epd-norge
Global program operatør

Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

VEX1015RS

EXHAUSTO

The Norwegian EPD Foundation

Owner of the declaration:
EXHAUSTO AS

Product:
VEX1015RS

Declared unit:
1 pcs

This declaration is based on Product Category Rules:
CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 030:2021 Part B for ventilation components

Program operator:
The Norwegian EPD Foundation

Declaration number:
Ref: NEPD-8571-8232-EN

Registration number:
Ref: NEPD-8571-8232-EN

Issue date:

Valid to:
13.12.2029

EPD software:
LCAno EPD generator ID: 716261

General information

Product

VEX1015RS

Owner of the declaration:

EXHAUSTO AS
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Program operator:

The Norwegian EPD Foundation
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Manufacturer:

EXHAUSTO A/S

Declaration number:

Ref: NEPD-8571-8232-EN

Place of production:

EXHAUSTO A/S
Odensevej 76
DK-5550 Langeskov, Denmark

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 030:2021 Part B for ventilation components

Management system:

ISO 9001

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:

812 701 002

Declared unit:

1 pcs VEX1015RS

Issue date:

Declared unit with option:

A1-A3,A4,A5,B1,B2,B3,B4,B5,B6,B7,C1,C2,C3,C4,D

Valid to:

13.12.2029

Year of study:

2024

Functional unit:

1 ventilation unit

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. NEPDT46 VKEs EPD-generator

Developer of EPD: Rasmus Runge Bechsgaard

Reviewer of company-specific input data and EPD: Henning Grønbæk

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.

Third party verifier:

Alexander Borg, Asplan Viak AS

(no signature required)

Approved:

Product

Product description:

VEX1015RS, compact air handling unit with rotary heat exchanger

Product specification

Materials	kg	%
Adhesive	0,51	0,22
Electronic - Unspecified	1,50	0,63
Filter, mineral based	0,55	0,23
Glass fibre reinforced plastic, polyamide	4,35	1,83
Insulation, Mineral based	21,90	9,21
Motor	13,05	5,49
Plastic - Polyamide	0,52	0,22
Rubber, synthetic	1,68	0,71
Metal - Aluminium	43,00	18,08
Metal - Stainless steel	8,35	3,51
Metal - Steel	137,47	57,79
Other	4,00	1,68
Plastic - Acrylonitrile butadiene styrene (ABS)	0,50	0,21
Plastic - Polycarbonate (PC)	0,50	0,21
Total	237,88	100,00

Technical data:

See our calculation tool: EXselectPRO

Market:

Europe.

Reference service life, product

25 years.

Reference service life, building or construction works

50 years.

LCA: Calculation rules

Declared unit:

1 pcs VEX1015RS

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. Energy, 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. The allocation is made in accordance with the provisions of EN 15804. Energy, 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
Adhesive	ecoinvent 3.6	Database	2019
Electronic - Unspecified	ecoinvent 3.6	Database	2019
Filter, mineral based	ecoinvent 3.6	Database	2019
Glass fibre reinforced plastic, polyamide	Modified ecoinvent 3.6	Database	2019
Insulation, Mineral based	ecoinvent 3.6	Database	2019
Metal - Aluminium	Modified ecoinvent 3.6	Database	2019
Metal - Stainless steel	ecoinvent 3.6	Database	2019
Metal - Steel	ecoinvent 3.6	Database	2019
Motor	Modified ecoinvent 3.6	Database	2019
Other	Material composition + ecoinvent 3.6	Supplier data + database	2019
Plastic - Acrylonitrile butadiene styrene (ABS)	ecoinvent 3.6	Database	2019
Plastic - Polyamide	ecoinvent 3.6	Database	2019
Plastic - Polycarbonate (PC)	ecoinvent 3.6	Database	2019
Rubber, synthetic	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	X	X	X	X	X	X	X	X	X	X	X	X

System boundary:

This EPD is based on a cradle-to-gate with options, modules C1-C3 and module D cf. EN 15804 + A2, in which 100%-weight of the products have 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.

Excluded processes:

- Use of electric screwdrivers during installation (module A5), and disassembly (module C1)

Product stage (A1-A3) includes:

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

A1-3: The product stage includes all the 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.
Construction process stage (A4-A5) includes:

A4: Transportation to the building site, is assumed to be an average of 300km.

A5: Treatment of the plastic folio used as packaging material.

Use stage (B1-B7) includes:

B1: This module has no activity.

