

## Statement of Verification

BREG EN EPD No.: 000388

Issue 01

This is to verify that the  
**Environmental Product Declaration**  
provided by:  
**GCP Applied Technologies**



is in accordance with the requirements of:

**EN 15804:2012+A1:2013**

and

**BRE Global Scheme Document SD207**

This declaration is for:

**1m<sup>2</sup> of Preprufe® 300R, Preprufe® 300R Plus, Preprufe® 160R and Preprufe® 160R Plus Waterproofing Membrane**

### Company Address

487/488 Ipswich Road  
Slough  
Berkshire  
SL1 4EP



**gcp** applied technologies



Signed for BRE Global Ltd

Emma Baker  
Operator

05 November 2021  
Date of this Issue

05 November 2021  
Date of First Issue

04 November 2026  
Expiry Date



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## Environmental Product Declaration

EPD Number: 000388

### General Information

EPD Programme Operator	Applicable Product Category Rules
BRE Global Watford, Herts WD25 9XX United Kingdom	BRE Environmental Profiles 2013 Product Category Rules for Type III environmental product declaration of construction products to EN 15804:2012+A1:2013
Commissioner of LCA study	LCA consultant/Tool
GCP Applied Technologies 487/488 Ipswich Road Slough Berkshire SL1 4EP	Andrew Dutfield/BRE LINA v2.0
Declared Unit	Applicability/Coverage
1m <sup>2</sup> (1.39 kg/m <sup>2</sup> maximum manufactured weight) of Preprufe® 300R, Preprufe® 300R Plus, Preprufe® 160R and Preprufe® 160R Plus waterproofing membrane installed over a 60 year period.	Product Average.
EPD Type	Background database
Cradle to Gate with options	ecoinvent v3.2
Demonstration of Verification	
CEN standard EN 15804 serves as the core PCR <sup>a</sup>	
Independent verification of the declaration and data according to EN ISO 14025:2010 <input type="checkbox"/> Internal <input checked="" type="checkbox"/> External	
(Where appropriate <sup>b</sup> )Third party verifier: Pat Hermon	
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+A1:2013. 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+A1:2013 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
<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 type="checkbox"/>

Note: Ticks indicate the Information Modules declared.

## Manufacturing site

350 Magnolia Drive  
Mt. Pleasant, Tennessee 38474  
USA

## Construction Product

### Product Description

Preprufe® waterproof membranes are composite sheets comprising a robust HPDE backing, a pressure sensitive adhesive and a trafficable weather resistant coating. Uniquely, the membrane develops a continuous adhesive bond to concrete poured against it. This prevents water migration between the structure and the membrane, substantially reducing the risk of leaks. Preprufe® is used as a moisture and gas barrier underneath structures. This EPD covers the products Preprufe® 300R, Preprufe® 300R Plus, Preprufe® 160R and Preprufe® 160R Plus waterproofing membranes and is calculated from a production weighted average of all products.

<https://gcpat.uk/en-gb/solutions/products/preprufe-pre-applied-waterproofing-solutions>

### Technical Information

Property	160R/160R Plus Value, Unit	300R/300R Plus Value, Unit
Visible defects (EN1850-2)	None	None
Straightness (EN1848-2)	Pass	Pass
Length (EN1848-2)	35.15-36.65 m ± 0.25	30.15-31.15 m ± 0.25
Thickness (EN1849-2)	0.8-0.85 mm ± 0.06	1.2-1.23 mm ± 0.06
Width Carrier Sheet (EN1848-2)	1.206-1.18 m ± 0.01	1.206-1.18 m ± 0.01
Mass per unit area net of release paper (EN1849-2)	810 g/m <sup>2</sup> ± 50	1150 g/m <sup>2</sup> ± 50
Water tightness to liquid water (at 60 kPa) (EN1928)	Pass	Pass

