

ENVIRONMENTAL PRODUCT DECLARATION

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

Wirubo hePEX
Uponor Corporation



EPD HUB, HUB-0484

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GENERAL INFORMATION

MANUFACTURER

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

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804+A2:2019 and ISO 14025
PCR	EPD Hub Core PCR version 1.0, 1 Feb 2022
Sector	Construction product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Dr. Shima Holder, Uponor Corporation
EPD verification	Independent verification of this EPD and data, according to ISO 14025: <input type="checkbox"/> Internal certification <input checked="" type="checkbox"/> External verification
EPD verifier	Elma Avdyli as an authorized verifier acting for EPD Hub

The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. 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.

PRODUCT

Product name	Wirso hePEX
Product reference	A1140313 A1140375 A1140500 A1140625 A1140750 A1141000 A1141250 A1141500 A1142000 A1180313 A1210375 A1210625 A1220313 A1220375 A1220500 A1220625 A1220750 A1240750 A1241000 A1250500 A1250625 A1250750 A1251000 A1251250 A1251500 A1252000 A1260500 A1921000 A1921250 A1921500 A1922000 A1922500 A1923000 A1930500 A1930625 A1930750
Place of production	Minnesota (Apple Valley/Hutchinson), USA
Period for data	2021
Averaging in EPD	No averaging

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg
Declared unit mass	1 kg
GWP-fossil, A1-A3 (kgCO ₂ e)	2,99E0
GWP-total, A1-A3 (kgCO ₂ e)	3,01E0
Secondary material, inputs (%)	0,546
Secondary material, outputs (%)	89,3
Total energy use, A1-A3 (kWh)	12,1
Total water use, A1-A3 (m ³ e)	8,77E-3

PRODUCT AND MANUFACTURER

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.

PRODUCT DESCRIPTION

Wirsbo hePEX is a crosslinked polyethylene PEX-a pipe that features an oxygen barrier for use in radiant and hydronic heating and cooling systems. Wirsbo hePEX pipe is used for closed-loop hydronic heating and cooling applications, including radiant heating and cooling, hydronic hot water heating, chilled water cooling, baseboard heating, and distribution piping for radiant, snow melt, turf conditioning, and permafrost prevention systems. The pipe features an oxygen-diffusion barrier that meets German DIN 4726 to prevent oxygen permeation. A polyethylene layer is extruded over the oxygen barrier to protect from site abuse and moisture saturation. Temperature and Pressure ratings:

200°F (93°C) at 80 psi (551 kPa)

180°F (82°C) at 100 psi (689 kPa)

73.4°F (23°C) at 160 psi (1,103 kPa)

Linear expansion rate: 1.1/10°F/100 ft. (27.94 mm/5.56°C/30.48 m)

Further information can be found at www.uponor.com.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	-	-
Minerals	-	-
Fossil materials	100	USA, EU
Bio-based materials	-	-

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	-
Biogenic carbon content in packaging, kg C	0,00626

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 kg
Mass per declared unit	1 kg

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

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		
x	x	x	x	x	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	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.

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

The product is manufactured from high density polyethylene, a crosslinking additive, and stabilizers. The materials are mixed after which the mix is fed into an extruder where the material melts, flows through tooling that forms the pipe profile, and is crosslinked. The crosslinked pipe is calibrated to the correct dimension, and subsequently coated with a multilayer oxygen barrier layer consisting of linear low density polyethylene (LLDPE) and ethylene vinyl alcohol copolymer (EVOH) and labeled using a printer. In a subsequent operation, the pipe is cut to length, coiled and packaged.

MANUFACTURING PROCESS



TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions. The transportation distance is defined according to the PCR. As installation places are located across the different states in USA, an average transportation distance from the production plant is assumed to be 1741 km based on sales history. The installation scenarios in Uponor’s EPDs are based on TEPFFA’s (The European Plastic Pipe and Fittings Association) industry averaged EPDs. These documents and their background reports include industry consensus estimates of the resource use, emissions and affluents of typical European installations; these parameters have been used as input for the Uponor EPD modelling. Environmental impacts from installation into the building (A5) include the product installation losses, energy use in installation and generation of waste at the construction site.

PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase.

Air, soil, and water impacts during the use phase have not been studied.

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 50 years of service life the collected product is assumed to be sent to the closest treatment facilities (C2). 99% of the end-of-life product is assumed to be sent to recycling and incineration facilities (C3). Only 1% of the end-of-life product and the ash generated in the incineration facility are sent to landfill (C4). Due to the recycling and incineration potential of PEX, the end-of-life product is converted into recycled PE and energy (D).



LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied 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, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

1. Allocation should be avoided.
2. Allocation should be based on physical properties (e.g., mass, volume) when the difference in revenue is small.
3. Allocation should be based on economic values.

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 are 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.

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.

Allocation used in environmental data sources is aligned with the above.

AVERAGES AND VARIABILITY

This EPD is product and factory specific and does not contain average calculations.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. Ecoinvent and One Click LCA databases were used as sources of environmental data.

ENVIRONMENTAL IMPACT DATA

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
GWP – total ¹⁾	kg CO ₂ e	2,68E0	7,64E-2	2,47E-1	3,01E0	5,52E-1	6,74E-2	MND	MND	MND	MND	MND	MND	MND	0E0	6,62E-3	1,32E0	1,48E-3	-1,27E0
GWP – fossil	kg CO ₂ e	2,68E0	7,64E-2	2,39E-1	2,99E0	5,57E-1	3,58E-2	MND	MND	MND	MND	MND	MND	MND	0E0	6,62E-3	1,24E0	1,48E-3	-1,33E0
GWP – biogenic	kg CO ₂ e	3,53E-3	-1,85E-5	7,57E-3	1,11E-2	3,41E-4	3,15E-2	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	5,62E-2
GWP – LULUC	kg CO ₂ e	1,04E-3	3,54E-5	1,53E-4	1,23E-3	1,97E-4	2,44E-5	MND	MND	MND	MND	MND	MND	MND	0E0	2,44E-6	1,34E-4	5,67E-8	6,77E-5
Ozone depletion pot.	kg CFC-11e	5,42E-8	1,51E-8	1,06E-8	7,99E-8	1,28E-7	3,08E-9	MND	MND	MND	MND	MND	MND	MND	0E0	1,45E-9	1,93E-8	3,28E-11	-5,31E-8
Acidification potential	mol H ⁺ e	1,08E-2	6,87E-4	1,03E-3	1,25E-2	2,29E-3	1,57E-4	MND	MND	MND	MND	MND	MND	MND	0E0	2,77E-5	8,76E-4	9,24E-7	-3,92E-3
EP-freshwater ²⁾	kg Pe	5,92E-5	9,26E-7	8,52E-6	6,87E-5	4,81E-6	1,96E-6	MND	MND	MND	MND	MND	MND	MND	0E0	6,61E-8	1,27E-5	1,99E-9	-4,76E-6
EP-marine	kg Ne	1,88E-3	2,5E-4	2,07E-4	2,34E-3	6,79E-4	4,09E-5	MND	MND	MND	MND	MND	MND	MND	0E0	8,04E-6	2,93E-4	5,65E-7	-6,3E-4
EP-terrestrial	mol Ne	2,09E-2	2,75E-3	2,37E-3	2,61E-2	7,51E-3	4,25E-4	MND	MND	MND	MND	MND	MND	MND	0E0	8,89E-5	2,99E-3	3,4E-6	-7,27E-3
POCP (“smog”) ³⁾	kg NMVOCe	8,94E-3	7,59E-4	8,68E-4	1,06E-2	2,36E-3	1,51E-4	MND	MND	MND	MND	MND	MND	MND	0E0	2,78E-5	9,37E-4	1,3E-6	-4E-3
ADP-minerals & metals ⁴⁾	kg Sbe	2,4E-5	9,46E-7	5,31E-6	3,03E-5	1,39E-5	1,39E-6	MND	MND	MND	MND	MND	MND	MND	0E0	1,61E-7	3,16E-6	1,14E-9	-6,89E-6
ADP-fossil resources	MJ	8,19E1	1,06E0	5,08E0	8,8E1	8,5E0	4,39E-1	MND	MND	MND	MND	MND	MND	MND	0E0	9,88E-2	2,5E0	2,51E-3	-4,81E1
Water use ⁵⁾	m ³ e depr.	1,16E0	5,55E-3	1,33E-1	1,3E0	3,02E-2	1,6E-2	MND	MND	MND	MND	MND	MND	MND	0E0	4,09E-4	4,83E-2	1,11E-4	-8,54E-1

