

Environmental Profile

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

Ecochain v3.5.80



Product: 3002852 - PVC Pipe GY BENOR 90x3 L=4 CH
 Unit: 1 piece
 Manufacturer: Wavin - NL - Hardenberg - Verified
 Address: J.C. Kellerlaan 3
 7772 SG Hardenberg
 Netherlands

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



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.

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 | ☑ | ☑ | ☑ | ☑ |

Product stage

A1 Raw material supply A2 Transport A3 Manufacturing

Construction process stage

A4 Transport gate to site
 A5 Assembly / Construction installation process

Use stage

B1 Use B2 Maintenance B3 Repair B4 Replacement B5 Refurbishment
 B6 Operational energy use B7 Operational water use

End-of-Life stage

C1 De-construction demolition C2 Transport C3 Waste processing
 C4 Disposal

Benefits and loads beyond the system boundaries

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 | 1.02 | 0.03 | 0.05 | 1.09 | 0.02 | 0.37 | 0 | -0.51 | 0.96 |
| ADPE | kg Sb-eq | 2.57E-4 | 5.67E-6 | 8.41E-6 | 2.71E-4 | 3.57E-6 | 3.00E-5 | 3.74E-8 | -1.07E-4 | 1.97E-4 |
| ADPF | kg Sb-eq | 1.13E-1 | 1.63E-3 | 2.25E-3 | 1.17E-1 | 1.01E-3 | 1.06E-2 | 5.28E-5 | -6.04E-2 | 6.85E-2 |
| GWP | kg CO2-eq | 9.15E+0 | 2.22E-1 | 4.01E-1 | 9.77E+0 | 1.37E-1 | 3.50E+0 | 3.35E-2 | -5.09E+0 | 8.36E+0 |
| ODP | kg CFC-11-eq | 5.37E-6 | 3.94E-8 | 3.77E-8 | 5.45E-6 | 2.54E-8 | 4.27E-7 | 1.27E-9 | -2.67E-6 | 3.24E-6 |
| POCP | kg ethene-eq | 5.60E-3 | 1.34E-4 | 1.77E-4 | 5.91E-3 | 8.22E-5 | 8.27E-4 | 8.90E-6 | -2.59E-3 | 4.23E-3 |
| AP | kg SO2-eq | 3.53E-2 | 9.76E-4 | 1.57E-3 | 3.79E-2 | 5.90E-4 | 6.05E-3 | 2.82E-5 | -1.66E-2 | 2.79E-2 |
| EP | kg PO4 3--eq | 4.21E-3 | 1.92E-4 | 2.48E-4 | 4.65E-3 | 1.18E-4 | 9.15E-4 | 1.08E-5 | -2.01E-3 | 3.69E-3 |
| HTP | kg 1,4-DB-eq | 3.60E+0 | 9.35E-2 | 1.51E-1 | 3.84E+0 | 5.86E-2 | 1.63E+0 | 2.89E-3 | -1.62E+0 | 3.92E+0 |
| FAETP | kg 1,4-DB-eq | 7.75E-2 | 2.73E-3 | 6.16E-3 | 8.64E-2 | 1.72E-3 | 2.40E-2 | 8.54E-4 | -3.54E-2 | 7.75E-2 |
| MAETP | kg 1,4-DB-eq | 2.26E+2 | 9.82E+0 | 2.51E+1 | 2.61E+2 | 6.13E+0 | 7.92E+1 | 1.05E+0 | -1.04E+2 | 2.43E+2 |
| TETP | kg 1,4-DB-eq | 2.49E-2 | 3.30E-4 | 9.40E-3 | 3.46E-2 | 2.08E-4 | 5.81E-3 | 9.60E-6 | -1.18E-2 | 2.88E-2 |
| Environmental impact | Unit | A1 | A2 | A3 | A1-A3 | C2 | C3 | C4 | D | Total |
| GWP-total | kg CO2 eq | 9.05E+0 | 2.24E-1 | 4.72E-1 | 9.75E+0 | 1.38E-1 | 3.94E+0 | 3.90E-2 | -5.24E+0 | 8.62E+0 |
| GWP-f | kg CO2 eq | 9.38E+0 | 2.24E-1 | 3.70E-1 | 9.98E+0 | 1.38E-1 | 3.53E+0 | 3.90E-2 | -5.20E+0 | 8.48E+0 |
| GWP-b | kg CO2 eq | -3.39E-1 | 1.03E-4 | 7.99E-2 | -2.59E-1 | 8.39E-5 | 4.12E-1 | 5.02E-5 | -3.67E-2 | 1.17E-1 |
| GWP-luluc | kg CO2 eq | 7.49E-3 | 8.21E-5 | 2.25E-2 | 3.01E-2 | 4.89E-5 | 1.64E-3 | 1.06E-6 | -3.46E-3 | 2.83E-2 |
| ODP | kg CFC11 eq | 5.30E-6 | 4.94E-8 | 4.47E-8 | 5.39E-6 | 3.18E-8 | 4.40E-7 | 1.57E-9 | -2.64E-6 | 3.22E-6 |
| AP | mol H+ eq | 4.26E-2 | 1.30E-3 | 2.02E-3 | 4.59E-2 | 7.87E-4 | 7.59E-3 | 3.77E-5 | -2.01E-2 | 3.42E-2 |
| EP-fw | kg P eq | 4.15E-4 | 2.26E-6 | 5.29E-6 | 4.23E-4 | 1.14E-6 | 5.44E-5 | 4.76E-8 | -1.95E-4 | 2.84E-4 |
| EP-m | kg N eq | 7.15E-3 | 4.58E-4 | 5.94E-4 | 8.20E-3 | 2.82E-4 | 1.84E-3 | 2.29E-5 | -3.49E-3 | 6.86E-3 |
| EP-T | mol N eq | 7.74E-2 | 5.05E-3 | 6.37E-3 | 8.88E-2 | 3.10E-3 | 2.03E-2 | 1.51E-4 | -3.74E-2 | 7.50E-2 |
| POCP | kg NMVOC eq | 2.67E-2 | 1.44E-3 | 1.80E-3 | 3.00E-2 | 8.87E-4 | 6.11E-3 | 5.13E-5 | -1.28E-2 | 2.42E-2 |
| ADP-mm | kg Sb eq | 2.57E-4 | 5.67E-6 | 8.41E-6 | 2.71E-4 | 3.57E-6 | 3.00E-5 | 3.74E-8 | -1.07E-4 | 1.97E-4 |
| ADP-f | MJ | 2.41E+2 | 3.38E+0 | 4.28E+0 | 2.49E+2 | 2.12E+0 | 2.09E+1 | 1.14E-1 | -1.27E+2 | 1.45E+2 |
| WDP | m3 depriv. | 1.59E+1 | 1.21E-2 | 2.89E+0 | 1.88E+1 | 6.51E-3 | 8.13E-1 | 6.57E-4 | -7.58E+0 | 1.20E+1 |
| PM | disease inc. | 2.99E-7 | 2.01E-8 | 3.13E-8 | 3.50E-7 | 1.25E-8 | 9.52E-8 | 7.82E-10 | -1.29E-7 | 3.29E-7 |
| IR | kBq U-235 eq | 5.11E-1 | 1.42E-2 | 7.72E-3 | 5.33E-1 | 9.27E-3 | 7.30E-2 | 5.23E-4 | -2.45E-1 | 3.71E-1 |
| ETP-fw | CTUe | 1.62E+2 | 3.01E+0 | 7.14E+0 | 1.72E+2 | 1.72E+0 | 1.56E+2 | 1.72E+0 | -7.51E+1 | 2.57E+2 |
| HTP-c | CTUh | 6.43E-9 | 9.77E-11 | 2.43E-10 | 6.77E-9 | 6.13E-11 | 2.29E-9 | 2.99E-12 | -2.80E-9 | 6.32E-9 |
| HTP-nc | CTUh | 2.04E-7 | 3.29E-9 | 7.45E-9 | 2.15E-7 | 2.05E-9 | 5.50E-8 | 3.30E-10 | -9.68E-8 | 1.76E-7 |
| SQP | Pt | 6.72E+1 | 2.93E+0 | 3.20E-1 | 7.04E+1 | 1.81E+0 | 1.31E+1 | 2.90E-1 | -2.16E+1 | 6.40E+1 |

