# Environmental Profile

This LCA is calculated according to: ISO 14044, ISO 14040 and EN 15804

Ecochain v3.5.80

| | |
|---|---|
| Product: | 3002887 - PVC Pipe GY 63x3 L=4 SG/CH Uncert |
| Unit: | 1 piece |
| Manufacturer: | Wavin - NL - Hardenberg - Verified |
| Address: | J.C. Kellerlaan 3<br>7772 SG Hardenberg<br>Netherlands |

Wavin carries a complete PVC range of outdoor sewers. With PVC as a material, a smooth-walled, flexible and completely watertight piping system is obtained. Moreover, PVC is absolutely resistant to all substances that occur in domestic waste water. By working with a light material, large pipe lengths and plug connections, a very fast installation is guaranteed.

| | |
|---|---|
| LCA standard: | NMD Bepalingsmethode 1.1 (2022) |
| Standard database: | Worldwide - Ecoinvent v 3.6 Cut-Off |
| Externally verified: | Yes |
| Issue date: | 08-06-2023 |
| End of validity: | 08-06-2028 |
| Verifier: | Martijn van Hövell - SGS Search |

This LCA was evaluated according to EN15804+A2. It was concluded that the LCA complies with this standard.

The LCA background information and project dossier have been registered in the online Ecochain application in the account Wavin - NL - Hardenberg - Verified (2020). (☑ = module declared, MND = module not declared).

| A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ☑ | ☑ | ☑ | MND | MND | MND | MND | MND | MND | MND | MND | MND | MND | ☑ | ☑ | ☑ | ☑ |

**Product stage**

A1 Raw material supply A2 Transport A3 Manufacturing

**Construction process stage**

A4 Transport gate to site
A5 Assembly / Construction installation process

**Use stage**

B1 Use B2 Maintenance B3 Repair B4 Replacement B5 Refurbishment
B6 Operational energy use B7 Operational water use

**End-of-Life stage**

C1 De-construction demolition C2 Transport C3 Waste processing
C4 Disposal

**Benefits and loads beyond the system boundaries**

D Reuse- Recovery- Recycling- potential

## Environmental impacts and parameters

**ECI** = Environmental Costs Indicator [euro]; **ADPE** = Abiotic depletion potential for non-fossil resources [kg Sb-eq]; **ADPF** = Abiotic depletion potential for fossil resources [kg Sb-eq]; **GWP** = Global warming potential [kg CO2-eq]; **ODP** = Depletion potential of the stratospheric ozone layer [kg CFC-11-eq]; **POCP** = Formation potential of tropospheric ozone photochemical oxidants [kg ethene-eq]; **AP** = Acidification potential of land and water [kg SO2-eq]; **EP** = Eutrophication potential [kg PO4 3−-eq]; **HTP** = Human toxicity potential [kg 1,4-DB-eq]; **FAETP** = Freshwater aquatic ecotoxicity potential [kg 1,4-DB-eq]; **MAETP** = Marine aquatic ecotoxicity potential [kg 1,4-DB-eq]; **TETP** = Terrestrial ecotoxicity potential [kg 1,4-DB-eq]; **GWP-total** = EF EN15804+A2 Climate Change [kg CO2 eq]; **GWP-f** = EF Climate change - Fossil [kg CO2 eq]; **GWP-b** = EF EN15804+A2 Climate Change - Biogenic [kg CO2 eq]; **GWP-luluc** = EF EN15804+A2 Climate Change - Land use and LU change [kg CO2 eq]; **ODP** = EF Ozone depletion [kg CFC11 eq]; **AP** = EF Acidification [mol H+ eq]; **EP-fw** = EF Eutrophication, freshwater [kg P eq]; **EP-m** = EF Eutrophication, marine [kg N eq]; **EP-T** = EF Eutrophication, terrestrial [mol N eq]; **POCP** = EF Photochemical ozone formation [kg NMVOC eq]; **ADP-mm** = EF Resource use, minerals and metals [kg Sb eq]; **ADP-f** = EF Resource use, fossils [MJ]; **WDP** = EF Water use [m3 depriv.]; **PM** = EF Particulate matter [disease inc.]; **IR** = EF Ionising radiation [kBq U-235 eq]; **ETP-fw** = EF Ecotoxicity, freshwater [CTUe]; **HTP-c** = EF Human toxicity, cancer [CTUh]; **HTP-nc** = EF Human toxicity, non-cancer [CTUh]; **SQP** = EF Land use [Pt]; **PERE** = Use of renewable primary energy excluding renewable primary energy resources used as raw materials [MJ]; **PERM** = Use of renewable primary energy resources used as raw materials [MJ]; **PERT** = Total use of renewable primary energy resources [MJ]; **PENRE** = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials [MJ]; **PENRM** = Use of non-renewable primary energy resources used as raw materials [MJ]; **PENRT** = Total use of non-renewable primary energy resources [MJ]; **PET** = Total energy [MJ]; **SM** = Use of secondary material [kg]; **RSF** = Use of renewable secondary fuels [MJ]; **NRSF** = Use of non-renewable secondary fuels [MJ]; **FW** = Use of net fresh water [m3]; **HWD** = Hazardous waste disposed [kg]; **NHWD** = Non-hazardous waste disposed [kg]; **RWD** = Radioactive waste disposed [kg]; **CRU** = Components for re-use [kg]; **MFR** = Materials for recycling [kg]; **MER** = Materials for energy recovery [kg]; **EE** = Exported energy [MJ]; **EET** = Exported energy thermic [MJ]; **EEE** = Exported energy electric [MJ]

