

ENVIRONMENTAL PRODUCT DECLARATION

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

Uponor PVC Sewer pipes
Uponor Corporation



EPD HUB, HUB-1576

Published on 13.06.2024, last updated on 13.06.2024, valid until 13.06.2029.

GENERAL INFORMATION

MANUFACTURER

| | |
|-----------------|--|
| Manufacturer | Uponor Corporation |
| Address | Ilmalantori 4, 00240 Helsinki, 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 1.1, 5 Dec 2023 |
| Sector | Construction product |
| Category of EPD | Third party verified EPD |
| Parent EPD number | |
| Scope of the EPD | Cradle to gate with options, A4-A5, and modules C1-C4, D |
| EPD author | Thomas Vogel |
| EPD verification | Independent verification of this EPD and data, according to ISO 14025: <input type="checkbox"/> Internal verification <input checked="" type="checkbox"/> External verification |
| EPD verifier | Edis Glogic, as an authorized verifier acting for EPD Hub Limited |

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 | Uponor PVC Sewer pipes |
| Additional labels | Uponor PVC Sewer pipes, |
| Product reference | 1054104 1054106 1054112 1086366 1054110 1054105 1054107 1054113 1085817 1050211 1050196 1050198 1050212 1085728 1050201 1050213 1086367 1050203 1067920 1050214 1088990 1050206 1067921 1050215 1050209 1067922 |
| Place of production | Kouvolantie 365, 15550 Nastola, Finland |
| Period for data | 2022 (calendar year) |
| Averaging in EPD | No averaging |
| Variation in GWP-fossil for A1-A3 | % |

ENVIRONMENTAL DATA SUMMARY

| | |
|---|--------------|
| Declared unit | 1 kg of pipe |
| Declared unit mass | 1 kg |
| GWP-fossil, A1-A3 (kgCO ₂ e) | 3,05E+00 |
| GWP-total, A1-A3 (kgCO ₂ e) | 3,04E+00 |
| Secondary material, inputs (%) | 0.8 |
| Secondary material, outputs (%) | 3.76 |
| Total energy use, A1-A3 (kWh) | 13.7 |
| Net freshwater use, A1-A3 (m ³) | 0.05 |

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

Uponor PVC Sewer pipes, range OD 110-400 mm is a smooth pipe system for gravity sewer applications.

The pipes are made of unplasticized polyvinyl chloride (PVC-U) and have a ring stiffness rating of SN8.

The colour of the system is red brown.

PVC is corrosion resistant and effectively withstands most solvents, acids, bases, and lubricants.

The smooth, massive wall design is developed for impact-resistant and durable pipes.

The pipes got NPM approval and fills standard EN 1401.

The different weights per m of pipe for the various nominal widths can be found in Annex 1 and 2.

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 | 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 | 0.00267 |

FUNCTIONAL UNIT AND SERVICE LIFE

| | |
|------------------------|--------------|
| Declared unit | 1 kg of pipe |
| Mass per declared unit | 1 kg |
| Functional unit | - |
| Reference service life | - |

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.

Manufacturing and Packaging

The production method is a pipe extrusion with in-line socketing. Socket and pipe of same material. The different stages are:

- Material conveying

- Extrusion (melting and processing of material)
- Cooling
- Cutting
- Socketing
- Packing

The finished product is packed on a wooden U-frame with a wooden lath on top of it. The number 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 around to tighten the package.

Differences in packaging can occur.

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. The average distance of transportation from the production plant to the installation site is based on the actual sales average figures of the company in the local markets. The installation scenarios in Uponor's infrastructure product EPDs are based on TEPPFA'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 effluents of typical European installations; these parameters have been used as input for the Uponor EPD modelling. Environmental impacts from installation include standardized energy and installation tools, waste packaging materials and release of biogenic carbon dioxide from wood pallets.

Reference: <https://www.teppfa.eu/sustainability/environmental-footprint/epd/>

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)

