ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

SEWER PIPE ULTRA RIB 2®

DIAMETER RANGE 200-560 MM

UPONOR CORPORATION

GENERAL INFORMATION

MANUFACTURER INFORMATION

Manufacturer	Uponor Corporation
Address	Äyritie 20, 01510 Vantaa, Finland
Contact details	info@uponor.com
Website	www.uponor.com

PRODUCT IDENTIFICATION

Product name	Sewer pipe Ultra Rib 2®
Product number / reference	1103066, 1103067, 1103068, 1103069, 1103070, 1103072, 1103073, 1103075, 1103076, 1103077
Place(s) of production	Uponor Infra AB, Industrivägen 11, 513 32 Fristad, Sweden

Kai Renholm

RTS EPD Committee secretary

Laura Apilo

Managing Director

EPD INFORMATION

EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

EPD program operator	The Building Information Foundation RTS / Building Information Ltd. Malminkatu 16 A 00100 Helsinki http://cer.rts.fi
EPD standards	This EPD is in accordance with EN 15804+A2 and ISO 14025 standards.
Product category rules	The CEN standard EN 15804 serves as the core PCR. In addition, the RTS PCR (Finnish version, 1.6.2020) is used.
EPD author	Stella Gustafsson, Uponor Corporation
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
Verification date	01.03.2021
EPD verifier	Silvia Vilčeková, Silcert, s.r.o.
EPD number	RTS_101_21
Publishing date	11.3.2021
EPD valid until	01.03.2026

PRODUCT INFORMATION

PRODUCT DESCRIPTION

Uponor pipe Ultra Rib 2® is a gravity sewer system.

PRODUCT APPLICATION

The pipes are used as sewer and storm water pipes in various kinds of applications like municipal, transport, commercial and residential.

TECHNICAL SPECIFICATIONS

Ultra Rib 2® is a ribbed and massive non-pressure pipe with injection moulded in-line socket. The material is polypropylene. Pipes are available from outer diameter 200mm up to diameter 560mm. Outer layer of the pipe is red brown and inner layer is white for easier inspection. The pipe has an injection moulded in-line socket, which is a solid part of the pipe and is produced on extrusion production line. The in-line socket reduces the number of joints needed by 50%. Ultra Rib 2® pipes are extremely tight, safe and strong. Socket has perfect shape and tolerances. Pipe cavity can be filled well-graded soil with up to 60mm particle size.

PRODUCT STANDARDS

EN 13476-3 Plastics piping systems for non-pressure underground drainage and sewerage. Structured-wall piping systems of unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE). Specifications for pipes and fittings with smooth internal and profiled external surface and the system, Type B

INSTA SBC EN 13467

PHYSICAL PROPERTIES OF THE PRODUCT

System and material properties	Value	Unit	Standard/Test method
Density	900	kg/m³	ISO 1183
Ring stiffness	SN8	kN/m²	ISO 9969
Long-term modulus of elasticity E50	425	MPa	ISO 527-2
Short-term modulus of elasticity E50	1650	MPa	ISO 527-2
Coefficient of thermal expansion	0,15	mm/m°K	
Thermal conductivity	0,23	W/ m°K	DIN 52612 v. 23°C
Max. continuous operating temperature	60	°C	
Max. instantaneous operating temperature	95-100	°C	

ADDITIONAL TECHNICAL INFORMATION

Further information can be found at www.uponor.com

PRODUCT RAW MATERIAL COMPOSITION

Material	Amount %	Usability			Origin
		Renewable	Non-renewable	Recycled	
Polypropylene (PP)	99		x		EU
Other	1		x		EU
Total	100%				

Material	Amount %	Origin
Metals		
Stone-based materials (minerals)		
Fossil materials	100	EU
Bio-based materials		

SUBSTANCES, REACH - VERY HIGH CONCERN

Products do not contain any REACH SVHC substances in amounts greater than 0,1% (1000 ppm). *Declaration of Conformity, According to the REACH regulation*

