ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A1*

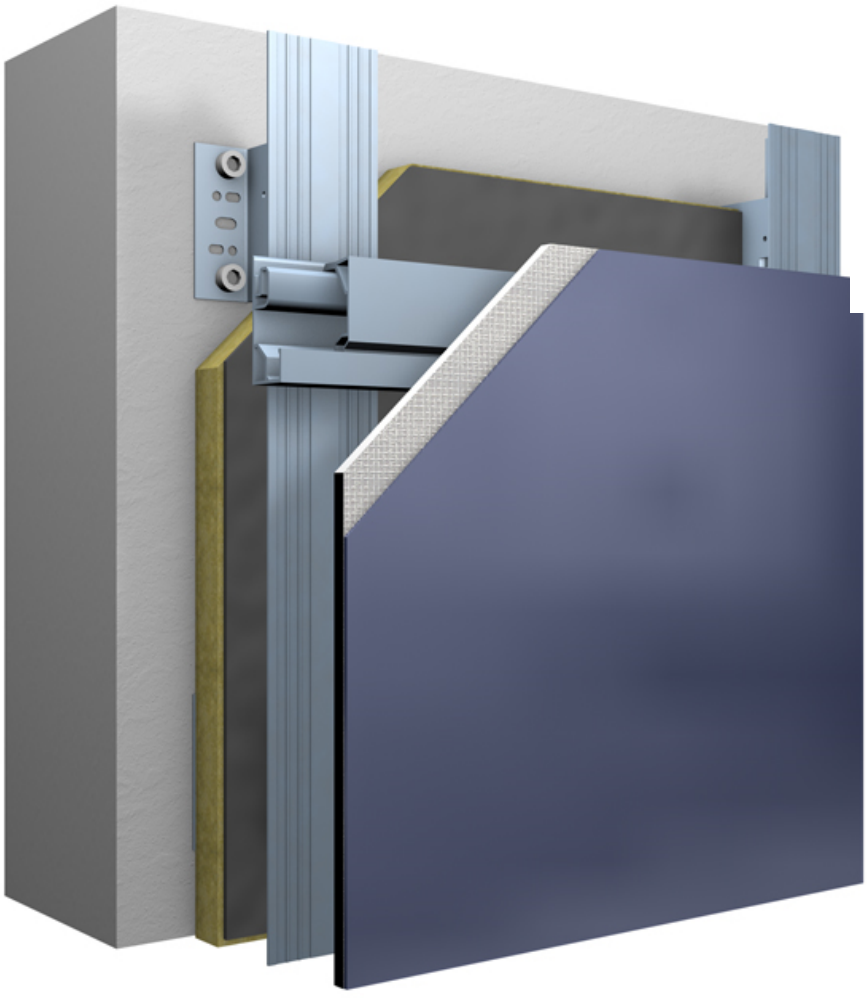
Owner of the Declaration	Sto SE & Co. KGaA and Sto Scandinavia AB
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-STO-20200208-CBA1-EN
Issue date	04/12/2020
Valid to	03/12/2025

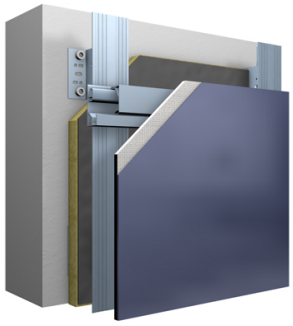
StoVentec Glass

Sto SE & Co. KGaA
Sto Scandinavia AB

Institut Bauen und Umwelt e.V.

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





Building with conscience.

General Information

Sto SE & Co. KGaA and Sto Scandinavia AB

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

Declaration number
EPD-STO-20200208-CBA1-EN

This declaration is based on the product category rules:
Curtain walling, 11/2015
(PCR checked and approved by the SVR)

Issue date
04/12/2020

Valid to
03/12/2025

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

Dr. Alexander Röder
(Managing Director Institut Bauen und Umwelt e.V.))

StoVentec Glass

Owner of the declaration
Sto SE & Co. KGaA
Ehrenbachstr. 1
79780 Stühlingen, Germany
and
Sto Scandinavia AB
Gesällgatan 6
582 77 Linköping, Sweden

Declared product / declared unit
1m² StoVentec Glass with a system weight (incl. Sto-Agrafe Profile) of 31,8 kg/m².