## Statement of Confidentiality

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# Results

| Environmental impact SBK set 1 | Unit | A1 | A2 | A3 | A1-A3 | C2 | C3 | C4 | D | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| ECI | euro | 0.64 | 0.03 | 0.03 | 0.7 | 0.01 | 0.24 | 0 | -0.32 | 0.62 |
| ADPE | kg Sb-eq | 1.63E-4 | 5.56E-6 | 5.44E-6 | 1.74E-4 | 2.36E-6 | 1.95E-5 | 2.43E-8 | -6.81E-5 | 1.28E-4 |
| ADPF | kg Sb-eq | 7.17E-2 | 1.60E-3 | 1.46E-3 | 7.47E-2 | 6.65E-4 | 6.87E-3 | 3.44E-5 | -3.83E-2 | 4.40E-2 |
| GWP | kg CO2-eq | 5.76E+0 | 2.17E-1 | 2.59E-1 | 6.24E+0 | 9.05E-2 | 2.26E+0 | 2.13E-2 | -3.22E+0 | 5.38E+0 |
| ODP | kg CFC-11-eq | 3.41E-6 | 3.86E-8 | 2.44E-8 | 3.47E-6 | 1.68E-8 | 2.73E-7 | 8.26E-10 | -1.69E-6 | 2.07E-6 |
| POCP | kg ethene-eq | 3.53E-3 | 1.31E-4 | 1.14E-4 | 3.78E-3 | 5.43E-5 | 5.40E-4 | 5.70E-6 | -1.64E-3 | 2.74E-3 |
| AP | kg SO2-eq | 2.21E-2 | 9.56E-4 | 1.02E-3 | 2.41E-2 | 3.90E-4 | 3.92E-3 | 1.83E-5 | -1.05E-2 | 1.79E-2 |
| EP | kg PO4 3−-eq | 2.64E-3 | 1.88E-4 | 1.61E-4 | 2.99E-3 | 7.78E-5 | 5.93E-4 | 6.97E-6 | -1.27E-3 | 2.40E-3 |
| HTP | kg 1,4-DB-eq | 2.27E+0 | 9.15E-2 | 9.78E-2 | 2.46E+0 | 3.87E-2 | 1.07E+0 | 1.86E-3 | -1.02E+0 | 2.54E+0 |
| FAETP | kg 1,4-DB-eq | 4.87E-2 | 2.67E-3 | 3.98E-3 | 5.54E-2 | 1.13E-3 | 1.56E-2 | 5.42E-4 | -2.24E-2 | 5.02E-2 |
| MAETP | kg 1,4-DB-eq | 1.42E+2 | 9.61E+0 | 1.63E+1 | 1.68E+2 | 4.05E+0 | 5.12E+1 | 6.66E-1 | -6.60E+1 | 1.58E+2 |
| TETP | kg 1,4-DB-eq | 1.57E-2 | 3.24E-4 | 6.08E-3 | 2.21E-2 | 1.37E-4 | 3.79E-3 | 6.14E-6 | -7.46E-3 | 1.85E-2 |
| Environmental impact | Unit | A1 | A2 | A3 | A1-A3 | C2 | C3 | C4 | D | Total |
| GWP-total | kg CO2 eq | 5.76E+0 | 2.19E-1 | 3.05E-1 | 6.28E+0 | 9.14E-2 | 2.48E+0 | 2.48E-2 | -3.32E+0 | 5.55E+0 |
| GWP-f | kg CO2 eq | 5.91E+0 | 2.19E-1 | 2.39E-1 | 6.37E+0 | 9.13E-2 | 2.27E+0 | 2.47E-2 | -3.30E+0 | 5.46E+0 |
