ENVIRONMENTAL PRODUCT DECLARATION

as per /ISO 14025/ and /EN 15804/

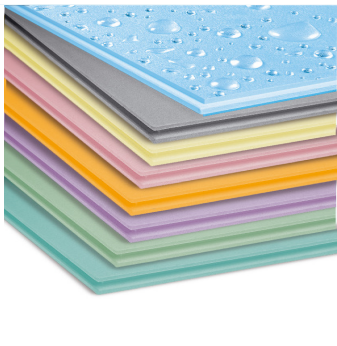
Owner of the Declaration	**EXIBA - European Extruded Polystyrene Insulation Board Association**
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-EXI-20190112-IBE1-EN
Issue date	03.12.2019
Valid to	02.12.2024

Extruded Polystyrene (XPS) Foam Insulation
with halogen free blowing agent

EXIBA - European Extruded Polystyrene Insulation Board Association

Institut Bauen und Umwelt e.V.

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



1. General Information

EXIBA - European Extruded Polystyrene Insulation Board Association	Extruded Polystyrene (XPS) Foam Insulation
Programme holder IBU - Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany	**Owner of the declaration** EXIBA - European Extruded Polystyrene Insulation Board Association Rue Belliard 40, Box 16 B- 1040 Brussels Belgium
Declaration number EPD-EXI-20190112-IBE1-EN	**Declared product / declared unit** XPS (extruded polystyrene foam) boards produced by the EXIBA members. The EPD applies to 1 m^2 of 100 mm thick XPS board, i.e. 0.1 m^3, with an average density of 33 kg/m^3.
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:** The companies contributing to the data collection produce about 85% of the extruded polystyrene foam boards produced with halogen-free blowing agent sold by the members of the EXIBA association in Europe. The data have been provided by 20 factories out of 6 companies (Austrotherm, BASF, Fibran, Jackon Insulation, Ravago Building Solutions and Ursa) for the year 2017. 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 03.12.2019	**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 02.12.2024	
 Dipl. Ing. Hans Peters (President of Institut Bauen und Umwelt e.V.)	
 Dr. Alexander Röder (Head of Board IBU)	 Christina Bocher (Independent verifier appointed by SVR)

2. Product

2.1 Product description / Product definition

Extruded polystyrene foam (XPS) is a thermoplastic insulation foam produced according to /EN 13164/ Building insulation, /EN 14307/ Equipment insulation, /EN 14934/ Civil engineering and available in board shape with a density range from 20 to 50 kg/m3. The boards can be delivered in various compressive strength values from 150 to 700 kPa. To meet the need of various applications the boards are produced with different surfaces: with the extrusion skin, planed, grooved or with thermal embossing. XPS boards are supplied with different edge treatments such as butt edge, ship lap and tongue and groove. The EPD is related to unfaced XPS products only; Heat lamination of several XPS layers is included. Additional product treatment is not considered.
The declared product reflects the European average of the association members.

For the placing on the market of the construction product in the European Union/ European Free Trade Association (EU/EFTA) (with the exception of Switzerland) Regulation (EU) No. 305/2011 (CPR) applies. The product needs a declaration of performance taking into consideration one of the three EN XPS standards (/EN 13164/ Building insulation, /EN 14307/ Equipment insulation, /EN 14934/ Civil engineering). For the application and use the respective national provisions apply.

2.2 Application

The variety of the performance properties of XPS thermal insulation foams make them suitable for use in a large number of applications such as: perimeter insulation, inverted insulation for terrace roofs, insulation of pitched roofs, floor insulation including insulation of highly loaded industrial floors, insulation of thermal bridges for exterior walls, ETICS, insulation of cavity walls, agricultural building ceiling insulation, prefabricated elements e.g. building sandwich panels, insulation for building equipment and industrial

installations (pipe sections, …) as well as a structural element for civil engineering.

2.3 Technical Data

Acoustic properties are not relevant for XPS. For fire performance these products except in Scandinavia achieve the fire classification Euroclass E according to /EN 13501-1/.

