Environmental Profile

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

Ecochain v3.5.80

Product:	3052459 - Wafix PVC Bend 45° BR/GY 110 SN8 S/SP
Unit:	1 piece
Manufacturer:	Wavin - NL - Hardenberg - Verified
Address:	J.C. Kellerlaan 3 7772 SG Hardenberg Netherlands

Wavin carries a complete PVC range of outdoor sewers. With PVC as a material, a smooth-walled, flexible and completely watertight piping system is obtained. Moreover, PVC is absolutely resistant to all substances that occur in domestic waste water. By working with a light material, large pipe lengths and plug connections, a very fast installation is guaranteed.

LCA standard:	NMD Bepalingsmethode 1.1 (2022)
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 - NL - Hardenberg - Verified (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

ECI = Environmental Costs Indicator [euro]; **ADPE** = Abiotic depletion potential for non-fossil resources [kg Sb-eq]; **ADPF** = Abiotic depletion potential for fossil resources [kg Sb-eq]; **GWP** = Global warming potential [kg CO2-eq]; **ODP** = Depletion potential of the stratospheric ozone layer [kg CFC-11-eq]; **POCP** = Formation potential of tropospheric ozone photochemical oxidants [kg ethene-eq]; **AP** = Acidification potential of land and water [kg SO2-eq]; **EP** = Eutrophication potential [kg PO4 3−-eq]; **HTP** = Human toxicity potential [kg 1,4-DB-eq]; **FAETP** = Freshwater aquatic ecotoxicity potential [kg 1,4-DB-eq]; **MAETP** = Marine aquatic ecotoxicity potential [kg 1,4-DB-eq]; **TETP** = Terrestrial ecotoxicity potential [kg 1,4-DB-eq]; **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

This document and supporting material contain confidential and proprietary business information of Wavin - NL - Hardenberg - Verified. These materials may be printed or (photo) copied or otherwise used only with the written consent of Wavin - NL - Hardenberg - Verified.