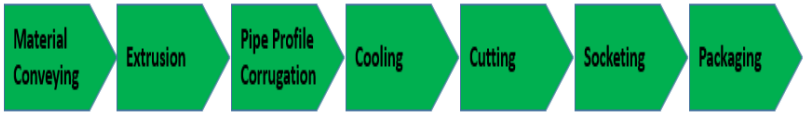
https://www.uponor.com/legal-information/reach

PRODUCT LIFE-CYCLE

MANUFACTURING AND PACKAGING (A1-A3)

The production method is a pipe extrusion with in-line injection moulded socketing. The different steps are:

- Material conveying
- Extrusion (melting and processing of material)
- Pipe profile corrugation
- Cooling
- Cutting
- Socketing
- Packaging



Manufacturing flowchart

The packaging of the finished product consists of a wooden U-frame with a wooden lath on top of it. The amount of pipes on a frame differs depending on the pipe diameter. The wooden frame has a nail plate on the edge to strengthen the structure as well as a plastic band around to tighten the package.

TRANSPORT (A4)

Transportation impacts occurred from final product's delivery to construction site cover direct exhaust emissions of fuel, environmental impacts of fuel production, as well as related infrastructure emissions.

PRODUCT END OF LIFE (C1-C4, D)

Since the consumption of energy and natural resources is negligible for disassembling of the end-of-life product, the impacts of demolition are assumed zero (C1). After ca 100 years of service life 5% of the end-of-life product is assumed to be sent to the closest treatment facilities (C2). The collected 5% from the demolition site is sent to recycling (C3), whereas the remaining 95% is left inert under the ground (C4). Due to the recycling of PP, the end-of-life product is converted into recycled PP (D).

LIFE-CYCLE ASSESSMENT

LIFE-CYCLE ASSESSMENT INFORMATION

Period for data	2019

DECLARED AND FUNCTIONAL UNIT

Declared unit	1 kg of pipe
Mass per declared unit	1 kg

BIOGENIC CARBON CONTENT

Product's biogenic carbon content per declared unit

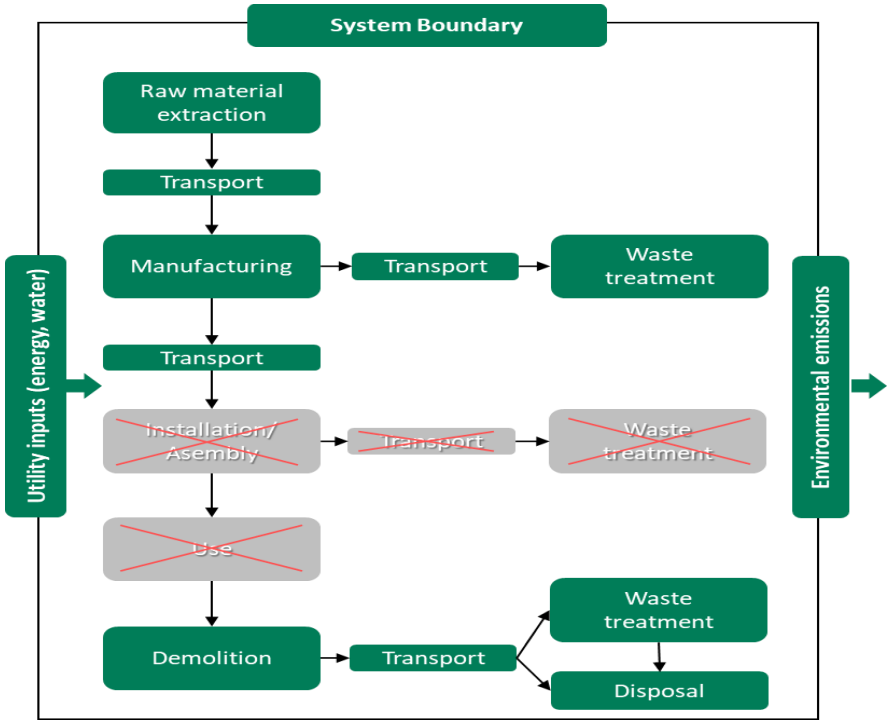
Biogenic carbon content in product, kg C	-
Biogenic carbon content in packaging, kg C	0,032

