Statement of Verification

BREG EN EPD No: 000816 Issue: 01

This is to verify that the Environmental Product Declaration provided by:

Adaptavate

are in accordance with the requirements of:

EN 15804:2012+A2:2019

and

BRE Global Scheme Document SD207

This declaration is for: 1 kg of Breathaplasta Thermal lime plaster, installed, over a 60 year lifetime.

Company Address

Adaptavate,
Unit 7 Vertex Business Park Oakwood Drive,
Emersons Green, Bristol, England, BS16 7LB

Signed for BRE Global Limited	Name Operator	
22 June 2026 Date of this Issue	22 June 2026 Date of First Issue	21 June 2031 Expiry Date

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Environmental Product Declaration

EPD Number: 000816

General Information

EPD Programme Operator	Applicable Product Category Rules
BRE Global Watford, Herts WD25 9XX United Kingdom	BRE Environmental Profiles Product Category Rules for Type III environmental product declaration of construction products to EN 15804+A2 PN 514 Rev 3.1
Commissioner of LCA study	**LCA consultant/Tool**
Adaptavate, Unit 7 Vertex Business Park Oakwood Drive, Emersons Green, Bristol, England, BS16 7LB	LCA model: Excel-based LCA tool, pre-verified by BRE, Owen Pearson and Matthew Fishwick EPD: LINA, Matthew Fishwick
Functional Unit	**Applicability/Coverage**
One kg of Breathaplasta Thermal lime plaster, installed, over a 60 year lifetime.	Product Specific.
EPD Type	**Background database**
Cradle to Grave	ecoinvent v3.6 (cut-off, Eugeos' 15804+A2_IA v4.1 extended version)

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 ☐Internal ☒ External
(Where appropriate [b])Third party verifier: Bala Subramanian
a: Product category rules 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

Cornish Lime, Brims Park, Old Callywith Road,
Bodmin PL31 2DZ

Construction Product:

Product Description

Breathaplasta is a range of quick setting lime plasters, that include the products “Thermal”, “Universal” and “Smooth” and are higher performance and healthier alternatives to mainstream plaster products. Breathaplasta Thermal (i.e. the product covered by this EPD) is made from lime, recycled glass beads and perlite. The Breathaplasta product range provides a system of breathable plaster materials that help regulate moisture and reduce problems with condensation and mould whilst improving insulation and enabling faster completion times on site. Breathaplasta products can be used to finish the internal faces of a building with a smooth or textured surface.

Technical Information

Property	Value, Unit
Max aggregate size	2.8 mm
Fresh mortar density:	850 kg/m^3
Dry hardened mortar density:	570 kg/m^3
Water absorption	1.3 kg/m^2.min$^{0.5}$
Compressive strength (mean)	3.4 Nmm^2
Flexural strength (mean)	0.44 Nmm^2

Property	Value, Unit
Adhesion (concrete substrate)	0.1 N/mm^2 - Fracture Pattern A
Water vapour diffusion coefficient (tabulated)	5 μ
Thermal conductivity (tabulated)	0.18 W/mK
Thermal conductivity (tested)	0.127 W/mK
Fire rating	Euroclass A1 (EN 13501-1:2007+a1:2009 - B, s1, d0 ASTM E84 -16)

