epd-norge
Global program operatør

Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

Nofi VAKOS PE pumping station



Haplast®

The Norwegian EPD Foundation

Owner of the declaration:
Haplast AS

Product:
Nofi VAKOS PE pumping station

Declared unit:
1 kg

This declaration is based on Product Category Rules:
CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 019:2022 Part B for Piping systems use in sewage and storm water systems (under gravity)

Program operator:
The Norwegian EPD Foundation

Declaration number:

Registration number:

Issue date:

Valid to:

EPD software:
LCAno EPD generator ID: 411279

General information

Product

Nofi VAKOS PE pumping station

Owner of the declaration:

Haplast AS
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Program operator:

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

Manufacturer:

Haplast AS

Declaration number:

Place of production:

Haplast AS
Industriveien 6
9062 Furuflaten, Norway

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 019:2022 Part B for Piping systems use in sewage and storm water systems (under gravity)

Management system:

EN 12201

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:

987 486 945

Declared unit:

1 kg Nofi VAKOS PE pumping station

Issue date:

Declared unit (cradle to gate) with option:

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

Valid to:

Year of study:

2023

Functional unit:

Not applicable.

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: Aleksander Arneberg

Reviewer of company-specific input data and EPD: Lena Steffensen

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.

Approved:

Third party verifier:

Elisabet Amat, GREENIZE projects

(no signature required)

Product

Product description:

Nofi VAKOS PE pumping station is in principle, a buried vertical tank equipped with pumps, associated pipe system, power supply and control.
Normally used for the delivery of drinking water, industrial water, storm water and waste water to consumers or sewage treatment plants.
It is usually the municipalities that own and operate this type of facility, or larger private water and sewage treatment plants.

Product specification

Further information can be found at https://www.nofivakos.no/pe-pumpestasjoner

This EPD applies only to the Pumping station produced by Haplast AS, and does not include technical installations (pump, valve, ladder, pipes, etc.)

Calculations for this EPD is done based on an average pumping station with size:
- Di 2000
- H 5000
- 3x3 m top deck
- 1 middle deck

Project specific EPD can be delivered on request.

Materials	kg	%
Pigments and Fillers	0,00	0,16
Plastic - Polyethylene (HDPE)	0,94	94,14
Plastic - Polypropylene (PP)	0,06	5,70
Total	1,00	100,00

Technical data:

https://www.nofivakos.no/

Profile type	Description
VW	This profile type is a homogeneous solid wall pipe with smooth inside and outside surfaces. Pipes can be used for internal working pressure.
PR	The main properties of this profile type are the smooth inside and the profiled outside surface. Significant low weight and the high stiffness.
SPR	This profile pipe has a smooth inside and outside surface including internal profile with one layer. This profile has a very high long-term stiffness.
OP	This profile has a smooth inside surface and the outside surface is profiled with an Olympic-rings-like pattern. Low weight and high stiffness.
SOP	This profile pipe has a smooth inside and outside including internal profiles with two layers. This profile has a very high long-term stiffness.
SQ	This profile pipe has a smooth inside and outside including internal profiles with one or more layers. This profile has a high long-term stiffness.
SP	To achieve different kinds of loads, the Krah pipe system makes it possible to combine different profiles in order to achieve the required effects

Market:

Nordic countries.

Reference service life, product

When installed according to the relevant installation manual and having normal operations, the service lifetime is at least 100 years.

Reference service life, building

Not applicable.

LCA: Calculation rules

Declared unit:

1 kg Nofi VAKOS PE pumping station

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. They represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on registered EPDs according to EN 15804, Ostfold Research databases, ecoinvent and other LCA databases. The data quality of the raw materials in A1 is presented in the table below.

