

# Environmental Profile

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

Ecochain v3.5.80



Product: 3000563 - PVC Pipe BR BENOR 200x4.9 SN4 L=3 SC/CH  
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         | 2.81     | 0.07     | 0.13     | 3.01     | 0.05     | 1.01    | 0.01     | -1.41    | 2.67    |
| ADPE                           | kg Sb-eq     | 7.71E-4  | 1.56E-5  | 2.28E-5  | 8.10E-4  | 9.81E-6  | 8.21E-5 | 1.03E-7  | -2.97E-4 | 6.05E-4 |
| ADPF                           | kg Sb-eq     | 3.13E-1  | 4.49E-3  | 6.12E-3  | 3.24E-1  | 2.76E-3  | 2.89E-2 | 1.45E-4  | -1.66E-1 | 1.89E-1 |
| GWP                            | kg CO2-eq    | 2.53E+1  | 6.11E-1  | 1.09E+0  | 2.70E+1  | 3.76E-1  | 9.76E+0 | 9.23E-2  | -1.40E+1 | 2.32E+1 |
| ODP                            | kg CFC-11-eq | 1.47E-5  | 1.08E-7  | 1.02E-7  | 1.50E-5  | 6.97E-8  | 1.17E-6 | 3.48E-9  | -7.31E-6 | 8.89E-6 |
| POCP                           | kg ethene-eq | 1.56E-2  | 3.69E-4  | 4.80E-4  | 1.64E-2  | 2.26E-4  | 2.27E-3 | 2.45E-5  | -7.13E-3 | 1.18E-2 |
| AP                             | kg SO2-eq    | 9.79E-2  | 2.69E-3  | 4.27E-3  | 1.05E-1  | 1.62E-3  | 1.66E-2 | 7.75E-5  | -4.57E-2 | 7.74E-2 |
| EP                             | kg PO4 3--eq | 1.17E-2  | 5.28E-4  | 6.74E-4  | 1.29E-2  | 3.23E-4  | 2.52E-3 | 3.01E-5  | -5.53E-3 | 1.02E-2 |
| HTP                            | kg 1,4-DB-eq | 9.95E+0  | 2.57E-1  | 4.11E-1  | 1.06E+1  | 1.61E-1  | 4.46E+0 | 7.95E-3  | -4.44E+0 | 1.08E+1 |
| FAETP                          | kg 1,4-DB-eq | 2.15E-1  | 7.51E-3  | 1.67E-2  | 2.39E-1  | 4.71E-3  | 6.57E-2 | 2.35E-3  | -9.72E-2 | 2.15E-1 |
| MAETP                          | kg 1,4-DB-eq | 6.27E+2  | 2.70E+1  | 6.83E+1  | 7.23E+2  | 1.68E+1  | 2.17E+2 | 2.88E+0  | -2.86E+2 | 6.73E+2 |
| TETP                           | kg 1,4-DB-eq | 6.84E-2  | 9.09E-4  | 2.55E-2  | 9.49E-2  | 5.70E-4  | 1.59E-2 | 2.64E-5  | -3.23E-2 | 7.91E-2 |
| Environmental impact           | Unit         | A1       | A2       | A3       | A1-A3    | C2       | C3      | C4       | D        | Total   |
| GWP-total                      | kg CO2 eq    | 2.47E+1  | 6.17E-1  | 1.28E+0  | 2.66E+1  | 3.79E-1  | 1.13E+1 | 1.07E-1  | -1.44E+1 | 2.39E+1 |
| GWP-f                          | kg CO2 eq    | 2.59E+1  | 6.16E-1  | 1.00E+0  | 2.75E+1  | 3.79E-1  | 9.83E+0 | 1.07E-1  | -1.43E+1 | 2.35E+1 |
| GWP-b                          | kg CO2 eq    | -1.23E+0 | 2.84E-4  | 2.17E-1  | -1.01E+0 | 2.30E-4  | 1.42E+0 | 1.38E-4  | -1.00E-1 | 3.14E-1 |
| GWP-luluc                      | kg CO2 eq    | 2.08E-2  | 2.26E-4  | 6.12E-2  | 8.23E-2  | 1.34E-4  | 4.48E-3 | 2.91E-6  | -9.53E-3 | 7.74E-2 |
| ODP                            | kg CFC11 eq  | 1.45E-5  | 1.36E-7  | 1.21E-7  | 1.48E-5  | 8.73E-8  | 1.21E-6 | 4.33E-9  | -7.24E-6 | 8.86E-6 |
| AP                             | mol H+ eq    | 1.18E-1  | 3.57E-3  | 5.48E-3  | 1.27E-1  | 2.16E-3  | 2.08E-2 | 1.04E-4  | -5.51E-2 | 9.49E-2 |
| EP-fw                          | kg P eq      | 1.15E-3  | 6.21E-6  | 1.44E-5  | 1.17E-3  | 3.12E-6  | 1.49E-4 | 1.31E-7  | -5.34E-4 | 7.85E-4 |
| EP-m                           | kg N eq      | 1.98E-2  | 1.26E-3  | 1.61E-3  | 2.27E-2  | 7.73E-4  | 5.07E-3 | 6.37E-5  | -9.60E-3 | 1.90E-2 |
| EP-T                           | mol N eq     | 2.15E-1  | 1.39E-2  | 1.73E-2  | 2.46E-1  | 8.51E-3  | 5.59E-2 | 4.15E-4  | -1.03E-1 | 2.08E-1 |
| POCP                           | kg NMVOC eq  | 7.43E-2  | 3.96E-3  | 4.89E-3  | 8.32E-2  | 2.43E-3  | 1.68E-2 | 1.41E-4  | -3.53E-2 | 6.73E-2 |
| ADP-mm                         | kg Sb eq     | 7.71E-4  | 1.56E-5  | 2.28E-5  | 8.10E-4  | 9.81E-6  | 8.21E-5 | 1.03E-7  | -2.97E-4 | 6.05E-4 |
| ADP-f                          | MJ           | 6.66E+2  | 9.29E+0  | 1.16E+1  | 6.87E+2  | 5.82E+0  | 5.73E+1 | 3.14E-1  | -3.48E+2 | 4.02E+2 |
| WDP                            | m3 depriv.   | 4.35E+1  | 3.32E-2  | 7.86E+0  | 5.14E+1  | 1.79E-2  | 2.23E+0 | 1.81E-3  | -2.08E+1 | 3.29E+1 |
| PM                             | disease inc. | 8.45E-7  | 5.53E-8  | 8.50E-8  | 9.85E-7  | 3.42E-8  | 2.61E-7 | 2.15E-9  | -3.56E-7 | 9.27E-7 |
| IR                             | kBq U-235 eq | 1.42E+0  | 3.89E-2  | 2.10E-2  | 1.48E+0  | 2.54E-2  | 2.00E-1 | 1.44E-3  | -6.72E-1 | 1.03E+0 |
| ETP-fw                         | CTUe         | 4.49E+2  | 8.28E+0  | 1.94E+1  | 4.77E+2  | 4.72E+0  | 4.28E+2 | 4.71E+0  | -2.07E+2 | 7.07E+2 |
| HTP-c                          | CTUh         | 1.78E-8  | 2.69E-10 | 6.61E-10 | 1.87E-8  | 1.68E-10 | 6.28E-9 | 8.22E-12 | -7.69E-9 | 1.75E-8 |
| HTP-nc                         | CTUh         | 5.63E-7  | 9.06E-9  | 2.02E-8  | 5.92E-7  | 5.63E-9  | 1.51E-7 | 9.06E-10 | -2.66E-7 | 4.84E-7 |
| SQP                            | Pt           | 2.12E+2  | 8.06E+0  | 8.70E-1  | 2.21E+2  | 4.98E+0  | 3.58E+1 | 7.97E-1  | -6.48E+1 | 1.97E+2 |