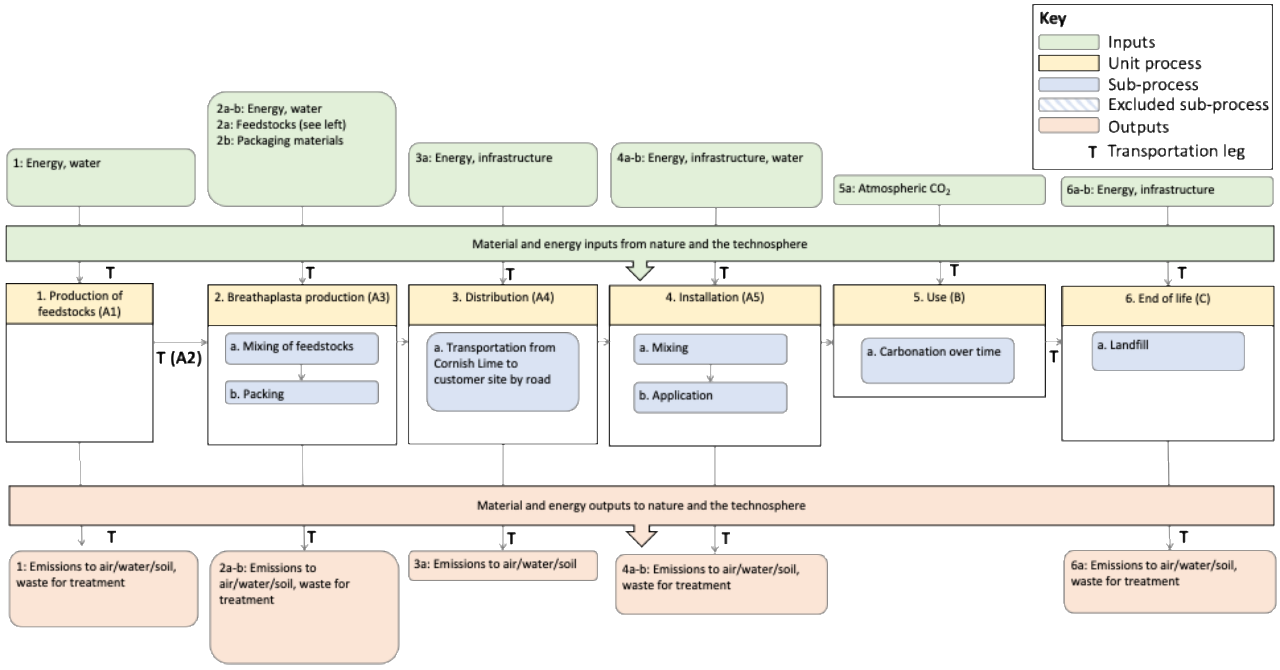
Main Product Contents

Material/Chemical Input	%
Lime, minerals and binding agents	51.2%
Recycled glass beads	45.1%
Additives	<4%

Manufacturing Process

The dry feedstocks e.g. lime, natural cement, sand are mixed together to produce the final dry plaster product. The dry plaster is bagged, ready for distribution.

Process flow diagram



Construction Installation

Installation of Breathaplasta products involves:
• Mixing - Water is added to the dried plaster to form a paste.
• Application - The wet plaster is applied over the designated area.
An assumption of 10% wastage is applied. Water requirements of 556 g / kg plaster are assumed for Breathaplasta Thermal, based on the technical data sheet.

Use Information

The product is assumed to have a 60 year life expectancy. The only relevant use phase activity is the carbonation of lime and cement contained in Breathaplasta. This was modelled using the following default values from BRE Global's PCR:
• 72% calcium oxide (CaO) in lime and 65% CaO in cement; and
• 100% of CaO in lime will carbonise and 75% of CaO in cement will carbonise.
All Breathaplasta carbonation was assumed to occur during the use phase.

End of Life

100% landfilling of Breathaplasta products is assumed as realistic worst-case scenario, with 50 km transportation to landfill assumed.

Life Cycle Assessment Calculation Rules

Functional unit description

One kg of Breathaplasta Thermal lime plaster, installed, over a 60 year lifetime.

System boundary

The system boundary for each product system in this LCA was ‘cradle-to-grave’, which comprises: the extraction/cultivation and processing of raw materials, production of the finished product (including packaging), use phase, end-of-life, and all transportation and waste stages throughout the lifecycle.

This boundary comprises the following modules given in BRE Environmental Profiles Product Category Rules for Type III environmental product declaration of construction products to EN 15804+A2 PN 514 Rev 3.1: the product stage (modules A1-A3), construction process stage (A4-A5), use stage (B1-B7), end-of-life stage (modules C1-C4) and benefits and loads beyond the system boundary (module D). The geographical scope is UK/EU for A1 and A2 and UK for A3, A4-A5, B, C and D.

Module A1 – raw material supply, comprising:
• All raw material inputs required, virgin and secondary for the manufacture of the quantity of the functional unit of the study product.

Module A2 – transport, comprising:
• Transport of the raw materials inputs and any other process inputs to the manufacturing plant.

Module A3 – manufacturing:
• The manufacturing process (energy, water), waste generated and disposed, other emissions, packaging and ancillary materials used and wasted, all other wastes from manufacturing plant allocated to the study product.

Modules A4-A5 – construction process stage:
• Transport of finished goods to construction site and installation of these finished goods in the building.

Modules B1-B7 – use stage:
• Carbonation of lime and cement in the product over its lifetime.

Modules C1-C4 – end-of-life:
• Deconstruction and removal of the product, transportation to waste treatment, waste processing and final disposal.

