# Statement of Verification

BREG EN EPD No.: 000673 Issue 01

This is to verify that the

**Environmental Product Declaration**

provided by:

**Haughley Block Plant Ltd**

BRE Global Verified EPD

is in accordance with the requirements of:

**EN 15804:2012+A2:2019**

and

**BRE Global Scheme Document SD207**

This declaration is for:

**1m2 of 215mm thick 7.3N HBP Hollow Blocks (268kg/m2, L:440mm x H:215mm x W:215mm).**

## Company Address

Haughley Block Plant Ltd
Station Road
Haughley, Stowmarket
Suffolk
IP14 3QP

HAUGHLEY BLOCK PLANT

| | | |
|---|---|---|
| Signed for BRE Global Ltd | Hayley Thomson<br>Operator | 25 March 2025<br>Date of this Issue |
| 25 March 2025<br>Date of First Issue | | 24 March 2030<br>Expiry Date |

BRE Global Verified EPD



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ECO PLATFORM EPD VERIFIED

# Environmental Product Declaration

## EPD Number: 000673

## General Information

| EPD Programme Operator | Applicable Product Category Rules |
|---|---|
| BRE Global<br>Watford, Herts<br>WD25 9XX<br>United Kingdom | BRE 2023 Product Category Rules (PN 514 Rev 3.1) for Type III environmental product declaration of construction products to EN 15804:2012+A2:2019 |
| **Commissioner of LCA study** | **LCA consultant/Tool** |
| Haughley Block Plant Ltd<br>Station Road<br>Haughley, Stowmarket<br>Suffolk<br>IP14 3QP | Francis Yu/ BRE LINA A2 |
| **Declared Unit** | **Applicability/Coverage** |
| 1m$^2$ of 215mm thick 7.3N HBP Hollow Blocks (268kg/m$^2$, L:440mm x H:215mm x W:215mm). | Product Specific. |
| **EPD Type** | **Background database** |
| Cradle to Gate with options | Ecoinvent 3.8 |

| Demonstration of Verification |
|---|
| CEN standard EN 15804 serves as the core PCR [a] |
| Independent verification of the declaration and data according to EN ISO 14025:2010<br>☐Internal ☒ External |
| (Where appropriate [b])Third party verifier:<br>Bala Subramanian |
| a: Product category rules<br>b: Optional for business-to-business communication; mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4) |

| Comparability |
|---|
| Environmental product declarations from different programmes may not be comparable if not compliant with EN 15804:2012+A2:2019. Comparability is further dependent on the specific product category rules, system boundaries and allocations, and background data sources. See Clause 5.3 of EN 15804:2012+A2:2019 for further guidance |

## Information modules covered

| Product | | | Construction | | Use stage | | | | | | | End-of-life | | | | | Benefits and loads beyond the system boundary |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Related to the building fabric | | | | | Related to the building | | | | | | | |
| A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | | D |
| Raw materials supply | Transport | Manufacturing | Transport to site | Construction – Installation | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | Deconstruction demolition | Transport | Waste processing | Disposal | | Reuse, Recovery and/or Recycling potential |
| ☑ | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ | | ☑ |

Note: Ticks indicate the Information Modules declared.

## Manufacturing site(s)

Haughley Block Plant Ltd.
Station Road,
Haughley,
Suffolk,
IP14 3QP

# Construction Product:

## Product Description

HBP Blocks are made of cement, aggregates and water. The blocks covered by this EPD are manufactured with semi-dry components, accurately weighed, thoroughly mixed before adding a measured amount of water. This semi dry mix is fed into a mould and mechanically pressed to form the block shape. Once demoulded, the blocks are cured in a warm and humid chamber, then moved externally for storage.

HBP blocks are used in a variety of applications including both interior and exterior load bearing and non-load bearing walls.

The LCA results listed in this product specific EPD are for 1m$^2$ of 215mm 7.3N Hollow Blocks (268kg/m$^2$).

This EPD can also be used for other different thicknesses of the product as they have the same design and composition, i.e. 1m$^2$ of 140mm 7.3N Hollow Blocks. The corresponding LCA results can be calculated using the conversion factors from the end-user table in the Interpretation section of the EPD.

