SAINT-GOBAIN

ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

CLIMALIT PLUS®

6-16-44.1

6-16-44.1Si

Version 1
Date of publication: 29/08/2024
Validity: 5 years
Valid until: 28/08/2029
Scope of the EPD®: Spain and Portugal

EPD of multiple products, based on worst-case results

EPD® THE INTERNATIONAL EPD® SYSTEM

Programme: The International EPD® System, www.environdec.com
Programme operator: EPD International AB.
Registration number: **EPD-IES-0016334**

ECO PLATFORM EPD VERIFIED

EPD VERIFIED

Plus® climalit SAINT-GOBAIN

SAINT-GOBAIN GLASS

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com.

General information

Company information

Manufacturer: Cvglass (Central Vidriera Granadina S.L.), Vitral Grup, Ramos Industrias del Vidrio S.L., Acristalamientos Vinuesa, S.A., Glassolutions España for CLIMALIT® transformation.

Production plant: The Climalit® partners glass processors included in this analysis are Central Vidriera Granadina S.L., plant in Peligros (Granada); Vitral Tancaments, S.L.U., plant in Alcoletge (Lleida); Ramos Industrias del Vidrio S.L., plant in Leganés (Madrid), Acristalamientos Vinuesa, S.A., plant in Navalcaballo (Soria); and La Veneciana S.A., plant in Lalín (Pontevedra);
Management system: Main material input for the CLIMALIT Glazing is glass substrate PLANICLEAR, which is manufactured in production plants with an integrated management system certified according to ISO 9001:2015, ISO 14001:2015 and OHSAS 18001:2009 standards.
Programme used: The International EPD® System.
PCR identification: PCR 2019:14 Construction products (EN 15804:2012+A2:2019/AC:2021) version 1.3.2 and its c-PCR-009 Flat glass products used in buildings and other construction works (EN17074:2019)
Prepared by: IVL Swedish Environmental Research Institute, EPD International Secretariat
UN CPC CODE: 371 Glass and glass products
Owner of the declaration: Saint-Gobain Glass España Príncipe de Vergara 132, 28002 Madrid.
Product name and manufacturer represented: CLIMALIT PLUS® 6-16-44.1 and CLIMALIT PLUS® 6-16-44.1Si produced by CLIMALIT PARTNERS.
EPD® prepared by: Marcel Gómez and Serni Morera (Marcel Gómez Consultoría Ambiental), Fernando de la Rubia (Saint-Gobain) and Mariluz Jimeno (Saint-Gobain)
Contact : fernando.delarubia@saint-gobain.com; mariluz.jimeno@saint-gobain.com
Geographical scope of the EPD®: Spain and Portugal
EPD® registration number: EPD-IES-0016334
Declaration issued: 29/08/2024, valid until: 28/08/2029
Demonstration of verification: an independent verification of the declaration was made, according to ISO 14025:2010. This verification was external and conducted by the following third party based on the PCR mentioned above.

Programme information

PROGRAMME:	The International EPD® System
ADDRESS:	EPD International AB - Box 210 60 - SE-100 31 Stockholm - Sweden
WEBSITE:	www.environdec.com
E-MAIL:	info@environdec.com

CEN standard EN 15804:2012 + A2:2019/AC:2021 serves as the Core Product Category Rules (PCR)
Product category rules (PCR): PCR 2019:14 Construction Products, version 1.3.2 and its c-PCR-009 Flat glass products used in buildings and other construction works (EN17074:2019)
PCR review was conducted by: The Technical Committee of the International EPD® System. See www.environdec.com for a list of members.
Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact.
Independent third-party verification of the declaration and data, according to ISO 14025:2006:
☐ EPD process certification ☒ EPD verification by individual verifier
Third party verifier: Dr. Patxi Hernandez
AUREA Consulting Ireland
patxi@aureaconsult.com
Approved by: The International EPD© System
Procedure for follow-up of data during EPD validity involves third part verifier: ☒ Yes ☐ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

Product description

Product description and description of use

This Environmental Product Declaration (EPD®) describes the environmental impacts of 1 m² of CLIMALIT PLUS® 6-16-44.1 and 6-16-44.1Si for an expected average service life of 30 years.