Physical properties data

Name	Value	Unit
Gross density	20 - 50	kg/m³
Calculation value for thermal conductivity acc. to /EN 12667/ and /EN 13164/ Annex C	0.03 - 0.04	W/(mK)
Water vapour diffusion resistance factor acc. to /EN 12086/	50 - 250	-
Water absorption after diffusion acc. to /EN 12088/	3 - 5	Vol.-%
Deformation under compressive load and temperature acc. to /EN 1605/	≤ 5	%
Compressive stress or strength at 10% deflection acc. to /EN 826/	0.15 - 0.70	N/mm²
Compressive modulus of elasticity acc. to /EN 826/	10 - 40	N/mm²
Tensile strength perpendicular to faces acc. to /EN 826/	0.1 - 0.4	N/mm²
Compressive creep/long-term comppressive strength acc. to /EN 1606/	< 0.25	N/mm²
Freeze-thaw resistance acc. to /EN 12091/	≤ 2	Vol.-%
Dimensional stability acc. to /EN 1604/	≤ 5	%

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to /EN 13164:2012+A1:2015/ - Thermal Insulation products for buildings / /EN 14307:2015/ Thermal Insulation products for building equipment and industrial installations /EN 14934:2007/ Thermal insulation and light weight fill products for civil engineering applications.

2.4 Delivery status

Length: 1000-3000 mm; Width: 600-1200 mm; Thickness: 20-200 mm (400 mm multilayer product)
For the LCA a thickness of 100 mm was considered.

2.5 Base materials / Ancillary materials

XPS foams are mostly made of Polystyrene (90 to 95% by weight – CAS 9003-53-6), blown with carbon dioxide (CAS 124-38-9) and halogen-free co-blowing agents altogether up to 8% by weight.

Basic material	Mass portion
Polystyrene	90 - 95 %
Blowing agents	5 - 8 %
Carbon Dioxide	40 - 80 %
Co-blowing Agents	20 - 60 %
Flame retardant	0 - 3 %
Additives (e.g. pigments)	Less than 1%

The brominated flame retardant is used to enable the foam to meet fire performance standards. Other additives are used, e.g. color pigments and processing aids in minor quantity.

Polystyrene is produced from oil and gas therefore it is linked to the availability of these raw materials. Polystyrene is mostly transported by truck or sometimes produced on the same site.

Information that product does not contain substances listed in the Candidate List of substances of very high concern (/REACH/ Regulation) exceeding 0.1%:
This product contains substances listed in the candidate list (date:15.01.2019) exceeding 0.1 percentage by mass: no

This product contains other Carcinogenic, Mutagenic, Reptrotoxic (CMR) 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

2.6 Manufacture

XPS is produced by a continuous extrusion process using electricity as the main power source: polystyrene granules are melted in an extruder and a blowing agent is injected into the extruder under high pressure. The drop in pressure at the exit die causes the polystyrene to foam into a board with homogeneous and closed cell structure.
Then the boards' edges are trimmed, and the product is cut to dimensions. The smooth foam skin resulting from the extrusion process remains on the boards or is removed mechanically for particular board types to achieve better adhesive strength in combination with e.g. concrete, mortar, or construction adhesives. Some boards receive special surface patterns or grooves.
Most of XPS foams off-grade material or scrap from production is ground and extruded in a separate line, the resulting recycle is then used in the production process of XPS.
A large number of the manufacturing plants are certified according to /ISO 9001/.

2.7 Environment and health during manufacturing

No further health protection measures beyond the regulated measures for manufacturing firms are necessary during all production steps. A large number of the manufacturing plants are certified according to /ISO 14001/.

2.8 Product processing/Installation

Handling recommendations for XPS foams can be found in product and application literature, brochures and data sheets provided directly by suppliers or available from the internet. There are no special required instructions regarding personal precautions and environmental protection during the product handling and installation.

2.9 Packaging

The boards are stacked in bundles, wrapped in 4 to 6 sided polyethylene film and palletised.
The polyethylene-based packaging film is recyclable and actually recycled in those countries having a return system.

2.10 Condition of use

Water pick-up by capillarity does generally not occur with XPS foams due to their closed-cell structure. The thermal insulation performance of XPS is practically not affected by exposure to water or water vapour. Usually, maintenance will not be required if the XPS boards are installed according to handling installation requirements (see: Installation description).

