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Excellent Construction Products

Verti-Block by Naylor Concrete



Environmental Product Declaration (EPD)



In accordance with
EN15804+A2 2019
including EN 15804+A1
2013 results & ISO 14025 /
21930

Scope

This document is an Environment Product Declaration of Naylor Verti-Block by Naylor Concrete retaining wall units. This is from raw material extraction to the end-of-life process for the product. The environmental impact will be recorded during each step and assessed at the end of the document to show where most emissions are created. The environmental burdens are calculated in relation to a declared unit. Manual labour is not included in the emissions. Operational and maintenance is out of scope for Verti-Block by Naylor Concrete Products Ltd.

Manufacturer information

Manufacturer	Naylor Concrete Products Ltd
Address	Whaley Road, Barugh Green, Barnsley S75 1HT
E-Mail	vertiblock@naylor.co.uk
Website	www.naylorconcrete.co.uk

Product Category Rules	This EPD uses CEN Standard EN 15804 as the core PCR
EPD Standards	This EPD is in accordance with the EN 15804+A2 including EN 15804+A1 and ISO 14025 standards
Reference service life	120 years
Declared unit	1 ton of concrete - 1000kg
EPD type	Cradle-to-gate with options, A4 modules C1-C4 and module D
Background database	EcolInvent 3.8
Date of EPD and Validity	September 2024 – September 2029
EPD verification	Self-declared

Internal verification of the declaration and data according to EN ISO 14025:2010

System Boundary

In accordance with the EN15804:2012+A2:2019 including A1:2013 results, this document is cradle-to-gate with options, A4, modules C1-C4 and module D. This includes the processes covered in manufacturing, construction, use and end-of-life stages as well as considering the benefits and loads beyond the system boundary scenario.

A mix of materials are used to manufacture Vert-Block by Naylor Concrete Products Ltd including sand, Limestone, Cement, and additives.



Product application

Verti-Block units are used as retaining walls.

Product material consumption

Material	% Of product
Limestone	36
Sand	36
CEM 1	18
Water	6
Admix	4

Environmental parameters derived from LCA

Product stage: Raw material extraction and processing, transportation to manufacturer, manufacturing.

- Extraction of raw material
- Transport of raw material to plant
- Mixing of raw products to create product

Construction stage: Includes all energy provisions, waste management processes and during construction up to waste disposal.

- Transport of Verti-Block to the location
- Installation of Verti-Block

Use stage (maintenance and operational use): Includes transport and all energy provisions, waste management processes up to waste for the final disposal during this use stage.

- Operational use of Verti-Block
- Maintenance of Verti-Block

End-of-life stage: Includes all energy provisions during the end-of-life stage.

- Extraction of Verti-Block after 120 years of expected service life
- Transport of Verti-Block after 120 years of expected service life to end of life
- End-of-life treatment of concrete



Product Stage

- Extraction of raw materials for concrete
- Transportation of raw materials to factory
- Production of concrete

Construction Stage

- Transport concrete to site
- Installation of concrete in required location

Use Stage

- Usage and maintenance of concrete in required location

End-of-life

- Disassembly of concrete after service life
- Transportation of concrete to end-of-life treatment
- End-of-life waste treatment of complete concrete



Parameters describing environmental impact

Impact Category	Global warming potential - Fossil	Global warming potential - Biogenic	Global warming potential - LULUC	Ozone depletion	Acidification potential	Eutrophication potential - Fresh water	Eutrophication potential - Marine	Eutrophication potential - Terrestrial	Photochemical oxidation creation potential
	kgCO2e	kgCO2e	kgCO2e	kg CFC-11 eq	Mol H+ eq	kg Po4 eq	kg N eq	Mol N eq	kg NMVOC nt
Product stage	4.39E+02	3.37E-01	1.10E-02	2.08E-05	1.18E+00	4.90E-03	3.24E-01	3.67E+00	9.58E-01
Construction stage	4.08E+01	1.63E-02	1.60E-02	9.44E-06	1.66E-01	2.86E-04	4.95E-02	5.45E-01	1.67E-01
Use stage	MND	MND	MND	MND	MND	MND	MND	MND	MND
End-of-life stage	0.00E+00	0.00E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	4.80E+02	3.53E-01	1.26E-01	3.02E-05	1.35E+00	5.19E-03	3.74E-01	4.22E+00	1.13E+00
External Impacts - D (not in totals)	-1.67E+01	5.16E-02	2.34E-02	-1.34E-06	-1.07E-01	-9.73E-04	-2.30E-02	-2.98E-01	-7.68E-02