This EPD is the result of an average of five glass processor sites from five CLIMALIT® partners in Spain, that use as main product the flat glass PLANICLEAR® manufactured in Saint-Gobain Glass Production Plant in Avilés. The EPD declares the results for multiple products, considering a weighted average of the production of the 5 factories.

CLIMALIT PLUS® is a high performing double glazing unit, meant for building applications (facades, windows …). CLIMALIT PLUS® incorporate a low emissivity coating on one face, which gives it its high-performing thermal properties. It complies with European standard EN 1279-5.
In this Environmental Product Declaration, one square m² of the following glazing configuration will be analyzed:

CLIMALIT PLUS® 6-16-44.1 and 6-16-44.1Si

Technical data/physical characteristics:

	CLIMALIT PLUS® 6-16-44.1	**CLIMALIT PLUS® 6-16-44.1Si**
Thickness (mm)	31	31
Visible parameters (CIE015:2018)		
Light transmittance (LT) %	71	71
External light reflection (RLE) (%)	14	14
Energetic parameters (EN410:2011)		
Energy transmittance (ET) %	33	33
Energy absorbance (EA) %	28	28
Solar factor g	0,37	0,37

Table 1: Performance Data of CLIMALIT PLUS® with PLANISTAR®

The performance data are given according to the EN 410-2011 standard.

Declaration of the main product components and/or materials

Description of the main components and/or materials for 1 m² of CLIMALIT PLUS®

PARAMETER		6-16-44.1Si	6-16-44.1	
Glass		96,61 %	97,03%	CAS number 65997-17-3, EINECS number 266-046-0
Coating		<0,01%	<0,01%	Metal oxides, which bring all the thermal properties to the glazing
Butyl sealant (Polymer)		0,02%	0,02%	Polymer
Sealant (polyurethane or polysulfide or silicone)		1,00%	1,01%	Polymers
Spacer bar (aluminium or plastic composite, called warm-edge)		0,56%	0,56%	Article
Desiccant		<0,01 %	<0,01%	CAS number 1318-02-1
Gas		0,071%	0,072%	Argon
PVB interlayer		1,82 %	1,39%	CAS number 63148-65-2 EINECS number 272-808-3
Thickness		31 mm		
Packaging for the transportation and distribution	**Rack**	7,81%		
	Film	0,02%		
	Seal tape	<0,01%		
	Spacer corks	<0,01%		
	Cardboard	0,05%		
Product used for the Installation		None		According to PCR EN 17074, none ancillary materials considered

There is no “Substance of Very High Concern” (SVHC) in concentration above 0,1% by weight, and neither do their packaging, following the European REACH regulation (Registration, Evaluation, Authorization and Restriction of Chemicals).

Description of the main product components and/or materials:

All raw materials contributing more than 5% to any environmental impact are listed in the following table.

Product components	Weight (kg)	Post-consumer material weight (%)	Biogenic material weight- and kg C/kg(%)
Glass	25-40	1%	0 %
Anodized aluminium	0,15-0,25	0 %	0 %
Polysulfide	0,20-0,45	0 %	0 %
Sum	**100%**	**1 %**	**0 %**
Packaging materials	**Weight (kg)**	**Weight (%)**	**Weight biogenic carbon kg C/kg**
Cast iron	2,83	7,81 %	0
Low density polyethylene	0,0076	0,02 %	0
Aluminium/PE (sealing tape)	0,0026	<0,01 %	0
Cork	0,0024	<0,01 %	0,5

