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ECO PLATFORM EPD VERIFIED

Owner: Urban Water Retention ApS
No.: MD-25005-EN
Issued: 15-04-2025
Valid to: 15-04-2030

3rd PARTY **VERIFIED**

EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | **ISO 14025 & EN 15804**

Owner of declaration
Urban Water Retention ApS
Bomose Alle 3, DK-3200 Helsinge,
Denmark
VAT no. 42330477

Programme
EPD Danmark
www.epddanmark.dk

☐ Industry EPD
☒ Product EPD

Declared product(s)
A UWR System Waterproof pipe module of type: UWR Pipe 302 HL, Black UWR nr.: 7204S-A-Ø including seals.

Number of declared datasets/product variations: 1

Production site
AVK Plast A/S
Øster Vedstedvej 26A
DK-6760 Ribe
Denmark

Use of Guarantees of Origin
☐ No certificates used
☒ Electricity covered by GoO
☐ Biogas covered by GoO

Declared/ functional unit
1 UWR System Waterproof pipe module of 301 liter gross volume and a weight of 20.76 kg.

Year of production site data (A3)
2023

EPD version
1st version

Issued: 15-04-2025
Valid to: 15-04-2030

Basis of calculation
This EPD is developed and verified in accordance with the European standard EN 15804+A2.

Comparability
EPDs of construction products may not be comparable if they do not comply with the requirements in EN 15804. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804 and if the background systems are not based on the same database.

Validity
This EPD has been verified in accordance with ISO 14025 and is valid for 5 years from the date of issue.

Use
The intended use of an EPD is to communicate scientifically based environmental information for construction products, for the purpose of assessing the environmental performance of buildings.

EPD type
☒Cradle-to-gate with modules C1-C4 and D
☐Cradle-to-gate with options, modules C1-C4 and D
☐Cradle-to-grave and module D
☐Cradle-to-gate
☐Cradle-to-gate with options

CEN standard EN 15804 serves as the core PCR

Independent verification of the declaration and data, according to EN ISO 14025

☐ internal ☒ external

Third party verifier:
Mie Ostenfeldt
Ostenfeldt Consulting

Martha Katrine Sørensen
EPD Danmark

Life cycle stages and modules (ND = Not Declared)																
Product			Construction process		Use							End of life				Beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport	Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Re-use, recovery and recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X

Product information

Product description

The UWR pipe module is the main component in a square pipe system designed as modular building blocks, the different modules connect and stack in height, width, and length. The system is designed for stormwater protection in urban areas as it acts as a water retention module and stores rainwater underground.

The main product components are shown in the table below.

Material	Weight-% of declared product
PP mix (Polypropylene)	97%
TPE(Thermoplastic elastomers)	2%
Rubber	0,7%

Product packaging:

The composition of the sales- and transport packaging of the product is shown in the table below.

Material	Weight of packaging material (kg)	Weight-% of packaging
Plastic foil	0,05	11%
EURO pallet – wood	0,41	89%
Total	0,46	100%

Representativity

This declaration, including data collection directly from manufacturers and the modeled foreground system including results, represents the production of the UWR pipe module on the production site located in Ribe, Denmark in the year of 2023. Product specific data are based on average values from production year 2023 collected in the year of 2024. Background data are based on EcoInvent 3.10.

Hazardous substances

UWR pipe module does not contain substances listed on the "Candidate List of Substances of Very High Concern for authorisation"

(http://echa.europa.eu/candidate-list-table)

Product(s) use

The system is designed for stormwater protection in urban areas as it acts as a water retention module and stores rainwater underground. The UWR System can be installed under the road surface with a road structure including the pavement and a base layer of only 40 cm and is designed for traffic loads of up to class DK T3 roadways. The system is waterproof, chemical and oil-resistant and does not require use of any membranes, geotextiles or foils, it can retain water and allow water to seep into pipe systems.

The system can be connected to traditional sewer pipes up to a DN 500 mm and road drains can be part of the system, it can also be supplied with various substrates for purification of rainwater as well as growing soil for trees and plant beds.