## Technical Information

| Property | Value, Unit |
|---|---|
| Harmonised standard | EN 771-3:2011+A1:2015 |
| Quality Management System compliance | ISO 9001, ISO 14001 and ISO 45001 |
| Category I, Manufacturing Control compliance | BS EN 1996-1-1: 2005 |
| Dimensions (mm) | W: 140mm/215mm, L: 440mm, H: 215mm |
| Dimensional tolerances | Category: D1<br>Flatness: NPD<br>Parallelism: NPD |
| Configuration | 140 – Group 1 Solid blocks<25% formed vertical voids<br>215 - Group 2 hollow blocks>25%<60% formed vertical voids |
| Dimensional stability | Moisture movement <=0.6mm/m |
| Shear bond | 0.15N/mm² (fixed value) |
| Flexural bond strength | NPD |
| Characteristic compressive strength | 7.3N/mm² (⊥ bed face) |
| Net dry density of concrete | 2000-2100kg/m3 |
| Reaction to fire | Euroclass A1 |
| Water absorption | NPD |
| Water Vapour Diffusion | 5/15μ (fixed value) |
| Thermal conductivity | P = 50% 1.05 W/(m.K) [λ10,dry] Table A.3 |
| Durability against freeze-thaw | Not to be left exposed |
| Reaction to fire | Classification to EN 13501-1: A1 |

Note: The technical properties are extracted from the HBP technical data sheet and apply to all 7.3N HBP Hollow Blocks covered in the EPD and the end-user table. Please contact Haughley Block Plant Ltd for details.

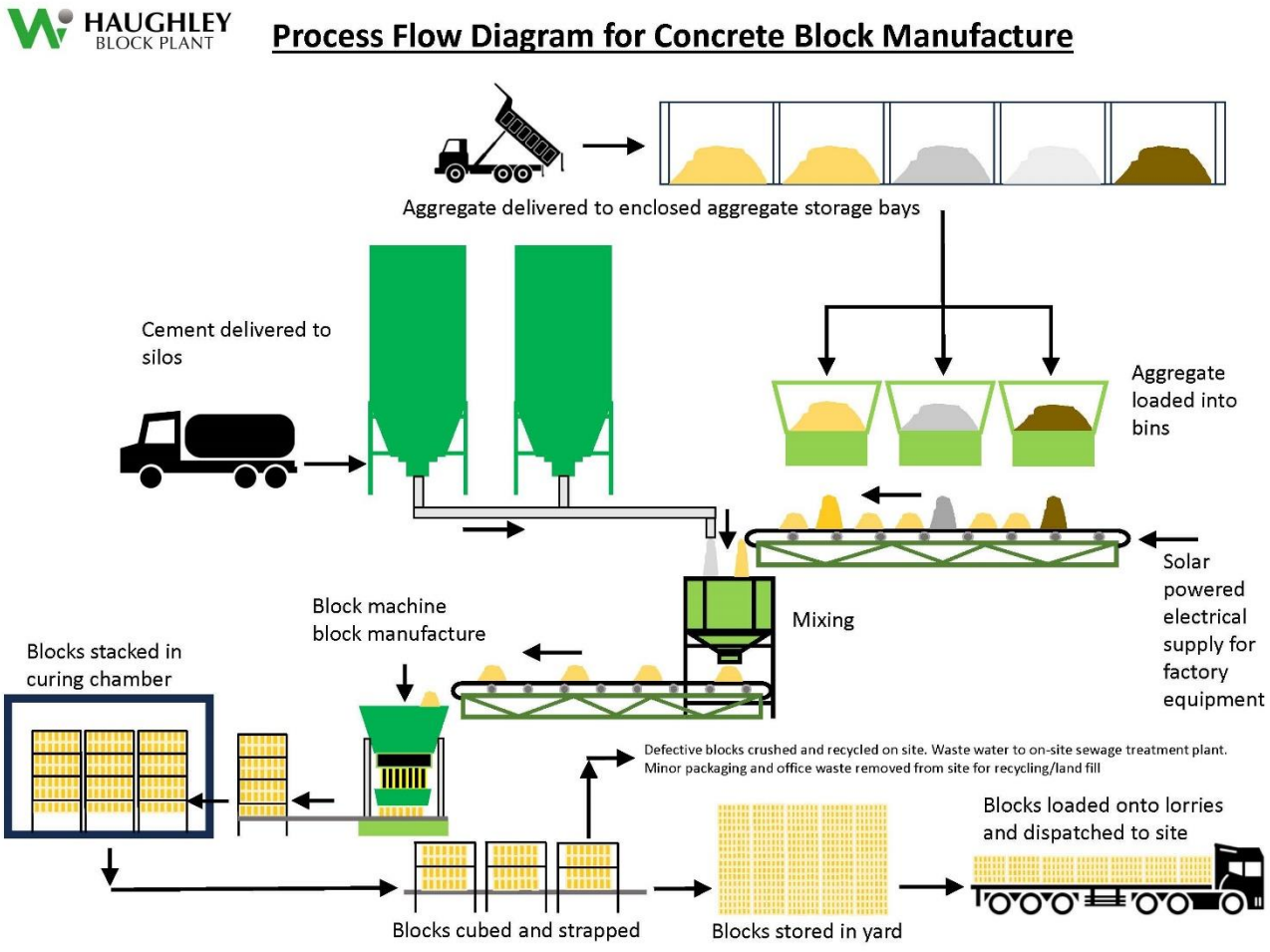
## Main Product Contents - 215mm 7.3N HBP Hollow Blocks

| Material/Chemical Input | % |
|---|---|
| Stone | 38 |
| Sand | 30 |
| Limestone Dust | 26 |
| Cement | 6 |

## Manufacturing Process

Aggregates and cement are delivered to the factory where they are mixed and transported via conveyors to the block machine which manufactures modular/special block units. These units are then stacked in the curing chambers. Post curing chamber, they are taken to the cuber, strapped and banded. They are then stored in the yard and loaded onto lorries for customer distribution.
The Haughley Block Plant factory recycles 100% of factory produced product waste.