ADDITIONAL (OPTIONAL) 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	8,83E-8	6,95E-9	1,22E-8	1,07E-7	4,3E-8	2,9E-9	MND	MND	MND	MND	MND	MND	MND	0E0	5,04E-10	1,8E-8	1,74E-11	-2,46E-8
Ionizing radiation ⁶⁾	kBq U235e	2,93E-2	4,42E-3	5,52E-3	3,93E-2	3,71E-2	1,35E-3	MND	MND	MND	MND	MND	MND	MND	0E0	4,12E-4	7,16E-3	9,82E-6	-1,08E-5
Ecotoxicity (freshwater)	CTUe	3,15E1	9,86E-1	1,28E1	4,53E1	6,64E0	4,41E0	MND	MND	MND	MND	MND	MND	MND	0E0	8,45E-2	4,24E1	2,61E-3	-4,7E0
Human toxicity, cancer	CTUh	7,3E-10	4,29E-11	3,04E-10	1,08E-9	1,88E-10	9,97E-11	MND	MND	MND	MND	MND	MND	MND	0E0	2,2E-12	5,59E-10	6,98E-14	-4,04E-11
Human tox. non-cancer	CTUh	1,91E-8	1,08E-9	4,2E-9	2,44E-8	7,61E-9	9,41E-10	MND	MND	MND	MND	MND	MND	MND	0E0	8,94E-11	6,24E-9	1,74E-12	-3,35E-9
SQP ⁷⁾	-	1,51E0	9,07E-1	9,5E-1	3,37E0	9,47E0	1,96E-1	MND	MND	MND	MND	MND	MND	MND	0E0	1,09E-1	1,62E0	8,85E-3	1,34E0

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
Renew. PER as energy ⁸⁾	MJ	1,03E0	1,97E-2	9,05E0	1,01E1	1,21E-1	2,53E-2	MND	MND	MND	MND	MND	MND	MND	0E0	1,13E-3	9,78E-2	4,44E-5	-5,68E-1
Renew. PER as material	MJ	0E0	0E0	2,21E-1	2,21E-1	0E0	-2,21E-1	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Total use of renew. PER	MJ	1,03E0	1,97E-2	9,27E0	1,03E1	1,21E-1	-1,96E-1	MND	MND	MND	MND	MND	MND	MND	0E0	1,13E-3	9,78E-2	4,44E-5	-5,68E-1
Non-re. PER as energy	MJ	2,97E1	1,06E0	2,61E0	3,34E1	8,5E0	4,29E-1	MND	MND	MND	MND	MND	MND	MND	0E0	9,88E-2	2,5E0	2,51E-3	-1,57E1
Non-re. PER as material	MJ	5,22E1	0E0	2,15E0	5,43E1	0E0	-6,46E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	-4,74E1	-4,78E-1	-3,24E1
Total use of non-re. PER	MJ	8,19E1	1,06E0	4,76E0	8,77E1	8,5E0	-6,03E0	MND	MND	MND	MND	MND	MND	MND	0E0	9,88E-2	-4,49E1	-4,76E-1	-4,81E1
Secondary materials	kg	4,99E-3	0E0	4,74E-4	5,46E-3	0E0	1,3E-3	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	6,76E-1
Renew. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Non-ren. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Use of net fresh water	m ³	6,78E-3	2,39E-4	1,74E-3	8,77E-3	1,61E-3	6,83E-4	MND	MND	MND	MND	MND	MND	MND	0E0	1,89E-5	8,33E-4	2,81E-6	-2,78E-3

8) PER = 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	1,15E-1	2,3E-3	1,58E-2	1,33E-1	8,84E-3	3,31E-3	MND	MND	MND	MND	MND	MND	MND	0E0	1,3E-4	0E0	4,58E-6	-7,41E-3
Non-hazardous waste	kg	2,43E0	8,1E-2	3,73E-1	2,88E0	7,35E-1	6,47E-2	MND	MND	MND	MND	MND	MND	MND	0E0	8,81E-3	0E0	1E-2	2,05E-2
Radioactive waste	kg	2,41E-5	6,85E-6	5,36E-6	3,63E-5	5,81E-5	1,51E-6	MND	MND	MND	MND	MND	MND	MND	0E0	6,54E-7	0E0	1,5E-8	1,39E-6

