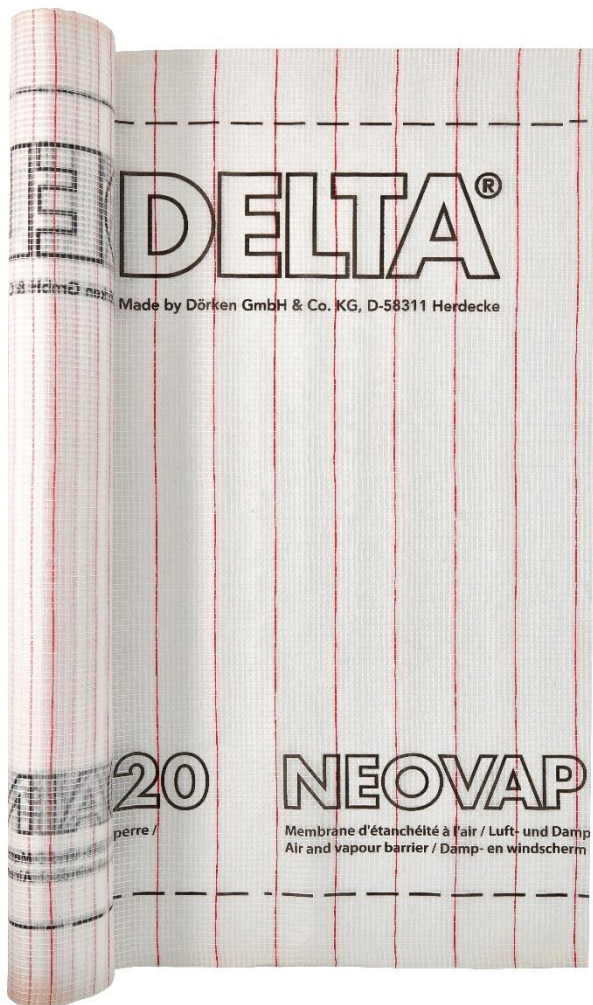


# Environmental Product Declaration

In accordance with ISO14025:2006 and EN15804:2012+A2:2019



## Reinforced vapor barrier

**storm**

**Owner of the declaration:**

Eric Storm A/S  
[www.eric-storm.dk](http://www.eric-storm.dk)

**Product name:**

Reinforced vapor barrier

**Declared unit:**

1m<sup>2</sup> produced vapor barrier

**Product category /PCR:**

CEN Standard EN 15804 + A2 is used as core PCR. Further NPCR Part A for Construction products and services And NCPR PartB for Roof waterproofing are used as supplementing PCRs

**Program holder and publisher:**

The Norwegian EPD foundation

**Declaration number:**

NEPD-7424-6813-EN

**Registration number:**

NEPD-7424-6813-EN

**Issue date:** 02.09.2024

**Valid to:** 02.09.2024

ver-050924

# General information

## Product:

Reinforced vapor barrier

## Program operator:

The Norwegian EPD Foundation  
Post Box 5250 Majorstuen, 0303 Oslo, Norway  
Tlf: +47 23 08 80 00  
e-mail: [post@epd-norge.no](mailto:post@epd-norge.no)

## Declaration number:

NEPD-7424-6813-EN

## This declaration is based on Product Category Rules:

PCR 2021:01 – Multipurpose films

## 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, life cycle assessment data and evidences.

## Declared unit:

1m<sup>2</sup> of Reinforced vapor barrier

## Year of study:

01.10.2022 - 30.09.2023

## Verification:

Independent verification of the declaration and data, according to ISO14025:2010

internal

external



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Independent verifier approved by EPD Norway  
Guangli Du  
Department of the Built Environment, Aalborg  
University, Denmark

## Owner of the declaration:

Eric Storm A/S  
Contact person: Michael Østergaard  
Phone: +45 66 13 53 64  
e-mail: [moe@eric-storm.dk](mailto:moe@eric-storm.dk)

## Wholesaler:

Eric Storm A/S  
Energivej 27, DK 5260 Odense S  
Denmark

## Place of production:

Germany

## Management system:

ISO 45001 and ISO 50001

## Organisation no:

VAT: 40755519

## Issue date:

02.09.2024

## Valid to:

02.09.2029

## Comparability:

EPD of construction products may not be able to compare if they do not comply with EN 15804 and are seen in a building context.

