E-04	7.11E-05	ND	ND	ND	ND	ND	ND	ND	1.10E-06	2.90E-05	1.77E-04	6.67E-06	-1.66E-04
EP-marine	kg Ne	2.48E-02	2.34E-03	1.03E-01	1.30E-01	3.05E-02	9.96E-03	ND	ND	ND	ND	ND	ND	ND	1.52E-03	4.79E-03	2.43E-02	1.65E-03	-8.39E-03
EP-terrestrial	mol Ne	3.08E-01	2.58E-02	1.12E+00	1.46E+00	3.37E-01	1.08E-01	ND	ND	ND	ND	ND	ND	ND	1.67E-02	5.29E-02	2.67E-01	1.80E-02	-9.73E-02
POCP ("smog")[3)]	kg NMVOCe	8.07E-02	7.89E-03	3.92E-01	4.81E-01	1.03E-01	3.43E-02	ND	ND	ND	ND	ND	ND	ND	4.59E-03	1.65E-02	7.42E-02	5.21E-03	-2.82E-02
ADP-minerals & metals[4)]	kg Sbe	4.55E-04	6.72E-06	9.62E-05	5.58E-04	8.79E-05	3.45E-05	ND	ND	ND	ND	ND	ND	ND	1.68E-07	1.21E-05	2.28E-05	1.60E-06	-3.73E-05
ADP-fossil resources	MJ	1.21E+02	2.84E+01	3.65E+03	3.80E+03	3.66E+02	2.18E+02	ND	ND	ND	ND	ND	ND	ND	4.45E+00	5.81E+01	1.25E+02	1.29E+01	-7.51E+01
Water use[5)]	m^3e depr.	3.02E+00	1.31E-01	3.91E+00	7.06E+00	1.60E+00	5.89E-01	ND	ND	ND	ND	ND	ND	ND	1.20E-02	2.66E-01	1.06E+00	4.91E-02	-9.70E-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.

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2

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	1.64E-06	1.65E-07	7.45E-06	9.25E-06	2.15E-06	1.11E-06	ND	ND	ND	ND	ND	ND	ND	9.22E-08	3.77E-07	8.35E-06	9.23E-08	-5.15E-07
Ionizing radiation[6)]	kBq U235e	5.86E-01	1.48E-01	2.50E+00	3.23E+00	1.70E+00	2.97E-01	ND	ND	ND	ND	ND	ND	ND	2.05E-02	2.94E-01	6.99E-01	5.97E-02	-2.43E-01
Ecotoxicity (freshwater)	CTUe	3.26E+02	2.35E+01	2.66E+02	6.15E+02	3.37E+02	6.39E+01	ND	ND	ND	ND	ND	ND	ND	2.68E+00	4.97E+01	1.26E+02	9.47E+00	-8.37E+01
Human toxicity, cancer	CTUh	3.09E-08	7.29E-10	2.61E-08	5.77E-08	9.46E-09	3.89E-09	ND	ND	ND	ND	ND	ND	ND	1.03E-10	1.42E-09	3.91E-09	2.81E-10	-2.89E-09
Human tox. non-cancer	CTUh	3.86E-07	2.38E-08	2.25E-07	6.35E-07	3.14E-07	5.66E-08	ND	ND	ND	ND	ND	ND	ND	1.94E-09	5.00E-08	8.19E-08	7.18E-09	-7.06E-08
SQP[7)]	-	5.32E+02	2.00E+01	1.28E+02	6.81E+02	2.53E+02	5.54E+01	ND	ND	ND	ND	ND	ND	ND	5.79E-01	5.03E+01	1.10E+02	2.37E+01	-6.12E+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	2.80E+01	4.05E-01	2.16E+02	2.45E+02	4.29E+00	1.28E+01	ND	ND	ND	ND	ND	ND	ND	2.54E-02	7.69E-01	5.16E+00	1.53E-01	-3.20E+00
Renew. PER as material	MJ	2.14E+01	0.00E+00	-1.70E+01	4.40E+00	0.00E+00	-4.40E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renew. PER	MJ	4.94E+01	4.05E-01	1.99E+02	2.49E+02	4.29E+00	8.40E+00	ND	ND	ND	ND	ND	ND	ND	2.54E-02	7.69E-01	5.16E+00	1.53E-01	-3.20E+00
Non-re. PER as energy	MJ	1.20E+02	2.84E+01	3.64E+03	3.79E+03	3.66E+02	2.17E+02	ND	ND	ND	ND	ND	ND	ND	4.45E+00	5.82E+01	1.25E+02	1.29E+01	-5.27E+01
Non-re. PER as material	MJ	1.41E+00	0.00E+00	1.47E+01	1.61E+01	0.00E+00	-1.61E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-2.30E-03
Total use of non-re. PER	MJ	1.21E+02	2.84E+01	3.66E+03	3.81E+03	3.66E+02	2.01E+02	ND	ND	ND	ND	ND	ND	ND	4.45E+00	5.82E+01	1.25E+02	1.29E+01	-5.27E+01
Secondary materials	kg	5.34E-01	9.50E-03	5.72E-01	1.11E+00	1.20E-01	6.66E-02	ND	ND	ND	ND	ND	ND	ND	1.74E-03	1.83E-02	4.37E-02	3.59E-03	4.32E-01
Renew. secondary fuels	MJ	5.66E-01	1.04E-04	1.26E-01	6.92E-01	1.56E-03	3.47E-02	ND	ND	ND	ND	ND	ND	ND	5.70E-06	1.96E-04	5.52E-04	6.71E-05	-2.64E-04
Non-ren. secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m^3	2.18E-01	3.57E-03	1.98E+00	2.20E+00	4.32E-02	1.03E-01	ND	ND	ND	ND	ND	ND	ND	2.70E-04	7.40E-03	5.33E-02	1.12E-02	-1.31E+00

