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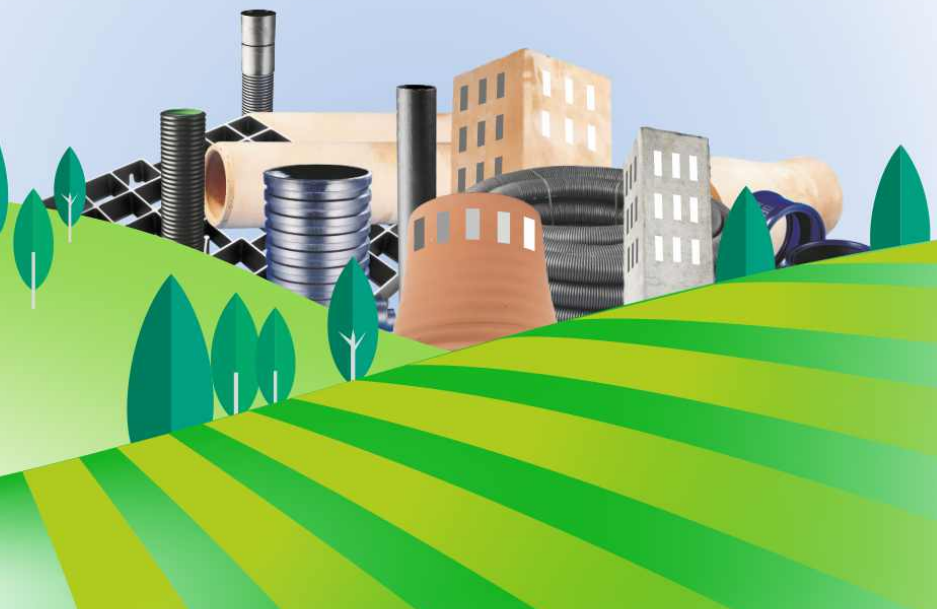
Naylor XtraFire Prestressed Concrete Lintels

Environmental Product Declaration (EPD)



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

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Scope

This document is an Environmental Product Declaration of Naylor XtraFire concrete lintels. 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 concrete as maintenance is not needed. XtraFire lintels are in accordance with standards BS8110, BS EN 845, BS EN 206, BS 8500 and BS 5896.

Manufacturer information

Manufacturer	Naylor Concrete Products Ltd
Address	Whaley Road, Barugh Green, Barnsley S75 1HT
E-Mail	info@naylor.co.uk
Website	www.naylor.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	50 years
Declared unit	1 ton of concrete - 1000kg
EPD type	Cradle-to-gate with options, A4, modules C1-C4 and module D
EPD verification	Self-declared
Background database	EcoInvent 3.6
Date of EPD and Validity	February 2023 – February 2028

System Boundary

In accordance with 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 material extraction, manufacturing, and end-of-life stages as well as considering the benefits and loads beyond the system boundary scenario.
There are a mix of materials are used to manufacture Naylor prestressed concrete lintels including sand, limestone, cement, and additives.

Product application

XtraFire lintels are used to provide structural support and stability to different structures and architectural elements.

Product material consumption

Material	% Of product
Limestone	36
Sand	35
CEM 1	18
Water	5
Admix	6

Prestressed steel wire and strand are included to concrete mix, these have been factored into overall emissions.

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 concrete lintels to the location
- Installation of concrete lintels

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 concrete lintels
- Maintenance of concrete lintels

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

- Extraction of concrete lintels after 50 years of expected service life
- Transport of concrete lintels after 50 years of expected service life to end of life
- End-of-life treatment of concrete

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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

