



Statement of Verification

BREG EN EPD No: 000773

Issue: 01

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

Gradus Limited

are in accordance with the requirements of:

EN 15804:2012+A2:2019

and

BRE Global Scheme Document SD207

This declaration is for:

1 meter of Wall Cladding Systems with an average weight of 8.76 kg/m.

Company Address

Park Green,
Macclesfield,
Cheshire
SK11 7LZS



GRADUS

Signed for BRE Global Limited

Hayley Thomson

Operator

10 April 2026

Date of this Issue

10 April 2026

Date of First Issue

09 April 2031

Expiry Date



This Statement of Verification is issued subject to terms and conditions (for details visit www.greenbooklive.com/terms).

To check the validity of this statement of verification please, visit www.greenbooklive.com/check or contact us.

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Environmental Product Declaration

EPD Number: 000773

General Information

EPD Programme Operator	Applicable Product Category Rules
BRE Global Watford, Herts WD25 9XX United Kingdom	BRE Environmental Profiles 2025 Product Category Rules for Type III environmental product declaration of construction products to EN 15804+A2 PN 514 Rev 3.2
Commissioner of LCA study	LCA consultant/Tool
Gradus Limited	Regina Poveda BRE LINA V2.0
Declared/Functional Unit	Applicability/Coverage
1 meter of Wall Cladding Systems with an average weight of 8.76 kg/m.	Product Average.
EPD Type	Background database
Cradle to Grave	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 <input checked="" type="checkbox"/> Internal <input type="checkbox"/> External	
(Where appropriate ^b)Third party verifier: Kim Allbury	
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
A1	A2	A3	A4	A5	Related to the building fabric					Related to the building		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
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Note: Ticks indicate the Information Modules declared.

Manufacturing site(s)

Winsford
 Gerflor Flooring UK Building,
 16 Road One,
 Winsford
 CW7 3QA

Construction Product:

Product Description

Wall Cladding Systems provide a durable and defensive layer designed to protect large surfaces from scuffs and scrapes, generally caused by pedestrians and movable objects such as chairs, trolleys and tables.

This is an average EPD and includes SureProtect Pure, SureProtect Endure, SureProtect Design and SureProtect Artworx.

All products have the same composition. Gradus offers the option to adjust the length on-site.



SureProtect Pure



SureProtect Endure



SureProtect Design



SureProtect Artworx

Technical Information

Property	SureProtect Endure	SureProtect Pure	SureProtect Design	SureProtect Artworx
Colours	35	21	7	Printed
Reaction to fire classification EN 13501-1: Class B Fire/s3 Smoke	✓	✓	✓	✓
Standard ISO22196:2011 and HBN 00-09	-	✓	-	-
Size	2440mm x 1220mm x 1.5mm. Bespoke sizes available	2440mm x 1220mm x 2.5mm 2500mm x 1220mm x 2.5mm 3048mm x 1220mm x 2.5mm Bespoke sizes available	3000mm x 1300mm x 2mm Bespoke sizes available	2440mm x 1220mm 3048mm x 1220mm (max size) Bespoke sizes available

Note: Technical information is available in the brochure, "Wall Protection Systems."
<https://www.gradus.com/download/brochure-wall-protection-systems>



Main Product Contents

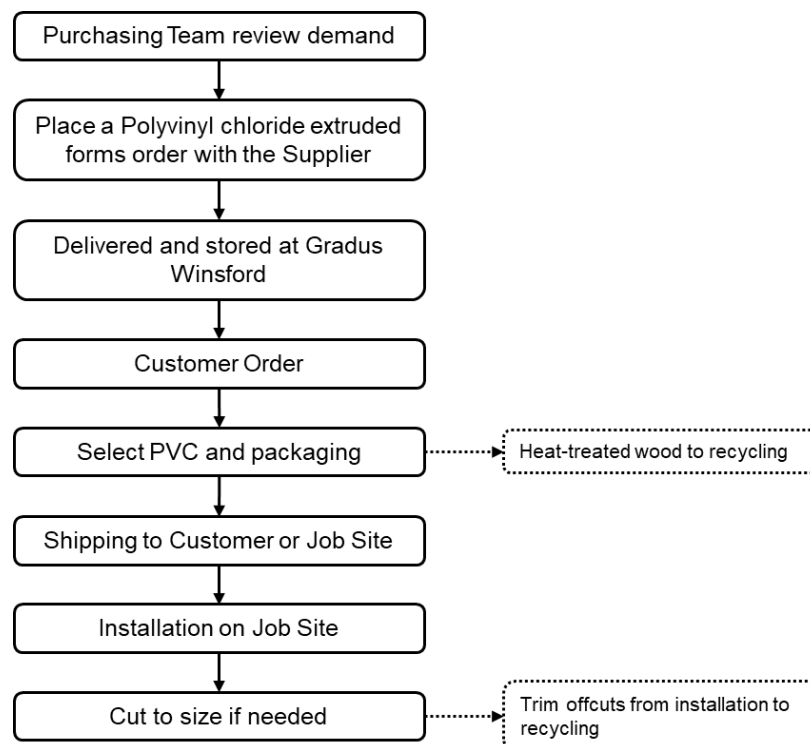
Material/Chemical Input	%
Polyvinyl chloride extruded forms (PVC)	100



