

# Environmental Profile

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

Ecochain v3.5.80



Product: 3001581 - KG Bend 87° BR DN100 EXP  
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



The Wavin KG sewer pipes and fittings are suitable for drain and underground sewer applications. This easy push-fit rubber ring jointing system is durable, corrosion free and light weight.

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         | 0.08     | 0        | 0        | 0.09     | 0        | 0.03     | 0        | -0.04     | 0.08     |
| ADPE                           | kg Sb-eq     | 7.28E-4  | 2.58E-7  | 1.11E-6  | 7.29E-4  | 2.39E-7  | 2.13E-6  | 2.74E-9  | -8.74E-6  | 7.23E-4  |
| ADPF                           | kg Sb-eq     | 8.98E-3  | 7.41E-5  | 1.91E-4  | 9.25E-3  | 6.73E-5  | 7.35E-4  | 3.79E-6  | -4.74E-3  | 5.32E-3  |
| GWP                            | kg CO2-eq    | 7.45E-1  | 1.01E-2  | 3.63E-2  | 7.92E-1  | 9.17E-3  | 2.97E-1  | 2.63E-3  | -4.10E-1  | 6.90E-1  |
| ODP                            | kg CFC-11-eq | 4.02E-7  | 1.79E-9  | 2.87E-9  | 4.07E-7  | 1.70E-9  | 3.08E-8  | 9.04E-11 | -2.00E-7  | 2.39E-7  |
| POCP                           | kg ethene-eq | 4.56E-4  | 6.08E-6  | 1.58E-5  | 4.78E-4  | 5.50E-6  | 5.81E-5  | 6.77E-7  | -2.07E-4  | 3.35E-4  |
| AP                             | kg SO2-eq    | 3.03E-3  | 4.43E-5  | 1.56E-4  | 3.23E-3  | 3.95E-5  | 4.32E-4  | 2.04E-6  | -1.35E-3  | 2.35E-3  |
| EP                             | kg PO4 3--eq | 3.87E-4  | 8.71E-6  | 2.00E-5  | 4.16E-4  | 7.88E-6  | 6.63E-5  | 8.84E-7  | -1.83E-4  | 3.08E-4  |
| HTP                            | kg 1,4-DB-eq | 2.94E-1  | 4.24E-3  | 1.68E-2  | 3.16E-1  | 3.92E-3  | 1.11E-1  | 2.14E-4  | -1.29E-1  | 3.02E-1  |
| FAETP                          | kg 1,4-DB-eq | 8.74E-3  | 1.24E-4  | 5.75E-4  | 9.44E-3  | 1.15E-4  | 1.70E-3  | 6.58E-5  | -3.60E-3  | 7.72E-3  |
| MAETP                          | kg 1,4-DB-eq | 2.10E+1  | 4.46E-1  | 2.27E+0  | 2.37E+1  | 4.10E-1  | 5.85E+0  | 8.03E-2  | -8.34E+0  | 2.17E+1  |
| TETP                           | kg 1,4-DB-eq | 2.09E-3  | 1.50E-5  | 1.25E-3  | 3.36E-3  | 1.39E-5  | 3.99E-4  | 7.23E-7  | -1.20E-3  | 2.57E-3  |
| Environmental impact           | Unit         | A1       | A2       | A3       | A1-A3    | C2       | C3       | C4       | D         | Total    |
| GWP-total                      | kg CO2 eq    | 7.69E-1  | 1.02E-2  | 4.15E-2  | 8.21E-1  | 9.25E-3  | 3.14E-1  | 3.06E-3  | -3.87E-1  | 7.60E-1  |
| GWP-f                          | kg CO2 eq    | 7.62E-1  | 1.02E-2  | 3.19E-2  | 8.04E-1  | 9.24E-3  | 2.99E-1  | 3.06E-3  | -4.19E-1  | 6.97E-1  |
| GWP-b                          | kg CO2 eq    | 6.22E-3  | 4.69E-6  | 6.58E-3  | 1.28E-2  | 5.61E-6  | 1.50E-2  | 3.82E-6  | 3.23E-2   | 6.01E-2  |
| GWP-luluc                      | kg CO2 eq    | 8.43E-4  | 3.73E-6  | 3.03E-3  | 3.87E-3  | 3.27E-6  | 1.14E-4  | 7.91E-8  | -4.94E-4  | 3.50E-3  |
| ODP                            | kg CFC11 eq  | 3.99E-7  | 2.24E-9  | 3.37E-9  | 4.05E-7  | 2.13E-9  | 3.17E-8  | 1.12E-10 | -1.98E-7  | 2.40E-7  |
| AP                             | mol H+ eq    | 3.68E-3  | 5.90E-5  | 1.94E-4  | 3.94E-3  | 5.27E-5  | 5.42E-4  | 2.73E-6  | -1.64E-3  | 2.90E-3  |
| EP-fw                          | kg P eq      | 3.62E-5  | 1.03E-7  | 5.58E-7  | 3.68E-5  | 7.61E-8  | 3.83E-6  | 3.58E-9  | -1.73E-5  | 2.34E-5  |
| EP-m                           | kg N eq      | 6.54E-4  | 2.08E-5  | 4.59E-5  | 7.20E-4  | 1.88E-5  | 1.33E-4  | 1.87E-6  | -2.94E-4  | 5.80E-4  |
| EP-T                           | mol N eq     | 7.07E-3  | 2.29E-4  | 5.06E-4  | 7.81E-3  | 2.08E-4  | 1.47E-3  | 1.09E-5  | -3.17E-3  | 6.33E-3  |
| POCP                           | kg NMVOC eq  | 2.33E-3  | 6.54E-5  | 1.44E-4  | 2.54E-3  | 5.94E-5  | 4.38E-4  | 3.76E-6  | -1.06E-3  | 1.98E-3  |
| ADP-mm                         | kg Sb eq     | 7.28E-4  | 2.58E-7  | 1.11E-6  | 7.29E-4  | 2.39E-7  | 2.13E-6  | 2.74E-9  | -8.74E-6  | 7.23E-4  |
| ADP-f                          | MJ           | 1.91E+1  | 1.53E-1  | 3.56E-1  | 1.96E+1  | 1.42E-1  | 1.45E+0  | 8.20E-3  | -9.95E+0  | 1.13E+1  |
| WDP                            | m3 depriv.   | 1.20E+0  | 5.48E-4  | 2.76E-1  | 1.48E+0  | 4.36E-4  | 5.79E-2  | 5.25E-5  | -6.07E-1  | 9.33E-1  |
| PM                             | disease inc. | 2.64E-8  | 9.13E-10 | 2.40E-9  | 2.97E-8  | 8.35E-10 | 6.66E-9  | 5.64E-11 | -1.26E-8  | 2.47E-8  |
| IR                             | kBq U-235 eq | 4.49E-2  | 6.42E-4  | 5.67E-4  | 4.61E-2  | 6.20E-4  | 5.14E-3  | 3.78E-5  | -2.03E-2  | 3.16E-2  |
| ETP-fw                         | CTUe         | 2.29E+1  | 1.37E-1  | 8.28E-1  | 2.38E+1  | 1.15E-1  | 1.13E+1  | 1.25E-1  | -8.03E+0  | 2.74E+1  |
| HTP-c                          | CTUh         | 6.17E-10 | 4.43E-12 | 2.87E-11 | 6.50E-10 | 4.10E-12 | 1.61E-10 | 2.26E-13 | -2.26E-10 | 5.90E-10 |
| HTP-nc                         | CTUh         | 2.02E-8  | 1.50E-10 | 8.95E-10 | 2.12E-8  | 1.37E-10 | 3.93E-9  | 2.42E-11 | -7.77E-9  | 1.75E-8  |
| SQP                            | Pt           | 4.00E+0  | 1.33E-1  | 2.66E-2  | 4.16E+0  | 1.21E-1  | 8.85E-1  | 2.10E-2  | -7.27E+0  | -2.08E+0 |