Essential characteristics

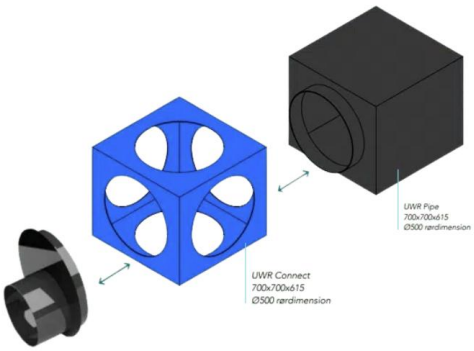
Further technical information can be obtained by contacting the manufacturer or on the manufacturer's website:

Urban Water Retention

Reference Service Life (RSL)

The RSL of a UWR pipe module is stated to be more than 75 years, this is based on Laboratory testing done by Force Technology.

Picture of product(s)



LCA background

Declared unit

The LCI and LCIA results in this EPD relates to 1 UWR Pipe module of type 302 HL, Black UWR nr.: 7204S-A-Ø

Name	Value	Unit
Declared unit	1	UWR pipe module
Density	20,76	kg/DU
Gross volume	301	L
Conversion factor to 1 kg.	0,0482	-

Functional unit

Not defined

PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804.

Energy modelling principles

Foreground system:

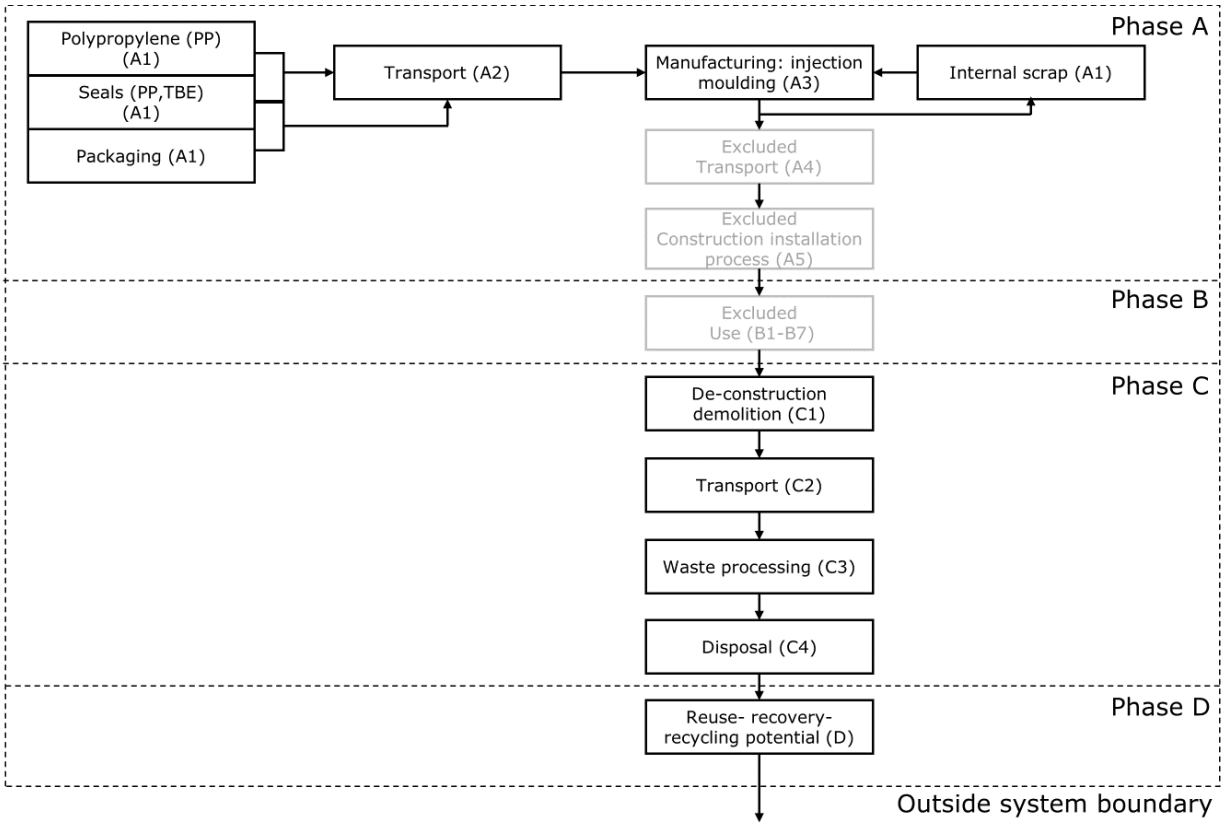
The production in Ribe is using hydropower, with guarantee of origin.