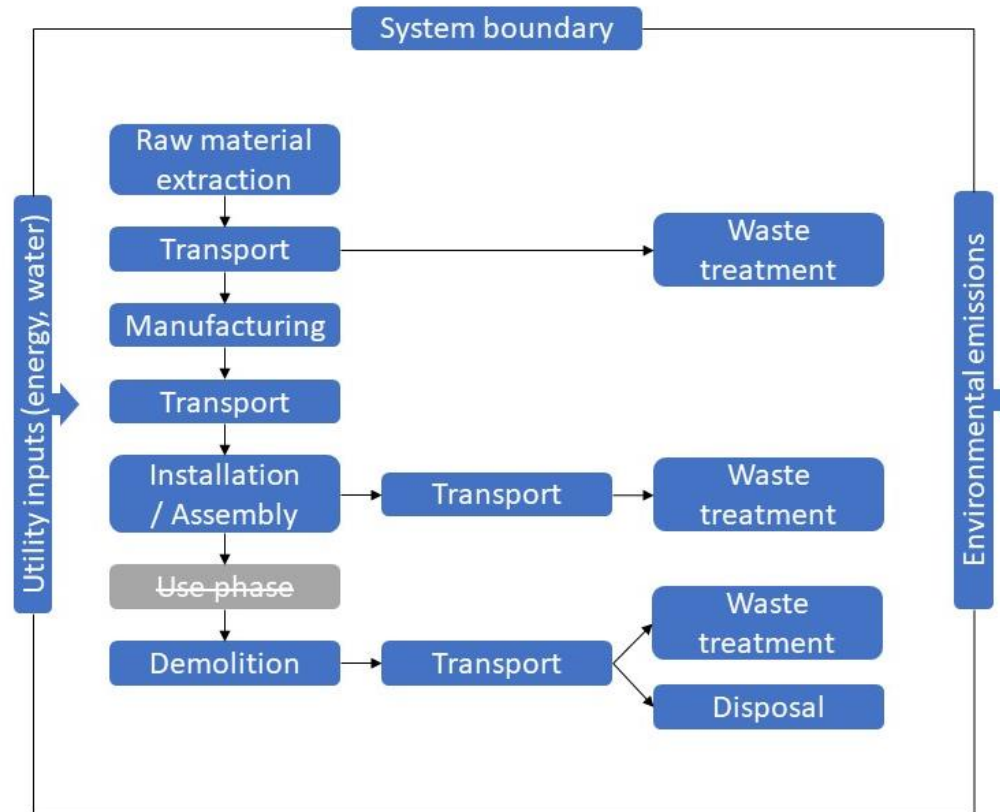
Since the consumption of energy and natural resources is negligible for disassembling of the end-of-life product, the impacts of demolition are

assumed negligible (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 PE, the end-of-life product is converted into recycled PE (D).

MANUFACTURING PROCESS AND SYSTEM BOUNDARY



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:

| Data type | Allocation |
|--------------------------------|-----------------------------|
| Raw materials | No allocation |
| Packaging materials | No allocation |
| Ancillary materials | No allocation |
| Manufacturing energy and waste | Allocated by mass or volume |

AVERAGES AND VARIABILITY

| | |
|-----------------------------------|----------------|
| Type of average | No averaging |
| Averaging method | Not applicable |
| Variation in GWP-fossil for A1-A3 | % |

