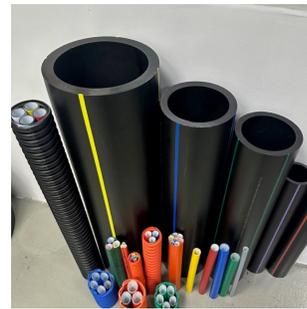


Environmental Product Declaration

In accordance with 14025 and EN15804 +A2

CPVC, UPVC, HDPE Pipes and fittings



Owner of the declaration:
New Products Industries Co. Ltd

Product name:
CPVC, UPVC, HDPE Pipes and fittings

Declared unit:
1 kg of CPVC, UPVC, HDPE pipes and fittings

Product category /PCR:
NPCR PART A: Construction products and services ISO 14025/14040/14044 and EN 15804

Program holder and publisher:
The Norwegian EPD foundation

Declaration number:
NEPD-4509-3772-EN

Registration number:
NEPD-4509-3772-EN

Issue date: 13.06.2023

Valid to: 13.06.2028

korr.200623

General information

Product:

CPVC, UPVC, HDPE Pipes and fittings CPVC, UPVC, HDPE Pipes and fittings

Program Operator:

The Norwegian EPD Foundation
Post Box 5250 Majorstuen, 0303 Oslo, Norway
Tlf: +47 23 08 80 00
e-mail: post@epd-norge.no

Declaration Number:

NEPD-4509-3772-EN

This declaration is based on Product Category Rules:

NPCR PART A: Construction products and services, NS-EN 15804:2012+A2:2019, ISO 14025:2006

Statements:

The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer, life cycle assessment data and evidences.

Declared unit:

1 kg of CPVC, UPVC, HDPE pipes and fittings,

Verification:

Independent verification of the declaration and data, according to ISO14025:2010

internal External Sign

Jane Anderson

Jane Anderson, ConstructionLCA Ltd
Independent verifier approved by EPD Norway

Owner of the declaration:

New Product Industries Co. Ltd
Contact person: Mohammad Hajrassi
Phone: +966126278080
e-mail: info@neproplast.com

Manufacturer:

New Product Industries Co. Ltd
P.O. Box 460 Jeddah 21411, Industrial City Phase 3, Saudi Arabia
Phone: +966126278080
e-mail: info@neproplast.com

Place of production:

P.O. Box 460 Jeddah 21411, Industrial City Phase 3, Saudi Arabia

Management system:

ISO 9001: 2015 Certification No. 0115617
ISO 45001 : 2018 Certification No. 0114532

Organisation no:

4030135494, 4030291027

Issue date:

13.06.2023

Valid to:

13.06.2028

Year of study:

2021

Comparability:

EPDs from other programmes than The Norwegian EPD Foundation may not be comparable.

The EPD has been worked out by:

Kripanshi Gupta, Intertek Health Science Inc.

Håkan Hauvåg

Approved _____
Manager of EPD Norway

Product

Product description:

The description of all the products studied is mentioned below:

Product	Description	Weight per meter	Outer Diameter	Inner Diameter	Maximum length of pipe	Dimension	Pressure Rating
CPVC Pipe	Suitable for cold and hot water applications. CPVC pipes are manufactured through extrusion process using dry-blend or ready to use materials.	0.76 kg	1 inch	24.3 mm.	6.0 meters	1/2" to 8" Sch. 80	630 psi at 23°C
UPVC Pipe	Produced according to national and different international standards in both metric and inch nominal sizes. UPVC pipes has a variety of applications from pressure, potable, irrigation, electrical conduit, etc. UPVC pipes are sometimes called as PVC pipes depending on the product standard to which they conform. UPVC pipes are manufactured through extrusion process.	2.676 kg	110 mm	99.4 mm.	6.0 meters	20mm. to 710 mm. in different SDR numbers	145 psi at 20°C
HDPE Pipe	Produced in different HDPE pipes for different application such as potable water, pressure, telecommunication, drainage, etc. HDPE Pipes are manufactured through extrusion process. The material used is a ready-to-use compound and passes through different stages of processes .	3.173 kg	110 mm.	90.0 mm.	12.0 meters	20mm. to 800 mm. in different SDR numbers	232 psi at 20°C

Product	Description	Weight per fitting	Type of fitting	Inner Diameter	Length mounted	Dimension	Pressure Rating
CPVC Fitting	CPVC fittings are used for hot and cold water applications.. CPVC fittings are produced through injection molding process and in different sizes and shapes .	0.074 kg	1.0 inch Coupling	33.65 mm.	63.0 mm.	1/2" to 8" Sch. 80	630 psi at 23°C
UPVC Fitting	UPVC fittings are used for potable water, pressure applications, drainage applications. They are produced in different colours and different shapes.	0.0664 kg	1 inch Coupling	33.65 mm.	63.0 mm.	½' to 8" Sch. 40 and Sch. 80	630 psi at 23°C
HDPE Fitting	HDPE fabricated fittings are produced from extruded HDPE pipes by cutting them into segments which are then joined into desired shapes (e.g. elbow, tee or branch) by a process called butt-fusion welding employing only heat and pressure in joining the segments together.	1.38 kg	110 mm. Elbow 45 °	90.0 mm.	241.6 mm.	20mm. to 800 mm. in different SDR numbers	232 psi at 20°C

Product specification:

The table below shows the materials included in the full product detailed above and summarized in the chart below. The UPVC and HDPE pipes and fittings are compliant with EN 476, whereas the compliance for CPVC pipe and fitting with EN 476 is applicable only for Drains and Sewers. The CPVC pipe and fittings are mainly for plumbing applications.

