epd-norge
Global program operatør

Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

Element Concrete PF70 Winter



The Norwegian EPD Foundation

Owner of the declaration:
Marlon Tørmørtel A/S

Product:
Element Concrete PF70 Winter

Declared unit:
1 kg

This declaration is based on Product Category Rules:
CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 009:2021 Part B for Technical - Chemical products for building and construction industry

Program operator:
The Norwegian EPD Foundation

Declaration number:

Registration number:

Issue date:

Valid to:

EPD Software:
LCA.no EPD generator ID: 192780

General information

Product

Element Concrete PF70 Winter

Owner of the declaration:

Marlon Tørmørtel A/S
Contact person: Bente Vesterager
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Program operator:

Post Box 5250 Majorstuen, 0303 Oslo, Norway
The Norwegian EPD Foundation
Phone: +47 23 08 80 00
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Manufacturer:

Marlon Tørmørtel A/S

Declaration number:

Place of production:

Marlon Tørmørtel A/S
Virkelyst 20
8740 Brædstrup, Denmark

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 009:2021 Part B for Technical - Chemical products for building and construction industry

Management system:

Statement of liability:

The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Organisation no:

DK13254079

Declared unit:

1 kg Element Concrete PF70 Winter

Issue date:

Declared unit with option:

A1-A3,A4,A5,C1,C2,C3,C4,D

Valid to:

Year of study:

2022

Functional unit:

No functional unit declared

Comparability:

EPD of construction products may not be comparable if they not comply with EN 15804 and seen in a building context.

General information on verification of EPD from EPD tools:

Independent verification of data, other environmental information and the declaration according to ISO 14025:2010, § 8.1.3 and § 8.1.4. Verification of each EPD is made according to EPD-Norway's guidelines for verification and approval requiring that tools are i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPD-Norway, and iii) the process is reviewed annually by an independent third party verifier. See Appendix G of EPD-Norway's General Programme Instructions for further information on EPD tools

Development and verification of EPD:

The declaration is created using EPD tool lca.tools ver EPD2022.03, developed by LCA.no. The EPD tool is integrated in the company's management system, and has been approved by EPD Norway.

Developer of EPD: Bente Vesterager

Reviewer of company-specific input data and EPD: Maria Hosbjerg Christensen

Verification of EPD tool:

Independent third party verification of the EPD tool, background data and test-EPD in accordance with EPDNorway's procedures and guidelines for verification and approval of EPD tools. NEPDT73

Approved:

Håkon Hauan, CEO EPD-Norge

Third party verifier:

Linda Høibye, Life Cycle Assessment Consulting

(no signature required)

Product

Product description:

Marlon Element Concrete PF70 Winter is a factory-produced expanding liquid mortar made of Portland cement, mineral adhesives, additives and oven-dried silica sand with a controlled grain curve. Marlon Element Concrete PF70 Winter requires only the addition of water and, when mixed, is a very fluid pumpable concrete.
ee link for more information on: https://marlon.dk/en/products/installation-and-joint-mortar/element-concrete-pf70-winter

Product specification

EPD covers:
Item no1000748 Marlon Element Concrete PF70 Winter

Materials	Value	Unit
Fillers/Aggregates	50-70	%
Binders	30-45	%
Additives	0-2	%
Packaging	2-3	%

Technical data:

Marlon Element Concrete PF70 Winter is produced and declared according to Bulletin no. 5 and EN 1504-3.
Compressive strength, 28 days > 65 MPa
Bending tensile strength, 28 days >10 MPa

See DoP at https://marlon.dk/ for all declared product properties.

Market:

Denmark

Reference service life, product

The reference service life of the product is similar to the service life of the building.

Reference service life, building

> 50 years.

LCA: Calculation rules

Declared unit:

1 kg Element Concrete PF70 Winter

Cut-off criteria:

All major raw materials and all the essential energy is included. The production processes for raw materials and energy flows with very small amounts (less than 1%) are not included. These cut-off criteria do not apply for hazardous materials and substances.

Allocation:

The allocation is made in accordance with the provisions of EN 15804. Incoming energy and water and waste production in-house is allocated equally among all products through mass allocation. Effects of primary production of recycled materials is allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.

