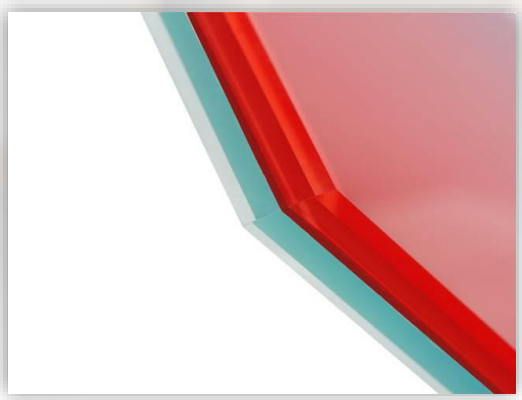
ENVIRONMENTAL PRODUCT DECLARATION

In accordance with EN 15804 and ISO 14025

SGG PLANILAQUE®
COLOR-IT STADIP

44.2 & 66.2

Dual lacquered laminated glass



Date of issue : 07-10-2016
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EPD VERIFIED

VERIFICATION

S-P-00976

SAINT-GOBAIN

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General information

Manufacturer:

SAINT-GOBAIN GLASS FRANCE[1]
18 avenue d'Alsace
92400 Courbevoie
FRANCE

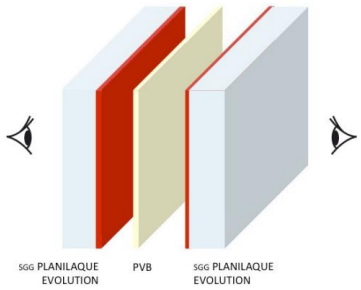
European standard EN 15804 served as core EPD	
Product / product family name and manufacturer represented	SGG PLANILAQUE® COLOR-IT STADIP produced by SAINT-GOBAIN GLASS INDUSTRY
Declaration issued:	15-11-2016
valid until:	15-11-2021
Program used	INTERNATIONAL EPD SYSTEM www.environdec.com
EPD registration number/declaration number:	S-P-00976
PCR identification	EN 15804 as the core PCR and PCR for construction products and construction services issue by the International EPD System (PCR 2012:01 Construction products and construction services, version 2.01 / 2016-03-09)
PCR review was conducted by	The technical committee of the international EPD system Chair: Massimo Marino Contact via info@environdec.com
CPC Classification:	37115 "Safety glass"
Independent verification of the declaration and data, according to ISO 14025	An independent verification of the declaration and data was made, according to ISO 14025:2010. This verification was based on the PCR mentioned above. EPD process certification (internal)
Third party verifier	Bureau Veritas Certification Sverige AB for the EPD process certification
Accredited or approved by	INTERNATIONAL EPD SYSTEM Swedac Ackreditering

[1] The manufacturing companies concerned are SAINT-GOBAIN GLASS FRANCE, SAINT-GOBAIN GLASS DEUTSCHLAND, SAINT -GOBAIN GLASS UK, SAINT-GOBAIN GLASS ITALY, SAINT-GOBAIN CRISTALLERIA, SAINT-GOBAIN GLASS POLSKA, SAINT-GOBAIN ROMANIA.

Product description

Product description and description of use

SGG PLANILAQUE COLOR-IT STADIP is a dual lacquered laminated safety glass. It is composed of two lacquered sheets of glass opaque and coloured in appearance thanks to the coating and curing of a layer of lacquer, on the back of each sheet. The two lacquered sheets are then assembled using a PVB (polyvinyl butyral) film.



SGG PLANILAQUE COLOR-IT STADIP is meant to be used in building and furniture applications. The combination of stylish, dual lacquered glass and safety performance make SGG PLANILAQUE COLOR-IT STADIP specially suited for partition walls and interior doors.

SGG PLANILAQUE COLOR-IT STADIP complies with standards EN 12543 and EN 14449. SGG PLANILAQUE STADIP 66.2 is classified 2B2 according to standard EN12600 (impact test).

In this Environmental Product Declaration, one square m^2 of SGG PLANILAQUE COLOR-IT STADIP 44.2 & 66.2 are analyzed.