B2: To maintain the performance of the ventilation unit and ensure a continuous supply of fresh ventilated air continuously throughout the lifespan, it is necessary to replace the ventilation filters. The production of new filters and the waste treatment of the replaced filters are included in B2. There is calculated with one filter replacement per year, to best fit the market trends. (However, EXHAUSTO recommends replacement of the filters twice a year to maintain optimal IAQ) It is important to note that B2 is modelled for one year and does not represent the lifespan of 25 years.

B3-B5: No repair, replacement, or refurbishment due to damage is expected within the reference service life of 25 years.

B6: No specification regarding use is described in EN 50693:2019. Therefore, the Ecodesign Directive (COMMISSION REGULATION (EU) No 1253/2014 of 7 July 2014 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for ventilation units) is used to determine the reference capacity and thus the energy use of the ventilation unit. The Ecodesign requirements specify a reference flow rate set at 70% of the maximum flow rate. The annual operating hours are set to 8,760 hours per year as a conservative approach which is in accordance with the default value that is used in the Ecodesign directive to calculate the SEC (specific energy consumption).
B6 is modelled for 1 year.

B7: This module has no activity.

End of Life (C1-C4) includes:
For the end-of-life scenario, a collection rate of 100% is assumed.

C1: No impacts from dismantling have been included in this module it is done manually.

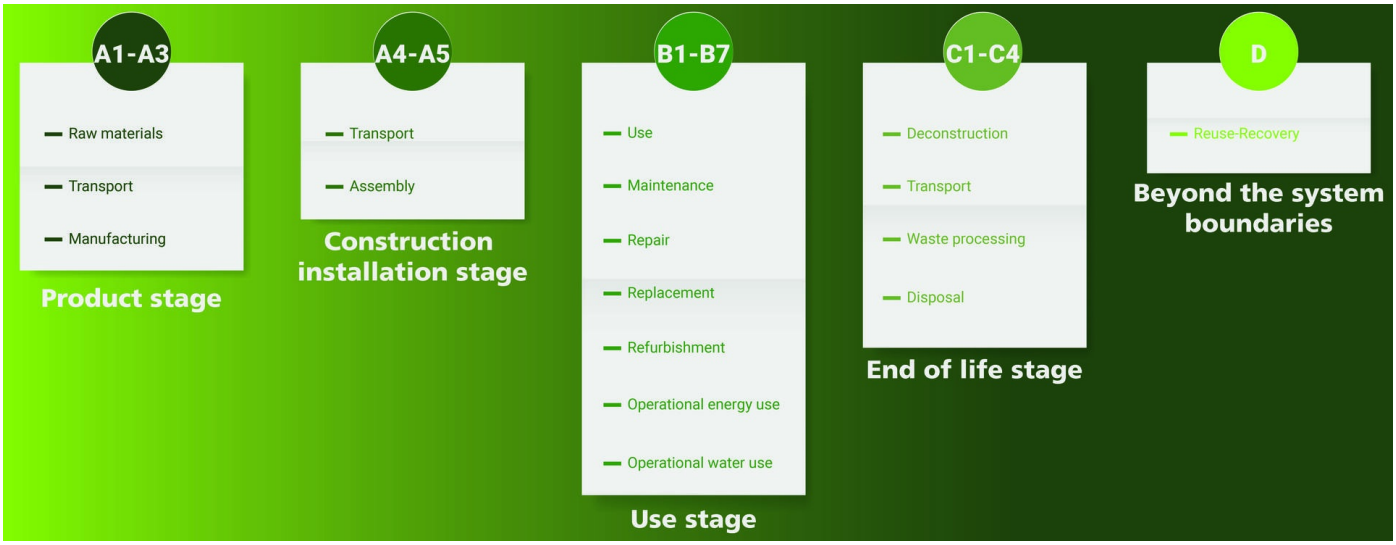
C2: Transportation to local recycling is assumed to be 200km.

C3: The average waste treatment for the different materials has been utilised.

C4: The average landfilling for the different materials has been utilised.

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

D: Potential benefits from recovery and recycling of materials from the product are calculated. The materials are either used as secondary material in a new product system, thus substituting virgin material, or incinerated with energy recovery.



