

# Environmental Product Declaration



THE INTERNATIONAL EPD® SYSTEM



In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

## Aircrete Blocks

Sector EPD from the Mineral Products Association (MPA)



Programme:	The International EPD® System, <a href="http://www.environdec.com">www.environdec.com</a>
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*An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at [www.environdec.com](http://www.environdec.com)*

## General information

### Programme information

<b>Programme:</b>	The International EPD® System
<b>Address:</b>	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
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<b>Accountabilities for PCR, LCA and independent, third-party verification</b>
<b>Product Category Rules (PCR)</b>
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
<b>Product Category Rules (PCR):</b> PCR 2019:14, V 1.3.4 (Construction Products), <b>UN CPC: 3754.</b>
PCR review was conducted by: The Technical Committee of the International EPD® System. See <a href="https://www.environdec.com/about-us/the-international-epd-system-about-the-system">https://www.environdec.com/about-us/the-international-epd-system-about-the-system</a> for a list of members. The review panel may be contacted via the Secretariat <a href="http://www.environdec.com/contact">www.environdec.com/contact</a>
<b>Life Cycle Assessment (LCA)</b>
LCA accountability: Mineral Products Association (MPA), <a href="http://mineralproducts.org/">http://mineralproducts.org/</a>
<b>Third-party verification</b>
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:  <input checked="" type="checkbox"/> EPD verification by individual verifier  Third-party verifier: <i>Chris Foster, EuGeos</i>  Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier:  <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

## Company information

**Owner of the EPD:** Mineral Products Association (MPA), 1st Floor, 297 Euston Road, London NW1 3AD, UK.

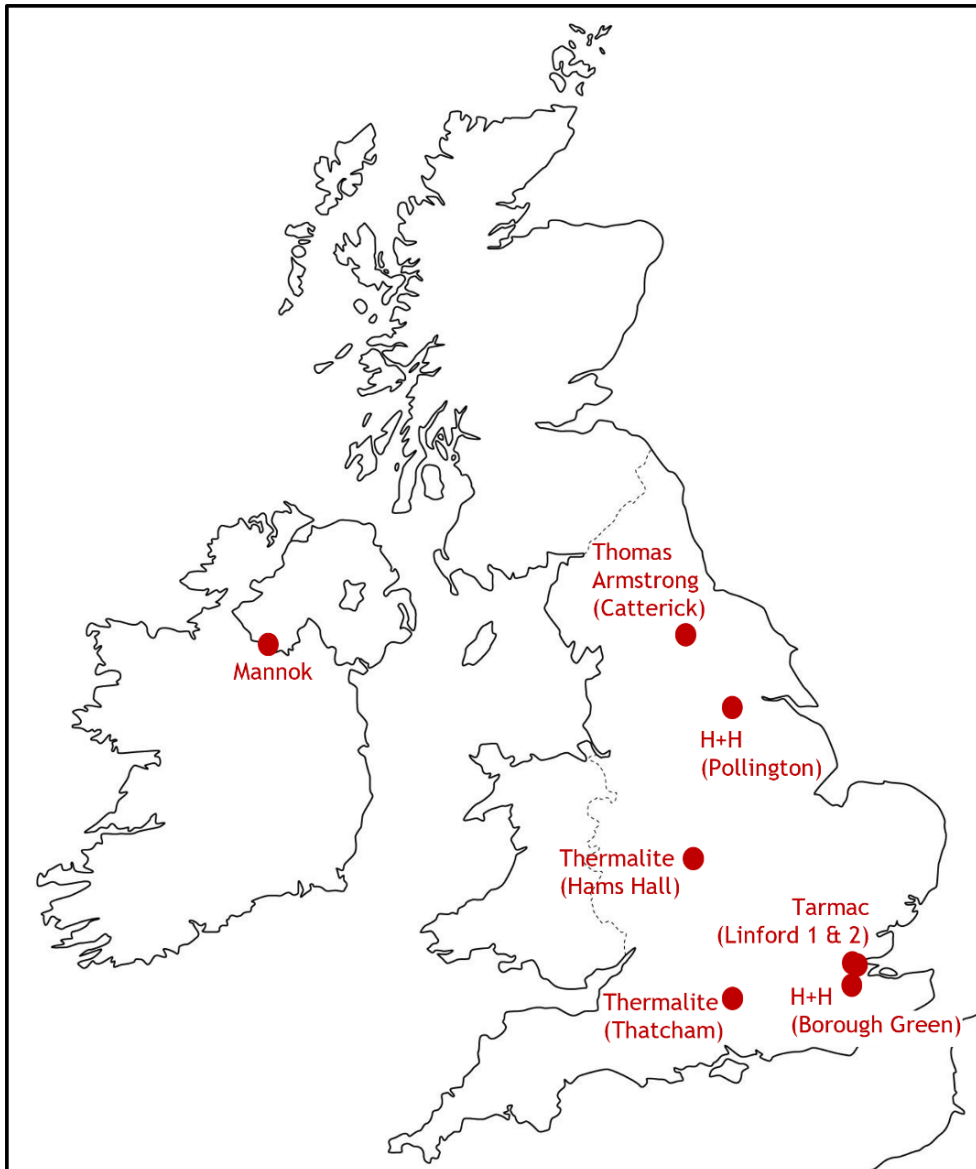
**Contact:** Dr Hafiz Elhag ([hafiz.elhag@mineralproducts.org](mailto:hafiz.elhag@mineralproducts.org))

