ENVIRONMENTAL PRODUCT DECLARATION

In accordance with EN 15804 and ISO 14025

Magnetron coated glass on SGG PLANILUX & SGG PARSOL

From 3 mm to 12 mm

Production zone: India
Date of issue : 27/10/2017
Version : V1

EPD VERIFIED

EPD®

VERIFICATION

S-P-01091

SAINT-GOBAIN

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General information

Manufacturer:

Saint-Gobain India Private Limited – Glass Business
Sigapi Aachi Building, Floor No. 7, 18/3, Rukmini Lakshmipathy Road,
600008 Chennai
India

European standard EN 15804 served as core EPD	
Product / product family name and manufacturer represented	Magnetron coated glass on SGG PLANILUX or SGG PARSOL produced by Saint-Gobain India Private Limited – Glass Business
Declaration issued:	27/10/2017
valid until:	27/10/2022
Program used	INTERNATIONAL EPD SYSTEM www.environdec.com
EPD registration number/declaration number:	S-P-01091
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:	37113 “Float glass and surface ground or polished glass, in sheets.”
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

Product description

Product description and description of use

Magnetron coated glass is soda-lime silicate glass produced using the float procedure, on which a magnetron coating has been applied. The glass is meant to be used in building, furniture & industrial applications.

Manufactured on Saint-Gobain India Private Limited – Glass Business 'magnetron' coater, a combination of thin multiple metal oxide layers are applied to float glass (SGG PLANILUX, SGG PARSOL…) using a magnetically enhanced cathodic sputtering process under vacuum conditions.

Depending on the composition of these transparent coating layers, several different products can be produced, distinguishable by the thermal performance, spectrophotometric values and processing characteristics.

Correlation commercial names and coatings	Cool-lite	Planitherm
SGG ANTELIO PLUS family: Advanced solar control providing abundant daylight to interiors	ST	
SGG COOL-LITE: High performance advanced solar control glass that provides optimum light transmission with minimal visual glare.	ST	
SGG EVO: Advanced solar control and thermal insulation for single glazing application.	ET	
SGG EVOLITE: Superior solar control and thermal insulation glass for single glazing application.	ET	
SGG PLANITHERM: Advanced thermal insulation glass that reflects long wave heat radiation and provides high thermal insulation.	-	PLT
SGG NANO Silver: Advanced solar control and thermal insulation glass (single silvered Low-E) with performance that directly fits green building requirements	KS	
SGG NANO: Advanced solar control and thermal insulation glass (single silvered Low-E) with performance that directly fits green building requirements.	KT	
SGG ENVISION: state of the art solar control and thermal insulation glass – double silvered Low E glass with high spectral selectivity.	SKN	

The product studied in this EPD is an average of all magnetron coated glass with one coating, made for building, furniture & industrial applications, produced by Saint-Gobain India Private Limited – Glass Business on the following substrates: SGG PLANILUX & SGG PARSOL.

Performances

All detailed performances can be found on Calumen (http://calumenlive.com/), Saint-Gobain's software for energy & visible parameters calculation. For family with a large range of coatings, one example is given, based on the most representative coating of the range.

Please note that the performance values given in these tables are for single glass panes not for the assemble products where this panes are included.

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

SGG EVO ET 125 (on SGG PLANILUX)

Thickness (mm)	3	3.5	4	5	6	8	10	12
Visible parameters								
Light transmittance (LT) %	28.6	28.6	28.5	28.4	28.3	28	27.8	27.5
External light reflection (RLE) (%)	28.6	28.4	28.3	28.1	27.9	27.5	27.1	26.7
Energetic parameters								
Energy transmittance (ET) %	21.6	21.4	21.3	21	20.7	20.1	19.6	19.1
Energy absorbance (EA) %	52.3	52.8	53.3	54.3	55.1	56.8	58.3	59.7
Solar factor g	0.30	0.3	0.30	0.30	0.29	0.29	0.29	0.29

SGG NANO KT 155 (on SGG PARSOL GREEN)

