ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A2*

Owner of the Declaration	UBBINK
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-UBB-20250596-IBA1-EN
Issue date	08/10/2025
Valid to	26/11/2028

Aerfoam insulated ductwork

UBBINK

Institut Bauen und Umwelt e.V.

ECO PLATFORM EPD VERIFIED

www.ibu-epd.com | https://epd-online.com

ubbink

1. General Information

UBBINK

Programme holder

IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

Declaration number

EPD-UBB-20250596-IBA1-EN

This declaration is based on the product category rules:

Insulating materials made of foam plastics, 01/08/2021
(PCR checked and approved by the SVR)

Issue date

08/10/2025

Valid to

26/11/2028

Dipl.-Ing. Hans Peters
(Chairman of Institut Bauen und Umwelt e.V.)

Florian Pronold
(Managing Director Institut Bauen und Umwelt e.V.)

Aerfoam insulated ductwork

Owner of the declaration

UBBINK
Verhuelweg 9
6984 AA DOESBURG
Netherlands

Declared product / declared unit

1 m³ pipe insulation Aerfoam insulated ductwork

Scope:

Product line Aerfoam insulated ductwork Self supporting ventilation pipe made of polyethene foam (PEF). This declaration is an Environmental Product Declaration according to /ISO14025/ describing the specific environmental performance of the product produced in Belgium at the site of Eynatten.
The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804*.

Verification

The standard EN 15804 serves as the core PCR
Independent verification of the declaration and data according to ISO 14025:2011
☐ internally ☒ externally

Dr. Matthew Fishwick,
(Independent verifier)

2. Product

2.1 Product description/Product definition

Aerfoam insulated ductwork is a professional polyethylene-based closed-cell foam for self-supporting ventilation pipes for interior use. Its low weight, corrosion resistance and good thermal and acoustic insulation, coupled with the fact that it is simple and quick to fit, make Aerfoam insulated ductwork a worthwhile alternative to conventional ventilation pipes.
Aerfoam insulated ductwork provides solutions that follow all necessary guidelines and standards for any type of installation.
For the placing on the market of the product in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) - Thermal Insulation products for building equipment and industrial installations.
Factory-made polyethylene foam (PEF) and the CE-marking.
For the application and use, the respective national provisions apply.

2.2 Application

Aerfoam insulated ductwork are used as self-supporting ventilation pipes for interior use in industrial installations and building equipment

- Polyethylene foam is a cost-efficient material with good insulating properties.
- Products made of polyethylene foam yield a good cost/performance ratio.
- Polyethylene foam is corrosion resistant and its good thermal and acoustic insulation allows a good alternative to conventional ventilation pipes.

2.3 Technical Data

Performance data of the product in accordance with the Declaration of Performance with respect to its Essential Characteristics according to *EN 14313* apply. Further data:

Name	Value	Unit
Gross density	30	kg/m^3
Thermal conductivity at 40 °C	0.048	W/(mK)
Max Service Temperature Acc. to EN 14707	100	°C
Min Service Temperature	0	°C
Water absorption Acc. to EN 13472	WS005	
Traces quantities of water soluble ions and pH-value Acc. to EN 13468 and EN 13472	Cl15 - F10 - pH 5.5	

2.4 Delivery status

The PE products are supplied as tubes and shaped pieces. The tubes are delivered in lengths of 2 m packed in cardboard. One insulation thickness of 16 mm is available for all common pipe diameters from 125 mm up to 200 mm inside diameter.

2.5 Base materials/Ancillary materials

Base materials

Aerfoam insulated ductwork are flexible insulation materials based on polyethene, which is produced using a mixture of up to seven basic component materials. The following table displays an average weighted of different elements of the formulation, and this for the complete Aerfoam insulated ductwork product range. This LCA study was carried out on the basis of the weighted average. This product contains substances listed in the REACH candidate list (date: 08.07.2021) exceeding 0.1 percentage by mass: **No**.

This product contains other CMR carcinogenic, mutagenic, reprotoxic (substances in categories 1A or 1B, which are not on the candidate list, exceeding 0.1 percentage by mass: **No**.

Biocide products were added to this construction product or it has been treated with biocide products (this then concerns a treated product as defined by the (EU) Ordinance on Biocide Products No. 528/2012): **No**.