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. The EPD Generator uses Ecoinvent v3.8, Plastics Europe, Federal LCA Commons and One Click LCA databases 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 | 2,19E+00 | 3,57E-01 | 4,94E-01 | 3,04E+00 | 6,83E-02 | 1,29E-01 | MND | MND | MND | MND | MND | MND | MND | 2,35E-05 | 2,35E-04 | 6,04E-02 | 7,25E-03 | -1,11E-01 |
| GWP – fossil | kg CO ₂ e | 2,19E+00 | 3,57E-01 | 5,01E-01 | 3,05E+00 | 6,82E-02 | 1,19E-01 | MND | MND | MND | MND | MND | MND | MND | 2,33E-05 | 2,35E-04 | 6,04E-02 | 7,25E-03 | -1,11E-01 |
| GWP – biogenic | kg CO ₂ e | 0,00E+00 | 0,00E+00 | -9,78E-03 | -9,78E-03 | 0,00E+00 | 9,78E-03 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| GWP – LULUC | kg CO ₂ e | 2,08E-03 | 1,41E-04 | 3,22E-03 | 5,44E-03 | 2,52E-05 | 1,53E-05 | MND | MND | MND | MND | MND | MND | MND | 2,19E-07 | 8,65E-08 | 8,18E-06 | 6,15E-06 | -9,67E-05 |
| Ozone depletion pot. | kg CFC ₁₁ e | 9,64E-07 | 8,24E-08 | 5,38E-08 | 1,10E-06 | 1,57E-08 | 2,54E-08 | MND | MND | MND | MND | MND | MND | MND | 9,54E-13 | 5,40E-11 | 1,94E-09 | 1,95E-09 | -5,61E-08 |
| Acidification potential | mol H ⁺ e | 1,03E-02 | 1,60E-03 | 1,80E-03 | 1,37E-02 | 2,89E-04 | 1,21E-03 | MND | MND | MND | MND | MND | MND | MND | 8,04E-08 | 9,93E-07 | 4,79E-05 | 5,44E-05 | -5,07E-04 |
| EP-freshwater ²⁾ | kg Pe | 7,23E-05 | 2,53E-06 | 1,42E-05 | 8,90E-05 | 5,59E-07 | 5,93E-07 | MND | MND | MND | MND | MND | MND | MND | 7,17E-10 | 1,92E-09 | 1,99E-07 | 1,06E-07 | -3,09E-06 |
| EP-marine | kg Ne | 1,88E-03 | 4,69E-04 | 3,01E-04 | 2,65E-03 | 8,59E-05 | 5,28E-04 | MND | MND | MND | MND | MND | MND | MND | 1,54E-08 | 2,95E-07 | 1,28E-05 | 1,89E-05 | -9,01E-05 |
| EP-terrestrial | mol Ne | 2,03E-02 | 5,18E-03 | 3,54E-03 | 2,91E-02 | 9,47E-04 | 5,79E-03 | MND | MND | MND | MND | MND | MND | MND | 1,92E-07 | 3,26E-06 | 1,35E-04 | 2,07E-04 | -9,85E-04 |
| POCP (“smog”) ³⁾ | kg NMVOCe | 6,55E-03 | 1,57E-03 | 1,00E-03 | 9,13E-03 | 3,03E-04 | 1,60E-03 | MND | MND | MND | MND | MND | MND | MND | 4,73E-08 | 1,04E-06 | 4,09E-05 | 5,96E-05 | -3,24E-04 |
| ADP-minerals & metals ⁴⁾ | kg Sbe | 3,89E-05 | 1,21E-06 | 1,79E-06 | 4,19E-05 | 1,60E-07 | 8,79E-08 | MND | MND | MND | MND | MND | MND | MND | 5,27E-11 | 5,50E-10 | 8,65E-08 | 2,53E-08 | -2,03E-06 |
| ADP-fossil resources | MJ | 4,58E+01 | 5,29E+00 | 1,29E+01 | 6,40E+01 | 1,02E+00 | 1,60E+00 | MND | MND | MND | MND | MND | MND | MND | 7,55E-04 | 3,52E-03 | 9,76E-02 | 1,44E-01 | -2,41E+00 |
| Water use ⁵⁾ | m ³ e depr. | 1,26E+00 | 2,43E-02 | 2,43E-01 | 1,53E+00 | 4,59E-03 | 6,63E-03 | MND | MND | MND | MND | MND | MND | MND | 1,38E-05 | 1,58E-05 | 5,42E-03 | 8,86E-04 | -6,81E-02 |

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and 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 experience with the indicator.

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 | 9,29E-08 | 3,16E-08 | 1,30E-08 | 1,37E-07 | 7,86E-09 | 3,20E-08 | MND | MND | MND | MND | MND | MND | MND | 5,10E-13 | 2,70E-11 | 4,75E-08 | 1,04E-09 | -4,49E-09 |
| Ionizing radiation ⁶⁾ | kBq U235e | 1,50E-01 | 2,74E-02 | 5,21E-01 | 6,98E-01 | 4,88E-03 | 7,51E-03 | MND | MND | MND | MND | MND | MND | MND | 3,90E-05 | 1,68E-05 | 6,49E-04 | 7,69E-04 | -2,66E-03 |
| Ecotoxicity (freshwater) | CTUe | 4,83E+01 | 4,42E+00 | 1,37E+01 | 6,64E+01 | 9,22E-01 | 1,06E+00 | MND | MND | MND | MND | MND | MND | MND | 4,43E-04 | 3,17E-03 | 3,31E+00 | 1,13E-01 | -2,16E+00 |
| Human toxicity, cancer | CTUh | 1,47E-09 | 1,35E-10 | 2,55E-10 | 1,86E-09 | 2,26E-11 | 5,82E-11 | MND | MND | MND | MND | MND | MND | MND | 9,38E-15 | 7,79E-14 | 1,16E-09 | 4,85E-12 | -7,39E-11 |
| Human tox. non-cancer | CTUh | 3,94E-08 | 4,46E-09 | 5,73E-09 | 4,96E-08 | 9,12E-10 | 7,87E-10 | MND | MND | MND | MND | MND | MND | MND | 2,33E-13 | 3,14E-12 | 1,10E-09 | 9,06E-11 | -1,95E-09 |
| SQP ⁷⁾ | - | 5,70E+00 | 3,92E+00 | 4,51E+00 | 1,41E+01 | 1,18E+00 | 2,19E-01 | MND | MND | MND | MND | MND | MND | MND | 2,96E-04 | 4,06E-03 | 6,67E-02 | 2,81E-01 | -1,99E-01 |

6) 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; 7) SQP = Land use related impacts/soil quality.

