# Environmental Profile

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

Ecochain v3.5.80

| | |
|---|---|
| Product: | 3004154 - PVC RWA Tee 87.3° GY 70 S/RSP |
| 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 | 0.02 | 0 | 0 | 0.03 | 0 | 0.01 | 0 | -0.01 | 0.02 |
| ADPE | kg Sb-eq | 2.18E-4 | 7.89E-8 | 3.43E-7 | 2.18E-4 | 7.15E-8 | 6.61E-7 | 7.98E-10 | -2.52E-6 | 2.16E-4 |
| ADPF | kg Sb-eq | 2.59E-3 | 2.27E-5 | 5.89E-5 | 2.67E-3 | 2.01E-5 | 2.26E-4 | 1.11E-6 | -1.42E-3 | 1.50E-3 |
| GWP | kg CO2-eq | 2.19E-1 | 3.09E-3 | 1.12E-2 | 2.33E-1 | 2.74E-3 | 7.71E-2 | 7.53E-4 | -1.23E-1 | 1.91E-1 |
| ODP | kg CFC-11-eq | 1.21E-7 | 5.48E-10 | 8.83E-10 | 1.23E-7 | 5.08E-10 | 9.47E-9 | 2.64E-11 | -6.12E-8 | 7.13E-8 |
| POCP | kg ethene-eq | 1.25E-4 | 1.86E-6 | 4.85E-6 | 1.31E-4 | 1.65E-6 | 1.81E-5 | 1.95E-7 | -6.46E-5 | 8.68E-5 |
| AP | kg SO2-eq | 8.76E-4 | 1.36E-5 | 4.80E-5 | 9.37E-4 | 1.18E-5 | 1.33E-4 | 5.95E-7 | -4.30E-4 | 6.53E-4 |
| EP | kg PO4 3−-eq | 1.16E-4 | 2.67E-6 | 6.17E-6 | 1.25E-4 | 2.36E-6 | 2.02E-5 | 2.35E-7 | -6.11E-5 | 8.64E-5 |
| HTP | kg 1,4-DB-eq | 8.52E-2 | 1.30E-3 | 5.19E-3 | 9.17E-2 | 1.17E-3 | 3.44E-2 | 6.25E-5 | -4.06E-2 | 8.67E-2 |
| FAETP | kg 1,4-DB-eq | 2.73E-3 | 3.80E-5 | 1.77E-4 | 2.94E-3 | 3.44E-5 | 5.28E-4 | 1.93E-5 | -1.25E-3 | 2.27E-3 |
| MAETP | kg 1,4-DB-eq | 6.04E+0 | 1.37E-1 | 6.98E-1 | 6.87E+0 | 1.23E-1 | 1.84E+0 | 2.35E-2 | -2.63E+0 | 6.23E+0 |
| TETP | kg 1,4-DB-eq | 6.40E-4 | 4.60E-6 | 3.86E-4 | 1.03E-3 | 4.16E-6 | 1.22E-4 | 2.10E-7 | -4.18E-4 | 7.38E-4 |
| Environmental impact | Unit | A1 | A2 | A3 | A1-A3 | C2 | C3 | C4 | D | Total |
| GWP-total | kg CO2 eq | 2.26E-1 | 3.12E-3 | 1.28E-2 | 2.42E-1 | 2.77E-3 | 8.46E-2 | 8.77E-4 | -1.11E-1 | 2.20E-1 |
| GWP-f | kg CO2 eq | 2.24E-1 | 3.12E-3 | 9.82E-3 | 2.36E-1 | 2.76E-3 | 7.76E-2 | 8.77E-4 | -1.26E-1 | 1.92E-1 |
| GWP-b | kg CO2 eq | 2.26E-3 | 1.44E-6 | 2.03E-3 | 4.28E-3 | 1.68E-6 | 6.94E-3 | 1.11E-6 | 1.52E-2 | 2.65E-2 |
| GWP-luluc | kg CO2 eq | 2.76E-4 | 1.14E-6 | 9.32E-4 | 1.21E-3 | 9.78E-7 | 3.51E-5 | 2.30E-8 | -1.88E-4 | 1.06E-3 |
| ODP | kg CFC11 eq | 1.20E-7 | 6.88E-10 | 1.04E-9 | 1.21E-7 | 6.37E-10 | 9.76E-9 | 3.27E-11 | -6.06E-8 | 7.11E-8 |
| AP | mol H+ eq | 1.07E-3 | 1.81E-5 | 5.99E-5 | 1.15E-3 | 1.57E-5 | 1.67E-4 | 7.96E-7 | -5.22E-4 | 8.10E-4 |
| EP-fw | kg P eq | 1.09E-5 | 3.14E-8 | 1.72E-7 | 1.11E-5 | 2.27E-8 | 1.18E-6 | 1.04E-9 | -5.75E-6 | 6.58E-6 |
| EP-m | kg N eq | 1.96E-4 | 6.37E-6 | 1.41E-5 | 2.17E-4 | 5.63E-6 | 4.11E-5 | 4.94E-7 | -9.45E-5 | 1.69E-4 |
| EP-T | mol N eq | 2.10E-3 | 7.02E-5 | 1.56E-4 | 2.33E-3 | 6.21E-5 | 4.52E-4 | 3.18E-6 | -1.02E-3 | 1.82E-3 |
| POCP | kg NMVOC eq | 6.64E-4 | 2.00E-5 | 4.44E-5 | 7.28E-4 | 1.77E-5 | 1.35E-4 | 1.09E-6 | -3.34E-4 | 5.48E-4 |
| ADP-mm | kg Sb eq | 2.18E-4 | 7.89E-8 | 3.42E-7 | 2.18E-4 | 7.15E-8 | 6.61E-7 | 7.98E-10 | -2.52E-6 | 2.16E-4 |
| ADP-f | MJ | 5.51E+0 | 4.70E-2 | 1.10E-1 | 5.66E+0 | 4.24E-2 | 4.48E-1 | 2.39E-3 | -3.00E+0 | 3.16E+0 |
| WDP | m3 depriv. | 3.62E-1 | 1.68E-4 | 8.50E-2 | 4.47E-1 | 1.30E-4 | 1.76E-2 | 1.55E-5 | -1.93E-1 | 2.72E-1 |
| PM | disease inc. | 7.45E-9 | 2.80E-10 | 7.40E-10 | 8.47E-9 | 2.49E-10 | 2.07E-9 | 1.65E-11 | -4.34E-9 | 6.47E-9 |
| IR | kBq U-235 eq | 1.27E-2 | 1.97E-4 | 1.75E-4 | 1.30E-2 | 1.85E-4 | 1.59E-3 | 1.10E-5 | -6.48E-3 | 8.36E-3 |
| ETP-fw | CTUe | 7.35E+0 | 4.19E-2 | 2.55E-1 | 7.65E+0 | 3.45E-2 | 3.47E+0 | 3.82E-2 | -2.85E+0 | 8.34E+0 |
| HTP-c | CTUh | 1.84E-10 | 1.36E-12 | 8.83E-12 | 1.94E-10 | 1.23E-12 | 5.00E-11 | 6.61E-14 | -7.17E-11 | 1.74E-10 |
| HTP-nc | CTUh | 6.07E-9 | 4.58E-11 | 2.76E-10 | 6.39E-9 | 4.11E-11 | 1.20E-9 | 7.32E-12 | -2.48E-9 | 5.16E-9 |
| SQP | Pt | 1.35E+0 | 4.08E-2 | 8.21E-3 | 1.40E+0 | 3.63E-2 | 2.73E-1 | 6.12E-3 | -3.18E+0 | -1.46E+0 |