SYSTEM BOUNDARY

The scope of the EPD is "cradle to gate with options, module A4, modules C1-C4 and module D". The modules A1 (Raw material supply), A2 (Transport) and A3 (Manufacturing), A4 (Transport) as well as C1 (Deconstruction/ demolition), C2 (Transport at end-of-life), C3 (Waste processing), C4 (Disposal) and D (benefits and loads beyond the system boundary) are included in the study.

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	D	D
x	x	x	x	MND	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	MNR	MNR	x
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstr./demol.	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = MND. Modules not relevant = MNR.



CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the EN 15804:2012+A2:2019 and RTS PCR. Excluded modules are A5, and use stage modules (B1-B7), which are not mandatory according to the RTS PCR. The study does not exclude any hazardous materials or substances.

The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes which data are available for are included in the calculation. There is no neglected unit process more than 1% of total mass and energy flows. The total neglected input and output flows do also not exceed 5% of energy usage or mass. The life cycle analysis includes all industrial processes from raw material acquisition to production, distribution and end-of-life stages.

The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

As it is impossible to collect all energy consumption data separately for each product produced in the plant, data is allocated. Allocation is based on annual production rate and made with high accuracy and precision.

The values for 1 kg of the product, which is used within this study is calculated by considering the total product weight per annual production. In the factory, several kinds of pipes are produced; since the production processes of these products are similar, the annual production percentage is taken into consideration for allocation. According to the ratio of the annual production of the declared product to the total annual production at the factory, the annual total fuel consumption, consumed water and the generated waste per the declared product are allocated. Subsequently, the product output fixed to 1 kg and the corresponding amount of product is used in the calculations. Besides, since the formulation of the product is certain, raw materials in the product do not need to be allocated considering the total annual production. The amounts of raw materials and packaging materials are given as per the formulations in Uponor's internal Bills of Material and the purchased amounts from the respective suppliers.

This LCA study is conducted in accordance with all methodological considerations, such as performance, system boundaries, data quality, allocation procedures, and decision rules to evaluate inputs and outputs. All estimations and assumptions are given below:

• Module A4: The transportation distance is defined according to RTS PCR. As installation places are located at different places around Sweden and Finland, an average transportation distance from the production plants is assumed to be 400 km. Transportation method is lorry. According to Uponor transportation doesn't cause losses as products are packaged properly. Also, volume capacity utilisation factor is assumed to be 1 for the nested packaged products.

• Module C1: The impacts of demolition stage are assumed zero, since the consumption of energy and natural resources for disassembling of the end-of-life product is negligible.

• Module C2: It is estimated that there is no mass loss during the use of the product, therefore the end-of-life product is assumed to have the same weight as the declared product. 5% waste is assumed to be collected from the demolition site. Since there is no follow up procedure, transportation distance to the closest disposal area is estimated as 50 km and the transportation method is assumed to be lorry, which is the most common.

• Module A2, A4 & C2: Vehicle capacity utilization volume factor is assumed to be 1 which means full load. In reality, it may vary but as role of transportation emission in total results is small and so the variety in load assumed to be negligible. Empty returns are not taken into account as it is assumed that return trip is used by transportation companies to serve needs of other clients.

• Module C3: It is assumed that 5% of the waste is recycled and 95% is left inert under the ground. While making this assumption, TEPFFA's Third Party Report from year 2013 is taken into account.