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 | 1,77E+00 | 7,37E-02 | 2,69E+00 | 4,53E+00 | 1,15E-02 | 1,37E-02 | MND | MND | MND | MND | MND | MND | MND | 1,91E-04 | 3,97E-05 | 8,17E-03 | 2,92E-03 | -5,86E-02 |
| Renew. PER as material | MJ | 0,00E+00 | 0,00E+00 | 8,57E-02 | 8,57E-02 | 0,00E+00 | -8,57E-02 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Total use of renew. PER | MJ | 1,77E+00 | 7,37E-02 | 2,77E+00 | 4,61E+00 | 1,15E-02 | -7,19E-02 | MND | MND | MND | MND | MND | MND | MND | 1,91E-04 | 3,97E-05 | 8,17E-03 | 2,92E-03 | -5,86E-02 |
| Non-re. PER as energy | MJ | 2,80E+01 | 5,29E+00 | 1,16E+01 | 4,49E+01 | 1,02E+00 | 1,59E+00 | MND | MND | MND | MND | MND | MND | MND | 7,55E-04 | 3,52E-03 | 9,77E-02 | 1,44E-01 | -1,33E+00 |
| Non-re. PER as material | MJ | 1,78E+01 | 0,00E+00 | 5,66E-03 | 1,78E+01 | 0,00E+00 | -5,66E-03 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | -8,91E-01 | -1,69E+01 | 0,00E+00 |
| Total use of non-re. PER | MJ | 4,58E+01 | 5,29E+00 | 1,17E+01 | 6,27E+01 | 1,02E+00 | 1,59E+00 | MND | MND | MND | MND | MND | MND | MND | 7,55E-04 | 3,52E-03 | -7,94E-01 | -1,68E+01 | -1,33E+00 |
| Secondary materials | kg | 7,98E-03 | 1,75E-03 | 1,26E-03 | 1,10E-02 | 2,85E-04 | 1,08E-03 | MND | MND | MND | MND | MND | MND | MND | 4,77E-08 | 9,78E-07 | 3,18E-05 | 5,80E-05 | 5,25E-02 |
| Renew. secondary fuels | MJ | 8,26E-05 | 1,89E-05 | 2,91E-03 | 3,02E-03 | 2,87E-06 | 2,66E-06 | MND | MND | MND | MND | MND | MND | MND | 2,19E-10 | 9,87E-09 | 9,01E-06 | 1,55E-06 | -3,04E-06 |
| Non-ren. secondary fuels | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Use of net fresh water | m ³ | 2,99E-02 | 6,64E-04 | 1,47E-02 | 4,53E-02 | 1,33E-04 | 1,26E-04 | MND | MND | MND | MND | MND | MND | MND | 6,42E-07 | 4,56E-07 | 2,49E-03 | 1,17E-04 | -1,56E-03 |

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 | 1,53E-01 | 6,06E-03 | 4,06E-02 | 2,00E-01 | 1,36E-03 | 3,12E-03 | MND | MND | MND | MND | MND | MND | MND | 1,76E-06 | 4,67E-06 | 1,14E-02 | 2,78E-04 | -7,97E-03 |
| Non-hazardous waste | kg | 2,76E+00 | 1,06E-01 | 6,25E-01 | 3,49E+00 | 2,23E-02 | 2,97E-02 | MND | MND | MND | MND | MND | MND | MND | 2,76E-05 | 7,68E-05 | 3,86E-02 | 4,18E-01 | -1,06E-01 |
| Radioactive waste | kg | 5,93E-05 | 3,64E-05 | 1,24E-04 | 2,20E-04 | 6,86E-06 | 1,09E-05 | MND | MND | MND | MND | MND | MND | MND | 8,46E-09 | 2,36E-08 | 3,89E-07 | 9,06E-07 | -1,51E-06 |

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 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Materials for recycling | kg | 0,00E+00 | 0,00E+00 | 2,95E-02 | 2,95E-02 | 0,00E+00 | 4,72E-06 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 5,00E-02 | 0,00E+00 | 0,00E+00 |
| Materials for energy rec | kg | 0,00E+00 | 0,00E+00 | 2,95E-02 | 2,95E-02 | 0,00E+00 | 4,97E-03 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Exported energy | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 6,25E-02 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |

