

# Environmental Profile

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

Ecochain v3.5.80



Product: 3001318 - Wafix PVC Branch 45° GY 160 SN4 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         | 0.45    | 0.01     | 0.03     | 0.48    | 0.01     | 0.15     | 0        | -0.23    | 0.41     |
| ADPE                           | kg Sb-eq     | 3.87E-3 | 1.47E-6  | 6.27E-6  | 3.88E-3 | 1.35E-6  | 1.19E-5  | 1.50E-8  | -4.56E-5 | 3.85E-3  |
| ADPF                           | kg Sb-eq     | 4.95E-2 | 4.22E-4  | 1.08E-3  | 5.10E-2 | 3.79E-4  | 4.11E-3  | 2.08E-5  | -2.69E-2 | 2.86E-2  |
| GWP                            | kg CO2-eq    | 4.04E+0 | 5.74E-2  | 2.04E-1  | 4.30E+0 | 5.17E-2  | 1.45E+0  | 1.46E-2  | -2.27E+0 | 3.55E+0  |
| ODP                            | kg CFC-11-eq | 2.14E-6 | 1.02E-8  | 1.62E-8  | 2.17E-6 | 9.58E-9  | 1.68E-7  | 4.97E-10 | -1.10E-6 | 1.25E-6  |
| POCP                           | kg ethene-eq | 2.44E-3 | 3.46E-5  | 8.88E-5  | 2.56E-3 | 3.10E-5  | 3.28E-4  | 3.75E-6  | -1.20E-3 | 1.73E-3  |
| AP                             | kg SO2-eq    | 1.61E-2 | 2.52E-4  | 8.78E-4  | 1.73E-2 | 2.22E-4  | 2.39E-3  | 1.12E-5  | -7.66E-3 | 1.22E-2  |
| EP                             | kg PO4 3--eq | 2.06E-3 | 4.96E-5  | 1.13E-4  | 2.22E-3 | 4.44E-5  | 3.64E-4  | 4.64E-6  | -1.03E-3 | 1.60E-3  |
| HTP                            | kg 1,4-DB-eq | 1.55E+0 | 2.42E-2  | 9.49E-2  | 1.66E+0 | 2.21E-2  | 6.32E-1  | 1.20E-3  | -7.19E-1 | 1.60E+0  |
| FAETP                          | kg 1,4-DB-eq | 4.65E-2 | 7.05E-4  | 3.24E-3  | 5.05E-2 | 6.47E-4  | 9.73E-3  | 4.27E-4  | -2.02E-2 | 4.10E-2  |
| MAETP                          | kg 1,4-DB-eq | 1.09E+2 | 2.54E+0  | 1.28E+1  | 1.25E+2 | 2.31E+0  | 3.29E+1  | 5.03E-1  | -4.65E+1 | 1.14E+2  |
| TETP                           | kg 1,4-DB-eq | 1.12E-2 | 8.54E-5  | 7.06E-3  | 1.83E-2 | 7.83E-5  | 2.24E-3  | 3.91E-6  | -6.73E-3 | 1.39E-2  |
| Environmental impact           | Unit         | A1      | A2       | A3       | A1-A3   | C2       | C3       | C4       | D        | Total    |
| GWP-total                      | kg CO2 eq    | 4.18E+0 | 5.79E-2  | 2.34E-1  | 4.47E+0 | 5.21E-2  | 1.55E+0  | 1.70E-2  | -2.14E+0 | 3.95E+0  |
| GWP-f                          | kg CO2 eq    | 4.14E+0 | 5.79E-2  | 1.80E-1  | 4.37E+0 | 5.21E-2  | 1.46E+0  | 1.70E-2  | -2.32E+0 | 3.58E+0  |
| GWP-b                          | kg CO2 eq    | 3.74E-2 | 2.67E-5  | 3.71E-2  | 7.45E-2 | 3.16E-5  | 8.65E-2  | 2.10E-5  | 1.86E-1  | 3.47E-1  |
| GWP-luluc                      | kg CO2 eq    | 4.53E-3 | 2.12E-5  | 1.71E-2  | 2.16E-2 | 1.84E-5  | 6.33E-4  | 4.33E-7  | -2.80E-3 | 1.95E-2  |
| ODP                            | kg CFC11 eq  | 2.12E-6 | 1.28E-8  | 1.90E-8  | 2.15E-6 | 1.20E-8  | 1.73E-7  | 6.17E-10 | -1.09E-6 | 1.25E-6  |
| AP                             | mol H+ eq    | 1.96E-2 | 3.36E-4  | 1.10E-3  | 2.11E-2 | 2.97E-4  | 3.00E-3  | 1.50E-5  | -9.28E-3 | 1.51E-2  |
| EP-fw                          | kg P eq      | 1.94E-4 | 5.84E-7  | 3.15E-6  | 1.97E-4 | 4.28E-7  | 2.11E-5  | 1.96E-8  | -9.70E-5 | 1.22E-4  |
| EP-m                           | kg N eq      | 3.50E-3 | 1.18E-4  | 2.59E-4  | 3.87E-3 | 1.06E-4  | 7.38E-4  | 9.78E-6  | -1.66E-3 | 3.07E-3  |
| EP-T                           | mol N eq     | 3.78E-2 | 1.30E-3  | 2.85E-3  | 4.19E-2 | 1.17E-3  | 8.13E-3  | 5.98E-5  | -1.79E-2 | 3.34E-2  |
| POCP                           | kg NMVOC eq  | 1.24E-2 | 3.72E-4  | 8.12E-4  | 1.36E-2 | 3.34E-4  | 2.44E-3  | 2.07E-5  | -6.01E-3 | 1.04E-2  |
| ADP-mm                         | kg Sb eq     | 3.87E-3 | 1.47E-6  | 6.27E-6  | 3.88E-3 | 1.35E-6  | 1.19E-5  | 1.50E-8  | -4.55E-5 | 3.85E-3  |
| ADP-f                          | MJ           | 1.05E+2 | 8.73E-1  | 2.01E+0  | 1.08E+2 | 7.99E-1  | 8.14E+0  | 4.50E-2  | -5.66E+1 | 6.07E+1  |
| WDP                            | m3 depriv.   | 6.53E+0 | 3.12E-3  | 1.55E+0  | 8.09E+0 | 2.45E-3  | 3.16E-1  | 2.86E-4  | -3.41E+0 | 4.99E+0  |
| PM                             | disease inc. | 1.38E-7 | 5.20E-9  | 1.35E-8  | 1.56E-7 | 4.70E-9  | 3.75E-8  | 3.10E-10 | -7.23E-8 | 1.26E-7  |
| IR                             | kBq U-235 eq | 2.35E-1 | 3.66E-3  | 3.19E-3  | 2.41E-1 | 3.49E-3  | 2.86E-2  | 2.07E-4  | -1.13E-1 | 1.61E-1  |
| ETP-fw                         | CTUe         | 1.22E+2 | 7.78E-1  | 4.67E+0  | 1.28E+2 | 6.49E-1  | 6.11E+1  | 6.74E-1  | -4.51E+1 | 1.45E+2  |
| HTP-c                          | CTUh         | 3.29E-9 | 2.52E-11 | 1.61E-10 | 3.47E-9 | 2.31E-11 | 9.09E-10 | 1.24E-12 | -1.26E-9 | 3.15E-9  |
| HTP-nc                         | CTUh         | 1.08E-7 | 8.51E-10 | 5.04E-9  | 1.14E-7 | 7.74E-10 | 2.16E-8  | 1.30E-10 | -4.34E-8 | 9.28E-8  |
| SQP                            | Pt           | 2.14E+1 | 7.57E-1  | 1.50E-1  | 2.23E+1 | 6.84E-1  | 5.02E+0  | 1.15E-1  | -4.16E+1 | -1.35E+1 |