Manufacturing Process

The wall cladding demand is reviewed and ordered by the Purchasing team. The order is delivered and stored at Gradus' Winsford site. Once a customer order is requested, the PVC is selected and packaged. The waste produced by the wood packaging is sent to a recycling facility. The Wall Cladding Systems are sent to the customer or job site, where they are installed and cut to size if needed. From this process, the trim offcuts are sent to a recycling facility. During installation, there is no energy used; only battery-powered tools are required. The electricity used at the Winsford sites is from the national grid.

Process flow diagram



Construction Installation

The transport distance to the construction site is set at 688 km by road, considering that the construction sites are based in the UK. All Wall Cladding Systems are sent via Gradus' own transport. Vehicles leave loaded and make multiple drop-offs on their route. These trucks are then utilised depending on the route to bring raw materials back from suppliers, such as raw PVC from a supplier.

Wall Cladding Systems installation happens at the final part of the construction project. Well before the job commences, the project team will price the job and work out the total meterage needed for the job. This includes a small % to allow for errors in estimation. Once the materials have been delivered to the site, our contracts team will move the material to the specific part of the job for installation.

Wall Cladding Systems are installed as full panels most of the time and only cut on the side where a full sheet will not fit. The remainder is used again where a part panel is required. They are installed using adhesive directly onto the substrate, and joints are then sealed with a weld rod to provide a continuous, hygienic, sealed surface. For installation, only battery-powered tools are used; no water is required.

Use Information

Wall Cladding Systems are installed in public buildings as wall protection on corners. Some have an aluminium retainer fixed to the wall corner, and then the PVC guarding attached to the retainer. The most common installation is fixing the corner guard directly to the substrate with commercial adhesive or



commercial-grade double sided, tape-dependant on the substrate. After installation, the maintenance of the Wall Cladding Systems includes only regular cleaning, which is done as needed by customer requirements. If a section of the Wall Cladding Systems is damaged, the product is replaced with another one. For this LCA analysis, it is assumed that the Wall Cladding Systems will be replaced once every 20 years. This assumption is based on the Wall protection warranty. Please contact Gradus Ltd for more information. During its use, Wall Cladding Systems do not require energy and/or water for normal operation.

End of Life

The building demolition can be done using different methods, which are linked to construction methodology and local geography. When the product reaches its End-of-Life, and the building is demolished; Wall Cladding Systems will be removed manually.

The End-of-Life scenario for the Wall Cladding Systems is based industrial average for Weatherboarding, Vinyl (PVC, cellular) 100% incineration with energy recovery according to BRE EN15804 A2 PCR 3.2. The energy used for removing the components from the final waste is considered to be negligible.



Life Cycle Assessment Calculation Rules

Declared / Functional unit description

1 meter of Wall Cladding Systems with an average weight of 8.76 kg/m.

System boundary

This is a Cradle to Grave LCA, reporting all modules of production stage A1 to A3, Construction process stage A4 – A5, Use stage B1-B7, end of life stage C1-C4 and Module D in accordance with EN15804:2012+A2:2019 and BRE 2025 Product Category Rules (PN 514 Rev. 3.2).

Data sources, quality and allocation

The LCA analysis is conducted for 1 meter of Wall Cladding Systems with an average weight of 8.76 kg/m, and it includes the manufacturer-specific data from Gradus covering a period of one year from 01 January 2024 to 31 December 2024.