Thickness (mm)	3	3.5	4	5	6	8	10	12
Visible parameters								
Light transmittance (LT) %	48.4	47.6	46.7	45.1	43.5	40.6	37.8	35.3
External light reflection (RLE) (%)	13.2	12.9	12.6	12.1	11.5	10.6	9.8	9.1
Energetic parameters								
Energy transmittance (ET) %	30.6	29.4	28.2	26.2	24.3	21.3	18.8	16.8
Energy absorbance (EA) %	56.5	58.6	60.5	63.7	66.4	70.7	74	76.6
Solar factor g	0.39	0.38	0.37	0.36	0.34	0.32	0.30	0.28

SGG ENVISION SKN 144 (on SGG PLANILUX)

Thickness (mm)	3	3.5	4	5	6	8	10	12
Visible parameters								
Light transmittance (LT) %	45.2	45.2	45.1	44.9	44.7	44.3	43.9	43.5
External light reflection (RLE) (%)	18.8	18.7	18.7	18.5	18.4	18.2	17.9	17.7
Energetic parameters								
Energy transmittance (ET) %	23.1	23	22.9	22.7	22.5	22.1	21.8	21.4
Energy absorbance (EA) %	42.4	43.1	43.8	45.1	46.4	48.8	50.9	52.9
Solar factor g	0.29	0.29	0.29	0.29	0.29	0.29	0.28	0.28

Declaration of the main product components and/or materials

Components	Weight (in %)	Comments
Glass	More than 99.99%	CAS number 65997-17-3. EINECS number 266-046-0
Coating	Less than 0.01%	Metal oxides. which bring all the thermal & visible properties to the glazing

At the date of issue of this declaration. 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).

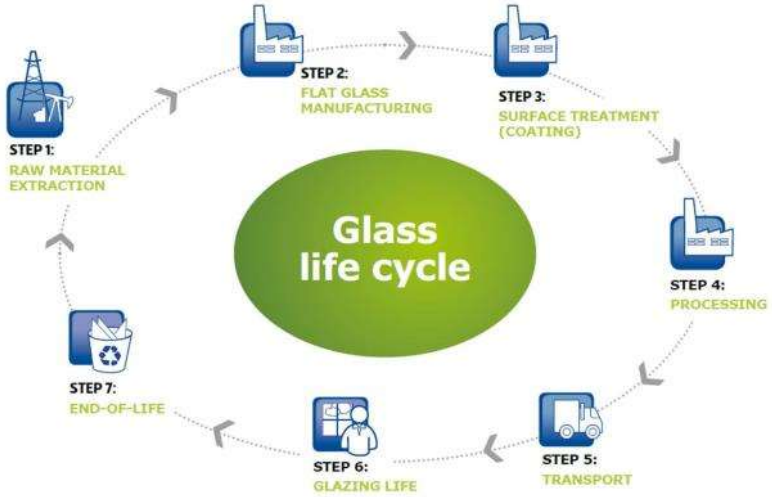
LCA calculation information

FUNCTIONAL UNIT / DECLARED UNIT	1m^2 of magnetron coated glass on SGG PLANILUX or SGG PARSOL to be incorporated into a building. furniture or industrial application. 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 information was established over the year 2016. The information collected comes from the Indian sites producing magnetron coated glass on SGG PLANILUX® or SGG PARSOL® (Saint-Gobain India Private Limited – Glass Business)
BACKGROUND DATA SOURCE	GaBi data were used to evaluate the environmental impacts.
SOFTWARE	GaBi 8 - GaBi Envision IN_SGG EPD Tool Building glass 1m2 for India_2017-10-06.gbmx

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 coated flat glass A1 to A3 represents the production of glass in the float 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.

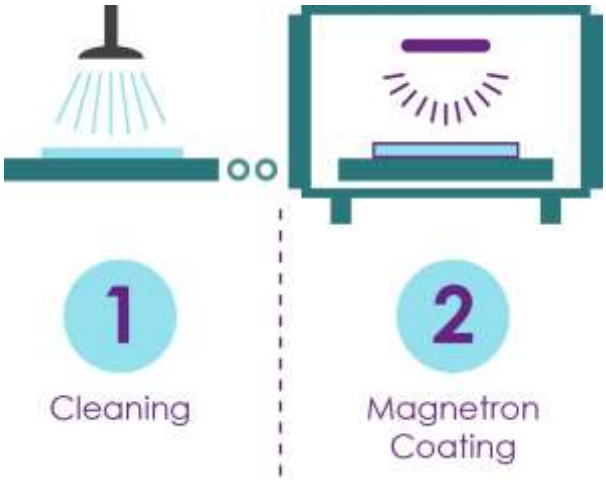
Manufacturing process flow diagram

©Saint-Gobain/Julien Kern pour SPECIFIQUE

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.
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.

