

# Environmental Profile

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

Ecochain v3.5.80



Product: 3001304 - Wafix PVC Bend 15° GY 160 SN4 S/S  
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]

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# Results

| Environmental impact SBK set 1 | Unit         | A1      | A2       | A3       | A1-A3   | C2       | C3       | C4       | D         | Total    |
|--------------------------------|--------------|---------|----------|----------|---------|----------|----------|----------|-----------|----------|
| ECI                            | euro         | 0.19    | 0        | 0.01     | 0.21    | 0        | 0.06     | 0        | -0.1      | 0.17     |
| ADPE                           | kg Sb-eq     | 1.54E-3 | 6.52E-7  | 2.48E-6  | 1.54E-3 | 5.80E-7  | 4.91E-6  | 6.46E-9  | -1.89E-5  | 1.53E-3  |
| ADPF                           | kg Sb-eq     | 2.22E-2 | 1.88E-4  | 4.26E-4  | 2.28E-2 | 1.63E-4  | 1.71E-3  | 8.97E-6  | -1.19E-2  | 1.28E-2  |
| GWP                            | kg CO2-eq    | 1.76E+0 | 2.55E-2  | 8.09E-2  | 1.86E+0 | 2.22E-2  | 6.33E-1  | 6.53E-3  | -9.88E-1  | 1.54E+0  |
| ODP                            | kg CFC-11-eq | 8.53E-7 | 4.53E-9  | 6.40E-9  | 8.64E-7 | 4.13E-9  | 6.67E-8  | 2.14E-10 | -4.47E-7  | 4.88E-7  |
| POCP                           | kg ethene-eq | 1.13E-3 | 1.54E-5  | 3.51E-5  | 1.18E-3 | 1.34E-5  | 1.39E-4  | 1.65E-6  | -5.30E-4  | 8.05E-4  |
| AP                             | kg SO2-eq    | 6.98E-3 | 1.12E-4  | 3.48E-4  | 7.44E-3 | 9.57E-5  | 9.85E-4  | 4.82E-6  | -3.29E-3  | 5.23E-3  |
| EP                             | kg PO4 3--eq | 8.83E-4 | 2.20E-5  | 4.47E-5  | 9.50E-4 | 1.91E-5  | 1.52E-4  | 2.13E-6  | -4.43E-4  | 6.80E-4  |
| HTP                            | kg 1,4-DB-eq | 6.52E-1 | 1.07E-2  | 3.76E-2  | 7.00E-1 | 9.52E-3  | 2.68E-1  | 5.28E-4  | -3.01E-1  | 6.76E-1  |
| FAETP                          | kg 1,4-DB-eq | 1.97E-2 | 3.14E-4  | 1.28E-3  | 2.13E-2 | 2.79E-4  | 4.19E-3  | 2.20E-4  | -8.68E-3  | 1.73E-2  |
| MAETP                          | kg 1,4-DB-eq | 4.62E+1 | 1.13E+0  | 5.06E+0  | 5.24E+1 | 9.96E-1  | 1.38E+1  | 2.51E-1  | -1.95E+1  | 4.80E+1  |
| TETP                           | kg 1,4-DB-eq | 4.57E-3 | 3.80E-5  | 2.79E-3  | 7.41E-3 | 3.37E-5  | 9.38E-4  | 1.65E-6  | -2.87E-3  | 5.51E-3  |
| Environmental impact           | Unit         | A1      | A2       | A3       | A1-A3   | C2       | C3       | C4       | D         | Total    |
| GWP-total                      | kg CO2 eq    | 1.82E+0 | 2.57E-2  | 9.26E-2  | 1.93E+0 | 2.24E-2  | 6.77E-1  | 7.63E-3  | -9.25E-1  | 1.72E+0  |
| GWP-f                          | kg CO2 eq    | 1.80E+0 | 2.57E-2  | 7.11E-2  | 1.90E+0 | 2.24E-2  | 6.37E-1  | 7.62E-3  | -1.01E+0  | 1.55E+0  |
| GWP-b                          | kg CO2 eq    | 1.41E-2 | 1.19E-5  | 1.47E-2  | 2.87E-2 | 1.36E-5  | 4.03E-2  | 9.07E-6  | 8.74E-2   | 1.57E-1  |
| GWP-luluc                      | kg CO2 eq    | 1.93E-3 | 9.43E-6  | 6.75E-3  | 8.69E-3 | 7.94E-6  | 2.59E-4  | 1.86E-7  | -1.23E-3  | 7.73E-3  |
| ODP                            | kg CFC11 eq  | 8.47E-7 | 5.68E-9  | 7.52E-9  | 8.60E-7 | 5.17E-9  | 6.90E-8  | 2.66E-10 | -4.43E-7  | 4.92E-7  |
| AP                             | mol H+ eq    | 8.49E-3 | 1.49E-4  | 4.34E-4  | 9.07E-3 | 1.28E-4  | 1.24E-3  | 6.45E-6  | -3.99E-3  | 6.46E-3  |
| EP-fw                          | kg P eq      | 8.05E-5 | 2.60E-7  | 1.25E-6  | 8.20E-5 | 1.85E-7  | 8.59E-6  | 8.44E-9  | -4.10E-5  | 4.98E-5  |
| EP-m                           | kg N eq      | 1.51E-3 | 5.26E-5  | 1.02E-4  | 1.66E-3 | 4.57E-5  | 3.09E-4  | 4.48E-6  | -7.16E-4  | 1.30E-3  |
| EP-T                           | mol N eq     | 1.63E-2 | 5.80E-4  | 1.13E-3  | 1.80E-2 | 5.04E-4  | 3.41E-3  | 2.58E-5  | -7.73E-3  | 1.42E-2  |
| POCP                           | kg NMVOC eq  | 5.54E-3 | 1.65E-4  | 3.21E-4  | 6.02E-3 | 1.44E-4  | 1.02E-3  | 8.99E-6  | -2.63E-3  | 4.57E-3  |
| ADP-mm                         | kg Sb eq     | 1.54E-3 | 6.52E-7  | 2.48E-6  | 1.54E-3 | 5.80E-7  | 4.91E-6  | 6.46E-9  | -1.89E-5  | 1.53E-3  |
| ADP-f                          | MJ           | 4.73E+1 | 3.88E-1  | 7.95E-1  | 4.85E+1 | 3.44E-1  | 3.39E+0  | 1.94E-2  | -2.50E+1  | 2.72E+1  |
| WDP                            | m3 depriv.   | 2.67E+0 | 1.39E-3  | 6.15E-1  | 3.29E+0 | 1.06E-3  | 1.27E-1  | 1.20E-4  | -1.43E+0  | 1.98E+0  |
| PM                             | disease inc. | 6.27E-8 | 2.31E-9  | 5.36E-9  | 7.03E-8 | 2.02E-9  | 1.58E-8  | 1.34E-10 | -3.19E-8  | 5.64E-8  |
| IR                             | kBq U-235 eq | 1.02E-1 | 1.63E-3  | 1.26E-3  | 1.04E-1 | 1.50E-3  | 1.18E-2  | 8.95E-5  | -4.73E-2  | 7.06E-2  |
| ETP-fw                         | CTUe         | 5.14E+1 | 3.46E-1  | 1.85E+0  | 5.36E+1 | 2.80E-1  | 2.40E+1  | 2.64E-1  | -1.94E+1  | 5.88E+1  |
| HTP-c                          | CTUh         | 1.35E-9 | 1.12E-11 | 6.39E-11 | 1.42E-9 | 9.95E-12 | 3.83E-10 | 5.28E-13 | -5.26E-10 | 1.29E-9  |
| HTP-nc                         | CTUh         | 4.37E-8 | 3.78E-10 | 2.00E-9  | 4.61E-8 | 3.33E-10 | 8.76E-9  | 5.19E-11 | -1.81E-8  | 3.71E-8  |
| SQP                            | Pt           | 9.51E+0 | 3.37E-1  | 5.95E-2  | 9.91E+0 | 2.95E-1  | 2.13E+0  | 4.97E-2  | -1.91E+1  | -6.72E+0 |