• Module C4: 95% of the product is left inert under the ground. While making this assumption, TEPFFA's Third Party Report from year 2013 is taken into account

• Module D: Due to the recycling process part of the end-of-life product is converted into a recycled PP raw material.

ENVIRONMENTAL IMPACT DATA

NOTE: ENVIRONMENTAL IMPACTS - EN 15804+A1, CML / ISO 21930 AND TRACI 2.1. / ISO 21930 ARE PRESENTED IN ANNEX

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Climate change – total	kg CO2e	2,01E0	1,33E−1	−8,32E−2	2,06E0	5,5E−2	MND	MND	MND	MND	MND	MND	MND	MND	0E0	3,19E−4	3,61E−2	6,21E−3	−9,95E−2
Climate change – fossil	kg CO2e	2E0	1,33E−1	6,89E−2	2,2E0	5,54E−2	MND	MND	MND	MND	MND	MND	MND	MND	0E0	3,19E−4	3,61E−2	6,17E−3	−9,92E−2
Climate change – biogenic	kg CO2e	4,07E−3	−1,97E−5	−1,52E−1	−1,48E−1	−8,24E−6	MND	MND	MND	MND	MND	MND	MND	MND	0E0	−4,73E−8	8,7E−8	2,95E−5	−2,01E−4
Climate change – LULUC	kg CO2e	4,94E−4	4,68E−5	7,82E−5	6,19E−4	1,96E−5	MND	MND	MND	MND	MND	MND	MND	MND	0E0	1,12E−7	1,09E−6	3,26E−6	−2,44E−5
Ozone depletion	kg CFC11e	3,24E−8	3,04E−8	1,02E−8	7,29E−8	1,27E−8	MND	MND	MND	MND	MND	MND	MND	MND	0E0	7,3E−11	3,94E−10	1,6E−9	−1,6E−9
Acidification	mol H+e	6,85E−3	3,11E−4	4,77E−4	7,64E−3	1,3E−4	MND	MND	MND	MND	MND	MND	MND	MND	0E0	7,47E−7	2,37E−5	3,11E−5	−3,39E−4
Eutrophication, aquatic freshwater	kg PO4e	2,69E−4	1,01E−5	1,95E−5	2,98E−4	4,22E−6	MND	MND	MND	MND	MND	MND	MND	MND	0E0	2,43E−8	2,17E−7	1,35E−6	−1,33E−5
Eutrophication, aquatic marine	kg Ne	1,18E−3	4,35E−5	2,74E−4	1,49E−3	1,82E−5	MND	MND	MND	MND	MND	MND	MND	MND	0E0	1,05E−7	2,28E−5	8,9E−6	−5,82E−5
Eutrophication, terrestrial	mol Ne	1,24E−2	4,63E−4	1,45E−3	1,43E−2	1,93E−4	MND	MND	MND	MND	MND	MND	MND	MND	0E0	1,11E−6	1,06E−4	9,6E−5	−6,15E−4
Photochemical ozone formation	kg NMVOCe	5,94E−3	2,4E−4	2,23E−4	6,4E−3	1E−4	MND	MND	MND	MND	MND	MND	MND	MND	0E0	5,77E−7	3,86E−5	3,07E−5	−2,94E−4
Abiotic depletion, minerals & metals	kg Sbe	1,73E−5	3,31E−6	1,37E−5	3,42E−5	1,38E−6	MND	MND	MND	MND	MND	MND	MND	MND	0E0	7,95E−9	3,88E−8	1,01E−7	−8,55E−7
Abiotic depletion of fossil resources	MJ	7,18E1	2E0	1,17E0	7,5E1	8,36E−1	MND	MND	MND	MND	MND	MND	MND	MND	0E0	4,8E−3	2,84E−2	1,2E−1	−3,56E0
Water use	m3e depr.	5,93E1	1,89E0	3,13E0	6,43E1	7,88E−1	MND	MND	MND	MND	MND	MND	MND	MND	0E0	4,53E−3	1,28E−2	5,8E−2	−2,93E0