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, 16-32 tonnes, EURO 6 (km)	36,7 %	300	0,043	l/tkm	12,90

Assembly (A5)	Unit	Value			
Waste, plastic, mixture, to average treatment - A5, inkl. transp. (kg)	kg/DU	0,12			

Maintenance (B2)	Unit	Value			
Filter component - ABS frame (kg) - Europe	kg	0,49			
Filter component - Glass fibre (kg) - Europe	kg	0,54			
Filter component - Glue, Polymeric mastic (kg) - Europe	kg	0,32			
Filter component - Hot glue (kg) - Europe	kg	0,18			

Operational energy (B6)	Unit	Value			
Electricity, Denmark (kWh)	kWh	11135,000000000			

De-construction demolition (C1)	Unit	Value			
Demolition of building per kg of ventilation product (kg)	kg	237,87			

Transport to waste processing (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, 16-32 tonnes, EURO 6 (km)	36,7 %	200	0,043	l/tkm	8,60

Waste processing (C3)	Unit	Value			
Waste treatment per kg Plastics, from incineration (kg)	kg	2,68			
Materials to recycling (kg)	kg	184,92			
Waste treatment per kg wire plastic, municipal incineration - C3 - RoW	kg	0,93			
Waste treatment per kg Electronics scrap, Control units, incineration (kg)	kg	1,50			
Waste treatment per kg Hazardous waste, incineration (kg)	kg	0,51			
Waste treatment per kg plastic, industrial electronics, municipal incineration with fly ash extraction (kg)	kg	0,24			
Waste treatment per kg Bulk iron waste, excluding reinforcement, sorting plant (kg)	kg	13,050			
Waste treatment per kg Rubber, municipal incineration with fly ash extraction (kg)	kg	1,68			

Disposal (C4)	Unit	Value			
Landfilling of ashes from incineration of Plastics, process per kg ashes and residues (kg)	kg	0,063			
Waste, plastic, mixture, to landfill (kg)	kg	3,86			
Landfilling of ashes from incineration per kg wire plastic, from municipal incineration - C4 - RoW	kg	0,13			
Waste treatment per kg Copper slag, to landfill, residual material landfill (kg) - GLO	kg	0,42			
Landfilling of ashes from incineration of Electronics scrap, Control units, process of ashes and residues (kg)	kg	1,052			
Landfilling of ashes from incineration per kg Hazardous waste, from incineration (kg)	kg	0,097			
Waste, mineral wool, to landfil (kg)	kg	22,44			
Landfilling of ashes from incineration per kg plastic, industrial electronics, From municipal incineration with fly ash extraction (kg)	kg	0,016			
Waste, scrap steel, to landfill (kg)	kg	15,56			
Waste, aluminium, to landfill (kg)	kg	3,092			
Landfilling of ashes from incineration of Rubber, municipal incineration with fly ash extraction (kg)	kg	0,087			

Benefits and loads beyond the system boundaries (D)	Unit	Value			
Substitution of electricity, in Norway (MJ)	MJ	3,87			
Substitution of thermal energy, district heating, in Norway (MJ)	MJ	58,56			
Substitution of primary copper with net scrap (kg)	kg	2,34			
Substitution of primary steel with net scrap (kg)	kg	113,23			
Substitution of primary aluminium with net scrap (kg)	kg	39,52			

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	B1	B2	B3	B4
	GWP-total	kg CO_2 -eq	1,80E+03	1,17E+01	9,51E-03	0	1,01E+01	0	0
	GWP-fossil	kg CO_2 -eq	1,79E+03	1,17E+01	9,50E-03	0	1,01E+01	0	0
	GWP-biogenic	kg CO_2 -eq	6,78E+00	4,82E-03	1,31E-06	0	2,91E-02	0	0
	GWP-luluc	kg CO_2 -eq	7,04E-01	4,15E-03	7,29E-07	0	4,23E-03	0	0
	ODP	kg CFC11 -eq	7,30E-05	2,64E-06	5,71E-10	0	9,99E-07	0	0
	AP	mol H+ -eq	1,39E+01	3,35E-02	1,17E-05	0	4,02E-02	0	0
	EP-FreshWater	kg P -eq	7,54E-02	9,31E-05	1,96E-08	0	2,42E-04	0	0
	EP-Marine	kg N -eq	1,96E+00	6,63E-03	1,07E-05	0	8,32E-03	0	0
	EP-Terrestial	mol N -eq	3,05E+01	7,41E-02	4,20E-05	0	9,12E-02	0	0
	POCP	kg NMVOC -eq	6,77E+00	2,84E-02	1,38E-05	0	3,08E-02	0	0
	ADP-minerals&metals[1]	kg Sb-eq	3,63E-01	3,22E-04	5,06E-08	0	2,99E-04	0	0
	ADP-fossil[1]	MJ	1,74E+04	1,76E+02	3,92E-02	0	1,50E+02	0	0
	WDP[1]	m^3	2,31E+04	1,70E+02	1,39E-01	0	3,40E+02	0	0