2.11 Environment and health during use

XPS product is in most applications not in direct contact with the environment nor with the indoor air. There is no significant release of substances from the product as installed during its service life, as confirmed by the best possible ratings obtained in existing Volatile Organic Compound (VOC) emission schemes; e. g. Committee for Health-related Evaluation of Building Product /AgBB/ French labelling (see 7.1 VOC).

2.12 Reference service life

The durability of XPS foam is normally at least as long as the lifetime of the building in which it is used. This is explained by the superior mechanical and water resistance properties of these products.

2.13 Extraordinary effects

Fire

XPS products except in Scandinavia achieve the fire classification Euroclass E according to /EN 13501-1/.

Fire performance

Name	Value
Building material class	E
Burning droplets	-
Smoke gas development	-

If the contact with the external flame stops, neither further burning nor smouldering can be observed. Ignition of the foam can only be observed after longer flame exposures.

Water

Water pick-up by capillarity does generally not occur with XPS foams due to their closed cell structure. The thermal insulation performance of XPS is practically not affected by exposure to water or water vapour.

Mechanical destruction

Not relevant for XPS products that have superior mechanical properties.

2.14 Re-use phase

In order to maximize the potential to re-use XPS boards, one must avoid that they are damaged or glued. Instead separation layers between the insulation and the concrete should be used or mechanical fixation should be applied.
In the inverted roof application XPS boards are installed loose laid and therefore can be easily removed and reused on another roof. For existing conventional flat-roofs the XPS boards can stay in place when for example the existing roof construction is thermally upgraded as a plus-roof. Recovered XPS boards from mechanically fixed applications can be reused for insulation of basement walls and foundations.
Due to the high calorific value of polystyrene, the energy embedded in XPS boards can be recovered in municipal waste incinerators equipped with energy recovery units for steam and electricity generation and district heating.

2.15 Disposal

XPS boards that cannot be easily retrieved from the building are usually landfilled. The material is assigned to the waste category: 17 06 04 insulation materials other than those mentioned in 17 06 01 (insulation materials containing asbestos) and 17 06 03 (other insulation materials consisting of or containing dangerous substances) /European List of Waste/.

2.16 Further information

Additional information can be found at the following Webpages:
www.exiba.org
www.austrotherm.com/en
www.styrodur.de
www.fibran.com
www.jackon-insulation.com/en
www.ravatherm.com
www.ursa.es

3. LCA: Calculation rules

3.1 Declared Unit

The declared unit is 1 m² with a thickness of 100 mm, e.g. 0.1 m³. The declared product reflects the European average of the association members weighted for market share.
Corresponding conversion factors are listed in the table below.

Declared unit

Name	Value	Unit
Declared unit with thickness 100 mm	1	m^2
Conversion factor to 1 kg (=1/3,3)	0.3	-
Gross density	33	kg/m^3
Declared unit	0.1	m^3

For XPS products with densities or thickness different from the reference density of 33.0 kg/m3 the environmental impacts may be calculated using the following equation:

$$I_{adap} = I_{ref} \times \frac{\rho_{adap}}{\rho_{ref}} \times \frac{d_{adap}}{d_{ref}}$$

I_{adap} – adapted LCIA indicator or LCI parameter
I_{ref} – LCIA indicator or LCI parameter for reference density of 33.0 kg/m3
ρ_{adap} – adapted density
ρ_{ref} – reference density 33.0 kg/m3
d_{adap} – adapted board thickness
d_{ref} – thickness of reference board (100 mm)

Exceptions are categories, which are not mainly driven by raw material consumption respective mass. That applies to photochemical ozone creation potential (POCP) and ozone depletion potential (ODP). These two categories do not correlate with the mass of the product and cannot be evaluated that way.