Data quality:

Specific data for the product composition are provided by the manufacturer. The data represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on EPDs according to EN 15804 and different LCA databases. The data quality of the raw materials in A1 is presented in the table below.

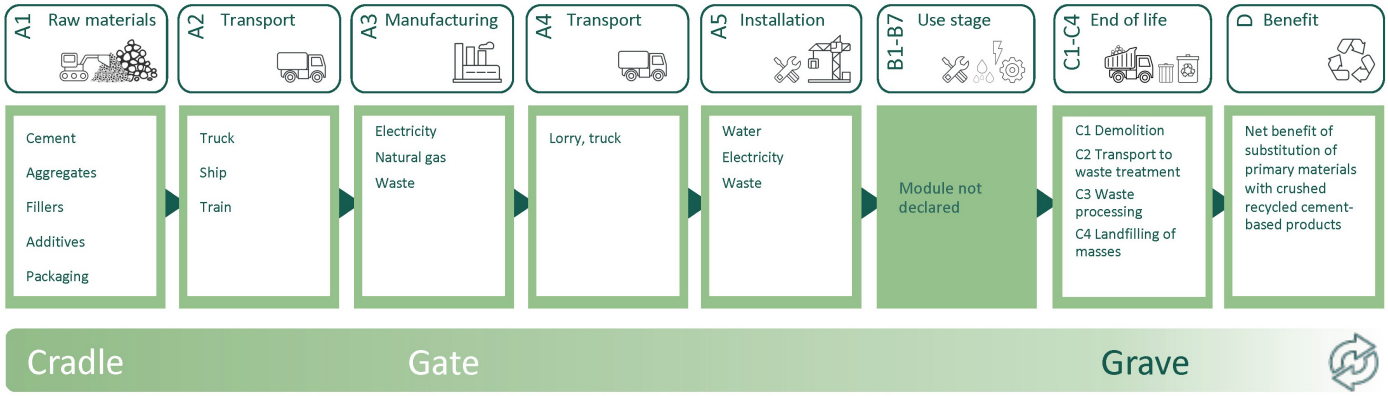
Materials	Source	Data quality	Year
Cement	ecoinvent 3.6	Database	2019
Chemical	ecoinvent 3.6	Database	2019
Defoamer	ecoinvent 3.6	Database	2019
Fillers	ecoinvent 3.6	Database	2019
Limestone	ecoinvent 3.6	Database	2019
Packaging - Plastic	ecoinvent 3.6	Database	2019
Quartz sand	ecoinvent 3.6	Database	2019
Rheology modifier	ecoinvent 3.6	Database	2019
Fillers	ecoinvent 3.6	Database	2020
Packaging - Cardboard	Modified ecoinvent 3.6	Database	2019
Packaging - Pallet	Modified ecoinvent 3.6	Database	2019

System boundaries (X=included, MND=module not declared, MNR=module not relevant)

Product stage			Construction installation stage		Use stage							End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

System boundary:

All processes from raw material extraction, to production, transport to the construction site and assembly, are included in the analysis as well as end of life stage and phases beyond the system boundary.



Additional technical information:

The product can be delivered in bulk, Big bag or plastic bags. The calculation includes data for plastic bags, as this is the most frequent used form of packaging.

LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

Transport from production place to user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, 16-32 tonnes, EURO 6 (km) - Europe	36,7 %	160	0,043	l/tkm	6,88

Assembly (A5)	Unit	Value			
	kg/DU	0,00			
Electricity, Denmark (kWh)	kWh/DU	0,01			
Waste, concrete, to landfill (kg)	kg/DU	0,02			
Waste, packaging, corrugated board box, to average treatment (kg) - A5, inkl. 85 km transp.	kg/DU	0,00			
Waste, packaging, pallet, EUR wooden pallet, reusable, average treatment (kg) - A5, inkl. 85 km transp.	kg	0,02			
Water, tap water (kg)	kg/DU	0,15			

De-construction demolition (C1)	Unit	Value			
Demolition of building per kg of cement-based product, C1 (kg)	kg/DU	1,00			

Transport to waste processing (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, 16-32 tonnes, EURO 5 (km) - Europe	36,7 %	50	0,044	l/tkm	2,20

Waste processing (C3)	Unit	Value			
Waste treatment of cement-based product after demolition, C3 (kg)	kg	0,90			

Disposal (C4)	Unit	Value			
Disposal of cement-based product in landfill (kg)	kg	0,10			

Benefits and loads beyond the system boundaries (D)	Unit	Value			
Substitution of primary aggregates with crushed recycled cement-based products (kg)	kg	0,90			

LCA: Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document.

