# Environmental Profile

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

Ecochain v4.3.1

| | |
|---|---|
| Product: | 3040234 - PPr Clips GY 32 |
| 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 | 3.35E-2 | 1.98E-3 | 6.31E-4 | 3.61E-2 | 5.80E-4 | 3.53E-2 | 2.72E-4 | -1.83E-2 | 5.40E-2 |
| GWP-f | kg CO2 eq | 3.36E-2 | 1.98E-3 | 6.10E-4 | 3.62E-2 | 5.79E-4 | 3.42E-2 | 2.72E-4 | -1.95E-2 | 5.19E-2 |
| GWP-b | kg CO2 eq | -1.44E-4 | -1.43E-7 | 2.13E-5 | -1.23E-4 | 3.52E-7 | 1.08E-3 | 2.34E-7 | 1.21E-3 | 2.17E-3 |
| GWP-luluc | kg CO2 eq | 2.20E-5 | 1.17E-6 | 3.72E-7 | 2.35E-5 | 2.05E-7 | 3.45E-6 | 5.13E-9 | -1.16E-5 | 1.56E-5 |
| ODP | kg CFC11 eq | 1.02E-9 | 4.10E-10 | 4.89E-11 | 1.48E-9 | 1.33E-10 | 5.02E-10 | 6.88E-12 | -1.13E-9 | 9.93E-10 |
| AP | mol H+ eq | 1.38E-4 | 4.81E-5 | 3.88E-6 | 1.90E-4 | 3.30E-6 | 2.17E-5 | 1.66E-7 | -4.81E-5 | 1.68E-4 |
| EP-fw | kg P eq | 7.66E-7 | 1.15E-8 | 4.87E-8 | 8.27E-7 | 4.77E-9 | 1.01E-7 | 2.28E-10 | -2.68E-7 | 6.64E-7 |
| EP-m | kg N eq | 2.42E-5 | 1.22E-5 | 1.35E-6 | 3.78E-5 | 1.18E-6 | 6.77E-6 | 1.03E-7 | -9.38E-6 | 3.64E-5 |
| EP-T | mol N eq | 2.74E-4 | 1.35E-4 | 9.16E-6 | 4.18E-4 | 1.30E-5 | 7.46E-5 | 6.69E-7 | -1.04E-4 | 4.02E-4 |
| POCP | kg NMVOC eq | 1.14E-4 | 3.54E-5 | 2.99E-6 | 1.52E-4 | 3.72E-6 | 2.30E-5 | 2.51E-7 | -4.32E-5 | 1.36E-4 |
| ADP-f | MJ | 1.04E+0 | 2.67E-2 | 6.06E-3 | 1.07E+0 | 8.89E-3 | 6.22E-2 | 5.04E-4 | -5.29E-1 | 6.12E-1 |
| ADP-mm | kg Sb eq | 6.44E-7 | 2.56E-8 | 4.84E-8 | 7.18E-7 | 1.50E-8 | 8.01E-8 | 1.71E-10 | -1.01E-7 | 7.13E-7 |
| WDP | m3 depriv. | 2.38E-2 | 5.76E-5 | 1.26E-3 | 2.51E-2 | 2.73E-5 | 1.18E-3 | 4.22E-6 | -9.56E-3 | 1.68E-2 |
| PM | disease inc. | 1.22E-9 | 9.62E-11 | 5.33E-11 | 1.37E-9 | 5.23E-11 | 3.41E-10 | 3.46E-12 | -4.53E-10 | 1.31E-9 |
| IR | kBq U-235 eq | 7.56E-4 | 1.13E-4 | 1.82E-5 | 8.88E-4 | 3.89E-5 | 1.92E-4 | 2.30E-6 | -3.05E-4 | 8.17E-4 |
| ETP-fw | CTUe | 4.51E-1 | 1.94E-2 | 3.28E-2 | 5.03E-1 | 7.22E-3 | 7.48E-2 | 4.21E-4 | -1.55E-1 | 4.30E-1 |
| HTP-c | CTUh | 1.00E-11 | 1.04E-12 | 1.99E-12 | 1.31E-11 | 2.57E-13 | 1.12E-11 | 1.36E-14 | -3.37E-12 | 2.12E-11 |
| HTP-nc | CTUh | 2.72E-10 | 1.80E-11 | 3.52E-11 | 3.26E-10 | 8.61E-12 | 1.20E-10 | 2.79E-13 | -9.44E-11 | 3.60E-10 |
| SQP | Pt | 1.28E-1 | 1.01E-2 | 8.09E-3 | 1.46E-1 | 7.61E-3 | 4.92E-2 | 1.28E-3 | -2.40E-1 | -3.58E-2 |
| Resource use | Unit | A1 | A2 | A3 | A1-A3 | C2 | C3 | C4 | D | Total |
| PERE | MJ | 3.36E-2 | 2.24E-4 | 1.10E-1 | 1.44E-1 | 1.28E-4 | 2.98E-3 | 1.86E-5 | -4.66E-2 | 1.01E-1 |
| PERM | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PERT | MJ | 3.36E-2 | 2.24E-4 | 1.10E-1 | 1.44E-1 | 1.28E-4 | 2.98E-3 | 1.86E-5 | -4.66E-2 | 1.01E-1 |
| PENRE | MJ | 1.11E+0 | 2.83E-2 | 6.44E-3 | 1.15E+0 | 9.44E-3 | 6.62E-2 | 5.34E-4 | -5.72E-1 | 6.51E-1 |
| PENRM | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PENRT | MJ | 1.11E+0 | 2.83E-2 | 6.44E-3 | 1.15E+0 | 9.44E-3 | 6.62E-2 | 5.34E-4 | -5.72E-1 | 6.51E-1 |
| PET | MJ | 1.15E+0 | 2.86E-2 | 1.17E-1 | 1.29E+0 | 9.56E-3 | 6.92E-2 | 5.53E-4 | -6.19E-1 | 7.51E-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 | 4.44E-4 | 1.99E-6 | 3.02E-5 | 4.76E-4 | 1.01E-6 | 3.74E-5 | 6.13E-7 | -1.65E-4 | 3.50E-4 |

| Output flows and waste categories | Unit | A1 | A2 | A3 | A1-A3 | C2 | C3 | C4 | D | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| HWD | kg | 2.04E-7 | 3.96E-8 | 3.90E-8 | 2.83E-7 | 2.27E-8 | 1.09E-7 | 6.22E-10 | -2.18E-7 | 1.98E-7 |
| NHWD | kg | 2.13E-3 | 6.00E-4 | 7.23E-4 | 3.46E-3 | 5.51E-4 | 3.77E-3 | 2.20E-3 | -4.65E-4 | 9.51E-3 |
| RWD | kg | 6.56E-7 | 1.82E-7 | 2.23E-8 | 8.60E-7 | 6.05E-8 | 2.47E-7 | 3.26E-9 | -2.90E-7 | 8.82E-7 |
| 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 | 2.64E-2 | 2.64E-2 | 0 | 0 | 0 | 0 | 2.64E-2 |
| 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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