END OF LIFE – OUTPUT FLOWS

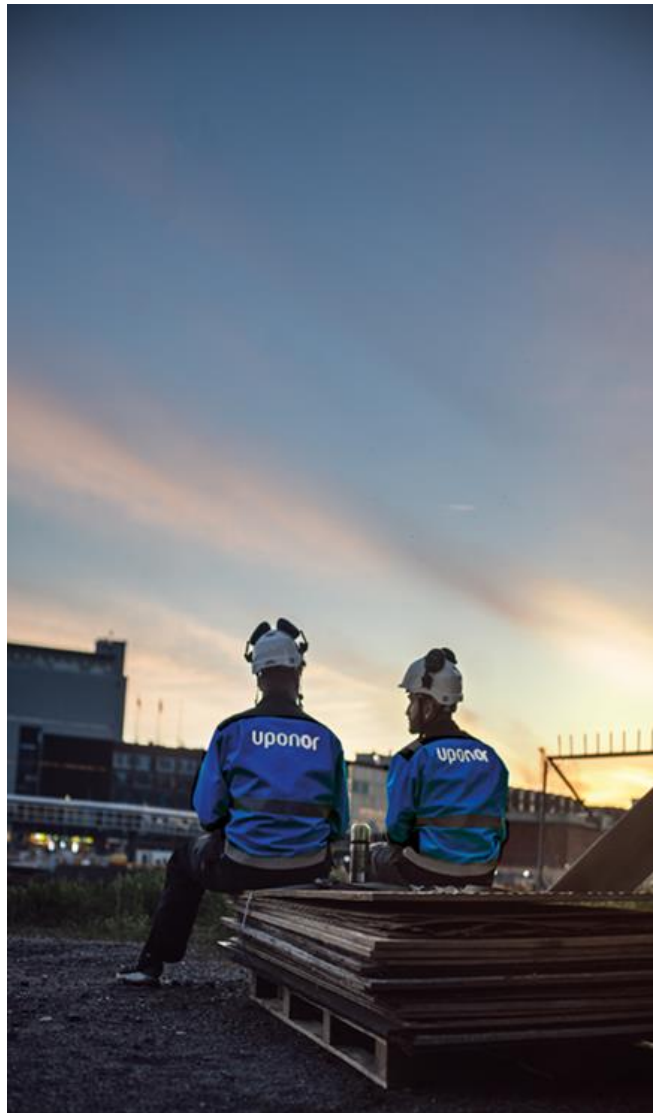
Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Materials for recycling	kg	0E0	0E0	1,54E-1	1,54E-1	0E0	1,01E-1	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	6,3E-1	0E0	0E0
Materials for energy rec	kg	0E0	0E0	6,8E-3	6,8E-3	0E0	8,58E-3	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	2,63E-1	0E0	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0

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 Pot.	kg CO ₂ e	2,49E0	7,56E-2	2,37E-1	2,8E0	5,52E-1	3,84E-2	MND	MND	MND	MND	MND	MND	MND	0E0	6,55E-3	1,27E0	1,05E-3	-1,2E0
Ozone depletion Pot.	kg CFC ₁₁ e	4,99E-8	1,2E-8	9,39E-9	7,13E-8	1,02E-7	2,61E-9	MND	MND	MND	MND	MND	MND	MND	0E0	1,15E-9	1,59E-8	2,61E-11	-4,24E-8
Acidification	kg SO ₂ e	9,37E-3	2,9E-4	8,44E-4	1,05E-2	1,14E-3	1,18E-4	MND	MND	MND	MND	MND	MND	MND	0E0	2,01E-5	6,7E-4	9,99E-7	-3,1E-3
Eutrophication	kg PO ₄ ³ e	2,32E-3	5,94E-5	4,29E-4	2,81E-3	2,36E-4	1,06E-4	MND	MND	MND	MND	MND	MND	MND	0E0	4,61E-6	8,06E-4	5,22E-5	1,3E-4
POCP (“smog”)	kg C ₂ H ₄ e	7,56E-4	1,57E-5	8,45E-5	8,56E-4	7,34E-5	1,37E-5	MND	MND	MND	MND	MND	MND	MND	0E0	8,7E-7	6,7E-5	2,18E-7	-3,82E-4
ADP-elements	kg Sbe	2,4E-5	9,46E-7	5,31E-6	3,03E-5	1,39E-5	1,39E-6	MND	MND	MND	MND	MND	MND	MND	0E0	1,61E-7	3,16E-6	1,14E-9	-6,89E-6
ADP-fossil	MJ	8,19E1	1,06E0	5,08E0	8,8E1	8,5E0	4,39E-1	MND	MND	MND	MND	MND	MND	MND	0E0	9,88E-2	2,5E0	2,51E-3	-4,81E1