**Description of the organisation:** The Mineral Products Association (MPA) is the UK industry trade association for the aggregates, asphalt, cement, concrete, dimension stone, lime, mortar and industrial sand industries. MPA membership covers 100% of UK cement and lime production, 90% of GB aggregates production, 95% of asphalt, and 100% of aircrete block production in the UK.

**Product-related or management system-related certifications:** MPA is a trade association. The data has been provided by MPA members. 100% of aircrete block production sites are certified to both ISO 9001 and ISO 14001. 96.35% of aircrete production is certified to BES 6001.

**Name and location of production site(s):** The following production sites were included:

Figure 1. Location map of sites included in the assessment



- Forterra plc (Thermalite) Hams Hall, Coleshill, Birmingham, United Kingdom.
- Forterra plc (Thermalite) Enterprise Way, Thatcham, United Kingdom.

- H+H UK Ltd. Borough Green, Kent, United Kingdom.
- H+H UK Ltd. Pollington, Yorkshire, United Kingdom.
- Tarmac Building Products, Linford 1. Linford, Stanford-Le-Hope, United Kingdom.
- Tarmac Building Products, Linford 2. Linford, Stanford-Le-Hope, United Kingdom.
- Thomas Armstrong (Concrete Blocks) Ltd. Catterick, Richmond, United Kingdom.
- Mannok – Aircrete Blocks, Derrylin, Enniskillen, United Kingdom.

## Product information

**Product name:** Aircrete blocks.

**Product identification:** The product is aircrete building blocks with an average density of 600.53 kg/m<sup>3</sup> (450 – 850 kg/m<sup>3</sup>), manufactured to BS EN 771-4. The constituents include CEM I, blended CEM II A-L, quicklime, pulverised fly ash (PFA), anhydrite, paper ash, limestone aggregates, sand, aluminium powder, and water locked in product, in addition to packaging.

**Product description:** Aircrete blocks (also known as autoclaved aerated concrete blocks) are made of a very fine-grained mixture of cement, quicklime, pulverised fly ash (PFA), sand, and water along with finely powdered aluminium. This mix produces hydrogen gas which results in the concrete mix's aeration. Aircrete blocks are then loaded into autoclaves for steam curing. Aircrete blocks are used in loadbearing and non-loadbearing wall applications, mainly in the housing sector. Aircrete blocks in this assessment are assumed to be 440mm long X 215mm high x 100mm wide. Typical Compressive strengths range between 2.9 to 10.4N/mm<sup>2</sup>. Aircrete blocks thermal conductivities range between 0.09 to 0.21 W/mK.

**UN CPC code:** 3754. Tiles, flagstones, bricks and similar articles, of cement, concrete or artificial stone.

**Geographical scope:** United Kingdom.

## LCA information

**Declared unit:** 1m<sup>3</sup> of aircrete blocks (**conversion to mass:** 600.53 kg)

**Reference service life:** 100 years.

**Time representativeness:** 2023.

**Database(s) and LCA software used:** One Click LCA EF3.1 (Ecoinvent 3.10)

**Description of system boundaries:** System boundary is for cradle to gate with options, modules C1–C4, and module D (A1–A3 + C + D and additional modules A4, A5, and B1). Modules A1-to-A3 are based on production data aggregated across MPA member aircrete production sites, including input flows such as raw materials, fuels and other consumables and output flows (production, production waste and other outputs). A4 stage accounts for emissions associated with the packaged blocks' transport to construction site. The scenarios adopted for module A5 and B1 are based on the methods described in EN 15804 and EN 15941, looking at impacts only related to the aircrete and its packaging. Mortar use and other construction activities are outside the scope of this EPD. Modules C (end-of-Life), and Module D (potential loads & benefits), are based on typical UK practice for demolition and recovery up to the point of End-of-Waste, as defined in EN 16757, focussing on the impact associated with the

aircrete blocks only: mainly impacts associated with demolition and crushing, and CO<sub>2</sub> removal via carbonation of the crushed aircrete. Carbonation was calculated in accordance with EN 16757 for modules A5, B1, C1, C3 and in secondary use beyond the system boundaries (see additional information).