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	1.31E+00	3.20E-02	9.01E-01	2.24E+00	5.26E-01	1.70E-01	ND	ND	ND	ND	ND	ND	ND	5.96E-03	6.96E-02	4.02E-01	1.69E-02	-3.09E-01
Non-hazardous waste	kg	1.29E+01	5.65E-01	1.85E+01	3.20E+01	8.41E+00	9.95E+00	ND	ND	ND	ND	ND	ND	ND	4.19E-02	1.20E+00	1.25E+02	2.44E-01	-4.95E+00
Radioactive waste	kg	5.82E-04	1.95E-04	2.34E-03	3.12E-03	2.42E-03	3.28E-04	ND	ND	ND	ND	ND	ND	ND	3.13E-05	3.96E-04	6.85E-04	8.56E-05	-1.82E-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	0.00E+00	ND	ND	ND	ND	ND	ND	ND	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	1.78E+01	1.78E+01	0.00E+00	5.81E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	9.32E+02	0.00E+00	0.00E+00
Materials for energy rec	kg	0.00E+00	0.00E+00	6.70E-01	6.70E-01	0.00E+00	2.51E-01	ND	ND	ND	ND	ND	ND	ND	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	0.00E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML

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 CO2e	9.78E+00	1.89E+00	2.18E+02	2.30E+02	2.50E+01	1.34E+01	ND	ND	ND	ND	ND	ND	ND	3.27E-01	3.86E+00	8.47E+00	5.63E-01	-4.37E+00
Ozone depletion Pot.	kg CFC-11e	1.06E-06	3.50E-07	2.79E-05	2.94E-05	4.41E-06	1.77E-06	ND	ND	ND	ND	ND	ND	ND	5.60E-08	7.14E-07	1.13E-06	1.47E-07	-3.00E-07
Acidification	kg SO_2e	6.97E-02	6.20E-03	1.32E+00	1.39E+00	8.15E-02	7.72E-02	ND	ND	ND	ND	ND	ND	ND	2.45E-03	1.25E-02	5.03E-02	3.54E-03	-2.37E-02
Eutrophication	kg PO_4^3e	2.13E-02	1.37E-03	4.75E-02	7.01E-02	1.87E-02	6.17E-03	ND	ND	ND	ND	ND	ND	ND	5.69E-04	2.84E-03	1.44E-02	7.99E-04	-5.90E-03
POCP (“smog”)	kg C_2H_4e	3.36E-03	2.51E-04	5.10E-02	5.46E-02	3.31E-03	3.02E-03	ND	ND	ND	ND	ND	ND	ND	5.36E-05	5.03E-04	1.55E-03	1.42E-04	-1.57E-03
ADP-elements	kg Sbe	4.53E-04	6.57E-06	9.48E-05	5.55E-04	8.58E-05	3.42E-05	ND	ND	ND	ND	ND	ND	ND	1.65E-07	1.18E-05	2.25E-05	1.57E-06	-3.71E-05
ADP-fossil	MJ	1.21E+02	2.84E+01	3.65E+03	3.80E+03	3.66E+02	2.18E+02	ND	ND	ND	ND	ND	ND	ND	4.45E+00	5.81E+01	1.25E+02	1.29E+01	-7.51E+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.

D.V, as authorized verifier acting for EPD HUB Limited
17.11.2023