Cardboard	0,0167	0,05 %	0,5

LCA calculation information

TYPE OF EPD	Cradle to grave and module D
FUNCTIONAL UNIT	1 m² of CLIMALIT PLUS® with a light transmittance of maximum 71% for an expected average service life of 30 years.
SYSTEM BOUNDARIES	Cradle to grave and module D Mandatory stages = A1-A3; A4-A5; B1-B7; C1-C4 and D
REFERENCE SERVICE LIFE (RSL)	According to PCR EN 17074:2019, the reference service life is 30 years
CUT-OFF RULES	All significant parameters shall be included. Life Cycle Inventory data for a minimum of 99% of total inflows to the upstream and core module shall be included. Flows related to human activities such as employee transport are excluded. Transportation in-site is excluded. The energy used for the installation of 1m² of glass is included in the cut-off-rules. Long-term emissions are excluded Infrastructure/capital goods are excluded
ALLOCATIONS	Allocations are done on mass basis (kg) The polluter pays and modularity principles have been followed
GEOGRAPHICAL COVERAGE AND TIME PERIOD	The information was established over the year 2021. The information collected comes from 5 manufacturing sites producing in Spain
BACKGROUND DATA SOURCE	Ecoinvent 3.8. The data are representative of the year 2021.
SOFTWARE	SimaPro 9.3.0.3

According to EN 15804+A2:2019/AC:2021, EPD of construction products may not be comparable if they do not comply with this standard. According to ISO 21930, EPD might not be comparable if they are from different programmes.

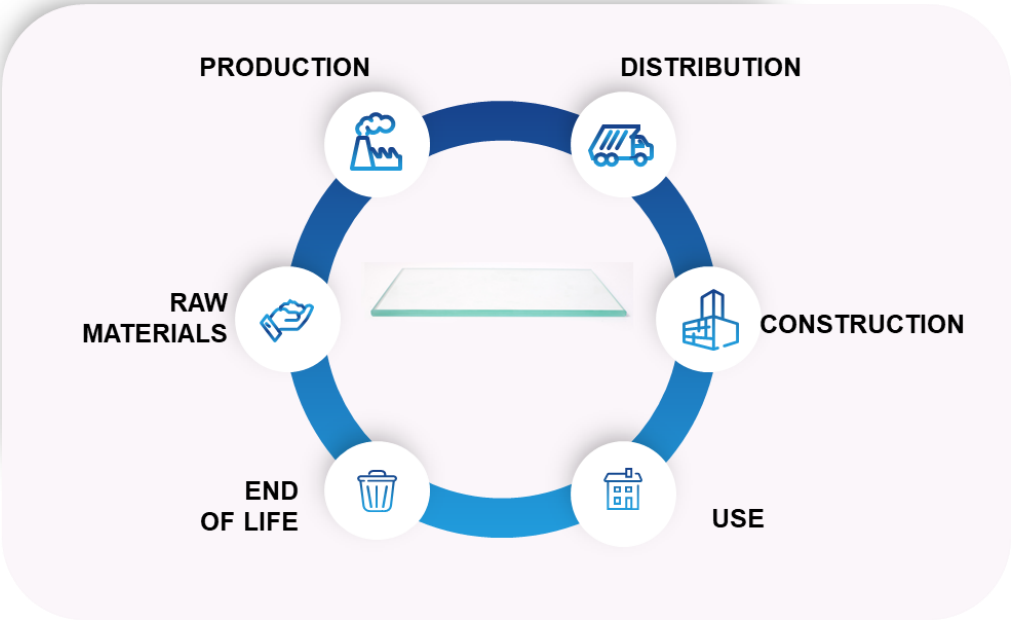
LCA scope

System boundaries (X=included. MND=module not declared)

	PRODUCT STAGE			CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
	Raw material supply	Transport	Manufacturing	Transport	Construction-Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-recovery
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Geography	EU	EU	ES	ES-PT	ES-PT	ES-PT	ES-PT	ES-PT	ES-PT	ES-PT	ES-PT	ES-PT	ES-PT	ES-PT	ES-PT	ES-PT	ES-PT

Specific data used	>90% GWP-GHG
Variation products	<1%
Variation sites	7,2%

Life cycle stages



A1-A3, Product stage

Description of the stage:

For double glazing A1 to A3 represents the production cradle to gate. The product stage includes the extraction and processing of raw materials and energies, transport to the manufacturer, manufacturing, and processing of double glazing units.