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 Pot.	kg CO ₂ e	2,51E0	7,53E-2	2,39E-1	2,83E0	5,51E-1	3,87E-2	MND	MND	MND	MND	MND	MND	MND	0E0	6,54E-3	1,27E0	1,11E-3	-1,21E0
Ozone Depletion	kg CFC ₁₁ e	6,33E-8	1,61E-8	1,21E-8	9,15E-8	1,35E-7	3,46E-9	MND	MND	MND	MND	MND	MND	MND	0E0	1,54E-9	2,1E-8	3,49E-11	-5,6E-8
Acidification	kg SO ₂ e	9,34E-3	6,13E-4	8,85E-4	1,08E-2	1,99E-3	1,38E-4	MND	MND	MND	MND	MND	MND	MND	0E0	2,42E-5	8,06E-4	8,25E-7	-3,22E-3
Eutrophication	kg Ne	7,4E-4	5,57E-5	1,03E-4	8,99E-4	2,82E-4	2,19E-5	MND	MND	MND	MND	MND	MND	MND	0E0	3,36E-6	1,56E-4	4,55E-7	-9,48E-5
POCP (“smog”)	kg O ₃ e	1,21E-1	1,59E-2	1,25E-2	1,49E-1	4,3E-2	2,35E-3	MND	MND	MND	MND	MND	MND	MND	0E0	5,1E-4	1,71E-2	1,96E-5	-4,33E-2
ADP-fossil	MJ	1,13E1	1,45E-1	6,55E-1	1,21E1	1,21E0	4,37E-2	MND	MND	MND	MND	MND	MND	MND	0E0	1,39E-2	3,12E-1	3,44E-4	-7,35E0



VERIFICATION STATEMENT

VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with reference standard, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The digital background data for this EPD

Why does verification transparency matter? [Read more online](#)

This EPD has been generated by One Click LCA EPD generator, which has been verified and approved by the EPD Hub.

THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried out, the presentation of environmental data in the EPD, and other additional environmental information, as present with respect to the procedural and methodological requirements in ISO 14025:2010 and reference standard.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

Elma Avdyli as an authorized verifier acting for EPD Hub Limited
10.06.2023



ANNEX 1: CONVERSION TABLE FOR PRODUCT STAGE (A1-A3) GWP-TOTAL – EN 15804+A2, PEF

Product Number	Product Description	Unit Product Weight (kg/ft of pipe)	GWP – total, Stages A1-A3 (kg CO2e/ft of pipe)	Product Length (ft)	GWP – total, Stages A1-A3 (kg CO2e)
A1140313	5/16" Wirsbo hePEX, 100-ft. coil	0,014	4,21E-2	100,0	4,21E+0
A1140375	3/8" Wirsbo hePEX, 100-ft. coil	0,019	5,72E-2	100,0	5,72E+0
A1140500	1/2" Wirsbo hePEX, 100-ft. coil	0,024	7,22E-2	100,0	7,22E+0
A1140625	5/8" Wirsbo hePEX, 100-ft. coil	0,034	1,02E-1	100,0	1,02E+1
