ENVIRONMENTAL PRODUCT DECLARATION

as per /ISO 14025/ and /EN 15804/

Owner of the Declaration	Sto SE & Co. KGaA
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-STO-20190105-IBA1-DE
Issue date	7 January 2020
Valid until	6 January 2025

Carrier boards. Formulations in the qualities (classes) B1 in accordance with DIN 4102-1 and A2-s1, d0 in accordance with EN 13501-1

Sto SE & Co. KGaA

Institut Bauen und Umwelt e.V.

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

1. General information

Sto SE & Co. KGaA	Sto-Render Carrier Board and StoPrefa Render Carrier Board
Programme holder IBU – Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany	**Owner of the Declaration** Sto SE & Co. KgaA Ehrenbachstraße 1 D-79780 Stühlingen
Declaration number EPD-STO-20190105-IBA1-DE	**Declared product/Declared unit** 1 m² carrier board (20 mm) with formulation in the quality (class) A2-s1, d0 in accordance with EN 13501-1. A conversion formula and conversion factors (see Chapters 4 and 5) are also available for calculations relating to 1 m² carrier board (12 mm) with the formulation in the quality (class) B1 in accordance with DIN 4102-1 (names: StoVentec Carrier Board or StoPrefa Render Carrier Board) and 1 m² carrier board with the formulation in the quality (class) A2-s1, d0 in accordance with EN 13501-1 (names: StoVentec Carrier Board A in 12 mm and StoPanel Plus in 12 mm and 20 mm).
This Declaration is based on the Product Category Rules: Lightweight construction boards made of expanded glass granulate and reactive resins, 07.2014 (PCR tested and approved by the independent committee of experts)	**Scope:** This EPD relates to carrier boards (20 mm) with formulations in the qualities (classes) B1 in accordance with DIN 4102-1 and A2-s1, d0 in accordance with EN 13501-1. These are produced by Verotec GmbH, Hanns-Martin-Schleyer-Straße 1, 89415 Lauingen, Germany. This is an environmental declaration for a specific product.
Issue date 07/01/2020	
Valid until 06/01/2025	The holder of this declaration is responsible for ensuring basic information and verification; IBU will accept no liability for manufacturer information, Life Cycle Assessment data, or verification.
	Verification The European standard /EN 15804/ serves as the core PCR Independent verification of the declaration and information in accordance with /ISO 14025:2010/ ☐ internal ☒ external
Dipl. Ing. Hans Peters (President of Institut Bauen und Umwelt e.V.)	
Dr Alexander Röder (Managing Director of IBU)	Dr.-Ing. Wolfram Trinius, independent verifier appointed by the independent committee of experts

2. Product

2.1 Product description/definition

Pressed carrier boards made of expanded glass granulate and reactive resins with glass fibre mesh reinforcement on both sides. The expanded glass granulate is made of recycled glass. The carrier boards fall into two categories:

1. Formulation in quality (class) B1 in accordance with /DIN 4102-1/. This includes the products listed below:

- StoVentec Carrier Board (12 mm)
- Sto-Render Carrier Board (20 mm)
- StoPrefa Render Carrier Board (12 mm, 20 mm)

2. Formulation in quality (class) A2-s1, d0 in accordance with /EN 13501-1/. This includes the products listed below:

- StoVentec Carrier Board A (12 mm)
- StoPanel Plus (12 mm, 20 mm)

In this EPD, the carrier board with a thickness of 20 mm and a formulation in the quality (class) B1 in accordance with /DIN 4102-1/ has been declared. A conversion formula and conversion factors (see Chapters 4 and 5) are also available for calculations relating to 1 m² carrier board with the formulation in the quality (class) B1 in accordance with /DIN 4102-1/, in 12 mm (names: StoVentec Carrier Board or StoPrefa Render Carrier Board), or 1 m² carrier board in the formulation in the quality (class) A2-s1, d0 in accordance with /EN 13501-1/ (names: StoVentec Carrier Board A in 12 mm or StoPanel Plus in 12 mm and 20 mm).

The relevant national regulations at the site of use apply when using this product. In Germany, for example, these are the building regulations that apply within the individual federal states and the technical provisions based on these regulations.

