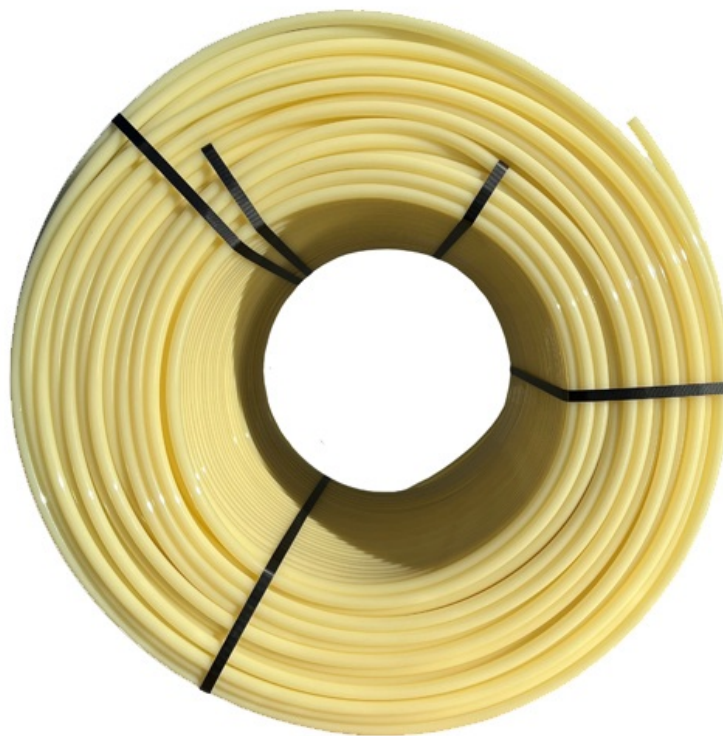


Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

Component EPD Ringebu: Purchased PEX pipes - used as material component in various finished mixed products



PIPELIFE 

The Norwegian EPD Foundation

Owner of the declaration:

Pipelife Norge AS

Product:

Component EPD Ringebu: Purchased PEX pipes - used as material component in various finished mixed products

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. Ver. 2.0
March 2021

Program operator:

The Norwegian EPD Foundation

Declaration number:

NEPD-7354-6753-EN

Registration number:

NEPD-7354-6753-EN

Issue date: 26.08.2024

Valid to: 26.08.2029

EPD software:

LCAno EPD generator ID: 443085

General information

Product

Component EPD Ringebu: Purchased PEX pipes - used as material component in various finished mixed products

Program operator:

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

Declaration number:

NEPD-7354-6753-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. Ver. 2.0 March 2021

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 Component EPD Ringebu: Purchased PEX pipes - used as material component in various finished mixed products

Declared unit (cradle to gate) with option:

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

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: Are Lyubråten
Phone: +47 71 65 88 00
e-mail: are.lyubraten@pipelife.com

Manufacturer:

Pipelife Norge AS
Hamnesvegen 97
6650 Surnadal, Norway

Place of production:

Pipelife Norge AS - Ringebu
Flyplassvegen 16
2630 Ringebu, Norway

Management system:

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

Organisation no:

980 457 575

Issue date:

26.08.2024

Valid to:

26.08.2029

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. NEPDT15

Developer of EPD: Diana Karin Schleider

Reviewer of company-specific input data and EPD: Are Lyubråten

Approved:



Håkon Hauan
Managing Director of EPD-Norway

Product

Product description:

PEX pipe of type PEX-c for tap water piping systems.

The colours are according to the product standards.

This EPD covers products as material components, intended for use in various finished mixed products as e.g. flexible piping systems with or without integrated frost protection, etc..

More information is found on 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 | % |
|------------------------|------|--------|
| Plastic - Polyethylene | 1,00 | 100,00 |
| Total | 1,00 | 100,00 |

Technical data:

For products covered by this EPD the following applies:

Products used as media pipes fulfill the requirements in accordance with EN ISO 15875-2 and meeting the requirements for diffusion resistance outlined in DIN 4726. GDV and VA approved. The products do not emit substances that can impair the quality of the drinking water or cause a health hazard. The product has been tested for leaching into drinking water according with KTW-BWGL.

For technical information, see our documentation for the specific finished mixed product where PEX pipes as covered by this EPD is a constituent component.

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 50 years (ref. NEPD-4933-4283-EN)

Reference service life, building

Not relevant

LCA: Calculation rules

Declared unit:

1 kg Component EPD Ringebu: Purchased PEX pipes - used as material component in various finished mixed products

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 energy and water and waste production in-house is not allocated among internally or externally purchased, components which are not further processed, only handled and assembled, before leaving Ringebu.

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.