**System diagram:**

Figure 2. Modules A1-A3 Manufacturing system diagram for typical aircrete blocks.

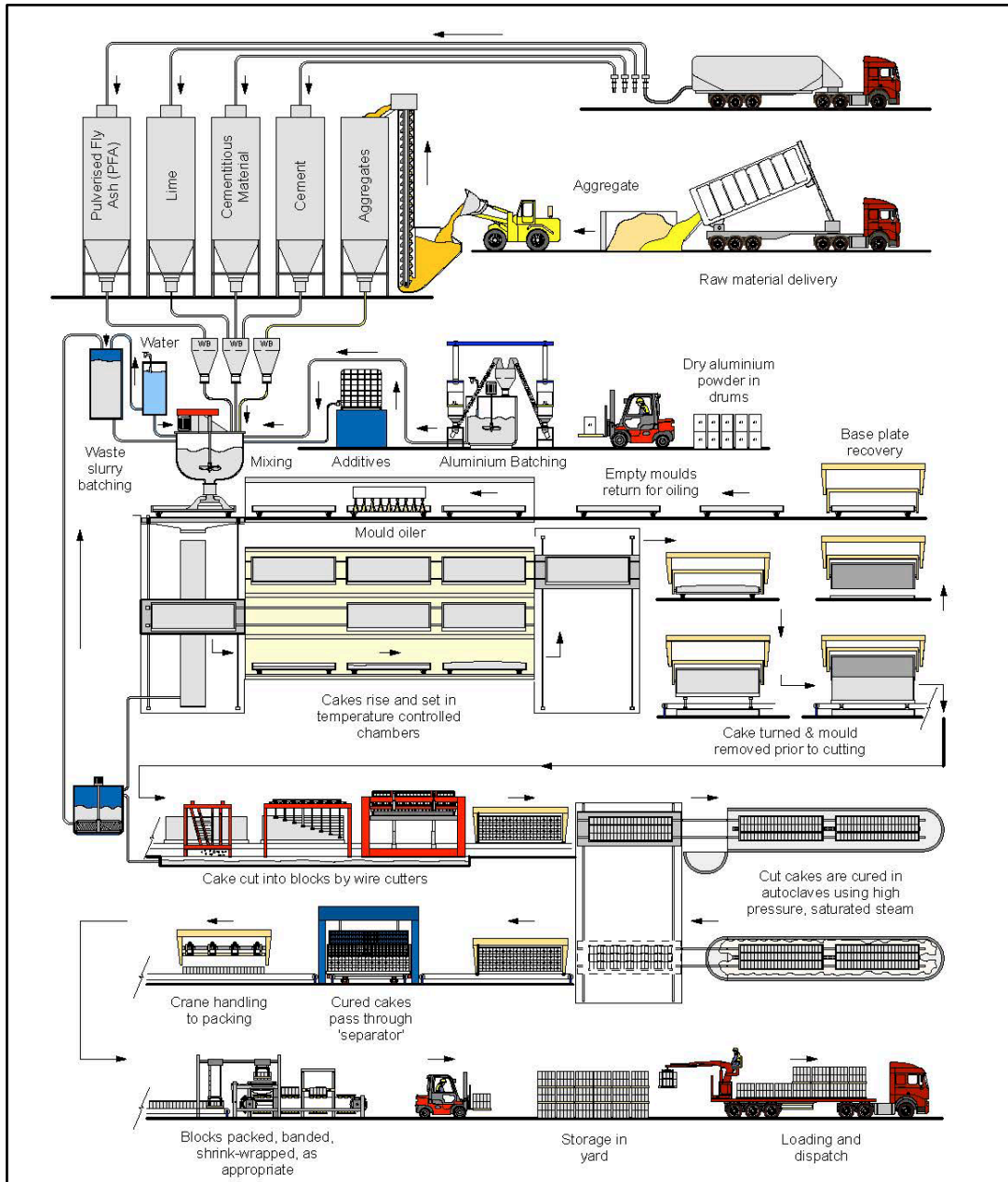
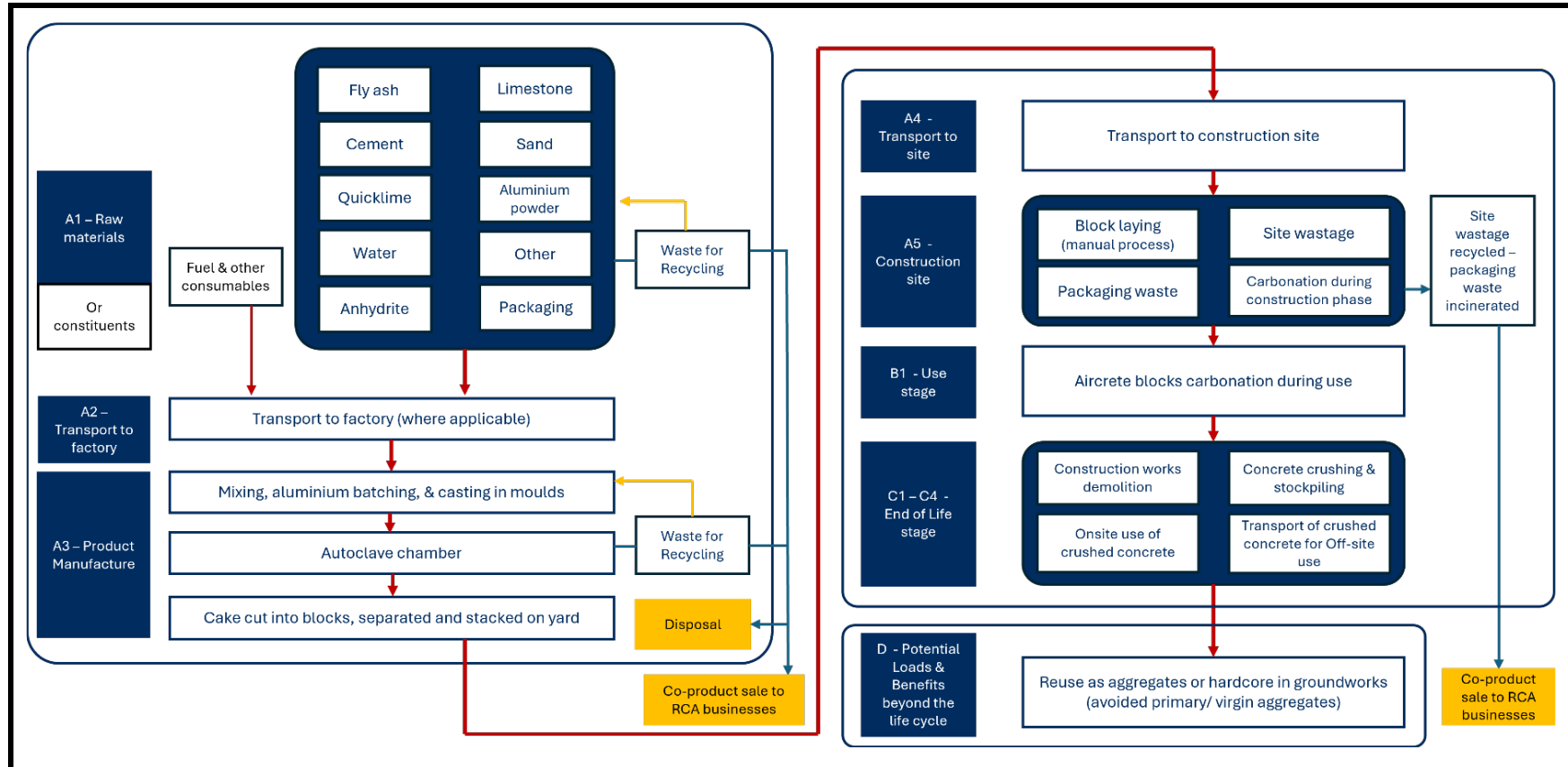