| Resource use | Unit | A1 | A2 | A3 | A1-A3 | C2 | C3 | C4 | D | Total |
|-----------------------------------|------|---------|---------|---------|---------|---------|---------|---------|----------|---------|
| PERE | MJ | 1.72E+1 | 4.23E-2 | 1.29E+1 | 3.02E+1 | 3.04E-2 | 1.50E+0 | 4.11E-3 | -7.13E+0 | 2.46E+1 |
| PERM | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PERT | MJ | 1.72E+1 | 4.23E-2 | 1.29E+1 | 3.02E+1 | 3.04E-2 | 1.50E+0 | 4.11E-3 | -7.13E+0 | 2.46E+1 |
| PENRE | MJ | 2.59E+2 | 3.59E+0 | 4.64E+0 | 2.67E+2 | 2.25E+0 | 2.22E+1 | 1.21E-1 | -1.37E+2 | 1.55E+2 |
| PENRM | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PENRT | MJ | 2.59E+2 | 3.59E+0 | 4.64E+0 | 2.67E+2 | 2.25E+0 | 2.22E+1 | 1.21E-1 | -1.37E+2 | 1.55E+2 |
| PET | MJ | 2.76E+2 | 3.63E+0 | 1.75E+1 | 2.97E+2 | 2.28E+0 | 2.37E+1 | 1.25E-1 | -1.44E+2 | 1.80E+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 | 1.69E-1 | 4.11E-4 | 6.81E-2 | 2.38E-1 | 2.40E-4 | 2.22E-2 | 1.40E-4 | -7.92E-2 | 1.81E-1 |
| Output flows and waste categories | Unit | A1 | A2 | A3 | A1-A3 | C2 | C3 | C4 | D | Total |
| HWD | kg | 1.92E-4 | 8.56E-6 | 5.99E-6 | 2.06E-4 | 5.42E-6 | 3.36E-5 | 1.38E-7 | -1.05E-4 | 1.40E-4 |
| NHWD | kg | 9.12E-1 | 2.14E-1 | 8.65E-3 | 1.13E+0 | 1.31E-1 | 7.73E-1 | 5.25E-1 | -4.06E-1 | 2.16E+0 |
| RWD | kg | 4.48E-4 | 2.22E-5 | 1.08E-5 | 4.81E-4 | 1.44E-5 | 7.83E-5 | 7.45E-7 | -2.16E-4 | 3.59E-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 |



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