

Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

Injection moulded PP fittings and gullies for sewer, surface water, land drainage and cable protection pipe systems





The Norwegian EPD Foundation

Owner of the declaration:

Pipelife Norge AS

Product:

Injection moulded PP fittings and gullies for sewer, surface water, land drainage 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-4619-3866-EN

Registration number:

NEPD-4619-3866-EN

Issue date: 26.06.2023

Valid to: 26.06.2028

EPD Software:

LCA.no EPD generator ID: 63686



General information

Product

Injection moulded PP fittings and gullies for sewer, surface water, land drainage and cable protection pipe systems

Program operator:

Post Box 5250 Majorstuen, 0303 Oslo, Norway The Norwegian EPD Foundation Phone: +47 23 08 80 00

web: post@epd-norge.no

Declaration number: NEPD-4619-3866-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 Injection moulded PP fittings and gullies for sewer, surface water,

Declared unit (cradle to gate) with option:

A1-A3,A4,A5,C1,C2,C3,C4,D land drainage and cable 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

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:

Injection moulded PP fittings and gullies for sewerage piping systems underground and inside buildings and for surface water, land drainage and cable protection piping systems underground. 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

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	%
Rubber, synthetic	0,03	4,30
Polypropylene (PP)	0,55	91,16
Tape	0,01	1,29
Thermoplastic elastomers (TPE)	0,02	3,25
Total	0,60	

Packaging	kg	%
Packaging - Plastic	0,00	0,53
Packaging - Cardboard	0,11	26,52
Packaging - Wood	0,29	72,95
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 Europe.

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

The normal reference service life for buildings is normally assumed to be 60 years.

LCA: Calculation rules

Declared unit:

1 kg Injection moulded PP fittings and gullies for sewer, surface water, land drainage 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
Packaging - Cardboard	ecoinvent 3.6	Database	2019
Packaging - Plastic	ecoinvent 3.6	Database	2019
Packaging - Wood	ecoinvent 3.6	Database	2019
Polypropylene (PP)	ecoinvent 3.6	Database	2019
Rubber, synthetic	ecoinvent 3.6	Database	2019
Tape	ecoinvent 3.6	Database	2019
Thermoplastic elastomers (TPE)	ecoinvent 3.6	Database	2019

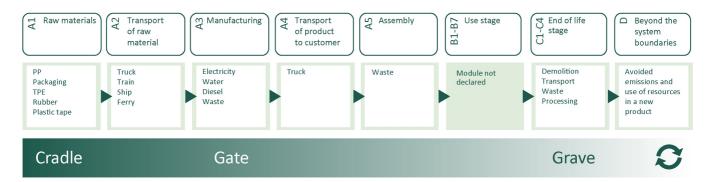


System boundaries (X=included, MND=module not declared, MNR=module not relevant)

	Prod	duct stag	je	Constr installati	uction on 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
A ²	ı	A2	A3	A4	A5	B1	B2	В3	B4	B5	В6	В7	C1	C2	C3	C4	D
X		Χ	Χ	X	X	MND	MND	MND	MND	MND	MND	MND	X	Χ	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.



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
Assembly (A5)	Unit	Value			
Waste, packaging, corrugated board box, to average treatment - A5 including transport (kg)	kg	0,11			
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	0,29			
Waste processing (C3)	Unit	Value			
Waste treatment of polypropylene (PP), incineration with energy recovery and fly ash extraction (kg)	kg	0,27			
Waste treatment per kg Rubber, incineration with fly ash extraction (kg)	kg	0,02			
Disposal (C4)	Unit	Value			
Landfilling of ashes from incineration of Polypropylene (PP), process per kg ashes and residues (kg)	kg	0,01			
Landfilling of ashes from incineration of Rubber, process per kg ashes and residues (kg)	kg	0,00			
Landfilling of plastic mixture (kg)	kg	0,30			
Benefits and loads beyond the system boundaries (D)	Unit	Value			
Substitution of electricity, in Norway (MJ)	MJ	0,48			
Substitution of thermal energy, district heating, in Norway (MJ)	МЈ	7,24			



LCA: Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document.

Enviro	nmental impact									
	Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	GWP-total	kg CO ₂ -eq	1,06E+00	1,63E-02	6,31E-01	0	0	7,72E-01	3,46E-02	-4,35E-02
	GWP-fossil	kg CO ₂ -eq	1,66E+00	1,63E-02	9,67E-03	0	0	7,72E-01	3,46E-02	-4,20E-02
	GWP-biogenic	kg CO ₂ -eq	-6,08E-01	6,76E-06	6,21E-01	0	0	7,62E-06	3,33E-06	-8,66E-05
	GWP-luluc	kg CO ₂ -eq	2,89E-03	5,81E-06	2,58E-06	0	0	1,17E-06	7,48E-07	-1,45E-03
Ö	ODP	kg CFC11 -eq	1,11E-07	3,70E-09	1,62E-09	0	0	6,82E-10	9,86E-10	-3,06E-03
Œ	AP	mol H+ -eq	7,63E-03	4,69E-05	7,09E-05	0	0	9,80E-05	2,50E-05	-3,46E-04
	EP-FreshWater	kg P -eq	4,97E-05	1,31E-07	1,08E-07	0	0	7,18E-08	3,84E-08	-3,73E-06
	EP-Marine	kg N -eq	1,52E-03	9,29E-06	2,98E-05	0	0	4,60E-05	4,42E-05	-1,13E-04
	EP-Terrestial	mol N -eq	1,68E-02	1,04E-04	3,18E-04	0	0	4,98E-04	9,85E-05	-1,22E-03
	POCP	kg NMVOC -eq	6,51E-03	3,98E-05	8,26E-05	0	0	1,20E-04	3,52E-05	-3,37E-04
	ADP-minerals&metals ¹	kg Sb -eq	7,11E-05	4,51E-07	1,69E-07	0	0	3,29E-08	2,55E-08	-4,17E-07
	ADP-fossil ¹	MJ	5,02E+01	2,47E-01	1,16E-01	0	0	5,45E-02	7,33E-02	-6,00E-01
<u>%</u>	WDP ¹	m ³	3,88E+02	2,39E-01	1,74E-01	0	0	1,70E-01	6,32E-01	-7,47E+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

