

# Environmental Profile

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

Ecochain v3.5.80



Product: 3004223 - PVC RWA Bend 45° WT 80 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]

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# Results

| Environmental impact SBK set 1 | Unit         | A1       | A2       | A3       | A1-A3    | C2       | C3       | C4       | D         | Total    |
|--------------------------------|--------------|----------|----------|----------|----------|----------|----------|----------|-----------|----------|
| ECI                            | euro         | 0.03     | 0        | 0        | 0.03     | 0        | 0.01     | 0        | -0.01     | 0.02     |
| ADPE                           | kg Sb-eq     | 2.74E-4  | 7.61E-8  | 3.38E-7  | 2.75E-4  | 6.88E-8  | 6.32E-7  | 7.81E-10 | -2.45E-6  | 2.73E-4  |
| ADPF                           | kg Sb-eq     | 2.56E-3  | 2.19E-5  | 5.81E-5  | 2.64E-3  | 1.94E-5  | 2.16E-4  | 1.07E-6  | -1.37E-3  | 1.50E-3  |
| GWP                            | kg CO2-eq    | 2.25E-1  | 2.98E-3  | 1.10E-2  | 2.39E-1  | 2.64E-3  | 7.45E-2  | 7.35E-4  | -1.20E-1  | 1.97E-1  |
| ODP                            | kg CFC-11-eq | 1.11E-7  | 5.28E-10 | 8.72E-10 | 1.12E-7  | 4.89E-10 | 8.90E-9  | 2.54E-11 | -5.91E-8  | 6.25E-8  |
| POCP                           | kg ethene-eq | 1.36E-4  | 1.80E-6  | 4.79E-6  | 1.43E-4  | 1.58E-6  | 1.75E-5  | 1.90E-7  | -6.34E-5  | 9.86E-5  |
| AP                             | kg SO2-eq    | 9.36E-4  | 1.31E-5  | 4.74E-5  | 9.96E-4  | 1.13E-5  | 1.27E-4  | 5.77E-7  | -4.25E-4  | 7.10E-4  |
| EP                             | kg PO4 3--eq | 1.24E-4  | 2.57E-6  | 6.10E-6  | 1.32E-4  | 2.27E-6  | 1.95E-5  | 2.24E-7  | -6.20E-5  | 9.22E-5  |
| HTP                            | kg 1,4-DB-eq | 8.45E-2  | 1.25E-3  | 5.13E-3  | 9.09E-2  | 1.13E-3  | 3.31E-2  | 6.01E-5  | -3.99E-2  | 8.53E-2  |
| FAETP                          | kg 1,4-DB-eq | 2.91E-3  | 3.66E-5  | 1.75E-4  | 3.12E-3  | 3.30E-5  | 5.11E-4  | 1.87E-5  | -1.29E-3  | 2.39E-3  |
| MAETP                          | kg 1,4-DB-eq | 6.12E+0  | 1.32E-1  | 6.90E-1  | 6.94E+0  | 1.18E-1  | 1.79E+0  | 2.30E-2  | -2.59E+0  | 6.28E+0  |
| TETP                           | kg 1,4-DB-eq | 6.17E-4  | 4.43E-6  | 3.81E-4  | 1.00E-3  | 4.00E-6  | 1.17E-4  | 2.03E-7  | -4.32E-4  | 6.92E-4  |
| Environmental impact           | Unit         | A1       | A2       | A3       | A1-A3    | C2       | C3       | C4       | D         | Total    |
| GWP-total                      | kg CO2 eq    | 2.33E-1  | 3.00E-3  | 1.26E-2  | 2.48E-1  | 2.66E-3  | 8.30E-2  | 8.57E-4  | -1.05E-1  | 2.30E-1  |
| GWP-f                          | kg CO2 eq    | 2.30E-1  | 3.00E-3  | 9.70E-3  | 2.43E-1  | 2.66E-3  | 7.50E-2  | 8.56E-4  | -1.22E-1  | 1.99E-1  |
| GWP-b                          | kg CO2 eq    | 2.28E-3  | 1.39E-6  | 2.00E-3  | 4.29E-3  | 1.61E-6  | 8.02E-3  | 1.06E-6  | 1.77E-2   | 3.01E-2  |
| GWP-luluc                      | kg CO2 eq    | 2.87E-4  | 1.10E-6  | 9.21E-4  | 1.21E-3  | 9.41E-7  | 3.32E-5  | 2.31E-8  | -2.03E-4  | 1.04E-3  |
| ODP                            | kg CFC11 eq  | 1.09E-7  | 6.63E-10 | 1.03E-9  | 1.11E-7  | 6.13E-10 | 9.18E-9  | 3.15E-11 | -5.85E-8  | 6.25E-8  |
| AP                             | mol H+ eq    | 1.14E-3  | 1.74E-5  | 5.92E-5  | 1.22E-3  | 1.51E-5  | 1.59E-4  | 7.71E-7  | -5.16E-4  | 8.79E-4  |
| EP-fw                          | kg P eq      | 1.12E-5  | 3.03E-8  | 1.70E-7  | 1.14E-5  | 2.19E-8  | 1.11E-6  | 1.03E-9  | -5.79E-6  | 6.70E-6  |
| EP-m                           | kg N eq      | 2.12E-4  | 6.14E-6  | 1.40E-5  | 2.32E-4  | 5.42E-6  | 3.96E-5  | 4.69E-7  | -9.41E-5  | 1.83E-4  |
| EP-T                           | mol N eq     | 2.23E-3  | 6.76E-5  | 1.54E-4  | 2.45E-3  | 5.97E-5  | 4.36E-4  | 3.07E-6  | -1.02E-3  | 1.93E-3  |
| POCP                           | kg NMVOC eq  | 7.12E-4  | 1.93E-5  | 4.39E-5  | 7.75E-4  | 1.71E-5  | 1.30E-4  | 1.06E-6  | -3.31E-4  | 5.93E-4  |
| ADP-mm                         | kg Sb eq     | 2.74E-4  | 7.61E-8  | 3.38E-7  | 2.75E-4  | 6.88E-8  | 6.32E-7  | 7.81E-10 | -2.45E-6  | 2.73E-4  |
| ADP-f                          | MJ           | 5.42E+0  | 4.53E-2  | 1.08E-1  | 5.58E+0  | 4.08E-2  | 4.28E-1  | 2.31E-3  | -2.91E+0  | 3.14E+0  |
| WDP                            | m3 depriv.   | 3.39E-1  | 1.62E-4  | 8.39E-2  | 4.23E-1  | 1.25E-4  | 1.66E-2  | 1.81E-5  | -1.90E-1  | 2.49E-1  |
| PM                             | disease inc. | 8.16E-9  | 2.70E-10 | 7.31E-10 | 9.16E-9  | 2.40E-10 | 1.99E-9  | 1.59E-11 | -4.46E-9  | 6.95E-9  |
| IR                             | kBq U-235 eq | 1.21E-2  | 1.90E-4  | 1.72E-4  | 1.25E-2  | 1.78E-4  | 1.52E-3  | 1.05E-5  | -6.42E-3  | 7.74E-3  |
| ETP-fw                         | CTUe         | 8.01E+0  | 4.04E-2  | 2.52E-1  | 8.31E+0  | 3.31E-2  | 3.24E+0  | 3.55E-2  | -2.98E+0  | 8.63E+0  |
| HTP-c                          | CTUh         | 1.93E-10 | 1.31E-12 | 8.72E-12 | 2.03E-10 | 1.18E-12 | 5.00E-11 | 6.59E-14 | -7.08E-11 | 1.83E-10 |
| HTP-nc                         | CTUh         | 6.17E-9  | 4.42E-11 | 2.72E-10 | 6.49E-9  | 3.95E-11 | 1.14E-9  | 6.86E-12 | -2.45E-9  | 5.23E-9  |
| SQP                            | Pt           | 1.43E+0  | 3.93E-2  | 8.11E-3  | 1.48E+0  | 3.49E-2  | 2.62E-1  | 5.90E-3  | -3.61E+0  | -1.83E+0 |