Description of the stage: the product stage of double glazing is subdivided into 3 modules A1, A2 and A3 respectively “Raw material supply”, “Transport to the manufacturer” and “Manufacturing”.

Description of the scenarios and other additional technical information:

A1, Raw materials supply

This includes the extraction and processing of all raw materials and energy which occur upstream from the manufacturing process. Main input is flat glass PLANICLEAR manufactured at Saint Gobain Avilés plant.

A2, Transport to the manufacturer

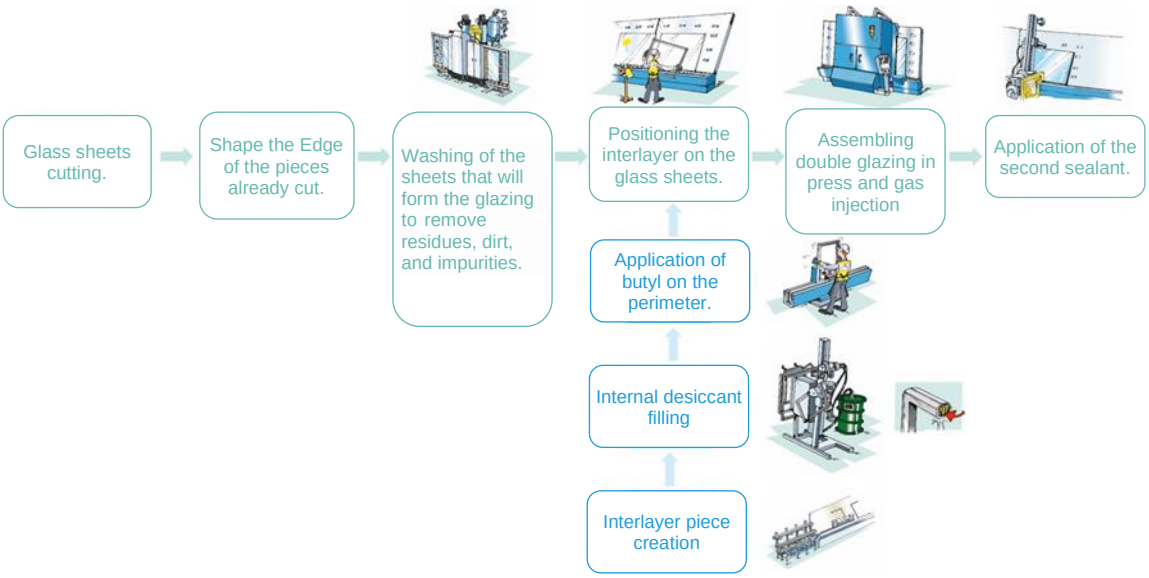
The raw materials are transported to the manufacturing site. The modelling includes road, boat and/or train transportations of each raw material.

A3, Manufacturing

This module includes the manufacture of products and the manufacture of packaging. The production of packaging material is taken into account at this stage. The processing of any waste arising from this stage is also included.

Manufacturing process flow diagram :

DOUBLE-GLAZING PRODUCTION
Glass sheets are received, washed and dried to remove all dirty particles. Two sheets are separated by an aluminum spacerbar or thermally insulating material. They are then sealed around the perimeter using organic seals, and the spacer bar is filled with desiccant to dry the air in the cavity. A secondary seal is then applied to hermetically seal the double-glazed unit.



A4-A5, Construction process stage

Description of the stage: The construction process is divided into 2 modules: A4, “Transport to the building site” and A5, “Installation in the building”.

A4, Transport to the building site:

This module includes transport from the production gate to the building site.
Transport is calculated on the basis of a scenario with the parameters described in the following table:

PARAMETER	VALUE
Fuel type and consumption of vehicle or vehicle type used for transport e.g. long distance truck, boat, etc.	Freight truck trailer with >32 t capacity, diesel consumption 38 liters for 100 km
Distance	191 km
Capacity utilisation (including empty returns)	100% of the capacity in volume 30 % of empty returns in mass
Bulk density of transported products*	2500 kg/m^3
Volume capacity utilisation factor	1

A5, Installation in the building:

The accompanying table quantifies the parameters for installing the product at the building site. All installation materials and their waste processing are included.