| Resource use                      | Unit | A1      | A2      | A3      | A1-A3   | C2      | C3      | C4      | D        | Total   |
|-----------------------------------|------|---------|---------|---------|---------|---------|---------|---------|----------|---------|
| PERE                              | MJ   | 6.68E+0 | 1.09E-2 | 9.77E+0 | 1.65E+1 | 1.15E-2 | 5.81E-1 | 1.69E-3 | -8.81E+0 | 8.24E+0 |
| PERM                              | MJ   | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       |
| PERT                              | MJ   | 6.68E+0 | 1.09E-2 | 9.77E+0 | 1.65E+1 | 1.15E-2 | 5.81E-1 | 1.69E-3 | -8.81E+0 | 8.24E+0 |
| PENRE                             | MJ   | 1.13E+2 | 9.26E-1 | 2.17E+0 | 1.16E+2 | 8.49E-1 | 8.66E+0 | 4.78E-2 | -6.09E+1 | 6.48E+1 |
| PENRM                             | MJ   | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       |
| PENRT                             | MJ   | 1.13E+2 | 9.26E-1 | 2.17E+0 | 1.16E+2 | 8.49E-1 | 8.66E+0 | 4.78E-2 | -6.09E+1 | 6.48E+1 |
| PET                               | MJ   | 1.20E+2 | 9.37E-1 | 1.19E+1 | 1.33E+2 | 8.60E-1 | 9.24E+0 | 4.95E-2 | -6.97E+1 | 7.31E+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   | 7.51E-2 | 1.06E-4 | 3.68E-2 | 1.12E-1 | 9.04E-5 | 8.69E-3 | 5.52E-5 | -4.04E-2 | 8.04E-2 |
| Output flows and waste categories | Unit | A1      | A2      | A3      | A1-A3   | C2      | C3      | C4      | D        | Total   |
| HWD                               | kg   | 5.52E-4 | 2.21E-6 | 2.13E-6 | 5.56E-4 | 2.04E-6 | 1.33E-5 | 5.48E-8 | -4.58E-5 | 5.26E-4 |
| NHWD                              | kg   | 4.17E-1 | 5.53E-2 | 3.29E-3 | 4.75E-1 | 4.95E-2 | 2.98E-1 | 1.98E-1 | -1.82E-1 | 8.40E-1 |
| RWD                               | kg   | 2.09E-4 | 5.73E-6 | 3.95E-6 | 2.19E-4 | 5.44E-6 | 3.09E-5 | 2.93E-7 | -1.00E-4 | 1.55E-4 |
| 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       |



Ecochain Technologies BV  
H.J.E. Wenckebachweg 123, 1096 AM Amsterdam, The Netherlands  
<https://www.ecochain.com>  
+31 20 3035 777