Environmental impact										
	Indicator	**Unit**	A1-A3	A4	A5	C1	C2	C3	C4	D
	GWP-total	kg CO_2 -eq	4,18E-01	2,68E-02	3,77E-02	4,00E-03	8,54E-03	6,48E-04	8,22E-04	-2,10E-03
	GWP-fossil	kg CO_2 -eq	4,52E-01	2,68E-02	3,06E-03	4,00E-03	8,53E-03	6,39E-04	8,20E-04	-2,06E-03
	GWP-biogenic	kg CO_2 -eq	-3,42E-02	1,11E-05	3,46E-02	7,50E-07	3,48E-06	5,52E-06	9,58E-07	-4,11E-05
	GWP-luluc	kg CO_2 -eq	1,73E-04	9,52E-06	3,71E-06	3,15E-07	2,98E-06	8,84E-07	2,02E-07	-1,39E-06
	ODP	kg CFC11 -eq	3,57E-08	6,06E-09	2,02E-10	8,64E-10	1,95E-09	1,26E-10	3,11E-10	-3,75E-10
	AP	mol H+ -eq	1,65E-03	7,69E-05	1,26E-05	4,19E-05	3,49E-05	5,17E-06	7,30E-06	-1,85E-05
	EP-FreshWater	kg P -eq	8,17E-06	2,14E-07	2,21E-07	1,46E-08	6,70E-08	4,04E-08	9,30E-09	-5,48E-08
	EP-Marine	kg N -eq	5,27E-04	1,52E-05	2,38E-06	1,85E-05	1,03E-05	1,52E-06	2,71E-06	-6,43E-06
	EP-Terrestial	mol N -eq	4,76E-03	1,70E-04	3,21E-05	2,00E-04	1,14E-04	1,75E-05	2,99E-05	-7,56E-05
	POCP	kg NMVOC -eq	1,16E-03	6,52E-05	7,46E-06	5,57E-05	3,50E-05	4,68E-06	8,56E-06	-2,00E-05
	ADP-minerals&metals[1]	kg Sb -eq	3,74E-06	7,39E-07	3,37E-08	6,14E-09	2,31E-07	8,11E-09	7,39E-09	-1,83E-07
	ADP-fossil[1]	MJ	2,90E+00	4,04E-01	4,21E-02	5,51E-02	1,29E-01	1,98E-02	2,26E-02	-3,49E-02
	WDP[1]	m^3	1,11E+01	3,91E-01	5,93E-01	1,17E-02	1,23E-01	2,19E+00	1,39E-01	-1,63E+00

GWP-total = Global Warming Potential total; GWP-fossil = Global Warming Potential fossil fuels; 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; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment: EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

1. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator

Remarks to environmental impacts

Additional environmental impact indicators

Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	PM	Disease incidence	1,20E-08	1,64E-09	9,10E-11	5,07E-09	6,14E-10	8,30E-11	1,56E-10	-3,95E-10
	IRP[2]	kgBq U235 -eq	1,11E-02	1,77E-03	2,06E-04	2,40E-04	5,62E-04	3,33E-04	1,03E-04	-3,20E-04
	ETP-fw[1]	CTUe	2,39E+01	3,00E-01	6,64E-02	3,01E-02	9,47E-02	1,41E-02	1,23E-02	-3,59E-02
	HTP-c[1]	CTUh	1,78E-10	0,00E+00	1,00E-12	1,00E-12	0,00E+00	1,00E-12	1,00E-12	-2,00E-12
	HTP-nc[1]	CTUh	5,42E-09	3,28E-10	4,70E-11	2,80E-11	1,02E-10	1,30E-11	9,00E-12	-4,40E-11
	SQP[1]	dimensionless	1,92E+00	2,83E-01	6,98E-02	6,69E-03	8,87E-02	1,12E-02	8,69E-02	7,91E-02

PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Potential Soil Quality Index (dimensionless)

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

1. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator
2. This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Resource use

Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	PERE	MJ	3,29E-01	5,79E-03	2,98E-02	3,00E-04	1,82E-03	1,02E-02	8,08E-04	-8,16E-03
	PERM	MJ	3,17E-01	0,00E+00	-3,16E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	PERT	MJ	6,46E-01	5,79E-03	1,32E-02	3,00E-04	1,82E-03	1,02E-02	8,08E-04	-8,16E-03
	PENRE	MJ	2,91E+00	4,05E-01	4,21E-02	5,51E-02	1,29E-01	1,99E-02	2,26E-02	-3,68E-02
	PENRM	MJ	5,33E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	PENRT	MJ	2,97E+00	4,05E-01	4,21E-02	5,51E-02	1,29E-01	1,99E-02	2,26E-02	-3,68E-02
	SM	kg	3,90E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	RSF	MJ	8,04E-03	2,07E-04	1,12E-03	0,00E+00	6,50E-05	0,00E+00	1,68E-05	-1,67E-04
	NRSF	MJ	2,22E-03	7,41E-04	2,12E-05	0,00E+00	2,32E-04	0,00E+00	3,62E-05	-1,71E-04
	FW	m^3	3,38E-03	4,33E-05	2,59E-04	2,83E-06	1,35E-05	3,40E-05	2,78E-05	-1,28E-03

PERE = Use of renewable primary energy excluding renewable primary energy resources 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 resources; SM = Use of secondary materials; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

End of life - Waste

Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	HWD	kg	9,24E-04	2,09E-05	4,67E-06	1,62E-06	6,56E-06	1,98E-06	0,00E+00	-8,40E-06
	NHWD	kg	4,38E-02	1,97E-02	2,15E-02	6,52E-05	6,15E-03	6,26E-05	1,00E-01	-2,55E-04
	RWD	kg	1,26E-05	2,76E-06	1,12E-07	3,82E-07	8,77E-07	2,10E-07	0,00E+00	-2,76E-07

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

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

End of life - Output flow

Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MFR	kg	1,88E-05	0,00E+00	5,09E-04	0,00E+00	0,00E+00	9,00E-01	0,00E+00	0,00E+00
	MER	kg	1,22E-04	0,00E+00	7,31E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	EEE	MJ	4,57E-04	0,00E+00	4,98E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	EET	MJ	6,92E-03	0,00E+00	7,54E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported energy electrical; EET = Exported energy thermal

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

Biogenic Carbon Content

Indicator	Unit	At the factory gate
Biogenic carbon content in product	kg C	4,84E-05
Biogenic carbon content in accompanying packaging	kg C	9,40E-03

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO2

Additional requirements

Greenhouse gas emissions from the use of electricity in the manufacturing phase

National production mix from import, low voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3).

Electricity mix	Data source	Amount	Unit
Electricity, Denmark (kWh)	ecoinvent 3.6	338,20	g CO2-eq/kWh

Dangerous substances

The product contains no substances given by the REACH Candidate list.

Indoor environment

Additional Environmental Information

Additional environmental impact indicators required in NPCR Part A for construction products									
Indicator	**Unit**	A1-A3	A4	A5	C1	C2	C3	C4	D
GWPIOBC	kg CO_2 -eq	4,58E-01	2,68E-02	3,72E-03	4,00E-03	8,54E-03	1,19E-03	0,00E+00	-2,20E-03

GWP-IOBC: Global warming potential calculated according to the principle of instantaneous oxidation. In order to increase the transparency of biogenic carbon contribution to climate impact, the indicator GWP-IOBC is required as it declares climate impacts calculated according to the principle of instantaneous oxidation. GWP-IOBC is also referred to as GWP-GHG in context to Swedish public procurement legislation.

Bibliography

ISO 14025:2010 Environmental labels and declarations - Type III environmental declarations - Principles and procedures.
ISO 14044:2006 Environmental management - Life cycle assessment - Requirements and guidelines.
EN 15804:2012+A2:2019 Environmental product declaration - Core rules for the product category of construction products.
ISO 21930:2017 Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products.
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