

# Environmental Profile

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

Ecochain v3.5.71



Product: 3039654 - Wavin UR Bend 15° BN 150 SN8 D/S  
 Unit: 1 piece  
 Manufacturer: Wavin - UK - Chippenham - Verified

LCA standard: EN15804+A2 (2019)  
 Standard database: Worldwide - Ecoinvent v 3.6 Cut-Off  
 Externally verified: Yes  
 Issue date: 09-02-2023  
 End of validity: 09-02-2028  
 Verifier: Martijn van Hövell - SGS Search



Wavin Osma UltraRib Corrugated pipe systems are designed for use in gravity drainage and sewerage installations at depths of up to 10 metres. Osma UltraRib is a fully socketed system of pipe and fittings which combines secure jointing with ease of installation.

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 - UK - Chippenham - 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

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

**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 | Unit         | A1       | A2       | A3       | A1-A3   | C2       | C3       | C4       | D         | Total   |
|----------------------|--------------|----------|----------|----------|---------|----------|----------|----------|-----------|---------|
| GWP-total            | kg CO2 eq    | 1.24E+0  | 5.38E-2  | 8.72E-2  | 1.39E+0 | 1.67E-2  | 4.52E-1  | 5.21E-3  | -6.94E-1  | 1.16E+0 |
| GWP-f                | kg CO2 eq    | 1.23E+0  | 5.38E-2  | 8.44E-2  | 1.37E+0 | 1.66E-2  | 4.52E-1  | 5.21E-3  | -6.89E-1  | 1.16E+0 |
| GWP-b                | kg CO2 eq    | 1.10E-2  | -1.15E-5 | 2.73E-3  | 1.37E-2 | 1.01E-5  | -4.55E-4 | 6.55E-6  | -4.87E-3  | 8.39E-3 |
| GWP-luluc            | kg CO2 eq    | 1.03E-3  | 3.54E-5  | 6.29E-5  | 1.13E-3 | 5.89E-6  | 2.05E-4  | 1.39E-7  | -4.52E-4  | 8.87E-4 |
| ODP                  | kg CFC11 eq  | 6.89E-7  | 1.09E-8  | 8.49E-9  | 7.09E-7 | 3.83E-9  | 5.61E-8  | 1.96E-10 | -3.51E-7  | 4.18E-7 |
| AP                   | mol H+ eq    | 5.72E-3  | 1.61E-3  | 4.35E-4  | 7.76E-3 | 9.48E-5  | 9.43E-4  | 4.76E-6  | -2.64E-3  | 6.17E-3 |
| EP-fw                | kg P eq      | 5.64E-5  | 2.42E-7  | 1.14E-6  | 5.78E-5 | 1.37E-7  | 6.85E-6  | 6.24E-9  | -2.57E-5  | 3.90E-5 |
| EP-m                 | kg N eq      | 9.64E-4  | 3.99E-4  | 9.30E-5  | 1.46E-3 | 3.39E-5  | 2.27E-4  | 2.92E-6  | -4.55E-4  | 1.26E-3 |
| EP-T                 | mol N eq     | 1.05E-2  | 4.43E-3  | 9.96E-4  | 1.59E-2 | 3.74E-4  | 2.50E-3  | 1.90E-5  | -4.83E-3  | 1.40E-2 |
| POCP                 | kg NMVOC eq  | 3.56E-3  | 1.15E-3  | 4.68E-4  | 5.17E-3 | 1.07E-4  | 7.50E-4  | 6.52E-6  | -1.68E-3  | 4.36E-3 |
| ADP-mm               | kg Sb eq     | 7.30E-4  | 4.96E-7  | 1.80E-6  | 7.33E-4 | 4.30E-7  | 3.73E-6  | 4.78E-9  | -1.43E-5  | 7.22E-4 |
| ADP-f                | MJ           | 3.15E+1  | 7.00E-1  | 9.32E-1  | 3.31E+1 | 2.55E-1  | 2.58E+0  | 1.43E-2  | -1.68E+1  | 1.91E+1 |
| WDP                  | m3 depriv.   | 2.08E+0  | 1.15E-3  | 3.00E-2  | 2.12E+0 | 7.84E-4  | 1.03E-1  | 9.77E-5  | -1.01E+0  | 1.21E+0 |