2.2 Area of application

The carrier boards are suitable for use in rainscreen cladding systems or for ceiling claddings in outdoor areas.
They can also be used in combination with external wall insulation systems and in interiors.

Placing on the market/application rules
Z-10.3-717 and ETA-17/0406 StoVentec R facade system with render coating.
Z-33.2-776 StoVentec C/M/S with ceramic, natural stone, and glass mosaic.
Z-10.3-710 and ETA-17/0406 StoVentec facade system with render coating on timber sub-construction
Z-10.3-720 StoVentec glass panels for use with ventilated external wall or ceiling cladding
Z-33.2-1152 StoVentec G facade system with glass surface

2.3 Technical data

Constructional data

Designation	Value	Unit
Bulk density TIAP 120 (Sto internal)	approx. 500	kg/m³
Thermal conductivity /DIN 52612/	0.09	W/(mK)
Swelling characteristics in water (23 °C) VIAM 020 (Sto internal)	0.4	mm/m
Swelling characteristics (23 °C) VIAM 015 (Sto internal)	0.4	mm/m
Modulus of elasticity /EN ISO 178/	1,700–1,900	N/mm²
Thermal expansion VIAM 020 (Sto internal)	0.000011	1/K
Water vapour diffusion-equivalent air layer thickness /EN ISO 7783-2/	19	µ

Product performance values in relation to its characteristics according to the relevant technical regulations (no CE marking).

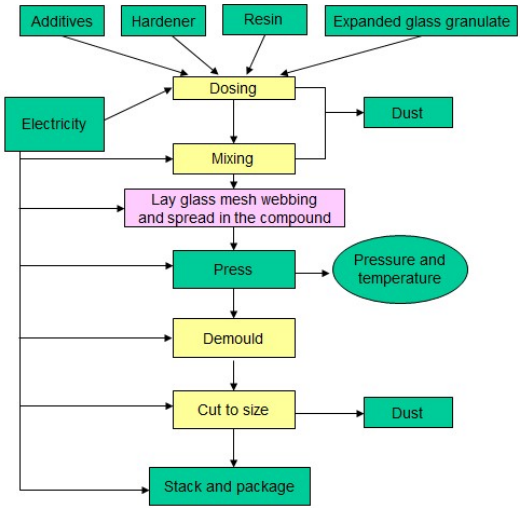
2.4 Delivery status

Delivery formats:
Boards up to a maximum length of 3,200 x 1,250 mm can be produced.

2.5 Base materials/processing aids

Base material	Mass [%]
Expanded glass granulate	< 85
Filling materials	< 10
Propellant and hydrophobic agents	< 1
Reactive polymer resin	< 10
Hardener	< 2
Glass fibre mesh	< 7

2.6 Manufacturing



This method is specific to the manufacturing location. The product components are dosed and mixed. The glass fibre mesh is laid out in the press mould and the mixture distributed. After being pressed at an increased temperature, the carrier boards are demoulded and cut to size.

2.7 Environment and health during manufacturing

Dust removal in the dosing, weighing, mixing, and cutting to size areas. The dust is disposed of. Staff wear protective glasses and P1 dust masks when cutting the finished boards.
Gloves must be worn when distributing the filling in the press mould. No further effects of the manufacturing process on the environment are known.

2.8 Product application/installation

In cases where the carrier boards are being used in a rainscreen cladding facade, they are screwed onto the sub-construction carrier profiles (metal or timber batten frame T/L-profiles).

A professional rechargeable screwdriver is normally used to screw them on.

Noise reduction precautions during installation are not necessary as rechargeable screwdrivers do not cause

any appreciable noise. The boards are installed manually as is common in facade construction.

In cases where the boards (8 or 20 mm) are being used in combination with external wall insulation systems, they are usually glued to the substrate and may also be mechanically fixed with anchors.

2.9 Packaging

Board formats up to 1,200 x 800 mm are stacked on Euro pallets. The Euro pallets are reused in the deposit recirculation system.
Board formats of > 1,200 x 800 mm are stacked on disposable pallets. The disposable pallets are reused thermally to generate energy. All boards are protected by being wrapped in polyethylene sheeting.
The waste code according to the European waste catalogue /EAK/ is 15 01 02 for plastic packaging (polythene film) and 15 01 03 for timber packaging (wooden pallets).

