

# Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

Extruded PVC-U pressure, sewer, surface water and cable protection pipe systems



The Norwegian EPD Foundation

**Owner of the declaration:**

Pipelife Norge AS

**Product:**

Extruded PVC-U pressure, sewer, surface water and cable protection pipe systems

**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-4617-3868-EN

**Registration number:**

NEPD-4617-3868-EN

**Issue date:** 26.06.2023

**Valid to:** 26.06.2028

**EPD Software:**

LCA.no EPD generator ID: 62569

## General information

### Product

Extruded PVC-U pressure, sewer, surface water and cable protection pipe systems

### Program operator:

Post Box 5250 Majorstuen, 0303 Oslo, Norway  
The Norwegian EPD Foundation  
Phone: +47 23 08 80 00  
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**Declaration number:** NEPD-4617-3868-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 Extruded PVC-U pressure, sewer, surface water and cable

### Declared unit (cradle to gate) with option:

A1-A3,A4,A5,C1,C2,C3,C4,D  
protection pipe systems

### Functional unit:

Not applicable

### 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:

Pipelife Norge AS  
Contact person: Bård Moen  
Phone: +47 71 65 88 00  
e-mail: [bard.moen@pipelife.com](mailto:bard.moen@pipelife.com)

### Manufacturer:

Pipelife Norge AS

### Place of production:

Pipelife Norge AS  
Hamnesvegen 97  
6650 Surnadal, Norway

### Management system:

NS-EN ISO 9001:2015 NS-EN ISO 14001:2015

### Organisation no:

980 457 575

**Issue date:** 26.06.2023

**Valid to:** 26.06.2028

### Year of study:

2021

### 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: Bård Moen

Reviewer of company-specific input data and EPD: Irene Leiknes

### Approved:



Håkon Hauan, CEO EPD-Norge

## Product

### Product description:

PVC-U pipes and fittings made from PVC-U pipes. The applications are underground water supply and sewers under pressure, non-pressure drains, sewers and surface water systems and cable protection. The colours are according to the product standards and the colour codes for these applications in Norway.

More information is found on [www.pipelife.no](http://www.pipelife.no)

### Product specification

The products covered by this EPD have small variations in composition and are manufactured with the same type of equipment. The composition below represents an average for these products manufactured in 2021.

| Materials                | kg   | %     |
|--------------------------|------|-------|
| Polyvinyl chloride (PVC) | 0,88 | 91,94 |
| Additives                | 0,02 | 2,24  |
| Rubber, synthetic        | 0,00 | 0,29  |
| Filler                   | 0,05 | 5,51  |
| Tape                     | 0,00 | 0,02  |
| Total                    | 0,96 |       |

| Packaging             | kg   | %     |
|-----------------------|------|-------|
| Packaging - Plastic   | 0,00 | 5,07  |
| Packaging - Cardboard | 0,00 | 2,30  |
| Packaging - Wood      | 0,04 | 92,63 |
| Total incl. packaging | 1,00 |       |

### Technical data:

See our handbook:

<https://www.pipelife.no/content/dam/pipelife/norway/marketing/general/r%C3%B8rh%C3%A5ndboka/r%C3%B8rh%C3%A5ndboka2021/M-Materialdata.pdf>

### Market:

Mainly Norway, but also the 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 relevant

## LCA: Calculation rules

### Declared unit:

1 kg Extruded PVC-U pressure, sewer, surface water and cable protection pipe systems

### Cut-off criteria:

All raw materials and all the essential energy are included.

### Allocation:

The allocation is made in accordance with the provisions of EN 15804. Incoming electricity and water are allocated according to measured electricity consumption for the actual production department. Water is used for cooling and it is assumed that the amount of water for cooling corresponds to the amount of energy used. Diesel and waste production in-house are allocated equally among all products through mass allocation.

