Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

Steel pipes – 3LPE – Cement Lining (Water)

See Product information for included products

from

CCI Leidingsystemen B.V.

Programme:	The International EPD System, www.environdec.com
Programme operator:	EPD International AB
Type of EPD:	EPD of multiple products based on a worst-case product
EPD registration number:	EPD-IES-0032840:001
Version date:	2026-07-08
Validity date:	2031-07-08
	An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com



GENERAL INFORMATION

Programme Information	
Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	support@environdec.com

Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): PCR 2019:14 Construction products, v 2.0.1, UN CPC 412
PCR review was conducted by: ***Rob Rouwette (chair), Noa Meron (co-chair)*** ***The Technical Committee of the International EPD System. A full list of members is available on www.environdec.com. The review panel may be contacted via support@environdec.com.***

Third-party Verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ **Individual EPD verification without a pre-verified LCA/EPD tool** Third-party verifier: *Axel Cullberg, CHM Analytics AB* Approved by: The International EPD System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit version number) or be based on fully aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison.
For further information about comparability, see EN 15804 and ISO 14025.

INFORMATION ABOUT EPD OWNER

Owner of the EPD: CCI Leidingsystemen B.V.
Address: Parelhoenweg 3
4791 PA Klundert
The Netherlands
Contact: Martijn Martens
Address and contact information of the LCA practitioner commissioned by the EPD owner: Albin Claesson, WSP Sverige AB, Fabrikstorget 1, Göteborg.

Description of the organisation:
CCI is an independent pipe coater in Western Europe, also providing welded and coated spool pieces and fittings.

CCI Leidingsystemen specializes in designing, producing and delivery of high-quality steel and GRP (Glassfiber Reinforced Polyester) piping systems, applicable in the potable and wastewater infrastructure as well for industrial purposes. CCI's family business has been in the industrial area at Moerdijk, Holland, ever since the late 1970's. Over these last decades CCI have grown to become your partner for a total solution in piping systems.

Piping systems form the basic infrastructure of this modern society. CCI's pipes allow transportation and distribution of potable and wastewater, gas, oil, etc., over long distances. Thanks to CCI's vast experience and expertise, CCI is able to provide its customers with professional advice, from the first design stage onwards.

CCI introduced internal cement lining for drinking water pipelines in Western Europe. CCI is using optimized cement mortar for drink-water pipes, developed over decades together with the National Water authorities in Europe. All measuring and inspection results are monitored by third party inspectors.

All buried pipes are coated at CCI's plants, and the modern equipment can provide 3LPE and/or 3LPP coating to relevant international specifications. With CCI's rail, sea and road connections the company can provide logistic solutions for all occasions.



Product-related or management system-related certifications: The company is certified by ISO 9001, and 14001.

PRODUCT INFORMATION

Product name: Steel pipes – 3LPE – Cement Lining (Water)
Product identification: Pipes are delivered in accordance with **EN10217-1 or EN10217-5** (material certificate according to EN 10204-3), featuring plastic protective caps and a maximum diameter tolerance of +/- 3 mm. In this study products with coating containing polypropylene and polyethylene-x are excluded. Only polyethylene coated products are accounted for.

The following dimensions are covered by this EPD:

- DN400
- DN500
- DN600
- DN700
- DN800
- DN900
- DN1000
- DN1200
- DN1400





UN CPC code: 412
Product description: Steel pipes coated with 3LPE and lined with cement mortar in multiple dimensions, where this EPD covers pipes with a diameter of 400 mm to 1400 mm. The pipes consist of a steel pipe that lines with cement mortar within to protect the steel pipe from corrosion and abrasion. On the outside, a 3-layer polyethylene (3LPE) coating is applied to keep the water pipes from corroding and as a mechanical protection. The production process is the same for all different dimensions of coated and lined steel pipes.