Weight of CPVC pipe per declared unit

Material	Weight (kg)	Material Composition in %
CPVC additives	0.003	0.30%
CPVC Resin (Pipes)	0.997	99.70%
Total	1.000	100.00%

Weight of UPVC pipe per declared unit

Material	Weight (kg)	Material Composition in %
Colorant	0.0001	0.01%
PVC Additives	0.0491	4.91%
PV resins	0.9251	92.51%
PVC stabilizer (pipe)	0.0263	2.63%
Processing Aid	0.0001	0.01%
Total	1.0000	100.00%

Weight of HDPE pipe per declared unit

Material	Weight (kg)	Material Composition in %
Colorant	0.0012	0.12%
Silicone	0.0016	0.16%
HDPE Dryblend	0.9970	99.70%
Rope	0.0074	0.74%
Trace wire	0.0002	0.02%
Total	1.0000	100.00%

Weight of CPVC fitting per declared unit

Material	Weight (kg)	Material Composition in %
CPVC Resin	0.990	69.08%
Brass Insert	0.010	0.70%

Material	Weight (kg)	Material Composition in %
Lip Seal Rubber	0.001	0.07%
Carton Box	0.432	30.15%
Total	1.433	100.00%

Weight of UPVC fitting per declared unit

Material	Weight (kg)	Material Composition in %
PV C fitting resin	0.908	85.15%
PVC stabilizer (INJ)	0.059	5.53%
Processing Aid	0.001	0.09%
PVC additives	0.0208	1.95%
Colorant (INJ)	0.001	0.09%
Brass Insert	0.0093	0.87%
Gasket	0.0001	0.01%
Lip Seal Rubber	0.0008	0.08%
Carton Box	0.0664	6.23%
Total	1.0664	100.00%

Weight of HDPE fitting per declared unit

Material	Weight (kg)	Material Composition in %
Colorant	0.0012	0.12%
Silicone	0.0016	0.16%
HDPE Dryblend	0.9898	98.98%
Rope	0.0073	0.73%
Trace wire	0.0002	0.02%
Total	1.0000	100.00%

Further information regarding the technical and functional characteristics of the product can be obtained from product literature (<https://neproplast.com/Product/>).

Technical data:

Lifetime on product calculated more than 100 years.*

Market:

Europe and Asia pacific

Reference service life, product:

As per DIN 8062, DIN 8074 and DIN 8079, lifetime of product calculated at 100 years.

*There can be considerable drop in allowable pressure for pipes over 50 years old.

LCA: Calculation rules

Declared unit:

The declared unit for this study is defined as one kilogram of pipe or one kilogram of fitting for each type.

This declared unit is consistent with the goal and scope of the study as the PCR says that the declared unit should be in kilogram that fulfils specified quality criteria given in regional standards during the life span of the construction work.

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 ecoinvent v3.8 (cut-off), and other LCA databases. The data quality assessment was done as per EN15804+A2 and the data quality assessment is presented in the LCA background report.

Allocation:

In this study, no allocation procedures for multi-product process were applicable as primary data was given by client specific to each process.. In terms of generic data, the main database used, ecoinvent v3 (cut-off), defaults to an economic allocation for most processes. However, in some cases a mass-based allocation is used, where there is a direct physical relationship. The allocation approach of specific ecoinvent modules is documented on their website and method reports (see www.ecoinvent.org).

In this study a “cut-off” method (also known as recycled content or 100:0 approach) was applied to all cases of end-of-life allocation, including in the case of generic data, where the ecoinvent database with a cut-off by classification end-of-life allocation method was used. In this approach, environmental burdens and benefits of recycled / reused materials are given to the product system consuming them, rather than the system providing them and are quantified based on recycling content of the material under investigation. This is a common approach in LCA for materials where there is a loss in inherent properties during recycling, the supply of recycled material exceeds demand and recycled content of the product is independent of whether it is recycled downstream. It is in compliance with the ISO standards on LCA and is prescribed in PCR NPCR PART A: Construction products and services. This EPD focuses on specific products and hence no averaging is done.

System boundary:

The system boundary of a product system determines the unit processes to be included in the LCA study and which data as inputs and/or outputs to/from the system can be omitted. In this LCA study the system boundary was defined as cradle to gate with modules C1–C4 and module D with additional module A4, which comprised CPVC, UPVC, HDPE pipe and fitting included in scope. Following assumptions are made:

- It is assumed that 100% of water incoming water is discharged to sewer (as no water is retained in the product)
- Packaging of pipes and HDPE fitting is not considered as they are sold loose
- Disassembly is assumed as manual labour
- Transport to the landfill site is taken as 100 km for end-of-life waste and waste processing is taken as nil as all the waste goes to landfill
- The originating facility is located in the vicinity of the Jeddah port (at less than 10km), so road transport to the port has been considered as negligible and excluded. Due to unavailability of data for road transport to the end customers in Europe from the destination port, only port to port transport has been considered.

Figure 1: Process flow diagram of CPVC and UPVC pipe

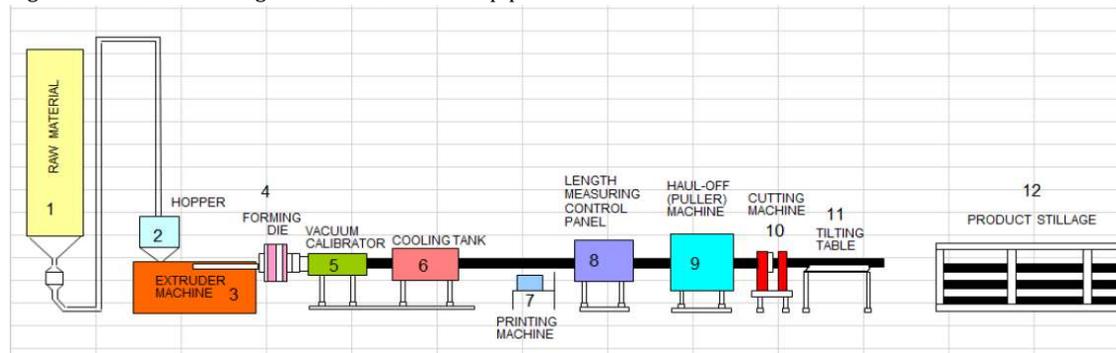
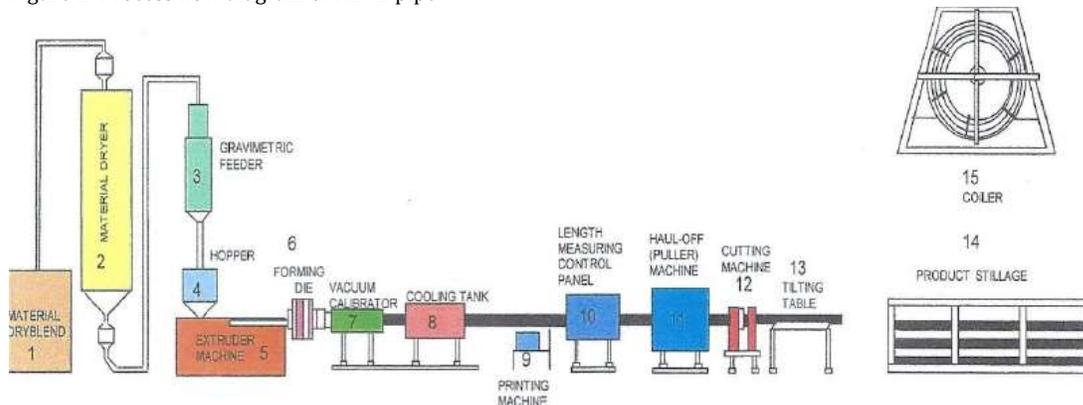