Modules D – benefit and loads beyond the system boundary:
• Net benefits and loads arising from the recycling of materials and/or recovery of energy from the product.

Data sources, quality and allocation

Primary data were collected from Adaptavate and Cornish Lime for A3 processes and raw materials quantity and type, covering 2020. Secondary data from ecoinvent v3.6 were used for background processes. Data quality: To ensure the quality of data were sufficient, data quality checks were completed in relation to time related coverage, geographical coverage, technology coverage, completeness, and representativeness. Data quality indicators from Table E.1 of Annex E of EN15804, covering technological, temporal and geographical representativeness, were applied using a data quality matrix whereby key data were assigned scores between 1 (very good) and 5 (very poor). All data scored between 1-3 (very good to fair). There are no poor or very poor data or fair data contributing to >30% of any core indicators.

Co-product allocation procedures: For cases where there is more than one product in the system being studied, BRE Global’s PCR prescribes the following procedure for the allocation of material and energy flows and environmental emissions.

• In the first instance, allocation should be avoided, by process sub-division.
• Where these methods are not applicable, the ISO 14040/44 requires that allocation reflects the physical relationships of the different products or functions. Allocation based on physical relationships such as mass or energy is a practical interpretation of this and is an approach often used in LCA.
• For some processes, allocation based on mass is not considered appropriate and, in these cases, economic allocation is used.

In this study, allocation procedures for multi-product processes followed the ISO approach above. Co-product allocation for primary/specific data used in the LCA is based on mass. In terms of co-product allocation of secondary/generic data, the main database used, ecoinvent v3.6 (cut-off), defaults to an economic allocation for most processes. However, in some cases a mass-based allocation is used, where there is a direct physical relationship. The allocation approach of specific ecoinvent modules is documented on their website and method reports (see www.ecoinvent.org).

End-of-life allocation procedures: In this study a “cut-off” method (aka recycled content or 100:0 approach) was applied to all cases of end-of-life allocation, including in the case of secondary data, where the ecoinvent v3.6 with a cut-off by classification end-of-life allocation method was used. In this approach, environmental burdens and benefits of recycled / reused materials and recovered energy are given to the product system consuming them, rather than the system providing them and are quantified based on recycling content of the material under investigation. The cutoff point is where an end-of-life state is reached, including any sorting, cleaning, and processing of waste prior to recycling, reuse, or energy recovery, following the “polluter pays principle”. This is a common approach in LCA for materials where there is a loss in inherent properties during recycling, the supply of recycled material exceeds demand and recycled content of the product is independent of whether it is recycled downstream. It is in compliance with the ISO standards on LCA, EN 15804, EN 15978 and is prescribed in BRE Global’s PCR. The exception to the use of this end-of-life allocation method was for module D, where loads and benefits beyond the system boundary, following a closed-loop approximation end-of-life allocation method, are presented separately.

A3 electricity was modelled using “market for electricity, medium voltage | electricity, medium voltage | Cutoff, U - GB” - Eugeos' 15804+A2_IA v4.1 extended version of ecoinvent v3.6 (cut-off) (GWP-GHG impact of 0.38 kgCO_2e/kWh, 2019, location-based approach).

Cut-off criteria

In the process of building an LCI it is typical to exclude items considered to have a negligible contribution to results. In order to do this in a consistent and robust manner there must be confidence that the exclusion is fair and reasonable. To this end, cut-off criteria were defined in this study, which allow items to be neglected if they meet the criteria. In accordance with BRE Global’s PCR, exclusions could be made if they were expected to be within the below criteria:
• A process can be excluded if it contributes to <1% of total mass or energy input of a unit process;
• A maximum of 5% of the total mass or energy of the lifecycle can be excluded; and
• The excluded process doesn’t meet the following exceptions: significant effects on energy use in extraction, use or disposal, significant environmental relevance (i.e. likely to contribute to an increase/decrease in impacts of more than 1%), are classed as hazardous waste. In addition to exclusions based on cut-off criteria, the follow general exclusions from the scope of the study were made:
• Human and animal energy inputs to processes;
• Transport of employees to and from their normal place of work and business travel; and
• Environmental impacts associated with support functions (e.g. R&D, marketing, finance, management etc.).