Name	Value	Unit
LDPE, LLDPE	64.6	%
Flame retardant	12.9	%
Internal PIR (Post Industrial Recycled Content	8.6	%
Pigment	0,7	%
Nucleating agent	0.8	%
Volume stabilizer	2.6	%
Blowing agent	9.8	%

Low Density Polyethylene, LDPE, our internal PIR (Post Industrial Recycled content) and fillers are the main components of the product and are responsible for the characteristics and performance of the product.

2.6 Manufacture

The manufacture of the Aerfoam insulated ductwork product consists of incorporating the ingredients of the formulation into an extruder, adding a foaming agent, mixing, heating and then extruding the mix through a die where foaming takes place. Then the product is cooled down with water (municipal water) before being heat-welded to itself, due to UBBINK's proprietary technology. Finally, the product is cut to size, packed, and stored.

The waste from the production of various products is recycled internally (on a dedicated machine for this purpose). This production waste (Internal PIR) passes through a re-granulation step by means of a dedicated re-granulation extruder. The waste is crushed, melted, filtered, cooled, and then cut into granules before being sent directly into silos before reinjection into production.

Quality assurance :
The manufacturing process is certified to ISO 9001 for quality management.

2.7 Environment and health during manufacturing

During all manufacturing in Belgium, the production follows all national guidelines and regulations. Solar panels are installed on the roof of the warehouse to reduce the requirement for grid electricity.

Quality assurance :
The manufacturing process is certified to *ISO 14001* environmental management system

2.8 Product processing/Installation

Aerfoam insulated ductwork can be installed using basic hand tools (e.g. craft knives). No special tools, nor specific protection is necessary.

2.9 Packaging

Aerfoam insulated ductwork products are packed in cardboard boxes and transported on reusable pallets. All packaging material can be recycled. The pallets used to transport the products are taken back or exchanged when the Aerfoam insulated ductwork is delivered, so the use of pallets is a close

loop economy.

2.10 Condition of use

During the use of the products for the purpose for which they are intended, there are no modifications unless one of the effects listed in extraordinary impacts occurs (see point 2.13).

2.11 Environment and health during use

There are no particular effects on environmental and health impacts during use related to the material composition of the product. The Aerfoam insulated ductworkproducts are used in a wide range of applications across the building sector. The Polyethylene (PEF) fulfil the German, Belgian and French regulations regarding the emission of Volatile Organic Compound (VOC) with emissions far below the most stringent limit values. The Eurofin Product Testing institute, at the request of the *CEFEP* (European group of PEF and FEF manufacturers) has made a wide range of tests for different PEF products from different manufacturers.

2.12 Reference service life

Aerfoam insulated ductwork can be used to insulate self-supporting interior ventilation pipes, as it needed no maintenance on behalf of internal dust cleaning, the service life can be considered as being the same as the building life cycle. Description of the influences on the ageing of the product when applied in accordance with the rules of technology.

2.13 Extraordinary effects

Fire

According to *EN13501-1*Aerfoam insulated ductwork are classified as EURO CLASS E and therefore have a limited speed of inflammation.

Fire protection

Name	Value
Building material class	E

Water

Aerfoam insulated ductwork is a closed cell foam and obtains the best water absorption class WS005 according to the product standard.

Mechanical destruction

Aerfoam insulated ductwork is chemically inert and does not present any environmental or health risk if mechanically destructed. Aerfoam insulated ductwork is not UV resistant. The product is not recommended for outside applications without complementary UV protection

2.14 Re-use phase

In principle, if removed carefully, Aerfoam insulated ductwork can be reused on any other ventilation system of similar dimensions. Any material not suitable for reuse is fully recyclable.

2.15 Disposal

Aerfoam insulated ductwork is fully recyclable using the same recycling systems as those used for other forms of PE waste. Any non-recycled material should be disposed of the materials according to the local regulations, and by the /European Waste Catalogue waste code 07 02 13 waste Plastic "Low Density Polyethylene"

2.16 Further information

Additional information about Aerfoam insulated ductwork, including data sheets, can be found on the UBBINK web site www.ubbink.com/int/.

3. LCA: Calculation rules

3.1 Declared Unit

This declaration refers to 1 m³ of Aerfoam insulated ductwork pipe insulation product. The LCA calculations, as the product is foam and has some tolerances, it is based on the average weight per meter and the density. The thermal conductivity coefficient (Lambda-value) and R-value per 16 mm thickness per product brand is provided below as additional information and support for installers.