PARAMETER	VALUE/DESCRIPTION
Wastage of materials on the building site before waste processing, generated by the product's installation (specified by type)	According to PCR EN 17074, no waste is considered
Output materials (specified by type) as results of waste processing at the building site e.g. of collection for recycling, for energy recovering, disposal (specified by route)	Packaging materials (film, sealing tape, cork, cardboard) 2,93E-02 kg/m^2 sent to landfill and Glass racks 2,83 kg/m^2 reused 100 times, however the proportional part of the final deposition to the landfill of the racks after its use is included.
Ancillary materials for installation (specified by materials)	According to PCR EN 17074, no ancillary materials considered
Other resource use	None
Quantitative description of energy type (regional mix) and consumption during the installation process	According to EN 15804+A2:2019/AC:2021, the energy needed during the installation is less than 0,1% of the total life cycle energy. It's included in the cut-off-rules.
Direct emissions to ambient air, soil and water	None

B1-B7, Use stage (excluding potential savings)

Description of the stage: the use stage is divided into the following modules:

- B1: Use
- B2: Maintenance
- B3: Repair
- B4: Replacement
- B5: Refurbishment
- B6: Operational energy use
- B7: Operational water use

B2, Maintenance:

PARAMETER	VALUE
Maintenance process	Water and cleaning agent
Maintenance cycle	Annual average
Ancillary materials for maintenance (e.g. cleaning agent, specify materials)	Cleaning agent: 0,001 kg/m² of glass/year
Wastage material during maintenance (specify materials)	0 kg
Net fresh water consumption during maintenance	0,2 kg/m² of glass/year
Energy input during maintenance	None required during product lifetime

Description of the scenarios and additional technical information:
The product has a reference service life of 30 years. This assumes that the product will last in situ with no requirements for repair, replacement or refurbishment throughout this period. Therefore, it has no impact at this stage, except for maintenance.

According to PCR EN 17074, only the maintenance by cleaning glass with water and cleaning agent is included in this study.

C1-C4, End of Life Stage

Description of the stage: this stage includes the next modules:

- C1, Deconstruction, demolition
- C2, Transport to waste processing
- C3, Waste processing for reuse, recovery and/or recycling
- C4, Disposal

End of life scenario used in this study is:
100% of glass is landfilled and the distance to the landfill site considered is 50 km.

Description of the scenarios and additional technical information:

PARAMETER	CLIMALIT PLUS® 6-16-44.1Si
Thickness (mm)	31
Collection process specified by type (kg)	36,23
Recovery system specified by type (kg)	0
Disposal specified by type (kg)	36,23
Assumptions for scenario development (e.g. transportation)	50 km transport to landfill

D, Reuse/recovery/recycling potential

An end of life recycling 0% (100% of glass wastes are landfilled) has been assumed using local demolition waste data and adjusted considering the recyclability of the product.

LCA results

As specified in EN 15804:2012+A2:2019/AC:2021 and the Product-Category Rules. The environmental impacts are declared and reported using the baseline characterization factors from the Environmental Footprint available at the JRC web page, specifically the EF reference package 3.0.

Specific data has been supplied by the plant, and generic data come from Ecoinvent 3.8 database. Specific data for the flat glass PLANICLEAR® manufactured by the Saint-Gobain Avilés plant has also been used in the LCA model.

The estimated impact results are only relative statements which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins or risks.
All emissions to air, water, and soil, and all materials and energy used have been included.

We discourage the use of the results of modules A1-A3 without considering the results of module C.

Raw materials and energy consumption, as well as transport distances have been taken directly from the manufacturing plant (Production data according 2021)

All result tables refer to a functional unit of 1 m² of CLIMALIT PLUS® and an expected average service life of 30 years. The results shown are referred to CLIMALIT PLUS® 6-16-44.1Si selected as worst case scenario.