## The EPD has been worked out by:

NIRAS A/S

Approved



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Approved Manager of EPD Norway

# Product

## Product description:

Eric Storm A/S Reinforced vapor barrier is used as an interior vapor barrier in isolated building construction. It prevents moisture from penetrating in and out of walls, floors and ceilings, and can thus prevent moisture formation.

Vapor barrier	Value	Unit
Declared unit	1	m <sup>2</sup>

The declared product of Reinforced vapor barrier covered in this EPD is produced with a certain mass per m<sup>2</sup>, and can be viewed in the table below.

Weight (kg/m <sup>2</sup> )	Scaling factor to 1 kg
1.20 E-01	8.33

The declared product is produced by a manufacturer in Germany, and is distributed by the wholesaler Eric Storm A/S, who is the owner of this EPD. No activities or processes, which changes the properties or material composition occurs at the site of Eric Storm A/S at Energivej 27, DK 5260 Odense S, Denmark. The received vapor barriers are only handled and stored for distribution at Eric Storm A/S site.

## Product specification:

The vapor barriers are produced from virgin PE granulates through extrusion. Nylon fibres are layered in between the vapor barrier films and melted together. The production of vapor barriers takes in Germany, where they are shipped to Eric Storm A/S's location in Denmark. The vapor barriers are then distributed to customers in Denmark.

Materials per 1 m <sup>2</sup> of vapor barrier	%	Value	Unit
Polyethylene	85	1.02 E-01	kg
Nylon	15	1.80 E-02	kg

The vapor barriers are packaged at the manufacturers in Germany. The vapor barriers are rolled on coreboards, wrapped in packaging film, and stacked on euro pallets. The packaging is not changed at Eric Storm A/S's location.

Packaging materials per 1 m <sup>2</sup> of vapor barrier	Value	Unit
Wooden pallet	7.33 E-04	kg
Packaging film	7.20 E-04	kg
Coreboard	4.32 E-03	kg

### Technical data:

The declared vapor barrier follows the EU Standard EN 13984. Further the vapor barrier is included in Nordic ECO-labelling's database for building products which can be used for Swan labeled constructions. The vapor barrier's ability to repel moisture is expressed in a z-value, and is 100 for the declared product of reinforced vapor barrier.

### Market:

Denmark

### Reference service life, product:

The reference service life for the declared product is 50 years

## LCA: Calculation rules

### Declared unit:

1m<sup>2</sup> produced vapor barrier of 100% virgin PE plastic.

### Cut-off criteria:

The general rules apply for the exclusion of inputs and outputs in the LCA which complies with 15804:2012+A2:2019. In cases of insufficient input data or data gaps for a unit process, the cut-off criteria shall be 1 % of renewable and non-renewable primary energy usage and 1 % of the total mass input of that. The total neglected input flows, e.g., per module A1-A3, A4-A5, and B1-B5, B6-B7, C1-C4 and module D shall be a maximum of 5 % of energy usage and mass.

All major raw materials and all the essential energy are included. This cut-off rule does not apply to hazardous materials and substances.

### Allocation:

Where possible, allocation has been avoided by dividing processes into subprocesses. Where no disaggregated data is available the physical relations between the produced products has been used for an allocation of mass. This is due to the production of vapor barriers at Eric storm A/S not being a joint co-production, and the energy and materials used for producing, storing, and handling vapor barriers at Eric Storm A/S is not different for each type of vapor barrier. The allocation principles are in accordance with EN 15804:2012+A2:2019.

### Data quality:

Product-specific data is delivered by Eric Storm A/S. Product-specific data is sourced from Eric Storm A/S's warehouse located in Denmark. Generic data is from Ecoinvent 3.9.1 "Allocation cut-off by classification". Product-specific data is representative of the year 2022 and was collected in the period 01.10.2022 - 30.09.2023.