Declared unit

Name	Value	Unit
Declared unit	1	m^3
Gross density	30	kg/m^3
Volume for 1kg	0.033	m3
Conversion factor from 1 m³ to 1 Linear meter	Value for 1 m3 divided section of the insulation pipe (m^2)	m

Thermal Conductivity λ : 0.048 W/mK at (40°C) R-value-thickness- : 16 mm : +/- 0,82 (m^2K/W) depending on the pipe diameter.

3.2 System boundary

The Data Collection refers to the yearly production in 2022. This study will cover the reporting of modules A1 to C4 and module D. EPD type: cradle to gate with options (A1-A3, A4, A5, C2, C3, C4 and D)

Modules A1 to A3: The LCA calculation covers the production of the raw materials, transport of these to the plant, the mixing of raw materials according to the respective recipes, manufacturing of the foam product and packaging for dispatch. All production takes place exclusively in Eynatten, Belgium.

Module A4: UBBINK's logistics department reported average figures for the distribution of UBBINK's products, the Aerfoam insulated ductwork is delivered to the following main countries: Germany, Netherlands, Austria, France, and Belgium with an average distance of 644.2 km. Aerfoam insulated ductwork is rarely the only product loaded in trucks, they are usually grouped with other products of higher density according to the place of destination. In addition, UBBINK works with regional expeditions companies that group different goods in order to optimize the weight-to-volumes ratio. For this reason, the fill rate of the trucks has been set to 10% of the mass payload capacity.

Module A5: Installation of Aerfoam insulated ductwork products is done by hand and requires no special equipment apart from a knife. The products can be placed end to end, and the remaining pieces can be reused. Cardboard as a packaging material is assumed to be recycled. No surplus for the installation has been accounted for in this study. The choice made is: the final user must calculate the impact of A5 himself in the function of his own case, by accounting for the extra amount of product needed during installation.

Module B1-B7: Once installed the Aerfoam insulated ductwork product requires no maintenance and no repair. Only manual cleaning with a brush is required to avoid the concentration of dust in this air distribution system. It will be dismantled by the end-of-life of the building. For this reason, there are not expected to be any impacts in B1 to B7 assuming correct specification and installation.

Module C1: As for the installation of the product, the disassembly is done manually and does not require any specific equipment. Disassembly is generally carried out at the same time as the replacement or removal of the ventilation system. Consequently, there are no impacts associated with C1.

Module C2: Transport at end-of-life stage is modeled as a Euro Cargo 0-6 mix truck with diesel fuel. The average distance to either mechanical recycling, incineration or landfills is assumed to be 100km.

Module C3 and C4: As our customers are not the end-users of Aerfoam insulated ductwork and are often not the same companies that handle disassembly, it is difficult to source primary data regarding the end-of-life of UBBINK's products. As Aerfoam insulated ductwork is fully recyclable, the legislation is pushing more in this direction and the overall pressure on plastic recycling is growing, the scenario with recycling is considered. The scenarios that have been retained for this LCA are 100% recycling (C3, C4, D), 100% landfill (C3/1, C4/1, D/1), and 100% incineration (C3/2, C4/2, D/2)

Module D: Aerfoam insulated ductwork is fully recyclable and can be used as a direct one-for-one substitute for virgin PE-LD granulates, with only minor additive additions, in the base-case end-of-life scenario of 100% recycling. In the 100% incineration end-of-life scenario, recovery of energy generated from the incineration was modeled using an industry-average dataset for the incineration of polyethylene.

3.3 Estimates and assumptions

The LCA calculation is conducted using the *Sphera managed LCA content database (2023) contained in the Sphera LCA for Experts 10* (Service Pack 2023001000). Not all necessary LCIs are included in the database. Where data were missing or were unavailable or where suppliers were unable to provide complete information, proxy datasets have been used. The environmental burden for the production of pigments, flame retardants and volume stabilizers are approximated.

3.4 Cut-off criteria

A process can be excluded if it contributes to <1% of the total mass or energy input of a unit process, up to a cumulative maximum of 5% of the total mass or energy of the lifecycle. The only exclusion based on these criteria was glue and adhesive tapes used during the installation (A5) as quantification of these materials is uncertain and their use by the various installers is too diverse, eventually adhesives and glues are not required in all/most cases, but may be used for some applications. In this study no other exclusions have been applied and all elementary incoming processes as well as all energy and water inputs and waste outputs have been counted.