Specific primary data derived from the Wall Cladding Systems production process in Gradus Limited sites, Winsford, Gerflor Flooring UK Building, 16 Road One, Winsford, CW7 3QA, has been modelled using BRE LINA A2 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. In addition to Wall Cladding Systems, other products are manufactured in the Winsford manufacturing site. Wall Cladding Systems account for 12% Winsford's total production.

All raw material, ancillary, packaging and production waste have been taken from actual usages of the site production provided by Gradus Ltd. As per energy and fuels, water and wastewater values have been allocated by mass production. There is no uplift of the raw material as it is within tolerance.

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. 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.

Gradus provides a 20-year warranty for SureProtect Endure and SureProtect Pure, and it includes manufacturing defects and excludes failure of the double-sided tape bond and welded and/or mastic joints used with SureProtect. However, this EPD includes other products. Therefore, an industrial average Reference Service Life has been used according to PVC, Weatherboarding, Vinyl (PVC, cellular) based on BRE 2025 Product Category rules (PN 514 Rev 3.2).

ISO14044 guidance. 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).	Less than 3 years difference between the reference year according to the documentation, and the time period for which data are representative

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 very good as the background LCI datasets are based on ecoinvent v3.8 which was compiled in 2021. The quality level of time representativeness is also Very Good, as the background LCI datasets are based on ecoinvent v3.8 which was compiled in 2021. Therefore, there is less than 3 years between the ecoinvent LCI reference year and the time period for which the LCA was undertaken.



Power mix uses a location-based approach. Therefore, UK Consumption mix was used for electricity with an emission factor of 0.239kgCO₂e/kWh.

Cut-off criteria

All processes associated with the manufacturing process have been included. All inputs or outputs have been included and all raw materials, ancillary, packaging, energy and fuels, water use, and wastes are included, except for direct emissions to air, water and soil which are not measure. Upstream extraction and/or processing of inputs are included within the use of background datasets within LINA.



