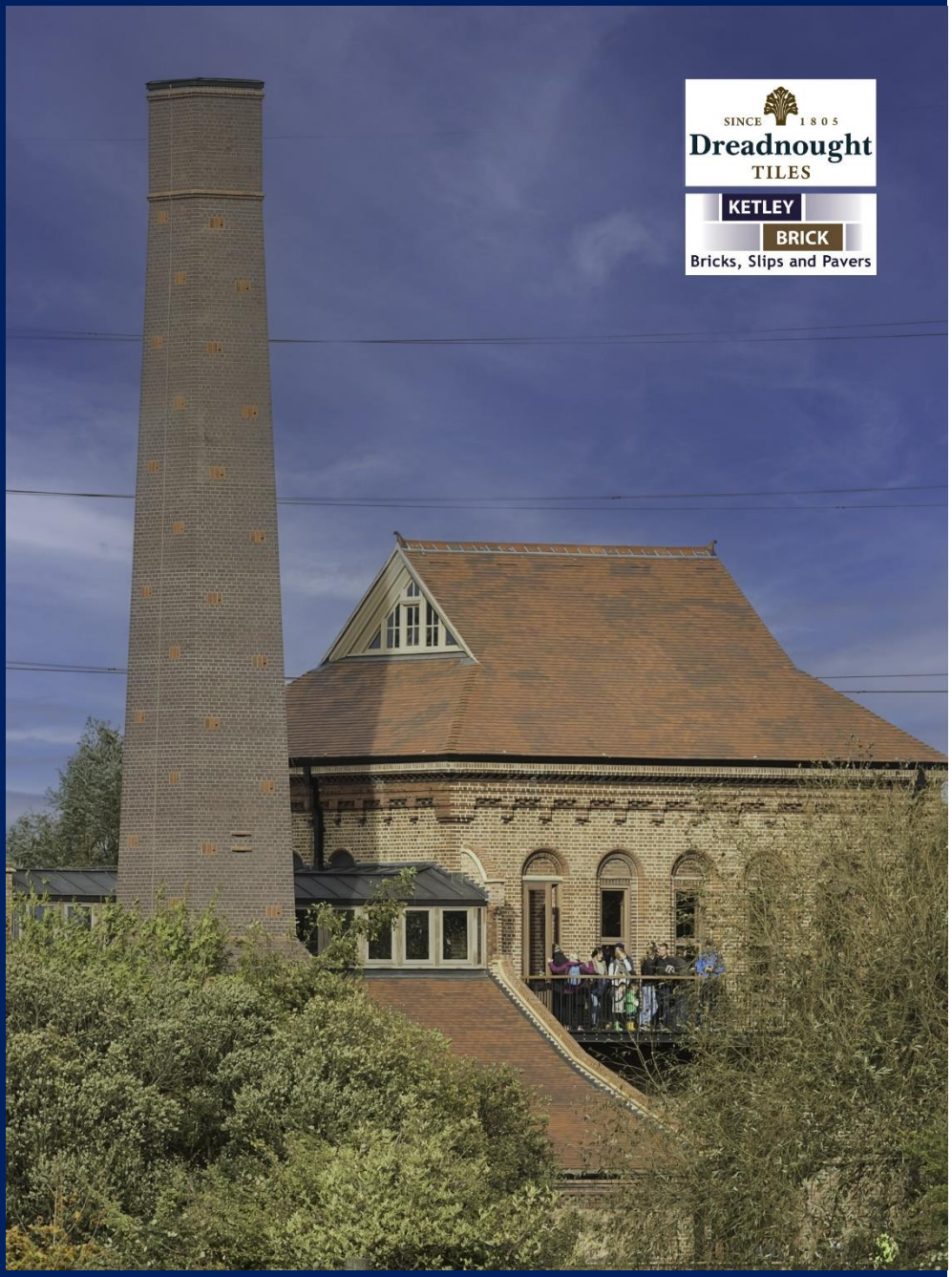


ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Staffordshire Etruria Marl Clay Brick, Paving & Roofing Products (Ketley Brick & Dreadnought Tiles)

Hinton Perry & Davenhill Ltd. Manufacturers of Dreadnought Tiles and Ketley Brick Clay Products

EPD HUB, HUB-6362

Published on 17.06.2026, last updated on 17.06.2026, valid until 16.06.2031

Life Cycle Assessment study has been performed in accordance with the requirements of EN 15804, EPD Hub PCR version 1.2 (24 Mar 2025) and JRC characterization factors EF 3.1.