3.5 Background data

The software system for life cycle engineering Sphera LCA for Experts 10 (former GaBi) developed by Sphera was used to perform this LCA. The Sphera Managed LCA Content database (2023) provides the life cycle inventory data for several of the raw and process materials obtained from the background system. The most recent update of the database was in 2023.

3.6 Data quality

All the foreground data requiring such energy or raw material coming from production, were verified and cross-checked before being included in the model. Most of the life cycle inventories for the basic materials are included in the Sphera LCA for Expert 10. For electrical and thermal energy Belgium-specific grid mixes and Belgium-specific supply for natural gas were considered.

3.7 Period under review

The production data for the year 2022 were used for the realization of this study

3.8 Geographic Representativeness

Land or region, in which the declared product system is manufactured, used or handled at the end of the product´s lifespan: Europe

3.9 Allocation

There are no co-products or by-products generated during the production of UBBINK's products. Due to the lack of specific data per production line and product, the energy has been allocated per overall produced volume of insulation foam.

Production waste

Most of the production waste from the process (machine start, end of production, non-conforming products, etc.) is recycled internally in order to be reused in the manufacturing process. These impacts are accounted for in A1-A3.

Installation and End-of-Life waste

Installation of the foam products is done by hand and requires no special equipment apart from a knife. Installation off-cuts are not considered in these calculations. Any glue and adhesive tapes used during the installation phase were not included in the LCA

3.10 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account.

4. LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

Information on describing the biogenic Carbon Content at factory gate

Information on describing the biogenic Carbon Content at factory gate for 1 Cubic meter of Aerfoam insulated ductwork Information concerning cardboard see: https://www.procarton.com/wp-content/uploads/2010/09/carton_carbon.pdf

Name	Value	Unit
Biogenic carbon content in product	-	kg C
Biogenic carbon content in accompanying packaging	9.2	kg C

Table Biogenic carbon content in product and packaging

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO_2.

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO_2.

Transport to the building site (A4)

Name	Value	Unit
Litres of fuel	0.684	l/100km
Transport distance	644	km
Capacity utilisation (including empty runs)	10	%
Gross density of products transported	30	kg/m^3

Use or application of the installed product (B1) see section 2.12 "Use"

Reference service life

Name	Value	Unit
Reference service life years	50	a

End of life (C1-C4)

Name	Value	Unit
Recycling (100% recycling base-case senario)	30	kg
Landfill (100% landfill)	30	kg
Incineration (100% insineration)	30	kg

5. LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

Product stage			Construction process stage		Use stage							End of life stage				Benefits and loads beyond the system boundaries
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	MND	MND	MNR	MNR	MNR	MND	MND	MND	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m³ Aerfoam insulated ductwork