The intended use of the steel pipes is as water pipes as well as for applications where smaller dimensions of water pipes are required. The technical lifespan of the product is 100 years. The pipes manufacturing processes are the production of steel pipes and other required materials supplied in A1. The pipes are then coated and lined as described above in A3.

Name and location of production site(s): CCI leidingsystemen b.v. in Moerdijk, the Netherlands.

CONTENT DECLARATION

Product content	Range of mass, kg	Post-consumer recycled material, mass-% of product	Biogenic material, mass-% of product	Biogenic material, kg C/ declared unit
Steel	701-765	0	0	0
Cement mortar	204-250	0	0	0
3LPE	27-51	0	0	0
TOTAL	-	0	0	0

The table above represents the range of all dimensions included in the study. For example, the DN 1200 consists of 765 kg of steel, 204 kg of cement mortar and 31 kg of 3LPE, while DN 500 consists of 701 kg of steel, 248 kg of cement mortar and 51 kg of 3LPE.

Packaging materials	Mass, kg	Mass-% (versus the product)	Biogenic material, kg C/product or declared unit
Endcaps (HDPE)	2.02	0.202	0
Wood	1.39	0.139	0.698
TOTAL	3.41	0.341	0.698

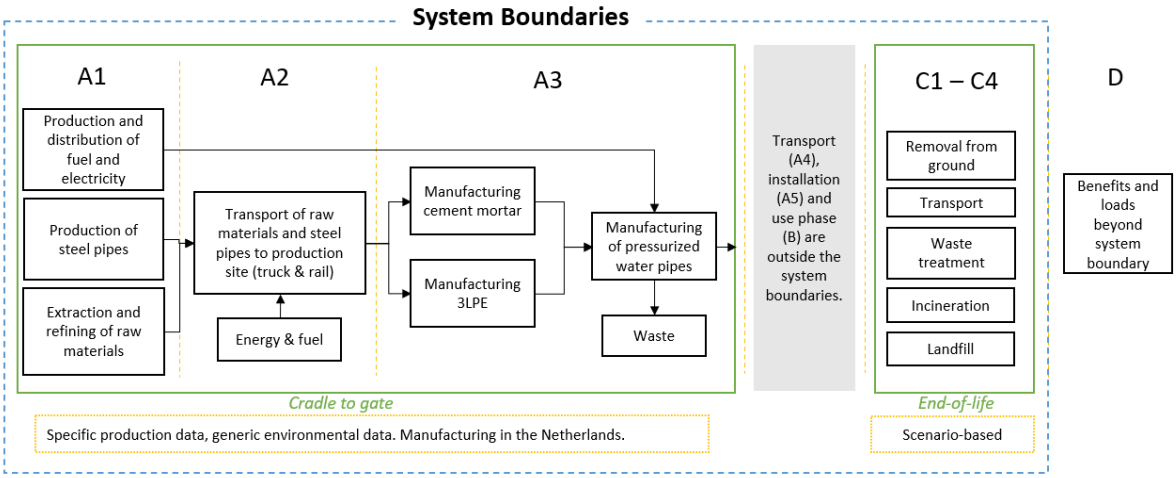
The epoxy used in the products contains Bisphenol A (BPA) which is on the list of substances of very high concern (SVHC), as defined and listed by the European Chemicals Agency (ECHA) Candidate List of substances of very high concern for Authorization. According to the products safety data sheet the product contains 5-<10 weight-% of Bisphenol A diglycidyl ether – bisphenol A copolymer and 0.3-<1 weight-% of Phenol, 4,4-(1-methylethylidene) bis-, polymer with (cholormethyl) oxirane, reaction products with 2-methyl-1H-imidazole. See table below.

Hazardous substances from the candidate list of SVHC	EC No.	CAS No.	Mass-% per product
Bishphenol A diglycidyl ether – bisphenol A copolymer	-	25036-25-3	5-<10
Phenol, 4,4-(1-methylethylidene) bis-, polymer with (cholormethyl) oxirane, reaction products with 2-methyl-1H-imidazole	-	68002-42-6	0.3-<1

The remaining materials of the product do not contain any SVHC, as defined and listed in ECHA Candidate List of substances of very high concern for Authorization, in levels above 0.1 % by weight for the products that concern this LCA report.