Figure 3. Study Boundary for all life cycle modules considered and information module D.



**Data quality:**

Life Cycle Inventory (LCI) data, and other main elementary flows (quantity) data, was collected directly from sites as part of MPA’s Sustainability Strategy initiative, covering total aircrete production in all 8 factories throughout 2023. Specific data was used for some raw materials where available. All datasets used are compatible with Ecoinvent 3.10. Overall, the data quality can be described as Very Good. A4 scenario was based on default factors in accordance with the RICS Whole Life Carbon Assessment (WLCA) standard V.2 (RICS, 2023). A5 data was based on recent industry research and EN 16757. B1 scenarios were based on a typical single-family house masonry wall construction and EN 16757. C1-C4 scenarios were based on statistics shared by NFDC and EN 16757.

**Cut off rules:**

Cut-off rules employed are in accordance with EN 15804 where a cut-off criteria of 1% (for renewable and non-renewable primary energy usage and total mass input) was maintained. The total of neglected input flows per module do not exceed 5% of energy usage or mass.

Some capital goods and infrastructure impacts associated with factory equipment, on-site wind turbines (A3), and transport (A4) are cut off in accordance with the EPD International PCR.

**Modules A1-A3 Manufacturing**

Allocation:

A1: Co-product allocation for fly ash from coal-fired station is based on economic allocation. However, for fly ash recovered from landfills or old stockpiles, no co-product allocation is employed.