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 | 2,12E+00 | 3,54E-01 | 4,96E-01 | 2,97E+00 | 6,75E-02 | 1,17E-01 | MND | MND | MND | MND | MND | MND | MND | 2,32E-05 | 2,32E-04 | 5,98E-02 | 7,14E-03 | -1,06E-01 |
| Ozone depletion Pot. | kg CFC-11e | 9,57E-07 | 6,53E-08 | 4,48E-08 | 1,07E-06 | 1,24E-08 | 2,02E-08 | MND | MND | MND | MND | MND | MND | MND | 8,48E-13 | 4,27E-11 | 1,78E-09 | 1,55E-09 | -5,60E-08 |
| Acidification | kg SO ₂ e | 8,48E-03 | 1,25E-03 | 1,48E-03 | 1,12E-02 | 2,24E-04 | 8,62E-04 | MND | MND | MND | MND | MND | MND | MND | 6,41E-08 | 7,72E-07 | 3,78E-05 | 4,11E-05 | -4,20E-04 |
| Eutrophication | kg PO ₄ ³ e | 4,39E-03 | 2,68E-04 | 5,94E-04 | 5,25E-03 | 5,11E-05 | 2,05E-04 | MND | MND | MND | MND | MND | MND | MND | 2,92E-08 | 1,76E-07 | 1,54E-04 | 1,24E-05 | -1,23E-04 |
| POCP ("smog") | kg C ₂ H ₄ e | 4,92E-04 | 4,88E-05 | 6,95E-05 | 6,10E-04 | 8,76E-06 | 2,03E-05 | MND | MND | MND | MND | MND | MND | MND | 3,03E-09 | 3,01E-08 | 4,35E-06 | 1,57E-06 | -2,38E-05 |
| ADP-elements | kg Sbe | 3,40E-05 | 1,18E-06 | 1,76E-06 | 3,69E-05 | 1,55E-07 | 8,61E-08 | MND | MND | MND | MND | MND | MND | MND | 5,34E-11 | 5,33E-10 | 6,27E-08 | 2,45E-08 | -1,73E-06 |
| ADP-fossil | MJ | 4,58E+01 | 5,29E+00 | 1,24E+01 | 6,34E+01 | 1,02E+00 | 1,60E+00 | MND | MND | MND | MND | MND | MND | MND | 6,98E-04 | 3,52E-03 | 9,76E-02 | 1,44E-01 | -2,41E+00 |

ENVIRONMENTAL IMPACTS – GWP-GHG - THE INTERNATIONAL EPD SYSTEM

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|-----------------------|----------------------|----------|----------|----------|----------|----------|----------|-----|-----|-----|-----|-----|-----|-----|----------|----------|----------|----------|-----------|
| GWP-GHG ⁹⁾ | kg CO ₂ e | 2,19E+00 | 3,57E-01 | 5,01E-01 | 3,05E+00 | 6,82E-02 | 1,19E-01 | MND | MND | MND | MND | MND | MND | MND | 2,33E-05 | 2,35E-04 | 6,04E-02 | 7,25E-03 | -1,11E-01 |

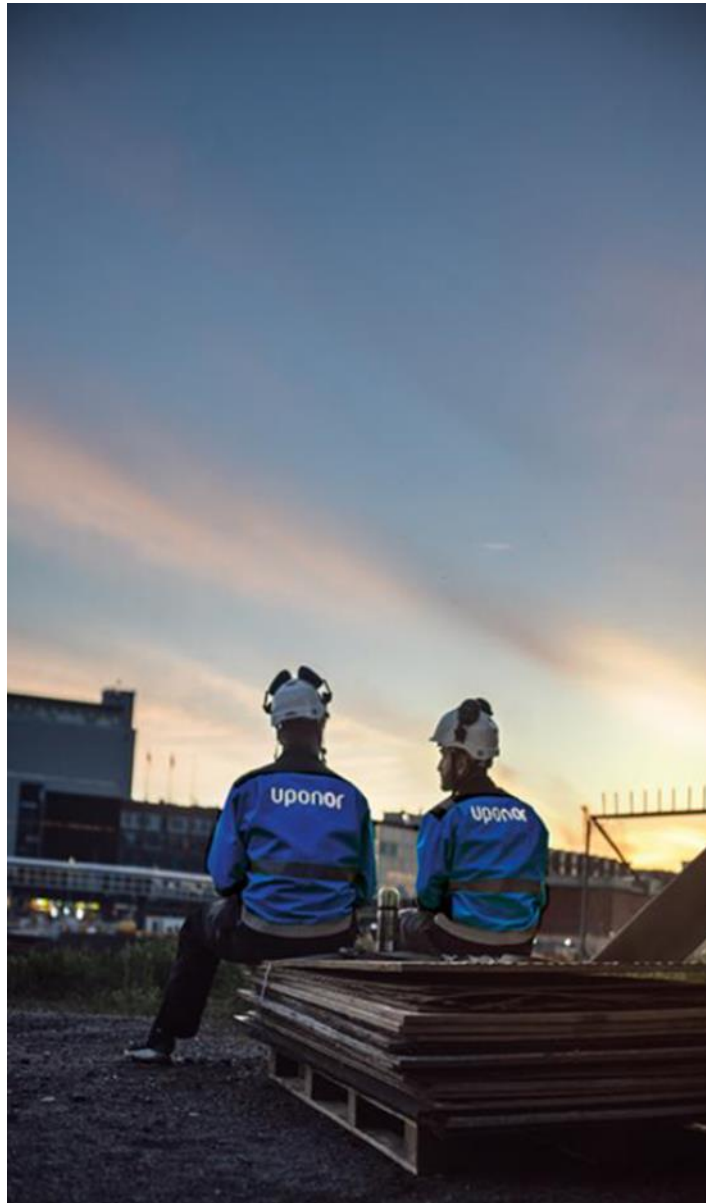
⁹⁾ This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013). In addition, the characterisation factors for the flows - CH₄ fossil, CH₄ biogenic and Dinitrogen monoxide - were updated in line with the guidance of IES PCR 1.2.5 Annex 1. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterization factor for biogenic CO₂ is set to zero.

