# Environmental Profile

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

Ecochain v3.5.80

| | |
|---|---|
| Product: | 3003977 - PVC RWA Pipe GY KOMO 80x1.5 L=2 |
| 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

# Results

| Environmental impact SBK set 1 | Unit | A1 | A2 | A3 | A1-A3 | C2 | C3 | C4 | D | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| ECI | euro | 0.24 | 0.01 | 0.01 | 0.26 | 0 | 0.09 | 0 | -0.12 | 0.23 |
| ADPE | kg Sb-eq | 6.11E-5 | 1.55E-6 | 1.98E-6 | 6.46E-5 | 8.40E-7 | 7.06E-6 | 8.71E-9 | -2.49E-5 | 4.76E-5 |
| ADPF | kg Sb-eq | 2.66E-2 | 4.45E-4 | 5.30E-4 | 2.76E-2 | 2.36E-4 | 2.49E-3 | 1.23E-5 | -1.40E-2 | 1.63E-2 |
| GWP | kg CO2-eq | 2.17E+0 | 6.05E-2 | 9.43E-2 | 2.32E+0 | 3.22E-2 | 8.17E-1 | 7.72E-3 | -1.18E+0 | 2.00E+0 |
| ODP | kg CFC-11-eq | 1.25E-6 | 1.07E-8 | 8.86E-9 | 1.27E-6 | 5.97E-9 | 9.98E-8 | 2.96E-10 | -6.18E-7 | 7.62E-7 |
| POCP | kg ethene-eq | 1.36E-3 | 3.65E-5 | 4.15E-5 | 1.43E-3 | 1.93E-5 | 1.99E-4 | 2.06E-6 | -6.18E-4 | 1.04E-3 |
| AP | kg SO2-eq | 8.48E-3 | 2.66E-4 | 3.70E-4 | 9.11E-3 | 1.39E-4 | 1.44E-3 | 6.57E-6 | -3.97E-3 | 6.73E-3 |
| EP | kg PO4 3−-eq | 1.04E-3 | 5.23E-5 | 5.84E-5 | 1.15E-3 | 2.77E-5 | 2.21E-4 | 2.52E-6 | -5.02E-4 | 9.02E-4 |
| HTP | kg 1,4-DB-eq | 8.53E-1 | 2.55E-2 | 3.56E-2 | 9.14E-1 | 1.38E-2 | 3.85E-1 | 6.72E-4 | -3.84E-1 | 9.29E-1 |
| FAETP | kg 1,4-DB-eq | 1.87E-2 | 7.44E-4 | 1.45E-3 | 2.09E-2 | 4.04E-4 | 5.64E-3 | 1.97E-4 | -8.40E-3 | 1.87E-2 |
| MAETP | kg 1,4-DB-eq | 5.43E+1 | 2.68E+0 | 5.92E+0 | 6.29E+1 | 1.44E+0 | 1.86E+1 | 2.42E-1 | -2.44E+1 | 5.88E+1 |
| TETP | kg 1,4-DB-eq | 5.95E-3 | 9.01E-5 | 2.21E-3 | 8.25E-3 | 4.88E-5 | 1.37E-3 | 2.23E-6 | -2.79E-3 | 6.88E-3 |
| Environmental impact | Unit | A1 | A2 | A3 | A1-A3 | C2 | C3 | C4 | D | Total |
| GWP-total | kg CO2 eq | 1.72E+0 | 6.11E-2 | 1.11E-1 | 1.90E+0 | 3.25E-2 | 1.34E+0 | 8.99E-3 | -1.22E+0 | 2.06E+0 |
| GWP-f | kg CO2 eq | 2.22E+0 | 6.10E-2 | 8.70E-2 | 2.37E+0 | 3.25E-2 | 8.24E-1 | 8.99E-3 | -1.21E+0 | 2.03E+0 |
| GWP-b | kg CO2 eq | -5.02E-1 | 2.82E-5 | 1.88E-2 | -4.83E-1 | 1.97E-5 | 5.18E-1 | 1.16E-5 | -8.48E-3 | 2.67E-2 |
| GWP-luluc | kg CO2 eq | 1.97E-3 | 2.24E-5 | 5.30E-3 | 7.30E-3 | 1.15E-5 | 3.83E-4 | 2.44E-7 | -8.61E-4 | 6.83E-3 |
| ODP | kg CFC11 eq | 1.24E-6 | 1.35E-8 | 1.05E-8 | 1.26E-6 | 7.48E-9 | 1.03E-7 | 3.68E-10 | -6.11E-7 | 7.61E-7 |
| AP | mol H+ eq | 1.03E-2 | 3.54E-4 | 4.75E-4 | 1.11E-2 | 1.85E-4 | 1.81E-3 | 8.79E-6 | -4.83E-3 | 8.27E-3 |
| EP-fw | kg P eq | 9.91E-5 | 6.16E-7 | 1.24E-6 | 1.01E-4 | 2.67E-7 | 1.27E-5 | 1.10E-8 | -4.56E-5 | 6.83E-5 |
| EP-m | kg N eq | 1.78E-3 | 1.25E-4 | 1.40E-4 | 2.05E-3 | 6.62E-5 | 4.49E-4 | 5.34E-6 | -8.62E-4 | 1.70E-3 |
| EP-T | mol N eq | 1.95E-2 | 1.38E-3 | 1.50E-3 | 2.24E-2 | 7.29E-4 | 4.96E-3 | 3.52E-5 | -9.54E-3 | 1.86E-2 |
| POCP | kg NMVOC eq | 6.60E-3 | 3.93E-4 | 4.24E-4 | 7.41E-3 | 2.08E-4 | 1.48E-3 | 1.19E-5 | -3.13E-3 | 5.99E-3 |
| ADP-mm | kg Sb eq | 6.11E-5 | 1.55E-6 | 1.98E-6 | 6.46E-5 | 8.40E-7 | 7.06E-6 | 8.71E-9 | -2.49E-5 | 4.76E-5 |
| ADP-f | MJ | 5.66E+1 | 9.21E-1 | 1.01E+0 | 5.85E+1 | 4.98E-1 | 4.93E+0 | 2.66E-2 | -2.94E+1 | 3.46E+1 |
| WDP | m3 depriv. | 3.70E+0 | 3.29E-3 | 6.81E-1 | 4.38E+0 | 1.53E-3 | 1.90E-1 | 1.47E-4 | -1.75E+0 | 2.82E+0 |
| PM | disease inc. | 9.04E-8 | 5.48E-9 | 7.36E-9 | 1.03E-7 | 2.93E-9 | 2.27E-8 | 1.82E-10 | -3.32E-8 | 9.59E-8 |
| IR | kBq U-235 eq | 1.23E-1 | 3.86E-3 | 1.82E-3 | 1.28E-1 | 2.18E-3 | 1.72E-2 | 1.22E-4 | -5.71E-2 | 9.08E-2 |
| ETP-fw | CTUe | 3.87E+1 | 8.21E-1 | 1.68E+0 | 4.12E+1 | 4.05E-1 | 3.63E+1 | 3.99E-1 | -1.91E+1 | 5.92E+1 |
| HTP-c | CTUh | 1.64E-9 | 2.66E-11 | 5.73E-11 | 1.72E-9 | 1.44E-11 | 5.61E-10 | 6.89E-13 | -6.73E-10 | 1.62E-9 |
| HTP-nc | CTUh | 4.90E-8 | 8.98E-10 | 1.75E-9 | 5.17E-8 | 4.82E-10 | 1.29E-8 | 7.67E-11 | -2.31E-8 | 4.20E-8 |
| SQP | Pt | 5.40E+1 | 7.99E-1 | 7.53E-2 | 5.49E+1 | 4.26E-1 | 3.09E+0 | 6.76E-2 | -1.32E+1 | 4.53E+1 |