| Resource use | Unit | A1 | A2 | A3 | A1-A3 | C2 | C3 | C4 | D | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| PERE | MJ | 4.05E-1 | 5.88E-4 | 5.34E-1 | 9.40E-1 | 6.09E-4 | 3.22E-2 | 8.93E-5 | -6.46E-1 | 3.27E-1 |
| PERM | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PERT | MJ | 4.05E-1 | 5.88E-4 | 5.34E-1 | 9.40E-1 | 6.09E-4 | 3.22E-2 | 8.93E-5 | -6.46E-1 | 3.27E-1 |
| PENRE | MJ | 5.91E+0 | 4.99E-2 | 1.19E-1 | 6.08E+0 | 4.50E-2 | 4.77E-1 | 2.54E-3 | -3.23E+0 | 3.37E+0 |
| PENRM | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PENRT | MJ | 5.91E+0 | 4.99E-2 | 1.19E-1 | 6.08E+0 | 4.50E-2 | 4.77E-1 | 2.54E-3 | -3.23E+0 | 3.37E+0 |
| PET | MJ | 6.31E+0 | 5.05E-2 | 6.53E-1 | 7.02E+0 | 4.57E-2 | 5.09E-1 | 2.63E-3 | -3.87E+0 | 3.70E+0 |
| 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 | 4.11E-3 | 5.72E-6 | 2.01E-3 | 6.12E-3 | 4.80E-6 | 4.83E-4 | 2.93E-6 | -2.38E-3 | 4.24E-3 |
| Output flows and waste categories | Unit | A1 | A2 | A3 | A1-A3 | C2 | C3 | C4 | D | Total |
| HWD | kg | 3.14E-5 | 1.19E-7 | 1.17E-7 | 3.16E-5 | 1.08E-7 | 7.37E-7 | 2.91E-9 | -2.57E-6 | 2.99E-5 |
| NHWD | kg | 2.37E-2 | 2.98E-3 | 1.80E-4 | 2.69E-2 | 2.63E-3 | 1.62E-2 | 1.05E-2 | -1.03E-2 | 4.59E-2 |
| RWD | kg | 1.11E-5 | 3.08E-7 | 2.16E-7 | 1.16E-5 | 2.89E-7 | 1.71E-6 | 1.56E-8 | -5.78E-6 | 7.81E-6 |
| 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 |