2.10 Usage conditions

The carrier boards are fixed to a suitable sub-construction or glued to the substrate. They are always coated and are not exposed to the weathering.
The product remains unchanged during its entire utilisation phase.

2.11 Environment and health during use

In outdoor areas, the carrier boards are fixed to a sub-construction or glued to the substrate and coated.
Nothing is known of any hazards to the environment or to health and none are expected.
No emissions are produced during the utilisation phase.
Epoxy resin reacts with the hardener component during the press process and does not diffuse further in the utilisation phase.

2.12 Reference service life

According to the BNB Sustainable Building assessment system of 7 July 2011, the carrier board approximately corresponds to /Code Nr. 335.915 (BNB)/, / wall coverings (systems): plastic, multi-layer lightweight construction boards with a service life of 40 years.
The board structure of recycled glass and reactive resin is extremely stable in its coated state. The reference service life could therefore be synonymous with the service life of the structure / building element.

2.13 Extraordinary effects

Fire
Information on the toxicity of the possible fire gases CO / CO2 and nitrogen oxides is to be found in the /ECOTOX Database/.

Water
Water pollution is possible in case of flooding or disposal on a disposal site. The leaching components are listed in a separate inspection report (see Chapter 7).

Mechanical destruction
No impact on the environment is to be expected in case of mechanical destruction.

2.14 Reuse phase

The used boards are not re-used or recycled after dismantling/demolition.

2.15 Disposal

The boards are disposed of following dismantling /demolition. The waste code according to the European waste catalogue (EAK) is 17 09 04.

2.16 Further information

The technical data sheet and the safety data sheet are available from: www.sto.de

3. LCA: Calculation rules

3.1 Declared unit

For the purposes of calculating the LCA, the declaration relates to 1 m² carrier board (20 mm) with a formulation in the quality (class) B1 in accordance with /DIN 4102-1/ (names: Sto-Render Carrier Board and StoPrefa Render Carrier Board) and a calculated density of 526 kg/m³. The calculated mass per unit area is 10.52 kg/m² for a board measuring 20 mm thick.

Declared unit

Designation	Value	Unit
Declared unit	1	m^2
Bulk density	526	kg/m^3
thickness	0.02	m
Conversion factor for 1 kg	0.095	-

A conversion formula and conversion factors (see Chapters 4 and 5) are also available for calculations relating to 1 m² carrier board with the formulation in the quality (class) B1 in accordance with /DIN 4102-1/, in 12 mm (names: StoVentec Carrier Board or StoPrefa Render Carrier Board), or 1 m² carrier board in the formulation in the quality (class) A2-s1, d0 in accordance with /EN 13501-1/ (names: StoVentec Carrier Board A in 12 mm or StoPanel Plus in 12 mm and 20 mm).

3.2 System boundary

EPD type: cradle to gate – with options. The LCA takes into account raw material extraction, raw material transport, the actual product manufacture with packaging materials (modules A1-A3), the treatment of the packaging materials in waste incineration units after installation of the product (module A5), transport following removal (module C2), and disposal of the product in a landfill for inert matter (module C4). The credits for electrical and thermal energy from disposal of the packaging have also been taken into account (module D). The use stage (module B) is not included in this study.

3.3 Estimates and assumptions

Apart from the assumptions for the scenarios described in Chapters 3.8 and 4, no estimates and assumptions were made since production processes

with GaBi data were available for all relevant raw materials.

3.4 Cut-off criteria
All the operating data collected was included in the LCA, i.e. all starting materials listed in the formulation, the thermal energy used, the power consumption, and all direct production waste.

Machines, equipment, and infrastructure required for production are not included.

3.5 Background data
The software system GaBi ts /GaBi 8.7/, developed by thinkstep AG, was used for modelling the life cycle for the production and disposal of the declared Verotec GmbH boards. The data records in the GaBi database are documented and can be viewed online in the GaBi-documentation /GaBi 8.7 B/.
The 2014 stream mix from /GaBi 8.7/ was used for the 2018 update.

3.6 Data quality
The overall data quality for the modelling can be regarded as good. The GaBi database contained the corresponding consistent records for all relevant pre-products and processing aids used. The last audit of the data used was less than two years ago.

