

# Environmental Profile

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

Ecochain v3.5.80



Product: 3001313 - Wafix PVC Branch 45° GY 110 SN8 S/S/SP  
Unit: 1 piece  
Manufacturer: Wavin - NL - Hardenberg - Verified  
Address: J.C. Kellerlaan 3  
7772 SG Hardenberg  
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                                                                |    |    |     |     | Use stage                                                                                                             |     |     |     |     |     |     | End-of-Life stage                                                             |    |    |    |   |
| A1 Raw material supply A2 Transport A3 Manufacturing                         |    |    |     |     | B1 Use B2 Maintenance B3 Repair B4 Replacement B5 Refurbishment<br>B6 Operational energy use B7 Operational water use |     |     |     |     |     |     | C1 De-construction demolition C2 Transport C3 Waste processing<br>C4 Disposal |    |    |    |   |
| Construction process stage                                                   |    |    |     |     |                                                                                                                       |     |     |     |     |     |     | Benefits and loads beyond the system boundaries                               |    |    |    |   |
| A4 Transport gate to site<br>A5 Assembly / Construction installation process |    |    |     |     |                                                                                                                       |     |     |     |     |     |     | 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         | 0.16    | 0        | 0.01     | 0.17    | 0        | 0.05     | 0        | -0.08     | 0.14     |
| ADPE                           | kg Sb-eq     | 1.35E-3 | 5.22E-7  | 2.21E-6  | 1.35E-3 | 4.77E-7  | 4.17E-6  | 5.32E-9  | -1.60E-5  | 1.34E-3  |
| ADPF                           | kg Sb-eq     | 1.77E-2 | 1.50E-4  | 3.80E-4  | 1.82E-2 | 1.34E-4  | 1.44E-3  | 7.37E-6  | -9.56E-3  | 1.02E-2  |
| GWP                            | kg CO2-eq    | 1.43E+0 | 2.04E-2  | 7.21E-2  | 1.53E+0 | 1.83E-2  | 5.14E-1  | 5.21E-3  | -8.05E-1  | 1.26E+0  |
| ODP                            | kg CFC-11-eq | 7.48E-7 | 3.62E-9  | 5.70E-9  | 7.57E-7 | 3.39E-9  | 5.84E-8  | 1.76E-10 | -3.85E-7  | 4.35E-7  |
| POCP                           | kg ethene-eq | 8.75E-4 | 1.23E-5  | 3.13E-5  | 9.19E-4 | 1.10E-5  | 1.16E-4  | 1.33E-6  | -4.26E-4  | 6.21E-4  |
| AP                             | kg SO2-eq    | 5.72E-3 | 8.98E-5  | 3.10E-4  | 6.12E-3 | 7.87E-5  | 8.38E-4  | 3.96E-6  | -2.71E-3  | 4.32E-3  |
| EP                             | kg PO4 3--eq | 7.28E-4 | 1.76E-5  | 3.98E-5  | 7.85E-4 | 1.57E-5  | 1.28E-4  | 1.66E-6  | -3.65E-4  | 5.66E-4  |
| HTP                            | kg 1,4-DB-eq | 5.45E-1 | 8.60E-3  | 3.35E-2  | 5.87E-1 | 7.82E-3  | 2.23E-1  | 4.26E-4  | -2.53E-1  | 5.65E-1  |
| FAETP                          | kg 1,4-DB-eq | 1.64E-2 | 2.51E-4  | 1.14E-3  | 1.78E-2 | 2.29E-4  | 3.44E-3  | 1.57E-4  | -7.16E-3  | 1.45E-2  |
| MAETP                          | kg 1,4-DB-eq | 3.86E+1 | 9.03E-1  | 4.51E+0  | 4.40E+1 | 8.18E-1  | 1.16E+1  | 1.83E-1  | -1.64E+1  | 4.02E+1  |
| TETP                           | kg 1,4-DB-eq | 3.92E-3 | 3.04E-5  | 2.49E-3  | 6.44E-3 | 2.77E-5  | 7.88E-4  | 1.38E-6  | -2.38E-3  | 4.88E-3  |
| Environmental impact           | Unit         | A1      | A2       | A3       | A1-A3   | C2       | C3       | C4       | D         | Total    |
| GWP-total                      | kg CO2 eq    | 1.48E+0 | 2.06E-2  | 8.25E-2  | 1.58E+0 | 1.84E-2  | 5.49E-1  | 6.07E-3  | -7.57E-1  | 1.40E+0  |
| GWP-f                          | kg CO2 eq    | 1.47E+0 | 2.06E-2  | 6.34E-2  | 1.55E+0 | 1.84E-2  | 5.18E-1  | 6.07E-3  | -8.23E-1  | 1.27E+0  |
| GWP-b                          | kg CO2 eq    | 1.29E-2 | 9.51E-6  | 1.31E-2  | 2.60E-2 | 1.12E-5  | 3.11E-2  | 7.42E-6  | 6.72E-2   | 1.24E-1  |
| GWP-luluc                      | kg CO2 eq    | 1.60E-3 | 7.55E-6  | 6.02E-3  | 7.63E-3 | 6.52E-6  | 2.22E-4  | 1.53E-7  | -9.95E-4  | 6.86E-3  |
| ODP                            | kg CFC11 eq  | 7.40E-7 | 4.55E-9  | 6.70E-9  | 7.52E-7 | 4.25E-9  | 6.03E-8  | 2.18E-10 | -3.81E-7  | 4.36E-7  |
| AP                             | mol H+ eq    | 6.95E-3 | 1.19E-4  | 3.87E-4  | 7.46E-3 | 1.05E-4  | 1.05E-3  | 5.31E-6  | -3.28E-3  | 5.34E-3  |
| EP-fw                          | kg P eq      | 6.81E-5 | 2.08E-7  | 1.11E-6  | 6.94E-5 | 1.52E-7  | 7.40E-6  | 6.94E-9  | -3.42E-5  | 4.27E-5  |
| EP-m                           | kg N eq      | 1.24E-3 | 4.21E-5  | 9.13E-5  | 1.37E-3 | 3.76E-5  | 2.60E-4  | 3.50E-6  | -5.87E-4  | 1.08E-3  |
| EP-T                           | mol N eq     | 1.34E-2 | 4.64E-4  | 1.01E-3  | 1.48E-2 | 4.14E-4  | 2.86E-3  | 2.12E-5  | -6.33E-3  | 1.18E-2  |
| POCP                           | kg NMVOC eq  | 4.42E-3 | 1.33E-4  | 2.87E-4  | 4.84E-3 | 1.18E-4  | 8.59E-4  | 7.34E-6  | -2.14E-3  | 3.69E-3  |
| ADP-mm                         | kg Sb eq     | 1.35E-3 | 5.22E-7  | 2.21E-6  | 1.35E-3 | 4.77E-7  | 4.17E-6  | 5.32E-9  | -1.60E-5  | 1.34E-3  |
| ADP-f                          | MJ           | 3.76E+1 | 3.11E-1  | 7.09E-1  | 3.86E+1 | 2.83E-1  | 2.86E+0  | 1.59E-2  | -2.01E+1  | 2.17E+1  |
| WDP                            | m3 depriv.   | 2.29E+0 | 1.11E-3  | 5.48E-1  | 2.84E+0 | 8.68E-4  | 1.10E-1  | 1.01E-4  | -1.20E+0  | 1.75E+0  |
| PM                             | disease inc. | 4.92E-8 | 1.85E-9  | 4.77E-9  | 5.58E-8 | 1.66E-9  | 1.32E-8  | 1.10E-10 | -2.57E-8  | 4.51E-8  |
| IR                             | kBq U-235 eq | 8.31E-2 | 1.30E-3  | 1.13E-3  | 8.55E-2 | 1.24E-3  | 1.01E-2  | 7.34E-5  | -3.97E-2  | 5.72E-2  |
| ETP-fw                         | CTUe         | 4.31E+1 | 2.77E-1  | 1.65E+0  | 4.50E+1 | 2.30E-1  | 2.13E+1  | 2.34E-1  | -1.60E+1  | 5.08E+1  |
| HTP-c                          | CTUh         | 1.15E-9 | 8.99E-12 | 5.70E-11 | 1.22E-9 | 8.17E-12 | 3.20E-10 | 4.37E-13 | -4.43E-10 | 1.11E-9  |
| HTP-nc                         | CTUh         | 3.78E-8 | 3.03E-10 | 1.78E-9  | 3.98E-8 | 2.74E-10 | 7.55E-9  | 4.55E-11 | -1.53E-8  | 3.24E-8  |
| SQP                            | Pt           | 7.63E+0 | 2.70E-1  | 5.30E-2  | 7.96E+0 | 2.42E-1  | 1.77E+0  | 4.08E-2  | -1.49E+1  | -4.93E+0 |