Property	160R/160R Plus Value, Unit	300R/300R Plus Value, Unit
Resistance to impact (AI board) (EN12691)	≥ 250 mm	≥ 400 mm
Resistance to tearing (Nail Shank)- unreinforced sheets (EN12310-1)	≥ 300 N	≥ 450 N
Joint strength (EN12317-2)	≥ 480 N/50mm	≥ 850 N/50mm
Water vapour transmission (EN1931)	700-950 μ (= sD/d) ± 30%	700-950 μ (= sD/d) ± 30%
Durability of water tightness against ageing/degradation (at 60 kPa) (EN1296 / EN1928 Method B)	Pass	Pass
Durability of water tightness against chemicals (at 60 kPa) (EN 1847 Method B / EN 1928 Method B)	Pass	Pass
Durability of tensile properties against chemicals (EN13967 Annex C)	Pass	Pass
Compatibility with bitumen (EN1548)	Pass	Pass
Resistance to static loading (EN12730)	≥ 20 - Pass	≥ 20 - Pass
Tensile properties – unreinforced sheets (EN 12311-2 Method A)	Longitudinal ≥ 60 N/50mm Transversal ≥ 60 N/50mm	Longitudinal ≥ 110 N/50mm Transversal ≥ 120 N/50mm
Tensile properties – unreinforced sheets - elongation (%) (EN 12311-2 Method A)	Longitudinal ≥ 4.5% Transversal ≥ 4.0%	Longitudinal ≥ 4.5% Transversal ≥ 4.0%
Reaction to fire (Class; test conditions) (EN 13501-1)	E	E



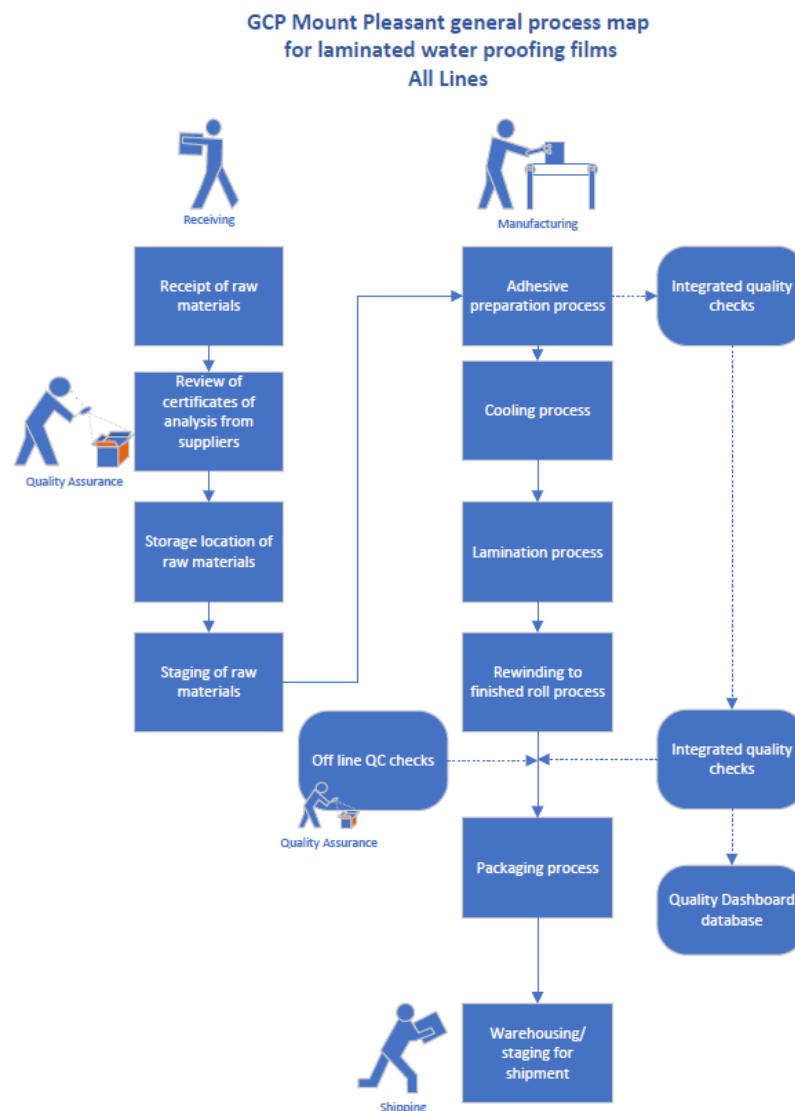
## Main Product Contents

Preprufe® 300R, Preprufe® 300R Plus, Preprufe® 160R and Preprufe® 160R Plus Material/Chemical Input	Average %
High density polyethylene, HDPE	63.5
Proprietary polymers and additives	33.4
Lagcoat or Lagcoat Plus release liner	3.1
Total	100

## Manufacturing Process

Heated adhesive is coated onto a film. A release liner/protective coating is applied and the product is cut to length, rolled and boxed for shipment.

