

# Environmental Profile

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

Ecochain v3.5.80



Product: 3001296 - Wafix PVC Bend 15° GY 110 SN8 S/S  
Unit: 1 piece  
Manufacturer: Wavin - NL - Hardenberg - Verified  
Address: J.C. Kellerlaan 3  
7772 SG Hardenberg  
Netherlands

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



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.

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         | 0.07     | 0        | 0        | 0.07     | 0        | 0.02     | 0        | -0.03     | 0.06     |
| ADPE                           | kg Sb-eq     | 5.20E-4  | 2.30E-7  | 9.25E-7  | 5.21E-4  | 2.04E-7  | 1.69E-6  | 2.27E-9  | -6.51E-6  | 5.17E-4  |
| ADPF                           | kg Sb-eq     | 7.93E-3  | 6.61E-5  | 1.59E-4  | 8.16E-3  | 5.75E-5  | 5.89E-4  | 3.16E-6  | -4.22E-3  | 4.59E-3  |
| GWP                            | kg CO2-eq    | 6.16E-1  | 8.99E-3  | 3.02E-2  | 6.55E-1  | 7.83E-3  | 2.23E-1  | 2.34E-3  | -3.46E-1  | 5.43E-1  |
| ODP                            | kg CFC-11-eq | 2.89E-7  | 1.60E-9  | 2.39E-9  | 2.93E-7  | 1.45E-9  | 2.25E-8  | 7.53E-11 | -1.53E-7  | 1.64E-7  |
| POCP                           | kg ethene-eq | 4.08E-4  | 5.42E-6  | 1.31E-5  | 4.27E-4  | 4.70E-6  | 4.80E-5  | 5.88E-7  | -1.86E-4  | 2.94E-4  |
| AP                             | kg SO2-eq    | 2.44E-3  | 3.95E-5  | 1.30E-4  | 2.61E-3  | 3.37E-5  | 3.38E-4  | 1.70E-6  | -1.14E-3  | 1.85E-3  |
| EP                             | kg PO4 3--eq | 3.04E-4  | 7.77E-6  | 1.67E-5  | 3.29E-4  | 6.73E-6  | 5.24E-5  | 7.69E-7  | -1.50E-4  | 2.39E-4  |
| HTP                            | kg 1,4-DB-eq | 2.26E-1  | 3.79E-3  | 1.40E-2  | 2.43E-1  | 3.35E-3  | 9.30E-2  | 1.88E-4  | -1.03E-1  | 2.37E-1  |
| FAETP                          | kg 1,4-DB-eq | 6.65E-3  | 1.11E-4  | 4.79E-4  | 7.24E-3  | 9.82E-5  | 1.47E-3  | 8.33E-5  | -2.88E-3  | 6.01E-3  |
| MAETP                          | kg 1,4-DB-eq | 1.60E+1  | 3.98E-1  | 1.89E+0  | 1.83E+1  | 3.51E-1  | 4.75E+0  | 9.36E-2  | -6.66E+0  | 1.68E+1  |
| TETP                           | kg 1,4-DB-eq | 1.55E-3  | 1.34E-5  | 1.04E-3  | 2.61E-3  | 1.19E-5  | 3.25E-4  | 5.77E-7  | -9.47E-4  | 2.00E-3  |
| Environmental impact           | Unit         | A1       | A2       | A3       | A1-A3    | C2       | C3       | C4       | D         | Total    |
| GWP-total                      | kg CO2 eq    | 6.37E-1  | 9.07E-3  | 3.45E-2  | 6.80E-1  | 7.90E-3  | 2.37E-1  | 2.73E-3  | -3.29E-1  | 5.99E-1  |
| GWP-f                          | kg CO2 eq    | 6.32E-1  | 9.07E-3  | 2.65E-2  | 6.67E-1  | 7.90E-3  | 2.25E-1  | 2.73E-3  | -3.54E-1  | 5.48E-1  |
| GWP-b                          | kg CO2 eq    | 4.54E-3  | 4.19E-6  | 5.48E-3  | 1.00E-2  | 4.80E-6  | 1.20E-2  | 3.20E-6  | 2.59E-2   | 4.79E-2  |
| GWP-luluc                      | kg CO2 eq    | 6.42E-4  | 3.32E-6  | 2.52E-3  | 3.17E-3  | 2.79E-6  | 8.88E-5  | 6.55E-8  | -3.95E-4  | 2.86E-3  |
| ODP                            | kg CFC11 eq  | 2.87E-7  | 2.00E-9  | 2.80E-9  | 2.92E-7  | 1.82E-9  | 2.34E-8  | 9.35E-11 | -1.51E-7  | 1.66E-7  |
| AP                             | mol H+ eq    | 2.97E-3  | 5.26E-5  | 1.62E-4  | 3.18E-3  | 4.50E-5  | 4.26E-4  | 2.27E-6  | -1.38E-3  | 2.28E-3  |
| EP-fw                          | kg P eq      | 2.75E-5  | 9.15E-8  | 4.65E-7  | 2.81E-5  | 6.50E-8  | 2.94E-6  | 2.97E-9  | -1.38E-5  | 1.73E-5  |
| EP-m                           | kg N eq      | 5.20E-4  | 1.85E-5  | 3.82E-5  | 5.77E-4  | 1.61E-5  | 1.06E-4  | 1.62E-6  | -2.46E-4  | 4.55E-4  |
| EP-T                           | mol N eq     | 5.65E-3  | 2.04E-4  | 4.21E-4  | 6.28E-3  | 1.77E-4  | 1.17E-3  | 9.08E-6  | -2.65E-3  | 4.98E-3  |
| POCP                           | kg NMVOC eq  | 1.96E-3  | 5.83E-5  | 1.20E-4  | 2.14E-3  | 5.07E-5  | 3.53E-4  | 3.17E-6  | -9.15E-4  | 1.63E-3  |
| ADP-mm                         | kg Sb eq     | 5.20E-4  | 2.30E-7  | 9.25E-7  | 5.21E-4  | 2.04E-7  | 1.69E-6  | 2.27E-9  | -6.51E-6  | 5.17E-4  |
| ADP-f                          | MJ           | 1.69E+1  | 1.37E-1  | 2.97E-1  | 1.73E+1  | 1.21E-1  | 1.17E+0  | 6.83E-3  | -8.86E+0  | 9.74E+0  |
| WDP                            | m3 depriv.   | 9.16E-1  | 4.89E-4  | 2.30E-1  | 1.15E+0  | 3.72E-4  | 4.34E-2  | 4.19E-5  | -4.90E-1  | 7.00E-1  |
| PM                             | disease inc. | 2.22E-8  | 8.14E-10 | 2.00E-9  | 2.50E-8  | 7.13E-10 | 5.46E-9  | 4.70E-11 | -1.08E-8  | 2.04E-8  |
| IR                             | kBq U-235 eq | 3.56E-2  | 5.73E-4  | 4.72E-4  | 3.66E-2  | 5.30E-4  | 4.07E-3  | 3.16E-5  | -1.61E-2  | 2.52E-2  |
| ETP-fw                         | CTUe         | 1.72E+1  | 1.22E-1  | 6.89E-1  | 1.80E+1  | 9.84E-2  | 8.10E+0  | 8.90E-2  | -6.38E+0  | 1.99E+1  |
| HTP-c                          | CTUh         | 4.61E-10 | 3.95E-12 | 2.39E-11 | 4.89E-10 | 3.50E-12 | 1.32E-10 | 1.85E-13 | -1.79E-10 | 4.46E-10 |
| HTP-nc                         | CTUh         | 1.49E-8  | 1.33E-10 | 7.45E-10 | 1.58E-8  | 1.17E-10 | 2.99E-9  | 1.76E-11 | -6.15E-9  | 1.27E-8  |
| SQP                            | Pt           | 3.16E+0  | 1.19E-1  | 2.22E-2  | 3.30E+0  | 1.04E-1  | 7.43E-1  | 1.75E-2  | -5.83E+0  | -1.66E+0 |

