ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

Lignacrete Hollow 10.4N 140

Lignacite Ltd

EPD HUB, HUB-142

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Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Lignacite Ltd
Address	Norfolk House, High Street, Brandon, Suffolk, IP270AX
Contact details	brandonsales@lignacite.co.uk
Website	www.lignacite.co.uk

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804+A2:2019 and ISO 14025
PCR	EPD Hub Core PCR version 1.0, 1 Feb 2022
Sector	Construction product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4 and D
EPD author	Marvyn Candler, Lignacite Ltd
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
EPD verifier	S.V, as an authorized verifier acting for EPD Hub Limited

The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

PRODUCT

Product name	Lignacrete Hollow 10.4N 140
Additional labels	DH14010 - 440x140x215
Product reference	DH1407
Place of production	Brandon, Suffolk, United Kingdom
Period for data	2021
Averaging in EPD	No averaging

ENVIRONMENTAL DATA SUMMARY

Declared unit	1m2
Declared unit mass	186 kg
GWP-fossil, A1-A3 (kgCO2e)	19.8
GWP-total, A1-A3 (kgCO2e)	20.0
Secondary material, inputs (%)	0.00985
Secondary material, outputs (%)	80.0
Total energy use, A1-A3 (kWh)	41.7
Total water use, A1-A3 (m3e)	1.31

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Formed in 1947, Lignacite has continued to develop innovative mixes and designs for their building blocks; more recently testing and successfully utilising many recycled materials to produce more sustainable products. We are committed to continuing an extensive R&D programme ensuring we stay at the cutting edge of the construction industry.

PRODUCT DESCRIPTION

• Hollow blocks to construct reinforced retaining walls• Infill units to beam and block flooring
• External and internal walls below ground
• High strength, loadbearing walls
• Separating walls including those conforming to Robust Detail specifications
• Internal walls including fire break walls
• The inner and outer leaves of external cavity walls,

Lignacrete can be considered for use in the following locations:

Lignacrete dense blocks are suitable for a wide range of applications. They have excellent levels of sound insulation and high strength capability, making them especially suitable for use in separating and partition walls. They can also be used as infill blocks in beam and block flooring systems. The blocks are medium grey to buff in colour with a texture, depending on grade suitable for plastering, rendering, directly painted or fair face. Fair Faced products are natural in colour and made to order.

Ligacrete is a high density, robust, loadbearing unit, suitable for internal and external walls. is a high strength block, available in standard, paint grade and fair face finishes, suitable for use internally and externally above and below ground.

Further information can be found at www.lignacite.co.uk.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals		
Minerals	100	
Fossil materials		
Bio-based materials	0	

BIOGENIC CARBON CONTENT

Product’s biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0
Biogenic carbon content in packaging, kg C	0

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1m2
Mass per declared unit	186 kg
Functional unit	

Reference service life

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D		
x	x	x	x	MND	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	x		
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstr./demol.	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = MND. Modules not relevant = MNR.

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

Concrete block production starts by transporting the binders, aggregates and additives to silos, from where they are dosed onto a conveyor and into a mixer. Cement is then added to the ingredients, after which the material is mixed dry. Water is then added to the mixture, followed by wet mixing. The wet mass is filled into molds and vibrated to its final shape. The blocks are then transported on an automatic line to a dryer. From the dryer, the ingots go to the packaging line, where they are banded and taken for storage.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

The transportation distance is defined according to the PCR. Average distance of transportation from production plant to building site is assumed as 52 km and the transportation method is assumed to be lorry. Vehicle capacity utilization is assumed to be 100 % which means full load. In reality, it may vary but as role of transportation emissions in total results is small, the variety in load is assumed to be negligible. Empty returns are not taken into account as it is assumed that return trip is used by the transportation company to serve the needs of other clients. Transportation does not cause losses as product are packaged properly. Also, volume capacity utilisation factor is assumed to be 100 % for the nested packaged products.

PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase.
Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

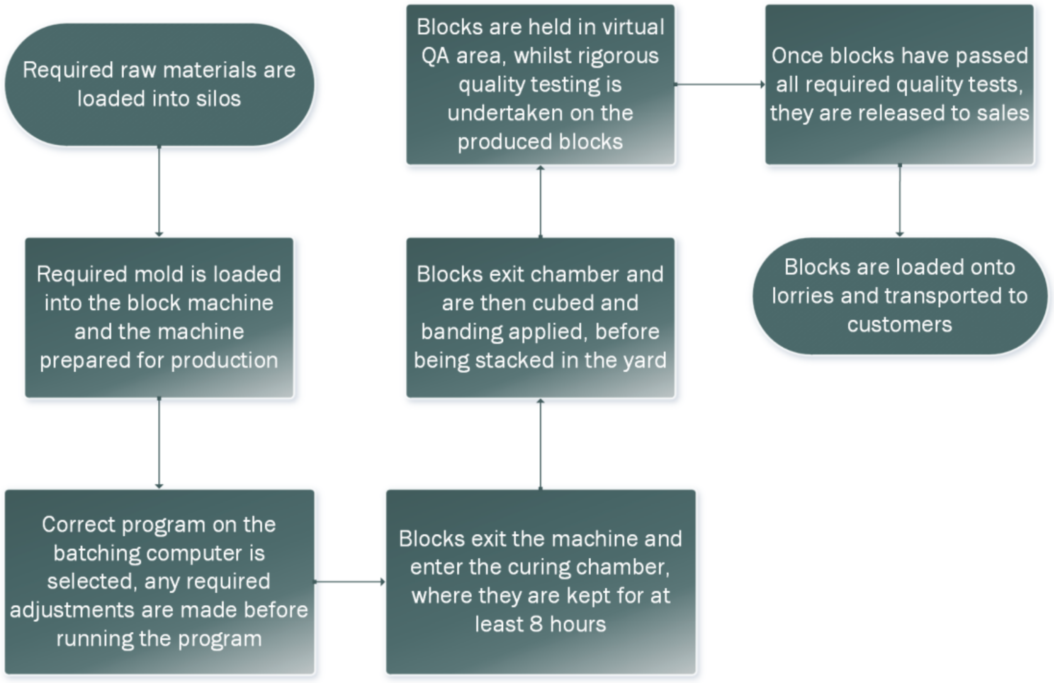
Due to the recycling potential of concrete, they can be crushed and used as secondary raw material, which avoids the use of virgin raw materials. The 80 % of concrete going to waste processing is converted into secondary raw materials after recycling. The recycled material content in the concrete itself is assumed to be 0 % (D).
At the waste treatment plant, waste that can be reused, recycled or recovered for energy is separated and diverted for further use. It can be assumed that 100% of the concrete blocks are transported to a waste

treatment plant, where the blocks are crushed and separated. About 80% of concrete (Betoniteollisuus ry, 2020) is recycled. The process losses of the waste treatment plant are assumed to be negligible (C3). The remaining 20% of concrete is to be sent to the landfill (C4).

The dismantled concrete blocks are delivered to the nearest construction waste treatment plant. It is estimated that there is no mass loss during the use of the product, therefore the end-of-life product is assumed that it has the same weight with the declared product. Transportation distance to the closest disposal area is estimated as 50 km and the transportation method is lorry which is the most common

At the end-of-life, in the demolition phase 100% of the waste is assumed to be collected as separate construction waste. The demolition process consumes energy in the form of diesel fuel used by building machines. Energy consumption of a demolition process is on the average 10 kWh/m2 (Bozdağ, Ö & Seçer, M. 2007). Basing on a Level(s) project, an average mass of a reinforced concrete building is about 1000 kg/m2. Therefore, energy consumption demolition is assumed to be 10 kWh/1000 kg = 0,01 kWh/kg. It is assumed the mass of the waste blocks per m2 will be the same as the declared value. The source of energy is diesel fuel used by work machines (C1).

MANUFACTURING PROCESS



LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	Allocated by mass or volume
Packaging materials	Allocated by mass or volume
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

AVERAGES AND VARIABILITY

Type of average	No averaging
Averaging method	Not applicable
Variation in GWP-fossil for A1-A3	Not relevant %

There is no average result considered in this study since this EPD refers to one specific product produced in one production plant.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. Ecoinvent and One Click LCA databases were used as sources of environmental data.