| GWP-b | kg CO2 eq | -1.56E-1 | 1.01E-4 | 5.17E-2 | -1.04E-1 | 5.54E-5 | 2.01E-1 | 3.20E-5 | -2.33E-2 | 7.43E-2 |
| GWP-luluc | kg CO2 eq | 4.66E-3 | 8.03E-5 | 1.46E-2 | 1.93E-2 | 3.23E-5 | 1.06E-3 | 6.80E-7 | -2.19E-3 | 1.82E-2 |
| ODP | kg CFC11 eq | 3.36E-6 | 4.84E-8 | 2.89E-8 | 3.43E-6 | 2.10E-8 | 2.82E-7 | 1.03E-9 | -1.67E-6 | 2.07E-6 |
| AP | mol H+ eq | 2.67E-2 | 1.27E-3 | 1.30E-3 | 2.92E-2 | 5.20E-4 | 4.91E-3 | 2.45E-5 | -1.27E-2 | 2.20E-2 |
| EP-fw | kg P eq | 2.61E-4 | 2.21E-6 | 3.42E-6 | 2.67E-4 | 7.51E-7 | 3.51E-5 | 3.06E-8 | -1.23E-4 | 1.79E-4 |
| EP-m | kg N eq | 4.48E-3 | 4.48E-4 | 3.84E-4 | 5.31E-3 | 1.86E-4 | 1.20E-3 | 1.48E-5 | -2.20E-3 | 4.51E-3 |
| EP-T | mol N eq | 4.84E-2 | 4.94E-3 | 4.12E-3 | 5.75E-2 | 2.05E-3 | 1.32E-2 | 9.81E-5 | -2.36E-2 | 4.93E-2 |
| POCP | kg NMVOC eq | 1.68E-2 | 1.41E-3 | 1.16E-3 | 1.94E-2 | 5.86E-4 | 3.97E-3 | 3.32E-5 | -8.11E-3 | 1.59E-2 |
| ADP-mm | kg Sb eq | 1.63E-4 | 5.56E-6 | 5.44E-6 | 1.74E-4 | 2.36E-6 | 1.95E-5 | 2.43E-8 | -6.81E-5 | 1.28E-4 |
| ADP-f | MJ | 1.53E+2 | 3.31E+0 | 2.77E+0 | 1.59E+2 | 1.40E+0 | 1.36E+1 | 7.43E-2 | -8.03E+1 | 9.34E+1 |
| WDP | m3 depriv. | 1.00E+1 | 1.18E-2 | 1.87E+0 | 1.19E+1 | 4.30E-3 | 5.22E-1 | 4.19E-4 | -4.80E+0 | 7.64E+0 |
| PM | disease inc. | 1.85E-7 | 1.97E-8 | 2.02E-8 | 2.25E-7 | 8.24E-9 | 6.22E-8 | 5.08E-10 | -8.14E-8 | 2.14E-7 |
| IR | kBq U-235 eq | 3.22E-1 | 1.39E-2 | 4.99E-3 | 3.41E-1 | 6.12E-3 | 4.74E-2 | 3.40E-4 | -1.55E-1 | 2.40E-1 |
| ETP-fw | CTUe | 1.00E+2 | 2.95E+0 | 4.61E+0 | 1.08E+2 | 1.14E+0 | 9.94E+1 | 1.09E+0 | -4.75E+1 | 1.62E+2 |
| HTP-c | CTUh | 4.04E-9 | 9.56E-11 | 1.57E-10 | 4.29E-9 | 4.05E-11 | 1.48E-9 | 1.91E-12 | -1.77E-9 | 4.04E-9 |
| HTP-nc | CTUh | 1.29E-7 | 3.23E-9 | 4.82E-9 | 1.37E-7 | 1.36E-9 | 3.54E-8 | 2.10E-10 | -6.13E-8 | 1.13E-7 |
| SQP | Pt | 3.71E+1 | 2.87E+0 | 2.07E-1 | 4.02E+1 | 1.20E+0 | 8.58E+0 | 1.88E-1 | -1.25E+1 | 3.76E+1 |

