# Environmental Profile

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

Ecochain v3.5.80

| | |
|---|---|
| Product: | 3001329 - Wafix PVC Branch 45° GY 110x75 SN4S/S/SG |
| 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 | 0.13 | 0 | 0.01 | 0.14 | 0 | 0.04 | 0 | -0.06 | 0.11 |
| ADPE | kg Sb-eq | 1.05E-3 | 4.16E-7 | 1.74E-6 | 1.05E-3 | 3.77E-7 | 3.26E-6 | 4.21E-9 | -1.26E-5 | 1.04E-3 |
| ADPF | kg Sb-eq | 1.41E-2 | 1.20E-4 | 2.99E-4 | 1.45E-2 | 1.06E-4 | 1.13E-3 | 5.83E-6 | -7.61E-3 | 8.17E-3 |
| GWP | kg CO2-eq | 1.14E+0 | 1.63E-2 | 5.68E-2 | 1.21E+0 | 1.45E-2 | 4.08E-1 | 4.16E-3 | -6.38E-1 | 9.98E-1 |
| ODP | kg CFC-11-eq | 5.81E-7 | 2.89E-9 | 4.49E-9 | 5.88E-7 | 2.68E-9 | 4.54E-8 | 1.39E-10 | -3.00E-7 | 3.36E-7 |
| POCP | kg ethene-eq | 7.06E-4 | 9.83E-6 | 2.47E-5 | 7.40E-4 | 8.68E-6 | 9.11E-5 | 1.06E-6 | -3.39E-4 | 5.02E-4 |
| AP | kg SO2-eq | 4.53E-3 | 7.16E-5 | 2.44E-4 | 4.84E-3 | 6.23E-5 | 6.56E-4 | 3.14E-6 | -2.14E-3 | 3.42E-3 |
| EP | kg PO4 3−-eq | 5.75E-4 | 1.41E-5 | 3.14E-5 | 6.20E-4 | 1.24E-5 | 1.01E-4 | 1.34E-6 | -2.88E-4 | 4.47E-4 |
| HTP | kg 1,4-DB-eq | 4.29E-1 | 6.86E-3 | 2.64E-2 | 4.62E-1 | 6.19E-3 | 1.76E-1 | 3.39E-4 | -1.99E-1 | 4.45E-1 |
| FAETP | kg 1,4-DB-eq | 1.29E-2 | 2.00E-4 | 9.01E-4 | 1.40E-2 | 1.81E-4 | 2.72E-3 | 1.30E-4 | -5.64E-3 | 1.14E-2 |
| MAETP | kg 1,4-DB-eq | 3.04E+1 | 7.20E-1 | 3.55E+0 | 3.46E+1 | 6.47E-1 | 9.11E+0 | 1.51E-1 | -1.29E+1 | 3.17E+1 |
| TETP | kg 1,4-DB-eq | 3.06E-3 | 2.42E-5 | 1.96E-3 | 5.05E-3 | 2.19E-5 | 6.19E-4 | 1.09E-6 | -1.87E-3 | 3.82E-3 |
| Environmental impact | Unit | A1 | A2 | A3 | A1-A3 | C2 | C3 | C4 | D | Total |
| GWP-total | kg CO2 eq | 1.17E+0 | 1.64E-2 | 6.50E-2 | 1.26E+0 | 1.46E-2 | 4.36E-1 | 4.85E-3 | -6.00E-1 | 1.11E+0 |
| GWP-f | kg CO2 eq | 1.16E+0 | 1.64E-2 | 4.99E-2 | 1.23E+0 | 1.46E-2 | 4.11E-1 | 4.85E-3 | -6.53E-1 | 1.01E+0 |
| GWP-b | kg CO2 eq | 9.89E-3 | 7.58E-6 | 1.03E-2 | 2.02E-2 | 8.86E-6 | 2.49E-2 | 5.88E-6 | 5.37E-2 | 9.89E-2 |
| GWP-luluc | kg CO2 eq | 1.26E-3 | 6.02E-6 | 4.74E-3 | 6.01E-3 | 5.16E-6 | 1.73E-4 | 1.21E-7 | -7.88E-4 | 5.40E-3 |
| ODP | kg CFC11 eq | 5.75E-7 | 3.62E-9 | 5.28E-9 | 5.84E-7 | 3.36E-9 | 4.69E-8 | 1.73E-10 | -2.97E-7 | 3.37E-7 |
| AP | mol H+ eq | 5.51E-3 | 9.52E-5 | 3.04E-4 | 5.91E-3 | 8.31E-5 | 8.25E-4 | 4.20E-6 | -2.59E-3 | 4.22E-3 |
| EP-fw | kg P eq | 5.34E-5 | 1.66E-7 | 8.75E-7 | 5.44E-5 | 1.20E-7 | 5.77E-6 | 5.49E-9 | -2.69E-5 | 3.34E-5 |
| EP-m | kg N eq | 9.78E-4 | 3.36E-5 | 7.19E-5 | 1.08E-3 | 2.97E-5 | 2.04E-4 | 2.82E-6 | -4.64E-4 | 8.56E-4 |
| EP-T | mol N eq | 1.06E-2 | 3.70E-4 | 7.93E-4 | 1.17E-2 | 3.28E-4 | 2.25E-3 | 1.68E-5 | -5.01E-3 | 9.33E-3 |
| POCP | kg NMVOC eq | 3.53E-3 | 1.06E-4 | 2.26E-4 | 3.86E-3 | 9.36E-5 | 6.75E-4 | 5.82E-6 | -1.70E-3 | 2.94E-3 |
| ADP-mm | kg Sb eq | 1.05E-3 | 4.16E-7 | 1.74E-6 | 1.05E-3 | 3.77E-7 | 3.26E-6 | 4.21E-9 | -1.26E-5 | 1.04E-3 |
| ADP-f | MJ | 3.01E+1 | 2.48E-1 | 5.58E-1 | 3.09E+1 | 2.24E-1 | 2.25E+0 | 1.26E-2 | -1.60E+1 | 1.73E+1 |
| WDP | m3 depriv. | 1.79E+0 | 8.86E-4 | 4.32E-1 | 2.22E+0 | 6.87E-4 | 8.59E-2 | 7.94E-5 | -9.45E-1 | 1.36E+0 |
| PM | disease inc. | 3.95E-8 | 1.47E-9 | 3.76E-9 | 4.47E-8 | 1.32E-9 | 1.04E-8 | 8.68E-11 | -2.04E-8 | 3.61E-8 |
| IR | kBq U-235 eq | 6.58E-2 | 1.04E-3 | 8.88E-4 | 6.78E-2 | 9.78E-4 | 7.88E-3 | 5.81E-5 | -3.12E-2 | 4.55E-2 |
| ETP-fw | CTUe | 3.38E+1 | 2.21E-1 | 1.30E+0 | 3.53E+1 | 1.82E-1 | 1.65E+1 | 1.81E-1 | -1.26E+1 | 3.96E+1 |
| HTP-c | CTUh | 9.01E-10 | 7.16E-12 | 4.49E-11 | 9.53E-10 | 6.47E-12 | 2.52E-10 | 3.45E-13 | -3.48E-10 | 8.65E-10 |
| HTP-nc | CTUh | 2.94E-8 | 2.42E-10 | 1.40E-9 | 3.11E-8 | 2.17E-10 | 5.89E-9 | 3.53E-11 | -1.20E-8 | 2.52E-8 |
| SQP | Pt | 6.07E+0 | 2.15E-1 | 4.17E-2 | 6.32E+0 | 1.92E-1 | 1.40E+0 | 3.23E-2 | -1.19E+1 | -3.97E+0 |