## Process flow diagram



## Construction Installation

Preprufe® is a pre-applied 1.2 m wide membrane on rolls for adhesive bond to freshly poured concrete, installed without heat or open flame, prior to the installation and fixing of steel reinforcement and the concrete pour. The overlaps of the membrane sheets are bonded by means of the prefabricated self-adhesive edges on the membrane sheets. Roll ends and details are bonded and sealed with Preprufe accessory tape. Due to the overlaps of the membrane sheets the average consumption of membrane per 1m<sup>2</sup> is approx. plus 7.5%. Installation work shall be carried out only by GCP trained applicators/contractors. For further details refer to data sheets on <https://gcpat.com/en/solutions/products/preprufe-membrane-pre-applied-waterproofing-solutions>.

## Use Information

If the Preprufe® system is properly and correctly installed as per GCP instructions, no maintenance, repair or replacement is required during the service life of the structure. The highly durable, robust and extremely reliable feature of the Preprufe® system will limit any repair work to a minimum, if membrane damage occurs the fully bonded membrane will prevent any water migration and between membrane and the concrete structure in the event of puncturing or damaging the membrane. Thus no scenario for repair work is defined.

## End of Life

When a building is demolished at the end of its service life, the Preprufe® system bonded to the concrete cannot be separated and remains part of the construction rubble. This is in general taken to landfill. Preprufe® is only a minor part of the whole volume during demolition of the concrete structure. Therefore no other steps are considered as necessary with the exception for transportation to a landfill.

If the client and wrecking contractor are required according to local regulations to separate the demolished concrete from steel reinforcement and other embedded items, the Preprufe® will remain bonded to the concrete, which can be grinded to smaller concrete particles and used as backfilling material or substrate in other construction work.

## Life Cycle Assessment Calculation Rules

### Declared unit description

1m<sup>2</sup> (1.39 kg/m<sup>2</sup> maximum manufactured weight) of Preprufe® 300R, Preprufe® 300R Plus, Preprufe® 160R and Preprufe® 160R Plus waterproofing membrane installed over a 60 year period.

### System boundary

This is a cradle to gate with options LCA of GCP's Preprufe® 300R, Preprufe® 300R Plus, Preprufe® 160R and Preprufe® 160R Plus waterproofing membrane products, manufactured by GCP in the United States. It follows the modular design defined in EN15804:2012+A1:2013. Cradle to gate modules, A1 to A3 and optional modules A4 to C4, are reported but not module D.

### Data sources, quality and allocation

Manufacturer-specific data from GCP covering a production period from 1st January to 30th April 2021 has been used for this EPD. Figures for input materials and packaging were uplifted to account for production waste.

GCP manufacture other products at the Mt. Pleasant site. Allocation by mass has been used to calculate the input energy flows (electricity and natural gas), emissions to air and water and waste flows per selected products according to the provisions of the BRE PCR PN514 and EN 15804. Product formulations including

packaging data were combined with allocated manufacturing data to calculate the cradle to gate LCA profiles for the Preprufe® products. Preprufe® products form 18.1% of total production at the site.

Since the Preprufe® 300R and 300R Plus products have the same weight per square metre, a production weighted average has been calculated for all entries. The 300R and 300R Plus products are also heavier per m<sup>2</sup> than the 160R and 160R Plus products and so the 300R and 300R Plus products were chosen to represent all products as a 'worst case scenario'. Figures for input materials and packaging were uplifted to account for production waste. The difference in weight between manufactured and installed weights is due to the release paper being removed during installation.

All data for modules A4 to C4 has been supplied by GCP. The waste created at installation is assumed to go to landfill. The scenario of transport to a landfill site in South London from an installation in the centre of London has been assumed. Preprufe® LT tape is used for the installation of the membrane. This is transported from the USA plant along with the membrane.

