

Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

Pipe Jacking (VO) Hobas with GRP Sleeve, DN700-1500, PN1, SN64000-160000 (+A2)





The Norwegian EPD Foundation

Owner of the declaration:
Amiblu Technology AS

Product:
Pipe Jacking (VO) Hobas with GRP Sleeve, DN700-1500,
PN1, SN64000-160000 (+A2)

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

Program operator:
The Norwegian EPD Foundation

Declaration number:
NEPD-4614-3870-EN

Registration number:
NEPD-4614-3870-EN

Issue date: 26.06.2023

Valid to: 26.06.2028

ver-230823

EPD Software:
LCA.no EPD generator ID:
64870

General information

Product

Pipe Jacking (VO) Hobas with GRP Sleeve, DN700-1500, PN1, SN64000-160000 (+A2)

Program operator:

Post Box 5250 Majorstuen, 0303 Oslo, Norway
The Norwegian EPD Foundation
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Declaration number: NEPD-4614-3870-EN

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

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 Pipe Jacking (VO) Hobas with GRP Sleeve, DN700-1500, PN1 SN64000-160000 (+A2)

Declared unit (cradle to gate) with option:

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

Functional unit:

1 kg of the piping system

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 EPDNorway's procedures and guidelines for verification and approval of EPD tools.

Third party verifier:

Michael M. Jenssen, Asplan Viak AS
(no signature required)

Owner of the declaration:

Amiblu Technology AS
Contact person: Frans Sørensen
Phone: +47 94 14 08 18
e-mail: frans.sorensen@amiblu.com

Manufacturer:

Amiblu Germany GmbH

Place of production:

Amiblu Germany GmbH
Gewerbepark 1,
17039 Trollenhagen, Germany

Management system:

ISO 14001

Organisation no:

916 041 195

Issue date: 26.06.2023

Valid to: 26.06.2028

Year of study:

2020

Comparability:

EPD of construction products may not be comparable if they not comply with EN 15804+A2 and seen in a construction 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: Frans Sørensen

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

Approved:



Håkon Hauan, CEO EPD-Norge

Product

Product description:

Hobas Jacking (VO) Pipe with GRP Sleeve

DN700-1500, PN1, SN64000-160000

Liner: Standard, Length: 3 m, Glass: E, Resin: Ortho, Liner Resin: Ortho, with GRP Sleeve Non-Pressure

Covered diameters classes and stiffness classes are described in Technical Data section.

Product specification

Glass: E, Resin: Ortho, Liner Resin: Ortho, with GRP Sleeve Non-Pressure

Specifications and product details are presented here: <https://www.amiblu.com/jacking-pipes/>

A typical composition of the pipes covered by this EPD is as follows:

Materials	Value	Unit
Polyester Resin	20-25	%
Sand	38-43	%
Glass fibers	8-12	%
Filler	30-35	%
Rubber gasket	0-1	%
Peroxide	0-1	%

Technical data:

The list under additional information on page 4 provides a mass of a functional unit (1m pipe section with the coupling assembled on a 3m pipe unit). This information is used to calculate the A1-A3 and A4 outputs for 1m section of pipeline by multiplying the values presented in tables on page 6-7 with the mass of the pipe.

Market:

Europe

Reference service life, product

Up to 150 years

Reference service life, building

LCA: Calculation rules

Declared unit:

1 kg Pipe Jacking (VO) Hobas with GRP Sleeve, DN700-1500, PN1, SN64000-160000 (+A2)

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.

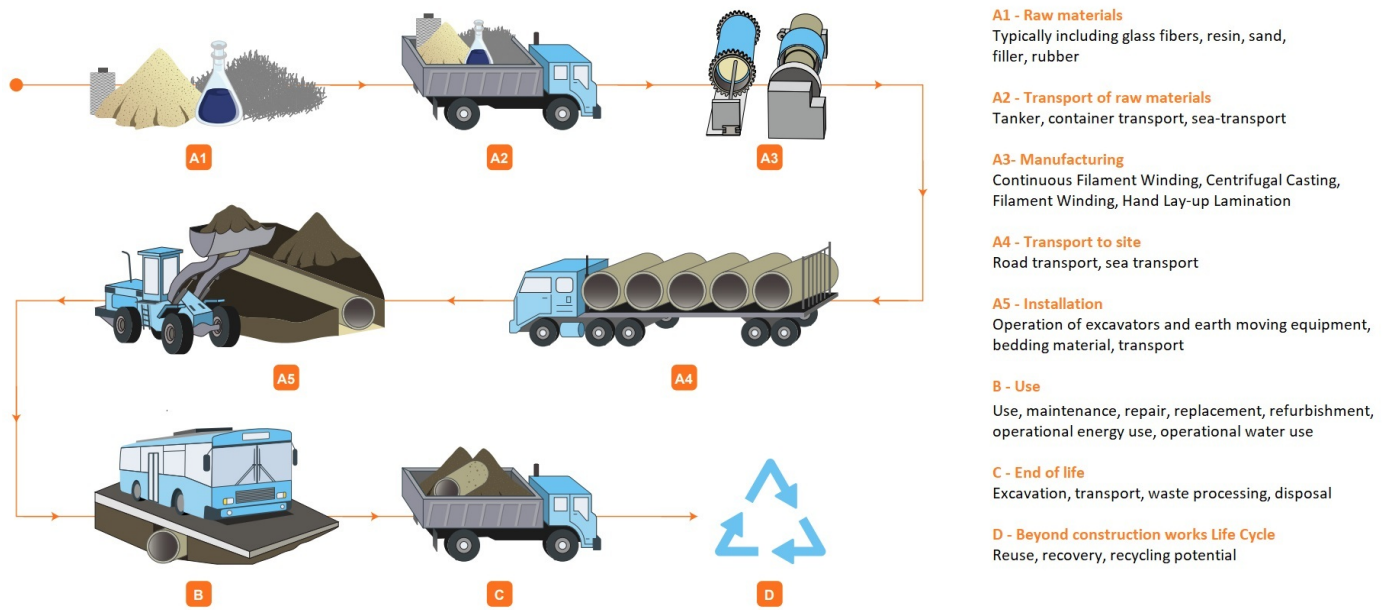
Materials	Source	Data quality	Year
Additives	ecoinvent 3.6	Database	2019
Chemical	ecoinvent 3.6	Database	2019
Filler	ecoinvent 3.6	Database	2019
Glass fibre	ecoinvent 3.6	Database	2019
Rubber, synthetic	ecoinvent 3.6	Database	2019
Polyester resin	Modified ecoinvent 3.6	Database	2019