A3: Some concrete waste from Aircrete block factories is sold to waste contractors and other precast factories for recycling and use as crushed concrete aggregates. However, total contribution to revenue in 2023 is believed to be ≤1%. So co-product allocation for the crushed aircrete is neglected.

Electricity mix

Some of the electricity used by MPA members for the manufacture of aircrete is either generated on-site or backed by Renewable Energy Guarantees of Origin (REGOs), issued by Ofgem.

Electricity	Renewable (REGOs)	Renewable (generated on-site)	Residual mix	Total
kWh/m <sup>3</sup>	9.98	0.60	4.74	15.32

The grid mix for REGO electricity is based on feedback from REGO providers (electricity companies). The grid mix for any renewable electricity content within the residual mix is based on DUKES (2023).

Total renewable electricity mix inc. REGO (%)	Onshore wind	Offshore wind	Solar	Hydro	Bioenergy & waste
	46.85%	16.68%	11.13%	25.32%	0.02%

The residual grid mix is based on statistics published by the UK government Department for Energy Security and Net Zero (DesNZ) in DUKES for 2023.

The corresponding climate impact, GWP-GHG, associated with the overall electricity mix at A3 is **~0.217 kg CO<sub>2e</sub>/ kWh**.

#### **Modules A4: Transport to construction site**

Aircrete blocks are transported in packaging from aircrete factories using Euro6 32+ lorries, fully laden (sometimes with additional trailers). The distance to construction site, and scenario for an empty return journey, are in accordance with the RICS WLCA standard.

Scenario parameter (A4)	Quantity	Unit
Specific transport CO <sub>2e</sub> emission factor	0.076	kg CO <sub>2e</sub> / tkm
Distance to site	80	km

#### **Module A5 Construction process**

A typical on-site wastage rate of 4% was used (Adams & Hobbs, 2023). The wooden pallet and plastic packaging are sent to recycling. Aircrete blocks are laid manually on site. Carbonation of aircrete was based on a 10 week period, which is the period assumed for masonry wall exposure until it is watertight and complete.

Scenario parameter (A5)	Quantity	Unit
Site wastage rate	4	%
Transport distance for product wastage	30	km
Aircrete CO <sub>2</sub> uptake (carbonation)	-1.09	Kg CO <sub>2</sub> /m <sup>3</sup>

#### **Module B1 Use stage**

Typically, concrete blocks with compressive strength <13N/mm<sup>2</sup> will have carbonated through their full 100mm depth by the end of its RSL. However, with indoor exposure, the degree of carbonation (D<sub>c</sub>) is only 40%. The quicklime content is expected to carbonate fully during Use Stage (D<sub>c</sub> = 70%).

Scenario parameter (B1)	Quantity	Unit
Aircrete CO <sub>2</sub> uptake (carbonation)	-46.26	Kg CO <sub>2</sub> /m <sup>3</sup>

#### **Modules C1-C4 End-of-Life**

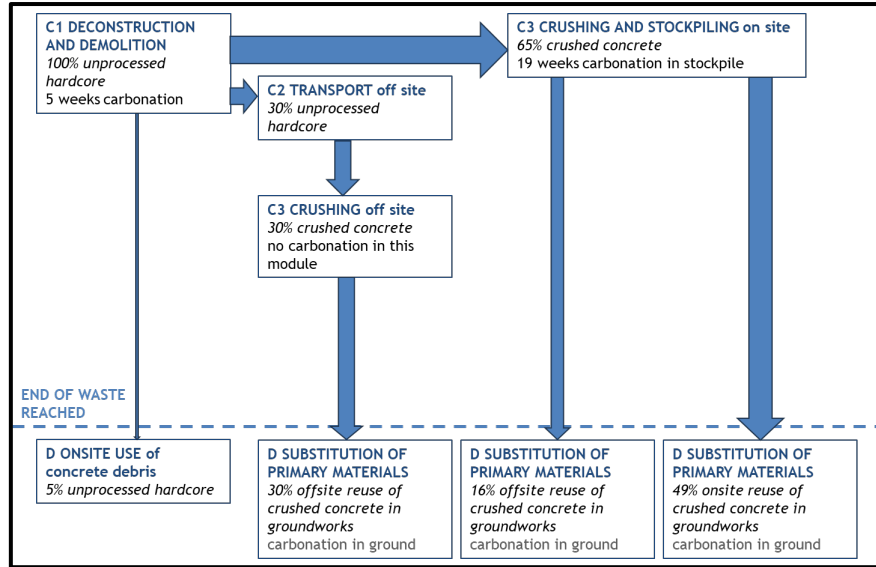
End-of-Life scenarios are based on the National Federation of Demolition Contractors (NFDC) statistics (see Figure 3). It is assumed that all concrete is processed post-demolition and then crushed to a 6F2 specification. The unprocessed material first remains on site for 5 weeks.