LCA Results

(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	7.06E-01	7.25E-01	-2.00E-02	1.49E-04	3.72E-08	1.52E-03	1.52E-04
	Transport	A2	6.77E-02	6.76E-02	8.62E-05	1.99E-05	1.60E-08	1.99E-04	1.40E-05
	Manufacturing	A3	2.81E-02	4.43E-02	-1.63E-02	6.65E-05	4.85E-09	1.74E-04	3.89E-05
	Total (Consumption grid)	A1-3	8.01E-01	8.37E-01	-3.62E-02	2.35E-04	5.80E-08	1.89E-03	2.05E-04
Construction process stage	Transport	A4	2.70E-02	2.70E-02	0.00E+00	7.91E-06	6.38E-09	7.65E-05	5.59E-06
	Construction	A5	1.11E-01	9.45E-02	1.63E-02	2.56E-05	6.88E-09	2.38E-04	2.56E-05
Use stage	Use	B1	-2.86E-01	-2.86E-01	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
100% Landfilling 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	6.42E-02	6.42E-02	0.00E+00	2.75E-06	4.01E-10	3.25E-04	3.53E-05
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Disposal	C4	3.24E-02	1.24E-02	2.00E-02	2.09E-06	3.07E-09	6.53E-05	2.66E-06
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	0.00E+00

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	3.73E-04	4.01E-03	1.28E-03	3.38E-06	6.05E+00	5.26E+01	1.72E-08
	Transport	A2	4.09E-05	4.42E-04	1.81E-04	1.09E-07	1.05E+00	7.54E-02	5.94E-09
	Manufacturing	A3	4.02E-05	4.06E-04	1.04E-04	1.25E-07	7.51E-01	4.63E+00	1.31E-09
	Total (Consumption grid)	A1-3	4.54E-04	4.85E-03	1.56E-03	3.61E-06	7.85E+00	5.73E+01	2.44E-08
Construction process stage	Transport	A4	1.56E-05	1.69E-04	7.05E-05	4.30E-08	4.17E-01	2.99E-02	2.37E-09
	Construction	A5	5.66E-05	6.05E-04	1.91E-04	3.76E-07	9.37E-01	5.82E+00	3.31E-09
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
100% Landfilling 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	6.85E-05	7.30E-04	1.89E-04	7.36E-08	8.23E-01	2.77E-02	4.53E-09
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Disposal	C4	2.38E-05	2.60E-04	7.63E-05	1.35E-08	2.17E-01	4.86E-01	1.55E-09
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	0.00E+00

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	2.19E-02	1.47E+00	1.04E-10	3.72E-09	3.90E+00
	Transport	A2	5.40E-03	4.45E-02	1.97E-11	1.26E-09	1.60E+00
	Manufacturing	A3	3.00E-02	6.07E-03	1.16E-11	1.87E-09	3.41E-02
	Total (Consumption grid)	A1-3	5.73E-02	1.52E+00	1.35E-10	6.85E-09	5.53E+00
Construction process stage	Transport	A4	2.15E-03	1.78E-02	7.85E-12	5.03E-10	6.39E-01
	Construction	A5	6.24E-03	1.54E-01	1.65E-11	1.13E-09	6.46E-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
100% Landfilling Scenario							
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	8.86E-04	2.07E-03	9.51E-12	3.43E-09	-5.11E-02
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Disposal	C4	1.37E-03	3.52E-03	5.03E-12	1.33E-10	3.35E-01
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

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	1.19E+00	5.20E-03	1.20E+00	6.02E+00	5.83E-02	6.08E+00
	Transport	A2	1.29E-02	0.00E+00	1.29E-02	1.07E+00	0.00E+00	1.07E+00
	Manufacturing	A3	3.56E-01	1.42E-01	4.98E-01	1.14E+00	0.00E+00	1.14E+00
	Total (Consumption grid)	A1-3	1.56E+00	1.48E-01	1.71E+00	8.23E+00	5.83E-02	8.29E+00
Construction process stage	Transport	A4	5.15E-03	0.00E+00	5.15E-03	4.26E-01	0.00E+00	4.26E-01
	Construction	A5	1.59E-01	0.00E+00	1.59E-01	9.80E-01	0.00E+00	9.80E-01
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
100% Landfilling 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	1.56E-02	0.00E+00	1.56E-02	8.38E-01	0.00E+00	8.38E-01
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Disposal	C4	8.58E-03	0.00E+00	8.58E-03	2.26E-01	0.00E+00	2.26E-01
Potential benefits and loads beyond the system	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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	3.15E-01	6.72E-03	-1.82E-04	2.22E-03
	Transport	A2	1.19E-04	4.47E-05	-6.92E-04	1.20E-04
	Manufacturing	A3	1.19E-04	1.25E-03	6.50E-04	6.42E-04
	Total (Consumption grid)	A1-3	3.15E-01	8.02E-03	-2.24E-04	2.98E-03
Construction process stage	Transport	A4	0.00E+00	1.77E-05	-2.74E-04	4.82E-05
	Construction	A5	3.16E-02	8.28E-04	-1.42E-04	1.23E-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
100% Landfilling Scenario						
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	0.00E+00	1.40E-05	-2.30E-04	1.66E-04
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Disposal	C4	5.37E-05	5.29E-05	-2.10E-04	2.80E-04
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

