# Statement of Verification

BREG EN EPD No.: 000622 Issue 01

This is to verify that the

**Environmental Product Declaration**

provided by:

Living Concrete Ltd

is in accordance with the requirements of:

EN 15804:2012+A2:2019

and

BRE Global Scheme Document SD207

This declaration is for:

1 m³ of GRC BTX concrete (1800 kg/m3)

## Company Address

Living Concrete Ltd
West Moseley Site
137C Armfield Close
West Moseley
Surrey KT8 2RT

| | | |
|---|---|---|
| Signed for BRE Global Ltd | Emma Baker<br>Operator | 30 July 2024<br>Date of this Issue |
| 30 July 2024<br>Date of First Issue | | 29 July 2029<br>Expiry Date |



BRE Global Ltd., Garston, Watford WD25 9XX.
T: +44 (0)333 321 8811 F: +44 (0)1923 664603 E: Enquiries@breglobal.com

# Environmental Product Declaration

## EPD Number: 000622

## General Information

| EPD Programme Operator | Applicable Product Category Rules |
|---|---|
| BRE Global<br>Watford, Herts<br>WD25 9XX<br>United Kingdom | BRE Environmental Profiles 2023 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** |
| Living Concrete Ltd<br>West Moseley Site<br>137C Armfield Close<br>West Moseley<br>Surrey KT8 2RT | Flavie Lowres/LINA A2 |
| **Declared/Functional Unit** | **Applicability/Coverage** |
| 1 $m^3$ of GRC BTX concrete (1800 $kg/m^3$) | Product Specific. |
| **EPD Type** | **Background database** |
| Cradle to Gate with Modules C and D | 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<br>☐Internal ☐ External |
| (Where appropriate [b]) Third party verifier:<br>Bala Subramanian |
| a: Product category rules<br>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(s)

The GRC BTX concrete is manufactured at the following site:

Living Concrete Ltd
West Moseley Site
137C Armfield Close
West Moseley
Surrey KT8 2RT

# Construction Product:

## Product Description

The Living Concrete Ltd's GRC BTX concrete mix is a glass fibre reinforced concrete. It can be used for various applications ranging from concrete panels and flooring, furniture, worktops, and wash basins. The concrete mix can be sprayed, moulded, and cast in any shape or forms.

The products all use the same mix, they just vary in size and shape, using different mould sizes and shapes depending on the final product.

This EPD therefore covers 1 $m^3$ of concrete mix and includes all stages of the processes to obtain a finished product.

The density of the concrete mix design is 1800 $kg/m^3$. By using the results of the concrete mix, the end user can calculate the impact of products using the volume (or size) of concrete used in the product. An example calculation has been provided at the end of this document in the Appendix section.

## Technical Information

Living Concrete Ltd is ISO14001 compliant.

| Technical properties | Result |
|---|---|
| Weight | 1800 $kg/m^3$ |

*Note: For other technical information, please contact Living Concrete Ltd.*

## Main Product Contents

The product composition is:

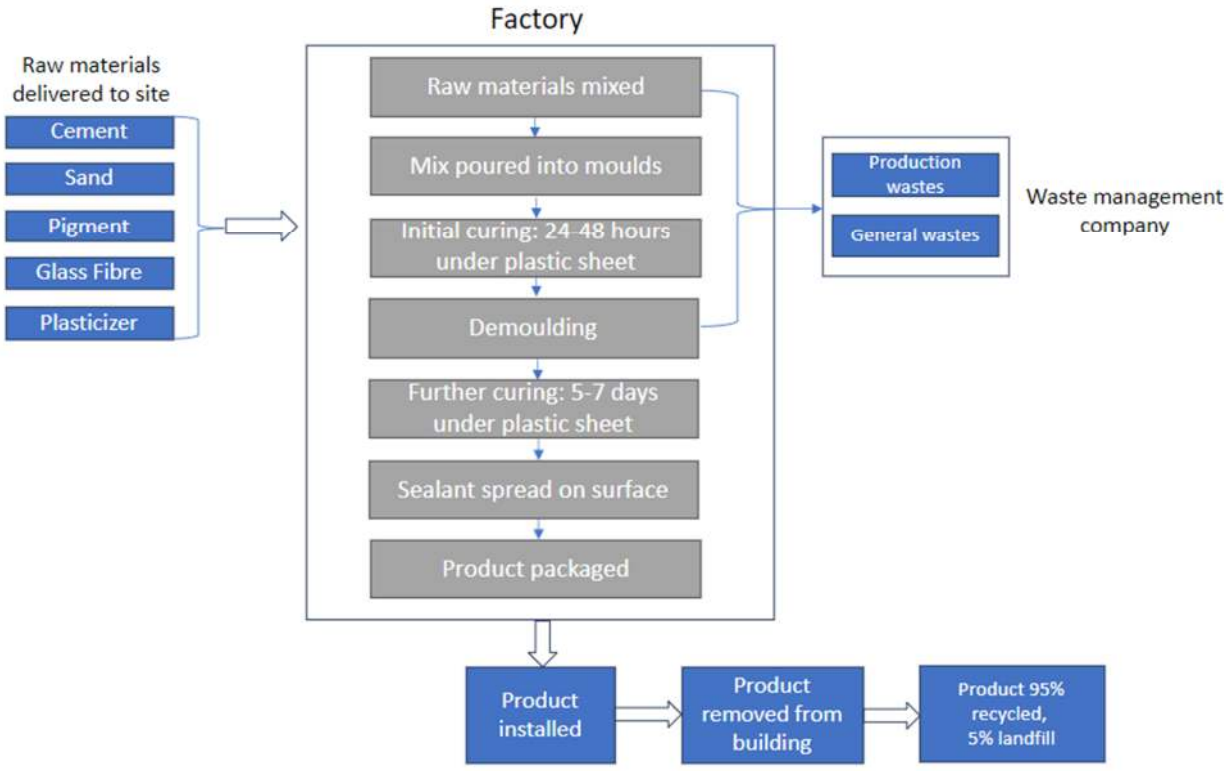
| Material/Chemical Input | % |
|---|---|
| Cement | 47% |
| Sand | 47% |
| Pigment | 2% |
| Glass fibre | 1% |
| Plasticizer | 3% |

## Manufacturing Process

The process of manufacturing GRC (Glass Reinforced Concrete) involves several steps, from the delivery of raw materials to packaging onto pallets:

1. Raw materials are delivered to site
2. The raw materials are mixed in a concrete mixer until a uniform flowing mix is achieved
3. The concrete mix is poured into moulds designed for the desired product shapes and covered with plastic sheets to retain moisture for 24-48 hours. This is the initial curing phase
5. After the initial curing period, the GRC products are removed from the moulds and allowed to cure for an additional 5-7 days while still covered with plastic to maintain a controlled curing environment.
7. Finally, the plastic cover is removed, and the products are allowed to cure for another 7-14 days under controlled conditions.
8. Once the GRC products have completed the curing process, a sealer may be applied to enhance their durability and appearance.
9. The cured and sealed GRC products are packaged onto pallets for storage or transportation.

## Process flow diagram




## End of Life

C1: the GRC BTX products are taken out of a building using mechanical tools. it was assumed that the amount of energy is very small and assumed to be zero in this EPD. this assumption is based on actual practice
C2: all elements of the system can be disassembled and recycled through commonly available waste management processing plant estimated to be 50 km from a typical site.
C3: no processing is required. 95% of concrete is recycled in accordance with BRE's PCR for EN15804+A2:2019
C4: 5% is landfill, in accordance with BRE's PCR for EN15804+A2:2019

# Life Cycle Assessment Calculation Rules

## Declared / Functional unit description

1 $m^3$ GRC BTX concrete (1800 $kg/m^3$)

## System boundary

In accordance with the modular approach as defined in EN15804:2012+A2:2019 and BRE 2023 PCR PN514 Rev 3.1, this cradle to gate with C and D EPD includes the processes covered in the manufacturing site and product stage A1 to A3, End-of-life stages C1 to C4 and Module D.

## Data sources, quality and allocation

Specific primary data derived from the Living Concrete Ltd production process in the West Moseley factory, in Surrey (UK), have been modelled using LINA A2 software for the period (01/01/2022 to 31/12/2022). In accordance with the requirements of EN15804, the most current available data has been used. Secondary data

has been obtained for all remaining upstream and downstream processes that are beyond the control of the manufacturer 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 EN15804+A2:2019. The GRC BTX concrete mix is the only product to processed at the West Mosely factory. 100% of data have been allocated to the product as it is the only product manufactured in the factory. By using the concrete mix, different products such as concrete panels, flooring, furniture, worktops, and wash basins are produced. These products are created using different mould sizes and shapes, depending on the final product, and vary only in size and shape. Therefore, the materials used for the moulding and casting process are also included in the analysis. This EPD covers 1 m³ of concrete mix and includes all stages of the processes to obtain a finished product.

