ENVIRONMENTAL PRODUCT DECLARATION

as per /ISO 14025/ and /EN 15804/

Owner of the Declaration	**Ubbink BV**
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-UBB-20180159-IBD1-EN
Issue date	07.02.2019
Valid to	06.02.2024

Aerfoam insulated ductwork
Ubbink BV

Institut Bauen und Umwelt e.V.

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1. General Information

Ubbink BV	Aerfoam insulated ductwork
Programme holder IBU - Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany	**Owner of the declaration** Ubbink BV Verhuellweg 9 6984 AA Doesburg The Netherlands
Declaration number EPD-UBB-20180159-IBD1-EN	**Declared product / declared unit** 1 m³ UBBINK Aerfoam insulated ductwork
This declaration is based on the product category rules: Insulating materials made of foam plastics, 06.2017 (PCR checked and approved by the SVR)	**Scope:** Product line UBBINK Aerfoam insulated ductwork. Self supporting ventilation pipe made of polyethylene foam (PEF). This declaration is an Environmental Product Declaration according to /ISO14025/ describing the specific environmental performance of the product produced in Belgium. 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.
Issue date 07.02.2019	**Verification** The standard /EN 15804/ serves as the core PCR Independent verification of the declaration and data according to /ISO 14025:2010/ ☐ internally ☒ externally
Valid to 06.02.2024	
Prof. Dr.-Ing. Horst J. Bossenmayer (President of Institut Bauen und Umwelt e.V.)	
Dr. Alexander Röder (Head of Board IBU)	Ms Jane Anderson (Independent verifier appointed by SVR)

2. Product

2.1 Product description / Product definition

UBBINK Aerfoam insulated ductwork is a professional bio-polyethylene-based closed-cell foam for self-supporting ventilation pipes for interior use. Its low weight, its corrosion resistance and its good thermal and acoustic insulation, coupled with the fact that it is simple and quick to fit, make UBBINK Aerfoam insulated ductwork a worthwhile alternative to conventional ventilation pipes. UBBINK 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 EU/EFTA (with the exception of Switzerland) Regulation (EU) No. 305/2011 (CPR) applies. The product needs a Declaration of Performance taking into consideration /EN 14313/ - 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

UBBINK Aerfoam insulated ductwork is 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 PE foam yield a good cost/performance ratio.
- Polyethylene Foam is corrosion resistant and its good thermal and acoustic insulation allows having 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/m³
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	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 180 mm inside diameter.

2.5 Base materials / Ancillary materials

Base materials

UBBINK Aerfoam insulated ductwork is a flexible insulation material based on bio-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 UBBINK Aerfoam insulated ductwork product range.
This LCA study was carried out on the basis of the weighted average.

Name	Value	Unit
BIO-PE	70,5	%
Flame retardant	13,2	%
LLDPE B	4,4	%
Pigment 1 Black	0,7	%
Nucleating	1,1	%
Volume stabilizer	1,3	%
Blowing Agent	8,8	%

BIO-PE and fillers are the main components of the product and are responsible for the characteristics and performance of the product
The blowing agent causes the expansion during manufacturing. The flame retardant ensures the fire resistance and conformity with fire protection regulations (see section 2.13).
According the European Chemicals Regulation /REACH/ manufacturers, importers and downstream users must register their chemicals and are responsible for their safe use. UBBINK BV uses exclusively verifiably registered and approved substances in its production. Products manufactured and put on the market by UBBINK do need to be registered. UBBINK Aerfoam insulated ductwork does not contain SVHC substances. Antimony trioxide and halogenated flame-retardants are applied.

2.6 Manufacture

The manufacturing process consists of a continuous extrusion. Solid pellets of thermoplastic resin are fed into a melting zone in which the resin is melted, to form a flowable thermoplastic mass. The thermoplastic mass is then metered to a mixing zone where it is thoroughly mixed with a blowing agent under pressure. The mixture of thermoplastic resin and blowing agent is then forced through a die, which imparts a shape to the thermoplastic mass, into a zone of lower pressure (i.e. atmospheric pressure). The blowing agent expands to form the cells of the foam and the product is then cooled with water (municipal water) before to be heat-welded to itself, due to a NMC's proprietary technology. Finally, the product is cut to size, packed and stored.

Quality assurance:
The manufacture is certified ISO 9001 for the quality management.