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 | 2,08E+00 | 3,54E-01 | 4,89E-01 | 2,93E+00 | 6,76E-02 | 1,18E-01 | MND | MND | MND | MND | MND | MND | MND | 2,28E-05 | 2,32E-04 | 5,96E-02 | 7,13E-03 | -1,04E-01 |
| Ozone Depletion | kg CFC ₁₁ e | 9,56E-07 | 6,53E-08 | 4,42E-08 | 1,07E-06 | 1,24E-08 | 2,02E-08 | MND | MND | MND | MND | MND | MND | MND | 7,91E-13 | 4,27E-11 | 1,77E-09 | 1,55E-09 | -5,60E-08 |
| Acidification | kg SO ₂ e | 4,55E-01 | 7,58E-02 | 7,97E-02 | 6,11E-01 | 1,37E-02 | 6,22E-02 | MND | MND | MND | MND | MND | MND | MND | 3,54E-06 | 4,72E-05 | 1,34E-02 | 2,67E-03 | -2,24E-02 |
| Eutrophication | kg Ne | 5,13E-04 | 1,53E-04 | 9,03E-05 | 7,56E-04 | 2,87E-05 | 9,11E-05 | MND | MND | MND | MND | MND | MND | MND | 2,85E-09 | 9,88E-08 | 4,93E-06 | 4,52E-06 | -2,46E-05 |
| POCP ("smog") | kg O ₃ e | 4,64E-03 | 1,21E-03 | 7,58E-04 | 6,62E-03 | 2,22E-04 | 1,36E-03 | MND | MND | MND | MND | MND | MND | MND | 3,84E-08 | 7,63E-07 | 3,33E-05 | 4,88E-05 | -2,25E-04 |
| ADP-fossil | MJ | 5,49E+00 | 7,31E-01 | 6,28E-01 | 6,85E+00 | 1,40E-01 | 2,23E-01 | MND | MND | MND | MND | MND | MND | MND | 1,31E-05 | 4,82E-04 | 1,05E-02 | 1,91E-02 | -3,05E-01 |

ENVIRONMENTAL IMPACTS – BEPALINGSMETODE, NETHERLANDS

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|-------------------------|--------|----------|----------|----------|----------|----------|----------|-----|-----|-----|-----|-----|-----|-----|----------|----------|----------|----------|-----------|
| Shadow price | € | 4,07E-01 | 4,45E-02 | 7,07E-02 | 5,22E-01 | 8,95E-03 | 1,91E-02 | MND | MND | MND | MND | MND | MND | MND | 3,57E-06 | 3,08E-05 | 2,45E-02 | 1,22E-03 | -1,88E-02 |
| Terrestrial ecotoxicity | DCB eq | 6,86E-03 | 1,01E-03 | 2,34E-03 | 1,02E-02 | 1,99E-04 | 1,66E-04 | MND | MND | MND | MND | MND | MND | MND | 5,35E-08 | 6,84E-07 | 7,24E-04 | 2,30E-05 | -1,64E-04 |
| Seawater ecotoxicity | DCB eq | 8,42E+02 | 4,75E+01 | 1,93E+02 | 1,08E+03 | 1,06E+01 | 9,72E+00 | MND | MND | MND | MND | MND | MND | MND | 1,30E-02 | 3,63E-02 | 7,73E+00 | 1,50E+00 | -4,21E+01 |
| Freshwater ecotoxicity | DCB eq | 2,54E-02 | 5,59E-03 | 5,19E-03 | 3,61E-02 | 1,17E-03 | 1,14E-03 | MND | MND | MND | MND | MND | MND | MND | 1,25E-07 | 4,03E-06 | 1,93E-03 | 1,19E-04 | -1,25E-03 |
| Human ecotoxicity | DCB eq | 1,53E+00 | 1,55E-01 | 1,55E-01 | 1,84E+00 | 3,35E-02 | 7,54E-02 | MND | MND | MND | MND | MND | MND | MND | 5,87E-06 | 1,15E-04 | 2,12E-01 | 4,65E-03 | -6,88E-02 |
| EEE | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 9,42E-03 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| ETE | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 5,31E-02 | MND | MND | MND | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| ADP Fossil Fuels | kg Sbe | 2,20E-02 | 2,55E-03 | 5,95E-03 | 3,05E-02 | 4,93E-04 | 7,68E-04 | MND | MND | MND | MND | MND | MND | MND | 3,36E-07 | 1,69E-06 | 4,70E-05 | 6,93E-05 | -1,16E-03 |