Figure 2: Process flow diagram of HDPE pipe



The LCA system boundary for this study includes cradle-to-gate with options life cycle stages. This boundary considers raw material extraction and processing, transport to the manufacturer, manufacturing, packaging, delivery, use and end of life processing.

The manufacturing, maintenance and decommissioning of capital equipment associated with primary data is excluded (such as factory capital equipment present at the Jeddah, Saudi Arabia production facility). Ancillary materials which are used for maintenance of manufacturing equipment are excluded. However, the background infrastructure for secondary data (Ecoinvent datasets) are included if it has already been accounted in the datasets used for this study. The products does not require energy or generate emissions during the use stage. The repair and maintenance during the life cycle is not included in the scope and cut-off approach is used to calculate this. For the end-of-life scenario, C1 to C4 is modelled as the products are used in buildings.

Cut-off criteria:

In the process of building an LCI it is typical to exclude items considered to have a negligible contribution to results. In order to do this in a consistent and robust manner there must be confidence that the exclusion is fair and reasonable. To this end, cut-off criteria were defined in this study, which allow items to be neglected if they meet the criteria. In accordance with NPCR PART A: Construction products, exclusions could be made if they were expected to be within the below criteria:

- Packaging of pipes and HDPE fitting is not considered as they are sold loose
- Production and disposal of infrastructure (machines, transport vehicles, roads, etc.) and their maintenance;
- Environmental impacts associated with support functions (e.g. R&D, marketing, finance, management etc.) are excluded as they are not directly linked with production process and it's understood that their impact on overall environmental impacts of the product is negligible. Hence they are not included in the system boundary. No known significant environmental flows are excluded using this criterion

LCA: Scenarios and additional technical information

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

Transport from production place to assembly/user (A4)

Distribution to Europe is done from Jeddah Islamic Seaport via container ship to the port of Antwerp and via ferry to Brussels

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance KM
Boat	100%	Container ship	8458
Boat	100%	Ferry	120

End of Life (C1, C3, C4)

	Unit	Value
Collected as mixed construction waste	Kg	1
To landfill	Kg	1

Transport to waste processing (C2)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance KM	Fuel/Energy consumption	value (l/t)
Truck	100	32 tons	100	Diesel	30l

Benefits and loads beyond the system boundaries (D)

	Unit	Value
Not applicable		

Results

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

Product stage			Assembly stage		Use stage								End of life stage				Benefits & loads beyond system boundary
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	

Core environmental impact indicators for CPVC Pipe

GWP-total: Global Warming Potential; **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**

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP-total	kg CO2 eq.	4.46E+00	9.29E-02	0	1.35E-02	0	9.57E-01	0
GWP-fossil	kg CO2 eq.	4.48E+00	9.28E-02	0	1.34E-02	0	5.98E-02	0
GWP-biogenic	kg CO2 eq.	-2.80E-02	-1.07E-05	0	3.63E-05	0	8.40E-01	0
GWP-LULUC	kg CO2 eq.	4.92E-03	6.68E-05	0	9.47E-05	0	2.38E-05	0
ODP	kg CFC11 eq.	1.36E-06	1.84E-08	0	2.84E-09	0	3.47E-09	0
AP	mol H ⁺ eq.	2.31E-02	3.02E-03	0	7.39E-05	0	1.77E-04	0
EP-freshwater	kg P eq.	1.29E-03	3.00E-06	0	1.11E-06	0	1.59E-05	0
EP-marine	kg N eq.	4.73E-03	7.44E-04	0	2.64E-05	0	1.79E-03	0
EP-terrestrial	mol N eq.	4.91E-02	8.27E-03	0	2.84E-04	0	4.84E-04	0
POCP	kg NMVOC eq.	1.49E-02	2.14E-03	0	8.21E-05	0	3.50E-04	0
ADP-M&M	kg Sb eq.	4.17E-05	1.25E-07	0	4.57E-08	0	7.00E-08	0
ADP-fossil	MJ	7.77E+01	1.18E+00	0	1.99E-01	0	3.17E-01	0
WDP	m ³	2.21E+00	2.02E-03	0	7.92E-04	0	1.19E-02	0

-freshwater: Eutrophication potential, fraction of nutrients reaching freshwater end compartment. **EP-marine:** Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **EP-terrestrial:** Eutrophication potential, Accumulated Exceedance; **POCP:** Formation potential of tropospheric ozone; **ADP-M&M:** Abiotic depletion potential for non-fossil resources (minerals and metals); **ADP-fossil:** Abiotic depletion potential for fossil resources; **WDP:** Water deprivation potential, deprivation weighted water consumption

Additional environmental impact indicators

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
PM	Disease incidence	1.82E-07	7.25E-01	0	1.46E-09	0	2.17E-09	0
IRP	kBq U235 eq.	4.03E-01	5.53E-11	0	9.52E-04	0	2.12E-03	0
ETP-fw	CTUe	7.58E+01	4.68E-10	0	1.79E-01	0	5.11E+00	0
HTP-c	CTUh	2.40E-09	1.59E-01	0	6.45E-12	0	3.31E-11	0
HTP-nc	CTUh	5.74E-08	7.25E-01	0	1.89E-10	0	1.53E-09	0
SQP	Dimensionless	1.72E+01	5.53E-11	0	1.82E-01	0	6.09E-01	0