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	1.01E-02	2.76E-01	1.41E-05
	Transport	A2	1.52E-04	1.99E-03	1.93E-07
	Manufacturing	A3	2.49E-03	4.68E-02	7.35E-06
	Total (Consumption grid)	A1-3	1.28E-02	3.24E-01	2.16E-05
Construction process stage	Transport	A4	5.93E-05	7.79E-04	6.90E-08
	Construction	A5	2.12E-03	3.87E-02	2.29E-06
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
100% Landfilling Scenario					
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	8.03E-03	5.31E-02	2.79E-07
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00
	Disposal	C4	1.50E-04	1.25E-03	8.11E-07
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00

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	2.68E-04	6.06E-06	0.00E+00	6.50E-04	0.00E+00
	Transport	A2	0.00E+00	1.05E-04	8.08E-08	0.00E+00	0.00E+00	0.00E+00
	Manufacturing	A3	0.00E+00	6.17E-05	7.19E-06	0.00E+00	0.00E+00	0.00E+00
	Total (Consumption grid)	A1-3	0.00E+00	4.35E-04	1.33E-05	0.00E+00	6.50E-04	0.00E+00
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+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
100% Landfilling 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	0.00E+00	0.00E+00	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	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
Reference service life	60 years according to EPD owner.		
A4 – Transport to the building site	Transportation of Breathaplasta from manufacturing site to construction site were modelled using a distance of 300 km by road (based on RICS, 2017). The utilisation and loading of the lorry is characterised in the ecoinvent tonne.km data used and used as provided. No return journeys have been considered as it was assumed that third-party logistic companies optimise deliveries using multi-drops. It was assumed that there were no losses of Breathaplasta (e.g. due to accidents, mis-handling).		
	Fuel type / Vehicle type	Litre of fuel type per distance or vehicle type	>32 t EURO4 diesel lorry
	Distance:	km	300
	Capacity utilisation (incl. empty returns)	%	37%
	Bulk density of transported products	kg/m^3	1,700
A5 – Installation in the building	Installation of Breathaplasta products involves: • Mixing - Water is added to the dried plaster to form a paste. • Application - The wet plaster is applied over the designated area. An assumption of 10% wastage is applied, disposed of in landfill. Packaging is assumed to be recycled. Water requirements of 556 g / kg plaster are assumed for Breathaplasta Thermal, based on the technical data sheet.		
B1 – Emissions	The only relevant use phase activity is the carbonation of lime and cement contained in Breathaplasta. This was modelled using the following default values from BRE Global's PCR: • 72% calcium oxide (CaO) in lime and 65% CaO in cement; and • 100% of CaO in lime will carbonise and 75% of CaO in cement will carbonise. All Breathaplasta carbonation was assumed to occur during the use phase.		
B2 to B7	These modules are not relevant for Breathaplasta. There are no impacts associated with these modules.		
C1 to C4 End of life,	A 50 km transportation to landfill has been assumed in C2 Module.100% landfilling of Breathaplasta products has been assumed as a realistic worst-case scenario and following EN 17328:2024. Modules C1 and C3 are irrelevant in the present case.		
Module D	100% landfilling of Breathaplasta products is assumed, therefore this module is not relevant.		

Summary, comments and additional information

Interpretation

For the majority of impact categories, raw material supply (A1) and construction (A5) dominate the environmental impact;
• In the case of construction (A5), the majority of this impact is due to the embodied impact of raw material supply associated with wastage;
• GWP-biogenic carbon emissions and removals balance each other out, as seen by a negative impact at the raw material supply (A1) stage associated with growing of biomass and a positive impact at disposal in A5 and/or C4;
• In the case of GWP-fossil, there is a negative impact at the use (B1) stage due to carbonation of cement and lime within Breathaplasta;
• Manufacturing (A3), incoming transportation of materials (A2) and transport of waste at end-of-life (C2) also make a notable contribution to life cycle impacts for the majority of impact categories; and
• All other modules make a minor or immaterial contribution to life cycle impacts for the majority of impact categories.