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Hinton Perry & Davenhill Ltd. Manufacturers of Dreadnought Tiles and Ketley Brick Clay Products
Address	Dreadnought Works, Dreadnought Road, Pensnett, Brierley Hill, West Midlands, DY5 4TH
Contact details	sales@dreadnought-tiles.co.uk; sales@ketley-brick.co.uk
Website	https://www.dreadnought-tiles.co.uk/; https://www.ketley-brick.co.uk/ketley-home

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804:2012+A2:2019/AC:2021 and ISO 14025
PCR	EPD Hub Core PCR Version 1.2, 24 Mar 2025
Sector	Construction product
Category of EPD	Third party verified EPD
Parent EPD number	
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Dr. Aaron Yeardley and Dr. Annaelle Hip Kam
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Elena Antuña-Bernardo as an authorized verifier for EPD Hub

This EPD is intended for business-to-business and/or business-to-consumer communication. 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	Staffordshire Etruria Marl Clay Brick, Paving & Roofing Products (Ketley Brick & Dreadnought Tiles)
Additional labels	Engineering bricks, clay pavers, quarry tiles, brick slips and clay roof tiles.
Product reference	
Place(s) of raw material origin	United Kingdom
Place of production	Pensnett, Brierley Hill, United Kingdom
Place(s) of installation and use	United Kingdom
Period for data	Financial year- 2024/25: 1st April 2024 to 31st March 2025
Averaging in EPD	No grouping
Variation in GWP-fossil for A1-A3 (%)	
GTIN (Global Trade Item Number)	-
NOBB (Norwegian Building Product Database)	-
A1-A3 Specific data (%)	88.8

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 tonne of clay product
Declared unit mass	1000 kg
Mass of packaging	5.617 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	157
GWP-total, A1-A3 ($kgCO_2e$)	148
Secondary material, inputs (%)	0.05
Total energy use, A1-A3 (kWh)	664
Net freshwater use, A1-A3 (m^3)	1.2

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Hinton Perry and Davenhill Ltd is the manufacturer behind Dreadnought Tiles and Ketley Bricks, produced continuously on the same historic site since 1805. As a family owned business, they specialise in the manufacture of long life clay products whose performance, character and durability have been proven for over two centuries.
All Etruria Marl clay is extracted from their own Hollybank Quarry and managed in house to ensure complete control over the quality and consistency of this vital raw material.
Every product is manufactured in the single factory using the same clay body, which underpins their distinctive aesthetics and long-term performance. Fired to 1130°C, their products achieve exceptionally low water absorption and outstanding durability.
The bricks, tiles and pavers are supplied to residential, civic and commercial projects throughout the UK and internationally.

PRODUCT DESCRIPTION

This EPD covers kiln-fired clay construction products manufactured at Dreadnought Works, Pensnett, United Kingdom. All products are produced from the same Etruria Marl clay body, extracted from the manufacturer's own Hollybank Quarry, and manufactured using the identical process: preparation of the clay body, forming (extrusion or pressing), drying, and firing at approximately 1130 °C under equivalent manufacturing conditions. Only one product type is modelled in this EPD. The declared unit is 1 tonne of fired clay product. Because all products covered share the same material composition and the same manufacturing process, the environmental impacts per tonne are identical regardless of the final shape or size of the individual item. No averaging has been applied in this EPD.