*Quality Level Geographical*
Datasets representative of UK electricity have been selected from the ecoinvent LCI. The quality level of time representativeness is good as the background LCI datasets are based on ecoinvent v3.8 which was compiled in 2021. Therefore, the most appropriate LCA data have been used. The input quantities have been uplifted to match the mass balance requirements. A proxy dataset “unspecified organic chemical” was used for the plasticiser.

*Data quality*

Technical representativeness: Data from processes and products under study. Same state of technology applied as defined in goal and scope (i.e. identical technology). Technical representativeness is therefore Very Good

Time representativeness: There is less than 5 years between the ecoinvent LCI reference year, and the time period for which the LCA was undertaken. 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. Therefore, there is less than 1 years between the ecoinvent LCI reference year and the time period for which the LCA was undertaken.

Geographical representativeness: Specific UK datasets have been selected from the ecoinvent LCI for this LCA. The quality level of geographical representativeness is therefore Very Good.

The GWP of the dataset used for this EPD is: 1 kWh UK electricity = 2E-01 kgCO2eq (Electricity GB (kWh) market for electricity, medium voltage)

## Cut-off criteria

This study includes the manufacturing of Living Concrete Ltd’s GRC BTX concrete and the end-of-life scenarios of this product (modules C and D). The final products are wrapped in stretch film and transported on pallets. The amount of stretch film used in the period is negligeable and was therefore not accounted for in this EPD. The pallets are reused, and none were bought in the period and therefore was also not included in this EPD. There are no emissions to air, water and soil in the analysis.

## LCA Results - 1 m3 GRC BTX concrete (1800 kg/m3)

(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 | 1.05E+03 | 1.04E+03 | 9.58E+00 | 5.69E-01 | 7.58E-05 | 3.82E+00 | 2.20E-01 |
| | Transport | A2 | 3.25E+01 | 3.24E+01 | 2.76E-02 | 1.28E-02 | 7.51E-06 | 1.33E-01 | 2.09E-03 |
| | Manufacturing | A3 | 7.41E+02 | 8.06E+02 | -6.82E+01 | 9.31E-01 | 7.75E-05 | 4.36E+00 | 2.35E-01 |
| | Total (Consumption grid) | A1-3 | 1.82E+03 | 1.88E+03 | -5.86E+01 | 1.51E+00 | 1.61E-04 | 8.31E+00 | 4.57E-01 |
| **Scenario: 95% of the concrete is recycled and 5% is landfilled** | | | | | | | | | |
| 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 | 1.50E+01 | 1.50E+01 | 1.28E-02 | 5.87E-03 | 3.46E-06 | 6.07E-02 | 9.63E-04 |
| | Waste processing | C3 | 6.87E+00 | 6.87E+00 | 2.43E-03 | 6.86E-04 | 1.47E-06 | 7.14E-02 | 2.13E-04 |
| | Disposal | C4 | 4.75E-01 | 4.74E-01 | 4.70E-04 | 4.48E-04 | 1.92E-07 | 4.46E-03 | 4.34E-05 |
| Potential benefits and loads beyond the system | Reuse, recovery, recycling potential | D | -1.44E+01 | -1.42E+01 | -1.84E-01 | -2.00E-02 | -1.14E-06 | -9.13E-02 | -7.73E-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) - 1 $m^3$ GRC BTX concrete (1800 $kg/m^3$)

