epd-norge
Global program operatør

Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

PVC-U Fittings and parts GPA NO

The Norwegian EPD Foundation

Owner of the declaration:
GPA Flowsystem AS

Product:
PVC-U Fittings and parts GPA NO

Declared unit:
1 kg

This declaration is based on Product Category Rules:
CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 019:2022 Part B for Piping systems use in sewage and storm water systems (under gravity)

Program operator:
The Norwegian EPD Foundation

Declaration number:

NEPD-9124-8697

Registration number:

NEPD-9124-8697

Issue date: 13.02.2025

Valid to: 13.02.2030

EPD software:
LCAno EPD generator ID: 707830

General information

Product

PVC-U Fittings and parts GPA NO

Owner of the declaration:

GPA Flowsystem AS
Contact person: Aleksander Haugen Knutsen
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Program operator:

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

Manufacturer:

Comer S.p.A

Declaration number:

NEPD-9124-8697

Place of production:

Comer S.p.A
Via Tangoni, 30
16030 Casarza Ligure GE, Italy

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 019:2022 Part B for Piping systems use in sewage and storm water systems (under gravity)

Management system:

ISO 9001 and 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:

936 875 025

Declared unit:

1 kg PVC-U Fittings and parts GPA NO

Issue date:

13.02.2025

Declared unit (cradle to gate) with option:

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

Valid to:

13.02.2030

Year of study:

2023

Functional unit:

Comparability:

EPD of construction products may not be comparable if they not comply with EN 15804 and seen in a building 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. 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

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: Stian Blænes

Reviewer of company-specific input data and EPD: Tobias Antonsen

Verification of EPD tool:

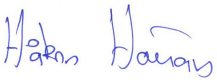
Independent third party verification of the EPD tool, background data and test-EPD in accordance with EPDNorway's procedures and guidelines for verification and approval of EPD tools.

Third party verifier:

Elisabet Amat, GREENIZE projects

(no signature required)

Approved:



Håkon Hauan, CEO EPD-Norge

Product

Product description:

This EPD covers unplastified polyvinyl chloride (PVC-U) piping parts and fittings for pipes from d16mm to d400mm for use in a wide range of applications including industrial applications, water treatment systems, chemical processing.

Product specification

This EPD covers the following product groups:
AD12U, BE30U, BF00U, BN61U, BR00U, CA70U, CA71U, CR30U, EL50U, EL51U, EL52U, EL57U, EY50U, EY51U, FF00U, FF01U, HN60U, HN61U, HN62U, NI61U, NR61U, NU80U, NU91U, PL71U, RB90U, RB91U, RB92U, RE21U, RE61U, RP20U, RS10U, RS11U, SD12U, SD17U, SF12U, SF17U, SO10U, SO11U, SO12U, SO15U, SO17U, ST10U, ST20U, ST23U, TE40U, TE41U, TE42U, TE47U, TR40U, TR42U, TY40U, UB80U, UB81U, UE80U, UE81U, UN72U, UN80U, UN81U, UN82U, US72U, US82U

All product numbers start with the product group as a prefix, before the relevant dimensions are included.

Materials	kg	%
Plastic - Polyvinyl chloride (PVC)	1,00	100,00
Total	1,00	100,00

Technical data:

EPD covers unplastified polyvinyl chloride (PVC-U) piping parts and fittings for pipes from d16mm to d400mm up to 25 bar pressure.
PVC-U material with density 1280kg/m3.

