Environmental Profile

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

Ecochain v3.5.80

Product:	3000564 - PVC Pipe BR BENOR 200x4.9 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	4.63	0.12	0.21	4.96	0.08	1.67	0.01	-2.33	4.4
ADPE	kg Sb-eq	1.23E-3	2.58E-5	3.81E-5	1.30E-3	1.63E-5	1.36E-4	1.71E-7	-4.91E-4	9.61E-4
ADPF	kg Sb-eq	5.17E-1	7.41E-3	1.02E-2	5.35E-1	4.58E-3	4.80E-2	2.41E-4	-2.75E-1	3.12E-1
GWP	kg CO2-eq	4.17E+1	1.01E+0	1.81E+0	4.45E+1	6.24E-1	1.61E+1	1.53E-1	-2.32E+1	3.82E+1
ODP	kg CFC-11-eq	2.44E-5	1.79E-7	1.71E-7	2.48E-5	1.16E-7	1.94E-6	5.77E-9	-1.21E-5	1.47E-5
POCP	kg ethene-eq	2.56E-2	6.08E-4	7.99E-4	2.70E-2	3.74E-4	3.76E-3	4.06E-5	-1.18E-2	1.94E-2
AP	kg SO2-eq	1.61E-1	4.43E-3	7.12E-3	1.73E-1	2.68E-3	2.75E-2	1.28E-4	-7.55E-2	1.27E-1
EP	kg PO4 3−-eq	1.92E-2	8.71E-4	1.12E-3	2.12E-2	5.36E-4	4.16E-3	4.97E-5	-9.09E-3	1.68E-2
HTP	kg 1,4-DB-eq	1.64E+1	4.24E-1	6.85E-1	1.75E+1	2.67E-1	7.39E+0	1.32E-2	-7.34E+0	1.78E+1
FAETP	kg 1,4-DB-eq	3.54E-1	1.24E-2	2.79E-2	3.94E-1	7.81E-3	1.09E-1	3.89E-3	-1.61E-1	3.54E-1
MAETP	kg 1,4-DB-eq	1.03E+3	4.46E+1	1.14E+2	1.19E+3	2.79E+1	3.60E+2	4.78E+0	-4.74E+2	1.11E+3
TETP	kg 1,4-DB-eq	1.13E-1	1.50E-3	4.26E-2	1.57E-1	9.45E-4	2.64E-2	4.37E-5	-5.35E-2	1.31E-1
Environmental impact	Unit	A1	A2	A3	A1-A3	C2	C3	C4	D	Total
GWP-total	kg CO2 eq	4.17E+1	1.02E+0	2.14E+0	4.48E+1	6.29E-1	1.76E+1	1.78E-1	-2.39E+1	3.94E+1
GWP-f	kg CO2 eq	4.28E+1	1.02E+0	1.67E+0	4.55E+1	6.29E-1	1.62E+1	1.78E-1	-2.37E+1	3.88E+1
GWP-b	kg CO2 eq	-1.10E+0	4.69E-4	3.62E-1	-7.38E-1	3.82E-4	1.43E+0	2.29E-4	-1.67E-1	5.26E-1
GWP-luluc	kg CO2 eq	3.39E-2	3.72E-4	1.02E-1	1.36E-1	2.22E-4	7.44E-3	4.82E-6	-1.57E-2	1.28E-1
ODP	kg CFC11 eq	2.41E-5	2.24E-7	2.02E-7	2.45E-5	1.45E-7	2.00E-6	7.17E-9	-1.20E-5	1.47E-5
AP	mol H+ eq	1.94E-1	5.90E-3	9.13E-3	2.09E-1	3.58E-3	3.45E-2	1.72E-4	-9.10E-2	1.56E-1
EP-fw	kg P eq	1.89E-3	1.03E-5	2.39E-5	1.92E-3	5.17E-6	2.47E-4	2.17E-7	-8.84E-4	1.29E-3
EP-m	kg N eq	3.25E-2	2.08E-3	2.69E-3	3.73E-2	1.28E-3	8.38E-3	1.05E-4	-1.58E-2	3.12E-2
EP-T	mol N eq	3.52E-1	2.29E-2	2.89E-2	4.04E-1	1.41E-2	9.23E-2	6.88E-4	-1.69E-1	3.42E-1
POCP	kg NMVOC eq	1.22E-1	6.54E-3	8.15E-3	1.37E-1	4.04E-3	2.77E-2	2.34E-4	-5.82E-2	1.10E-1
ADP-mm	kg Sb eq	1.23E-3	2.58E-5	3.81E-5	1.30E-3	1.63E-5	1.36E-4	1.71E-7	-4.91E-4	9.61E-4
ADP-f	MJ	1.10E+3	1.53E+1	1.94E+1	1.13E+3	9.65E+0	9.50E+1	5.20E-1	-5.77E+2	6.62E+2
WDP	m3 depriv.	7.21E+1	5.48E-2	1.31E+1	8.53E+1	2.96E-2	3.70E+0	3.00E-3	-3.45E+1	5.46E+1
PM	disease inc.	1.35E-6	9.13E-8	1.42E-7	1.58E-6	5.67E-8	4.32E-7	3.56E-9	-5.84E-7	1.49E-6
IR	kBq U-235 eq	2.33E+0	6.42E-2	3.50E-2	2.43E+0	4.22E-2	3.32E-1	2.39E-3	-1.11E+0	1.70E+0
ETP-fw	CTUe	7.38E+2	1.37E+1	3.23E+1	7.84E+2	7.84E+0	7.10E+2	7.82E+0	-3.40E+2	1.17E+3
HTP-c	CTUh	2.91E-8	4.43E-10	1.10E-9	3.07E-8	2.79E-10	1.04E-8	1.36E-11	-1.27E-8	2.86E-8
HTP-nc	CTUh	9.29E-7	1.50E-8	3.37E-8	9.78E-7	9.34E-9	2.50E-7	1.50E-9	-4.39E-7	7.99E-7
SQP	Pt	2.66E+2	1.33E+1	1.45E+0	2.81E+2	8.26E+0	5.93E+1	1.32E+0	-8.95E+1	2.60E+2