A1140750	3/4" Wirsbo hePEX, 100-ft. coil	0,046	1,38E-1	100,0	1,38E+1
A1141000	1" Wirsbo hePEX, 100-ft. coil	0,077	2,32E-1	100,0	2,32E+1
A1141250	1 1/4" Wirsbo hePEX, 100-ft. coil	0,109	3,28E-1	100,0	3,28E+1
A1141500	1 1/2" Wirsbo hePEX, 100-ft. coil	0,158	4,76E-1	100,0	4,76E+1
A1142000	2" Wirsbo hePEX, 100-ft. coil	0,273	8,22E-1	100,0	8,22E+1
A1180313	5/16" Wirsbo hePEX, 250-ft. coil	0,014	4,21E-2	250,0	1,05E+1
A1210375	3/8" Wirsbo hePEX, 400-ft. coil	0,019	5,72E-2	400,0	2,29E+1
A1210625	5/8" Wirsbo hePEX, 400-ft. coil	0,034	1,02E-1	400,0	4,09E+1
A1220313	5/16" Wirsbo hePEX, 1,000-ft. coil	0,014	4,21E-2	1000,0	4,21E+1
A1220375	3/8" Wirsbo hePEX, 1,000-ft. coil	0,019	5,72E-2	1000,0	5,72E+1
A1220500	1/2" Wirsbo hePEX, 1,000-ft. coil	0,024	7,22E-2	1000,0	7,22E+1
A1220625	5/8" Wirsbo hePEX, 1,000-ft. coil	0,034	1,02E-1	1000,0	1,02E+2
A1220750	3/4" Wirsbo hePEX, 1,000-ft. coil	0,046	1,38E-1	1000,0	1,38E+2
A1240750	3/4" Wirsbo hePEX, 500-ft. coil	0,046	1,38E-1	500,0	6,92E+1
A1241000	1" Wirsbo hePEX, 500-ft. coil	0,077	2,32E-1	500,0	1,16E+2
A1250500	1/2" Wirsbo hePEX, 300-ft. coil	0,024	7,22E-2	300,0	2,17E+1
A1250625	5/8" Wirsbo hePEX, 300-ft. coil	0,034	1,02E-1	300,0	3,07E+1
A1250750	3/4" Wirsbo hePEX, 300-ft. coil	0,046	1,38E-1	300,0	4,15E+1
A1251000	1" Wirsbo hePEX, 300-ft. coil	0,077	2,32E-1	300,0	6,95E+1
A1251250	1 1/4" Wirsbo hePEX, 300-ft. coil	0,109	3,28E-1	300,0	9,84E+1
A1251500	1 1/2" Wirsbo hePEX, 300-ft. coil	0,158	4,76E-1	300,0	1,43E+2
A1252000	2" Wirsbo hePEX, 300-ft. coil	0,273	8,22E-1	300,0	2,47E+2
A1260500	1/2" Wirsbo hePEX, 500-ft. coil	0,024	7,22E-2	500,0	3,61E+1
A1921000	1" Wirsbo hePEX, 20-ft. straight length, 200 ft. (10 per bundle)	0,077	2,32E-1	200,0	4,64E+1
A1921250	1 1/4" Wirsbo hePEX, 20-ft. straight length, 100 ft. (5 per bundle)	0,109	3,28E-1	100,0	3,28E+1
A1921500	1 1/2" Wirsbo hePEX, 20-ft. straight length, 100 ft. (5 per bundle)	0,158	4,76E-1	100,0	4,76E+1
A1922000	2" Wirsbo hePEX, 20-ft. straight length, 100 ft. (5 per bundle)	0,273	8,22E-1	100,0	8,22E+1
A1922500	2 1/2" Wirsbo hePEX 20-ft. straight length, 60 ft. (3 per bundle)	0,418	1,26E+0	60,0	7,55E+1

