

Statement of Verification

BREG EN EPD No.: 000481

Issue 02

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



is in accordance with the requirements of:
EN 15804:2012+A1:2013
and
BRE Global Scheme Document SD207

This declaration is for:
1 m² (1.8 kg/m²) Cellcore HX B EPS compressible / collapsible panels with
laminated polypropylene twin walls

Company Address

Cordek Ltd.
Spring Copse Business Park,
Slinfold,
West Sussex
RH13 0SZ



Signed for BRE Global Ltd

Emma Baker
Operator

24 March 2023
Date of this Issue

17 March 2023
Date of First Issue

20 March 2028
Expiry Date



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Environmental Product Declaration

EPD Number: 000481

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
Cordek Ltd. Spring Copse Business Park, Slinfold, West Sussex RH13 0SZ	Andrew Dutfield/ BRE LINA v2.0
Declared Unit	Applicability/Coverage
1 m ² (1.8 kg/m ²) Cellcore HX B EPS compressible / collapsible panels with laminated polypropylene twin walls	Product Average.
EPD Type	Background database
Cradle to Gate	Ecoinvent v3.2
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 type="checkbox"/> Internal <input checked="" type="checkbox"/> External	
(Where appropriate ^b)Third party verifier: Connick Roger	
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 type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note: Ticks indicate the Information Modules declared.

Manufacturing site(s)

Spring Copse Business Park,
Slinfold,
West Sussex
RH13 0SZ

Construction Product:

Product Description

Cellcore is an Expanded Polystyrene (EPS) cellular void former for use in limiting the pressure exerted on in-situ reinforced suspended concrete floors or piled ground beams by expansion of clay soils, (clay heave), or ground recovery. The product comprises EPS compressible / collapsible panels with a laminated polypropylene or combination of EPS insulation and polypropylene sheet bonded to the uppermost surface.

Cellcore is available in a range of thicknesses from 85mm to 220mm and widths from 300 to 1200mm, so this EPD represents 1 m² (1.8 kg/m²) of Cellcore HX B EPS compressible / collapsible panels with laminated polypropylene twin walls in order to calculate the impacts of other dimensions.

Technical Information

Property	Value, Unit
Cellcore has third party accreditation by BBA, Certificate 11 / 4862 Product Sheet 1 and can satisfy or contribute to satisfying the relevant requirements in relation to NHBC Standards, 4.2 (4.2.7 to 4.2.10) Building near trees, 4.3 Strip and trench fill foundations and 4.4 Raft, pile, pier and beam foundations.	Conforms

Note: Technical properties of all products assessed within this average EPD



Main Product Contents

Material/Chemical Input	%
Expandable Polystyrene Bead	43
Twin Wall Polypropylene Sheet	56
Adhesive	1

Note: Material composition of all products assessed within this average EPD

Manufacturing Process

Pre-expansion

Spherical expandable polystyrene beads supplied to Cordek arrive in recyclable cardboard octabins, each containing 1100 kg of raw material. The expandable bead contains a blowing agent, pentane, (typically 5% by weight), which when heated by steam expands the beads to approximately forty times their original size.

Maturing

As the pre-expanded beads cool a partial vacuum is formed inside. The beads are returned to a holding silo to allow the pressure differential to equalize, giving a stabilised granule.

Moulding

In this final stage the pre-expanded stabilized beads are reheated with steam in a mould. The mould may be a simple block mould or a shape mould depending on the finished product requirements. The final expansion takes place, and the beads fuse together to form the finished EPS block or shape moulding. In this final form the EPS is 98% air.