LCA INFORMATION

Declared unit: 1000 kg of pressurized water pipe
Time representativeness: 2023
Geographical scope: EU27
Database(s) and LCA software used: Ecoinvent 3.11, SimaPro version 10.2.0.1
Description of system boundaries: Cradle-to-gate with modules C1-C4 and module D
Process flow diagram:



More information:
All major material and energy flows have been included in the model and impact assessment. The maximum cut-off criteria established by the PCR is 1 % of all material and energy flows to a single unit process and 5 % of total inflows (mass and energy) to the upstream and core module. No cut-offs exceeding this limit have been made.

EN 15804 reference package based on EF 3.1 has been used.

Overall summary of data assessment:

Geographical representativeness	Technical representativeness	Time representativeness
Good	Good	Very good

21 of 27 data sets were assessed as good for geographical representativeness, 25 of 27 data sets were assessed as good for technical representativeness and 26 of 27 were assessed as very good for time representativeness. Based on this distribution the overall assessment of data quality was made.

The data collection period of primary data for this study is 2023.

Only dataset that contribute to over 10 % of the GWP-GHG is the data set used for Steel pipes. This process is called Steel welded pipe/EU and is assess as good for all three categories. Reference year is 2019.

Primary data used in this EPD account for 7.14 % of GWP-GHG. The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that supports the use of more primary data, to increase the representativeness of and comparability between EPDs. Note

that the indicator does not capture all relevant aspects of data quality and is not comparable across product categories.

Infrastructure/capital goods have been excluded in this EPD.

The climate impact of electricity purchased in the manufacturing process in A3 is 7.05 E-01 kg CO_2 eq/kWh and is the medium voltage residual mix of the Netherlands.

Additional information for modules C and D
Model C and D are scenario-based calculations, below are the assumptions for each module described. In the end-of-life stage the water pipes are either left in the ground or excavated and transported for further waste treatment, including material recycling, incineration and landfill.

Assumption in Module C
An end-of-life scenario has been developed based on the information provided by the company, representing a scenario based on technologies available.

Current practices mainly involve leaving the water pipes in the ground after their service life. No recycling or reuse occurs when worn-out water pipes are left in the ground. Normally, new pipes are placed in new places rather than removing the old to reduce costs. In some cases, the water pipes are, however, excavated and removed to make room for new water pipes. There is no available data on the share that is collected, however, to avoid underestimating the amount, it has been assumed that 25 % is removed from the ground.

For those cases where the water pipes are collected, they are transported to recycling facilities where the concrete, 3LPE and steel are separated. The recycling rate of the steel is assumed to be 85 %, based on the Product Environmental Footprint (PEF) and the R2 values in Annex C[1].

In the table below the end-of-life scenario for the collected share of water pipes are presented.

Material	End-of-life assumptions for the collected water pipes
Steel	85 % material recycling 15 % landfill
Concrete	100 % landfill
3LPE	100 % incineration

C1 – Deconstruction / Demolition
It is assumed that the collected product is being excavated, cut into manageable sections, lifted out of the ground, and loaded onto trucks for transport to waste processing facilities. The collecting of the product is performed by machines powered by diesel.

C2 – Transport to waste processing
The transport distance to waste processing facilities is assumed to be 50 km.

C3 – Waste processing
- The steel is assumed to be shredded and processed before it is sent to the recycling plant.
- It is assumed that the concrete is crushed before it is sent to disposal.
- The 3LPE is assumed to be incinerated.

[1] Annex C version 2.1 May 2020. https://eplca.jrc.ec.europa.eu/LCDN/developerEF.html

C4 – Disposal

- 15 % of the steel is assumed to be disposed at landfill.
- 100 % of the concrete is assumed to be landfilled.