| Resource use                      | Unit | A1      | A2      | A3      | A1-A3   | C2      | C3      | C4      | D        | Total   |
|-----------------------------------|------|---------|---------|---------|---------|---------|---------|---------|----------|---------|
| PERE                              | MJ   | 5.14E+1 | 1.16E-1 | 3.51E+1 | 8.66E+1 | 8.35E-2 | 4.10E+0 | 1.13E-2 | -2.07E+1 | 7.01E+1 |
| PERM                              | MJ   | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       |
| PERT                              | MJ   | 5.14E+1 | 1.16E-1 | 3.51E+1 | 8.66E+1 | 8.35E-2 | 4.10E+0 | 1.13E-2 | -2.07E+1 | 7.01E+1 |
| PENRE                             | MJ   | 7.14E+2 | 9.86E+0 | 1.26E+1 | 7.36E+2 | 6.18E+0 | 6.09E+1 | 3.33E-1 | -3.75E+2 | 4.29E+2 |
| PENRM                             | MJ   | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       |
| PENRT                             | MJ   | 7.14E+2 | 9.86E+0 | 1.26E+1 | 7.36E+2 | 6.18E+0 | 6.09E+1 | 3.33E-1 | -3.75E+2 | 4.29E+2 |
| PET                               | MJ   | 7.65E+2 | 9.98E+0 | 4.77E+1 | 8.23E+2 | 6.26E+0 | 6.50E+1 | 3.44E-1 | -3.96E+2 | 4.99E+2 |
| 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   | 4.67E-1 | 1.13E-3 | 1.85E-1 | 6.53E-1 | 6.58E-4 | 6.11E-2 | 3.85E-4 | -2.17E-1 | 4.98E-1 |
| Output flows and waste categories | Unit | A1      | A2      | A3      | A1-A3   | C2      | C3      | C4      | D        | Total   |
| HWD                               | kg   | 5.30E-4 | 2.35E-5 | 1.63E-5 | 5.70E-4 | 1.49E-5 | 9.23E-5 | 3.79E-7 | -2.90E-4 | 3.88E-4 |
| NHWD                              | kg   | 2.53E+0 | 5.89E-1 | 2.35E-2 | 3.14E+0 | 3.61E-1 | 2.13E+0 | 1.44E+0 | -1.12E+0 | 5.96E+0 |
| RWD                               | kg   | 1.25E-3 | 6.10E-5 | 2.92E-5 | 1.34E-3 | 3.96E-5 | 2.15E-4 | 2.05E-6 | -5.93E-4 | 1.00E-3 |
| 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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