Scope:
This declaration covers the StoVentec Glass ventilated facade system only and does not include data for the subconstruction and insulation.

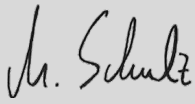
Product components are produced by Sto SE & Co. KGaA (production sites at Lauingen, Germany) and by external suppliers. The system components are then transported to the warehouse in Sweden, were the system is commissioned, packed and delivered.

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+A1*. 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 14025:2010*
☐ internally ☒ externally



Matthias Schulz
(Independent verifier)

Product

Information about the enterprise
Sto SE & Co. KGaA is a major international manufacturer of products and systems for building coatings with over 5,500 employees and € 1,39 billion in turnover (2019).The core business are facade systems of external wall insulation systems (EWIS) and rainscreen cladding facade systems (RSC). Sto Scandinavia AB operates in the Nordics (Sweden, Norway, Denmark and Finland) as a fully owned subsidiary to Sto SE & Co KGaA. The business includes development, production, marketing and sales of products, systems and solutions for facades, concrete, interior and floors.

Product description/Product definition
The StoVentec Glass product is a composite panel comprising a toughened enamelled glass which is bonded to a lightweight carrier board (made of expanded glass granulate) with an integrated panel carrier profile on the back side. The panel itself is being used within Rainscreen Cladding systems with a joint-accentuated appearance.

The StoVentec Glass product offers a wide range of different design options regarding formats, colours, glass types as well as glass surfaces. Thanks to the prefabrication of the panels, the installation on site is easy and not depending on weather conditions.

This environmental product declaration does only include the panel itself as well as the agrafe profile fixed to the subconstruction / wall but not the insulation and not the subconstruction being used within the Rainscreen Cladding system.

For the use and application of the product the respective national provisions at the place fo use apply, in Germany for example the building codes of the federal states and the corresponding national specifications apply.

Application
The declared product StoVentec Glass is being used as a joint-accentuated facade panel within an RSC (Rainscreen cladding) system. For the application and use national regulations apply. For example, in Germany the “Allgemeine bauaufsichtliche Zulassung Z-10.3-720” issued by the Deutsches Institut für Bautechnik (DiBt), Berlin, applies.

Technical Data

Name	Value	Unit
Formats vertical	max. 1,25x4,5	m
Formats horizontal	max. 3,75x1,5	m
Panel Weight (depending on glass thickness 6)	30	kg/m²
Panel thickness (without backrail)	30	mm
Fire resistance class acc. EN 13501-1	B-s1,d0	class
Heat transfer coefficient glass	NR	W/(m²K)
Driving rain impermeability acc EN 12154	NR	Pa
Air permeability	NR	class
Fire resistance class	NR	class
Resistance to own weight	NR	-
Direct airborne sound insulationn - 1	NR	dB
Radiation properties acc. EN 410 or 13363-1 and -2: Total energy transmittance g	NR	%
Radiation properties EN 410 or 13363-1 and -2: Light transmission level rv	NR	%

NR = not relevant

Performance data of the product with respect to its characteristics in accordance with the relevant technical provision (no CE-marking).

Base materials/Ancillary materials
This EPD applies with the following panel mass and the mass of the Sto-Agrafe profile.

The StoVentec Glass panel (incl. Sto-Agrafe Profile) has a total mass of around 31.8 kg/m² for this declaration comprising the following components:

- 6 mm toughened Glass (15 kg/m²)
- Silicone based adhesive (3 kg/m²)
- 20 mm StoVentec Carrier Board (10 kg/m²)
- Sto-Board Carrier Profile (1.8 kg/m²)
- Sto-Agrafe Profile (2 kg/m²)

This product/article/at least one partial article contains substances listed in the *candidate list* (date: 25.06.2020) exceeding 0.1 percentage by mass: No.

This product/article/at least one partial article does contain other carcinogenic, mutagenic, reprotoxic (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.

Reference service life
With regular installation and proper maintenance, the system can reach the life span of the building *Lengsfeld 2015*. The Sustainable Building Assessment System is above 50 years. A reference service life according to *ISO 15686* is not reported.

Maintenance
The surface quality is affected by climatic and environmental influences on the system over time.

