ENVIRONMENTAL PRODUCT DECLARATION

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

Owner of the Declaration	Sto Scandinavia AB
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-STO-20230192-CBA1-EN
Issue date	11.08.2023
Valid to	10.08.2028

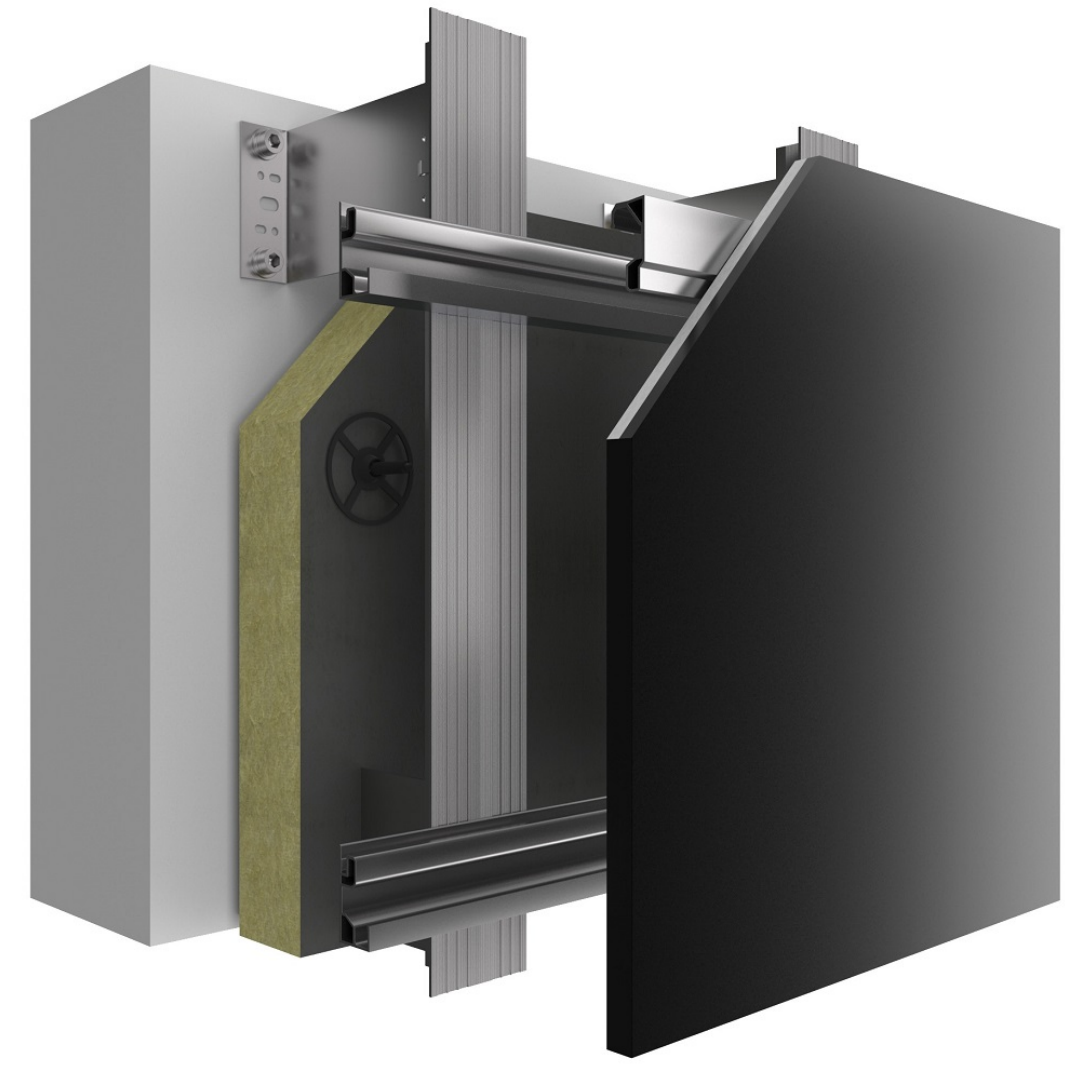
StoVentec Glass A

Sto SE & Co. KGaA

Institut Bauen und Umwelt e.V.