Indicator		Unit	B5	B6	B7	C1	C2	C3	C4	D
	GWP-total	kg CO_2 -eq	0	3,77E+03	0	3,14E-01	7,78E+00	1,71E+01	8,87E-01	-4,90E+02
	GWP-fossil	kg CO_2 -eq	0	3,72E+03	0	3,14E-01	7,77E+00	1,71E+01	8,87E-01	-4,81E+02
	GWP-biogenic	kg CO_2 -eq	0	3,86E+01	0	5,88E-05	3,22E-03	6,25E-03	5,87E-04	-1,71E+00
	GWP-luluc	kg CO_2 -eq	0	5,01E+00	0	2,47E-05	2,77E-03	5,88E-04	1,38E-04	-6,74E+00
	ODP	kg CFC11 -eq	0	1,27E-04	0	6,78E-08	1,76E-06	2,31E-07	1,18E-07	-2,48E-02
	AP	mol H+ -eq	0	1,49E+01	0	3,28E-03	2,23E-02	5,02E-03	2,92E-03	-3,94E+00
	EP-FreshWater	kg P -eq	0	3,05E-01	0	1,14E-06	6,21E-05	3,89E-05	5,66E-06	-2,76E-02
	EP-Marine	kg N -eq	0	2,51E+00	0	1,45E-03	4,42E-03	1,55E-03	1,46E-03	-4,68E-01
	EP-Terrestial	mol N -eq	0	3,58E+01	0	1,59E-02	4,94E-02	1,65E-02	1,11E-02	-5,22E+00
	POCP	kg NMVOC -eq	0	7,64E+00	0	4,37E-03	1,89E-02	4,25E-03	3,26E-03	-1,90E+00
	ADP-minerals&metals[1]	kg Sb-eq	0	3,32E-02	0	4,81E-07	2,15E-04	1,07E-05	5,27E-06	-6,89E-03
	ADP-fossil[1]	MJ	0	4,83E+04	0	4,32E+00	1,17E+02	9,12E+00	8,54E+00	-5,57E+03
	WDP[1]	m^3	0	7,50E+05	0	9,17E-01	1,14E+02	5,18E+01	4,75E+01	-1,94E+05

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	B1	B2	B3	B4
	PM	Disease incidence	1,60E-04	7,14E-07	2,11E-10	0	3,51E-07	0	0
	IRP[2]	kgBq U235 -eq	2,93E+01	7,70E-01	1,77E-04	0	3,55E-01	0	0
	ETP-fw[1]	CTUe	7,39E+04	1,31E+02	3,74E-02	0	1,52E+02	0	0
	HTP-c[1]	CTUh	5,36E-06	0,00E+00	1,00E-12	0	7,59E-09	0	0
	HTP-nc[1]	CTUh	6,44E-05	1,43E-07	3,50E-11	0	1,62E-07	0	0
	SQP[1]	dimensionless	5,60E+03	1,23E+02	6,84E-02	0	3,16E+01	0	0

Indicator		Unit	B5	B6	B7	C1	C2	C3	C4	D
	PM	Disease incidence	0	7,31E-05	0	8,68E-08	4,76E-07	4,47E-08	5,26E-08	-3,69E-05
	IRP[2]	kgBq U235 -eq	0	2,36E+02	0	1,85E-02	5,14E-01	4,01E-02	3,92E-02	-1,91E+01
	ETP-fw[1]	CTUe	0	8,59E+04	0	2,36E+00	8,71E+01	1,24E+02	1,93E+03	-2,09E+04
	HTP-c[1]	CTUh	0	1,69E-06	0	0,00E+00	0,00E+00	2,09E-09	1,01E-08	-1,61E-06
	HTP-nc[1]	CTUh	0	5,62E-05	0	2,14E-09	9,52E-08	5,88E-08	6,80E-07	-7,82E-06
	SQP[1]	dimensionless	0	7,93E+04	0	5,48E-01	8,22E+01	3,26E+00	2,25E+01	-2,59E+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	B1	B2	B3	B4
	PERE	MJ	1,52E+03	2,52E+00	9,90E-04	0	6,40E+00	0	0
	PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0	0
	PERT	MJ	1,52E+03	2,52E+00	9,90E-04	0	6,40E+00	0	0
	PENRE	MJ	1,71E+04	1,76E+02	3,92E-02	0	1,15E+02	0	0
	PENRM	MJ	2,82E+02	0,00E+00	0,00E+00	0	0,00E+00	0	0
	PENRT	MJ	1,74E+04	1,76E+02	3,92E-02	0	1,15E+02	0	0
	SM	kg	2,02E+01	0,00E+00	0,00E+00	0	0,00E+00	0	0
	RSF	MJ	2,00E+01	9,03E-02	2,60E-05	0	3,43E-01	0	0
	NRSF	MJ	2,78E+02	3,23E-01	6,80E-05	0	1,62E-01	0	0
	FW	m^3	9,24E+00	1,88E-02	2,07E-05	0	8,37E-02	0	0