After the production. coatings are applied off-line independently of the float glass manufacturing process. with two additional steps:

1. CLEANING: the sheet of glass is cleaned in the automatic washing machine using roller brushes. sprays. scrubbing bridges and air knives. It is essential that the surface is perfectly clean to avoid any coating defects.
2. MAGNETRON COATINGS: the glass passes through a tightly sealed pumping chamber. in which the vacuum is formed. Multiple layers of metals. metal and non-metal oxides and nitrides are then applied to the glass using a magnetically enhanced cathodic sputtering method. The resultant thin and transparent coating offers thermal insulation. solar control properties…



LCA results

The table below present the environmental impacts associated with the production of 1 square meter of magnetron coated glass on SGG PLANILUX or SGG PARSOL substrate. as a mix of every coating. This is a Cradle-to-Gate EPD. The environmental impacts of all the other stages in the life cycle of the magnetron coated glass are not declared (MND).

Magnetron coated glass on SGG PLANILUX 2 mm

ENVIRONMENTAL IMPACTS 2mm

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	
Global Warming Potential (GWP) - *kg CO_2 equiv/FU*	10	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*	1.04E-10	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*	0.0824	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*	0.00537	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*	0.00417	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*	8.28E-5	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*	107	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 2mm

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*	7.48	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*	7.48	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*	110	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*	110	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of secondary material *kg/FU*	0.366	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	0.0489	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

WASTE CATEGORIES 2mm

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*	1.57E-7	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Non-hazardous(excluding inert) waste disposed *kg/FU*	0.157	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Radioactive waste disposed *kg/FU*	0.00103	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

OUTPUT FLOWS 2mm

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*	0.0209	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 3mm

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	
Global Warming Potential (GWP) - *kg CO_2 equiv/FU*	13.2	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*	1.17E-10	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*	0.101	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*	0.00713	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*	0.00521	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*	0.000105	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*	143	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 3mm

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*	8.8	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*	8.8	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*	146	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*	146	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of secondary material *kg/FU*	0.548	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*	0.0572	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

WASTE CATEGORIES 3mm

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*	2.19E-7	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Non-hazardous(excluding inert) waste disposed *kg/FU*	0.222	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Radioactive waste disposed *kg/FU*	0.00129	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

OUTPUT FLOWS 3mm

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*	0.0306	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 3.5mm

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*	14.9	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*	1.23E-10	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*	0.111	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*	0.00801	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*	0.00573	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*	0.000116	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*	161	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 3.5mm

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*	9.47	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*	9.47	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*	164	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*	164	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of secondary material *kg/FU*	0.64	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*	0.0613	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

WASTE CATEGORIES 3.5mm

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*	2.51E-7	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Non-hazardous(excluding inert) waste disposed *kg/FU*	0.255	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Radioactive waste disposed *kg/FU*	0.00142	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

OUTPUT FLOWS 3.5mm

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*	0.0354	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 4mm

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	
Global Warming Potential (GWP) - *kg CO_2 equiv/FU*	16.5	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*	1.29E-10	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*	0.12	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*	0.00889	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*	0.00624	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*	0.000127	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*	178	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 4mm

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*	10.1	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*	10.1	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*	182	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*	182	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of secondary material *kg/FU*	0.731	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*		MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of net fresh water - m^3/FU	0.0654	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

WASTE CATEGORIES 4mm

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*	2.82E-7	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Non-hazardous(excluding inert) waste disposed *kg/FU*	0.287	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Radioactive waste disposed *kg/FU*	0.00155	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

OUTPUT FLOWS 4mm

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*	0.0403	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 5mm

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	
Global Warming Potential (GWP) - *kg CO_2 equiv/FU*	19.7	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*	1.42E-10	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*	0.139	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*	0.0107	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*	0.00728	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*	0.00015	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*	214	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 5mm

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*	11.5	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*	11.5	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*	218	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*	218	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of secondary material *kg/FU*	0.914	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	0.0737	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