Secondary data have been drawn from the BRE LINA database v2.0.82 and the background LCI datasets are based on ecoinvent v3.2 (2015).

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)	n/a
Fair	n/a	n/a	Less than 10 years of difference between the reference year according to the documentation, and the time period for which data are representative

The quality level of geographical and technical representativeness is Very Good. The quality level of time representativeness is Fair as the background LCI datasets are based on ecoinvent v3.2 which was compiled in 2015 and so there is less than 10 years between the reference year according to the documentation, and the time period for which data are representative.

### Cut-off criteria

No inputs or outputs have been excluded. All raw materials and packaging inputs, plus their transport, process and general energy and water use, production and non-production waste, and direct emissions to air have been included. Direct emissions to water and soil have not been included as these are not measured.

## LCA Results

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

Parameters describing environmental impacts			GWP	ODP	AP	EP	POCP	ADPE	ADPF
			kg CO <sub>2</sub> equiv.	kg CFC 11 equiv.	kg SO <sub>2</sub> equiv.	kg (PO <sub>4</sub> ) <sup>3-</sup> equiv.	kg C <sub>2</sub> H <sub>4</sub> equiv.	kg Sb equiv.	MJ, net calorific value.
Product stage	Raw material supply	A1	AGG	AGG	AGG	AGG	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG	AGG	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG	AGG	AGG	AGG	AGG
	Total (of product stage)	A1-3	3.69E+00	2.22E-07	1.78E-02	9.12E-03	4.66E-03	8.77E-06	1.14E+02
Construction process stage	Transport	A4	3.39E-01	6.01E-08	2.98E-03	4.48E-04	2.89E-04	6.52E-07	5.03E+00
	Construction	A5	1.16E+00	7.06E-08	5.46E-03	2.16E-03	7.74E-04	5.66E-06	2.55E+01
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
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	1.63E-03	2.99E-10	5.44E-06	1.44E-06	9.49E-07	4.28E-09	2.46E-02
	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	1.22E-01	3.88E-09	1.12E-04	1.02E-02	3.73E-05	2.17E-08	3.55E-01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	MND	MND	MND	MND	MND	MND	MND

GWP = Global Warming Potential;  
 ODP = Ozone Depletion Potential;  
 AP = Acidification Potential for Soil and Water;  
 EP = Eutrophication Potential;

POCP = Formation potential of tropospheric Ozone;  
 ADPE = Abiotic Depletion Potential – Elements;  
 ADPF = Abiotic Depletion Potential – Fossil Fuels;



## LCA Results (continued)

Parameters describing resource use, primary energy			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	AGG	AGG	AGG	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG	AGG	AGG	AGG
	Total (of product stage)	A1-3	1.33E+01	1.20E-03	1.33E+01	1.18E+02	1.08E+02	2.26E+02
Construction process stage	Transport	A4	8.40E-02	2.13E-07	8.40E-02	5.04E+00	0.00E+00	5.04E+00
	Construction	A5	1.54E+00	3.82E-05	1.54E+00	2.64E+01	0.00E+00	2.64E+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
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	3.26E-04	1.21E-09	3.26E-04	2.44E-02	0.00E+00	2.44E-02
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Disposal	C4	1.29E-02	3.38E-08	1.29E-02	3.66E-01	0.00E+00	3.66E-01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	MND	MND	MND	MND	MND	MND

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)

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 <sup>3</sup>
Product stage	Raw material supply	A1	AGG	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG	AGG
	Total (of product stage)	A1-3	0.00E+00	0.00E+00	0.00E+00	5.71E-02
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	1.13E-03
	Construction	A5	0.00E+00	0.00E+00	0.00E+00	3.18E-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	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
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	5.33E-06
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	4.07E-04
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	MND	MND	MND	MND

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)

Other environmental information describing waste categories			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG
	Total (of product stage)	A1-3	1.19E-01	3.65E-01	1.14E-04
Construction process stage	Transport	A4	2.11E-03	1.67E-01	3.46E-05
	Construction	A5	1.99E-02	2.02E-01	4.79E-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	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
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.03E-05	1.15E-03	1.69E-07
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00
	Disposal	C4	2.73E-04	1.39E+00	2.32E-06
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	MND	MND	MND

