

ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

Terrain PVC Waste Pipe - 40mm White
Polypipe Building Services



EPD HUB, HUB-2105

Published on 13.12.2024, last updated on 05.08.2024, valid until 12.12.2029

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Polypipe Building Services
Address	Polypipe Building Services, College Road, New Hythe Business Park, Aylesford, Kent, ME20 7PJ, United Kingdom
Contact details	commercialenquiries@polypipe.com
Website	www.polypipe.com/commercial-building-services

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804+A2:2019 and ISO 14025
PCR	EPD Hub Core PCR Version 1.1, 5 Dec 2023
Sector	Construction product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Nigel Delo, Chris Goodwin, Giles Coombes, Andrew Croft and Dylan Stoppard
EPD verification	Independent verification of this EPD and data, according to ISO 14025: <input type="checkbox"/> Internal verification <input checked="" type="checkbox"/> External verification
EPD verifier	Haiha Nguyen, as an authorized verifier acting for EPD Hub Limited

The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if

One Click LCA Created with One Click LCA

they do not comply with EN 15804 and if they are not compared in a building context.

PRODUCT

Product name	Terrain PVC Waste Pipe - 40mm White
Additional labels	200.125.30; 200.125.40; 200.15.30; 200.15.40; 200.2.30; 200.2.40
Product reference	200.15.40W
Place of production	Aylesford, United Kingdom
Period for data	2023
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	0%

ENVIRONMENTAL DATA SUMMARY

Declared unit	1m of pipe 40mm diameter white
Declared unit mass	0.405 kg
GWP-fossil, A1-A3 (kgCO ₂ e)	7,73E-01
GWP-total, A1-A3 (kgCO ₂ e)	7,67E-01
Secondary material, inputs (%)	0.74
Secondary material, outputs (%)	73.3
Total energy use, A1-A3 (kWh)	3.55
Net freshwater use, A1-A3 (m ³)	0.02

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Polypipe Building Services is a UK manufacturer of plastic piping systems for water management and supply systems, servicing the commercial and industrial sectors of the UK construction industry.

Part of the Genuit Group, we aim to help create a better built environment by developing and producing sustainable solutions to the key challenges in water, climate, and ventilation management.

Polypipe Building Services are specialists in providing engineered above ground drainage and supply systems, leveraging offsite fabrication to design and deliver solutions to mechanical and public health engineers, M&E contractors as well as local authorities. Polypipe Building Services houses the industry leading brand Terrain drainage systems and has been delivering solutions to commercial, multiple occupancy residential, healthcare, education, and leisure projects for over 60 years.

PRODUCT DESCRIPTION

Having pioneered the development of solvent-welded drainage systems, Terrain represents the industry benchmark for quality, installation flexibility and product innovation - backed by the highest levels of customer service.

Terrain drainage systems include an extensive range of soil and waste products for multi-occupancy residential, hotels, hospitals, schools and public sector developments. The systems include solvent-welded and push-fit options for both soil and waste drainage, overflow and trap systems and a comprehensive range of fittings, adaptors and accessories. Terrain PVC Pipe is now manufactured with up to 65% recycled content – combining

performance with sustainability.

Built on a platform of innovation and technical expertise, Terrain PVC drainage stacks offer premium quality, quick installation, and outstanding flexibility.

Further information can be found at www.polypipe.com/commercial-building-services.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	0	-
Minerals	15.12	UK
Fossil materials	84.88	EU
Bio-based materials	0	-

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	-
Biogenic carbon content in packaging, kg C	0.002

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1m of pipe 40mm diameter white
Mass per declared unit	0.405 kg
Functional unit	-
Reference service life	50 years

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

Product stage		Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
x	x	x	x	x	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	x	x
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Deconstruction/ demolition	Transport	Waste processing	Disposal	Reuse	Recycling	

Modules not declared = MND. Modules not relevant = MNR

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

The virgin PVC polymer is mixed with other raw material inputs. The material is then extruded into 3 and 4 metre lengths and sleeved. The product is then placed onto a timber frame and secured with plastic strapping. Electricity consumed is split between renewable energy via wind turbines (32% supported by a Renewable Energy Guarantee of Origin - REGO) and 68% by an onsite Combined Heat and Energy Plant - CHP. Production scrap is reprocessed on site and put back into the process. Head waste that cannot be reprocessed on site is sent to local waste processing (A3).