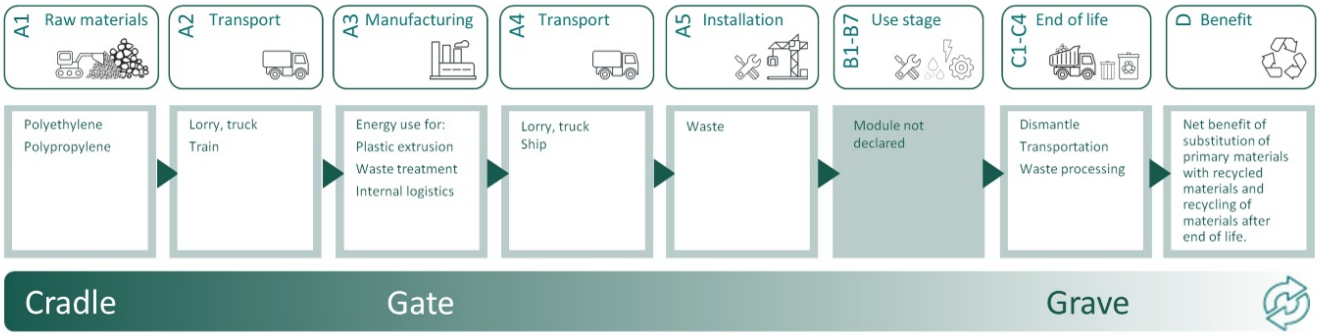
Materials	Source	Data quality	Year
Pigments and Fillers	ecoinvent 3.6	Database	2019
Plastic - Polyethylene (HDPE)	ecoinvent 3.6	Database	2019
Plastic - Polypropylene (PP)	ecoinvent 3.6	Database	2019

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:

The system boundaries for this EPD is module A1-A5 and C2.
A1: Packaging is not included due to different packaging scenarios.
A4: Distance for transport from manufacturer to building site is set to 300 km by truck or lorry. This distance is given in new PCRs as default value for Norway.
A5: Installation is not included due to different installation methods. Specific EPDs including A5 can be provided on request.
C1, C3, C4 and D: Included as zero due to various demolition scenarios, however it is assumed that after 100 years of service life, all end-of-life product is expected to be collected from demolition site (C1). Most of the product materials is assumed to be recycled (C3) while the rest is assumed to be incinerated (C3) and/or landfilled (C4).
C2: Transportation distance to nearest waste handling facility is estimated to be 85 km by truck. This distance is given in new PCRs as default value for Norway.



Additional technical information:

Professionally executed design, storage, handling, installation and operations are a precondition for a long service life. The installation instructions must be followed.

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 %	300	0,043	l/tkm	12,90

De-construction demolition (C1)	Unit	Value			
PE, Material to incineration (kg)	kg/DU	0,00			
PE, Material to landfill (kg)	kg/DU	0,00			
PE, Material to recycling (kg)	kg/DU	0,00			
PP, Material to incineration (kg)	kg/DU	0,00			
PP, Material to landfill (kg)	kg/DU	0,00			
PP, Material to recycling (kg)	kg/DU	0,00			

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) - Europe	36,7 %	85	0,043	l/tkm	3,66

Waste processing (C3)	Unit	Value			
Materials to recycling (kg)	kg	0,00			
Waste treatment per kg Polyethylene (PE), incineration with fly ash extraction (kg)	kg	0,00			
Waste treatment per kg Polypropylene (PP), incineration with fly ash extraction (kg)	kg	0,00			

Disposal (C4)	Unit	Value			
Landfilling of ashes from incineration of Polyethylene (PE), process per kg ashes and residues (kg)	kg	0,00			
Landfilling of ashes from incineration of Polypropylene (PP), process per kg ashes and residues (kg)	kg	0,00			
Waste, polyethylene (PE), to landfill (kg)	kg	0,00			
Waste, polypropylene (PP), to landfill (kg)	kg	0,00			

Benefits and loads beyond the system boundaries (D)	Unit	Value			
Substitution of electricity, in Norway (MJ)	MJ	0,00			
Substitution of Polyethylene, HDPE, granulate (kg)	kg	0,00			
Substitution of Polypropylene, PP, granulate (kg)	kg	0,00			
Substitution of thermal energy, district heating, in Norway (MJ)	MJ	0,00			

