

Environmental and health product declaration

Drenotube Drainage and Infiltration System



As per NF EN ISO 14025, NF EN 15804+A1 and NF EN 15804/CN

Drenotube Drainage and Infiltration System

EPD in accordance with the INIES declaration program

Issue date: 29 – 07 – 2019

Valid to: 29 – 07 – 2024

Verification number: 7-418 :2019

Version 1.0



CSTB
le futur en construction

Foreword

The information contained within this declaration are provided under the responsibility of FUMOSO INDUSTRIAL S.A. as per NF EN ISO 14025, NF EN 15804+A1 and its national supplement NF EN 15804+A1/CN.

Any use, in whole or in part, of the information provided within this document must at least be accompanied by a complete reference to the original EPD as well as to its producer who may provide a complete copy.

The standard EN 15804+A1 serves as product category rules (PCR).

Reading guide

The following writing conventions are used:

- Numerical values are expressed according to simplified scientific notation: $0,0038 = 3,80 \times 10^{-3} = 3,80E-3$;
- When the result of calculation of the inventory is null, then the value zero is displayed;
- Non-zero values are expressed with 3 significant digits.

List of abbreviations used:

LCA: Life Cycle Analysis
RSL: Reference Service Life
FU: Functional Unit

Comparability of EPD for construction products

The FDES of construction products may not be comparable if they do not comply with standard NF EN 15804+A1.

Standard NF EN 15804+A1 defines the conditions under which construction products can be compared in §5.3 Comparability of FDES for construction products based on the information provided by the EPD:

"In principle the comparison of products on the basis of their EPD is defined by the contribution they make to the environmental performance of the building. Consequently, comparison of the environmental performance of construction products using the EPD information shall be based on the product's use in and its impacts on the building, and shall consider the complete life cycle (all information modules)".

General Information

This EPD is an individual EPD covering the life cycle from cradle to grave and produced at the request of FUMOSO INDUSTRIAL S.A. - C / Levante, nº 9 Pol.Ind LEVANTE 08150 Parets del Vallés (Barcelona) – Spain

Person responsible for the declaration and placing on the market of the products: Jacques Baldó,
sales@drenotube.com

Product covered by the declaration: Drenotube® products from 300 to 370mm produced by FUMOSO at the Parets del Vallés factory.

The study that led to this environmental and health declaration was carried out by the CSTB represented by Manuel BAZZANA, research engineer in the Energy Environment Department and Jacques CHEVALIER, divisional head.

Contact information : manuel.bazzana@cstb.fr

Verification

The standard EN 15804+A1 and the national complement NF EN 15804/CN serve as PCR	
Independent verification of the declaration according to EN ISO 14025: 2010	
<input type="checkbox"/> Internal	<input checked="" type="checkbox"/> External
	Verifier name: Marcel Gómez. Marcel Gómez Consultoría Ambiental. info@marcelgomez.com Verification program: FDES INIES
Adresse : Association HQE. 4, avenue du Recteur Poincaré - 75016 Paris	

This EPD has been published on 29/07/19.

Description of the functional unit of the product

Description of the functional unit

Provide the function of drainage or infiltration for 1 linear meter with an internal diameter of 110 to 160 mm for a period of 50 years without earthwork.

Product description and field of application

The Drenotube® DR system is intended for the realization of underground drainage and infiltration networks. It is composed of a drain-embedding-geotextile assembly, substituting the traditional gravel layer with expanded polystyrene particles (EPS).

Proof of fitness for use

The product is covered by ETA 15/0201 (22/04/2015).

Other technical aspect not included in the functional unit.

The surface of the drainage tubes complies with the specifications of standard NF P 16-351.

Description of the main components and materials of the product

The main components of the product are:

A R2 type TP (Totally Perforated) drain pipe with corrugated outer wall and plain inner wall, available in two classes of stiffness, SN4 and SN8 and two sizes of diameter 110mm and 160mm.

Geosynthetic aggregates in expanded polystyrene (EPS).

A filtration geotextile located between the aggregates and the net, which covers three quarters of the perimeter of Drenotube® DR.

A tubular polyethylene net attached to both ends of the tube with polyamide flanges to hold in place the assembly, the tube, the PSE aggregates and the geotextile filter.

A polypropylene sleeve that allows the elements of Drenotube® DR to be assembled together to ensure the continuity of the drainage network.