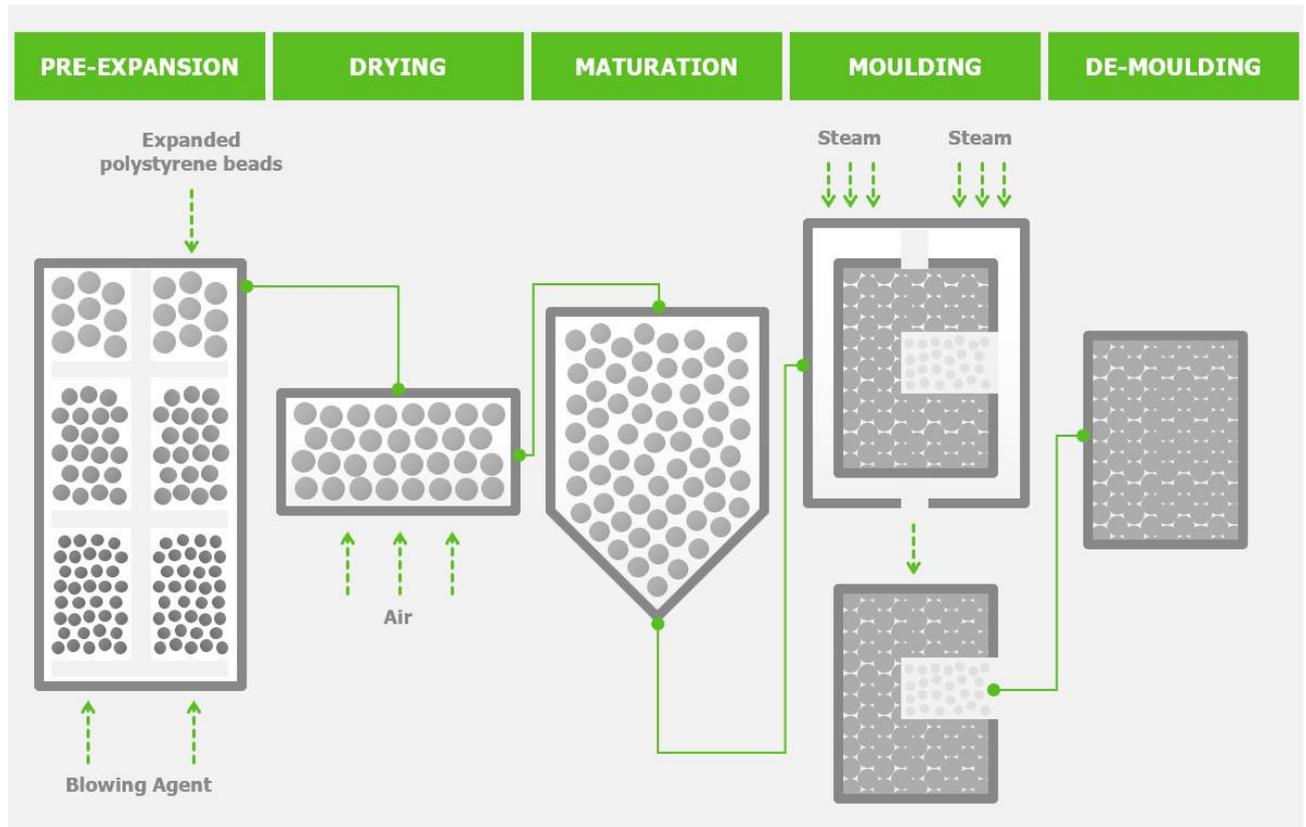
Cutting

Block moulded EPS may require cutting into the desired final sheet or shape using heated wires.

Lamination

Cordek bond or laminate the polypropylene sheet and or sheet EPS to the uppermost surface of the Cellcore EPS panels using a spray applied hot melt adhesive.

Process flow diagram



Construction Installation

Please refer to the BBA Certificate and product data sheet web links for installation information.

Use Information

The products are confined within the structure of the buildings and require no maintenance. The products are dimensionally stable under varying conditions of temperature and humidity. They are rot-proof and water-resistant and will continue to perform effectively as a void former for the life of the building.

End of Life

Cellcore remains in the construction for the life of the building. Should the building be demolished, and the product removed, both the expanded polystyrene (EPS) and polypropylene can be fully recycled.

Life Cycle Assessment Calculation Rules

Declared unit description

1 m² (1.8 kg/m²) Cellcore HX B EPS compressible / collapsible panels with laminated polypropylene twin walls

System boundary

This is a cradle-to-gate LCA, reporting all production life cycle stages of modules A1 to A3 in accordance with EN 15804:2012+A1:2013.

Data sources, quality and allocation

The datasets are derived from Ecoinvent v3.2 (2015), and the LCA tool used was BRE LINA v2.0. The LCA models and reports the production stage modules, A1 to A3. The quantity used in the data collection for this EPD is the total quantity of Cellcore HX B manufactured as a proportion of the total manufactured during the data collection period (01/01/21-31/12/21) which was calculated at 36%.

