

Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

HDPE-Based Construction, Ventilation, and Water Treatment Solutions



The Norwegian EPD Foundation

Owner of the declaration:

EXPO-NET Danmark A/S

Product:

HDPE-Based Construction, Ventilation, and Water Treatment Solutions

Declared unit:

1 kg

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR

NPCR Part A: Construction products and services (application for plastic products)

Program operator:

The Norwegian EPD Foundation

Declaration number:

NEPD-9991-9922

Registration number:

NEPD-9991-9922

Issue date:

07.05.2025

Valid to:

07.05.2030

EPD software:

LCAno EPD generator ID: 928386

General information

Product:

HDPE-Based Construction, Ventilation, and Water Treatment Solutions

Program operator:

The Norwegian EPD Foundation
Post Box 5250 Majorstuen, 0303 Oslo, Norway
Phone: +47 977 22 020
web: www.epd-norge.no

Declaration number:

NEPD-9991-9922

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR Part A: Construction products and services (application for plastic products)

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.

Declared unit:

1 kg HDPE-Based Construction, Ventilation, and Water Treatment Solutions

Declared unit with option:

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

Functional unit:**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

Verification of EPD tool:

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

Third party verifier:

Elisabet Amat, GREENIZE projects

(no signature required)

Owner of the declaration:

EXPO-NET Danmark A/S
Contact person: Lars Klinkby
Phone: 98922122
e-mail: lk@expo-net.dk

Manufacturer:

EXPO-NET Danmark A/S

Place of production:

EXPO-NET Danmark A/S
Georg Jensens Vej 5
DK-9800 Hjørring, Denmark

Management system:

ISO 9001:2015 ISO 14001:2015

Organisation no:

DK53271715

Issue date:

07.05.2025

Valid to:

07.05.2030

Year of study:**Comparability:**

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

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: Emil Pedersen - Nordic LCA

Reviewer of company-specific input data and EPD: Børge Heggen Johansen, Energiråd AS

Approved:

Håkon Hauan, CEO EPD-Norge

Product:

Product description:

This EPD covers various HDPE-based products designed for construction, ventilation, and water treatment applications.

Insect Netting: A UV-resistant, metal-free mesh that prevents insects and drifting snow from entering buildings while maintaining airflow.

Snow and Bird Barrier: Installed at the roof edge and ridge to block birds and reduce drifting snow, while allowing proper ventilation.

Snow Filter Tubes, Ventilation Tubes, and Head Joint Tubes: Designed to prevent snow infiltration and regulate airflow in roof and wall constructions, ensuring proper ventilation while protecting against the elements, as well as preventing entry of insects and small animals in certain applications.

BIO-BLOK: A durable HDPE-based media designed to optimize wastewater treatment, aquaculture filtration, and stormwater management. Its high surface area enhances biological processes for pollutant reduction.

Product specification:

The products are primarily made of high-density polyethylene (HDPE). Some products contain color granulates, known as masterbatch, in green, gray, white, and black. The masterbatch is typically LDPE-based, except for the black variant, which is PP-based.

Materials	kg	%
Binder	0,00010	0,01
Chemical	0,00010	0,01
Plastic - Polyethylene (HDPE)	0,96	96,57
Plastic - Polyethylene (LDPE)	0,016	1,6
Polypropylene (PP)	0,017	1,78
Solvent	0,00030	0,03
Total	1,00	100,00

Packaging	kg	%
Packaging - Cardboard	0,03	50,00
Packaging - Pallet	0,03	50,00
Total incl. packaging	1,06	100,00

Technical data:

Further technical information can be obtained by contacting the manufacturer or on the manufacturers website: <https://www.expo-net.dk/>.

Market:

Denmark, Sweden, England, Chile and others.

Reference service life, product:

25 years.

Reference service life, building or construction works:

LCA: Calculation rules

Declared unit:

1 kg HDPE-Based Construction, Ventilation, and Water Treatment Solutions

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
Binder	ecoinvent 3.6	Database	2019
Chemical	ecoinvent 3.6	Database	2019
Packaging - Cardboard	Modified ecoinvent 3.6	Database	2019
Packaging - Pallet	ecoinvent 3.6	Database	2019
Packaging - Pallet	Modified ecoinvent 3.6	Database	2019
Plastic - Polyethylene (HDPE)	ecoinvent 3.6	Database	2019
Plastic - Polyethylene (LDPE)	ecoinvent 3.6	Database	2019
Polypropylene (PP)	ecoinvent 3.6	Database	2019
Solvent	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	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

System boundary:

This EPD is based on a cradle-to-gate LCA, in which 100 weight-% has been accounted for. The general rules for the exclusion of inputs and outputs follows the requirements in EN 15804, 6.3.5, where the total of neglected input flows per module shall be a maximum of 5% of energy usage and mass and 1% of energy usage and mass for unit processes.