Reference flow

Main product:

Drenotube 370 mm ®, 1m: 2,48 kg

Packaging

Pallets: 0,341 kg

Plastic bags: 0,082 kg

LDPE film: 0,012 kg

cardboard separator: 0,105 kg

Additional implementation products:

Polypropylene sleeve: 0,006 kg

Polypropylene manhole: 0,113 kg

Total reference flow: 3,139 kg

Substances from the candidate list according to REACH

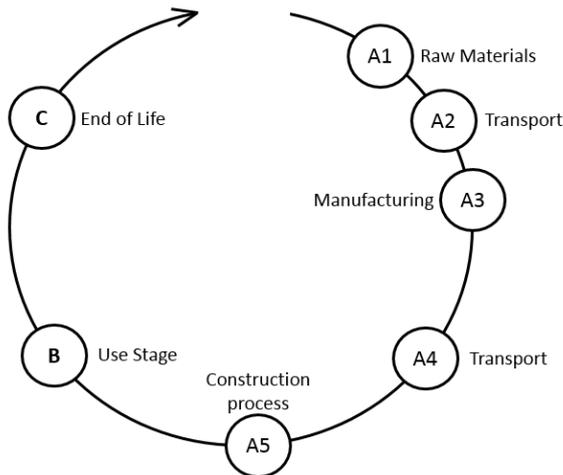
The product does not contain any substances from the candidate list according to the REACH Regulation at more than 0,1% by mass.

Description of the reference service life

The estimated service life of the product is 50 years. No maintenance is required during the service life.

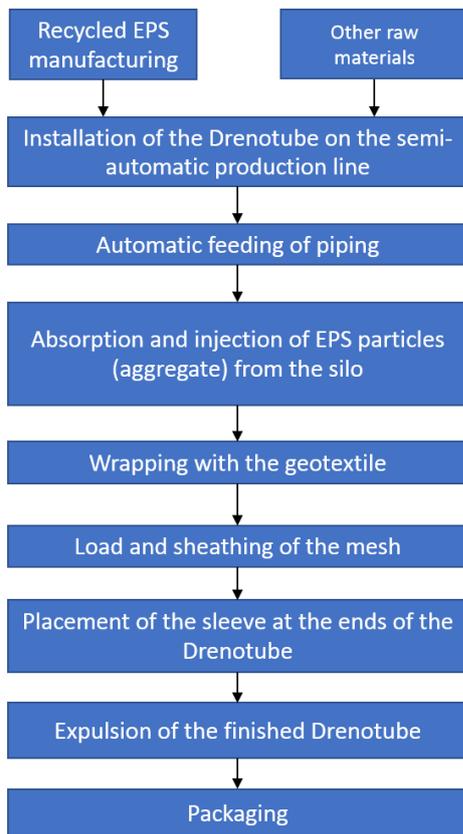
Parameter	Value
Reference service life	50 years
Declared product properties	Product having passed the internal quality controls
Design application parameters	-
An assumed quality of work	Implementation according to manufacturer's instructions
Outdoor environment	Avoid exposure to UV during implementation.
Indoor environment	-
Usage conditions	Standard use
Maintenance	No maintenance required

Steps of the life cycle



Production step, A1-A3

The product production phase follows the principle of the following diagram (only the main input and output are shown).



Transport step, A4

The transport phase to the implementation site has been divided into three parts:

- A first transport step from the production site to the center of France in Bourges;

- A second transport step to a distributor within a 500 km radius by truck;
- Final transportation from the distributor to the site over 50 km.

Parameter	Value
Fuel type and consumption of vehicle or vehicle type used for transport	Diesel, transport by truck.
Distance	1331 km by truck
Capacity utilization	About 50%.
Bulk density of transported products	Linear density: 3.02 kg/m
Volume capacity utilization factor	Not calculated

Installation step, A5

The installation step includes:

- The provision of polypropylene manholes (complementary elements);
- The production and end of life of production losses (2%);
- The end of life of the packaging (treatment in a non-dangerous waste storage facility).

To avoid double counting during building life cycle analyzes, the digging of the trench is not included in the study.

Parameter	Value
Ancillary materials for installation	Polypropylene (112,56 g)
Water use	None
Other resource use	None
Quantitative description of energy type (regional mix) and consumption during the installation process	None
Waste materials on the building site before waste processing	Packaging: 540 g, production losses: 49.6 g
Output materials (specified by type) as result of waste processing at the building site	Treatment as non-dangerous waste: 540 g
Direct emissions to ambient air, soil and water	None

Use stage, B1-B7

No scenarios were developed: the products require no maintenance, service, repair or replacement during the reference service life. In addition, it does not use energy or water and no direct emission during life could be identified.

End of life C1-C4

The end-of-life scenario is based on the following assumptions:

- The main product and the ancillary product are manually disposed of;
- The disposal waste is transported over 50 km and then stored in a non-hazardous waste storage facility.

Parameter	Value
Collection process specified by type	2,59 kg collected separately
Recovery system specified by type	-
Disposal specified by type	2,59 kg for final deposition as non-dangerous waste;
Assumptions for scenario development	Transport over a distance of 50 km.