LCA: Calculation rules

Declared Unit
The declared unit for the StoVentec Glass facade system is 1 m² with a surface weight of 31,80 kg/m² and a thickness of 30mm without agraffen profiles and 62mm with agraffen profiles.

Declared unit

Name	Value	Unit
Declared unit	1	m²
Conversion factor to 1 kg	0.03144 654088	-
Surface weight	31.8	kg/m²
Thickness	62	mm

System boundary
Cradle to gate - with options.

Description of the system boundaries:

Module A1 to A3:
This module considers the manufacturing of system components (e.g. carrier board, fastening, plaster etc.), the transport to the site in Sweden and the manufacturing/compiling of the façade system components. The impact for producing packaging materials is included as well.

Module A4:

This module considers 100 km truck transport to site. The transport distance can be modified project specific.

Module A5:
Treatment and disposal of packaging material. Credits for potential avoided burdens on electricity and thermal energy generation are declared in module D and affects only the rate of virgin material.

An average electricity consumption for installation is considered.

Installation losses have not been accounted for, since such losses highly depend on the specific building geometry and other site-specific factors. Installation losses may be estimated based on the LCA results for manufacturing and End-of-life (EoL), e.g. via scaling.

Module C1 to C4:
C1: Manual dismantling, no environmental burdens.
C2: 50 km transport to waste treatment by truck (may be adapted on building level).
C3: No additional waste processing, no environmental burdens.
C4: European scenario for average landfill emissions is declared.

Module D:
Benefits and loads for metal components and avoided burdens from packaging treatment.

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.

For calculating the LCA, the folllowing software and databases have been used:
GaBi Software version 9.5.1, Sphera Solutions GmbH, Stuttgart. GaBi Professional database, Service Pack 40, 2020.

LCA: Scenarios and additional technical information

Transport from the gate to the site (A4)

Name	Value	Unit
Litres of fuel	0.0259	l/100km
Transport distance	100	km
Capacity utilisation (including empty runs)	61	%

Assembly (A5)

Name	Value	Unit
Electricity consumption	0,2362	MJ/m²

Reference service life

Name	Value	Unit
Life Span (according to BBSR)	≤50	a

End of life (C1-C4)

Name	Value	Unit
Collected separately waste type	31.8	kg
Recycling	3.8	kg
Landfilling	28	kg

Building with conscience.

LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE 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	X	X	MND	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A1: 1 m² StoVentec Glass ventilated facade system

Parameter	Unit	A1-A3	A4	A5	C1	C2	C4	D
GWP	[kg CO_2-Eq.]	92.81	0.22	4.98	0.00	0.11	0.38	-30.00
ODP	[kg CFC11-Eq.]	8.52E-12	3.59E-17	1.50E-15	0.00E+0	1.79E-17	2.10E-15	-5.98E-14
AP	[kg SO_2-Eq.]	3.73E-1	1.72E-4	4.67E-4	0.00E+0	8.58E-5	2.43E-3	-1.28E-1
EP	[kg $(PO_4)^{3-}$-Eq.]	3.49E-2	3.16E-5	9.64E-5	0.00E+0	1.58E-5	2.73E-4	-6.42E-3
POCP	[kg ethene-Eq.]	5.12E-3	-7.77E-7	4.02E-5	0.00E+0	-3.88E-7	1.84E-4	-7.13E-3
ADPE	[kg Sb-Eq.]	8.38E-4	1.61E-8	1.70E-8	0.00E+0	8.04E-9	3.85E-8	-3.74E-6
ADPF	[MJ]	1247.22	2.97	1.09	0.00	1.49	5.42	-324.00

Caption	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

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A1: 1 m² StoVentec Glass ventilated facade system

Parameter	Unit	A1-A3	A4	A5	C1	C2	C4	D
PERE	[MJ]	400.62	0.17	22.40	0.00	0.08	2.04	-174.00
PERM	[MJ]	23.34	0.00	-22.00	0.00	0.00	-1.31	0.00
PERT	[MJ]	423.96	0.17	0.38	0.00	0.08	0.73	-174.00
PENRE	[MJ]	1274.98	2.98	15.60	0.00	1.49	90.50	-385.00
PENRM	[MJ]	99.15	0.00	-14.20	0.00	0.00	-84.90	0.00
PENRT	[MJ]	1374.13	2.98	1.41	0.00	1.49	5.58	-385.00
SM	[kg]	8.45	0.00	0.00	0.00	0.00	0.00	0.00
RSF	[MJ]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NRSF	[MJ]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	[m³]	7.48E-1	1.94E-4	1.16E-2	0.00E+0	9.70E-5	1.41E-3	-4.40E-1