EN 15804+A2 disclaimer for Abiotic depletion and Water use indicators and all optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	6,03E−8	9,7E−9	4,58E−9	7,46E−8	4,06E−9	MND	MND	MND	MND	MND	MND	MND	MND	0E0	2,33E−11	1,3E−8	7,57E−10	−2,99E−9
Ionizing radiation, human health	kBq U235e	1,04E−1	1,05E−2	7,36E−3	1,22E−1	4,37E−3	MND	MND	MND	MND	MND	MND	MND	MND	0E0	2,51E−5	1,37E−4	5,72E−4	−5,16E−3
Eco-toxicity (freshwater)	CTUe	1,31E−1	7,32E−2	6,54E−2	2,7E−1	3,06E−2	MND	MND	MND	MND	MND	MND	MND	MND	0E0	1,76E−4	5,2E−2	1,93E−3	−6,5E−3
Human toxicity, cancer effects	CTUh	3,55E−10	4,11E−11	6,08E−11	4,57E−10	1,72E−11	MND	MND	MND	MND	MND	MND	MND	MND	0E0	9,88E−14	6,79E−11	3,28E−12	−1,76E−11
Human toxicity, non-cancer effects	CTUh	2,95E−8	2,6E−9	3,48E−9	3,55E−8	1,09E−9	MND	MND	MND	MND	MND	MND	MND	MND	0E0	6,25E−12	3,31E−10	1,39E−10	−1,46E−9
Land use related impacts/soil quality	-	3,83E−1	2,23E0	5,45E−1	3,15E0	9,31E−1	MND	MND	MND	MND	MND	MND	MND	MND	0E0	5,35E−3	4,14E−2	3,11E−1	−1,89E−2

EN 15804+A2 disclaimer for Ionizing radiation, human health. 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

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renewable PER used as energy	MJ	1,01E0	2,87E−2	3,53E0	4,57E0	1,2E−2	MND	MND	MND	MND	MND	MND	MND	MND	0E0	6,9E−5	4,91E−4	2,05E−3	−4,98E−2
Renewable PER used as materials	MJ	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Total use of renewable PER	MJ	1,01E0	2,87E−2	3,53E0	4,57E0	1,2E−2	MND	MND	MND	MND	MND	MND	MND	MND	0E0	6,9E−5	4,91E−4	2,05E−3	−4,98E−2
Non-renew. PER used as energy	MJ	2,72E1	2,04E0	1,25E0	3,05E1	8,54E−1	MND	MND	MND	MND	MND	MND	MND	MND	0E0	4,9E−3	2,89E−2	1,23E−1	−1,35E0
Non-renew. PER used as materials	MJ	4,81E1	0E0	1,74E−2	4,81E1	0E0	MND	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	−2,39E0
Total use of non-renewable PER	MJ	7,53E1	2,04E0	1,26E0	7,86E1	8,54E−1	MND	MND	MND	MND	MND	MND	MND	MND	0E0	4,9E−3	2,89E−2	1,23E−1	−3,73E0

Use of secondary materials	kg	3,89E−3	8,1E−4	4,25E−3	8,95E−3	3,39E−4	MND	MND	MND	MND	MND	MND	MND	MND	0E0	1,95E−6	1,9E−5	5,93E−5	−1,92E−4
Use of renewable secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Use of non-renew. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Use of net fresh water	m3	4,39E−3	3,83E−4	1,92E−3	6,69E−3	1,6E−4	MND	MND	MND	MND	MND	MND	MND	MND	0E0	9,21E−7	8,63E−6	9,37E−5	−2,17E−4