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

ECO PLATFORM EPD VERIFIED



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General Information

Sto SE & Co. KGaA

Programme holder

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

Declaration number

EPD-STO-20230192-CBA1-EN

This declaration is based on the product category rules:

Curtain walling, 01.08.2021
(PCR checked and approved by the SVR)

Issue date

11.08.2023

Valid to

10.08.2028

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

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

StoVentec Glass A

Owner of the declaration

Sto Scandinavia AB
Gesällgatan 6
58110 Linköping
Sweden

Declared product / declared unit

1m² of the product StoVentec Glass A (incl. Sto-Agrafe Profile).

Scope:

This environmental product declaration does only include the StoVentec Glass A 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.

Within this environmental product declaration the specific product named "StoVentec Glass A" with a fire behaviour classification A2-s1,d0 in accordance with EN 13501-1 is described.

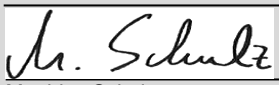
Environmental data of the product named "StoVentec Glass" with a fire behaviour classification B-s1,d0 in accordance with EN 13501-1 can be found in the annexe.

Product components are produced by Sto SE & Co. KGaA (production sites at Lauingen, Germany) and by external suppliers.
The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

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

Verification

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



Matthias Schulz,
(Independent verifier)

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Product

Product description/Product definition

The StoVentec Glass A product is a composite panel comprising a toughened enamelled glass which is bonded to a lightweight carrier board (made of expanded perlite 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 A 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.
For the placing of the product on the market in the European Union/European Free Trade Association/EU/EFTA (with the exception of Switzerland) the Regulation (EU) No. 305/2011 (CPR) applies. The product needs a declaration of performance taking into consideration ETA-23/0283 of 2023/05/15 StoVentec Glass A and the CE marking.

For the application and use the respective national provisions apply.
For example in Germany the "Allgemeine bauaufsichtliche Zulassung Z-10.3-720", issued by the Deutsches Institut für Bautechnik (DiBt) Berlin, applies.

Application

The declared product StoVentec Glass A is being used as a joint-accentuated facade panel within an RSC (Rainscreen cladding) system. For the application and use national regulations
apply.

Technical Data

StoVentec Glass A Panel

Name	Value	Unit
Formats vertical	max. 1,25x4,5	m
Formats horizontal	max. 3,75x1,5	m
Panel Weight (depending on glass thickness 6)	27	kg/m²
Panel thickness (without backrail)	23	mm
Fire resistance class acc. EN 13501-1	A2-s1,d0	class

Other constructional data are 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

The StoVentec Glass A panel (incl. Sto-Agrafe Profile) has a total mass of around 29,1 kg/m^2 comprising the following components:

- 6 mm toughened Glass (<60% by mass)
- Silicone- based adhesive (<2% by mass)
- 15 mm Verolith Carrier Board (<35% by mass)
- Sto-Board Carrier Profile (<10% by mass)
- Sto-Agrafe Profile (<10% by mass)

This product/article/at least one partial article contains substances listed in the
candidate list (date: 17.01.2023) 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. 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 A facade system is 1 m².

Declared unit

Name	Value	Unit
Declared unit	1	m^2
Grammage (with agraffenprofiles)	29.1	kg/m^2
Layer thickness (without agraffenprofiles)	0.023	m
Layer thickness (with agraffenprofiles)	0.055	m

System boundary

Type of EPD: Cradle to gate with options, modules C1- C4 and module D (A1-A3 + C + D and additional modules: A4, A5). The LCA considers the following modules of the life cycle:

Production Stage (A1-A3): The Product stage includes:

- A1 Raw material supply and processing,
- A2 Transport of raw materials to the manufacturer,
- A3 Production of StoVentec Glass A in the factory, (incl. energy provision, water provision, production of packaging materials)

Construction stage (A4-A5): The construction process stage includes:

- A4 transport to the construction site 100km by truck,
- A5 installation of the product with a machine and treatment of the packaging materials in waste incineration units after installation of the product

End-of-life stage (C1-C4): The end-of-life stage includes:

- C1 de-construction with machine
- C2 transport to waste processing; 50 km with truck
  Transport distance can be adjusted at building level if necessary (e.g., for 100 km actual transport distance: multiply LCA values by factor 2).
- C4 disposal of the product in a landfill for inert matter

Benefits and loads beyond the System Boundary (D):
Module D includes:
Loads and benefits from material recycling of metals and energy recovery potentials from the thermal treatment of the pallets and mixed plastic waste from packaging.