WASTE CATEGORIES 5mm

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*	3.44E-7	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Non-hazardous(excluding inert) waste disposed *kg/FU*	0.353	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Radioactive waste disposed *kg/FU*	0.00181	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

OUTPUT FLOWS 5mm

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*	0.05	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

Magnetron coated glass on SGG PLANILUX 6 mm

ENVIRONMENTAL IMPACTS 6mm

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	
Global Warming Potential (GWP) - *kg CO_2 equiv/FU*	23	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*	1.55E-10	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*	0.157	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*	0.0124	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*	0.00832	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*	0.000172	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*	249	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 6mm

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*	12.8	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*	12.8	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*	254	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*	254	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of secondary material *kg/FU*	1.1	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	0.0819	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

WASTE CATEGORIES 6mm

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*	4.07E-7	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Non-hazardous(excluding inert) waste disposed *kg/FU*	0.418	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Radioactive waste disposed *kg/FU*	0.00207	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

OUTPUT FLOWS 6mm

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*	0.0596	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

Magnetron coated glass on SGG PLANILUX 8 mm

ENVIRONMENTAL IMPACTS 8mm

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	
Global Warming Potential (GWP) - *kg CO_2 equiv/FU*	29.4	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*	1.8E-10	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*	0.195	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*	0.0159	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*	0.0104	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*	0.000216	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*	320	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 8mm

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*	15.4	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*	15.4	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*	327	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*	327	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of secondary material *kg/FU*	1.46	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	0.0984	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

WASTE CATEGORIES 8mm

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*	5.32E-7	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Non-hazardous(excluding inert) waste disposed *kg/FU*	0.548	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Radioactive waste disposed *kg/FU*	0.00259	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

OUTPUT FLOWS 8mm

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*	0.079	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

Magnetron coated glass on SGG PLANILUX10 mm

ENVIRONMENTAL IMPACTS 10mm

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	
Global Warming Potential (GWP) - *kg CO_2 equiv/FU*	35.9	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*	2.05E-10	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*	0.232	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*	0.0195	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*	0.0125	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*	0.000261	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*	391	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 10mm

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*	18.1	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*	18.1	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*	399	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*	399	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of secondary material *kg/FU*	1.83	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	0.115	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

WASTE CATEGORIES 10mm

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*	6.57E-7	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Non-hazardous(excluding inert) waste disposed *kg/FU*	0.678	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Radioactive waste disposed *kg/FU*	0.00311	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

OUTPUT FLOWS 10mm

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*	0.0984	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

Magnetron coated glass on SGG PLANILUX 12 mm

ENVIRONMENTAL IMPACTS 12mm

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	
Global Warming Potential (GWP) - *kg CO_2 equiv/FU*	42.4	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*	2.31E-10	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*	0.27	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*	0.023	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*	0.0145	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*	0.000305	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*	462	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 12mm

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*	20.8	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*	20.8	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*	471	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*	471	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of secondary material *kg/FU*	2.19	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	0.131	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

WASTE CATEGORIES 12mm

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*	7.82E-7	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Non-hazardous(excluding inert) waste disposed *kg/FU*	0.809	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Radioactive waste disposed *kg/FU*	0.00363	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

OUTPUT FLOWS 12mm

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*	0.118	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 SGG PARSOL 3mm

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	
Global Warming Potential (GWP) - *kg CO_2 equiv/FU*	15.2	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*	1.48E-10	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*	0.116	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*	0.0057	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*	0.00579	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*	8.39E-5	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*	167	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 SGG PARSOL 3mm

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*	10.9	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*	10.9	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*	171	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*	171	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of secondary material *kg/FU*	1.79	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	0.0673	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

WASTE CATEGORIES SGG PARSOL 3mm

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*	2.22E-7	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Non-hazardous(excluding inert) waste disposed *kg/FU*	0.192	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Radioactive waste disposed *kg/FU*	0.00153	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

OUTPUT FLOWS SGG PARSOL 3mm

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*	0.00149	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 3.5mm

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	
Global Warming Potential (GWP) - *kg CO_2 equiv/FU*	17.1	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*	1.59E-10	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*	0.128	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*	0.00635	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*	0.00641	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*	9.15E-5	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*	188	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 3.5mm

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*	11.9	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*	11.9	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*	193	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*	193	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of secondary material *kg/FU*	2.08	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	0.0731	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