| Resource use | Unit | A1 | A2 | A3 | A1-A3 | C2 | C3 | C4 | D | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| PERE | MJ | 9.75E+0 | 1.15E-2 | 3.04E+0 | 1.28E+1 | 7.15E-3 | 3.51E-1 | 9.57E-4 | -3.30E+0 | 9.86E+0 |
| PERM | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PERT | MJ | 9.75E+0 | 1.15E-2 | 3.04E+0 | 1.28E+1 | 7.15E-3 | 3.51E-1 | 9.57E-4 | -3.30E+0 | 9.86E+0 |
| PENRE | MJ | 6.07E+1 | 9.78E-1 | 1.09E+0 | 6.28E+1 | 5.29E-1 | 5.25E+0 | 2.83E-2 | -3.17E+1 | 3.69E+1 |
| PENRM | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PENRT | MJ | 6.07E+1 | 9.78E-1 | 1.09E+0 | 6.28E+1 | 5.29E-1 | 5.25E+0 | 2.83E-2 | -3.17E+1 | 3.69E+1 |
| PET | MJ | 7.05E+1 | 9.89E-1 | 4.13E+0 | 7.56E+1 | 5.36E-1 | 5.60E+0 | 2.92E-2 | -3.50E+1 | 4.68E+1 |
| 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 | 3.99E-2 | 1.12E-4 | 1.60E-2 | 5.60E-2 | 5.64E-5 | 5.24E-3 | 3.27E-5 | -1.84E-2 | 4.30E-2 |
| Output flows and waste categories | Unit | A1 | A2 | A3 | A1-A3 | C2 | C3 | C4 | D | Total |
| HWD | kg | 4.75E-5 | 2.33E-6 | 1.41E-6 | 5.12E-5 | 1.27E-6 | 7.96E-6 | 3.21E-8 | -2.47E-5 | 3.58E-5 |
| NHWD | kg | 2.30E-1 | 5.84E-2 | 2.03E-3 | 2.91E-1 | 3.09E-2 | 1.90E-1 | 1.23E-1 | -9.74E-2 | 5.37E-1 |
| RWD | kg | 1.09E-4 | 6.05E-6 | 2.53E-6 | 1.17E-4 | 3.39E-6 | 1.86E-5 | 1.74E-7 | -5.05E-5 | 8.88E-5 |
| 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 |