Summary for End-of-life, C1-C4

End-of-life (C1-C4)	**Unit (per declared unit)**	**Weight / distance**
Collection processes specified by type	kg collected separately	250
	kg collected with mixed construction waste	0
Recovery system specified by type	kg for re-use	0
	kg for recycling	162
	kg for energy recovery	8
Disposal specified by type	kg product or material for final deposition	80
Assumptions for scenario development e.g. transportation	km	50

Assumption in Module D

The steel in the collected share of the water pipe is material recycled and replaces primary steel in steel production. The amount of recycled steel being calculated in module D is 162 kg.

Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	EU27	EU27	EU27	ND	ND	ND	ND	ND	ND	ND	ND	ND	EU27	EU27	EU27	EU27	EU27
Specific data used	6.20 %			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	<10 %[2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	-[3]			-	-	-	-	-	-	-	-	-	-	-	-	-	-

[2] This EPD includes products from CCI in the different dimensions: 400 mm to 1400 mm The materials and processes are the same for the different products, the products differ in diameter.
[3] The products are only produced at one site.

ENVIRONMENTAL PERFORMANCE

LCA results of the product(s) - main environmental performance results

Mandatory impact category indicators according to EN 15804

Results per declared unit							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-fossil	kg CO_2 eq.	**2.20E+03**	5.61E+00	9.48E-01	2.49E+01	2.17E-01	-3.16E+02
GWP-biogenic	kg CO_2 eq.	**6.51E+00**	9.96E-04	2.21E-04	7.01E-04	7.91E-05	0
GWP-luluc	kg CO_2 eq.	**4.30E-01**	2.31E-04	1.55E-05	5.91E-05	1.10E-05	-2.88E-02
GWP-total	kg CO_2 eq.	**2.20E+03**	5.61E+00	9.49E-01	2.49E+01	2.18E-01	-3.16E+02
ODP	kg CFC 11 eq.	**8.39E-06**	8.54E-08	2.23E-08	1.19E-08	3.12E-09	-1.03E-06
AP	mol H^+ eq.	**6.26E+00**	5.18E-02	1.21E-03	9.79E-03	1.96E-03	-1.21E+00
EP-freshwater	kg P eq.	**9.84E-03**	5.28E-06	6.06E-07	2.14E-06	7.14E-07	-1.79E-02
EP-marine	kg N eq.	**1.42E+00**	2.44E-02	2.69E-04	4.67E-03	8.92E-04	-2.50E-01
EP-terrestrial	mol N eq.	**1.51E+01**	2.68E-01	2.92E-03	5.18E-02	9.78E-03	-2.90E+00
POCP	kg NMVOC eq.	**5.45E+00**	7.99E-02	2.37E-03	1.42E-02	2.97E-03	-9.99E-01
ADP-minerals&metals*	kg Sb eq.	**7.72E-04**	1.96E-07	2.56E-08	1.15E-07	7.23E-09	-2.61E-03
ADP-fossil*	MJ	**2.57E+04**	7.33E+01	1.30E+01	9.13E+00	2.78E+00	-2.94E+03
WDP*	m^3	**5.73E+01**	5.48E-02	4.27E-03	8.46E-03	2.43E-03	-3.68E+01
Acronyms	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						

Note: Biogenic carbon in packaging is balanced in A1-A3.

