

# Environmental Profile

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

Ecochain v3.5.80



Product: 3000276 - U3 Pipe GY KOMO 200 SN8 L=10 CH  
Unit: 1 piece  
Manufacturer: Wavin - NL - Hardenberg - Verified  
Address: J.C. Kellerlaan 3  
7772 SG Hardenberg  
Netherlands

Multi-layer U3 PVC pipes from Wavin made with recycled PVC in the middle layer. The tubes contain at least 40% recycled material.

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         | 4.39     | 0.23     | 0.39    | 5.01     | 0.14     | 3.04    | 0.02     | -1.25    | 6.96    |
| ADPE                           | kg Sb-eq     | 1.09E-3  | 4.93E-5  | 7.05E-5 | 1.21E-3  | 2.98E-5  | 2.48E-4 | 3.08E-7  | -1.84E-4 | 1.31E-3 |
| ADPF                           | kg Sb-eq     | 4.51E-1  | 1.42E-2  | 1.89E-2 | 4.84E-1  | 8.40E-3  | 8.74E-2 | 4.37E-4  | -1.59E-1 | 4.21E-1 |
| GWP                            | kg CO2-eq    | 3.90E+1  | 1.93E+0  | 3.36E+0 | 4.43E+1  | 1.14E+0  | 2.89E+1 | 2.76E-1  | -1.46E+1 | 6.00E+1 |
| ODP                            | kg CFC-11-eq | 1.91E-5  | 3.42E-7  | 3.16E-7 | 1.97E-5  | 2.12E-7  | 3.49E-6 | 1.05E-8  | -4.98E-6 | 1.85E-5 |
| POCP                           | kg ethene-eq | 2.52E-2  | 1.16E-3  | 1.48E-3 | 2.79E-2  | 6.87E-4  | 6.89E-3 | 7.34E-5  | -5.77E-3 | 2.97E-2 |
| AP                             | kg SO2-eq    | 1.52E-1  | 8.48E-3  | 1.32E-2 | 1.73E-1  | 4.92E-3  | 5.01E-2 | 2.33E-4  | -3.35E-2 | 1.95E-1 |
| EP                             | kg PO4 3--eq | 2.02E-2  | 1.67E-3  | 2.08E-3 | 2.39E-2  | 9.83E-4  | 7.59E-3 | 9.06E-5  | -4.40E-3 | 2.82E-2 |
| HTP                            | kg 1,4-DB-eq | 1.48E+1  | 8.12E-1  | 1.27E+0 | 1.68E+1  | 4.89E-1  | 1.35E+1 | 2.39E-2  | -3.16E+0 | 2.77E+1 |
| FAETP                          | kg 1,4-DB-eq | 1.67E+0  | 2.37E-2  | 5.16E-2 | 1.75E+0  | 1.43E-2  | 1.99E-1 | 7.31E-3  | -6.56E-2 | 1.90E+0 |
| MAETP                          | kg 1,4-DB-eq | 1.14E+3  | 8.52E+1  | 2.11E+2 | 1.43E+3  | 5.12E+1  | 6.54E+2 | 8.87E+0  | -1.94E+2 | 1.95E+3 |
| TETP                           | kg 1,4-DB-eq | 6.92E-1  | 2.87E-3  | 7.87E-2 | 7.73E-1  | 1.73E-3  | 4.81E-2 | 7.86E-5  | -2.16E-2 | 8.02E-1 |
| Environmental impact           | Unit         | A1       | A2       | A3      | A1-A3    | C2       | C3      | C4       | D        | Total   |
| GWP-total                      | kg CO2 eq    | 3.61E+1  | 1.95E+0  | 3.96E+0 | 4.20E+1  | 1.15E+0  | 3.44E+1 | 3.21E-1  | -1.50E+1 | 6.29E+1 |
| GWP-f                          | kg CO2 eq    | 3.98E+1  | 1.94E+0  | 3.10E+0 | 4.49E+1  | 1.15E+0  | 2.92E+1 | 3.21E-1  | -1.49E+1 | 6.06E+1 |
| GWP-b                          | kg CO2 eq    | -3.88E+0 | 8.98E-4  | 6.70E-1 | -3.21E+0 | 7.00E-4  | 5.25E+0 | 4.13E-4  | -6.61E-2 | 1.97E+0 |
| GWP-luluc                      | kg CO2 eq    | 1.87E-1  | 7.12E-4  | 1.89E-1 | 3.76E-1  | 4.08E-4  | 1.35E-2 | 8.61E-6  | -6.80E-3 | 3.83E-1 |
| ODP                            | kg CFC11 eq  | 1.89E-5  | 4.29E-7  | 3.74E-7 | 1.97E-5  | 2.66E-7  | 3.60E-6 | 1.31E-8  | -5.01E-6 | 1.86E-5 |
| AP                             | mol H+ eq    | 1.86E-1  | 1.13E-2  | 1.69E-2 | 2.14E-1  | 6.57E-3  | 6.28E-2 | 3.12E-4  | -4.12E-2 | 2.42E-1 |
| EP-fw                          | kg P eq      | 1.68E-3  | 1.96E-5  | 4.43E-5 | 1.75E-3  | 9.49E-6  | 4.48E-4 | 3.89E-7  | -3.50E-4 | 1.85E-3 |
| EP-m                           | kg N eq      | 3.64E-2  | 3.97E-3  | 4.98E-3 | 4.53E-2  | 2.35E-3  | 1.53E-2 | 1.92E-4  | -8.03E-3 | 5.52E-2 |
| EP-T                           | mol N eq     | 3.86E-1  | 4.38E-2  | 5.34E-2 | 4.83E-1  | 2.59E-2  | 1.69E-1 | 1.25E-3  | -8.98E-2 | 5.89E-1 |
| POCP                           | kg NMVOC eq  | 1.28E-1  | 1.25E-2  | 1.51E-2 | 1.56E-1  | 7.41E-3  | 5.08E-2 | 4.24E-4  | -2.96E-2 | 1.85E-1 |
| ADP-mm                         | kg Sb eq     | 1.09E-3  | 4.93E-5  | 7.05E-5 | 1.21E-3  | 2.98E-5  | 2.48E-4 | 3.08E-7  | -1.84E-4 | 1.31E-3 |
| ADP-f                          | MJ           | 9.52E+2  | 2.93E+1  | 3.58E+1 | 1.02E+3  | 1.77E+1  | 1.73E+2 | 9.45E-1  | -3.22E+2 | 8.88E+2 |
| WDP                            | m3 depriv.   | 5.75E+1  | 1.05E-1  | 2.42E+1 | 8.18E+1  | 5.43E-2  | 6.67E+0 | 5.04E-3  | -1.33E+1 | 7.53E+1 |
| PM                             | disease inc. | 1.90E-6  | 1.75E-7  | 2.62E-7 | 2.33E-6  | 1.04E-7  | 7.91E-7 | 6.47E-9  | -2.75E-7 | 2.96E-6 |
| IR                             | kBq U-235 eq | 1.97E+0  | 1.23E-1  | 6.47E-2 | 2.16E+0  | 7.74E-2  | 6.03E-1 | 4.34E-3  | -4.56E-1 | 2.39E+0 |
| ETP-fw                         | CTUe         | 6.54E+2  | 2.61E+1  | 5.98E+1 | 7.40E+2  | 1.44E+1  | 1.27E+3 | 1.40E+1  | -1.57E+2 | 1.88E+3 |
| HTP-c                          | CTUh         | 2.72E-8  | 8.48E-10 | 2.04E-9 | 3.01E-8  | 5.12E-10 | 1.88E-8 | 2.43E-11 | -5.41E-9 | 4.40E-8 |
| HTP-nc                         | CTUh         | 7.93E-7  | 2.86E-8  | 6.24E-8 | 8.84E-7  | 1.71E-8  | 4.52E-7 | 2.69E-9  | -1.76E-7 | 1.18E-6 |
| SQP                            | Pt           | 6.04E+2  | 2.54E+1  | 2.68E+0 | 6.32E+2  | 1.51E+1  | 1.09E+2 | 2.40E+0  | -1.23E+2 | 6.35E+2 |

