# Environmental Profile

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

Ecochain v4.3.1

| | |
|---|---|
| Product: | 3040135 - PPr Elbow 90°GY 110 |
| Unit: | 1 piece |
| Manufacturer: | Wavin - TR - Adana |
| Location: | Güzelevler Mahallesi |
| Address: | Girne Bulvarı 294<br>01321 Adana<br>Turkey |

| | |
|---|---|
| LCA standard: | EN15804+A2 (2019) |
| Standard database: | Worldwide - Ecoinvent v 3.6 Cut-Off |
| Externally verified: | Yes |
| Issue date: | 04-10-2022 |
| End of validity: | 04-10-2027 |
| 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 - TR - Adana (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-f** = EF Resource use, fossils [MJ]; **ADP-mm** = EF Resource use, minerals and metals [kg Sb eq]; **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

# Results

| Environmental impact | Unit | A1 | A2 | A3 | A1-A3 | C2 | C3 | C4 | D | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| GWP-total | kg CO2 eq | 2.61E+0 | 1.94E-1 | 7.48E-2 | 2.88E+0 | 6.25E-2 | 2.12E+0 | 2.94E-2 | -1.42E+0 | 3.67E+0 |
| GWP-f | kg CO2 eq | 2.60E+0 | 1.94E-1 | 7.23E-2 | 2.87E+0 | 6.24E-2 | 1.98E+0 | 2.94E-2 | -1.57E+0 | 3.37E+0 |
| GWP-b | kg CO2 eq | 1.10E-2 | -3.31E-5 | 2.53E-3 | 1.35E-2 | 3.79E-5 | 1.35E-1 | 2.56E-5 | 1.52E-1 | 3.01E-1 |
| GWP-luluc | kg CO2 eq | 1.57E-3 | 1.23E-4 | 4.41E-5 | 1.74E-3 | 2.21E-5 | 3.60E-4 | 5.07E-7 | -1.38E-3 | 7.43E-4 |
| ODP | kg CFC11 eq | 6.53E-8 | 3.95E-8 | 5.79E-9 | 1.11E-7 | 1.44E-8 | 5.02E-8 | 7.39E-10 | -6.92E-8 | 1.07E-7 |
| AP | mol H+ eq | 9.70E-3 | 5.38E-3 | 4.60E-4 | 1.55E-2 | 3.56E-4 | 2.09E-3 | 1.76E-5 | -4.84E-3 | 1.32E-2 |
| EP-fw | kg P eq | 4.75E-5 | 9.81E-7 | 5.77E-6 | 5.42E-5 | 5.14E-7 | 1.05E-5 | 2.32E-8 | -2.97E-5 | 3.56E-5 |
| EP-m | kg N eq | 1.74E-3 | 1.34E-3 | 1.60E-4 | 3.25E-3 | 1.27E-4 | 6.22E-4 | 1.14E-5 | -9.00E-4 | 3.11E-3 |
| EP-T | mol N eq | 1.93E-2 | 1.49E-2 | 1.09E-3 | 3.53E-2 | 1.40E-3 | 6.84E-3 | 7.16E-5 | -1.00E-2 | 3.36E-2 |
| POCP | kg NMVOC eq | 8.20E-3 | 3.89E-3 | 3.54E-4 | 1.24E-2 | 4.01E-4 | 2.15E-3 | 2.69E-5 | -4.20E-3 | 1.08E-2 |
| ADP-f | MJ | 8.86E+1 | 2.55E+0 | 7.18E-1 | 9.19E+1 | 9.58E-1 | 6.40E+0 | 5.39E-2 | -4.79E+1 | 5.14E+1 |
| ADP-mm | kg Sb eq | 4.01E-5 | 2.05E-6 | 5.73E-6 | 4.78E-5 | 1.62E-6 | 8.27E-6 | 1.78E-8 | -1.07E-5 | 4.71E-5 |
