Environmental Profile

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

Ecochain v3.5.80

Product:	2002489 - X-Stream PP Branch 45° BK 250x200
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	2.99E+0	2.40E-1	4.28E-2	3.27E+0	1.21E-1	1.17E+1	5.68E-2	-6.67E+0	8.47E+0
GWP-f	kg CO2 eq	1.10E+1	2.40E-1	4.32E-2	1.13E+1	1.20E-1	3.59E+0	5.68E-2	-6.65E+0	8.42E+0
GWP-b	kg CO2 eq	-8.03E+0	1.46E-4	-4.56E-4	-8.03E+0	7.32E-5	8.10E+0	4.94E-5	-1.98E-2	4.92E-2
GWP-luluc	kg CO2 eq	6.81E-3	8.49E-5	4.41E-5	6.94E-3	4.26E-5	6.98E-4	9.70E-7	-4.96E-3	2.72E-3
ODP	kg CFC11 eq	4.35E-7	5.53E-8	2.44E-9	4.93E-7	2.78E-8	9.70E-8	1.42E-9	-3.72E-7	2.47E-7
AP	mol H+ eq	4.24E-2	1.37E-3	4.36E-4	4.42E-2	6.86E-4	4.04E-3	3.40E-5	-2.29E-2	2.60E-2
EP-fw	kg P eq	1.99E-4	1.97E-6	2.43E-6	2.04E-4	9.92E-7	2.02E-5	4.44E-8	-1.14E-4	1.11E-4
EP-m	kg N eq	7.89E-3	4.89E-4	4.58E-5	8.42E-3	2.46E-4	1.21E-3	2.22E-5	-4.73E-3	5.16E-3
EP-T	mol N eq	8.87E-2	5.39E-3	5.48E-4	9.46E-2	2.71E-3	1.33E-2	1.38E-4	-5.38E-2	5.70E-2
POCP	kg NMVOC eq	3.90E-2	1.54E-3	1.85E-4	4.07E-2	7.74E-4	4.15E-3	5.18E-5	-2.25E-2	2.32E-2
ADP-mm	kg Sb eq	1.54E-4	6.21E-6	5.81E-6	1.66E-4	3.12E-6	1.56E-5	3.43E-8	-5.65E-5	1.28E-4
ADP-f	MJ	3.60E+2	3.68E+0	4.01E-1	3.64E+2	1.85E+0	1.24E+1	1.04E-1	-1.94E+2	1.84E+2
WDP	m3 depriv.	6.83E+0	1.13E-2	1.54E-2	6.85E+0	5.68E-3	2.34E-1	5.36E-4	-3.41E+0	3.68E+0
PM	disease inc.	4.78E-7	2.17E-8	2.68E-9	5.02E-7	1.09E-8	6.52E-8	7.15E-10	-2.76E-7	3.02E-7
IR	kBq U-235 eq	2.54E-1	1.61E-2	3.01E-4	2.70E-1	8.09E-3	3.85E-2	4.82E-4	-1.36E-1	1.81E-1
ETP-fw	CTUe	8.92E+1	2.99E+0	3.57E+0	9.57E+1	1.50E+0	1.38E+1	8.72E-2	-5.39E+1	5.73E+1
HTP-c	CTUh	6.18E-9	1.06E-10	1.82E-10	6.47E-9	5.35E-11	1.74E-9	2.55E-12	-3.87E-9	4.40E-9
HTP-nc	CTUh	9.59E-8	3.57E-9	4.63E-9	1.04E-7	1.79E-9	2.07E-8	5.61E-11	-5.15E-8	7.52E-8
SQP	Pt	6.90E+2	3.15E+0	6.62E-1	6.94E+2	1.58E+0	9.88E+0	2.67E-1	-5.73E+2	1.33E+2
Resource use	Unit	A1	A2	A3	A1-A3	C2	C3	C4	D	Total
PERE	MJ	1.17E+2	5.28E-2	7.10E+0	1.24E+2	2.65E-2	6.00E-1	4.02E-3	-8.74E+1	3.72E+1
PERM	MJ	0	0	0	0	0	0	0	0	0
PERT	MJ	1.17E+2	5.28E-2	7.10E+0	1.24E+2	2.65E-2	6.00E-1	4.02E-3	-8.74E+1	3.72E+1
PENRE	MJ	3.86E+2	3.91E+0	4.27E-1	3.91E+2	1.96E+0	1.32E+1	1.10E-1	-2.09E+2	1.97E+2
PENRM	MJ	0	0	0	0	0	0	0	0	0
PENRT	MJ	3.86E+2	3.91E+0	4.27E-1	3.91E+2	1.96E+0	1.32E+1	1.10E-1	-2.09E+2	1.97E+2
PET	MJ	5.03E+2	3.96E+0	7.53E+0	5.15E+2	1.99E+0	1.38E+1	1.14E-1	-2.97E+2	2.34E+2
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	1.09E-1	4.17E-4	4.31E-4	1.09E-1	2.09E-4	7.08E-3	1.28E-4	-5.53E-2	6.14E-2

Output flows and waste categories	Unit	A1	A2	A3	A1-A3	C2	C3	C4	D	Total
HWD	kg	1.01E-4	9.42E-6	8.07E-11	1.10E-4	4.73E-6	2.06E-5	1.25E-7	-8.61E-5	4.99E-5
NHWD	kg	7.57E-1	2.28E-1	3.12E-4	9.85E-1	1.15E-1	6.15E-1	4.58E-1	-4.55E-1	1.72E+0
RWD	kg	2.58E-4	2.50E-5	3.24E-11	2.83E-4	1.26E-5	4.92E-5	6.79E-7	-1.37E-4	2.09E-4
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