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

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.
The background data comes from the *GaBi* database *GaBi software Version CUP2022.2*

LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

Information on describing the biogenic Carbon Content at factory gate

Name	Value	Unit
Biogenic carbon content in product	-	kg C
Biogenic carbon content in accompanying packaging	0.795	kg C

Transport from the gate to the site (A4)

Name	Value	Unit
Transport distance	100	km

Assembly (A5)
Module A5 includes installation of the product with a machine and the treatment and disposal of packaging material. Benefits for potential avoided burdens due to energy substitution of electricity and thermal energy generation are declared in module D and affects only the rate of
primary material (no secondary materials)

Name	Value	Unit
Electricity consumption	0.2362	MJ/m²
wooden pallets	2.04	kg/m²
polyethylene	0.03	kg/m²
polystyrene	0.34	kg/m²
polypropylene	0.09	kg/m²

End of life (C1-C4)
Deconstruction (C1)
The product dismantling from the building is done with a machine

Transport to EoL treatment (C2)
Transport to waste treatment: 50 km by truck

Disposal (C4)
landfilling

Name	Value	Unit
Recycling	3.8	kg
Landfilling	25.3	kg

Reuse, recovery and/or recycling potentials (D), relevant scenario information
European datasets have been used.

Name	Value	Unit
For energy recovery (packaging)	2.5	kg

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LCA: Results

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

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

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m² StoVentec Glass A ventilated facade system

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	7.13E+01	2.08E-01	5.26E+00	2.75E-02	1.04E-01	0	3.78E-01	-2.96E+01
GWP-fossil	kg CO_2 eq	7.41E+01	2.07E-01	1.6E+00	2.75E-02	1.04E-01	0	3.78E-01	-2.95E+01
GWP-biogenic	kg CO_2 eq	-2.88E+00	0	3.66E+00	1.62E-05	0	0	0	-7.89E-02
GWP-luluc	kg CO_2 eq	3.43E-02	1.15E-03	1.03E-05	1.78E-06	5.75E-04	0	6.97E-04	-5.2E-03
ODP	kg CFC11 eq	1.22E-10	1.24E-14	6.1E-13	2.72E-13	6.18E-15	0	8.87E-13	-3.04E-11
AP	mol H^+ eq	3.78E-01	1.97E-04	7E-04	4.04E-05	9.84E-05	0	2.68E-03	-1.44E-01
EP-freshwater	kg P eq	7.62E-05	6.16E-07	9.28E-08	1.23E-08	3.08E-07	0	6.4E-07	-1.29E-05
EP-marine	kg N eq	7.17E-02	6.13E-05	2.12E-04	1.1E-05	3.07E-05	0	6.84E-04	-1.71E-02
EP-terrestrial	mol N eq	8.06E-01	7.37E-04	3.25E-03	1.18E-04	3.69E-04	0	7.52E-03	-1.86E-01
POCP	kg NMVOC eq	1.86E-01	1.71E-04	5.83E-04	3.12E-05	8.57E-05	0	2.08E-03	-5.36E-02
ADPE	kg Sb eq	3.89E-04	1.72E-08	1.15E-08	3.27E-09	8.62E-09	0	3.87E-08	-2.17E-06
ADPF	MJ	1.02E+03	2.76E+00	1.52E+00	5.83E-01	1.38E+00	0	4.95E+00	-3.76E+02
WDP	m^3 world eq deprived	7.66E+00	1.85E-03	5.12E-01	2.05E-03	9.25E-04	0	4.14E-02	-4.63E+00

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

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 m² StoVentec Glass A ventilated facade system

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	2.71E+02	1.57E-01	2.23E+01	8.43E-02	7.83E-02	0	7.42E-01	-1.78E+02
PERM	MJ	2.2E+01	0	-2.2E+01	0	0	0	0	0
PERT	MJ	2.93E+02	1.57E-01	3.01E-01	8.43E-02	7.83E-02	0	7.42E-01	-1.78E+02
PENRE	MJ	9.85E+02	2.76E+00	1.97E+01	5.83E-01	1.38E+00	0	2.67E+01	-3.77E+02
PENRM	MJ	3.99E+01	0	-1.82E+01	0	0	0	-2.17E+01	0
PENRT	MJ	1.02E+03	2.76E+00	1.52E+00	5.83E-01	1.38E+00	0	4.95E+00	-3.77E+02
SM	kg	0	0	0	0	0	0	0	3.61E+00
RSF	MJ	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0
FW	m^3	5.73E-01	1.77E-04	1.21E-02	1.28E-04	8.86E-05	0	1.26E-03	-4.41E-01