The products included are:
- Class A engineering bricks (solid and perforated)
- Clay pavers
- Quarry tiles
- Clay roof tiles with matching fittings
- Brick slips
- Special-shaped clay products

These products are unambiguously identified as complying with the following standards (where applicable):
- Clay masonry units: BS EN 771-1
- Clay pavers: BS EN 1344
- Clay quarry tiles: BS EN 14411 (Group A1b)
- Clay roof tiles: BS EN 1304

The products are dense, long-life clay materials with low water absorption and high durability, achieved through the high-temperature firing process. Natural colour variations arise through the careful control of the kiln atmosphere; no surface coatings, stains or pigments are used.
The products are intended for structural masonry, paving, flooring and roofing applications in buildings and civil engineering works, primarily in the United Kingdom, where long-term durability, frost resistance and low maintenance are required.
The reference service life (RSL) of these products in typical applications is 150 years.
Technical performance data in this EPD refer to testing according to the standards listed above.

Further information can be found at:
https://www.dreadnought-tiles.co.uk/;
https://www.ketley-brick.co.uk/ketley-home

PRODUCT RAW MATERIAL MAIN COMPOSITION

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

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	0.000209

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 tonne of clay product
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

Not declared = ND.

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.

A market-based approach is used in modelling the electricity mix utilized in the factory.

The product stage covers the cradle-to-gate production of 1 tonne of fired clay products at Dreadnought Works, Pensnett, United Kingdom, in accordance with EN 15804+A2. It includes raw material supply (A1), transport to the manufacturing site (A2), and manufacturing operations including energy use, ancillary materials, packaging, and manufacturing waste management (A3). All activity data are reported per tonne of fired product.

A1 – Raw material supply
Primary raw materials are Etruria Marl clay (extracted from the manufacturer's own Hollybank Quarry), sand, manganese dioxide, barium carbonate, and lignosulfonate. Upstream processes for extraction, processing, and production of these materials are included. Where supplier-specific data were unavailable, equivalent generic datasets were used.

A2 – Transport to manufacturing site
Transport of raw materials, ancillary materials, and packaging to the production site (per tonne of fired product) is modelled using the following distances and vehicle types:

- Clay: 1,088.7 kg by lorry, 27 km
- Sand: 66.7 kg by lorry, 17 km
- Manganese dioxide: 3.9 kg by HGV, 114 km
- Lignosulfonate: 0.256 kg by HGV, 146 km
- Barium carbonate: 0.569 kg by HGV, 114 km
- Wooden pallets: 4.881 kg by lorry, 15 km
- Steel nails and wires: 0.075 kg by lorry, 8 km
- Paper packaging: 0.312 kg by van, 257 km
- Plastic strapping: 0.183 kg by van, 552 km
- Plastic edging: 0.166 kg by van, 135 km

A3 – Manufacturing
This stage includes clay preparation, mixing, forming (extrusion or pressing), drying, and firing at approximately 1130 °C.

Production losses (shrinkage, breakage, and rejects during forming, drying, and firing) are modelled at 8.87 % (1,088.7 kg of raw clay input required per 1,000 kg of fired product). All manufacturing rejects are collected and fully reused internally in the clay body as raw material input (closed-loop recycling). These rejects have therefore been modelled using the cut-off approach in accordance with EN 15804+A2 (no additional environmental burdens or benefits allocated).

Manufacturing waste leaving the site consists of waste mineral oil (used hydraulic oil) amounting to 0.46 kg per tonne of fired product. This waste stream is included in the LCA model and has been modelled using the cut-off approach with appropriate hazardous waste treatment datasets. No significant manufacturing rejects leave the facility.
Ancillary materials (per tonne of product): hydraulic oil 0.461 kg, water 133.79 kg. The water is assumed to evaporate completely during the drying and firing processes and is therefore reported as a direct emission to air (water vapour).

Energy consumption (per tonne of product):

- Natural gas: 153.3 m3 (kiln firing and drying)
- Electricity: 112.73 kWh (machinery and plant operations, UK residual electricity mix)
- Diesel: 6.2 kWh (internal transport)

Approximately 5 % of total site electricity (administrative offices) has been excluded.

Direct emissions to air from A3 include:

- Water vapour from evaporation of process water: 133.79 kg per tonne of product.
- Carbon dioxide from calcination of barium carbonate additive: 0.127 kg CO_2 per tonne of product (calculated from the reaction $BaCO_3 \rightarrow BaO + CO_2$, using 0.569 kg $BaCO_3$ input and a stoichiometric factor of 0.223 kg CO_2/kg $BaCO_3$).
- CO_2 and other emissions from natural gas combustion.