3.2 System boundary

Type of EPD: cradle-to-gate (A1 - A3) – with options
The following modules are considered in the Life Cycle Assessment:

- Raw material supply (A1),
- Transport to the manufacturer (A2),
- Manufacturing (A3),
- Transport to the construction site (A4)
- Transport to EoL (C2),
- Disposal (C) with two 100 % scenarios (thermal treatment (sc. 1: C3) and landfill and (sc. 2: C4)
- Reuse, recovery or recycling potential (D) - beyond system boundary.

3.3 Estimates and assumptions

The environmental profile of the flame retardant is based on valid estimations, based on literature data, basically /Ullmanns/.

As a worst-case approach the study does not consider post-consumer polystyrene recycle granulate in the LCA results. The average of the post-consumer PS recycle granulate share is < 5 %.

3.4 Cut-off criteria

In the assessment, all available data from the production process are considered, i.e. all raw materials used, utilised thermal energy, and electric power consumption using best available LCI datasets. A few additives with low mass ratio were not addressed in the questionnaire. These filler materials and pigments underrun a ratio of 5 mass-% of total material input. Used fillers are e. g. talc and citric acid, which do not have relevant impacts in regard to the considered categories. Pigments, which are generally used in all XPS products are included in the declared mass of polystyrene already. Only environmentally non-hazardous pigments are applied. The missing filler amount is calculative filled up by polystyrene; thus an under-counting is avoided.

3.5 Background data

Background data is taken from the GaBi software /GaBi ts/, see www.gabi-software.com/databases.

3.6 Data quality

The foreground data, mainly the raw material and energy consumption during the production process is measured data.
Most of the necessary life cycle inventories are available in the /GaBi ts/ database. The last update of the database was 2018.

3.7 Period under review

The foreground data collected by the manufacturers are based on yearly production amounts and extrapolations of measurements on specific machines and plants. The production data refer to an average of the year 2017.

3.8 Allocation

There are no co-products generated during the XPS-production. Allocations in the foreground system are done for waste respective recycling materials only.

Allocation for waste materials:
Post-industrial XPS waste from extrusion lines, which does not get reused in the process, is sent to a waste incineration plant.
All applied incineration processes are displayed via a partial stream consideration for the combustion process, according to the specific composition of the incinerated material. For the waste incineration plant an R1-value of >0.6 is assumed.
Resulting electrical and thermal energy is looped inside module A1-A3. The quality of the recovered energy is assumed to be the same as that of the input energy.
In the software model, the environmental burdens of the supply chain are displayed via aggregated datasets. Due to this fact, thermal energy resulting from incineration processes are credited with a GaBi-process of thermal energy from natural gas (EU-28), integrated into module A1-A3.
Environmental burden of the incineration of the product in the EoL-scenario are assigned to the system (C3); resulting benefits for thermal and electrical energy are declared in module D.
Benefits are given according to European average data for electrical and thermal energy generated from natural gas.

Allocation for upstream data
For all refinery products, allocation by mass and net calorific value has been applied. The manufacturing route of every refinery product is modelled and the product-specific effort associated with their production is calculated.
For other materials' inventory used in the production process calculation the most suitable allocation rules are applied. Information on single Life Cycle Inventory (LCI)s is documented on http://database-documentation.gabi-software.com/support/gabi/.

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.

Used Database is /GaBi ts/..

4. LCA: Scenarios and additional technical information

The following technical information is a basis for the declared modules or can be used for developing specific scenarios in the context of a building assessment if modules are not declared (MND).
The values refer to the declared unit of 1 m² XPS.

Transport to the building site (A4)

Name	Value	Unit
Payload of truck	5	t
Litres of fuel diesel with maximum load	0.012	l/100km
Transport distance (market-weighted average)	521	km
Capacity utilisation (including empty runs)	70	%
Gross density of products transported	33	kg/m^3

Installation into the building (A5)
At the construction site, 18.3 g of PE film are applied per m². Disposal of the packaging materials takes place in module A5 and is not declared in this EPD.

End of life (C2, C3 and C4)
For the End of Life stage two different scenarios are considered. One scenario with 100% incineration (sc. 1: C3, D) and one scenario with 100% landfill (sc. 2: C4) are calculated. The incineration of XPS results in benefits, beyond the system boundary, for thermal energy and electricity under European conditions.