Cordek manufactures other products in addition to Cellcore HX B at Unit 4 therefore the allocation of water consumption & discharge, and waste emission was required, and this has been done according to the provisions of the BRE PCR PN514 and EN 15804. Electricity, gas, water, and waste have been allocated according to the m3 production EPS. Electricity and gas were taken from energy usage dictated by meter readings and utility bills for the entire business site. Waste has been allocated to the volume of EPS produced in each of the product categories and divided it by the total site waste number to allocate a % of waste to each product group. Secondary data have been drawn from the BRE LINA database v2.0.97 and the background LCI datasets are based on ecoinvent v3.2 (2015). 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

All raw materials and energy input to the manufacturing process have been included, except for direct emissions to air, water and soil, which are not measured. The inventory process in this LCA includes all data related to raw material, packaging material and consumable items. Process energy, water use, and discharge and general waste are included. EPS process waste is included but no polypropylene sheet process waste is assumed to be created.

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 ₂ equiv.	kg CFC 11 equiv.	kg SO ₂ equiv.	kg (PO ₄) ³⁻ equiv.	kg C ₂ H ₄ equiv.	kg Sb equiv.	MJ, net calorific value.
Product stage	Raw material supply	A1	5.29E+00	9.05E-08	1.85E-02	2.71E-03	5.09E-03	1.76E-06	1.45E+02
	Transport	A2	9.01E-02	1.65E-08	3.07E-04	8.30E-05	5.30E-05	2.36E-07	1.36E+00
	Manufacturing	A3	1.79E+00	2.15E-07	5.32E-03	1.46E-03	5.24E-04	1.15E-06	3.10E+01
	Total (of product stage)	A1-3	7.17E+00	3.22E-07	2.41E-02	4.25E-03	5.66E-03	3.15E-06	1.77E+02

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;

Parameters describing resource use, primary energy			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	2.37E+00	7.37E-04	2.37E+00	AGG	AGG	AGG
	Transport	A2	2.06E-02	6.88E-08	2.06E-02	AGG	AGG	AGG
	Manufacturing	A3	1.07E+00	3.09E-06	1.07E+00	AGG	AGG	AGG
	Total (of product stage)	A1-3	3.45E+00	7.40E-04	3.45E+00	1.80E+02	4.40E+01	2.24E+02

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 ³
Product stage	Raw material supply	A1	0.00E+00	0.00E+00	0.00E+00	8.20E-02
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	3.08E-04
	Manufacturing	A3	0.00E+00	0.00E+00	0.00E+00	1.02E-02
	Total (of product stage)	A1-3	0.00E+00	0.00E+00	0.00E+00	9.24E-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

Other environmental information describing waste categories						
			HWD	NHWD	RWD	
			kg	kg	kg	
Product stage	Raw material supply	A1	6.88E-02	8.56E-02	3.47E-05	
	Transport	A2	6.10E-04	6.23E-02	9.39E-06	
	Manufacturing	A3	5.09E-03	3.77E-02	9.32E-05	
	Total (of product stage)	A1-3	7.45E-02	1.86E-01	1.37E-04	

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

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	4.12E-02	0.00E+00	0.00E+00
	Total (of product stage)	A1-3	0.00E+00	4.12E-02	0.00E+00	0.00E+00

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EE = Exported Energy

Interpretation

The bulk of the environmental impacts are attributed to the upstream extraction of Expandable Polystyrene bead and Twin-wall polypropylene sheet and the manufacturing process of Cellcore HX B, covered by information modules A1-A3 of EN15804:2012+A1:2013.

Individual product calculations

The LCA results listed in the tables above are for Cordek HX B panels, which are for the processing of 1 m². The end-user of this EPD can therefore use these results to calculate impact profiles for each HXB product with different thicknesses by using the weight per m². In the below calculation table, the GWP impacts have been calculated for the standard product thicknesses, with results also calculated for 1 kg/m² as an example to enable calculations for other thicknesses.

	Cellcore HX B		85mm	155mm	220mm
Kg/m ²	1.8	1	1.49	1.65	1.94
A1	5.29E+00	2.94E+00	4.39E+00	4.84E+00	5.72E+00
A2	9.01E-02	5.01E-02	7.48E-02	8.25E-02	9.74E-02
A3	1.79E+00	9.96E-01	1.49E+00	1.64E+00	1.94E+00
A1-A3	7.17E+00	3.99E+00	5.95E+00	6.56E+00	7.75E+00

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.

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