Approximately 5 % of total site electricity consumption (administrative offices) has been excluded as non-production related.

Packaging (per tonne of product): The wooden pallet requirement of 4.881 kg is derived from site data (19.8 kg per pallet; 6,065 pallets used for 24,606 tonnes of product produced in the reporting year). Other packaging includes steel nails and wires, paper, plastic strapping, and plastic edging.

Manufacturing waste: Only minor waste from disposal of waste lubricants and ancillary materials is generated and leaves the site. This waste is modelled according to site-specific treatment routes. No significant manufacturing rejects leave the facility, as they are reused internally.
Outputs from A3 include direct emissions to air (mainly CO_2 and water vapour from firing), wastewater, and the minor waste streams noted above."

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.

A4-Transport to construction site: The 1000 kg product and the 5.7 kg packaging is transported across the UK and therefore an estimated distance of 150 km.

A5 -Installation: A material loss rate of 5% during installation has been assumed, representing breakage or cutting losses typical for clay construction products. Installation waste is assumed to be managed through a combination of recycling and disposal processes. Packaging waste generated at the construction site is modelled using European average waste management scenarios including recycling, energy recovery, and landfill.

PRODUCT END OF LIFE (C1-C4, D)

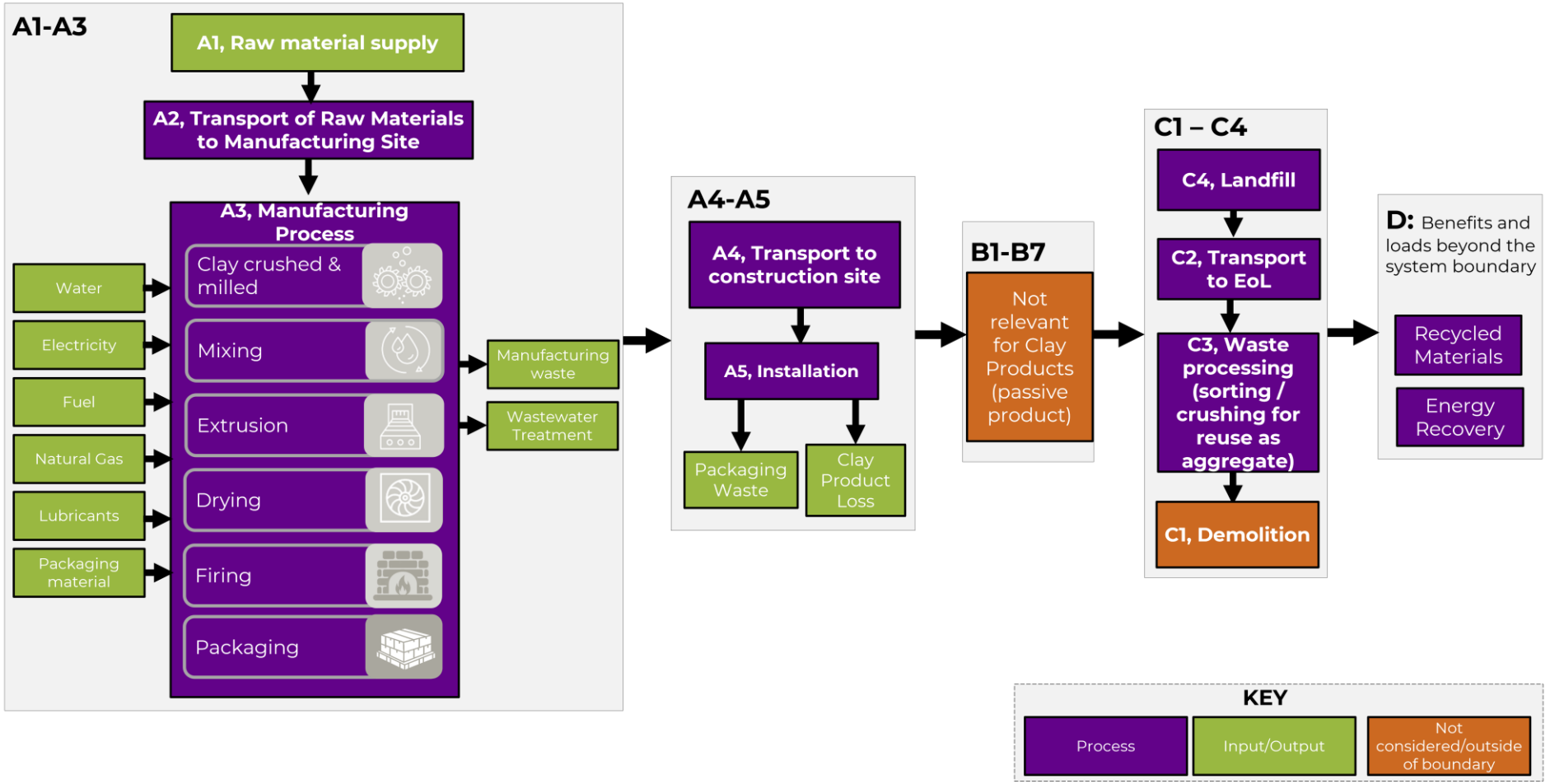
End-of-life stage (C1–C4) and benefits beyond the system boundary (D)
The end-of-life stage covers deconstruction, transport, waste processing, and final disposal of clay products and associated packaging, modelled in accordance with EN 15804 and the EI 3.11 scenario.