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	2,40E+00	4,90E-02	0	0,00E+00	1,39E-02	0,00E+00	0,00E+00	0,00E+00
	GWP-fossil	kg CO_2 -eq	2,39E+00	4,90E-02	0	0,00E+00	1,39E-02	0,00E+00	0,00E+00	0,00E+00
	GWP-biogenic	kg CO_2 -eq	1,04E-02	2,03E-05	0	0,00E+00	5,75E-06	0,00E+00	0,00E+00	0,00E+00
	GWP-luluc	kg CO_2 -eq	1,33E-03	1,74E-05	0	0,00E+00	4,94E-06	0,00E+00	0,00E+00	0,00E+00
	ODP	kg CFC11 -eq	1,32E-07	1,11E-08	0	0,00E+00	3,15E-09	0,00E+00	0,00E+00	0,00E+00
	AP	mol H+ -eq	8,85E-03	1,41E-04	0	0,00E+00	3,99E-05	0,00E+00	0,00E+00	0,00E+00
	EP-FreshWater	kg P -eq	5,27E-05	3,92E-07	0	0,00E+00	1,11E-07	0,00E+00	0,00E+00	0,00E+00
	EP-Marine	kg N -eq	1,56E-03	2,79E-05	0	0,00E+00	7,90E-06	0,00E+00	0,00E+00	0,00E+00
	EP-Terrestial	mol N -eq	1,75E-02	3,12E-04	0	0,00E+00	8,83E-05	0,00E+00	0,00E+00	0,00E+00
	POCP	kg NMVOC -eq	7,58E-03	1,19E-04	0	0,00E+00	3,38E-05	0,00E+00	0,00E+00	0,00E+00
	ADP-minerals&metals[1]	kg Sb-eq	2,80E-05	1,35E-06	0	0,00E+00	3,84E-07	0,00E+00	0,00E+00	0,00E+00
	ADP-fossil[1]	MJ	7,28E+01	7,41E-01	0	0,00E+00	2,10E-01	0,00E+00	0,00E+00	0,00E+00
	WDP[1]	m^3	2,42E+02	7,17E-01	0	0,00E+00	2,03E-01	0,00E+00	0,00E+00	0,00E+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	8,25E-08	3,00E-09	0	0,00E+00	8,50E-10	0,00E+00	0,00E+00	0,00E+00
	IRP[2]	kgBq U235 -eq	1,08E-01	3,24E-03	0	0,00E+00	9,18E-04	0,00E+00	0,00E+00	0,00E+00
	ETP-fw[1]	CTUe	1,77E+01	5,49E-01	0	0,00E+00	1,56E-01	0,00E+00	0,00E+00	0,00E+00
	HTP-c[1]	CTUh	7,28E-10	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	HTP-nc[1]	CTUh	1,91E-08	6,00E-10	0	0,00E+00	1,70E-10	0,00E+00	0,00E+00	0,00E+00
	SQP[1]	dimensionless	9,88E+00	5,18E-01	0	0,00E+00	1,47E-01	0,00E+00	0,00E+00	0,00E+00

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 = Soil Quality (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	6,16E+00	1,06E-02	0	0,00E+00	3,01E-03	0,00E+00	0,00E+00	0,00E+00
	PERM	MJ	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	PERT	MJ	6,16E+00	1,06E-02	0	0,00E+00	3,01E-03	0,00E+00	0,00E+00	0,00E+00
	PENRE	MJ	3,22E+01	7,41E-01	0	0,00E+00	2,10E-01	0,00E+00	0,00E+00	0,00E+00
	PENRM	MJ	4,19E+01	0,00E+00	0	0,00E+00	0,00E+00	-4,19E+01	0,00E+00	0,00E+00
	PENRT	MJ	7,40E+01	7,41E-01	0	0,00E+00	2,10E-01	-4,19E+01	0,00E+00	0,00E+00
	SM	kg	1,09E-01	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	RSF	MJ	1,17E-01	3,79E-04	0	0,00E+00	1,08E-04	0,00E+00	0,00E+00	0,00E+00
	NRSF	MJ	3,30E-02	1,36E-03	0	0,00E+00	3,84E-04	0,00E+00	0,00E+00	0,00E+00
	FW	m^3	6,13E-02	7,92E-05	0	0,00E+00	2,25E-05	0,00E+00	0,00E+00	0,00E+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	C1	C2	C3	C4	D
	HWD	kg	8,23E-03	3,82E-05	0	0,00E+00	1,08E-05	0,00E+00	0,00E+00	0,00E+00
	NHWD	kg	2,89E-01	3,60E-02	0	0,00E+00	1,02E-02	0,00E+00	0,00E+00	0,00E+00
	RWD	kg	9,95E-05	5,05E-06	0	0,00E+00	1,43E-06	0,00E+00	0,00E+00	0,00E+00

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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MFR	kg	6,20E-05	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MER	kg	1,84E-02	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	EEE	MJ	1,10E-02	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	EET	MJ	1,66E-01	0,00E+00	0	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	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, Norway (kWh)	ecoinvent 3.6	24,33	g CO2-eq/kWh

Dangerous substances

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

Indoor environment

No impact on 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	2,36E+00	4,90E-02	0	0,00E+00	1,39E-02	0,00E+00	0,00E+00	0,00E+00

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

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