Parameter	Unit	A1-A3	A4	A5	C2	C3	C3/1	C3/2	C4	C4/1	C4/2	D	D/1	D/2
GWP-total	kg CO_2 eq	9.34E+01	2.03E+00	7.26E+00	8.94E-02	8.57E+00	0	9.39E+01	0	2.03E+00	0	-4.27E+01	0	-4.21E+01
GWP-fossil	kg CO_2 eq	9.47E+01	2.04E+00	5.45E+00	8.98E-02	8.52E+00	0	9.39E+01	0	2.06E+00	0	-4.24E+01	0	-4.19E+01
GWP-biogenic	kg CO_2 eq	-1.77E+00	-2.74E-02	1.77E+00	-1.21E-03	5.48E-02	0	2.51E-03	0	-2.54E-02	0	-3.23E-01	0	-1.93E-01
GWP-luluc	kg CO_2 eq	4.85E-01	1.84E-02	4.48E-02	8.11E-04	7.92E-04	0	9.27E-05	0	1.7E-03	0	-4.73E-03	0	-2.74E-03
ODP	kg CFC11 eq	4.39E-07	2.59E-13	1.77E-11	1.14E-14	9.48E-11	0	4.45E-12	0	3.47E-12	0	-3E-10	0	-3.32E-10
AP	mol H^+ eq	9.35E-01	2.42E-03	2.94E-02	1.07E-04	1.26E-02	0	9.26E-03	0	6.19E-03	0	-6.11E-02	0	-5.27E-02
EP-freshwater	kg P eq	7.76E-04	7.28E-06	1.52E-04	3.2E-07	7.06E-05	0	1.05E-06	0	3.97E-04	0	-9.41E-05	0	-6.86E-05
EP-marine	kg N eq	6.11E-02	8.24E-04	1.45E-02	3.63E-05	3.23E-03	0	1.94E-03	0	1.42E-03	0	-1.82E-02	0	-1.54E-02
EP-terrestrial	mol N eq	6.27E-01	9.73E-03	1.51E-01	4.29E-04	3.39E-02	0	4.36E-02	0	1.56E-02	0	-1.89E-01	0	-1.64E-01
POCP	kg NMVOC eq	2.41E+00	2.48E-03	3.78E-02	1.09E-04	8.59E-03	0	5.77E-03	0	4.5E-03	0	-5.89E-02	0	-4.28E-02
ADPE	kg Sb eq	1.19E+00	1.32E-07	1.25E-06	5.81E-09	8.04E-07	0	4.13E-08	0	5.46E-08	0	-3.07E-06	0	-3.03E-06
ADPF	MJ	3.09E+03	2.71E+01	8.77E+01	1.19E+00	1.22E+02	0	1.12E+01	0	3.08E+01	0	-1.76E+03	0	-7.74E+02
WDP	m^3 world eq deprived	9.28E+01	2.4E-02	9.77E-01	1.06E-03	1.41E+00	0	8.66E+00	0	-2.91E-02	0	-7.18E-01	0	-4.03E+00

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential)

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 m³ Aerfoam insulated ductwork

Parameter	Unit	A1-A3	A4	A5	C2	C3	C3/1	C3/2	C4	C4/1	C4/2	D	D/1	D/2
PERE	MJ	3.84E+02	1.97E+00	2.53E+01	1.74E-01	6.46E+01	0	2.85E+00	0	2.78E+00	0	-1.47E+02	0	-2.27E+02
PERM	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0
PERT	MJ	3.84E+02	1.97E+00	2.53E+01	1.74E-01	6.46E+01	0	2.85E+00	0	2.78E+00	0	-1.47E+02	0	-2.27E+02
PENRE	MJ	2.09E+03	2.72E+01	8.78E+01	2.4E+00	1.22E+02	0	1.12E+01	0	3.08E+01	0	-1.76E+03	0	-7.74E+02
PENRM	MJ	1.03E+03	0	0	0	0	0	0	0	0	0	0	0	0
PENRT	MJ	3.12E+03	2.72E+01	8.78E+01	2.4E+00	1.22E+02	0	1.12E+01	0	3.08E+01	0	-1.76E+03	0	-7.74E+02
SM	kg	2.29E+01	0	0	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	m^3	2.46E+00	2.16E-03	6.3E-02	9.51E-05	5.83E-02	0	2.03E-01	0	3.04E-04	0	-2.03E-01	0	-1.84E-01

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used 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 used 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; FW = Use of net fresh water

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 m³ Aerfoam insulated ductwork

Parameter	Unit	A1-A3	A4	A5	C2	C3	C3/1	C3/2	C4	C4/1	C4/2	D	D/1	D/2
HWD	kg	1.53E-03	8.42E-11	5.09E-08	3.71E-12	-6.19E-09	0	2.51E-10	0	2.59E-09	0	-1.28E-07	0	-4.05E-08
NHWD	kg	4.3E+00	4.15E-03	1.15E-01	1.83E-04	3.14E+00	0	3.72E-01	0	2.99E+01	0	-4.52E-01	0	-3.84E-01
RWD	kg	3.62E-02	5.09E-05	3.15E-03	2.24E-06	1.71E-02	0	6.72E-04	0	3.65E-04	0	-1.54E-02	0	-6.02E-02
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	0	0
MFR	kg	0	0	2.29E+01	0	3.14E+00	0	3.72E-01	0	0	0	0	0	0
MER	kg	0	0	0	0	0	0	0	0	0	0	0	0	0

EEE	MJ	0	0	0	0	0	0	2E+02	0	0	0	0	0	0
EET	MJ	0	0	0	0	0	0	3.56E+02	0	0	0	0	0	0

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 m³ Aerfoam insulated ductwork

