

# Environmental Profile

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

Ecochain v3.5.80



Product: 3000359 - PVC Pipe BR BENOR 160x4.7 SN8 L=5 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         | 3.53     | 0.09     | 0.16     | 3.78     | 0.06     | 1.28    | 0.01     | -1.78    | 3.35    |
| ADPE                           | kg Sb-eq     | 9.34E-4  | 1.96E-5  | 2.93E-5  | 9.83E-4  | 1.24E-5  | 1.04E-4 | 1.30E-7  | -3.74E-4 | 7.25E-4 |
| ADPF                           | kg Sb-eq     | 3.94E-1  | 5.65E-3  | 7.86E-3  | 4.08E-1  | 3.50E-3  | 3.66E-2 | 1.84E-4  | -2.10E-1 | 2.38E-1 |
| GWP                            | kg CO2-eq    | 3.18E+1  | 7.68E-1  | 1.40E+0  | 3.40E+1  | 4.76E-1  | 1.23E+1 | 1.17E-1  | -1.77E+1 | 2.91E+1 |
| ODP                            | kg CFC-11-eq | 1.87E-5  | 1.36E-7  | 1.31E-7  | 1.89E-5  | 8.83E-8  | 1.48E-6 | 4.41E-9  | -9.26E-6 | 1.12E-5 |
| POCP                           | kg ethene-eq | 1.95E-2  | 4.64E-4  | 6.16E-4  | 2.05E-2  | 2.86E-4  | 2.87E-3 | 3.10E-5  | -8.99E-3 | 1.47E-2 |
| AP                             | kg SO2-eq    | 1.23E-1  | 3.38E-3  | 5.48E-3  | 1.32E-1  | 2.05E-3  | 2.10E-2 | 9.80E-5  | -5.76E-2 | 9.71E-2 |
| EP                             | kg PO4 3--eq | 1.46E-2  | 6.64E-4  | 8.66E-4  | 1.61E-2  | 4.09E-4  | 3.17E-3 | 3.79E-5  | -6.92E-3 | 1.28E-2 |
| HTP                            | kg 1,4-DB-eq | 1.25E+1  | 3.24E-1  | 5.28E-1  | 1.34E+1  | 2.04E-1  | 5.65E+0 | 1.01E-2  | -5.60E+0 | 1.36E+1 |
| FAETP                          | kg 1,4-DB-eq | 2.69E-1  | 9.44E-3  | 2.15E-2  | 3.00E-1  | 5.97E-3  | 8.32E-2 | 2.97E-3  | -1.23E-1 | 2.70E-1 |
| MAETP                          | kg 1,4-DB-eq | 7.86E+2  | 3.40E+1  | 8.76E+1  | 9.08E+2  | 2.13E+1  | 2.75E+2 | 3.65E+0  | -3.62E+2 | 8.46E+2 |
| TETP                           | kg 1,4-DB-eq | 8.61E-2  | 1.14E-3  | 3.28E-2  | 1.20E-1  | 7.22E-4  | 2.02E-2 | 3.34E-5  | -4.09E-2 | 1.00E-1 |
| Environmental impact           | Unit         | A1       | A2       | A3       | A1-A3    | C2       | C3      | C4       | D        | Total   |
| GWP-total                      | kg CO2 eq    | 3.20E+1  | 7.76E-1  | 1.65E+0  | 3.45E+1  | 4.81E-1  | 1.32E+1 | 1.36E-1  | -1.82E+1 | 3.00E+1 |
| GWP-f                          | kg CO2 eq    | 3.26E+1  | 7.75E-1  | 1.29E+0  | 3.47E+1  | 4.80E-1  | 1.24E+1 | 1.36E-1  | -1.81E+1 | 2.95E+1 |
| GWP-b                          | kg CO2 eq    | -5.94E-1 | 3.58E-4  | 2.79E-1  | -3.15E-1 | 2.92E-4  | 8.46E-1 | 1.75E-4  | -1.27E-1 | 4.05E-1 |
| GWP-luluc                      | kg CO2 eq    | 2.57E-2  | 2.84E-4  | 7.86E-2  | 1.05E-1  | 1.70E-4  | 5.68E-3 | 3.68E-6  | -1.19E-2 | 9.85E-2 |
| ODP                            | kg CFC11 eq  | 1.84E-5  | 1.71E-7  | 1.56E-7  | 1.87E-5  | 1.11E-7  | 1.53E-6 | 5.48E-9  | -9.17E-6 | 1.12E-5 |
| AP                             | mol H+ eq    | 1.48E-1  | 4.49E-3  | 7.03E-3  | 1.59E-1  | 2.73E-3  | 2.63E-2 | 1.31E-4  | -6.94E-2 | 1.19E-1 |
| EP-fw                          | kg P eq      | 1.44E-3  | 7.82E-6  | 1.84E-5  | 1.47E-3  | 3.95E-6  | 1.89E-4 | 1.66E-7  | -6.75E-4 | 9.85E-4 |
| EP-m                           | kg N eq      | 2.47E-2  | 1.58E-3  | 2.07E-3  | 2.84E-2  | 9.79E-4  | 6.39E-3 | 8.02E-5  | -1.20E-2 | 2.38E-2 |
| EP-T                           | mol N eq     | 2.68E-1  | 1.75E-2  | 2.22E-2  | 3.07E-1  | 1.08E-2  | 7.04E-2 | 5.25E-4  | -1.29E-1 | 2.60E-1 |
| POCP                           | kg NMVOC eq  | 9.27E-2  | 4.98E-3  | 6.28E-3  | 1.04E-1  | 3.08E-3  | 2.11E-2 | 1.79E-4  | -4.43E-2 | 8.40E-2 |
| ADP-mm                         | kg Sb eq     | 9.34E-4  | 1.96E-5  | 2.93E-5  | 9.83E-4  | 1.24E-5  | 1.04E-4 | 1.30E-7  | -3.74E-4 | 7.25E-4 |
| ADP-f                          | MJ           | 8.39E+2  | 1.17E+1  | 1.49E+1  | 8.65E+2  | 7.37E+0  | 7.25E+1 | 3.97E-1  | -4.41E+2 | 5.05E+2 |
| WDP                            | m3 depriv.   | 5.51E+1  | 4.18E-2  | 1.01E+1  | 6.52E+1  | 2.26E-2  | 2.82E+0 | 2.29E-3  | -2.63E+1 | 4.17E+1 |
| PM                             | disease inc. | 1.01E-6  | 6.96E-8  | 1.09E-7  | 1.19E-6  | 4.33E-8  | 3.30E-7 | 2.72E-9  | -4.44E-7 | 1.13E-6 |
| IR                             | kBq U-235 eq | 1.78E+0  | 4.90E-2  | 2.69E-2  | 1.85E+0  | 3.22E-2  | 2.53E-1 | 1.82E-3  | -8.50E-1 | 1.29E+0 |
| ETP-fw                         | CTUe         | 5.62E+2  | 1.04E+1  | 2.49E+1  | 5.97E+2  | 5.98E+0  | 5.42E+2 | 5.97E+0  | -2.59E+2 | 8.93E+2 |
| HTP-c                          | CTUh         | 2.21E-8  | 3.38E-10 | 8.49E-10 | 2.33E-8  | 2.13E-10 | 7.90E-9 | 1.04E-11 | -9.69E-9 | 2.18E-8 |
| HTP-nc                         | CTUh         | 7.08E-7  | 1.14E-8  | 2.60E-8  | 7.46E-7  | 7.13E-9  | 1.91E-7 | 1.15E-9  | -3.35E-7 | 6.10E-7 |
| SQP                            | Pt           | 1.81E+2  | 1.01E+1  | 1.12E+0  | 1.92E+2  | 6.31E+0  | 4.53E+1 | 1.01E+0  | -6.36E+1 | 1.81E+2 |