### 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 |
| Filler                   | ecoinvent 3.6 | Database     | 2019 |
| Packaging - Cardboard    | ecoinvent 3.6 | Database     | 2019 |
| Packaging - Plastic      | ecoinvent 3.6 | Database     | 2019 |
| Packaging - Wood         | ecoinvent 3.6 | Database     | 2019 |
| Polyvinyl chloride (PVC) | ecoinvent 3.6 | Database     | 2019 |
| Rubber, synthetic        | ecoinvent 3.6 | Database     | 2019 |
| Tape                     | ecoinvent 3.6 | Database     | 2019 |



## 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 %                                | 100           | 0,043                   | l/tkm | 4,30                |
| Assembly (A5)   |                                       |               |                         |       |                     |
|   | Unit                                  | Value         |                         |       |                     |
| Waste, packaging, corrugated board box, to average treatment - A5 including transport (kg)                | kg                                    | 0,00          |                         |       |                     |
| Waste, packaging, plastic film (LDPE), to average treatment - A5 including transport (kg)                 | kg                                    | 0,00          |                         |       |                     |
| Waste, packaging, wood to average treatment - A5 including transp. (kg)                                   | kg                                    | 0,04          |                         |       |                     |
| Waste processing (C3)   |                                       |               |                         |       |                     |
|   | Unit                                  | Value         |                         |       |                     |
| Waste treatment of hazardous waste, incineration with energy recovery and fly ash extraction (kg)         | kg                                    | 0,01          |                         |       |                     |
| Waste treatment of plastic mixture, incineration with energy recovery and fly ash extraction (kg)         | kg                                    | 0,03          |                         |       |                     |
| Waste treatment of polyvinylchloride (PVC), incineration with energy recovery and fly ash extraction (kg) | kg                                    | 0,44          |                         |       |                     |
| Waste treatment per kg Rubber, incineration with fly ash extraction (kg)                                  | kg                                    | 0,00          |                         |       |                     |
| Disposal (C4)   |                                       |               |                         |       |                     |
|   | Unit                                  | Value         |                         |       |                     |
| Landfilling of ashes from incineration of Hazardous waste, process per kg ashes and residues (kg)         | kg                                    | 0,00          |                         |       |                     |
| Landfilling of ashes from incineration of Plastic mixture, process per kg ashes and residues (kg)         | kg                                    | 0,00          |                         |       |                     |
| Landfilling of ashes from incineration of Polyvinylchloride (PVC), process per kg ashes and residues (kg) | kg                                    | 0,07          |                         |       |                     |
| Landfilling of ashes from incineration of Rubber, process per kg ashes and residues (kg)                  | kg                                    | 0,00          |                         |       |                     |
| Landfilling of hazardous waste (kg)   | kg                                    | 0,01          |                         |       |                     |
| Landfilling of plastic mixture (kg)   | kg                                    | 0,47          |                         |       |                     |
| Benefits and loads beyond the system boundaries (D)   |                                       |               |                         |       |                     |
|   | Unit                                  | Value         |                         |       |                     |
| Substitution of electricity, in Norway (MJ)   | MJ                                    | 0,49          |                         |       |                     |
| Substitution of thermal energy, district heating, in Norway (MJ)  | MJ                                    | 7,45          |                         |       |                     |