- Around 65% of the aircrete is then crushed and recycled onsite, remaining at the demolished structure's (e.g. home) site for an average period of 19 weeks prior to being used on-site as hardcore for site reinstatement.
- Around 30% of the demolished masonry is transported for further treatment and processing.
- Around 5% is left unprocessed at the demolition site.

Carbonation takes place at two stages: At C1, when the aircrete walls are first demolished, and at C3 when the crushed aircrete is further processed and managed until it is no longer waste or until demolition and site reinstatement works are complete. All carbonation calculations were carried out in accordance with the methodology introduced in EN 16757.

Scenario parameter (C1-C4)	Quantity	Unit
Diesel use for crushing and processing operations (up to end-of-waste)	1.2	kWh/ m <sup>3</sup>
Transport for waste concrete treatment	25	km
CO <sub>2</sub> uptake (carbonation) at C1	-0.96	kg CO <sub>2</sub> /m <sup>3</sup>
CO <sub>2</sub> uptake (carbonation) at C3	-6.6	kg CO <sub>2</sub> /m <sup>3</sup>

Figure 4. Typical flows of end-of-life concrete during modules C and D (NFDC, 2023).



**Module D Loads & Benefits beyond the System Boundary**

Substitution of virgin materials (aggregates) by the crushed aircrete from the demolished building (e.g. home) is based on 95% of the total mass of aircrete.

Modules declared, geographical scope, share of specific data (in GWP-GHG results) and variation in GWP-GHG results between products and sites.

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	X	X	X	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	UK	UK	UK	UK	UK	-	-	-	-	-	-	-	UK	UK	UK	UK	UK
Specific data used	15%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	N/A			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	+40.8% <sup>(1)</sup> / -10.1%			0%	0%	-	-	-	-	-	-	-	-	-	-	-	-

(1) Production sites with the higher A1-to-A3 GWP-GHG limit collectively make up well under 3% of the overall production covered in the LCI (by volume and mass). Variations are mainly due to products' concrete mix and fuels used in A3.

## Content information

Product components	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg*
CEM I	93.98	0.09%	-
Blended CEM II A-L	16.58		-
Limestone Aggregate	59.00		-
Quicklime	46.53		-
Sand	8.17		-
Fly ash (PFA) and paper ash	286.78	23.88%	-
Anhydrite	10.77		-
Aluminium powder	0.38		-
Water	78.33		-
TOTAL	600.53	23.97%	-
Packaging materials	Weight, kg	Weight-% (versus the product)	Weight biogenic carbon, kg C/kg
Packing wrap	0.48	0.08%	-
Strapping	0.05	>0.01%	-
Pallet (½ unit)	11.48	1.91%	0.007

\*1kg biogenic C converts to 3.667 kgCO<sub>2</sub>

Aircrete blocks do not contain substances from the candidate list of SVHC for Authorization in levels above 0.1% by weight.