The transport to End of Life (C2) is calculated with a distance of 50 km (with 70% utilization).

Name	Value	Unit
Collected separately XPS	3.3	kg
Landfilling Scenario 2	3.3	kg
Energy recovery Scenario 1	3.3	kg

Reuse, recovery and/or recycling potentials (D), relevant scenario information

Module D includes the credits of the incineration process C3 (incineration of XPS boards). A waste incineration plant with R1-value > 0.6 is assumed.

5. LCA: Results

The following tables display the environmental relevant results according to /EN 15804/ for 1 m² XPS board. The two EoL Scenarios are represented in modules C3, C4 and D. C3 and D show the environmental results in case of thermal treatment of XPS-boards, module C4 reflects the landfilling of XPS (for scenario 2 "landfilling" the values in Module D are 0).

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	MND	MND	MND	MNR	MNR	MNR	MND	MND	MND	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 m² XPS board with a thickness of 100 mm

Parameter	Unit	A1-A3	A4	C2	C3	C4	D
Global warming potential	[kg CO_2-Eq.]	9.14E+0	2.76E-1	2.58E-2	1.11E+1	2.26E-1	-4.70E+0
Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	5.69E-14	4.58E-17	4.29E-18	1.00E-15	7.91E-16	-6.49E-14
Acidification potential of land and water	[kg SO_2-Eq.]	1.60E-2	6.43E-4	6.01E-5	6.54E-4	6.25E-4	-7.95E-3
Eutrophication potential	[kg $(PO_4)^{3-}$-Eq.]	1.89E-3	1.59E-4	1.49E-5	1.35E-4	6.33E-4	-8.60E-4
Formation potential of tropospheric ozone photochemical oxidants	[kg ethene-Eq.]	1.41E-2	-2.13E-4	-2.00E-5	6.45E-5	7.04E-5	-6.29E-4
Abiotic depletion potential for non-fossil resources	[kg Sb-Eq.]	2.30E-6	2.14E-8	2.00E-9	7.18E-8	4.38E-8	-8.49E-7
Abiotic depletion potential for fossil resources	[MJ]	2.66E+2	3.76E+0	3.52E-1	1.11E+0	3.45E+0	-6.63E+1

RESULTS OF THE LCA - RESOURCE USE: 1 m² XPS board with a thickness of 100 mm

Parameter	Unit	A1-A3	A4	C2	C3	C4	D
Renewable primary energy as energy carrier	[MJ]	1.32E+1	2.19E-1	2.05E-2	2.37E-1	2.46E-1	-1.69E+1
Renewable primary energy resources as material utilization	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Total use of renewable primary energy resources	[MJ]	1.32E+1	2.19E-1	2.05E-2	2.37E-1	2.46E-1	-1.69E+1
Non-renewable primary energy as energy carrier	[MJ]	1.42E+2	3.77E+0	3.53E-1	1.33E+2	3.57E+0	-8.33E+1
Non-renewable primary energy as material utilization	[MJ]	1.34E+2	0.00E+0	0.00E+0	-1.32E+2	0.00E+0	0.00E+0
Total use of non-renewable primary energy resources	[MJ]	2.76E+2	3.77E+0	3.53E-1	1.32E+0	3.57E+0	-8.33E+1
Use of secondary material	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Use of renewable secondary fuels	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Use of non-renewable secondary fuels	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Use of net fresh water	[m³]	4.92E-2	3.70E-4	3.46E-5	2.11E-2	6.05E-5	-1.99E-2

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: 1 m² XPS board with a thickness of 100 mm

Parameter	Unit	A1-A3	A4	C2	C3	C4	D
Hazardous waste disposed	[kg]	1.35E-7	2.11E-7	1.97E-8	1.37E-9	1.50E-8	-3.43E-8
Non-hazardous waste disposed	[kg]	5.47E-2	3.07E-4	2.87E-5	6.35E-2	3.29E+0	-3.60E-2
Radioactive waste disposed	[kg]	3.79E-3	5.12E-6	4.79E-7	8.43E-5	4.76E-5	-6.74E-3
Components for re-use	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Materials for recycling	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Materials for energy recovery	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Exported electrical energy	[MJ]	0.00E+0	0.00E+0	0.00E+0	1.71E+1	0.00E+0	0.00E+0
Exported thermal energy	[MJ]	0.00E+0	0.00E+0	0.00E+0	3.93E+1	0.00E+0	0.00E+0