Parameter	Unit	A1-A3	A4	A5	C2	C3	C3/1	C3/2	C4	C4/1	C4/2	D	D/1	D/2
PM	Disease incidence	6.72E-05	1.83E-08	7.31E-07	8.04E-10	1.07E-07	0	5.43E-08	0	6E-08	0	-4.58E-07	0	-4.47E-07
IR	kBq U235 eq	1.66E+01	7.59E-03	5.2E-01	3.34E-04	2.84E+00	0	1.09E-01	0	5.39E-02	0	-1.62E+00	0	-1E+01
ETP-fw	CTUe	1.4E+03	1.94E+01	3.58E+01	8.55E-01	3.37E+01	0	4.39E+00	0	2.63E+01	0	-7.82E+02	0	-1.09E+02
HTP-c	CTUh	4.09E-08	3.94E-10	1.19E-09	1.73E-11	1.9E-09	0	6.1E-10	0	1.35E-09	0	-2E-08	0	-8.59E-09
HTP-nc	CTUh	1.54E-06	1.75E-08	6.42E-08	7.72E-10	4.88E-08	0	4.57E-09	0	1.08E-07	0	-7.26E-07	0	-2.11E-07
SQP	SQP	3.94E+02	1.13E+01	9.35E+01	4.99E-01	4.26E+01	0	3.52E+00	0	2.67E+00	0	-1.03E+02	0	-1.49E+02

PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index

Disclaimer 1 – for the indicator “Potential Human exposure efficiency relative to U235”. 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 or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators “abiotic depletion potential for non-fossil resources”, “abiotic depletion potential for fossil resources”, “water (user) deprivation potential, deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit for humans – cancerogenic”, “Potential comparative toxic unit for humans - not cancerogenic”, “potential soil quality index”. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high as there is limited experience with the indicator.

This EPD was created using a software tool.

6. LCA: Interpretation

The use of internally recycled material in Aerfoam insulated ductwork reduces the need for raw materials and avoids wasting resources. Aerfoam insulated ductwork has a very low density, which means that little raw material is needed for high insulation efficiency, which results in significant energy savings. In addition, Aerfoam insulated ductwork is largely made of low-density polyethylene, so it is fully recyclable and can be recycled when it reaches the end of its life.
When we analyse the complete life cycle, we see that the most impacting part for all environmental impact factors is the production module and more particularly the raw materials. With regard to global warming for the complete life cycle, more than 89 % comes from the production module 2 % of transport to the places of installation and 8,5 % comes from the end of life. A more in-depth analysis of the production module A1 to A3, shows that the production of raw materials and their transport account for almost 95 % of the impact Global Warming Potential.

As the Aerfoam insulated ductwork is fully recyclable; the choice for the end of life in the base-case was that of 100 % recycling (with 100% landfill and 100% incineration scenarios). This avoids the use of new raw materials and or the exploitation of renewable or non-renewable resources.
The 100 % end-of-life landfill scenario has a significant impact, particularly from a climate change perspective. However, the 100 % incineration scenario has the greatest impact, as incineration results in a significant release of carbon dioxide. Recycling is the recommended end-of-life solution.

Aerfoam insulated ductwork self-supporting ventilation pipes for interiors offer solutions to prevent both noise and heat loss. The energy savings due to the good insulating capacity of Aerfoam insulated ductwork are not counted in this study.
One way for UBBINK to continue to reduce the environmental impact of the Aerfoam insulated ductwork would be to continue to diversify our energy sources by switching more and more to renewable energies. Looking for more eco-responsible suppliers must also be put in place, as well as finding raw materials manufactured locally to avoid long-distance transport as much as possible. An analysis of the plant's carbon footprint, which is currently being carried out, should enable UBBINK to identify areas for improvement and find solutions to achieve the goal of net zero carbon.

7. Requisite evidence

7.1 VOC emissions
Eurofins Product Testing A/S has tested a wide range and variety of typical PEF (Polyethylene foam) products marketed in the EU from CEFEP (European Group of PEF/FEF manufacturers) Based on the loading factor 0.05m2/m3 (determined after consideration of the real-life applications of PEF products (in living rooms) and recommendations by the experts of the test institute) all results were found to be clearly below the limit values. For all samples below 100mg/m3 TVOC after 28 days. Certificates are available on request.