WASTE CATEGORIES 3.5mm

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*	2.54E-7	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Non-hazardous(excluding inert) waste disposed *kg/FU*	0.22	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Radioactive waste disposed *kg/FU*	0.0017	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

OUTPUT FLOWS 3.5mm

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*	0.00149	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 4mm

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	
Global Warming Potential (GWP) - *kg CO_2 equiv/FU*	19.1	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*	1.71E-10	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*	0.14	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*	0.00699	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*	0.00702	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*	9.9E-5	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*	210	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 4mm

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*	12.9	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*	12.9	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*	215	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*	215	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of secondary material *kg/FU*	2.38	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	0.079	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

WASTE CATEGORIES 4mm

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*	2.86E-7	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Non-hazardous(excluding inert) waste disposed *kg/FU*	0.247	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Radioactive waste disposed *kg/FU*	0.00187	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

OUTPUT FLOWS 4mm

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*	0.00149	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

Magnetron coated glass on SGG PARSOL 5 mm

ENVIRONMENTAL IMPACTS 5mm

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	
Global Warming Potential (GWP) - *kg CO_2 equiv/FU*	23	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*	1.94E-10	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*	0.163	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*	0.00828	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*	0.00825	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*	0.000114	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*	253	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 5mm

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*	14.9	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*	14.9	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*	259	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*	259	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of secondary material *kg/FU*	2.97	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	0.0906	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

WASTE CATEGORIES 5mm

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*	23.49E-7	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Non-hazardous(excluding inert) waste disposed *kg/FU*	0.303	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Radioactive waste disposed *kg/FU*	0.00221	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

OUTPUT FLOWS 5mm

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*	0.00149	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 6mm

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	
Global Warming Potential (GWP) - *kg CO_2 equiv/FU*	26.9	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*	2.17E-10	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*	0.187	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*	0.00956	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*	0.00949	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*	0.000129	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*	297	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 6mm

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*	16.9	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*	16.9	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*	303	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*	303	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of secondary material *kg/FU*	3.57	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	0.102	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

WASTE CATEGORIES 6mm

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*	4.13E-7	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Non-hazardous(excluding inert) waste disposed *kg/FU*	0.358	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Radioactive waste disposed *kg/FU*	0.00255	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

OUTPUT FLOWS 6mm

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*	0.00149	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 8mm

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	
Global Warming Potential (GWP) - *kg CO_2 equiv/FU*	34.6	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*	2.64E-10	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*	0.234	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*	0.0121	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*	0.012	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*	0.00016	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*	383	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 8mm

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*	21	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*	21	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*	392	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*	392	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
 Use of secondary material *kg/FU*	4.76	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*	0.125	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

WASTE CATEGORIES 8mm

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*	5.4E-7	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Non-hazardous(excluding inert) waste disposed *kg/FU*	0.468	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Radioactive waste disposed *kg/FU*	0.00323	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

OUTPUT FLOWS 8mm

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*	0.00149	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 magnetron coated glass. main impacts are linked to the production of glass.

Due to the low abiotic depletion elements of the glass, the impact of the use of metal oxides, even in a very low quantity, accounts for more than 30% of the ADP (Abiotic depletion potential) value.

In the production of the substrate for the magnetron coated glass. two main sources of impacts are found.

One is the energy consumed in the furnace and the other one is the impacts generated in the production of one of the main raw materials. the soda ash.

Soda ash is in the origin of more than 25% of the GWP (global warming potential). more than 60% of the abiotic depletion for non fossil fuels (ADP elements) and more than 20% of the energy consumption.

		Environmental impacts (A1-A3) Magnetron coated glass on SGG PLANILUX 6mm	**Unit**
	Global warming	**23**	Kg CO_2 equiv/FU
	Non-Renewable resources consumption[1]	**249**	MJ/FU
	Energy consumption[2]	**266.8**	MJ/FU
	Water consumption[3]	**0.0819**	M^3/FU
	Waste production[4]	**0.420**	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 (renewable and non-renewable)
[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, flat glass is an inert material that does not release any inorganic & organic compounds. in particular no VOC (volatile organic compounds).

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

(Required for LEED v4 Building product disclosure and optimization - sourcing of raw materials)

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 intent to discard it and therefore it would never have entered the solid waste stream.

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.

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