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

The transport distance is defined by the product category rules (PCRs). The average transport distance to builders merchants (319km) and from builders merchants to site of installation (40km). This was calculated using a comprehensive sample of products shipped throughout 2023. This could vary depending on location of builders merchants and installation. All vehicles used are to Euro 5 standard and use HVO biodiesel. There are no losses associated with transport because the product is wrapped and secured effectively. Volume capacity utilisation is assumed to be that for packaged products.

The installation of the declared unit requires the use of a forklift truck to take the product from the vehicle on to site ready for installation. Cleaning fluid and solvent cement are used to prepare and weld during the installation process.

At Polypipe Building Services we offer a collection and recovery service for

product and packaging through our distribution channel, for all plastic waste, which can then be recycled and reused at our Aylesford site. However, we realise that not everyone will use this and therefore the reality is that some of our product and packaging will become part of the general site waste.

PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase.

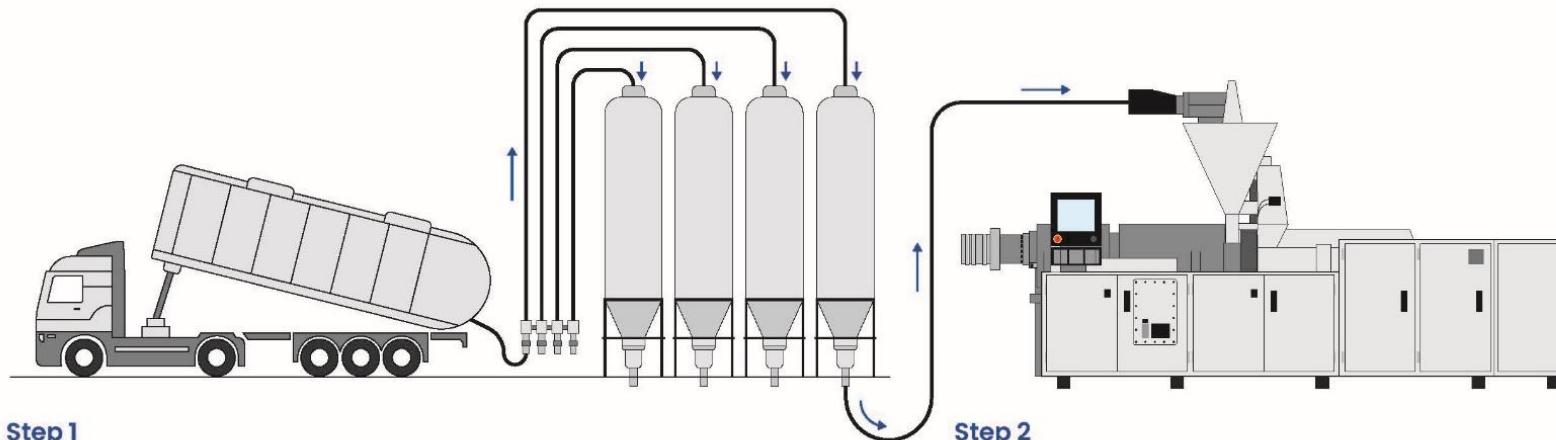
Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

As part of the deconstruction process it is assumed that diesel powered equipment would be used to transport the product around the site. This would vary depending on the deconstruction methodology. C2 has been modeled using secondary data of waste processing facilities across the UK which all fall within a 50km distance. End of life scenarios have been modelled against Plastics Europe 2021 data due to a lack of verified product specific end-of-life data, the following scenario was used 34% recycled, 42% energy recovery, 25% landfill.

Due to the recycling and incineration potential of PVC, the end-of-life product is converted into the recycled PVC while energy and heat is produced from its incineration. The benefits and loads of waste packaging materials in A5 are also considered in module D.