Parameters describing resource input

Impact Category	PERE	PERM	PERT	PENRE	PENRM	PENRT	Use of water
	MJ	MJ	MJ	MJ	MJ	MJ	m ³
Product stage	1.96E+02	5.27E-01	1.97E+02	2.58E+03	2.60E+01	2.61E+03	3.83E+00
Construction stage	8.69E+00	0.00E+00	8.69E+00	6.06E+02	0.00E+00	6.06E+02	7.62E-02
Use stage	MND	MND	MND	MND	MND	MND	MND
End-of-life stage	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	2.05E+02	5.27E-01	2.06E+02	3.19E+03	2.60E+01	3.22E+03	3.91E+00
External impact (D)	-2.30E+01	0.00E+00	-2.30E+01	-2.45E+02	0.00E+00	-2.45E+02	-7.50E-01



- 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 material.
- PENRT** = Total use of non-renewable primary energy resource.

Parameters describing different waste categories

Environmental parameters	Hazardous waste	Non-hazardous waste	Nuclear waste
	kg	kg	kg
Product stage	7.74E+00	2.15E+02	2.48E-02
Construction stage	6.80E-01	1.21E+01	4.17E-03
Use stage	MND	MND	MND
End-of-life stage	0.00E+00	0.00E+00	0.00E+00
Total	8.42E+00	2.27E+02	2.90E-02
External impacts (D)	-1.41E+00	-4.28E+01	-1.25E-03



Parameters describing further output material flows

Parameters describing output material flows	Unit	Parameter unit expressed per functional unit
Components for re-use	kg	0.00+E1
Materials for recycling	kg	1.76E-E2
Materials for energy recovery	kg	1.14E-02



Scenarios and additional technical information

Scenario	Parameter	Parameter unit
A2 – Transportation to manufacturer	Vehicle type used for transport or fuel type consumption of vehicle	Materials are sourced as locally as possible. Environmental burdens created during transport are calculated with “Transport, freight, sea, container ship” and “Transport, freight, lorry 16-32 ton, EURO5”.
A3 – Manufacturing	Energy usage during production	0.42kWh of electricity used during production per ton of Verti-Block.
A4 – Transportation to building site	Vehicle type used for transport or fuel type consumption of vehicle	Since Verti-Block can be sent anywhere, the distance of 100km was used, this can be extrapolated if needed. Fuel consumption is specified in EcolInvent V3.6 data records “Transport, freight, lorry 16-32 ton, EURO5” at 75% capacity utilisation.
C1-C4	End-of-life Treatment	26.795kWh of energy used in deconstruction and demolition. After the service life of 120 years Verti-Block is removed and reused where possible. Unusable parts are incinerated; an average distance of 50km (Number can be extrapolated based on actual distance) to the nearest recycling and/or regranulation plant is used. 05% is recycled and 5% is landfilled. This is calculated using “Transport, freight, lorry 16-32 ton, EURO5”.



Annex - EN 15804+A1 Results

Impact Category	Global warming	Ozone layer depletion	Acidification	Eutrophication	Photochemical oxidation	Abiotic depletion (non-fossil)	Abiotic depletion (fossil fuels)
	kgCO2e	kg CFC-11 e	kgSO2e	kg P04 e	kg Ethane e	kg Sb e	MJ
Product stage	4.31E+02	1.72E-05	8.78E-01	2.56E-01	3.59E-02	9.89E-04	2.41E+03
Construction stage	4.04E+01	7.48E-06	1.29E-02	2.92E-02	5.27E-03	1.41E-04	6.06E+02
Use stage	MND	MND	MND	MND	MND	MND	MND
End-of-life stage	0.00+00	0.00+00	0.00+00	0.00+00	0.00+00	0.00+00	0.00+00
Total	4.71E+02	2.47E-05	1.01E+00	2.85E-01	4.12E-02	1.13E-03	3.02E+03
External Impacts - D	-1.63+01	-1.11E-06	-8.33E-02	-4.00E-02	-5.60E-03	-1.56E-04	-2.45E+02

References

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