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 m² StoVentec Glass A ventilated facade system

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	9.39E-08	1.32E-11	1.31E-10	4.17E-11	6.61E-12	0	2.54E-10	4.12E-08
NHWD	kg	1.33E+01	3.96E-04	3.23E-02	1.24E-04	1.98E-04	0	2.53E+01	-8.18E+00
RWD	kg	3.99E-02	3.4E-06	1.52E-04	9.69E-05	1.7E-06	0	5.51E-05	-2.39E-02
CRU	kg	0	0	0	0	0	0	0	0
MFR	kg	0	0	0	3.8E+00	0	0	0	0
MER	kg	0	0	0	0	0	0	0	0

EEE	MJ	0	0	8.2E+00	0	0	0	0	0
EET	MJ	0	0	1.47E+01	0	0	0	0	0

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

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional:
1 m² StoVentec Glass A ventilated facade system

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	Disease incidence	3.35E-06	1.19E-09	3.73E-09	3.61E-10	5.93E-10	0	3.29E-08	-1.5E-06
IR	kBq U235 eq	7.35E+00	4.99E-04	2.33E-02	1.42E-02	2.49E-04	0	6.12E-03	-4.97E+00
ETP-fw	CTUe	7.86E+02	1.91E+00	5.93E-01	1.79E-01	9.57E-01	0	2.77E+00	-1.34E+02
HTP-c	CTUh	3.65E-08	3.86E-11	3.49E-11	3.29E-12	1.93E-11	0	4.23E-10	-1.72E-08
HTP-nc	CTUh	2.15E-06	2.01E-09	1.25E-09	1.7E-10	1.01E-09	0	4.69E-08	-3.6E-07
SQP	SQP	6.08E+02	9.48E-01	3.31E-01	5.35E-02	4.74E-01	0	1.03E+00	-1.6E+01

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

Disclaimer 1 – for the indicator “Potential Human exposure efficiency relative to U235”. This impact category deals mainly with the eventual impact of low-dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

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

References

Standards

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.

Further References

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.

GaBi ts documentation
GaBi life cycle inventory data documentation (https://www.gabisoftware.com/support/gabi/gabidatabase2020lcidocun

GaBi ts software
Sphera Solutions GmbH
GaBi Software System and Database for Life Cycle Engineering
CUP Version: 2022.2
University of Stuttgart
Leinfelden Echterdingen

IBU 2021
Institut Bauen und Umwelt e.V.: General Programme Instructions for the Preparation of EPDs at the Institut Bauen und Umwelt e.V. Version 2.0, Berlin: Institut Bauen und Umwelt e.V., 2021

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 Part A
PCR - Part A: Calculation Rules for the Life CycleAssessment and Requirements on the Project
Report,Berlin: Institut Bauen und Umwelt e.V., www.ibu-epd.com, Version 1.3, 2021

PCR B: Curtain Walling
PCR Guidance-Texts for Building-Related Products and Services. Part B: Requirements on the EPD for Curtain walling, Version 1. Berlin: Institut Bauen und Umwelt e.V. (Ed.), 2023.

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Annex

1. StoVentec Glass with Sto-Render Carrier Board (20 mm)

to the

ENVIRONMENTAL PRODUCT DECLARATION
as per *ISO 14025* and *EN 15804+A2*

Owner of the Declaration	Sto SE & Co. KGaA
Declaration number	
Issue date	
Valid to	

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

Institut Bauen und Umwelt e.V.

General Information

This document applies to StoVentec Glass with Sto-Render Carrier Board (20 mm) as a public annex to the EPD-STO-20230192-CBA1-EN document. The declared unit is 1 m^2 with various weights. The LCA data were based on production data from the year 2021.

Product

Technical Data

EPD StoVentec Glass

StoVentec Glass Panel		
Name	**Value**	**Unit**
Formats vertical	max. 1,25x4,5	m
Formats horizontal	max. 3,75x1,5	m
Panel Weight (glass thickness 6 mm)	29,8	kg/m²
Panel thickness (without backrail)	29	mm
Fire resistance class acc. EN 13501-1	B-s1,d0	class

Base materials/Ancillary materials

The StoVentec Glass panel (incl. Sto-Agrafe Profile) has a total mass of around 31,8 kg/m² comprising the following components:

- 6 mm toughened Glass (<60%)
- Silicone based adhesive (<2%)
- 20 mm Sto-Render Carrier Board (<35%)
- Sto-Board Carrier Profile (<10%)
- Sto-Agrafe Profile (<10%)

1. LCA: Calculation rules

Declared Unit
The declared unit is 1m².