## Process flow diagram



## Construction Installation

All block products are manually constructed to create block walling. The construction of walls should be in accordance with BS EN 1996: (1-1: 2005, 1-2: 2005) and 2: 2006) and normal good practice. For use above DPC, the blocks should be laid using mortar strength class M4. Below DPC level strength class M4, or M6, can be used depending on the risk of saturation and freezing.

## Use Information

There is no energy use associated with the product once installed.

## End of Life

At the end-of-life stage, the concrete block walls are crushed and screened on site as part of the building demolition. Industrial average end-of-life data has been used for this EPD, according BRE PCR for Type III EPD of Construction Products to EN 15804+A2, 95% of the concrete blocks are recycled as aggregates and 5% are sent to landfill.

# Life Cycle Assessment Calculation Rules

## Declared / Functional unit description

1m2 of 215mm thick 7.3N HBP Hollow Blocks (268kg/m2, L:440mm x H:215mm x W:215mm).

## System boundary

This cradle-to-gate with options EPD has assessed in accordance with the modular approach as defined in EN15804:2012+A2:2019 and BRE 2023 Product Category Rules (PN 514 Rev 3.1) and includes the processes covered in the manufacturing site and product stage A1 to A3, A4-A5, B1-B7, C1-C4 and D.

## Data sources, quality and allocation

Specific primary data derived from Haughley Block Plant Ltd's production process at Station Road, Haughley, Suffolk, IP14 3QP factory, have been modelled using the LINA LCA A2 software and the ecoinvent 3.8 database. In accordance with the requirements of EN 15804:2012+A2:2019, the most current available data has been used. The manufacturer-specific data from Haughley Block Plant Ltd covers a period of one year (01/10/2023 – 30/09/2024). Secondary data has been obtained for all other upstream and downstream processes that are beyond the control of the manufacturer (i.e. raw material production) from the ecoinvent 3.8 database. Renewable electricity (from mono solar PV) has been used in the EPD. HBP blocks production data includes data for all product variants. All ecoinvent datasets are complete within the context used and conform to the system boundary and the criteria for the exclusion of inputs and outputs, according to the requirements specified in EN 15804:2012+A2:2019.

The LCAs are based on 215mm 7.3N HBP Hollow Blocks, which account for 1.15% of Haughley Block Plant total production. A list of conversion factors has been attached at the end of EPD for other variants (140mm 7.3N HBP Hollow Blocks). All the products have similar composition and manufacturing processes, therefore they are listed in the same EPD. Haughley Block Plant Ltd manufactures other products in addition to HBP Hollow Blocks, therefore, an allocation of fuel, water, material usage, and waste are required. All energy, water and waste have been allocated to the products by square metre according to the provisions of the BRE PCR PN514 Rev 3.1 and EN 15804:2012+A2:2019. Site wide values for energy, water and wastewater have been taken from bills. Figures for the raw materials, ancillary materials and packaging were from actual usages.

Haughley Block Plant is 100% solar with significant surplus generation sold back into the grid, Haughley Block Plant solar installation generates 200,147kWh of solar electricity and imports from the grid 84,636kWh per year.

| Quality Level | Geographical representativeness | Technical representativeness | Time representativeness |
|---|---|---|---|
| Very Good | Data from area under study. | Data from processes and products under study. Same state of technology applied as defined in goal and scope (i.e. identical technology). | There is less than 5 years between the ecoinvent LCI reference year, and the time period for which the LCA was undertaken. |

Specific UK datasets have been selected from the ecoinvent LCI for this LCA. The quality level of geographical and technical representativeness is therefore very good. The quality level of time representativeness is good as the background LCI datasets are based on ecoinvent v3.8 which was compiled in 2021. Therefore, there is less than 5 years between the ecoinvent LCI reference year and the time period for which the LCA was undertaken.

UK consumption mix was used for electricity with an emissions factor of 0.239kgCO2e/kWh.
UK renewable electricity (roof, mono solar PV) was used with an emission factor of 0.125 kgCO2e/kWh.

## Cut-off criteria

All raw materials, packaging materials, transportation, process energy, general energy, water use and non-production waste have been included where appropriate. Direct emissions to air, water and soil are not produced and have been excluded. No production waste is generated as all waste materials are crushed and re-used on site in the same production process. Upstream extraction and/or processing of inputs are included within the use of the background datasets within LINA.