| Resource use                      | Unit | A1      | A2      | A3      | A1-A3   | C2      | C3      | C4      | D        | Total   |
|-----------------------------------|------|---------|---------|---------|---------|---------|---------|---------|----------|---------|
| PERE                              | MJ   | 5.20E+1 | 1.46E-1 | 4.50E+1 | 9.71E+1 | 1.06E-1 | 5.20E+0 | 1.43E-2 | -2.25E+1 | 7.99E+1 |
| PERM                              | MJ   | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       |
| PERT                              | MJ   | 5.20E+1 | 1.46E-1 | 4.50E+1 | 9.71E+1 | 1.06E-1 | 5.20E+0 | 1.43E-2 | -2.25E+1 | 7.99E+1 |
| PENRE                             | MJ   | 9.00E+2 | 1.24E+1 | 1.62E+1 | 9.28E+2 | 7.82E+0 | 7.72E+1 | 4.21E-1 | -4.75E+2 | 5.39E+2 |
| PENRM                             | MJ   | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       |
| PENRT                             | MJ   | 9.00E+2 | 1.24E+1 | 1.62E+1 | 9.28E+2 | 7.82E+0 | 7.72E+1 | 4.21E-1 | -4.75E+2 | 5.39E+2 |
| PET                               | MJ   | 9.52E+2 | 1.26E+1 | 6.12E+1 | 1.03E+3 | 7.93E+0 | 8.24E+1 | 4.36E-1 | -4.97E+2 | 6.19E+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   | 5.88E-1 | 1.42E-3 | 2.38E-1 | 8.27E-1 | 8.34E-4 | 7.72E-2 | 4.86E-4 | -2.75E-1 | 6.30E-1 |
| Output flows and waste categories | Unit | A1      | A2      | A3      | A1-A3   | C2      | C3      | C4      | D        | Total   |
| HWD                               | kg   | 6.64E-4 | 2.96E-5 | 2.09E-5 | 7.14E-4 | 1.88E-5 | 1.17E-4 | 4.79E-7 | -3.66E-4 | 4.84E-4 |
| NHWD                              | kg   | 3.15E+0 | 7.41E-1 | 3.01E-2 | 3.92E+0 | 4.57E-1 | 2.68E+0 | 1.83E+0 | -1.41E+0 | 7.47E+0 |
| RWD                               | kg   | 1.56E-3 | 7.67E-5 | 3.75E-5 | 1.68E-3 | 5.01E-5 | 2.72E-4 | 2.59E-6 | -7.50E-4 | 1.25E-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       |