Declared Unit

Name	Value	Unit
Declared Unit	1	m²
Grammage (StoVentec Glass with Sto-Render Carrier Board (20mm))	31,8	kg/m²

2. LCA: Scenarios and additional technical information

Characteristics product properties
Information on biogenic Carbon

Information on describing the biogenic Carbon Content at factory gate

Name	Value	Unit
Biogenic Carbon Content in accompanying packaging (StoVentec Glass with Sto-Render Carrier Board (20mm))	0.795	kg C

The following technical scenario information is required for the declared modules and optional for non-declared modules. 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. The values refer to the declared unit of 1 m² StoVentec Glass.

Transport to the building site (A4)

Name	Value	Unit
Transport distance	100	km

Installation into building (A5)
Module A5 includes installation of the product with machine and the treatment and disposal of packaging material. Benefits for potential avoided burdens due to energy substitution of electricity and thermal energy generation are declared in module D and affects only the rate of primary material (no secondary materials)

Name	Value	Unit
Electricity consumption	0.2362	MJ/kg
Wooden pallets	2.04	kg
polyethylene	0.03	kg
polystyrene	0.34	kg
polypropylene	0.09	kg

End of life (C1-C4)

Deconstruction (C1)
The product dismantling from the building is done with machine

Transport to EoL treatment (C2)
Transport to waste treatment: 50 km by truck

Disposal (C4)
landfilling

Name	Value	Unit
Recycling	3.8	kg

Landfilling (StoVentec Glass with Sto-Render Carrier Board (20mm))	28	kg

Name	Value	Unit
For energy recovery (packaging)	2.5	kg

Reuse, recovery and/or recycling potentials (D), relevant scenario information
Loads and benefits from material recycling of metals and beneftis for substituted thermal energy and electricity exported from modules A5.

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3. LCA: Results StoVentec Glass with Sto-Render Carrier Board (20mm)

The following tables display the environmental relevant results according to /EN 15804/ for 1 m^2 StoVentec Glass with Sto-Render Carrier Board (20mm)

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	MND	MND	MND	MND	MND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN15804+A2: 1 m^2 StoVentec Glass with Sto-Render Carrier Board (20mm)

Core Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	[kg CO_2-Eq.]	9,54E+01	2,26E-01	5,26E+00	2,75E-02	1,13E-01	0,00E+00	4,19E-01	-2,96E+01
GWP-fossil	[kg CO_2-Eq.]	9,81E+01	2,25E-01	1,60E+00	2,75E-02	1,12E-01	0,00E+00	4,18E-01	-2,95E+01
GWP-biogenic	[kg CO_2-Eq.]	-2,76E+00	0,00E+00	3,66E+00	1,62E-05	0,00E+00	0,00E+00	0,00E+00	-7,89E-02
GWP-luluc	[kg CO_2-Eq.]	4,71E-02	1,25E-03	1,03E-05	1,78E-06	6,24E-04	0,00E+00	7,71E-04	-5,20E-03
ODP	[kg CFC11-Eq.]	2,69E-10	1,34E-14	6,10E-13	2,72E-13	6,71E-15	0,00E+00	9,82E-13	-3,04E-11
AP	[mol H^+-Eq.]	4,55E-01	2,14E-04	7,00E-04	4,04E-05	1,07E-04	0,00E+00	2,96E-03	-1,44E-01
EP-freshwater	[kg PO_4-Eq.]	1,31E-04	6,68E-07	9,28E-08	1,23E-08	3,34E-07	0,00E+00	7,08E-07	-1,29E-05
EP-marine	[kg N-Eq.]	9,10E-02	6,66E-05	2,12E-04	1,10E-05	3,33E-05	0,00E+00	7,57E-04	-1,71E-02
EP-terrestrial	[mol N-Eq.]	1,02E+00	8,00E-04	3,25E-03	1,18E-04	4,00E-04	0,00E+00	8,32E-03	-1,86E-01
POCP	[kg NMVOC-Eq.]	2,47E-01	1,86E-04	5,83E-04	3,12E-05	9,30E-05	0,00E+00	2,30E-03	-5,36E-02
ADPE	[kg Sb-Eq.]	7,59E-04	1,87E-08	1,15E-08	3,27E-09	9,36E-09	0,00E+00	4,28E-08	-2,17E-06
ADPF	[MJ]	1,39E+03	2,99E+00	1,52E+00	5,83E-01	1,50E+00	0,00E+00	5,47E+00	-3,76E+02
WDP	[m^3 world-Eq deprived]	1,07E+01	2,01E-03	5,12E-01	2,05E-03	1,00E-03	0,00E+00	4,58E-02	-4,63E+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; WDP = Water use