## LCA Results – 215mm 7.3N HBP Hollow Blocks (268kg/m2)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Parameters describing environmental impacts | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | GWP-total | GWP-fossil | GWP-biogenic | GWP-luluc | ODP | AP | EP-freshwater |
| | | | kg $CO_2$ eq | kg $CO_2$ eq | kg $CO_2$ eq | kg $CO_2$ eq | kg CFC11 eq | mol $H^+$ eq | kg $(PO_4)^{3-}$ eq |
| Product stage | Raw material supply | A1 | 1.49E+01 | 1.47E+01 | 1.62E-01 | 6.41E-03 | 5.85E-07 | 5.07E-02 | 2.17E-03 |
| | Transport | A2 | 5.50E-01 | 5.49E-01 | 5.30E-04 | 1.99E-04 | 1.31E-07 | 2.29E-03 | 3.43E-05 |
| | Manufacturing | A3 | -2.22E+00 | 8.55E-01 | -3.08E+00 | 3.48E-03 | 1.23E-07 | 5.97E-03 | 2.91E-04 |
| | Total (of product stage) | A1-3 | 1.32E+01 | 1.61E+01 | -2.92E+00 | 1.01E-02 | 8.38E-07 | 5.89E-02 | 2.50E-03 |
| Construction process stage | Transport | A4 | 1.58E+00 | 1.58E+00 | 1.54E-03 | 5.68E-04 | 3.78E-07 | 6.60E-03 | 9.84E-05 |
| | Construction | A5 | 3.99E-01 | 4.86E-01 | -8.76E-02 | 3.04E-04 | 2.53E-08 | 1.78E-03 | 7.52E-05 |
| Use stage | Use | B1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Maintenance | B2 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Repair | B3 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Replacement | B4 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Refurbishment | B5 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Operational energy use | B6 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Operational water use | B7 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **95% to recycling and 5% to landfill Scenario** | | | | | | | | | |
| End of life | Deconstruction, demolition | C1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Transport | C2 | 8.92E-01 | 8.91E-01 | 7.59E-04 | 3.50E-04 | 2.06E-07 | 3.62E-03 | 5.74E-05 |
| | Waste processing | C3 | 1.02E+00 | 1.02E+00 | 3.61E-04 | 1.02E-04 | 2.19E-07 | 1.06E-02 | 3.17E-05 |
| | Disposal | C4 | 7.07E-02 | 7.06E-02 | 6.99E-05 | 6.66E-05 | 2.85E-08 | 6.64E-04 | 6.46E-06 |
| Potential benefits and loads beyond the system boundaries | Reuse, recovery, recycling potential | D | -2.14E+00 | -2.11E+00 | -2.74E-02 | -2.98E-03 | -1.70E-07 | -1.36E-02 | -1.15E-03 |

GWP-total = Global warming potential, total;
GWP-fossil = Global warming potential, fossil;
GWP-biogenic = Global warming potential, biogenic;
GWP-luluc = Global warming potential, land use and land use change;

ODP = Depletion potential of the stratospheric ozone layer;
AP = Acidification potential, accumulated exceedance; and
EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment

## LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Parameters describing environmental impacts | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | EP-marine | EP-terrestrial | POCP | ADP-mineral &metals | ADP-fossil | WDP | PM |
| | | | kg N eq | mol N eq | kg NMVOC eq | kg Sb eq | MJ, net calorific value | $m^3$ world eq deprived | disease incidence |
| Product stage | Raw material supply | A1 | 1.44E-02 | 1.67E-01 | 4.14E-02 | 4.72E-05 | 8.07E+01 | 7.98E+00 | 4.53E-07 |
| | Transport | A2 | 6.98E-04 | 7.63E-03 | 2.45E-03 | 1.30E-06 | 8.55E+00 | 4.11E-02 | 6.36E-08 |
| | Manufacturing | A3 | 1.85E-03 | 2.02E-02 | 6.80E-03 | 1.43E-05 | 1.56E+01 | 6.00E-01 | 1.36E-07 |
| | Total (of product stage) | A1-3 | 1.69E-02 | 1.95E-01 | 5.06E-02 | 6.29E-05 | 1.05E+02 | 8.62E+00 | 6.52E-07 |
| Construction process stage | Transport | A4 | 2.01E-03 | 2.20E-02 | 7.08E-03 | 3.62E-06 | 2.46E+01 | 1.19E-01 | 1.86E-07 |
| | Construction | A5 | 5.11E-04 | 5.88E-03 | 1.53E-03 | 1.90E-06 | 3.17E+00 | 2.59E-01 | 1.97E-08 |
| Use stage | Use | B1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Maintenance | B2 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Repair | B3 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Replacement | B4 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Refurbishment | B5 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Operational energy use | B6 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Operational water use | B7 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **95% to recycling and 5% to landfill Scenario** | | | | | | | | | |
| End of life | Deconstruction, demolition | C1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Transport | C2 | 1.09E-03 | 1.19E-02 | 3.64E-03 | 3.10E-06 | 1.35E+01 | 6.06E-02 | 7.69E-08 |
| | Waste processing | C3 | 4.71E-03 | 5.16E-02 | 1.42E-02 | 5.26E-07 | 1.40E+01 | 3.24E-02 | 2.18E-06 |
| | Disposal | C4 | 2.31E-04 | 2.53E-03 | 7.35E-04 | 1.61E-07 | 1.97E+00 | 9.04E-02 | 1.34E-08 |
| Potential benefits and loads beyond the system boundaries | Reuse, recovery, recycling potential | D | -3.14E-03 | -3.77E-02 | -9.72E-03 | -2.00E-05 | -3.11E+01 | -4.06E+00 | -1.72E-07 |

EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment;
EP-terrestrial = Eutrophication potential, accumulated exceedance;
POCP = Formation potential of tropospheric ozone;
ADP-mineral&metals = Abiotic depletion potential for non-fossil resources;
ADP-fossil = Depletion potential of the stratospheric ozone layer;
WDP = Water (user) deprivation potential, deprivation-weighted water consumption; and
PM = Particulate matter.

## LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Parameters describing environmental impacts | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | IRP | ETP-fw | HTP-c | HTP-nc | SQP |
| | | | kBq $U^{235}$ eq | CTUe | CTUh | CTUh | dimensionless |
| Product stage | Raw material supply | A1 | 5.65E-01 | 3.60E+02 | 3.92E-09 | 1.27E-07 | 6.25E+01 |
| | Transport | A2 | 4.33E-02 | 6.68E+00 | 1.86E-10 | 7.29E-09 | 9.56E+00 |
| | Manufacturing | A3 | 1.66E-01 | 2.14E+01 | 4.31E-09 | 2.10E-08 | 2.76E+02 |
| | Total (of product stage) | A1-3 | 7.74E-01 | 3.88E+02 | 8.41E-09 | 1.55E-07 | 3.48E+02 |
| Construction process stage | Transport | A4 | 1.25E-01 | 1.92E+01 | 5.32E-10 | 2.11E-08 | 2.82E+01 |
| | Construction | A5 | 2.34E-02 | 1.17E+01 | 2.56E-10 | 4.68E-09 | 1.05E+01 |
| Use stage | Use | B1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Maintenance | B2 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Repair | B3 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Replacement | B4 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Refurbishment | B5 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Operational energy use | B6 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Operational water use | B7 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **95% to recycling and 5% to landfill Scenario** | | | | | | | |
| End of life | Deconstruction, demolition | C1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Transport | C2 | 6.92E-02 | 1.05E+01 | 3.40E-10 | 1.10E-08 | 9.25E+00 |
| | Waste processing | C3 | 6.32E-02 | 8.21E+00 | 3.18E-10 | 5.95E-09 | 1.79E+00 |
| | Disposal | C4 | 8.75E-03 | 1.24E+00 | 3.16E-11 | 8.19E-10 | 4.14E+00 |
| Potential benefits and loads beyond the system boundaries | Reuse, recovery, recycling potential | D | -4.82E-01 | -3.60E+01 | -2.09E-09 | -3.78E-08 | -2.86E+01 |

IRP = Potential human exposure efficiency relative to U235;
ETP-fw = Potential comparative toxic unit for ecosystems;
HTP-c = Potential comparative toxic unit for humans;
HTP-nc = Potential comparative toxic unit for humans; and
SQP = Potential soil quality index.

## LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Parameters describing resource use, primary energy | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | PERE | PERM | PERT | PENRE | PENRM | PENRT |
| | | | MJ | MJ | MJ | MJ | MJ | MJ |
| Product stage | Raw material supply | A1 | 5.39E+00 | 0.00E+00 | 5.39E+00 | 8.00E+01 | 0.00E+00 | 8.00E+01 |
| | Transport | A2 | 1.09E-01 | 0.00E+00 | 1.09E-01 | 8.39E+00 | 0.00E+00 | 8.39E+00 |
| | Manufacturing | A3 | 2.51E+01 | 2.98E+01 | 5.49E+01 | 1.48E+01 | 1.42E+00 | 1.62E+01 |
| | Total (of product stage) | A1-3 | 3.06E+01 | 2.98E+01 | 6.04E+01 | 1.03E+02 | 1.42E+00 | 1.05E+02 |
| Construction process stage | Transport | A4 | 3.13E-01 | 0.00E+00 | 3.13E-01 | 2.42E+01 | 0.00E+00 | 2.42E+01 |
| | Construction | A5 | 9.17E-01 | 8.94E-01 | 1.81E+00 | 2.77E+00 | 3.74E-01 | 3.14E+00 |
| Use stage | Use | B1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Maintenance | B2 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Repair | B3 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Replacement | B4 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Refurbishment | B5 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Operational energy use | B6 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Operational water use | B7 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **95% to recycling and 5% to landfill Scenario** | | | | | | | | |
| End of life | Deconstruction, demolition | C1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Transport | C2 | 1.90E-01 | 0.00E+00 | 1.90E-01 | 1.32E+01 | 0.00E+00 | 1.32E+01 |
| | Waste processing | C3 | 7.86E-02 | 0.00E+00 | 7.86E-02 | 1.38E+01 | 0.00E+00 | 1.38E+01 |
| | Disposal | C4 | 1.68E-02 | 0.00E+00 | 1.68E-02 | 1.93E+00 | 0.00E+00 | 1.93E+00 |
| Potential benefits and loads beyond the system boundaries | Reuse, recovery, recycling potential | D | -2.93E+00 | 0.00E+00 | -2.93E+00 | -3.12E+01 | 0.00E+00 | -3.12E+01 |