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	2.46E+01	2.47E+01	-1.65E-01	2.61E-02	1.02E-05	1.18E-01	8.28E-03
	Transport	A2	4.43E-02	4.42E-02	3.77E-05	1.74E-05	1.02E-08	1.80E-04	2.85E-06
	Manufacturing	A3	1.19E-01	1.06E-01	1.31E-02	1.06E-04	7.18E-09	2.25E-04	1.53E-05
	Total (Consumption grid)	A1-3	2.48E+01	2.49E+01	-1.52E-01	2.62E-02	1.03E-05	1.18E-01	8.30E-03
Construction process stage	Transport	A4	1.00E+00	1.00E+00	8.54E-04	3.93E-04	2.32E-07	4.07E-03	6.45E-05
	Construction	A5	1.06E+00	1.06E+00	-3.52E-03	1.00E-03	3.74E-07	4.67E-03	3.12E-04
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	5.38E+01	5.40E+01	-3.09E-01	5.53E-02	2.18E-05	2.55E-01	1.74E-02
	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
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	7.29E-02	7.28E-02	6.21E-05	2.86E-05	1.68E-08	2.96E-04	4.69E-06
	Waste processing	C3	1.85E+01	1.85E+01	3.99E-02	2.56E-03	5.82E-07	1.37E-02	8.09E-04
	Disposal	C4	0.00E+00	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	-5.05E+00	-4.97E+00	-6.50E-02	-5.26E-03	-3.51E-07	-2.89E-02	-2.74E-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 & metal	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	2.25E-02	2.28E-01	7.24E-02	3.38E-04	5.21E+02	1.72E+01	1.03E-06
	Transport	A2	5.41E-05	5.91E-04	1.81E-04	1.54E-07	6.69E-01	3.01E-03	3.82E-09
	Manufacturing	A3	8.66E-05	7.55E-04	1.89E-04	5.81E-07	2.41E+00	1.51E-02	1.85E-09
	Total (Consumption grid)	A1-3	2.27E-02	2.30E-01	7.28E-02	3.39E-04	5.24E+02	1.72E+01	1.04E-06
Construction process stage	Transport	A4	1.22E-03	1.34E-02	4.10E-03	3.48E-06	1.51E+01	6.82E-02	8.64E-08
	Construction	A5	9.58E-04	9.40E-03	3.03E-03	1.26E-05	2.09E+01	6.74E-01	4.56E-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	4.99E-02	5.07E-01	1.60E-01	7.10E-04	1.12E+03	3.59E+01	2.35E-06
	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
End of life	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
	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	8.90E-05	9.72E-04	2.98E-04	2.53E-07	1.10E+00	4.95E-03	6.28E-09
	Waste processing	C3	3.99E-03	3.66E-02	1.02E-02	1.98E-05	2.86E+01	3.49E+01	1.09E-07
Potential benefits and loads beyond the system boundaries	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Reuse, recovery, recycling potential	D	-4.22E-03	-4.19E-02	-1.17E-02	-2.93E-06	-7.86E+01	-2.09E+00	-2.02E-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	2.55E+00	4.69E+02	1.68E-08	4.04E-07	9.74E+01
	Transport	A2	3.44E-03	5.22E-01	1.69E-11	5.47E-10	4.60E-01
	Manufacturing	A3	7.85E-02	1.53E+00	5.25E-11	9.93E-10	1.84E+00
	Total (Consumption grid)	A1-3	2.64E+00	4.71E+02	1.68E-08	4.05E-07	9.97E+01
Construction process stage	Transport	A4	7.78E-02	1.18E+01	3.83E-10	1.24E-08	1.04E+01
	Construction	A5	9.98E-02	1.88E+01	7.48E-10	1.57E-08	4.43E+00
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	5.64E+00	1.00E+03	3.60E-08	8.69E-07	2.30E+02
	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
End of life	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	5.66E-03	8.59E-01	2.78E-11	9.01E-10	7.56E-01
	Waste processing	C3	1.94E-01	1.03E+03	3.74E-09	2.88E-07	1.62E+01
	Disposal	C4	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	-1.27E+00	-7.19E+01	-1.18E-09	-3.70E-08	-2.39E+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	3.07E+01	0.00E+00	3.07E+01	3.29E+02	1.88E+02	5.17E+02
	Transport	A2	9.42E-03	0.00E+00	9.42E-03	6.57E-01	0.00E+00	6.57E-01
	Manufacturing	A3	4.32E-01	3.17E-01	7.49E-01	3.03E+00	1.35E-01	3.17E+00
	Total (Consumption grid)	A1-3	3.11E+01	3.17E-01	3.14E+01	3.33E+02	1.88E+02	5.21E+02
Construction process stage	Transport	A4	2.13E-01	0.00E+00	2.13E-01	1.49E+01	0.00E+00	1.49E+01
	Construction	A5	1.11E+00	2.51E-02	1.14E+00	-4.63E-01	2.02E+01	1.98E+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	6.49E+01	6.83E-01	6.56E+01	6.96E+02	4.17E+02	1.11E+03
	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
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	1.55E-02	0.00E+00	1.55E-02	1.08E+00	0.00E+00	1.08E+00
	Waste processing	C3	2.62E+00	0.00E+00	2.62E+00	-1.60E+02	1.88E+02	2.83E+01
	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	-1.16E+01	0.00E+00	-1.16E+01	-7.89E+01	0.00E+00	-7.89E+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	1.04E-01	0.00E+00	0.00E+00	4.12E-01
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	7.46E-05
	Manufacturing	A3	6.70E-04	2.06E-06	0.00E+00	7.44E-04
	Total (Consumption grid)	A1-3	1.05E-01	2.06E-06	0.00E+00	4.13E-01
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	1.69E-03
	Construction	A5	3.69E-03	7.19E-08	0.00E+00	1.61E-02
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	2.17E-01	4.25E-06	0.00E+00	8.62E-01
	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
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	1.23E-04
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	8.13E-01
	Disposal	C4	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	-5.20E-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	1.79E+00	3.84E+01	8.91E-04
	Transport	A2	7.37E-04	1.31E-02	4.53E-06
	Manufacturing	A3	4.77E-03	9.58E-02	2.04E-05
	Total (Consumption grid)	A1-3	1.79E+00	3.85E+01	9.16E-04
Construction process stage	Transport	A4	1.67E-02	2.97E-01	1.02E-04
	Construction	A5	7.19E-02	1.41E+00	3.31E-05
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	3.77E+00	8.04E+01	2.12E-03
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00
End of life	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00
	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.21E-03	2.15E-02	7.45E-06
	Waste processing	C3	4.84E+00	1.18E+01	1.41E-04
Potential benefits and loads beyond the system boundaries	Disposal	C4	0.00E+00	0.00E+00	0.00E+00
	Reuse, recovery, recycling potential	D	-3.22E-01	-1.71E+01	-3.86E-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
			kg	kg	kg	MJ per energy carrier
Product stage	Raw material supply	A1	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
	Manufacturing	A3	0.00E+00	3.56E-05	1.58E-08	1.65E-03
	Total (Consumption grid)	A1-3	0.00E+00	3.56E-05	1.58E-08	1.65E-03
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Construction	A5	0.00E+00	3.10E-01	2.55E-03	5.74E-05
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	6.20E-01	5.09E-03	3.40E-03
	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
End of life	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	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	0.00E+00
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	6.65E+01
Potential benefits and loads beyond the system boundaries	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Reuse, recovery, recycling potential	D	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