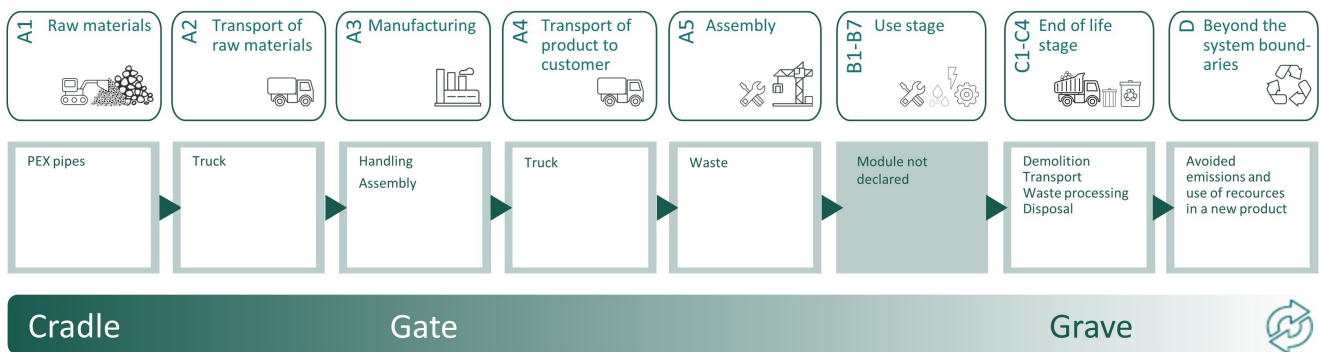
| Materials | Source | Data quality | Year |
|------------------------|-------------------|--------------|------|
| Plastic - Polyethylene | NEPD-4933-4283-EN | EPD | 2021 |

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 analysis is a cradle-to-gate (A1 - A3) study, with option A4 transport to market. It includes the extraction and production of raw materials, transportation to the production site, the production process itself and transport to the market. A5, installation, is included for the transport of packaging waste from the construction site and the treatment of this waste - not the installation of the products. The material data set used in A1 is generated from the cradle to gate part (A1-A3) of a published EPD from Roth North Europe A/S. Transport in A2 is the specific transport of the material from Roth North Europe A/S to Ringebu.



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.

Pipelife Norway AS is certified according to EN ISO 14001:2015

See www.pipelife.no for more information on how we are working on environmental issues.














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 |
| Waste processing (C3) | | | | | |
| | Unit | Value | | | |
| Waste treatment of polyethylene (PE), incineration with energy recovery and fly ash extraction (kg) | kg | 0,50 | | | |
| Disposal (C4) | | | | | |
| | Unit | Value | | | |
| Landfilling of ashes from incineration of Polyethylene (PE), process per kg ashes and residues (kg) | kg | 0,02 | | | |
| Landfilling of plastic mixture (kg) | kg | 0,50 | | | |
| Benefits and loads beyond the system boundaries (D) | | | | | |
| | Unit | Value | | | |
| Substitution of electricity, in Norway (MJ) | MJ | 0,97 | | | |
| Substitution of thermal energy, district heating, in Norway (MJ) | MJ | 14,67 | | | |

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 | 3,05E+00 | 1,63E-02 | 0 | 0 | 0 | 1,51E+00 | 5,81E-02 | -8,81E-02 | |
|  GWP-fossil | kg CO ₂ -eq | 3,03E+00 | 1,63E-02 | 0 | 0 | 0 | 1,51E+00 | 5,81E-02 | -8,50E-02 | |
|  GWP-biogenic | kg CO ₂ -eq | 1,97E-02 | 6,76E-06 | 0 | 0 | 0 | 1,22E-05 | 5,60E-06 | -1,76E-04 | |
|  GWP-luluc | kg CO ₂ -eq | 1,36E-03 | 5,81E-06 | 0 | 0 | 0 | 1,79E-06 | 1,26E-06 | -2,93E-03 | |
|  ODP | kg CFC11 -eq | 1,47E-07 | 3,70E-09 | 0 | 0 | 0 | 1,16E-09 | 1,66E-09 | -6,20E-03 | |
|  AP | mol H+ -eq | 1,03E-02 | 4,69E-05 | 0 | 0 | 0 | 1,89E-04 | 4,21E-05 | -7,01E-04 | |
|  EP-FreshWater | kg P -eq | 1,13E-04 | 1,31E-07 | 0 | 0 | 0 | 1,16E-07 | 6,45E-08 | -7,56E-06 | |
|  EP-Marine | kg N -eq | 1,82E-03 | 9,29E-06 | 0 | 0 | 0 | 9,07E-05 | 7,43E-05 | -2,29E-04 | |
|  EP-Terrestrial | mol N -eq | 2,13E-02 | 1,04E-04 | 0 | 0 | 0 | 9,81E-04 | 1,66E-04 | -2,48E-03 | |
|  POCP | kg NMVOC -eq | 8,92E-03 | 3,98E-05 | 0 | 0 | 0 | 2,35E-04 | 5,93E-05 | -6,83E-04 | |
|  ADP-minerals&metals ¹ | kg Sb-eq | 3,06E-05 | 4,51E-07 | 0 | 0 | 0 | 5,28E-08 | 4,31E-08 | -8,46E-07 | |
|  ADP-fossil ¹ | MJ | 8,81E+01 | 2,47E-01 | 0 | 0 | 0 | 9,87E-02 | 1,24E-01 | -1,22E+00 | |
|  WDP ¹ | m ³ | 1,53E+02 | 2,39E-01 | 0 | 0 | 0 | 2,23E-01 | 1,06E+00 | -1,51E+01 | |