| PM                   | disease inc. | 3.70E-8  | 1.96E-9  | 2.91E-9  | 4.18E-8 | 1.50E-9  | 1.16E-8  | 9.84E-11 | -1.67E-8  | 3.84E-8 |
| IR                   | kBq U-235 eq | 6.84E-2  | 3.01E-3  | 2.52E-3  | 7.40E-2 | 1.12E-3  | 9.07E-3  | 6.56E-5  | -3.24E-2  | 5.18E-2 |
| ETP-fw               | CTUe         | 2.68E+1  | 4.64E-1  | 2.23E+0  | 2.95E+1 | 2.07E-1  | 2.01E+1  | 2.23E-1  | -9.68E+0  | 4.04E+1 |
| HTP-c                | CTUh         | 9.60E-10 | 2.98E-11 | 8.75E-11 | 1.08E-9 | 7.38E-12 | 2.88E-10 | 3.96E-13 | -3.68E-10 | 1.00E-9 |
| HTP-nc               | CTUh         | 3.09E-8  | 3.96E-10 | 5.78E-9  | 3.71E-8 | 2.47E-10 | 6.97E-9  | 4.29E-11 | -1.28E-8  | 3.16E-8 |
| SQP                  | Pt           | 4.01E+0  | 1.52E-1  | 2.97E-1  | 4.46E+0 | 2.18E-1  | 1.59E+0  | 3.65E-2  | -1.79E+0  | 4.51E+0 |
| Resource use         | Unit         | A1       | A2       | A3       | A1-A3   | C2       | C3       | C4       | D         | Total   |
| PERE                 | MJ           | 1.55E+0  | 5.33E-3  | 4.36E+0  | 5.92E+0 | 3.66E-3  | 1.88E-1  | 5.27E-4  | -7.30E-1  | 5.38E+0 |
| PERM                 | MJ           | 0        | 0        | 0        | 0       | 0        | 0        | 0        | 0         | 0       |
| PERT                 | MJ           | 1.55E+0  | 5.33E-3  | 4.36E+0  | 5.92E+0 | 3.66E-3  | 1.88E-1  | 5.27E-4  | -7.30E-1  | 5.38E+0 |
| PENRE                | MJ           | 3.38E+1  | 7.44E-1  | 9.89E-1  | 3.55E+1 | 2.71E-1  | 2.75E+0  | 1.52E-2  | -1.81E+1  | 2.04E+1 |
| PENRM                | MJ           | 0        | 0        | 0        | 0       | 0        | 0        | 0        | 0         | 0       |
| PENRT                | MJ           | 3.38E+1  | 7.44E-1  | 9.89E-1  | 3.55E+1 | 2.71E-1  | 2.75E+0  | 1.52E-2  | -1.81E+1  | 2.04E+1 |
| PET                  | MJ           | 3.53E+1  | 7.49E-1  | 5.35E+0  | 4.14E+1 | 2.75E-1  | 2.93E+0  | 1.57E-2  | -1.88E+1  | 2.58E+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           | 2.27E-2  | 4.13E-5  | 8.45E-4  | 2.36E-2 | 2.89E-5  | 2.82E-3  | 1.75E-5  | -1.05E-2  | 1.59E-2 |

| Output flows and waste categories | Unit | A1      | A2      | A3      | A1-A3   | C2      | C3      | C4      | D        | Total   |
|-----------------------------------|------|---------|---------|---------|---------|---------|---------|---------|----------|---------|
| HWD                               | kg   | 1.13E-4 | 7.71E-7 | 1.05E-5 | 1.24E-4 | 6.53E-7 | 4.16E-6 | 1.74E-8 | -1.39E-5 | 1.15E-4 |
| NHWD                              | kg   | 1.20E-1 | 6.39E-3 | 2.12E-3 | 1.29E-1 | 1.58E-2 | 9.32E-2 | 6.33E-2 | -5.35E-2 | 2.48E-1 |
| RWD                               | kg   | 5.94E-5 | 4.86E-6 | 2.79E-6 | 6.71E-5 | 1.74E-6 | 9.64E-6 | 9.30E-8 | -2.86E-5 | 5.00E-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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