Environmental Impacts

Environmental indicators	PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				REUSE, RECOVERY RECYCLING
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
Climate Change [kg CO2 eq.]	5,23E+01	5,21E-01	7,31E-02	0	1,05E-01	0	0	0	0	0	0	3,24E-01	0	8,65E-02	0
Climate Change (fossil) [kg CO2 eq.]	5,22E+01	5,21E-01	3,81E-02	0	9,77E-02	0	0	0	0	0	0	3,24E-01	0	8,64E-02	0
Climate Change (biogenic) [kg CO2 eq.]	-3,49E-02	0	3,49E-02	0	0	0	0	0	0	0	0	0	0	0	0
Climate Change (land use change) [kg CO2 eq.]	8,02E-02	9,91E-06	7,28E-07	0	7,06E-03	0	0	0	0	0	0	5,91E-06	0	4,09E-06	0
Ozone depletion [kg CFC-11 eq.]	1,06E-06	1,22E-07	8,90E-09	0	1,38E-08	0	0	0	0	0	0	7,25E-08	0	1,94E-08	0
Acidification terrestrial and freshwater [Mole of H+ eq.]	3,14E-01	1,11E-03	8,25E-05	0	6,32E-04	0	0	0	0	0	0	6,62E-04	0	9,15E-04	0
Eutrophication freshwater [kg P eq.]	2,71E-04	1,24E-06	9,11E-08	0	5,85E-06	0	0	0	0	0	0	7,40E-07	0	7,89E-08	0
Eutrophication marine [kg N eq.]	7,41E-02	1,85E-04	1,42E-05	0	1,96E-04	0	0	0	0	0	0	1,10E-04	0	4,09E-04	0
Eutrophication terrestrial [Mole of N eq.]	9,01E-01	2,06E-03	1,57E-04	0	1,43E-03	0	0	0	0	0	0	1,23E-03	0	4,49E-03	0
Photochemical ozone formation - human health [kg NMVOC eq.]	2,00E-01	7,16E-04	5,42E-05	0	3,59E-04	0	0	0	0	0	0	4,25E-04	0	1,23E-03	0
Resource use, mineral and metals [kg Sb eq.][1]	3,23E-05	4,46E-08	3,26E-09	0	5,73E-07	0	0	0	0	0	0	2,66E-08	0	4,43E-09	0
Resource use, energy carriers [MJ][1]	7,36E+02	7,60E+00	5,56E-01	0	1,55E+00	0	0	0	0	0	0	4,53E+00	0	1,20E+00	0
Water deprivation potential [m³ world equiv.][1]	9,64E+00	2,94E-03	2,15E-04	0	3,65E-01	0	0	0	0	0	0	1,76E-03	0	3,20E-04	0

[1] 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

Resources Use

Resources Use indicators	PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				D REUSE, RECOVERY, RECYCLING
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
Use of renewable primary energy (PERE) [MJ]	1,36E+02	9,89E-03	7,30E-04	0	5,43E-01	0	0	0	0	0	0	5,90E-03	0	3,29E-02	0
Renewable primary energy resources used as raw materials (PERM) [MJ]	3,28E-01	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total use of renewable primary energy resources (PERT) [MJ]	1,36E+02	9,89E-03	7,30E-04	0	5,43E-01	0	0	0	0	0	0	5,90E-03	0	3,29E-02	0
Use of non-renewable primary energy (PENRE) [MJ]	7,42E+02	8,07E+00	5,90E-01	0	1,67E+00	0	0	0	0	0	0	4,81E+00	0	1,27E+00	0
Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	3,95E+00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total use of non-renewable primary energy resources (PENRT) [MJ]	7,46E+02	8,07E+00	5,90E-01	0	1,67E+00	0	0	0	0	0	0	4,81E+00	0	1,27E+00	0
Input of secondary material (SM) [kg]	3,72E+00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Use of renewable secondary fuels (RSF) [MJ]	3,61E-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Use of non-renewable secondary fuels (NRSF) [MJ]	4,24E-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Use of net fresh water (FW) [m3]	2,59E-01	1,84E-04	1,34E-05	0	9,36E-03	0	0	0	0	0	0	1,09E-04	0	2,89E-05	0