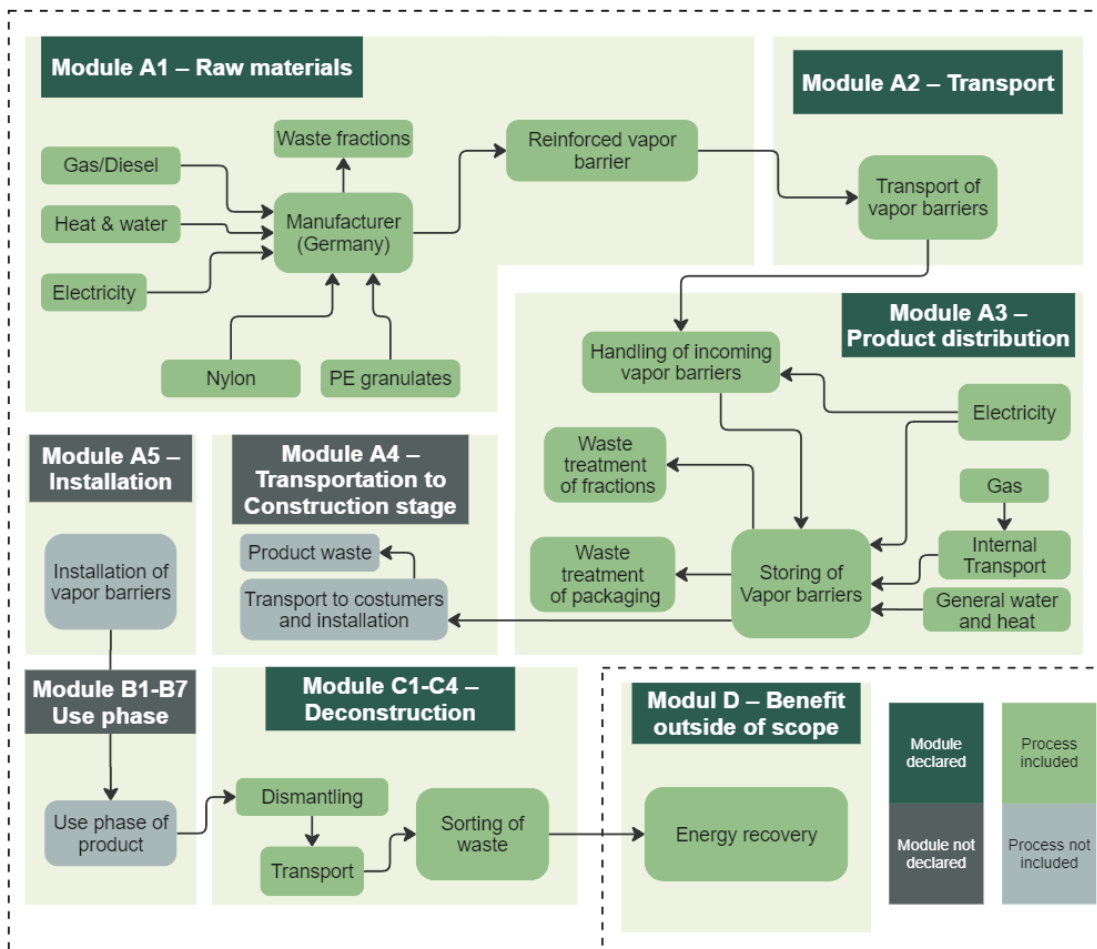
### System boundary:

The analysis is a cradle-to-gate, with module options C1, C2, C3, C4, and D

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

Product stage			Assembly stage		Use stage								End of life stage			Benefits & loads beyond system boundary
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	MND	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

### Scope



# LCA: Scenarios and additional technical information

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

## Product stage (A1-A3)

Module A1 is the manufacturing of Eric Storm A/S's vapor barriers at their supplier's production sites located in Germany. Eric Storm A/S's Reinforced vapor barrier is manufactured from virgin polyethylene (PE) and nylon. The vapor barriers are manufactured through an extrusion manufacturing process, where granulates of PE are heated and extruded to the correct thickness. Nylon fibres are layered in between the vapor barrier films and melted together. Packaging of the product is performed at the production site, where the product is rolled onto a wooden pallet, and wrapped in packaging film.

Production in Germany is based on the national residual electricity mix and utilize excess heat generated during production for facility heating. For modelling of heat consumption, a market mix for Europe is utilized.