| Resource use                      | Unit | A1      | A2      | A3      | A1-A3   | C2      | C3      | C4      | D        | Total   |
|-----------------------------------|------|---------|---------|---------|---------|---------|---------|---------|----------|---------|
| PERE                              | MJ   | 2.88E+0 | 4.86E-3 | 3.87E+0 | 6.76E+0 | 4.94E-3 | 2.37E-1 | 7.37E-4 | -3.99E+0 | 3.01E+0 |
| PERM                              | MJ   | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       |
| PERT                              | MJ   | 2.88E+0 | 4.86E-3 | 3.87E+0 | 6.76E+0 | 4.94E-3 | 2.37E-1 | 7.37E-4 | -3.99E+0 | 3.01E+0 |
| PENRE                             | MJ   | 5.07E+1 | 4.12E-1 | 8.60E-1 | 5.20E+1 | 3.65E-1 | 3.61E+0 | 2.06E-2 | -2.69E+1 | 2.90E+1 |
| PENRM                             | MJ   | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       |
| PENRT                             | MJ   | 5.07E+1 | 4.12E-1 | 8.60E-1 | 5.20E+1 | 3.65E-1 | 3.61E+0 | 2.06E-2 | -2.69E+1 | 2.90E+1 |
| PET                               | MJ   | 5.36E+1 | 4.17E-1 | 4.73E+0 | 5.87E+1 | 3.70E-1 | 3.85E+0 | 2.13E-2 | -3.09E+1 | 3.20E+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   | 3.19E-2 | 4.73E-5 | 1.45E-2 | 4.65E-2 | 3.90E-5 | 3.52E-3 | 2.38E-5 | -1.73E-2 | 3.28E-2 |
| Output flows and waste categories | Unit | A1      | A2      | A3      | A1-A3   | C2      | C3      | C4      | D        | Total   |
| HWD                               | kg   | 2.16E-4 | 9.83E-7 | 8.45E-7 | 2.18E-4 | 8.80E-7 | 5.57E-6 | 2.36E-8 | -1.92E-5 | 2.06E-4 |
| NHWD                              | kg   | 1.74E-1 | 2.46E-2 | 1.30E-3 | 2.00E-1 | 2.13E-2 | 1.27E-1 | 8.53E-2 | -7.59E-2 | 3.58E-1 |
| RWD                               | kg   | 9.37E-5 | 2.55E-6 | 1.57E-6 | 9.78E-5 | 2.34E-6 | 1.29E-5 | 1.26E-7 | -4.21E-5 | 7.11E-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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