A1923000	3" Wirsbo hePEX 20-ft. straight length, 40 ft. (2 per bundle)	0,588	1,77E+0	40,0	7,08E+1
A1930500	1/2" Wirsbo hePEX, 20-ft. straight length, 500 ft. (25 per bundle)	0,024	7,22E-2	500,0	3,61E+1
A1930625	5/8" Wirsbo hePEX, 20-ft. straight length, 300 ft. (15 per bundle)	0,034	1,02E-1	300,0	3,07E+1
A1930750	3/4" Wirsbo hePEX, 20-ft. straight length, 300 ft. (15 per bundle)	0,046	1,38E-1	300,0	4,15E+1

ANNEX 2: CONVERSION TABLE FOR PRODUCT STAGE (A1-A3) GWP – EN 15804+A1, CML/ISO 21930

Product Number	Product Description	Unit Product Weight (kg/ft of pipe)	GWP – total, Stages A1-A3 (kg CO2e/ft of pipe)	Product Length (ft)	GWP – total, Stages A1-A3 (kg CO2e)
A1140313	5/16" Wirsbo hePEX, 100-ft. coil	0,014	3,92E-2	100,0	3,92E+0
A1140375	3/8" Wirsbo hePEX, 100-ft. coil	0,019	5,32E-2	100,0	5,32E+0
A1140500	1/2" Wirsbo hePEX, 100-ft. coil	0,024	6,72E-2	100,0	6,72E+0
A1140625	5/8" Wirsbo hePEX, 100-ft. coil	0,034	9,52E-2	100,0	9,52E+0
A1140750	3/4" Wirsbo hePEX, 100-ft. coil	0,046	1,29E-1	100,0	1,29E+1
A1141000	1" Wirsbo hePEX, 100-ft. coil	0,077	2,16E-1	100,0	2,16E+1
A1141250	1 1/4" Wirsbo hePEX, 100-ft. coil	0,109	3,05E-1	100,0	3,05E+1
A1141500	1 1/2" Wirsbo hePEX, 100-ft. coil	0,158	4,42E-1	100,0	4,42E+1
A1142000	2" Wirsbo hePEX, 100-ft. coil	0,273	7,64E-1	100,0	7,64E+1
A1180313	5/16" Wirsbo hePEX, 250-ft. coil	0,014	3,92E-2	250,0	9,80E+0
A1210375	3/8" Wirsbo hePEX, 400-ft. coil	0,019	5,32E-2	400,0	2,13E+1
A1210625	5/8" Wirsbo hePEX, 400-ft. coil	0,034	9,52E-2	400,0	3,81E+1
A1220313	5/16" Wirsbo hePEX, 1,000-ft. coil	0,014	3,92E-2	1000,0	3,92E+1
A1220375	3/8" Wirsbo hePEX, 1,000-ft. coil	0,019	5,32E-2	1000,0	5,32E+1
A1220500	1/2" Wirsbo hePEX, 1,000-ft. coil	0,024	6,72E-2	1000,0	6,72E+1
A1220625	5/8" Wirsbo hePEX, 1,000-ft. coil	0,034	9,52E-2	1000,0	9,52E+1
A1220750	3/4" Wirsbo hePEX, 1,000-ft. coil	0,046	1,29E-1	1000,0	1,29E+2
A1240750	3/4" Wirsbo hePEX, 500-ft. coil	0,046	1,29E-1	500,0	6,44E+1
A1241000	1" Wirsbo hePEX, 500-ft. coil	0,077	2,16E-1	500,0	1,08E+2
A1250500	1/2" Wirsbo hePEX, 300-ft. coil	0,024	6,72E-2	300,0	2,02E+1
A1250625	5/8" Wirsbo hePEX, 300-ft. coil	0,034	9,52E-2	300,0	2,86E+1
A1250750	3/4" Wirsbo hePEX, 300-ft. coil	0,046	1,29E-1	300,0	3,86E+1
A1251000	1" Wirsbo hePEX, 300-ft. coil	0,077	2,16E-1	300,0	6,47E+1
A1251250	1 1/4" Wirsbo hePEX, 300-ft. coil	0,109	3,05E-1	300,0	9,16E+1
A1251500	1 1/2" Wirsbo hePEX, 300-ft. coil	0,158	4,42E-1	300,0	1,33E+2
A1252000	2" Wirsbo hePEX, 300-ft. coil	0,273	7,64E-1	300,0	2,29E+2

A1260500	1/2" Wirsbo hePEX, 500-ft. coil	0,024	6,72E-2	500,0	3,36E+1
A1921000	1" Wirsbo hePEX, 20-ft. straight length, 200 ft. (10 per bundle)	0,077	2,16E-1	200,0	4,31E+1
A1921250	1 1/4" Wirsbo hePEX, 20-ft. straight length, 100 ft. (5 per bundle)	0,109	3,05E-1	100,0	3,05E+1
A1921500	1 1/2" Wirsbo hePEX, 20-ft. straight length, 100 ft. (5 per bundle)	0,158	4,42E-1	100,0	4,42E+1
A1922000	2" Wirsbo hePEX, 20-ft. straight length, 100 ft. (5 per bundle)	0,273	7,64E-1	100,0	7,64E+1
A1922500	2 1/2" Wirsbo hePEX 20-ft. straight length, 60 ft. (3 per bundle)	0,418	1,17E+0	60,0	7,02E+1
A1923000	3" Wirsbo hePEX 20-ft. straight length, 40 ft. (2 per bundle)	0,588	1,65E+0	40,0	6,59E+1
A1930500	1/2" Wirsbo hePEX, 20-ft. straight length, 500 ft. (25 per bundle)	0,024	6,72E-2	500,0	3,36E+1
A1930625	5/8" Wirsbo hePEX, 20-ft. straight length, 300 ft. (15 per bundle)	0,034	9,52E-2	300,0	2,86E+1
A1930750	3/4" Wirsbo hePEX, 20-ft. straight length, 300 ft. (15 per bundle)	0,046	1,29E-1	300,0	3,86E+1