(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 | 8.88E-01 | 9.87E+00 | 2.78E+00 | 5.16E-03 | 1.01E+04 | 3.44E+02 | 3.00E-05 |
| | Transport | A2 | 3.99E-02 | 4.36E-01 | 1.33E-01 | 1.13E-04 | 4.90E+02 | 2.21E+00 | 2.80E-06 |
| | Manufacturing | A3 | 1.27E+00 | 1.30E+01 | 3.72E+00 | 5.99E-03 | 1.55E+04 | 6.67E+02 | 6.64E-05 |
| | Total (Consumption grid) | A1-3 | 2.20E+00 | 2.33E+01 | 6.63E+00 | 1.13E-02 | 2.61E+04 | 1.01E+03 | 9.92E-05 |
| **Scenario: 95% of the concrete is recycled and 5% is landfilled** | | | | | | | | | |
| 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 | 1.83E-02 | 2.00E-01 | 6.12E-02 | 5.20E-05 | 2.26E+02 | 1.02E+00 | 1.29E-06 |
| | Waste processing | C3 | 3.16E-02 | 3.46E-01 | 9.53E-02 | 3.53E-06 | 9.43E+01 | 2.18E-01 | 1.46E-05 |
| | Disposal | C4 | 1.55E-03 | 1.70E-02 | 4.94E-03 | 1.08E-06 | 1.32E+01 | 6.07E-01 | 8.98E-08 |
| Potential benefits and loads beyond the system | Reuse, recovery, recycling potential | D | -2.11E-02 | -2.54E-01 | -6.53E-02 | -1.34E-04 | -2.09E+02 | -2.73E+01 | -1.15E-06 |

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) - 1 $m^3$ GRC BTX concrete (1800 $kg/m^3$)

(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 | 5.44E+01 | 1.35E+04 | 5.83E-07 | 1.32E-05 | 2.89E+03 |
| | Transport | A2 | 2.52E+00 | 3.83E+02 | 1.24E-08 | 4.01E-07 | 3.37E+02 |
| | Manufacturing | A3 | 2.50E+02 | 1.83E+04 | 4.06E-06 | 1.03E-05 | 4.21E+04 |
| | Total (Consumption grid) | A1-3 | 3.07E+02 | 3.22E+04 | 4.66E-06 | 2.39E-05 | 4.53E+04 |
| **Scenario: 95% of the concrete is recycled and 5% is landfilled** | | | | | | | |
| End of life | Deconstruction, demolition | C1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Transport | C2 | 1.16E+00 | 1.76E+02 | 5.72E-09 | 1.85E-07 | 1.55E+02 |
| | Waste processing | C3 | 4.25E-01 | 5.51E+01 | 2.13E-09 | 4.00E-08 | 1.20E+01 |
| | Disposal | C4 | 5.88E-02 | 8.36E+00 | 2.12E-10 | 5.50E-09 | 2.78E+01 |
| Potential benefits and loads beyond the system | Reuse, recovery, recycling potential | D | -3.23E+00 | -2.42E+02 | -1.41E-08 | -2.54E-07 | -1.92E+02 |

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) - 1 $m^3$ GRC BTX concrete (1800 $kg/m^3$)

(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 | 6.08E+02 | 0.00E+00 | 6.08E+02 | 1.14E+04 | 1.28E+03 | 1.27E+04 |
| | Transport | A2 | 6.91E+00 | 0.00E+00 | 6.91E+00 | 4.82E+02 | 0.00E+00 | 4.82E+02 |
| | Manufacturing | A3 | -5.70E+03 | 1.38E+04 | 8.10E+03 | 3.33E+03 | 1.15E+04 | 1.49E+04 |
| | Total (Consumption grid) | A1-3 | -5.09E+03 | 1.38E+04 | 8.71E+03 | 1.52E+04 | 1.28E+04 | 2.81E+04 |
| **Scenario: 95% of the concrete is recycled and 5% is landfilled** | | | | | | | | |
| 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 | 3.19E+00 | 0.00E+00 | 3.19E+00 | 2.22E+02 | 0.00E+00 | 2.22E+02 |
| | Waste processing | C3 | 5.28E-01 | 0.00E+00 | 5.28E-01 | 9.24E+01 | 0.00E+00 | 9.24E+01 |
| | Disposal | C4 | 1.13E-01 | 0.00E+00 | 1.13E-01 | 1.30E+01 | 0.00E+00 | 1.30E+01 |
| Potential benefits and loads beyond the system | Reuse, recovery, recycling potential | D | -1.97E+01 | 0.00E+00 | -1.97E+01 | -2.09E+02 | 0.00E+00 | -2.09E+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) - 1 $m^3$ GRC BTX concrete (1800 $kg/m^3$)

