Environmental Profile

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

Ecochain v3.5.80

Product:	3000569 - PVC Pipe BR BENOR 400x9.8 SN4 L=5 SC/CH
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	18.64	0.49	0.83	19.95	0.3	6.72	0.04	-9.3	17.71
ADPE	kg Sb-eq	5.02E-3	1.03E-4	1.51E-4	5.27E-3	6.44E-5	5.40E-4	6.77E-7	-1.95E-3	3.93E-3
ADPF	kg Sb-eq	2.08E+0	2.97E-2	4.04E-2	2.15E+0	1.81E-2	1.90E-1	9.54E-4	-1.10E+0	1.26E+0
GWP	kg CO2-eq	1.68E+2	4.03E+0	7.19E+0	1.79E+2	2.47E+0	6.52E+1	6.06E-1	-9.28E+1	1.54E+2
ODP	kg CFC-11-eq	9.70E-5	7.16E-7	6.75E-7	9.84E-5	4.58E-7	7.69E-6	2.29E-8	-4.81E-5	5.84E-5
POCP	kg ethene-eq	1.04E-1	2.43E-3	3.17E-3	1.10E-1	1.48E-3	1.50E-2	1.61E-4	-4.71E-2	7.92E-2
AP	kg SO2-eq	6.50E-1	1.77E-2	2.82E-2	6.96E-1	1.06E-2	1.09E-1	5.09E-4	-3.01E-1	5.15E-1
EP	kg PO4 3−-eq	7.76E-2	3.49E-3	4.45E-3	8.55E-2	2.12E-3	1.66E-2	1.97E-4	-3.66E-2	6.79E-2
HTP	kg 1,4-DB-eq	6.59E+1	1.70E+0	2.71E+0	7.03E+1	1.06E+0	2.94E+1	5.22E-2	-2.93E+1	7.15E+1
FAETP	kg 1,4-DB-eq	1.42E+0	4.96E-2	1.10E-1	1.58E+0	3.10E-2	4.39E-1	1.54E-2	-6.40E-1	1.43E+0
MAETP	kg 1,4-DB-eq	4.16E+3	1.78E+2	4.51E+2	4.79E+3	1.11E+2	1.44E+3	1.90E+1	-1.88E+3	4.47E+3
TETP	kg 1,4-DB-eq	4.52E-1	6.00E-3	1.69E-1	6.27E-1	3.75E-3	1.05E-1	1.73E-4	-2.13E-1	5.22E-1
Environmental impact	Unit	A1	A2	A3	A1-A3	C2	C3	C4	D	Total
GWP-total	kg CO2 eq	1.62E+2	4.07E+0	8.47E+0	1.75E+2	2.49E+0	7.68E+1	7.06E-1	-9.56E+1	1.59E+2
GWP-f	kg CO2 eq	1.72E+2	4.07E+0	6.63E+0	1.83E+2	2.49E+0	6.57E+1	7.06E-1	-9.49E+1	1.57E+2
GWP-b	kg CO2 eq	-9.82E+0	1.88E-3	1.43E+0	-8.39E+0	1.51E-3	1.11E+1	9.07E-4	-6.61E-1	2.04E+0
GWP-luluc	kg CO2 eq	1.39E-1	1.49E-3	4.04E-1	5.45E-1	8.82E-4	2.95E-2	1.91E-5	-6.30E-2	5.12E-1
ODP	kg CFC11 eq	9.57E-5	8.98E-7	8.01E-7	9.74E-5	5.74E-7	7.93E-6	2.84E-8	-4.77E-5	5.82E-5
AP	mol H+ eq	7.83E-1	2.36E-2	3.62E-2	8.43E-1	1.42E-2	1.37E-1	6.82E-4	-3.64E-1	6.31E-1
EP-fw	kg P eq	7.59E-3	4.10E-5	9.48E-5	7.73E-3	2.05E-5	9.80E-4	8.61E-7	-3.51E-3	5.22E-3
EP-m	kg N eq	1.32E-1	8.32E-3	1.07E-2	1.51E-1	5.08E-3	3.35E-2	4.18E-4	-6.36E-2	1.26E-1
EP-T	mol N eq	1.43E+0	9.17E-2	1.14E-1	1.64E+0	5.60E-2	3.69E-1	2.73E-3	-6.84E-1	1.38E+0
POCP	kg NMVOC eq	4.96E-1	2.62E-2	3.23E-2	5.54E-1	1.60E-2	1.11E-1	9.28E-4	-2.33E-1	4.49E-1
ADP-mm	kg Sb eq	5.02E-3	1.03E-4	1.51E-4	5.27E-3	6.44E-5	5.40E-4	6.77E-7	-1.95E-3	3.93E-3
ADP-f	MJ	4.42E+3	6.14E+1	7.67E+1	4.55E+3	3.82E+1	3.77E+2	2.06E+0	-2.30E+3	2.67E+3
WDP	m3 depriv.	2.87E+2	2.20E-1	5.19E+1	3.40E+2	1.17E-1	1.47E+1	1.19E-2	-1.37E+2	2.18E+2
PM	disease inc.	5.69E-6	3.65E-7	5.61E-7	6.62E-6	2.25E-7	1.72E-6	1.41E-8	-2.36E-6	6.22E-6
IR	kBq U-235 eq	9.37E+0	2.57E-1	1.39E-1	9.76E+0	1.67E-1	1.32E+0	9.46E-3	-4.42E+0	6.83E+0
ETP-fw	CTUe	2.98E+3	5.47E+1	1.28E+2	3.16E+3	3.11E+1	2.81E+3	3.10E+1	-1.37E+3	4.66E+3
HTP-c	CTUh	1.18E-7	1.77E-9	4.37E-9	1.24E-7	1.11E-9	4.16E-8	5.40E-11	-5.07E-8	1.16E-7
HTP-nc	CTUh	3.72E-6	5.99E-8	1.34E-7	3.91E-6	3.70E-8	9.93E-7	5.95E-9	-1.75E-6	3.20E-6
SQP	Pt	1.55E+3	5.32E+1	5.74E+0	1.61E+3	3.27E+1	2.36E+2	5.24E+0	-4.60E+2	1.43E+3