Results

Environmental impact SBK set 1	Unit	A1	A2	A3	A1-A3	C2	C3	C4	D	Total
ECI	euro	0.08	0	0	0.08	0	0.03	0	-0.04	0.07
ADPE	kg Sb-eq	6.48E-4	2.52E-7	1.12E-6	6.49E-4	2.29E-7	2.00E-6	2.56E-9	-7.70E-6	6.44E-4
ADPF	kg Sb-eq	8.51E-3	7.24E-5	1.93E-4	8.78E-3	6.46E-5	6.94E-4	3.55E-6	-4.60E-3	4.93E-3
GWP	kg CO2-eq	6.90E-1	9.84E-3	3.66E-2	7.36E-1	8.80E-3	2.48E-1	2.51E-3	-3.88E-1	6.08E-1
ODP	kg CFC-11-eq	3.59E-7	1.75E-9	2.89E-9	3.64E-7	1.63E-9	2.80E-8	8.46E-11	-1.85E-7	2.09E-7
POCP	kg ethene-eq	4.23E-4	5.94E-6	1.59E-5	4.44E-4	5.28E-6	5.57E-5	6.42E-7	-2.05E-4	3.01E-4
AP	kg SO2-eq	2.75E-3	4.33E-5	1.57E-4	2.95E-3	3.79E-5	4.03E-4	1.91E-6	-1.31E-3	2.09E-3
EP	kg PO4 3−-eq	3.50E-4	8.50E-6	2.02E-5	3.79E-4	7.56E-6	6.16E-5	8.02E-7	-1.75E-4	2.74E-4
HTP	kg 1,4-DB-eq	2.62E-1	4.14E-3	1.70E-2	2.83E-1	3.76E-3	1.07E-1	2.05E-4	-1.22E-1	2.73E-1
FAETP	kg 1,4-DB-eq	7.90E-3	1.21E-4	5.80E-4	8.60E-3	1.10E-4	1.66E-3	7.60E-5	-3.44E-3	7.00E-3
MAETP	kg 1,4-DB-eq	1.86E+1	4.35E-1	2.29E+0	2.13E+1	3.94E-1	5.57E+0	8.87E-2	-7.87E+0	1.95E+1
TETP	kg 1,4-DB-eq	1.89E-3	1.46E-5	1.26E-3	3.16E-3	1.33E-5	3.79E-4	6.63E-7	-1.14E-3	2.41E-3
Environmental impact	Unit	A1	A2	A3	A1-A3	C2	C3	C4	D	Total
GWP-total	kg CO2 eq	7.13E-1	9.93E-3	4.19E-2	7.65E-1	8.88E-3	2.65E-1	2.93E-3	-3.65E-1	6.77E-1
GWP-f	kg CO2 eq	7.06E-1	9.93E-3	3.22E-2	7.49E-1	8.87E-3	2.49E-1	2.93E-3	-3.96E-1	6.13E-1
GWP-b	kg CO2 eq	6.19E-3	4.58E-6	6.64E-3	1.28E-2	5.39E-6	1.50E-2	3.57E-6	3.24E-2	6.02E-2
GWP-luluc	kg CO2 eq	7.70E-4	3.64E-6	3.05E-3	3.83E-3	3.14E-6	1.07E-4	7.38E-8	-4.79E-4	3.46E-3
ODP	kg CFC11 eq	3.55E-7	2.19E-9	3.40E-9	3.61E-7	2.04E-9	2.90E-8	1.05E-10	-1.83E-7	2.09E-7
AP	mol H+ eq	3.35E-3	5.76E-5	1.96E-4	3.60E-3	5.05E-5	5.06E-4	2.55E-6	-1.58E-3	2.58E-3
EP-fw	kg P eq	3.27E-5	1.00E-7	5.63E-7	3.34E-5	7.30E-8	3.55E-6	3.34E-9	-1.65E-5	2.06E-5
EP-m	kg N eq	5.96E-4	2.03E-5	4.63E-5	6.62E-4	1.81E-5	1.25E-4	1.69E-6	-2.83E-4	5.24E-4
EP-T	mol N eq	6.44E-3	2.24E-4	5.11E-4	7.18E-3	1.99E-4	1.38E-3	1.02E-5	-3.05E-3	5.72E-3
POCP	kg NMVOC eq	2.13E-3	6.39E-5	1.45E-4	2.34E-3	5.70E-5	4.13E-4	3.53E-6	-1.03E-3	1.79E-3
ADP-mm	kg Sb eq	6.48E-4	2.52E-7	1.12E-6	6.49E-4	2.29E-7	2.00E-6	2.56E-9	-7.70E-6	6.43E-4
ADP-f	MJ	1.81E+1	1.50E-1	3.60E-1	1.86E+1	1.36E-1	1.38E+0	7.68E-3	-9.69E+0	1.05E+1
WDP	m3 depriv.	1.10E+0	5.36E-4	2.78E-1	1.38E+0	4.18E-4	5.30E-2	4.87E-5	-5.78E-1	8.54E-1
PM	disease inc.	2.38E-8	8.91E-10	2.42E-9	2.71E-8	8.01E-10	6.35E-9	5.28E-11	-1.24E-8	2.19E-8
IR	kBq U-235 eq	4.00E-2	6.27E-4	5.72E-4	4.12E-2	5.95E-4	4.84E-3	3.53E-5	-1.91E-2	2.76E-2
ETP-fw	CTUe	2.07E+1	1.33E-1	8.35E-1	2.17E+1	1.11E-1	1.02E+1	1.12E-1	-7.69E+0	2.44E+1
HTP-c	CTUh	5.55E-10	4.33E-12	2.89E-11	5.88E-10	3.93E-12	1.54E-10	2.10E-13	-2.13E-10	5.33E-10
HTP-nc	CTUh	1.81E-8	1.46E-10	9.03E-10	1.92E-8	1.32E-10	3.63E-9	2.18E-11	-7.34E-9	1.56E-8
SQP	Pt	3.68E+0	1.30E-1	2.69E-2	3.84E+0	1.16E-1	8.53E-1	1.97E-2	-7.20E+0	-2.37E+0

Resource use	Unit	A1	A2	A3	A1-A3	C2	C3	C4	D	Total
PERE	MJ	1.14E+0	1.87E-3	1.75E+0	2.89E+0	1.95E-3	9.77E-2	2.89E-4	-1.52E+0	1.47E+0
PERM	MJ	0	0	0	0	0	0	0	0	0
PERT	MJ	1.14E+0	1.87E-3	1.75E+0	2.89E+0	1.95E-3	9.77E-2	2.89E-4	-1.52E+0	1.47E+0
PENRE	MJ	1.94E+1	1.59E-1	3.89E-1	2.00E+1	1.45E-1	1.46E+0	8.14E-3	-1.04E+1	1.12E+1
PENRM	MJ	0	0	0	0	0	0	0	0	0
PENRT	MJ	1.94E+1	1.59E-1	3.89E-1	2.00E+1	1.45E-1	1.46E+0	8.14E-3	-1.04E+1	1.12E+1
PET	MJ	2.06E+1	1.61E-1	2.14E+0	2.29E+1	1.47E-1	1.56E+0	8.43E-3	-1.20E+1	1.26E+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	1.28E-2	1.82E-5	6.58E-3	1.93E-2	1.54E-5	1.46E-3	9.41E-6	-6.87E-3	1.40E-2
Output flows and waste categories	Unit	A1	A2	A3	A1-A3	C2	C3	C4	D	Total
HWD	kg	9.21E-5	3.79E-7	3.82E-7	9.29E-5	3.48E-7	2.25E-6	9.33E-9	-7.76E-6	8.77E-5
NHWD	kg	7.07E-2	9.50E-3	5.89E-4	8.08E-2	8.44E-3	5.07E-2	3.37E-2	-3.07E-2	1.43E-1
RWD	kg	3.60E-5	9.83E-7	7.08E-7	3.76E-5	9.26E-7	5.23E-6	4.99E-8	-1.70E-5	2.69E-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	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