epd-norge
Global program operatør

Environmental product declaration

in accordance with ISO 14025, ISO 21930 and EN 15804

Pipe Jacking (VO) Hobas, with GRP Sleeve, DN2200 PN1 SN40000

Amiblu®

The Norwegian EPD Foundation

Owner of the declaration:
Amiblu Technology AS

Pipe Jacking (VO) Hobas, with GRP Sleeve, DN2200 PN1 SN40000

Declared unit:
1 m

This declaration is based on Product Category Rules:
CEN Standard EN 15804:2012+A1:2013 serves as core PCR
NPCR 019:2018 Part B for Piping systems use in sewage and storm water systems (under gravity)

Program operator:
The Norwegian EPD Foundation

Declaration number:

NEPD-4569-3820-EN

Registration number:

NEPD-4569-3820-EN

Issue date: 14.06.2023

Valid to: 14.06.2028

EPD Software:
LCA.no EPD generator ID: 64820

General information

Product

Pipe Jacking (VO) Hobas, with GRP Sleeve, DN2200 PN1 SN40000

Owner of the declaration:

Amiblu Technology AS
Contact person: Frans Sørensen
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Program operator:

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The Norwegian EPD Foundation
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Manufacturer:

Amiblu Germany GmbH

Declaration number:

NEPD-4569-3820-EN

Place of production:

Amiblu Germany GmbH
Gewerbepark 1,
17039 Trollenhagen, Germany

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A1:2013 serves as core PCR
NPCR 019:2018 Part B for Piping systems use in sewage and storm water systems (under gravity)

Management system:

ISO 14001

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:

916 041 195

Declared unit:

1 m Pipe Jacking (VO) Hobas, with GRP Sleeve, DN2200 PN1 SN40000

Issue date: 14.06.2023

Declared unit with option:

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

Valid to: 14.06.2028

Year of study:

2020

Functional unit:

1m section of a pipeline constructed using Hobas Jacking (VO) Pipe with GRP sleeve (the length of the pipe unit is 6m).

Comparability:

EPD of construction products may not be comparable if they not comply with EN 15804 and seen in a construction works 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. Individualthird party verification of each EPD is not required when the EPD tool is i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPDNorway, and iii) the proccess is reviewed annualy. 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.

Collected/registered by: Frans Sørensen

Reviewer of company-specific input data and EPD: Petter Åsrud

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.

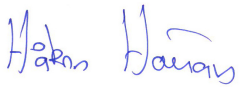
Third party verifier:

Michael M. Jenssen, Asplan Viak AS

(no signature required)

Approved:

Sign



Håkon Hauan, CEO EPD-Norge

Product

Product description:

Hobas Jacking (VO) Pipe with GRP sleeve coupling for pipe jacking application.

Product specification

Jacking (VO) Pipe, Hobas Diameter Series,
DN: 2200
PN: 1
SN: 40000
Length: 6m
Liner: Standard, Length: 6 m, Glass: E, Resin: Ortho, Liner Resin: Ortho, with GRP Sleeve Non-Pressure

Materials	Value	Unit
Rubber gasket	0.04-0.05	%
Peroxide	0.8-1.2	%
Calcium Carbonate	27-33	%
Glass fiber	8-14	%
Silica sand	34-42	%
Resin	18-24	%

Technical data:

Pressure rating (PN): 1 bar

Market:

New Zealand

Reference service life, product

Up to 100 years.

Reference service life, construcion

LCA: Calculation rules

Declared unit:

1 m Pipe Jacking (VO) Hobas, with GRP Sleeve, DN2200 PN1 SN40000

Cut-off criteria:

All raw materials which are present in the final product at a concentration greater than 0.1 % are included. Some of the raw materials used at lower content are modeled using datasets representing the closest match according to the best knowledge of Amiblu. The contribution of capital goods is estimated to be lower than the general cut-off criteria of 1%. Transport of personnel is outside the scope of the LCA

Allocation:

Allocation was carried out in accordance with EN 15804. There are no-allocations between co-products in the EPD since there are no co-products created during the manufacturing. Environmental burdens related to A1 and A2 stages are allocated to pipes based on the specific pipe composition, transport modes and distances of raw materials to a plant in which the product has been produced. All manufacturing inputs (energy and auxiliary materials) are allocated equally to products through mass allocation. Equal allocation also applies to waste, although for certain waste flows, a specific allocation was performed based on the production process and product formulation. 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:

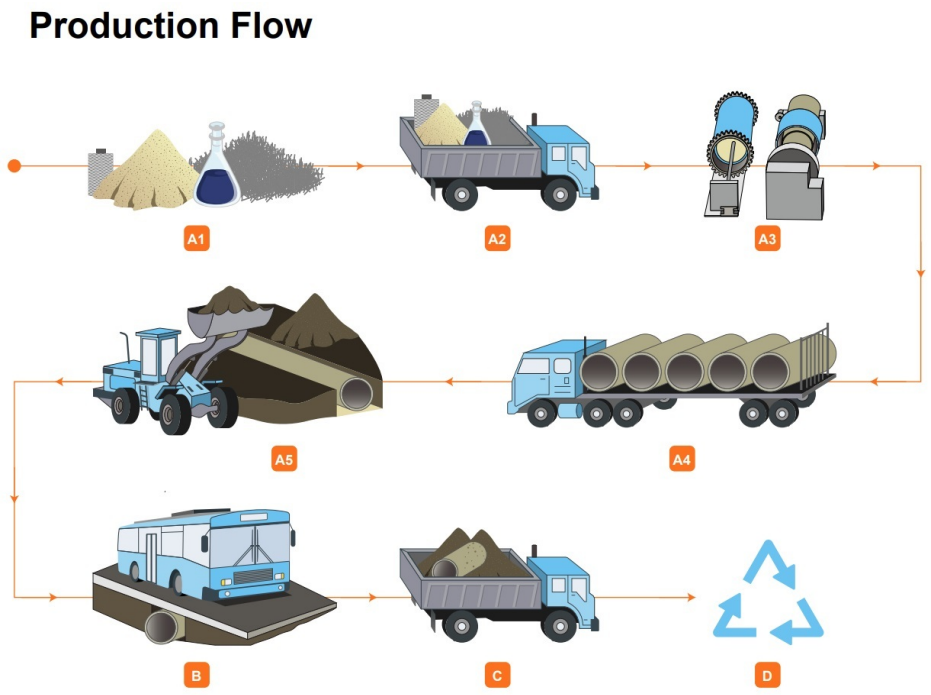
Specific data for the product compositions are used. In case of some raw materials, data from ecoinvent 3.6 were modified to better reflect the composition of specific materials used by Amiblu. Transportation modes and distances are collected for all raw materials, specific for each production site. Energy inputs are also specific for each site. Production site data were collected in the year of study defined on page 2. The data quality of the raw materials in A1 is presented in the table below.

Materials	Source	Data quality	Year
Additives	ecoinvent 3.6	Database	2019
Chemical	ecoinvent 3.6	Database	2019
Filler	ecoinvent 3.6	Database	2019
Glass fibre	ecoinvent 3.6	Database	2019
Rubber, synthetic	ecoinvent 3.6	Database	2019
Polyester resin	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	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

System boundary:



A1 - Raw materials
Typically including glass fibers, resin, sand, filler, rubber

A2 - Transport of raw materials
Tanker, container transport, sea-transport

A3- Manufacturing
Continuous Filament Winding, Centrifugal Casting, Filament Winding, Hand Lay-up Lamination

A4 - Transport to site
Road transport, sea transport

A5 - Installation
Operation of excavators and earth moving equipment, bedding material, transport

B - Use
Use, maintenance, repair, replacement, refurbishment, operational energy use, operational water use

C - End of life
Excavation, transport, waste processing, disposal

D - Beyond construction works Life Cycle
Reuse, recovery, recycling potential

Additional technical information:

https://www.amiblu.com/jacking-pipes/

LCA: Scenarios and additional technical information

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

For A4 stage, a road transport distance of 389 km from the pipe production plant to Harmburg and a ship transport distance of 27183 km from Hamburg to Auckland, is calculated.
For A5 module, is not included due to specific installation scenario of jacking pipes. The impact of the installation has to be evaluated by the constructor.

Use stage has not been included since glass reinforced plastic piping, once installed, does not require maintenance.
It has been assumed that at the end of the functional life of the piping, the installation is either left in ground or re-lined. Potential relining is considered to be a second life stage, thus, all environmental burdens associated with re-lining are omitted in this declaration.

LCA study was performed for the production process and material composition specific for 3 m long Hobas Jacking (VO) Pipe with Coupling, DN2200 PN1 SN40000 on the Centrifugal Casting line in Germany.

Transport from production place to user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonn)
Ship, Regional bulk ship, 35000 DWT (km)	50,0 %	27183	0,003	l/tkm	81,55
Truck, 16-32 tonnes, EURO 5 (kgkm)	36,7 %	389	0,044	l/tkm	17,12

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	1,39E+03	4,18E+02	0	0	0	0	0
	GWP-fossil	kg CO_2 -eq	1,36E+03	4,18E+02	0	0	0	0	0
	GWP-biogenic	kg CO_2 -eq	2,98E+01	1,12E-01	0	0	0	0	0
	GWP-luluc	kg CO_2 -eq	9,15E-01	2,07E-01	0	0	0	0	0
	ODP	kg CFC11 -eq	1,75E-04	8,00E-05	0	0	0	0	0
	AP	mol H+ -eq	7,10E+00	1,05E+01	0	0	0	0	0
	EP-FreshWater	kg P -eq	5,42E-02	1,72E-03	0	0	0	0	0
	EP-Marine	kg N -eq	1,33E+00	2,39E+00	0	0	0	0	0
	EP-Terrestial	mol N -eq	1,45E+01	2,66E+01	0	0	0	0	0
	POCP	kg NMVOC -eq	7,66E+00	6,97E+00	0	0	0	0	0
	ADP-minerals&metals[1]	kg Sb -eq	3,81E-02	3,98E-03	0	0	0	0	0
	ADP-fossil[1]	MJ	2,76E+04	5,53E+03	0	0	0	0	0
	WDP[1]	m^3	5,76E+04	2,10E+03	0	0	0	0	0