		44.2	66.2
GLAZING ONE	Flat glass	SGG PLANILAQUE COLOR IT 4 mm	SGG PLANILAQUE COLOR IT 6 mm
Interlayer	Type	PVB	PVB
	Number & thickness	2 sheets of 0.38 mm	2 sheets of 0.38 mm
GLAZING TWO	Flat glass	SGG PLANILAQUE COLOR IT 4 mm	SGG PLANILAQUE COLOR IT 6 mm

Declaration of the main product components and/or materials

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

Components	Weight (in %)	Comments
Glass	>96%	CAS number 65997-17-3, EINECS number 266-046-0
Paint layer	Less than 1%	Industrial paint.
PVB interlayer	<4%	CAS number 63148-65-2 EINECS number 272-808-3

The percentages are given for a 44.2 laminated glass; the % may vary depending on the glazing configuration.

At the date of issue of this declaration, the polyvinyl butyral ("PVB") interlayer sheet contains more than 0.1% by weight of 2-(2H-benzotriazol-2yl)-4,6-ditertpentylphenol (UV-328). We are working on the substitution of this substance.

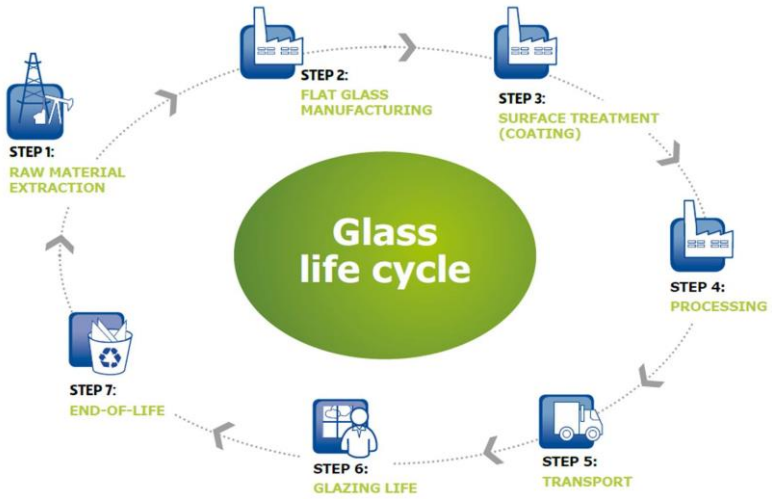
LCA calculation information

FUNCTIONAL UNIT / DECLARED UNIT	1m^2 of SGG PLANILAQUE® COLOR IT STADIP to be incorporated into a building or furniture. The impacts of installation are not taken into account.
SYSTEM BOUNDARIES	Cradle to gate: Mandatory Stages = A1-A3
REFERENCE SERVICE LIFE (RSL)	n/a. Boundaries are cradle to gate
CUT-OFF RULES	All significant parameters shall be included. According to EN 15804, mass flows under 1% of the total mass input; and/or energy flows representing less than 1% of the total primary energy usage of the associated unit process may be omitted. However, the total amount of energy and mass omitted must not exceed 5% per module. Substances of Very High Concern (SVHC), as defined in the REACH Regulation (article 57), in a concentration above 0.1% by weight, in glass final products, shall be included in the Life Cycle Inventory and the cut-off rules shall not apply.
ALLOCATIONS	Allocations are done on mass basis (kg)
GEOGRAPHICAL COVERAGE AND TIME PERIOD	The informations were established over the year 2014. The information collected comes from the European sites producing SGG PLANILAQUE® COLOR IT STADIP (SAINT-GOBAIN GLASS INDUSTRY).
BACKGROUND DATA SOURCE	GaBi data were used to evaluate the environmental impacts.
SOFTWARE	Gabi 6 - GaBi envision SGG_EPD tool for Building glass 1m2_2016-08-09.gmbx

According to EN 15804, 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.

