Environmental Profile

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

Ecochain v3.5.80

Product:	3015147 - X-Stream PP Branch 45° BK 500x160Waf
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	1.24E+1	1.59E+0	4.28E-2	1.40E+1	4.84E-1	4.65E+1	2.28E-1	-2.62E+1	3.51E+1
GWP-f	kg CO2 eq	4.43E+1	1.58E+0	4.32E-2	4.59E+1	4.84E-1	1.43E+1	2.28E-1	-2.61E+1	3.49E+1
GWP-b	kg CO2 eq	-3.20E+1	9.62E-4	-4.56E-4	-3.20E+1	2.94E-4	3.23E+1	1.99E-4	-7.95E-2	2.04E-1
GWP-luluc	kg CO2 eq	2.92E-2	5.61E-4	4.41E-5	2.98E-2	1.71E-4	2.80E-3	3.89E-6	-1.83E-2	1.45E-2
ODP	kg CFC11 eq	1.73E-6	3.65E-7	2.44E-9	2.10E-6	1.12E-7	3.90E-7	5.72E-9	-1.42E-6	1.18E-6
AP	mol H+ eq	1.73E-1	9.02E-3	4.36E-4	1.82E-1	2.76E-3	1.64E-2	1.37E-4	-8.98E-2	1.12E-1
EP-fw	kg P eq	8.11E-4	1.30E-5	2.43E-6	8.26E-4	3.98E-6	8.12E-5	1.78E-7	-4.35E-4	4.76E-4
EP-m	kg N eq	3.22E-2	3.23E-3	4.58E-5	3.55E-2	9.86E-4	4.95E-3	8.88E-5	-1.84E-2	2.31E-2
EP-T	mol N eq	3.67E-1	3.56E-2	5.48E-4	4.03E-1	1.09E-2	5.46E-2	5.54E-4	-2.12E-1	2.57E-1
POCP	kg NMVOC eq	1.57E-1	1.02E-2	1.85E-4	1.67E-1	3.11E-3	1.70E-2	2.08E-4	-8.69E-2	1.01E-1
ADP-mm	kg Sb eq	7.15E-4	4.10E-5	5.81E-6	7.62E-4	1.25E-5	6.27E-5	1.38E-7	-2.17E-4	6.20E-4
ADP-f	MJ	1.44E+3	2.43E+1	4.01E-1	1.47E+3	7.43E+0	4.98E+1	4.18E-1	-7.69E+2	7.54E+2
WDP	m3 depriv.	2.77E+1	7.46E-2	1.54E-2	2.78E+1	2.28E-2	9.41E-1	2.16E-3	-1.35E+1	1.52E+1
PM	disease inc.	2.07E-6	1.43E-7	2.68E-9	2.21E-6	4.37E-8	2.63E-7	2.87E-9	-1.06E-6	1.46E-6
IR	kBq U-235 eq	1.03E+0	1.06E-1	3.01E-4	1.13E+0	3.25E-2	1.54E-1	1.94E-3	-5.21E-1	8.00E-1
ETP-fw	CTUe	3.69E+2	1.97E+1	3.57E+0	3.92E+2	6.03E+0	5.57E+1	3.50E-1	-2.16E+2	2.38E+2
HTP-c	CTUh	2.50E-8	7.02E-10	1.82E-10	2.59E-8	2.15E-10	7.19E-9	1.02E-11	-1.41E-8	1.93E-8
HTP-nc	CTUh	3.96E-7	2.35E-8	4.63E-9	4.25E-7	7.19E-9	8.37E-8	2.25E-10	-2.00E-7	3.16E-7
SQP	Pt	2.79E+3	2.08E+1	6.62E-1	2.81E+3	6.35E+0	3.97E+1	1.07E+0	-2.05E+3	8.04E+2
Resource use	Unit	A1	A2	A3	A1-A3	C2	C3	C4	D	Total
PERE	MJ	4.73E+2	3.49E-1	7.10E+0	4.80E+2	1.07E-1	2.41E+0	1.61E-2	-3.18E+2	1.65E+2
PERM	MJ	0	0	0	0	0	0	0	0	0
PERT	MJ	4.73E+2	3.49E-1	7.10E+0	4.80E+2	1.07E-1	2.41E+0	1.61E-2	-3.18E+2	1.65E+2
PENRE	MJ	1.55E+3	2.58E+1	4.27E-1	1.57E+3	7.89E+0	5.30E+1	4.43E-1	-8.28E+2	8.05E+2
PENRM	MJ	0	0	0	0	0	0	0	0	0
PENRT	MJ	1.55E+3	2.58E+1	4.27E-1	1.57E+3	7.89E+0	5.30E+1	4.43E-1	-8.28E+2	8.05E+2
PET	MJ	2.02E+3	2.62E+1	7.53E+0	2.05E+3	7.99E+0	5.54E+1	4.59E-1	-1.15E+3	9.70E+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	4.43E-1	2.75E-3	4.31E-4	4.47E-1	8.41E-4	2.88E-2	5.15E-4	-2.17E-1	2.59E-1

Output flows and waste categories	Unit	A1	A2	A3	A1-A3	C2	C3	C4	D	Total
HWD	kg	4.25E-4	6.22E-5	8.07E-11	4.87E-4	1.90E-5	8.29E-5	5.04E-7	-3.21E-4	2.69E-4
NHWD	kg	3.22E+0	1.51E+0	3.12E-4	4.73E+0	4.60E-1	2.53E+0	1.84E+0	-1.68E+0	7.88E+0
RWD	kg	1.03E-3	1.65E-4	3.24E-11	1.20E-3	5.05E-5	1.97E-4	2.73E-6	-5.20E-4	9.30E-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