Background system:

Upstream processes are modelled using Polish and Swedish residual mix.

Dataset	EF	Unit
Heat, district or industrial, SE, ref. year 2023	0,0497	kg CO_2e/kWh
Heat, district or industrial, natural gas, SE, ref. year 2023	0,0331	kg CO_2e/MJ
Heat, district or industrial, PL, ref. year 2023	1,0986	kg CO_2e/kWh
Heat, district or industrial, natural gas, PL, ref. year 2023	0,0416	kg CO_2e/MJ
Hydropower - electricity production, DK ref. year 2023	0,0044	kg CO_2e/ kWh

Flowdiagram



This EPD is based on a cradle-to-gate LCA, in which 98.4 weight-% has been accounted for.

Rubber as well as chemicals and additives are excluded as they account for 0.15 and 0.19 kg/DU respectively, both being under 1% of the total mass.

The general rules for the exclusion of inputs and outputs follows the requirements in EN 15804, 6.3.5, where the total of neglected input flows per module shall be a maximum of 5 % of energy usage and mass and 1 % of energy usage and mass for unit processes.

Product stage (A1-A3) includes:

A1 – Extraction and processing of raw materials

A2 – Transport to the production site

A3 – Manufacturing processes

The product stage comprises the acquisition of all raw materials, products and energy, transport to the production site, packaging and waste processing up to the ”end-of-waste” state or final disposal. The LCA results are declared in aggregated form for the product stage, which means, that the sub-modules A1, A2 and A3 are declared as one module A1-A3.

UWR receives PP granulate from Sweden and seals from Poland. The production of the pipe module is done by injection moulding in Ribe, Denmark, waste from the production is either recycled or incinerated.

End of Life (C1-C4) includes:

The pipe module is removed as part of the the sewage system, that includes excavation and dismantling. The pipe module is then transported with other construction waste for separation, recycling and incineration. The module is 100% recyclable. Fractions and percentages for recycling and energy recovery, are modelled for a Danish system using the EASETECH software. For PP 90,3% is assumed to be recycled and 9.7% to be incinerated. TPE follows the recycling process according to the Danish Ministry of Environment annual waste statistics report of 2024, where 5% of construction waste is getting disposed in landfills, 33% is recycled, 54% is downcycled and 7% is incinerated (Danish Ministry of Environemnt, 2024).

Re-use, recovery and recycling potential (D) includes:

D stage modelling is made using processes in EASETECH software, where the benefit is only accounted for recycling and energy recovery from virgin PP and TPE. The treatment of the TPE follows the recycling process for construction waste according to the Danish Ministry of Environment as mentioned in the EoL section, where 33% is recycled, 54% is downcycled and 7% is incinerated (Danish Ministry of Environemnt, 2024).