| Resource use                      | Unit | A1      | A2      | A3      | A1-A3   | C2      | C3      | C4      | D        | Total   |
|-----------------------------------|------|---------|---------|---------|---------|---------|---------|---------|----------|---------|
| PERE                              | MJ   | 1.15E+2 | 3.67E-1 | 1.08E+2 | 2.23E+2 | 2.54E-1 | 1.23E+1 | 3.40E-2 | -2.94E+1 | 2.07E+2 |
| PERM                              | MJ   | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       |
| PERT                              | MJ   | 1.15E+2 | 3.67E-1 | 1.08E+2 | 2.23E+2 | 2.54E-1 | 1.23E+1 | 3.40E-2 | -2.94E+1 | 2.07E+2 |
| PENRE                             | MJ   | 1.02E+3 | 3.11E+1 | 3.88E+1 | 1.09E+3 | 1.88E+1 | 1.84E+2 | 1.00E+0 | -3.49E+2 | 9.46E+2 |
| PENRM                             | MJ   | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       |
| PENRT                             | MJ   | 1.02E+3 | 3.11E+1 | 3.88E+1 | 1.09E+3 | 1.88E+1 | 1.84E+2 | 1.00E+0 | -3.49E+2 | 9.46E+2 |
| PET                               | MJ   | 1.14E+3 | 3.15E+1 | 1.47E+2 | 1.31E+3 | 1.91E+1 | 1.97E+2 | 1.04E+0 | -3.79E+2 | 1.15E+3 |
| 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   | 6.56E-1 | 3.57E-3 | 5.71E-1 | 1.23E+0 | 2.00E-3 | 1.83E-1 | 1.16E-3 | -1.46E-1 | 1.27E+0 |
| Output flows and waste categories | Unit | A1      | A2      | A3      | A1-A3   | C2      | C3      | C4      | D        | Total   |
| HWD                               | kg   | 7.92E-4 | 7.43E-5 | 5.02E-5 | 9.16E-4 | 4.53E-5 | 2.79E-4 | 1.14E-6 | -2.97E-4 | 9.45E-4 |
| NHWD                              | kg   | 3.89E+0 | 1.86E+0 | 7.24E-2 | 5.82E+0 | 1.10E+0 | 6.46E+0 | 4.39E+0 | -7.62E-1 | 1.70E+1 |
| RWD                               | kg   | 1.80E-3 | 1.93E-4 | 9.02E-5 | 2.08E-3 | 1.20E-4 | 6.50E-4 | 6.18E-6 | -4.17E-4 | 2.44E-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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