For modelling purposes, data (with reference year 2017) was collected for all the relevant parameters. The data for the packaging material per m² was taken from 2011.

The manufacturer-specific modelling of the expanded glass was also updated as a background data record.

3.7 Period under review
The stock of data for this LCA is based on data collected from 2017. The quantities of raw materials, energy, and input and operating materials used are included as average values from a period of 12 months in the Lauingen plant.

3.8 Allocation
Packaging materials are burnt in a waste incineration unit. These are input-specifically modelled in the model. Emissions which occur in the process are included in the model (module A5). Credits for thermal recycling in accordance with their elementary composition and the resulting thermal values are included in module D.
No by-products are created in the Verotec GmbH plant.

3.9 Comparability
A comparison or the assessment of EPD data is generally only possible if all records to be compared were compiled in accordance with /EN 15804/ and the building context and/or the product-specific characteristics are taken into account.
The LCA has been carried out using GaBi ts /GaBi 8.7 2018/ software for holistic balancing, developed by thinkstep AG, and the GaBi database. All the data records are documented and can be viewed online in the GaBi-documentation /GaBi 8.7 B/.

4. LCA: Scenarios and additional technical information

The following technical information is necessary for the declared modules or can be used for the development of specific scenarios in the context of building assessment.

Installation in the building (A5)
The following packaging materials can be found on the construction site:

Wooden pallets 0.348 kg
Paper 0.0334 kg
Polyethylene sheeting 0.00532 kg

End of the life cycle (C1-C4)
Module C2 is taken into account. The transport distance is set as 50 km (customer's assumption).

Designation	Value	Unit
Collected as mixed construction waste	10.5	kg
For landfill disposal	10.5	kg

The two tables below contain the conversion factors (F) for calculating the LCA:

Explanation:
20 mm nb = conversion factor (F) for the formulation in the quality (class) A2-s1, d0 in accordance with EN 13501-1, StoPanel Plus (20 mm)
12 mm nb = conversion factor (F) for the formulation in the quality (class) A2-s1, d0 in accordance with EN 13501-1, StoVentec Carrier Board A (12 mm) and StoPanel Plus (12 mm)
12 mm = conversion factor (F) for the formulation in the quality (class) B1 in accordance with DIN 4102-1, StoVentec Carrier Board (12 mm) and StoPrefa Render Carrier Board (12 mm)

A1 - A3	20 mm nb	12 mm	12 mm nb
GWP	0,93	0,61	0,64
ODP	0,95	0,68	0,71
AP	0,96	0,63	0,66
EP	0,93	0,59	0,61
POCP	0,95	0,61	0,65
ADPE	0,96	0,71	0,74
ADPF	0,94	0,59	0,63
PERT	0,95	0,65	0,67
PENRT	0,93	0,60	0,63

	20 mm nb	12 mm	12 mm nb
A 5	1,00	0,55	0,55
C 2	0,96	0,57	0,59
C 4	0,96	0,57	0,59
D	1,00	0,55	0,55

For the results of modules A5, C2, C4, and D, the same conversion factor (F) is used for calculating the various indicators.

5. LCA: Results

All life cycle studies that have been declared are specified in Table 1 (“Description of the system boundary”) with “X”; all those that have not been declared are specified with “MNR” (module not relevant; modules B3, B4, and B5 are set to “MNR” as standard).

The following tables show the results of the impact estimation indicators, resource use, waste, and other output streams in relation to 1 m² of carrier board (20 mm) with the formulation in the quality (class) B1 in accordance with DIN 4102-1, manufactured by Verotec GmbH. The results for 1 m² with the formulation in the quality (class) B1 in accordance with DIN 4102-1 and the formulation in the quality (class) A2-s1, d0 in accordance with EN 13501-1 can be calculated using the conversion formula below. Calculations can be performed for carrier boards with thicknesses of 12 mm and 20 mm.