Life cycle stages

Diagram of the Life Cycle



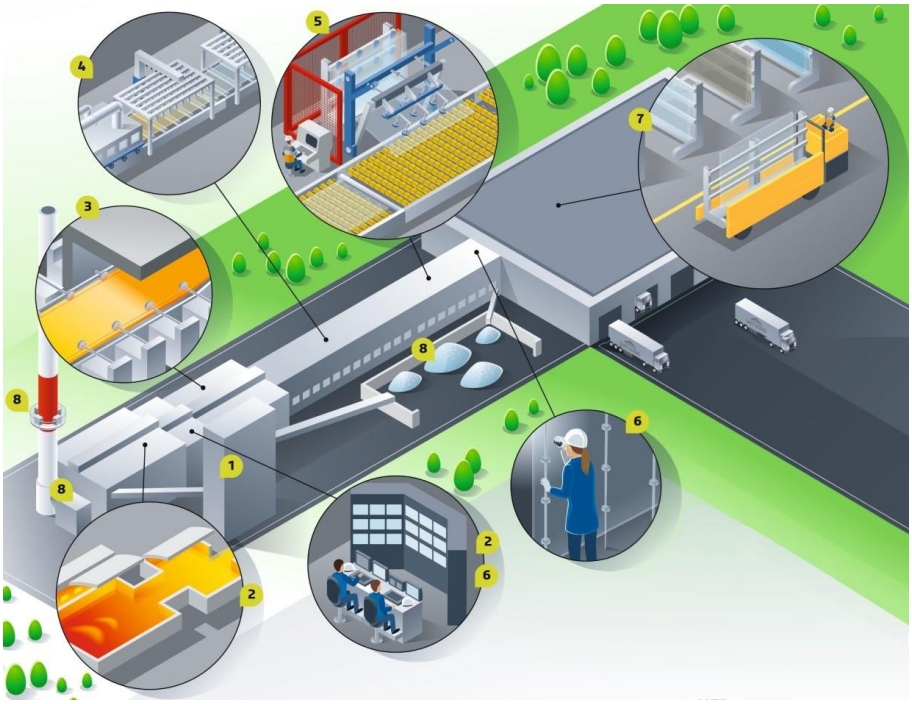
Not relevant stages**: as this is a cradle to gate with options declaration stages A4, A5 and B1-B7 are not** relevant.

Product stage, A1-A3

Description of the stage: For laminated lacquered glass A1 to A3 represents the production of glass in the float, the lacquering process and the laminating line from cradle to gate.

The product stage includes the extraction and processing of raw materials and energies, transport to the manufacturer, manufacturing and processing of flat glass.

Manufacturing process flow diagram



1. BATCH MIXER: Mix of raw materials (silica, soda ash, lime, feldspar and dolomite) to which is added recycled glass (cullet) and other compounds depending on the desired color and properties.
2. FUSION FURNACE: Raw materials are melted at 1,550°C in a furnace.

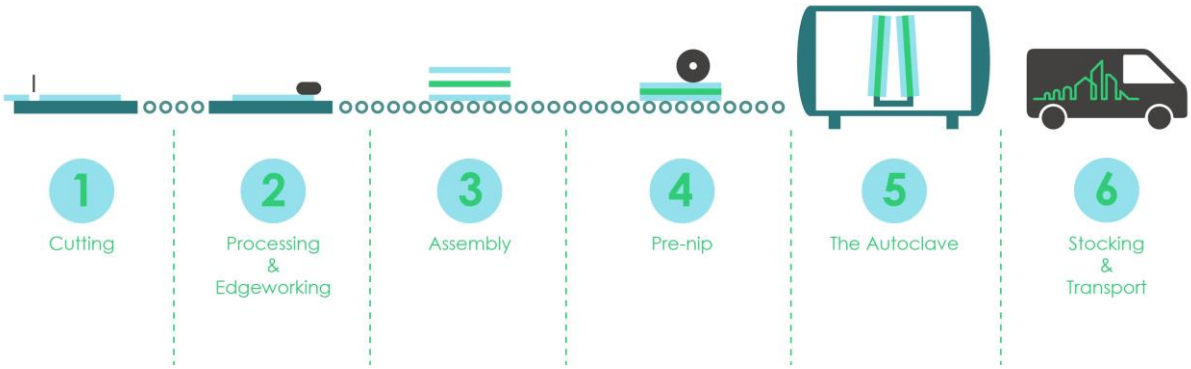
3. FLOAT: The molten glass is fed into a bath of molten tin. The glass floats on this flat surface and is drawn off in a ribbon. Serrated wheels, or top rolls, pull and push the glass sideways depending on the desired thickness (from 2 to 19 millimeters).
4. ANNEALING LEHR: The glass is lifted onto conveyor rollers and passes through a controlled cooling tunnel measuring more than 100 meters in length. Approximately 600°C at the start of this step, the glass exits the lehr at room temperature.