| Resource use                      | Unit | A1      | A2      | A3      | A1-A3   | C2      | C3      | C4      | D        | Total   |
|-----------------------------------|------|---------|---------|---------|---------|---------|---------|---------|----------|---------|
| PERE                              | MJ   | 2.37E+0 | 3.89E-3 | 3.45E+0 | 5.82E+0 | 4.06E-3 | 2.03E-1 | 6.01E-4 | -3.15E+0 | 2.87E+0 |
| PERM                              | MJ   | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       |
| PERT                              | MJ   | 2.37E+0 | 3.89E-3 | 3.45E+0 | 5.82E+0 | 4.06E-3 | 2.03E-1 | 6.01E-4 | -3.15E+0 | 2.87E+0 |
| PENRE                             | MJ   | 4.03E+1 | 3.30E-1 | 7.66E-1 | 4.14E+1 | 3.00E-1 | 3.05E+0 | 1.69E-2 | -2.17E+1 | 2.31E+1 |
| PENRM                             | MJ   | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       |
| PENRT                             | MJ   | 4.03E+1 | 3.30E-1 | 7.66E-1 | 4.14E+1 | 3.00E-1 | 3.05E+0 | 1.69E-2 | -2.17E+1 | 2.31E+1 |
| PET                               | MJ   | 4.27E+1 | 3.34E-1 | 4.21E+0 | 4.72E+1 | 3.04E-1 | 3.25E+0 | 1.75E-2 | -2.48E+1 | 2.60E+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   | 2.65E-2 | 3.78E-5 | 1.30E-2 | 3.95E-2 | 3.20E-5 | 3.04E-3 | 1.95E-5 | -1.43E-2 | 2.83E-2 |
| Output flows and waste categories | Unit | A1      | A2      | A3      | A1-A3   | C2      | C3      | C4      | D        | Total   |
| HWD                               | kg   | 1.92E-4 | 7.87E-7 | 7.53E-7 | 1.94E-4 | 7.23E-7 | 4.69E-6 | 1.94E-8 | -1.61E-5 | 1.83E-4 |
| NHWD                              | kg   | 1.47E-1 | 1.97E-2 | 1.16E-3 | 1.68E-1 | 1.75E-2 | 1.05E-1 | 7.01E-2 | -6.39E-2 | 2.97E-1 |
| RWD                               | kg   | 7.46E-5 | 2.04E-6 | 1.39E-6 | 7.80E-5 | 1.92E-6 | 1.09E-5 | 1.04E-7 | -3.53E-5 | 5.56E-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       |