ANNEX 3: CONVERSION TABLE FOR PRODUCT STAGE (A1-A3) GWP – TRACI 2.1. / ISO 21930

Product Number	Product Description	Unit Product Weight (kg/ft of pipe)	GWP – total, Stages A1-A3 (kg CO2e/ft of pipe)	Product Length (ft)	GWP – total, Stages A1-A3 (kg CO2e)
A1140313	5/16" Wirsbo hePEX, 100-ft. coil	0,014	3,96E-2	100,0	3,96E+0
A1140375	3/8" Wirsbo hePEX, 100-ft. coil	0,019	5,38E-2	100,0	5,38E+0
A1140500	1/2" Wirsbo hePEX, 100-ft. coil	0,024	6,79E-2	100,0	6,79E+0
A1140625	5/8" Wirsbo hePEX, 100-ft. coil	0,034	9,62E-2	100,0	9,62E+0
A1140750	3/4" Wirsbo hePEX, 100-ft. coil	0,046	1,30E-1	100,0	1,30E+1
A1141000	1" Wirsbo hePEX, 100-ft. coil	0,077	2,18E-1	100,0	2,18E+1
A1141250	1 1/4" Wirsbo hePEX, 100-ft. coil	0,109	3,08E-1	100,0	3,08E+1
A1141500	1 1/2" Wirsbo hePEX, 100-ft. coil	0,158	4,47E-1	100,0	4,47E+1
A1142000	2" Wirsbo hePEX, 100-ft. coil	0,273	7,73E-1	100,0	7,73E+1
A1180313	5/16" Wirsbo hePEX, 250-ft. coil	0,014	3,96E-2	250,0	9,91E+0
A1210375	3/8" Wirsbo hePEX, 400-ft. coil	0,019	5,38E-2	400,0	2,15E+1
A1210625	5/8" Wirsbo hePEX, 400-ft. coil	0,034	9,62E-2	400,0	3,85E+1
A1220313	5/16" Wirsbo hePEX, 1,000-ft. coil	0,014	3,96E-2	1000,0	3,96E+1
A1220375	3/8" Wirsbo hePEX, 1,000-ft. coil	0,019	5,38E-2	1000,0	5,38E+1
A1220500	1/2" Wirsbo hePEX, 1,000-ft. coil	0,024	6,79E-2	1000,0	6,79E+1
A1220625	5/8" Wirsbo hePEX, 1,000-ft. coil	0,034	9,62E-2	1000,0	9,62E+1
A1220750	3/4" Wirsbo hePEX, 1,000-ft. coil	0,046	1,30E-1	1000,0	1,30E+2
A1240750	3/4" Wirsbo hePEX, 500-ft. coil	0,046	1,30E-1	500,0	6,51E+1
A1241000	1" Wirsbo hePEX, 500-ft. coil	0,077	2,18E-1	500,0	1,09E+2
A1250500	1/2" Wirsbo hePEX, 300-ft. coil	0,024	6,79E-2	300,0	2,04E+1

A1250625	5/8" Wirsbo hePEX, 300-ft. coil	0,034	9,62E-2	300,0	2,89E+1
A1250750	3/4" Wirsbo hePEX, 300-ft. coil	0,046	1,30E-1	300,0	3,91E+1
A1251000	1" Wirsbo hePEX, 300-ft. coil	0,077	2,18E-1	300,0	6,54E+1
A1251250	1 1/4" Wirsbo hePEX, 300-ft. coil	0,109	3,08E-1	300,0	9,25E+1
A1251500	1 1/2" Wirsbo hePEX, 300-ft. coil	0,158	4,47E-1	300,0	1,34E+2
A1252000	2" Wirsbo hePEX, 300-ft. coil	0,273	7,73E-1	300,0	2,32E+2
A1260500	1/2" Wirsbo hePEX, 500-ft. coil	0,024	6,79E-2	500,0	3,40E+1
A1921000	1" Wirsbo hePEX, 20-ft. straight length, 200 ft. (10 per bundle)	0,077	2,18E-1	200,0	4,36E+1
A1921250	1 1/4" Wirsbo hePEX, 20-ft. straight length, 100 ft. (5 per bundle)	0,109	3,08E-1	100,0	3,08E+1
A1921500	1 1/2" Wirsbo hePEX, 20-ft. straight length, 100 ft. (5 per bundle)	0,158	4,47E-1	100,0	4,47E+1
A1922000	2" Wirsbo hePEX, 20-ft. straight length, 100 ft. (5 per bundle)	0,273	7,73E-1	100,0	7,73E+1
A1922500	2 1/2" Wirsbo hePEX 20-ft. straight length, 60 ft. (3 per bundle)	0,418	1,18E+0	60,0	7,10E+1
A1923000	3" Wirsbo hePEX 20-ft. straight length, 40 ft. (2 per bundle)	0,588	1,66E+0	40,0	6,66E+1
A1930500	1/2" Wirsbo hePEX, 20-ft. straight length, 500 ft. (25 per bundle)	0,024	6,79E-2	500,0	3,40E+1
A1930625	5/8" Wirsbo hePEX, 20-ft. straight length, 300 ft. (15 per bundle)	0,034	9,62E-2	300,0	2,89E+1
A1930750	3/4" Wirsbo hePEX, 20-ft. straight length, 300 ft. (15 per bundle)	0,046	1,30E-1	300,0	3,91E+1