RESspec (specific result): RESspec = REStab x F

RESspec: specific calculated result, REStab: value from results table, F: conversion factor

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

Production stage			Construction process stage		Use stage							Disposal stage				Credits and loads beyond the system boundary
Raw material supply	Transport	Manufacturing	Transportation from the manufacturer to the location of use	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction / demolition	Transport	Waste processing	Elimination	Reuse, recovery, or recycling potential
A1	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
X	X	X	MND	X	MND	MND	MNR	MNR	MNR	MND	MND	MND	X	MND	X	X

RESULTS OF THE LCA – ENVIRONMENTAL IMPACT: 1 m² carrier board (20 mm) with the formulation in the quality (class) B1 in accordance with 4102-1

Parameter	Unit	A1-A3	A5	C2	C4	D
Global warming potential	[kg CO_2-Eq.]	1.50E+1	6.94E-1	4.32E-2	1.68E-1	-2.88E-1
Potential for depletion of the stratospheric ozone layer	[kg CFC11-Eq.]	6.69E-12	8.05E-15	9.09E-16	3.73E-14	-2.10E-13
Potential for ground and water acidification	[kg SO_2-Eq.]	2.83E-2	8.70E-5	3.51E-5	9.91E-4	-3.03E-4
Eutrophication potential	[kg $(PO_4)^3$-Eq.]	5.25E-3	1.86E-5	7.92E-6	1.37E-4	-5.08E-5
Formation potential for tropospheric ozone	[kg Ethen -Eq.]	2.31E-3	5.71E-6	-1.41E-6	7.71E-5	-2.62E-5
Potential for scarcity of abiotic resources – non-fossil resources	[kg Sb -Eq.]	6.35E-5	1.03E-8	4.49E-9	6.45E-8	-1.05E-7
Potential for the abiotic degradation of fossil fuels	[MJ]	2.27E+2	1.50E-1	5.79E-1	2.17E+0	-3.76E+0

RESULTS OF THE LCA – RESOURCE USE: 1 m² carrier board (20 mm) with the formulation in the quality (class) B1 in accordance with 4102-1

Parameter	Unit	A1-A3	A5	C2	C4	D
Renewable primary energy as an energy source	[MJ]	2.94E+1	2.51E+1	IND	2.79E+1	IND
Renewable primary energy for use of the material	[MJ]	2.48E+1	-2.48E+1	IND	0.00E+0	IND
Total renewable primary energy	[MJ]	3.19E+1	2.99E-2	3.91E-2	2.79E-1	-8.67E-1
Non-renewable primary energy as an energy source	[MJ]	2.08E+2	3.67E+1	IND	3.47E+1	IND
Non-renewable primary energy for use of the material	[MJ]	3.26E+1	-2.00E-1	IND	-3.24E+1	IND
Total non-renewable primary energy	[MJ]	2.41E+2	1.67E-1	5.81E-1	2.25E+0	-4.22E+0
Use of secondary materials	[kg]	9.15E+0	3.87E-1	IND	IND	IND
Renewable secondary fuels	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Non-renewable secondary fuels	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Use of freshwater resources	[m³]	3.83E-2	1.70E-3	4.54E-5	4.28E-4	-5.53E-4

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: 1 m² carrier board (20 mm) with formulation in the quality (class) B1 in accordance with DIN 4102-1

Parameter	Unit	A1-A3	A5	C2	C4	D
Hazardous waste for landfill disposal	[kg]	7.45E-7	1.66E-10	3.73E-8	3.87E-8	-2.35E-9
Disposed-of, non-hazardous waste	[kg]	7.28E-1	3.70E-3	4.33E-5	1.05E+1	-2.19E-3
Disposed-of, radioactive waste	[kg]	5.30E-3	6.79E-6	7.02E-7	3.22E-5	-1.83E-4
Components for reuse	[kg]	IND	IND	IND	IND	IND
Materials for recycling	[kg]	IND	IND	IND	IND	IND
Materials for energy recovery	[kg]	IND	IND	IND	IND	IND
Exported electrical energy	[MJ]	IND	8.71E-1	IND	IND	IND
Exported thermal energy	[MJ]	IND	1.99E+0	IND	IND	IND

6. LCA: Interpretation

Primary energy non-renewable (PENRT)
The expanded glass, epoxy resin, and glass fibre mesh pre-products use the largest amount of non-renewable primary energy (just under 87 %). The epoxy resin accounts for a share of approx. 44 %. The power and thermal energy involved in manufacturing the boards themselves account for approx. 8 % of the total use.