Biogenic carbon (product)	Biogenic carbon (packaging)
kg C	kg C
0.00E+00	1.33E-02

Scenarios and additional technical information

Scenarios and additional technical information			
Scenario	Parameter	Units	Results
A4 – Transport to the building site	All Wall Cladding Systems are transported using Gradus transport. Lorries are loaded and make multiple drop-offs on their route. When needed, the same lorries are used to carry raw material from suppliers, depending on the route. To conduct the LCA analysis, it is assumed that the Wall Cladding products are sold only in the UK. Therefore, a transport distance from the Winsford site to the building site is assumed to be 688 km.		
	Vehicle type	Litre of fuel type per distance or vehicle type	Lorry, 16 -32 metric ton
	Distance:	km	688
	Capacity utilisation (incl. empty returns)	%	50
A5 – Installation in the building	Installation occurs near the final part of the construction project. Well before the job commences, the project team will price the job and work out the total meterage needed for the job. This includes a small % to allow for errors in estimation. Once the materials have been delivered to the site, our contracts team will move the material to the specific part of the job for installation. Wall panels are installed as full panels most of the time and only cut on the side to where a full sheet will not fit. The remainder is used again where a part panel is required. They are installed using adhesive straight onto the substrate, joints are then sealed with a weld rod to give a continuous, hygienic sealed surface.		
	Installation wastage rate	%	3.5
	Trim offcuts from installation - PVC to recycling	kg	0.31
B1 - Use	Wall Cladding Systems are installed to provide wall protection on corners.		
B2 – Maintenance	Wall Cladding Systems only require general cleaning. No ancillary materials, energy and/or water are needed during this process.		
B3 – Repair	No repairs are carried out for Wall Cladding Systems.		
B4 – Replacement	If a section of Wall Cladding Systems is damaged, the section is removed and a new section fitted in its place. The replacement of the Handrail product is more likely to occur once the product reaches the end of its service life, which typically occurs after 20 years.		
	Number of replacements per study period	Qty	2
B5 – Refurbishment	No refurbishment is carried out for Wall Cladding Systems.		
Reference service life	Industrial average based on BRE 2025 Product Category rules (PN 514 Rev 3.2).		
	PVC, Weatherboarding, Vinyl (PVC, cellular)	years	35
B6 – Use of energy	No operational energy needed.		
B5 – Refurbishment	No refurbishment is carried out for Wall Cladding Systems.		
B7 – Use of water	No operational water needed.		
C1 – Deconstruction	When Wall Cladding Systems reach the End-of-Life, they will be manually removed and sent to a waste processing facility. It is assumed that 100% of the product is recovered for final disposal.		