(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 | 1.58E-01 | 0.00E+00 | 0.00E+00 | 8.22E+00 |
| | Transport | A2 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.46E-02 |
| | Manufacturing | A3 | 4.89E+00 | 0.00E+00 | 0.00E+00 | 1.58E+01 |
| | Total (Consumption grid) | A1-3 | 5.05E+00 | 0.00E+00 | 0.00E+00 | 2.41E+01 |
| **Scenario: 95% of the concrete is recycled and 5% is landfilled** | | | | | | |
| 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 | 2.52E-02 |
| | Waste processing | C3 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.38E-03 |
| | Disposal | C4 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.42E-02 |
| Potential benefits and loads beyond the system | Reuse, recovery, recycling potential | D | 0.00E+00 | 0.00E+00 | 0.00E+00 | -6.45E-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

## LCA Results (continued) - 1 $m^3$ GRC BTX concrete (1800 $kg/m^3$)

(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 | 1.88E+01 | 6.46E+02 | 1.21E-02 |
| | Transport | A2 | 5.41E-01 | 9.60E+00 | 3.32E-03 |
| | Manufacturing | A3 | 4.91E+01 | 1.14E+03 | 7.11E-02 |
| | Total (Consumption grid) | A1-3 | 6.84E+01 | 1.80E+03 | 8.65E-02 |
| **Scenario: 95% of the concrete is recycled and 5% is landfilled** | | | | | |
| End of life | Deconstruction, demolition | C1 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Transport | C2 | 2.49E-01 | 4.43E+00 | 1.53E-03 |
| | Waste processing | C3 | 1.24E-01 | 8.69E-01 | 6.52E-04 |
| | Disposal | C4 | 1.38E-02 | 1.94E-01 | 8.68E-05 |
| Potential benefits and loads beyond the system boundaries | Reuse, recovery, recycling potential | D | -1.20E+00 | -3.66E+01 | -1.07E-03 |

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

## LCA Results (continued) - 1 $m^3$ GRC BTX concrete (1800 $kg/m^3$)

(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 | 0.00E+00 | 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 | 0.00E+00 | 0.00E+00 |
| | Manufacturing | A3 | 0.00E+00 | 6.53E+02 | 6.50E-06 | 0.00E+00 | 8.77E+01 | 0.00E+00 |
| | Total (Consumption grid) | A1-3 | 0.00E+00 | 6.53E+02 | 6.50E-06 | 0.00E+00 | 8.77E+01 | 0.00E+00 |
| **Scenario: 95% of the concrete is recycled and 5% is landfilled** | | | | | | | | |
| 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 | 1.23E-04 | 1.97E-06 | 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 boundaries | 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

## Interpretation of results

## Scenarios and additional technical information

| Scenarios and additional technical information | | | |
|---|---|---|---|
| Scenario | Parameter | Units | Results |
| C1 - Deconstruction | The GRC BTX products are taken out of a building using mechanical tools. it was assumed that the amount of energy is very small and assumed to be zero in this EPD. this assumption is based on actual practice | | |
| C2 - Transport from site to pre-processing facility or landfill | Typical transport to a waste processing plant for concrete | km | 50 |
| C3 - Pre-processing of uninstalled product (if relevant) | According to BRE's PCR, concrete products are 95% recycled – for 1 $m^3$ | kg | 1,710 |
| C4 – Disposal | According to BRE's PCR, concrete products are 5% landfilled – for 1 $m^3$ | kg | 90 |
| Module D | Concrete is widely recycled. It has been assumed that 95% will be recycled, in accordance with BRE's PCR | | |

## References

BSI. Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products. BS EN 15804:2012+A2:2019. London, BSI, 2019.

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.

BS EN ISO 14001:2015 - Environmental management systems. Requirements with guidance for use. London, BSI, 2015.

## Appendix – Interpretation of results

58% of the impact of A1-A3 in GWP total is associated with the use of raw materials (A1). A3 represents 41% of the impact.

Sand and cement are both 47% by mass of the product, however cement represents 67% of the impact in GWP total and sand less than 0.5%. 17% of the impact in GWP total are associated with the pigment and the plasticizer accounts for 10% of the impact.

## Appendix – how to use the results of this EPD

A panel of a size of 600 x 600 x 15 mm would have a volume of 0.0054 $m^3$. The GWP total of 1 $m^3$ of living concrete mix is 1.82E+03 $kgCO_2eq$ (A1 to A3), so the GWP total of the panel would be: 0.0054 x 1820 = 9.8 $kgCO_2eq$.