C1- C4 -Deconstruction/demolition: Demolition of clay products is assumed to occur using typical mechanical demolition equipment. The energy used during deconstruction is modelled separately in C1, with an assumed consumption of 10 kWh per tonne of clay products. Transport of demolition waste to waste treatment facilities is modelled using freight transport with an assumed distance of 50 km. At end-of-life, clay products are assumed to be managed through a combination of recycling and disposal.
Approximately 70% of ceramic waste is assumed to be recovered and processed for recycling as aggregate or secondary construction material, while the remaining 30% is assumed to be disposed of in landfill.

D -Benefits and loads beyond the system boundary: Potential benefits are reported for recycled clay products aggregate (70%), packaging materials, such as wood, steel, plastic, and paper and are modelled using European average recycling scenarios, generating potential benefits from avoided production of virgin materials.

MANUFACTURING PROCESS

Declared unit: 1 tonne of Clay Product (at factory gate)



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.

The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

VALIDATION OF DATA

Data collection for production, transport, and packaging was conducted using time and site-specific information, as defined in the general information section on page 1 and 2. Upstream process calculations rely on generic data as defined in the Bibliography section. Manufacturer-provided specific and generic data were used for the product's manufacturing stage. The analysis was performed in One Click LCA EPD Generator, with the 'Cut-Off, EN 15804+A2' allocation method, and characterization factors according to EN 15804:2012+A2:2019/AC:2021 and JRC EF 3.1.

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 material	No allocation
Ancillary materials	Not applicable
Manufacturing energy and waste	No allocation

PRODUCT & MANUFACTURING SITES GROUPING

Type of grouping	No grouping
Grouping method	Not applicable
Variation in GWP-fossil for A1-A3, %	

This EPD is product and factory specific.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator for EPD Hub V3 and EPD Process Certification v3.2.5. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.10.1/3.11/3.12 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1/3.11/3.12 environmental data sources follow the methodology ‘allocation, Cut-off, EN 15804+A2‘.

Ecoinvent database – www.ecoinvent.ch
EN 15804:2012 + A2:2019/AC:2021 — Sustainability of construction works — Environmental product declarations — Core rules for the product category of construction products.
ISO 14025:2006, ISO 14040:2006, ISO 14044:2006.
EN 17160:2019 — Product Category Rules for ceramic tiles (reference for end-of-life modelling).
BS EN 771-1, BS EN 1344, BS EN 1304, BS EN 14411 (product standards).