| Resource use | Unit | A1 | A2 | A3 | A1-A3 | C2 | C3 | C4 | D | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| PERE | MJ | 1.01E+1 | 4.14E-2 | 8.35E+0 | 1.85E+1 | 2.01E-2 | 9.67E-1 | 2.64E-3 | -4.29E+0 | 1.52E+1 |
| PERM | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PERT | MJ | 1.01E+1 | 4.14E-2 | 8.35E+0 | 1.85E+1 | 2.01E-2 | 9.67E-1 | 2.64E-3 | -4.29E+0 | 1.52E+1 |
| PENRE | MJ | 1.64E+2 | 3.51E+0 | 3.00E+0 | 1.70E+2 | 1.49E+0 | 1.45E+1 | 7.88E-2 | -8.65E+1 | 9.97E+1 |
| PENRM | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PENRT | MJ | 1.64E+2 | 3.51E+0 | 3.00E+0 | 1.70E+2 | 1.49E+0 | 1.45E+1 | 7.88E-2 | -8.65E+1 | 9.97E+1 |
| PET | MJ | 1.74E+2 | 3.55E+0 | 1.13E+1 | 1.89E+2 | 1.51E+0 | 1.55E+1 | 8.15E-2 | -9.08E+1 | 1.15E+2 |
| SM | kg | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| RSF | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NRSF | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FW | m3 | 1.07E-1 | 4.03E-4 | 4.41E-2 | 1.51E-1 | 1.59E-4 | 1.43E-2 | 9.09E-5 | -5.03E-2 | 1.15E-1 |
| Output flows and waste categories | Unit | A1 | A2 | A3 | A1-A3 | C2 | C3 | C4 | D | Total |
| HWD | kg | 1.21E-4 | 8.38E-6 | 3.87E-6 | 1.33E-4 | 3.58E-6 | 2.19E-5 | 8.94E-8 | -6.67E-5 | 9.22E-5 |
| NHWD | kg | 5.73E-1 | 2.10E-1 | 5.59E-3 | 7.88E-1 | 8.68E-2 | 5.07E-1 | 3.47E-1 | -2.57E-1 | 1.47E+0 |
| RWD | kg | 2.83E-4 | 2.17E-5 | 6.96E-6 | 3.11E-4 | 9.53E-6 | 5.11E-5 | 4.86E-7 | -1.37E-4 | 2.35E-4 |
| CRU | kg | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MFR | kg | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MER | kg | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EE | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EET | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EEE | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Ecochain

Ecochain Technologies BV
H.J.E. Wenckebachweg 123, 1096 AM Amsterdam, The Netherlands
https://www.ecochain.com
+31 20 3035 777