

## Statement of Verification

BREG EN EPD No.: 000196

Issue 01

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



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

This declaration is for:  
**C32/40 CIIB Ready Mix Concrete**

### Company Address

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United Kingdom



Signed for BRE Global Ltd

Emma Baker  
Operator

23 April 2018  
Date of this Issue

23 April 2018  
Date of First Issue

22 April 2023  
Expiry Date



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## Environmental Product Declaration

EPD Number: 000196

### 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
Hanson UK Maidenhead 14 Castle Hill Maidenhead Berkshire SL6 4JJ United Kingdom	BRE LINA v 2.0.8
Declared/Functional Unit	Applicability/Coverage
1 cubic meter of ready mix concrete	Product specific across multiple sites.
EPD Type	Background database
Cradle to Gate	ecoinvent

#### 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

Internal  External

(Where appropriate <sup>b</sup>)Third party verifier:  
Nigel Jones

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)

Sum of all operating Hanson concrete sites during 2016, totalling 167 plants in the UK.

### Construction Product:

#### Product Description

This EPD covers the production of C32/40 CIIIB concrete at 167 Hanson Concrete plants. C32/40 CIIIB is a multi-purpose concrete for use in a wide range of construction applications, typically used for structural beams and foundations.

#### Technical Information

Property	Value, Unit
Typical Density of Normal Weight fresh wet Concrete (BS EN206)	2000 - 2600 kg/m <sup>3</sup>
Compressive strength (BS EN206)	40 N/mm <sup>2</sup>



### Main Product Contents

Material/Chemical Input	%
Cement	5.8%
Ground granulated blast furnace slag	12.5%
Aggregates	76.7%
Admixtures	0.1%
Mix Water	4.9%

### Manufacturing Process

Ready mix concrete produced at Hanson concrete plants involves the combination of materials to a recipe that achieves a specified product performance. Typical ingredients are Portland Cement, Regen (Ground Granulated Blast Furnace Slag, GGBS), coarse aggregates such as gravel, sand, water and admixtures. These materials are either mixed within the plant and discharged in a mixer truck (wet mix) or the materials are fed directly into the mixer truck where they are combined (dry mix) with water.

Process flow diagram

**MANUFACTURE OF CONCRETE**



**Life Cycle Assessment Calculation Rules**

**Declared / Functional unit description**

1 cubic meter of ready-mix C32/40 CIIIB Concrete.

**System boundary**

This EPD covers the Cradle to Gate processes involved in the manufacture of concrete and reports the product stage (A1 to A3) in accordance with EN 15804+A1.

**Data sources, quality and allocation**

The LCA study was carried out using BRE LINA. The tool has been pre-verified to conform to the modelling requirements of EN 15804+A1. Manufacturer specific data from Hanson batching records for the full year of 2016 have been used to calculate an average concrete composition for 1m<sup>3</sup>. The full data set was validated to identify and remove erroneous records leaving 26,979 mixes in the calculation of the average mix. The process removed any batches which fell outside the required density range as expressed in the Technical Information table.

Hanson produces other products in addition to this type of concrete and the allocation of other relevant site-wide data has been done in accordance with the BRE product category rules and EN 15804+A1.

Secondary data for upstream and downstream processes are as provided within the BRE LINA tool. The background LCI datasets are based on ecoinvent database v3.2. The Hanson UK average CEM 1 cement, Regen (GGBS), coarse and fine aggregate datasets used had been previously created in BRE LINA using Hanson specific data.

## Cut-off criteria

No inputs or outputs have been excluded. All raw materials, including the delivery of raw materials to site, the delivery and use of fuel to plant including the fuel used by the mobile plant, the water used and waste produced are included. Calculated emission to air and water related to the production process are also considered using technical estimations. As ready-mix concrete is delivered in trucks, no packaging input is relevant within the scope of this LCA.

## 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	1.60E+02	5.08E-06	4.12E-01	1.21E-01	4.36E-02	6.39E-05	1.12E+03
	Transport	A2	1.63E+01	2.96E-06	5.99E-02	1.74E-02	1.11E-02	3.30E-05	2.50E+02
	Manufacturing	A3	2.17E+00	1.93E-07	1.25E-02	3.25E-03	1.13E-03	2.36E-06	3.21E+01
	Total (of product stage)	A1-3	1.78E+02	8.23E-06	4.85E-01	1.42E-01	5.58E-02	9.93E-05	1.41E+03

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	4.04E+01	8.72E-04	4.04E+01	1.26E+03	0.00E+00	1.26E+03
	Transport	A2	5.66E+00	1.19E-05	5.66E+00	2.54E+02	0.00E+00	2.54E+02
	Manufacturing	A3	2.29E+00	5.53E-06	2.29E+00	4.06E+01	0.00E+00	4.06E+01
	Total (of product stage)	A1-3	4.83E+01	8.89E-04	4.83E+01	1.55E+03	0.00E+00	1.55E+03

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	1.15E+01	0.00E+00	0.00E+00	6.50E-01
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	6.74E-02
	Manufacturing	A3	0.00E+00	0.00E+00	0.00E+00	1.20E-01
	Total (of product stage)	A1-3	1.15E+01	0.00E+00	0.00E+00	8.37E-01

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	8.57E-01	1.69E+00	4.29E-03	
	Transport	A2	1.31E-01	1.65E+01	1.73E-03	
	Manufacturing	A3	9.24E-03	1.53E-01	2.35E-04	
	Total (of product stage)	A1-3	9.97E-01	1.83E+01	6.26E-03	

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	1.97E-01	9.48E-01	0.00E+00	0.00E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Manufacturing	A3	2.31E+00	1.94E+01	0.00E+00	0.00E+00
	Total (of product stage)	A1-3	2.51E+00	2.03E+01	0.00E+00	0.00E+00

CRU = Components for reuse;  
MFR = Materials for recycling

MER = Materials for energy recovery;  
EE = Exported Energy



## Sustainability at Hanson UK – Our vision



Our vision is to be the clear and sustainable market leader, focused on exceeding customer expectations through an engaged team that is responsible, reliable and safe.

Our approach is built around six topics which underpin our sustainability policy and performance indicators:

- **Enabling sustainable construction** – partnership and product development
- **People and communities** – zero harm in the workplace; creating sustainable communities and working with our stakeholders
- **Carbon and energy** – climate change and energy use
- **Waste and raw materials** – sustainable consumption and production
- **Water and biodiversity** – water conservation and enhancing the natural environment
- **Quality processes and systems** – management systems for continual improvement.

We have clear targets within these topics and report annually on progress and performance.

## References

BSI. Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products. BS EN 15804:2012+A1:2013 (EN 15804+A1). 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. BSI Standards Publication - Concrete - Specification, performance, production and conformity. BS EN 206:2013+A1:2016