Primary energy renewable (PERT)
The impact of the three pre-products (expanded glass, epoxy resin, and glass fibre mesh) accounts for just under 59 % in this case. The power consumption required to produce the boards contributes approx. 18 % to the result.

Global warming potential (GWP)
Approx. 83 % of the global warming potential is created by the expanded glass (42 %), epoxy resin (34 %), and glass fibre mesh (7 %) pre-products. Together, power and thermal energy contribute approx. 9 %. This is due to the carbon dioxide emissions in the upstream chains.

Ozone depletion potential (ODP)
The ozone depletion potential is dominated by power production at just under 7 %. The relevant emissions for this are non-methane volatile organic compounds (NMVOCs).

Acidification potential (AP)
The acidification is primarily the result of the pre-products expanded glass (approx. 43 % from the production of the expanded glass), epoxy resin (approx. 17 %, primarily from the production of pre-products), and glass fibre mesh (approx. 21 %). The provision of power and thermal energy contributes approx. 11 % to acidification.

Eutrophication potential (EP)
The eutrophication potential is primarily influenced by the provision of expanded glass (52 %). Epoxy resin contributes 19 % and glass fibre mesh approx. 9 % to the EP.

Photochemical ozone creation potential (POCP)
Epoxy resin (30 %), glass fibre mesh (18 %), and expanded glass (33 %), primarily from NMVOC and sulphur dioxide emissions in upstream chains, have the biggest impact on the POCP.

Potential for scarcity of elementary abiotic resources (ADP elements)
The abiotic consumption of resources is dominated by the provision of glass fibre mesh at just under 56 %. This can be attributed to the raw materials used for coating the glass fibre mesh.

Potential for scarcity of fossil abiotic resources (ADP of fossil fuels)
Fossil abiotic resource consumption is dominated by epoxy resin (35 %) and expanded glass (approx. 33 %). The most important energy sources are natural gas and mineral oil. The power and thermal energy involved in manufacturing the boards account for approx. 13 % in this category.

7. Requisite evidence

7.1 VOC emissions
The StoPanel Plus carrier board is also used in interiors. The measurements were performed by the TIAA – Analytics department at Sto SE & Co. KGaA in Stühlingen on 23 March 2010. There have been no formulation changes since then.

Emission measurements

Designation	Value	Unit
TVOC	<1,000	µg/m³
TSVOC	<100	µg/m³
R value	<1	µg/m³
VOC without LCI	<100	µg/m³
Carcinogenic substances	<1	µg/m³

7.2 Leaching
Leachability with water in accordance with /LAGA EW 98 S/ in relation to the assignment criteria for disposal classes in accordance with DepV and VVerDR (2009). Sto SE & Co. KGaA laboratory report “Ventec TP MP-LAGA EW98S.xls vom 24.02.2012“.

The carrier boards are assigned to disposal class 1 based on the laboratory results in accordance with /DepV/ and /VVerDR/.

8. References

/Committee for Health-related Evaluation of Building Products/
Committee for Health-related Evaluation of Building Products, 2010: assessment scheme for VOC from building products. 2010

/CML/
CML-IA Characterisation Factors; Institute of Environmental Sciences, 5 February 2013: http://cml.leiden.edu/software/data-cmlia.html

/Code Nr. 335.915/
Code Nr. 335.915 (BNB); Federal Office for Building and Regional Planning (BBSR), 2011: Nutzungsdauern von Bauteilen für Lebenszyklusanalysen nach Bewertungssystem Nachhaltiges Bauen (BNB) (Service lives of building elements for Life Cycle Assessments conducted according to the BNB Sustainable Building assessment system): https://www.nachhaltigesbauen.de/fileadmin/pdf/baustoff_gebauededaten/BNB_Nutzungsdauern_von_Bauteilen_2017-02-24.pdf, dated: 24 February 2017

/DIN 18516-1/
DIN 18516-1:2010-06 Cladding for external walls, ventilated at rear – Part 1: Requirements, principles of testing

/DIN 4102/

DIN 4102:1998 Fire behaviour of building materials and building components – Part 1: Building materials; concepts, requirements and tests

