Environmental Profile

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

Ecochain v3.5.80

Product:	3000440 - U3 Pipe GY KOMO 160 SN4 L=5 CH
Unit:	1 piece
Manufacturer:	Wavin - NL - Hardenberg - Verified
Address:	J.C. Kellerlaan 3 7772 SG Hardenberg Netherlands

Multi-layer U3 PVC pipes from Wavin made with recycled PVC in the middle layer. The tubes contain at least 40% recycled material.

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

Results

Environmental impact SBK set 1	Unit	A1	A2	A3	A1-A3	C2	C3	C4	D	Total
ECI	euro	1.12	0.06	0.1	1.28	0.04	0.78	0	-0.32	1.77
ADPE	kg Sb-eq	2.79E-4	1.26E-5	1.80E-5	3.09E-4	7.63E-6	6.33E-5	7.88E-8	-4.70E-5	3.33E-4
ADPF	kg Sb-eq	1.15E-1	3.62E-3	4.83E-3	1.24E-1	2.15E-3	2.23E-2	1.12E-4	-4.07E-2	1.07E-1
GWP	kg CO2-eq	9.94E+0	4.92E-1	8.58E-1	1.13E+1	2.93E-1	7.40E+0	7.05E-2	-3.74E+0	1.53E+1
ODP	kg CFC-11-eq	4.87E-6	8.72E-8	8.07E-8	5.04E-6	5.43E-8	8.93E-7	2.69E-9	-1.27E-6	4.72E-6
POCP	kg ethene-eq	6.41E-3	2.97E-4	3.78E-4	7.09E-3	1.76E-4	1.76E-3	1.88E-5	-1.47E-3	7.57E-3
AP	kg SO2-eq	3.86E-2	2.16E-3	3.37E-3	4.42E-2	1.26E-3	1.28E-2	5.95E-5	-8.50E-3	4.98E-2
EP	kg PO4 3−-eq	5.12E-3	4.25E-4	5.32E-4	6.08E-3	2.51E-4	1.94E-3	2.32E-5	-1.10E-3	7.19E-3
HTP	kg 1,4-DB-eq	3.76E+0	2.07E-1	3.24E-1	4.29E+0	1.25E-1	3.46E+0	6.12E-3	-8.03E-1	7.07E+0
FAETP	kg 1,4-DB-eq	4.27E-1	6.04E-3	1.32E-2	4.47E-1	3.67E-3	5.09E-2	1.87E-3	-1.67E-2	4.86E-1
MAETP	kg 1,4-DB-eq	2.90E+2	2.17E+1	5.38E+1	3.65E+2	1.31E+1	1.67E+2	2.27E+0	-4.95E+1	4.98E+2
TETP	kg 1,4-DB-eq	1.77E-1	7.32E-4	2.01E-2	1.98E-1	4.43E-4	1.23E-2	2.01E-5	-5.48E-3	2.05E-1
Environmental impact	Unit	A1	A2	A3	A1-A3	C2	C3	C4	D	Total
GWP-total	kg CO2 eq	9.41E+0	4.96E-1	1.01E+0	1.09E+1	2.95E-1	8.60E+0	8.21E-2	-3.83E+0	1.61E+1
GWP-f	kg CO2 eq	1.01E+1	4.96E-1	7.92E-1	1.14E+1	2.95E-1	7.46E+0	8.20E-2	-3.81E+0	1.55E+1
GWP-b	kg CO2 eq	-7.85E-1	2.29E-4	1.71E-1	-6.13E-1	1.79E-4	1.13E+0	1.05E-4	-1.69E-2	5.05E-1
GWP-luluc	kg CO2 eq	4.76E-2	1.82E-4	4.83E-2	9.60E-2	1.04E-4	3.45E-3	2.20E-6	-1.71E-3	9.79E-2
ODP	kg CFC11 eq	4.82E-6	1.09E-7	9.57E-8	5.03E-6	6.80E-8	9.21E-7	3.34E-9	-1.28E-6	4.74E-6
AP	mol H+ eq	4.72E-2	2.88E-3	4.32E-3	5.44E-2	1.68E-3	1.60E-2	7.97E-5	-1.04E-2	6.18E-2
EP-fw	kg P eq	4.28E-4	5.00E-6	1.13E-5	4.44E-4	2.43E-6	1.14E-4	9.96E-8	-8.91E-5	4.72E-4
EP-m	kg N eq	9.23E-3	1.01E-3	1.27E-3	1.15E-2	6.01E-4	3.91E-3	4.91E-5	-2.03E-3	1.40E-2
EP-T	mol N eq	9.78E-2	1.12E-2	1.36E-2	1.23E-1	6.62E-3	4.31E-2	3.19E-4	-2.25E-2	1.50E-1
POCP	kg NMVOC eq	3.26E-2	3.19E-3	3.85E-3	3.96E-2	1.89E-3	1.30E-2	1.08E-4	-7.49E-3	4.71E-2
ADP-mm	kg Sb eq	2.79E-4	1.26E-5	1.80E-5	3.09E-4	7.63E-6	6.33E-5	7.88E-8	-4.70E-5	3.33E-4
ADP-f	MJ	2.43E+2	7.48E+0	9.17E+0	2.60E+2	4.53E+0	4.42E+1	2.42E-1	-8.22E+1	2.26E+2
WDP	m3 depriv.	1.47E+1	2.68E-2	6.20E+0	2.09E+1	1.39E-2	1.71E+0	1.29E-3	-3.40E+0	1.92E+1
PM	disease inc.	4.75E-7	4.45E-8	6.70E-8	5.86E-7	2.66E-8	2.02E-7	1.65E-9	-6.88E-8	7.48E-7
IR	kBq U-235 eq	5.03E-1	3.13E-2	1.65E-2	5.50E-1	1.98E-2	1.54E-1	1.11E-3	-1.16E-1	6.09E-1
ETP-fw	CTUe	1.66E+2	6.67E+0	1.53E+1	1.88E+2	3.68E+0	3.26E+2	3.58E+0	-3.94E+1	4.82E+2
HTP-c	CTUh	6.87E-9	2.16E-10	5.22E-10	7.61E-9	1.31E-10	4.80E-9	6.21E-12	-1.37E-9	1.12E-8
HTP-nc	CTUh	2.02E-7	7.30E-9	1.60E-8	2.25E-7	4.38E-9	1.16E-7	6.88E-10	-4.47E-8	3.01E-7
SQP	Pt	1.36E+2	6.49E+0	6.86E-1	1.43E+2	3.87E+0	2.78E+1	6.13E-1	-2.75E+1	1.48E+2