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 compliance 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.

Edis Glogic, as an authorized verifier acting for EPD Hub Limited
13.06.2024



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

| Product Number | Product Description | Unit Product Weight (kg/m of pipe) | GWP – total, Stages A1-A3 (kg CO2e/m of pipe) | Product Length (m) | GWP – total, Stages A1-A3 (kg CO2e) |
|----------------|--------------------------------|------------------------------------|---|--------------------|-------------------------------------|
| 1050196 | SEWER PIPE 200 SN8 1M PVC | 5,96 | 1,81E+1 | 1 | 1,81E+1 |
| 1050198 | SEWER PIPE 200 SN8 2M PVC | 5,70 | 1,73E+1 | 2 | 3,47E+1 |
| 1050201 | SEWER PIPE 200 SN8 6M PVC | 5,53 | 1,68E+1 | 6 | 1,01E+2 |
| 1050203 | SEWER PIPE 250 SN8 6M PVC | 8,58 | 2,61E+1 | 6 | 1,57E+2 |
| 1050206 | SEWER PIPE 315 SN8 6M PVC | 13,68 | 4,16E+1 | 6 | 2,49E+2 |
| 1050209 | SEWER PIPE 400 SN8 6M PVC | 22,16 | 6,74E+1 | 6 | 4,04E+2 |
| 1050211 | SEWER PIPE 160 SN8 6M PVC | 3,76 | 1,14E+1 | 6 | 6,86E+1 |
| 1050212 | SEWER PIPE 200 SN8 3M PVC | 5,60 | 1,70E+1 | 3 | 5,11E+1 |
| 1050213 | SEWER PIPE 250 SN8 3M PVC | 8,72 | 2,65E+1 | 3 | 7,96E+1 |
| 1050214 | SEWER PIPE 315 SN8 3M PVC | 13,93 | 4,24E+1 | 3 | 1,27E+2 |
| 1050215 | SEWER PIPE 400 SN8 3M PVC | 22,65 | 6,88E+1 | 3 | 2,07E+2 |
| 1054104 | SEWER PIPE 110 SN8 1M PVC | 1,83 | 5,56E+0 | 1 | 5,56E+0 |
| 1054105 | SEWER PIPE 160 SN8 1M PVC | 3,78 | 1,15E+1 | 1 | 1,15E+1 |
| 1054106 | SEWER PIPE 110 SN8 2M PVC | 1,71 | 5,20E+0 | 2 | 1,04E+1 |
| 1054107 | SEWER PIPE 160 SN8 2M PVC | 3,66 | 1,11E+1 | 2 | 2,22E+1 |
| 1054110 | SEWER PIPE 110 SN8 6M PVC | 1,73 | 5,25E+0 | 6 | 3,15E+1 |
| 1054112 | SEWER PIPE 110 SN8 3M PVC | 1,69 | 5,15E+0 | 3 | 1,54E+1 |
| 1054113 | SEWER PIPE 160 SN8 3M PVC | 3,62 | 1,10E+1 | 3 | 3,30E+1 |
| 1067920 | SEWER PIPE 250X7,3 SN8 2M PVC | 9,14 | 2,78E+1 | 2 | 5,56E+1 |
| 1067921 | SEWER PIPE 315X9,2 SN8 2M PVC | 14,92 | 4,53E+1 | 2 | 9,07E+1 |
| 1067922 | SEWER PIPE 400X11,7 SN8 2M PVC | 24,41 | 7,42E+1 | 2 | 1,48E+2 |
| 1085728 | SEWER PIPE 200 SN8 4M PVC | 7,00 | 2,13E+1 | 4 | 8,51E+1 |
| 1085817 | SEWER PIPE 160 SN8 4M PVC | 3,68 | 1,12E+1 | 4 | 4,48E+1 |
| 1086366 | SEWER PIPE 110 SN8 4M PVC | 1,63 | 4,94E+0 | 4 | 1,98E+1 |
| 1086367 | SEWER PIPE 250 SN8 4M PVC | 8,75 | 2,66E+1 | 4 | 1,06E+2 |
| 1088990 | SEWER PIPE 315 SN8 4M PVC | 13,83 | 4,20E+1 | 4 | 1,68E+2 |