ENVIRONMENTAL IMPACT DATA

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total[1]	kg CO_2e	1.86E1	8.27E-1	6.07E-1	2E1	8.71E-1	2.09E-1	MND	MND	MND	MND	MND	MND	MND	6.13E-1	9.33E-1	6.04E-1	1.96E-1	-1.26E0
GWP – fossil	kg CO_2e	1.83E1	8.51E-1	6.08E-1	1.98E1	8.79E-1	2.07E-1	MND	MND	MND	MND	MND	MND	MND	6.13E-1	9.33E-1	6.04E-1	1.96E-1	-1.25E0
GWP – biogenic	kg CO_2e	2.77E-1	-2.41E-2	-1.68E-3	2.51E-1	6.38E-4	2.51E-3	MND	MND	MND	MND	MND	MND	MND	1.71E-4	-1.05E-4	1.3E-4	3.88E-4	-1.35E-2
GWP – LULUC	kg CO_2e	4.89E-3	5.15E-4	5.5E-4	5.95E-3	2.65E-4	6.22E-5	MND	MND	MND	MND	MND	MND	MND	5.18E-5	4.94E-4	5.52E-5	5.82E-5	-1.57E-3
Ozone depletion pot.	kg CFC_{11}e	1.07E-6	1.73E-7	8.76E-8	1.33E-6	2.07E-7	1.54E-8	MND	MND	MND	MND	MND	MND	MND	1.32E-7	1.65E-7	1.29E-7	8.07E-8	-1.23E-7
Acidification potential	mol H^+e	7.28E-2	5.27E-3	2.79E-3	8.09E-2	3.69E-3	8.46E-4	MND	MND	MND	MND	MND	MND	MND	6.41E-3	7.53E-3	6.25E-3	1.86E-3	-8.07E-3
EP-freshwater[2]	kg Pe	3.2E-4	1.05E-5	1.48E-5	3.45E-4	7.15E-6	3.53E-6	MND	MND	MND	MND	MND	MND	MND	2.48E-6	2.71E-5	2.55E-6	2.37E-6	-7.95E-5
EP-marine	kg Ne	1.83E-2	1.81E-3	7.87E-4	2.09E-2	1.11E-3	2.2E-4	MND	MND	MND	MND	MND	MND	MND	2.83E-3	2.61E-3	2.76E-3	6.4E-4	-1.7E-3
EP-terrestrial	mol Ne	2.11E-1	2E-2	8.83E-3	2.4E-1	1.23E-2	2.52E-3	MND	MND	MND	MND	MND	MND	MND	3.11E-2	2.89E-2	3.02E-2	7.05E-3	-2.24E-2
POCP (“smog”)[3]	kg NMVOCe	5.62E-2	5.84E-3	2.46E-3	6.45E-2	3.95E-3	6.84E-4	MND	MND	MND	MND	MND	MND	MND	8.54E-3	8.37E-3	8.32E-3	2.05E-3	-5.71E-3
ADP-minerals & metals[4]	kg Sbe	2.1E-4	2.68E-5	2.55E-6	2.39E-4	1.5E-5	2.54E-6	MND	MND	MND	MND	MND	MND	MND	9.36E-7	2.25E-5	1.01E-6	1.79E-6	-1.36E-4
ADP-fossil resources	MJ	1.16E2	1.22E1	1.34E1	1.42E2	1.37E1	1.56E0	MND	MND	MND	MND	MND	MND	MND	8.44E0	1.41E1	8.28E0	5.48E0	-1.9E1
Water use[5]	m^3e depr.	2.81E0	6.34E-2	6.21E-2	2.93E0	5.09E-2	2.98E-2	MND	MND	MND	MND	MND	MND	MND	1.57E-2	1.28E-1	1.71E-2	2.53E-1	-2.22E0