Resource use	Unit	A1	A2	A3	A1-A3	C2	C3	C4	D	Total
PERE	MJ	2.65E+1	9.36E-2	2.76E+1	5.43E+1	6.50E-2	3.15E+0	8.71E-3	-6.72E+0	5.08E+1
PERM	MJ	0	0	0	0	0	0	0	0	0
PERT	MJ	2.65E+1	9.36E-2	2.76E+1	5.43E+1	6.50E-2	3.15E+0	8.71E-3	-6.72E+0	5.08E+1
PENRE	MJ	2.61E+2	7.94E+0	9.93E+0	2.79E+2	4.81E+0	4.71E+1	2.56E-1	-8.93E+1	2.41E+2
PENRM	MJ	0	0	0	0	0	0	0	0	0
PENRT	MJ	2.61E+2	7.94E+0	9.93E+0	2.79E+2	4.81E+0	4.71E+1	2.56E-1	-8.93E+1	2.41E+2
PET	MJ	2.87E+2	8.03E+0	3.76E+1	3.33E+2	4.87E+0	5.02E+1	2.65E-1	-9.60E+1	2.92E+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	1.67E-1	9.11E-4	1.46E-1	3.14E-1	5.12E-4	4.67E-2	2.96E-4	-3.73E-2	3.24E-1
Output flows and waste categories	Unit	A1	A2	A3	A1-A3	C2	C3	C4	D	Total
HWD	kg	2.01E-4	1.90E-5	1.28E-5	2.33E-4	1.16E-5	7.12E-5	2.90E-7	-7.57E-5	2.40E-4
NHWD	kg	9.84E-1	4.74E-1	1.85E-2	1.48E+0	2.81E-1	1.65E+0	1.12E+0	-1.93E-1	4.33E+0
RWD	kg	4.57E-4	4.91E-5	2.31E-5	5.29E-4	3.08E-5	1.66E-4	1.58E-6	-1.06E-4	6.22E-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