## 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 <sub>2</sub> -eq | 1,93E+00  | 1,63E-02 | 6,44E-02 | 0  | 0  | 9,72E-01 | 7,32E-02 | -4,48E-02 |  |
| GWP-fossil                       | kg CO <sub>2</sub> -eq | 1,98E+00  | 1,63E-02 | 1,27E-03 | 0  | 0  | 9,72E-01 | 7,32E-02 | -4,32E-02 |  |
| GWP-biogenic                     | kg CO <sub>2</sub> -eq | -5,63E-02 | 6,76E-06 | 6,31E-02 | 0  | 0  | 4,20E-04 | 1,52E-05 | -8,91E-05 |  |
| GWP-luluc                        | kg CO <sub>2</sub> -eq | 1,65E-03  | 5,81E-06 | 2,96E-07 | 0  | 0  | 7,51E-05 | 2,33E-05 | -1,49E-03 |  |
| ODP                              | kg CFC11 -eq           | 1,07E-06  | 3,70E-09 | 1,86E-10 | 0  | 0  | 3,18E-08 | 2,69E-09 | -3,15E-03 |  |
| AP                               | mol H+ -eq             | 9,25E-03  | 4,69E-05 | 8,99E-06 | 0  | 0  | 5,59E-04 | 9,46E-05 | -3,56E-04 |  |
| EP-FreshWater                    | kg P -eq               | 8,37E-05  | 1,31E-07 | 1,35E-08 | 0  | 0  | 3,18E-06 | 3,96E-07 | -3,84E-06 |  |
| EP-Marine                        | kg N -eq               | 1,77E-03  | 9,29E-06 | 3,95E-06 | 0  | 0  | 1,38E-04 | 8,44E-05 | -1,16E-04 |  |
| EP-Terrestrial                   | mol N -eq              | 1,90E-02  | 1,04E-04 | 4,10E-05 | 0  | 0  | 1,48E-03 | 3,26E-04 | -1,26E-03 |  |
| POCP                             | kg NMVOC -eq           | 6,44E-03  | 3,98E-05 | 1,06E-05 | 0  | 0  | 4,17E-04 | 1,06E-04 | -3,47E-04 |  |
| ADP-minerals&metals <sup>1</sup> | kg Sb -eq              | 4,84E-05  | 4,51E-07 | 1,89E-08 | 0  | 0  | 1,95E-06 | 1,02E-07 | -4,29E-07 |  |
| ADP-fossil <sup>1</sup>          | MJ                     | 4,95E+01  | 2,47E-01 | 1,37E-02 | 0  | 0  | 1,27E+00 | 2,39E-01 | -6,17E-01 |  |
| WDP <sup>1</sup>                 | m <sup>3</sup>         | 1,59E+02  | 2,39E-01 | 2,24E-02 | 0  | 0  | 2,41E+01 | 2,77E+00 | -7,69E+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<sup>-3</sup> = 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

Mechanical recycling of PVC-U is very sustainable and in line with the circular economy. Scrap and used products should be collected for recycling.






| Additional environmental impact indicators  |                   |          |          |          |    |    |          |          |           |  |
|---|-------------------|----------|----------|----------|----|----|----------|----------|-----------|--|
| Indicator   | Unit              | A1-A3    | A4       | A5       | C1 | C2 | C3       | C4       | D         |  |
|  PM                  | Disease incidence | 7,92E-08 | 1,00E-09 | 1,11E-10 | 0  | 0  | 3,91E-09 | 1,36E-09 | -2,16E-08 |  |
|  IRP <sup>2</sup>    | kgBq U235 -eq     | 1,10E-01 | 1,08E-03 | 5,03E-05 | 0  | 0  | 6,11E-03 | 1,12E-03 | -3,94E-03 |  |
|  ETP-fw <sup>1</sup> | CTUe              | 3,08E+01 | 1,83E-01 | 1,55E-02 | 0  | 0  | 5,62E+01 | 4,95E-01 | -3,36E+00 |  |
|  HTP-c <sup>1</sup>  | CTUh              | 1,26E-09 | 0,00E+00 | 2,00E-12 | 0  | 0  | 1,51E-10 | 3,00E-11 | -6,10E-11 |  |
|  HTP-nc <sup>1</sup> | CTUh              | 3,50E-08 | 2,00E-10 | 7,80E-11 | 0  | 0  | 1,34E-08 | 7,53E-10 | -3,22E-09 |  |
|  SQP <sup>1</sup>    | dimensionless     | 9,48E+00 | 1,73E-01 | 8,53E-03 | 0  | 0  | 4,63E-01 | 8,16E-01 | -4,13E+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<sup>-3</sup> = 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             | 3,07E+00 | 3,54E-03 | 2,83E-04  | 0  | 0  | 1,66E-01 | 2,35E-02 | -3,81E+00 |  |
|  PERM  | MJ             | 5,71E-01 | 0,00E+00 | -5,71E-01 | 0  | 0  | 0,00E+00 | 0,00E+00 | 0,00E+00  |  |
|  PERT  | MJ             | 3,64E+00 | 3,54E-03 | -5,70E-01 | 0  | 0  | 1,66E-01 | 2,35E-02 | -3,81E+00 |  |
|  PENRE | MJ             | 2,96E+01 | 2,47E-01 | 1,37E-02  | 0  | 0  | 1,27E+00 | 2,39E-01 | -6,17E-01 |  |
|  PENRM | MJ             | 1,99E+01 | 0,00E+00 | -9,34E-02 | 0  | 0  | 0,00E+00 | 0,00E+00 | 0,00E+00  |  |
|  PENRT | MJ             | 4,95E+01 | 2,47E-01 | -7,98E-02 | 0  | 0  | 1,27E+00 | 2,39E-01 | -6,17E-01 |  |
|  SM    | kg             | 1,05E-02 | 0,00E+00 | 0,00E+00  | 0  | 0  | 0,00E+00 | 2,82E-04 | 0,00E+00  |  |
|  RSF   | MJ             | 1,50E-01 | 1,26E-04 | 8,22E-06  | 0  | 0  | 3,08E-03 | 3,57E-04 | -6,68E-04 |  |
|  NRSF  | MJ             | 1,91E-02 | 4,52E-04 | 8,85E-05  | 0  | 0  | 0,00E+00 | 3,77E-03 | -2,26E-01 |  |
|  FW    | m <sup>3</sup> | 3,41E-02 | 2,64E-05 | 9,74E-06  | 0  | 0  | 2,79E-02 | 2,50E-04 | -4,59E-03 |  |