PM: Particulate matter emissions; **IRP:** Ionising radiation, human health; **ETP-fw:** Ecotoxicity (freshwater); **ETP-c:** Human toxicity, cancer effects; **HTP-nc:** Human toxicity, non-cancer effects; **SQP:** Land use related impacts / soil quality

Classification of disclaimers to the declaration of core and additional environmental impact indicators

ILCD classification	Indicator	Disclaimer
ILCD type / level 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
	Potential incidence of disease due to PM emissions (PM)	None
	Acidification potential, Accumulated Exceedance (AP)	None
ILCD type / level 2	Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine)	None
	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	None
	Formation potential of tropospheric ozone (POCP)	None
ILCD type / level 3	Potential Human exposure efficiency relative to U235 (IRP)	1
	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	2
	Abiotic depletion potential for fossil resources (ADP-fossil)	2
	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	2
	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	2

ILCD classification	Indicator	Disclaimer
	Potential Comparative Toxic Unit for humans (HTP-c)	2
	Potential Comparative Toxic Unit for humans (HTP-nc)	2
	Potential Soil quality index (SQP)	2
<p>Disclaimer 1 – 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.</p>		
<p>Disclaimer 2 – 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</p>		

Resource use

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D	Total
RPEE	MJ	4.83E+00	7.94E-03	0	3.47E-03	0	1.53E-02	0	4.83E+00
RPEM	MJ	0	0	0	0	0	0	0	0
TPE	MJ	4.83E+00	7.94E-03	0	3.47E-03	0	1.53E-02	0	4.83E+00
NRPE	MJ	4.97E+01	1.26E+00	0	2.15E-01	0	3.59E-01	0	4.97E+01
NRPM	MJ	4.1E+01	0	0	0	0	0	0	4.1E+01
TRPE	MJ	9.07E+01	1.26E+00	0	2.15E-01	0	3.59E-01	0	9.07E+01
SM	kg	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0
W	m ³	4.74E-02	5.98E-05	0	2.47E-05	0	2.99E-04	0	4.74E-02

RPEE Renewable primary energy resources used as energy carrier; RPEM Renewable primary energy resources used as raw materials; TPE Total use of renewable primary energy resources; NRPE Non renewable primary energy resources used as energy carrier; NRPM Non renewable primary energy resources used as materials;

TRPE 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; W Use of net fresh water

End of life - Waste

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D	Total
HW	KG	9.10E-05	1.10E-06	0	5.26E-07	0	1.13E-06	0	9.10E-05
NHW	KG	4.78E-01	2.89E-03	0	1.40E-02	0	1.00E+00	0	4.78E-01
RW	KG	1.70E-04	8.25E-06	0	1.33E-06	0	1.75E-06	0	1.70E-04

HW Hazardous waste disposed; NHW Non hazardous waste disposed; RW Radioactive waste disposed

End of life – output flow

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D	Total
CR	kg	0	0	0	0	0	0	0	0
MR	kg	0	0	0	0	0	0	0	0
MER	kg	0	0	0	0	0	0	0	0
EEE	MJ	0	0	0	0	0	0	0	0
ETE	MJ	0	0	0	0	0	0	0	0

CR Components for reuse; MR Materials for recycling; MER Materials for energy recovery; EEE Exported electric energy; ETE Exported thermal energy

Reading example: 9,0 E-03 = 9,0*10⁻³ = 0,009

Core environmental impact indicators for UPVC Pipe

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP-total	kg CO2 eq.	4.31E+00	9.29E-02	0	1.35E-02	0	9.57E-01	0
GWP-fossil	kg CO2 eq.	4.33E+00	9.28E-02	0	1.34E-02	0	5.98E-02	0
GWP-biogenic	kg CO2 eq.	-2.40E-02	-1.07E-05	0	3.63E-05	0	8.40E-01	0

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP-LULUC	kg CO2 eq.	4.73E-03	6.68E-05	0	9.47E-05	0	2.38E-05	0
ODP	kg CFC11 eq.	1.28E-06	1.84E-08	0	2.84E-09	0	3.47E-09	0
AP	mol H ⁺ eq.	2.30E-02	3.02E-03	0	7.39E-05	0	1.77E-04	0
EP-freshwater	kg P eq.	1.37E-03	3.00E-06	0	1.11E-06	0	1.59E-05	0
EP-marine	kg N eq.	4.25E-03	7.44E-04	0	2.64E-05	0	1.79E-03	0
EP-terrestrial	mol N eq.	4.40E-02	8.27E-03	0	2.84E-04	0	4.84E-04	0
POCP	kg NMVOC eq.	1.36E-02	2.14E-03	0	8.21E-05	0	3.50E-04	0
ADP-M&M	kg Sb eq.	1.05E-04	1.25E-07	0	4.57E-08	0	7.00E-08	0
ADP-fossil	MJ	7.37E+01	1.18E+00	0	1.99E-01	0	3.17E-01	0
WDP	m ³	2.19E+00	2.02E-03	0	7.92E-04	0	1.19E-02	0

GWP-total: Global Warming Potential; **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 freshwater end compartment; **EP-terrestrial:** Eutrophication potential, Accumulated Exceedance; **POCP:** Formation potential of tropospheric ozone; **ADP-M&M:** Abiotic depletion potential for non-fossil resources (minerals and metals); **ADP-fossil:** Abiotic depletion potential for fossil resources; **WDP:** Water deprivation potential, deprivation weighted water consumption

Additional environmental impact indicators

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
PM	Disease incidence	1.97E-07	2.88E-09	0	1.46E-09	0	2.17E-09	0
IRP	kBq U235 eq.	3.96E-01	5.36E-03	0	9.52E-04	0	2.12E-03	0
ETP-fw	CTUe	9.11E+01	7.25E-01	0	1.79E-01	0	5.11E+00	0
HTP-c	CTUh	3.12E-09	5.53E-11	0	6.45E-12	0	3.31E-11	0