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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 oxdiation 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	1.68E+02	2.44	9.45E-02	9.24E-06	5.7E-01	3.16E-03	1.23E-01	1.4	3.76E-01
Construction stage	9.41	6.83E-03	2.83E-03	2.21E-06	3.95E-02	7.65E-05	1.19E-02	1.32E-01	4.23E-02
Use stage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
End-of-life stage	4.97E+01	2.57E+01	1.76E-02	5.54E-06	1.68E-01	4.95E-04	5.81E-02	6.39E-01	1.81E-01
Total	2.27E+02	2.82E+01	1.15E-01	1.7E-05	7.78E-01	3.74E-03	1.93E-01	2.22	5.99E-01
External Impacts - D (not in totals)	4.7E-01	4.77E-04	1.29E-04	1.35E-07	4.32E-03	4.4E-06	1.69E-03	1.86E-02	5.22E-03

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	1.52E+02	3.23E+01	1.84E+02	1.84E+03	18.23	1.86E+03	2.42
Construction stage	3.67	0	3.67	2.6E+02	0	2.6E+02	3.05E-02
Use stage	N/A	N/A	N/A	N/A	N/A	N/A	N/A
End-of-life stage	42.86	0	42.86	5.47E+02	0	5.47E+02	2.31E-01
Total	1.98E+02	3.23E+01	2.31E+02	2.65E+03	18.23	2.67E+03	2.68
External impact (D)	-3.39	N/A	-3.39	-3.97E+01	N/A	-3.97E+01	-3.96E-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	3.98	1.43E+02	8.02E-03
Construction stage	1.42E-01	1.57E+01	1E-03
Use stage	N/A	N/A	N/A
End-of-life stage	7.78E-01	5.1E+01	2.45E-03
Total	4.896	2.09E+02	1.15E-02
External impacts (D)	-2.24E-01	-9.18	-1.98E-04

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Parameters describing further output material flows

Parameters describing output material flows	Unit	Parameter unit expressed per functional unit
Components for re-use	kg	3E+01
Materials for recycling	kg	7.93E+02
Materials for energy recovery	kg	N/A

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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	26.946kWh of electricity and heat production and used during production per ton of Naylor concrete.
A4 – Transportation to building site	Vehicle type used for transport or fuel type consumption of vehicle	Since Naylor concrete can be sent anywhere, the distance of 100km was used, this can be extrapolated if needed. Fuel consumption is specified in EcoInvent V3.6 data records "Transport, freight, lorry 16-32 ton, EURO5" at 75% capacity utilisation.
A5 – Installation into building/location	Waste on building site after product installation	30kg of wood and 12.5kg for recycling. 50km (Number can be extrapolated based on actual distance) to nearest recycling plant using "Transport, freight, lorry 16-32 ton, EURO5".
C1-C4	End-of-life Treatment	26.795kWh of energy used in deconstruction and demolition. After the service life of 50 years Naylor concrete 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. 5% is recycled and 5% is landfilled. This is calculated using "Transport, freight, lorry 16-32 ton, EURO5".

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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 PO4 e	kg Ethane e	kg Sb e	MJ
Product stage	2.22E+02	1.2E-05	8.2E-01	1.56E-01	5.52E-02	1.15E-03	1.84E+03
Construction stage	9.32	1.76E-06	1.91E-02	3.87E-03	1.21E-03	1.61E-04	1.46E+02
Use stage	N/A	N/A	N/A	N/A	N/A	N/A	N/A
End-of-life stage	4.98E+01	4.75E-06	8.01E-02	1.56E-01	5.67E-03	2.15E-04	5.47E+02
Total	2.81E+02	1.85E-05	9.19E-01	3.16E-01	6.21E-02	1.52E-03	2.53E+03
External Impacts - D	-2.71	-2.29E-07	-1.12E-02	-6E-03	-9.11E-04	-3.06E-04	-3.97E+01

References

BSI. (2020). *BS EN ISO 14040:2006+A1:2020: Environmental Management - Life cycle assessment - Principles and framework.* BSI Standards Publication.

BSI. (2021). *BS EN 15804:2012+A2:2019: Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products.* BSI.

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Dated 1 February 2023