Potential for recycling, reuse and recovery, D
No scenario developed.

Information pour le calcul de l'ACV

Parameter	Value
PCR used	NF EN 15804+A1 and NF EN 15804/CN
System boundaries	The study covers the entire life cycle as defined by standard NF EN 15804 and NF EN 15804\CN. The following modules have not been considered due to the lack of suitable data: <ul style="list-style-type: none"> - B1 (Use): No suitable data identified; - B2 - Maintenance: no maintenance for the products concerned; - B3 (Repair): Not applicable; - B4 (Replacement): the reference study period and the product service life are identical; - B5: Not applicable;

	<ul style="list-style-type: none"> - B6, B7 - Consumption of energy and water: no consumption. - C3 - No treatment attributable to the products.
Allocations	The provision of energy and raw materials in factories did not require allocation.
Cut-off rules	1% of renewable and non-renewable primary energy use and 1 % of the total mass input each unit process. Excluded processes: <ul style="list-style-type: none"> - Production and maintenance of road and building infrastructures; - Production and maintenance of production tools; - Flows related to the administrative, management, R&D, sales and marketing activities of the product. Operation of staff restoration and production facilities (lighting, heating, sanitary and cleaning).
Geographical and temporal representativeness of primary data	Background data comes from the 2017 Ecoinvent v3.4 database, which is subject to an internal critical review as defined by ISO 14040. Foreground data were provided by the manufacturer from their own measurements, accounting and estimates and correspond to the context of the year 2019.
Variability of results	No variability assessment carried out
Software used	Simapro 8.5
Additional assumptions	The environmental profile of the product is likely to vary according to several parameters: use case (drainage or infiltration), diameter 300 or 370 mm, length (3 or 6m, which influences the quantities of packing and raw material per linear meter). In the context of the development of this EPD, a penalizing approach has been adopted: the identified parameters being independent of each other,

retaining each time the one whose impacts are the highest ensures that no configuration can have greater impacts to those declared.

The impact models are based on CML 4.1 (October 2012). Characterization factors of the air pollution and water pollution indicators are taken from Appendix C of NF EN 15804 / CN: 2066-06.

LIFE CYCLE ASSESSMENT RESULTS

Impacts	A1-A3	Total A4-A5	A4	A5	Total B	B1	B2	B3	B4	B5	B6	B7	Total C1-C4	C1	C2	C3	C4	Total life cycle	D
GWP (kg CO2 eq.)	6,96E+00	1,25E+00	6,70E-01	5,77E-01	0	0	0	0	0	0	0	0	1,50E-01	0	2,16E-02	0	1,29E-01	8,35E+00	MND
ODP (kg CFC 11 eq.)	4,05E-07	1,51E-07	1,22E-07	2,92E-08	0	0	0	0	0	0	0	0	1,18E-08	0	3,93E-09	0	7,91E-09	5,68E-07	MND
AP (kg SO2 eq.)	2,37E-02	4,24E-03	2,18E-03	2,06E-03	0	0	0	0	0	0	0	0	4,61E-04	0	7,04E-05	0	3,91E-04	2,84E-02	MND
EP (kg PO43 eq.)	2,33E-03	9,11E-04	3,54E-04	5,57E-04	0	0	0	0	0	0	0	0	1,54E-03	0	1,14E-05	0	1,53E-03	4,77E-03	MND
POCP (kg Éth. eq.)	2,22E-02	1,17E-03	3,46E-04	8,23E-04	0	0	0	0	0	0	0	0	3,86E-04	0	1,12E-05	0	3,75E-04	2,38E-02	MND
ADPE (kg Sb eq.)	3,80E-06	2,37E-06	2,04E-06	3,29E-07	0	0	0	0	0	0	0	0	1,24E-07	0	6,58E-08	0	5,78E-08	6,30E-06	MND
ADPF (MJ)	1,56E+02	2,33E+01	1,00E+01	1,32E+01	0	0	0	0	0	0	0	0	1,18E+00	0	3,24E-01	0	8,58E-01	1,81E+02	MND
WP (m3)	1,06E+00	3,73E-01	2,39E-01	1,35E-01	0	0	0	0	0	0	0	0	2,29E-01	0	7,70E-03	0	2,21E-01	1,67E+00	MND
AP (m3)	9,94E+02	1,27E+02	7,07E+01	5,60E+01	0	0	0	0	0	0	0	0	1,36E+01	0	2,28E+00	0	1,13E+01	1,13E+03	MND

GWP : Global warming ; **ODP** : Depletion of the ozone layer ; **AP** : Acidification of soil and water ; **EP** : Eutrophication ; **POCP** : Photochemical ozone formation ; **ADPE** : Exhaustion of abiotic resources (elements) ; **ADPF** : Exhaustion of abiotic resources (fossil) ; **WP** : Water pollution ; **AP** : Air pollution