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:

Production Flow



Additional technical information:

<https://www.amiblu.com/>

The list below provides a mass of a functional unit (1 m pipe section with the coupling assembled on a 3 m pipe unit). This information is used to calculate the A1-A3 and A4 outputs for 1 m section of pipeline by multiplying the values presented in tables on page 6-7 with the mass of the pipe.

DN700 PN1 SN64000 - 130.2 kg DN700 PN1 SN80000 - 139.1 kg
 DN700 PN1 SN100000 - 147.9 kg DN700 PN1 SN128000 - 161.1 kg
 DN700 PN1 SN160000 - 182.8 kg DN750 PN1 SN64000 - 146 kg
 DN750 PN1 SN80000 - 159.9 kg DN750 PN1 SN100000 - 173.7 kg
 DN750 PN1 SN128000 - 187.4 kg DN750 PN1 SN160000 - 201 kg
 DN800 PN1 SN64000 - 176.1 kg DN800 PN1 SN80000 - 186.2 kg
 DN800 PN1 SN100000 - 201.3 kg DN800 PN1 SN128000 - 221.3 kg
 DN800 PN1 SN160000 - 236.1 kg DN860 PN1 SN64000 - 195.7 kg
 DN860 PN1 SN80000 - 206.3 kg DN860 PN1 SN100000 - 222.1 kg
 DN860 PN1 SN128000 - 237.9 kg DN860 PN1 SN160000 - 258.7 kg
 DN900 PN1 SN64000 - 222.3 kg DN900 PN1 SN80000 - 239.4 kg
 DN900 PN1 SN100000 - 250.8 kg DN900 PN1 SN128000 - 273.3 kg
 DN900 PN1 SN160000 - 295.7 kg DN960 PN1 SN64000 - 243.3 kg
 DN960 PN1 SN80000 - 261.1 kg DN960 PN1 SN100000 - 272.9 kg
 DN960 PN1 SN128000 - 296.3 kg DN960 PN1 SN160000 - 319.5 kg
 DN1000 PN1 SN64000 - 274.1 kg DN1000 PN1 SN80000 - 293.3 kg
 DN1000 PN1 SN100000 - 318.5 kg DN1000 PN1 SN128000 - 343.5 kg
 DN1000 PN1 SN160000 - 368.3 kg DN1100 PN1 SN64000 - 314.9 kg
 DN1100 PN1 SN80000 - 342.1 kg DN1100 PN1 SN100000 - 362.3 kg
 DN1100 PN1 SN128000 - 395.8 kg DN1100 PN1 SN160000 - 415.7 kg
 DN1200 PN1 SN64000 - 392.4 kg DN1200 PN1 SN80000 - 422.8 kg
 DN1200 PN1 SN100000 - 445.5 kg DN1200 PN1 SN128000 - 483 kg
 DN1200 PN1 SN160000 - 520.2 kg DN1280 PN1 SN64000 - 433.4 kg
 DN1280 PN1 SN80000 - 457.2 kg DN1280 PN1 SN100000 - 488.7 kg
 DN1280 PN1 SN128000 - 527.8 kg DN1280 PN1 SN160000 - 558.7 kg
 DN1348 PN1 SN64000 - 474.5 kg DN1348 PN1 SN80000 - 507.9 kg
 DN1348 PN1 SN100000 - 541 kg DN1348 PN1 SN128000 - 582.1 kg
 DN1348 PN1 SN160000 - 622.9 kg DN1400 PN1 SN64000 - 532.8 kg
 DN1400 PN1 SN80000 - 568.2 kg DN1400 PN1 SN100000 - 603.8 kg
 DN1400 PN1 SN128000 - 656.3 kg DN1400 PN1 SN160000 - 699.9 kg
 DN1500 PN1 SN64000 - 585.9 kg DN1500 PN1 SN80000 - 623.2 kg
 DN1500 PN1 SN100000 - 660.1 kg DN1500 PN1 SN128000 - 714.9 kg

LCA: Scenarios and additional technical information

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

For A4 stage, a typical transport distance of 500 km from the pipe production plant to the installation site is assumed. A project specific EPD can be provided

on request. The impact of trenchless installation are not included in this EPD.