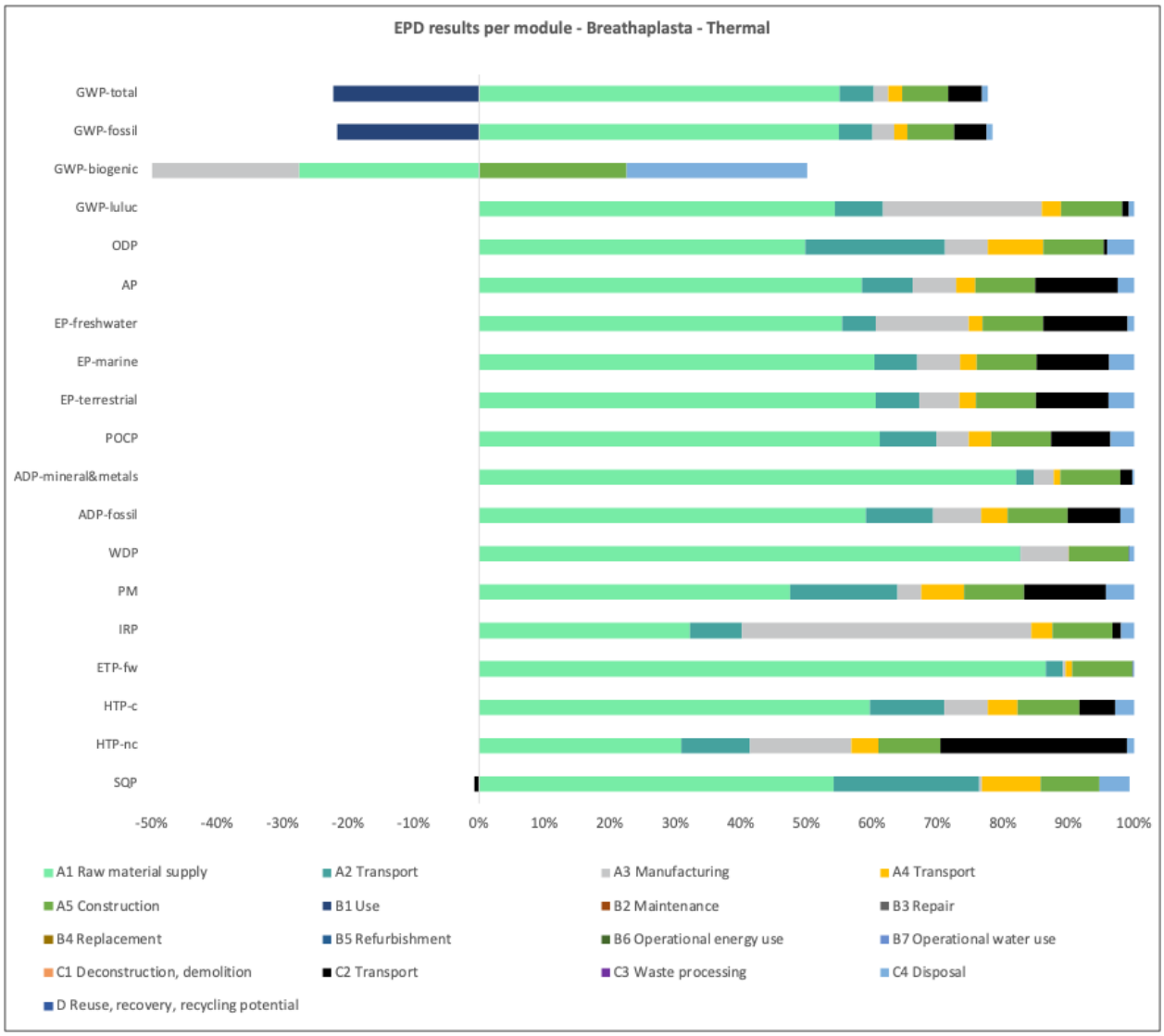


Figure 1: LCIA hotspots for cradle-to-grave lifecycle stages of 1 kg of Breathaplasta Thermal

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