Module A2 includes the transport from Eric Storm A/S' suppliers in Germany to Eric Storm A/S' warehouse in Odense, Denmark, where site specific data on distances and loads are provided by Eric Storm A/S. The vapor barriers are transported by truck.

Module A3 is Eric Storm A/S's own warehouse activities. This includes electricity, heating, water, and gas for internal transport. For Eric Storm A/S's entire Electricity consumption, Guarantees of Origin (GO) certificates has been purchased for Danish wind Energy, where a customized process is modelled based on National data for the production of electricity in Denmark from wind turbines (*WindEurope, 2020*).

## End of Life (C1, C3, C4)

For the end-of-life stage a waste-scenario is modelled based on Danish conditions. The product does not contribute to Module C1, as no processes are tied to the disassembling of foils and does not require handling during the demolition/rebuilding of a structure. The following waste scenario is applied, where 100% of the Reinforced vapor barrier is incinerated, and are based on data from The Danish Environmental- and food Ministry (*Miljø- og fødevareministeriet 2023*).

Waste treatment of 1 m <sup>2</sup> vapor barrier	%	Value	Unit
Reuse	0	0	kg
Recycling	0%	0	kg
To incineration	100%	1.20 E-01	kg
To landfill	0	0	kg

## Transport to waste processing (C2)

Module C2 Transport from the building/demolition site to the waste treatment/recycling facility is estimated to be 50 km as the waste is managed within Denmark's national border.

Transport from production place to assembly/user (C2)	Capacity utilisation (incl. return)	Distance (km)	Fuel/Energy consumption	Value	Unit
Truck	26.3%	50	Diesel	0.044	L/tkm

## Benefits and loads beyond the system boundaries (D)

The energy recovered mitigates 25% electricity, and 75% heat, with a 5 % loss factored in, and is modelled based on Danish conditions, based on statistics from the Danish Energy Agency (*Energistyrelsen, 2021*)

Benefits and loads beyond the system boundaries (D)	Value	Unit
Substitution of electricity, in Denmark	-9.78 E-01	MJ
Substitution of thermal energy, district heating, in Denmark	-1.36 E-01	MJ

## LCA: Results

### Core environmental impact indicators

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP - total	kg CO2 eq	4.81E-01	0.00E+00	1.13E-03	3.62E-01	0.00E+00	-1.08E-01
GWP - fossil	kg CO2 eq	4.73E-01	0.00E+00	1.13E-03	3.62E-01	0.00E+00	-1.02E-01
GWP - biogenic	kg CO2 eq	1.56E-03	0.00E+00	1.02E-06	1.95E-05	0.00E+00	-6.37E-03
GWP - luluc	kg CO2 eq	2.06E-04	0.00E+00	5.49E-07	6.08E-07	0.00E+00	-2.65E-04
ODP	kg CFC11 eq	2.99E-09	0.00E+00	2.46E-11	1.05E-10	0.00E+00	-3.13E-09
AP	molc H+ eq	1.71E-03	0.00E+00	3.68E-06	4.52E-05	0.00E+00	-4.99E-04
EP- freshwater	kg P eq	6.00E-05	0.00E+00	7.90E-08	3.12E-07	0.00E+00	-6.12E-05
EP -marine	kg N eq	3.84E-04	0.00E+00	1.27E-06	2.33E-05	0.00E+00	-1.27E-04
EP - terrestrial	molc N eq	3.89E-03	0.00E+00	1.34E-05	2.38E-04	0.00E+00	-1.70E-03
POCP	kg NMVOC eq	1.56E-03	0.00E+00	5.50E-06	5.86E-05	0.00E+00	-3.71E-04
ADP-M&M <sup>2</sup>	kg Sb-Eq	2.32E-06	0.00E+00	3.63E-09	5.43E-09	0.00E+00	-4.94E-07
ADP-fossil <sup>2</sup>	MJ	1.09E+01	0.00E+00	1.60E-02	2.59E-02	0.00E+00	-1.57E+00
WDP <sup>2</sup>	m <sup>3</sup>	3.22E-01	0.00E+00	6.53E-05	6.41E-04	0.00E+00	-1.40E-02

