Environmental Profile

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

Ecochain v3.5.80

Product:	3015148 - X-Stream PP Branch 45° BK 600x160Waf
Unit:	1 piece
Manufacturer:	Wavin - PL -Buk - Extra products

Wavin X-Stream is a new generation of double-walled pipes and □ttings made of polypropylene. The system is

LCA standard:	EN15804+A2 (2019)
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 - PL -Buk - Extra products (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

Results

Environmental impact	Unit	A1	A2	A3	A1-A3	C2	C3	C4	D	Total
GWP-total	kg CO2 eq	1.95E+1	2.41E+0	4.28E-2	2.19E+1	7.10E-1	6.64E+1	3.34E-1	-3.77E+1	5.17E+1
GWP-f	kg CO2 eq	6.45E+1	2.41E+0	4.32E-2	6.70E+1	7.09E-1	2.09E+1	3.34E-1	-3.75E+1	5.14E+1
GWP-b	kg CO2 eq	-4.50E+1	1.46E-3	-4.56E-4	-4.50E+1	4.31E-4	4.54E+1	2.91E-4	-1.17E-1	2.89E-1
GWP-luluc	kg CO2 eq	4.13E-2	8.53E-4	4.41E-5	4.22E-2	2.51E-4	4.10E-3	5.71E-6	-2.47E-2	2.19E-2
ODP	kg CFC11 eq	2.51E-6	5.56E-7	2.44E-9	3.06E-6	1.63E-7	5.70E-7	8.39E-9	-2.01E-6	1.79E-6
AP	mol H+ eq	2.52E-1	1.37E-2	4.36E-4	2.66E-1	4.04E-3	2.42E-2	2.00E-4	-1.28E-1	1.66E-1
EP-fw	kg P eq	1.18E-3	1.98E-5	2.43E-6	1.20E-3	5.84E-6	1.19E-4	2.62E-7	-6.09E-4	7.17E-4
EP-m	kg N eq	4.69E-2	4.91E-3	4.58E-5	5.18E-2	1.45E-3	7.32E-3	1.30E-4	-2.62E-2	3.46E-2
EP-T	mol N eq	5.36E-1	5.41E-2	5.48E-4	5.91E-1	1.59E-2	8.08E-2	8.12E-4	-3.02E-1	3.86E-1
POCP	kg NMVOC eq	2.27E-1	1.55E-2	1.85E-4	2.43E-1	4.55E-3	2.51E-2	3.05E-4	-1.23E-1	1.49E-1
ADP-mm	kg Sb eq	1.09E-3	6.24E-5	5.81E-6	1.16E-3	1.83E-5	9.16E-5	2.02E-7	-3.07E-4	9.62E-4
ADP-f	MJ	2.10E+3	3.70E+1	4.01E-1	2.14E+3	1.09E+1	7.29E+1	6.12E-1	-1.11E+3	1.11E+3
WDP	m3 depriv.	4.05E+1	1.14E-1	1.54E-2	4.07E+1	3.34E-2	1.38E+0	3.18E-3	-1.97E+1	2.24E+1
PM	disease inc.	3.11E-6	2.18E-7	2.68E-9	3.33E-6	6.40E-8	3.87E-7	4.21E-9	-1.48E-6	2.30E-6
IR	kBq U-235 eq	1.50E+0	1.62E-1	3.01E-4	1.66E+0	4.76E-2	2.25E-1	2.84E-3	-7.31E-1	1.21E+0
ETP-fw	CTUe	5.36E+2	3.01E+1	3.57E+0	5.70E+2	8.84E+0	8.16E+1	5.12E-1	-3.11E+2	3.50E+2
HTP-c	CTUh	3.57E-8	1.07E-9	1.82E-10	3.69E-8	3.15E-10	1.07E-8	1.50E-11	-1.88E-8	2.91E-8
HTP-nc	CTUh	5.77E-7	3.58E-8	4.63E-9	6.17E-7	1.05E-8	1.23E-7	3.30E-10	-2.84E-7	4.68E-7
SQP	Pt	3.96E+3	3.17E+1	6.62E-1	4.00E+3	9.31E+0	5.81E+1	1.57E+0	-2.69E+3	1.38E+3
Resource use	Unit	A1	A2	A3	A1-A3	C2	C3	C4	D	Total
PERE	MJ	6.72E+2	5.31E-1	7.10E+0	6.80E+2	1.56E-1	3.52E+0	2.37E-2	-4.22E+2	2.61E+2
PERM	MJ	0	0	0	0	0	0	0	0	0
PERT	MJ	6.72E+2	5.31E-1	7.10E+0	6.80E+2	1.56E-1	3.52E+0	2.37E-2	-4.22E+2	2.61E+2
PENRE	MJ	2.25E+3	3.93E+1	4.27E-1	2.29E+3	1.16E+1	7.76E+1	6.50E-1	-1.20E+3	1.18E+3
PENRM	MJ	0	0	0	0	0	0	0	0	0
PENRT	MJ	2.25E+3	3.93E+1	4.27E-1	2.29E+3	1.16E+1	7.76E+1	6.50E-1	-1.20E+3	1.18E+3
PET	MJ	2.93E+3	3.98E+1	7.53E+0	2.97E+3	1.17E+1	8.11E+1	6.73E-1	-1.62E+3	1.44E+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	6.48E-1	4.19E-3	4.31E-4	6.53E-1	1.23E-3	4.24E-2	7.54E-4	-3.13E-1	3.85E-1

Output flows and waste categories	Unit	A1	A2	A3	A1-A3	C2	C3	C4	D	Total
HWD	kg	6.19E-4	9.46E-5	8.07E-11	7.14E-4	2.78E-5	1.21E-4	7.39E-7	-4.42E-4	4.22E-4
NHWD	kg	4.67E+0	2.29E+0	3.12E-4	6.97E+0	6.75E-1	3.76E+0	2.70E+0	-2.27E+0	1.18E+1
RWD	kg	1.51E-3	2.52E-4	3.24E-11	1.76E-3	7.40E-5	2.88E-4	4.00E-6	-7.25E-4	1.40E-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

Ecochain Technologies BV
H.J.E. Wenckebachweg 123, 1096 AM Amsterdam, The Netherlands
https://www.ecochain.com
+31 20 3035 777