**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 experience with the indicator.*

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.
The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3)

Additional mandatory and voluntary impact category indicators

Results per declared unit							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[4]	kg CO_2 eq.	**2.20E+03**	5.61E+00	9.48E-01	2.49E+01	2.17E-01	-3.16E+02

Resource use indicators

Results per declared unit							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	**6.49E+02**	1.60E-01	3.25E-02	4.83E-02	1.31E-02	-7.31E+00
PERM	MJ	**0**[5]	0	0	0.00E+00	0.00E+00	0
PERT	MJ	**6.49E+02**	1.60E-01	3.25E-02	4.83E-02	1.31E-02	-7.31E+00
PENRE	MJ	**2.74E+04**	7.80E+01	1.39E+01	4.21E+01	9.71E+02	-2.60E+01
PENRM	MJ	**1.29E+03**[6]	0	0	-3.22E+02	-9.68E+02	0
PENRT	MJ	**2.87E+04**	7.80E+01	1.39E+01	-2.81E+02	2.96E+00	-2.60E+01
SM	kg	**0**	0	0	0	0	0
RSF	MJ	**0**	0	0	0	0	0
NRSF	MJ	**0**	0	0	0	0	0
FW	m^3	**8.95E+00**	2.96E-06	5.19E-07	3.22E-07	1.08E-07	-1.11E-04
Acronyms	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 material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water						

For calculation of the primary energy indicators, Option A in PCR, Annex 3 has been used.

[4] This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero.
[5] PERM in packaging materials is balanced out in A3. PERM is 2.65E+01
[6] PENRM in packaging materials is balanced out in A3. PENRM is 8.69E+01

Waste indicators

Results per declared unit							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	**0**	0	0	0	0	0
Non-hazardous waste disposed	kg	**0**	0	0	0	0	0
Radioactive waste disposed	kg	**0**	0	0	0	0	0

Output flow indicators

Results per declared unit							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	**0**	0	0	0	0	0
Material for recycling	kg	**0**	0	0	1.62E+02	0	0
Materials for energy recovery	kg	**0**	0	0	0	0	0
Exported energy, electricity	MJ	**5.09E+01**	0	0	8.72E+01	0	0
Exported energy, thermal	MJ	**1.19E+02**	0	0	2.03E+02	0	0

Additional LCA results (other environmental performance results) of the product(s)

Results per functional or declared unit							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Particulate matter	Disease incidences	**1.29E-04**	1.49E-06	7.45E-08	1.64E-07	5.54E-08	-2.28E-05
Ionising radiation, human health**	kBq U235 eq.	**1.19E+01**	1.42E-02	3.28E-03	1.30E-03	2.75E-04	2.60E+00
Ecotoxicity, freshwater***	CTUe	**3.14E+03**	2.10E+00	5.26E-01	4.65E+00	1.06E-01	-2.03E+03
Human toxicity, cancer***	CTUh	**2.81E-07**	3.00E-10	6.32E-11	2.84E-09	1.50E-11	-1.50E-07
Human toxicity, non-cancer***	CTUh	**7.38E-06**	1.25E-01	1.66E-02	3.47E-08	2.87E-10	-1.65E-06
Land Use***	Pt	**1.28E+03**	1.25E-01	1.66E-02	2.09E-01	3.28E+00	-5.39E+02

*** 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.*

**** 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*

ADDITIONAL INFORMATION

Scenarios for end of life

Scenario End of life: 100 % of product is left in the ground					
Indicator	**Unit**	**C1**	**C2**	**C3**	**C4**
GWP-fossil	kg CO_2 eq.	0	0	0	0
GWP-biogenic	kg CO_2 eq.	0	0	0	0
GWP-luluc	kg CO_2 eq.	0	0	0	0
GWP-total	kg CO_2 eq.	0	0	0	0
ODP	kg CFC 11 eq.	0	0	0	0
AP	mol H^+ eq.	0	0	0	0
EP-freshwater	kg P eq.	0	0	0	0
EP-marine	kg N eq.	0	0	0	0
EP-terrestrial	mol N eq.	0	0	0	0
POCP	kg NMVOC eq.	0	0	0	0
ADP-minerals&metals*	kg Sb eq.	0	0	0	0
ADP-fossil*	MJ	0	0	0	0
WDP*	m^3	0	0	0	0
Acronyms	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				