Resource use	Unit	A1	A2	A3	A1-A3	C2	C3	C4	D	Total
PERE	MJ	3.63E+2	7.68E-1	2.31E+2	5.95E+2	5.49E-1	2.70E+1	7.44E-2	-1.43E+2	4.80E+2
PERM	MJ	0	0	0	0	0	0	0	0	0
PERT	MJ	3.63E+2	7.68E-1	2.31E+2	5.95E+2	5.49E-1	2.70E+1	7.44E-2	-1.43E+2	4.80E+2
PENRE	MJ	4.74E+3	6.52E+1	8.32E+1	4.89E+3	4.06E+1	4.01E+2	2.19E+0	-2.48E+3	2.85E+3
PENRM	MJ	0	0	0	0	0	0	0	0	0
PENRT	MJ	4.74E+3	6.52E+1	8.32E+1	4.89E+3	4.06E+1	4.01E+2	2.19E+0	-2.48E+3	2.85E+3
PET	MJ	5.10E+3	6.59E+1	3.15E+2	5.48E+3	4.11E+1	4.28E+2	2.26E+0	-2.62E+3	3.33E+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	3.10E+0	7.47E-3	1.22E+0	4.33E+0	4.33E-3	4.02E-1	2.53E-3	-1.43E+0	3.31E+0
Output flows and waste categories	Unit	A1	A2	A3	A1-A3	C2	C3	C4	D	Total
HWD	kg	3.50E-3	1.56E-4	1.07E-4	3.77E-3	9.78E-5	6.08E-4	2.49E-6	-1.92E-3	2.55E-3
NHWD	kg	1.68E+1	3.89E+0	1.55E-1	2.08E+1	2.37E+0	1.41E+1	9.49E+0	-7.36E+0	3.94E+1
RWD	kg	8.25E-3	4.03E-4	1.93E-4	8.85E-3	2.60E-4	1.41E-3	1.35E-5	-3.91E-3	6.63E-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

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