LCA results

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
GWP-total	[kg CO_2 eq.]	1,91E+01	5,49E-01	6,98E-01	3,80E+00	1,55E-04	-5,28E+00
GWP-fossil	[kg CO_2 eq.]	2,02E+01	5,48E-01	6,97E-01	3,61E+00	1,54E-04	-5,26E+00
GWP-biogenic	[kg CO_2 eq.]	-1,05E+00	1,74E-04	4,58E-04	1,86E-01	8,52E-07	-1,72E-02
GWP-luluc	[kg CO_2 eq.]	1,66E-02	5,83E-05	2,32E-04	1,25E-02	3,74E-08	-2,94E-03
ODP	[kg CFC 11 eq.]	4,73E-07	1,03E-08	1,50E-08	9,38E-08	4,82E-12	-2,31E-07
AP	[mol H^+ eq.]	1,11E-01	4,72E-03	1,47E-03	1,26E-02	1,70E-06	-1,56E-02
EP-freshwater	[kg P eq.]	4,22E-03	2,37E-05	4,72E-05	1,74E-03	2,58E-07	-9,72E-04
EP-marine	[kg N eq.]	2,37E-02	2,18E-03	3,53E-04	3,06E-03	4,24E-07	-3,12E-03
EP-terrestrial	[mol N eq.]	2,53E-01	2,39E-02	3,81E-03	3,62E-02	4,55E-06	-3,24E-02
POCP	[kg NMVOC eq.]	1,04E-01	7,26E-03	2,42E-03	9,79E-03	1,67E-06	-2,69E-02
ADPm[1]	[kg Sb eq.]	9,32E-04	2,46E-07	2,45E-06	1,82E-05	3,02E-10	-4,69E-05
ADPf[1]	[MJ]	4,90E+02	7,07E+00	9,81E+00	6,01E+01	3,58E-03	-1,57E+02
WDP[1]	[m^3 world eq. deprived]	5,53E+00	2,54E-02	4,78E-02	5,21E+00	2,15E-05	-1,41E+00
Caption	GWP-total = Globale 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 = Ozone Depletion; AP = Acidifcation; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water depletion potential						
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.						
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator						

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
PM	[Disease incidence]	1,07E-06	1,34E-07	5,13E-08	9,86E-08	2,58E-11	-1,40E-07
IRP[2]	[kBq U235 eq.]	9,71E+00	5,74E-03	1,31E-02	1,06E+00	4,80E-06	-3,99E-01
ETP-fw[1]	[CTUe]	5,37E+02	1,40E+00	2,65E+00	1,22E+01	2,64E-03	-1,93E+01
HTP-c[1]	[CTUh]	1,98E-06	3,61E-09	4,91E-09	1,24E-08	8,75E-13	-1,92E-08
HTP-nc[1]	[CTUh]	5,32E-06	1,22E-09	6,37E-09	4,09E-08	4,30E-12	-4,37E-08
SQP[1]	-	2,18E+02	5,13E-01	5,88E+00	8,11E+01	8,79E-03	-1,64E+01
Caption	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)						
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.						
Disclaimers	[1] The results of this environmental 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.						

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
PERE	[MJ]	6,20E+01	7,19E-02	1,68E-01	6,93E+01	7,45E-05	-7,57E+00
PERM	[MJ]	9,63E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	[MJ]	7,17E+01	7,19E-02	1,68E-01	6,93E+01	7,45E-05	-7,57E+00
PENRE	[MJ]	4,08E+02	7,07E+00	1,95E+00	5,97E+01	3,58E-03	-9,42E+01
PENRM	[MJ]	8,25E+01	0,00E+00	0,00E+00	4,23E-01	0,00E+00	-6,30E+01

PENRT	[MJ]	4,90E+02	7,07E+00	9,81E+00	6,01E+01	3,58E-03	-1,57E+02
SM	[kg]	5,39E-01	5,07E-03	4,51E-03	2,07E-02	1,19E-06	-2,83E-02
RSF	[MJ]	2,01E-01	8,28E-06	5,71E-05	8,28E-05	2,16E-08	-2,70E-03
NRSF	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	[m^3]	2,17E-01	5,36E-04	1,32E-03	2,25E-01	-4,33E-05	-3,84E-02
Caption	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 = Net use of fresh water						
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112						

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
HWD	[kg]	1,90E+00	1,23E-02	1,42E-02	2,57E-01	6,06E-06	-1,91E-01
NHWD	[kg]	7,09E+01	1,71E-01	3,04E-01	1,67E+01	5,50E-02	-3,60E+01
RWD	[kg]	3,00E-03	1,43E-06	3,71E-06	2,41E-04	1,17E-09	-1,01E-04

CRU	[kg]	5,39E-01	5,07E-03	4,51E-03	2,07E-02	1,19E-06	-2,83E-02
MFR	[kg]	6,78E-03	2,46E-05	7,39E-05	1,07E-02	4,63E-08	-1,45E-03
MER	[kg]	6,55E-05	1,35E-07	6,26E-07	1,27E-05	8,90E-11	-8,29E-06
EEE	[MJ]	1,22E-01	7,46E-04	1,67E-03	5,95E-03	1,49E-06	-5,71E-02
EET	[MJ]	1,04E-01	2,59E-04	2,42E-03	2,09E-02	3,34E-06	-4,45E-02
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy						
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.						