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
HTP-nc	CTUh	9.49E-08	4.68E-10	0	1.89E-10	0	1.53E-09	0
SQP	Dimensionless	1.97E+01	1.59E-01	0	1.82E-01	0	6.09E-01	0

PM: Particulate matter emissions; **IRP:** Ionising radiation, human health; **ETP-fw:** Ecotoxicity (freshwater); **ETP-c:** Human toxicity, cancer effects; **HTP-nc:** Human toxicity, non-cancer effects; **SQP:** Land use related impacts / soil quality

Resource use

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D
RPEE	MJ	4.73E+00	7.94E-03	0	3.47E-03	0	1.53E-02	0
RPEM	MJ	0	0	0	0	0	0	0
TPE	MJ	4.73E+00	7.94E-03	0	3.47E-03	0	1.53E-02	0
NRPE	MJ	4.67E+01	1.26E+00	0	2.15E-01	0	3.59E-01	0
NRPM	MJ	3.95E+01	0	0	0	0	0	0
TRPE	MJ	8.62E+01	1.26E+00	0	2.15E-01	0	3.59E-01	0
SM	kg	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0
W	m ³	4.73E-02	5.98E-05	0	2.47E-05	0	2.99E-04	0

RPEE Renewable primary energy resources used as energy carrier; *RPEM* Renewable primary energy resources used as raw materials; *TPE* Total use of renewable primary energy resources; *NRPE* Non renewable primary energy resources used as energy carrier; *NRPM* Non renewable primary energy resources used as materials; *TRPE* 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; *W* Use of net fresh water

End of life - Waste

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D	Total
HW	KG	1.74E-04	1.10E-06	0	5.26E-07	0	1.13E-06	0	1.74E-04
NHW	KG	6.59E-01	2.89E-03	0	1.40E-02	0	1.00E+00	0	6.59E-01
RW	KG	1.72E-04	8.25E-06	0	1.33E-06	0	1.75E-06	0	1.72E-04

HW Hazardous waste disposed; NHW Non hazardous waste disposed; RW Radioactive waste disposed

End of life – output flow

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D	Total
CR	kg	0	0	0	0	0	0	0	0
MR	kg	0	0	0	0	0	0	0	0
MER	kg	0	0	0	0	0	0	0	0
EEE	MJ	0	0	0	0	0	0	0	0
ETE	MJ	0	0	0	0	0	0	0	0

CR Components for reuse; MR Materials for recycling; MER Materials for energy recovery; EEE Exported electric energy; ETE Exported thermal energy

Core environmental impact indicators for HDPE Pipe

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP-total	kg CO2 eq.	4.50E+00	9.29E-02	0	1.35E-02	0	9.57E-01	0
GWP-fossil	kg CO2 eq.	4.53E+00	9.28E-02	0	1.34E-02	0	5.98E-02	0
GWP-biogenic	kg CO2 eq.	-3.24E-02	-1.07E-05	0	3.63E-05	0	8.40E-01	0
GWP-LULUC	kg CO2 eq.	3.22E-03	6.68E-05	0	9.47E-05	0	2.38E-05	0
ODP	kg CFC11 eq.	2.95E-07	1.84E-08	0	2.84E-09	0	3.47E-09	0
AP	mol H ⁺ eq.	1.99E-02	3.02E-03	0	7.39E-05	0	1.77E-04	0

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
EP-freshwater	kg P eq.	9.86E-04	3.00E-06	0	1.11E-06	0	1.59E-05	0
EP-marine	kg N eq.	3.85E-03	7.44E-04	0	2.64E-05	0	1.79E-03	0
EP-terrestrial	mol N eq.	4.05E-02	8.27E-03	0	2.84E-04	0	4.84E-04	0
POCP	kg NMVOC eq.	1.45E-02	2.14E-03	0	8.21E-05	0	3.50E-04	0
ADP-M&M	kg Sb eq.	1.94E-05	1.25E-07	0	4.57E-08	0	7.00E-08	0
ADP-fossil	MJ	1.01E+02	1.18E+00	0	1.99E-01	0	3.17E-01	0
WDP	m ³	1.58E+00	2.02E-03	0	7.92E-04	0	1.19E-02	0

GWP-total: Global Warming Potential; **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 freshwater end compartment; **EP-terrestrial:** Eutrophication potential, Accumulated Exceedance; **POCP:** Formation potential of tropospheric ozone; **ADP-M&M:** Abiotic depletion potential for non-fossil resources (minerals and metals); **ADP-fossil:** Abiotic depletion potential for fossil resources; **WDP:** Water deprivation potential, deprivation weighted water consumption

Additional environmental impact indicators

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
PM	Disease incidence	1.84E-07	2.88E-09	0	1.46E-09	0	2.17E-09	0
IRP	kBq U235 eq.	3.14E-01	5.36E-03	0	9.52E-04	0	2.12E-03	0
ETP-fw	CTUe	5.36E+01	7.25E-01	0	1.79E-01	0	5.11E+00	0
HTP-c	CTUh	1.48E-09	5.53E-11	0	6.45E-12	0	3.31E-11	0
HTP-nc	CTUh	3.42E-08	4.68E-10	0	1.89E-10	0	1.53E-09	0
SQP	Dimensionless	1.56E+01	1.59E-01	0	1.82E-01	0	6.09E-01	0

PM: Particulate matter emissions; **IRP:** Ionising radiation, human health; **ETP-fw:** Ecotoxicity (freshwater); **ETP-c:** Human toxicity, cancer effects; **HTP-nc:** Human toxicity, non-cancer effects; **SQP:** Land use related impacts / soil quality

Resource use

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D
RPEE	MJ	3.83E+00	7.94E-03	0	3.47E-03	0	1.53E-02	0
RPEM	MJ	0	0	0	0	0	0	0
TPE	MJ	3.83E+00	7.94E-03	0	3.47E-03	0	1.53E-02	0
NRPE	MJ	8.09E+01	1.26E+00	0	2.15E-01	0	3.59E-01	0
NRPM	MJ	3.41E+01	0	0	0	0	0	0
TRPE	MJ	1.15E+02	1.26E+00	0	2.15E-01	0	3.59E-01	0
SM	kg	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0
W	m ³	3.82E-02	5.98E-05	0	2.47E-05	0	2.99E-04	0