Remarks to environmental impacts

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

[&]quot;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



Addition	al environme	ntal impact indicators								
In	dicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	PM	Disease incidence	8,22E-08	1,00E-09	8,89E-10	0	0	4,59E-10	4,88E-10	-2,10E-08
	IRP ²	kgBq U235 -eq	8,71E-02	1,08E-03	4,37E-04	0	0	1,04E-04	3,54E-04	-3,83E-03
	ETP-fw ¹	CTUe	3,16E+01	1,83E-01	1,37E-01	0	0	2,66E-01	9,18E-02	-3,26E+00
48.* *****	HTP-c ¹	CTUh	8,54E-10	0,00E+00	1,30E-11	0	0	1,60E-11	2,00E-12	-5,90E-11
& D	HTP-nc ¹	CTUh	2,17E-08	2,00E-10	5,98E-10	0	0	6,42E-10	7,00E-11	-3,13E-09
	SQP ¹	dimensionless	2,75E+01	1,73E-01	6,85E-02	0	0	7,47E-03	2,73E-01	-4,01E+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)

[&]quot;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										
	dicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Ö	PERE	MJ	3,01E+01	3,54E-03	2,29E-03	0	0	1,93E-03	3,47E-03	-3,71E+00
	PERM	МЈ	4,92E+00	0,00E+00	-4,92E+00	0	0	0,00E+00	0,00E+00	0,00E+00
ីក្ន	PERT	МЈ	3,50E+01	3,54E-03	-4,91E+00	0	0	1,93E-03	3,47E-03	-3,71E+00
	PENRE	МЈ	3,20E+01	2,47E-01	1,16E-01	0	0	5,45E-02	7,33E-02	-6,00E-01
eğ.	PENRM	МЈ	1,96E+01	0,00E+00	-8,92E-02	0	0	0,00E+00	0,00E+00	0,00E+00
IA	PENRT	МЈ	5,17E+01	2,47E-01	2,69E-02	0	0	5,45E-02	7,33E-02	-6,00E-01
	SM	kg	3,86E-02	0,00E+00	0,00E+00	0	0	0,00E+00	3,27E-05	0,00E+00
2	RSF	МЈ	7,49E-02	1,26E-04	6,84E-05	0	0	5,13E-05	7,31E-05	-6,49E-04
	NRSF	МЈ	5,91E-02	4,52E-04	6,80E-04	0	0	0,00E+00	1,17E-03	-2,20E-01
&	FW	m^3	2,08E-01	2,64E-05	7,83E-05	0	0	2,03E-04	8,97E-05	-4,46E-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 resources used as raw materials; PENRM = Use of non renewable primary energy resources; SM = Use of secondary materials; PENRM = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water

[&]quot;Reading example: 9,0 E-03 = 9,0*10-3 = 0,009" *INA Indicator Not Assessed



End of life - Was	ste									
Inc	dicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
ā	HWD	kg	4,72E-03	1,27E-05	0,00E+00	0	0	0,00E+00	7,74E-03	-2,82E-05
Ū	NHWD	kg	2,57E-01	1,20E-02	3,97E-01	0	0	0,00E+00	3,03E-01	-1,42E-02
3	RWD	kg	7,45E-05	1,68E-06	0,00E+00	0	0	0,00E+00	4,80E-07	-3,14E-06

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 - Outpu	ıt flow									
Indica	tor	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
@ 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	9,90E-02	0	0	0,00E+00	2,67E-05	0,00E+00
DF	MER	kg	5,40E-03	0,00E+00	2,97E-01	0	0	2,98E-01	6,53E-07	0,00E+00
50	EEE	MJ	5,46E-03	0,00E+00	2,07E-01	0	0	4,78E-01	4,23E-05	0,00E+00
₽	EET	MJ	8,26E-02	0,00E+00	3,14E+00	0	0	7,24E+00	6,41E-04	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											
Unit At the factory gate											
kg C 0,00E+00											
kg C 1,69E-01											
ļ											

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, Norway (kWh)	ecoinvent 3.6	24,33	g CO2-eg/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	A5	C1	C2	C3	C4	D	
GWPIOBC	kg CO₂ -eq	1,61E+00	1,63E-02	4,50E-01	0	0	7,72E-01	6,02E-04	-4,29E-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 1852, EN 1451, EN 1253-1, NPG/PS 102, NPG/PS 107 and EN 274.

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