## Results of the environmental performance indicators

### Mandatory impact category indicators according to EN 15804

#### Results per functional or declared unit

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-fossil <sup>(1)</sup>	kg CO <sub>2</sub> eq.	1.68E+02	3.48E+00	6.78E+00	-4.63E+01	ND	ND	ND	ND	ND	ND	-5.27E-01	5.43E-01	-4.10E+00	1.87E-01	-3.02E-01
GWP-biogenic	kg CO <sub>2</sub> eq.	-8.63E-01	0.00E+00	8.08E-01	0.00E+00	ND	ND	ND	ND	ND	ND	0.00E+00	-1,36E-20	5.19 E-02	2.73 E-03	0.00 E+00
GWP-luluc	kg CO <sub>2</sub> eq.	2.09E-02	1.35E-03	1.00E-03	0.00E+00	ND	ND	ND	ND	ND	ND	4.44E-05	2.12E-04	2.56E-04	1.07E-04	3.57E-04
GWP-total	kg CO <sub>2</sub> eq.	1.67E+02	3.48E+00	7.59 E+00	-4.63E+01	ND	ND	ND	ND	ND	ND	-5.27E-01	5.44E-01	-4.05E+00	1.90E-01	-3.02E-01
ODP	kg CFC 11 eq.	5.63E-06	7.26E-08	2.34E-07	0.00E+00	ND	ND	ND	ND	ND	ND	6.63E-09	1.13E-08	3.82E-08	5.43E-09	-8.96E-08
AP	mol H <sup>+</sup> eq.	3.54E-01	8.21E-03	1.78E-02	0.00E+00	ND	ND	ND	ND	ND	ND	3.91E-03	1.28E-03	2.25E-02	1.33E-03	-3.92E-03
EP-freshwater	kg P eq.	1.06E-02	2.43E-04	5.22E-04	0.00E+00	ND	ND	ND	ND	ND	ND	1.25E-05	3.80E-05	7.21E-05	1.54E-05	1.18E-04
EP-marine	kg N eq.	4.92E-02	2.15E-03	4.26E-03	0.00E+00	ND	ND	ND	ND	ND	ND	1.81E-03	3.36E-04	1.05E-02	5.07E-04	-1.88E-03
EP-terrestrial	mol N eq.	1.17E+00	2.33E-02	6.39E-02	0.00E+00	ND	ND	ND	ND	ND	ND	1.98E-02	3.64E-03	1.14E-01	5.53E-03	-2.13E-02
POCP	kg NMVOC eq.	3.24E-01	1.43E-02	1.82 E-02	0.00E+00	ND	ND	ND	ND	ND	ND	5.92E-03	2.23E-03	3.41E-02	1.98E-03	-5.95E-03
ADP-minerals&metals*	kg Sb eq.	1.53E-04	9.95E-06	7.31E-06	0.00E+00	ND	ND	ND	ND	ND	ND	1.55E-07	1.55E-06	8.95E-07	2.98E-07	-7.67 E-07
ADP-fossil*	MJ	1.13E+03	5.22E+01	5.22E+01	0.00E+00	ND	ND	ND	ND	ND	ND	5.66E+00	8.16E+00	3.27E+01	4.60E+00	-3.16E+00
WDP*	m <sup>3</sup>	1.19E+02	2.67E-01	5.19E+00	0.00E+00	ND	ND	ND	ND	ND	ND	1.41E-02	4.18E-02	8.16E-02	1.33E-02	-1.03E-01
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; 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; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption															

1) The indicated Global Warming Potential fossil fuels (GWP-fossil) value includes GHG emissions from combustion of both fossil and waste-derived fuels during cement manufacture. The A1-A3 'net' (or cut-off by Classification) value of GWP-fossil, excluding combustion of waste-derived fuel, is **161 kg CO<sub>2</sub>e/ m<sup>3</sup>**.

\* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

### Additional mandatory and voluntary impact category indicators

#### Results per functional or declared unit

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG <sup>1</sup>	kg CO <sub>2</sub> eq.	1.68E+02	3.48E+00	6.78E+00	-4.63E+01	ND	ND	ND	ND	ND	ND	-5.27E-01	5.44E-01	-4.10E+00	1.88E-01	-3.02E-01

Additional voluntary environmental impact indicators (EN 15804 Table 4) are not declared

### Resource use indicators

#### Results per functional or declared unit

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	2.13E+04	8.50E-01	6.57E+02	0.00E+00	ND	ND	ND	ND	ND	ND	3.59E-02	1.33E-01	2.07E-01	4.44E-01	6.92E-01
PERM	MJ	1.81E+01	0.00E+00	-7.42E+00	0.00E+00	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	-1.02E+01	-5.35E-01	0.00E+00
PERT	MJ	2.13E+04	8.50E-01	6.49E+02	0.00E+00	ND	ND	ND	ND	ND	ND	3.59E-02	1.33E-01	-9.96E+00	-4.91E-01	6.92E-01
PENRE	MJ	1.10E+03	5.22E+01	6.56E+01	0.00E+00	ND	ND	ND	ND	ND	ND	5.66E+00	8.16E+00	3.27E+01	4.60E+00	-3.16E+00
PENRM	MJ	2.79E+01	0.00E+00	-2.48E+01	0.00E+00	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	-2.96E+00	-1.56E-01	0.00E+00
PENRT	MJ	1.13E+03	5.22E+01	8.04E+01	0.00E+00	ND	ND	ND	ND	ND	ND	5.66E+00	8.16E+00	2.97E+01	4.45E+00	-3.16E+00
SM	kg	8.02E+00	2.26E-02	3.27E-01	0.00E+00	ND	ND	ND	ND	ND	ND	2.35E-03	3.53E-03	1.36E-02	1.16E-03	6.24E-04
RSF	MJ	8.78E+01	2.85E-04	3.51E+00	0.00E+00	ND	ND	ND	ND	ND	ND	6.15E-06	4.45E-05	3.55E-05	2.39E-05	2.16E-06
NRSF	MJ	1.47E+02	0.00E+00	5.89E+00	0.00E+00	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m <sup>3</sup>	3.40E-01	7.71E-03	1.67E-02	0.00E+00	ND	ND	ND	ND	ND	ND	3.74E-04	1.20E-03	2.16E-03	4.78E-03	-7.08E-03

Acronyms PERE = Use of renewable primary energy excluding renewable primary energy resources 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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

<sup>1</sup> This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO<sub>2</sub> is set to zero.