| Resource use | Unit | A1 | A2 | A3 | A1-A3 | C2 | C3 | C4 | D | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| PERE | MJ | 1.87E+0 | 3.10E-3 | 2.71E+0 | 4.59E+0 | 3.21E-3 | 1.59E-1 | 4.77E-4 | -2.51E+0 | 2.24E+0 |
| PERM | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PERT | MJ | 1.87E+0 | 3.10E-3 | 2.71E+0 | 4.59E+0 | 3.21E-3 | 1.59E-1 | 4.77E-4 | -2.51E+0 | 2.24E+0 |
| PENRE | MJ | 3.22E+1 | 2.63E-1 | 6.04E-1 | 3.31E+1 | 2.38E-1 | 2.39E+0 | 1.34E-2 | -1.72E+1 | 1.85E+1 |
| PENRM | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PENRT | MJ | 3.22E+1 | 2.63E-1 | 6.04E-1 | 3.31E+1 | 2.38E-1 | 2.39E+0 | 1.34E-2 | -1.72E+1 | 1.85E+1 |
| PET | MJ | 3.41E+1 | 2.66E-1 | 3.32E+0 | 3.77E+1 | 2.41E-1 | 2.55E+0 | 1.39E-2 | -1.98E+1 | 2.07E+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 | 2.09E-2 | 3.02E-5 | 1.02E-2 | 3.11E-2 | 2.53E-5 | 2.37E-3 | 1.55E-5 | -1.13E-2 | 2.23E-2 |
| Output flows and waste categories | Unit | A1 | A2 | A3 | A1-A3 | C2 | C3 | C4 | D | Total |
| HWD | kg | 1.49E-4 | 6.28E-7 | 5.93E-7 | 1.50E-4 | 5.72E-7 | 3.68E-6 | 1.53E-8 | -1.27E-5 | 1.41E-4 |
| NHWD | kg | 1.15E-1 | 1.57E-2 | 9.15E-4 | 1.32E-1 | 1.39E-2 | 8.32E-2 | 5.55E-2 | -5.02E-2 | 2.34E-1 |
| RWD | kg | 5.96E-5 | 1.63E-6 | 1.10E-6 | 6.23E-5 | 1.52E-6 | 8.54E-6 | 8.21E-8 | -2.77E-5 | 4.47E-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 |

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