ENVIRONMENTAL IMPACT DATA

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

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	1.22E+01	7.63E+00	1.28E+02	1.48E+02	3.63E+01	2.04E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	9.67E+00	3.06E+00	3.00E+00	-1.09E+01
GWP – fossil	kg CO_2e	1.22E+01	7.63E+00	1.37E+02	1.57E+02	3.63E+01	1.15E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	9.67E+00	3.06E+00	3.00E+00	-7.98E+00
GWP – biogenic	kg CO_2e	-9.48E-03	1.47E-03	-8.82E+00	-8.83E+00	7.02E-03	8.90E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	5.75E-04	0.00E+00	-4.96E-03	-2.86E+00
GWP – LULUC	kg CO_2e	9.07E-03	2.56E-03	1.15E-01	1.27E-01	1.21E-02	7.75E-03	ND	ND	ND	ND	ND	ND	ND	0.00E+00	3.42E-03	3.14E-04	8.27E-04	-6.36E-03
Ozone depletion pot.	kg CFC-$_{11}$e	2.42E-07	1.52E-07	2.67E-05	2.71E-05	7.24E-07	1.42E-06	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.92E-07	4.69E-08	9.41E-08	-7.00E-08
Acidification potential	mol H^+e	1.21E-01	2.28E-02	5.42E-01	6.86E-01	1.08E-01	4.80E-02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	3.02E-02	2.76E-02	3.31E-02	-4.86E-02
EP-freshwater[2)]	kg Pe	2.04E+00	4.98E-04	1.34E-02	2.05E+00	2.36E-03	1.03E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	6.41E-04	8.84E-05	5.04E-03	-2.82E-03
EP-marine	kg Ne	2.06E-02	7.63E-03	1.48E-01	1.77E-01	3.63E-02	1.42E-02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.02E-02	1.28E-02	8.26E-03	-1.12E-02
EP-terrestrial	mol Ne	2.59E-01	8.31E-02	1.54E+00	1.88E+00	3.95E-01	1.45E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.11E-01	1.40E-01	8.87E-02	-1.33E-01
POCP ("smog")[3)]	kg NMVOCe	7.31E-02	3.60E-02	5.56E-01	6.65E-01	1.71E-01	5.27E-02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	4.74E-02	4.19E-02	3.25E-02	-3.77E-02
ADP-minerals & metals[4)]	kg Sbe	2.96E-04	2.51E-05	3.09E-02	3.12E-02	1.18E-04	1.57E-03	ND	ND	ND	ND	ND	ND	ND	0.00E+00	3.16E-05	1.10E-06	5.89E-06	-3.95E-05
ADP-fossil resources	MJ	1.72E+02	1.06E+02	7.22E+03	7.50E+03	5.05E+02	4.23E+02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.36E+02	4.01E+01	6.98E+01	-1.01E+02
Water use[5)]	m^3e depr.	2.31E+01	5.18E-01	6.31E+02	6.55E+02	2.45E+00	3.39E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	6.67E-01	1.00E-01	4.23E-01	-1.06E+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, 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
Particulate matter	Incidence	1.72E-06	5.14E-07	2.44E-06	4.68E-06	2.45E-06	9.00E-07	ND	ND	ND	ND	ND	ND	ND	0.00E+00	7.60E-07	5.99E-06	5.04E-07	-7.00E-07
Ionizing radiation[6]	kBq U235e	2.60E-01	1.63E-01	4.76E+01	4.80E+01	7.71E-01	2.51E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.73E-01	1.78E-02	9.32E-02	-8.24E-01
Ecotoxicity (freshwater)	CTUe	1.21E+03	1.53E+01	3.20E+02	1.54E+03	7.24E+01	3.50E+02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.78E+01	2.21E+00	4.67E+01	-4.05E+01
Human toxicity, cancer	CTUh	2.17E-08	1.23E-09	3.64E-08	5.93E-08	5.81E-09	3.67E-09	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.65E-09	3.15E-10	1.29E-09	-2.01E-09
Human tox. non-cancer	CTUh	1.06E-06	6.26E-08	6.25E-07	1.74E-06	2.97E-07	1.21E-07	ND	ND	ND	ND	ND	ND	ND	0.00E+00	8.53E-08	4.99E-09	8.33E-08	-6.03E-08
SQP[7]	-	1.45E+02	5.46E+01	1.01E+03	1.21E+03	2.60E+02	9.55E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	8.08E+01	2.81E+00	1.71E+02	-1.11E+02