PER abbreviation stands for primary energy resources

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	Kg	4,23E−2	2,1E−3	3,71E−3	4,82E−2	8,8E−4	MND	MND	MND	MND	MND	MND	MND	MND	0E0	5,06E−6	1,44E−4	2,16E−4	−2,1E−3
Non-hazardous waste	Kg	1,27E0	1,75E−1	1,03E−1	1,55E0	7,32E−2	MND	MND	MND	MND	MND	MND	MND	MND	0E0	4,2E−4	5,24E−2	3,08E−1	−6,26E−2
Radioactive waste	Kg	2,84E−5	1,38E−5	4,93E−6	4,72E−5	5,79E−6	MND	MND	MND	MND	MND	MND	MND	MND	0E0	3,32E−8	1,76E−7	7,27E−7	−1,4E−6

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for reuse	Kg	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Materials for recycling	Kg	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	5E−2	0E0	0E0
Materials for energy recovery	Kg	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0

KEY INFORMATION TABLE (RTS) – KEY INFORMATION PER KG OF PRODUCT

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Climate change – total	kg CO2e	2,01E0	1,33E−1	−8,32E−2	2,06E0	5,55E−2	MND	MND	MND	MND	MND	MND	MND	MND	0E0	3,19E−4	3,61E−2	6,21E−3	−9,95E−2
Abiotic depletion, minerals & metals	kg Sbe	1,73E−5	3,31E−6	1,37E−5	3,42E−5	1,38E−6	MND	MND	MND	MND	MND	MND	MND	MND	0E0	7,95E−9	3,88E−8	1,01E−7	−8,55E−7
Abiotic depletion of fossil resources	MJ	7,18E1	2E0	1,17E0	7,5E1	8,36E−1	MND	MND	MND	MND	MND	MND	MND	MND	0E0	4,8E−3	2,84E−2	1,2E−1	−3,56E0
Water use	m3e depr.	4,39E−3	3,83E−4	1,92E−3	6,69E−3	1,6E−4	MND	MND	MND	MND	MND	MND	MND	MND	0E0	9,21E−7	8,63E−6	9,37E−5	−2,17E−4
Use of secondary materials	kg	3,89E−3	8,1E−4	4,25E−3	8,95E−3	3,39E−4	MND	MND	MND	MND	MND	MND	MND	MND	0E0	1,95E−6	1,9E−5	5,93E−5	−1,92E−4
Biogenic carbon content in product	kg C	N/A	N/A	0E0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Biogenic carbon content in packaging	kg C	N/A	N/A	3,20E-2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

SCENARIO DOCUMENTATION

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	All electricity consumed is provided from renewable energy (Renewable Energy Certificate by Gasum). Data Source: Electricity production, wind, 1-3mw turbine, onshore, Sweden 2019
Electricity CO2e / kWh	0.0148 kg CO2e / kWh

Transport scenario documentation

Scenario parameter	Value
A4 specific transport CO2e emissions, kg CO2e / tkm	0.13
A4 average transport distance, km	400
Transport capacity utilization, %	100
Bulk density of transported products, kg/m^3	-
Volume capacity utilisation factor for nested packaged products	1

End of life scenario documentation

Scenario parameter	Value
Collection process – kg collected separately	0,05
Collection process – kg collected with mixed waste	-
Recovery process – kg for re-use	-
Recovery process – kg for recycling	0,05
Disposal (total) – kg for final deposition	0,95
Scenario assumptions e.g. transportation	End-of-life product is transported 50km with an average lorry