MANUFACTURING PROCESS

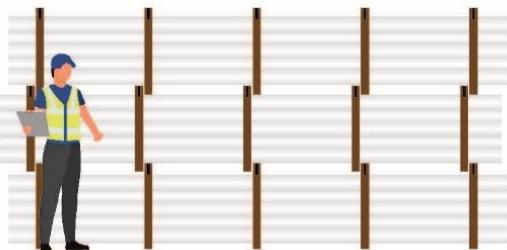


Step 1

Raw material is delivered to our factory on a tanker and deposited into our silos.

Step 2

Raw material is fed from the silo into the hopper where the material is passed through a screw and barrel and extruded through a die and calibration before cooling.



Step 3

Once produced, Terrain fittings are palletised and stored on site.



Step 4

The product is then loaded onto a lorry and dispatched.

LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

The LCA includes all industrial processes from raw material acquisition to production, distribution, installation and end-of-life stages. The study includes modules A1-A3, A4, A5, C1-C4 and D modules, and does not exclude any modules or processes which are stated mandatory in the EN 15804:2012+A2:2019 and the applied PCR.

The stage-specific total neglected input and output flows do not exceed 5% of energy usage.

The study includes hazardous materials, substances and raw material. All inputs and outputs of the unit processes, for which data is available, are included in the calculation.

The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities and energy related to company management and sales activities are excluded.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	-
Packaging material	-
Ancillary materials	-
Manufacturing energy and waste	Allocated by mass or volume

AVERAGES AND VARIABILITY

Type of average	No averaging
Averaging method	Not applicable
Variation in GWP-fossil for A1-A3	0%

This EPD is product and factory specific and does not contain average calculations.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.8, Plastics Europe, Federal LCA Commons and One Click LCA databases as sources of environmental data.

ENVIRONMENTAL IMPACT DATA

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total ¹⁾	kg CO ₂ e	6,98E-01	2,77E-02	4,10E-02	7,67E-01	1,45E-02	6,11E-02	MND	1,85E-04	1,12E-03	3,58E-01	1,77E-01	-3,68E-01						
GWP – fossil	kg CO ₂ e	6,97E-01	2,77E-02	4,83E-02	7,73E-01	1,44E-02	5,43E-02	MND	1,85E-04	1,12E-03	3,58E-01	1,77E-01	-3,72E-01						
GWP – biogenic	kg CO ₂ e	2,26E-05	1,63E-07	-7,34E-03	-7,31E-03	5,59E-06	6,81E-03	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,02E-03						
GWP – LULUC	kg CO ₂ e	5,55E-04	1,02E-05	6,76E-05	6,33E-04	5,33E-06	1,90E-05	MND	1,85E-08	4,14E-07	6,26E-05	1,26E-06	-3,20E-04						
Ozone depletion pot.	kg CFC-11e	4,00E-07	6,37E-09	2,05E-09	4,09E-07	3,32E-09	9,56E-09	MND	3,96E-11	2,58E-10	1,15E-08	4,65E-10	-1,65E-07						
Acidification potential	mol H ⁺ e	3,05E-03	1,17E-04	1,55E-04	3,33E-03	6,11E-05	1,34E-04	MND	1,93E-06	4,75E-06	2,96E-04	3,31E-05	-1,89E-03						
EP-freshwater ²⁾	kg Pe	2,81E-05	2,27E-07	1,11E-06	2,94E-05	1,18E-07	8,49E-07	MND	6,14E-10	9,18E-09	1,55E-06	3,09E-08	-1,75E-05						
EP-marine	kg Ne	5,25E-04	3,48E-05	3,39E-05	5,94E-04	1,82E-05	2,54E-05	MND	8,52E-07	1,41E-06	7,88E-05	1,55E-05	-2,84E-04						
EP-terrestrial	mol Ne	5,40E-03	3,84E-04	3,50E-04	6,13E-03	2,01E-04	2,67E-04	MND	9,35E-06	1,56E-05	7,96E-04	1,59E-04	-3,08E-03						
POCP ("smog") ³⁾	kg NMVOCe	1,93E-03	1,23E-04	1,13E-04	2,17E-03	6,41E-05	9,90E-05	MND	2,57E-06	4,98E-06	2,26E-04	4,74E-05	-1,03E-03						
ADP-minerals & metals ⁴⁾	kg Sbe	1,53E-05	6,49E-08	6,30E-08	1,54E-05	3,39E-08	4,43E-07	MND	9,39E-11	2,63E-09	6,56E-07	9,93E-09	-5,71E-06						
ADP-fossil resources	MJ	1,79E+01	4,16E-01	1,21E+00	1,95E+01	2,17E-01	9,12E-01	MND	2,49E-03	1,68E-02	6,03E-01	3,78E-02	-8,76E+00						
Water use ⁵⁾	m ³ e depr.	5,18E-01	1,86E-03	-3,19E-02	4,88E-01	9,71E-04	2,03E-02	MND	6,70E-06	7,54E-05	3,60E-02	4,91E-03	-2,34E-01						