Market:

Norway

Reference service life, product

50

Reference service life, building

50

LCA: Calculation rules

Declared unit:

1 kg PVC-U Fittings and parts GPA NO

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:

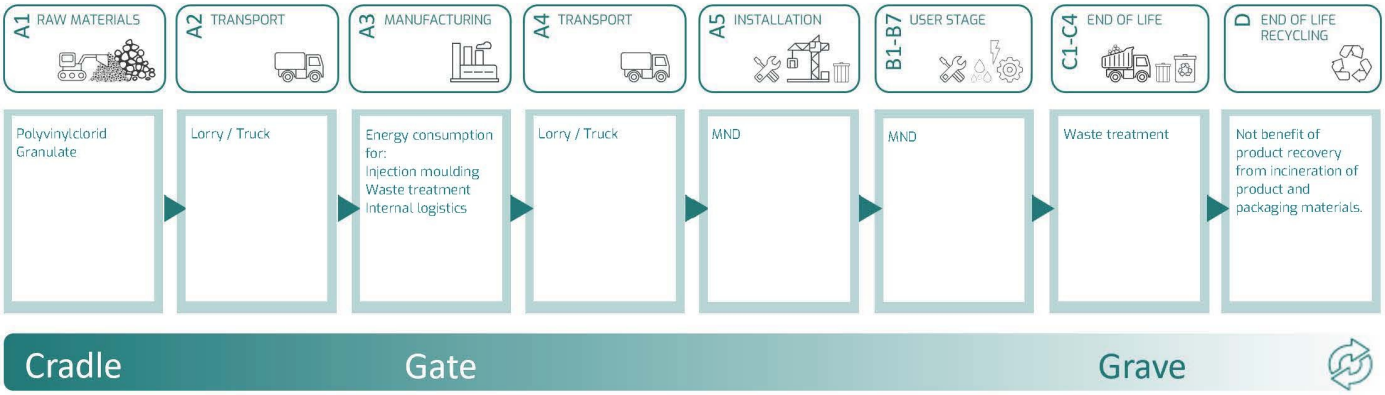
Specific data for the product composition are provided by the manufacturer. They represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on registered EPDs according to EN 15804, Ostfold Research databases, ecoinvent and other LCA databases. The data quality of the raw materials in A1 is presented in the table below.

Materials	Source	Data quality	Year
Plastic - Polyvinyl chloride (PVC)	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:



Additional technical information:

Packaging material is not included in this EPD, but can be provided for project specific EPD on request.

LCA: Scenarios and additional technical information

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

A4: The pipes are transported 2100km from Casarza Ligure, Italy to Langhus, Norway by truck, before delivery to customer which is set to 300km. The distance of 300km is given in newer PCRs as a default value for Norwegian domestic transport.
A5: Has not been included due to there being several ways of installation. Project specific EPDs available on request.
C1-C4: Has not been included as it is assumed that the pressure pipes are left as is after end of life.

Transport from production place to user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, over 32 tonnes, EURO 6 (km) - Europe	53,3 %	2100	0,023	l/tkm	48,30
Truck, over 32 tonnes, EURO 6 (km) - Europe	53,3 %	300	0,023	l/tkm	6,90