Utilisation des ressources	A1-A3	Total A4-A5	A4	A5	Total B	B1	B2	B3	B4	B5	B6	B7	Total C1-C4	C1	C2	C3	C4	Total ABC	D
PERE (MJ)	1,68E+01	8,31E-01	1,29E-01	7,02E-01	0	0	0	0	0	0	0	0	5,05E-02	0	4,17E-03	0	4,64E-02	1,77E+01	MND
PERM (MJ)	1,07E+00	2,13E-02	0	2,13E-02	0	0	0	0	0	0	0	0	0	0	0	0	0	1,09E+00	MND
PERT (MJ)	1,79E+01	8,53E-01	1,29E-01	7,23E-01	0	0	0	0	0	0	0	0	5,05E-02	0	4,17E-03	0	4,64E-02	1,88E+01	MND
PENRE (MJ)	1,07E+02	1,81E+01	1,02E+01	7,94E+00	0	0	0	0	0	0	0	0	1,25E+00	0	3,29E-01	0	9,19E-01	1,27E+02	MND
PENRM (MJ)	9,72E+01	7,13E+00	0	7,13E+00	0	0	0	0	0	0	0	0	0	0	0	0	0	1,04E+02	MND
PENRT (MJ)	1,71E+02	2,46E+01	1,02E+01	1,44E+01	0	0	0	0	0	0	0	0	1,25E+00	0	3,29E-01	0	9,19E-01	1,96E+02	MND
SM (kg)	8,82E-01	1,76E-02	0	1,76E-02	0	0	0	0	0	0	0	0	0	0	0	0	0	8,99E-01	MND
RSF (MJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	MND
NRSF (MJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	MND
FWU (m3)	4,86E-02	6,44E-03	1,84E-03	4,60E-03	0	0	0	0	0	0	0	0	9,03E-04	0	5,94E-05	0	8,43E-04	5,59E-02	MND

PERE: Use of renewable primary energy, excluding renewable primary energy resources used as raw materials ; **PERM**: Use of renewable primary energy resources as raw materials ; **PERT**: Total use of renewable primary energy resources ; **PENRE**: Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials ; **PENRM**: Use of non-renewable primary energy resources as raw materials; **PENRT**: Total use of non-renewable primary energy resources ; **SM** : Use of secondary material ; **RSF**: Use of renewable secondary fuels ; **NRSF** : Use of non-renewable secondary fuels ; **FWU** : Total freshwater use

Catégorie de déchets	A1-A3	Total A4-A5	A4	A5	Total B	B1	B2	B3	B4	B5	B6	B7	Total C1-C4	C1	C2	C3	C4	Total ABC	D
HWD (kg)	1,19E-01	1,74E-02	6,39E-03	1,10E-02	0	0	0	0	0	0	0	0	4,11E-03	0	2,06E-04	0	3,90E-03	1,40E-01	MND
NHWD (kg)	1,82E+00	1,29E+00	5,37E-01	7,52E-01	0	0	0	0	0	0	0	0	2,64E+00	0	1,73E-02	0	2,62E+00	5,75E+00	MND
RWD (kg)	1,91E-04	8,53E-05	6,87E-05	1,66E-05	0	0	0	0	0	0	0	0	6,95E-06	0	2,22E-06	0	4,73E-06	2,83E-04	MND

HWD : Hazardous waste disposed ; **NHWD** : Non-hazardous waste disposed ; **RWD** : Radioactive waste disposed.

Flux sortants	A1-A3	Total A4-A5	A4	A5	Total B	B1	B2	B3	B4	B5	B6	B7	Total C1-C4	C1	C2	C3	C4	Total ABC	D
CRU (kg)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	MND
MFR (kg)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	MND
MER (kg)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	MND
EEE (MJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	MND
EET (MJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	MND
EEG (MJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	MND

CRU : Components for re-use ; **MFR** : Materials for recycling ; **MER** : Materials for energy recovery ; **EEE** : Exported electrical energy ; **EET** : Exported thermal energy (steam) ; **EEG** : Exported gaz energy ;

Additional information on release of dangerous substances to indoor air, soil and water during the use stage

Indoor air

Not applicable.

Soil and water

The product is not connected to the drinking water network. No water emission tests were performed.

Contribution of product to the assessment of quality of life inside the building

Hygrothermal comfort

This product does not claim any hygrothermal performance.

Acoustic comfort

This product does not claim any acoustic.

Visual comfort

This product does not claim any visual performance.

Olfactory comfort

This product does not claim any olfactory performance.