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	2,33E-08	3,19E-09	4,60E-09	3,10E-08	1,66E-09	1,36E-09	MND	5,16E-11	1,29E-10	2,79E-09	6,68E-10	-1,38E-08						
Ionizing radiation ⁶⁾	kBq U235e	1,09E-01	1,98E-03	3,36E-03	1,15E-01	1,03E-03	3,60E-03	MND	1,15E-05	8,02E-05	4,42E-03	1,45E-04	-6,79E-02						
Ecotoxicity (freshwater)	CTUe	1,25E+01	3,74E-01	6,43E-01	1,35E+01	1,95E-01	4,82E-01	MND	1,50E-03	1,51E-02	2,05E+01	1,66E-01	-5,60E+00						
Human toxicity, cancer	CTUh	5,36E-10	9,19E-12	1,05E-10	6,50E-10	4,79E-12	2,13E-11	MND	5,74E-14	3,72E-13	9,96E-11	2,73E-11	-2,27E-10						
Human tox. non-cancer	CTUh	1,63E-08	3,70E-10	1,99E-09	1,87E-08	1,93E-10	5,44E-10	MND	1,08E-12	1,50E-11	5,70E-09	3,37E-10	-7,07E-09						
SQP ⁷⁾	-	1,75E+00	4,79E-01	6,27E-01	2,86E+00	2,50E-01	1,05E-01	MND	3,24E-04	1,94E-02	4,38E-01	3,94E-02	-1,16E+00						

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. This impact category deals mainly with the eventual impact of low-dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator; 7) SQP = Land use related impacts/soil quality.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy ⁸⁾	MJ	8,83E-01	4,68E-03	1,97E-01	1,08E+00	2,44E-03	3,16E-02	MND	1,43E-05	1,90E-04	5,78E-02	6,94E-04	-5,92E-01						
Renew. PER as material	MJ	0,00E+00	0,00E+00	5,66E-02	5,66E-02	0,00E+00	-5,66E-02	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,01E-03						
Total use of renew. PER	MJ	8,83E-01	4,68E-03	2,53E-01	1,14E+00	2,44E-03	-2,50E-02	MND	1,43E-05	1,90E-04	5,78E-02	6,94E-04	-5,88E-01						
Non-re. PER as energy	MJ	1,04E+01	4,16E-01	8,58E-01	1,17E+01	2,17E-01	4,53E-01	MND	2,49E-03	1,68E-02	6,03E-01	3,78E-02	-5,53E+00						
Non-re. PER as material	MJ	7,47E+00	0,00E+00	3,52E-01	7,82E+00	0,00E+00	-4,98E-02	MND	0,00E+00	0,00E+00	-2,51E+00	-4,88E+00	1,87E-01						
Total use of non-re. PER	MJ	1,79E+01	4,16E-01	1,21E+00	1,95E+01	2,17E-01	4,03E-01	MND	2,49E-03	1,68E-02	-1,91E+00	-4,84E+00	-5,34E+00						
Secondary materials	kg	2,98E-03	1,15E-04	4,06E-04	3,50E-03	6,02E-05	1,48E-04	MND	9,76E-07	4,68E-06	6,31E-04	3,16E-05	1,52E-01						
Renew. secondary fuels	MJ	3,00E-05	1,16E-06	2,45E-03	2,48E-03	6,08E-07	5,03E-05	MND	3,19E-09	4,72E-08	5,90E-05	2,61E-07	-8,41E-06						
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00						
Use of net fresh water	m ³	1,26E-02	5,39E-05	1,12E-02	2,39E-02	2,81E-05	7,20E-04	MND	1,51E-07	2,18E-06	1,55E-02	2,44E-05	-6,20E-03						