Scenarios and additional technical information

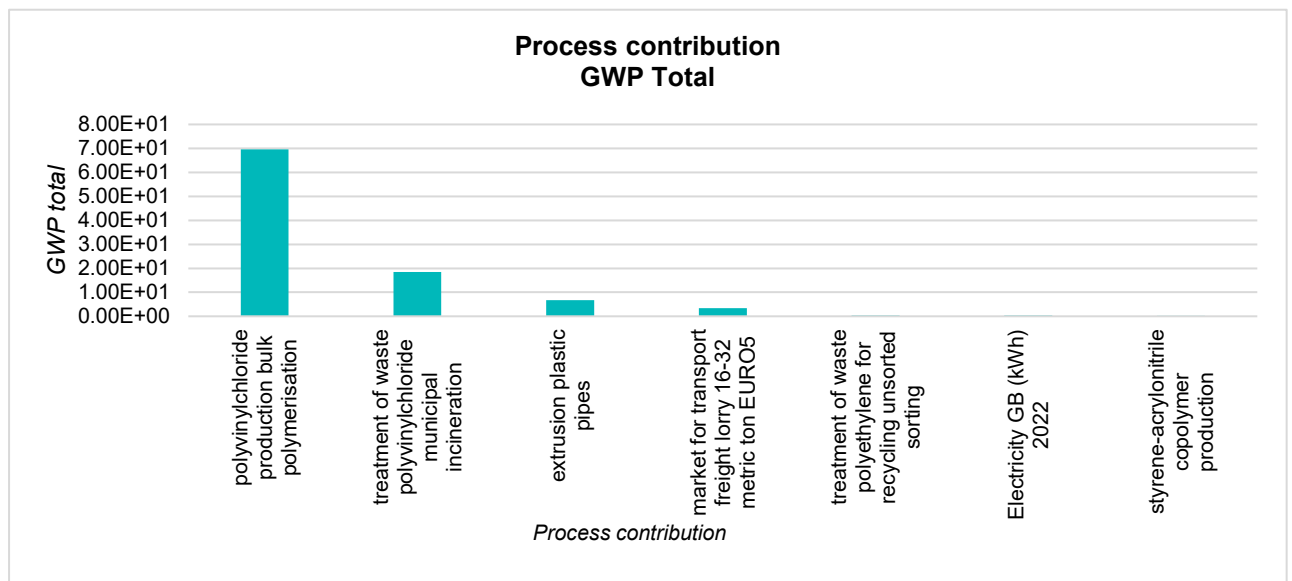
Scenario	Parameter	Units	Results
C2 - Transport	50km by road has been modelled for module C2 as a typical distance from the demolition site to the recycling/ landfill unit. However, end-users of the EPD can use this information to calculate the impacts of a bespoke transport distance for module C2 if required.		
	Road transport	km	50
C3 - Preprocessing	Once Wall Cladding Systems reach the End-of-Life, they will be sent to the waste processing facility. The industrial End-of-Life scenario has been selected for PVC, Weatherboarding, Vinyl (PVC, cellular). I.e. 100% incineration with energy recovery. The End-of-Life scenario is based on BRE 2025 Product Category rules (PN 514 Rev 3.2)		
	PVC to incineration with energy recovery	kg	8.76
C4 - Disposal	There is no disposal		
Module D	<p>“Benefits and loads beyond the system boundary” (module D) accounts for the environmental benefits and loads resulting from PVC that are used as raw material in Wall Cladding Systems, and that are collected for incineration at the end-of-life. It is considered that 100% of the PVC will be incinerated.</p> <p>For the benefits arising from incineration, the calorific value of Polyvinyl Chloride (PVC) has been considered, based on the Combustion and Gasification Properties of Plastics Particles (https://doi.org/10.1080/10473289.1997.10464461). The efficiency rate of 37.4% has been calculated by taking the weighted average of the number of waste incineration plants available in the UK. According to the Environmental Agency's 2013 article on "CHP Ready Guidance for Combustion and Energy from Waste Power Plants" in the UK, EFW plants have an efficiency of 33%, and CHP plants have an efficiency of 55%. Additionally, according to Azapagic, A., & Jeswani, H. K. (2016), there are currently 25 MSW incinerators with energy recovery in the UK. It is assumed that 20 plants generate heat and power at 33%, while 5 plants generate electricity at 55%. Therefore, the weighted average calculation is used to determine the efficiency, which is calculated at 37.5%.)</p> <p>The calculation includes a bespoke dataset for heat and electricity. The dataset used to calculate the avoided impacts of heat and electricity consumption in a future system was 'Heat, district or industrial, other than natural gas {Europe without Switzerland} market for heat, district or industrial, other than natural gas EN15804, U', 'Heat, district or industrial, natural gas {Europe without Switzerland} market for heat, district or industrial, natural gas EN15804, U. ', 'Electricity, high voltage {Europe without Switzerland} market group for electricity, high voltage EN15804, U' all of them are from 2021.</p> <p>Calorific value of PVC: 21.2MJ/kg</p>		
	Benefits due to the incineration of waste PVC	Kg	8.76



Interpretation of results

The bulk of environmental impacts are attributed to the Product Module covered by information modules A1-A3 of EN 15804:2012+A2:2019. i.e Raw material supply. The GWP total for A1 is 2.46E+01 kg CO₂ eq.

The GWP Total process contribution can be found in the table below and it show that the major contributor is polyvinylchloride production bulk polymerisation by 73.97%.





References

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