RPEE Renewable primary energy resources used as energy carrier; RPEM Renewable primary energy resources used as raw materials; TPE Total use of renewable primary energy resources; NRPE Non renewable primary energy resources used as energy carrier; NRPM Non renewable primary energy resources used as materials; TRPE 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; W Use of net fresh water

End of life - Waste

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D
HW	KG	6.95E-05	1.10E-06	0	5.26E-07	0	1.13E-06	0
NHW	KG	4.53E-01	2.89E-03	0	1.40E-02	0	1.00E+00	0
RW	KG	1.43E-04	8.25E-06	0	1.33E-06	0	1.75E-06	0

HW Hazardous waste disposed; NHW Non hazardous waste disposed; RW Radioactive waste disposed

End of life – output flow

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D	Total
CR	kg	0	0	0	0	0	0	0	0
MR	kg	0	0	0	0	0	0	0	0
MER	kg	0	0	0	0	0	0	0	0
EEE	MJ	0	0	0	0	0	0	0	0
ETE	MJ	0	0	0	0	0	0	0	0

CR Components for reuse; MR Materials for recycling; MER Materials for energy recovery; EEE Exported electric energy; ETE Exported thermal energy

Core environmental impact indicators for CVPC fitting

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP-total	kg CO2 eq.	6.99E+00	9.29E-02	0	1.35E-02	0	9.57E-01	0
GWP-fossil	kg CO2 eq.	7.09E+00	9.28E-02	0	1.34E-02	0	5.98E-02	0
GWP-biogenic	kg CO2 eq.	-1.33E-01	-1.07E-05	0	3.63E-05	0	8.40E-01	0
GWP-LULUC	kg CO2 eq.	2.76E-02	6.68E-05	0	9.47E-05	0	2.38E-05	0
ODP	kg CFC11 eq.	1.71E-06	1.84E-08	0	2.84E-09	0	3.47E-09	0
AP	mol H ⁺ eq.	5.87E-02	3.02E-03	0	7.39E-05	0	1.77E-04	0
EP-freshwater	kg P eq.	2.19E-03	3.00E-06	0	1.11E-06	0	1.59E-05	0
EP-marine	kg N eq.	1.26E-02	7.44E-04	0	2.64E-05	0	1.79E-03	0
EP-terrestrial	mol N eq.	1.33E-01	8.27E-03	0	2.84E-04	0	4.84E-04	0
POCP	kg NMVOC eq.	3.76E-02	2.14E-03	0	8.21E-05	0	3.50E-04	0
ADP-M&M	kg Sb eq.	8.03E-05	1.25E-07	0	4.57E-08	0	7.00E-08	0
ADP-fossil	MJ	1.12E+02	1.18E+00	0	1.99E-01	0	3.17E-01	0
WDP	m ³	2.52E+00	2.02E-03	0	7.92E-04	0	1.19E-02	0

GWP-total: Global Warming Potential; **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 freshwater end compartment; **EP-terrestrial:** Eutrophication potential, Accumulated Exceedance; **POCP:** Formation potential of tropospheric ozone; **ADP-M&M:** Abiotic depletion potential for non-fossil resources (minerals and metals); **ADP-fossil:** Abiotic depletion potential for fossil resources; **WDP:** Water deprivation potential, deprivation weighted water consumption

Additional environmental impact indicators

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
PM	Disease incidence	2.91E-07	2.88E-09	0	1.46E-09	0	2.17E-09	0
IRP	kBq U235 eq.	5.27E-01	5.36E-03	0	9.52E-04	0	2.12E-03	0
ETP-fw	CTUe	1.50E+02	7.25E-01	0	1.79E-01	0	5.11E+00	0
HTP-c	CTUh	3.78E-09	5.53E-11	0	6.45E-12	0	3.31E-11	0
HTP-nc	CTUh	1.01E-07	4.68E-10	0	1.89E-10	0	1.53E-09	0
SQP	Dimensionless	4.25E+01	1.59E-01	0	1.82E-01	0	6.09E-01	0

PM: Particulate matter emissions; **IRP:** Ionising radiation, human health; **ETP-fw:** Ecotoxicity (freshwater); **ETP-c:** Human toxicity, cancer effects; **HTP-nc:** Human toxicity, non-cancer effects; **SQP:** Land use related impacts / soil quality

Resource use

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D
RPEE	MJ	3.08E+00	7.94E-03	0	3.47E-03	0	1.53E-02	0
RPEM	MJ	6.92E+00	0	0	0	0	0	0
TPE	MJ	1.00E+01	7.94E-03	0	3.47E-03	0	1.53E-02	0
NRPE	MJ	8.80E+01	1.26E+00	0	2.15E-01	0	3.59E-01	0
NRPM	MJ	4.10E+01	0	0	0	0	0	0

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D
TRPE	MJ	1.29E+02	1.26E+00	0	2.15E-01	0	3.59E-01	0
SM	kg	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0
W	m ³	5.64E-02	5.98E-05	0	2.47E-05	0	2.99E-04	0

RPEE Renewable primary energy resources used as energy carrier; RPEM Renewable primary energy resources used as raw materials; TPE Total use of renewable primary energy resources; NRPE Non renewable primary energy resources used as energy carrier; NRPM Non renewable primary energy resources used as materials; TRPE 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; W Use of net fresh water

End of life - Waste

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D
HW	KG	5.92E-04	1.10E-06	0	5.26E-07	0	1.13E-06	0
NHW	KG	6.26E-01	2.89E-03	0	1.40E-02	0	1.00E+00	0
RW	KG	2.89E-04	8.25E-06	0	1.33E-06	0	1.75E-06	0

HW Hazardous waste disposed; NHW Non hazardous waste disposed; RW Radioactive waste disposed

End of life – output flow

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D	Total
CR	kg	0	0	0	0	0	0	0	0
MR	kg	0	0	0	0	0	0	0	0
MER	kg	0	0	0	0	0	0	0	0
EEE	MJ	0	0	0	0	0	0	0	0
ETE	MJ	0	0	0	0	0	0	0	0