| Resource use                      | Unit | A1      | A2      | A3      | A1-A3   | C2      | C3      | C4      | D        | Total   |
|-----------------------------------|------|---------|---------|---------|---------|---------|---------|---------|----------|---------|
| PERE                              | MJ   | 1.23E+0 | 1.92E-3 | 1.73E+0 | 2.96E+0 | 2.04E-3 | 1.05E-1 | 3.10E-4 | -1.54E+0 | 1.53E+0 |
| PERM                              | MJ   | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       |
| PERT                              | MJ   | 1.23E+0 | 1.92E-3 | 1.73E+0 | 2.96E+0 | 2.04E-3 | 1.05E-1 | 3.10E-4 | -1.54E+0 | 1.53E+0 |
| PENRE                             | MJ   | 2.05E+1 | 1.63E-1 | 3.85E-1 | 2.10E+1 | 1.51E-1 | 1.55E+0 | 8.70E-3 | -1.07E+1 | 1.20E+1 |
| PENRM                             | MJ   | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0        | 0       |
| PENRT                             | MJ   | 2.05E+1 | 1.63E-1 | 3.85E-1 | 2.10E+1 | 1.51E-1 | 1.55E+0 | 8.70E-3 | -1.07E+1 | 1.20E+1 |
| PET                               | MJ   | 2.17E+1 | 1.65E-1 | 2.12E+0 | 2.40E+1 | 1.53E-1 | 1.65E+0 | 9.01E-3 | -1.23E+1 | 1.35E+1 |
| 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   | 1.40E-2 | 1.87E-5 | 6.52E-3 | 2.05E-2 | 1.61E-5 | 1.63E-3 | 1.01E-5 | -7.14E-3 | 1.50E-2 |
| Output flows and waste categories | Unit | A1      | A2      | A3      | A1-A3   | C2      | C3      | C4      | D        | Total   |
| HWD                               | kg   | 1.03E-4 | 3.89E-7 | 3.79E-7 | 1.03E-4 | 3.63E-7 | 2.40E-6 | 9.98E-9 | -8.52E-6 | 9.77E-5 |
| NHWD                              | kg   | 7.90E-2 | 9.73E-3 | 5.84E-4 | 8.93E-2 | 8.80E-3 | 5.33E-2 | 3.60E-2 | -3.25E-2 | 1.55E-1 |
| RWD                               | kg   | 4.10E-5 | 1.01E-6 | 7.01E-7 | 4.28E-5 | 9.65E-7 | 5.51E-6 | 5.34E-8 | -1.81E-5 | 3.12E-5 |
| 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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