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

| Product Number | Product Description | Unit Product Weight (kg/m of pipe) | GWP – total, Stages A1-A3 (kg CO2e/m of pipe) | Product Length (m) | GWP – total, Stages A1-A3 (kg CO2e) |
|----------------|--------------------------------|------------------------------------|---|--------------------|-------------------------------------|
| 1050196 | SEWER PIPE 200 SN8 1M PVC | 5,96 | 1,77E+1 | 1 | 1,77E+1 |
| 1050198 | SEWER PIPE 200 SN8 2M PVC | 5,70 | 1,69E+1 | 2 | 3,39E+1 |
| 1050201 | SEWER PIPE 200 SN8 6M PVC | 5,53 | 1,64E+1 | 6 | 9,86E+1 |
| 1050203 | SEWER PIPE 250 SN8 6M PVC | 8,58 | 2,55E+1 | 6 | 1,53E+2 |
| 1050206 | SEWER PIPE 315 SN8 6M PVC | 13,68 | 4,06E+1 | 6 | 2,44E+2 |
| 1050209 | SEWER PIPE 400 SN8 6M PVC | 22,16 | 6,58E+1 | 6 | 3,95E+2 |
| 1050211 | SEWER PIPE 160 SN8 6M PVC | 3,76 | 1,12E+1 | 6 | 6,71E+1 |
| 1050212 | SEWER PIPE 200 SN8 3M PVC | 5,60 | 1,66E+1 | 3 | 4,99E+1 |
| 1050213 | SEWER PIPE 250 SN8 3M PVC | 8,72 | 2,59E+1 | 3 | 7,77E+1 |
| 1050214 | SEWER PIPE 315 SN8 3M PVC | 13,93 | 4,14E+1 | 3 | 1,24E+2 |
| 1050215 | SEWER PIPE 400 SN8 3M PVC | 22,65 | 6,73E+1 | 3 | 2,02E+2 |
| 1054104 | SEWER PIPE 110 SN8 1M PVC | 1,83 | 5,44E+0 | 1 | 5,44E+0 |
| 1054105 | SEWER PIPE 160 SN8 1M PVC | 3,78 | 1,12E+1 | 1 | 1,12E+1 |
| 1054106 | SEWER PIPE 110 SN8 2M PVC | 1,71 | 5,08E+0 | 2 | 1,02E+1 |
| 1054107 | SEWER PIPE 160 SN8 2M PVC | 3,66 | 1,09E+1 | 2 | 2,17E+1 |
| 1054110 | SEWER PIPE 110 SN8 6M PVC | 1,73 | 5,13E+0 | 6 | 3,08E+1 |
| 1054112 | SEWER PIPE 110 SN8 3M PVC | 1,69 | 5,03E+0 | 3 | 1,51E+1 |
| 1054113 | SEWER PIPE 160 SN8 3M PVC | 3,62 | 1,07E+1 | 3 | 3,22E+1 |
| 1067920 | SEWER PIPE 250X7,3 SN8 2M PVC | 9,14 | 2,71E+1 | 2 | 5,43E+1 |
| 1067921 | SEWER PIPE 315X9,2 SN8 2M PVC | 14,92 | 4,43E+1 | 2 | 8,86E+1 |
| 1067922 | SEWER PIPE 400X11,7 SN8 2M PVC | 24,41 | 7,25E+1 | 2 | 1,45E+2 |
| 1085728 | SEWER PIPE 200 SN8 4M PVC | 7,00 | 2,08E+1 | 4 | 8,32E+1 |
| 1085817 | SEWER PIPE 160 SN8 4M PVC | 3,68 | 1,09E+1 | 4 | 4,38E+1 |
| 1086366 | SEWER PIPE 110 SN8 4M PVC | 1,63 | 4,83E+0 | 4 | 1,93E+1 |
| 1086367 | SEWER PIPE 250 SN8 4M PVC | 8,75 | 2,60E+1 | 4 | 1,04E+2 |
| 1088990 | SEWER PIPE 315 SN8 4M PVC | 13,83 | 4,11E+1 | 4 | 1,64E+2 |