6. LCA: Interpretation

Overall most of the impact categories and LCI parameters are dominated by the polystyrene (PS) production.
Another very important driver is the electricity consumption during XPS production. Emissions of blowing agents during the manufacturing process are of relevant influence within the photochemical ozone creation potential.
In general the transports, the production of blowing agents and flame retardant have low relevance regarding the considered impact categories. The chosen End of life (EoL) scenario has a high influence on the results. Moreover, the eutrophication potential (EP) is influenced by the end of life in case of scenario landfill.

There is a difference detectable regarding primary energy renewable between A1-A3 and the benefit in D. In this study renewable energy is only consumed via the electricity grid mix. Due to the high heating value of XPS the benefit of electricity generated in the waste incineration plant is higher than the requested electricity during manufacturing. Moreover the additional benefit is caused by the use of different electricity datasets on the input and output side. In A1-A3 country-specific electricity data sets are used on

the base of the market share. In D the model refers to an average EU electricity dataset with higher renewable energy content.

7. Requisite evidence

7.1 VOC Emissions

XPS products can be used indoor however they are generally not exposed to the indoor air but covered by a finishing element or system.
The emissions of 14 samples of XPS products from all EXIBA members have been tested by Eurofins Product Testing A/S, Denmark in July 2011.
The emission testing met the requirements of the Committee for Health-related Evaluation of Building Products/German Institute for Structural Engineering (AgBB) method.
The tested products all complied with the requirements of /AgBB/ (May 2010) for the use in the indoor environment.
The tested products also all achieved the A+ rating of the French VOC labelling scheme.

VOC Emissions

Name	Value	Unit
Overview of Results (28 days)	-	µg/m³
TVOC (C6 - C16)	0 - 1000	µg/m³
Sum SVOC (C16 - C22)	0 - 100	µg/m³
R (dimensionless)	0 - 1	-
VOC without NIK	0 - 100	µg/m³
Carcinogenic Substances	not detected	µg/m³

7.2 Leaching performance

Leaching behaviour is not relevant for extruded polystyrene foam products.

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

/AgBB/
Indoor air quality requirements in buildings: Health evaluation of volatile organic compounds (VVOC, VOC and SVOC) emissions from construction products, German Committee for Health-Related Evaluation of Building Products, 2010

/Arrêté/
Arrêté du 19 avril 2011 relatif à l'étiquetage des produits de construction ou de revêtement de mur ou de sol et des peintures et vernis sur leurs émissions de polluants volatils

/CPR/
Regulation No. 305/2011: Construction Products Regulation of the European Parliament and of the European Council, 2011.

/PCR Part A/
/PCR 2018 - Part A/, Calculation rules for the Life Cycle Assessment and Requirements on the Background Report, Version 1.7, Institut Bauen und Umwelt e.V., 2018, www.bau-umwelt.com

/PCR Part B/
Product category rules for construction products Part B: Requirements of the EPD for foam plastic insulation materials, version 1.7, 2017
www.bau-umwelt.de

/ISO 9001/
/ISO 9001: 2015/, Quality management systems - Requirements

/ISO 14001/
/ISO 14001: 2015/, Environmental management systems - Requirements with guidance for use

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

/EN 1604/
/EN 1604: 2013/, Thermal insulating products for building applications – Determination of dimensional stability under specified temperature and humidity conditions

/EN 1605/
/EN 1605: 2013/, Thermal insulating products for building applications – Determination of deformation under specified compressive load and temperature conditions

/EN 1606/
/EN 1606: 2013/, Thermal insulating products for building applications – Determination of compressive creep

/EN 1607/
/EN 1607: 2013/, Thermal insulating products for building applications – Determination of tensile strength perpendicular to face

/EN 12086/
/EN 12086: 2013**/,** Thermal insulation products for

building applications – Determination of water vapour trans-mission properties

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