Waste Category & Output flows

	PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				D REUSE, RECOVERY, RECYCLING
Waste Category & Output Flows	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
Hazardous waste disposed (HWD) [kg]	2,36E-02	2,05E-05	1,50E-06	0	1,35E-06	0	0	0	0	0	0	1,23E-05	0	3,11E-06	0
Non-hazardous waste disposed (NHWD) [kg]	2,01E+00	2,01E-03	5,76E-02	0	6,58E-03	0	0	0	0	0	0	1,20E-03	0	3,62E+01	0
Radioactive waste disposed (RWD) [kg]	3,42E-03	5,36E-05	3,92E-06	0	3,32E-06	0	0	0	0	0	0	3,20E-05	0	8,59E-06	0
Components for re-use (CRU) [kg]	0	0	2,82E+00	0	0	0	0	0	0	0	0	0	0	0	0
Materials for Recycling (MFR) [kg]	9,82E+00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Material for Energy Recovery (MER) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported electrical energy (EEE) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported thermal energy (EET) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Additional voluntary indicators from EN 15804 (according to ISO 21930:2017)

	PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				REUSE, RECOVERY RECYCLING
Environmental indicators	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
GWP-GHG [kg CO2 eq.][2]	5,21E+01	5,17E-01	3,79E-02	0	9,62E-02	0	0	0	0	0	0	3,22E-01	0	8,56E-02	0

[2] The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Information on biogenic carbon content

Biogenic Carbon Content		PRODUCT STAGE A1 / A2 / A3
	Biogenic carbon content in product [kg]	0
	Biogenic carbon content in packaging [kg]	9,53E-03

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO2.

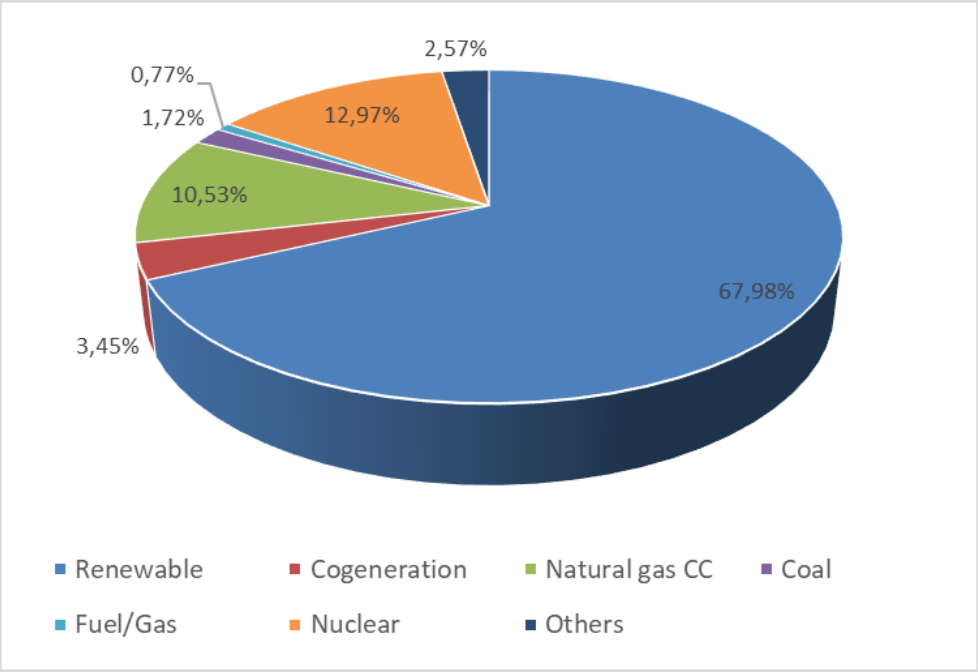
There is no biogenic carbon in glass product. The biogenic carbon comes only from the packaging.