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 3 m Hobas Jacking pipe VO DN1280 PN1 SN160000 with the corresponding GRP sleeve.

The environmental impacts for 1kg of other piping systems covered by this EPD stays within the +/- 10% range compared to values presented on pages 6 and 7.

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 5 (kgkm)	36,7 %	500	0,044	l/tkm	22,00

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	C1	C2	C3	C4	D	
 GWP-total	kg CO ₂ -eq	1,30E+00	8,34E-02	0	0	0	0	0	0
 GWP-fossil	kg CO ₂ -eq	1,27E+00	8,33E-02	0	0	0	0	0	0
 GWP-biogenic	kg CO ₂ -eq	2,68E-02	3,40E-05	0	0	0	0	0	0
 GWP-luluc	kg CO ₂ -eq	8,40E-04	2,91E-05	0	0	0	0	0	0
 ODP	kg CFC11 -eq	1,71E-07	1,90E-08	0	0	0	0	0	0
 AP	mol H ⁺ -eq	6,62E-03	3,41E-04	0	0	0	0	0	0
 EP-FreshWater	kg P -eq	5,14E-05	6,55E-07	0	0	0	0	0	0
 EP-Marine	kg N -eq	1,23E-03	1,01E-04	0	0	0	0	0	0
 EP-Terrestrial	mol N -eq	1,34E-02	1,12E-03	0	0	0	0	0	0
 POCP	kg NMVOC -eq	7,26E-03	3,42E-04	0	0	0	0	0	0
 ADP-minerals&metals ¹	kg Sb -eq	3,34E-05	2,26E-06	0	0	0	0	0	0
 ADP-fossil ¹	MJ	2,67E+01	1,26E+00	0	0	0	0	0	0
 WDP ¹	m ³	6,51E+01	1,20E+00	0	0	0	0	0	0







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	5,76E-08	6,00E-09	0	0	0	0	0	
 IRP ²	kgBq U235 -eq	5,91E-02	5,49E-03	0	0	0	0	0	
 ETP-fw ¹	CTUe	3,18E+01	9,26E-01	0	0	0	0	0	
 HTP-c ¹	CTUh	1,92E-09	0,00E+00	0	0	0	0	0	
 HTP-nc ¹	CTUh	2,93E-08	1,00E-09	0	0	0	0	0	
 SQP ¹	dimensionless	4,87E+00	8,66E-01	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	1,21E+00	1,77E-02	0	0	0	0	0	0
 PERM	MJ	0,00E+00	0,00E+00	0	0	0	0	0	0
 PERT	MJ	1,21E+00	1,77E-02	0	0	0	0	0	0
 PENRE	MJ	2,70E+01	1,26E+00	0	0	0	0	0	0
 PENRM	MJ	4,51E-02	0,00E+00	0	0	0	0	0	0
 PENRT	MJ	2,71E+01	1,26E+00	0	0	0	0	0	0
 SM	kg	3,83E-03	0,00E+00	0	0	0	0	0	0
 RSF	MJ	1,06E-01	6,35E-04	0	0	0	0	0	0
 NRSF	MJ	2,53E-03	2,27E-03	0	0	0	0	0	0
 FW	m ³	1,52E-02	1,32E-04	0	0	0	0	0	0

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	1,18E-02	6,41E-05	0	0	0	0	0
	NHWD	kg	2,05E-01	6,01E-02	0	0	0	0	0
	RWD	kg	6,36E-05	8,57E-06	0	0	0	0	0

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed

*Reading example: 9,0 E-03 = $9,0 \cdot 10^{-3} = 0,009$

*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	1,98E-03	0,00E+00	0	0	0	0	0
	MER	kg	4,41E-02	0,00E+00	0	0	0	0	0
	EEE	MJ	2,69E-02	0,00E+00	0	0	0	0	0
	EET	MJ	4,07E-01	0,00E+00	0	0	0	0	0

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 = $9,0 \cdot 10^{-3} = 0,009$

*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 CO ₂ -eq/kWh

Dangerous substances

No substances given by the REACH Candidate list or the Norwegian priority list are intentionally added to the product.

Indoor environment

Not relevant

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	1,25E+00	8,34E-02	0	0	0	0	0

GWPIOBC: 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.

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Ruttenborg et al., (2021) EPD generator for Amiblu Technology AS Background information for customer application and LCA data, LCA.no report number 01.21

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