| WDP | m3 depriv. | 1.79E+0 | 4.77E-3 | 1.49E-1 | 1.94E+0 | 2.94E-3 | 1.22E-1 | 2.93E-4 | -1.02E+0 | 1.05E+0 |
| PM | disease inc. | 8.95E-8 | 7.93E-9 | 6.31E-9 | 1.04E-7 | 5.64E-9 | 3.41E-8 | 3.71E-10 | -4.90E-8 | 9.49E-8 |
| IR | kBq U-235 eq | 5.22E-2 | 1.09E-2 | 2.15E-3 | 6.53E-2 | 4.19E-3 | 1.97E-2 | 2.50E-4 | -3.11E-2 | 5.83E-2 |
| ETP-fw | CTUe | 3.36E+1 | 1.77E+0 | 3.88E+0 | 3.93E+1 | 7.78E-1 | 7.47E+0 | 4.51E-2 | -1.76E+1 | 2.99E+1 |
| HTP-c | CTUh | 6.65E-10 | 1.05E-10 | 2.36E-10 | 1.01E-9 | 2.77E-11 | 9.01E-10 | 1.33E-12 | -3.36E-10 | 1.60E-9 |
| HTP-nc | CTUh | 1.84E-8 | 1.55E-9 | 4.17E-9 | 2.42E-8 | 9.28E-10 | 1.09E-8 | 2.92E-11 | -9.99E-9 | 2.60E-8 |
| SQP | Pt | 9.74E+0 | 7.06E-1 | 9.58E-1 | 1.14E+1 | 8.20E-1 | 5.04E+0 | 1.38E-1 | -2.95E+1 | -1.21E+1 |
| Resource use | Unit | A1 | A2 | A3 | A1-A3 | C2 | C3 | C4 | D | Total |
| PERE | MJ | 2.62E+0 | 1.97E-2 | 1.30E+1 | 1.57E+1 | 1.38E-2 | 3.10E-1 | 2.08E-3 | -5.69E+0 | 1.03E+1 |
| PERM | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PERT | MJ | 2.62E+0 | 1.97E-2 | 1.30E+1 | 1.57E+1 | 1.38E-2 | 3.10E-1 | 2.08E-3 | -5.69E+0 | 1.03E+1 |
| PENRE | MJ | 9.51E+1 | 2.71E+0 | 7.63E-1 | 9.86E+1 | 1.02E+0 | 6.81E+0 | 5.72E-2 | -5.16E+1 | 5.49E+1 |
| PENRM | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PENRT | MJ | 9.51E+1 | 2.71E+0 | 7.63E-1 | 9.86E+1 | 1.02E+0 | 6.81E+0 | 5.72E-2 | -5.16E+1 | 5.49E+1 |
| PET | MJ | 9.77E+1 | 2.73E+0 | 1.38E+1 | 1.14E+2 | 1.03E+0 | 7.12E+0 | 5.93E-2 | -5.73E+1 | 6.52E+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 | 2.87E-2 | 1.67E-4 | 3.58E-3 | 3.24E-2 | 1.08E-4 | 3.65E-3 | 6.64E-5 | -1.78E-2 | 1.84E-2 |

| Output flows and waste categories | Unit | A1 | A2 | A3 | A1-A3 | C2 | C3 | C4 | D | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| HWD | kg | 1.41E-5 | 3.18E-6 | 4.62E-6 | 2.19E-5 | 2.45E-6 | 1.07E-5 | 6.52E-8 | -1.33E-5 | 2.18E-5 |
| NHWD | kg | 1.30E-1 | 3.61E-2 | 8.56E-2 | 2.52E-1 | 5.94E-2 | 3.18E-1 | 2.37E-1 | -4.78E-2 | 8.18E-1 |
| RWD | kg | 4.64E-5 | 1.75E-5 | 2.64E-6 | 6.66E-5 | 6.52E-6 | 2.52E-5 | 3.52E-7 | -2.86E-5 | 7.00E-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 | 3.12E+0 | 3.12E+0 | 0 | 0 | 0 | 0 | 3.12E+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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