Product stage (A1-A3) includes:

- A1 – Extraction and processing of raw materials.
- A2 – Transport to the production site.
- A3 – Manufacturing processes.

The product stage comprises the acquisition of all raw materials, products and energy, transport to the production site, packaging and waste processing up to the “end-of-waste” state or final disposal. The LCA results are declared in aggregated form for the product stage, which means, that the sub-modules A1, A2 and A3 are declared as one module A1-A3.

Transport (A4) is assumed to cover a distance of 900 km.

End of Life (C1-C4) includes:

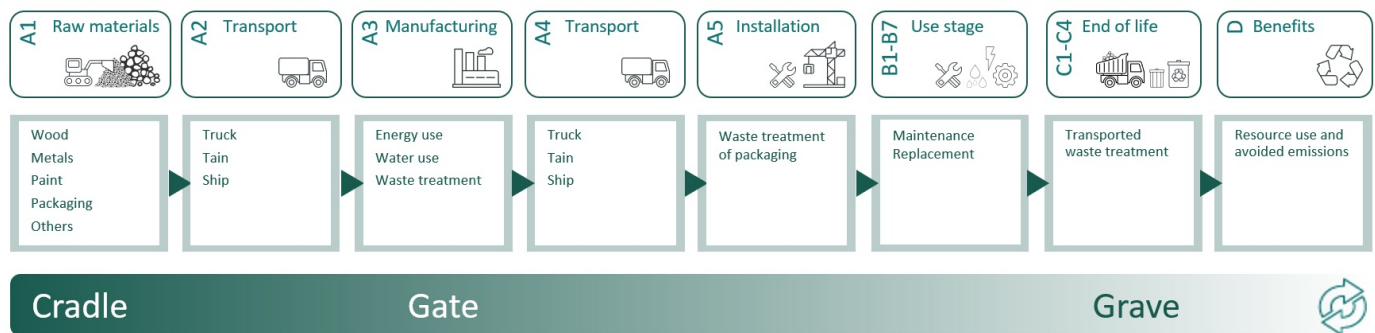
End of Life (C1-C4) includes only modules C2 and C3 in the declaration. In module C1 disassembly is assumed to be performed manually, possibly using hand tools, with minimal energy consumption.

After disassembly, the components are transported to a relevant waste processing facility. The transport distance is estimated to be 50 km.

The components of the HDPE-Based Construction, Ventilation, and Water Treatment Solutions are either recycled or incinerated with additional benefits. Treated plastic is incinerated at waste-to-energy facilities.

Re-use, recovery and recycling potential (D) includes:

The materials in the HDPE-Based Construction, Ventilation, and Water Treatment Solutions contribute to benefits and burdens beyond its system boundaries. When the materials are incinerated, they generate both electricity and heat. The electricity replaces the Danish electricity grid mix, while the heat substitutes district heating in Denmark, with the energy distribution comprising 25% electricity and 75% heat.



Additional technical information:



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, unspecified (kgkm) - RER	48,7 %	900	0,051	l/tkm	45,90
Transport to waste processing (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, unspecified (kgkm) - RER	48,7 %	50	0,051	l/tkm	2,55
Waste processing (C3)	Unit	Value			
Waste treatment per kg Plastic, Mixture, municipal incineration with fly ash extraction (kg)	kg	1,00			
Balancing waste - NRPM (MJ) - (Type 4)	MJ	42,26			
Balancing waste - RPEM (MJ) - (Type 4)	MJ	0,47			
Balancing waste - Biogenic carbon in product (kg) - (Type 4)	kg	0,035			
Disposal (C4)	Unit	Value			
Landfilling of ashes from incineration of Plastics, Mixture, municipal incineration with fly ash extraction, process per kg ashes and residues - C4 (kg)	kg	0,034			
Benefits and loads beyond the system boundaries (D)	Unit	Value			
Substitution of Electricity, Denmark (kWh)	kWh	1,53			
Substitution of District heating, Denmark (MJ)	MJ	23,24			