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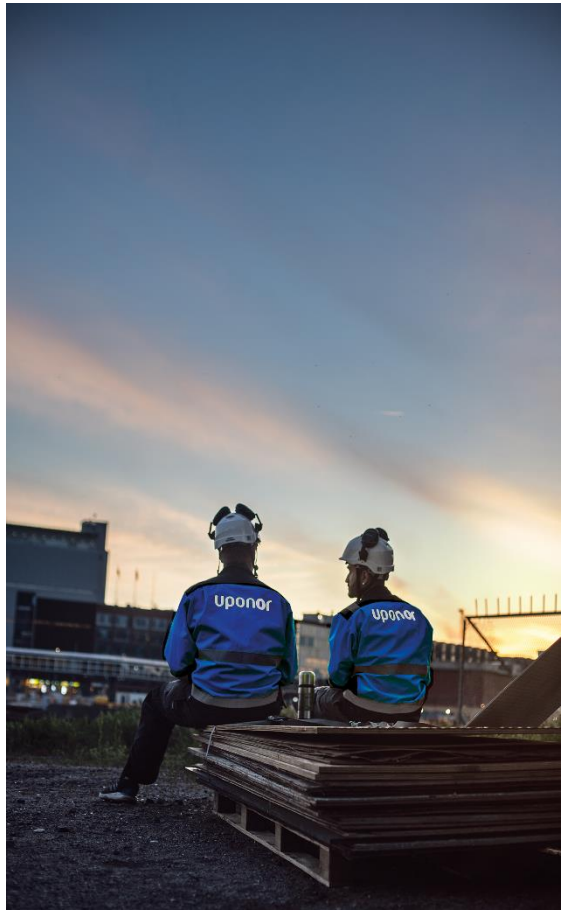

ABOUT THE MANUFACTURER

Uponor is rethinking water for future generations. Our offering, including safe drinking water delivery, energy-efficient radiant heating and cooling and reliable infrastructure, enables a more sustainable living environment. We help our customers in residential and commercial construction, municipalities and utilities, as well as different industries to work faster and smarter. We employ about 3,800 professionals in 26 countries in Europe and North America. Over 100 years of expertise and trust form the basis of any successful partnership. This is the basis, on which they can build, in a literal and metaphorical sense. We create trust together with our partners: Customers, prospective customers and suppliers. We establish this with shared knowledge, quality and sustainable results.

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Background data	This EPD is based on Ecoinvent 3.6 (cut-off) and One Click LCA databases.
LCA software	The LCA and EPD have been created using One Click LCA Pre-Verified EPD Generator for Plumbing Products, Components, Equipment and Systems

ANNEX 1

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global warming potential	kg CO2e	1,83 E0	1,31 E−1	6,71 E−2	2,03E0	5,5E −2	MND	MND	MND	MND	MND	MND	MND	MND	0E0	3,16 E−4	3,32 E−2	6,09 E−3	−9,09 E−2
Depletion of stratospheric ozone	kg CFC11e	3,33 E−8	2,42 E−8	8,83 E−9	6,64E−8	1,01 E−8	MND	MND	MND	MND	MND	MND	MND	MND	0E0	5,81 E−11	3,15 E−10	1,27 E−9	−1,64 E−9
Acidification	kg SO2e	5,85 E−3	2,7E −4	3,46 E−4	6,47E−3	1,13 E−4	MND	MND	MND	MND	MND	MND	MND	MND	0E0	6,49 E−7	2,34 E−5	2,29 E−4	−2,9 E−4
Eutrophication	kg PO4 3e	1,27 E−3	5,62 E−5	2,19 E−4	1,54E−3	2,35 E−5	MND	MND	MND	MND	MND	MND	MND	MND	0E0	1,35 E−7	6,2E −4	7,98 E−6	−6,27 E−5
Photochemical ozone formation	kg C2H4e	3,83 E−4	1,75 E−5	1,69 E−5	4,18E−4	7,3E −6	MND	MND	MND	MND	MND	MND	MND	MND	0E0	4,2E −8	1,29 E−5	1,29 E−6	−1,89 E−5
Abiotic depletion of non-fossil res.	kg Sbe	1,73 E−5	3,31 E−6	1,37 E−5	3,42E−5	1,38 E−6	MND	MND	MND	MND	MND	MND	MND	MND	0E0	7,95 E−9	3,88 E−8	1,01 E−7	−8,55 E−7
Abiotic depletion of fossil resources	MJ	7,18 E1	2E0	1,17 E0	7,5E1	8,36 E−1	MND	MND	MND	MND	MND	MND	MND	MND	0E0	4,8E −3	2,84 E−2	1,2E −1	−3,56 E0