/DIN 52612/
DIN 52612:1984 Testing of thermal insulating materials; determination of thermal conductivity by means of the guarded hot plate apparatus; conversion of the measured values for building applications

/DIN EN 15804/
DIN EN 15804 Sustainability of construction works – Environmental product declaration – Core rules for the product category of construction products; German version EN 15804:2012, 2012-04

/DIN EN ISO 14025/
DIN EN ISO 14025: Environmental labels and declarations – Type III environmental declarations – Principles and procedures, 2009-11

/DIN EN ISO 178/
DIN EN ISO 178:2010 Plastics – Determination of flexural properties (ISO 178:2010); German version EN ISO 178:2010, 2011-04

/DIN EN 13501-1/
DIN EN 13501-1 Fire classification of construction products and building elements – Part 1: Classification using data from reaction to fire tests;
German version EN 13501-1:2007+A1:2009, 2010-01

/EN ISO 7783-2/
EN ISO 7783-2:1999 Paints and varnishes – Coating materials and coating systems for exterior masonry and concrete – Part 2: Determination and classification of water vapour transmission rate (permeability) (ISO 7783-2:1999), 1999-06

/ECOTOX Database/
ECOTOX Database https://cfpub.epa.gov/ecotox/**,** 2019-06

/GaBi 8.7/
GaBi 8.7 Software-System and Database for Life Cycle Engineering. Copyright, TM. Stuttgart, Echterdingen, 2018. http://www.gabi-software.com/international/support/

/GaBi 8.7 B/
GaBi 8.7 B 2018 GaBi database documentation: Extensive GaBi database LCI documentation – by dataset, thinkstep 2018. http://www.gabi-software.com/international/databases

/PCR Part A/
PCR Part A: Product Category Rules for Building-Related Products and Services. Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report, Version 1.7. Berlin: Institut Bauen und Umwelt e.V. (ed.), 2018.

/PCR Part B/
PCR Part B: Product Category Rules for Building-Related Products and Services. Part B: Requirements on the EPD for Lightweight Construction Boards Made of Expanded Glass Granulate and Reactive Resins, Version 1.6. Berlin: Institut Bauen und Umwelt e.V. (ed.), 2017-11.

/EWC/
European Waste Catalogue (EWC); Regulation (EC) No. 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006

/LAGA EW 98 S/
LAGA EW 98S Bund/Länder-Arbeitsgemeinschaft Abfall (Federal/State Working Group for Waste; LAGA) 33
https://www.umwelt-online.de/recht/abfall/laga/m33_ges.htm, September 2017

/DepV/ and /VVerDR/
DepV (Landfill Ordinance) and VVerDR (Ordinance on Simplifying Landfill Law): 2009, German Federal Ministry of Justice and Consumer Protection, and Federal Office of Justice
https://www.gesetze-im-internet.de/depv_2009/DepV.pdf, 27 April 2009

/IBU 2016/
IBU (2016): General EPD programme guide from Institut Bauen und Umwelt e.V. (IBU). Version 1.1, Institut Bauen und Umwelt e.V., Berlin.

/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.

Publisher
Institut Bauen und Umwelt e.V.
Panoramastr.1
10178 Berlin
Germany

Tel.: +49 (0)30 3087748- 0
Fax: +49 (0)30 3087748- 29
E-mail: info@ibu-epd.com
Web **www.ibu-epd.com**

Programme holder
Institut Bauen und Umwelt e.V.
Panoramastr.1
10178 Berlin
Germany

Tel.: +49 (0)30 3087748- 0
Fax: +49 (0)30 3087748- 29
E-mail: info@ibu-epd.com
Web **www.ibu-epd.com**

Author of the Life Cycle Assessment
thinkstep AG
Hauptstraße 111–113
70771 Leinfelden-Echterdingen
Germany

Tel. +49 711 341817-0
Fax +49 711 341817-25
E-mail info@thinkstep.com
Web **http://www.thinkstep.com**

Owner of the Declaration
Sto SE & Co. KGaA
Ehrenbachstr. 1
D-79780 Stühlingen
Germany

Tel. +49 7744 57-1010
Fax +49 7744 57-2010
E-mail infoservice@sto.com
Web **www.sto.com**