LACQUERING:

- the lacquering process involves the all-over or partial spraying of paint onto one surface of the glass before being baked at 180°-200°C. There are many aesthetics effects possible using lacquering: frosted, opaque, translucent, matt, multi-colored, metallic…

5. CUTTING AND STACKING: The glass is automatically cut lengthwise and crosswise. The sheets of glass are raised by vacuum frames that then place them on glass stillages.
6. QUALITY: Automatic inspections and regular samples are taken to check the quality of the glass at each step in the glassmaking process.
7. STORAGE AND TRANSPORTATION: The stillages are placed on storage racks in the warehouse.
8. ENVIRONMENT: Use of recycled cullet, installation of pollution abatement systems and closed circuit management of water: every measure is taken to limit the consumption of energy, extraction of natural resources, production of waste and emissions into the atmosphere.

LAMINATING:



1. CUTTING: Flat glass is manufactured in sheets up to 6 * 3.210 m in size. Before laminating, each sheet is lifted using suction cups and placed on the cutting table where a diamond glass cutter scores the glass to the required size. Each piece is then automatically or manually broken out
2. PROCESSING AND EDGEWORKING: Once cut to the required size, the glass can be treated to improve its functionality, highlight its appearance or personalize it even further. There are many types of decorative processing: edgeworking, polishing, shaping, drilling of holes and notches, sand blasting, engraving …
3. ASSEMBLY: The assembly of the two sheets of glass and the PVB interlayer takes place in a protective environment. The PVB is rolled out onto one glass sheet and cut to the same size. The second sheet is then positioned on top.
4. PRE-NIP: The glass is nipped together with a pre-nip roller to force any air out from between the PVB and the glass. The glass assembly is then pre-heat in the pre-nip oven to around 100°C to bond the PVB to the glass and prevent any air from returning back in. At this stage the PVB film has become less opaque and the assembly is stacked ready for transferal to the autoclave.
5. AUTOCLAVE: to ensure total adhesion between the glass and film, and to remove any final bubbles, the assembly is one more placed in a 100°C for around 2-3 hours. The time can vary depending on the thickness and composition of the laminated glass.
6. STACKING AND TRANSPORT: a stacking system lifts the glass sheets vertically using suction cups, placing a thin layer of interleafing lucite power between each sheet for protection against scartches. These are then safely transported in special vans.

LCA results

The table below present the environmental impacts associated with the production of 1 square meter of SGG PLANILAQUE® COLOR IT STADIP, as a mix of every colors. This is a Cradle-to-Gate EPD. The environmental impacts of all the other stages in the life cycle of SGG PLANILAQUE® COLOR IT STADIP are not declared (MND).

ENVIRONMENTAL IMPACTS 44.2 mm

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				
	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
Global Warming Potential (GWP) - *kg CO_2 equiv/FU*	36.2	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
	The global warming potential of a gas refers to the total contribution to global warming resulting from the emission of one unit of that gas relative to one unit of the reference gas. carbon dioxide. which is assigned a value of 1.														
Ozone Depletion (ODP) *kg CFC 11 equiv/FU*	4.34E-9	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
	Destruction of the stratospheric ozone layer which shields the earth from ultraviolet radiation harmful to life. This destruction of ozone is caused by the breakdown of certain chlorine and/or bromine containing compounds (chlorofluorocarbonsor halons). Which break down when they reach the stratosphere and then catalytically destroy ozone molecules.														
Acidification potential (AP) *kg SO_2 equiv/FU*	0.147	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
	Acid depositions have negative impacts on natural ecosystems and the man-made environment incl. buildings. The main sources for emissions of acidifying substances are agriculture and fossil fuel combustion used for electricity production. heating and transport.														
Eutrophication potential (EP) *kg $(PO_4)^{3-}$ equiv/FU*	0.0401	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
	Excessive enrichment of waters and continental surfaces with nutrients. and the associated adverse biological effects.														
Photochemical ozone creation (POPC) *kg Ethene equiv/FU*	0.0109	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
	Chemical reactions brought about by the light energy of the sun. The reaction of nitrogen oxides with hydrocarbons in the presence of sunlight to form ozone is an example of a photochemical reaction.														
Abiotic depletion potential for non-fossil ressources (ADP-elements) - *kg Sb equiv/FU*	0.000179	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Abiotic depletion potential for fossil ressources (ADP-fossil fuels) - *MJ/FU*	466	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
	Consumption of non-renewable resources. thereby lowering their availability for future generations.														