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy[8]	MJ	6.59E0	5.85E-1	2.06E0	9.24E0	1.72E-1	9.41E-2	MND	MND	MND	MND	MND	MND	MND	4.56E-2	2.34E-1	4.84E-2	4.43E-2	-1.5E0
Renew. PER as material	MJ	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Total use of renew. PER	MJ	6.59E0	5.85E-1	2.06E0	9.24E0	1.72E-1	9.41E-2	MND	MND	MND	MND	MND	MND	MND	4.56E-2	2.34E-1	4.84E-2	4.43E-2	-1.5E0
Non-re. PER as energy	MJ	1.16E2	1.22E1	1.23E1	1.41E2	1.37E1	1.55E0	MND	MND	MND	MND	MND	MND	MND	8.44E0	1.41E1	8.28E0	5.48E0	-1.79E1
Non-re. PER as material	MJ	0E0	0E0	1.09E0	1.09E0	0E0	1.09E-2	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	-1.09E0
Total use of non-re. PER	MJ	1.16E2	1.22E1	1.34E1	1.42E2	1.37E1	1.56E0	MND	MND	MND	MND	MND	MND	MND	8.44E0	1.41E1	8.28E0	5.48E0	-1.9E1
Secondary materials	kg	1.81E-2	0E0	1.96E-4	1.83E-2	0E0	1.83E-4	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	2.3E-2
Renew. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Non-ren. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Use of net fresh water	m^3	6.65E-1	2.63E-3	6.38E-1	1.31E0	2.85E-3	1.31E-2	MND	MND	MND	MND	MND	MND	MND	7.45E-4	4.17E-3	7.49E-4	5.99E-3	-8.1E-1

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	4.49E-1	2.61E-2	3.16E-2	5.07E-1	1.33E-2	5.2E-3	MND	MND	MND	MND	MND	MND	MND	9.08E-3	5.17E-2	0E0	5.11E-3	-9.05E-2
Non-hazardous waste	kg	1.54E1	1.12E0	4.78E-1	1.7E1	1.47E0	1.84E-1	MND	MND	MND	MND	MND	MND	MND	9.71E-2	2.85E0	0E0	3.72E1	-3.73E0
Radioactive waste	kg	5.76E-4	7.84E-5	8.81E-5	7.42E-4	9.39E-5	8.36E-6	MND	MND	MND	MND	MND	MND	MND	5.91E-5	7.45E-5	0E0	3.62E-5	-8.07E-5

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Materials for recycling	kg	0E0	0E0	1.82E0	1.82E0	0E0	1.82E-2	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	1.49E2	0E0	0E0
Materials for energy rec	kg	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2e	1.81E1	8.41E-1	5.98E-1	1.96E1	8.71E-1	2.04E-1	MND	MND	MND	MND	MND	MND	MND	6.09E-1	9.19E-1	5.99E-1	1.92E-1	-1.22E0
Ozone depletion Pot.	kg CFC_{-11}e	8.86E-7	1.38E-7	7.42E-8	1.1E-6	1.64E-7	1.26E-8	MND	MND	MND	MND	MND	MND	MND	1.05E-7	1.33E-7	1.02E-7	6.39E-8	-1.02E-7
Acidification	kg SO_2e	5.2E-2	3.39E-3	1.67E-3	5.71E-2	1.79E-3	5.89E-4	MND	MND	MND	MND	MND	MND	MND	9.05E-4	3.04E-3	8.94E-4	7.75E-4	-4.97E-3
Eutrophication	kg PO_4^{3}e	1.4E-2	8.9E-4	4.98E-4	1.53E-2	3.61E-4	1.57E-4	MND	MND	MND	MND	MND	MND	MND	1.59E-4	9.61E-4	1.72E-4	1.5E-4	-2.63E-3
POCP ("smog")	kg C_2H_4e	2.23E-3	1.61E-4	9.51E-5	2.49E-3	1.13E-4	2.6E-5	MND	MND	MND	MND	MND	MND	MND	9.32E-5	1.53E-4	9.2E-5	5.68E-5	-4.08E-4
ADP-elements	kg Sbe	2.1E-4	2.68E-5	2.55E-6	2.39E-4	1.5E-5	2.54E-6	MND	MND	MND	MND	MND	MND	MND	9.36E-7	2.25E-5	1.01E-6	1.79E-6	-1.36E-4
ADP-fossil	MJ	1.16E2	1.22E1	1.34E1	1.42E2	1.37E1	1.56E0	MND	MND	MND	MND	MND	MND	MND	8.44E0	1.41E1	8.28E0	5.48E0	-1.9E1

VERIFICATION STATEMENT

VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with reference standard, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The digital background data for this EPD

Why does verification transparency matter? Read more online
This EPD has been generated by One Click LCA EPD generator, which has been verified and approved by the EPD Hub.

THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried out, the presentation of environmental data in the EPD, and other additional environmental information, as present with respect to the procedural and methodological requirements in ISO 14025:2010 and reference standard.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

Silvia Vilčeková, as an authorized verifier acting for EPD Hub Limited
07.10.2022

EPD Hub
VERIFIED ISO 14025