Caption	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+A1: 1 m² StoVentec Glass ventilated facade system

Parameter	Unit	A1-A3	A4	A5	C1	C2	C4	D
HWD	[kg]	6.19E-6	1.39E-7	8.45E-10	0.00E+0	6.94E-8	8.50E-8	-1.56E-7
NHWD	[kg]	1.82E+1	4.56E-4	3.13E-2	0.00E+0	2.28E-4	2.80E+1	-8.17E+0
RWD	[kg]	5.02E-2	3.69E-6	1.25E-4	0.00E+0	1.85E-6	6.34E-5	-2.39E-2
CRU	[kg]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MFR	[kg]	0.00	0.00	0.00	3.80	0.00	0.00	0.00
MER	[kg]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EEE	[MJ]	0.00	0.00	7.60	0.00	0.00	0.00	0.00
EET	[MJ]	0.00	0.00	13.60	0.00	0.00	0.00	0.00

Caption	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; EEE = Exported thermal energy

References

AbZ: Z-10.3-720
National technical approval Z-10.3-720 Includes "StoVentec Glass" panels for use in rainscreen cladding façade or ceiling coverings, issued by the Deutsches Institut für Bautechnik (DiBt), Berlin

EAD 090019-00-0404
Kits for ventilated external wall claddings of lightweight boards on subframe with rendering applied in situ with or without thermal insulation.

DIN EN 410
The DIN EN 410 specifies the calculation method for determining the photometric and radiation-physical parameters of glazing.

DIN EN 12154
DIN EN 12154:2000-06, Curtain walling - Watertightness - Performance requirements and classification.

DIN EN 13363-1
Solar protection devices combined with glazing - Calculation of solar and light transmittance - Part 1: Simplified method

DIN EN 13363-2
Solar protection devices combined with glazing - Calculation of total solar energy transmittance and light transmittance - Part 2: Detailed calculation method

DIN EN 13501
DIN EN 13501-1:2019-05:Fire classification of construction products and building elements – Part 1: Classification using data from reaction to fire tests; German version EN 13501-1:2018.

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

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

ISO 15686
Buildings and constructed assets - Service life planning.

BBSR
Service Life of Building Components; version 03.11.2011: https://www.nachhaltigesbauen.de/austausch/nutzungsdauern-von-bauteilen/.

Candidate list
Candidate list of substances of very high concern for Authorisation - published in accordance with Article 59(10) of the REACH Regulation.

IBU 2016
Institut Bauen und Umwelt e.V.: General Programme Instructions for the Preparation of EPDs at the Institut Bauen und Umwelt e.V. Version 1., Berlin: Institut Bauen und Umwelt e.V., 2016. "http://www.ibu-epd." www.ibu-epd.com.

Lengsfeld 2015
Lengsfeld, Kristin: Beurteilung der Langzeitbewährung von Ausgeführten Wärmedämmverbundsystemen, Fraunhofer IBP-Bericht HTB-06/2015, beauftragt vom Fachverband Wärmedämmverbundsystem e. V., Juni 2015.

PCR 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 1.8. Berlin: Institut Bauen und Umwelt e.V. (Ed.), 04.07.2019.

PCR B: Curtain Walling
PCR Guidance-Texts for Building-Related Products and Services. Part B: Requirements on the EPD for Curtain walling, Version 1.6. Berlin: Institut Bauen und Umwelt e.V. (Ed.), 30.11.2017.

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

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

Author of the Life Cycle Assessment
Sphera Solutions GmbH
Hauptstraße 111- 113
70771 Leinfelden-Echterdingen
Germany

Tel +49 711 341817-0
Fax +49 711 341817-25
Mail info@sphera.com
Web **www.sphera.com**

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

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

Sto Scandinavia AB
Gesällgatan 6
58110 Linköping
Sweden

Tel +46 13 37 71 00
Fax +46 13 37 71 00
Mail kundkontakt@sto.com
Web **https://www.sto.se**