RESOURCE USE 44.2 mm

Parameters	Product stage	Construction process 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	
Use of renewable primary energy excluding renewable primary energy resources used as raw materials - *MJ/FU*	38.6	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of renewable primary energy used as raw materials *MJ/FU*	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) *MJ/FU*	38.6	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials - *MJ/FU*	496	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of non-renewable primary energy used as raw materials *MJ/FU*	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) - *MJ/FU*	496	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of secondary material *kg/FU*	1.99	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of renewable secondary fuels- *MJ/FU*	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of non-renewable secondary fuels - *MJ/FU*	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of net fresh water - *m^3/FU*	0.202	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

WASTE CATEGORIES 44.2 mm

Parameters	Product stage	Construction process 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	
Hazardous waste disposed *kg/FU*	8.9E-7	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Non-hazardous(excluding inert) waste disposed *kg/FU*	0.862	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Radioactive waste disposed *kg/FU*	0.0119	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

OUTPUT FLOWS 44.2 mm

Parameters	Product stage	Construction process 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	
Components for re-use *kg/FU*	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Materials for recycling *kg/FU*	1.36	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Materials for energy recovery *kg/FU*	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Exported energy. detailed by energy carrier *MJ/FU*	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

ENVIRONMENTAL IMPACTS 66.2

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				
	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
Global Warming Potential (GWP) - *kg CO_2 equiv/FU*	48	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
	The global warming potential of a gas refers to the total contribution to global warming resulting from the emission of one unit of that gas relative to one unit of the reference gas. carbon dioxide. which is assigned a value of 1.														
Ozone Depletion (ODP) *kg CFC 11 equiv/FU*	4.57E-9	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
	Destruction of the stratospheric ozone layer which shields the earth from ultraviolet radiation harmful to life. This destruction of ozone is caused by the breakdown of certain chlorine and/or bromine containing compounds (chlorofluorocarbonsor halons). Which break down when they reach the stratosphere and then catalytically destroy ozone molecules.														
Acidification potential (AP) *kg SO_2 equiv/FU*	0.207	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
	Acid depositions have negative impacts on natural ecosystems and the man-made environment incl. buildings. The main sources for emissions of acidifying substances are agriculture and fossil fuel combustion used for electricity production. heating and transport.														
Eutrophication potential (EP) *kg $(PO_4)^{3-}$ equiv/FU*	0.0583	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
	Excessive enrichment of waters and continental surfaces with nutrients. and the associated adverse biological effects.														
Photochemical ozone creation (POPC) *kg Ethene equiv/FU*	0.0148	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
	Chemical reactions brought about by the light energy of the sun. The reaction of nitrogen oxides with hydrocarbons in the presence of sunlight to form ozone is an example of a photochemical reaction.														
Abiotic depletion potential for non-fossil ressources (ADP-elements) - *kg Sb equiv/FU*	0.000266	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Abiotic depletion potential for fossil ressources (ADP-fossil fuels) - *MJ/FU*	608	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
	Consumption of non-renewable resources. thereby lowering their availability for future generations.														

RESOURCE USE 66.2

Parameters	Product stage	Construction process 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	
Use of renewable primary energy excluding renewable primary energy resources used as raw materials - *MJ/FU*	44.3	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of renewable primary energy used as raw materials *MJ/FU*	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) *MJ/FU*	44.3	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials - *MJ/FU*	642	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of non-renewable primary energy used as raw materials *MJ/FU*	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) - *MJ/FU*	642	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of secondary material *kg/FU*	2.99	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of renewable secondary fuels- *MJ/FU*	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of non-renewable secondary fuels - *MJ/FU*	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of net fresh water - *m^3/FU*	0.233	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

WASTE CATEGORIES 66.2

Parameters	Product stage	Construction process 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	
Hazardous waste disposed *kg/FU*	1.27E-6	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Non-hazardous(excluding inert) waste disposed *kg/FU*	1.15	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Radioactive waste disposed *kg/FU*	0.0136	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

OUTPUT FLOWS 66.2

Parameters	Product stage	Construction process 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	
Components for re-use *kg/FU*	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Materials for recycling *kg/FU*	1.64	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Materials for energy recovery *kg/FU*	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Exported energy. detailed by energy carrier *MJ/FU*	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

LCA results interpretation

In the production of SGG PLANILAQUE, the impacts due to glass production account as average for more than 80% of total impacts.