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	4,43E-02	5,51E-04	1,42E-03	4,63E-02	2,88E-04	1,44E-03	MND	3,34E-06	2,23E-05	4,98E-02	1,21E-03	-2,47E-02						
Non-hazardous waste	kg	1,11E+00	9,06E-03	4,54E-02	1,17E+00	4,73E-03	4,96E-02	MND	2,35E-05	3,67E-04	1,39E-01	8,49E-02	-8,18E-01						
Radioactive waste	kg	3,46E-05	2,78E-06	1,06E-06	3,85E-05	1,45E-06	1,50E-06	MND	1,76E-08	1,13E-07	1,73E-06	1,73E-07	-2,13E-05						

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00						
Materials for recycling	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,46E-02	MND	0,00E+00	0,00E+00	1,38E-01	0,00E+00	0,00E+00						
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,00E-03	MND	0,00E+00	0,00E+00	1,66E-01	0,00E+00	0,00E+00						
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,14E-01	MND	0,00E+00	0,00E+00	1,36E+00	0,00E+00	0,00E+00						

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO ₂ e	6,75E-01	2,74E-02	4,70E-02	7,49E-01	1,43E-02	5,31E-02	MND	1,83E-04	1,11E-03	3,62E-01	1,76E-01	-3,58E-01						
Ozone depletion Pot.	kg CFC-11e	4,00E-07	5,04E-09	1,79E-09	4,07E-07	2,63E-09	9,26E-09	MND	3,14E-11	2,04E-10	1,06E-08	3,79E-10	-1,64E-07						
Acidification	kg SO ₂ e	2,55E-03	9,11E-05	1,28E-04	2,77E-03	4,75E-05	1,11E-04	MND	1,37E-06	3,69E-06	2,35E-04	2,36E-05	-1,59E-03						
Eutrophication	kg PO ₄ ³⁻ e	1,52E-03	2,07E-05	4,79E-05	1,58E-03	1,08E-05	1,43E-04	MND	3,18E-07	8,40E-07	1,43E-04	5,19E-04	-6,46E-04						
POCP ("smog")	kg C ₂ H ₄ e	1,62E-04	3,55E-06	1,38E-05	1,80E-04	1,85E-06	7,40E-06	MND	3,00E-08	1,44E-07	1,68E-05	5,05E-06	-8,67E-05						
ADP-elements	kg Sbe	1,32E-05	6,28E-08	6,07E-08	1,34E-05	3,28E-08	4,02E-07	MND	9,25E-11	2,55E-09	5,07E-07	8,99E-09	-4,89E-06						
ADP-fossil	MJ	1,79E+01	4,16E-01	1,21E+00	1,95E+01	2,17E-01	9,12E-01	MND	2,49E-03	1,68E-02	6,03E-01	3,78E-02	-8,75E+00						

ANNEX:

PRODUCT SCALING

PVC WASTE PIPE (mm)	WEIGHT (kg)	SCALING FACTOR (multiple of)	A1-A3 GWP FOSSIL (kg/CO2e)
32	0.327	0.807	0.62
40	0.405	1.000	0.77
50	0.569	1.405	1.09

VERIFICATION STATEMENT

VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with reference standard, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The digital background data for this EPD

Why does verification transparency matter? Read more online

This EPD has been generated by One Click LCA EPD generator, which has been verified and approved by the EPD Hub.

THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried out, the presentation of environmental data in the EPD, and other additional environmental information, as present with respect to the procedural and methodological requirements in ISO 14025:2010 and reference standard.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

HaiHa Nguyen, as an authorized verifier acting for EPD Hub Limited
13.12.2024