CR Components for reuse; MR Materials for recycling; MER Materials for energy recovery; EEE Exported electric energy; ETE Exported thermal energy

Core environmental impact indicators for UVPC fitting

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP-total	kg CO2 eq.	6.93E+00	9.29E-02	0	1.35E-02	0	9.57E-01	0
GWP-fossil	kg CO2 eq.	6.95E+00	9.28E-02	0	1.34E-02	0	5.98E-02	0
GWP-biogenic	kg CO2 eq.	-3.77E-02	-1.07E-05	0	3.63E-05	0	8.40E-01	0
GWP-LULUC	kg CO2 eq.	8.89E-03	6.68E-05	0	9.47E-05	0	2.38E-05	0
ODP	kg CFC11 eq.	1.74E-06	1.84E-08	0	2.84E-09	0	3.47E-09	0
AP	mol H ⁺ eq.	4.22E-02	3.02E-03	0	7.39E-05	0	1.77E-04	0
EP-freshwater	kg P eq.	2.17E-03	3.00E-06	0	1.11E-06	0	1.59E-05	0
EP-marine	kg N eq.	8.39E-03	7.44E-04	0	2.64E-05	0	1.79E-03	0
EP-terrestrial	mol N eq.	8.87E-02	8.27E-03	0	2.84E-04	0	4.84E-04	0
POCP	kg NMVOC eq.	2.67E-02	2.14E-03	0	8.21E-05	0	3.50E-04	0
ADP-M&M	kg Sb eq.	2.28E-04	1.25E-07	0	4.57E-08	0	7.00E-08	0
ADP-fossil	MJ	1.10E+02	1.18E+00	0	1.99E-01	0	3.17E-01	0
WDP	m ³	2.57E+00	2.02E-03	0	7.92E-04	0	1.19E-02	0

GWP-total: Global Warming Potential; **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 freshwater end compartment; **EP-terrestrial:** Eutrophication potential, Accumulated Exceedance; **POCP:** Formation potential of tropospheric ozone; **ADP-M&M:** Abiotic depletion potential for non-fossil resources (minerals and metals); **ADP-fossil:** Abiotic depletion potential for fossil resources; **WDP:** Water deprivation potential, deprivation weighted water consumption

Additional environmental impact indicators

Indicator	Unit	A1-A3	A4	C1	C2	C3	C1-C4	D
PM	Disease incidence	4.13E-07	2.88E-09	0	1.46E-09	0	2.17E-09	0
IRP	kBq U235 eq.	5.55E-01	5.36E-03	0	9.52E-04	0	2.12E-03	0
ETP-fw	CTUe	1.59E+02	7.25E-01	0	1.79E-01	0	5.11E+00	0
HTP-c	CTUh	5.31E-09	5.53E-11	0	6.45E-12	0	3.31E-11	0
HTP-nc	CTUh	1.93E-07	4.68E-10	0	1.89E-10	0	1.53E-09	0
SQP	Dimensionless	4.48E+01	1.59E-01	0	1.82E-01	0	6.09E-01	0

PM: Particulate matter emissions; **IRP:** Ionising radiation, human health; **ETP-fw:** Ecotoxicity (freshwater); **ETP-c:** Human toxicity, cancer effects; **HTP-nc:** Human toxicity, non-cancer effects; **SQP:** Land use related impacts / soil quality

Resource use

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D
RPEE	MJ	1.06E+01	7.94E-03	0	3.47E-03	0	1.53E-02	0
RPEM	MJ	5.10E+00	0	0	0	0	0	0
TPE	MJ	6.16E+00	7.94E-03	0	3.47E-03	0	1.53E-02	0
NRPE	MJ	8.76E+01	1.26E+00	0	2.15E-01	0	3.59E-01	0
NRPM	MJ	4.04E+01	0	0	0.00E+00	0	0.00E+00	0
TRPE	MJ	1.28E+02	1.26E+00	0	2.15E-01	0	3.59E-01	0
SM	kg	0	0	0	0.00E+00	0	0.00E+00	0
RSF	MJ	0	0	0	0.00E+00	0	0.00E+00	0
NRSF	MJ	0	0	0	0.00E+00	0	0.00E+00	0
W	m ³	5.78E-02	5.98E-05	0	2.47E-05	0	2.99E-04	0

RPEE Renewable primary energy resources used as energy carrier; **RPEM** Renewable primary energy resources used as raw materials; **TPE** Total use of renewable primary energy resources; **NRPE** Non renewable primary energy resources used as energy carrier; **NRPM** Non renewable primary energy resources used as materials; **TRPE** 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; **W** Use of net fresh water

End of life - Waste

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D
HW	KG	4.00E-04	1.10E-06	0	5.26E-07	0	1.13E-06	0
NHW	KG	2.10E+00	2.89E-03	0	1.40E-02	0	1.00E+00	0
RW	KG	3.57E-04	8.25E-06	0	1.33E-06	0	1.75E-06	0

HW Hazardous waste disposed; NHW Non hazardous waste disposed; RW Radioactive waste disposed

End of life – output flow

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D	Total
CR	kg	0	0	0	0	0	0	0	0
MR	kg	0	0	0	0	0	0	0	0
MER	kg	0	0	0	0	0	0	0	0
EEE	MJ	0	0	0	0	0	0	0	0
ETE	MJ	0	0	0	0	0	0	0	0

CR Components for reuse; MR Materials for recycling; MER Materials for energy recovery; EEE Exported electric energy; ETE Exported thermal energy

Core environmental impact indicators for HDPE fitting

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP-total	kg CO2 eq.	4.47E+00	9.29E-02	0	1.35E-02	0	9.57E-01	0
GWP-fossil	kg CO2 eq.	4.50E+00	9.28E-02	0	1.34E-02	0	5.98E-02	0
GWP-biogenic	kg CO2 eq.	-3.21E-02	-1.07E-05	0	3.63E-05	0	8.40E-01	0
GWP-LULUC	kg CO2 eq.	3.19E-03	6.68E-05	0	9.47E-05	0	2.38E-05	0
ODP	kg CFC11 eq.	2.92E-07	1.84E-08	0	2.84E-09	0	3.47E-09	0
AP	mol H ⁺ eq.	1.97E-02	3.02E-03	0	7.39E-05	0	1.77E-04	0
EP-freshwater	kg P eq.	9.80E-04	3.00E-06	0	1.11E-06	0	1.59E-05	0