2.7 Environment and health during manufacturing

During all manufacturing steps, 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 manufacture is certified /ISO 14001/ environmental management system

2.8 Product processing/Installation

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

2.9 Packaging

UBBINK Aerfoam insulated ductwork products are packed in cardboard boxes and transported on reusable pallets. All packaging material can be recycled.

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 products are used in a wide range of applications across the building sector. The Polyethylene Furanoate (PEF) foams 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

UBBINK 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.

2.13 Extraordinary effects

Fire

According to /EN13501-1/ the products are classified as EURO CLASS E and therefore have a limited speed of inflammation.

Fire protection

Name	Value
Building material class	E

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

Mechanical destruction
UBBINK Aerfoam insulated ductwork is chemically inert and does not present any environmental or health risk if mechanically destructed. UBBINK 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, UBBINK 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
UBBINK 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/ (http://www.wastesupport.co.uk/ewc-codes/) waste code 07 02 13 waste Plastic "Low Density Polyethylene"

2.16 Further information
Additional information about UBBINK Aerfoam insulated ductwork can be found on the UBBINK web Site www.ubbink.nl. Here data sheets can be found.

3. LCA: Calculation rules

3.1 Declared Unit
This declaration refers to 1 m³ of produced pipe insulation product. For the LCA calculations, as the product is foam and have some tolerances, the LCA calculation 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	section of the ventilation pipe (m²)	

Thermal Conductivity λ : 0.048 W/mK at (40°C)
R-value- thickness- : 16 mm : +/- 0,82 (m²K/W) depending of the pipe diameter.

3.2 System boundary
The Data collection refers to the yearly production in 2017. EPD type: cradle to gate with options (A1-A3, A4, A5, C2, C4 and D)

Module 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: Transport of the final product to the application site. The average transport distance has been calculated based on a weighted value for main customers representing more than 90% of the sales volume in 2017. Capacity utilisation by volume is 100%. However, given the low density of the product, capacity utilisation by mass has been estimated as 10%.

Module A5: The products can be placed end to end and the remaining pieces can be reused on other pipes. The calculations do not contain any installation waste. Cardboard as packaging material is assumed to be recycled. As input material cardboard made of waste paper is considered. Thus, environmental burden for packaging material are considered already in A1-A3. The value of the environmental impact for A5 is declared as “0”. No biogenic carbon has been accounted for the recycled content of cardboard in A3 or A5.

Module B1-B7:
Once installed the products require no maintenance and no repair. Only manual cleaning with brush is required to avoid concentration of dust into this air distribution system. It will be dismantled by the end of live 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:
Disassembly is done manually. There are no impacts associated with C1. The information module is not declared.

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:
The chosen scenario of 100% landfilling does not require any waste processing. Module C3 is not declared.

Module C4:

The environmental burden for the chosen scenario of 100% landfilling is declared in module C4.
The product contains raw materials from renewable sources. By calculating the environmental burden for the production process the sequestration of CO2 from atmosphere has taken into account.
The environmental effects of (bio-)plastic on a landfill site in the next 100 years cannot be foreseen as a full picture today. In this declaration it is assumed, that the sequestered CO2 is still integrated in a solid matrix.

Module D:
The end-of-life scenarios for packaging material and product do not deliver any benefits for the next system. Recycling of cardboard is a closed cycle with the production process.
The product is landfilled; energy or material gain cannot be expected.

3.3 Estimates and assumptions
The LCA calculation is conducted using the GaBi-database. 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
Any glue and adhesive tapes used during the installation (A5) have not been included 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 others cut-off criteria 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 /GaBi 2018/ developed by thinkstep AG was used to perform this LCA. The GaBi LCI database /GaBi 2018/ 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 2018.

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 available in the/ GaBi 2018/ database.
For electrical and thermal energy regional specific grid mixes and regional specific supply for natural gas were considered.

3.7 Period under review
The production data for the year 2017 were used for the realization of this study.

3.8 Allocation
There is no co-product or by-product generated during the production of the products.
Due to 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 in Eynatten Plant. These impacts are accounted for in A1-A3. Smaller amounts are disposed of on a landfill site.

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-cut is not considered in this calculations.