Additional information:

Electricity information

TYPE OF INFORMATION	DESCRIPTION
Location	5 manufacturing sites located in Spain
Electricity mix composition*	Renewable 67,98% Cogeneration 3,45% Natural Gas CC 10,53% Coal 1,72% Fuel/Gas 0,77% Nuclear 12,97% Other 2,57%
Reference year	2021
Type of dataset	Cradle-to-gate from Ecoinvent 3.8 modified according to the different suppliers
Source	Supplier
CO_2 emission kg CO_2 eq. / kWh	0,113 kg CO_2 eq/kwh

*The electricity mix shown is calculated considering the different suppliers of the different companies and the contribution of each manufacturing to the electricity consumption.



Data quality

Inventory data quality is judged by geographical, temporal, and technological representativeness. To cover these requirements and to ensure reliable results, first-hand industry data crossed with LCA background datasets were used. The data was collected from internal records and reporting documents from 2021. After evaluating the inventory, according to the defined ranking in the LCA report, the assessment reflects good (3,79) inventory data quality.

Variation between products

The only difference between products is the layer of PVB, which is a little bit thicker for 6-16-44.1Si. This product has been selected as the worst-case scenario because its environmental impact results are slightly higher than for the other model (6-16-44.1).

Health characteristics

Concerning the indoor air quality, clear flat glass is an inert material that doesn't release any inorganic & organic compounds, in particular no VOC (volatile organic compounds).

The sealant is made of organic materials which have been tested regarding their VOC emissions (following ISO 16000 standard): Eurofins report G07104, G08363 and G07102. All sealants have an emission class A+.

If the glass is laminated, a PVB layer is included in the glazing. The VOC emissions test (following ISO 16000 standard) rank the PVB A+ (highest rank) following the French regulation (Eurofins report G10504).

Additional Environmental Information

Saint-Gobain's environmental policy
Saint-Gobain's environmental vision is to ensure the sustainable development of its Activities, while preserving the environment from the impacts of its processes and services throughout their life cycle. The Group thus seeks to ensure the preservation of resources, meet the expectations of its relevant stakeholders, and offer its customers the highest added value with the lowest environmental impact.

The Group has set two long-term objectives: zero environmental accidents and a minimum impact of its activities on the environment. Short and medium-term goals are set to address these two ambitions. They concern five environmental areas identified by the Group: raw materials and waste; energy, atmospheric emissions, and climate; water; biodiversity; and environmental accidents and nuisance.

Our products' contribution to Sustainable Buildings:

Saint-Gobain encourages sustainable construction and develops innovative solutions for new and renovated buildings that are energy efficient, comfortable, healthy, and esthetically superior, while at the same time protecting natural resources.
The following information might be of help for green building certification programs:

RESPONSIBLE SOURCING
(Required for BREEAM International new construction 2013 – MAT 03 Responsible sourcing)

All Saint-Gobain Glass Industry sites with a glassmaking furnace, including the Avilés plant, are ISO 14001 certified.

All internal Saint-Gobain Glass quarries are certified ISO 14001 like, for example, SAINT-GOBAIN SAMIN (sand) in France. Many Saint-Gobain Glass raw material suppliers are certified ISO 14001. Our policy consists in encouraging the sourcing of raw materials extracted or made in sites certified ISO 14001 (or the equivalent).

For any other question / document / certification, please contact our local sales teams.

References

1. ISO 14040:2006: Environmental Management-Life Cycle Assessment-Principles and framework.
2. ISO 14044:2006: Environmental Management-Life Cycle Assessment-Requirements and guidelines.
3. ISO 14025:2006: Environmental labels and Declarations-Type III Environmental Declarations-Principles and procedures.
4. Product category rules 2019 :14. Construction products version 1.3.2.
5. EN 15804:2019+A2/AC:2021 - Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
6. European Chemical Agency, Candidate List of substances of very high concern for Authorization. http://echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp
7. ISO 21930: 2017 Sustainability in building construction – Environmental declaration of building products
8. EN 17074:2019 Glass in building – Environmental product declaration – Product category rules for flat glass products.
9. General Program Instruction of the International EPD® System (version 4.0:2021)
10. LCA report, Análisis de ciclo de vida del producto doble vidrio Climalit plus Saint-Gobain Building Glass.