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
EP-marine	kg N eq.	3.83E-03	7.44E-04	0	2.64E-05	0	1.79E-03	0
EP-terrestrial	mol N eq.	4.02E-02	8.27E-03	0	2.84E-04	0	4.84E-04	0
POCP	kg NMVOC eq.	1.44E-02	2.14E-03	0	8.21E-05	0	3.50E-04	0
ADP-M&M	kg Sb eq.	1.92E-05	1.25E-07	0	4.57E-08	0	7.00E-08	0
ADP-fossil	MJ	1.00E+02	1.18E+00	0	1.99E-01	0	3.17E-01	0
WDP	m ³	1.55E+00	2.02E-03	0	7.92E-04	0	1.19E-02	0

GWP-total: Global Warming Potential; **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 freshwater end compartment; **EP-terrestrial:** Eutrophication potential, Accumulated Exceedance; **POCP:** Formation potential of tropospheric ozone; **ADP-M&M:** Abiotic depletion potential for non-fossil resources (minerals and metals); **ADP-fossil:** Abiotic depletion potential for fossil resources; **WDP:** Water deprivation potential, deprivation weighted water consumption

Additional environmental impact indicators

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
PM	Disease incidence	1.78E-07	2.88E-09	0	1.46E-09	0	2.17E-09	0
IRP	kBq U235 eq.	3.08E-01	5.36E-03	0	9.52E-04	0	2.12E-03	0
ETP-fw	CTUe	5.24E+01	7.25E-01	0	1.79E-01	0	5.11E+00	0
HTP-c	CTUh	1.44E-09	5.53E-11	0	6.45E-12	0	3.31E-11	0
HTP-nc	CTUh	3.35E-08	4.68E-10	0	1.89E-10	0	1.53E-09	0
SQP	Dimensionless	1.53E+01	1.59E-01	0	1.82E-01	0	6.09E-01	0

PM: Particulate matter emissions; **IRP:** Ionising radiation, human health; **ETP-fw:** Ecotoxicity (freshwater); **ETP-c:** Human toxicity, cancer effects; **HTP-nc:** Human toxicity, non-cancer effects; **SQP:** Land use related impacts / soil quality

Resource use

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D
RPEE	MJ	3.81E+00	7.94E-03	0	3.47E-03	0	1.53E-02	0
RPEM	MJ	0	0	0	0.00E+00	0	0.00E+00	0
TPE	MJ	3.81E+00	7.94E-03	0	3.47E-03	0	1.53E-02	0
NRPE	MJ	7.99E+01	1.26E+00	0	2.15E-01	0	3.59E-01	0
NRPM	MJ	3.41E+01	0	0	0	0	0	0
TRPE	MJ	1.14E+02	1.26E+00	0	2.15E-01	0	3.59E-01	0
SM	kg	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0
W	m ³	3.75E-02	5.98E-05	0	2.47E-05	0	2.99E-04	0

RPEE Renewable primary energy resources used as energy carrier; RPEM Renewable primary energy resources used as raw materials; TPE Total use of renewable primary energy resources; NRPE Non renewable primary energy resources used as energy carrier; NRPM Non renewable primary energy resources used as materials; TRPE 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; W Use of net fresh water

End of life - Waste

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D
HW	KG	6.91E-05	1.10E-06	0	5.26E-07	0	1.13E-06	0
NHW	KG	4.50E-01	2.89E-03	0	1.40E-02	0	1.00E+00	0
RW	KG	1.42E-04	8.25E-06	0	1.33E-06	0	1.75E-06	0

HW Hazardous waste disposed; NHW Non hazardous waste disposed; RW Radioactive waste disposed

End of life – output flow

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D	Total
CR	kg	0	0	0	0	0	0	0	0

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D	Total
MR	kg	0	0	0	0	0	0	0	0
MER	kg	0	0	0	0	0	0	0	0
EEE	MJ	0	0	0	0	0	0	0	0
ETE	MJ	0	0	0	0	0	0	0	0

CR Components for reuse; MR Materials for recycling; MER Materials for energy recovery; EEE Exported electric energy; ETE Exported thermal energy

Information describing the biogenic carbon content at the factory gate

Biogenic carbon content	Unit	CPVC pipe	UPVC pipe	HDPE pipe	CPVC fitting	UPVC fitting	HDPE fitting	CPVC pipe
Biogenic carbon content in product	kg C	0	0	0	0	0	0	0
Biogenic carbon content in the accompanying packaging	kg C	0	0	0	0.190	0.030	0	0

Additional Norwegian requirements

Greenhouse gas emission 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).

National electricity grid	Unit	Value
Electricity-mix, Saudi Arabia (kWh)	kg CO2 -eq/kWh	1.01E+00

Additional environmental impact indicators required in NPCR Part A for construction products

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.

Impact category GWP considering instantaneous oxidation GWP-IOBC *(CO2 eq.)	A1-A3	A4	C1	C2	C3	C4	D
CPVC Pipe	4.46E+00	9.29E-02	0	1.35E-02	0	9.57E-01	0
UPVC Pipe	4.31E+00	9.29E-02	0	1.35E-02	0	9.57E-01	0
HDPE Pipe	4.50E+00	9.29E-02	0	1.35E-02	0	9.57E-01	0
CPVC Fitting	6.99E+00	9.29E-02	0	1.35E-02	0	9.57E-01	0
UPVC Fitting	6.93E+00	9.29E-02	0	1.35E-02	0	9.57E-01	0
HDPE Fitting	4.47E+00	9.29E-02	0	1.35E-02	0	9.57E-01	0

GWP-IOBC Global warming potential calculated according to the principle of instantaneous oxidation.

Hazardous substances

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

Indoor environment

The product meets the requirements for low emissions.

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