GWP Global warming potential; ODP Depletion potential of the stratospheric ozone layer; POCP Formation potential of tropospheric photochemical oxidants; AP Acidification potential of land and water; EP Eutrophication potential; ADPM Abiotic depletion potential for non fossil resources; ADPE Abiotic depletion potential for fossil resources

"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
3. Eutrophication aquatic freshwater shall be in kg P-eq., there is a typo in EN 15804:2012+A2:2019 regarding this unit. Eutrophication calculated as PO4-eq is presented on page 11

Remarks to environmental impacts

Additional environmental impact indicators									
Indicator		Unit	A1-A3	A4	C1	C2	C3	C4	D
	PM	Disease incidence	6,29E-05	5,40E-06	0	0	0	0	0
	IRP[2]	kgBq U235 -eq	5,80E+01	2,40E+01	0	0	0	0	0
	ETP-fw[1]	CTUe	3,41E+04	3,23E+03	0	0	0	0	0
	HTP-c[1]	CTUh	1,99E-06	0,00E+00	0	0	0	0	0
	HTP-nc[1]	CTUh	3,10E-05	9,00E-07	0	0	0	0	0
	SQP[1]	dimensionless	5,21E+03	1,35E+03	0	0	0	0	0

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	C1	C2	C3	C4	D
	PERE	MJ	1,23E+03	4,17E+01	0	0	0	0	0
	PERM	MJ	0,00E+00	0,00E+00	0	0	0	0	0
	PERT	MJ	1,23E+03	4,17E+01	0	0	0	0	0
	PENRE	MJ	2,78E+04	5,53E+03	0	0	0	0	0
	PENRM	MJ	1,21E+01	0,00E+00	0	0	0	0	0
	PENRT	MJ	2,78E+04	5,53E+03	0	0	0	0	0
	SM	kg	4,04E+00	0,00E+00	0	0	0	0	0
	RSF	MJ	1,06E+02	1,46E+00	0	0	0	0	0
	NRSF	MJ	9,76E-01	9,71E+00	0	0	0	0	0
	FW	m^3	1,57E+01	2,79E-01	0	0	0	0	0

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; NRPE Non renewable primary energy resources used as energy carrier; NRPM Non renewable primary energy resources used as materials; TRPE Total use of non renewable primary energy; SM Use of secondary materials; RSF Use of renewable secondary fuels; NRSF Use of non renewable secondary fuels; W Use of net 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	1,37E+01	2,18E-01	0	0	0	0	0
	NHWD	kg	2,25E+02	6,20E+01	0	0	0	0	0
	RWD	kg	6,32E-02	3,86E-02	0	0	0	0	0

HW Hazardous waste disposed; NHW Non hazardous waste disposed; RW 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	0	0	0
	MFR	kg	2,05E+00	0,00E+00	0	0	0	0	0
	MER	kg	5,10E+01	0,00E+00	0	0	0	0	0
	EEE	MJ	3,10E+01	0,00E+00	0	0	0	0	0
	EET	MJ	4,70E+02	0,00E+00	0	0	0	0	0

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

"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	Data source	Amount	Unit
Electricity, Germany (kWh)	ecoinvent 3.6	585,93	g CO2-eq/kWh

Dangerous substances

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

Indoor environment

Not relevant

Additional Environmental Information

Environmental impact indicators EN 15804+A1 and NPCR Part A v2.0								
Indicator	**Unit**	A1-A3	A4	C1	C2	C3	C4	D
GWP	kg CO_2 -eq	1,33E+03	4,14E+02	0	0	0	0	0
ODP	kg CFC11 -eq	1,66E-04	7,64E-05	0	0	0	0	0
POCP	kg C_2H_4 -eq	4,50E-01	2,37E-01	0	0	0	0	0
AP	kg SO_2 -eq	5,53E+00	8,39E+00	0	0	0	0	0
EP	kg PO_4^{3-} -eq	7,62E-01	8,24E-01	0	0	0	0	0
ADPM	kg Sb -eq	3,81E-02	3,98E-03	0	0	0	0	0
ADPE	MJ	2,58E+04	5,48E+03	0	0	0	0	0
GWPIOBC	kg CO_2 -eq	1,34E+03	4,18E+02	0	0	0	0	0

GWP Global warming potential; ODP Depletion potential of the stratospheric ozone layer; POCP Formation potential of tropospheric photochemical oxidants; AP Acidification potential of land and water; EP Eutrophication potential; ADPM Abiotic depletion potential for non fossil resources; ADPE Abiotic depletion potential for fossil resources; GWP-IOBC/GHG Global warming potential calculated according to the principle of instantanious oxidation (except emissions and uptake of biogenic carbon)

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+A1:2013 Environmental product declaration - Core rules for the product category of construction products.
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