### Waste indicators

#### Results per functional or declared unit

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	4.08E+00	7.56E-02	2.54E-01	0.00E+00	ND	ND	ND	ND	ND	ND	6.30E-03	1.18E-02	3.64E-02	5.08E-03	3.59E-04
Non-hazardous waste disposed	kg	3.19E+02	1.51E+00	2.58E+01	0.00E+00	ND	ND	ND	ND	ND	ND	8.59E-02	2.36E-01	4.95E-01	1.16E-01	4.91E-01
Radioactive waste disposed	kg	7.05E-04	1.56E-05	3.00E-05	0.00E+00	ND	ND	ND	ND	ND	ND	6.16E-07	2.43E-06	3.55E-06	7.05E-07	-2.00E-05

### Output flow indicators

#### Results per functional or declared unit

Indicator	Unit	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	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material for recycling	kg	2.64E+02	0.00E+00	1.06E+01	0.00E+00	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	5.71E+02	0.00E+00	0.00E+00
Materials for energy recovery	kg	3.36E-04	0.00E+00	1.15E+01	0.00E+00	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	3.27E-02	0.00E+00	1.31E-03	0.00E+00	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

### Other environmental performance indicators

None declared.

The calculations draw on mixed background databases. As a consequence, the results for categories ODP, FW, and all Waste indicator categories are of low reliability.

## Additional environmental information

### Further aircrete carbonation beyond system boundaries

95% of the Declared Unit is crushed and reused in groundworks, either within the demolished building's site, or offsite. By assuming a 6F2 distribution for the recycled concrete and a "Buried in ground (above groundwater level)" exposure condition, and by considering a Secondary Life extended over 100 years, the additional carbonation beyond the system boundary would be around 10.36 kg CO<sub>2</sub>/ m<sup>3</sup>. This calculation was carried out in accordance with Annex G of EN 16757.

Overall CO<sub>2</sub> uptake in aircrete blocks (100 years RSL)

LIFECYCLE STAGE	CO <sub>2</sub> uptake
	kg CO <sub>2</sub> / m <sup>3</sup> aircrete
<b>MODULE A5</b>	1.09
<b>MODULE B1</b>	46.3
<b>MODULE C1</b>	0.96
<b>MODULE C3</b>	6.6
<b>TOTAL (modules A-C)</b>	54.9
<b>SECONDARY USE</b> (beyond system boundary)	10.36
<b>TOTAL (all modules including secondary use)</b>	65.3

## Information related to Sector EPD

This sector EPD is for a specific product, which is UK-produced aircrete blocks. This EPD was modelled using collective average data from production sites where only aircrete products are manufactured. Member companies submitted raw material mixes based on their products' own water content (water locked in product) for all densities. 2023 production data was then used to produce a weighted average for raw materials' mix. The data used represents 100% of the total UK production and market for aircrete blocks. Specific suppliers' CEM I EPDs were used in the model. Where such data was unknown, the UK's collective EPD for CEM I was used.

The GWP-fossil values reported in this EPD are based on 'gross' CO<sub>2</sub>e emissions, i.e., they include combustion of both fossil and waste-derived fuels (also called 'alternative' or 'secondary' fuels) during the manufacture of cement. An equivalent 'Net' (*Cut-off by Classification*) GWP-GHG value, which excludes waste-derived fuel emissions in accordance with the "Polluter Pays" principle, is also reported in the table's footnote as recommended in EN 16908 (**161 kg CO<sub>2</sub>e/m<sup>3</sup>** for A1-A3). When comparing with alternative non-concrete and non-masonry construction solutions' EPDs, it is important to note that the 'Net' GWP value offers a fairer basis for such comparisons.

The LCA indicators for aircrete blocks in this sector EPD are intended to provide the basis for the environmental assessment of buildings and other construction works in typical UK situations and in

accordance with nationally recognised standards, such as the UK's RICS WLCA Standard. Such assessments should consider the whole lifecycle; modules A1-A3 should not be used alone without considering results for Module C. The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks. The declared product is an average that is not available for purchase on the market and that the results are not representative for any specific manufacturer or its product.

For very detailed calculations requiring LCA data for specific manufacturer mixes and densities, please refer to EPDs from the individual manufacturer.

## Differences versus previous versions

A number of editorial amendments carried out for version from 2025.04.03:

- Logo changed from 'MPA UK Concrete' to 'MPA Masonry'.
- Product Identification section corrected by including correct reference to product standard and raw materials.
- Product description section corrected by correcting grammar and reference to product dimensions.
- Typos corrected in Mandatory indicators GWP-fossil (C4) and GWP-Total (C4).
- Wording improved in "Information related to Sector EPD" section.

## References

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