PERE = Use of renewable primary energy excluding renewable primary energy used as raw materials;
PERM = Use of renewable primary energy resources used as raw materials;
PERT = Total use of renewable primary energy resources;

PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials;
PENRM = Use of non-renewable primary energy resources used as raw materials;
PENRT = Total use of non-renewable primary energy resource

## LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Parameters describing resource use, secondary materials and fuels, use of water | | | | | | |
|---|---|---|---|---|---|---|
| | | | SM | RSF | NRSF | FW |
| | | | kg | MJ net calorific value | MJ net calorific value | $m^3$ |
| Product stage | Raw material supply | A1 | 2.75E-02 | 0.00E+00 | 0.00E+00 | 1.89E-01 |
| | Transport | A2 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.01E-03 |
| | Manufacturing | A3 | 1.12E-01 | 1.80E-06 | 0.00E+00 | 1.47E-02 |
| | Total (of product stage) | A1-3 | 1.40E-01 | 1.80E-06 | 0.00E+00 | 2.04E-01 |
| Construction process stage | Transport | A4 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.93E-03 |
| | Construction | A5 | 4.19E-03 | 5.41E-08 | 0.00E+00 | 6.15E-03 |
| Use stage | Use | B1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Maintenance | B2 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Repair | B3 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Replacement | B4 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Refurbishment | B5 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Operational energy use | B6 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Operational water use | B7 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **95% to recycling and 5% to landfill Scenario** | | | | | | |
| End of life | Deconstruction, demolition | C1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Transport | C2 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.50E-03 |
| | Waste processing | C3 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 8.00E-04 |
| | Disposal | C4 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.11E-03 |
| Potential benefits and loads beyond the system boundaries | Reuse, recovery, recycling potential | D | 0.00E+00 | 0.00E+00 | 0.00E+00 | -9.60E-02 |

SM = Use of secondary material;
RSF = Use of renewable secondary fuels;
NRSF = Use of non-renewable secondary fuels;
FW = Net use of fresh water

## LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Other environmental information describing waste categories | | | | | |
|---|---|---|---|---|---|
| | | | HWD | NHWD | RWD |
| | | | kg | kg | kg |
| Product stage | Raw material supply | A1 | 3.62E-01 | 1.02E+01 | 3.31E-04 |
| | Transport | A2 | 9.03E-03 | 1.57E-01 | 5.40E+01 |
| | Manufacturing | A3 | 6.07E-02 | 1.23E+00 | 7.25E-05 |
| | Total (of product stage) | A1-3 | 4.32E-01 | 1.16E+01 | 5.40E+01 |
| Construction process stage | Transport | A4 | 2.60E-02 | 4.51E-01 | 1.65E+02 |
| | Construction | A5 | 1.30E-02 | 3.50E-01 | 1.62E+00 |
| Use stage | Use | B1 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Maintenance | B2 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Repair | B3 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Replacement | B4 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Refurbishment | B5 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Operational energy use | B6 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Operational water use | B7 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **95% to recycling and 5% to landfill Scenario** | | | | | |
| End of life | Deconstruction, demolition | C1 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Transport | C2 | 1.48E-02 | 2.64E-01 | 9.11E-05 |
| | Waste processing | C3 | 1.84E-02 | 1.29E-01 | 9.70E-05 |
| | Disposal | C4 | 2.05E-03 | 2.89E-02 | 1.29E-05 |
| Potential benefits and loads beyond the system boundaries | Reuse, recovery, recycling potential | D | -1.79E-01 | -5.45E+00 | -1.59E-04 |

HWD = Hazardous waste disposed;
NHWD = Non-hazardous waste disposed;
RWD = Radioactive waste disposed

## LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Other environmental information describing output flows – at end of life | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | CRU | MFR | MER | EE | Biogenic carbon (product) | Biogenic carbon (packaging) |
| | | | kg | kg | kg | MJ per energy carrier | kg C | kg C |
| Product stage | Raw material supply | A1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Transport | A2 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Manufacturing | A3 | 0.00E+00 | 3.13E-05 | 1.33E-08 | 1.44E-03 | 0.00E+00 | -9.38E-01 |
| | Total (of product stage) | A1-3 | 0.00E+00 | 3.13E-05 | 1.33E-08 | 1.44E-03 | 0.00E+00 | -9.38E-01 |
| Construction process stage | Transport | A4 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Construction | A5 | 0.00E+00 | 7.06E-03 | 4.00E-10 | 4.32E-05 | 0.00E+00 | -2.81E-02 |
| Use stage | Use | B1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Maintenance | B2 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Repair | B3 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Replacement | B4 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Refurbishment | B5 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Operational energy use | B6 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Operational water use | B7 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **95% to recycling and 5% to landfill Scenario** | | | | | | | | |
| End of life | Deconstruction, demolition | C1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Transport | C2 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Waste processing | C3 | 0.00E+00 | 1.83E-05 | 2.93E-07 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Disposal | C4 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Potential benefits and loads beyond the system boundaries | Reuse, recovery, recycling potential | D | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EE = Exported Energy

## Scenarios and additional technical information

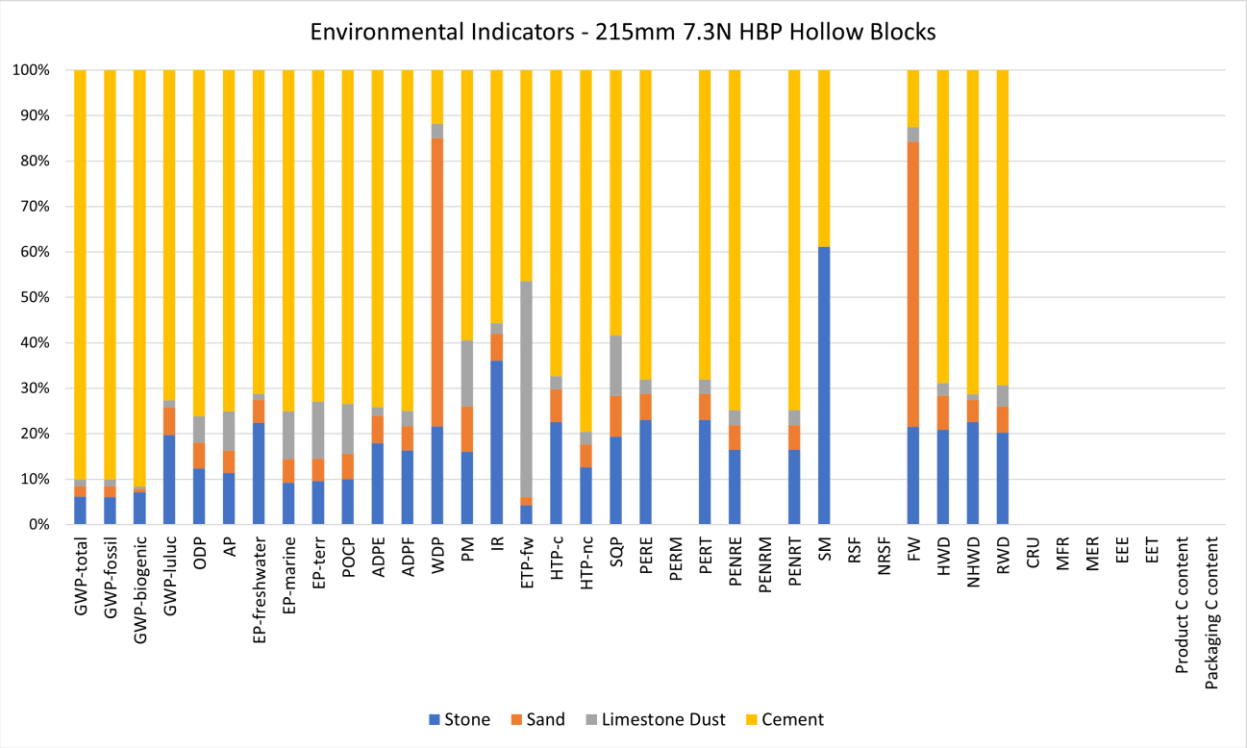
| Scenarios and additional technical information | | | |
|---|---|---|---|
| Scenario | Parameter | Units | Results |
| A4 – Transport to the building site | 14% of the production goes to London (161km)<br>86% of the production is sold locally (50km average)<br>So the total average for the factory is 65km. | | |
| | Fuel type / Vehicle type | Litre of fuel type per distance or vehicle type | Lorry,>32 metric ton |
| | Distance: | km | 65 |
| | Bulk density of transported products | kg/m$^3$ | 2000-2100 |
| A5 – Installation in the building | All block products are manually constructed to create block walling. The product is manually installed, energy / fuel is negligible. | | |
| | Installation wastage rate | % | 3 |
| | Material loss | kg | 8.04 |
| B2 – Maintenance | Maintenance not required - once walling is installed, it is static and inert. | | |
| B3 – Repair | Repair not required - once walling is installed, it is static and inert. | | |
| B4 – Replacement | Replacement not required - once walling is installed, it will satisfy the intended function for the life of the building. | | |
| B5 – Refurbishment | Refurbishment not required - once walling is installed, it will satisfy the intended function for the life of the building. | | |
| B6 – Use of energy;<br>B7 – Use of water | There is no operational energy and water use required - once walling is installed, it is static and inert. | | |
| C1 to C4<br>End of life, | Description of scenario | | |
| C1 – Deconstruction | Walling is dismantled manually or mechanically as part of the whole building demolition process, then crushed and screened for recycled hardcore. No data is available for deconstruction from the manufacturer. 100% recovery rate of the product has been assumed at its end of life. | MJ | 0 |
| C2 – Transport from site to pre-processing facility or landfill | A common practice is that the deconstructed walling is crushed on site and transported locally for re-use as hardcore. But a typical 20km assumption has also been given in this module in case an external crushing facility is used. | | |
| | Road, 16-32 metric ton, euro5 | km | 20 |
| C3 - Pre-processing of uninstalled product | There is currently no process in place to dispose of the product waste by the manufacturer. Therefore, industrial average end-of-life data for 'Block, concrete (dense)' has been used according to BRE PCR PN 514 Rev 3.1, i.e. 95% of waste to recycling. So 95% x 268= 254.6kg will be recycled. | | |
| | Concrete waste to recycling | kg | 254.6 |
| C4 – Disposal | There is currently no process in place to dispose of the product waste by the manufacturer. Therefore, industrial average end-of-life data for 'Block, concrete (dense)' has been used according to BRE PCR PN 514 Rev 3.1, i.e. 5% of waste to landfill. So 5% x 268= 13.4kg will be landfilled. | | |
| | Concrete waste to landfill | kg | 13.4 |