**GWP-total:** Global Warming Potential; **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; See "additional Norwegian requirements" for indicator given as PO4 eq. **EP-marine:** Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **EP-terrestrial:** Eutrophication potential, Accumulated Exceedance; **POCP:** Formation potential of tropospheric ozone; **ADP-M&M:** Abiotic depletion potential for non-fossil resources (minerals and metals); **ADP-fossil:** Abiotic depletion potential for fossil resources; **WDP:** Water deprivation potential, deprivation weighted water consumption

Reading example: 9,0 E-03 = 9,0\*10<sup>-3</sup> = 0,009



## Additional environmental impact indicators

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
PM	Disease incidence	1.87E-08	0.00E+00	8.99E-11	1.80E-10	0.00E+00	-4.49E-09
IRP <sup>1</sup>	kBq U235 eq.	2.61E-02	0.00E+00	2.14E-05	5.86E-05	0.00E+00	-2.57E-02
ETP-fw <sup>2</sup>	CTUe	7.41E-01	0.00E+00	7.90E-03	6.92E-02	0.00E+00	-3.46E-01
HTP-c <sup>2</sup>	CTUh	1.05E-10	0.00E+00	5.13E-13	7.88E-12	0.00E+00	-5.36E-11
HTP-nc <sup>2</sup>	CTUh	2.09E-09	0.00E+00	1.13E-11	3.64E-10	0.00E+00	-1.54E-09
SQP <sup>2</sup>	Dimensionless	9.10E-01	0.00E+00	9.53E-03	6.95E-03	0.00E+00	-5.12E+00

**PM:** Particulate matter emissions; **IRP:** Ionising radiation, human health; **ETP-fw:** Ecotoxicity (freshwater); **ETP-c:** Human toxicity, cancer effects; **HTP-nc:** Human toxicity, non-cancer effects; **SQP:** Land use related impacts / soil quality

<sup>1</sup> 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.

<sup>2</sup> 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

## Resource use

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
RPEE	MJ	2.79E-01	0.00E+00	2.48E-04	8.70E-04	0.00E+00	-2.02E+00
RPEM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TPE	MJ	2.79E-01	0.00E+00	2.48E-04	8.70E-04	0.00E+00	-2.02E+00
NRPE	MJ	6.04E+00	0.00E+00	1.60E-02	4.91E+00	0.00E+00	-1.57E+00
NRPM	MJ	4.89E+00	0.00E+00	0.00E+00	-4.89E+00	0.00E+00	0.00E+00
TRPE	MJ	1.09E+01	0.00E+00	1.60E-02	2.59E-02	0.00E+00	-1.57E+00
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
W	m <sup>3</sup>	6.46E-03	0.00E+00	2.28E-06	6.81E-05	0.00E+00	-2.61E-03

**RPEE** Renewable primary energy resources used as energy carrier; **RPEM** Renewable primary energy resources used as raw materials; **TPE** Total use of renewable primary energy resources; **NRPE** Nonrenewable primary energy resources used as energy carrier; **NRPM** Nonrenewable primary energy resources used as materials; **TRPE** 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; **W** Use of net fresh water.

## End of life – Waste

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
HW	kg	6.35E-06	0.00E+00	1.02E-07	3.15E-07	0.00E+00	-3.65E-06
NHW	kg	3.12E-02	0.00E+00	7.82E-04	2.39E-03	0.00E+00	-8.59E-03
RW	kg	7.19E-06	0.00E+00	5.20E-09	1.45E-08	0.00E+00	-6.02E-06

**HW** Hazardous waste disposed; **NHW** Non-hazardous waste disposed; **RW** Radioactive waste disposed.

## End of life – output flow

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
CR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MR	kg	4.20E-04	0.00E+00	0.00E+00	8.74E-02	0.00E+00	0.00E+00
MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	MJ	1.80E-02	0.00E+00	0.00E+00	2.05E-02	0.00E+00	0.00E+00
ETE	MJ	6.75E-02	0.00E+00	0.00E+00	7.70E-02	0.00E+00	0.00E+00

**CR** Components for reuse; **MR** Materials for recycling; **MER** Materials for energy recovery; **EEE** Exported electric energy; **ETE** Exported thermal energy.