RESULTS OF THE LCA – INDICATORS TO DESCRIBE RESOURCE USE according to EN15804+A2: 1 m^2 StoVentec Glass with Sto-Render Carrier Board (20mm)

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	[MJ]	4,44E+02	1,70E-01	2,23E+01	8,43E-02	8,50E-02	0,00E+00	2,13E+00	-1,78E+02
PERM	[MJ]	2,20E+01	0,00E+00	-2,20E+01	0,00E+00	0,00E+00	0,00E+00	-1,31E+00	0,00E+00
PERT	[MJ]	4,66E+02	1,70E-01	3,01E-01	8,43E-02	8,50E-02	0,00E+00	8,22E-01	-1,78E+02
PENRE	[MJ]	1,29E+03	3,00E+00	1,97E+01	5,83E-01	1,50E+00	0,00E+00	9,04E+01	-3,77E+02
PENRM	[MJ]	1,03E+02	0,00E+00	-1,82E+01	0,00E+00	0,00E+00	0,00E+00	-8,49E+01	0,00E+00
PENRT	[MJ]	1,39E+03	3,00E+00	1,52E+00	5,83E-01	1,50E+00	0,00E+00	5,48E+00	-3,77E+02
SM	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,61E+00
RSF	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	[m^3]	7,98E-01	1,92E-04	1,21E-02	1,28E-04	9,62E-05	0,00E+00	1,39E-03	-4,41E-01

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 EN15804+A2: 1 m² StoVentec Glass with Sto-Render Carrier Board (20mm)

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	[kg]	1,54E-07	1,44E-11	1,31E-10	4,17E-11	7,18E-12	0,00E+00	2,81E-10	4,12E-08
NHWD	[kg]	1,82E+01	0,00043	3,23E-02	1,24E-04	0,000215	0,00E+00	2,80E+01	-8,18E+00
RWD	[kg]	5,29E-02	3,69E-06	1,52E-04	9,69E-05	1,85E-06	0,00E+00	6,10E-05	-2,39E-02
CRU	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	[kg]	0,00E+00	0,00E+00	0,00E+00	3,80E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	[MJ]	0,00E+00	0,00E+00	8,20E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	[MJ]	0,00E+00	0,00E+00	1,47E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+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

RESULTS OF THE LCA– additional impact categories according to EN15804+A2-optional: 1 m² StoVentec Glass with Sto-Render Carrier Board (20mm)

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	[Disease Incidence]	4,10E-06	1,29E-09	3,73E-09	3,61E-10	6,44E-10	0,00E+00	3,65E-08	-1,50E-06
IR	[kBq U235-Eq.]	9,14E+00	5,41E-04	2,33E-02	1,42E-02	2,71E-04	0,00E+00	6,78E-03	-4,97E+00
ETP-fw	[CTUe]	1,03E+03	2,08E+00	5,93E-01	1,79E-01	1,04E+00	0,00E+00	3,07E+00	-1,34E+02
HTP-c	[CTUh]	1,37E-07	4,19E-11	3,49E-11	3,29E-12	2,09E-11	0,00E+00	4,68E-10	-1,72E-08
HTP-nc	[CTUh]	1,38E-05	2,18E-09	1,25E-09	1,70E-10	1,09E-09	0,00E+00	5,19E-08	-3,60E-07
SQP	[-]	1,25E+03	1,03E+00	3,31E-01	5,35E-02	5,15E-01	0,00E+00	1,14E+00	-1,60E+01

Caption	PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans; HTP-nc = Potential comparative Toxic Unit for humans; SQP = Potential soil quality index

Disclaimer 1 – for the indicator “Potential Human exposure efficiency relative to U235”. This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

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

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