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	C1	C2	C3	C4	D	
 GWP-total	kg CO ₂ -eq	2,81E+00	1,19E-01	0	6,59E-03	2,40E+00	9,95E-05	-1,10E+00	
 GWP-fossil	kg CO ₂ -eq	2,84E+00	1,18E-01	0	6,58E-03	2,37E+00	9,95E-05	-1,09E+00	
 GWP-biogenic	kg CO ₂ -eq	-3,56E-02	5,08E-05	0	2,82E-06	3,55E-02	5,06E-08	-2,26E-03	
 GWP-luluc	kg CO ₂ -eq	1,85E-03	4,19E-05	0	2,33E-06	9,60E-06	1,38E-08	-1,28E-03	
 ODP	kg CFC11 -eq	1,40E-07	2,70E-08	0	1,50E-09	5,14E-09	9,00E-12	-4,00E-08	
 AP	mol H ⁺ -eq	1,10E-02	6,75E-04	0	3,75E-05	5,19E-04	3,15E-07	-6,90E-03	
 EP-FreshWater	kg P -eq	7,20E-05	9,75E-07	0	5,42E-08	4,56E-07	1,38E-09	-6,88E-05	
 EP-Marine	kg N -eq	2,24E-03	2,41E-04	0	1,34E-05	2,48E-04	9,53E-08	-1,13E-03	
 EP-Terrestrial	mol N -eq	2,53E-02	2,66E-03	0	1,48E-04	2,54E-03	1,09E-06	-1,58E-02	
 POCP	kg NMVOC -eq	9,93E-03	7,61E-04	0	4,23E-05	6,13E-04	2,98E-07	-3,46E-03	
 ADP-minerals&metals ¹	kg Sb-eq	2,96E-05	3,07E-06	0	1,70E-07	2,59E-07	4,43E-10	-6,28E-06	
 ADP-fossil ¹	MJ	8,50E+01	1,82E+00	0	1,01E-01	3,25E-01	7,69E-04	-1,29E+01	
 WDP ¹	m ³	1,59E+02	1,72E+00	0	9,57E-02	2,35E+00	9,85E-03	-1,28E+02	

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	C1	C2	C3	C4	D
 PM	Disease incidence	1,04E-07	1,08E-08	0	6,00E-10	2,27E-09	3,00E-12	-5,88E-08
 IRP ²	kgBq U235 -eq	9,37E-02	7,95E-03	0	4,42E-04	8,19E-04	3,81E-06	-4,33E-02
 ETP-fw ¹	CTUe	2,72E+01	1,36E+00	0	7,55E-02	5,00E+00	1,69E-03	-3,55E+01
 HTP-c ¹	CTUh	7,92E-10	0,00E+00	0	0,00E+00	1,37E-10	0,00E+00	-4,90E-10
 HTP-nc ¹	CTUh	2,36E-08	1,80E-09	0	1,00E-10	6,24E-09	3,00E-12	-1,62E-08
 SQP ¹	dimensionless	2,25E+01	1,56E+00	0	8,65E-02	5,94E-02	2,29E-03	-5,86E+01

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	C1	C2	C3	C4	D	
 PERE	MJ	6,20E+00	2,61E-02	0	1,45E-03	1,81E-02	5,38E-05	-1,64E+01	
 PERM	MJ	4,78E-01	0,00E+00	0	0,00E+00	-4,78E-01	0,00E+00	0,00E+00	
 PERT	MJ	6,68E+00	2,61E-02	0	1,45E-03	-4,59E-01	5,38E-05	-1,64E+01	
 PENRE	MJ	4,37E+01	1,82E+00	0	1,01E-01	3,25E-01	7,69E-04	-1,30E+01	
 PENRM	MJ	4,23E+01	0,00E+00	0	0,00E+00	-4,23E+01	0,00E+00	0,00E+00	
 PENRT	MJ	8,59E+01	1,82E+00	0	1,01E-01	-4,19E+01	7,69E-04	-1,30E+01	
 SM	kg	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	
 RSF	MJ	2,32E-01	9,28E-04	0	5,16E-05	3,89E-04	1,33E-06	-2,63E-01	
 NRSF	MJ	1,81E-02	3,26E-03	0	1,81E-04	0,00E+00	1,26E-04	-3,30E-03	
 FW	m ³	4,18E-02	2,06E-04	0	1,14E-05	2,75E-03	7,10E-07	-2,61E-02	

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	C1	C2	C3	C4	D	
	HWD	kg	2,61E-03	9,80E-05	0	5,45E-06	0,00E+00	9,28E-04	-2,38E-03
	NHWD	kg	4,20E-01	1,13E-01	0	6,26E-03	0,00E+00	8,89E-04	-7,72E-02
	RWD	kg	9,05E-05	1,24E-05	0	6,87E-07	0,00E+00	4,61E-09	-1,16E-05

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	C1	C2	C3	C4	D	
	CRU	kg	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MFR	kg	2,81E-02	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MER	kg	1,25E-07	0,00E+00	0	0,00E+00	1,00E+00	0,00E+00	0,00E+00
	EEE	MJ	3,47E-04	0,00E+00	0	0,00E+00	1,54E+00	0,00E+00	0,00E+00
	EET	MJ	5,24E-03	0,00E+00	0	0,00E+00	2,32E+01	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	0,00E+00
Biogenic carbon content in accompanying packaging	kg C	1,39E-02

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	Source	Amount	Unit
Electricity, Denmark (kWh)	ecoinvent 3.6	338,20	g CO ₂ -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	C1	C2	C3	C4	D
GWPIOBC	kg CO ₂ -eq	2,88E+00	1,19E-01	0	6,58E-03	2,37E+00	2,96E-03	-1,30E+00

GWPI-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

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NPCR Part A: Construction products and services. Ver. 2.0. March 2021, EPD-Norge.

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