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	2.51E+01	2.09E+00	1.48E+02	1.75E+02	9.87E+00	-6.63E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.35E+00	2.54E-01	1.47E+00	5.62E+00
Renew. PER as material	MJ	0.00E+00	0.00E+00	7.82E+01	7.82E+01	0.00E+00	-7.82E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.85E+01
Total use of renew. PER	MJ	2.51E+01	2.09E+00	2.26E+02	2.53E+02	9.87E+00	-1.44E+02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.35E+00	2.54E-01	1.47E+00	3.41E+01
Non-re. PER as energy	MJ	1.73E+02	1.06E+02	1.93E+03	2.21E+03	5.05E+02	1.45E+02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.36E+02	4.01E+01	6.98E+01	-1.01E+02
Non-re. PER as material	MJ	0.00E+00	0.00E+00	2.14E+01	2.14E+01	0.00E+00	-2.14E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.11E+00
Total use of non-re. PER	MJ	1.73E+02	1.06E+02	1.95E+03	2.23E+03	5.05E+02	1.23E+02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.36E+02	4.01E+01	6.98E+01	-9.72E+01
Secondary materials	kg	4.57E-01	4.68E-02	9.44E-01	1.45E+00	2.21E-01	9.38E-02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	6.22E-02	1.66E-02	2.32E-02	1.65E-01
Renew. secondary fuels	MJ	1.88E-03	4.76E-04	2.53E+00	2.53E+00	2.25E-03	1.27E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	7.85E-04	4.35E-05	4.20E-04	-3.15E-03
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	2.55E-01	1.46E-02	9.31E-01	1.20E+00	6.92E-02	4.59E-03	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.83E-02	2.65E-03	-8.44E-01	-2.54E-01

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	1.45E+00	1.39E-01	7.04E+00	8.62E+00	6.57E-01	5.16E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.95E-01	4.46E-02	1.18E-01	-7.24E-01
Non-hazardous waste	kg	2.21E+01	3.27E+00	5.02E+01	7.55E+01	1.55E+01	7.73E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	4.11E+00	6.08E-01	1.07E+03	-1.66E+01
Radioactive waste	kg	3.76E-04	4.07E-05	5.04E-03	5.46E-03	1.93E-04	3.00E-04	ND	ND	ND	ND	ND	ND	ND	0.00E+00	4.30E-05	4.35E-06	2.28E-05	-2.02E-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	1.90E-11	1.90E-11	0.00E+00	2.02E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	7.00E+02	0.00E+00	0.00E+00
Materials for energy rec	kg	0.00E+00	0.00E+00	9.92E-20	9.92E-20	0.00E+00	4.96E-21	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	9.97E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy – Electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.20E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy – Heat	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.77E+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 CO_2e	1.26E+01	7.58E+00	1.35E+02	1.55E+02	3.60E+01	1.16E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	9.61E+00	3.05E+00	2.98E+00	-7.94E+00
Ozone depletion Pot.	kg $CFC_{-11}e$	1.94E-07	1.21E-07	2.29E-05	2.32E-05	5.76E-07	1.21E-06	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.53E-07	3.72E-08	7.49E-08	-5.88E-08
Acidification	kg SO_2e	1.06E-01	1.73E-02	4.31E-01	5.55E-01	8.23E-02	3.81E-02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.30E-02	1.94E-02	2.66E-02	-3.80E-02
Eutrophication	kg PO_4^3e	2.31E-02	4.26E-03	1.58E-01	1.85E-01	2.02E-02	1.20E-02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	5.84E-03	4.54E-03	7.07E-03	-7.10E-03
POCP (“smog”)	kg C_2H_4e	6.79E-03	1.65E-03	3.47E-02	4.31E-02	7.85E-03	3.07E-03	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.19E-03	1.46E-03	1.72E-03	-3.26E-03
ADP-elements	kg Sbe	2.94E-04	2.44E-05	3.09E-02	3.12E-02	1.15E-04	1.57E-03	ND	ND	ND	ND	ND	ND	ND	0.00E+00	3.09E-05	1.07E-06	5.72E-06	-3.89E-05