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

## LCA Results (continued)

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	AGG	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG	AGG
	Total (of product stage)	A1-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Construction	A5	0.00E+00	1.69E-01	0.00E+00	0.00E+00
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
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	0.00E+00
	Waste processing	C3	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
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	MND	MND	MND	MND

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	Distances from US plant to UK distribution including Preprufe® LT tape used for installation.			
	Diesel/ 16-32 t lorry	Kg/vkm	0.3	
	Distance:	km	1012.3	
	Lorry capacity utilisation (incl. empty returns)	%	24	
	Ship distance by sea	km	6614.4	
	Ship capacity utilisation (incl. empty returns)	%	65	
	Weight of transported products	Kg per roll	50	
A5 – Installation in the building	Preprufe® is a pre-applied 1.2 m wide membrane on rolls to achieve adhesive bonds to freshly poured concrete, installed without heat or open flame, prior to the installation and fixing of steel reinforcement and the concrete pour. The overlaps of the membrane sheets are bonded by means of the prefabricated self-adhesive edges on the membrane sheets. Roll ends and details are bonded and sealed with Preprufe® LT accessory tape.			
	Preprufe® LT tape	kg	0.26	
	Preprufe® waterproofing membrane waste at installation (2.5%)	kg	0.034	
	Transport of installation waste to landfill: Diesel/ 16-32 t lorry	kg/vkm	0.3	
	Distance	km	7	
B1 - Use B2 – Maintenance B3 – Repair B4 – Replacement B5 – Refurbishment	Preprufe® is a fully bonded waterproofing membrane for below ground waterproofing of building structures. Uniquely, the membrane develops a continuous adhesive bond to concrete poured against it. If the Preprufe® system is properly and correctly installed as per GCP instructions, no maintenance, repair or replacement is required during the service life of the structure. The highly durable, robust and extremely reliable feature of the Preprufe® system will limit any repair work to a minimum, if membrane damage occurs. The fully bonded membrane will prevent any water migration and between membrane and the concrete structure in the event of puncturing or damaging the membrane. Thus no scenario for repair work is defined.			
	Reference service life	According to the BBA Agreement Certificate 97/3325 the service life for the Preprufe® system is stated for the lifetime of the structure. PrePrufe® is based on a highly durable HDPE carrier film with life time expectations > 100 years in service. Therefore, at least a 60 year building service life can be assumed.		
	C1 to C4 End of life,	When a building is demolished at the end of its service life, the Preprufe® membrane system bonded to the concrete cannot be separated and remains part of the construction rubble. This is in general taken to landfill. Preprufe® membrane is only a minor part of the whole volume during demolition of the concrete structure. Therefore no other steps are considered as necessary with the exception for a transportation to a landfill. Distance assumed is to a middle-sized landfill in South London and from the location of installations in the centre of London.		
		Diesel/ 16-32 t lorry	kg/vkm	0.3

**Scenarios and additional technical information**

Scenario	Parameter	Units	Results
	Distance	km	7
	Capacity utilisation (incl. empty returns)	%	24
	Weight of transported products to landfill	kg/unit	1.39

## Interpretation

Analysis of the results shows that the following raw materials have the highest and second highest impacts for the selected indicators:

Indicator	Highest impact	2nd highest impact
GWP	HDPE (68.3%)	Block copolymer (11.3%)
ODP	KELC resin (30.5%)	HDPE (20.3%)
AP	HDPE (52.0%)	KELC resin (19.6%)
EP	KELC resin (58.9%)	HDPE (17.6%)
POCP	HDPE (61.6%)	KELC resin (19.9%)
ADPE	Block copolymer (63.0%)	KELC resin (15.5%)
ADPF	HDPE (65.9%)	KELC resin (11.5%)

## References

BSI. Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products. BS EN 15804:2012+A1:2013. London, BSI, 2013.

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.

BSI. Environmental management – Life cycle assessment – requirements and guidelines. BS EN ISO 14044:2006. London, BSI, 2006.