**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 experience with the indicator.*

Scenario End of life: 100 % of product is collected and recycled					
Indicator	**Unit**	**C1**	**C2**	**C3**	**C4**
GWP-fossil	kg CO_2 eq.	2.24E+01	3.79E+00	9,97E+01	8,70E-01
GWP-biogenic	kg CO_2 eq.	3.98E-03	8.82E-04	2,81E-03	3,16E-04
GWP-luluc	kg CO_2 eq.	9.24E-04	6.20E-05	2,37E-04	4,39E-05
GWP-total	kg CO_2 eq.	2.24E+01	3.79E+00	9,97E+01	8,70E-01
ODP	kg CFC 11 eq.	3.41E-07	8.92E-08	4,77E-08	1,25E-08
AP	mol H^+ eq.	2.07E-01	4.83E-03	3,92E-02	7,82E-03
EP-freshwater	kg P eq.	2.11E-05	2.42E-06	8,58E-06	2,86E-06
EP-marine	kg N eq.	9.77E-02	1.08E-03	1,87E-02	3,57E-03
EP-terrestrial	mol N eq.	1.07E+00	1.17E-02	2,07E-01	3,91E-02
POCP	kg NMVOC eq.	3.20E-01	9.49E-03	5,69E-02	1,19E-02
ADP-minerals&metals*	kg Sb eq.	7.86E-07	1.02E-07	4,59E-07	2,89E-08
ADP-fossil*	MJ	2.93E+02	5.22E+01	3,65E+01	1,11E+01
WDP*	m^3	2.19E-01	1.71E-02	3,38E-02	9,72E-03
Acronyms	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				

**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 experience with the indicator.*

ABBREVIATIONS

Abbreviation	Definition
General Abbreviations	
EN	European Norm (Standard)
EPD	Environmental Product Declaration
EF	Environmental Footprint
GPI	General Programme Instructions
ISO	International Organization for Standardization
LCA	Life Cycle Assessment
PCR	Product Category Rules
c-PCR	Complementary Product Category Rules
CEN	European Committee for Standardization
CLC	Co-location centre
CPC	Central product classification
GHS	Globally harmonized system of classification and labelling of chemicals
GRI	Global Reporting Initiative
Environmental Impact Indicators (EN 15804)	
GHG	Greenhouse gas
GWP	Global Warming Potential (kg CO_2 eq.)
GWP-fossil	Global Warming Potential from fossil sources (kg CO_2 eq.)
GWP-biogenic	Global Warming Potential from biogenic sources (kg CO_2 eq.)
GWP-luluc	Global Warming Potential from land use and land use change (kg CO_2 eq.)
GWP-total	Total Global Warming Potential (kg CO_2 eq.)
GWP-GHG	Global Warming Potential for greenhouse gases (kg CO_2 eq.)
ODP	Ozone Depletion Potential (kg CFC-11 eq.)
AP	Acidification Potential (mol H^+ eq.)
EP	Eutrophication Potential
EP-freshwater	Freshwater eutrophication potential (kg P eq.)
EP-marine	Marine eutrophication potential (kg N eq.)
EP-terrestrial	Terrestrial eutrophication potential (mol N eq.)
POCP	Photochemical Ozone Creation Potential (kg NMVOC eq.)
ADP	Abiotic Depletion Potential
ADP-minerals&metals	Abiotic depletion potential for non-fossil resources (kg Sb eq.)
ADP-fossil	Abiotic depletion potential for fossil resources (MJ)
WDP	Water Deprivation Potential (m^3)
Resource Use Indicators	
PERE	Use of renewable primary energy excluding renewable primary energy resources used as raw materials (MJ)
PERM	Use of renewable primary energy resources used as raw materials (MJ)
PERT	Total use of renewable primary energy resources (MJ)
PENRE	Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials (MJ)
PENRM	Use of non-renewable primary energy resources used as raw materials (MJ)
PENRT	Total use of non-renewable primary energy resources (MJ)
SM	Use of secondary material (kg)
RSF	Use of renewable secondary fuels (MJ)
NRSF	Use of non-renewable secondary fuels (MJ)
FW	Use of net fresh water (m^3)
Waste Indicators	
HW	Hazardous Waste (disposed) (kg)
NHW	Non-Hazardous Waste (disposed) (kg)
RW	Radioactive Waste (disposed) (kg)
Output Flow Indicators	
CFR	Components for Reuse (kg)
MR	Material for Recycling (kg)