| Resource use                      | Unit | A1      | A2      | A3      | A1-A3   | C2      | C3      | C4      | D        | Total   |
|-----------------------------------|------|---------|---------|---------|---------|---------|---------|---------|----------|---------|
| PERE                              | MJ   | 9.66E-1 | 1.71E-3 | 1.44E+0 | 2.41E+0 | 1.74E-3 | 8.11E-2 | 2.61E-4 | -1.24E+0 | 1.25E+0 |
| PERM                              | MJ   | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       |
| PERT                              | MJ   | 9.66E-1 | 1.71E-3 | 1.44E+0 | 2.41E+0 | 1.74E-3 | 8.11E-2 | 2.61E-4 | -1.24E+0 | 1.25E+0 |
| PENRE                             | MJ   | 1.81E+1 | 1.45E-1 | 3.21E-1 | 1.86E+1 | 1.29E-1 | 1.25E+0 | 7.25E-3 | -9.54E+0 | 1.04E+1 |
| PENRM                             | MJ   | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       |
| PENRT                             | MJ   | 1.81E+1 | 1.45E-1 | 3.21E-1 | 1.86E+1 | 1.29E-1 | 1.25E+0 | 7.25E-3 | -9.54E+0 | 1.04E+1 |
| PET                               | MJ   | 1.91E+1 | 1.47E-1 | 1.76E+0 | 2.10E+1 | 1.30E-1 | 1.33E+0 | 7.51E-3 | -1.08E+1 | 1.16E+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   | 1.11E-2 | 1.67E-5 | 5.43E-3 | 1.65E-2 | 1.37E-5 | 1.21E-3 | 8.39E-6 | -5.85E-3 | 1.19E-2 |
| Output flows and waste categories | Unit | A1      | A2      | A3      | A1-A3   | C2      | C3      | C4      | D        | Total   |
| HWD                               | kg   | 7.28E-5 | 3.47E-7 | 3.15E-7 | 7.35E-5 | 3.10E-7 | 1.92E-6 | 8.30E-9 | -6.59E-6 | 6.91E-5 |
| NHWD                              | kg   | 5.94E-2 | 8.67E-3 | 4.86E-4 | 6.86E-2 | 7.51E-3 | 4.44E-2 | 3.00E-2 | -2.59E-2 | 1.25E-1 |
| RWD                               | kg   | 3.33E-5 | 8.98E-7 | 5.84E-7 | 3.47E-5 | 8.24E-7 | 4.45E-6 | 4.45E-8 | -1.43E-5 | 2.58E-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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