| Resource use                      | Unit | A1      | A2      | A3      | A1-A3   | C2      | C3      | C4      | D        | Total   |
|-----------------------------------|------|---------|---------|---------|---------|---------|---------|---------|----------|---------|
| PERE                              | MJ   | 4.11E-1 | 5.67E-4 | 5.27E-1 | 9.39E-1 | 5.85E-4 | 3.05E-2 | 8.44E-5 | -7.22E-1 | 2.49E-1 |
| PERM                              | MJ   | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       |
| PERT                              | MJ   | 4.11E-1 | 5.67E-4 | 5.27E-1 | 9.39E-1 | 5.85E-4 | 3.05E-2 | 8.44E-5 | -7.22E-1 | 2.49E-1 |
| PENRE                             | MJ   | 5.82E+0 | 4.81E-2 | 1.17E-1 | 5.99E+0 | 4.33E-2 | 4.56E-1 | 2.45E-3 | -3.13E+0 | 3.36E+0 |
| PENRM                             | MJ   | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       |
| PENRT                             | MJ   | 5.82E+0 | 4.81E-2 | 1.17E-1 | 5.99E+0 | 4.33E-2 | 4.56E-1 | 2.45E-3 | -3.13E+0 | 3.36E+0 |
| PET                               | MJ   | 6.23E+0 | 4.86E-2 | 6.45E-1 | 6.93E+0 | 4.39E-2 | 4.86E-1 | 2.53E-3 | -3.85E+0 | 3.61E+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   | 4.02E-3 | 5.51E-6 | 1.98E-3 | 6.01E-3 | 4.62E-6 | 4.55E-4 | 2.81E-6 | -2.40E-3 | 4.07E-3 |
| Output flows and waste categories | Unit | A1      | A2      | A3      | A1-A3   | C2      | C3      | C4      | D        | Total   |
| HWD                               | kg   | 3.83E-5 | 1.15E-7 | 1.15E-7 | 3.85E-5 | 1.04E-7 | 7.10E-7 | 2.84E-9 | -2.50E-6 | 3.69E-5 |
| NHWD                              | kg   | 2.35E-2 | 2.87E-3 | 1.78E-4 | 2.65E-2 | 2.53E-3 | 1.56E-2 | 1.01E-2 | -1.02E-2 | 4.46E-2 |
| RWD                               | kg   | 1.05E-5 | 2.97E-7 | 2.13E-7 | 1.11E-5 | 2.78E-7 | 1.65E-6 | 1.50E-8 | -5.74E-6 | 7.25E-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       |



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