MER	Materials for Energy Recovery (kg)
EEE	Exported Energy, Electricity (MJ)
EET	Exported Energy, Thermal (MJ)
Lifecycle Stages / Modules	
A1	Raw material supply
A2	Transport
A3	Manufacturing
A4	Transport to site
A5	Construction/Installation
B1	Use
B2	Maintenance
B3	Repair
B4	Replacement
B5	Refurbishment
B6	Operational energy use
B7	Operational water use
C1	Deconstruction/Demolition
C2	Transport to waste processing
C3	Waste processing
C4	Disposal
D	Reuse-Recovery-Recycling potential
Other Relevant Terms	
SVHC	Substances of Very High Concern
EC No.	European Community Number
CAS No.	Chemical Abstracts Service Number
MJ	Megajoule
kg	Kilogram
m^3	Cubic Meter
NMVOC	Non-Methane Volatile Organic Compounds
Sb eq.	Antimony Equivalents
P eq.	Phosphorus Equivalents
N eq.	Nitrogen Equivalents
CFC-11 eq.	Chlorofluorocarbon-11 Equivalents
CO_2 eq.	Carbon Dioxide Equivalents
kg C	Kilograms of Carbon
kg CO_2 eq.	Kilograms of Carbon Dioxide Equivalent
ND	Not Declared

REFERENCES

a) General Programme Instructions of International EPD System. 5.0.1
b) PCR 2019:14. Construction Products. V2.0.1
c) LCA Report – Pressurized water pipes
d) Core production data for materials, transport, energy and waste has been delivered by Cees van Overloop, Van Leeuwen.
e) Ecoinvent database version 3.11
f) EN 15804:2012+A2:2019/AC:2021 Sustainability of construction works - Environmental Product Declarations - Core rules for the product category of construction products
g) Energiföretagen (2024). Kraftvärme. https://www.energiforetagen.se/energifakta/kraftvarme/
h) Erlandsson M. and Pettersson D. (2015). *Klimatpåverkan för byggnader med olika energiprestanda.* Underlagsrapport till kontrollstation 2015. För Energimyndigheten och Boverket. IVL rapport nr 5176
i) European Committee for Standardization (CEN). (2019). EN 15804:2012+A2:2019/AC:2021 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products. Brussels: CEN.
j) Europen Environment Agency. (2025). *Waste management country profile – with a focus on municipal and packaging waste. https://www.eea.europa.eu/en/topics/in-depth/waste-and-recycling/municipal-and-packaging-waste-management-country-profiles-2025/nl-municipal-waste-factsheet.pdf/@@download/file*
k) C. Leroy *et al.* 2019 *IOP Conf. Ser.: Earth Environ. Sci.* 323 012049. *Reconciling recycling at production stage and end of life stage in EN 15804: the case of metal construction products*
l) Panda, Achyut & Singh, Raghubansh Kumar & Mishra, Dhanada. *(2017). Thermolysis of waste plastics to liquid fuel A suitable method for plastic waste management and production of value added products - A world prospective. 88. 13-18.*
m) PlasticsEurope (2019). Eco-profiles and Environmental Product Declarations of the European Plastics Manufacturers. Polycarbonate (PC).
n) Wood Energy - List and values of wood fuel parameters - Part 1

VERSION HISTORY

Original Version of the EPD, 2026-07-08

EPD
INTERNATIONAL EPD SYSTEM
www.environdec.com