BIOGENIC CARBON CONTENT PER DU		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	[kg C]	0,0
Biogenic carbon centent in accompanying packagaing	[kg C]	0,0
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Additional information

LCA interpretation

The most important material is polypropylene (PP), as 97% of the product is made of PP, the rest is made of rubber and thermoplastic. Beside some manual assembly the product is made exclusively by using the injection moulding process, the energy for this process is hydropower documented by a GoO, and thus it has a negligible contribution to the environmental impacts.

The total GWP of the DU, one UWR pipe module adds up to 19,2 kg CO_2-eq for phase A1-A3.

Technical information on scenarios

The deconstruction phase C1 is achieved by excavation. The pipe module would be a part of a larger system, and the system can vary greatly in size depending on the water retention capacity needed. The excavation needed per pipe module was therefore estimated based on different system sizes, the average excavation volume per pipe module is 0.923 m^3. The system sizes were provided by UWR and represent most common system sizes. The ecoinvent process used is 'excavation, hydraulic digger, RER'.

For modelling of phases C2, C3 and C4 and D The installation site of the stormwater retention pipe module is assumed to be in Copenhagen and all reuse, recovery and/or recycling potentials are modeled based on EASETECH software and According to the Danish Ministry of environment annual waste statistics. The phases will vary depending on installation site and waste treatment.

Reference service life

RSL information		Unit
Reference service Life	>75	Years
Declared product properties	301 liter gross volume	See UWRs website for information regarding use, and environment. https://uwrsystem.dk
Design application parameters	See website	
Assumed quality of work	See website	
Outdoor environment	Yes	
Indoor environment	No	
Usage conditions	See website	
Maintenance	Can be rinsed by standard equipment for pipe maintenance.	https://uwrsystem.dk/en/maintenance-guide/

End of life (C1-C4)

Scenario information	Value	Unit
Collected separately	20,76	kg
Collected with mixed waste	0	kg
For reuse	0	kg
For recycling	18,6	kg
For downcycling	0,167	kg
For energy recovery	1,99	kg
For final disposal	0,0155	kg

Re-use, recovery and recycling potential (D)

Scenario information/Materiel	Value	Unit
Displaced material	2,05	kg
Energy recovery from waste incineration	10,35	MJ

Indoor air

Not relevant

Soil and water

The EPD does not give information on release of dangerous substances to soil and water because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.2.

References

Publisher	www.epddanmark.dk Template version 2024.1
Programme operator	Danish Technological Institute Gregersensvej DK-2630 Taastrup www.teknologisk.dk
LCA-practitioner	Rambøll Group Hannemanns Allé 53, København, Region Hovedstaden 2300, Denmark Conducted by: Spyridoula-Christina Karali, Adriana M. Wenda and Maria Faragò
LCA software /background data	*EASETECH 3.6 professional database and the EcoInvent 3.10 database* *EN 15804 reference package 3.1*
3rd party verifier	*Mie Ostenfeldt* *Ostenfeldt Consulting* *Liljevangsvej 26* *2760 Måløv*

General programme instructions
General Programme Instructions, version 2.0, spring 2020
www.epddanmark.dk

EN 15804
DS/EN 15804 + A2:2019 - ”Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products”

EN 15942
DS/EN 15942:2011 – ” Sustainability of construction works – Environmental product declarations – Communication format business-to-business”

ISO 14025
DS/EN ISO 14025:2010 – ” Environmental labels and declarations – Type III environmental declarations – Principles and procedures”

ISO 14040
DS/EN ISO 14040:2008 – ” Environmental management – Life cycle assessment – Principles and framework”

ISO 14044
DS/EN ISO 14044:2008 – ” Environmental management – Life cycle assessment – Requirements and guidelines”

Danish Ministry of Environemnt. (2024). Affaldsstatistik 2022 - Revideret udgave. Retrieved from https://www2.mst.dk/Udgiv/publikationer/2024/08/978-87-7038-639-5.pdf