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	3,25E+00	2,09E-01	0	0	0	0	0
	GWP-fossil	kg CO_2 -eq	3,23E+00	2,09E-01	0	0	0	0	0
	GWP-biogenic	kg CO_2 -eq	1,49E-02	8,95E-05	0	0	0	0	0
	GWP-luluc	kg CO_2 -eq	2,09E-03	6,37E-05	0	0	0	0	0
	ODP	kg CFC11 -eq	1,23E-06	5,04E-08	0	0	0	0	0
	AP	mol H+ -eq	1,46E-02	6,73E-04	0	0	0	0	0
	EP-FreshWater	kg P -eq	1,08E-04	1,66E-06	0	0	0	0	0
	EP-Marine	kg N -eq	2,62E-03	1,47E-04	0	0	0	0	0
	EP-Terrestial	mol N -eq	2,95E-02	1,64E-03	0	0	0	0	0
	POCP	kg NMVOC -eq	9,13E-03	6,46E-04	0	0	0	0	0
	ADP-minerals&metals[1]	kg Sb-eq	6,30E-05	3,72E-06	0	0	0	0	0
	ADP-fossil[1]	MJ	6,06E+01	3,40E+00	0	0	0	0	0
	WDP[1]	m^3	1,06E+02	2,60E+00	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	1,16E-07	1,92E-08	0	0	0	0	0
	IRP[2]	kgBq U235 -eq	9,41E-02	1,48E-02	0	0	0	0	0
	ETP-fw[1]	CTUe	5,58E+01	2,48E+00	0	0	0	0	0
	HTP-c[1]	CTUh	1,68E-09	0,00E+00	0	0	0	0	0
	HTP-nc[1]	CTUh	4,21E-08	2,40E-09	0	0	0	0	0
	SQP[1]	dimensionless	9,25E+00	3,89E+00	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	4,66E+00	4,27E-02	0	0	0	0	0
	PERM	MJ	0,00E+00	0,00E+00	0	0	0	0	0
	PERT	MJ	4,66E+00	4,27E-02	0	0	0	0	0
	PENRE	MJ	3,91E+01	3,40E+00	0	0	0	0	0
	PENRM	MJ	2,15E+01	0,00E+00	0	0	0	0	0
	PENRT	MJ	6,06E+01	3,40E+00	0	0	0	0	0
	SM	kg	0,00E+00	0,00E+00	0	0	0	0	0
	RSF	MJ	3,20E-01	1,49E-03	0	0	0	0	0
	NRSF	MJ	1,40E-02	5,01E-03	0	0	0	0	0
	FW	m^3	7,27E-02	3,86E-04	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	1,30E-02	1,86E-04	0	0	0	0	0
	NHWD	kg	3,56E-01	2,95E-01	0	0	0	0	0
	RWD	kg	8,67E-05	2,32E-05	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*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	2,02E-02	0,00E+00	0	0	0	0	0
	MER	kg	5,42E-03	0,00E+00	0	0	0	0	0
	EEE	MJ	6,18E-03	0,00E+00	0	0	0	0	0
	EET	MJ	9,36E-02	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*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	Source	Amount	Unit
Electricity, Italy (kWh)	ecoinvent 3.6	426,14	g CO2-eq/kWh
Electricity, low voltage, photovoltaic, panel, mounted (kWh) - Italy	ecoinvent 3.6	83,25	g CO2-eq/kWh

Dangerous substances

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

Indoor environment

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	3,26E+00	2,09E-01	0	0	0	0	0

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 report number: 07.21.
Ruttenborg et al., (2023) EPD generator for NPCR019:2022 - Background information for EPD generator application and LCA data, LCA.no report number: 04.23.
NPCR Part A: Construction products and services. Ver. 2.0. March 2021, EPD-Norge.
NPCR 019:2022 Part B for Piping systems use in sewage and storm water systems (under gravity). Ver. 2.0 May 2022, EPD-Norge.

ISO 265-1 Pipe and fittings of plastics materials - Fittings for domestic and industrial waste pipe - Basic dimensions: Metric series - Part 1: Unplasticized poly(vinyl chloride) (PVC-U)
ISO 727-1 Fittings made from unplasticized poly(vinyl chloride) (PVC-U), chlorinated poly(vinyl chloride) (PVC-C) or acrylonitrile/butadiene/styrene (ABS) with plain sockets for pipe under pressure - Part 1: Metric series
ISO 727-2 Fittings made from unplasticized poly(vinyl chloride) (PVC-U), chlorinated poly(vinyl chloride) (PVC-C) or acrylonitrile/butadiene/styrene (ABS) with plain sockets for pipe under pressure - Part 2: Inch-based series
ISO 1452 Plastics piping systems for water supply and for buried and above-ground drainage and sewerage under pressure - Unplasticized poly(vinyl chloride) (PVC-U)
ISO 15493 - Plastics piping systems for industrial applications - Acrylonitrile-butadiene-styrene (ABS), unplasticized poly(vinyl chloride) (PVC-U) and chlorinated poly(vinyl chloride) (PVC-C)

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