PVB has to be stored at a certain range of temperature, so the use of refrigerant is required which accounts for nearly a half of ozone layer depletion indicator.

For the production of glass, the main impacts are related to the energy consumed in the furnace and on the impacts generated in the production of one of the main raw materials, the soda ash.

		Environmental impacts (A1-A3) SGG PLANILAQUE® COLOR IT STADIP 44.2	**Unit**
	Global warming	36.2	Kg CO_2 equiv/FU
	Non-Renewable resources consumption[1]	466	MJ/FU
	Energy consumption[2]	534.6	MJ/FU
	Water consumption[3]	0.202	M^3/FU
	Waste production[4]	0.8739	Kg/FU

[1]: This indicator corresponds to the abiotic depletion potential of fossil resources.
[2]: This indicator corresponds to the total use of primary energy.
[3]: This indicator corresponds to the use of fresh net water.
[4]: This indicator corresponds to the sum of hazardous, non-hazardous and radioactive waste disposed.

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).

Regarding the PVB interlayer, VOC measurements following ISO 16000 have been taken by EUROFINS. Total VOCs after 28 days are strictly below 1000 µg/m3 and Total formaldehyde after 28 days are strictly below 10 µg/m3,(Report No. G10504). The emissions of the PVB correspond in conclusion to the emission class A+ (highest ranking), of the French regulation on the labeling of "product for construction or wall cladding or flooring and paint and varnish" on their emissions of volatile pollutants (Arrêté April 2011).

Regarding the lacquer, VOC measurements following ISO 16000 have been taken by EUROFINS. Total VOCs and Total formaldehyde after 28 days are strictly below 1000 µg/m^3 (TCOV) and 10 µg/m^3 (formaldehyde). As a consequence, the emission of the tested product SGG PLANILAQUE COLOR-IT corresponds to the emission class A+ (highest ranking), of the French regulation on the labeling of product for construction or wall cladding or flooring and paint and varnish on their emissions of volatile pollutants (Arrêté April 2011).

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.

Saint-Gobain's long term objectives:

	Non recovered waste (2010-2025) : -50% Long-term: zero non-recovered waste
	Energy consumption: -15% (2010-2025) CO_2 emissions: -20% (2010-2025) Emissions of NOx, SO_2 and dust: -20% for each emissions category (2010-2025)
	Water discharge: -80% (2010-2025) Long-term: zero industrial water discharge in liquid form
	2025: promote the preservation of natural areas at Company sites as much as possible
	2025: all environmental events are recorded, registered and investigated

More information on our website: www.saint-gobain.com and our Registration Document.

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:

RECYCLED CONTENT

Recycled content: proportion, by mass, of recycled material in a product or packaging. Only pre-consumer and post-consumer materials shall be considered as recycled content.

- Post-consumer material: material generated by households or commercial, industrial and institutional facilities in their role as end-users of the product which can no longer be used for its intended purpose.

  In practice, in the case of flat glass, all material coming from glass recycling collection schemes falls under this category, i.e. glass waste from end-of-life vehicles, construction and demolition waste, etc.

- Pre-consumer material: material diverted from the waste stream during a manufacturing process. Excluded is reutilization of materials such as rework, regrind, or scrap generated in a process and capable of being reclaimed within the same process that generated it.

  In the case of flat glass, this waste originates from the processing or re-processing of glass that takes place before the final product reaches the consumer market. Pre-consumer waste flat glass is made of cut-offs, losses during laminating, bending and other processing, including the manufacture of insulating glass units or automotive windscreens.

Cullet generated in the furnace plant and which is reintroduced into the furnace cannot be considered as pre-consumer recycled content, since there was never an intent to discard it and therefore it would never have entered the solid waste stream.

LEED v4 Building product disclosure and optimization - sourcing of raw materials

Pre-consumer cullet	~7%
Post-consumer cullet	< 1%

In the future, Saint-Gobain Glass intends to continue the increase of recycled material in its products, especially when recycling building post-consumer cullet glass dismantling and recycling networks will be available in every country.

RESPONSIBLE SOURCING

BREEAM International new construction 2013 – MAT 03 Responsible sourcing

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

The Saint-Gobain Glass Industry site from the UK (Eggborough) has a BES 6001 certification, with a Very Good score.

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.