## Information describing the biogenic carbon content at the factory gate

Biogenic carbon content	Unit	Value
Biogenic carbon content in product	kg C	0
Biogenic carbon content in the accompanying packaging	kg C	7.19E-03

## Additional requirements

### Location based electricity mix from the use of electricity in manufacturing

A national residual mix has been applied for the manufacturing in Germany (A1), as no Guarantees of Origin (GO) certificate have been provided.

National electricity grid	Data source	Foreground / core [kWh]	GWP <sub>total</sub> [kg CO <sub>2</sub> - eq/kWh]	SUM [kg CO <sub>2</sub> - eq]
Electricity, medium voltage {DE_Residual} (A1)	Ecoinvent 3.9.1	8.11 E-02	0.192	1.55 E-02

### Guarantees of origin from the use of electricity in the manufacturing phase

Eric Storm A/S (A3) has purchased Guarantees of Origin (GOs) for their electricity consumption in the time period 01.07.2022-31.12.2024 with a guarantee of electricity from Danish wind turbines. The Certificates are provided by EnergiFyn, located in Denmark. The certificate for the period 01.07.2022-31.12.2022 covers a consumption of 19,685.0 kWh, the certificate for the period 01.01.2023-31.12.2023 covers a consumption of 42,342.0 kWh, and the certificate for the time period 01.01.2024-31.12.2024 covers a consumption of 42,342.0 kWh. When Eric Storm A/S purchases new certificates for their supply of electricity, the verifier of this study will be notified.

Eric Storm A/S has in the 1 year from 01.10.22 to 31.09.2023 consumed 40,704.0 kWh, which covers the entire electricity consumption of the site, including office buildings, electrical vehicles and electrical machinery. Since all the electricity consumed in module A3 is covered by certificates, there is no residual electricity to report on, and double counting is avoided. The electricity mix is modelled as wind energy from Danish windfarms based on statistics for wind energy produced in Denmark in 2020 (*WindEurope, 2020*)

Electricity source	Foreground / core [kWh]	GWP <sub>total</sub> [kg CO <sub>2</sub> - eq/kWh]	SUM [kgCO <sub>2</sub> -eq]
Guarantee of origin electricity used in the foreground (A3)	9.41 E-03	1.75 E-02	1.65 E-04

### Additional environmental impact indicators required for construction products

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.

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
GWP-IOBC	kg	1.44E-03	0.00E+00	1.02E-06	1.95E-05	0.00E+00	-3.20E-03

**GWP-IOBC** Global warming potential calculated according to the principle of instantaneous oxidation.

## Hazardous substances

The declaration is based upon reference to threshold values and/or test results and/or material safety data sheets provided to EPD verifiers. Documentation available upon request to EPD owner.

- The REACH Candidate list contains no substances.
- The product contains substances given by the REACH Candidate list that are less than 0,1 % by weight.
- The product contains dangerous substances, more then 0,1% by weight, given by the REACH Candidate List, see table.
- The product contains no substances given by the REACH Candidate list.
- The product is classified as hazardous waste, see table.

## Indoor environment







Not relevant.

## Carbon footprint

Carbon footprint according to ISO 14067 has not been worked out for the product.

## 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	Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products
ISO 21930:2007	Sustainability in building construction - Environmental declaration of building products
The Norwegian EPD Foundation:2017	Part A: Constriction products and services
EPD International: 2021	PCR 2021:01 ver. 1.0.2 – Multipurpose films
The Norwegian EPD Foundation:2019	General Program Instructions for The Norwegian EPD
Ecoinvent 3.9.1, 2023	Ecoinvent - The world's most consistent & Transparent life cycle inventory database <a href="http://www.ecoinvent.org">www.ecoinvent.org</a>
Miljø- og fødevarer- Ministeriet, 2023	Miljøprojekt nr. 2239 - <i>Emballagestatistik 2021 – Statistik for emballageforsyning og indsamling af emballageaffald 2021</i>
Energistyrelsen, 2021	<i>Technology Data – Generation of Electricity and District heating. Technology descriptions and projections for long term energy system planning.</i>

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