7.2 Leaching
According to /EN 13468/ the content of water-soluble chloride ions for Aerfoam insulated ductwork is <15mg/kg

8. References

EU Ordinance
Biocide Products No. 528/2012

EU Regulation
regulation (EU) No. 305/2011 (CPR) apply

EN 1602
EN 1602: 2013: Thermal insulating products for building applications - Determination of the apparent density

EN ISO 8497
EN ISO 8497: Thermal insulation - Determination of steady-state thermal transmission properties of thermal insulation for circular pipes

ISO 9001
ISO 9001: 2015: Quality management systems.

EN 13468
EN 13468: Thermal insulating products for building equipment and industrial installations - Determination of trace quantities of water soluble chloride, fluoride, silicate, sodium ions and pH

EN 13472
EN 13472:2012: Thermal insulating products for building equipment and industrial installations - Determination of short term water absorption by partial immersion of preformed pipe insulation

EN 13501-1
EN 13501-1:2007+A1: 2013 Fire classification of construction products and building elements - Classification using test data from reaction to fire tests

ISO 14001
ISO 14001: 2015 Environmental management systems.

EN ISO 14025
EN ISO 14025: 2011-10: Environmental labels and declarations — Type III environmental declarations — Principles and procedures

ISO 14040
ISO 14040: Environmental management — Life cycle assessment — Principles and framework

ISO 14044
ISO 14044: Environmental management — Life cycle assessment — Requirements and guidelines

EN 14313
EN 14313:2015 Thermal insulation products for building equipment and industrial installations - Factory made polyethylene foam (PEF) products

EN 14707
EN 14707: 2012: Thermal insulating products for building equipment and industrial installations. Determination of maximum service temperature for preformed pipe insulation

EN 15804
EN 15804: 2012-04 + A2 2019: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

CEN/TR 15941
CEN/TR 15941: Sustainability of construction works - Environmental product declarations - Methodology for selection and use of generic data

CEN TS 16516
CEN TS 16516: /AgBB/, /ISO 16000-3/, /ISO 16000-6/, /ISO16000-9/, /ISO 16000-11/ Construction products - Assessment of release of dangerous substances. Determination of emissions into indoor air

EN 16783
EN 16783: 2017 Thermal insulation products - Product category rules (PCR) for factory made and in-situ formed products for preparing environmental product declarations

Eurostat
European Statistics: Recovery rates for packaging waste Paper and cardboard packaging for the European Union 27 countries 2014 http://ec.europa.eu/eurostat/home

Eurofins
Eurofins: Product Testing Institute

Institut Bauen und Umwelt
Institut Bauen und Umwelt e.V., Berlin(pub.): General Instructions for the EPD Programme of Institut Bauen und Umwelt e.V., Version 2.0 2021

Product Category Rules for Building-Related Products and Services
Institute Construction and Environment e.V. (IBU) Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report Version 1.7

PCR Guidance-Texts for Building-Related Products and Services
From the range of Environmental Product Declarations of Institute Construction and Environment e.V. (IBU) Part B: Requirements on the EPD for Insulating materials made of foam plastics Version 1.6 (Template) Version 1.2 (PCR specific)

Sphera
Sphera Solutions Gmbh. GaBi 10 LCI documentation. GaBi Databases (sphera.com) Stuttgart, Echterdingen: Sphera Solutions Gmbh

SPHERA LCA for Experts
SPHERA LCA for Experts 10 SPHERA LCA for Experts Software-System and Database for Life Cycle Engineering Copyright © 1992-2021 Sphera Solutions Gmbh Version: 10.5.0.78 DB Schema 8007

Publisher

Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

+49 (0)30 3087748- 0
info@ibu-epd.com
www.ibu-epd.com

Programme holder

Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

+49 (0)30 3087748- 0
info@ibu-epd.com
www.ibu-epd.com

Author of the Life Cycle Assessment

NMC S.A.
Gert Noël Strasse 1
4731 Eynatten
Belgium

+3287858500
robert.christiaans@nmc.be
www.nmc-insulation.com

Owner of the Declaration

UBBINK
Verhuelweg 9
6984 AA DOESBURG
Netherlands

0031313480200
info@ubbink.nl
https://www.ubbink.com/gb/