Resource use	Unit	A1	A2	A3	A1-A3	C2	C3	C4	D	Total
PERE	MJ	7.25E+1	1.92E-1	5.84E+1	1.31E+2	1.38E-1	6.80E+0	1.88E-2	-3.07E+1	1.07E+2
PERM	MJ	0	0	0	0	0	0	0	0	0
PERT	MJ	7.25E+1	1.92E-1	5.84E+1	1.31E+2	1.38E-1	6.80E+0	1.88E-2	-3.07E+1	1.07E+2
PENRE	MJ	1.18E+3	1.63E+1	2.10E+1	1.22E+3	1.02E+1	1.01E+2	5.52E-1	-6.22E+2	7.07E+2
PENRM	MJ	0	0	0	0	0	0	0	0	0
PENRT	MJ	1.18E+3	1.63E+1	2.10E+1	1.22E+3	1.02E+1	1.01E+2	5.52E-1	-6.22E+2	7.07E+2
PET	MJ	1.25E+3	1.65E+1	7.94E+1	1.35E+3	1.04E+1	1.08E+2	5.71E-1	-6.52E+2	8.14E+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	7.71E-1	1.87E-3	3.09E-1	1.08E+0	1.09E-3	1.01E-1	6.37E-4	-3.60E-1	8.24E-1
Output flows and waste categories	Unit	A1	A2	A3	A1-A3	C2	C3	C4	D	Total
HWD	kg	8.71E-4	3.88E-5	2.71E-5	9.37E-4	2.47E-5	1.53E-4	6.27E-7	-4.80E-4	6.36E-4
NHWD	kg	4.14E+0	9.72E-1	3.91E-2	5.15E+0	5.98E-1	3.51E+0	2.39E+0	-1.84E+0	9.81E+0
RWD	kg	2.05E-3	1.01E-4	4.87E-5	2.20E-3	6.56E-5	3.56E-4	3.40E-6	-9.82E-4	1.64E-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