3.9 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

Transport to the building site (A4)

Name	Value	Unit
Litres of fuel	0.469	l/100km
Transport distance	702	km
Capacity utilisation (including empty runs)	10	%
Gross density of products transported	30	kg/m^3
Capacity utilisation volume factor	0.5	-

End of life (C1-C4)

Name	Value	Unit
Landfilling	30	kg

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5. LCA: Results

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

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	MND	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 m³ UBBINK Aerfoam insulated ductwork

Parameter	Unit	A1-A3	A4	A5	C2	C4	D
Global warming potential	[kg CO_2-Eq.]	-16.34	9.78	0.00	0.21	2.11	0.00
Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	1.05E-7	4.06E-13	0.00E+0	8.60E-15	5.69E-13	0.00E+0
Acidification potential of land and water	[kg SO_2-Eq.]	1.17E+0	4.45E-2	0.00E+0	8.77E-4	5.76E-3	0.00E+0
Eutrophication potential	[kg $(PO_4)^{3-}$-Eq.]	8.16E-1	1.14E-2	0.00E+0	2.24E-4	5.88E-3	0.00E+0
Formation potential of tropospheric ozone photochemical oxidants	[kg ethene-Eq.]	2.34E-1	-1.87E-2	0.00E+0	-3.63E-4	6.29E-4	0.00E+0
Abiotic depletion potential for non-fossil resources	[kg Sb-Eq.]	2.96E-1	8.66E-7	0.00E+0	1.83E-8	4.61E-7	0.00E+0
Abiotic depletion potential for fossil resources	[MJ]	6.98E+2	1.33E+2	0.00E+0	2.81E+0	3.06E+1	0.00E+0

RESULTS OF THE LCA - RESOURCE USE: 1 m³ UBBINK Aerfoam insulated ductwork

Parameter	Unit	A1-A3	A4	A5	C2	C4	D
Renewable primary energy as energy carrier	[MJ]	2581.90	6.98	0.00	0.15	2.36	0.00
Renewable primary energy resources as material utilization	[MJ]	909.45	0.00	0.00	0.00	0.00	0.00
Total use of renewable primary energy resources	[MJ]	3491.35	6.98	0.00	0.15	2.36	0.00
Non-renewable primary energy as energy carrier	[MJ]	791.05	133.66	0.00	2.83	31.72	0.00
Non-renewable primary energy as material utilization	[MJ]	174.84	0.00	0.00	0.00	0.00	0.00
Total use of non-renewable primary energy resources	[MJ]	965.89	133.66	0.00	2.83	31.72	0.00
Use of secondary material	[kg]	20.20	0.00	0.00	0.00	0.00	0.00
Use of renewable secondary fuels	[MJ]	0.00	0.00	0.00	0.00	0.00	0.00
Use of non-renewable secondary fuels	[MJ]	0.00	0.00	0.00	0.00	0.00	0.00
Use of net fresh water	[m³]	1.07E+0	1.28E-2	0.00E+0	2.72E-4	-8.15E-5	0.00E+0

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: 1 m³ UBBINK Aerfoam insulated ductwork

Parameter	Unit	A1-A3	A4	A5	C2	C4	D
Hazardous waste disposed	[kg]	6.34E-4	7.05E-6	0.00E+0	1.49E-7	1.35E-7	0.00E+0
Non-hazardous waste disposed	[kg]	9.65E+0	1.07E-2	0.00E+0	2.27E-4	3.00E+1	0.00E+0
Radioactive waste disposed	[kg]	1.06E-1	2.79E-4	0.00E+0	5.91E-6	4.50E-4	0.00E+0
Components for re-use	[kg]	0.00	0.00	0.00	0.00	0.00	0.00
Materials for recycling	[kg]	0.00	0.00	20.20	0.00	0.00	0.00
Materials for energy recovery	[kg]	0.00	0.00	0.00	0.00	0.00	0.00
Exported electrical energy	[MJ]	0.00	0.00	0.00	0.00	0.00	0.00
Exported thermal energy	[MJ]	0.00	0.00	0.00	0.00	0.00	0.00