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<sup>-3</sup> = 0,009"

\*INA Indicator Not Assessed








| End of life - Waste  |      |          |          |          |    |    |          |          |           |  |
|--|------|----------|----------|----------|----|----|----------|----------|-----------|--|
| Indicator  | Unit | A1-A3    | A4       | A5       | C1 | C2 | C3       | C4       | D         |  |
|  HWD  | kg   | 4,69E-03 | 1,27E-05 | 0,00E+00 | 0  | 0  | 0,00E+00 | 1,71E-02 | -2,90E-05 |  |
|  NHWD | kg   | 2,53E-01 | 1,20E-02 | 4,34E-02 | 0  | 0  | 1,07E-02 | 5,34E-01 | -1,46E-02 |  |
|  RWD  | kg   | 1,03E-04 | 1,68E-06 | 0,00E+00 | 0  | 0  | 0,00E+00 | 9,47E-07 | -3,23E-06 |  |

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

\*Reading example: 9,0 E-03 = 9,0\*10<sup>-3</sup> = 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 | 0,00E+00 | 0  | 0  | 0,00E+00 | 0,00E+00 | 0,00E+00 |  |
|  MFR | kg   | 1,04E-02 | 0,00E+00 | 2,05E-03 | 0  | 0  | 0,00E+00 | 4,19E-05 | 0,00E+00 |  |
|  MER | kg   | 4,94E-03 | 0,00E+00 | 4,03E-02 | 0  | 0  | 4,78E-01 | 1,03E-06 | 0,00E+00 |  |
|  EEE | MJ   | 5,42E-03 | 0,00E+00 | 2,80E-02 | 0  | 0  | 4,92E-01 | 6,65E-05 | 0,00E+00 |  |
|  EET | MJ   | 8,20E-02 | 0,00E+00 | 4,24E-01 | 0  | 0  | 7,45E+00 | 1,01E-03 | 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<sup>-3</sup> = 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 | 1,72E-02            |

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO<sub>2</sub>

## 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).

### 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       | A5       | C1 | C2 | C3       | C4       | D         |
|-----------|------------------------|----------|----------|----------|----|----|----------|----------|-----------|
| GWPIOBC   | kg CO <sub>2</sub> -eq | 1,99E+00 | 1,63E-02 | 6,25E-02 | 0  | 0  | 9,74E-01 | 1,84E-02 | -4,41E-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 rapportnummer: : 07.21.  
 Vold, et al., (2019) EPD generator for Pipelife - Background information for customer application and LCA data. report number 08.19  
 NPCR Part A: Construction products and services. Ver. 2.0. March 2021, EPD-Norge.

Relevant product standards are EN ISO 1452, EN 1401, prNS 2967 and prNS 2970.

|   |  |   |
|---|--|---|
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|    | ECO Platform<br>ECO Portal   | web: <a href="http://www.eco-platform.org">www.eco-platform.org</a><br>web: ECO Portal  |