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
ADP-fossil	MJ	1.35E+02	1.04E+02	7.20E+03	7.44E+03	4.92E+02	4.18E+02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.33E+02	3.98E+01	6.83E+01	-8.78E+01

ADDITIONAL INDICATOR – GWP-GHG

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	1.22E+01	7.63E+00	1.37E+02	1.57E+02	3.63E+01	1.15E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	9.67E+00	3.06E+00	3.00E+00	-7.99E+00

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. In addition, the characterisation factors for the flows – CH4 fossil, CH4 biogenic and Dinitrogen monoxide – were updated. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterisation factor for biogenic CO2 is set to zero

SCENARIO DOCUMENTATION

DATA SOURCES

Manufacturing energy scenario documentation

1. Electricity, United Kingdom, residual mix, 2024, United Kingdom, One Click LCA, 0.61 kgCO2e/kWh
2. Market for extrusion, plastic film, World, Ecoinvent, 0.47 kgCO2e/kg
3. Diesel engine (2020), United Kingdom, ProBas, 0.24 kgCO2e/MJ
4. Market for natural gas, low pressure, United Kingdom, Ecoinvent, 0.37 kgCO2e/m3

Transport scenario documentation - A4 (Transport resources)

1. Transport, freight, lorry 7.5-16 metric ton, EURO5, 150 km

Transport to the building site (A4) - Scenario documentation

Scenario parameter	Value
Capacity utilization (including empty return) %	50
Bulk density of transported products	1910
Volume capacity utilization factor	1

Installation at the building site (A5) - Scenario documentation

Scenario parameter	Value
Energy: type and consumption (MJ or kWh)	-
Water use (m^3)	-
Ancillary materials: type and mass (kg)	-
Waste materials: type and mass (kg)	The installation waste per declared unit comes from additional installation losses and the packaging. - Treatment of waste brick - 50 kg. - Plastic packaging - 0.35 kg. - Wood packaging - 4.88 kg. - Paper packaging - 0.31 kg - Steel packaging - 0.075 kg.
Waste materials: output routes	The waste treatment follows the standard EU scenarios.
Direct emissions (kg)	The direct emissions come from having to produce the 50 kg of extra brick products that are lose through installation losses. - Direct water vapour from ancillary water - 14.6 kg.

End of life (C1-C4) - Scenario documentation

Scenario information	Value
Collection process: collected separately (kg)	The waste is collected together as it is all 100% ceramic brick waste.
Collection process: Mixed waste (kg)	Recycling 70% of the brick waste as per EN 17160. The remaining is sent to landfill.
Recovery: re-use (kg)	0
Recovery: recycling (kg)	700
Recovery: energy recovery (kg)	0
Disposal (kg)	0
Scenario assumptions e.g. transportation (mode, km) & other	Recycling, 50 km. Landfill, 50 km.

THIRD-PARTY VERIFICATION STATEMENT

EPD Hub declares that this EPD is verified in accordance with ISO 14025 by an independent, third-party verifier. The project report on the Life Cycle Assessment and the report(s) on features of environmental relevance are filed at EPD Hub. EPD Hub PCR and ECO Platform verification checklist are used.

EPD Hub is not able to identify any unjustified deviations from the PCR and EN 15804+A2 in the Environmental Product Declaration and its project report.

EPD Hub maintains its independence as a third-party body; it was not involved in the execution of the LCA or in the development of the declaration and has no conflicts of interest regarding this verification.

The company-specific data and upstream and downstream data have been examined as regards plausibility and consistency. The publisher is responsible for ensuring the factual integrity and legal compliance of this declaration.

The software used in creation of this LCA and EPD is verified by EPD Hub to conform to the procedural and methodological requirements outlined in ISO 14025:2010, ISO 14040/14044, EN 15804+A2, and EPD Hub Core Product Category Rules and General Program Instructions.

Verified tools

Tool verifier: Magaly Gonzalez Vazquez
Tool verification validity: 27 March 2025 - 26 March 2028

Elena Antuña-Bernardo as an authorized verifier for EPD Hub Limited
17.06.2026