Indicator		**Unit**	B5	B6	B7	C1	C2	C3	C4	D
	PERE	MJ	0	4,14E+04	0	2,34E-02	1,68E+00	1,31E+00	3,27E-01	-1,75E+03
	PERM	MJ	0	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	PERT	MJ	0	4,14E+04	0	2,34E-02	1,68E+00	1,31E+00	3,27E-01	-1,75E+03
	PENRE	MJ	0	4,83E+04	0	4,32E+00	1,18E+02	9,12E+00	8,54E+00	-5,57E+03
	PENRM	MJ	0	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	PENRT	MJ	0	4,83E+04	0	4,32E+00	1,18E+02	9,12E+00	8,54E+00	-5,57E+03
	SM	kg	0	0,00E+00	0	2,12E-03	0,00E+00	1,44E-04	9,56E-05	1,64E+00
	RSF	MJ	0	1,56E+03	0	5,74E-04	6,02E-02	2,82E-02	6,99E-03	3,99E+00
	NRSF	MJ	0	8,25E+00	0	8,45E-03	2,15E-01	-7,85E-04	1,84E-02	1,32E+02
	FW	m^3	0	1,54E+02	0	2,22E-04	1,26E-02	7,12E-02	1,20E-02	-9,26E+00

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	B1	B2	B3	B4
	HWD	kg	1,10E+01	9,09E-03	0,00E+00	0	3,03E-02	0	0
	NHWD	kg	4,50E+02	8,57E+00	1,20E-01	0	2,80E+00	0	0
	RWD	kg	3,08E-02	1,20E-03	0,00E+00	0	3,81E-04	0	0

Indicator		Unit	B5	B6	B7	C1	C2	C3	C4	D
	HWD	kg	0	6,38E+00	0	1,27E-04	6,06E-03	5,00E-03	1,45E-01	7,68E-01
	NHWD	kg	0	2,95E+02	0	5,11E-03	5,71E+00	1,22E+00	4,65E+01	-1,56E+02
	RWD	kg	0	1,52E-01	0	3,00E-05	8,00E-04	4,55E-06	3,24E-05	-1,80E-02

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	B1	B2	B3	B4
	CRU	kg	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0	0
	MFR	kg	3,88E+01	0,00E+00	6,13E-02	0	4,18E-05	0	0
	MER	kg	3,22E+00	0,00E+00	6,00E-06	0	7,92E-01	0	0
	EEE	MJ	2,44E+00	0,00E+00	9,22E-06	0	4,13E-01	0	0
	EET	MJ	3,69E+01	0,00E+00	1,39E-04	0	6,25E+00	0	0

Indicator		Unit	B5	B6	B7	C1	C2	C3	C4	D
	CRU	kg	0	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MFR	kg	0	0,00E+00	0	2,08E-03	0,00E+00	1,85E+02	1,26E-03	-6,42E-02
	MER	kg	0	0,00E+00	0	6,45E-06	0,00E+00	3,38E+00	1,81E-05	-8,45E-03
	EEE	MJ	0	0,00E+00	0	2,21E-05	0,00E+00	4,73E+00	6,19E-04	-2,07E-02
	EET	MJ	0	0,00E+00	0	3,35E-04	0,00E+00	7,15E+01	9,37E-03	-3,13E-01

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	0,00E+00

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 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	B1	B2	B3	B4
GWPIOBC	kg CO_2 -eq	1,80E+03	1,17E+01	9,51E-03	0	1,01E+01	0	0

Indicator	**Unit**	B5	B6	B7	C1	C2	C3	C4	D
GWPIOBC	kg CO_2 -eq	0	5,21E+03	0	3,14E-01	7,78E+00	1,71E+01	8,96E-01	-5,32E+02

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.
ecoinvent v3, Allocation, cut-off by classification, Swiss Centre of Life Cycle Inventories.
Iversen et al., (2021) eEPD v2021.09 Background information for EPD generator tool system verification, LCA.no Report number: 07.21
Graafland and Iversen (2022) EPD generator for NPCR 030 Ventilation components, Background information for EPD generator application and LCA data, LCA.no report number: 12.22
NPCR Part A: Construction products and services. Ver. 2.0. April 2021, EPD-Norge.
NPCR 030 Part B for Ventilation components, Ver. 1.0, 18.05.2021, EPD Norway.

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