| Scenarios and additional technical information | | | |
|---|---|---|---|
| Scenario | Parameter | Units | Results |
| Module D | 95% i.e. 254.6kg of concrete waste will be sent to recycling plant. Out of which, stone, sand, limestone dust and CEM II contain 0% of existing post-consumer waste.<br>Therefore, 100% of the concrete block waste to recycling benefits can be declared in Module D, i.e. 254.6kg. | | |
| | Benefits due to recycling | kg | 254.6 |

## Interpretation

Out of the total mass of input materials, stone accounts for 38%, sand accounts for 30%, limestone dust accounts for 26%, and cement accounts for 6%. The bulk of the environmental impacts and primary energy demand are attributed to the manufacturing phase, covered by information modules A1-A3 of EN15804:2012+A2:2019.

As a result, Cement (CEM II/AL) contributes the most on overall environmental impacts.




## End-user table

The LCA results in the EPD are for 1m2 of 215mm 7.3N Hollow Blocks (268kg/m2). The environmental impacts of other product sizes in this series can be obtained from multiplying the 215mm 7.3N LCA results by the conversion factors below. The proportion/breakdown of impacts remain the same throughout the range.

(For example, to calculate the environment impacts of 140mm 7.3N blocks, the EPD users need to multiply the conversion factor 0.74 by the LCA results of 215mm 7.3N blocks).

| Block sizes (mm) | Weight (kg/m$^2$) | Conversion Factors |
|---|---|---|
| 215mm (7.3N L:440x H:215 x W:215) | 268 | 1 |
| 140mm (7.3N L:440x H:215 x W:140) | 199 | 0.74 |

## References


BSI. Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products. BS EN 15804:2012+A2:2019. London, BSI, 2019.

BSI. Environmental labels and declarations – Type III Environmental declarations – Principles and procedures. BS EN ISO 14025:2010 (exactly identical to ISO 14025:2006). London, BSI, 2010.

BSI. Environmental management – Life cycle assessment – Principles and framework. BS EN ISO 14040:2006. London, BSI, 2006.

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ecoinvent Centre. Swiss Centre for life Cycle Inventories. http://www.ecoinvent.org

BSI. Specification for masonry units. Aggregate concrete masonry units (Dense and lightweight aggregates). BS EN 771-3:2011+A1:2015. London, BSI, 2011.

ISO. Quality management systems — Requirements. ISO 9001:2015.

ISO. Environmental management systems — Requirements with guidance for use. ISO 14001:2015

ISO. Occupational health and safety management systems — Requirements with guidance for use. ISO 45001:2018

BSI. Fire classification of construction products and building elements. Classification using test data from reaction to fire tests. BS EN 13501-1:2007+A1:2009. London, BSI, 2007.

BSI. Eurocode 6. Design of masonry structures. General rules for reinforced and unreinforced masonry structures. BS EN 1996-1-1:2005+A1:2012. London, BSI, 2005.