ENVIRONMENTAL IMPACTS - TRACI 2.1. / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global warming potential	kg CO2e	1,85E0	1,31E−1	6,73E−2	2,05E0	5,49E−2	MND	MND	MND	MND	MND	MND	MND	MND	0E0	3,15E−4	3,33E−2	6,07E−3	−9,19 E−2
Ozone depletion	kg CFC11e	4,09E−8	3,22E−8	1,11E−8	8,42E−8	1,35E−8	MND	MND	MND	MND	MND	MND	MND	MND	0E0	7,74E−11	4,19E−10	1,7E−9	−2,02 E−9
Acidification	kg SO2e	5,65E−3	2,54E−4	3,54E−4	6,26E−3	1,06E−4	MND	MND	MND	MND	MND	MND	MND	MND	0E0	6,1E−7	2,54E−5	2,72E−5	−2,8E −4
Eutrophication	kg Ne	2,27E−3	1,24E−4	4,51E−4	2,85E−3	5,19E−5	MND	MND	MND	MND	MND	MND	MND	MND	0E0	2,98E−7	1,73E−3	1,42E−5	−1,13 E−4
Photochemical Smog Formation	kg O3e	7,08E−2	2,6E−3	2,93E−3	7,63E−2	1,09E−3	MND	MND	MND	MND	MND	MND	MND	MND	0E0	6,25E−6	6,41E−4	5,52E−4	−3,51 E−3
Depletion of non-renewable energy	MJ	1,05E1	2,88E−1	1,47E−1	1,09E1	1,21E−1	MND	MND	MND	MND	MND	MND	MND	MND	0E0	6,93E−4	3,84E−3	1,62E−2	−5,2E −1

ANNEX 2: GWP TOTAL AND ACIDIFICATION FOR A1-A3 STAGES PER AVAILABLE DIMENSION (CML / ISO 21930)

Product number	Product name	Weight per 1 m pipe (kg)	Outer diameter (mm)	Pipe length (m)	Global Warming Potential total for A1-A3 stages (kg CO2e)	Acidification total for A1-A3 stages (kg SO2e)
1103066	ULTRA RIB 2 PIPE 200 SN8 3M	2,57	200	3	1,565E+01	4,988E-02
1103067	ULTRA RIB 2 PIPE 200 SN8 6M	2,65	200	6	3,228E+01	1,029E-01
1103068	ULTRA RIB 2 PIPE 250 SN8 3M	3,76	250	3	2,290E+01	7,298E-02
1103069	ULTRA RIB 2 PIPE 250 SN8 6M	3,75	250	6	4,568E+01	1,456E-01
1103070	ULTRA RIB 2 PIPE 315 SN8 3M	5,68	315	3	3,459E+01	1,102E-01
1103072	ULTRA RIB 2 PIPE 315 SN8 6M	5,58	315	6	6,796E+01	2,166E-01
1103073	ULTRA RIB 2 PIPE 450 SN8 3M	11,09	450	3	6,754E+01	2,153E-01
1103075	ULTRA RIB 2 PIPE 450 SN8 6M	11,06	450	6	1,347E+02	4,293E-01
1103076	ULTRA RIB 2 PIPE 560 SN8 3M	17,27	560	3	1,052E+02	3,352E-01
1103077	ULTRA RIB 2 PIPE 560 SN8 6M	17,45	560	6	2,125E+02	6,774E-01

Stages A1-A3 include *Raw material extraction and processing*; *Transport to the manufacturer*, *Manufacturing*

For additional indicators, please refer to the previous tables in the document that represent 1kg of pipe. Multiply the results with weight/meter value and the respective pipe length to receive the impact per product number.