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 | 8,86E-08 | 1,00E-09 | 0 | 0 | 0 | 7,40E-10 | 8,24E-10 | -4,25E-08 | |
|  IRP ² | kgBq U235 -eq | 9,20E-02 | 1,08E-03 | 0 | 0 | 0 | 1,67E-04 | 5,96E-04 | -7,77E-03 | |
|  ETP-fw ¹ | CTUe | 2,08E+01 | 1,83E-01 | 0 | 0 | 0 | 2,95E-01 | 1,54E-01 | -6,61E+00 | |
|  HTP-c ¹ | CTUh | 7,42E-10 | 0,00E+00 | 0 | 0 | 0 | 3,40E-11 | 4,00E-12 | -1,21E-10 | |
|  HTP-nc ¹ | CTUh | 2,24E-08 | 2,00E-10 | 0 | 0 | 0 | 1,27E-09 | 1,19E-10 | -6,34E-09 | |
|  SQP ¹ | dimensionless | 6,82E+00 | 1,73E-01 | 0 | 0 | 0 | 1,20E-02 | 4,59E-01 | -8,13E+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*10⁻³ = 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 | 2,57E+00 | 3,54E-03 | 0 | 0 | 0 | 2,90E-03 | 5,83E-03 | -7,51E+00 | |
|  PERM | MJ | 0,00E+00 | 0,00E+00 | 0 | 0 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | |
|  PERT | MJ | 2,57E+00 | 3,54E-03 | 0 | 0 | 0 | 2,90E-03 | 5,83E-03 | -7,51E+00 | |
|  PENRE | MJ | 4,56E+01 | 2,47E-01 | 0 | 0 | 0 | 9,87E-02 | 1,24E-01 | -1,22E+00 | |
|  PENRM | MJ | 4,25E+01 | 0,00E+00 | 0 | 0 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | |
|  PENRT | MJ | 8,80E+01 | 2,47E-01 | 0 | 0 | 0 | 9,87E-02 | 1,24E-01 | -1,22E+00 | |
|  SM | kg | 3,21E-04 | 0,00E+00 | 0 | 0 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | |
|  RSF | MJ | 4,55E-01 | 1,26E-04 | 0 | 0 | 0 | 8,17E-05 | 1,23E-04 | -1,32E-03 | |
|  NRSF | MJ | 1,93E-02 | 4,52E-04 | 0 | 0 | 0 | 0,00E+00 | 1,97E-03 | -4,45E-01 | |
|  FW | m ³ | 3,03E-02 | 2,64E-05 | 0 | 0 | 0 | 2,79E-04 | 1,51E-04 | -9,05E-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*10⁻³ = 0,009"






*INA Indicator Not Assessed

| End of life - Waste | | | | | | | | | | |
|--|------|----------|----------|----|----|----|----------|----------|-----------|--|
| Indicator | Unit | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D | |
|  HWD | kg | 3,50E-03 | 1,27E-05 | 0 | 0 | 0 | 0,00E+00 | 1,49E-02 | -5,72E-05 | |
|  NHWD | kg | 2,90E-01 | 1,20E-02 | 0 | 0 | 0 | 0,00E+00 | 5,09E-01 | -2,87E-02 | |
|  RWD | kg | 1,03E-04 | 1,68E-06 | 0 | 0 | 0 | 0,00E+00 | 8,10E-07 | -6,37E-06 | |

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 | A5 | C1 | C2 | C3 | C4 | D | |
|  CRU | kg | 0,00E+00 | 0,00E+00 | 0 | 0 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | |
|  MFR | kg | 0,00E+00 | 0,00E+00 | 0 | 0 | 0 | 0,00E+00 | 4,48E-05 | 0,00E+00 | |
|  MER | kg | 0,00E+00 | 0,00E+00 | 0 | 0 | 0 | 5,00E-01 | 1,10E-06 | 0,00E+00 | |
|  EEE | MJ | 0,00E+00 | 0,00E+00 | 0 | 0 | 0 | 9,70E-01 | 7,12E-05 | 0,00E+00 | |
|  EET | MJ | 0,00E+00 | 0,00E+00 | 0 | 0 | 0 | 1,47E+01 | 1,08E-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 = $9,0 \cdot 10^{-3} = 0,009$

*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).

Dangerous substances

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

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 ₂ -eq | 2,93E+00 | 1,63E-02 | 0 | 0 | 0 | 1,51E+00 | 5,81E-02 | -8,69E-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

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 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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| | | |
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