6. LCA: Interpretation

The base polymer used is produced from renewable resources (biomass). While growing of the plants, atmospheric carbon dioxide is sequestered.
1 kg of bio-polyethylene contains the carbon of 2.83 kg CO2. In the production process energy and material are necessary, which lead to CO2 emissions. Summarizing these effects results in an overall negative value for GWP of -2.62 kg CO2e per 1 kg of bio-polyethylene. The total value for GWP (A1-A3) refers to the applied input materials and the emissions for the total process chain to achieve the foam product. For the EoL-scenario landfilling is assumed. Polyethylene is assumed not to be biodegradable. Thus the sequestered CO2 remains bonded in hydrocarbon chains. Further longterm effects of plastics on a landfill site on the ecosystems cannot be foreseen so far. The operation of the landfill site requires energy and material, which result to environmental burden for all impact categories, Transport processes (A2, A4 and C2) also contributes to all impact categories listed.
The most impacting modules of the LCA are the modules A1 to A3 and more particularly the raw material supply.
Due to the low density of the final product, A4 (transport) has a comparatively high GWP (9,78 kg CO2-Eq./m3).

The value for primary energy demand results mostly from renewable resources due to the use of bio-based polyethylene rather than fossil-based polyethylene.
An improvement path to further improve the impact of the products would be to reuse or recycling 100% of the products rather than put on Landfill the material at end of life. From a resource perspective, landfill should also be avoided.
The use of bio-polyethylene for the manufacture of UBBINK Aerfoam insulated ductwork makes it possible to obtain a value near to 0 with regard to global warming potential - electricity consumption is the main source of emissions during manufacturing. One of the solutions to continue to improve the assessment of UBBINK Aerfoam insulated ductwork would be to modify the sources of electrical supply. For example, by finding suppliers that produce electricity from more renewable energy sources.

7. Requisite evidence

7.1. VOC emissions
Eurofins Product Testing A/S has tested a wide range and variety of typical PEF (Polyethylene Furanoate 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 is <15mg/kg

8. References

/IBU 2016/
IBU (2016): General Programme Instructions for the Preparation of EPDs at the Institut Bauen und Umwelt e.V., Version 1.1 Institut Bauen und Umwelt e.V., Berlin.
www.ibu-epd.de

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

/EN 15804/
/EN 15804:2012-04+A1 2013/, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

/IBU 2016/
IBU (2016): General Programme Instructions for the Preparation of EPDs at the Institut Bauen und Umwelt e.V., Version 1.1 Institut Bauen und Umwelt e.V., Berlin.
www.ibu-epd.de

/ISO 14040:2006/
ISO 14040:2006: Environmental management — Life cycle assessment — Principles and framework

/Institut Bauen und Umwelt/
Institut Bauen und Umwelt e.V., Berlin(pub.): Generation of Environmental Product Declarations (EPDs)

/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)

/ISO 14044:2006/
ISO 14044:2006: Environmental management — Life cycle assessment — Requirements and guidelines

/CEN/TR 15941:2010/
CEN/TR 15941:2010: Sustainability of construction works - Environmental product declarations - Methodology for selection and use of generic data

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

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

/EN ISO 8497:1997/
EN ISO 8497:1997: Thermal insulation. Determination of steady-state thermal transmission properties of thermal insulation for circular pipes

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

/EN 1602:2013/
EN 1602: 2013: Thermal insulating products for

building applications. Determination of the apparent density

/EN 13472:2012/
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 13468:2001/
EN 13468:2001: Thermal insulating products for building equipment and industrial installations. Determination of trace quantities of water soluble chloride, fluoride, silicate, sodium ions and pH

/CEN/TS 16516:2013/
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

/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

/REACH/ European Chemicals Regulation

/European Waste Catalogue/
European Waste Catalogue <http://ec.europa.eu/environment/waste/framework/list.htm>

/PlasticsEurope/
Association of Plastics Manufacturers: PlasticsEurope is one of the leading European trade associations http://www.plasticseurope.org/about-us.aspx Overview Plastic Waste from Building & Construction by Polymer and by Recycling, Energy recovery and disposal. Building and Construction Post Consumer Waste Generation 2014 (Europe EU 28+2)

/Gabi ts/
GaBi 8 GaBi Software-System and Database for Life Cycle Engineering Copyright © 1992-2018 Thinkstep AG Compilation: 8.7.0.18 DB version 8007

/Thinkstep/
thinkstep (2018) thinkstep AG, 2018. GaBi 8 LCI documentation. <http://www.gabi-software.com/support/gabi/gabi-database-2018-lci-documentation/>. Stuttgart, Leinfelden-Echterdingen: thinkstep AG

/ISO 9001:2015/
Quality Management Systems.

/ISO 14001: 2015/
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